School District of Philadelphia
Office of Environmental Management & Services
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# CHEMICAL MANAGEMENT PLAN:

# Material Safety Data Sheets For All Approved Chemicals

The School District of Philadelphia
Office of Environmental Management Services

# Chemical Management Plan

## *Science +Chemicals =A Safer Green Environment*

## A Guide for Science Teachers within the School District of Philadelphia

June 2009

Dear Educators:

The School District of Philadelphia has developed for you the ***Chemical Management Plan, Science + Chemicals = A Safer Green Environment — A Guide for Science Teachers within the School District of Philadelphia***.

Research shows effective hands-on experiences dramatically enhance a student's educational experience. You, as a practitioner of this hands-on teaching method, know firsthand the value of laboratory time.

We believe you will find the ***Guide*** to be a useful tool to help you implement practices that will reduce your exposure to such incidents. The ***Guide*** will discuss the School District's internal policies on how to purchase chemicals, manage chemicals once they are in your laboratory and how to deal with unwanted chemicals. The ***Guide*** will also provide information on how you can scale down experiments and substitute material without reducing the experience for the student.

If you have any questions regarding ***Chemical Management Plan***, ***Science + Chemicals = A Safer Green Environment— A Guide for Science Teachers within the School District of Philadelphia***., please do not hesitate to contact the School District of Philadelphia, Office of Environmental Management and Services at 440 North Broad Street, Philadelphia, PA 19130, or Mrs. Francine Locke at 215-400-5213 or Mr. Jerrry Junod at 215-400-6738.

## Disclaimer

This document was conceived off of four primary publications:

The ***Laboratory Waste Minimization and Pollution Prevention, A Guide for Teachers in Pennsylvania***, June 2003, by the Pacific Northwest National Laboratory, operated by Battelle Memorial Institute for the U.S. Department of Energy under Contract DE-AC06- 76RLO 1830.;

The ***Safety Guidelines for Technology Education & Elementary Science/Technology Education***, Pennsylvania Department of Education, Bureau of Curriculum and Academic Services, Division of Curriculum and Instruction.

***Schools Chemical Cleanout Campaign Lessons Learned Report***, January 30, 2009, TechLaw, Inc, for the USEPA.

***School Chemistry Laboratory Safety Guide***, October 2006, NIOSH, US Consumer Product Safety Commission and CDC.

The following information has been updated as of June 2009, but certain information may still be outdated or no longer relevant. Please use this guide as a tool for further investigation into appropriate processes to minimize laboratory waste and adhere to safe disposal practices. If you are not completely certain what procedures to follow, please contact one of the contacts in this publication.

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# 1 Introduction

This guide explains how you can minimize the need for chemicals used in your science departments and also decrease the hazardous wastes and other chemical pollution generated by experiments that are performed in classroom laboratories. It is intended mainly for middle and high school science teachers.

Our goal is to make a safe and green environment for our students and faculty, by generating less waste and pollution and save money by purchasing chemicals effectively.

**Specifically, this guide will help you:**

- ✓ Purchase only approved and necessary chemicals for your curriculum
- ✓ Substitute safer chemicals for hazardous chemicals
- ✓ Properly label, segregate, and store your chemicals
- ✓ Maintain chemical inventories and Material Safety Data Sheets (MSDS) for these chemicals
- ✓ Deal with a large inventory of mislabeled or unlabeled chemicals that were left by another teacher.
- ✓ Communicate the importance of waste minimization to school administrators.
- ✓ Recycle chemicals.
- ✓ Teach students environmental responsibility as you teach them to perform experiments.

This guide deals primarily with chemicals that will be used in a chemistry or biology laboratory in an educational institution. It does not deal with radioactive materials as no school is allowed to possess these materials at any time.

Because this guide is intended for teachers ranging from middle school to high school, not all guidelines apply to everyone. For example, guidance to substitute cyclohexane for benzene would be irrelevant to a middle school science teacher, whose students would never use a substance as hazardous as benzene. Similarly, a high school teacher might not have access to the resources needed to obtain the equipment necessary to do microscale experiments. If a guideline doesn't apply to you, it may give you other ideas. If you feel a guideline may be very helpful but you do not have the resources to implement it, you may want to approach your administration and request the necessary resources.

We realize that, as a teacher, you are subject to many pressures. We don't want waste minimization and pollution prevention to become another burden. It is our intention that this guide will provide you with information to help you deal with important waste minimization issues in the easiest manner possible. In fact, you should find that minimizing waste will simplify other jobs that you currently perform, such as disposing of chemicals and dealing with excess inventory.

# 2 WHY IS THIS NEEDED?

The United States Environmental Protection Agency (US EPA) and our School District have been completing detailed environmental audits of our schools and other schools in Pennsylvania for over a year. The results of the audits have opened our eyes to the lack of management of the chemicals related to our school science labs.

During the EPA's Schools Chemical Cleanout Campaign (SC3) the notable findings included that:

- schools possessed large quantities of expired chemicals;
- many chemicals were not properly stored;
- most schools had not designated a Chemical Coordinator;
- most schools had not developed a Chemical Management Plan, and;
- most schools did not have the appropriate safety equipment needed to respond to a chemical spill.

In our audit work, we found these similar issues including that chemical purchases were not being managed or controlled, schools were excepting chemicals from private donations without any limitations or oversight, some very hazardous chemicals were being stored at the school which should have never been accepted/purchased, and no Material Safety Data Sheets (MSDS) for the chemicals were on site. We have found numerous instances were chemicals at a school included those that are not appropriate for students under the age of 18. These chemicals included those that are highly reactive, carcinogenic and shock sensitive.

Another trend that we noted was that large chemical cleanouts were being completed every 3 to 5 yrs in the science labs yet the same repeat issues are being identified. Full chemical inventories were being completed but never maintained by the schools. Therefore they are no longer valid and must be redone. This is not only a potential safety issue but also it is a high economic cost to the schools and tax payers.

The handling of the chemical waste at the schools has included the inappropriate practice of disposing of these materials down the drain. Chemicals are not permitted to be disposed down sink drains. This is a violation of the Clean Water Act and local sewer ordinances with the City of Philadelphia.

# 3 RESPONSIBILITIES

It is the responsibility of schools to ensure that chemicals and their wastes are safely and legally handled and disposed of properly. The school board, superintendent, the district safety coordinator, the administrator (principal and/or department head) and the teacher are all responsible for a safe working environment. The school board, the administration and the instructor have the legal responsibility to provide a safe environment for students to work while they are participating in technology education activities.

## *School Board/Superintendent/District Department Head*

The school district controls budget, curriculum and personnel policy to a major degree. Without district level support, safety program effectiveness will at best be spotty--conducted by dedicated personnel and ignored by others.

A strong comprehensive plan must have involvement and support from the district level administrators. This can be accomplished by instituting a strong chemical management program which includes some of the following elements:

- Enforce that only approved chemicals that are warranted and are safe for our students and staff are allowed in a school setting;
- Mandating current chemical inventories to be maintained;
- Requiring current MSDS for each chemicals stored;
- Demand the proper storage and disposal of all chemicals; and
- Insist on proper labeling of the chemical storage areas.

Your school's administrators can:

- secure necessary funding and other resources
- play an active role in helping you carry out your program (for instance, by interacting with chemical suppliers or tracking waste minimization savings)
- identify other schools and institutions carrying out similar programs that can aid your efforts
- provide special services that will help your program, such as identifying sources of federal grants to apply for.

School administrators may not initially recognize the importance of waste minimization in your activities, or realize how waste minimization can benefit the school. This may simply be because they don't speak the technical language (for example, they may not know why chemicals like carbon tetrachloride are bad for the environment). Or maybe your administrators do not realize the bottom-line savings that a waste minimization program can provide, or how waste minimization benefits the school's community.

However, administrators, like teachers, students, and your community, are concerned about the environment. You may be amazed at the amount of support you receive once they understand the environmental, financial, and community benefits of waste minimization activities.

### *Individual School Principal and/or Science Department Head*

The individual school is the central unit of an educational enterprise. Therefore, the building principal is likely to be the administrator who is most directly responsible for the school's science program. If a specialized supervisor or department head functions with the principal and works directly with teachers, some of the responsibilities for the chemical management program may be delegated.

Your primary role would be to enforce that the chemical management programs is put in place through training of the staff, follow up on the implementation of the program and verification that the program is being followed at all times.

### *The Teacher*

The **major** responsibility for daily chemical management and laboratory safety falls on the teacher. The teacher is the person who directly interacts with the students in the lab and around the chemicals. The teachers have full access to the chemicals and how they are used, stored and disposed. If as a teacher, you have concerns over chemical management you must bring these concerns up to your school principal and/or science department head immediately.

As the facilitator of the program, you need to follow the chemical management program and look to improve the department to the best of your ability. Proper management of chemicals can lead to a green and safe environment for both yourself and the student that you interact with.

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# 4 What are Waste Minimization and Pollution Prevention?

Pollution prevention means **not** generating waste in the first place by reducing it at the source. Waste minimization is a broader term that also includes recycling and other means to reduce the amount of waste which must be treated/disposed of.

A *waste chemical* is a chemical that has no further use. A *hazardous waste* is a chemical that presents a danger to people or the environment. Regulatory agencies determine which chemicals are considered hazardous. Sometimes, specific chemicals are regulated as hazardous substances (e.g., benzene or carbon tetrachloride). Other times, chemicals or chemical mixtures are regulated based on their hazardous characteristics, such as ignitability, reactivity, corrosivity, and toxicity.

Most hazardous waste definitions and requirements are set by the federal government; however, some states have differing definitions and requirements. In Pennsylvania, the Department of Environmental Protection (DEP) oversees the regulation of hazardous waste.

Because this guidance focuses on waste minimization, we won't go into more detail on hazardous waste regulation. However, keep in mind that meeting regulatory requirements is a key part of the

proper management of laboratory waste. It is important to be familiar with the requirements covering lab waste developed by agencies such as:

- The City of Philadelphia Fire Department
- The City of Philadelphia local sewer agency
- PennSafe (OSHA does not apply to public schools)
- PA Department of Environmental Protection (DEP)
- U.S. Environmental Protection Agency (EPA)

## *THE WASTE MANAGEMENT HIERARCHY*

There are a variety of methods to deal with the problem of chemical laboratory wastes.

**The Waste Management Hierarchy**

**Best Method---**Reduce waste production at the source.

**Second Choice---**Recover and reuse wastes on-site (i.e., recycling).

**Third Choice---**Recycle off-site.

**Fourth Choice---**Treat wastes to reduce volume or toxicity.

**Fifth Choice---**Dispose of wastes in a manner that protects air, water quality, land quality, and human health and safety.

**Last Choice**---Landfill a waste.

The waste management hierarchy above shows methods of dealing with hazardous waste, in order of preference. The most preferable option on the hierarchy is to reduce the amount of waste that is produced in the first place. This approach—known as source reduction—means that no one has to deal with the waste at all. This is the cornerstone of pollution prevention.

Unfortunately, not all waste can be eliminated, and the waste that is generated must be dealt with. The second best option for managing this waste includes recycling, refining, or recovering the waste for reuse so that new raw materials are not required and so that waste pollutants never reach the land (e.g., a landfill), the water, or the atmosphere, and resources are conserved.

If that is not possible, the next best option would be to treat the waste to reduce its toxicity and its

potential for harming the environment.

The least preferred management method for hazardous wastes (and non-hazardous wastes) is disposal by landfilling or incineration with proper disposal of the residual ash.

While each of these options may be necessary for managing waste at certain times, it is in our best interests to always try to "move up the management hierarchy" with the wastes we generate. At the top of the hierarchy, source reduction should be the cornerstone of our efforts. It is the emphasis of this guide.

# 5 Why are Waste Minimization and Pollution Prevention Important?

There are a number of reasons.

Waste minimization and pollution prevention are environmentally responsible. By reducing wastes at the source, you are taking the most effective step towards eliminating wastes that would otherwise be released to the environment. Schools are highly visible members of the community, and waste minimization provides the opportunity to set an example for the community, even if a school generates relatively little waste.

Practicing waste minimization and pollution prevention in schools teaches environmental responsibility. By emphasizing the importance of these approaches to your students, you can help instill habits that will be of value the rest of their lives—in the laboratory, on the job, and at home.

Waste minimization and pollution prevention encourage safety in the laboratory. Hazardous wastes can be hazardous to students and teachers, as well as to the environment. If you reduce the quantity of hazardous substances they handle, you reduce the hazard.

Waste minimization and pollution prevention save money. One effective waste minimization practice is to reduce the quantity of chemicals purchased, which in turn reduces the amount of money that is tied up in chemical inventory. Reducing chemical use will also reduce disposal costs, which can run from $6 to $41 per kilogram.

Finally, waste minimization and pollution prevention help ensure schools meet legal requirements. There are federal, state, and even local laws that govern waste disposal. Many schools may be violating some of these laws right now. The best way to comply with these laws is to not generate the waste in the first place.

So how do you minimize waste? Beginning with the next chapter, we'll present some specific suggestions.

# 6 Purchasing Chemicals

Effective waste minimization begins with effective purchasing decisions. The idea is to buy only what you need, because if you don't buy it, you don't have to get rid of it.

The American Chemical Society estimates that unused chemicals can constitute up to 40% of the wastes generated by a lab. In many schools, unused chemicals have not made it into the waste stream—yet. These schools have an inventory of unused chemicals left over by former teachers or researchers. These chemicals can be a problem for everyone. They may be useless (or even unstable) because their shelf life has expired. Containers may be in poor condition. They may be poorly labeled, illegally labeled, or unlabeled. Unused chemicals can present a safety hazard in the lab and are likely to be difficult and expensive to dispose of.

Chapter 6 will present some specific recommendations for dealing with these inventories. This chapter will tell you what you can do to prevent these inventories from accumulating—preventing damage to the environment, your budget, and your relationship with your successor.

## *The myth of buying in bulk*

All teachers estimate the quantity of a chemical that they will need before purchasing that chemical. Problems arise when these estimates are inaccurate. The simplest way to increase the accuracy of an estimate is to shorten the time horizon; in other words, if you estimate the quantity of a chemical that you will need for a single experiment, that estimate is likely to be more accurate than an estimate of how much you will need for an entire year. If you buy smaller quantities more often, your inventory should shrink.

The problem, many believe, is that it is cheaper to buy chemicals in bulk. When you buy in bulk, you spend less time placing orders, you worry less about shipments arriving on time, and many chemical suppliers will give discounts when a large quantity is purchased.

An important fact to consider, however, is that the cost savings associated with buying in bulk are frequently offset by the costs of disposing of the unused chemicals. The following table presents an example.

**The Effect of Disposal Costs**

| | Package Size | |
|---|---|---|
| *If 1000 mL are used...* | *500mL* | *2500mL* |
| Unit cost | 6.25¢mL | 4.2¢mL |
| Purchase cost | $62.00 | $104.00 |
| Disposal cost | 0.00 | 45.34 |
| Total cost | $62.00 | $149.34 |

| ***Actual unit cost*** | ***6.21¢mL*** | ***15.0¢mL*** |
|---|---|---|
| *If 1677 mL are used…* | *500 mL* | *2500mL* |
| Unit cost | 6.25¢mL | 4.2¢mL |
| Purchase cost | $124.00 | $104.00 |
| Disposal cost | $13.08 | $45.34 |
| Total cost | $137.08 | $149.34 |
| **Actual unit cost** | **8.20¢mL** | **8.9¢mL** |

In this example, even though the 2500-mL size costs 37% less than the 500-mL size to purchase, the larger size can cost up to about 250% *more* to use once disposal costs are factored in.

## *School District Approved Chemicals*

The School District of Philadelphia has an "Approved" chemical list. Only those chemicals identified on list of 279 chemicals are allowed to be in a school science department. These chemicals have a known science curriculum need and lower overall hazards for our students. A copy of the Approved Chemical List is in Appendix A.

Teachers, who may have an individual need for a chemical that is not on the approved list, may request "Project Specific Approval". This request would be made in writing to the School District's Office of Environmental Management and Service. The forms for such request can be found in Appendix B of this management plan. Approval will not be given for any chemical which are known carcinogens or have high hazards rankings.

## *Other Purchasing Strategies*

In addition to buying chemicals in smaller amounts, there are other purchasing strategies that can reduce the amount of chemical waste generated.

- Select a chemical supplier who will support waste minimization efforts. Find a supplier who can deliver small amounts of chemicals on short notice and who will accept unopened chemicals that are returned.

- Look for safer greener alternative chemicals to complete the needed curriculum element. Ask suppliers, other teachers, or even look to District Department Head for suggestions. The DEP and EPA are also a source that maybe able to assist.

- Allow only one person to complete all the chemical purchasing at your school. This person will be aware of the "big picture" and may be able to point out purchases that can be consolidated.

- It may help to create a "Required Use List" for the chemicals. Therefore the known use, teacher, and curriculum for that item is known. If it is found that the chemical is not used due to a change in the curriculum or teacher need, then there is no need to further order this item in the future and the current chemical can be placed aside for proper disposal. This can serve to steer

# 7 Managing Chemical Inventories

Managing chemical inventories effectively can prevent many of the ills that plague environmental managers: unknown chemicals, excessive inventory stocks, and poor use of materials. By managing chemical inventories in a few simple but effective ways, you can avoid many of these problems.

## *Label Chemicals Properly*

Proper labeling is a simple and powerful way to reduce many of the environmental hazards and costs associated with chemicals used in the laboratory. Since science teachers and students are responsible for producing chemicals wastes, they should shoulder the responsibility for identifying the wastes. Mixing unknown or improperly identified wastes can produce dangerous reactions; people have been injured and killed at waste treatment facilities because wastes were poorly identified and packaged.

Consider also the costs of mislabeled or unidentified chemicals on your shelf: the cost of analyzing a chemical prior to disposal can exceed $1,000, by one estimate, many times the original cost of the product. Properly labeling containers also decreases the risk of accidents and injuries, and aids in complying with regulatory requirements such as hazard communication to the local fire department.

Some recommendations for labeling are:

- Establish a policy that requires identifying all chemical containers—including waste containers—and specifying a responsible party.
- Adopt a standard labeling procedure for chemicals and wastes.
- Use labels that are colorfast and permanent.
- Do not use non-laboratory grade containers (ex. Tupperware, empty soda bottles, ketchup containers)

## *Store Chemicals In A Centralized Place*

Laboratories often use a wide variety of toxic, corrosive, reactive and flammable chemicals in small containers. These chemicals should all be stored in a designated, centralized place. Even a small middle school chemistry program should establish a designated chemical storage area.

See Chapter 7 for more data on chemical storage and segregation.

## *Guidelines for Conducting a Chemical Inventory*

The first step in developing a comprehensive chemical health and safety plan is to inventory existing chemicals. This may pose significant risks to the individuals taking the inventory and ample time should be allowed to properly conduct the inventory. Only those who have technical knowledge about the chemicals should be involved in the inventory; students should never be involved! In some cases an inventory may take two people many hours to complete; it's important not to underestimate the amount of time required to complete the inventory. Administrators may not be aware of the time commitment and the importance of an accurate inventory, therefore it is very important to educate them. If you are new to the school and/or a recent inventory has not been conducted you need to be especially cautious. Serious injury can result from touching or moving chemicals that have become shock sensitive or pressurized.

**If any chemical container is unmarked, bulging, leaking, rusted, cracked, or has a degraded top, liquid above a solid, or crystals in a liquid, it should not be moved, even for the inventory.**

It is best to be cautious! In most cases the inventory will need to be used to generate a disposal list and to determine the quality of the chemicals to be retained. Hazardous waste removal companies require very specific information. Therefore, it is important to include as much information about the chemical to avoid unexpected price changes. For example, anhydrous aluminum chloride is much more expensive to dispose of than is hydrated aluminum chloride. In developing a disposal list it is important to list the proper chemical name, the size of the container and the approximate amount present.

## *Suggested Procedure:*

1. Allow ample time to conduct the inventory.

2. Have a plan to deal with potential explosives if they are found. Will the local or state bomb squad remove the potential explosives? What agencies need to be alerted? What is the procedure for removal of potential explosives? Will the school have to close until the chemical is removed? Notify your local authority (e.g. fire dept.) that you will be doing an inventory, especially if this is the first inventory in several years.

3. Work in pairs and never work alone. It is best if one team does the entire inventory.

4. Be sure the areas in which you are working have adequate lighting.

5. Wear appropriate personal protective equipment. This should include gloves, chemical splash goggles, a lab apron and closed toed shoes.

6. Provide access to a phone, eyewash and a safety shower.

7. Have a written response plan nearby in case of a spill or accident.

8. One person should act as the recorder and the other person should list the chemicals. Be sure to pronounce the chemical correctly; the recorder should read the chemical name after it is recorded to confirm it is correct.

9. Enter the storage area and develop a general feel for the area. Is this a room in which no one has been in five years? Are there obvious vapors; are broken containers present? Are the shelving units secured to the walls? How is the lighting? If above eye level storage is present use a safety step stool or a small

step-ladder to reach the top shelf.

10. Record the room number and the date on your record sheet. Also indicate where in the room the inventory begins. Starting on the top shelf record the name of each chemical, the size of the container, the type of container, the approximate amount of chemical present, the condition of the container (i.e. rust, cracks, degraded top, bulging, liquid above a solid, crystals in a liquid), the presence of spills, defects in the shelving or its supports, corroded wires or gas lines or any other indicator of a hazard present. Do not touch or move chemicals if they are listed as potential explosives or the container appears distorted in any manner.

**Serious injury can occur from merely touching the top of a container of picric acid or expired ethyl ether. Use extreme caution not to knock any container to the floor.**

11. Be sure you examine all containers and record as much information as possible. For example, if ethyl ether is present record its lot number, expiration date and the manufacturer. **Do not touch the container.** You only want to conduct the inventory once and you want to gather as much information as possible. If the inventory is conducted over several days be sure you mark where you stopped at the end of the day.

12. If kits are present be sure to inventory all chemicals in each kit. Many older kits may contain unlabeled chemicals with only manufacturer's numbers on them. Although kits are particularly time consuming to inventory, each container must be identified. Record the manufacturer, the chemical number, and the size of the container and any information concerning the manufacturer such as phone number and address as well as the kit identification number. Do not ignore the kits; many contain carcinogens such as cadmium powder or toxic chemicals such as sodium azide.

13. If preserved specimens are present, record the preservative used. Contact the supplier to determine if the specimens are capable of outgassing formaldehyde. Many specimens contain some formaldehyde.

14. Be sure to examine all areas in each room including desks.

15. Once the inventory is developed, the next step is to decide if any immediate response is required. Does any chemical present pose a significant risk if not addressed immediately? This is a difficult question to answer particularly if potentially explosive chemicals are present. If you have a chemical health and safety committee or a chemical hygiene/safety officer they should discuss the situation with the principal and the local fire chief.

This inventory procedure was adapted from Chem Info Net. Additional information can be found on their web site, http://cheminfonet.org. Conducting a chemical inventory may be hazardous and those who do so should proceed with extreme caution. A school should consider contracting a licensed Hazardous Waste disposal firm to conduct the inventory and dispose of any hazardous waste.

## *Track Chemicals From "Cradle To Grave"*

An effective chemical tracking system and inventory control is essential to waste minimization. For instance, by tracking chemical purchases and shelf life, you can identify how frequently materials are used, dispose of chemicals as shelf life expires, identify chemicals for exchange with other schools, reduce quantities purchased so that chemicals are completely used before their shelf life expires, and minimize needless waste.

The chemical tracking system should be designed to track chemicals from the time they are purchased through the time when they are used, and ultimately disposed. A tracking system should provide information on who uses chemicals and where chemicals are kept. The "cradle-to-grave" tracking system you develop will depend on the resources you have at your disposal to revise your current inventory control, the demands on your chemical inventory, and the scale of your laboratory operations. A good chemical inventory system will provide the chemicals needed in the right amount with a minimum hassle, and maximize efficient chemical use and distribution.

A cradle-to-grave tracking system includes a centralized inventory space, a file or data management system, and a person assigned to overseeing chemical inventory control and distribution. The inventory control system can be relatively straightforward or very complex, using the latest inventory management methods. Very easy to use inventory systems are available from such vendors as Baker Chem, Flinn, and the American Chemical Society for about $200. Alternatively, many off-the-shelf software packages such as Excel, Lotus 1-2-3, or FoxPro can be used to track chemical inventories. Some inventory system options include

- Always compare  new purchasing requests to your current chemical inventory so that excess chemicals in stock can be used before buying more, or ensure that purchasers regularly check the inventory to avoid overstocking chemicals.

- If materials are not centralized, conduct a school-wide inventory to identify where chemicals are located to facilitate sharing, and identify expired chemicals that should be disposed of. Provide a simple monthly listing to chemical users on available chemical stocks, location, and points-of-contact.

- Date chemical purchases and rotate chemical stocks using a "first in, first out" rotation; in other words, use the oldest chemicals first.

- Conduct regularly scheduled inventory audits or review “Required Needs List” to identify chemicals that aren't being used, and use this data when reviewing future chemical purchases to cut down on excess inventory going to waste.

- Regularly "purge" chemicals that are no longer used, if possible, and list them with the local chemical exchange. Also, return expired materials to the supplier, if possible.

## *Storing Waste Prior To Disposal*

Storing wastes should follow many of the same practices used for storing virgin chemicals. That is, wastes should be clearly labeled, they should be grouped and segregated according to type, and they should be tracked. Here are some general suggestions for how to store waste, whether or not it is legally considered hazardous:

- If you know that the waste is hazardous, label the waste with the words "Hazardous Waste," the date, and the type of hazard of the material (corrosive, explosive, etc.). Otherwise, label your waste with the words "Potentially Hazardous Waste," the date, and the type of hazard. A waste label should provide as much information as possible.

- As with all chemical storage containers, make sure the waste storage container is compatible with its contents. Keep it tightly closed.

- Segregate all wastes based on chemical incompatibilities.

- Store so you can inspect it all (e.g., don't pile containers on top of each other). Inspect the waste regularly for damage to containers or leaks.

- Make sure that any people handling the waste are familiar with the hazards associated with it, as well as with the regulations governing waste handling and storage.

Finally, keep in mind that storing waste isn't the end of the story—you need to have a plan in place for disposing of the waste. Even small science programs are limited in the amount of hazardous waste they can accumulate on-site at any one time. Under federal law, if you accumulate over 1,000 kg of hazardous waste, you will be subject to considerable regulation; state and local laws may impose lower limits than federal regulations. See Chapter 6 for more information on waste disposal or contact the School District's Office of Environmental Management and Services for more information on chemical waste storage and disposal.

# 8 Dealing with an Existing Inventory of Unwanted Chemicals

If you have inherited a cabinet full of poorly labeled or even unlabeled chemicals from a previous teacher, you are not alone. Many teachers are left with stockpiled chemicals and don't know how to deal with them in a manner that does not present a danger to the environment—or even to themselves or their students.

Old inventories are a common problem. In 1986, a survey was conducted of over 100 secondary schools in Massachusetts. These schools reported that they had 8700 pounds and 500 gallons of unwanted chemicals. Forty-eight percent of the respondents said that chemicals had never been removed from their inventory. A survey of Illinois schools revealed similar problems.

These inventories tend to sit around because it is too much trouble to dispose of them properly. However, the truth is that these inventories are a huge liability—an accident waiting to happen. Dealing with an exposure to a student, teacher, or staff member will be a lot more trouble than safely disposing of the inventory.

## *Getting Help*

The first step in dealing with an unwanted inventory is to realize that stockpiled chemicals are not just your problem—they're the school district's problem and even the city, county, or state's problem. The district and local and regional government have an obligation to help and you will need their help to dispose of the stockpile safely.

Both the EPA and PADEP have a number of programs in place to help schools and individuals dispose of unwanted chemicals and hazardous materials. Our School District has contractors who specialize in chemical waste disposal who assist us regularly with these matters.

With some ingenuity, you may be able to secure other forms of assistance. For example, you may be able to enlist the help of a graduate student, whose time would be funded by a university, to assess and help you deal with the problem.

No matter what your situation, the School District's Office of Environmental Management and Services should be your first contacts in trying to solve your problem.

School District of Philadelphia
Office of Environmental Management & Services
440 North Broad Street
Philadelphia, PA 19130
215-400-5213 p
215-400-4751 f

## *Disposing of Expired, Unneeded or Non-Approved Chemicals*

If you know what a chemical is and can safely and legally dispose of it through your Building Engineer's waste pickups, then do so. But don't expect to be able to dispose of a hazardous or unlabeled inventory yourself. It's a job for professionals—you will probably need to hire a hazardous waste disposal contractor to properly pack and dispose of these chemicals. Again, the School District Office

of Environmental Management and Service can assist you and has the licensed contractors who can do the work properly.

***Remember that if a chemical is hazardous or you don't know what it is, you can't throw it in the trash or pour it down the drain.***

## *Making Sure It Doesn't Happen Again*

So, once you dispose of your inventory, work to keep excess inventory from accumulating again. That's a good policy even if you have an unmanageable inventory. Don't let the problem get any worse. It may also be a good idea to set aside time each marking period and then deliberately search for and dispose of unwanted chemicals on an incremental basis.

Ironically, inventories of dangerous chemicals may accumulate as schools switch to safer chemicals. If you discontinue use of a dangerous chemical, by all means get rid of the hazardous chemical at that time.

# 9 Proper Chemical Storage

Proper chemical storage controls health or physical hazards posed by chemical compounds during storage in the lab. It is designed to 1) protect flammables from ignition; 2) minimize the potential of exposure to poisons; and 3) segregate incompatible compounds to prevent their accidental mixing (via spills, residues, fires or human error). These guidelines are not only a good management practice but also required by law and fire codes. The City of Philadelphia Fire Department has been working with the School District to help create a safe lab set up for all.

## *Segregation*

**Do not store chemicals alphabetically as a general group.** This may result in incompatibles appearing together on a shelf. Separate chemicals into their primary hazard class or organic and inorganic families and then related and compatible groups. Separation of chemical groups can be by different shelves within the same cabinet if spill containers are used.

The labels on several manufacturers' chemicals include a Storage Code. This color-coded bar provides a visible guide to storage compatibility by primary hazard class. Some of the groups may be further subdivided. The School District of Philadelphia requires that chemicals be systematically stored into five storage groups:

- **RED:** Flammable. Store in area segregated for flammable reagents.
- **BLUE**: Health Hazard. Toxic if inhaled, ingested or absorbed through skin. Store in secure area.
- **YELLOW**: Reactive and oxidizing reagent. May react violently with air, water or other substances. Store away from flammable and combustible materials.
- **WHITE**: Corrosive. May harm skin, eyes, mucous membranes. Store away from red-, yellow-, and blue-coded reagents.
- **GRAY, GREEN or ORANGE**: Presents no more than moderate hazard. For general chemical storage.

Store incompatible materials separately (e.g., keep flammables in a separate cabinet, away from oxidizers, acids from bases). Using a systematic order for storing your chemicals will not only help avoid accidents, it will make retrieval easier.

## *Storage*

The primary requirements for proper storage include:

- Store chemicals in cabinets and on shelving provided for such storage. Store chemicals in such a way as to reduce the risks of breakage and spills that could release materials into the environment. For example, glass containers should always have secondary containment, such as a heavy gauge plastic tub, in case of breakage. Make sure that the secondary containment material is compatible with the chemical stored.
- Record any spills or leaks and have a plan to respond to them.
- Periodically inspect stored chemicals for signs of leakage, poor storage practices, or any other

- Spill and leak protection should be available in chemical storerooms. Berms, sumps, or even simple plastic bins can be useful forms of protection. If necessary, showers, sinks, absorbent materials, and other sanitary and safety equipment should be readily available for cleaning up a spill.

- Keep chemical storage areas off limits to all students.

- Avoid storing chemicals on bench tops or in fume hoods. Store flammable materials in a Flammable Storage Cabinet. Also do not store chemicals on top of cabinets, and never store any material within 18 inches of the ceiling in sprinklered areas.

- Label all chemical containers, including samples, appropriately with the full name and hazard warning.

- Use secondary containment if the chemicals are stored near a sink or other drain or to segregate incompatible materials (e.g. acids and bases in a corrosive storage cabinet).

The School District of Philadelphia also requires the schools to keep Material Safety Data Sheets (MSDS) on hand and easily accessible for each chemical in your laboratory. Material Safety Data Sheets contain valuable information on chemical handling and storage, physical and chemical properties, transport, disposal, hazards and safety.

***The School District maintains the current MSDS for all "Approved" chemicals on the internal server at the following location: XXX***

A chemical segregation flow chart should be posted in all chemical storage rooms. A copy of such a flow chart can be found in Appendix C.

# 10 Conducting Experiment

Waste minimization in the laboratory doesn't necessarily require major changes in the way you run experiments. Some basic efforts to be more efficient and careful with experimental procedures can substantially reduce the amount of waste generated.

## *Teach—And Practice—Resource-Efficient Procedures*

A starting point for waste minimization is being efficient in your use of resources. If you, as a teacher, place emphasis on being sparing with chemical usage or use of other resources (such as water or electricity), then students will be more likely to pay attention to these resources as well. Getting students to think about the environmental consequences of their laboratory activities makes sense in any experiment. Some suggestions for teaching resource-efficient procedures include:

- Have students use solvents and other hazardous materials sparingly.
- Monitor experimental reactions closely and add additional chemicals only as necessary.
- Emphasize water conservation by reducing rinse times where possible.
- Be alert for opportunities to save electricity. For example, don't leave equipment running when it's not being used.

## *Set Up Experiments With Waste Minimization In Mind*

In addition to being just plain careful about chemical use, you can take a number of steps in the design and set up of experiments that will help to minimize waste. Chapter 9 will cover in detail the option of scaling down the size of experiments. Other steps you can take include:

- Pre-weigh chemicals for students. This will take more time on your part, but it will also make lab time more productive for the students.
- Have students work in teams. For example, pairing students can cut the number of chemicals that will be used in half. Pairing also teaches students to work together.
- Alternatively, you may want to demonstrate some experiments yourself, rather than having the whole class perform them.
- Set up a procedure to use spent or recovered solvents for an initial rinse, and save fresh solvents for use in the final rinse only.

Where feasible, include a step as part of the experiment that destroys or inactivates any hazardous products. Chapter 13 will cover "treatment" of hazardous waste materials in more detail. Certain hazardous chemicals such as acids and bases can be easily neutralized as a part of the experiment.

## *Encourage Students To Research Waste Minimization*

Finally, a good way to get students thinking about waste minimization as they run experiments is to have them actually research waste minimization techniques. You might think of including an experiment in your curriculum that actually gets the students to identify ways to minimize use of hazardous chemicals or generation of hazardous byproducts.

# 11 Scaling Down Experiment

Typically, educational experiments are designed at a macroscale level, with little thought about waste minimization. Most macroscale experiments can be easily scaled down and still achieve the same level of analytical rigor. Experimental quantities can be scaled down by about 50% with little effort or cost, or scaled down to 1/100th to 1/1000th of the original quantities using glassware and experiments designed for microexperimentation. The result—less waste, less student exposure, and fewer chemical purchases.

In upper-level chemistry courses, microscaling complements the use of analytical equipment such as chromatographs, spectrophotometers, nuclear magnetic resonance systems, etc. These systems require extremely small sample quantities for analysis.

## *Reduced Scale Chemistry*

If you cannot convert to true microscale chemistry, try decreasing experimental quantities by a third or half. A 50% reduction in quantities can usually be achieved with conventional glassware. Such scale reductions may require a few trial runs to ensure desired experimental results—a good exercise for students who volunteer for extra credit lab work. (Caution: Instructor supervision is important!)

## *Microscale Chemistry*

Microscale chemistry techniques and equipment can reduce chemical use by as many as three orders of magnitude. Efforts at developing classroom micro experiments for general, organic, inorganic, and physical chemistry courses have been and continue to be successful. Several student and instructor textbooks have been published. Some recommended textbooks are listed in Chapter 15. Two of these books (Ehrenkranz & Mauch, 1993, and Waterman & Thompson, 1993) are specifically intended for high school chemistry classes.

Micro techniques are also being explored and developed in radioactive chemistry and radiochemistry. Most microscale techniques can easily be mastered by beginning students, with proper instruction.

As an example, conventional experiments with solids use 10- to 50-gram amounts, while microscale experiments can use as little as 25-100 milligrams (mg). Similarly, experiments with liquids can be cut from 25-100 milliliters (mL) to 100-200 microliters (pL). Highly accurate density and specific gravity determinations can be achieved using less than 1 mL of liquid and a micropipette, rather than the conventional larger volumetric flask method, requiring up to 30 mL of the solution.

## *Implementing Microscale*

An inexpensive way to achieve an initial level of microscale would be to use flexible, small diameter polyethylene tubing instead of bent glass tubing to transfer gases, using micro pipettes, microburets, and Hirsch filtration funnels rather than the traditional larger size equivalents. (Note: Some of the plasticware may not be suitable for organics.)

To fully retrofit a conventional chemistry lab to microscale, some investment is necessary. Full microscale glassware kits cost up to $110 to $150 (advanced levels) per student (1994 prices). Analytical microscale equipment also adds to the initial cost. Typically, one piece of equipment (e.g., one electronic digital balance or one capillary melting point apparatus) suffices for 15 students.

These costs are typically recovered in nine months to three years (depending on the size and scope of the program). Chapter 14 provides possible strategies for acquiring funding or equipment to convert to microscale chemistry.

The National Microscale Chemistry Center (NMC2) at Merrimack College in North Andover, Massachusetts, offers a wealth of information on implementing mircorscale chemistry in the laboratory. You can visit their web site at http://www.silvertech.com/microscale. Many other colleges are practicing, or are converting to, microscale experimentation in their laboratories and may offer training or auditing of courses using microscale.

# 12 Substituting Materials

Substitution of hazardous chemicals in the laboratories with nonhazardous (or at least less-hazardous) chemicals is an important source reduction strategy. If you use nonhazardous chemicals in place of hazardous chemicals, you've gone a long way towards avoiding a hazardous waste problem. Substitution can sometimes be done in conjunction with scaling down quantities used in experiments (see Chapter 8), giving you a double savings. Both substitution and scaling down experiments should be considered before such options as reuse, recycling, or treatment. (Remember that, according to the waste management hierarchy, source reduction is always preferable to recycling, treatment, or disposal.)

Substitution of hazardous chemicals with non- or less-hazardous chemicals has been achieved by a number of secondary schools, as well as some high schools and introductory college chemistry courses. These schools have created laboratory curricula that rely on chemicals and compounds that can be purchased at the local grocery store, rather than from a chemical supplier. Below is a table that includes some of the possible substitutes for hazardous chemicals.

**Possible substitutes for hazardous chemicals**

| Procedure | Hazardous Chemical | Substitute |
|---|---|---|
| Glassware cleaning | Chromic-sulfuric acid solutions<br>Alcoholic potassium hydroxide | laboratory detergents, enzymatic cleaners, aqueous solvents |
| Density determination | methanol solution | sugar water |
| Organic synthesis | chromate ion | hypochlorite ion |

| | | |
|---|---|---|
| | ethyl ether | methyl t-butyl ether |
| Qualitative test for heavy metals | sulfide ion | hydroxide ion |
| Molecular weight determination freezing point lowering methods | benzene | cyclohexane |
| Temperature | mercury thermometers | red or green liquid thermometers |
| Storage of biological specimens | formaldehyde | ethanol or other preservatives |
| In-phase change and freezing depression | acetamide | stearic acid point |
| Qualitative test for halide ions | carbon tetrachloride | cyclohexane |
| Measurement of vapor pressure- by isotensiscope | carbon tetrachloride | isopropyl alcohol temperature |
| Acid-base experiments | conventional acids<br>conventional bases | vinegar<br>ammonia |

Table from *Less is Better* and Freeman, 1995, pg. 511

# 13 Alternatives to Wet Chemistry

In addition to substituting safer chemicals and reducing the scale of experimentation, you might also want to consider avoiding certain experiments altogether. While hands-on wet chemistry experience is important to a certain degree, there are good reasons for exploring alternatives such as instrumental analysis, computer simulation, or even videos. One important consideration is that commercial and industrial laboratories are moving away from wet chemistry and towards instrumentation and simulation whenever possible, so it is important for students to gain experiences with these techniques. In addition, of course, these techniques offer a means of minimizing or avoiding some chemical wastes.

## *Instrumentation*

Sample separation, purification, and other new techniques and equipment have advanced significantly in the last decade. However, many of the new instruments can be expensive, and can require users to be rather sophisticated. By and large, these instruments are more applicable to higher-level university science classes than to introductory science or chemistry courses.

Chapter 9 discussed several instruments related specifically to microscale experimentation. In addition, there are a number of other instruments that can perform important laboratory analyses with reduced chemical input requirements. Some of these instruments include:

- ion, liquid, and gas chromatographs El mass spectrophotometer
- IR and UV spectrophotometer II nuclear magnetic resonance (NMR)
- atomic absorption instrument II X-ray diffraction instrument

These highly sensitive instruments can reduce the quantities of analytes required for testing by 10- to 100-fold. For example, NMR analysis requires a 1 mL sample for quantitative analysis.

Again, many of these instruments may be beyond your budget, or may be inappropriate for the scale of your classes. However, keep in mind that just like other technologies (e.g., computers), they may become more affordable and easier to use in time.

## *Sample Preparation*

Another area where alternatives to wet chemistry exist is in the preparation of samples for analysis. Most samples require some extraction and/or concentration in preparation for further analysis. Traditional procedures (liquid-liquid or liquid-solid extraction) are time-consuming and waste substantial quantities of solvents. Solid phase microextraction (SPME) and supercritical fluid extraction (SFE) are two recently developed methods that eliminate the need for solvent to separate analytes. (These methods may not be relevant for high school laboratories.)

SPME is a solventless sample preparation method for analysis of organic compounds by gas

chromatograph (GC). This approach replaces traditional methods such as purge and trap systems or liquid-liquid extraction. Essentially, SPME is a modified syringe holding a phase-coated fused silica fiber that adsorbs organic analytes when placed in the water sample. The analytes are then desorbed from the fiber into a capillary GC column at the heated injection port. The equipment is fairly small and reasonably priced, and the fibers are reusable up to 100 times. SPME is particularly cost effective when you consider the savings in solvent purchase and disposal.

SFE uses the unique characteristics of supercritical $CO^2$ to extract analytes from a sample, fully eliminating solvent use. Because supercritical fluids have lower viscosity and diffuse more rapidly into a sample, it also greatly reduces sample preparation time. The smaller, more recent SFE equipment models may be appropriate for some classroom settings. These models offer microprocessor controls as well as an elimination of moving parts to make maintenance and use easier. A typical extraction takes about 30 minutes at a material cost of about 10 cents.

## *Computer Simulation/Videos*

Again, it is important that students gain laboratory experience in using glassware and equipment. However, due to time constraints in lab courses, and the length of typical introductory experiments, computer simulation may allow students to see a wider variety of experimental results, without generating wastes, and in a much shorter time period. At higher level educational institutions, computer simulation may greatly decrease the amount of chemicals (and wastes) required in research and development by allowing researchers or students to tweak and optimize experiments on a computer instead of repeating experiments again and again at a bench-scale or full-scale level.

A number of computer software vendors are producing chemical reaction simulation software. In some cases, this software is quite elaborate and complicated, as it is oriented towards commercial and industrial applications. In other cases, the software might be useful in the classroom. A good resource for more information (in addition to your local software store) might be a regional or state university, many of which have already started to implement simulation software. In addition, more and more information is being provided on the Internet.

In addition to computer simulations, you might also be able to teach certain experimental principles by using videos—even "home grown" videos.

# 14 Reusing and Recycling Chemical Resources

After doing as much as possible to minimize waste generation through source reduction, the next most preferable options are recycling and reuse. Although people tend to avoid recovery efforts because of the "costs" involved, chemicals can often be recovered at net costs lower than the cost of disposal. Reuse and recycling can occur at a number of points in the chemical use cycle. Some options include recovering chemicals as part of the experimental process, participating in a chemical swap, and including recovery activities as part of the experiment. Again, some of these options will only be appropriate for larger, more advanced laboratories; others—such as the chemical swaps—may work even if you have a smaller program.

## *Recovery in Process*

Recovery of chemicals can serve as a valuable learning tool for students and can be presented as the final step of a chemistry experiment, or can be an "extra-credit" opportunity for interested students. (Caution: Recovery methods should always be performed under supervision.)

The College of the Redwoods, located in California, has designed a series of "closed loop" experiments where the by-products of one experiment become the reagents/reactants of the next experiment. At the end of the series, the by-products of the final experiment are available for the next set of students to start the process all over again. See the reference list in Chapter 15 for more information on this "no waste" lab manual.

## *Chemical Swaps*

Finding a use for surplus opened containers of chemicals is a good way to avoid having to dispose of them as waste. In many cases, laboratories or other users may be able to use these chemicals even though they have a lower purity. In addition, outside organizations may be willing to accept waste streams from laboratories if they can economically recover the valuable constituents. (Note: waste transport is subject to state/local regulations.) Some things you can do to encourage chemical swaps/waste exchanges:

- Talk with other schools in your area to see if you can set up a simple exchange mechanism for school district.

- Consult the Merck Index to see what types of manufacturers in your area may be interested in your chemicals. For example, artisans may use metal salts for ceramic glazes; auto shops may be able to use distilled solvents for parts cleaning. This is most likely to happen with unused raw material that is properly labeled and in good condition.

When in-house or inter-school exchanges are not possible or too difficult to set up, external surplus exchange services might be helpful. Most exchange services are non-profit; some target educational laboratory institutions, some target industry, and some target both. Services are mostly regional to minimize transportation of potentially hazardous wastes.

Passive surplus exchange services allow generators to "advertise" for free their chemicals and waste materials that may be of use to others. A "catalog" is published every few months, or an on-line database may be available. Items are listed as "wanted" or "available." (You can help close the recycling loop by obtaining chemicals for your lab from the "available" section.) Passive services rely on advertisers and readers to communicate directly to negotiate any exchanges. One such exchange service in Pennsylvania is listed below.

| **Passive Surplus Exchange Service** | **Web Address** |
|---|---|
| Pennsylvania Material Trader | http://www.materialtrader.org/ |

Active exchange services, and/or chemical brokers may be able to find (or provide tips on how to find) market alternatives for reusable chemical wastes. Brokers charge a fee for an exchange, but may offer a free consultation visit to inform you of potential customers for your chemicals. Contact your local DEP Regional Office for more information on waste or chemical exchange services in your area. Remember that containers must be properly labeled and in good condition.

## *Solvent recovery*

If you regularly generate spent solvents, recovery can be very cost-effective, as well as environmentally sound. Spent solvents that are properly segregated (see Chapter 12) can be easily distilled in-house to a high purity that will allow multiple reuse of the same batch of solvent. Many solvents are excellent candidates for distillation, including xylene, methanol, acetone, and toluene. Some exceptions are peroxide-forming solvents, which should not be distilled, and ethanol, which may require a permit for distillation.

In-house, bench-top distillation units ("stills") are commercially available, or can be set up at little or no additional cost with existing laboratory equipment. However, it is important to consult your local fire department before you consider purchasing or setting up a still, since most fire departments have regulations that apply to stills used to process flammables. Alternatively, you may be able to contract with off-site recyclers to recover used solvents, depending on the quantity of solvents you generate.

If you use high-performance liquid chromatography (which tends to generate a substantial quantity of used solvent), you should know that automated, in-line solvent recovery systems are available that make it very easy to recapture up to 80% of high-purity solvents. The recovery equipment is fairly small, is low-maintenance, and requires minimal attention. The recovered solvent can be reused again and again. Such systems are available for a few thousand dollars and can pay for themselves in about one year due to reduced solvent purchases and waste disposal fees.

## *Metal recovery*

Many heavy metals have been largely phased out of school science experiments, although mercury, silver, and others may still be used. Even small amounts of these metals can be successfully recovered in the laboratory, possibly as an educational exercise. For larger quantities, local or regional industries may be interested in metal-bearing wastes for recovery of the metals. In fact, the original suppliers may be interested in taking back such wastes for credit and/or recovery.

A few companies in the U.S. recover and clean contaminated mercury for reuse. It is possible to develop a closed-loop system whereby your mercury wastes are purified and returned to you specifically. These companies provide DOT-approved containers for accumulation and transport. Types of mercury

accepted for recovery, recycling, or purification include spill debris, liquid mercury, and mercury in switches, thermometers, barometers, fluorescent lamps, and other items.

# 15 Managing the Waste Streams

School science laboratory programs will generate two types of waste streams. Those that are hazardous waste and those that are non-hazardous. Hazardous waste is highly regulated by both federal and state laws. We must properly manage and dispose of these waste streams.

Hazardous wastes can not be put down a drain or into the trash.

## *Determining if a Waste is Regulated as Hazardous*

It is the responsibility of the generator of the waste (this would be the science teacher who is conducting the experiment) to determine if the waste is hazardous. Checking to see if a chemical is on one of the lists is simple enough, but deciding whether a chemical or product is a characteristic waste might take a little research. The Material Safety Data Sheet (MSDS) for the material will usually provide enough information to identify characteristic wastes. Occasionally, a chemical or mixture may have to be tested to determine whether it is hazardous.

The disposal options for hazardous waste generated by educational facilities are either *listed* (commonly called "Listed "Hazardous Wastes) in 40 Code of Federal Regulations (CFR) 261 Subpart D, or they are wastes *characterized* (commonly called "Characteristic" Hazardous Waste) in 40 CFR 261 Subpart C as hazardous.

A hazardous waste determination must be made of any chemical waste material generated. (See 40 CFR 262.11).

## *What Makes Up Hazardous Waste*

The disposal of certain chemicals is regulated by federal law: the Resource Conservation and Recovery Act of 1976. This law is frequently referred to by its acronym, "RCRA" (pronounced "rick-rah"). RCRA defines which chemicals are regulated and requires that they be subjected to "cradle to grave" monitoring until they are destroyed, rendered non-hazardous, or buried in a special hazardous waste landfill.

Schools should try to reduce or eliminate as many of their waste streams as possible. If a school is not generating any hazardous waste, the associated disposal costs, potential spills, potential health and safety hazards, and recordkeeping requirements will not be applicable.

A chemical to be disposed of will be a regulated hazardous waste if it exhibits one or more hazardous characteristics (characteristic waste) or because it appears on one of four lists (listed waste).

### Characteristic Waste

There are four types of characteristic hazardous waste: ignitable, corrosive, reactive, and toxic. These are referred to in the regulations as "D" wastes. The complete definitions of characteristic wastes can be found in 40 CFR 261.21-261.24 accessible from EPA's website: ***www.epa.gov***

The following are abbreviated definitions of these characteristic wastes.

***Ignitable***

There are four reasons a waste could be classified as ignitable:

- ° It is a *liquid* that has a flash point less than 140°F (60°C.) (The flash point is the temperature at which a liquid gives off enough vapor that the vapor will ignite if initiated by a flame or spark.) Examples are ethyl ether, most mineral spirits, ethanol, and gasoline.

- ° It is *not a liquid* and is capable, under ordinary conditions, of causing fire through friction, absorption of moisture, or spontaneous chemical change. Examples are activated carbon, metal dusts, pyrophorics, and matches.

- ° It is an *ignitable compressed gas*. Examples are cylinders of hydrogen, acetylene, and propane, and aerosol cans using flammable gas as a propellant.

- ° It is an *oxidizer*; that is, capable of supporting combustion by contributing oxygen. Examples are oxygen, nitrates, peroxides, and hypochlorites.

***Corrosive***

• A corrosive waste is a *liquid* with a pH less than or equal to 2 or greater than or equal to 12.5; that is, it is strongly acidic or caustic. Examples are concentrated acids and concentrated ammonium hydroxide.

***Reactive***

• A reactive waste exhibits one or more of the following properties:

- ° It is *unstable* under ordinary conditions. An example would be any explosive, such as dried picric acid.
- ° It *reacts violently with water*, sometimes producing toxic, corrosive or flammable gases. Examples are alkali metals, acid anhydrides, phosphides and organometallics.
- ° It is a *cyanide or sulfide-bearing waste* that, when exposed to a pH between 2 and 12.5, can generate toxic gases. Examples are potassium cyanide and sodium sulfide.

***Toxic***

• The characteristic of toxicity refers to a waste from which harmful chemicals would leach if it were disposed of in a landfill. A test, the Toxicity Characteristic Leachate Procedure (TCLP, pronounced *T-clip*), is performed on the waste, and if the resulting leachate exceeds the allowable concentration of any one of 39 substances, the waste is a regulated hazardous waste. The list of these 39 chemicals can be found in 40 CFR 261.24. Examples are absorbent material used to clean up a spill of trichloroethylene, lead-based paint, and electronic equipment containing heavy metals. (It is not always necessary to have the TCLP test performed if you have sufficient knowledge of the waste to accurately predict whether it would pass or fail. For example, you would know that barium chloride would fail the test for barium, but barium sulfate would pass, because it is practically insoluble.)

## Listed Wastes

The other category of hazardous waste is listed waste. There are four lists: F, K, U and P:

- F-wastes are mixtures from non-specific sources: for example, solvents used for cleaning.
- K-wastes are those produced by specific industrial sources; schools would not have any of these wastes.

- U-wastes, listed by name, are commercial chemical products.
- P-wastes are also commercial chemical products listed by name, but P-wastes are considered to be "acutely hazardous" and are more strictly regulated.

Most listed hazardous wastes generated by school laboratories would be on the U or P lists. All these lists are in 40 CFR 261.31-261.33 available at: ***www.epa.gov***

## *We generated Hazardous Waste-Now what?*

When a hazardous waste determination has been conducted, the amount of waste generated monthly or stored on site will establish generator status.

To determine a schools status, one must measure all quantities of listed and characteristic hazardous wastes that are:

- Accumulated on the property for any period of time before disposal or recycling;
- Packaged and transported away from your facility;
- Placed directly in a regulated treatment or disposal unit at your facility; or
- Generated as still bottoms or sludges.

It is most likely that a school facility will be a Conditionally Exempt Small Quantity Generator (CESQG) of hazardous waste. CESQGs generate 220 pounds (100 kilograms) or less per month of hazardous waste, or 2.2 pounds (1 kilogram) or less per month of acutely (or P-listed )hazardous waste.

Therefore almost all schools with science labs would be required as a CESQGs (see 40 CFR261.5) to:

- CESQGs must identify all the hazardous waste generated.
- CESQGs may not accumulate more than 2,200 pounds (1,000 kilograms) of hazardous waste at any time.
- CESQGs must ensure that hazardous waste is delivered to a person or facility that is authorized to manage it.
- Written documentation must be kept for three years.

If you generate more than the waste volumes noted above your facility status could be a LQG (large quantity generator), or a SQG (Small Quantity Generator), contact the School District's Office of Environmental Management and Services for further assistance as the regulation are much more complicated and strict with the high waste volumes generated.

## *Segregation of Waste Streams*

Segregating laboratory wastes during handling, storing, and lab packing is important for safety reasons, for legal reasons, for pollution prevention reasons, and for ensuring the lowest disposal costs. Many of the ideas presented in Chapter 5 on Managing Inventories can also help you manage wastes.

Segregation of incompatible materials in a storage area is critical. Ignitables should be separated from oxidizers or sources of ignition, especially solvents. Acids should be separated from bases, and oxidizing agents from reducing agents. There are also more specific chemical incompatibilities that you might want to consider during waste storage—these can be found in waste management publications or in the references cited in Chapter 15.

Hazardous and nonhazardous wastes should not be mixed together. Likewise, organic and inorganic waste streams should be segregated. For example, if you mix solvents with oils (e.g., from auto shop),

you can expect to pay up to five times the disposal cost because the waste is now mixed. Segregating wastes within the same material type is also important, especially in the category of organic wastes.

Waste streams that you can recycle, especially recoverable metals or solvents, should be stored separately. In some cases, segregation will be important to facilitate recycling. For example, halogenated solvents and non-halogenated solvents should always be stored separately, since they need to be distilled separately. In particular, chlorinated solvents (which you might want to avoid using altogether) should not be mixed with non-chlorinated solvent wastes.

## *Disposal of Hazardous Wastes*

Hazardous wastes have the potential to harm human health and the environment. These wastes cannot be put in the garbage or down the drain. They cannot be disposed on or in the ground, or in local landfills, septic tanks, or injection wells, and may not be disposed of by open burning. You may recycle or reclaim these wastes or dispose of them through licensed hazardous waste management firms. **Not complying with hazardous waste regulations can lead to significant fines and penalties for both the school and yourself directly.**

Regardless of quantity, the generator of HW is ultimately responsible for the waste from "cradle to grave", and can be held liable for improper management of HW even though it may have been sent to a "proper" HW management facility using a licensed transporter. The School District's Office of Environmental Management and Services has the proper licensed contractors and they are the only contractors who can package, remove and dispose of chemicals wastes on School District property.

## *Chemical Disposal Guidelines*

When disposing of chemical waste follow these guidelines:

a) Do not transport the wastes from the school property they are currently located on.

b) **DO NOT** dispose of waste chemicals down the drain unless they have been properly treated in accordance with local, state and federal guidelines. In the City of Philadelphia only elementary neutralization is acceptable.

c) Do not use fume hoods to evaporate volatile chemicals.

d) Dispose of wastes by recycling, reclamation or chemical deactivation whenever possible. A hazardous waste transporter will be needed for this step.

e) Avoid stocking over 2.2 pounds (1.0 kilogram) of "P-listed" chemical products. This could help you stay below large quantity hazardous waste generator status. This link will help you identify listed wastes. http://www.epa.gov/epaoswer/osw/hazwaste.htm.

As of May 8, 1990, most hazardous wastes must be treated to meet Land Disposal Restrictions (LDR) prior to disposal in permitted hazardous waste landfills or surface impoundments. **The LDR rule prohibits the dilution of restricted wastes as a substitute for effective adequate treatment.**

Certain wastes, such as heavy metals or pure chemical product, must **NEVER** be discharged to the sanitary sewer in **ANY** concentration. These wastes must be collected and managed as hazardous waste. Contact School District's Office of Environmental Management and Services for specific information.

Since most concentrations in a lab are a 0.1 Molar solution, keep in mind that 0.1 Molar $CuSO_4$ is equal to 6355 mg/L of copper.

You may dispose of chemical waste as outlined below. It is the responsibility of the teachers, principals, administrators, and school district to ensure hazardous waste does not end up in ground water, soil or the atmosphere through improper disposal.

1) **Sanitary Sewer** - Some chemicals (acids or bases) may be neutralized and disposed to the sanitary sewer. This disposal option must be approved by the School District's Office of Environmental Management and Services prior to disposal. Hazardous waste may **NOT** be disposed of in this manner. This includes heavy metals.

2) **Disposal Through a Licensed and Approved Contractor** - A contractor may be used for the disposal of the waste chemicals. Remember that you must keep documentation of your hazardous waste disposal for at least three years. This information must include a waste manifest, reclamation agreement or any written record which describes the waste and how much was disposed, where it was disposed and when it was disposed. Waste analysis records must also be kept when making a determination is necessary. **Any unknown chemicals should be considered hazardous**!

Call the School District's Office of Environmental Management and Services for additional information:

# 16 In-Laboratory Treatment of Wastes

As a last line of defense in efforts to minimize waste generation, you might want to consider options for in-laboratory treatment of wastes.

An important distinction exists between recycling or reclamation of chemicals and treatment of chemical waste. Reclamation or recycling generally applies to efforts to recover chemicals for re-use—either in the laboratory or elsewhere. By contrast, treatment generally applies to efforts to make waste less hazardous, followed by disposal. While treatment may be a useful activity, you should be aware that the treatment of hazardous waste may require a permit or be subject to regulation.

In the laboratory setting, treatment that occurs as the last step in an experiment is technically not covered by regulation. Therefore, you will be in the best position if you can fold the following treatment options into your experiments directly.

Types of treatment techniques for rendering compounds non- or less hazardous—or in some cases reusable—include:

neutralization precipitation

separation degradation

fixation ion exchange II oxidation

Neutralization of acids and bases is probably the most commonly used treatment method in educational institutions. Neutralization reduces a material's corrosivity (acid or caustic properties) by raising or lowering the pH to a neutral range, between 6 and 9.

In some cases you may need to accumulate wastes before treatment is practical. Treatment of chemical waste outside the experimental process may involve additional regulatory requirements.

**Before you implement any treatment methods outside of the experimental process, you should discuss your plans with the School District of Philadelphia Office of Environmental Management and Services.**

# 17 Getting More Information

Here is a list of organizations and publications that may be of help to you as you establish your pollution prevention program.

## *Organizations*

- Pennsylvania Chemical Industry Education Foundation (see page 18), (717) 232-6681.
- The PA Department of Environmental Protection (See the list of DEP regional offices on page 8.)
- U.S. Environmental Protection Agency, Regional Office in Philadelphia serves all of Pennsylvania -(215) 814-5000 or (800) 438-2474
- El National Science Foundation – (703) 306-1234
- II American Chemical Society, 1155 –16th Street NW, Washington, DC 20036
- College Chemistry Programs and Pollution Prevention Programs. Publications: Laboratory Waste Minimization
- American Chemical Society. (1993). Less is better: Laboratory chemical waste management for waste reduction (2nd ed.). Washington, DC: Author.
- American Chemical Society (1994). Laboratory Waste Management: A Guidebook. Washington, DC: Author.
- American Chemical Society (1995). Model Chemical Hygiene Plan for High Schools. Washington, DC: Author. Available on disk: MacOS or MS-DOS.
- Environmental Protection Agency. (1990, June). Guides to pollution prevention: Research and educational institutions. Cincinnati: U.S. Environmental Protection Agency.
- Field, R.A. (1986). Management strategies and technologies for the minimization of chemical wastes from laboratories. Raleigh: North Carolina Pollution Prevention Pays Program.
- Illinois Department of Natural Resources. (1990, May). Waste reduction guide for Illinois schools. Springfield, IL: Author.
- Kaufman, J.A. (Ed.). (1990). Waste Disposal in Academic Institutions. Chelsea, MI: Lewis Publishers, Inc.
- National Research Council. (1983). Prudent practices for disposal of chemicals fromlaboratories. Washington, DC: National Academy Press.

- Jacobson, L. (no date). Children's art hazards. New York: Natural Resources Defense Council, Inc.

- State of Washington School Chemistry Lab/Storeroom Safety Committee. (1984). Who should conduct high school lab/store room cleanups and assure safe disposal? Contact James Knudson, Washington State Department of Ecology, Hazardous Waste Section, (206) 459-6203.

- Task Force on RCRA. (1990). The waste management manual for laboratory for personnel. Washington, DC: American Chemical Society.

- Wahl, G.H., Jr. (Ed.). (no date). Reduction of hazardous waste from high school chemistry laboratories. Raleigh: Pollution Prevention Pays Program, North Carolina Department of Environment and Natural Resources.


## *Publications: General Waste Minimization*


- Freeman, H.M. (Ed.). (1990). Hazardous waste minimization. New York: McGraw-Hill Publishing Company.

- National Renewable Energy Laboratory. (no date). Waste World: Teaching students about municipal solid waste. Municipal Waste Resource Management Program—Project Fact Sheet. Golden, CO: Author.

- National Research Council. (1985). Reducing hazardous waste generation: An evaluation and a call for action. Washington, DC: National Academy Press.

- Tulis, J.J., & Thomann, W.R. (Eds.). (1992). Proceedings: Strategies for Improved Chemical and Biological Waste Management for Hospitals and Clinical Laboratories. Raleigh: Office of Waste Reduction, North Carolina Department of Environment and Natural Resources.


## *Publications: Laboratory Manuals*


- Bergstrom, W., & Howells, M. (1988). Hazardous waste reduction for chemical instruction laboratories. Cincinnati: U.S. Environmental Protection Agency.

- College of the Redwoods. (1989). No-waste lab manual for educational institutions. Sacramento: California Department of Toxic Substances Control.

- Ehrenkranz, D.F. (1993). Chemistry in microscale: a set of microscale laboratory experiments. Dubuque, Iowa: Kendall/Hunt Pub. Co.

- Ehrenkranz, D.F. (1993). Chemistry in microscale: a set of microscale laboratory experiments with teacher guides. Dubuque, Iowa: Kendall/Hunt Pub. Co.

- Flinn Scientific (1994). Spectrophotometer Laboratory Manual. Batavia.

- Hathaway, R.A. (Ed.). (1991). Safety considerations in microscale chemistry laboratories.

Symposium at the 197th national meeting of the American Chemical Society, April 12, 1989, Dallas. Washington, DC: American Chemical Society.

- Mayo, D.W., Pike, R.M., Trumper, P.K., & Fickett, P. M. (1994). Instructor's Manual, Microscale Techniques for the Organic Laboratory. Third Edition. New York. John Wiley & Sons, Inc.

- Mayo, D.W., Pike, R.M., & Trumper, P.K. (1994). Microscale Organic Laboratory with Multistep and Multiscale Syntheses (3rd ed.). New York: John Wiley & Sons, Inc.

- Mayo, D.W., Pike, R.M., Butcher, S.S., & Trumper, P.K. (1991). Microscale Techniques for the Organic Laboratory. New York. John Wiley & Sons, Inc.

- Mayo, D.W., Pike, R.M., & Butcher, S.S. (1989). Microscale Organic Laboratory (2nd ed.). New York. John Wiley & Sons, Inc.

- Pavia, D.L., Lampman, G.M., Kriz, G.S., & Engel, R.G. (1990). Introduction to Organic Laboratory Techniques: A Microscale Approach. Philadelphia: Harcourt Brace College Publishers.

- Pike, R.M. (Winter 1994). Microscale Chemistry - Small Scale, Big Idea. EM Scientist, 3(1), pp. 1-2.

- Szafran, Z., Pike, R.M., & Singh. (1991). Microscale inorganic chemistry: A comprehensive laboratory experience. New York: John Wiley & Sons, Inc.

- Waterman, E.L. (1993). Small scale chemistry laboratory manual. Menlo Park, CA: Addison-Wesley Publishing Co.

- Waterman, E.L. (1993). Addison-Wesley small scale chemistry. Menlo Park, CA: Addison-Wesley Publishing Co.

- Williamson, K.L. (1989). Macroscale and Microscale Organic Experiments. Lexington, MA: D.C. Heath and Company.

## *Online Resources*

- Pennsylvania Department of Environmental Protection, http://www.dep.state.pa.us/. Information on waste minimization, recycling, pollution prevention and hazardous waste disposal in Pennsylvania.

- U.S. Environmental Protection Agency, http://www.epa.gov/. Information on hazardous waste disposal and pollution prevention.

- National Microscale Chemistry Center, http://www.silvertech.com/microscale/ — Web site for Merrimack College's Microscale Chemistry Center, dealing with the use of microscale chemistry as a pollution prevention technique.

- Pollution Prevention in Chemical Laboratory Instruction,

- http://www.pprc.org/pprc/rpd/statefnd/minn oea/pollutio.html— Summary of Laboratory P2 project at the University of Minnesota on P2 in Laboratory settings

- National Pollution Prevention Center for Higher Education, http://www.umich.edu/-nppcpub/resources/ -Home page for the National Pollution Prevention Center for Higher Education (NPPC), which is established to help educators integrate P2 into the curriculum. A good source for readings and curricular materials.

- http://www.ehs.uiuc.edu/— Great resource on laboratory pollution prevention developed for use at the University of Illinois at Urbana-Champaign. Includes "101 Ways to Reduce Waste in the Laboratory."

- http://www.epa.gov/greenchemistry/

# Waste Minimization Checklist

The following checklist is designed to help you minimize the amount of waste generated in the laboratory. The list is not all-inclusive, but should serve as a starting point for your efforts.

**Purchasing Chemicals**

- ❍ Develop a purchasing strategy for chemicals and other hazardous materials.
- ❍ Purchase chemicals in smaller sizes.
- ❍ Standardize chemical purchases across classes or laboratories.
- ❍ Designate a single person to be responsible for purchasing chemicals and monitoring inventories.
- ❍ Link purchasing requests into an inventory system so that excess chemicals in stock can be used before buying more.
- ❍ Find a supplier who will accept unopened chemicals that are returned, or will otherwise support waste minimization efforts.

**Managing Chemical Inventories**

**Institute inventory control**

- ❍ Conduct a school-wide inventory to identify where chemicals are located.
- ❍ Designate a centralized place for chemical storage and another for waste storage, with spill containment.
- ❍ Organize your chemical and waste storage systematically to keep like chemicals together.
- ❍ Adopt a standard labeling procedure for chemicals and waste, using labels that are colorfast and permanent.
- ❍ Designate who is responsible for labeling and inventory control.
- ❍ Use tags, bar codes, or some other system to establish a computer tracking of chemicals.
- ❍ Use a first-in/first-out policy.
- ❍ Return expired material to supplier.
- ❍ Perform regular inventory audits to identify chemicals that aren't being used.
- ❍ Provide a simple regular listing to chemical users on available chemical stocks, location, and point-of-contact.

**Work on spill and leak prevention**

- ❍ Keep chemicals and waste containers covered to prevent spills.
- ❍ Install spill and leak protection in chemical storerooms, including berms, sumps, or even simple plastic containers.
- ❍ Anchor storage cabinets to walls and floors.
- ❍ Periodically inspect stored chemicals for signs of leakage, poor storage practices, or any other problems.

- Keep a record of spills and leaks and note why they happened and how they can be avoided in the future.

**Conducting Experiments**

**Teach resource-efficient policies**

- Use solvents and other hazardous materials sparingly.
- Have students monitor reactions closely and add only what's needed.
- Emphasize conservation of water, electricity and other general resources.

**Set up experiments with waste minimization in mind**

- Pre-weigh chemicals for students.
- Have students work in teams.
- Demonstrate some experiments rather than having the entire class perform them.
- Use spent/recovered solvents for an initial rinse and fresh solvents for a final rinse.

**Include final steps in experiments to destroy or inactive hazardous substances**

- Neutralize acids and bases.
- Perform chemical conversions to non-hazardous substances.
- Provide students with the opportunity to research waste minimization techniques.

**Scaling Down Experiments**

- Reduce scale of experiment (and associated quantities of chemicals) where possible.
- Move to microscale chemistry.

**Substituting Materials**

**Substitute less hazardous chemicals for more hazardous ones**

- Use laboratory detergents rather than hazardous cleaning baths (e.g., substitute detergents for chromic acid solutions).
- Use non-halogenated rather than halogenated solvents (e.g., substitute cyclohexane for carbon tetrachloride).
- Use less toxic/hazardous solvents rather than more toxic/hazardous solvents.

**Finding Alternatives to Wet Chemistry**

- Substitute computer simulations, videos, etc. for actual experiments.
- Use alternatives to solvent-based extraction (e.g., Solid Phase Microextraction or Supercritical Fluid Extraction).
- Use instruments in place of wet chemistry (e.g., chromatography, spectrophotometry, atomic absorption, nuclear magnetic resonance, X-ray diffraction).

**Reuse and Recycling**

**Establish a chemical swap**

- Set up an internal surplus chemical exchange.
- Participate in an outside chemical/waste exchange program.

**Reclaim solvents**

- Filter spent solvent for reuse.Distill spent solvents on-site.
- Recycle solvents via a solvent recycling service.

**Reclaim metal-bearing waste**

- Identify an outside industry interested in taking metal-bearing waste for recovery.

**Segregating Individual Waste Streams**

**Segregate wastes**

- Keep hazardous waste separate from non-hazardous waste.
- Keep organic waste separate from inorganic waste.
- El Keep different groups of solvent separate (e.g., halogenated vs. non-halogenated solvents).
- Keep incompatible materials separated (ignitables and oxidizers; acids and bases; oxidizers and reducers, etc.).

**In-Lab Treatment**

- Neutralize acids and bases.
- Perform chemical conversions to create non-hazardous substances.

**Strategies for the Entire School**

**Create a Lab or School wide Program**

- Create a waste minimization team composed of students, teachers, and administrators.
- Develop a written statement of commitment to waste minimization.
- Perform a waste audit of the school/lab.
- Provide a forum or suggestion box for waste minimization/pollution prevention ideas. CI Set up waste minimization education sessions for students/staff.
- Set up specific reduction goals (e.g., 50% reduction in amount of waste generated per year).

**Implement other (non-laboratory) waste minimization/pollution prevention opportunities**

- Perform routine maintenance of school equipment to fix leaks, avoid accidents.

- Reduce use of fertilizers and pesticides on school grounds.
- Compost grass and other trimmings.
- Keep school vehicles properly tuned up.
- Maintain air conditioner and heater filters to reduce energy consumption.
- Replace inefficient lighting with compact fluorescent or other energy-smart lighting.

# Approved Chemicals

***Only approved chemicals may be purchased or used.***

| APPROVED CHEMICALS | |
|---|---|
| **CAS Number** | **Chemical Name** |
| 60-35-5 | Acetamide |
| 64-19-7 | Acetic Acid (<1 Molar) |
| 64-19-7 | Acetic Acid (>6 Molar) |
| 64-19-7 | Acetic Acid (1 Molar to 6 Molar) |
| 67-64-1 | Acetone |
| 9002-18-0 | Agar |
| 7429-90-5 | Aluminum - Metal Lump |
| 7784-26-1 | Aluminum Ammonium Sulfate |
| 7784-13-6 | Aluminum Chloride - Hexahydrate |
| 10043-01-3 | Aluminum Sulfate - 18 hydrate |
| 10043-01-3 | Aluminum Sulfate - Anhydrous |
| 1066-33-7 | Ammonium Bicarbonate |
| 506-87-6 | Ammonium Carbonate |
| 12125-02-9 | Ammonium Chloride |
| 3012-65-5 | Ammonium Citrate |
| 1336-21-6 | Ammonium Hydroxide (<1 Molar) |
| 1336-21-6 | Ammonium Hydroxide (>6 Molar) |
| 1336-21-6 | Ammonium Hydroxide (1 Molar to 6 Molar) |
| 12054-85-2 | Ammonium Molybdate |
| 6484-52-2 | Ammonium Nitrate |
| 1113-38-8 | Ammonium Oxalate - Anhydrous |
| 6009-70-7 | Ammonium Oxalate - Monohydrate |
| 7783-20-2 | Ammonium Sulfate |
| 50-81-7 | Ascorbic Acid |
| 10326-27-9 | Barium Chloride |
| 12230-71-6 | Barium Hydroxide (Anhydrous) |
| 10022-31-8 | Barium Nitrate |
| mixture | Benedict's Reagent |
| 65-85-0 | Benzoic Acid |
| 108-19-0 | Biuret |
| 108-19-0 | Biuret Reagent (94% water, 5% sodium hydroxide, 0.6% potassium sodium tartrate, 0.15% copper sulfate pentahydrate) |
| 10043-35-3 | Boric Acid |
| 633-03-4 | Brilliant Green |
| 76-60-8 | Bromocresol Green |
| 115-40-2 | Bromocresol Purple |
| 115-39-9 | Bromophenol Blue |
| 76-59-5 | Bromothymol Blue |
| 71-36-3 | Butanol, 1- |
| 71-36-3 | Butanol, 2- |
| 62-54-4 | Calcium Acetate |
| 75-20-7 | Calcium Carbide |
| 471-34-1 | Calcium Carbonate |
| 10043-52-4 | Calcium Chloride (Anhydrous) |
| 1305-62-0 | Calcium Hydroxide |
| 7778-54-3 | Calcium Hypochlorite |
| 10124-37-5 | Calcium Nitrate - Anhydrous |
| 13477-34-4 | Calcium Nitrate - Tetrahydrate |
| 7757-93-9 | Calcium Phosphate, Dibasic |
| 7758-23-8 | Calcium Phosphate, Monobasic |

| | |
|---|---|
| 1306-06-5 | Calcium Phosphate, Tribasic |
| 10101-41-4 | Calcium Sulfate - Dihydrate |
| 10034-76-1 | Calcium Sulfate - Hemihydrate |
| 7440-44-0 | Carbon |
| 8015-86-9 | Carnauba Wax |
| 9000-71-9 | Casein |
| 8000-27-9 | Cedarwood Oil |
| 9004-34-6 | Cellulose |
| 68855-54-9 | Celite |
| 7440-44-0 | Charcoal |
| diluted 7782-50-5 | Chlorine Water |
| 77-92-9 | Citric Acid |
| 7646-79-9 | Cobalt Chloride - Anhydrous |
| 7791-13-1 | Cobalt Chloride - Hexahydrate |
| 10141-05-6 | Cobalt Nitrate - Anhydrous |
| 10026-22-9 | Cobalt Nitrate - Hexahydrate |
| 10026-24-1 | Cobalt Sulfate - Heptahdrate |
| 573-58-0 | Congo Red |
| 7440-50-8 | Copper - Metal Lump |
| 6046-93-1 | Copper Acetate - Anhydrous |
| 6046-93-1 | Copper Acetate - Hydrate |
| 7789-45-9 | Copper Bromide |
| 12069-69-1 | Copper Carbonate |
| 7447-39-4 | Copper Chloride - Anhydrous |
| 10125-13-0 | Copper Chloride - Dihydrate |
| 3251-23-8 | Copper Nitrate - Anhydrous |
| 19004-19-4 | Copper Nitrate - Hemipentahydrate |
| 10031-43-3 | Copper Nitrate - Trihydrate |
| 7758-99-8 | Copper Sulfate |
| 57-00-1 | Creatine |
| 2303-01-7 | Cresol Purple |
| 548-62-9 | Crystal Violet |
| 1317-38-0 | Cupric Oxide (Copper Oxide) |
| 50-99-7 | Dextrose |
| mixture | Dish Detergent |
| 9000-92-4 | Diastase of Malt |
| 68855-54-9 | Diatomaceous Earth |
| 122-39-4 | Diphenylamine |
| 1787-61-7 | Eriochrome Black T |
| 64-17-5 | Ethanol (denatured alcohol) |
| 141-78-6 | Ethyl Acetate |
| 107-21-1 | Ethylene Glycol |
| 60-00-4 | Ethylenediamine Tetraacetic Acid (EDTA) |
| 2353-45-9 | Fast Green |
| mixture | Fehling's Solution A |
| mixture | Fehling's Solution B |
| 2-61-8 (solution) 10421-48-4 (pow | Ferric Nitrate |
| 22-5 (Anhydrous); 15244-10-7 (hy | Ferric Sulfate |
| 10045-89-3 | Ferrous Ammonium Sulfate - Anhydrous |
| 7758-94-3 | Ferrous Chloride (Iron Chloride) -Anhydrous |
| 7782-63-0 | Ferrous Sulfate, Anhydrous |
| 7782-63-0 | Ferrous Sulfate, Heptahydrate |

| | |
|---|---|
| 57-48-7 | Fructose |
| mixture | Fuchsin Acid |
| 632-99-5 | Fuchsin Basic |
| 8031-18-3 | Fuller's Earth |
| 59-23-4 | Galactose |
| 9000-70-8 | Gelatin |
| 548-62-9 | Gentian Violet (aka Methyl violet) |
| 51811-82-6 | Giemsa Stain |
| 50-99-7 | Glucose |
| 56-81-5 | Glycerin |
| mixture | Gram's Iodine Stain (Iodine 0.5% 7553-56-2, Potassium Iodide 1% 7681-11-0, Water 98.5%) |
| mixture | Grams Safranin (safranine 0 1% 477-73-6, ethanol 99% 64-17-5) |
| 7782-42-5 | Graphite |
| 9000-01-5 | Gum Arabic |
| 8050-09-7 | Gum Rosin |
| 7440-59-7 | Helium |
| 110-54-3 | Hexane |
| 7647-01-0 | Hydrochloric Acid (<1 molar) |
| 7647-01-0 | Hydrochloric Acid (>6 molar) |
| 7647-01-0 | Hydrochloric Acid (1 molar to 6 molar ) |
| 7722-84-1 | Hydrogen Peroxide ( <4%) |
| 7722-84-1 | Hydrogen Peroxide ( 20% to 30% ) |
| 7722-84-1 | Hydrogen Peroxide ( 4% to 20% ) |
| | Immersion Oil |
| 860-22-0 | Indigo Carmine |
| 620-45-1 | Indophenol, 2, 6 Dichlorophenol (sodium salt) |
| 9001-57-4 | Invertase |
| 7553-56-3 | Iodine |
| | Iodine Tincture |
| 7439-89-6 | Iron - Metal Lump |
| 7439-89-6 | Iron - Powder |
| 67-63-0 | Isopropanol (IPA) |
| 2869-83-2 | Janus Green B |
| 1332-58-7 | Kaolin |
| 50-21-5 | Lactic Acid |
| 63-42-3 | Lactose |
| 8006-54-0 | Lanolin |
| 143-07-7 | Lauric Acid |
| 7439-92-1 | Lead - Metal Lump |
| 10099-74-8 | Lead Nitrate |
| 7447-41-8 | Lithium Chloride |
| 7790-69-4 | Lithium Nitrate |
| 1393-92-6 | Litmus |
| mixture | Lugol's Iodine |
| 521-31-3 | Luminol |
| 7439-95-4 | Magnesium - Metal Lump |
| 7791-18-6 | Magnesium Chloride - Anhydrous |
| 7791-18-6 | Magnesium Chloride - Hexahydrate |
| 1309-42-8 | Magnesium Hydroxide |
| 10377-60-3 | Magnesium Nitrate - Anhydrous |
| 13446-18-9 | Magnesium Nitrate - Hexahydrate |

| | |
|---|---|
| 1309-48-4 | Magnesium Oxide |
| 7487-88-9 | Magnesium Sulfate (Epsom salts) |
| 2437-29-8 | Malachite Green |
| 110-16-7 | Maleic Acid |
| 141-82-2 | Malonic Acid |
| 69-79-4 | Maltose, D- - Anydrous |
| 6363-53-7 | Maltose, D- - Monohydrate |
| 1313-13-9 | Manganese Dioxide |
| 7785-87-7 | Manganese (II) Sulfate - Anhydrous |
| 10034-96-5 | Manganese (II) Sulfate - Monohydrate |
| 69-65-8 | Mannitol |
| 471-34-1 | Marble Chips |
| 67-56-1 | Methanol (Methyl Alcohol) |
| 547-58-0 | Methyl Orange |
| 845-10-3 | Methyl Red |
| 119-36-8 | Methyl Salicylate |
| 8004-87-3 | Methyl Violet (Gentian Violet) |
| -4 (Anhydrous); 7220-79-3 (Trihy | Methylene Blue |
| 8012-95-1 | Mineral Oil |
| | Molisch Reagent |
| 59-67-6 | Niacin |
| 485-47-2 | Ninhydrin |
| 7697-37-2 | Nitric Acid (<1 molar) |
| 7697-37-2 | Nitric Acid (>6 molar) |
| 7697-37-2 | Nitric Acid (1 molar to 6 molar) |
| 112-80-1 | Oleic Acid |
| 6153-56-6 | Oxalic Acid - Dihydrate |
| 8049-47-6 | Pancreatin |
| 8002-74-2 | Paraffin |
| 9001-75-6 | Pepsin |
| 73049-73-7 | Peptone |
| mixture | pH 10 Buffer - Ammonium Hydroxide |
| mixture | pH 10 Buffer - Borate |
| mixture | pH 10 Buffer - Clear |
| mixture | pH 4 Buffer - Acetate |
| 877-24-7 | pH 4 Buffer - Biphthalate |
| mixture | pH 7 Buffer - Phosphate |
| | pH 7.4 Buffer - Tris |
| 143-74-8 | Phenol Red |
| 77-09-8 | Phenolphthalein |
| 7664-38-2 | Phosphoric Acid (<1 molar) |
| 7664-38-2 | Phosphoric Acid (>6 molar) |
| 7664-38-2 | Phosphoric Acid (1 molar to 6 molar) |
| | Polyurethane Foam - Part A |
| | Polyurethane Foam- Part B |
| 3811-04-9 | Potassium Chlorate |
| 7447-40-7 | Potassium Chloride |
| 7778-50-9 | Potassium Dichromate |
| 13746-66-2 | Potassium Ferricyanide |
| 877-24-7 | Potassium Hydrogen Phthalate |
| 1310-58-3 | Potassium Hydroxide (<1 molar) |
| 1310-58-3 | Potassium Hydroxide (>6 molar) |

| | |
|---|---|
| 1310-58-3 | Potassium Hydroxide (1 molar to 6 molar) |
| 7758-05-6 | Potassium Iodate |
| 7681-11-0 | Potassium Iodide |
| 7757-79-1 | Potassium Nitrate |
| 7722-64-7 | Potassium Permanganate |
| 7758-11-4 | Potassium Phosphate - Dibasic |
| 7778-77-0 | Potassium Phosphate - Monobasic |
| 7778-53-2 | Potassium Phosphate - Tribasic |
| 333-20-0 | Potassium Thiocyanate |
| 71-23-8 | Propanol |
| 57-55-6 | Propylene Glycol |
| mixture | Ringer's Solution |
| 11121-48-5 | Rose Bengal |
| 69-72-7 | Salicylic Acid |
| 63231-67-4 | Silica Gel |
| 7761-88-8 | Silver Nitrate |
| mixture | Soda Lime |
| 127-09-3 | Sodium Acetate - Anhydrous |
| 6131-90-4 | Sodium Acetate - Hydrate |
| 532-32-1 | Sodium Benzoate |
| 144-55-8 | Sodium Bicarbonate |
| 7681-38-1 | Sodium Bisulfate - Monohydrate |
| 7631-90-5 | Sodium Bisulfite |
| 1330-43-4 | Sodium Borate |
| 7647-15-6 | Sodium Bromide |
| 497-19-8 | Sodium Carbonate |
| 7647-14-5 | Sodium Chloride |
| 68-04-2 | Sodium Citrate |
| 1310-73-2 | Sodium Hydroxide - solution (<1 molar) |
| 1310-73-2 | Sodium Hydroxide - solution (>6 molar ) |
| 1310-73-2 | Sodium Hydroxide - solution (1 M to 6 M) |
| 7681-52-9 | Sodium Hypochlorite - Solution (<6%) |
| 7681-82-5 | Sodium Iodide |
| 7631-99-4 | Sodium Nitrate |
| 7558-79-4 | Sodium Phosphate - Dibasic - Anhydrous |
| 7782-85-6 | Sodium Phosphate - Dibasic - Heptahydrate |
| 10049-21-5 | Sodium Phosphate - Monobasic |
| 10101-89-0 | Sodium Phosphate - Tribasic |
| 54-21-7 | Sodium Salicylate |
| mixture | Sodium Silicate |
| 7757-82-6 | Sodium Sulfate |
| 7757-83-7 | Sodium Sulfite |
| 540-72-7 | Sodium Thiocyanate |
| 7772-98-7 | Sodium Thiosulfate - Anhydrous |
| 10102-17-7 | Sodium Thiosulfate - Pentahydrate |
| 7772-99-8 | Stannous Chloride |
| 9005-84-9 | Starch |
| 57-11-4 | Stearic Acid - Laboratory Grade |
| 57-11-4 | Stearic Acid - Reagent Grade |
| -4 (Anhydrous); 10025-70-4 (Hex | Strontium Chloride |
| 10042-76-9 | Strontium Nitrate |
| 57-50-1 | Sucrose |

| | |
|---|---|
| 85-86-9 | Sudan III |
| 85-86-9 | Sudan III Alcohol Solution |
| 85-83-6 | Sudan IV |
| | Sudan IV Solution |
| 7704-34-9 | Sulfur - Precipitated |
| 7664-93-9 | Sulfuric Acid (<1 molar) |
| 7664-93-9 | Sulfuric Acid (>6 molar) |
| 7664-93-9 | Sulfuric Acid (1 molar to 6 molar) |
| 14807-96-6 | Talc |
| 87-69-4 | Tartaric Acid |
| 89-83-8 | Thymol |
| 76-61-9 | Thymol Blue |
| 7440-31-5 | Tin - Metal Lump |
| mixture | Universal Indicator (main chemical is alcohol) |
| 57-13-6 | Urea |
| 8001-25-0 | Vegetable Oil |
| 98988-92-1 | Wrights™s Stain Solution |
| 7440-66-6 | Zinc - Metal Lump |
| 7440-66-6 | Zinc - Powder |
| 10196-18-6 | Zinc Nitrate - Hexahydrate |
| 1314-13-2 | Zinc Oxide |
| 1314-98-3 | Zinc Sulfide |

# Flammable

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| **CAS #** | **CHEMICAL** | **RATING** | **CAS #** | **CHEMICAL** | **RATING** |
| 67-64-1 | Acetone | 2 | 7782-42-5 | Graphite | 2 |
| 71-36-3 | Butanol | 3 | | Iodine Tincture | 2 |
| 75-20-7 | Calcium Carbide | 3 | 7439-95-4 | Magnesium Metal | 2 |
| 9000-71-9 | Casein | 2 | 7704-34-9 | Sulfur - Precipitated | 3 |
| 573-58-0 | Congo Red | 3 | 8001-25-0 | Vegetable Oil | 2 |
| 9000-92-4 | Diastase Malt | 2 | | | |
| 64-17-5 | Ethanol | 2 | | | |
| 141-78-6 | Ethyl Acetate | 3 | | | |
| 60-00-4 | EDTA | 2 | | | |
| 110-54-3 | Hexane | 3 | | | |
| 67-63-0 | Isopropanol | 1 (3) | | | |
| 69-65-8 | Mannitol | 2 | | | |
| 67-56-1 | Methanol | 3 | | | |
| | Molisch Reagent | 3 | | | |
| 112-80-1 | Oleic Acid | 3 | | | |
| 71-23-8 | Propanol | 3 | | | |
| 57-11-4 | Stearic Acid | 2 | | | |
| 87-69-4 | Tartaric Acid | 2 | | | |
| 98988-92-1 | Wright's Stain Solution | 2 | | | |
| 7440-66-6 | Zinc Powder | 3 | | | |

# Corrosives

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| **CAS #** | **CHEMICAL** | **RATING** | **CAS #** | **CHEMICAL** | **RATING** |
| 64-19-7 | Acetic Acid (<1M) | 0 | 12125-02-9 | Ammonium Chloride | 2 |
| 64-19-7 | Acetic Acid (>6M) | 3 | 7758-94-3 | Ferrous Chloride (Anhyd) | 2 |
| 64-19-7 | Acetic Acid (1M - 6M) | 2 | 7647-01-0 | Hydrochloric Acid (<1M) | 1 |
| 50-21-5 | Lactic Acid | 3 | 7647-01-0 | Hydrochloric Acid (>6M) | 3 |
| 2437-29-8 | Malachite Green | 2 | 7647-01-0 | Hydrochloric Acid (1M-6M) | 2 |
| 110-16-7 | Maleic Acid | 3 | 7553-56-3 | Iodine | 2 |
| 119-36-8 | Methyl Salicylate | 3 | 7697-37-2 | Nitric Acid (<1M) | 3 |
| 485-47-2 | Ninhydrin | 3 | 7697-37-2 | Nitric Acid (>6M) | 3 |
| 6153-56-6 | Oxalic Acid (Di) | 3 | 7697-37-2 | Nitric Acid (1M-6M) | 3 |
| 9001-75-6 | Pepsin | 2 | mixture | pH 10 Buffer NH4OH | 2 |
| mixture | pH 4 Buffer Acetate | 2 | mixture | pH 10 Buffer Borate | 2 |
| 877-24-7 | pH 4 Buffer Biphthalate | 2 | mixture | pH 10 Buffer Clear | 2 |
| | pH 7.4 Buffer Tris | 2 | mixture | pH 7 Buffer Phosphate | 2 |
| | Polyurethane Foam-Part A | 3 | 7664-38-2 | Phosphoric Acid (<1M) | 2 |
| | Polyurethane Foam-Part B | 3 | 7664-38-2 | Phosphoric Acid (>6M) | 3 |
| 877-24-7 | Potassium Hydrogen Phthalate | 2 | 7664-38-2 | Phosphoric Acid (1M-6M) | 3 |
| 69-72-7 | Salicylic Acid | 2 | 1310-58-3 | Potassium Hydroxide (<1M) | 2 |
| 532-32-1 | Sodium Benzoate | 2 | 1310-58-3 | Potassium Hydroxide (>6M) | 3 |
| 497-19-8 | Sodium Carbonate | 2 | 1310-58-3 | Potassium Hydroxide (1M-6M) | 2 |
| 85-83-6 | Sudan IV | 2 | mixture | Soda Lime | 3 |
| | Sudan IV Solution | 2 | 7681-38-1 | Sodium Bisulfate (Mono) | 3 |
| 76-61-9 | Thymol Blue | 2 | 7631-90-5 | Sodium Bisulfite | 2 |
| | | | 1310-73-2 | Sodium Hydroxide (<1M) | 2 |
| | | | 1310-73-2 | Sodium Hydroxide (>6M) | 3 |
| | | | 1310-73-2 | Sodium Hydroxide (1M-6M) | 2 |
| | | | 7681-52-9 | Sodium Hypochlorite (<6%) | 2 |
| | | | 10101-89-0 | Sodium Phosphate (Tri) | 2 |
| | | | mixture | Sodium Silicate | 2 |
| | | | 10476-85-4 | Strontium Chloride (Anhyd) | 2 |
| | | | 10025-70-4 | Strontium Chloride (Hexa) | 2 |
| | | | 7664-93-9 | Sulfuric Acid (<1M) | 2 |
| | | | 7664-93-9 | Sulfuric Acid (>6M) | 3 |
| | | | 7664-93-9 | Sulfuric Acid (1M-6M) | 2 |

# Reactive

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 77-92-9 | Citric Acid | 2 | 6484-52-2 | Ammonium Nitrate | 3 |
| | | | 10043-52-4 | Calcium Chloride (Anhyd) | 2 |
| | | | 7778-54-3 | Calcium Hypochlorite | 3 |
| | | | 10124-37-5 | Calcium Nitrate (Anhyd) | 3 |
| | | | 13477-34-4 | Calcium Nitrate (Tetra) | 2 |
| | | | 7789-45-9 | Copper Bromide | 2 |
| | | | 3251-23-8 | Copper Nitrate (Anhyd) | 3 |
| | | | 19004-19-4 | Copper Nitrate (Hemi) | 2 |
| | | | 10031-43-3 | Copper Nitrate (Tri) | 2 |
| | | | 7782-61-8 | Ferric Nitrate (solution) | 3 |
| | | | 10421-48-4 | Ferric Nitrate (powder) | 3 |
| | | | 10099-74-8 | Lead Nitrate | 3 |
| | | | 7790-69-4 | Lithium Nitrate | 2 |
| | | | 10377-60-3 | Magnesium Nitrate (Anhyd) | 2 |
| | | | 13446-18-9 | Magnesium Nitrate (Hexa) | 2 |
| | | | 1313-13-9 | Manganese Dioxide | 2 |
| | | | 3811-04-9 | Potassium Chlorate | 3 |
| | | | 7778-50-9 | Potassium Dichromate | 3 |
| | | | 7758-05-6 | Potassium Iodate | 3 |
| | | | 7757-79-1 | Potassium Nitrate | 3 |
| | | | 7722-64-7 | Potassium Permanganate | 2 |
| | | | 7761-88-8 | Silver Nitrate | 3 |
| | | | 7631-99-4 | Sodium Nitrate | 2 |
| | | | 7757-82-6 | Sodium Sulfate | 2 |
| | | | 10042-76-9 | Strontium Nitrate | 2 |
| | | | 10196-18-6 | Zinc Nitrate (Hexa) | 3 |
| | | | 1314-98-3 | Zinc Sulfide | 3 |

# Health

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 60-35-5 | Acetamide | 2 | 7784-26-1 | Aluminum Ammonium Sulfate | 2 |
| 1066-33-7 | Ammonium Bicarbonate | 2 | 7784-13-6 | Aluminum Chloride (Hexa) | 3 |
| 506-87-6 | Ammonium Carbonate | 2 | 10043-01-3 | Aluminum Sulfate | 2 |
| 3012-65-5 | Ammonium Citrate | 2 | 1336-21-6 | Ammonium Hydroxide (<1M) | 2 |
| 6009-70-7 | Ammonium Oxalate (Mono) | 3 | 1336-21-7 | Ammonium Hydroxide (>6M) | 3 |
| 1113-38-8 | Ammonium Oxalate (Anhyd) | 3 | 1336-21-8 | Ammonium Hydroxide (1M-6M) | 2 |
| mixture | Benedict's Reagent | 2 | 12054-85-2 | Ammonium Molybdate | 2 |
| 65-85-0 | Benzoic Acid | 2 | 7783-20-2 | Ammonium Sulfate | 2 |
| 108-19-0 | Biuret | 2 | 10326-27-9 | Barium Chloride | 2 |
| 633-03-4 | Brilliant Green | 3 | 12230-71-6 | Barium Hydroxide (Anhyd) | 3 |
| 76-60-8 | Bromocresol Green | 2 | 10022-31-8 | Barium Nitrate | 3 |
| 115-40-2 | Bromocresol Purple | 2 | 10043-35-3 | Boric Acid | 2 |
| 115-39-9 | Bromophenol Blue | 2 | 1305-62-0 | Calcium Hydroxide | 2 |
| 76-59-5 | Bromothymol Blue | 2 | 7758-23-8 | Calcium Phosphate (Mono) | 2 |
| 62-54-4 | Calcium Acetate | 2 | 7757-93-9 | Calcium Phosphate (Di) | 2 |
| 471-34-1 | Calcium Carbonate | 2 | 1306-06-5 | Calcium Phosphate (Tri) | 2 |
| 7440-44-0 | Carbon | 2 | 7782-50-5 | Chlorine Water | 3 |
| 8000-27-9 | Cedarwood Oil | 2 | 7646-79-9 | Cobalt Chloride (Anhyd) | 3 |
| 7440-44-0 | Charcoal | 2 | 7791-13-1 | Cobalt Chloride (Hexa) | 3 |
| 12069-69-1 | Copper Carbonate | 2 | 10141-05-6 | Cobalt Nitrate (Anhyd) | 3 |
| 57-00-1 | Creatine | 2 | 10026-22-9 | Cobalt Nitrate (Hexa) | 2 |
| 2303-01-7 | Cresol Purple | 2 | 10026-24-1 | Cobalt Sulfate (Hepta) | 2 |
| 68855-54-9 | Diatomaceous Earth | 2 | 6046-93-1 | Copper Acetate (Anhyd) | 3 |
| 122-39-4 | Diphenylamine | 3 | 6046-93-1 | Copper Acetate (Hydrate) | 2 |
| 1787-61-7 | Eriochrome Black T | 2 | 7447-39-4 | Copper Chloride (Anhyd) | 3 |
| 107-21-1 | Ethylene Glycol | 2 | 10125-13-0 | Copper Chloride (Di) | 2 |
| 2353-45-9 | Fast Green | 2 | 1317-38-0 | Copper Oxide | 2 |
| mixture | Fehling's Solution A | 2 | 7758-99-8 | Copper Sulfate | 2 |
| mixture | Fehling's Solution B | 2 | 10028-22-5 | Ferric Sulfate (Anhyd) | 2 |
| mixture | Fuchsin Acid | 2 | 15244-10-7 | Ferric Sulfate (Hyd) | 3 |
| 632-99-5 | Fuchsin Basic | 2 | 10045-89-3 | Ferrous Ammonium Sulfate | 3 |
| 8031-18-3 | Fuller's Earth | 2 | 7782-63-0 | Ferrous Sulfate (Anhyd) | 3 |
| 548-62-9 | Gentian Violet | 2 | 7782-63-0 | Ferrous Sulfate (Hepta) | 3 |
| 51811-82-6 | Giemsa Stain | 2 | mixture | Gram's Iodine Stain | 2 |
| 56-81-5 | Glycerin | 2 | 7722-84-1 | Hydrogen Peroxide (4%-20%) | 3 |
| mixture | Gram's Safranin | 3 | 7722-84-1 | Hydrogen Peroxide (20%-30%) | 3 |
| 8050-09-7 | Gum Rosin | 2 | 1332-58-7 | Kaolin | 2 |
| 860-22-0 | Indigo Carmine | 2 | 7439-92-1 | Lead Metal | 2 |
| 620-45-1 | Indophenol, 2,6 Dichlorophenol | 2 | 7447-41-8 | Lithium Chloride | 3 |
| 2869-83-2 | Janus Green B | 2 | mixture | Lugol's Iodine | 2 |
| 143-07-7 | Lauric Acid | 2 | 7791-18-6 | Magnesium Chloride (Anhyd) | 2 |
| 521-31-3 | Luminol | 2 | 7791-18-6 | Magnesium Chloride (Hexa) | 2 |
| 141-82-2 | Malonic Acid | 3 | 1309-42-8 | Magnesium Hydroxide | 2 |
| 547-58-0 | Methyl Orange | 3 | 1309-48-4 | Magnesium Oxide | 2 |
| 845-10-3 | Methyl Red | 2 | 7487-88-9 | Magnesium Sulfate | 2 |

# Health

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 8004-87-3 | Methyl Violet | 2 | 7785-87-7 | Manganese (II) Sulfate (Anhyd) | 3 |
| 61-73-4 | Methylene Blue (Anhyd) | 2 | 10034-96-5 | Manganese (II) Sulfate (Mono) | 2 |
| 7220-79-3 | Methylene Blue (Tri) | 2 | 7447-40-7 | Potassium Chloride | 2 |
| 59-67-6 | Niacin | 2 | 13746-66-2 | Potassium Ferricyanide | 2 |
| 8049-47-6 | Pancreatin | 2 | 7681-11-0 | Potassium Iodide | 2 |
| 143-74-8 | Phenol Red | 2 | 7758-11-4 | Potassium Phospohate (Di) | 2 |
| 77-09-8 | Phenolphthalein | 2 | 7778-77-0 | Potassium Phospohate (Mono) | 2 |
| 57-55-6 | Propylene Glycol | 2 | 7778-53-2 | Potassium Phospohate (Tri) | 2 |
| mixture | Ringer's Solution | 2 | 333-20-0 | Potassium Thiocyanate | 2 |
| 11121-48-5 | Rose Bengal | 2 | 63231-67-4 | Silica Gel | 2 |
| 127-09-3 | Sodium Acetate (Anhyd) | 2 | 1330-43-4 | Sodium Borate | 2 |
| 6131-90-4 | Sodium Acetate (Hyd) | 2 | 7647-15-6 | Sodium Bromide | 2 |
| 68-04-2 | Sodium Citrate | 2 | 7681-82-5 | Sodium Iodide | 2 |
| 54-21-7 | Sodium Salicylate | 3 | 7558-79-4 | Sodium Phosphate (Di-Anhyd) | 2 |
| 85-86-9 | Sudan III | 2 | 7782-85-6 | Sodium Phosphate (Di-Hepta) | 2 |
| 85-86-9 | Sudan III Alcohol Solution | 2 | 10049-21-5 | Sodium Phosphate (Mono) | 2 |
| 89-83-8 | Thymol | 2 | 7757-83-7 | Sodium Sulfite | 3 |
| mixture | Universal Indicator | 2 | 540-72-7 | Sodium Thiocyanate | 2 |
| 57-13-6 | Urea | 3 | 7772-98-7 | Sodium Thiosulfate (Anhyd) | 3 |
| | | | 10102-17-7 | Sodium Thiosulfate (Penta) | 2 |
| | | | 7772-99-8 | Stannous Chloride | 3 |
| | | | 14807-96-6 | Talc | 2 |
| | | | 1314-13-2 | Zinc Oxide | 2 |

# Low Hazard

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 50-81-7 | Ascorbic Acid | 0 | 9002-18-0 | Agar | 1 |
| 8015-86-9 | Carnauba Wax | 0 | 7429-90-5 | Aluminum Metal | 0 |
| 68855-54-9 | Celite | 1 | 10034-76-1 | Calcium Sulfate (Hemi) | 0 |
| 9004-34-6 | Cellulose | 1 | 10101-41-4 | Calcium Sulfate (Di) | 0 |
| 7440-50-8 | Copper | 0 | mixture | Dish Detergent | 0 |
| 548-62-9 | Crystal Violet | 1 | 7440-59-7 | Helium | 1 |
| 50-99-7 | Dextrose | 1 | 7722-84-1 | Hydrogen Peroxide (<4%) | 1 |
| 57-48-7 | Fructose | 0 | 7439-89-6 | Iron Metal | 0 |
| 59-23-4 | Galactose | 0 | 7439-89-6 | Iron Powder | 1 |
| 9000-70-8 | Gelatin | 0 | 7647-14-5 | Sodium Chloride | 0 |
| 50-99-7 | Glucose | 0 | 7440-31-5 | Tin Metal | 0 |
| 9000-01-5 | Gum Arabic | 1 | 7440-66-6 | Zinc Metal | 1 |
| | Immersion Oil | 1 | | | |
| 9001-57-4 | Invertase | 0 | | | |
| 63-42-3 | Lactose | 0 | | | |
| 8006-54-0 | Lanolin | 1 | | | |
| 1393-92-6 | Litmus | 1 | | | |
| 69-79-4 | Maltose, D- (Anhyd) | 0 | | | |
| 6363-53-7 | Maltose, D- (Mono) | 0 | | | |
| 471-34-1 | Marble Chips | | | | |
| 8012-95-1 | Mineral Oil | 1 | | | |
| 8002-74-2 | Paraffin | 0 | | | |
| 73049-73-7 | Peptone | 2 | | | |
| 144-55-8 | Sodium Bicarbonate | 0 | | | |
| 9005-84-9 | Starch | 0 | | | |
| 57-50-1 | Sucrose | 0 | | | |

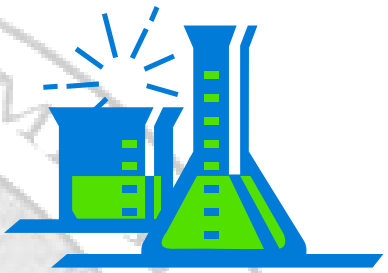
The School District of Philadelphia
Office of Environmental Management Services

# Chemical Management Plan

***Science +Chemicals =A Safer Green Environment***

## A Guide for Science Teachers within the School District of Philadelphia

# Introduction



- This program is designed to:
  - Inform educators about the new *Approved Chemical List*.
  - Inform educators how to properly store chemicals and maintain a chemical inventory.
  - Replace high hazardous chemicals with lower hazard chemicals whenever possible.
  - Strengthen a student's knowledge of environmental responsibility.
  - Ensure all hazardous waste is disposed properly.

# Why is this Needed?

- Chemicals found were:
  - High hazards
  - Expired
  - Stored Incorrectly
- Most schools lacked:
  - A Chemical Coordinator
  - A Chemical Management Plan
  - The appropriate equipment needed to respond to chemical spills

# Teamwork!

- In order to be successful, this Chemical Management Plan needs the combined effort of all educators and district level administrators to:
  - Enforce that only approved chemicals exist inside the schools.
  - Maintain chemical inventories.
  - Make sure the MSDS sheets are easily accessible.
  - Demand all chemicals are properly stored and labeled

# Waste Minimization and Pollution Prevention

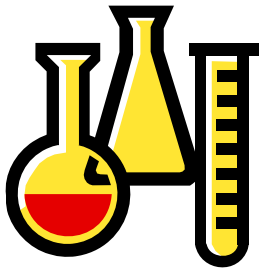
- Pollution Prevention
  - Focuses on not generating waste by reducing it at the source.
- Waste Minimization
  - Focuses on reducing accumulated waste that must be treated or disposed.



# Why is Waste Management Important?

- Reducing the quantity of hazard waste handled → reduces the hazard.
- Helps schools be environmentally responsible and meet legal requirements.
- Saves Money
  - Reducing the amount of chemicals purchased leads to a reduction in disposal costs.

# Purchasing Chemicals



- Buying in bulk doesn't save money.
  - Excess chemicals leads to disposal charges.
  - Only buy what is needed for a
  - single experiment.

- Purchases may only be made from the list of 279 Approved Chemicals.

- A request may be made to purchase a chemical that is not approved if needed.

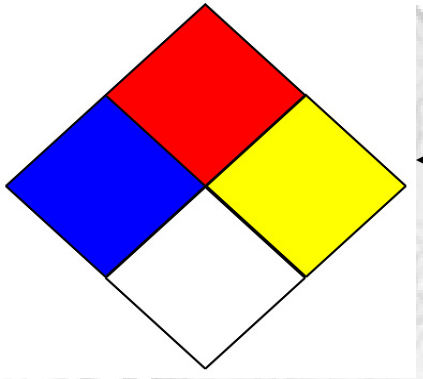
# Labeling Chemicals

- Labeling chemicals reduces environmental hazards.
- Dangerous reactions can occur if labeling is incorrect or non-existent.
- Recommendations
  - Identify all chemicals containers.
  - Adopt a standard chemical labeling procedure.
  - Use colorfast and permanent labels.
  - DO NOT use non-laboratory grade containers.


*Image from Purdue Department of Chemistry*

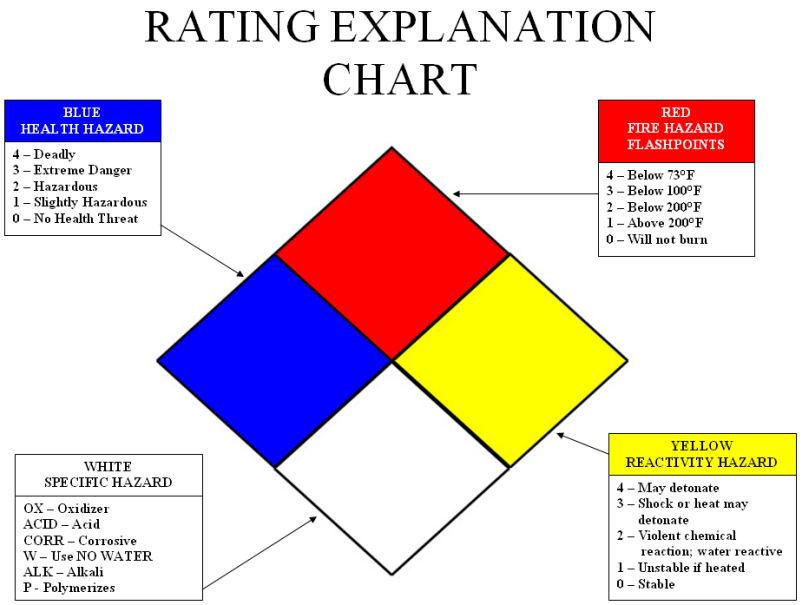
# What Will You See?


To be posted at the entrance of all Chemical Prep Areas.



To be posted at the entrance of all laboratories and Chemical Storage rooms.

To be posted inside all laboratories.



# Managing Chemical Inventories

- A Proper Chemical Inventory:
  - Has labeled chemicals.
  - Stores chemicals in a centralized place.
  - Stores waste properly until it is disposed.
- A Chemical Inventory Prevents:
  - Unknown chemicals
  - Excessive inventory stocks
  - Poor use of materials

# Conducting a Chemical Inventory

- Inventory existing chemicals.
    - NEVER involve students when doing this!
- DO NOT move any unmarked, bulging, leaking, rusted, cracked, or degraded chemical containers. Develop a disposal list with all important information about the chemicals.
- For a suggested procedure see the handout or manual guide – Chapter 7.

# Tracking Chemicals: From "Cradle to Grave"

- Chemicals must be tracked when they are bought, used, and disposed.
- Designate a centralized storage areas and a chemical coordinator.
- Use the old chemicals before purchasing or using the new.
- Regularly purge chemicals that are not used.

# Storing Waste Prior to Disposal

- All waste should be:
  - clearly labeled
  - Segregated by type and compatibility
  - Tracked
  - Labeled as “Hazardous” or “Potentially Hazardous” with the date and type of hazard
  - Inspected for leaks and damage regularly
  - Stored until it is able to be disposed properly

# Dealing with Unwanted Chemicals

- If possible, dispose of any non-hazardous chemicals you are familiar with in a safe and legal manner.
- Maintain your chemical inventory to avoid future accumulation of excess chemicals.
- Contact the School District's Office of Environmental Management and Services for additional help.

School District of Philadelphia
Office of Environmental Management & Services
440 North Broad Street
Philadelphia, PA 19130
215-400-5213 p
215-400-4751 f

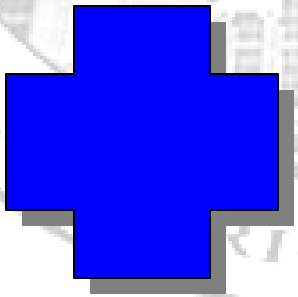
# Proper Chemical Storage

- Designed to:
  - Protect Flammables from ignition.
  - Minimize the potential of exposure to poisons.
  - Segregate incompatible chemicals to prevent accidental mixing.

- These guidelines are required by the Philadelphia Fire Department.

# Segregation

- DO NOT store chemicals alphabetically.
- Chemicals should be segregated by hazard class:
  - **RED:** Flammable.
  - **BLUE**: Health Hazard.
  - **YELLOW**: Reactive and oxidizing reagent.
    Corrosive.
  - **GRAY**, **GREEN** **or** **ORANGE**: Presents no more than moderate hazard.



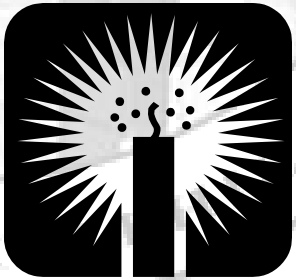


*Image from chemistry.about.com*

# Segregation

The signs below will be posted in every chemical storage room. The signs list each chemical by its hazard category and ranking. Each chemical should be stored by the hazard it is listed under.

## Low Hazard

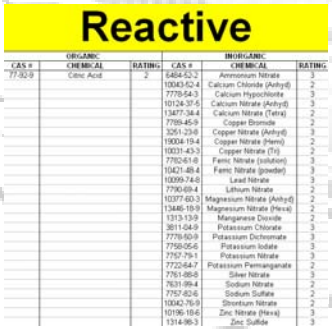
| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 50-81-7 | Ascorbic Acid | 0 | 9002-18-0 | Agar | 1 |
| 8015-86-9 | Carnauba Wax | 0 | 7429-90-5 | Aluminum Metal | 0 |
| 68855-54-9 | Celite | 1 | 10034-76-1 | Calcium Sulfate (Hem) | 0 |
| 9004-34-6 | Cellulose | 1 | 10101-41-4 | Calcium Sulfate (Di) | 0 |
| 7440-50-8 | Copper | 0 | mixture | Dish Detergent | 0 |
| 548-62-9 | Crystal Violet | 1 | 7440-59-7 | Helium | 1 |
| 50-99-7 | Dextrose | 1 | 7722-84-1 | Hydrogen Peroxide (<4%) | 1 |
| 57-48-7 | Fructose | 0 | 7439-89-6 | Iron Metal | 0 |
| 59-23-4 | Galactose | 0 | 7439-89-6 | Iron Powder | 1 |
| 9000-70-8 | Gelatin | 0 | 7647-14-5 | Sodium Chloride | 0 |
| 50-99-7 | Glucose | 0 | 7440-31-5 | Tin Metal | 0 |
| 9000-01-5 | Gum Arabic | 1 | 7440-66-6 | Zinc Metal | 1 |
| | Immersion Oil | 1 | | | |
| 9001-57-4 | Invertase | 0 | | | |
| 63-42-3 | Lactose | 0 | | | |
| 8006-54-0 | Lanolin | 1 | | | |
| 1393-92-6 | Litmus | 1 | | | |
| 69-79-4 | Maltose, D- (Anhyd) | 0 | | | |
| 6363-53-7 | Maltose, D- (Mono) | 0 | | | |
| 471-34-1 | Marble Chips | | | | |
| 8012-95-1 | Mineral Oil | 1 | | | |
| 8002-74-2 | Paraffin | 0 | | | |
| 73049-73-7 | Peptone | 2 | | | |
| 144-55-8 | Sodium Bicarbonate | 0 | | | |
| 9005-84-9 | Starch | 0 | | | |
| 57-50-1 | Sucrose | 0 | | | |

## Flammable

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 67-64-1 | Acetone | 2 | 7782-42-5 | Graphite | 2 |
| 71-36-3 | Butanol | 3 | | Iodine Tincture | 2 |
| 75-20-7 | Calcium Carbide | 3 | 7439-95-4 | Magnesium Metal | 2 |
| 9000-71-9 | Casein | 2 | 7704-34-9 | Sulfur - Precipitated | 3 |
| 573-58-0 | Congo Red | 3 | 8001-26-0 | Vegetable Oil | 2 |
| 9000-92-4 | Diastase Malt | 2 | | | |
| 64-17-5 | Ethanol | 2 | | | |
| 141-78-6 | Ethyl Acetate | 3 | | | |
| 60-00-4 | EDTA | 2 | | | |
| 110-54-3 | Hexane | 3 | | | |
| 67-63-0 | Isopropanol | 1 (3) | | | |
| 69-65-8 | Mannitol | 2 | | | |
| 67-56-1 | Methanol | 3 | | | |
| | Molisch Reagent | 3 | | | |
| 112-80-1 | Oleic Acid | 3 | | | |
| 71-23-8 | Propanol | 3 | | | |
| 57-11-4 | Stearic Acid | 2 | | | |
| 87-69-4 | Tartaric Acid | 2 | | | |
| 98988-92-1 | Wright's Stain Solution | 2 | | | |
| 7440-66-6 | Zinc Powder | 3 | | | |

## Corrosives

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 64-19-7 | Acetic Acid (<1M) | 0 | 12125-02-9 | Ammonium Chloride | 2 |
| 64-19-7 | Acetic Acid (>6M) | 3 | 7758-94-3 | Ferrous Chloride (Anhyd) | 2 |
| 64-19-7 | Acetic Acid (1M - 6M) | 2 | 7647-01-0 | Hydrochloric Acid (<1M) | 1 |
| 50-21-5 | Lactic Acid | 3 | 7647-01-0 | Hydrochloric Acid (>6M) | 3 |
| 2437-29-8 | Malachite Green | 2 | 7647-01-0 | Hydrochloric Acid (1M-6M) | 2 |
| 110-16-7 | Maleic Acid | 3 | 7553-56-2 | Iodine | 2 |
| 119-36-8 | Methyl Salicylate | 3 | 7697-37-2 | Nitric Acid (<1M) | 3 |
| 486-47-2 | Ninhydrin | 3 | 7697-37-2 | Nitric Acid (>6M) | 3 |
| 6153-56-6 | Oxalic Acid (Di) | 3 | 7697-37-2 | Nitric Acid (1M-6M) | 3 |
| 9001-75-6 | Pepsin | 2 | mixture | pH 10 Buffer NH4OH | 2 |
| mixture | pH 4 Buffer Acetate | 2 | mixture | pH 10 Buffer Borate | 2 |
| 877-24-7 | pH 4 Buffer Biphthalate | 2 | mixture | pH 10 Buffer Clear | 2 |
| | pH 7.4 Buffer Tris | 2 | mixture | pH 7 Buffer Phosphate | 2 |
| | Polyurethane Foam-Part A | 3 | 7664-38-2 | Phosphoric Acid (<1M) | 2 |
| | Polyurethane Foam-Part B | 3 | 7664-38-2 | Phosphoric Acid (>6M) | 3 |
| 877-24-7 | Potassium Hydrogen Phthalate | 2 | 7664-38-2 | Phosphoric Acid (1M-6M) | 3 |
| 69-72-7 | Salicylic Acid | 2 | 1310-58-3 | Potassium Hydroxide (<1M) | 2 |
| 532-32-1 | Sodium Benzoate | 2 | 1310-58-3 | Potassium Hydroxide (>6M) | 3 |
| 497-19-8 | Sodium Carbonate | 2 | 1310-58-3 | Potassium Hydroxide (1M-6M) | 2 |
| 85-83-6 | Sudan IV | 2 | mixture | Soda Lime | 3 |
| | Sudan IV Solution | 2 | 7681-38-1 | Sodium Bisulfate (Mono) | 3 |
| 76-61-9 | Thymol Blue | 2 | 7631-90-5 | Sodium Bisulfite | 2 |
| | | | 1310-73-2 | Sodium Hydroxide (<1M) | 2 |
| | | | 1310-73-2 | Sodium Hydroxide (>6M) | 3 |
| | | | 1310-73-2 | Sodium Hydroxide (1M-6M) | 2 |
| | | | 7681-52-9 | Sodium Hypochlorite (<6%) | 2 |
| | | | 10101-89-0 | Sodium Phosphate (Tri) | 2 |
| | | | mixture | Sodium Silicate | 2 |
| | | | 10476-85-4 | Strontium Chloride (Anhyd) | 2 |
| | | | 10025-70-4 | Strontium Chloride (Hexa) | 2 |
| | | | 7664-93-9 | Sulfuric Acid (<1M) | 2 |
| | | | 7664-93-9 | Sulfuric Acid (>6M) | 3 |
| | | | 7664-93-9 | Sulfuric Acid (1M-6M) | 2 |



## Reactive

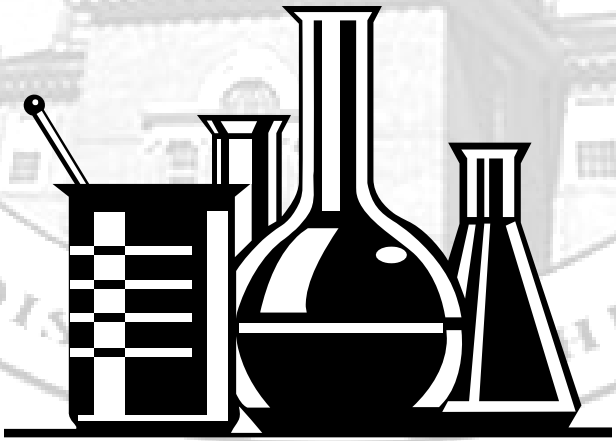
| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 77-92-9 | Citric Acid | 2 | 6484-52-2 | Ammonium Nitrate | 3 |
| | | | 10043-52-4 | Calcium Chloride (Anhyd) | 2 |
| | | | 7778-54-3 | Calcium Hypochlorite | 3 |
| | | | 10124-37-5 | Calcium Nitrate (Anhyd) | 3 |
| | | | 13477-34-4 | Calcium Nitrate (Tetra) | 2 |
| | | | 7789-45-9 | Copper Bromide | 2 |
| | | | 3251-23-8 | Copper Nitrate (Anhyd) | 3 |
| | | | 19004-19-4 | Copper Nitrate (Hemi) | 2 |
| | | | 10031-43-3 | Copper Nitrate (Tri) | 2 |
| | | | 7782-61-8 | Ferric Nitrate (solution) | 3 |
| | | | 10421-48-4 | Ferric Nitrate (powder) | 3 |
| | | | 10099-74-8 | Lead Nitrate | 3 |
| | | | 7790-69-4 | Lithium Nitrate | 3 |
| | | | 10377-60-3 | Magnesium Nitrate (Anhyd) | 2 |
| | | | 13446-18-9 | Magnesium Nitrate (Hexa) | 2 |
| | | | 1313-13-9 | Manganese Dioxide | 2 |
| | | | 3811-04-9 | Potassium Chlorate | 3 |
| | | | 7778-50-9 | Potassium Dichromate | 3 |
| | | | 7758-05-6 | Potassium Iodate | 3 |
| | | | 7757-79-1 | Potassium Nitrate | 3 |
| | | | 7722-64-7 | Potassium Permanganate | 2 |
| | | | 7761-88-8 | Silver Nitrate | 3 |
| | | | 7631-99-4 | Sodium Nitrate | 2 |
| | | | 7757-82-6 | Sodium Sulfate | 2 |
| | | | 10042-76-9 | Strontium Nitrate | 2 |
| | | | 10196-18-6 | Zinc Nitrate (Hexa) | 3 |
| | | | 1314-98-3 | Zinc Sulfide | 3 |

## Health

| ORGANIC | | | INORGANIC | | |
|---|---|---|---|---|---|
| CAS # | CHEMICAL | RATING | CAS # | CHEMICAL | RATING |
| 8004-87-3 | Methyl Violet | 2 | 7785-87-7 | Manganese (II) Sulfate (Anhyd) | 3 |
| 61-73-4 | Methylene Blue (Anhyd) | 2 | 10034-96-5 | Manganese (II) Sulfate (Mono) | 2 |
| 7220-79-3 | Methylene Blue (Tri) | 2 | 7447-40-7 | Potassium Chloride | 2 |
| 59-67-6 | Niacin | 2 | 13746-66-2 | Potassium Ferricyanide | 2 |
| 8049-47-6 | Pancreatin | 2 | 7681-11-0 | Potassium Iodide | 2 |
| 143-74-8 | Phenol Red | 2 | 7758-11-4 | Potassium Phosphate (Di) | 2 |
| 77-09-8 | Phenolphthalein | 2 | 7778-77-0 | Potassium Phosphate (Mono) | 2 |
| 57-55-6 | Propylene Glycol | 2 | 7778-53-2 | Potassium Phosphate (Tri) | 2 |
| mixture | Ringer's Solution | 2 | 333-20-0 | Potassium Thiocyanate | 2 |
| 11121-48-5 | Rose Bengal | 2 | 63231-67-4 | Silica Gel | 2 |
| 127-09-3 | Sodium Acetate (Anhyd) | 2 | 1330-43-4 | Sodium Borate | 2 |
| 6131-90-4 | Sodium Acetate (Hyd) | 2 | 7647-15-6 | Sodium Bromide | 2 |
| 68-04-2 | Sodium Citrate | 2 | 7681-82-5 | Sodium Iodide | 2 |
| 54-21-7 | Sodium Salicylate | 3 | 7558-79-4 | Sodium Phosphate (Di-Anhyd) | 2 |
| 85-86-9 | Sudan B | 2 | 7782-85-6 | Sodium Phosphate (Di-Hepta) | 2 |
| 85-86-9 | Sudan B Alcohol Solution | 2 | 10049-21-5 | Sodium Phosphate (Mono) | 2 |
| 89-83-8 | Thymol | 2 | 7757-83-7 | Sodium Sulfite | 3 |
| mixture | Universal Indicator | 2 | 540-72-7 | Sodium Thiocyanate | 2 |
| 57-13-6 | Urea | 3 | 7772-98-7 | Sodium Thiosulfate (Anhyd) | 3 |
| | | | 10102-17-7 | Sodium Thiosulfate (Penta) | 2 |
| | | | 7772-99-8 | Stannous Chloride | 3 |
| | | | 14807-96-6 | Talc | 2 |
| | | | 1314-13-2 | Zinc Oxide | 2 |

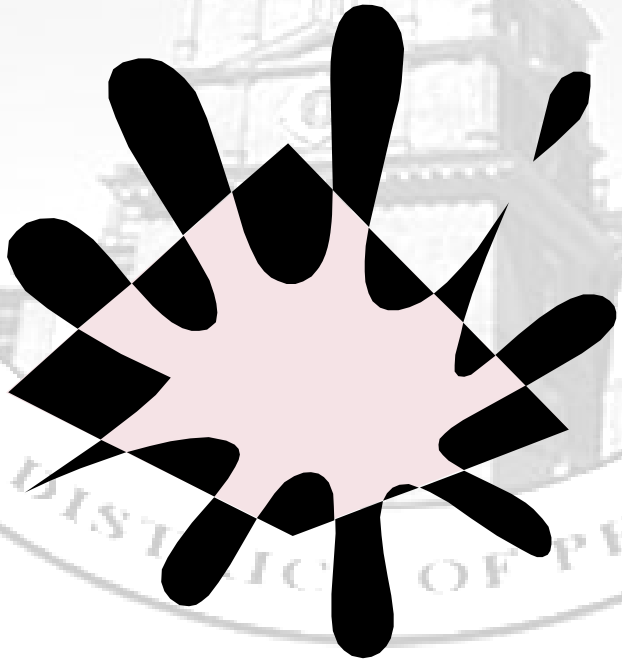
# Storage Tips

- Store chemicals in a way that will reduce risks of breakage or spills. *(ex: glass in a secondary container)*
- Do not allow students to have any access to the storage rooms.
- Avoid storing chemicals on top of fume hoods.
- Store flammable chemicals in a designated flammable cabinet.
- Label all chemicals properly → full name and hazard type



# Spills and Leaks….

- What do we do?
  - Record any spills or leaks.
  - Have a response plan ready.
  - Inspect daily for any spills or leaks.
  - Have spill and leak protection inside all storage rooms.
  - Call the building engineer IMMEDIATELY for help.

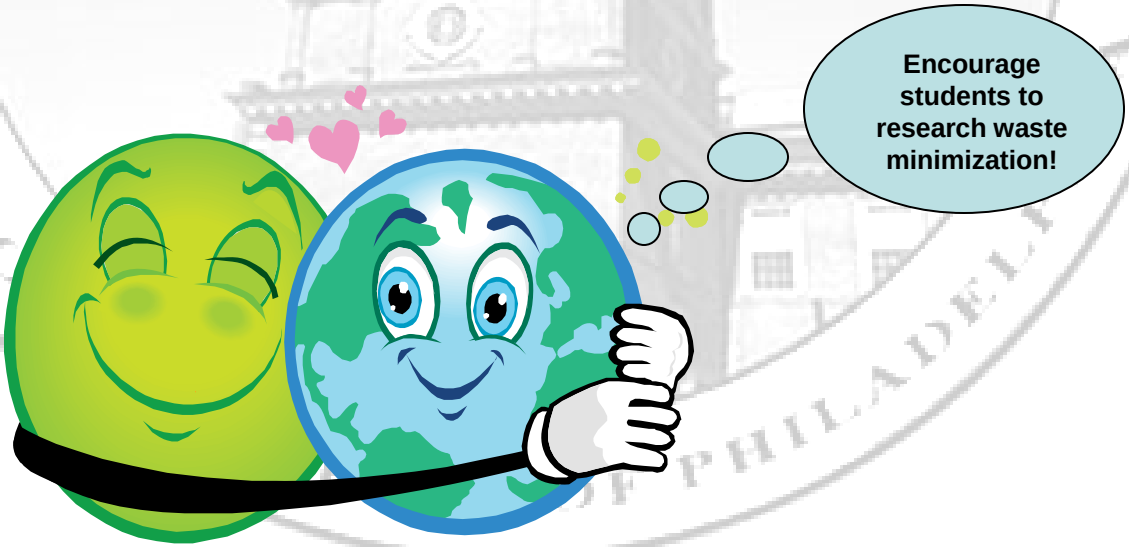


# Conducting Experiments

- Resource-Efficient Procedures
  - Limit the use of solvent and hazardous materials.
  - Monitor experiments closely and add additional chemicals only when necessary.
  - Conserve water by reducing rinse times whenever possible.
  - Save electricity by turning off equipment when not in use.

# Conducting Experiments

- Think Waste Minimization!
  - Pre-weigh chemicals for students.
  - Pair the students up to cut the use of chemicals in half.
  - Demonstrate some experiments to avoid having the entire class do them.



# Substituting Materials

- Substitute hazardous chemicals with low or non-hazardous chemicals whenever possible.
  - This helps avoid hazardous waste problems.
- See the manual guide for possible subsitutions.
  - *Chapter 12*

# Reusing and Recycling Chemicals

- Solvent Recovery
  - Spent solvents can easily be distilled “in-house” to a high purity that will allow for multiple reuse.
- Chemical Swap
  - A system in which schools can obtain chemicals from another school if given permission.
  - A system in which schools may be able to swap an unwanted chemical with a company in exchange for an approved chemical.




# Managing the Waste Streams

- It is the responsibility of the science teacher to determine if a waste is hazardous.
  - A chemical is considered Hazardous if it has one or more hazardous characteristics.
    - » Ignitable
    - » Corrosive
    - » Reactive
    - » Toxic
  - MSDS sheets should provide all necessary information.

# Segregating of Waste Streams

- Separating lab wastes is important for safety, legal, and pollution prevention reasons.
- Do not mix:
  - Hazardous with Non-Hazardous materials.
  - Organic with Inorganic materials.
  - Halogenated with Non-Halogenated materials.
- Segregating wastes helps cut down on disposal costs.

# Disposal of Hazardous Wastes

- DO NOT put hazardous wastes down the drain.
- You must recycle or dispose of them through licensed hazardous waste management firms.
- The generator of the waste is responsible for the hazardous waste until it is dispose of.
- For additional information or help, contact the School District of Philadelphia's Office of Environmental Management and Services.

# Chemical Disposal

- It's simple → Follow these guidelines:
  - DO NOT transfer the chemicals off of school property.
  - DO NOT POUR CHEMICALS DOWN THE DRAINS!!!!
  - DO NOT use fume hoods to evaporate volatile chemicals.
  - Dispose of wastes by recycling, reclamation or chemical deactivation whenever possible.

# In-Laboratory Treatment of Wastes

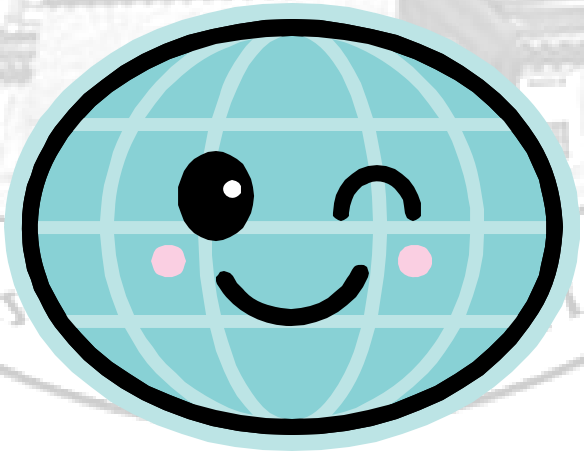
- For compounds that are non or less-hazardous you can use:
  - Neutralization
  - Separation
  - Fixation
  - Precipitation
  - Degradation
  - Ion exchange II oxidation

# Additional Information!

- For additional information you may contact the School District of Philadelphia's Office of Environmental Management and Services.

The School District of Philadelphia
Office of Environmental Management Services

- Additional information is also available in Chapter 17 of the Chemical Management Guide.



# CHEMICAL MANAGEMENT PROGRAM

*The School District of Philadelphia*

## The Do's

- **Label all chemicals.**
- **Properly dispose of chemicals.**
- **Organize all chemicals by their proper hazard category.**
- **Replace high hazardous chemicals with lower hazardous chemicals whenever possible.**

## The Don'ts

- **Do not purchase, store, or use any chemicals that do not appear on the School District's Approved List.**
- **Do not pour chemicals down the drains.**
- **Do not store chemicals alphabetically.**
- **Do not allow students to enter the prep areas or storage rooms.**
- **Do not take any chemicals off of school property for ANY reason.**

# Conducting a Chemical Inventory

## Suggested Procedure

1. Allow ample time to conduct the inventory.

2. Have a plan to deal with potential explosives if they are found. Will the local or state bomb squad remove the potential explosives? What agencies need to be alerted? What is the procedure for removal of potential explosives? Will the school have to close until the chemical is removed? Notify your local authority (e.g. fire dept.) that you will be doing an inventory, especially if this is the first inventory in several years.

3. Work in pairs and never work alone. It is best if one team does the entire inventory.

4. Be sure the areas in which you are working have adequate lighting.

5. Wear appropriate personal protective equipment. This should include gloves, chemical splash goggles, a lab apron and closed toed shoes.

6. Provide access to a phone, eyewash and a safety shower.

7. Have a written response plan nearby in case of a spill or accident.

8. One person should act as the recorder and the other person should list the chemicals. Be sure to pronounce the chemical correctly; the recorder should read the chemical name after it is recorded to confirm it is correct.

9. Enter the storage area and develop a general feel for the area. Is this a room in which no one has been in five years? Are there obvious vapors; are broken containers present? Are the shelving units secured to the walls? How is the lighting? If above eye level storage is present use a safety step stool or a small
step-ladder to reach the top shelf.

10. Record the room number and the date on your record sheet. Also indicate where in the room the inventory begins. Starting on the top shelf record the name of each chemical, the size of the container, the type of container, the approximate amount of chemical present, the condition of the container (i.e. rust, cracks, degraded top, bulging, liquid above a solid, crystals in a liquid), the presence of spills, defects in the shelving or its supports, corroded wires or gas lines or any other indicator of a hazard present. Do not touch or move chemicals if they are listed as potential explosives or the container appears distorted in any manner.

**Serious injury can occur from merely touching the top of a container of picric acid or expired ethyl ether. Use extreme caution not to knock any container to the floor.**

11. Be sure you examine all containers and record as much information as possible. For example, if ethyl ether is present record its lot number, expiration date and the manufacturer. **Do not touch the container.** You only want to conduct the inventory once and you want to gather as much information as possible. If the inventory is conducted over several days be sure you mark where you stopped at the end of the day.

12. If kits are present be sure to inventory all chemicals in each kit. Many older kits may contain unlabeled chemicals with only manufacturer's numbers on them. Although kits are particularly time consuming to inventory, each container must be identified. Record the manufacturer, the chemical number, and the size of the container and any information concerning the manufacturer such as phone number and address as well as the kit identification number. Do not ignore the kits; many contain carcinogens such as cadmium powder or toxic chemicals such as sodium azide.

13. If preserved specimens are present, record the preservative used. Contact the supplier to determine if the specimens are capable of outgassing formaldehyde. Many specimens contain some formaldehyde.

14. Be sure to examine all areas in each room including desks.

15. Once the inventory is developed, the next step is to decide if any immediate response is required. Does any chemical present pose a significant risk if not addressed immediately? This is a difficult question to answer particularly if potentially explosive chemicals are present. If you have a chemical health and safety committee or a chemical hygiene/safety officer they should discuss the situation with the principal and the local fire chief.

This inventory procedure was adapted from Chem Info Net. Additional information can be found on their web site, http://cheminfonet.org. Conducting a chemical inventory may be hazardous and those who do so should proceed with extreme caution. A school should consider contracting a licensed Hazardous Waste disposal firm to conduct the inventory and dispose of any hazardous waste.

# Chemical Compatibility Chart

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Inorganic Acids | 1 | | | | | | | | | | | | | | | | | | | | | |
| 2 | Organic acids | X | 2 | | | | | | | | | | | | | | | | | | | | |
| 3 | Caustics | X | X | 3 | | | | | | | | | | | | | | | | | | | |
| 4 | Amines & Alkanolamines | X | X | | 4 | | | | | | | | | | | | | | | | | | |
| 5 | Halogenated Compounds | X | | X | X | 5 | | | | | | | | | | | | | | | | | |
| 6 | Alcohols, Glycols & Glycol Ethers | X | | | | | 6 | | | | | | | | | | | | | | | | |
| 7 | Aldehydes | X | X | X | X | | X | 7 | | | | | | | | | | | | | | | |
| 8 | Ketone | X | | X | X | | | X | 8 | | | | | | | | | | | | | | |
| 9 | Saturated Hydrocarbons | | | | | | | | | 9 | | | | | | | | | | | | | |
| 10 | Aromatic Hydrocarbons | X | | | | | | | | | 10 | | | | | | | | | | | | |
| 11 | Olefins | X | | | | X | | | | | | 11 | | | | | | | | | | | |
| 12 | Petrolum Oils | | | | | | | | | | | | 12 | | | | | | | | | | |
| 13 | Esters | X | | X | X | | | | | | | | | 13 | | | | | | | | | |
| 14 | Monomers & Polymerizable Esters | X | X | X | X | X | X | | | | | | | | 14 | | | | | | | | |
| 15 | Phenols | | | X | X | | | X | | | | | | | X | 15 | | | | | | | |
| 16 | Alkylene Oxides | X | X | X | X | | X | X | | | | | | | X | X | 16 | | | | | | |
| 17 | Cyanohydrins | X | X | X | X | X | | X | | | | | | | | | X | 17 | | | | | |
| 18 | Nitriles | X | X | X | X | | | | | | | | | | | | X | | 18 | | | | |
| 19 | Ammonia | X | X | | | | | X | X | | | | | X | X | X | X | X | | 19 | | | |
| 20 | Halogens | | | X | | | X | X | X | X | X | X | X | X | X | X | | | | X | 20 | | |
| 21 | Ethers | X | | | | | | | | | | | | | X | | | | | | X | 21 | |
| 22 | Phosphorus, Elemental | X | X | X | | | | | | | | | | | | | | | | | X | | 22 |
| 23 | Sulfur, Molten | | | | | | | | | X | X | X | X | | | | X | | | | | | X | 23 |
| 24 | Acid Anhydrides | X | | X | X | | X | X | | | | | | | X | | X | X | X | X | | | | 24 |

X Represents Unsafe Combinations

Represents Safe Combinations

**Group 1: Inorganic Acids**

Chlorosulfonic acid
Hydrochloric acid (aqueous)
Hydrofluoric acid (aqueous)
Hydrogen chloride (anhydrous)
Hydrogen fluoride (anhydrous)
Nitric acid
Oleum
Phosphoric acid
Sulfuric acid

**Group 2: Organic Acids**

Acetic acid
Butyric acid (n-)
Formic acid
Propionic acid
Rosin Oil
Tall oil

**Group 3: Caustics**

Caustic potash solution
Caustic soda solution

**Group 4: Amines and Alkanolamines**

Aminoethylethanolamine
Aniline
Diethanolamine
Diethylenetriamine
Diisopropanolamine
Dimethylamine
Ethylenediamine
Hexamethylenediamine
2-Methyl-5-ethylpyridine
Monoethanolamine
Monoisopropanolamine
Morpholine
Pyridine
Triethanolamine
Triethlamine
Triethylenetetramine
Trimethylamine

**Group 5: Halogenated Compounds**

Allyl chloride
Carbon tetrachloride
Chlorobenzene
Chloroform
Chlorohydrines, crude
Dichlorobenzene (o-)
Dichlorobenzene (p-)
Dichlorodifluoromethane
Dichloroethyl ether
Dichloropropane
Dichloropropene
Ethyl chloride
Ethylene dibromide
Ethylene dichloride
Methyl bromide
Methyl chloride
Methylene chloride
Monochlorodifluoromethane
Perchloroethylene
Propylene dichloride
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
Trichloroethylene
Trichlorofluoromethane

**Group 6: Alcohols, Glycols and Glycol Ethers**

Allyl alcohol
Amyl alcohol
1,4-Butanediol
Butyl alcohol (iso, n, sec, tert)
Butylene glycol
Corn syrup
Cyclohexyl alcohol
Decyl alcohol (n, iso)
Dextrose solution
Diacetone alcohol
Diethylene glycol
Diethylene glycol dimethyl ether
Diethylene glycol monobutyl ether
Diethylene glycol monoethyl ether
Diethylene glycol monomethyl ether
Diisobutyl carbitol
Dipropylene glycol
Dodecanol
Ethoxylated dodecanol
Ethoxylated pentadecanol
Ethoxylated tetradecanol
Ethoxylated tridecanol
Ethoxytriglycol
Ethyl alcohol
Ethyl butanol
2-Ethylbuytl alcohol
2-Ethylhexyl alcohol
Ethylene glycol
Ethylene glycol monobutyl ether
Ethylene glycol monoethyl ether
Ethylene glycol monomethyl ether
Furfuryl alcohol
Glycerine
Heptanol
Hexanol

**Group 6: Alcohols, Glycols and Glycol Ethers (cont.)**

Hexylene glycol
Isoamyl alcohol
Isooctyl alcohol
Methyoxytriglycol
Methyl alcohol
Methylamyl alcohol
Molasses, all
Nonanol
Octanol
Pentadecanol
Polypropylene glycol methyl ether
Propyl alcohols (n, iso)
Propylene glycol
Sorbitol
Tetradecanol
Tetraethylene glycol
Tridecyl alcohol
Triethylene glycol
Undecanol

**Group 7: Aldehydes**

Acetaldehyde
Acrolein (inhibited)
Butyraldehyde (n, iso)
Crotonaldehyde
Decaldehyde (n, iso)
2-Ethyl-3-proplyacrolein
Formaldehyde solutions
Furfural
Hexamethylenetetramine
Isooctyl aldehyde
Methyl butyraldehyde
Methyl formal
Paraformaldehyde
Valeraldehyde

**Group 8: Ketones**

Acetone
Acetophenone
Camphor oil
Cylcohexanone
Diisobutyl ketone
Isophorone
Mesityl oxide
Methyl ethyl ketone
Methyl isobutyl ketone

**Group 9: Saturated Hydrocarbons**

Butane
Cyclohexane
Ethane
Heptane
Hexane
Isobutane
Liquified natural gas
Liquified petroleum gas
Methane
Nonane
n-Paraffins
Pentane
Petrolatum
Petroleum ethers
Petroleum naphtha
Polybutene
Propane
Propylene butylene polymer

**Group 10: Aromatic Hydrocarbons**

Benzene
Cumene
p-Cymene
Coal tar oil
Diethybenzene
Dodecyl benzene
Dowtherm
Ethylbenzene
Naphtha, coal tar
Naphthalene (includes molten)
Tetrahdyronaphthalene
Toluene
Triethyl benzene
Xylene (m-, o-, p-)

**Group 11: Olefins**

Butylene
1-Decene
Dicylcopentadiene
Diisobuytlene
Dipentene
Dodecene
1-Dodecene
Ethylene
Liquified petroleum gas
1-Heptene
1-Hexane
Isobutylene
Nonene
1-Octene
1-Pentene
Polybutene
Propylene
Propylene butylene polymer

**Group 11: Olefins (cont.)**

- Propylene tetramer (dodecene)
- 1-Tetradecene
- 1-Tridecene
- Turpentine
- 1-Undecene

**Group 12: Petroleum Oils**

- Asphalt
- Gasolines
  - Casingead
  - Automotive
  - Aviation
- Jet Fuels
- JP-1 (kerosene)
- JP-3
- JP-4
- JP-5 (kerosene, heavy)
- Kerosene
- Mineral spirits
- Naphtha (non aromatic)
- Naphtha
  - Solvent
  - Stoddard solvent
  - VM&P
- Oils
  - Absorption oil
  - Clarified oil
  - Crude oil
  - Diesel oil
  - Fuel oil
    - No. 1 (kerosene)
    - No. 1-D
    - No. 2
    - No. 2-D
    - No. 4
    - No. 5
    - No. 6
  - Lubricating oil
  - Mineral oil
  - Mineral seal oil
  - Motor oil
  - Penetration oil
  - Range oil
  - Road oil
  - Spindle oil
  - Spray oil
  - Transformer oil
  - Turbine oil

**Group 13: Esters**

- Amyl acetate
- Amyl tallate
- Butyl acetates (n, iso, sec)
- Butyl benzyl phthalate
- Castor oil
- Croton oil
- Dibutyl phthalate
- Diethyl carbonate
- Dimethyl sulfate
- Dioctyl adipate
- Dioctyl phthalate
- Epoxidized vegetable oils
- Ethyl acetate
- Ethyl diacetate
- Ethylene glycol monoethyl ether acetate
- Ethylhexyl tallate
- Fish oil
- Glycol diacetate
- Methyl acetate
- Methyl amyl acetate
- Neatsfoot oil
- Olive oil
- Peanut oil
- Propyl acetates (n, iso)
- Resin oil
- Soya bean oil
- Sperm oil
- Tallow
- Tanner's oil
- Vegetable oil
- Wax, carnauba

**Group 14: Monomers and Polymerizable esters**

- Acrylic acid (inhibited)
- Acrylonitrile
- Butadiene (inhibited)
- Butyl acrylate (n, iso)
- Ethyl acrylate (inhibited)
- 2-Ethylhexyl acrylate (inhibited)
- Isodecyl acrylate (inhibited)
- Isoprene (inhibited)
- Methyl acrylate (inhibited)
- Methyl methacrylate (inhibited)
- o-Propiolactone
- Styrene (inhibited)
- Vinyl acetate (inhibited)
- Vinyl chloride (inhibited)
- Vinylidene chloride (inhibited)
- Vinyl toluene

**Group 15: Phenols**

Carbolic oil
Creosote, coal tar
Cresols
Nonylphenol
Phenol

**Group 16: Alkylene Oxides**

Ethylene Oxide
Propylene Oxide

**Group 17: Cyanohydrins**

Acetone cyanohydrin
Ethylene cyanohydrin

**Group 18: Nitriles**

Acetonitrile
Adiponitrile

**Group 19: Ammonia**

Ammonium hydroxide

**Group 20: Halogens**

Bromine
Chlorine

**Group 21: Ethers**

Diethyl ether (ethyl ether)
1, 4, Dioxane
Isoprophyl ether
Ethers (cont)
Tetrahydrofuran

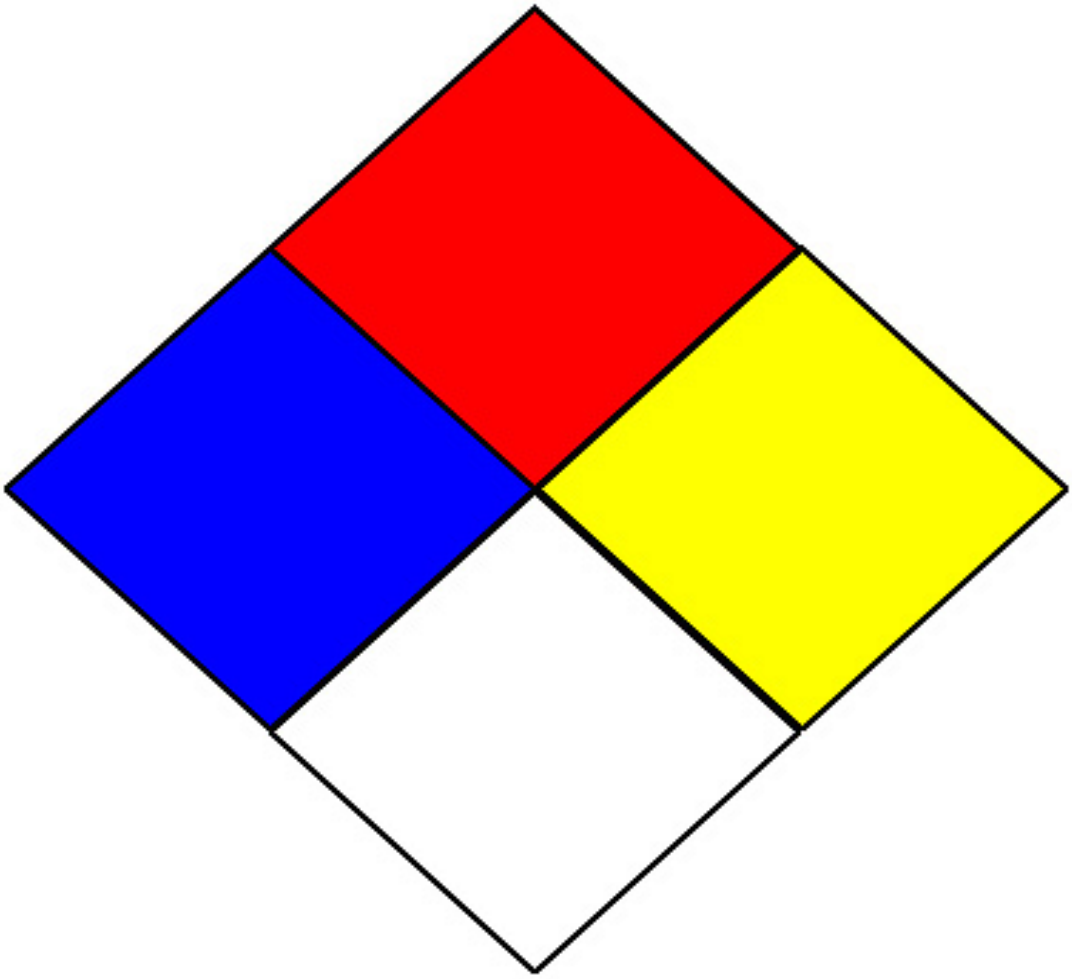
**Group 22: Phosphorus, elemental**

**Group 23: Sulfur, molten**

**Group 24: Acid Anhydride**

Acetic anhydride
Propionic anhydride

# HMIS LABEL



# CHEMICAL STORAGE SIGN

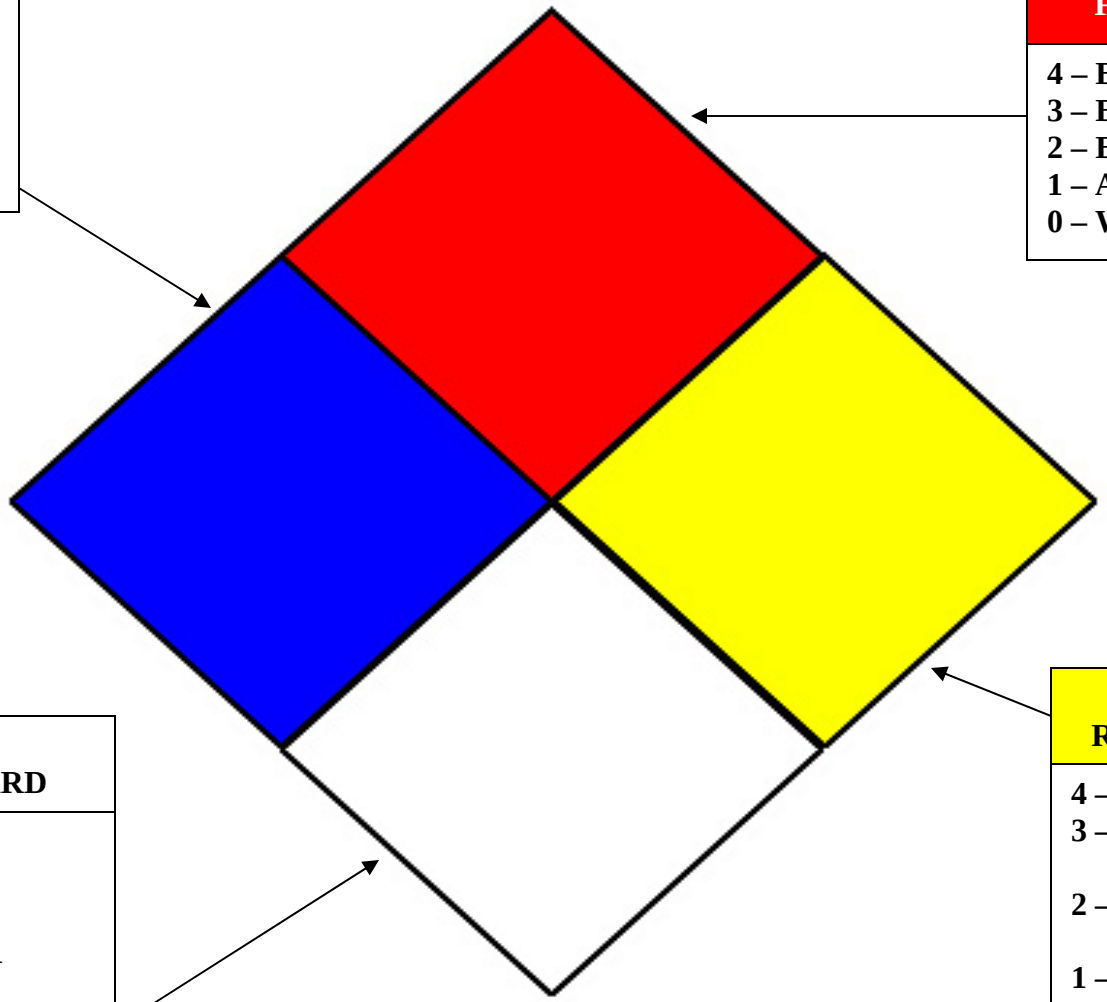
# RATING EXPLANATION CHART

**BLUE**
**HEALTH HAZARD**

**4 – Deadly**
**3 – Extreme Danger**
**2 – Hazardous**
**1 – Slightly Hazardous**
**0 – No Health Threat**

**RED**
**FIRE HAZARD**
**FLASHPOINTS**

**4 – Below 73°F**
**3 – Below 100°F**
**2 – Below 200°F**
**1 – Above 200°F**
**0 – Will not burn**



**WHITE**
**SPECIFIC HAZARD**

**OX – Oxidizer**
**ACID – Acid**
**CORR – Corrosive**
**W – Use NO WATER**
**ALK – Alkali**
**P - Polymerizes**

**YELLOW**
**REACTIVITY HAZARD**

**4 – May detonate**
**3 – Shock or heat may detonate**
**2 – Violent chemical reaction; water reactive**
**1 – Unstable if heated**
**0 – Stable**

# Material Safety Data Sheets

***These papers must be easily accessible for all Firefighters and Authorized Personnel.***

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 3.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Acetamide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Acetamide
Synonyms: acetic acid amide, ethanamide
CAS#: 60-35-5

### Section 3 — Hazards Identification

Colorless to white crystal; deliquescent. Musty odor.
Avoid all body tissue contact. Irritating to body tissues.
Possible carcinogen.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-1
Exposure-3
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water and mild liquid soap for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control immediately.

### Section 5 — Fire Fighting Measures

Non-flammable, combustible liquid.
When heated to decomposition, may produce toxic fumes of NOx,CO, or NH3.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information. Remove all ignition sources and ventilate area.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Deliquescent, store in Flinn Chem-Saf bag. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).

## Section 9 — Physical and Chemical Properties

Colorless to white crystal.
Solubility: One gram dissolves in 0.5 ml of water and 2 ml of alcohol, soluble in chloroform.
Formula: CH3CONH2
Formula Weight: 59.07

Specific Gravity: 1.159
Melting Point: 81 C
Vapor Pressure: 1mm @ 65 C
Boiling Point: 222 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Poor; deliquescent.

## Section 11 — Toxicological Information

Acute effects: irritant
Chronic effects: possible carcinogen, mutagen
Target organs: liver

ORL-RAT LD50: 7000 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-473-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

**FLINN SCIENTIFIC INC.**
**"Your Safer Source for Science Supplies"**

***Flinn--"Your Safer Source for Chemicals"***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **A0323** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***02/16/06***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Acetic Acid Solution

## 1. Product Identification

**Synonyms:** methane carboxylic acid; Acetic acid, 30% solution (w/v); Acetic acid solution 4.0N
**CAS No.:** 64-19-7
**Molecular Weight:** 60.05
**Chemical Formula:** CH3COOH (in water)
**Product Codes:** 0320, 0330

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Acetic Acid | 64-19-7 | 22 - 30% | Yes |
| Water | 7732-18-5 | 70 - 78% | No |

## 3. Hazards Identification

**Emergency Overview**

**POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE. FLAMMABLE LIQUID AND VAPOR.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 2 - Moderate
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: White (Corrosive)

**Potential Health Effects**

Hazard evaluation based upon pure (glacial) acetic acid. Hazards of dilute solutions may not be as severe as those of glacial acetic acid.

**Inhalation:**
Inhalation of concentrated vapors may cause serious damage to the lining of the nose, throat, and lungs. Breathing difficulties may occur. Neither odor nor degree of irritation are adequate to indicate vapor concentration.
**Ingestion:**
Swallowing can cause severe injury leading to death. Symptoms include sore throat, vomiting, and diarrhea. Ingestion of as little as 1.0 ml has resulted in perforation of the esophagus.
**Skin Contact:**
Contact with concentrated solution may cause serious damage to the skin. Effects may include redness, pain, skin burns. High vapor concentrations may cause skin sensitization.
**Eye Contact:**
Eye contact with concentrated solutions may cause severe eye damage followed by loss of sight. Exposure to vapor may cause intense watering and irritation to eyes.
**Chronic Exposure:**
Repeated or prolonged exposures may cause darkening of the skin, erosion of exposed front teeth, and chronic inflammation of the nose, throat, and bronchial tubes.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems, or impaired respiratory function may be more susceptible to the effects of the substance.

## 4. First Aid Measures

Hazard evaluation based upon pure (glacial) acetic acid. Hazards of dilute solutions may not be as severe as those of glacial acetic acid.
**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
Flash point: 39C (102F) CC
Autoignition temperature: 516C (961F)
Flammable limits in air % by volume:
lel: 4.0; uel: 19.9
Listed fire data is for Glacial Acetic Acid. Flammable Liquid and Vapor!
**Explosion:**
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water diluted acid can react with metals to form hydrogen gas.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Use water spray to dilute spill to a nonflammable mixture. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Use non-sparking tools and equipment. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

## 7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Store above 17C (63F). Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
10 ppm (TWA).
-ACGIH Threshold Limit Value (TLV):
10 ppm (TWA); 15 ppm (STEL).

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

Physical data below refers to Acetic Acid Glacial.
**Appearance:**
Clear, colorless liquid.
**Odor:**
Strong, vinegar-like.
**Solubility:**
Infinitely soluble.
**Density:**
1.05
**pH:**
2.4 (1.0M solution)
**% Volatiles by volume @ 21C (70F):**

100
**Boiling Point:**
118C (244F)
**Melting Point:**
16.6C (63F)
**Vapor Density (Air=1):**
2.1
**Vapor Pressure (mm Hg):**
11 @ 20C (68F)
**Evaporation Rate (BuAc=1):**
0.97

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition. May also release toxic and irritating vapors.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acetic Acid is incompatible with chromic acid, nitric acid, ethylene glycol, perchloric acid, phosphorous trichloride, oxidizers, sodium peroxide, strong caustics, most metals (except aluminum), carbonates, hydroxides, oxides, and phosphates.
**Conditions to Avoid:**
Heat, flame, ignition sources, freezing, incompatibles

## 11. Toxicological Information

For Acetic Acid: Oral rat LD50: 3310 mg/kg. Dermal rabbit LD50: 1.06g/Kg. Inhalation mouse LC50: 5620 ppm/1 hr. Investigated as a mutagen, reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Acetic Acid (64-19-7) | No | No | None |
| Water (7732-18-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
For glacial acetic acid: If released to the atmosphere, it is degraded in the vapor phase by reaction with photochemically produced hydroxyl radicals (estimated typical half-life of 26.7 days). If released to water, acetic acid will biodegrade readily. If released to soil, it will biodegrade readily. Standard dilution BOD water, 5-day 57.7% theoretical BOD average. Acetic acid shows no potential for biological accumulation or food chain contamination. BCF estimated < 1.
**Environmental Toxicity:**
For glacial acetic acid:
EC50 (wheat fumigation) = 23.3 mg/m3/2-hr, effect: leaf injury
LC50 (shrimp) = 100 - 300 mg/l/48-hr
LC50 (fathead minnow) = 88 mg/l/96-hr
This material may be toxic to aquatic life.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** ACETIC ACID, 30% SOLUTION
**Hazard Class:** 8
**UN/NA:** UN2790
Packing Group: III
**Information reported for product/size:** 200L

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** ACETIC ACID, 30% SOLUTION
**Hazard Class:** 8
**UN/NA:** UN2790
Packing Group: III
**Information reported for product/size:** 200L

**International (Air, I.C.A.O.)**
---
**Proper Shipping Name:** ACETIC ACID, 30% SOLUTION
**Hazard Class:** 8
**UN/NA:** UN2790
Packing Group: III

**Information reported for product/size:** 200L

## 15. Regulatory Information

```
--------\Chemical Inventory Status - Part 1\---------------------------------
Ingredient                                    TSCA  EC   Japan  Australia
----------------------------------------------  ----  ---  -----  ---------
Acetic Acid (64-19-7)                          Yes  Yes   Yes      Yes
Water (7732-18-5)                              Yes  Yes   Yes      Yes

--------\Chemical Inventory Status - Part 2\---------------------------------
                                                        --Canada--
Ingredient                                    Korea  DSL   NDSL  Phil.
----------------------------------------------  -----  ---   ----  -----
Acetic Acid (64-19-7)                          Yes   Yes   No     Yes
Water (7732-18-5)                              Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                      -SARA 302-    ------SARA 313------
Ingredient                            RQ    TPQ     List  Chemical Catg.
------------------------------------  ---   -----   ----  ---------------
Acetic Acid (64-19-7)                 No    No      No          No
Water (7732-18-5)                     No    No      No          No

--------\Federal, State & International Regulations - Part 2\----------------
                                                -RCRA-    -TSCA-
Ingredient                            CERCLA    261.33     8(d)
------------------------------------  ------    ------    ------
Acetic Acid (64-19-7)                 5000      No         No
Water (7732-18-5)                     No        No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: Yes Pressure: No
Reactivity: Yes         (Mixture / Liquid)
```

**Australian Hazchem Code:** 2R
**Poison Schedule:** S5
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE. FLAMMABLE LIQUID AND VAPOR.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat, sparks and flame.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A0446** * * * * * *Effective Date:* ***02/01/07*** * * * * * *Supercedes:* ***05/20/04***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# ACETONE

## 1. Product Identification

**Synonyms:** Dimethylketone; 2-propanone; dimethylketal
**CAS No.:** 67-64-1
**Molecular Weight:** 58.08
**Chemical Formula:** (CH3)2CO
**Product Codes:**
J.T. Baker: 5008, 5018, 5356, 5580, 5965, 5975, 9001, 9002, 9003, 9004, 9005, 9006, 9007, 9008, 9009, 9010, 9015, 9024, 9036, 9125, 9254, 9271, A134, V655
Mallinckrodt: 0018, 2432, 2435, 2437, 2438, 2440, 2443, 2850, H451, H580, H981

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Acetone | 67-64-1 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 0 - None
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

**Potential Health Effects**

**Inhalation:**
Inhalation of vapors irritates the respiratory tract. May cause coughing, dizziness, dullness, and headache. Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.
**Ingestion:**
Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms are expected to parallel inhalation.
**Skin Contact:**
Irritating due to defatting action on skin. Causes redness, pain, drying and cracking of the skin.
**Eye Contact:**
Vapors are irritating to the eyes. Splashes may cause severe irritation, with stinging, tearing, redness and pain.
**Chronic Exposure:**
Prolonged or repeated skin contact may produce severe irritation or dermatitis.
**Aggravation of Pre-existing Conditions:**
Use of alcoholic beverages enhances toxic effects. Exposure may increase the toxic potential of chlorinated hydrocarbons, such as chloroform, trichloroethane.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.

Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

## 5. Fire Fighting Measures

**Fire:**
Flash point: -20C (-4F) CC
Autoignition temperature: 465C (869F)
Flammable limits in air % by volume:
lel: 2.5; uel: 12.8
Extremely Flammable Liquid and Vapor! Vapor may cause flash fire.
**Explosion:**
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. This material may produce a floating fire hazard. Sensitive to static discharge.
**Fire Extinguishing Media:**
Dry chemical, alcohol foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

## 7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
Acetone:
-OSHA Permissible Exposure Limit (PEL):
1000 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):
500 ppm (TWA), 750 ppm (STEL) A4 - not classifiable as a human carcinogen
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless, volatile liquid.
**Odor:**
Fragrant, mint-like
**Solubility:**
Miscible in all proportions in water.
**Specific Gravity:**
0.79 @ 20C/4C
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
100
**Boiling Point:**

56.5C (133F) @ 760 mm Hg
**Melting Point:**
-95C (-139F)
**Vapor Density (Air=1):**
2.0
**Vapor Pressure (mm Hg):**
400 @ 39.5C (104F)
**Evaporation Rate (BuAc=1):**
ca. 7.7

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Concentrated nitric and sulfuric acid mixtures, oxidizing materials, chloroform, alkalis, chlorine compounds, acids, potassium t-butoxide.
**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.

## 11. Toxicological Information

Oral rat LD50: 5800 mg/kg; Inhalation rat LC50: 50,100mg/m3; Irritation eye rabbit, Standard Draize, 20 mg severe; investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Acetone (67-64-1) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released to water, this material is expected to quickly evaporate. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition.
**Environmental Toxicity:**
This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** ACETONE
**Hazard Class:** 3
**UN/NA:** UN1090
Packing Group: II
**Information reported for product/size:** 188L

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** ACETONE
**Hazard Class:** 3
**UN/NA:** UN1090
Packing Group: II
**Information reported for product/size:** 188L

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Acetone (67-64-1) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| | --Canada-- |
|---|---|

| Ingredient | Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Acetone (67-64-1) | Yes | Yes | No | Yes |

| | -SARA 302- | | -SARA 313- | |
|---|---|---|---|---|
| Ingredient | RQ | TPQ | List | Chemical Catg. |
| Acetone (67-64-1) | No | No | Yes | No |

| | | -RCRA- | -TSCA- |
|---|---|---|---|
| Ingredient | CERCLA | 261.33 | 8(d) |
| Acetone (67-64-1) | 5000 | U002 | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

**Australian Hazchem Code:** 2[Y]E
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **3** Reactivity: **0**
**Label Hazard Warning:**
DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.
**Label Precautions:**
Keep away from heat, sparks and flame.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid breathing vapor.
Avoid contact with eyes, skin and clothing.
**Label First Aid:**
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A1856** * * * * * *Effective Date:* ***08/03/07*** * * * * * *Supercedes:* ***11/10/05***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AGAR AGAR

## 1. Product Identification

**Synonyms:** Polysaccharide Complex
**CAS No.:** 9002-18-0
**Molecular Weight:** Not applicable.
**Chemical Formula:** Not applicable.
**Product Codes:** A434

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Agar | 9002-18-0 | 90 - 100% | No |

## 3. Hazards Identification

**Emergency Overview**

**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 0 - None
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
No adverse health effects via inhalation.
**Ingestion:**
Not expected to be a health hazard via ingestion.
**Skin Contact:**
Not expected to be a health hazard from skin exposure.
**Eye Contact:**
Not expected to be a health hazard.
**Chronic Exposure:**
No adverse health effects expected.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Not expected to require first aid measures. If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**
Not expected to require first aid measures. Wash thoroughly with running water. Get medical advice if irritation develops.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
Not expected to require any special ventilation.
**Personal Respirators (NIOSH Approved):**
Not expected to require personal respirator usage.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**
Transparent strips, or thin translucent membranous pieces, or white to pale buff fine or coarse powder.
**Odor:**
Odorless.
**Solubility:**
Negligible (< 0.1%)
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
Not applicable.
**Vapor Pressure (mm Hg):**
Not applicable.
**Evaporation Rate (BuAc=1):**
No information found.

---

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
Moisture and incompatibles.

---

## 11. Toxicological Information

Agar: 11 gm/kg rat oral LD50. Investigated as a tumorigen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Agar (9002-18-0) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Agar (9002-18-0) | Yes | Yes | No | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Agar (9002-18-0) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Agar (9002-18-0) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Agar (9002-18-0) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A2760** * * * * * *Effective Date:* ***02/03/09*** * * * * * *Supercedes:* ***05/19/08***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# ALUMINUM AMMONIUM SULFATE

## 1. Product Identification

**Synonyms:** Aluminum ammonium disulfate dodecahydrate;Aluminum ammonium disulfate, 12-hydrate; Ammonium alum; sulfuric acid aluminum ammonium salt (2:1:1), dodecahydrate
**CAS No.:** 7784-25-0 (Anhydrous) 7784-26-1 (Dodecahydrate)
**Molecular Weight:** 453.32
**Chemical Formula:** AlNH4(SO4)2 . 12H2O
**Product Codes:**
J.T. Baker: 0484
Mallinckrodt: 3212

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Sulfuric Acid, Aluminum Ammonium Salt (2:1:1) | 7784-25-0 | 98 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

This material hydrolyzes in water to form sulfuric acid, which is responsible for the irritating effects given below.

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. There have been two cases of fatal human poisonings from ingestion of 30 grams of alum.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:**
Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard. May release flammable ammonia if involved in a fire.

**Explosion:**
Not considered to be an explosion hazard. Sealed containers may rupture when heated.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire. Keep in mind that addition of water can cause the formation of sulfuric acid.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Cover spill with sodium bicarbonate or soda ash and mix. Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
15 mg/m3 (TWA) total dust and 5 mg/m3 (TWA)
respirable fraction for Aluminum metal as Al.
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 respirable fraction (TWA), Aluminum metal and Insoluble compounds, A4.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Colorless crystals.
**Odor:**
Odorless.
**Solubility:**
14% in water, 200% in boiling water
**Density:**
1.65
**pH:**
4.6 (0.05M solution)
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
280C (536F) Decomposes.
**Melting Point:**
94.5C (201F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Toxic oxides of nitrogen, sulfur dioxide, ammonia, and sulfur trioxide may form at elevated temperatures. Hydrolyzes to form sulfuric acid.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Contact with alkalis may release ammonia gas. Corrosive to metals in the presence of water.
**Conditions to Avoid:**
Moisture and incompatibles.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Sulfuric Acid, Aluminum Ammonium Salt (2:1:1) (7784-25-0) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Sulfuric Acid, Aluminum Ammonium Salt (2:1:1) (7784-25-0) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Sulfuric Acid, Aluminum Ammonium Salt (2:1:1) (7784-25-0) | Yes | Yes | No | No |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Sulfuric Acid, Aluminum Ammonium Salt (2:1:1) (7784-25-0) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Sulfuric Acid, Aluminum Ammonium Salt (2:1:1) (7784-25-0) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 8.
**Disclaimer:**
**********
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 36.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Aluminum Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Aluminum Chloride
Synonym: Hexahydrate Aluminum Trichloride
CAS#: 7784-13-6

### Section 3 — Hazards Identification

Moist, white crystals.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Deliquescent. Store in a Chem-Saf bag. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).

## Section 9 — Physical and Chemical Properties

Moist, white crystals.
Solubility: Water.
Formula: AlCl3 6H2O
Formula Weight: 241.43

Specific Gravity: 2.4

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf life: Poor; deliquescent. Store in a Chem-Saf bag.

## Section 11 — Toxicological Information

Acute effects: dust is an irritant.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 3311 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-208-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

**FLINN SCIENTIFIC INC.**
**"Your Safer Source for Science Supplies"**

***Flinn--"Your Safer Source for Chemicals"***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **A2914** * * * * * *Effective Date:* ***02/03/09*** * * * * * *Supercedes:* ***05/19/08***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# ALUMINUM SULFATE

## 1. Product Identification

**Synonyms:** Sulfuric acid, aluminum salt (3:2), octadeca hydrate; Cake alum; Patent alum
**CAS No.:** 10043-01-3 (Anhydrous) 7784-31-8 (Octadecahydrate)
**Molecular Weight:** 666.44
**Chemical Formula:** Al2(SO4)3.18H2O
**Product Codes:**
J.T. Baker: 0564
Mallinckrodt: 3208

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Aluminum Sulfate | 10043-01-3 | 98 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

This material hydrolyzes in water to form sulfuric acid, which is responsible for the irritating effects given below.

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. There have been two cases of fatal human poisonings from ingestion of 30 grams of alum.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get

medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Keep in mind that addition of water can cause the formation of sulfuric acid.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Cover spill with sodium bicarbonate or soda ash and mix. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Aluminum sulfate absorbs moisture and becomes a safety hazard when spilled because it absorbs moisture and becomes slippery. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
15 mg/m3 (TWA) total dust and 5 mg/m3 (TWA)
respirable fraction for Aluminum metal as Al.
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 respirable fraction (TWA), Aluminum metal and Insoluble compounds, A4.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Colorless crystals.
**Odor:**
Odorless.
**Solubility:**
87 g/100 cc water @ 0C (32F).
**Specific Gravity:**
1.69 @ 17C/4C
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
87C (189F) Decomposes.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Hydrolyzes to form dilute sulfuric acid. Toxic and corrosive oxides of sulfur may be formed when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Corrosive to metals in the presence of water.
**Conditions to Avoid:**
Moisture and incompatibles.

## 11. Toxicological Information

Anhydrous Material: Oral mouse LD50: 6207 mg/kg; Irritation eyes rabbit: 10 mg/24H severe; investigated as a mutagen and reproductive effector.
18-Hydrate: Oral mouse LD50: > 9 gm/kg; investigated as a mutagen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Aluminum Sulfate (10043-01-3) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Aluminum Sulfate (10043-01-3) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Aluminum Sulfate (10043-01-3) | Yes | Yes | No | No |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Aluminum Sulfate (10043-01-3) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Aluminum Sulfate (10043-01-3) | 5000 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 8.
**Disclaimer:**
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**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A2705** * * * * * *Effective Date:* ***02/03/09*** * * * * * *Supercedes:* ***05/17/07***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# ALUMINUM METAL (WIRE, FOIL, SHOT)

## 1. Product Identification

**Synonyms:** Aluminum wire; Aluminum foil; Aluminum shot; Aluminum uncrated nonpyrophoric
**CAS No.:** 7429-90-5
**Molecular Weight:** 26.98
**Chemical Formula:** Al
**Product Codes:** 0449, 0456

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Aluminum Metal | 7429-90-5 | 95 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 0 - None
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Not expected to be a health hazard.
**Ingestion:**
Not expected to be a health hazard.
**Skin Contact:**
No adverse effects expected.
**Eye Contact:**
No adverse effects expected.
**Chronic Exposure:**
No adverse effects expected.
**Aggravation of Pre-existing Conditions:**
No adverse health effects expected.

## 4. First Aid Measures

**Inhalation:**
Not expected to require first aid measures.
**Ingestion:**
Not expected to require first aid measures.
**Skin Contact:**
Not expected to require first aid measures.
**Eye Contact:**
Not expected to require first aid measures.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

## 6. Accidental Release Measures

Sweep, scoop or pick up spilled material. Package for reclamation or recovery. Package unreclaimable material for disposal in an approved waste disposal facility.

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## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
15 mg/m3 (TWA) total dust and 5 mg/m3 (TWA)
respirable fraction for Aluminum metal as Al.
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 respirable fraction (TWA), Aluminum metal and Insoluble compounds, A4.
**Ventilation System:**
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
**Personal Respirators (NIOSH Approved):**
Not expected to require personal respirator usage.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Safety glasses.

---

## 9. Physical and Chemical Properties

**Appearance:**
Bright, silver-white metal.
**Odor:**
Odorless.
**Solubility:**
Insoluble in water.
**Density:**
2.70
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
2327C (4221F)
**Melting Point:**
660C (1220F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
1 @ 1284C (2343F)
**Evaporation Rate (BuAc=1):**
No information found.

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## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Toxic metal fumes may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Mercury, halocarbons, halogens, water (with bulk aluminum powder) strong oxidizing agents, some acids, bases and many other materials.
**Conditions to Avoid:**
Incompatibles.

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## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

| Ingredient | NTP Carcinogen: Known | NTP Carcinogen: Anticipated | IARC Category |
|---|---|---|---|
| Aluminum Metal (7429-90-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Aluminum Metal (7429-90-5) | Yes | Yes | No | Yes |

| Ingredient | Korea | Canada: DSL | Canada: NDSL | Canada: Phil. |
|---|---|---|---|---|
| Aluminum Metal (7429-90-5) | Yes | Yes | No | Yes |

| Ingredient | SARA 302: RQ | SARA 302: TPQ | SARA 313: List | SARA 313: Chemical Catg. |
|---|---|---|---|---|
| Aluminum Metal (7429-90-5) | No | No | Yes | No |

| Ingredient | CERCLA | RCRA: 261.33 | TSCA: 8(d) |
|---|---|---|---|
| Aluminum Metal (7429-90-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 8.
**Disclaimer:**
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**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.**

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A5616** * * * * * *Effective Date:* ***01/24/07*** * * * * * *Supercedes:* ***08/10/04***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AMMONIUM BICARBONATE

## 1. Product Identification

**Synonyms:** Ammonium hydrogen carbonate; Ammonium acid carbonate
**CAS No.:** 1066-33-7
**Molecular Weight:** 79.06
**Chemical Formula:** NH4HCO3
**Product Codes:**
J.T. Baker: 3003
Mallinckrodt: 0155, 3281

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Bicarbonate | 1066-33-7 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Dust may cause irritation of the nose, throat, and lungs. Ammonia vapors released upon decomposition may cause irritation of the upper respiratory tract, with coughing, vomiting, and redness to the mucous membranes. Higher concentrations (> 1000 ppm) may cause restlessness, tightness in the chest, pulmonary edema, weak pulse, and cyanosis.
**Ingestion:**
Large oral doses may cause irritation to the gastrointestinal tract.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard. Irritating and toxic ammonia gas may form in fires.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Store at temperatures below 80F (27C) to minimize decomposition.
Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Fine white crystals.
**Odor:**
Slight ammonia odor.
**Solubility:**
17.4% @ 20C (68F) in water.
**Specific Gravity:**
1.59
**pH:**
7.8
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
107.5C (226F) (Decomposes 36-60C)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce ammonia, nitrogen oxides. Burning may produce ammonia, carbon monoxide, carbon dioxide, nitrogen oxides.

**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Can react dangerously with acids, caustic alkalis and strong oxidizing agents.
**Conditions to Avoid:**
Heat, incompatibles.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Bicarbonate (1066-33-7) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Bicarbonate (1066-33-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ammonium Bicarbonate (1066-33-7) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ammonium Bicarbonate (1066-33-7) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Bicarbonate (1066-33-7) | 5000 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Wash thoroughly after handling.
Keep container closed.

Use only with adequate ventilation.

**Label First Aid:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 3.

**Disclaimer:**

**********



**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A5688** * * * * * *Effective Date:* ***02/15/08*** * * * * * *Supercedes:* ***04/15/05***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Ammonium Carbonate

## 1. Product Identification

**Synonyms:** Carbonic Acid,Diammonium Salt; Diammonium Carbonate;Crystal Ammonia
**CAS No.:** 506-87-6
**Molecular Weight:** 96.09
**Chemical Formula:** (NH4)2CO3
**Product Codes:**
J.T. Baker: 0642, 0647, 0650, 0651
Mallinckrodt: 3330, 3352

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Carbonate | 506-87-6 | 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 1 - Slight
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Dust may cause irritation of the nose, throat, and lungs. Ammonia vapors released upon decomposition may cause irritation of the upper respiratory tract, with coughing, vomiting, and redness to the mucous membranes. Higher concentrations (> 1000 ppm) may cause restlessness, tightness in the chest, pulmonary edema, weak pulse, and cyanosis.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain. Causes burning or serious burns if decontamination is delayed.
**Eye Contact:**
Causes irritation, redness, and pain. Causes burning or serious burns if decontamination is delayed.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing lung disease may be more susceptible to the effects of this substance.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Generation of ammonia gas may be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Store below 30C. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
For Ammonia:
- OSHA Permissible Exposure Limit (PEL) -
50 ppm
- ACGIH Threshold Limit Value (TLV) -
25 ppm (TWA), 35 ppm (STEL)
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an ammonia/methylamine cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Colorless crystal or white powder.
**Odor:**
Strong ammonia-like odor.
**Solubility:**
Soluble in water, decomposes in hot water
**Specific Gravity:**
1.50 @ 20C/4C
**pH:**
9.0 (100g/L H2O)
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
@ 760 mm Hg (Decomposes)
**Melting Point:**
58C (136F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
760 @ 60C (140F)
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Becomes unstable upon exposure to air and converts into ammonium bicarbonate. This process liberates ammonia and carbon dioxide.
**Hazardous Decomposition Products:**
Burning may produce ammonia, carbon monoxide, carbon dioxide, nitrogen oxides. Contact with water or prolonged contact with air may liberate ammonia.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Sodium hypochlorate, acids and acid salts, iron salts, zinc, alkaloids, aluminum and calomel, sodium nitrate and nitrites. Corrosive to nickel, copper and other alloys.
**Conditions to Avoid:**
Exposure to heat, prolonged exposure to air, contact with water, and incompatibles.

## 11. Toxicological Information

For Ammonium Carbonate, Oral rat LD50: 2150 mg/kg

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Carbonate (506-87-6) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
96 Hr LC50 fathead minnow: 37 mg/L

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Carbonate (506-87-6) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ammonium Carbonate (506-87-6) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ammonium Carbonate (506-87-6) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Carbonate (506-87-6) | 5000 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **2**

**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust or vapors.
Keep container closed.
Use only with adequate ventilation.
**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A5724** * * * * * *Effective Date:* ***08/23/07*** * * * * * *Supercedes:* ***08/18/05***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AMMONIUM CHLORIDE

## 1. Product Identification

**Synonyms:** Sal ammoniac; Ammonium muriate
**CAS No.:** 12125-02-9
**Molecular Weight:** 53.49
**Chemical Formula:** NH4Cl
**Product Codes:**
J.T. Baker: 0660
Mallinckrodt: 1614, 3355, 3363, 3364, 3384

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Chloride | 12125-02-9 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR INHALED.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
At fire temperatures ammonium chloride begins to corrode metals and may dissociate into ammonia and hydrogen chloride. Mixtures of about 16% to 25% (by volume) ammonia gas in air are flammable.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
Ammonium chloride:
-ACGIH Threshold Limit Value (TLV):
10 mg/m3 (TWA); 20 mg/m3 (STEL) Fume
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White powder.
**Odor:**
Odorless.
**Solubility:**
29.7g/100g water @ 0C (32F)
**Specific Gravity:**
1.53
**pH:**
5.5 (1% aq.sol.); 5.1 (3% aq.sol.); 5.0 (10% aq.sol.)
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
520C (968F)
**Melting Point:**
338C (640F) Sublimes.
**Vapor Density (Air=1):**
1.9
**Vapor Pressure (mm Hg):**
1.0 @ 160C (320F)
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Involvement in a fire causes decomposition to form hydrogen chloride and ammonia.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Concentrated acids, strong bases, silver salts, potassium chlorate, ammonium nitrate, bromine trifluoride and iodine heptafluoride. Ammonium chloride reacts explosively with potassium chlorate or bromine trifluoride, and violently with bromide pentafluoride, ammonium compounds, nitrates, and iodine heptafluoride. Explosive nitrogen trichloride may result from reaction of ammonium chloride and hydrogen cyanide.
**Conditions to Avoid:**
Heat, moisture, incompatibles.

## 11. Toxicological Information

Oral rat LD50 : 1650 mg/kg Investigated as a mutagen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Chloride (12125-02-9) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
24 Hr LC50 Lepomis macrochirus (bluegill): 725 mg/L
96 Hr LC50 Cyprinus carpio (carp): 209 mg/L [static]

24 Hr EC50 water flea: 202 mg/L

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Chloride (12125-02-9) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ammonium Chloride (12125-02-9) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ammonium Chloride (12125-02-9) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Chloride (12125-02-9) | 5000 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR INHALED.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Wash thoroughly after handling.
Keep container closed.
Use only with adequate ventilation.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 12.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A5736** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***02/22/06***

MSDS Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AMMONIA CITRATE DIBASIC

## 1. Product Identification

**Synonyms:** Diammonium hydrogen citrate; Citric acid diammonium salt; 1,2,3-Propanetricarboxylic acid,2-hydroxy-,diammonium salt
**CAS No.:** 3012-65-5
**Molecular Weight:** 226.19
**Chemical Formula:** (NH4)2HC6H5O7
**Product Codes:**
J.T. Baker: 0682
Mallinckrodt: 0644

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Citrate Dibasic | 3012-65-5 | 98 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. Higher concentrations may cause severe irritation.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
Persons with impaired respiratory function may be more susceptible to the effects of the substance.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage. Store separately from reactive or combustible materials, and out of direct sunlight. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White granules or powder.
**Odor:**
Slight ammonia odor.
**Solubility:**
ca. 100 gm/100 gm water
**Specific Gravity:**
1.48 @ 25C/4C
**pH:**
4.3
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce ammonia, carbon monoxide, carbon dioxide, nitrogen oxides.
**Hazardous Polymerization:**
Will not occur.

**Incompatibilities:**
No incompatibility data found.
**Conditions to Avoid:**
No information found.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Citrate Dibasic (3012-65-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
When released into water, this material may biodegrade to a moderate extent. This material is not expected to significantly bioaccumulate.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Citrate Dibasic (3012-65-5) | Yes | Yes | No | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ammonium Citrate Dibasic (3012-65-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | List | ------SARA 313------ Chemical Catg. |
|---|---|---|---|---|
| Ammonium Citrate Dibasic (3012-65-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Citrate Dibasic (3012-65-5) | 5000 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.

**Label First Aid:**
In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A5916** * * * * * *Effective Date:* ***06/05/08*** * * * * * *Supercedes:* ***05/04/07***

MSDS Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AMMONIUM HYDROXIDE (10 - 35% NH3)

## 1. Product Identification

**Synonyms:** Ammonium hydroxide solutions; ammonia aqueous; ammonia solutions
**CAS No.:** 1336-21-6
**Molecular Weight:** 35.05
**Chemical Formula:** NH4OH in H2O
**Product Codes:**
J.T. Baker: 4807, 5204, 5224, 5350, 5358, 5604, 5817, 5820, 5851, 5852, 5891, 5893, 5993, 7847, 9718, 9719, 9721, 9730, 9731, 9733, 9741, 9742, 9743
Mallinckrodt: 0124, 0127, 1177, 3256, 3258, 5318, 6665, H010, H893, H894, V592, V649, V893, XL002, XM-187, XM-189

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Hydroxide | 1336-21-6 | 21 - 72% | Yes |
| Water | 7732-18-5 | 28 - 79% | No |

Contains between 10 and 35% ammonia.

## 3. Hazards Identification

**Emergency Overview**

**POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White Stripe (Store Separately)

**Potential Health Effects**

**Inhalation:**
Vapors and mists cause irritation to the respiratory tract. Higher concentrations can cause burns, pulmonary edema and death. Brief exposure to 5000 ppm can be fatal.
**Ingestion:**
Toxic! May cause corrosion to the esophagus and stomach with perforation and peritonitis. Symptoms may include pain in the mouth, chest, and abdomen, with coughing, vomiting and collapse. Ingestion of as little as 3-4 mL may be fatal.
**Skin Contact:**
Causes irritation and burns to the skin.
**Eye Contact:**
Vapors cause irritation. Splashes cause severe pain, eye damage, and permanent blindness.
**Chronic Exposure:**
Repeated exposure may cause damage to the tissues of the mucous membranes, upper respiratory tract, eyes and skin.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing eye disorders or impaired respiratory function may be more susceptible to the effects of this material.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
**Eye Contact:**
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately. Immediate action is critical to minimize possibility of blindness.

## 5. Fire Fighting Measures

**Fire:**
Autoignition temperature: 651C (1204F)
Flammable limits in air % by volume:
lel: 16; uel: 25
**Explosion:**
Flammable vapors may accumulate in confined spaces.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal.
US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRACIT®-2 or BuCAIM® caustic neutralizers are recommended for spills of this product.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from incompatibilities. Store below 25C. Protect from direct sunlight. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
50 ppm (NH3)
-ACGIH Threshold Limit Value (TLV):
25 ppm (NH3) (TWA) 35 ppm (STEL)
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an ammonia/methylamine cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended materials. Polyvinyl alcohol is not recommended.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless solution.
**Odor:**
Ammonia odor.
**Solubility:**
Infinitely soluble.
**Specific Gravity:**
0.9 (28% NH4OH)
**pH:**
13.8 (29% solution).
**% Volatiles by volume @ 21C (70F):**
No information found.
**Boiling Point:**
ca. 36C (ca. 97F)
**Melting Point:**
-72C (-98F)

**Vapor Density (Air=1):**
0.60 NH3
**Vapor Pressure (mm Hg):**
115 @ 20C for 10% solution; 580 @ 20C for 28% solution.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce ammonia, nitrogen oxides.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acids, acrolein, dimethyl sulfate, halogens, silver nitrate, propylene oxide, nitromethane, silver oxide, silver permanganate, oleum, beta-propiolactone. Most common metals.
**Conditions to Avoid:**
Heat, sunlight, incompatibles, sources of ignition.

## 11. Toxicological Information

For ammonium hydroxide:
oral rat LD50: 350 mg/kg; eye, rabbit, standard Draize, 250 ug; severe, investigated as a mutagen.
For ammonia:
inhalation rat LC50: 2000 ppm/4-hr; investigated as a tumorigen, mutagen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | No | No | None |
| Water (7732-18-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
This material is not expected to significantly bioaccumulate.
**Environmental Toxicity:**
24 Hr LC50 rainbow trout: 0.008 mg/L;
96 Hr LC50 fathead minnow: 8.2 mg/L;
48 Hr LC50 bluegill: 0.024 mg/L;
48 Hr EC50 water flea: 0.66 mg/L

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** AMMONIA SOLUTIONS (WITH 10-35% AMMONIA)
**Hazard Class:** 8
**UN/NA:** UN2672
Packing Group: III
**Information reported for product/size:** 385LB

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** AMMONIA SOLUTIONS (WITH 10-35% AMMONIA)
**Hazard Class:** 8
**UN/NA:** UN2672
Packing Group: III
**Information reported for product/size:** 385LB

## 15. Regulatory Information

WHMIS Classification: D1B, E

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | No | No | No | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | 1000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** 2P
**Poison Schedule:** S6
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

## 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. IMMEDIATE ACTION IS ESSENTIAL FOR EYE EXPOSURES. In all cases call a physician immediately.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 15.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A5988** * * * * * *Effective Date:* ***05/04/07*** * * * * * *Supercedes:* ***07/26/04***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AMMONIUM MOLYBDATE

## 1. Product Identification

**Synonyms:** Molybdic acid hexammonium salt tetrahydrate; ammonium molybdate tetrahydrate;ammonium heptamolybdate, tetrahydrate
**CAS No.:** 12027-67-7 (Anhydrous); 12054-85-2 (Tetrahydrate)
**Molecular Weight:** 1235.86
**Chemical Formula:** (NH4)6Mo7O24.4H2O
**Product Codes:**
J.T. Baker: 0716
Mallinckrodt: 3420

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Hexaammonium Molybdate | 12027-67-7 | 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS KIDNEYS AND BLOOD.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Irritant for the upper respiratory system. Pungent taste in mouth and throat, coughing, labored breathing. Can be a route of absorption by the body with symptoms like ingestion.
**Ingestion:**
Irritant to the digestive system. Symptoms of sore throat, abdominal pain, nausea may occur. May cause anemia,gout, headaches, weight loss, joint pain, and liver or kidney damage.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
Prolonged or repeated exposure to this product may cause symptoms similar to ingestion.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders, blood disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.

Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water spray may be used to keep fire exposed containers cool.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

## 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
5 mg/m3 for soluble molybdenum compounds as Mo
15 mg/m3 for insoluble molybdenum compounds as Mo

-ACGIH Threshold Limit Value (TLV):
Molybdenum, metal and insoluble compounds, inhalable fraction, as Mo: 10 mg/m3
Molybdenum, metal and insoluble compounds, respirable fraction, as Mo: 3 mg/m3
Molybdenum, soluble compounds, respirable fraction, as Mo: 0.5 mg/m3, A3 - Confirmed animal carcinogen with unknown relevance to humans
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White to yellow-green crystals
**Odor:**
Odorless.
**Solubility:**
43 g / 100 cc cold water.
**Density:**
2.498
**pH:**
5.0 - 5.5
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
190C (374F) Decomposes.
**Melting Point:**
90C (194F) Loses 1 water @ this temperature.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce ammonia, nitrogen oxides and metal fumes.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Alkali metals
**Conditions to Avoid:**
Incompatibles.

## 11. Toxicological Information

Anhydrous: Oral rat LD50: 333 mg/kg. Investigated as a mutagen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Hexaammonium Molybdate (12027-67-7) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Hexaammonium Molybdate (12027-67-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Hexaammonium Molybdate (12027-67-7) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Hexaammonium Molybdate (12027-67-7) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Hexaammonium Molybdate (12027-67-7) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS KIDNEYS AND BLOOD.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3, 11, 16.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A6048** * * * * * *Effective Date:* ***05/04/07*** * * * * * *Supercedes:* ***07/21/04***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# AMMONIUM NITRATE

## 1. Product Identification

**Synonyms:** Nitric acid, ammonium salt
**CAS No.:** 6484-52-2
**Molecular Weight:** 80.04
**Chemical Formula:** NH4NO3
**Product Codes:**
J.T. Baker: 0729, 0731, 0829
Mallinckrodt: 3436

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Nitrate | 6484-52-2 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE OR EXPLOSION. MAY BE HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 1 - Slight
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Yellow (Reactive)

**Potential Health Effects**

**Inhalation:**
May cause irritation to the respiratory tract; symptoms may include coughing, sore throat, and shortness of breath. At high temperatures, exposure to toxic nitrogen oxides decomposition products can quickly cause acute respiratory problems. Inhalation of large amounts causes systemic acidosis and abnormal hemoglobin.
**Ingestion:**
Large oral doses of nitrates may cause dizziness, abdominal pain, vomiting, bloody diarrhea, weakness, convulsions, and collapse. Harmful if swallowed. May cause methemoglobinemia resulting in cyanosis.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
Small repeated oral doses of nitrates may cause weakness, depression, headache, and mental impairment.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention

immediately.
**Skin Contact:**
Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
**Eye Contact:**
Wash thoroughly with running water. Get medical advice if irritation develops.

## 5. Fire Fighting Measures

**Fire:**
Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. May support combustion in an existing fire.
**Explosion:**
Contact with oxidizable substances may cause extremely violent combustion. Sealed containers may rupture when heated. Sensitive to mechanical impact.
**Fire Extinguishing Media:**
Use flooding amounts of water in early stages of fire involving ammonium nitrate. Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Remove sources of heat and ignition.
Collected waste may be transferred to a closed, preferably metal, container and sent to a RCRA approved waste disposal facility.
Alternatively, sweep spill into noncombustible container and dissolve in large amount of water. Add soda ash. Mix and neutralize with 6M-HCl. Neutralized sludge may be sent to an approved waste disposal facility.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Protect against physical damage. Store in a dry location separate from combustible, organic or other readily oxidizable materials. Avoid storage on wood floors. Remove and dispose of any spilled dichromates; do not return to original containers. Do not store above 54C (130F) preferably below 30C (86F). Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Colorless crystals.
**Odor:**
Odorless.
**Solubility:**
118g/100g water @ 0C (32F).
**Specific Gravity:**
1.73 @ 23C (77F)
**pH:**
5.4
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
210C (410F) Decomposes.
**Melting Point:**
170C (338F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Hygroscopic.
**Hazardous Decomposition Products:**
Emits nitrous oxides when heated to decomposition. Liberates ammonia in reaction with strong alkalis.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Aluminum, antimony, chromium, copper, iron, lead, magnesium, manganese, nickel, zinc, brass, oil, charcoal, organic material, acetic acid, ammonium chloride, bismuth, cadmium, chlorides, cobalt, phosphorus, potassium and ammonium sulfate, sodium, sodium hypochlorite, sodium perchlorate, sodium-potassium alloy, and sulfure.
**Conditions to Avoid:**
Heat, flame, ignition sources, dusting and incompatibles. Moisture and combustible materials. Shock sensitive.

---

## 11. Toxicological Information

Oral rat LD50: 2217 mg/kg.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Nitrate (6484-52-2) | No | No | None |

---

## 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material is expected to readily biodegrade.
**Environmental Toxicity:**
No information found.

---

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** AMMONIUM NITRATE
**Hazard Class:** 5.1
**UN/NA:** UN1942
Packing Group: III
**Information reported for product/size:** 50KG

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** AMMONIUM NITRATE
**Hazard Class:** 5.1
**UN/NA:** UN1942
Packing Group: III
**Information reported for product/size:** 50KG

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## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Nitrate (6484-52-2) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ammonium Nitrate (6484-52-2) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ammonium Nitrate (6484-52-2) | No | No | No | Nitrate cmpd |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Nitrate (6484-52-2) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No

SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: Yes (Pure / Solid)

**Australian Hazchem Code:** 1[S]
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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## 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **3** Other: **Oxidizer**
**Label Hazard Warning:**
DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE OR EXPLOSION. MAY BE HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Store in a tightly closed container.
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Remove and wash contaminated clothing promptly.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store preferably below 30C
**Label First Aid:**
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
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**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 62.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Ammonium Oxalate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ammonium Oxalate
Synonym: Ethanedioic Acid Diammonium Salt
CAS#: 6009-70-7

### Section 3 — Hazards Identification

White odorless powder.
Toxic by ingestion and inhalation. Can cause severe kidney damage. Moderately corrosive to body tissues. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
When heated to decomposition, emits toxic fumes of ammonia and oxalic acid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Use and dispense in a hood. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White odorless powder.
Solubility: Water soluble (2.54 g/100 ml).
Formula: (NH4)2C2O4 H2O
Formula Weight: 142.11

Specific Gravity: 1.5
Melting Point: 133 C (dec.)

## Section 10 — Stability and Reactivity

May react violently with NaOCl and ammonium acetate.
Shelf life: indefinite

## Section 11 — Toxicological Information

Acute effects: Corrosive, toxic, irritant
Chronic effects: N.A.
Target organs: Kidneys, nerves

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not Regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

**FLINN SCIENTIFIC INC.**
**"Your Safer Source for Science Supplies"**

***Flinn--"Your Safer Source for Chemicals"***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 67.00
**Revision Date:** March 7, 2001

### Section 1 — Chemical Product and Company Identification

## Ammonium Sulfate and Solutions

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ammonium Sulfate and Solutions: Ammonium Sulfate (7783-20-2) 1-13%, Water (7732-18-5) 87-99%

CAS#: 7783-20-2

### Section 3 — Hazards Identification

White, odorless crystals or clear, colorless solution.
Slightly toxic by ingestion. Irritating to body tissues. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable, non-combustible solid and solutions.
When heated to decomposition, emits very toxic fumes of NOx, NH3, and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established.

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White, odorless crystals.
Solubility: Soluble in water (44 %).
Formula: (NH4)2SO4
Formula Weight: 132.16

Specific Gravity: 1.77
Melting Point: 235 C (dec.)

## Section 10 — Stability and Reactivity

May explode if mixed with oxidizers. Contact with caustic liberates ammonia.
Avoid contact with strong oxidizers and bases. Incompatible with (K+NH4NO3), KNO2, (NaK+NH4NO3).
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2840 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-984-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **A7608** * * * * * *Effective Date:* ***05/19/08*** * * * * * *Supercedes:* ***08/18/05***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# ASCORBIC ACID

## 1. Product Identification

**Synonyms:** L-ascorbic acid; vitamin C; L-3-Ketothreohexuronic acid lactone
**CAS No.:** 50-81-7
**Molecular Weight:** 176.13
**Chemical Formula:** C6H8O6
**Product Codes:**
J.T. Baker: 0936, 0937, 0938, 0939, B581
Mallinckrodt: 1852, 4407, 8829

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| L-Ascorbic Acid | 50-81-7 | 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS A EXTINGUISHER
Storage Color Code: Green (General Storage)

**Potential Health Effects**

Ascorbic acid is relatively non-hazardous in routine industrial situations. It is not expected to present significant health risks to the workers who use it.

**Inhalation:**
May cause mild irritation to the respiratory tract.
**Ingestion:**
Large oral doses may cause gastrointestinal disturbances.
**Skin Contact:**
May cause mild irritation.
**Eye Contact:**
May cause mild irritation.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**

Wash thoroughly with running water. Get medical advice if irritation develops.

## 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White crystals.
**Odor:**
Odorless.
**Solubility:**
33g/100g water.
**Density:**
1.65
**pH:**
3 for 5mg/L aqueous solution; 2 for 50mg/L aqueous solution.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
192C (378F) Slightly decomposes.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Aqueous solutions are rapidly oxidized by air.
**Hazardous Decomposition Products:**
May produce acrid smoke and irritating fumes when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**

Strong oxidizers and alkali hydroxides, alkalis, iron, copper, sodium salicylate, sodium nitrite, theobromine and methenamine.
**Conditions to Avoid:**
No information found.

## 11. Toxicological Information

Oral (rat) LD50 11,900 mg/kg . Investigated as a tumorigen, mutagen, and reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| L-Ascorbic Acid (50-81-7) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| L-Ascorbic Acid (50-81-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| L-Ascorbic Acid (50-81-7) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| L-Ascorbic Acid (50-81-7) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| L-Ascorbic Acid (50-81-7) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**

No Changes.

**Disclaimer:**

**********

**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 95.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Barium Hydroxide and Solutions

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Barium Hydroxide And Solutions: Barium Hydroxide (12230-71-6) 3% and Water (7732-18-5) 97%

CAS#: 12230-71-6

### Section 3 — Hazards Identification

White crystalline powder or clear colorless liquid.
Toxic by ingestion as barium. Ingestion could be fatal. All soluble barium compounds are poisonous if swallowed and cause nausea, vomiting, stomach pains and diarrhea.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-0
Exposure-3
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. After vomiting, give a mixture of 1 Tbs. magnesium sulfate in one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid or liquid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

If liquid: Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.
If solid: Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Use and dispense in a hood. Store in a cool dry place.
Keep container tightly closed. Store in Flinn ChemSaf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.5 mg/m3 (Ba) (OSHA, ACGIH)

## Section 9 — Physical and Chemical Properties

White crystalline powder.
0.1M Barium Hydroxide CAS# 12230-71-6 3.2%
Solubility: Soluble in water and alcohol.

Formula: $Ba(OH)_2 8H_2O$
Formula Weight: 315.50
Specific Gravity: 2.2

## Section 10 — Stability and Reactivity

Avoid contact with acids.
Shelf life: Poor; absorbs $CO_2$ from the air.

## Section 11 — Toxicological Information

Acute effects: highly toxic, corrosive
Chronic effects: N.A.
Target organs: heart, kidneys, GI system, bone marrow, spleen, liver

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27h is one option.

## Section 14 — Transport Information

Shipping Name: Barium Compounds, n.o.s.
Hazard Class: 6.1, keep away from food
UN Number: UN1564

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (241-234-5), RCRA D002, D005.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

**FLINN SCIENTIFIC INC.**
**"Your Safer Source for Science Supplies"**

***Flinn--"Your Safer Source for Chemicals"***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 94.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Barium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Barium Chloride

CAS#: 10326-27-9

### Section 3 — Hazards Identification

White odorless powder.
Highly toxic by ingestion and inhalation. All soluble barium compounds are poisonous if swallowed and cause nausea, vomiting, stomach pains and diarrhea.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-0
Exposure-3
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. After vomiting, give a mixture of 1 Tbs. magnesium sulfate in one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a Flinn Chem-Saf Bag.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.5 mg/m3 (Ba) (OSHA, ACGIH)

## Section 9 — Physical and Chemical Properties

White odorless powder.
Solubility: Soluble in water. (39.3 grams/100 ml).

Formula: BaCl2 2H2O
Formula Weight: 244.28
Specific Gravity: 3.1

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: highly toxic, irritant, stomach pains, vomiting, diarrhea
Chronic effects: N.A.
Target organs: heart, nerves, kidneys, GI system, bone marrow, spleen, liver

ORL-RAT LD50: 118 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27h is one option.

## Section 14 — Transport Information

Shipping Name: Barium Compounds, n.o.s.
Hazard Class: 6.1, keep away from foods.
UN Number: UN1564

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-788-1), RCRA D005.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

MSDS Number: **B0432** * * * * * *Effective Date:* ***06/13/07*** * * * * * *Supercedes:* ***05/07/07***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# BARIUM NITRATE

## 1. Product Identification

**Synonyms:** Barium dinitrate; nitric acid, barium salt; nitrobarite
**CAS No.:** 10022-31-8
**Molecular Weight:** 261.34
**Chemical Formula:** Ba(NO3)2
**Product Codes:**
J.T. Baker: 1018
Mallinckrodt: 3788

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Barium Nitrate | 10022-31-8 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS MUSCLES (INCLUDING THE HEART), AND CENTRAL NERVOUS SYSTEM.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Yellow (Reactive)

**Potential Health Effects**

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. Systemic poisoning may occur with symptoms similar to those of ingestion.
**Ingestion:**
Toxic! May cause tightness of the muscles of the face and neck, vomiting, diarrhea, abdominal pain, muscular tremors, anxiety, weakness, labored breathing, cardiac irregularity, convulsions, and death from cardiac and respiratory failure. Estimated lethal dose lies between 1 to 15 grams. Death may occur within hours or up to a few days. May cause kidney damage.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin and nervous system disorders or impaired respiratory or kidney function may be more susceptible to the effects of this substance.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Get medical attention immediately. Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. After vomiting, a mixture of 1 tablespoon of sodium or magnesium sulfate (Epsom salts) dissolved in 8 oz. of water to drink maybe indicated to precipitate the

barium as the nontoxic and insoluble barium sulfate.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

**Note to Physician:**
Monitor patients with significant ingestion for respiratory, cardiovascular, and blood pressure status. Watch for cardiac arrhythmias, respiratory failure due to flaccid paralysis of respiratory muscles, pulmonary edema, vocal cord paralysis, severe hypertension, and late effect kidney failure. Acute barium poisoning results in hypokalemia. The administration of fluids containing dilute concentrations of potassium salts may be indicated.

## 5. Fire Fighting Measures

**Fire:**
Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.
**Explosion:**
Contact with oxidizable substances may cause extremely violent combustion. See section 10. Sensitive to mechanical impact.
**Fire Extinguishing Media:**
Use flooding amounts of water in early stages of fire. Foam, dry chemical, or carbon dioxide may also be used. Do not use water on molten material. Emits nitrogen oxides when heated to decomposition.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Do not release runoff from fire control methods to sewers or waterways.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Separate from combustibles, organic or other readily oxidizable materials. Avoid storage on wood floors. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
For Soluble Barium Compounds:
OSHA Permissible Exposure Limit (PEL):
0.5 mg (Ba)/m3
ACGIH Threshold Limit Value (TLV):
0.5 mg (Ba)/m3 A4 - not classifiable as a human carcinogen
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, a full facepiece respirator with dust/mist filter may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White crystals.
**Odor:**
Odorless.
**Solubility:**
8.7 grams/100 g water @ 20C (68F).
**Density:**
3.24 @ 23C (73F)
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Decomposes.
**Melting Point:**
592C (1098F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**

No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Oxides of nitrogen and toxic metal fumes may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Magnesium plus barium oxide plus zinc, aluminum and magnesium alloys, combustibles (paper, oil, wood),acids, and oxidizers. Mixtures with finely divided aluminum-magnesium alloys are easily ignitable and extremely sensitive to friction or impact.
**Conditions to Avoid:**
Heat, dusting, contact with combustibles and incompatibles.

## 11. Toxicological Information

For Barium Nitrate: Oral rat LD50: 355 mg/kg. Irritation Data: Skin rabbit 500 mg/24H mild. Eye rabbit 100 mg/24H moderate.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Barium Nitrate (10022-31-8) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
This material may bioaccumulate to some extent.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** BARIUM NITRATE
**Hazard Class:** 5.1, 6.1
**UN/NA:** UN1446
Packing Group: II
**Information reported for product/size:** 100LB

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** BARIUM NITRATE
**Hazard Class:** 5.1, 6.1
**UN/NA:** UN1446
Packing Group: II
**Information reported for product/size:** 100LB

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Barium Nitrate (10022-31-8) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Barium Nitrate (10022-31-8) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Barium Nitrate (10022-31-8) | No | No | No | Barium compo |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Barium Nitrate (10022-31-8) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** 2W
**Poison Schedule:** S6
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

## 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0** Other: **Oxidizer**
**Label Hazard Warning:**
DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS MUSCLES (INCLUDING THE HEART), AND CENTRAL NERVOUS SYSTEM.
**Label Precautions:**
Keep from contact with clothing and other combustible materials.
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Store in a tightly closed container.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. In all cases call a physician.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# MATERIAL SAFETY DATA SHEET

Revised: 05/15/08
BENEDICT'S REAGENT — Replaces: 07/10/07
CAROLINA BIOLOGICAL — Printed: 05/20/08

## 1. PRODUCT DESCRIPTION

Product Name: Benedict Reagent
Product Code(s): 84-7091, 85-0090
Size: N/A
Chemical Name: Benedict Reagent
CAS Number: See section 2
Formula: See section 2
Synonyms: None known
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principal Hazardous Components:
Sodium Carbonate (CAS#497-19-8) 35%
Cupric Sulfate (CAS#7758-99-8) 6%
Sodium Citrate (CAS#6132-04-3) 59%
TLV and PEL units: None established for Sodium Carbonate and Sodium Citrate. For Cupric Sulfate, both OSHA PEL and ACGIH TLV are 1 $mg/m^3$ (TWA) for copper dusts and mists (as Cu).

## 3. HAZARD IDENTIFICATION

Emergency Overview: Harmful if inhaled or swallowed.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush thoroughly with plenty of water. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area with soap and water. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water to dilute. If large amounts were ingested, get medical attention.
Inhalation - Move to fresh air. Get medical attention if breathing is difficult.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): None
NFPA Rating (est): Health: 1
Fire: 0
Reactivity: 0
Extinguisher Media:
Use media suitable to extinguish surrounding fire.
Flammable Limits in Air % by Volume: N/A
Autoignition Temperature: N/A
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: Thermal decomposition produces

toxic fumes.

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Clean-up personnel should wear proper protective equipment. Avoid creating dust. Sweep or scoop up and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Keep container tightly closed and store in cool dry area.
Other Precautions: Do not breathe dust. Wash thoroughly after handling.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
None needed under normal conditions of use with adequate ventilation. NIOSH approved equipment should be worn if PELs are exceeded.
Ventilation:
Local Exhaust: Yes
Mechanical(General): Yes
Special: No
Other: No
Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | No data available |
| Melting Point: | No data available |
| Boiling Point: | No data available |
| Vapor Pressure: | No data available |
| Vapor Density(Air=1): | No data available |
| Specific Gravity(H2O=1): | No data available |
| Percent Volatile by Volume: | No data available |
| Evaporation Rate(H2O=1): | No data available |
| Solubility in Water: | Soluble |
| Appearance and Odor: | Blue powder |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: High temperatures and contact with strong acids
Incompatibility(Materials to Avoid): Acids and Oxidizers
Hazardous Decomposition Products: SOx, COx
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data:
Cupric Sulfate: orl-rat LD50: 300 mg/kg
Sodium Carbonate: orl-rat LD50: 4090 mg/kg
Sodium Citrate: Not available
Effects of Overexposure:
Acute: See section 3
Chronic: Cupric Sulfate: Tests on laboratory animals indicate

material may produce adverse mutagenic and reproductive effects.
Sodium Carbonate and Sodium Citrate: None
Conditions Aggravated by Overexposure: No data available
Target Organs: No data available
Primary Route(s) of Entry: Inhalation, ingestion

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Not regulated

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Sodium Carbonate | No | No | No | No | No |
| Cupric Sulfate | No | No | No | 10 | No |
| Sodium Citrate | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 106.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Benzoic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Benzoic Acid
Synonym: benzene carboxylic acid
CAS#: 65-85-0

### Section 3 — Hazards Identification

White crystalline powder with a maple syrup-like odor.
Slightly toxic by ingestion. Severe irritant. Avoid contact with skin, eyes and respiratory tract.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-1
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Flash Point: 250 F Autoignition Temperature: 1061 F
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-2
F-1
R-1

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water . Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn suggested chemical storage pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White crystalline powder with a maple syrup-like odor.
Solubility: Soluble in alcohol, slightly in water.
Formula: C6H5COOH
Formula Weight: 122.13

Specific Gravity: 1.27
Boiling Point: 249 C
Vapor Density: 4.21

## Section 10 — Stability and Reactivity

Avoid contact with heat, strong oxidizers, bases and reducing agents. Combustible.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Severe irritant, sensitizer
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1700 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-618-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 120.00
**Revision Date:** March 7, 2001

### Section 1 — Chemical Product and Company Identification

## Biuret

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Biuret

CAS#: 108-19-0

### Section 3 — Hazards Identification

White powder. Odor of vomit.
May be a slight irritant to skin.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place. Loses waters of hydration at elevated room temperatures; Store in a Flinn Chem-Saf bag and then inside a Flinn Saf-Stor can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White powder
Solubility: Slightly in water (2g/100mL).
Formula: NH2CONHCONH2
Formula Weight: 103.94

Specific Gravity: 1.5
Melting Point: 190 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and bases.
Shelf life: Poor. Loses waters of hydration at elevated room temperature.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (203-559-0).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# MATERIAL SAFETY DATA SHEET

Revised: 15/05/08
BIURET POWDER, POSITIVE TEST Replaces: 10/07/07
CAROLINA BIOLOGICAL Printed: 20/05/08

## 1. PRODUCT DESCRIPTION

Product Name: Biuret Powder Reagent
Product Code(s): 84-8200
Size: 25 g
Chemical Name: Biuret
CAS Number: 108-19-0
Formula: C2H5N3O2
Synonyms: Carbamylurea; Imidodicarbonic diamide
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principle Hazardous Components: Biuret Powder (CAS# 108-19-0) 100%
TLV and PEL units: None established

## 3. HAZARD IDENTIFICATION

Emergency Overview:
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water and induce vomiting immediately as directed by medical personnel. Immediately call a physician or poison control center. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm, quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): No data available.
NFPA Rating: Health: 2
Fire: 1
Reactivity: 0
Extinguisher Media:
Use dry chemical, CO2 or appropriate foam.
Flammable Limits in Air % by Volume: No data available.
Autoignition Temperature: No data available.
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: Fire or excessive heat may produce

hazardous decomposition products; can react vigorously with oxidizing materials.

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Clean-up personnel should wear proper protective equipment. Avoid creating dust. Sweep or scoop up and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Store in a cool, dry place.
Wash thoroughly after handling.
Other Precautions: Read label on container before using. Do not take internally.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
None needed under normal conditions of use with adequate ventilation. NIOSH approved equipment should be worn if PELs are exceeded.
Ventilation:
Local Exhaust: Preferred
Mechanical(General): Acceptable
Special: No
Other: No
Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

Molecular Weight: 103.09
Melting Point: 188-192C
Boiling Point: Decomposes
Vapor Pressure: Negligible
Vapor Density(Air=1): Unknown
Specific Gravity($H_2O$=1): 1.467 @ 20C
Percent Volatile by Volume: No data available.
Evaporation Rate($H_2O$=1): No data available.
Solubility in Water: 2.01 g/100L water at 25C
Appearance and Odor: White to gray powder; odorless.

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Excessive temperatures and heat.
Incompatibility(Materials to Avoid): Strong oxidizing agents, strong caustic agents.
Hazardous Decomposition Products: Thermal decomposition will produce carbon dioxide and/or carbon monoxide and oxides of nitrogen (NOx).
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: No data available.
Effects of Overexposure:
Acute: See section 3
Chronic: No chronic effects data found. Not listed as causing cancer
by IARC, NTP, or OSHA.
Conditions Aggravated by Overexposure: No data available.
Target Organs: No data available.
Primary Route(s) of Entry: Inhalation

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal,
State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Non-regulated material.

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Biuret Powder | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.
Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit

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ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 125.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Boric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Boric Acid

CAS#: 10043-35-3

### Section 3 — Hazards Identification

White, odorless crystalline powder.
Slightly toxic by ingestion, inhalation or skin absorption; irritant to skin in dry form.
Avoid ingestion, inhalation and skin absorption.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #9, store with other inorganic acids.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White, odorless crystalline powder.
Solubility: Soluble in water.
Specific Gravity: 2.46

Formula: H3BO3
Formula Weight: 61.84
Melting Point: 185 C

## Section 10 — Stability and Reactivity

Avoid contact with potassium, acid anhydrides.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2660 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-139-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 130.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Brilliant Green and Solutions

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Brilliant Green and Solutions: Brilliant Green (633-03-4) 1%, Water (7732-18-5) 99%
Synonym: C.I. 42040

CAS#: 633-03-4

### Section 3 — Hazards Identification

Metallic-green crystals or green liquid.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
When heated to decomposition, can emit toxic SOx and NOx fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.
Keep container tightly closed.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Metallic-green crystals.
Solubility: Soluble in water.
Formula: C27H34N2O4S
Formula Weight: 482.64

Boiling Point: 210 C (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
When heated to decomposition, emits toxic fumes of NH3 and NOx.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (211-190-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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MSDS Number: **B4392** * * * * * *Effective Date:* ***02/01/07*** * * * * * *Supercedes:* ***04/27/04***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# BROMOCRESOL GREEN

## 1. Product Identification

**Synonyms:** 3,3',5,5'-Tetrabromo-m-cresolsulfonphthalein; 4,4'-(3H-2, 1-Benzoxathiol-3-ylidene) bis [2,6-dibromo-3 methylphenol]S,S-dioxide; BCG
**CAS No.:** 76-60-8
**Molecular Weight:** 698.02
**Chemical Formula:** C21H14O5Br4S
**Product Codes:**
J.T. Baker: C946
Mallinckrodt: 1793

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Bromocresol Green | 76-60-8 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
**Ingestion:**
Large oral doses may cause irritation to the gastrointestinal tract.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

## 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Light brick colored powder.
**Odor:**
Odorless or faint medicinal odor.
**Solubility:**
Slightly soluble in water.
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
218C (424F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce bromines, sulfur oxides, carbon dioxide, and carbon monoxide.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
No information found.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a mutagen.

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Bromocresol Green (76-60-8) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Bromocresol Green (76-60-8) | Yes | Yes | No | Yes |

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Bromocresol Green (76-60-8) | Yes | Yes | No | Yes |

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Bromocresol Green (76-60-8) | No | No | No | No |

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Bromocresol Green (76-60-8) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.
**Label First Aid:**
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.
**Product Use:**
Laboratory Reagent.

**Revision Information:**
MSDS Section(s) changed since last revision of document include: 1, 3.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **B4420** * * * * * *Effective Date:* ***02/01/07*** * * * * * *Supercedes:* ***06/29/04***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# BROMOCRESOL PURPLE, INDICATOR GRADE

## 1. Product Identification

**Synonyms:** 5'-5"Dibromo-o-cresol sulfonephthalein; pH indicator; phenol,4,4'- (3H-2,1-benzoxathiol-3-ylidene) bis [2-bromo-6-methyl-, S,S-dioxide.
**CAS No.:** 115-40-2
**Molecular Weight:** 540.24
**Chemical Formula:** C21H16Br2O5S
**Product Codes:**
J.T. Baker: C949
Mallinckrodt: 2090

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Bromocresol Purple Indicator grade | 115-40-2 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! TOXICOLOGICAL PROPERTIES UNKNOWN. MAY BE HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate (Life)
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

The toxicological properties of this material have not been investigated.

**Inhalation:**
No information found, but compound should be handled as a potential health hazard. May cause irritation to the respiratory tract. Symptoms may include coughing, sore throat, labored breathing, and chest pain.
**Ingestion:**
No information found, but compound should be handled as a potential health hazard. May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
**Skin Contact:**
No information found, but compound should be handled as a potential health hazard. May cause irritation with redness and pain. May be absorbed through the skin with possible systemic effects.
**Eye Contact:**
No information found, but compound should be handled as a potential health hazard. May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if symptoms occur.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

## 5. Fire Fighting Measures

**Fire:**
Not expected to be a fire hazard.
**Explosion:**
No information found.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Purple powder.
**Odor:**
Odorless.
**Solubility:**
Practically insoluble in water.
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
241 - 242C (466 - 468F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**
Burning may produce bromines, sulfur oxides, carbon dioxide, and carbon monoxide.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
No information found.
**Conditions to Avoid:**
No information found.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Bromocresol Purple Indicator grade (115-40-2) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Bromocresol Purple Indicator grade (115-40-2) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Bromocresol Purple Indicator grade (115-40-2) | No | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Bromocresol Purple Indicator grade (115-40-2) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Bromocresol Purple Indicator grade (115-40-2) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! TOXICOLOGICAL PROPERTIES UNKNOWN. MAY BE HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.

MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

**Label Precautions:**

Use with adequate ventilation.
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Wash thoroughly after handling.

**Label First Aid:**

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 3, 9.

**Disclaimer:**

**********



**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **B5056** * * * * * *Effective Date:* ***03/14/07*** * * * * * *Supercedes:* ***08/10/04***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# BROMOPHENOL BLUE

## 1. Product Identification

**Synonyms:** 3,3',5,5'-Tetrabromophenol sulfonphthalein; 4,4'-(3H-2,1-benzoxathiol-3-ylidene)bis[2,6-dibromophenol]S ,S dioxide
**CAS No.:** 115-39-9
**Molecular Weight:** 670.02
**Chemical Formula:** C19H10Br4O5S
**Product Codes:** D293

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Bromophenol Blue | 115-39-9 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
**Ingestion:**
Effects not determined. Large oral doses may cause irritation to the gastrointestinal tract.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
Not determined.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

## 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

---

## 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**
Tan to orange, light pink to purple or red crystalline powder.
**Odor:**
Slightly amine to odorless.
**Solubility:**
0.4g/100g water @ 20C (68F).
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
279C (534F)
**Melting Point:**
273C (523F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce bromines, sulfur oxides, carbon dioxide, and carbon monoxide.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a mutagen.

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Bromophenol Blue (115-39-9) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Bromophenol Blue (115-39-9) | Yes | Yes | Yes | Yes |

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Bromophenol Blue (115-39-9) | Yes | Yes | No | Yes |

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Bromophenol Blue (115-39-9) | No | No | No | No |

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Bromophenol Blue (115-39-9) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

**Label First Aid:**
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.

**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **B5380** * * * * * *Effective Date:* ***03/14/07*** * * * * * *Supercedes:* ***08/10/04***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# BROMOTHYMOL BLUE

## 1. Product Identification

**Synonyms:** 3,3',-Dibromothymolsulfonphthalein; 4,4'-(3H-2,1 Benzoxathiol-3-ylidene) bis [2 bromo-3-methyl-6-(1-methylethyl)phenol] S,S-dioxide
**CAS No.:** 76-59-5
**Molecular Weight:** 624.38
**Chemical Formula:** C27H28Br2O5S
**Product Codes:** D470

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Bromothymol Blue | 76-59-5 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY BE HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

Limited health information was found in the published literature to perform a complete hazard evaluation for this substance. Special precautions must be used in handling and storage. Protective equipment should be chosen using professional judgment.

**Inhalation:**
No specific information found. Probably irritating to respiratory tract.
**Ingestion:**
Effects not determined. Probably irritating to the gastro-intestinal tract.
**Skin Contact:**
No specific information found. Probably irritating to moist skin.
**Eye Contact:**
No specific information found. Probably irritating to eye tissues.
**Chronic Exposure:**
Not determined.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.
**Skin Contact:**
Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.
**Eye Contact:**
Wash eyes with plenty of water for at least 15 minutes. Call a physician.

## 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

## 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Gloves and lab coat, apron or coveralls.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

Little information was found in the literature.
**Appearance:**
Yellow crystals.
**Odor:**
Characteristic odor.
**Solubility:**
Very slightly soluble in water.
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
200 - 202C (392 - 396F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce bromines, sulfur oxides, carbon dioxide, and carbon monoxide.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**

Strong oxidizers.
**Conditions to Avoid:**
Incompatibles.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a mutagen.

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Bromothymol Blue (76-59-5) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Bromothymol Blue (76-59-5) | Yes | Yes | No | Yes |

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Bromothymol Blue (76-59-5) | Yes | Yes | No | Yes |

| Ingredient | -SARA 302- RQ | TPQ | -----SARA 313----- List | Chemical Catg. |
|---|---|---|---|---|
| Bromothymol Blue (76-59-5) | No | No | No | No |

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Bromothymol Blue (76-59-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY BE HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Store in a tightly closed container.
Use with adequate ventilation.
**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact,

immediately flush eyes or skin with plenty of water for at least 15 minutes. If irritation develops call a physician. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

**Product Use:**
Laboratory Reagent.

**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.

**Disclaimer:**
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 181.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## n-Butyl Alcohol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

n-Butyl Alcohol
Synonym: 1-butanol
CAS#: 71-36-3

### Section 3 — Hazards Identification

Clear colorless liquid; wine-like odor.
Moderately toxic by inhalation or ingestion. Irritant to body tissue. Absorbed through the skin.
Avoid vapors.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-2
Flammability-3
Reactivity-1
Exposure-2
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class 1C-Flammable liquid.
Flash Point: 95 F Upper: 11.2% Lower: 1.4% Autoignition Temperature: 649 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-3
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor can.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 100 ppm, (OSHA).

## Section 9 — Physical and Chemical Properties

Clear colorless liquid; vinous odor.
Solubility: Soluble in water (20%). Miscible with alcohol.
Formula: CH3(CH2)2CH2OH
Formula Weight: 74.14

Specific Gravity: 0.81
Melting Point: -90 C
Boiling Point: 117.7

## Section 10 — Stability and Reactivity

Avoid contact with aluminum, chromium trioxide and oxidizing materials.
When heated to decomposition, it emits acrid smoke and fumes. Substance may develop explosive hydroperoxides.
Shelf life: Fair, substance may oxidize.

## Section 11 — Toxicological Information

Acute effects: Severe irritant, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: Central nervous system, ears, liver, kidneys, blood

ORL-RAT LD50: 790 mg/kg
IHL-RAT LC50: 8000 ppm/4H
SKN-RBT LD50: 3400 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Butanols
Hazard Class: 3, Flammable Liquid
UN Number: UN1120

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-751-6), RCRA code U031.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 193.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Acetate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Acetate
Synonym: Calcium Diacetate
CAS#: 62-54-4

### Section 3 — Hazards Identification

White powder with a slight acetic acid odor.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits acrid smoke and fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White powder with a slight acetic acid odor.
Solubility: Water soluble. Slightly soluble in alcohol.
Decomposes on heating.
Formula: $Ca(C_2H_3O_2)_2 H_2O$
Formula Weight: 176.19

Specific Gravity: 1.5

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and open flame.
Shelf life: Fair to poor, hygroscopic.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-540-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 194.00
**Revision Date:** June 18, 2001

### Section 1 — Chemical Product and Company Identification

## Calcium Carbide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Carbide
Synonym: Calcium Acetylide
CAS#: 75-20-7

### Section 3 — Hazards Identification

Rock-like, grayish-black solid; odor of acetylene always present. Garlic like odor.
Corrosive. Avoid all body tissue contact.
Exposure to water or moisture evolves flammable acetylene.

**FLINN AT-A-GLANCE**
Health-1
Flammability-3
Reactivity-3
Exposure-1
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable solid. Exposure to water or moisture evolves flammable acetylene. 500 g of calcium carbide will yield approx. 150L of flammable acetylene. **Fire Fighting Instructions:** Use Class D, Met-L-X, or dry sand as a fire extinguisher. Do not use $CO_2$, halogenated extinguishing agent, or water: violent reaction with water. Firefighters should wear PPE and SCBA with full facepiece operating in positive mode.

**NFPA CODE**
H-3
F-3
R-2
No Water

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water . Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #5. Store with sulfides, phosphides, carbides and nitrides.
Store in a cool dry place. Store in a Flinn Chem-Saf bag and then inside a Flinn Saf-Stor can. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Rock-like, grayish-black; odor of acetylene always present.
Garlic-like odor.
Solubility: Reacts with water-decomposes in water.
Forms calcium hydroxide and acetylene with much heat.
Formula: CaC2
Formula Weight: 64.10

Specific Gravity: 2.22

## Section 10 — Stability and Reactivity

Exposure to moisture; decomposes in water to form acetylene and calcium hydroxide. Store in a metal can or a flammables cabinet.
Avoid contact with water, acids, halogens, silver nitrate, copper compounds and heavy metals.
Shelf life: Good if stored under dry conditions.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #25 is one option.

## Section 14 — Transport Information

Shipping Name: Calcium Carbide
Hazard Class: 4.3, Dangerous when wet
UN Number: UN1402

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-848-3), RCRA code D001, D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals.
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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 195.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Carbonate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Carbonate
Synonym: chalk, dolomite, limestone
CAS#: 471-34-1

### Section 3 — Hazards Identification

White odorless powder.
Irritant to body tissues. Severe eye and moderate skin irritant.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White odorless powder.
Solubility: Slightly soluble in water.
Formula: CaCO3
Formula Weight: 100.09

Specific Gravity: 2.7
Melting Point: 825 C (dec)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, acids, magnesium and aluminum.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 6450 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (207-439-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 196.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Chloride and Calcium Chloride dihydrate

CAS#: 10043-52-4 ; dihydrate: 10035-04-8

### Section 3 — Hazards Identification

White odorless powder, crystals or flakes.
Slightly toxic by ingestion. Mild irritant to skin, eyes and mucous membranes. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
When heated to decomposition, emits toxic chlorine gases.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White odorless powder, crystals or flakes.
Solubility: Dihydrate: Water soluble
Formula: CaCl2; dihydrate: CaCl2 2H2O
Formula Weight: 110.98

Specific Gravity: 2.15; dihydrate: 0.835
Melting Point: 772 C

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf life: Fair to Poor, deliquescent.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1000 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-140-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 199.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Hydroxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Hydroxide
Synonym: slaked lime, calcium hydrate
CAS#: 1305-62-0

### Section 3 — Hazards Identification

White odorless powder.
Toxic by inhalation. Irritant to body tissue. Strong solution is caustic. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable, non-combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Use and dispense in a hood. Store in a Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).Exposure guidelines: TWA 5 mg/m3 (OSHA)

## Section 9 — Physical and Chemical Properties

White odorless powder.
Solubility: Slightly soluble in water. Soluble in acids and some organic liquids. Absorbs CO2 from air.
pH of water solution (25%) 12.4.

Formula: Ca(OH)2
Formula Weight: 74.10
Specific Gravity: 2.34
Melting Point: loses water at 580 C

## Section 10 — Stability and Reactivity

Avoid contact with strong acids, maleic anhydride, and nitro compounds.
Shelf life: Fair to poor. Absorbs CO2 from air.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 7340 mg/Kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #10 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-137-3), RCRA code D002.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 200.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Calcium Hypochlorite

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Hypochlorite

CAS#: 7778-54-3

### Section 3 — Hazards Identification

Off-white or white solid or powder. Pungent odor; chlorine-like.
Irritant to body tissues. Moderately toxic by ingestion and inhalation.
Oxidizer, fire risk in contact with organic substances.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-3
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
Dangerous fire risk in contact with organic material. When heated to decomposition, emits toxic fumes of Na2O and Cl.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-3
F-0
R-1
OX

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #6. Store with bromates and chlorates.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White powder. Pungent odor; chlorine-like.
Solubility: Decomposes in water and alcohol.
Formula: Ca(OCl)2
Formula Weight: 142.99

Specific Gravity: 2.35
65-70% available chlorine.

## Section 10 — Stability and Reactivity

Avoid contact with water, alcohol, strong reducing agents and acids.
Shelf life: Fair to poor.

## Section 11 — Toxicological Information

Acute effects: Severe irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 850 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Calcium Hypochlorite, dry
Hazard Class: 5.1, Oxidizer
UN Number: UN1748

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-908-7), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 201.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Nitrate
Synonym: lime nitrate
CAS#: 13477-34-4

### Section 3 — Hazards Identification

Moist, white odorless crystals.
Body tissue irritant, slightly toxic. Harmful if inhaled. Avoid breathing dust. Avoid contact with skin and eyes.
Strong oxidizer; potential fire risk in contact with organic material; may explode if shocked or heated. When heated, emits toxic NOx fumes, becomes explosive.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
When heated, emits toxic NOx fumes. Explosion and fire hazard on contact with organic materials. May explode if shocked or heated.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Gather up material in a pile (do not sweep). Place in a suitable container. Use the disposal method listed on the right.
Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Moist, white, odorless crystals.
Solubility: Soluble in water, acetone and alcohol. Deliquescent.
Formula: Ca(NO3)2 4H2O
Formula Weight: 236.16

Specific Gravity: 1.82
Melting Point: 45 C

## Section 10 — Stability and Reactivity

Avoid contact with strong reducing agents, acids, and organic material.
Shelf life: Fair to poor, deliquescent; store in a Flinn Chem-Saf bag.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: Blood, central nervous system

ORL-RAT LD50: 3900 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Calcium Nitrate
Hazard Class: 5.1
UN Number: UN1454

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-332-1), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 205.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Phosphate, Dibasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Phosphate, dibasic
Synonym: dicalcium phosphate
CAS#: 7757-93-9

### Section 3 — Hazards Identification

White crystalline powder. Odorless.
Skin and eye irritant. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
When heated to decomposition, emits toxic fumes of POx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystalline powder. Odorless.
Solubility: Soluble in acids except acetic. Insoluble in alcohol; slightly in water.
Formula: CaHPO4
Formula Weight: 172.09

Specific Gravity: 2.31

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant, gastrointestinal disturbances, nausea, headache and vomiting.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-826-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 204.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Phosphate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Phosphate, monobasic

CAS#: 10031-30-8

### Section 3 — Hazards Identification

White crystalline powder. Odorless.
Mild body tissue irritant.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
When heated to decomposition, emits toxic fumes of POx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystalline powder. Odorless.
Solubility: Water soluble. Aqueous solutions are acidic.
Soluble in acid.
Formula: $Ca(H_2PO_4)_2 H_2O$
Formula Weight: 252.08

Specific Gravity: 2.2
Melting Point: loses water at 100 C

## Section 10 — Stability and Reactivity

Prudent laboratory practices should be observed.
Avoid contact with strong oxidizers.
Shelf life: Fair to poor; deliquescent.

## Section 11 — Toxicological Information

Acute effects: Irritant, gastrointestinal disturbances, nausea, headache and vomiting.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 17500 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-837-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 206.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Phosphate, Tribasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Phosphate, tribasic
Synonym: tricalcium phosphate
CAS#: 12167-74-7

### Section 3 — Hazards Identification

White crystalline powder. Odorless.
Skin and eye irritant. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
When heated to decomposition, emits toxic fumes of POx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystalline powder. Odorless.
Solubility: Soluble in acids except acetic.
Insoluble in water and alcohol.
Formula: Ca10(OH)2(PO4)6
Formula Weight: 1004.64

Specific Gravity: 3.18
Melting Point: 1670 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite

## Section 11 — Toxicological Information

Acute effects: Irritant, gastrointestinal disturbances, nausea, headache and vomiting.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (235-330-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 207.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Sulfate, Hydrate
Synonym: alabaster, mineral white, gypsum
CAS#: 10101-41-4

### Section 3 — Hazards Identification

White odorless powder.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
When heated to decomposition, may emit toxic fumes of SOx.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 10 mg/m3, total dust. (ACGIH)

## Section 9 — Physical and Chemical Properties

White odorless powder.
Solubility: Slightly soluble in water.
Formula: CaSO4 2H2O
Formula Weight: 172.18

Specific Gravity: 2.32
Melting Point: 128 C (loses water)
Boiling Point: 163 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Contact with diazomethane vapor results in an exotherm and may lead to detonation.
Shelf life: Indefinite

## Section 11 — Toxicological Information

Acute effects: Irritating dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-900-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 208.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Calcium Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Calcium Sulfate
Synonyms: plaster of paris, hemihydrate
CAS#: 10034-76-1

### Section 3 — Hazards Identification

White powder. Odorless.
Irritating dust. Avoid inhalation.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with soap and water.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable, non-combustible solid.
When heated to decomposition, may emit toxic fumes of SOx.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Hygroscopic, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 10 mg/m3, total dust (ACGlH)

## Section 9 — Physical and Chemical Properties

White powder. Hydrated form. Odorless.
Solubility: Slightly soluble in water.
Formula: CaSO4 1/2H2O
Formula Weight: 145.15

Specific Gravity: 2.964
Melting Point: 1450 C

## Section 10 — Stability and Reactivity

Contact with diazomethane vapor results in an exotherm and may lead to detonation. Reacts violently with aluminum when heated.
Shelf life: Poor, unless kept dry; store in a Flinn Chem-Saf bag.

## Section 11 — Toxicological Information

Acute effects: Irritating dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-900-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 211.50
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Carbon

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Carbon

CAS#: 7440-44-0

### Section 3 — Hazards Identification

Black rod. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with mild soap and water.
Internal: Rinse out mouth with water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Autoignition Temperature: 842 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water . Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Black rod, odorless.
Solubility: Insoluble in water
Formula: C
Formula Weight: 12.01

Specific Gravity: 1.821-2.1
Boiling Point: 4200 C

## Section 10 — Stability and Reactivity

Avoid heat, flame and oxidizing agents.
Shelf life: Good, if kept dry.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class:
UN Number:

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-153-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 218.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Carnauba Wax

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Carnauba Wax
Synonym: brazil wax
CAS#: 8015-86-9

### Section 3 — Hazards Identification

Yellow flakes; odorless.
Combustible solid. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible, non-flammable solid.
Flash Point: 540 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-0
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters and aldehydes.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Yellow flakes; odorless.
Solubility: Insoluble in water. Soluble in ether and other organic solvents.

Specific Gravity: 0.99
Melting Point: 84-86 C

## Section 10 — Stability and Reactivity

Prudent laboratory practices should be observed.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 220.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Casein

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Casein

CAS#: 9000-71-9

### Section 3 — Hazards Identification

Pale-yellow powder. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable, combustible solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Pale-yellow powder. Odorless.
Solubility: Soluble in acids. Soluble in dilute alkalies and concentrated acids. Precipitates from weak acid solutions.
Formula: Aggregate of proteins
Formula Weight: Varies

Specific Gravity: 1.3

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers. Avoid moisture, deteriorates when damp or wet.
Shelf life: Fair to poor; deteriorates when damp.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number:N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (232-555-1).

## Section 16 — Other Information

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 222.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Cedarwood Oil

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cedarwood Oil

CAS#: 8000-27-9

### Section 3 — Hazards Identification

Clear oil. May yellow or brown in color with age. Odorless.
Moderately toxic by inhalation, ingestion or skin absorption. May cause skin irritation.
Combustible.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible liquid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #4. Store with ethers, ketones, halogenated hydrocarbons and ethylene oxide. Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor Can.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Clear oil. May yellow or brown in color with age.
Solubility: Soluble in many organic solvents. An essential oil.

Specific Gravity: 0.947

## Section 10 — Stability and Reactivity

Avoid strong oxidizing agents. May discolor on exposure to light.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Moderately toxic, irritant
Chronic effects: N.A.
Target organs: Central nervous system

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: 500 mg/24H

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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MSDS Number: **C1630** * * * * * *Effective Date:* ***11/06/08*** * * * * * *Supercedes:* ***12/05/07***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Celite® 503

## 1. Product Identification

**Synonyms:** Diatomaceous Earth; Diatomite; Kieselguhr Soda Ash Flux Calcined
**CAS No.:** 68855-54-9
**Molecular Weight:** Not applicable.
**Chemical Formula:** Not applicable.
**Product Codes:**
J.T. Baker: E406
Mallinckrodt: 4382

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Kieselguhr, Soda Ash Flux-calcined | 68855-54-9 | 100% | Yes |
| This product may contain up to 75% crystalline silica: | | | |
| Cristobalite | 14464-46-1 | < 70% | Yes |
| Quartz | 14808-60-7 | < 5% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY AFFECT LUNGS. CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends upon duration and level of exposure.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Cancer Causing)
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

**Potential Health Effects**

**Inhalation:**
Causes dryness and irritation to the respiratory tract. Symptoms may include coughing, sore throat, breathing difficulty (dyspnea), and wheezing. Excessive inhalation may cause decreased pulmonary function, lung damage and silicosis. Acute silicosis is manifested by dyspnea, fever, cough and weight loss. Severe respiratory symptoms may lead to death.
**Ingestion:**
No adverse effects expected.
**Skin Contact:**
Causes irritation with dryness and abrasion.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
Prolonged inhalation exposure may produce silicosis. Chronic symptoms include cough, dyspnea, wheezing, increased susceptibility to tuberculosis, decreased chest expansion, and repeated nonspecific chest illnesses. Progressive respiratory and cardiopulmonary impairment may be fatal. Chronic inhalation of crystalline silica is a lung cancer hazard.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing respiratory or cardiopulmonary problems may be more susceptible to the effects of this substance.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:**
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. When pouring into a container of flammable liquid, ground both containers electrically to prevent a static electric spark. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
OSHA PERMISSIBLE LIMITS (PEL*s*):
- For silica, amorphous, including natural diatomaceous earth (112926-00-8):
( 80 mg/m3) / (%SiO2), (TWA).
- For silica, crystalline, quartz (14808-60-7):
(30mg/m3)/(%SiO2 + 2), (TWA), total dust;
(10 mg/m3)/(%SiO2 + 2), (TWA), respirable fraction;
where "%SiO2" is the percentage of crystalline silica
determined by airborne samples, as defined by
29 CFR 1910.1000, Z-3.
- For silica, crystalline, tridymite (15468-32-3) or cristobalite (14464-46-1):
Use one-half of the quartz exposure limits.

ACGIH THRESHOLD LIMIT VALUES:
- For silica, crystalline, quartz (14808-60-7):
0.025 mg/m3 (TWA), respirable fraction, A2 - Suspected Human Carcinogen.
- For silica, crystalline, cristobalite (14464-46-1):
0.025 mg/m3 (TWA), respirable fraction.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White to gray Powder.
**Odor:**
Odorless.
**Solubility:**
Slight (0.1-1%)
**Specific Gravity:**
2.30

**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
Not applicable.
**Vapor Pressure (mm Hg):**
Not applicable.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
No information found.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Reacts with hydrogen fluoride, fluorine, oxygen difluoride, chlorine trifluoride, strong acids, strong bases, and oxidizers.
**Conditions to Avoid:**
Moisture, extreme heat, and incompatibles.

## 11. Toxicological Information

**Toxicological Data:**
No LD50/LC50 information found relating to normal routes of occupational exposure.

Silica, Amorphous:
- diatomaceous earth: investigated as a tumorigen.

Silica, Crystalline:
- tripoli: investigated as a tumorigen.
- tridymite: investigated as a tumorigen and mutagen.
- quartz: investigated as a tumorigen and mutagen.
- cristobalite: investigated as a tumorigen.
- fused: investigated as a tumorigen.

**Carcinogenicity:**
For Silica, Crystalline:
- Cristobalite (14464-46-1), quartz (14808-60-7), and tridymite (15468-32-3) are listed by NTP as known to be a human carcinogen.
- NIOSH considers cristobalite, tridymite, quartz, and tripoli (1317-95-9) to be potential occupational carcinogens.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Kieselguhr, Soda Ash Flux-calcined (68855-54-9) | No | No | None |
| Cristobalite (14464-46-1) | Yes | No | 1 |
| Quartz (14808-60-7) | Yes | No | 1 |

## 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is not expected to biodegrade. When released into water, this material is not expected to biodegrade.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Kieselguhr, Soda Ash Flux-calcined (68855-54-9) | Yes | Yes | No | Yes |

| Ingredient | Korea | Canada DSL | Canada NDSL | Canada Phil. |
|---|---|---|---|---|
| Cristobalite (14464-46-1) | Yes | Yes | Yes | Yes |
| Quartz (14808-60-7) | Yes | Yes | Yes | Yes |

| Ingredient | SARA 302 RQ | SARA 302 TPQ | SARA 313 List | SARA 313 Chemical Catg. |
|---|---|---|---|---|
| Kieselguhr, Soda Ash Flux-calcined (68855-54-9) | No | No | No | No |
| Cristobalite (14464-46-1) | No | No | No | No |
| Quartz (14808-60-7) | No | No | No | No |

| Ingredient | CERCLA | RCRA 261.33 | TSCA 8(d) |
|---|---|---|---|
| Kieselguhr, Soda Ash Flux-calcined (68855-54-9) | No | No | No |
| Cristobalite (14464-46-1) | No | No | No |
| Quartz (14808-60-7) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**WARNING:**
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

## 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY AFFECT LUNGS. CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends upon duration and level of exposure.
**Label Precautions:**
Do not breathe dust.
Keep container closed.
Use only with adequate ventilation.
Do not get in eyes, on skin, or on clothing.
Wash thoroughly after handling.
**Label First Aid:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 8.
**Disclaimer:**
**********
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 225.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Cellulose

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cellulose

CAS#: 9004-34-6

### Section 3 — Hazards Identification

Off white, fibrous powder; odorless.
Irritating dust. Avoid inhalation. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with soap and water.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Dust explosions are possible. When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, sugars, amines, amides, imines, imides. Store in a cool dry place. Store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire). Exposure guidelines: TWA 15 ppm (OSHA).

## Section 9 — Physical and Chemical Properties

Off white, fibrous powder; odorless.
Solubility: Insoluble in water (1% or less)
Formula: $(C_6H_{10}O_5)_n$
Formula Weight: Varies

Specific Gravity: 1.55

## Section 10 — Stability and Reactivity

Avoid contact with calcium oxide, bleaching powder, perchlorates, perchloric acid, sodium chlorate, fluoride, nitric acid, sodium nitrite and sodium nitrate.
Shelf life: Good, if kept dry.

## Section 11 — Toxicological Information

Acute effects: Irritating dust.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (232-674-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 228.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Charcoal

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Charcoal
Synonym: activated carbon
CAS#: 7440-44-0

### Section 3 — Hazards Identification

Black powder, granule or lump. Odorless.
Dust hazardous by inhalation.
Flammable solid as dust. Avoid any source of ignition.

**FLINN AT-A-GLANCE**
Health-1
Flammability-2
Reactivity-1
Exposure-1
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable solid as a dust.
Autoignition Temperature: 842 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water . Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in Flinn Chem-Saf bag, in a Flinn Saf-Stor can. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Black powder, granule or lump odorless.
Solubility: Insoluble in water
Formula: C
Formula Weight: 12.01

Specific Gravity: 1.821-2.1
Boiling Point: 4200 C

## Section 10 — Stability and Reactivity

Avoid heat, flame and oxidizing agents.
Shelf life: Good, if kept dry.

## Section 11 — Toxicological Information

Acute effects: Irritating dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Charcoal
Hazard Class: 4.2, Spontaneously combustible
UN Number: NA1361

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-153-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 231.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Chlorine Water

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Chlorine (7782-50-5) and Water (7732-18-5)

CAS#: None established

### Section 3 — Hazards Identification

Pungent odor, light yellow liquid.
Toxic by inhalation and ingestion. Very irritating to mucous membranes. This is a weak solution of chlorine gas and water. Chlorine gas will slowly leave solution.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-2
Exposure-3
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Evacuate area. Open all windows and ventilate as much as possible. If bottle is left open all the chlorine will eventually leave the container. Absorb with sand or absorbent material; after all the chlorine is released, deposit in sealed bag or container.
See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Use and dispense in a hood. Keep container tightly closed. Store in Flinn Chem Saf Bag and then inside Flinn Saf Stor Can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.5 ppm, STEL 1 ppm (OSHA, NIOSH).

## Section 9 — Physical and Chemical Properties

Water saturated with chlorine gas. Water 99+% chlorine 0.4%

## Section 10 — Stability and Reactivity

Avoid contact with organic materials (such as ether, turpentine, hydrocarbons), ammonia and powdered metals.
Shelf life: Poor, perhaps six months at best.

## Section 11 — Toxicological Information

Acute effects: Very irritating.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Allow the chlorine water to stand in an open container in a hood in a well-ventilated, protected area. The chlorine will leave the water and the container. The remaining water (now effectively degassed) can be put down the drain.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 244.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Citric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Citric Acid monohydrate and/or Citric Acid anhydrous
Synonym: 2-hydroxy-1,2,3-propanetricarboxylic acid
CAS#: 77-92-9 (anhydrous) or 5949-29-1 (monohydrate)

### Section 3 — Hazards Identification

White granules. Odorless.
A severe eye and moderate skin irritant.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
When heated to decomposition, emits acrid smoke and fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn suggested chemical storage pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place. Store in a Flinn Chem Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White granules. Odorless.
Solubility: Water soluble.
Formula: C6H8O7
Formula Weight: 192.14

Specific Gravity: 1.54 (anhydrous)

## Section 10 — Stability and Reactivity

Avoid contact with oxidizers, bases and reducing agents.
Shelf life: Substance efflorescent.

## Section 11 — Toxicological Information

Acute effects: Severe eye irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (201-069-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 255.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Cobalt Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cobalt Chloride
Synonym: cobalt (II) chloride, cobaltous chloride, cobalt dichloride
CAS#: 7791-13-1

### Section 3 — Hazards Identification

Damp, red crystal. Odorless.
Irritant to body tissues. Moderately toxic by ingestion. Prolonged exposure may cease production of red blood cells. Avoid ingestion, inhalation and skin absorption. Cobalt and cobalt compounds are possible carcinogens.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-0
Exposure-3
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic hydrogen chloride gas and cobalt fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Gather up material in a pile (do not sweep). Place in a suitable container. Use the disposal method listed on the right.
Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.05 mg/m3 (NIOSH)

## Section 9 — Physical and Chemical Properties

Damp, red crystal. Odorless.
Solubility: Water soluble.
Formula: CoCl2 6H2O
Formula Weight: 237.95

Specific Gravity: 1.92
Melting Point: 230 F

## Section 10 — Stability and Reactivity

Avoid contact with moisture, oxidizers, and alkali metals.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, possible sensitizer
Chronic effects: Possible carcinogen, mutagen
Target organs: N.A.

ORL-RAT LD50: 766 mg/Kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27f is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-589-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 256.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Cobalt Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cobalt Nitrate
Synonym: cobalt (II) nitrate, cobaltous nitrate, cobalt dinitrate
CAS#: 10026-22-9

### Section 3 — Hazards Identification

Small, red flakes; slight nitric acid odor.
Moderately toxic by ingestion or inhalation. Irritant to body tissues. Avoid breathing dust. Causes burns. May cause an allergic skin reaction. Cobalt and cobalt compounds are possible carcinogens. Severe fire hazard in contact with organic materials.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-3
Exposure-3
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
Strong oxidizing material, severe fire hazard in contact with organic materials. When heated to decomposition, emits toxic fumes of NOx and Co.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Deliquescent, store in Flinn Chem-Saf Bag. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.05 mg/m3 STEL 0.1 mg/m3 (ACGlH)

## Section 9 — Physical and Chemical Properties

Small, red flakes, slight nitric acid odor.
Solubility: Soluble in most organic solvents.
Formula: Co(NO3)2 6H2O
Formula Weight: 291.05

Specific Gravity: 1.88
Melting Point: 56 C

## Section 10 — Stability and Reactivity

Avoid contact with reducers, organic materials, heat and moisture.
Shelf life: Poor; deliquescent.

## Section 11 — Toxicological Information

Acute effects: Harmful dust, irritant
Chronic effects: N.A.
Target organs: Lungs, thyroid

ORL-RAT LD50: 691 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27f is one option.

## Section 14 — Transport Information

Shipping Name: Nitrates, Inorganic, n.o.s.
Hazard Class: 5.1, Oxidizer
UN Number: UN1477

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-402-1), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 258.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Cobalt Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cobalt Sulfate
Synonym: cobalt (II) sulfate, cobaltous sulfate.
CAS#: 10026-24-1

### Section 3 — Hazards Identification

Red-pink crystals. Odorless.
Moderately toxic by ingestion or inhalation. Irritant to body tissues. May cause an allergic skin reaction. Cobalt and cobalt compounds are possible carcinogens. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-0
Exposure-3
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, may produce toxic fumes of Co and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.05 mg/m3 STEL 0.1 mg/m3 (ACGlH, ACGlH)

## Section 9 — Physical and Chemical Properties

Red-pink crystals. Odorless.
Solubility: Water soluble, slightly soluble in alcohols.
Formula: CoSO4 7H2O
Formula Weight: 281.12

Specific Gravity: 1.948
Melting Point: 420 C

## Section 10 — Stability and Reactivity

Avoid contact with moisture.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: Lungs and thyroid

ORL-RAT LD50: 768 mg/kg
IHL-RAT LC50:
SKN-RBT LD50:

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27f is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-334-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 263.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Congo Red

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Congo Red
Synonym: direct red 28, C.I. 22120
CAS#: 573-58-0

### Section 3 — Hazards Identification

Brownish-red powder. Odorless.
Body tissue irritant, eye irritant. Avoid body tissue contact. This material, if ingested, inhaled, absorbed through the skin, may metabolize to Benzidine, a probable carcinogen.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-0
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of CO, CO2, and NOx, SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Brownish-red powder. Odorless.
Solubility: Soluble in water.
Formula: C32H22N6Na2O6S2
Formula Weight: 696.67

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite

## Section 11 — Toxicological Information

Acute effects: Toxic, eye irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 15200 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (209-358-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 278.00

**Revision Date:** September 20, 2004

### Section 1 — Chemical Product and Company Identification

# Copper(II) Acetate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper(II) acetate, monohydrate
Synonyms: cupric acetate

CAS#: 6046-93-1

### Section 3 — Hazards Identification

Dark green crystals or powder. Odorless.
Moderately toxic by ingestion.
Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**

Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**

None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).

## Section 9 — Physical and Chemical Properties

Dark green crystals or powder. Odorless.
Solubility: Soluble in water and alcohol.
Formula: (CH3CO2)2Cu H2O
Formula Weight: 199.65

Specific Gravity: 1.88
Melting Point: 115 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Harmful dust, irritant, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 710 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (205-553-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 279.00

**Revision Date:** September 20, 2004

### Section 1 — Chemical Product and Company Identification

# Copper(II) Bromide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper(II) bromide
Synonym: cupric bromide, copper dibromide

CAS#: 7789-45-9

### Section 3 — Hazards Identification

Grayish to black, crystalline powder. Bromine-like odor.
Mild tissue irritant. Avoid contact with eyes and mucous membranes.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Releases toxic fumes of Br upon decomposition.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Moisture sensitive material. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire). Exposure guidelines: TWA 0.1 mg/m3 (OSHA)

## Section 9 — Physical and Chemical Properties

Grayish to black, crystalline powder. Bromine-like odor.
Solubility: Soluble: water, alcohol and acetone.
Formula: CuBr2
Formula Weight: 223.27

Specific Gravity: 4.77
Melting Point: 498 C

## Section 10 — Stability and Reactivity

Avoid contact with moisture and alkali metals.
Shelf life: Poor; hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Irritant, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (232-167-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 280.00

**Revision Date:** September 20, 2004

### Section 1 — Chemical Product and Company Identification

# Copper(II) Carbonate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper(II) carbonate
Synonym: cupric carbonate, malachite

CAS#: 12069-69-1

### Section 3 — Hazards Identification

Green to blue powder or dark-green crystals. Odorless.
Slightly toxic by ingestion and inhalation. Irritant to skin, eyes, and mucous membranes. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Store in the dark. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Green to blue powder or dark-green crystals. Odorless.
Solubility: Insoluble in water; soluble in acids.
Decomposes at 200 C
Formula: Cu2(OH)2CO3
Formula Weight: 221.11

Specific Gravity: 4.0

## Section 10 — Stability and Reactivity

Avoid contact with acids and oxidizing agents.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1350 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (235-113-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 281.00

**Revision Date:** September 20, 2004

### Section 1 — Chemical Product and Company Identification

# Copper(II) Chloride, Anhydrous

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper(II) chloride, anhydrous
Synonym: cupric chloride, copper dichloride

CAS#: 7447-39-4

### Section 3 — Hazards Identification

Olive-tan powder or crystals. Slight vanilla odor.
Highly toxic by ingestion and inhalation. Irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Cl.
Fire Fighting Instructions: Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).

## Section 9 — Physical and Chemical Properties

Olive-tan powder or crystals. Slight vanilla odor.
Solubility: Water soluble and alcohol.
Formula: CuCl2
Formula Weight: 134.45

Specific Gravity: 3.4
Melting Point: 620 C

## Section 10 — Stability and Reactivity

Avoid contact with moisture and alkali metals.
Shelf life: Poor; deliquescent.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 140 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Copper Chloride
Hazard Class: 8, Corrosive
UN Number: UN2802

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-210-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

**FLINN SCIENTIFIC INC.**
**"Your Safer Source for Science Supplies"**

***Flinn--"Your Safer Source for Chemicals"***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 281.05

**Revision Date:** September 20, 2004

### Section 1 — Chemical Product and Company Identification

# Copper(II) Chloride, Dihydrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper (II) chloride, dihydrate
Synonym: Cupric chloride, copper dichloride

CAS#: 10125-13-0

### Section 3 — Hazards Identification

Light blue/green powder or crystals. Odorless.
Highly toxic by ingestion and inhalation. Irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Cl.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).

## Section 9 — Physical and Chemical Properties

Light blue/green powder or crystals. Odorless.
Solubility: Water soluble and alcohol.
Formula: CuCl2 2H2O
Formula Weight: 170.49

Specific Gravity: 2.5
Melting Point: 100 C

## Section 10 — Stability and Reactivity

Avoid contact with moisture and alkali metals.
Shelf life: Poor; deliquescent.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 140 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Copper Chloride
Hazard Class: 8, Corrosive
UN Number: UN2802

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-210-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 265.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Copper

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper

CAS#: 7440-50-8

### Section 3 — Hazards Identification

Reddish-brown ductile metal. May be in the form of granules, shot, powder, sheet, wire, foil, or turnings. Odorless.
Irritant to body tissues as dust. Avoid contact with nitric acid, emits toxic fumes of nitrogen oxides.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-1
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Non-combustible solid in bulk form, but air-born dust may ignite.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.1 mg/m3 (OSHA)

## Section 9 — Physical and Chemical Properties

Reddish-brown ductile metal. Also granules, shot, powder, sheet, wire, foil turnings. Odorless.
Solubility: Soluble in nitric acid and hot sulfuric acid.
Formula: Cu
Formula Weight: 63.54

Specific Gravity: 8.92
Melting Point: 1083 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, strong acids, bromates, chlorates, iodates and halogens. Avoid contact with nitric acid, emits toxic fumes of nitrogen oxides.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: Respiratory system, skin, liver, kidneys, increased risk with Wilson's disease.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-159-6), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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*Flinn Chemical Packaging Prevents Accidents*

flinn@flinnsci.com www.flinnsci.com
P.O. Box 219 Batavia IL 60510
(800) 452-1261 Fax (866) 452-1436

MSDS Number: **C5874** * * * * * *Effective Date:* ***05/04/07*** * * * * * *Supercedes:* ***08/10/04***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# CUPRIC NITRATE

## 1. Product Identification

**Synonyms:** Cupric nitrate hemipentahydrate; nitric acid, copper (2+) salt, hydrate (2:5); copper II nitrate hemihydrate
**CAS No.:** 3251-23-8 (Anhydrous) 19004-19-4 (hemipentahydrate)
**Molecular Weight:** 232.6
**Chemical Formula:** Cu(NO3)2 . 2.5H2O
**Product Codes:**
J.T. Baker: 1800, 1803
Mallinckrodt: 4828

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Cupric Nitrate | 3251-23-8 | 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED. AFFECTS THE LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Yellow (Reactive)

**Potential Health Effects**

**Inhalation:**
Causes irritation to respiratory tract, symptoms may include coughing, sore throat, and shortness of breath. May result in ulceration and perforation of respiratory tract. When heated, this compound may give off copper fume, which can cause symptoms similar to the common cold, including chills and stuffiness of the head.
**Ingestion:**
May cause burning pain in the mouth, esophagus, and stomach. Hemorrhagic gastritis, nausea, vomiting, abdominal pain, metallic taste, and diarrhea may occur. If vomiting does not occur immediately systemic copper poisoning may occur. Symptoms may include capillary damage, headache, cold sweat, weak pulse, kidney and liver damage, central nervous excitation followed by depression, jaundice, convulsions, blood effects, paralysis and coma. Death may occur from shock or renal failure.
**Skin Contact:**
Causes irritation to skin. Irritation may be severe.
**Eye Contact:**
Cause irritation, redness, pain, discoloration, and possible eye damage.
**Chronic Exposure:**
Prolonged or repeated skin exposure may cause dermatitis. Prolonged or repeated exposure to dusts of copper salts may cause discoloration of the skin or hair, blood and liver damage, ulceration and perforation of the nasal septum, runny nose, metallic taste, and atrophic changes and irritation of the mucous membranes.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders, impaired liver, kidney, or pulmonary function, glucose 6-phosphate-dehydrogenase deficiency, or pre-existing Wilson's disease may be more susceptible to the effects of this material.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician immediately.
**Skin Contact:**
In case of contact, wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Increases flammability of any combustible substance in contact with it.
**Explosion:**
Contact with oxidizable substances may cause extremely violent combustion.
**Fire Extinguishing Media:**
Water or water spray in early stages of fire. Foam or dry chemical may also be used.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from combustible, organic, or any other readily oxidizable materials. Do not store on wooden floors. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
1 mg/m3 (TWA) for copper dusts & mists as Cu
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 (TWA) for copper dusts & mists as Cu
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Blue crystals.
**Odor:**
Odorless.
**Solubility:**
138g/100ml water @ 0C (trihydrate); soluble in water (anhydrous).
**Specific Gravity:**
2.32 (anhydrous), 2.05 (trihydrate)
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
170C (338F) Decomposes (anhydrous).
**Melting Point:**
115C (239F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**

No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Oxides of nitrogen and toxic metal fumes may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Paper, wood, organic materials, ether, potassium ferrocyanide, tin, acetylene, hydrazine, nitromethane, ammonia + potassium amide, acetic anhydride, sodium hypobromite, nitromethanes, and any readily oxidizable substance.
**Conditions to Avoid:**
Incompatibles.

## 11. Toxicological Information

Oral rat LD50: 794 mg/kg (anhydrous); skin rabbit (Draize) 500 mg, severe (anhydrous); eye rabbit (Draize) 100 mg, severe (anhydrous).

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Cupric Nitrate (3251-23-8) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
This material is expected to significantly bioaccumulate. This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. Bioaccumulation data for copper.
**Environmental Toxicity:**
This material is expected to be very toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l. The IC50/72-hour values for algae are less than 1 mg/l. Toxicity data for copper.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** RQ, NITRATES, INORGANIC, N.O.S. (CUPRIC NITRATE)
**Hazard Class:** 5.1
**UN/NA:** UN1477
Packing Group: II
**Information reported for product/size:** 100KG

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** NITRATES, INORGANIC, N.O.S. (CUPRIC NITRATE)
**Hazard Class:** 5.1
**UN/NA:** UN1477
Packing Group: II
**Information reported for product/size:** 100KG

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Cupric Nitrate (3251-23-8) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Cupric Nitrate (3251-23-8) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Cupric Nitrate (3251-23-8) | No | No | No | Copper cmpd/ |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Cupric Nitrate (3251-23-8) | 100 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0** Other: **Oxidizer**
**Label Hazard Warning:**
DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. HARMFUL IF SWALLOWED. AFFECTS THE LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Keep from contact with clothing and other combustible materials.
Store in a tightly closed container.
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 282.00
**Revision Date:** July 11, 2005

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Copper(II) Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Copper(II) Nitrate
Synonym: Cupric Nitrate
CAS#: 10031-43-3

### SECTION 3 — HAZARDS IDENTIFICATION

Blue crystals, nitric acid odor.
Moderately toxic by ingestion and inhalation. Corrosive. Body tissue irritant. Avoid all body tissue contact.
Strong oxidizer, keep away from organic material.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-3
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non flammable, non combustible solid.
Strong oxidizer. Avoid contact with combustible and organic materials. Heating to decomposition may emit toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None
Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Blue crystals, nitric acid odor.
Solubility: Soluble in water and alcohol.
Formula: Cu(NO3)2 3H2O
Formula Weight: 241.60

Specific Gravity: 2.0
Melting Point: 115 C

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with organic materials, reducing agents, heat or moisture. Avoid dust.
Shelf life: Poor; substance deliquescent.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 940 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Nitrates, Inorganic, n.o.s.
Hazard Class: 5.1, Oxidizer
UN Number: UN1477
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (221-838-5), RCRA code D001.

## SECTION 16 — OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 285.00

**Revision Date:** September 20, 2004

### Section 1 — Chemical Product and Company Identification

# Copper(II) Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Copper(II) sulfate, pentahydrate
Synonym: Cupric sulfate, blue vitiol, chalcanthite

CAS#: 7758-99-8

### Section 3 — Hazards Identification

Blue crystalline powder, granules or larger crystals. Odorless.
Skin and respiratory irritant; moderately toxic by ingestion and inhalation.

**FLINN AT-A-GLANCE**

Health-2
Flammability-0
Reactivity-0
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
However, sulfur trioxide can be produced at temperatures above 653 C.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**

None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Efflorescent. Protect from air, store in a Flinn Chem-Saf bag. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Blue crystalline powder, granules or larger crystals. Odorless.
Solubility: Soluble in water and methanol; slightly in alcohol.
Formula: CuSO4 5H2O
Formula Weight: 249.69

Specific Gravity: 2.28

## Section 10 — Stability and Reactivity

Avoid contact with finely powdered metals, heat. Will corrode steel.
Shelf Life: Fair, slowly effloresces in air.

## Section 11 — Toxicological Information

Acute effects: Toxic, severe eye irritant, gastrointestinal disturbances
Chronic effects: Possible mutagen
Target organs: Liver, kidneys, blood

ORL-RAT LD50: 300 mg/Kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-847-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **C5357** * * * * * *Effective Date:* ***08/20/08*** * * * * * *Supercedes:* ***11/10/05***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Creatine, Monohydrate

## 1. Product Identification

**Synonyms:** N-Amidinosarcosine; N-(Aminoiminomethyl)-N-methylglycine
**CAS No.:** 57-00-1 (Anhydrous) 6020-87-7(monohydrate)
**Molecular Weight:** 149.15
**Chemical Formula:** NH2C(:NH)N(CH3)CH2COOH . H2O
**Product Codes:** F812

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Creatine (anhydrous) | 57-00-1 | 90 - 100% | No |

## 3. Hazards Identification

**Emergency Overview**

**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
No adverse health effects expected from inhalation. May cause mild irritation to the respiratory tract.
**Ingestion:**
Not expected to be a health hazard via ingestion. Large oral doses may cause irritation to the gastrointestinal tract.
**Skin Contact:**
Not expected to be a health hazard from skin exposure. May cause mild irritation and redness.
**Eye Contact:**
Not expected to be a health hazard. May cause mild irritation, possible reddening.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Not expected to require first aid measures. If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**
Not expected to require first aid measures. Wash thoroughly with running water. Get medical advice if irritation develops.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

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## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
Not expected to require any special ventilation.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**
White Crystalline solid.
**Odor:**
No information found.
**Solubility:**
Moderate (1-10%)
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
300C (572F)
**Vapor Density (Air=1):**
Not applicable.
**Vapor Pressure (mm Hg):**
Not applicable.
**Evaporation Rate (BuAc=1):**
No information found.

---

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce ammonia, carbon monoxide, carbon dioxide, nitrogen oxides.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizing agents.
**Conditions to Avoid:**
Moisture and incompatibles.

---

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Creatine (anhydrous) (57-00-1) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Creatine (anhydrous) (57-00-1) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | --Canada-- Korea | DSL | NDSL | Phil. |
|---|---|---|---|---|
| Creatine (anhydrous) (57-00-1) | Yes | Yes | No | No |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Creatine (anhydrous) (57-00-1) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Creatine (anhydrous) (57-00-1) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.**

**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 276.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Crystal Violet

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Crystal Violet
Synonym: C.I. 42555, basic violet 3, gentian violet
CAS#: 548-62-9

### Section 3 — Hazards Identification

Green powder. Odorless.
Moderately toxic by ingestion and inhalation, body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of CO, CO2, NOx and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Green powder. Odorless.
Solubility: Water soluble. Biological stain.
Formula: C25H30ClN3
Formula Weight: 408.00

Melting Point: 215 C (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, nausea, headache and vomiting
Chronic effects: Mutagen
Target organs: N.A.

ORL-RAT LD50: 420 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (208-953-6).

## Section 16 — Other Information

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**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 284.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Cupric Oxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cupric Oxide
Synonym: copper (II) oxide
CAS#: 1317-38-0

### Section 3 — Hazards Identification

Black or brownish-black color granules or powder. Odorless.
Irritating to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Keep container tightly closed. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Black or brownish-black color granules or powder. Odorless.
Solubility: Soluble in acids; difficult to dissolve in water.
Formula: CuO
Formula Weight: 79.54

Specific Gravity: 5.75-6.09
Decomposes at 1026 C

## Section 10 — Stability and Reactivity

Avoid contact with reducing agents, aluminum, alkali metals, finely powdered metals.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-269-1).

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 272.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## m-Cresol Purple and Solutions

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

m-Cresol Purple and Solution: m-Cresol Purple (2303-01-7) <0.1%, Sodium Hydroxide (1310-73-2) <0.1%, and Water (7732-18-5) >99%

CAS#: 62625-31-4

### Section 3 — Hazards Identification

Shiny black crystals or powder. Odorless. The solution is purple/blue in color and odorless. Possibly a mild irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of CO, CO2, SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Shiny black crystals or powder. Odorless. The solution is purple/blue in color and odorless.
Solubility: An acid-base indicator. Soluble in water and alcohol.
Formula: C6H4SO2OC(C6H3(OH)CH3)2
Formula Weight: 382.43

## Section 10 — Stability and Reactivity

Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Mild irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (218-960-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 296.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Dextrose

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Dextrose

CAS#: 5996-10-1 (monohydrate); 492-62-6 (anhydrous)

### Section 3 — Hazards Identification

Colorless to white crystals. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with mild soap and water.
Internal: Give large quantities of water.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, sugars, amines, amides, imines, and imides. Store in a cool dry place. Store in a Finn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless to white crystals. Odorless.
Solubility: Soluble in water.
Formula: C6H12O6 H2O
Formula Weight: 198.18

Specific Gravity: 1.544
Melting Point: 83 C

## Section 10 — Stability and Reactivity

Shelf Life: Good, if kept dry.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

EINECS-listed (207-757-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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P.O. Box 219 Batavia IL 60510
(800) 452-1261 Fax (866) 452-1436

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 298.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Diastase of Malt

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Diastase of Malt
Synonym: maltin
CAS#: 9000-92-4

### Section 3 — Hazards Identification

White-tan powder; slight yeast odor.
Irritating dust. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic Miscellaneous.
Store in a cool dry place. Keep container tightly closed. Moisture sensitive material, store in a Flinn Chem-Saf bag. Best stored under dry conditions in a refrigerator.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White-tan powder; slight yeast odor.
Solubility: Water soluble.

## Section 10 — Stability and Reactivity

Enzyme activity may be destroyed by exposure to high temperature.
Shelf life: Poor unless kept dry.

## Section 11 — Toxicological Information

Acute effects: Mild irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 299.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Diatomaceous Earth

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Diatomaceous Earth
Synonyms: celite, infusorial earth
CAS#: 61790-53-2

### Section 3 — Hazards Identification

White to buff-colored solid. Slightly spicy odor.
Avoid breathing dust. Irritating to skin, eyes and mucous membranes.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Moisture sensitive material, store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White to buff-colored solid (88% Silica)
Slightly spicy odor.
Solubility: Soluble in strong alkalies; no acid except hydrofluoric.

Specific Gravity: 1.9-2.35

## Section 10 — Stability and Reactivity

Avoid contact with hydrofluoric acid.
Shelf Life: Good, if kept dry.

## Section 11 — Toxicological Information

Acute effects: Harmful dust.
Chronic effects: N.A.
Target organs: Lungs

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 310.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Diphenylamine

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Diphenylamine

CAS#: 122-39-4

### Section 3 — Hazards Identification

White to tan flakes. Strong floral odor.
Moderately toxic by ingestion and inhalation. Irritant. Avoid contact with body tissues.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
When heated to decomposition, emits fumes of nitrogen oxides.
Flash Point: 307 F Autoignition Temperature: 1175 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-3
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place and light sensitive. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 10 mg/m3 ppm, (OSHA)

## Section 9 — Physical and Chemical Properties

White to tan flakes. Strong floral odor.
Solubility: Insoluble in water; soluble in carbon disulfide, benzene, alcohol and ether.
Formula: (C6H5)2NH
Formula Weight: 169.24

Specific Gravity: 1.16
Boiling Point: 302 C
Melting Point: 54 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizing agents and strong acids.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, Irritant
Chronic effects: Possible mutagen, possible teratogen
Target organs: Liver, kidneys, blood, heart, bladder

ORL-RAT LD50: 300 mg/Kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #5 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (204-539-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 251.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Cleaner - Household Liquid Dishwashing Detergent

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Cleaner - Household Liquid Dishwashing Detergent

CAS#: None Established

### Section 3 — Hazards Identification

A pink or white viscous liquid. Odor: Soap-like.
May be eye irritant. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible liquid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic Miscellaneous, or near washing area.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Pink or white viscous liquid. Odor: soap-like.
Entirely water soluble.

## Section 10 — Stability and Reactivity

Prudent laboratory practices should be observed.
Shelf Life: Good.

## Section 11 — Toxicological Information

Acute effects: Mild eye irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

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***Flinn Chemical Packaging Prevents Accidents***

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**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **E0150** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***01/13/06***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# (ETHYLENEDINITRILO) TETRAACETIC ACID

## 1. Product Identification

**Synonyms:** EDTA; edetic acid; versene acid; ethylenediaminetetraacetic acid.
**CAS No.:** 60-00-4
**Molecular Weight:** 292.24
**Chemical Formula:** (HOCOCH2)2NCH2CH2N- (HOCOCH2)2
**Product Codes:**
J.T. Baker: 8991
Mallinckrodt: 2580

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ethylenediamine Tetraacetic Acid | 60-00-4 | 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY BE HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

**Inhalation:**
Mild irritant. Can cause sore throat and coughing.
**Ingestion:**
Substance has low toxicity by ingestion. Large amounts may cause gastrointestinal upset due to osmotic imbalance caused by its ability to sequester metal ions.
**Skin Contact:**
Can cause redness and pain.
**Eye Contact:**
Can cause redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

## 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
**Ingestion:**
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White crystals.
**Odor:**
Odorless.
**Solubility:**
0.05 g/100 ml @ 20C (68F)
**Density:**
ca. 0.9
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
240C (464F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Oxidizing agents.
**Conditions to Avoid:**

Incompatibles.

## 11. Toxicological Information

Investigated as a mutagen, reproductive effector. Oral LD50 Rat: 1658 mg/kg;
Dermal LD50 Rat: >2000 mg/kg

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ethylenediamine Tetraacetic Acid (60-00-4) | No | No | None |

## 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material is not expected to evaporate significantly. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by photolysis.
**Environmental Toxicity:**
24 Hr LC50 rainbow trout: 340 mg/L;
96 Hr LC50 bluegill sunfish:486 mg/L;
96 Hr LC50 channel catfish: 129 mg/L

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

Not regulated.

## 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ethylenediamine Tetraacetic Acid (60-00-4) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ethylenediamine Tetraacetic Acid (60-00-4) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ethylenediamine Tetraacetic Acid (60-00-4) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ethylenediamine Tetraacetic Acid (60-00-4) | 5000 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY BE HARMFUL IF SWALLOWED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid breathing dust.

Use with adequate ventilation.
Keep container closed.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.

**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes.

**Product Use:**
Laboratory Reagent.

**Revision Information:**
No Changes.

**Disclaimer:**
**********

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 320.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Eriochrome Black T

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Eriochrome Black T
Synonyms: mordant black 11, C.I. 14645
CAS#: 1787-61-7

### Section 3 — Hazards Identification

Brownish black powder or crystals. Reddish-brown liquid in solution. Odor of new rubber.
May be slightly irritating to body tissues. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Brownish black powder or crystals.
Reddish-brown liquid in solution. Odor of new rubber.
Solubility: Soluble in hot water.
Formula: C20H12N3NaO7S
Formula Weight: 461.38

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (217-250-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 326.00
**Revision Date:** March 8, 2001

### Section 1 — Chemical Product and Company Identification

## Ethyl Alcohol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ethyl Alcohol
Synonym: ethanol
CAS#: 64-17-5

### Section 3 — Hazards Identification

Clear liquid; strong alcohol odor.
Toxic by ingestion and inhalation. Body tissue irritant. Avoid all body tissue contact. Denatured with isopropanol and methanol. Not for human consumption.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-3
Flammability-3
Reactivity-1
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class IB Flammable liquid.
Flash Point: 48 F Upper: 24.5% Lower: 3.3% Autoignition Temperature: 683 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-0
F-3
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Use and dispense in a hood. Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1000 ppm (OSHA)

## Section 9 — Physical and Chemical Properties

Clear liquid; strong alcohol odor.
Solubility: Miscible with water and many organic solvents.
Formula: C2H5OH
Formula Weight: 46.07

Specific Gravity: .785
Melting Point: -130 C
Boiling Point: 78 C

## Section 10 — Stability and Reactivity

Avoid contact with oxidizing agents, peroxides, acids, acid chlorides, acid anhydrides, and alkali metals, ammonia, moisture, heat, open flame or any source of ignition.
Shelf life: Excellent, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Poison, irritant, nausea, dizziness and headache
Chronic effects: N.A.
Target organs: Eyes, liver, kidneys, nerves

ORL-RAT LD50: 7060 mg/Kg
IHL-RAT LC50: 20000 ppm/10H
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26b is one option.

## Section 14 — Transport Information

Shipping Name: Ethyl alcohol
Hazard Class: 3, Flammable liquid
UN Number: UN1170

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-578-6), RCRA code D001.

## Section 16 — Other Information

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# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 325.00
**Revision Date:** April 23, 2007

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Ethyl Acetate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Ethyl Acetate
Synonym: acetic acid ethyl ester
CAS#: 141-78-6

### SECTION 3 — HAZARDS IDENTIFICATION

Colorless, fragrant liquid.
Slightly toxic by inhalation, ingestion and skin absorption.
Avoid all body tissue contact.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-1
Flammability-3
Reactivity-0
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Class 1B Flammable liquid.
Flash Point: 26 F Upper: 11.5% (38 C) Lower: 2.2% (38 C) Autoignition Temperature: 905 F
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-3
R-0

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters and aldehydes.
Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor Can.
Moisture sensitive material. Store in a cool dry place. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 400 ppm, (OSHA)

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Colorless, fragrant liquid.
Solubility: Soluble in chloroform, alcohol and ether; only slightly in water.
Formula: CH3COOC2H5
Formula Weight: 88.12

Specific Gravity: 0.902
Melting Point: -84 C

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with oxidizers, bases, acids, moisture, heat.
Shelf life: Good, if stored safely.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Irritant, nausea, headache and vomiting
Chronic effects: Anemia
Target organs: Liver, kidneys, central nervous system, blood

ORL-RAT LD50: 5620 mg/kg
IHL-RAT LC50: 45 gm/m3/2H
SKN-RBT LD50: 720 gm/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #18a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Ethyl acetate
Hazard Class: 3, Flammable Liquid
UN Number: UN1173

N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (205-500-4), RCRA code U112.

## SECTION 16 — OTHER INFORMATION

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**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 330.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Ethylene Glycol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ethylene Glycol
Synonym: 1,2 ethanediol
CAS#: 107-21-1

### Section 3 — Hazards Identification

Colorless, viscous, liquid. Sweet, antifreeze-like odor.
Moderately toxic by ingestion and skin absorption. Skin, eye, and mucous membrane irritant. Avoid all body tissue contact. Avoid inhaling toxic fumes.
Combustible.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible liquid.
When heated to decomposition, emits acrid smoke and irritating fumes.
Flash Point: 232 F Upper: 15.3% Lower: 3.2% Autoignition Temperature: 752 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, viscous liquid.
Sweet, antifreeze-like odor.
Solubility: Water soluble.
Formula: HOCH2CH2OH
Formula Weight: 62.08

Specific Gravity: 1.1153
Melting Point: -13 C
Boiling Point: 196-198 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, strong bases, heat, open flame or any source of ignition.
Shelf life: Fair. Substance is hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, nausea, headache and vomiting
Chronic effects: Reproductive hazard
Target organs: Liver, kidneys, central nervous system

ORL-RAT LD50: 4700 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: 9530 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (203-473-3).

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 357.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Fuchsin, Basic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Fuchsin, Basic
Synonyms: Basic violet 14, rosaniline, C.I. 42510
CAS#: 632-99-5

### Section 3 — Hazards Identification

Green, lustrous powder. Odorless.
Dust may be irritating. Avoid inhalation.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
When heated to decomposition, emits toxic fumes of NOx and chlorides.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Green, lustrous powder. Odorless.
pH indicator. Soluble in water and alcohol.
C20H19N3 HCl
F.W. 337.85

Melting Point: 250 C (dec.)
pH from 1.2 red to 3.0 purple and
11.6 purple to 14.0 colorless

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritating as dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (211-189-6).

## Section 16 — Other Information

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 333.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Fast Green FCF

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Fast Green FCF
Synonym: C.I. 42053
CAS#: 2353-45-9

### Section 3 — Hazards Identification

Dark green powder or granules with metallic luster. Odorless.
Irritant to body tissues. Slightly toxic by ingestion. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of NH3 and NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Keep container tightly closed. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Dark green powder or granules with metallic luster. Odorless.
Solution is dark green with a slight vinegar-like odor.
Solubility: Soluble in water, alcohol.
Formula: C37H34O10N2S3Na2
Formula Weight: 810.91

Melting Point: 290 C (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizing agents.
Shelf life: Indefinite

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (219-091-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# MATERIAL SAFETY DATA SHEET

Revised: 15/05/08
FEHLING SOLUTION A Replaces: 10/07/07
CAROLINA BIOLOGICAL Printed: 20/05/08

## 1. PRODUCT DESCRIPTION

Product Name: Fehling Solution A
Product Code(s): 86-2271, 86-2273
Size: 120ml, 500ml
Chemical Name: Does not apply product is a mixture
CAS Number: None assigned to this mixture-See individual components
Formula: CuSO2/Water Solution
Synonyms: None known
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principle Hazardous Components: Cupric Sulfate (CAS#7758-98-7) 7%
Cupric Sulfate: ACGIH-TLV 1mg(Cu)/m3 (TWA)
OSHA-PEL 1mg (Cu)/m3 (TWA)

## 3. HAZARD IDENTIFICATION

Emergency Overview: Caution, May be harmful if swallowed.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water and induce vomiting immediately as directed by medical personnel. Immediately call a physician or poison control center. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm, quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): Non-flammable liquid.
NFPA Rating: None established
Extinguisher Media:
Use media suitable to extinguish surrounding fire.
Flammable Limits in Air % by Volume: No information available
Autoignition Temperature: No information available
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: If dry heated above 600C, SO2 is

evolved.

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Store in a cool place. Avoid contact with eyes or prolonged contact with skin. Wash thoroughly after handling.
Other Precautions: Do not take internally.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.
Ventilation:
Local Exhaust: Preferred
Mechanical(General): Acceptable
Special: No
Other: No
Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

Molecular Weight: No data available
Melting Point: Freezes Approximtely -5C (23F)
Boiling Point: Approximately 105C (221 F)
Vapor Pressure: 14 (water)
Vapor Density(Air=1): 0.7 (water)
Specific Gravity(H2O=1): Approximately 1.1
Percent Volatile by Volume: 93%
Evaporation Rate(H2O=1): Greater than 1
Solubility in Water: Complete
Appearance and Odor: Clear, blue colored, liquid; no odor.

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Excessive temperature and heat, open flame or sparks
Incompatibility(Materials to Avoid): Solution is corrosive to mild steel.
Hazardous Decomposition Products: If dry heated above 1100F (600C) sulfur dioxide (SO2) may be released.
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: To the best of our knowledge, the toxicological properties of
this mixture have not been thoroughly evaluated. Data is listed for individual components.
Effects of Overexposure:
Acute: See section 3
Chronic: Mutation data cited. Tumorigenic data cited. IARC Cancer
Review: Reproductive effects data cited; IMEMDT 16,187,78. Not listed
OSHA or NTP as causing cancer.
Conditions Aggravated by Overexposure: Preexisting conditions of the eyes,
skin and upper respiratory tract.
Target Organs: Eyes, skin, upper respiratory tract.
Primary Route(s) of Entry: Inhalation, skin contact

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal,
State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

DOT Proper Shipping Name: None (non-regulated material)

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Cupric Sulfate | No | No | No | 10 | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.
Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act

# MATERIAL SAFETY DATA SHEET



DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# MATERIAL SAFETY DATA SHEET

Revised: 16/07/04
FEHLING SOLUTION B — Replaces: 16/07/04
CAROLINA BIOLOGICAL — Printed: 20/05/08

## 1. PRODUCT DESCRIPTION

Product Name: Fehling Solution B (Alkaline)
Product Code(s): 86-2281, 86-2283
Size: 120 ml, 500 ml
Chemical Name: Does not apply
CAS Number: Not assigned to this mixture
Formula: See Section 2
Synonyms: N/A
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principle Hazardous Components: Potassium Sodium Tartrate (CAS# 6381-59-5) 34.6%
Sodium Hydroxide (CAS# 1310-73-2) 10%
TLV and PEL units: ACGIH TLV Sodium Hydroxide ceiling 2 mg/m3
OSHA-PEL Sodium Hydroxide 2 mg/m3 (TWA)

## 3. HAZARD IDENTIFICATION

Emergency Overview: Extremely hazardous to eyes.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water and induce vomiting immediately as directed by medical personnel. Immediately call a physician or poison control center. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm, quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): None
NFPA Rating: None established
Extinguisher Media:
Use media suitable to extinguish surrounding fire.
Flammable Limits in Air % by Volume: No data available
Autoignition Temperature: No data available
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: No data available

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing: Store in a tightly closed
container away from acids.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):

## 9. PHYSICAL DATA

Molecular Weight: No data available
Melting Point: No data available
Boiling Point: No data available
Vapor Pressure: No data available
Vapor Density(Air=1): No data available
Specific Gravity($H_2O$=1): No data available
Percent Volatile by Volume: No data available
Evaporation Rate($H_2O$=1): No data available
Solubility in Water: 100%
Appearance and Odor: Clear, odorless liquid

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: None known
Incompatibility(Materials to Avoid): Acids
Hazardous Decomposition Products: No information available
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: None cited
Effects of Overexposure: No data available
Acute: See section 3
Chronic: None cited
Conditions Aggravated by Overexposure: No data available
Target Organs: No data available
Primary Route(s) of Entry: No data available

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal,
State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Description: Corrosive liquids, n.o.s.(sodium hydroxide), 8, UN1760, II

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory

Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Potassium Sodium Tartrate | No | No | No | No | No |
| Sodium Hydroxide | No | No | No | 1000 | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

Glossary

ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 340.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Ferric Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ferric Nitrate
Synonym: iron (III) nitrate
CAS#: 7782-61-8

### Section 3 — Hazards Identification

Pale violet crystal. Slight nitric acid odor.
Slightly toxic by ingestion and inhalation. Irritant to body tissues. Avoid all body tissue contact.
Strong oxidizer. Dangerous fire risk.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer, contact with comubustible material may cause fire. When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Moisture sensitive material. Deliquescent, store in Flinn Chem-Saf Bag. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Pale violet crystal. Slight nitric acid odor.
Solubility: Soluble in water, alcohol, acetone.
Formula: Fe(NO3)3 9H2O
Formula Weight: 404.00

Specific Gravity: 1.7
Melting Point: 47.2 C

## Section 10 — Stability and Reactivity

Avoid contact with combustible materials.
Shelf life: Fair to poor, deliquescent, store in a Flinn Chem-Saf bag.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 3250 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Ferric nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1466

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-899-5), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 348.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Ferrous Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ferrous Sulfate
Synonym: iron (II) sulfate
CAS#: 7782-63-0

### Section 3 — Hazards Identification

Light blue or light blue-green crystals. Odorless.
Slightly toxic by ingestion. Body tissue irritant. Avoid ingestion, inhalation and skin absorption.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits non-combustible toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Air and moisture sensitive.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1 mg/m3 (ACGlH)

## Section 9 — Physical and Chemical Properties

Light blue or light blue-green crystals. Odoless.
Solubility: Soluble: water; not alcohol. Hygroscopic.
Formula: Fe(SO4) 7H2O
Formula Weight: 278.03

Specific Gravity: 1.89
Melting Point: 64 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Fair to poor; hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Irritant, Intestinal distress
Chronic effects: N.A.
Target organs: Gastrointestinal system, liver, kidneys

ORL-MUS LD50: 1520 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-753-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

MSDS Number: **F1616** * * * * * *Effective Date:* ***05/19/08*** * * * * * *Supercedes:* ***08/16/05***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# FERROUS AMMONIUM SULFATE

## 1. Product Identification

**Synonyms:** Ammonium iron (II) sulfate (2:1:2); ammonium ferrous sulfate; ferrous ammonium sulfate, hexahydrate
**CAS No.:** 10045-89-3 Anhydrous; (7783-85-9 Hexahydrate)
**Molecular Weight:** 392.13
**Chemical Formula:** Fe(NH4)2(SO4)2 6H2O
**Product Codes:**
J.T. Baker: 2054
Mallinckrodt: 5064

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ferrous Ammonium Sulfate | 10045-89-3 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**
---
**WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR INHALED.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
---
Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Green (General Storage)
---

**Potential Health Effects**
---

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. Low toxicity in small quantities but larger dosages may cause nausea, vomiting, diarrhea, and black stool. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma, and death from iron poisoning has been recorded.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard. Irritating and toxic ammonia gas may form in fires.
**Explosion:**
Not considered to be an explosion hazard. Sealed containers may rupture when heated.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. Small amounts of residue may be flushed to sewer with plenty of water. US Regulations (CERCLA)

require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

# 7. Handling and Storage

Keep in a tightly closed light-resistant container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 (TWA) soluble iron salt as Fe
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Pale blue-green crystals.
**Odor:**
Odorless.
**Solubility:**
26.9 g/100cc water @ 20C (68F)
**Specific Gravity:**
1.86
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.

**Melting Point:**
100 - 110C (212 - 230F)
**Vapor Density (Air=1):**
> 1.0
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Slowly oxidizes in moist air.
**Hazardous Decomposition Products:**
May emit ammonia, oxides of sulfur, oxides of nitrogen, and oxides of carbon.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Sulfuric acid
**Conditions to Avoid:**
Heat, light, moisture.

---

# 11. Toxicological Information

Oral rat LD50: 3250 mg/kg

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ferrous Ammonium Sulfate (10045-89-3) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

```
--------\Chemical Inventory Status - Part 1\---------------------------------
Ingredient                                    TSCA  EC   Japan  Australia
-------------------------------------------  ----  ---  -----  ---------
Ferrous Ammonium Sulfate (10045-89-3)         Yes  Yes   No       Yes

--------\Chemical Inventory Status - Part 2\---------------------------------
                                                      --Canada--
Ingredient                                    Korea  DSL   NDSL  Phil.
-------------------------------------------  -----  ---   ----  -----
Ferrous Ammonium Sulfate (10045-89-3)         Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                        -SARA 302-    ------SARA 313------
Ingredient                              RQ    TPQ     List  Chemical Catg.
--------------------------------------  ---   -----   ----  --------------
Ferrous Ammonium Sulfate (10045-89-3)   No    No      No         No

--------\Federal, State & International Regulations - Part 2\----------------
                                                    -RCRA-    -TSCA-
Ingredient                              CERCLA      261.33     8(d)
--------------------------------------  ------      ------    ------
Ferrous Ammonium Sulfate (10045-89-3)   1000        No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR INHALED.
**Label Precautions:**
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Keep container closed.
Use only with adequate ventilation.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********

**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **F1678** * * * * * *Effective Date:* ***08/20/08*** * * * * * *Supercedes:* ***11/10/05***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Ferrous Chloride, 4-Hydrate

## 1. Product Identification

**Synonyms:** Iron (II) Chloride, Tetrahydrate; Iron Chloride, Tetrahydrate
**CAS No.:** 7758-94-3 (Anhydrous) 13478-10-9 (Tetrahydrate)
**Molecular Weight:** 198.81
**Chemical Formula:** FeCl2.4H2O
**Product Codes:** 2064

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ferrous Chloride | 7758-94-3 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

---

**DANGER! CORROSIVE. CAUSES SEVERE IRRITATION OR BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. AFFECTS THE LIVER.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

---

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

---

**Potential Health Effects**

---

**Inhalation:**
Corrosive. Extremely destructive to tissues of the mucous membranes and upper respiratory tract. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting.
**Ingestion:**
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach. Can cause sore throat, vomiting, diarrhea. Low systemic toxicity in small quantities but larger doses may cause systemic effects. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma and death may follow, sometimes delayed as long as three days.
**Skin Contact:**
Corrosive. May cause severe irritation, redness, pain, and skin burns.
**Eye Contact:**
Corrosive. Contact causes severe irritation, burns, redness, and pain.
**Chronic Exposure:**
Repeated ingestion may cause liver damage. Prolonged exposure of the eyes may cause discoloration.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard. Irritating hydrogen chloride fumes may form in fire.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire. Use water carefully as material will react with water to form acidic solution.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable

container for reclamation or disposal, using a method that does not generate dust. Material dissolves in water to form an acidic solution. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Material dissolves in water to form an acidic solution. Isolate from incompatible substances. Containers of this material are hazardous when empty since they retain product residues; observe all warnings for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-ACGIH Threshold Limit Value (TLV):
1 mg/m3 (TWA) soluble iron salt as Fe
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece particulate respirator (NIOSH type N100 filters) may be worn for up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids. glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Light green crystals.
**Odor:**
Odorless.
**Solubility:**
Appreciable (> 10%)
**Specific Gravity:**
1.93
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
1023C (1873F) (anhydrous)
**Melting Point:**

110C (230F) Loses two waters.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
10 @ 700C (1292F)
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
May produce hydrogen chloride. Material dissolves in water to form an acidic solution.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Ethylene oxide, potassium, sodium.
**Conditions to Avoid:**
Incompatibles.

---

# 11. Toxicological Information

Anhydrous: Oral rat LD50: 450 mg/kg. Investigated as a mutagen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ferrous Chloride (7758-94-3) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

**Domestic (Land, D.O.T.)**
---

**Proper Shipping Name:** FERROUS CHLORIDE, SOLID
**Hazard Class:** 8
**UN/NA:** NA1759
Packing Group: II
**Information reported for product/size:** 2.5KG

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (FERROUS CHLORIDE)
**Hazard Class:** 8
**UN/NA:** UN3260
Packing Group: II
**Information reported for product/size:** 2.5KG

**International (Air, I.C.A.O.)**
---
**Proper Shipping Name:** CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (FERROUS CHLORIDE)
**Hazard Class:** 8
**UN/NA:** UN3260
Packing Group: II
**Information reported for product/size:** 2.5KG

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ferrous Chloride (7758-94-3) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Ferrous Chloride (7758-94-3) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ferrous Chloride (7758-94-3) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ferrous Chloride (7758-94-3) | 100 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0**

**Label Hazard Warning:**

DANGER! CORROSIVE. CAUSES SEVERE IRRITATION OR BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. AFFECTS THE LIVER.

**Label Precautions:**

Do not get in eyes, on skin, or on clothing.
Do not breathe dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

**Label First Aid:**

In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

**********



**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 348.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Ferrous Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ferrous Sulfate
Synonym: iron (II) sulfate
CAS#: 7782-63-0

### Section 3 — Hazards Identification

Light blue or light blue-green crystals. Odorless.
Slightly toxic by ingestion. Body tissue irritant. Avoid ingestion, inhalation and skin absorption.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits non-combustible toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Air and moisture sensitive.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1 mg/m3 (ACGlH)

## Section 9 — Physical and Chemical Properties

Light blue or light blue-green crystals. Odoless.
Solubility: Soluble: water; not alcohol. Hygroscopic.
Formula: Fe(SO4) 7H2O
Formula Weight: 278.03

Specific Gravity: 1.89
Melting Point: 64 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Fair to poor; hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Irritant, Intestinal distress
Chronic effects: N.A.
Target organs: Gastrointestinal system, liver, kidneys

ORL-MUS LD50: 1520 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-753-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

MSDS Number: **F6552** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***01/16/06***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# FRUCTOSE

## 1. Product Identification

**Synonyms:** D-fructopyranose; levulose, fruit sugar; d-(-)-fructose
**CAS No.:** 57-48-7
**Molecular Weight:** 180.16
**Chemical Formula:** OCH2(CHOH)3COHCH2OH
**Product Codes:**
J.T. Baker: M556
Mallinckrodt: 7756

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Fructose | 57-48-7 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

---

**Potential Health Effects**
---

**Inhalation:**
No adverse health effects expected from inhalation.
**Ingestion:**
Extremely large oral dosages may produce gastrointestinal disturbances.
**Skin Contact:**
Not expected to be a health hazard from skin exposure.
**Eye Contact:**
No adverse effects expected but dust may cause mechanical irritation.
**Chronic Exposure:**
No adverse health effects expected.
**Aggravation of Pre-existing Conditions:**
No adverse health effects expected.

---

# 4. First Aid Measures

**Inhalation:**
Not expected to require first aid measures.
**Ingestion:**
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Not expected to require first aid measures.
**Eye Contact:**
Wash thoroughly with running water. Get medical advice if irritation develops.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain

product residues (dust, solids); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
White crystals.
**Odor:**
Odorless.
**Solubility:**
Very soluble in water.
**Density:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
103 - 105C (217 - 221F) Decomposes.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**

Strong, oxidizing agents.
**Conditions to Avoid:**
Incompatibles.

---

# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Fructose (57-48-7) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Fructose (57-48-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Fructose (57-48-7) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Fructose (57-48-7) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Fructose (57-48-7) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 356.00
**Revision Date:** May 5, 2008

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Fuchsin Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Fuchsin Acid
Synonym: Acid Fuchsin; C.I. 42685; Acid Magenta; Acid Violet 19
CAS#: 3244-88-0

### SECTION 3 — HAZARDS IDENTIFICATION

Dark green powder. Odorless.
Irritant. Avoid body contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non-flammable solid.
When heated to decomposition, emits toxic fumes of NOx and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-0
R-0

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Avoid generating dusty conditions. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Dark green powder. Odorless.
Solubility: Soluble in alcohol and water.
Formula: C20H17N3Na2O9S3
Formula Weight: 585.55

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (221-816-5).

## SECTION 16 — OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**



| | |
|---|---|
| Health | 2 |
| Fire | 0 |
| Reactivity | 0 |
| Personal Protection | E |

# Material Safety Data Sheet
## Fuller's Earth MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Fuller's Earth

**Catalog Codes:** SLF1474

**CAS#:** 8031-18-3

**RTECS:** Not available.

**TSCA:** TSCA 8(b) inventory: Fuller's earth

**CI#:** Not available.

**Synonym:**

**Chemical Name:** Not available.

**Chemical Formula:** Not available.

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Fuller's earth | 8031-18-3 | 100 |

**Toxicological Data on Ingredients:** Fuller's earth LD50: Not available. LC50: Not available.

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

**Potential Chronic Health Effects:**
Hazardous in case of eye contact (irritant), of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant).
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.

## Section 4: First Aid Measures

**Eye Contact:** Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

**Serious Skin Contact:** Not available.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:**
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

## Section 7: Handling and Storage

**Precautions:**
Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation,

wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible.

**Storage:**
No specific storage is required. Use shelves or cabinets sturdy enough to bear the weight of the chemicals. Be sure that it is not necessary to strain to reach materials, and that shelves are not overloaded.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:**
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:** Not available.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** Not available.

**Color:** Not available.

**pH (1% soln/water):** Not available.

**Boiling Point:** Not available.

**Melting Point:** Decomposes.

**Critical Temperature:** Not available.

**Specific Gravity:** Not available.

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Not available.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
LD50: Not available.
LC50: Not available.

**Chronic Effects on Humans:** Not available.

**Other Toxic Effects on Humans:**
Hazardous in case of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are as toxic as the original product.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## Section 15: Other Regulatory Information

**Federal and State Regulations:** TSCA 8(b) inventory: Fuller's earth

**Other Regulations:** Not available..

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):** R36- Irritating to eyes.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent.
Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:35 PM

**Last Updated:** 11/06/2008 12:00 PM

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 361.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## d(+)Galactose

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

d(+) Galactose

CAS#: 59-23-4

### Section 3 — Hazards Identification

White, powder. Malt-like odor.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White powder. Malt-like odor.
Solubility: Soluble in hot water and pyridine.
Formula: C6H12O6
Formula Weight: 180.16

Specific Gravity: 1.5
Melting Point: 165-168 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-416-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 363.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Gelatin

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Gelatin

CAS#: 9000-70-8

### Section 3 — Hazards Identification

Light amber granules. Faint, sour, animal-like odor.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Granular, light amber color.
Faint, sour, animal-like odor.
Solubility: Soluble in water. Insoluble in most organic solvents.

## Section 10 — Stability and Reactivity

Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Shelf Life:

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

**FLINN SCIENTIFIC INC.**
**"Your Safer Source for Science Supplies"**

***Improve Safety--Use Flinn Chemicals***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **G1580** * * * * * *Effective Date:* ***02/01/07*** * * * * * *Supercedes:* ***06/18/04***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# GENTIAN VIOLET

## 1. Product Identification

**Synonyms:** Crystal violet; CI Basic Violet 3
**CAS No.:** 548-62-9
**Molecular Weight:** 407.99
**Chemical Formula:** C25H30ClN3
**Product Codes:** E518

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Hexamethyl-p-rosaniline Chloride | 548-62-9 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED. MAY BE HARMFUL IF INHALED. CAUSES SEVERE EYE IRRITATION. MAY CAUSE IRRITATION TO SKIN AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**
---

**Inhalation:**
Inhalation of dust may irritate the mucous membranes of the upper respiratory tract.
**Ingestion:**
Toxic. Results in symptoms of nausea, vomiting, diarrhea, and abdominal pain. Severe systemic poisonings have not been reported in man, but animal studies have shown blood pressure rise and death from respiratory paralysis. Estimated lethal human dose: 1 tsp - 1 oz.
**Skin Contact:**
May cause irritation. Can stain area of contacted skin.
**Eye Contact:**
Causes severe irritation. Contact may cause permanent eye damage.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

**Note to Physician:**
Monitor for possible nitrite intoxication.

---

# 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable

container for reclamation or disposal, using a method that does not generate dust.

## 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Dark green powder or greenish glistening pieces having a metallic luster.
**Odor:**
Slight characteristic odor.
**Solubility:**
Soluble in water.
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
215C (419F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
When heated to decomposition it emits toxic fumes of nitrogen oxides and hydrogen chloride.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
Incompatibles.

---

# 11. Toxicological Information

Oral rat LD50: 420 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\------------------------------------------------------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Hexamethyl-p-rosaniline Chloride (548-62-9) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Hexamethyl-p-rosaniline Chloride (548-62-9) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|

| Hexamethyl-p-rosaniline Chloride (548-62-9) | Yes | Yes | No | Yes |
|---|---|---|---|---|

\Federal, State & International Regulations - Part 1\

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Hexamethyl-p-rosaniline Chloride (548-62-9) | No | No | No | No |

\Federal, State & International Regulations - Part 2\

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Hexamethyl-p-rosaniline Chloride (548-62-9) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED. MAY BE HARMFUL IF INHALED. CAUSES SEVERE EYE IRRITATION. MAY CAUSE IRRITATION TO SKIN AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid breathing dust.
Store in a tightly closed container.
Use with adequate ventilation.
Wash thoroughly after handling.
Do not get in eyes.
Avoid contact with skin and clothing.
**Label First Aid:**
In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **G1902** * * * * * *Effective Date:* ***02/09/09*** * * * * * *Supercedes:* ***04/10/06***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# GIEMSA STAIN

## 1. Product Identification

**Synonyms:** Giemsa stain certified; Giemsa's Stain
**CAS No.:** 51811-82-6
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** No information found.
**Product Codes:**
J.T. Baker: M702
Mallinckrodt: E060

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Giemsa Stain | 51811-82-6 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

---

**Potential Health Effects**
---

Information on the human health effects from exposure to this substance is limited.

**Inhalation:**
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
**Ingestion:**
Large oral doses may cause irritation to the gastrointestinal tract.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**
Purple-black crystals.
**Odor:**
No information found.
**Solubility:**
No information found.
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
No information found.
**Boiling Point:**
No information found.
**Melting Point:**
300C (572F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
No information found.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
No information found.
**Conditions to Avoid:**
No information found.

---

# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Giemsa Stain (51811-82-6) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Giemsa Stain (51811-82-6) | Yes | Yes | No | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Giemsa Stain (51811-82-6) | No | Yes | No | No |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Giemsa Stain (51811-82-6) | No | No | No | No |

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Giemsa Stain (51811-82-6) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.
**Label First Aid:**
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **D0835** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***02/16/06***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# DEXTROSE , ANHYDROUS

## 1. Product Identification

**Synonyms:** D-glucose, anhydrous; dextrosol; dextrose U.S.P. anhydrous; corn sugar; grape sugar
**CAS No.:** 50-99-7
**Molecular Weight:** 180.16
**Chemical Formula:** C6H12O6
**Product Codes:**
J.T. Baker: 1916, 1919, 1920, 4893
Mallinckrodt: 4908, 4912, 4915, 7730

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Dextrose Anhydrous | 50-99-7 | 90 - 100% | No |

## 3. Hazards Identification

**Emergency Overview**
---
**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
---
Health Rating: 0 - None
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 0 - None
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

---

**Potential Health Effects**
---

**Inhalation:**
Not expected to be a health hazard.
**Ingestion:**
Extremely large oral dosages may produce gastrointestinal disturbances.
**Skin Contact:**
No adverse effects expected.
**Eye Contact:**
No adverse effects expected but dust may cause mechanical irritation.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Not expected to require first aid measures.
**Ingestion:**
Not expected to require first aid measures.
**Skin Contact:**
Not expected to require first aid measures.
**Eye Contact:**
Wash thoroughly with running water. Get medical advice if irritation develops.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
This material in sufficient quantity and reduced particle size is capable of creating a dust explosion
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Wear full protective clothing and breathing equipment for high-intensity fire or potential explosion conditions.

---

# 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Colorless crystals or white crystalline powder.
**Odor:**
Odorless.
**Solubility:**
1 g/1.1 ml water @ 25C (77F).
**Density:**
1.54 @ 25C/4C
**pH:**
5.9 For 0.5 M aqueous solution
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
146C (295F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**

Will not occur.
**Incompatibilities:**
Reacts with sodium nitrite plus potassium nitrite, sodium peroxide plus potassium nitrate.
**Conditions to Avoid:**
Moisture and incompatibles.

---

# 11. Toxicological Information

Oral rat LD50: 25800 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Dextrose Anhydrous (50-99-7) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Dextrose Anhydrous (50-99-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Dextrose Anhydrous (50-99-7) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Dextrose Anhydrous (50-99-7) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

-RCRA- -TSCA-

| Ingredient | CERCLA | 261.33 | 8(d) |
|---|---|---|---|
| Dextrose Anhydrous (50-99-7) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********

**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **G4774** * * * * * *Effective Date:* ***02/15/08*** * * * * * *Supercedes:* ***05/25/05***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# GLYCEROL

## 1. Product Identification

**Synonyms:** 1,2,3-propanetriol; glycerin; glycol alcohol; glycerol, anhydrous
**CAS No.:** 56-81-5
**Molecular Weight:** 92.10
**Chemical Formula:** C3H5(OH)3
**Product Codes:**
J.T. Baker: 2135, 2136, 2140, 2142, 2143, 2988, 4043, 5093, M778
Mallinckrodt: 0564, 5092, 5093, 5100

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Glycerin | 56-81-5 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**
---
**CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY AFFECT KIDNEYS.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
---
Health Rating: 2 - Moderate (Life)
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

---

**Potential Health Effects**
---

**Inhalation:**
Due to the low vapor pressure, inhalation of the vapors at room temperatures is unlikely. Inhalation of mist may cause irritation of respiratory tract.
**Ingestion:**
Low toxicity. May cause nausea, headache, diarrhea.
**Skin Contact:**
May cause irritation.
**Eye Contact:**
May cause irritation.
**Chronic Exposure:**
May cause kidney injury.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

---

# 5. Fire Fighting Measures

**Fire:**
Flash point: 199C (390F) CC
Autoignition temperature: 370C (698F)
Slight fire hazard when exposed to heat or flame. Slight fire hazard when exposed to heat or flame.
**Explosion:**
Above flash point, vapor-air mixtures may cause flash fire.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire. Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such

as saw dust. Do not flush to sewer!

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
For Glycerin Mist:
- OSHA Permissible Exposure Limit (PEL):
Total Dust: 15 mg/m3 (TWA);
Respirable Fraction: 5 mg/m3(TWA).
- ACGIH Threshold Limit Value (TLV):
10 mg/m3
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type P95 or R95 filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type P100 or R100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. Please note that N filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear oily liquid.
**Odor:**
Odorless.
**Solubility:**
Miscible in water.
**Specific Gravity:**
1.26 @ 20C/4C
**pH:**
(neutral to litmus)
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
290C (554F)

**Melting Point:**
18C (64F)
**Vapor Density (Air=1):**
3.17
**Vapor Pressure (mm Hg):**
0.0025 @ 50C (122F)
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Toxic gases and vapors may be released if involved in a fire. Glycerin decomposes upon heating above 290C, forming corrosive gas (acrolein).
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers. Can react violently with acetic anhydride, calcium oxychloride, chromium oxides and alkali metal hydrides.
**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.

---

# 11. Toxicological Information

Oral rat LD50: 12,600 mg/kg. Investigated as a mutagen, reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Glycerin (56-81-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material is expected to readily biodegrade. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.
**Environmental Toxicity:**
This material is not expected to be toxic to aquatic life.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Glycerin (56-81-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Glycerin (56-81-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Glycerin (56-81-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Glycerin (56-81-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. MAY AFFECT KIDNEYS.
**Label Precautions:**
Avoid breathing mist.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.
**Product Use:**
Laboratory Reagent.

**Revision Information:**
No Changes.
**Disclaimer:**
**********

**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 412.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Iodine Solution, Gram

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Iodine (7553-56-2) <1%, Potassium Iodide (7681-11-0) <1%, and Water (7732-18-5) >99%.

CAS#: None Established

### Section 3 — Hazards Identification

Deep brown-colored liquid. Iodine odor.
May be skin irritant.
Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible liquid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store away from heat and direct light.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Deep brown-colored liquid. Iodine odor.

## Section 10 — Stability and Reactivity

Shelf Life: Fair to poor.

## Section 11 — Toxicological Information

Acute effects: Irritant, stomach cramps
Chronic effects: N.A.
Target organs: Thyroid

ORL-HUM LD50: 2-4 gm as iodine
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**"Your Safer Source for Science Supplies"**

***Flinn Is No. 1 in Safety***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# Material Safety Data Sheet
## Gram Safranin

ACC# 89197

## Section 1 - Chemical Product and Company Identification

**MSDS Name:** Gram Safranin
**Catalog Numbers:** 66760B
**Synonyms:** Mixture
**Company Identification:**

Fisher Diagnostics
Fisher Scientific Company, LLC
8365 Valley Pike
Middletown, VA 22645-0307

**For information, call:** 800-524-0294
**Emergency Number:** 800-524-0294
**For CHEMTREC assistance, call:** 800-424-9300
**For International CHEMTREC assistance, call:** 703-527-3887

## Section 2 - Composition, Information on Ingredients

| CAS# | Chemical Name | Percent | EINECS/ELINCS |
|---|---|---|---|
| 7732-18-5 | Deionized Water | 79.3 | 231-791-2 |
| 64-17-5 | Ethyl Alcohol | 19 | 200-578-6 |
| 67-56-1 | Methyl Alcohol | 1 | 200-659-6 |
| 477-73-6 | Safranin | <0.7 | 207-518-8 |

## Section 3 - Hazards Identification

### EMERGENCY OVERVIEW

Appearance: red liquid. Flash Point: 82 deg F.
**Caution!** May cause severe eye irritation and possible injury. May be absorbed through intact skin. **Combustible liquid and vapor.** May cause respiratory tract irritation. May cause skin irritation. May cause central nervous system depression. May cause liver and kidney damage. May cause blindness if swallowed. May cause fetal effects based upon animal studies.
**Target Organs:** Kidneys, central nervous system, liver, eyes.

### Potential Health Effects

**Eye:** Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. Vapors may cause eye irritation. May cause painful sensitization to light.
**Skin:** May cause skin irritation. May be absorbed through the skin in harmful amounts.
**Ingestion:** May cause kidney damage. May cause systemic toxicity with acidosis. May cause liver and kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause blindness if swallowed.
**Inhalation:** Harmful if inhaled. May cause respiratory tract irritation. May cause liver and kidney damage. May cause narcotic effects in high concentration. May cause drowsiness, unconsciousness, and

central nervous system depression.
**Chronic:** Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation may cause effects similar to those of acute inhalation.

## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid imme diately.
**Skin:** Get medical aid. Rinse area with large amounts of water for at least 15 minutes.
**Ingestion:** Call a poison control center. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical aid.
**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Combustible liquid. Containers may explode when heated.
**Extinguishing Media:** Use water spray to cool fire-exposed containers. Use water spray, dry chemical, carbon dioxide, or chemical foam. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.
**Flash Point:** 82e deg F ( 27.78 deg C)
**Autoignition Temperature:** Not available.
**Explosion Limits, Lower:**3.3
**Upper:** 19
**NFPA Rating:** (estimated) Health: 1; Flammability: 2; Instability: 0

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.
**Spills/Leaks:** Sweep up, then place into a suitable container for disposal. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as sawdust. Provide ventilation.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
**Storage:** Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

**Exposure Limits**

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---|---|---|---|
| Deionized Water | none listed | none listed | none listed |
| Ethyl Alcohol | 1000 ppm TWA | 1000 ppm TWA; 1900 mg/m3 TWA 3300 ppm IDLH | 1000 ppm TWA; 1900 mg/m3 TWA |
| Methyl Alcohol | 200 ppm TWA; 250 ppm STEL; skin - potential for cutaneous absorption | 200 ppm TWA; 260 mg/m3 TWA 6000 ppm IDLH | 200 ppm TWA; 260 mg/m3 TWA |
| Safranin | none listed | none listed | none listed |

**OSHA Vacated PELs:** Deionized Water: No OSHA Vacated PELs are listed for this chemical. Ethyl Alcohol: 1000 ppm TWA; 1900 mg/m3 TWA Methyl Alcohol: 200 ppm TWA; 260 mg/m3 TWA Safranin: No OSHA Vacated PELs are listed for this chemical.

**Personal Protective Equipment**

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid
**Appearance:** red
**Odor:** pungent odor
**pH:** Not available.
**Vapor Pressure:** 40 mm Hg @19C
**Vapor Density:** 1.59
**Evaporation Rate:**Not available.
**Viscosity:** Not available.
**Boiling Point:** 95 deg C
**Freezing/Melting Point:**Not available.
**Decomposition Temperature:**Not available.
**Solubility:** Soluble in water.
**Specific Gravity/Density:**1
**Molecular Formula:**Not available.
**Molecular Weight:**Not available.

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** Incompatible materials, ignition sources, excess heat.

**Incompatibilities with Other Materials:** Ethanol is incompatible with acetic anhydride, acetyl bromide, ammonia + silver nitrate, disulfuric acid + nitric acid, dichloromethane + sulfuric acid,

disulfuryl difluoride, magnesium perchlorate, nitric acid + silver, oxidants, phosphorus (III) oxide, platinum, potassium, potassium tert-butoxide, silver nitrate, silver oxide, sodium and tetrachlorosilane. Methanol is incompatible with acetyl bromide, alkylaluminum solutions, beryllium hydride, carbon tetrachloride + metals, chloroform + sodium, chloroform + sodium hydroxide, cyanuric chloride, dichloromethane, diethylzinc, metals, oxidants, phosphorus (III) oxide, and potassium tert-butoxide.
**Hazardous Decomposition Products:** Hydrogen chloride, carbon monoxide, oxides of nitrogen, carbon dioxide, formaldehyde.
**Hazardous Polymerization:** Will not occur.

## Section 11 - Toxicological Information

**RTECS#:**
**CAS#** 7732-18-5: ZC0110000
**CAS#** 64-17-5: KQ6300000
**CAS#** 67-56-1: PC1400000
**CAS#** 477-73-6: SG1623000
**LD50/LC50:**
CAS# 7732-18-5:
Oral, rat: LD50 = >90 mL/kg;

CAS# 64-17-5:
Draize test, rabbit, eye: 500 mg Severe;
Draize test, rabbit, eye: 500 mg/24H Mild;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, mouse: LC50 = 39 gm/m3/4H;
Inhalation, rat: LC50 = 20000 ppm/10H;
Oral, mouse: LD50 = 3450 mg/kg;
Oral, rabbit: LD50 = 6300 mg/kg;
Oral, rat: LD50 = 7060 mg/kg;
Oral, rat: LD50 = 9000 mg/kg;

CAS# 67-56-1:
Draize test, rabbit, eye: 40 mg Moderate;
Draize test, rabbit, eye: 100 mg/24H Moderate;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, rabbit: LC50 = 81000 mg/m3/14H;
Inhalation, rat: LC50 = 64000 ppm/4H;
Oral, mouse: LD50 = 7300 mg/kg;
Oral, rabbit: LD50 = 14200 mg/kg;
Oral, rat: LD50 = 5600 mg/kg;
Skin, rabbit: LD50 = 15800 mg/kg;

CAS# 477-73-6:

**Carcinogenicity:**
CAS# 7732-18-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 64-17-5: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 67-56-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.
CAS# 477-73-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** This product contains methanol and ethanol which have been s hown to produce fetoxicity in the embryo or fetus. Specifi c abnormalities for methanol include the cardiovascular, mus culoskeletal and urogenital systems.
**Teratogenicity:** No data available.
**Reproductive Effects:** Methanol has been shown to produce reproductive effects in laboratory

animals. Prenatal exposure to ethanol is associated with a distinct pattern of congenital malformations that have been collectively termed the "fetal alcohol syndrome". Among the characteristics of this syndrome are intrauterine and postnatal growth deficiency, a distinctive pattern of physical malformation, and behavioral/cognitive impairment such as fine motor dysfunction and mental retardation. Not all affected children have all of the features of the syndrome.
**Neurotoxicity:** No data available.
**Mutagenicity:** Methanol has been shown to produce DNA damage in laboratory animals.
**Other Studies:** No data available.

## Section 12 - Ecological Information

No information available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
**RCRA P-Series:** None listed.
**RCRA U-Series:** CAS# 67-56-1: waste number U154 (Ignitable waste).

## Section 14 - Transport Information

| | US DOT | Canada TDG |
|---|---|---|
| **Shipping Name:** | No information available. | No information available. |
| **Hazard Class:** | | |
| **UN Number:** | | |
| **Packing Group:** | | |

## Section 15 - Regulatory Information

### US FEDERAL

**TSCA**
CAS# 7732-18-5 is listed on the TSCA inventory.
CAS# 64-17-5 is listed on the TSCA inventory.
CAS# 67-56-1 is listed on the TSCA inventory.
CAS# 477-73-6 is listed on the TSCA inventory.
**Health & Safety Reporting List**
None of the chemicals are on the Health & Safety Reporting List.
**Chemical Test Rules**
None of the chemicals in this product are under a Chemical Test Rule.
**Section 12b**
None of the chemicals are listed under TSCA Section 12b.
**TSCA Significant New Use Rule**
None of the chemicals in this material have a SNUR under TSCA.
**SARA**

**CERCLA Hazardous Substances and corresponding RQs**
CAS# 67-56-1: 5000 lb final RQ; 2270 kg final RQ

**SARA Section 302 Extremely Hazardous Substances**
None of the chemicals in this product have a TPQ.
**SARA Codes**
CAS # 64-17-5: acute, chronic, flammable. CAS # 67-56-1: acute, flammable. CAS # 477-73-6: acute, reactive.
**Section 313**
This chemical is not at a high enough concentration to be reportable under Section 313. No chemicals are reportable under Section 313.
**Clean Air Act:**
CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
**Clean Water Act:**
None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
**OSHA:**
None of the chemicals in this product are considered highly hazardous by OSHA.
**STATE**
CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 477-73-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.
WARNING: This product contains Ethyl Alcohol, a chemical known to the state of California to cause developmental reproductive toxicity.
California No Significant Risk Level: None of the chemicals in this product are listed.

## European/International Regulations

**European Labeling in Accordance with EC Directives**
**Hazard Symbols:**
Not available.
**Risk Phrases:**

**Safety Phrases:**

**WGK (Water Danger/Protection)**
CAS# 7732-18-5: No information available.
CAS# 64-17-5: 0
CAS# 67-56-1: 1
CAS# 477-73-6: No information available.
**Canada - DSL/NDSL**
CAS# 7732-18-5 is listed on Canada's DSL List.
CAS# 64-17-5 is listed on Canada's DSL List.
CAS# 67-56-1 is listed on Canada's DSL List.
CAS# 477-73-6 is listed on Canada's DSL List.
**Canada - WHMIS**
This product has a WHMIS classification of B3, D2A.
**Canadian Ingredient Disclosure List**
CAS# 64-17-5 is listed on the Canadian Ingredient Disclosure List.
CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

## Section 16 - Additional Information

**MSDS Creation Date:** 8/04/1998
**Revision #6 Date:** 12/03/2002

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 376.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Graphite

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Graphite
Synonyms: carbon, black lead, plumbago
CAS#: 7782-42-5

### Section 3 — Hazards Identification

Steel gray to black, greasy feeling, odorless solid.
Dust is mildly irritating to lungs. Avoid inhalation.
Combustible solid. Powder is a fire risk.

**FLINN AT-A-GLANCE**
Health-1
Flammability-2
Reactivity-0
Exposure-1
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Finely divided powder is a fire and explosion risk.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Store in a Flinn Saf-Stor Can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2.5 mg/m3 (NIOSH)

## Section 9 — Physical and Chemical Properties

Steel gray to black, greasy feeling. Odorless solid.
Solubility: Generally insoluble.
Formula: C
Formula Weight: 12.011

Specific Gravity: 2.0-2.25

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, halogens, and potassium superoxide.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritating dust
Chronic effects: N.A.
Target organs: Respiratory system, cardiovascular system

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-955-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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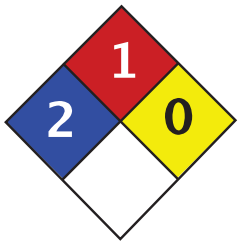


| | |
|---|---|
| Health | 2 |
| Fire | 1 |
| Reactivity | 1 |
| Personal Protection | E |

# Material Safety Data Sheet
## Rosin (Gum) MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Rosin (Gum)

**Catalog Codes:** SLR1003

**CAS#:** 8050-09-7

**RTECS:** VL04800000

**TSCA:** TSCA 8(b) inventory: Rosin (Gum)

**CI#:** Not available.

**Synonym:** Gum Rosin; colophony

**Chemical Name:** Not available.

**Chemical Formula:** Not available.

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Rosin (Gum) | 8050-09-7 | 100 |

**Toxicological Data on Ingredients:** Rosin (Gum) LD50: Not available. LC50: Not available.

## Section 3: Hazards Identification

**Potential Acute Health Effects:**
Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation.

**Potential Chronic Health Effects:**
Slightly hazardous in case of skin contact (sensitizer).
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to lungs, skin.
Repeated or prolonged exposure to the substance can produce target organs damage.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** Not available.

**Flash Points:** CLOSED CUP: 187°C (368.6°F). OPEN CUP: 205°C (401°F).

**Flammable Limits:** Not available.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:**
Slightly flammable to flammable in presence of heat.
Non-flammable in presence of shocks.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available.
Slightly explosive in presence of open flames and sparks.

**Fire Fighting Media and Instructions:**
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:**
Thermal decomposition products include formaldehyde, acetone, methanol, aldehydes, carbon dioxide, carbon monoxide, methane, ethane, and acids.

**Special Remarks on Explosion Hazards:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

## Section 6: Accidental Release Measures

**Small Spill:**
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:** Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
Rosin Core Solder Pyroloysis Products:
TWA: 0.1 (mg/m3) (as formaldehyde) from ACGIH (TLV) [United States]
Gum Rosin (solid):
TWA: 10 (mg/m3)
Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** Not available.

**Color:** Yellow. (Light.)

**pH (1% soln/water):** Not applicable.

**Boiling Point:** Not available.

**Melting Point:** 70°C (158°F) - 78 C.

**Critical Temperature:** Not available.

**Specific Gravity:** 1.06 - 1.08 @ 25 deg. C (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:**
Soluble in diethyl ether.
Insoluble in cold water, hot water.
Soluble in alcohol, oils, benzene, carbon tetrachloride, glacial acetic acid, aliphatic, aromatic, and chlorinated hydrocarbons.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Excess heat

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Inhalation. Ingestion.

**Toxicity to Animals:**
LD50: Not available.
LC50: Not available.

**Chronic Effects on Humans:** May cause damage to the following organs: lungs, skin.

**Other Toxic Effects on Humans:**
Hazardous in case of of ingestion.
Slightly hazardous in case of skin contact (irritant), of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects:
Rosin has two types of hazards - from the rosin itself, and from the thermal decomposition products. The thermal decomposition products (aka Rosin Core Solder Pyrolysis Products) include formaldehyde, acetone, methanol, aldehydes, carbon dioxide, carbon monoxide, methane, ethane, and acids.
The handling of the rosin in the solid state is expected to be a low hazard. It may cause skin, eyes, and respiratory tract irritation. Ingestion may cause digestion tract irritation. The thermal decomposition products of Rosin (Rosin core solder pyrolysis products) can be irritating to the eyes, nose, throat in acute exposure.
Chronic Potential Health Effects:
Skin: Repeated or prolonged skin contact with the rosin itself can cause contact dermatitis, an allergic reaction. It can also cause eczema.
Inhalation: Repeated or prolonged inhalation of the rosin dust or smoke can cause asthma, an allergic reaction. Rosin core solder pyrolysis products can be sensitizing, and exposures should be reduced to as low as possible

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** Not available.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Minnesota: Rosin (Gum)
TSCA 8(b) inventory: Rosin (Gum)

**Other Regulations:**
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**

R43- May cause sensitization by skin contact.
S24- Avoid contact with skin.
S37- Wear suitable gloves.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 1

**Reactivity:** 1

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 1

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 06:22 PM

**Last Updated:** 11/06/2008 12:00 PM

# MATERIAL SAFETY DATA SHEET

Revised: 05/15/08
GUM ARABIC Replaces: 01/10/08
CAROLINA BIOLOGICAL Printed: 05/20/08

## 1. PRODUCT DESCRIPTION

Product Name: Gum Arabic
Product Code(s): 86-6108, 86-6110
Size: 100 g, 500 g
Chemical Name: Acacia Powder
CAS Number: See section 2
Formula: Composition varies
Synonyms: Gum Arabic
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principle Components: Gum Arabic (9000-01-5) 100%
TLV and PEL units: None established

## 3. HAZARD IDENTIFICATION

Emergency Overview: May cause allergic reaction. May be irritating to skin, eyes and mucus membranes.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush thoroughly with water. Seek medical attention if irritation persists.
Skin - Wash exposed area with soap and water. Seek medical attention if irritation persists.
Ingestion - In quantities normally handled, symptoms would not be expected. If swallowed, if conscious, give water. Seek medical attention if gastrointestinal irritation or other unexpected symptoms develop.
Inhalation - Not expected to present a problem. However, if the exposed person is having trouble breathing, remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm and quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): N/A
NFPA Rating (est): Health: 0
Fire: 0
Reactivity: 0
Extinguisher Media:
Use dry chemical, $CO_2$ or appropriate foam.
Flammable Limits in Air % by Volume: N/A
Autoignition Temperature: N/A
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: None

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Clean-up personnel should wear proper protective equipment. Avoid creating dust. Sweep or scoop up and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Keep container closed. Store at controlled room temperature.
Other Precautions: Do not breathe dust. Do not get in eyes, on skin, or on clothing.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
None needed under normal conditions of use with adequate ventilation. NIOSH approved equipment should be worn if PELs are exceeded.
Ventilation:
Local Exhaust: Yes
Mechanical(General): Yes
Special: No
Other: No
Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | N/A |
| Melting Point: | N/A |
| Boiling Point: | N/A |
| Vapor Pressure: | N/A |
| Vapor Density(Air=1): | N/A |
| Specific Gravity(H2O=1): | N/A |
| Percent Volatile by Volume: | N/A |
| Evaporation Rate(H2O=1): | N/A |
| Solubility in Water: | Readily soluble |
| Appearance and Odor: | White powder or granules, practically odorless |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Extreme heat
Incompatibility(Materials to Avoid): Ferric salts, borax, basic lead acetate, alcohol, sodium silicate, gelatin.
Hazardous Decomposition Products: COx
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: Oral Rat LD50: >16g/kg
Effects of Overexposure:
Acute: See section 3
Chronic: None found.
Conditions Aggravated by Overexposure: Contact may cause dermatitis.

Dust inhalation may cause hives, eczema, coughing, asthma, wheezing.
Target Organs: Respiratory conditions.
Primary Route(s) of Entry: Inhalation, ingestion

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Not regulated for transport

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Arabic Gum | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 379.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Helium Gas

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Helium Gas

CAS#: 7440-59-7

### Section 3 — Hazards Identification

Colorless, odorless gas.
Asphyxiant by displacing air. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.

### Section 5 — Fire Fighting Measures

Nonflammable gas.
Pressurized gas. Keep from heat.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Allow gas to dissipate.

### Section 7 — Handling and Storage

Store with the bottled gases in a secure area.
Cylinder temperature should not exceed 125 F (52 C)

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless, odorless gas
Formula: He
Formula Weight: 4.00

Specific Gravity: 0.1785 g/L @ 0 C
Melting Point: -272.2 C @ 26 atm
Boiling Point: -268 C

## Section 10 — Stability and Reactivity

Avoid contact with heat.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Nausea, dizziness and headache
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
One option is to completely empty the cylinder in an operating fume hood or outdoors. Then dispose of empty cylinder in trash if

## Section 14 — Transport Information

Shipping Name: Helium, compressed
Hazard Class: 2.2, Nonflammable gas
UN Number: UN1046

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-168-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 389.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Hexanes

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Hexanes

CAS#: 110-54-3

### Section 3 — Hazards Identification

Odorless, clear liquid. Faint paint-thinner odor.
Irritant to body tissues. Mildly toxic by inhalation. Avoid all body contact.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-1
Flammability-3
Reactivity-0
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse mouth out with water. Give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable liquid.
Flash Point: -10 F Upper: 7.7% Lower: 1.2% Autoignition Temperature: 482 F
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-3
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters and aldehydes.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 500 ppm, (OSHA)

## Section 9 — Physical and Chemical Properties

Colorless, clear liquid. Faint odor.
Solubility: Soluble in alcohol and acetone; not water.
Formula: C6H14
Formula Weight: 86.20

Specific Gravity: 0.66
Melting Point: -95 C
Boiling Point: 69 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, chlorine, fluorine, magnesium perchlorate.
Shelf life: Indefinite, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Harmful vapor, irritant, coughing, chest pains, difficulty breathing, lung irritation and edema which may be fatal.
Chronic effects: Neurological hazard
Target organs: N.A.

ORL-RAT LD50: 28710 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #18a is one option.

## Section 14 — Transport Information

Shipping Name: Hexanes
Hazard Class: 3, Flammable liquid
UN Number: UN1208

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (203-777-6), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 395.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Hydrochloric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Hydrochloric Acid, 36.5-38.0%, concentrated
Synonym: Muriatic acid
CAS#: 7647-01-0

### Section 3 — Hazards Identification

Clear liquid; pungent odor; constantly fuming.
Highly toxic by inhalation and ingestion.
Severe corrosive to all body tissues, especially skin and eyes. Avoid all body contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-2
Exposure-3
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.
When heated to decomposition, emits toxic fumes of Cl.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material, neutralize with sodium bicarbonate or calcium hydroxide and deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #9. Store with inorganic acids.
Store in a dedicated acid cabinet and away from any source of water; if an acid cabinet is not available, store in Flinn Saf-Cube.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 5 ppm (OSHA)

## Section 9 — Physical and Chemical Properties

Clear liquid; pungent odor; constantly fuming.
Solubility: Soluble in water, alcohol and benzene.
Formula: HCl
Formula Weight: 36.46

Specific Gravity: 1.2

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, bases, amines, alkali metals, copper, copper alloys, aluminum. Corrodes steel and reacts violently with water.
Shelf Life: Good, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Poison, corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RBT LD50: 900 mg/kg
IHL-RAT LC50: 3124 ppm/1H
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24b is one option.

## Section 14 — Transport Information

Shipping Name: Hydrochloric acid
Hazard Class: 8, Corrosive
UN Number: UN1789

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-595-7), RCRA code D002.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 398.00
**Revision Date:** May 29, 2009

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Hydrogen Peroxide (30%)

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Hydrogen Peroxide
Synonyms: Hydrogen Dioxide
CAS#: 7722-84-1

### SECTION 3 — HAZARDS IDENTIFICATION

Clear, colorless, liquid with a slight acrid odor.
Harmful by ingestion, inhalation or skin contact. Corrosive and severe irritant to skin, eyes and respiratory tract. Causes severe burns. Avoid all body contact. Contact with eyes may cause blindness. 30% hydrogen peroxide will decompose rapidily when exposed to almost any substance and generate significant heat.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-3
Exposure-3
Storage-1

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for at least 15 minutes.Seek medical attention for further treatment.
External: Wash continuously with fresh water for at least 15 minutes.
Internal: Do not induce vomiting. Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Noncombustible liquid, but a powerful oxidizer.
Strong oxidizing agent, a dangerous fire and explosion risk when in contact with combustible materials.
Fire Fighting Instructions: Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
Not established.

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or other inorganic absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Inorganic #6. Store with bromates and chlorates. Store away from organics, combustables, reducing agents, and strong bases.
Light sensitive. Store in a dark, vented container. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin, and clothing. Wear chemical splash goggles, chemical-resistant gloves, and chemical-resistant apron.Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1 ppm (OSHA)

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Clear, colorless, liquid with a slightly acrid odor.
Solubility: Soluble in water and alcohol.
Formula: $H_2O_2$
Formula Weight: 34.02

Specific Gravity: 1.112
Melting Point: -25 C
Boiling Point: 106 C
Vapor density: 1.17
pH (30%): 3.3

## SECTION 10 — STABILITY AND REACTIVITY

Keep away from reducing agents, strong bases, organics, combustable material, and oxidizable materials. Avoid heating this substance.
Shelf Life: Fair to poor. Stored at room temperature, this substance decomposes at about 0.5% per year.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Corrosive to all body tissues.
Chronic effects: Dermatitis
Target organs: N.A.

ORL-MAN $LDL_0$: 1429 mg/kg
IHL-RAT $LC_{50}$: 2000 mg/m3
SKN-RAT $LD_{50}$: 3000 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Carp $LC_{50}$: 42 mg/L (48 hour); Daphnia $EC_{50}$: 2.4 mg/L (48 hour)

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #22a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Hydrogen peroxide, aqueous solutions
Hazard Class: 5.1, Oxidizer, corrosive
UN Number: UN2014
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (231-765-0), RCRA code D001, D002.

## SECTION 16 — OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 401.50
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Immersion Oil-High & Low Viscosity

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Immersion Oil-high & low viscosity

CAS#: None Established

### Section 3 — Hazards Identification

Clear liquid with slight yellow color. Odorless.
This material is generally considered nonhazardous, however not all health aspects of this substance have been fully investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.
Burning may release acrid fumes and vapors.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters, aldehydes, and oils.
Keep away from extreme head or open flame.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Clear liquid with slight yellow color. Odorless.
Solubility: Not soluble in water. Material is a proprietary mineral oil mixture.

Boiling Point: 205 C
Specific Gravity: 0.9236

## Section 10 — Stability and Reactivity

Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 402.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Indigo Carmine

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Indigo Carmine
Synonyms: acid blue 74, C.I. 73015
CAS#: 860-22-0

### Section 3 — Hazards Identification

Dark blue, crystalline powder. Odorless.
Irritating to mucous membranes and upper respiratory tract. Slightly toxic by ingestion.
Causes eye and skin irritation. Avoid contact with all body tissues.
Decomposition releases toxic fumes.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits acrid and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Keep container tightly closed.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Dark blue, crystalline powder. Odorless.
Solubility: Water soluble; slightly in alcohol.
Formula: C16H8N2O8S2Na2
Formula Weight: 466.37

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite, protect from light.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (212-728-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 303.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## 2,6-Dichloroindophenol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

2, 6-Dichloroindophenol, sodium salt
Synonym: Tillmans reagent
CAS#: 620-45-1

### Section 3 — Hazards Identification

Dark green to black powder. Odor of throat lozenge.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When decomposed toxic fumes of carbon monoxide, carbon dioxide, hydrogen chloride gas, and nitrogen oxides could be produced.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #8. Store with phenols and cresols.
Solutions of this indicator have a poor shelf life; make fresh solution for best results.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Dark green to black powder. Odor of throat lozenge.
Solubility: Soluble: water and alcohol.
Formula: NaOC6H4N:C6H2(Cl2):O
Formula Weight: 290.09

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Poor, substance hygroscopic.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #5 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (210-640-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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## Material Safety Data Sheet (MSDS)

**MSDS #:** 406.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Invertase

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Invertase

CAS#: 9001-57-4

### Section 3 — Hazards Identification

Tan powder. Odor of dry dog food.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Tan powder, odor of dry dog food.
Enzyme produced by yeast.
Solubility: Soluble in water.

## Section 10 — Stability and Reactivity

Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Overexposure may result in sensitization
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (232-615-7).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 408.00
**Revision Date:** October 27, 2006

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Iodine, Tincture

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Iodine (7553-56-2) 5%, Potassium Iodide (7681-11-0) 5%, Water (7732-18-5) 6%, and Ethyl Alcohol (64-17-5) 84%.

CAS#: None Established

### SECTION 3 — HAZARDS IDENTIFICATION

Reddish-brown liquid; odor of iodine and alcohol.
Toxic by ingestion, inhalation, and skin absorption.
Contains ethyl alcohol; flammable liquid. Avoid all sources of ignition.

**FLINN AT-A-GLANCE**
Health-3
Flammability-3
Reactivity-1
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Combustible liquid.
Contains ethyl alcohol; when heated to decomposition, emits toxic fumes of iodide.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a Flinn Chem-Saf bag.Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor can. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Reddish-brown liquid; odor of iodine and alcohol.

## SECTION 10 — STABILITY AND REACTIVITY

This material should not be used as medication. It is sold for use as a laboratory reagent only.
Shelf life: Good, if stored safely.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Poison, irritant, nausea, dizziness, and headaches
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method 12a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Ethyl Alcohol
Hazard Class: 3, Flammable liquid
UN Number: UN1170

N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

Not listed.

## SECTION 16 — OTHER INFORMATION

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**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 407.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Iodine

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Iodine

CAS#: 7553-56-2

### Section 3 — Hazards Identification

Gray-black flakes, metallic luster, characteristic odor.
Highly toxic by ingestion and inhalation.
Irritating and corrosive to skin. Avoid all body contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-2
Exposure-3
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable, noncombustible solid.
When heated to decomposition, emits toxic fumes of iodide and various iodine compounds.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Store in a Flinn Chem-Saf bag; the substance sublimes. Frequently oxidizes metal shelves or metal containers in proximity to the iodine. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: ceiling 0.1 ppm (OSHA)

## Section 9 — Physical and Chemical Properties

Gray-black flakes, metallic luster, characteristic odor.
Solubility: Soluble in alcohol and other organic solvents; not in water.
Formula: I2
Formula Weight: 253.80

Boiling Point: 185.24 C
Specific gravity: 4.98
Melting Point: 113.5 C

## Section 10 — Stability and Reactivity

Avoid contact with magnesium, zinc, ammonia, aluminum, corrodes steel. Reacts violently with acetaldehyde.
Shelf Life: Fair; the substance sublimes. Frequently oxidizes metal shelves or metal containers in proximity to the iodine.

## Section 11 — Toxicological Information

Acute effects: Highly toxic, harmful vapor, corrosive, severe lachrymatol, sensitizer, stomach pains, vomiting.
Chronic effects: Dermatitis
Target organs: Thyroid

ORL-HUM LD50: 2-4 gm for an adult
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Toxic solid, inorganic, n.o.s.
Hazard Class: 6.1 Keep away from food
UN Number: UN3288

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-442-4), RCRA code D002.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 416.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Iron

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Iron

CAS#: 7439-89-6

### Section 3 — Hazards Identification

Silver-white, malleable metal. Forms: filings, nails, powder, and sheets. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.
Flammable solid in dust form.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Finely divided iron can be flammable.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides.
Moisture sensitive material.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Silver-white, malleable metal. Odorless.
Solubility: Insoluble in water. Soluble in sulfuric, hydrochloric and nitric acids.
Formula: Fe
Formula Weight: 55.85

Specific Gravity: 7.87
Melting Point: 1536 C

## Section 10 — Stability and Reactivity

Avoid contact with acids, moisture, strong oxidizing agents, halogens, phosphorus and oxygen.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Harmful dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 30 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-096-4), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# MATERIAL SAFETY DATA SHEET

Revised: 09/07/07
2-PROPANOL Replaces: 07/10/07
CAROLINA BIOLOGICAL Printed: 05/20/08

## 1. PRODUCT DESCRIPTION

Product Name: 2-Propanol
Product Code(s): 88-4890, 88-4892, 88-4865
Size: 500ml, 4L, 20L
Chemical Name: Alcohols
CAS Number: See section 2
Formula: $CH_2CHOHCH_3$
Synonyms: Isopropyl Alcohol; Isopropanol; IPA; Sec-Propanol; Dimethylcarbinol
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principal Hazardous Components: 2-Propanol(CAS#67-63-0)99-100%
TLV and PEL units: ACGIH-TLV: 400 ppm (STEL) 200 ppm (TWA)
OSHA-PEL : 400 ppm (TWA)

## 3. HAZARD IDENTIFICATION

Emergency Overview: Highly flammable. Keep container tightly closed. Keep away from sources of ignition- No smoking.
Potential Health Effects:
Eyes: Vapors may cause irritation; eye splash causes severe irritation, possibly eye damage.
Skin: May cause irritation with redness and pain.
Ingestion: May cause gastrointestinal discomfort. May cause drowsiness or unconsciousness. Large amounts (8 oz or more) may be fatal.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention immediately.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medial attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water. Get immediate medical help. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm and quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): (TCC)53F;(TOC)63F
NFPA Rating: Health: 1
Fire: 3
Reactivity: 0
Extinguisher Media:
Use dry chemical, CO2 or appropriate foam.
Flammable Limits in Air % by Volume: 12.7 upper, 2.0 lower
Autoignition Temperature: 399 C(750 F)
Special Firefighting Procedures:

Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may cause fire.

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Keep container tightly closed. Store in a cool, dry, well-ventilated, flammable liquid storage area, away from oxidizing materials.
Other Precautions: Bond and ground containers when transferring liquid. Wash hands thoroughly after handling.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.
Ventilation:

| | |
|---|---|
| Local Exhaust: | Yes |
| Mechanical(General): | Yes |
| Special: | No |
| Other: | No |

Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | 60.10 |
| Melting Point: | -88.5 to -89.5 C |
| Boiling Point: | 82.5 C( 179 F) |
| Vapor Pressure: | 33 mm Hg at 20 C |
| Vapor Density(Air=1): | 2.07 |
| Specific Gravity(H2O=1): | 0.7861 at 20 C |
| Percent Volatile by Volume: | 99% |
| Evaporation Rate(H2O=1): | 2.3 |
| Solubility in Water: | Miscible |
| Appearance and Odor: | Clear colorless liquid with characteristic alcohol odor. |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Heat, flame, other sources of ignition
Incompatibility(Materials to Avoid): Strong oxidizing agents, aluminum, strong acids, nitric acid, sulfuric acid, halogens, active halogen compounds, amines and ammonia, aldehydes.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide

Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: oral-rat LD50: 5045 mg/kg
oral-mouse LD50: 3600 mg/kg
Effects of Overexposure:
Acute: See section 3
Chronic: None
Conditions Aggravated by Overexposure: Irritation of the skin and eyes. Rapid absorption to the skin. Irritation of nose throat, headache, nausea.
Target Organs: Eyes, skin respiratory system, lungs, central nervous system, liver, kidneys.
Primary Route(s) of Entry: Inhalation, ingestion, skin contact, eye contact, absorption.

## 12. ECOLOGICAL DATA

EPA Waste Numbers: D001

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Description: Isopropanol, 3, UN1219, II

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute, Chronic, Fire

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| 2-Propanol | No | Yes | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.
Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot

N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 421.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Janus Green B

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Janus Green B
Synonym: C.I. 11050
CAS#: 2869-83-2

### Section 3 — Hazards Identification

Black/green powder. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Biological stain. Black/green powder. Odorless.
Solubility: Soluble in water and alcohol.
Formula: C30H31ClN6
Formula Weight: 511.12

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #5 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (220-695-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 424.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Kaolin

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Kaolin

CAS#: 1332-58-7

### Section 3 — Hazards Identification

White, yellowish-gray powder. Odorless.
Dust may be irritating. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 15 mg/m3 (OSHA)

## Section 9 — Physical and Chemical Properties

Aluminum silicate.
Solubility: Insoluble in water, dilute acids and alkali hydroxides.

Specific Gravity: 1.8-2.6

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritating dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 427.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Lactic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Lactic Acid
Synonym: acetonic acid
CAS#: 50-21-5

### Section 3 — Hazards Identification

Colorless or yellowish, hygroscopic syrupy liquid. Odorless.
Corrosive to eyes; irritates skin and respiratory tract. Slightly toxic by ingestion.

**FLINN AT-A-GLANCE**
Health-1
Flammability-1
Reactivity-1
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible liquid.
Flash Point: 230 F
When heated to decomposition, emits toxic acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless or yellowish, hygroscopic syrupy liquid. Odorless.
Solubility: Miscible with water and other solvents.
Formula: C3H6O3
Formula Weight: 90.09

Specific Gravity: 1.2
Melting Point: 18 C

## Section 10 — Stability and Reactivity

Avoid contact with bases, oxidizing agents and reducing agents.
Shelf life: Poor; substance hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 3730 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-018-0), RCRA code D002.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 428.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Lactose

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Lactose
Synonym: milk sugar
CAS#: 63-42-3

### Section 3 — Hazards Identification

White crystalline powder.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystalline powder.
Solubility: Soluble in water; slightly in alcohol.
Formula: C12H22O11
Formula Weight: 342.34

Specific Gravity: 1.525
Melting point (dec.) at 203.5 C

## Section 10 — Stability and Reactivity

Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 429.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Lanolin

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Lanolin
Synonym: wool fat
CAS#: 8006-54-0

### Section 3 — Hazards Identification

Yellow moist solid. Shoe polish odor.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Flash Point: 230 F Autoignition Temperature: 833 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-0
F-1
R-0

### Section 6 — Accidental Release Measures

Place in school trash.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters, aldehydes, and oils.
Store in a cool dry place. Store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Yellow moist solid.
Solubility: Practically insoluble in water; soluble in many common organic solvents.

Specific Gravity: 0.95
Melting Point: 38-42 C
Boiling Point: 175 C (dec.)

## Section 10 — Stability and Reactivity

Shelf life: Good, if kept cool and dry.

## Section 11 — Toxicological Information

Acute effects: Aspiration or inhalation may cause chemical pneumonitis.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (232-348-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 431.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Lauric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Lauric Acid
Synonym: dodecanoic acid
CAS#: 143-07-7

### Section 3 — Hazards Identification

Colorless, needle-like crystals; slight odor of bay oil.
Irritating to body tissues. Avoid all body tissue contact.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class IIIB combustible solid.
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless, needle-like crystals; slight odor of bay oil.
Solubility: Insoluble in water. Soluble in ether and benzene.
Formula: CH3(CH2)10COOH
Formula Weight: 200.32

Specific Gravity: 0.833
Melting Point: 43-45 C
Boiling Point: 225 C @ 100mm

## Section 10 — Stability and Reactivity

Avoid contact with bases, oxidizing agents and reducing agents.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 12 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (205-582-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 437.00
**Revision Date:** May 20, 2008

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Lead Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Lead Nitrate
Synonym: lead (II) nitrate
CAS#: 10099-74-8

### SECTION 3 — HAZARDS IDENTIFICATION

White crystals. Slight nitric acid odor.
Moderately toxic by ingestion or inhalation. Toxic as lead dust or lead fume. Probable carcinogen.
Severe eye, skin and mucous membrane irritant. Avoid all body contact.
Chronic exposure to inorganic lead via inhalation or ingestion can result in accumulation in and damage to the soft tissues and bones.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-3
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non flammable solid.
Strong oxidizer, dangerous fire risk in contact with organic materials.
When heated to decomposition, emits toxic fumes of Pb and NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None
Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.15 mg/m3 (Pb) (ACGIH)

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

White crystals. Slight nitric acid odor.
Solubility: Soluble in water and alcohol. Decomposes at 470 C
Formula: Pb(NO3)2
Formula Weight: 331.21

Specific Gravity: 4.53
Melting Point: 470 C (dec.)

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with strong reducers, finely powdered metals.
Shelf Life: Indefinite.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Harmful dust, irritant
Chronic effects: Probable carcinogen, reproductive hazard
Target organs: Blood, kidneys, nerves, male/female reproductive system

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27f is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Lead nitrate
Hazard Class: 5.1, Oxidizer, poison
UN Number: UN1469

N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (233-245-9), RCRA code D001, D008.

## SECTION 16 — OTHER INFORMATION

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# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 432.00

**Revision Date:** December 21, 2007

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Lead

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Lead

CAS#: 7439-92-1

### SECTION 3 — HAZARDS IDENTIFICATION

Heavy, ductile, gray solid. Forms: foil, sheets, shot, strips, and wire. Odorless.
Lead as a powder or dust is toxic by ingestion or inhalation. Lead and lead compounds are possible carcinogens. Avoid ingestion and inhalation.
Emits highly toxic fumes of Pb when heated.
Chronic exposure to inorganic lead via inhalation or ingestion can result in accumulation in and damage to the soft tissues and bones.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Finely divided lead dust is flammable.
Emits highly toxic fumes of Pb when heated.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides.
Use fume hood when handling powder form.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.15 mg/m3 (ACGIH)

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Heavy, ductile, gray solid.
Solubility: Soluble in dilute nitric acid. Insoluble in water.
Lead wire also contains 1% antimony (CAS #7440-36-0)
Formula: Pb
Formula Weight: 207.19

Specific Gravity: 11.35
Melting Point: 327.4 C

## SECTION 10 — STABILITY AND REACTIVITY

Avoid strong acids, ammonium nitrate, hydrogen peroxide, sodium azide, zirconium, sodium acetylide and chlorine.
Shelf Life: Indefinite.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: N.A.
Chronic effects: Anemia, reproductive hazard
Target organs: Nerves, blood, kidneys, female/male reproductive system

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27d is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (231-100-4), RCRA code D008.

## SECTION 16 — OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 454.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Lithium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Lithium Chloride

CAS#: 7447-41-8

### Section 3 — Hazards Identification

White, odorless crystals.
Moderately toxic by ingestion. Irritant to body tissues. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, odorless crystals.
Solubility: Soluble in water and alcohol. Hygroscopic.
Formula: LiCl
Formula Weight: 42.39

Specific Gravity: 2.068
Melting Point: 614 C
Boiling Point: 1350 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and strong acids.
Shelf life: Fair to poor

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: Possible teratogen
Target organs: Central nervous system

ORL-RAT LD50: 526 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-212-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 456.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Lithium Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Lithium Nitrate

CAS#: 7790-69-4

### Section 3 — Hazards Identification

Colorless odorless powder.
Slightly toxic by ingestion and inhalation. Irritant to body tissues.
Strong oxidizer, explosion risk when shocked or heated.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Oxidizer; explosion risk when shocked or heated.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a Flinn Chem-Saf bag and then inside a Flinn Saf-Stor can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless, odorless powder.
Solubility: Soluble in water and alcohol.
Formula: LiNO3
Formula Weight: 68.95

Specific Gravity: 2.38
Melting Point: 261 C

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers and organic materials.
Shelf life: Indefinite, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Irritant, stomach pains, vomiting, diarrhea, nausea, dizziness and headache
Chronic effects: Convulsions
Target organs: Blood, central nervous system

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Lithium nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN2722

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (232-218-9), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 459.00
**Revision Date:** May 10, 2007

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Litmus

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Litmus
Synonym: lichen blue
CAS#: 1393-92-6

### SECTION 3 — HAZARDS IDENTIFICATION

Dark-purple powder. Odor of decaying plant.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non flammable solid.

**NFPA CODE**
None
Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Moisture sensitive material. Store in a Flinn Chem-Saf bag.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Dark-purple powder. Odor of decaying plant.
Solubility: Soluble in water.
Acid/Base indicator: pH 4.5 red to 8.3 blue.

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with strong oxidizers.
Shelf life: Indefinite, if bottle kept tightly closed.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

EINECS-listed (215-739-6).

## SECTION 16 — OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# MATERIAL SAFETY DATA SHEET

Revised: 05/15/08
LUGOL SOLUTION Replaces: 07/10/07
CAROLINA BIOLOGICAL Printed: 05/20/08

## 1. PRODUCT DESCRIPTION

Product Name: Lugol Solution
Product Code(s): 87-2793, 87-2795
Size: 100 ML, 500 ML
Chemical Name: Product is mixture
CAS Number: See section 2
Formula: See section 2
Synonyms: Donaldson's Amoeba Stain 2
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principal Hazardous Components:
Potassium Iodide(CAS# 7681-11-0)10%
Iodine(CAS# 7553-56-2)5%
TLV and PEL units:
Potassium Iodide: No information found
Iodine: ACGIH-TLV Ceiling 0.1 ppm
OSHA-PEL Ceiling 0.1 ppm, Ceiling 1 mg/m3

## 3. HAZARD IDENTIFICATION

Emergency Overview: Harmful if swallowed, inhaled or absorbed through the skin. May cause irritation to eyes, skin and mucous membranes. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis,shortness of breath, headache, nausea and vomiting.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water to dilute, and get medical attention immediately. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm and quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): No information available.
NFPA Rating: None established
Extinguisher Media:
Use dry chemical, CO2 or appropriate foam.
Flammable Limits in Air % by Volume: No information available
Autoignition Temperature: No information available.

Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: When heated to excessive temperatures may emit toxic and corrosive fumes of iodine.

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Store tightly closed in a cool, dry, well ventilated area away from incompatible materials. Suitable for storage in any general chemical storage area.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.
Ventilation:

| | |
|---|---|
| Local Exhaust: | Preferred |
| Mechanical(General): | Acceptable |
| Special: | No |
| Other: | No |

Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | No information available |
| Melting Point: | No information available |
| Boiling Point: | Approximately 100C |
| Vapor Pressure: | Approximately 17.535 @ 20C |
| Vapor Density(Air=1): | No information available |
| Specific Gravity(H2O=1): | 1.0 |
| Percent Volatile by Volume: | 98% |
| Evaporation Rate(H2O=1): | 1 |
| Solubility in Water: | Complete, product is aqueous solution |
| Appearance and Odor: | Deep amber liquid with characteristic odor of iodine. |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: High temperatures or excessive heat.
Incompatibility(Materials to Avoid): Contact with ammonia fumes may cause formation of explosive nitroiodide.
Hazardous Decomposition Products: Free Iodine
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: Mixture has not been thoroughly evaluated. Data is listed for individual components.
Potassium Iodide: orl-mus LCLo: 1862 mg/kg
Iodine: orl-rat LD50: 14g/kg
Effects of Overexposure:
Acute: See section 3
Chronic:
Potassium Iodide and Iodine: Mutation data cited. Reproductive data cited. Not listed as causing by IARC, NTP, OR OSHA
Conditions Aggravated by Overexposure: Preexisting conditions of the eyes, skin, nose and throat.
Target Organs: No information available.
Primary Route(s) of Entry: Inhalation, ingestion, irritation in eyes or skin contact.

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Non-regulated

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Potassium Iodide | No | No | No | No | No |
| Iodine | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.
Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot

N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 463.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Luminol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Luminol
Synonyms: 5-amino-2,3-dihydro-1,4-phthalazinedione & 3-aminophthalhydrazide
CAS#: 521-31-3

### Section 3 — Hazards Identification

Yellow odorless powder.
Body tissue irritant. Avoid body tissue contact and inhalation of dust.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of NOx under fire conditions.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Yellow odorless powder.
Solubility: Soluble in alcohol. Slightly soluble in water.
Formula: C8H7N3O2
Formula Weight: 177.17

Melting Point: 280 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, strong acids, strong bases, strong reducers.
Shelf life: Poor

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #5 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (208-309-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 473.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Magnesium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Magnesium Chloride

CAS#: 7791-18-6

### Section 3 — Hazards Identification

Colorless, white crystals or flakes. Odorless.
Slightly toxic by ingestion. Irritant. Avoid ingestion, inhalation, skin absorption.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, white crystals or flakes. Odorless.
Solubility: Soluble in water and alcohol.
Formula: MgCl2 6H2O
Formula Weight: 203.33

Specific Gravity: 1.56
Melting Point: 116-118 C (if heated rapidly) - with decomposition.

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Fair to poor; substance deliquescent.

## Section 11 — Toxicological Information

Acute effects: Irritant, stomach pains, vomiting, diarrhea
Chronic effects: N.A.
Target organs: Central nervous system, kidneys

ORL-RAT LD50: 2800 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

EINECS-listed (232-094-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 475.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Magnesium Hydroxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Magnesium Hydroxide
Synonym: magnesium hydrate
CAS#: 1309-42-8

### Section 3 — Hazards Identification

White, odorless powder.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Not combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, odorless powder.
Solubility: Almost insoluble in water and alcohol. Soluble in solutions of ammonium salts and dilute acids.
Formula: Mg(OH)2
Formula Weight: 58.34

Specific Gravity: 2.36

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Dust may be irritant
Chronic effects: Diarrhea and abdominal pain
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-170-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 476.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Magnesium Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Magnesium Nitrate, hydrate

CAS#: 13446-18-9

### Section 3 — Hazards Identification

White odorless crystals.
Body tissue irritant. Avoid contact with body tissues.
Strong oxidizer; fire risk when in contact with combustible materials.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-3
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer; fire risk when in contact with combustible materials.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White odorless crystals.
Solubility: Soluble in water and alcohol. Decomposes at 330 C.
Formula: $Mg(NO_3)_2\ 6H_2O$
Formula Weight: 256.43

Specific Gravity: 1.45
Melting Point: 95-100 C

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, strong acids.
Shelf life: Fair to poor

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 5440 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Magnesium Nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1474

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-826-7), RCRA code D001.

## Section 16 — Other Information

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 478.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Magnesium Oxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Magnesium Oxide
Synonym: magnesia
CAS#: 1309-48-4

### Section 3 — Hazards Identification

White, odorless powder.
Inhalation may cause respiratory irritation. Slight eye irritant.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Air and moisture sensitive. Store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 15 mg/m3 (OSHA)

## Section 9 — Physical and Chemical Properties

White, odorless powder.
Solubility: Only slightly soluble in water; soluble in acids and ammonium salts solutions.
Formula: MgO
Formula Weight: 40.32

Specific Gravity: 2.4 (varies)
Melting Point: 2800 C
Boiling Point: 3600 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and acids.
Shelf life: Fair to poor.

## Section 11 — Toxicological Information

Acute effects: Irritant, laxative effect
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-171-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 480.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Magnesium Sulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Magnesium Sulfate anhydrous or heptahydrate
Synonym: epsom salts

CAS#: 7487-88-9 (anhydrous), 10034-99-8 (heptahydrate)

### Section 3 — Hazards Identification

White, odorless powder.
Avoid inhalation. May irritate eyes and respiratory tract.
Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White, odorless powder.
Solubility: Very soluble in water. Soluble in glycerol.
Anhydrous decomposes at 1124 C.
Formula: MgSO4 7H2O or MgSO4 (Anhydrous)
Formula Weight: 246.50 or 120.37

Specific Gravity: 2.65 (for anhydrous)
1.678 (for hydrous).

## Section 10 — Stability and Reactivity

Shelf Life: Poor; substance hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Irritant, abdominal pain
Chronic effects: N.A.
Target organs: Central nervous system, GI system

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-298-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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## Material Safety Data Sheet (MSDS)

**MSDS #:** 468.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Magnesium

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Magnesium

CAS#: 7439-95-4

### Section 3 — Hazards Identification

Silvery-white, odorless, metal, turnings or ribbon.
Flammable solid.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-2
Reactivity-2
Exposure-0
Storage-2

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable solid.
Water reactive metal; avoid contact with acids or water.
**Fire Fighting Instructions:** Use Class D, Met-L-X, or dry sand as a fire extinguisher. Avoid water contact, violent reaction with water. Firefighters should wear PPE and SCBA with full facepiece operating in positive mode.

**NFPA CODE**
H-0
F-1
R-1

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides.
Store in a Flinn Saf-Stor can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Silvery-white, odorless, metal, granular, turnings or ribbon.
Solubility: Insoluble in water. Soluble in acids.
Formula: Mg
Formula Weight: 24.31

Specific Gravity: 1.74
Melting Point: 651 C

## Section 10 — Stability and Reactivity

Avoid contact with acids, acid chlorides, strong oxidizers, halogens, chlorinated solvents.
Shelf life: Indefinite, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Irritating dust.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Magnesium
Hazard Class: 4.1, Flammable solid
UN Number: UN1869

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-104-6), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 482.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Malachite Green Oxalate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Malachite Green Oxalate
Synonyms: basic green 4, C. I. 42000
CAS#: 2437-29-8

### Section 3 — Hazards Identification

Shiny, green crystals. Odorless.
Moderately toxic by ingestion. Severe eye irritant.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Not combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Shiny, green crystals. Odorless.
Solubility: Very soluble in water. Soluble in alcohol.
Formula: C46H50N4 3C2H2O4
Formula Weight: 364.90 C

Specific Gravity: Varies.
Melting Point: 164 (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Highly toxic, severe eye irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 275 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #5 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

EINECS-listed (219-441-7).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 485.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Maleic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Maleic Acid
Synonyms: maleinic acid, butenedioic acid
CAS#: 110-16-7

### Section 3 — Hazards Identification

White crystal. Faint tea odor.
Moderately toxic by ingestion, inhalation, and skin absorption. Inhalation of dust may cause respiratory irritation. Corrosive to body tissues.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystal. Faint tea odor.
Solubility: Soluble in water, alcohol and acetone.
Slightly soluble in benzene.
Formula: HOOCCH:CHCOOH (cis Isomer)
Formula Weight: 116.07

Specific Gravity: 1.59 (solid)
Melting Point: 130-131 C

## Section 10 — Stability and Reactivity

Avoid contact with bases, oxidizers, reducers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Corrosive, gastrointestinal disturbances
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 708 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: 1560 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Maleic acid
Hazard Class: 8, Corrosive
UN Number: NA2215

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (203-742-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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***Flinn Chemicals--Your Best Choice***

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 486.00
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### Section 1 — Chemical Product and Company Identification

## Malonic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Malonic acid
Synonym: propanedioic acid
CAS#: 141-82-2

### Section 3 — Hazards Identification

White crystal. Faint beef bouillon odor.
Slightly toxic. This substance is regulated (as a drug intermediate) in some states.
Severe eye irritant, mild body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-1
Reactivity-1
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystal. Faint beef bouillon odor.
Solubility: Soluble: water, alcohol, ether.
Formula: CH2(CO2H)2
Formula Weight: 104.07

Specific Gravity: 1.63
Melting Point: 132-134 C

## Section 10 — Stability and Reactivity

Avoid contact with bases, oxidizers, reducers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Severe irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1310 mg/kg
IHL-RAT LC50: N.A.
EYE-RBT LD50: 100 mg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (205-503-0).

## Section 16 — Other Information

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 487.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Maltose

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Maltose
Synonyms: malt sugar, maltibiose
CAS#: 6363-53-7

### Section 3 — Hazards Identification

Colorless to light tan crystals or flakes. Odor of fresh cut hay.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Sweep up and place in school trash.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless to light tan crystals or flakes. Odor of fresh cut hay.
Solubility: Completely soluble in water; slightly soluble in alcohol. Insoluble in ether.
Formula: C12H22O11 H2O
Formula Weight: 360.32

Specific Gravity: 1.395
Melting Point: 102-103 C

## Section 10 — Stability and Reactivity

Shelf life: Indefinite

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 34800 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-716-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 489.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Manganese Dioxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Manganese Dioxide

CAS#: 1313-13-9

### Section 3 — Hazards Identification

Black or silver crystals or powder. Odorless.
Dust is irritant to eyes and respiratory tract. Avoid inhalation of dust.
Strong oxidizer; fire hazard.
Chronic exposure to manganese dust through inhalation can lead to respiratory problems and disorders of the central nervous system.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-2
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
Strong oxidizer, fire hazard when in contact with combustible materials.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1 mg/m3 (Mn), STEL 3 mg/m3 (Mn) (NIOSH, NIOSH)

## Section 9 — Physical and Chemical Properties

Black or silver crystals or powder. Odorless.
Solubility: Soluble in hydrochloric acid. Insoluble in water.
Formula: $MnO_2$
Formula Weight: 86.94

Specific Gravity: 5.026
Melting Point: 535 C (dec.)

## Section 10 — Stability and Reactivity

May ignite organic materials; strong oxidant; reacts violently with combustible and reducing agents. Avoid contact with other oxidizing agents.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritating dust
Chronic effects: N.A.
Target organs: Nerves, lungs

ORL-RAT LD50: 9000 mg/kg as manganese dust
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-202-6), RCRA code D001.

## Section 16 — Other Information

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MSDS Number: **M0793** * * * * * *Effective Date:* ***05/26/09*** * * * * * *Supercedes:* ***08/17/06***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# MANGANESE SULFATE

## 1. Product Identification

**Synonyms:** Manganous sulfate, monohydrate; sulfuric acid, manganese (2+) salt (1:1), monohydrate; Manganese (II) sulfate, monohydrate
**CAS No.:** 7785-87-7 (Anhydrous) 10034-96-5 (Monohydrate)
**Molecular Weight:** 169.02
**Chemical Formula:** MnSO4 H2O
**Product Codes:**
J.T. Baker: 2550, 2552
Mallinckrodt: 2147, 6097, 6192, 6200, 7780

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Manganese(II) Sulfate (1:1) | 7785-87-7 | 98 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS LUNGS, CENTRAL NERVOUS SYSTEM, BLOOD AND KIDNEYS. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)
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**Potential Health Effects**
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**Inhalation:**
Inhalation can cause a flu-like illness (metal fume fever). This 24- to 48-hour illness is characterized by chills, fever, aching muscles, dryness in the mouth and throat and headache. May irritate the respiratory tract. May increase the incidence of upper respiratory infections (pneumonia). Absorption of inorganic manganese salts through the lungs is poor but may occur in chronic poisoning.
**Ingestion:**
May cause abdominal pain and nausea. Although they are poorly absorbed through the intestines, inorganic manganese salts may produce hypoglycemia and decreased calcium blood levels should absorption occur.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
Chronic manganese poisoning can result from excessive inhalation and ingestion exposure and involves impairment of the central nervous system. Early symptoms include sluggishness, sleepiness, and weakness in the legs. Advanced cases have shown fixed facial expression, emotional disturbances, spastic gait, and falling. Illness closely resembles Parkinson's Disease. Kidney effects, blood changes and manganese psychosis also may occur as a result of chronic exposure. Chronic inhalation exposure can cause lung damage.
**Aggravation of Pre-existing Conditions:**
Persons with impaired respiratory function, psychiatric or neurological disturbances, and nutritional deficiencies may be more susceptible to the effect of this substance.

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# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

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# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
- OSHA Permissible Exposure Limit (PEL):
5 mg/m3 Ceiling for manganese compounds as Mn

- ACGIH Threshold Limit Value (TLV):
0.2 mg/m3 (TWA) for manganese, elemental and inorganic compounds as Mn

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Skin Protection:**
Wear protective gloves and clean body-covering clothing.

**Eye Protection:**
Safety glasses. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Pale pink granular powder.

**Odor:**
Odorless.

**Solubility:**
Soluble in 1 part water.

**Density:**
2.95
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
850C (1562F) Decomposes.
**Melting Point:**
700C (1292F) Loses all water @ 400-500C
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

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# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Oxides of sulfur and the contained metal.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Powdered metals, strong oxidizers.
**Conditions to Avoid:**
Incompatibles.

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# 11. Toxicological Information

**Toxicological Data:**
Oral rat LD50: 2150 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.
**Reproductive Toxicity:**
For manganese metal:
May damage the reproductive system. Has shown teratogenic effects in laboratory animals.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Manganese(II) Sulfate (1:1) (7785-87-7) | No | No | None |

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# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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# 14. Transport Information

Not regulated.

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# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Manganese(II) Sulfate (1:1) (7785-87-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Manganese(II) Sulfate (1:1) (7785-87-7) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Manganese(II) Sulfate (1:1) (7785-87-7) | No | No | No | Manganese co |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Manganese(II) Sulfate (1:1) (7785-87-7) | 1 | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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# 16. Other Information

**NFPA Ratings:** Health: **2** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED OR INHALED. AFFECTS LUNGS, CENTRAL NERVOUS SYSTEM, BLOOD AND KIDNEYS. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep container closed.

Use only with adequate ventilation.

**Label First Aid:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. In all cases, get medical attention.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

**********

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 493.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Mannitol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Mannitol
Synonym: manna sugar
CAS#: 69-65-8

### Section 3 — Hazards Identification

White crystalline powder or granules; faint sweet taste.
Mildly toxic by ingestion. Doses of 40 grams in humans produce only a laxative effect.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-1
Flammability-1
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Autoignition Temperature: 600 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Sweep up and place in school trash.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystalline powder or granules; faint sweet taste.
Solubility: Soluble in water; Slightly soluble in lower alcohols and amines.
Formula: C6H14O6
Formula Weight: 182.18

Specific Gravity: 1.52
Melting Point: 166-168 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and heat.

## Section 11 — Toxicological Information

Acute effects: Possible skin irritant, laxative
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 13500 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-711-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 494.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Marble Chips

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Marble Chips
Synonym: calcium carbonate
CAS#: 471-34-1

### Section 3 — Hazards Identification

White marble-looking chips. Odorless.
Dust may be irritating. Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non combustible solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Sweep up and place in school trash.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White marble-looking chips. Odorless.
Solubility: Slightly soluble in water. Soluble in acids with evolution of carbon dioxide. Decomposes at 825 C.
Formula: CaCO3
Formula Weight: 100.09

Specific Gravity: 2.7-2.95

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, acids, magnesium aluminum.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 6450 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (207-439-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 509.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Methyl Alcohol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Methyl Alcohol
Synonyms: methanol, wood alcohol
CAS#: 67-56-1

### Section 3 — Hazards Identification

Clear, colorless liquid. Alcohol odor.
Toxic by ingestion (may cause blindness), inhalation or absorption. Irritating to body tissues.
Avoid body tissue contact.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-3
Flammability-3
Reactivity-1
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable liquid.
Flash Point: 54 F Upper 36% Lower: 6% Autoignition Temperature: 725 F
Dangerous fire risk. When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-3
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor can.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 200 ppm, STEL 250 ppm (OSHA, NIOSH)

## Section 9 — Physical and Chemical Properties

Clear, colorless, mobile, highly polar liquid. Alcohol odor.
Specific Gravity: 0.7924
Miscible with water, alcohol and ether.
Formula: CH3OH
Formula Weight: 32.05

Melting Point: -98 C
Boiling Point: 64.6 C
Vapor Pressure: 410 mm (50 C)
Vapor Density: 1.1

## Section 10 — Stability and Reactivity

Avoid contact with acids, acid chlorides, acid anhydrates, oxidizers, reducers, alkali metals.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Poison, irritant, GI disturbances
Chronic effects: N.A.
Target organs: Eyes, kidneys

ORL-RAT LD50: 5628 mg/kg
IHL-RAT LC50: 64000 ppm/4H
SKN-RBT LD50: 15800 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18a is one option.

## Section 14 — Transport Information

Shipping Name: Methyl Alcohol
Hazard Class: 3, Flammable liquid
UN Number: UN1230

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-659-6), RCRA code U154.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 516.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Methyl Orange

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Methyl Orange
Synonym: C.I. 13025
CAS#: 547-58-0

### Section 3 — Hazards Identification

Orange powder. Burnt rubber-like odor.
Highly toxic by ingestion.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non combustible solid.
Release toxic fumes upon decomposition.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Orange powder. Burnt rubber-like odor.
Acid/Base indicator: pH 3.0 red to 4.4 yellow.
Solubility: Soluble in hot water. Insoluble in alcohol.
Formula: C14H15N3O3S.Na
Formula Weight: 328.33

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Highly toxic
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 60 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Toxic solids, organic, n.o.s.
Hazard Class: 6.1, Keep away from food
UN Number: UN2811

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (208-925-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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## Material Safety Data Sheet (MSDS)

**MSDS #:** 518.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Methyl Red

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Methyl Red
Synonyms: sodium salt, C.I. 13020
CAS#: 845-10-3

### Section 3 — Hazards Identification

Orange or gold crystals or powder. Odorless.
Possible irritant. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Not combustible solid.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Orange or gold crystals or powder. Odorless.
Solubility: Insoluble in water. Soluble in alcohol, ether and acetic acid.
Formula: C15H14N3O2Na
Formula Weight: 291.28

Melting Point: 181-182 C
Acid/Base indicator: pH 4.4 red to 6.2 yellow.

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Possible irritant
Chronic effects: Possible mutagen
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (212-682-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 520.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Methyl Salicylate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Methyl Salicylate
Synonym: wintergreen oil
CAS#: 119-36-8

### Section 3 — Hazards Identification

Clear liquid; odor of wintergreen.
Moderately toxic by ingestion. Avoid all body tissue. Severe skin and eye irritant.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible liquid.
Flash Point: 230 F Autoignition Temperature: 847 F
When heated to decomposition, emits acrid smoke and irritating fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters and aldehydes.
Store in a cool dry place. Store in a Flinn Chem-Saf bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Clear liquid; odor of wintergreen.
Solubility: Soluble in alcohol; slightly soluble in water, ether and acetic acid.
Formula: C8H8O3
Formula Weight: 152.16

Specific Gravity: 1.180-1.185
Melting Point: -8.6 C
Boiling Point: 222 C
Vapor Pressure: 1 mm (54 C)
Vapor Density: 5.26

## Section 10 — Stability and Reactivity

Avoid high temperatures, strong oxidizing agents and strong bases.
Shelf life: Indefinite, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 887 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (204-317-7).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 521.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Methyl Violet 2B

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Methyl Violet 2B
Synonyms: basic violet 1, C.I. 42535
CAS#: 8004-87-3

### Section 3 — Hazards Identification

Greenish, odorless powder.
Moderately toxic by ingestion.
Severe eye irritant and possible skin irritant. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Not combustible solid.
Decomposition releases toxic nitrogen oxide and hydrogen chloride gases.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Keep container tightly closed. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Greenish, odorless powder.
Solubility: Soluble in water and chloroform; partially in alcohol and glycerol.
Formula: C24H28N3Cl
Formula Weight: 393.96

Specific Gravity: 1.18
Melting Point: 137 C (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, severe eye irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 413 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 524.00
**Revision Date:** April 14, 2008

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Methylene Blue

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Methylene Blue
Synonyms: biological stain, C.I. 52015
CAS#: 7220-79-3

### SECTION 3 — HAZARDS IDENTIFICATION

Dark green with bronze-like luster; slight odor. Crystals or powder.
Slightly toxic by ingestion. Severe eye irritant. Irritating to body tissues.
Avoid ingestion, inhalation and skin absorption.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non flammable solid.
When heated to decomposition, emits toxic fumes of NOx, SOx and Cl-.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place. Protect from heat and moisture. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Dark green with bronze-like luster, slight odor. Crystals or powder.
Solubility: Soluble in water, alcohol and chloroform.
Formula: C16H18ClN3S.3H2O
Formula Weight: 373.90

Specific Gravity: 1.335
Melting Point: 190 C (dec.)

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with strong oxidizers, reducers, and strong bases.
Shelf life: Indefinite.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Severe eye irritant, stomach pains, vomiting, diarrhea, nausea, dizziness, headache
Chronic effects: Possible mutagen
Target organs: Blood

ORL-RAT LD50: 1180 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed.

## SECTION 16 — OTHER INFORMATION

This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 529.00

**Revision Date:** January 16, 2005

### Section 1 — Chemical Product and Company Identification

## Mineral Oil

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Mineral Oil

CAS#: 8020-83-5

### Section 3 — Hazards Identification

White, odorless, transparent fluid.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.
Combustible liquid.

**FLINN AT-A-GLANCE**

Health-0
Flammability-1
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible liquid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**

H-0
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters, aldehydes, and oils.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, odorless, transparent fluid.
Solubility: Only slightly soluble in water. Insoluble in acids.
Soluble in many common organic solvents.

Specific Gravity: 0.845-0.860

## Section 10 — Stability and Reactivity

Shelf life: Indefinite

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 530.07
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Molisch Reagent

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

1-Naphthol (90-15-3) 5%, Ethyl Alcohol (64-17-5) 95%

CAS#: None Established

### Section 3 — Hazards Identification

Colorless to brown liquid with an ethyl alcohol-like odor.
Contains ethyl alcohol. Toxic by ingestion and inhalation. Body tissue irritant.

**FLINN AT-A-GLANCE**
Health-3
Flammability-3
Reactivity-1
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable liquid.
Contains ethyl alcohol, severe fire risk.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor can.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1000 ppm, as ethyl alcohol. (OSHA)

## Section 9 — Physical and Chemical Properties

Colorless to brown liquid with an ethyl alcohol-like odor.

## Section 10 — Stability and Reactivity

Avoid heat.
Shelf life: Fair. Naphthol darkens on exposure to light.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 7060 mg/kg as ethyl alcohol
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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P.O. Box 219 Batavia IL 60510
(800) 452-1261 Fax (866) 452-1436

MSDS Number: **N2730** * * * * * *Effective Date:* ***02/26/07*** * * * * * *Supercedes:* ***11/10/05***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# NIACIN

## 1. Product Identification

**Synonyms:** Nicotinic acid; 3-carboxypyridine; 3-pyridinecarboxylic acid
**CAS No.:** 59-67-6
**Molecular Weight:** 123.11
**Chemical Formula:** C6H5NO2
**Product Codes:** 2745

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Niacin | 59-67-6 | 99 - 100% | No |

## 3. Hazards Identification

**Emergency Overview**

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**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

---

Health Rating: 1 - Slight (Life)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

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**Potential Health Effects**

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**Inhalation:**
No adverse health effects expected from inhalation. May cause mild irritation to the respiratory tract.
**Ingestion:**
Not expected to be a health hazard via ingestion. Extremely large oral dosages may produce gastrointestinal disturbances. May cause a transient flushing, itching and burning of the skin of the upper trunk, usually brief without other complications.
**Skin Contact:**
No adverse effects expected.
**Eye Contact:**
No adverse effects expected but dust may cause mechanical irritation.
**Chronic Exposure:**
May cause depressed liver function and activation of peptic ulcer. Tumorigenic effects noted in animals.
**Aggravation of Pre-existing Conditions:**
Persons with impaired kidney function may be more susceptible to the effects of the substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**
Wash thoroughly with running water. Get medical advice if irritation develops.

---

# 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

# 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since

they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
White crystals or crystalline powder.
**Odor:**
Slightly amine to odorless.
**Solubility:**
Slightly soluble in water.
**Specific Gravity:**
1.473
**pH:**
2.7 (saturated aqueous solution).
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Sublimes.
**Melting Point:**
237C (459F)
**Vapor Density (Air=1):**
4.25
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides.
**Hazardous Polymerization:**

Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
Heat, flame, sources of ignition, light and incompatibles.

---

# 11. Toxicological Information

Oral rat LD50: 7,000 mg/kg. Investigated as a tumorigen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Niacin (59-67-6) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is expected to readily biodegrade. When released into water, this material is expected to readily biodegrade. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Niacin (59-67-6) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Niacin (59-67-6) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|

```
  Niacin (59-67-6)                          No    No      No    Nicotine sal

  --------\Federal, State & International Regulations - Part 2\----------------
                                                        -RCRA-    -TSCA-
  Ingredient                                CERCLA      261.33     8(d)
  ----------------------------------------  ------      ------    ------
  Niacin (59-67-6)                          No          No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: No       Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 550.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Ninhydrin

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Ninhydrin
Synonyms: 1,2,3,-indantrione, monohydrate
CAS#: 485-47-2

### Section 3 — Hazards Identification

White to yellowish crystals or powder; characteristic odor of fresh paint. Turns red when heated above 100C.
Irritant to skin and mucous membranes. May cause redding and inflammation to the skin.
Avoid all body tissue contact. Slightly toxic by ingestion.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place. Light sensitive, store in Flinn Chem-Saf bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White to yellowish crystals or powder; characteristic odor of fresh paint. Turns red when heated above 100 C.
Solubility: Soluble in both water and alcohol.
Formula: C6H4-1,2-(CO)2CO H2O
Formula Weight: 195.15

Melting Point: 240-245 C

## Section 10 — Stability and Reactivity

Avoid strong bases and amines.
Shelf life: Indefinite, but light sensitive.

## Section 11 — Toxicological Information

Acute effects: Irritant, reddening and inflammation of skin.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (207-618-1).

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 552.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Nitric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Nitric Acid
Synonym: 15.8 thru 8 Molar
CAS#: 7697-37-2

### Section 3 — Hazards Identification

Clear, colorless or yellowish, fuming, suffocating liquid. Yellow color (if present) results from exposure to light and release of nitrogen dioxide.
Severly corrosive; will cause severe damage to eyes, skin and mucous membranes. Toxic by ingestion and inhalation. Strong oxidizer. Avoid contact with acetic acid and readily oxidized substances.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-3
Exposure-3
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. May also give gastric antacids such as Milk of Magnesia. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.
Strong oxidizer. Dangerous fire risk in contact with acetic acid, combustible or organic materials.
When heated to decomposition, emits toxic fumes of NOx and hydrogen nitrate.
Fire Fighting Instructions: Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-4
F-0
R-0
OX

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material, neutralize with sodium bicarbonate or calcium hydroxide and deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a dedicated acid cabinet and away from any source of water; if an acid cabinet is not available, store in Flinn Saf-Cube. Never store with acetic acid. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2 ppm, STEL 4 ppm (OSHA, NIOSH)

## Section 9 — Physical and Chemical Properties

Transparent, colorless or yellowish, fuming, suffocating, corrosive liquid.
Solubility: Miscible with water. Hygroscopic.
Formula: HNO3
Formula Weight: 63.01

Specific Gravity: 1.504
Nitric Acid, 69%, 15.8m

## Section 10 — Stability and Reactivity

Avoid conctact with bases, reducers, alcohols, alkali metals, brass, copper, copper alloys, galvanized iron, aluminum, corrodes steel, organic materials, amines, acetic acid, and readily oxidized substances.
Shelf life: Fair, product may turn yellow due to exposure to light.

## Section 11 — Toxicological Information

Acute effects: Poison, corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: 2500 ppm/1hr.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24b is one option.

## Section 14 — Transport Information

Shipping Name: Nitric acid
Hazard Class: 8, Corrosive
UN Number: UN2031

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-714-2), RCRA code D001, D002, D003.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 562.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Oleic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Oleic Acid
Synonym: red oil, cis-9-octadenenoic acid
CAS#: 112-80-1

### Section 3 — Hazards Identification

Clear, oily liquid. Darkens on exposure to air. Wax-like odor.
Irritating to skin and mucous membranes. Avoid all body tissue contact.
Combustible liquid.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class IIIB Combustible liquid.
Flash Point: 230 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-0
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Keep container tightly closed; darkens on exposure to air. Store in a Flinn Chem-Saf bag. Refrigerate.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Clear, oily liquid. Darkens on exposure to air. Wax like odor.
Solubility: Soluble in most organic solvents and alcohol.
Insoluble in water.
Formula: C18H34O2
Formula Weight: 282.52

Specific Gravity: 0.895
Melting Point: 14 C
Boiling Point: 194-195 @ 1.2mm

## Section 10 — Stability and Reactivity

Shelf life: Fair.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 74 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (204-007-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 571.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Oxalic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Oxalic Acid, dihydrate
Synonym: ethandionic acid
CAS#: 6153-56-6

### Section 3 — Hazards Identification

White, odorless crystalline solid.
Moderately toxic by ingestion and inhalation. Corrosive to body tissues. Will cause burns.
Avoid all body contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-3
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic 1. Store with acids, anhydrides and peracids.
Store in a cool dry place.Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1 mg/m3, STEL 2mg/m3 (OSHA, ACGIH)

## Section 9 — Physical and Chemical Properties

White, odorless crystalline solid.
Solubility: Partially soluble in water or alcohol.
Formula: H2C2O4 2H2O
Formula Weight: 126.07

Specific Gravity: 1.653
Melting Point: 101.5 C (dihydrate)

## Section 10 — Stability and Reactivity

Avoid contact with bases, acid chlorides, alkali metals, corrodes steel.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, corrosive, dermatitis, abdominal pain
Chronic effects: N.A.
Target organs: Kidneys, nerves

ORL-RAT LD50: 375 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (205-6343-3), RCRA code D002.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 574.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Pancreatin and Solutions

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Pancreatin And Pancreatin Solutions: Pancreatin (8049-47-6) 0.5% and Water (7732-18-5) 99.5%.

CAS#: 8049-47-6

### Section 3 — Hazards Identification

Yellowish, amorphous powder. Cloudy liquid as solution. Sour malt odor.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Solid: Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.
Liquid: Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Keep refrigerated.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Yellowish, amorphous powder. Sour malt odor.
Solubility: Soluble in water. Insoluble in alcohol.

## Section 10 — Stability and Reactivity

Shelf life: Good, only if kept refrigerated.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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## Material Safety Data Sheet (MSDS)

**MSDS #:** 575.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Paraffin Wax

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Paraffin Wax

CAS#: 8002-74-2

### Section 3 — Hazards Identification

White, odorless, translucent solid.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with mild soap and water.

### Section 5 — Fire Fighting Measures

Combustible solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #3. Store with hydrocarbons, esters, aldehydes and oils.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2mg/m3, (NIOSH)

## Section 9 — Physical and Chemical Properties

White, odorless, translucent solid.
Solubility: Insoluble in water.
Mixture of solid hydrocarbons of high molecular weight.

Specific Gravity: 0.880-0.915
Melting Point: 50-57 C

## Section 10 — Stability and Reactivity

Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 580.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Pepsin

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Pepsin

CAS#: 9001-75-6

### Section 3 — Hazards Identification

White or yellowish-white; odor of sour malt.
May be a slight irritant and sensitizer.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Fine powder when mixed with air may be explosive.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool dry place. Keep container tightly closed.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White or yellowish-white; odor of sour malt.
Soluble in water. Insoluble in alcohol.

## Section 10 — Stability and Reactivity

Avoid contact with alcohol, alkalis, tannins and salts of heavy metals.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant, sensitizer
Chronic effects: Possible hypersensitization, dermatitis
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 581.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Peptone

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Peptone

CAS#: None Established

### Section 3 — Hazards Identification

Light brown, amorphous powder. Odor of sour malt.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with soap and water.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Miscellaneous non-hazardous organic materials.
Store in a cool dry place. Store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Light brown, amorphous powder. Odor of sour malt.
Solubility: Soluble in water. Insoluble in alcohol.

## Section 10 — Stability and Reactivity

Shelf life: Indefinite, if kept dry.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

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MSDS Number: **B5635** * * * * * *Effective Date:* ***06/13/07*** * * * * * *Supercedes:* ***05/07/07***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Buffer Solution (Borate), pH 10

## 1. Product Identification

**Synonyms:** None
**CAS No.:** Not applicable to mixtures.
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** Not applicable to mixtures.
**Product Codes:**
J.T. Baker: 5609
Mallinckrodt: 0032

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Boric Acid | 10043-35-3 | < 1% | No |
| Potassium Hydroxide | 1310-58-3 | < 1% | Yes |
| Water | 7732-18-5 | > 99% | No |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! CORROSIVE. HARMFUL IF SWALLOWED OR INHALED. CAUSES BURNS TO ANY AREA OF CONTACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - Severe
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)
---

**Potential Health Effects**
---

The health effects from exposure to diluted forms of this chemical are not well documented. They are expected to be less severe than those for concentrated forms which are referenced in the descriptions below.

**Inhalation:**
Respiratory tract irritant, may cause serious burns on acute contact. Severe injury is usually avoided by the self-limiting coughing and sneezing symptoms.
**Ingestion:**
Toxic! Corrosive to mucous membranes and may cause perforation of the esophagus and stomach. Abdominal pain, nausea, vomiting, general gastro-intestinal upset can be expected.
**Skin Contact:**
Irritant, possibly corrosive if contact is prolonged. Soreness, redness, destruction of skin may result.
**Eye Contact:**
Irritant, possibly corrosive to eye tissues. Tearing, redness, pain, impaired vision are symptoms.
**Chronic Exposure:**
Development of a defatting dermatitis on prolonged contact with potassium hydroxide has been reported. Continued irritation may lead to increased susceptibility to respiratory illness.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of the substance.

---

# 4. First Aid Measures

First aid procedures given apply to concentrated solutions. Exposures to dilute solutions may not require these extensive first aid procedures.
**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Sealed containers may rupture when heated.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

# 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Protect from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
For Potassium Hydroxide [1310-58-3]:
- ACGIH Threshold Limit value (TLV):
2 mg/m3 Ceiling
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless liquid.
**Odor:**
Odorless.
**Solubility:**
Complete (100%)

**Specific Gravity:**
No information found.
**pH:**
10
**% Volatiles by volume @ 21C (70F):**
ca. 99 (as water)
**Boiling Point:**
ca. 100C (ca. 212F)
**Melting Point:**
ca. 0C (ca. 32F)
**Vapor Density (Air=1):**
Essentially the same as water.
**Vapor Pressure (mm Hg):**
Essentially the same as water.
**Evaporation Rate (BuAc=1):**
Essentially the same as water.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Potassium oxide at very high temperatures.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acids.
**Conditions to Avoid:**
Incompatibles.

---

# 11. Toxicological Information

For potassium hydroxide: Oral rat LD50: 273 mg/kg; Investigated as a mutagen. Skin Irritation Data (std Draize, 50 mg/24 H): Human, Severe; Rabbit, Severe. Eye Irritation Data(Rabbit, non-std test,1 mg/24 H, rinse): Moderate.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Boric Acid (10043-35-3) | No | No | None |
| Potassium Hydroxide (1310-58-3) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
Potassium Hydroxide: TLm: 80 ppm/Mosquito fish/ 24 hr./ Fresh water

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE, BORIC ACID)
**Hazard Class:** 8
**UN/NA:** UN3266
Packing Group: III
**Information reported for product/size:** 20L

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE, BORIC ACID)
**Hazard Class:** 8
**UN/NA:** UN3266
Packing Group: III
**Information reported for product/size:** 20L

**International (Air, I.C.A.O.)**
---
**Proper Shipping Name:** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE, BORIC ACID)
**Hazard Class:** 8
**UN/NA:** UN3266
Packing Group: III
**Information reported for product/size:** 20L

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Boric Acid (10043-35-3) | Yes | Yes | Yes | Yes |
| Potassium Hydroxide (1310-58-3) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| | | --Canada-- | | |
|---|---|---|---|---|
| Ingredient | Korea | DSL | NDSL | Phil. |
| Boric Acid (10043-35-3) | Yes | Yes | No | Yes |
| Potassium Hydroxide (1310-58-3) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| | -SARA 302- | | ------SARA 313------ | |
|---|---|---|---|---|
| Ingredient | RQ | TPQ | List | Chemical Catg. |
| Boric Acid (10043-35-3) | No | No | No | No |
| Potassium Hydroxide (1310-58-3) | No | No | No | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Boric Acid (10043-35-3) | No | No | No |
| Potassium Hydroxide (1310-58-3) | 1000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
DANGER! CORROSIVE. HARMFUL IF SWALLOWED OR INHALED. CAUSES BURNS TO ANY AREA OF CONTACT.
**Label Precautions:**
Do not breathe mist.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **B5638** * * * * * *Effective Date:* ***07/03/07*** * * * * * *Supercedes:* ***05/07/07***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# pH 10 BUFFER NH4Cl, NH4OH

## 1. Product Identification

**Synonyms:** Ammonium hydroxide buffer, NH4Cl, NH4OH
**CAS No.:** Not applicable to mixtures.
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** Not applicable to mixtures.
**Product Codes:** 5887

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Ammonium Hydroxide | 1336-21-6 | 7% | Yes |
| Ammonium Chloride | 12125-02-9 | 1% | Yes |
| Water | 7732-18-5 | 92% | No |

## 3. Hazards Identification

**Emergency Overview**

**POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White Stripe (Store Separately)

**Potential Health Effects**
---

The following hazards are for concentrated solutions. Hazards of less concentrated solutions may be reduced. Degree of hazard for reduced concentrations is not currently addressed in the available literature.

**Inhalation:**
Vapors and mists cause irritation to the respiratory tract. Higher concentrations can cause burns, pulmonary edema and death. Brief exposure to 5000 ppm can be fatal.
**Ingestion:**
Toxic! May cause corrosion to the esophagus and stomach with perforation and peritonitis. Symptoms may include pain in the mouth, chest, and abdomen, with coughing, vomiting and collapse. Ingestion of as little as 3-4 mL may be fatal.
**Skin Contact:**
Causes irritation and burns to the skin.
**Eye Contact:**
Vapors cause irritation. Splashes cause severe pain, eye damage, and permanent blindness.
**Chronic Exposure:**
Repeated exposure may cause damage to the tissues of the mucous membranes, upper respiratory tract, eyes and skin.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing eye disorders or impaired respiratory function may be more susceptible to the effects of this material.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately. Call a physician immediately.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
**Eye Contact:**
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately. Immediate action is critical to minimize possibility of blindness.

---

# 5. Fire Fighting Measures

**Fire:**
Not expected to be a fire hazard.
**Explosion:**
Flammable vapors may accumulate in confined spaces.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal.
US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRACIT®-2 or BuCAIM® caustic neutralizers are recommended for spills of this product.

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from incompatibilities. Store below 25C. Protect from direct sunlight. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
50 ppm (NH3)
-ACGIH Threshold Limit Value (TLV):
25 ppm (NH3) (TWA) 35 ppm (STEL)
Ammonium chloride:
-ACGIH Threshold Limit Value (TLV):
10 mg/m3 (TWA); 20 mg/m3 (STEL) Fume
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an ammonia/methylamine cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended materials. Polyvinyl alcohol is not recommended.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**

Clear, colorless solution.
**Odor:**
Ammonia odor.
**Solubility:**
Infinitely soluble.
**Specific Gravity:**
No information found.
**pH:**
10-11
**% Volatiles by volume @ 21C (70F):**
No information found.
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce ammonia, nitrogen oxides.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acids, acrolein, dimethyl sulfate, halogens, silver nitrate, propylene oxide, nitromethane, silver oxide, silver permanganate, oleum, beta-propiolactone. Most common metals.
**Conditions to Avoid:**
Heat, sunlight, incompatibles, sources of ignition.

---

# 11. Toxicological Information

For ammonium hydroxide:
oral rat LD50: 350 mg/kg; eye, rabbit, standard Draize, 250 ug; severe, investigated as a mutagen.
For ammonia:
inhalation rat LC50: 2000 ppm/4-hr; investigated as a tumorigen, mutagen.
Ammonium Chloride:
Oral rat LD50 : 1650 mg/kg
Investigated as a mutagen.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | No | No | None |
| Ammonium Chloride (12125-02-9) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
This material is not expected to significantly bioaccumulate.
**Environmental Toxicity:**
This material is expected to be very toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l. The EC50/48-hour values for daphnia are less than 1 mg/l.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** CORROSIVE LIQUIDS, N.O.S. (AMMONIUM HYDROXIDE, AMMONIUM CHLORIDE)
**Hazard Class:** 8
**UN/NA:** UN1760
Packing Group: III
**Information reported for product/size:** 1L

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** CORROSIVE LIQUIDS, N.O.S. (AMMONIUM HYDROXIDE, AMMONIUM CHLORIDE)
**Hazard Class:** 8
**UN/NA:** UN1760
Packing Group: III
**Information reported for product/size:** 1L

**International (Air, I.C.A.O.)**
---
**Proper Shipping Name:** CORROSIVE LIQUIDS, N.O.S. (AMMONIUM HYDROXIDE, AMMONIUM CHLORIDE)
**Hazard Class:** 8
**UN/NA:** UN1760
Packing Group: III
**Information reported for product/size:** 1L

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | Yes | Yes | Yes | Yes |
| Ammonium Chloride (12125-02-9) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| | | --Canada-- | | |
|---|---|---|---|---|
| Ingredient | Korea | DSL | NDSL | Phil. |

| | | | | |
|---|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | Yes | Yes | No | Yes |
| Ammonium Chloride (12125-02-9) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | No | No | No | No |
| Ammonium Chloride (12125-02-9) | No | No | No | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Ammonium Hydroxide (1336-21-6) | 1000 | No | No |
| Ammonium Chloride (12125-02-9) | 5000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** 2P
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. IMMEDIATE ACTION IS ESSENTIAL FOR EYE EXPOSURES. In all cases call a physician immediately.
**Product Use:**
Buffering solution.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.**

**Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **A0329** * * * * * *Effective Date:* ***08/22/08*** * * * * * *Supercedes:* ***11/01/06***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# pH 4.5 Acetate Buffer

## 1. Product Identification

**Synonyms:** Acetic acid solution
**CAS No.:** Not applicable to mixtures.
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:**
**Product Codes:** D017, XL-224

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Sodium Acetate | 127-09-3 | 8% | Yes |
| Water | 7732-18-5 | 92% | No |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE SKIN AND EYE IRRITATION.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 2 - Moderate
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**
---

**Inhalation:**
May cause irritation to the respiratory tract. Inhalation is not an expected hazard unless misted or heated to high temperatures. Mist or vapor inhalation can cause irritation to the nose, throat, and upper respiratory tract. Severe exposures can lead to a chemical pneumonitis.
**Ingestion:**
May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance. Persons with impaired kidney function may be more susceptible to the effects of the substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
**Ingestion:**
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Contact with strong oxidizers may cause fire. Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water diluted acid can react with metals to form hydrogen gas.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Use

water spray to dilute spill to a nonflammable mixture. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Use non-sparking tools and equipment. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

---

# 7. Handling and Storage

Store at room temperature. Protect container from physical damage. Store in a well-ventilated area. Protect from moisture. Isolate from any source of heat or ignition. Outside or detached storage is recommended. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
For Acetic Acid Component:
-OSHA Permissible Exposure Limit (PEL):
10 ppm (TWA).
-ACGIH Threshold Limit Value (TLV):
10 ppm (TWA); 15 ppm (STEL).
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless liquid.
**Odor:**
Strong, vinegar-like.
**Solubility:**
Infinitely soluble.
**Density:**

No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
No information found.
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition. May also release toxic and irritating vapors.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acetic Acid is incompatible with chromic acid, nitric acid, ethylene glycol, perchloric acid, phosphorous trichloride, oxidizers, sodium peroxide, strong caustics, most metals (except aluminum), carbonates, hydroxides, oxides, and phosphates.
**Conditions to Avoid:**
Heat, flame, ignition sources, freezing, incompatibles

---

# 11. Toxicological Information

For Acetic Acid: Oral rat LD50: 3310 mg/kg. Dermal rabbit LD50: 1.06g/Kg. Inhalation mouse LC50: 5620 ppm/1 hr. Investigated as a mutagen, reproductive effector.

Results from Corrositex® Testing: > 60 minutes, non-corrosive.

--------\Cancer Lists\------------------------------------------------------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Sodium Acetate (127-09-3) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
For glacial acetic acid: If released to the atmosphere, it is degraded in the vapor phase by reaction with photochemically produced hydroxyl radicals (estimated typical half-life of 26.7 days). If released to water, acetic acid will biodegrade readily. If released to soil, it will biodegrade readily. Standard dilution BOD water, 5-day 57.7% theoretical BOD average. Acetic acid shows no potential for biological accumulation or food chain contamination. BCF estimated < 1.

**Environmental Toxicity:**
For glacial acetic acid:
EC50 (wheat fumigation) = 23.3 mg/m3/2-hr, effect: leaf injury
LC50 (shrimp) = 100 - 300 mg/l/48-hr
LC50 (fathead minnow) = 88 mg/l/96-hr
This material may be toxic to aquatic life.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Sodium Acetate (127-09-3) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Sodium Acetate (127-09-3) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Sodium Acetate (127-09-3) | No | No | No | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Sodium Acetate (127-09-3) | No | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Mixture / Liquid)

**Australian Hazchem Code:** 2R
**Poison Schedule:** S5
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE SKIN AND EYE IRRITATION.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 7.
**Disclaimer:**
**********

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**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **B5625** * * * * * *Effective Date:* ***03/14/07*** * * * * * *Supercedes:* ***11/10/05***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker®

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Buffer Concentrate (Biphthalate), pH 4, DILUT-IT®

## 1. Product Identification

**Synonyms:** None
**CAS No.:** 877-24-7
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** HOOC-C6H4COOK in H2O
**Product Codes:** 4795

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Potassium Acid Phthalate | 877-24-7 | 10 - 11% | Yes |
| Water | 7732-18-5 | 89 - 90% | No |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

---

Information on the human health effects from exposure to this substance is limited.

**Inhalation:**
Not expected to be an inhalation hazard. May cause irritation to respiratory tract because of slight acidity. Symptoms may include coughing and sore throat.
**Ingestion:**
Large doses may produce nausea, vomiting, and abnormal sensations in hands and feet. Because of slight acidity, causes irritation to the mucous membranes.
**Skin Contact:**
Contact may cause irritation, with redness and pain.
**Eye Contact:**
May cause eye irritation.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

---

# 5. Fire Fighting Measures

**Fire:**
Not expected to be a fire hazard.
**Explosion:**
No information found.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
**Personal Respirators (NIOSH Approved):**
Not expected to require personal respirator usage.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless liquid.
**Odor:**
Odorless.
**Solubility:**
Complete (100%)
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
ca. 90
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
Not applicable.
**Vapor Pressure (mm Hg):**
Not applicable.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.

**Incompatibilities:**
Nitric Acid. Strong oxidizing agents.
**Conditions to Avoid:**
Heat, ignition sources and incompatibililites.

---

# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | No | No | No | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | No | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Keep container closed.
Wash thoroughly after handling.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
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**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **B5631** * * * * * *Effective Date:* ***10/15/08*** * * * * * *Supercedes:* ***04/21/08***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# Buffer Solution (Phosphate), pH 7

## 1. Product Identification

**Synonyms:** None
**CAS No.:** Not applicable to mixtures.
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** Not applicable to mixtures.
**Product Codes:**
J.T. Baker: 5608
Mallinckrodt: 0031

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Potassium Phosphate Monobasic | 7778-77-0 | < 1% | No |
| Sodium Phosphate, Dibasic | 7558-79-4 | < 1% | No |
| Water | 7732-18-5 | > 99% | No |

## 3. Hazards Identification

**Emergency Overview**

**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 0 - None
Lab Protective Equip: GOGGLES; LAB COAT

Storage Color Code: Green (General Storage)

---

**Potential Health Effects**

---

**Inhalation:**
No adverse health effects via inhalation.
**Ingestion:**
Not expected to be a health hazard via ingestion. Large oral doses may cause irritation to the gastrointestinal tract.
**Skin Contact:**
Not expected to be a health hazard from skin exposure.
**Eye Contact:**
No adverse effects expected.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

Not expected to require first aid measures.
**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**
Wash thoroughly with running water. Get medical advice if irritation develops.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust.

---

# 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
**Personal Respirators (NIOSH Approved):**
Not expected to require personal respirator usage.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless liquid.
**Odor:**
Odorless.
**Solubility:**
Complete (100%)
**Specific Gravity:**
No information found.
**pH:**
7
**% Volatiles by volume @ 21C (70F):**
ca. 99
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
Not applicable.
**Vapor Pressure (mm Hg):**
Not applicable.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
No information found.
**Hazardous Polymerization:**

Will not occur.
**Incompatibilities:**
No information found.
**Conditions to Avoid:**
Heat.

---

# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\------------------------------------------------------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Potassium Phosphate Monobasic (7778-77-0) | No | No | None |
| Sodium Phosphate, Dibasic (7558-79-4) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Dilute with water and flush to sewer if local ordinances allow, otherwise, whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Potassium Phosphate Monobasic (7778-77-0) | Yes | Yes | Yes | Yes |
| Sodium Phosphate, Dibasic (7558-79-4) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Potassium Phosphate Monobasic (7778-77-0) | Yes | Yes | No | Yes |
| Sodium Phosphate, Dibasic (7558-79-4) | Yes | Yes | No | Yes |

```
Water (7732-18-5)                                Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                              -SARA 302-    ------SARA 313------
Ingredient                                    RQ    TPQ     List  Chemical Catg.
--------------------------------------------  ---   -----   ----  --------------
Potassium Phosphate Monobasic (7778-77-0)     No    No      No         No
Sodium Phosphate, Dibasic (7558-79-4)         No    No      No         No
Water (7732-18-5)                             No    No      No         No

--------\Federal, State & International Regulations - Part 2\----------------
                                                      -RCRA-    -TSCA-
Ingredient                                    CERCLA  261.33    8(d)
--------------------------------------------  ------  ------    ------
Potassium Phosphate Monobasic                 No      No        No
(7778-77-0)
Sodium Phosphate, Dibasic (7558-79-4)         5000    No        No
Water (7732-18-5)                             No      No        No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: No       Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Mixture / Liquid)
```

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 9.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 834.50
**Revision Date:** October 1, 2007

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Tris-glycine - SDS Buffer (10X)

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Tris (hydroxylmethyl) aminomethane (77-86-1) 30%, Glycine (56-40-6) 14.4%, sodiumdodecyl sulfate (151-21-3) 1% water (7732-18-5) 82%

CAS#: None Established

### SECTION 3 — HAZARDS IDENTIFICATION

Clear colorless liquid, no odor.
Body tissue irritant. Avoid contact with body tissues.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non flammable, non combustible liquid.

**NFPA CODE**
H-1
F-0
R-0

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic Miscellaneous. Store with other electrophoresis supplies.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Clear, colorless liquid.
pH @ 20 C = 8.3-8.6
Note: This is a 10X buffer concentrate. Dilute 1:10 with water to obtain working strength buffer for electrophoresis.

## SECTION 10 — STABILITY AND REACTIVITY

Avoid heat.
Shelf life: Good

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26b is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

Not listed.

## SECTION 16 — OTHER INFORMATION

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**Consult your copy of the Flinn Chemical Catalog/Reference Manual for additional information about laboratory chemicals**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 589.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Phenol Red

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Phenol Red, sodium salt
Synonyms: phenolsulfonephthalein indicator
CAS#: 34487-61-1

### Section 3 — Hazards Identification

Bright to dark red crystal or powder. Odorless.
Irritating to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Bright to dark red crystal or powder. Odorless.
Acid/base Indicator: pH 6.8 yellow to 8.4 red
Solubility: Alkali hydroxides and carbonates; slightly in water and alcohol.

Formula: C19H13NaO5S
Formula Weight: 376.36

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (252-057-8).

## Section 16 — Other Information

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**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 591.00
**Revision Date:** May 20, 2008

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Phenolphthalein

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Phenolphthalein

CAS#: 77-09-8

### SECTION 3 — HAZARDS IDENTIFICATION

Pale yellow or off-white powder. Odorless.
Acts as a laxative upon ingestion. Irritating to body tissues. Avoid body tissue contact.
Possible carcinogen.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Non flammable solid.
When heated to decomposition, emits acrid and toxic fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool dry place.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

Pale yellow powder.
Solubility: Insoluble in water. Soluble in alcohol, alkalies, and ether.
Formula: C20H14O4
Formula Weight: 318.31

Specific Gravity: 1.299
Melting Point: 258-262 C

## SECTION 10 — STABILITY AND REACTIVITY

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Irritant, laxative
Chronic effects: Possible carcinogen.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (201-004-7).

## SECTION 16 — OTHER INFORMATION

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 600.00
**Revision Date:** March 10, 2001

### Section 1 — Chemical Product and Company Identification

## o-Phosphoric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

o-Phosphoric Acid
Synonym: orthophosphoric acid
CAS#: 7664-38-2

### Section 3 — Hazards Identification

Colorless, odorless viscous liquid.
Moderately toxic by ingestion and inhalation; severe corrosive to body tissues.
Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-2
Exposure-3
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.
When heated to decomposition, emits toxic fumes of POx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-3
F-0
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material, neutralize with sodium bicarbonate or calcium hydroxide and deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #9. Store with acids.
Store in a dedicated acid cabinet and away from any source of water; if an acid cabinet is not available, store in Flinn Saf-Cube.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).Exposure guidelines: TWA 1.0 mg/m3 (STEL) 3.0 mg/m3(OSHA)

## Section 9 — Physical and Chemical Properties

Colorless, odorless, viscous liquid.
Solubility: Soluble in water and alcohol.
Formula: H3PO4
Formula Weight: 98.00

Specific Gravity: 1.685

## Section 10 — Stability and Reactivity

Avoid contact with strong bases, finely powdered metals. Forms a detonable mixture with nitromethane.
Shelf life: Good, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Harmful liquid, corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1530 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: 2740 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24b is one option.

## Section 14 — Transport Information

Shipping Name: Phosphoric Acid
Hazard Class: 8, Corrosive
UN Number: UN1805

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-633-2), RCRA code D002.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 607.50
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Polyurethane Foam System (Part A)

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Part A: proprietary mixture containing a poly ether polyol, a tertiary amine, and a silicone surfactant.

CAS#: None Established

### Section 3 — Hazards Identification

Yellow/amber colored liquid with a rubber-like odor.
Irritating to body tissues and respiratory tract.
Avoid all body tissue contact. Do not breathe vapor.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class IIIB combustible liquid.
Flash Point: 200 F
When heated to decomposition, emits toxic fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Do not store longer than 3 years. Immediately reseal container after dispensing to preserve the expanding property.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Yellow/amber colored liquid with a rubber-like odor.
Solubility: Acetone and some other organic solvents.

## Section 10 — Stability and Reactivity

Avoid exposure to flame.
Shelf life: Should not be stored for more than 3 years.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: >5000 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: >5000 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 607.60
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Polyurethane Foam System (Part B)

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Part B: proprietary mixture containing a 4,4-diphenylmethane diisocyanate (101-68-8) 38-50%, polymethylene polyphenyl isocyanate (9016-87-9) 20-35%, and diphenylmethane diisocyanate (26447-40-5) 20-35%.

CAS#: None Established

### Section 3 — Hazards Identification

Dark brown liquid; odorless.
Irritating to body tissues and respiratory tract. Avoid all body tissue contact. Do not breathe vapor.
Combustible liquid.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class IIIB combustible liquid.
Flash Point: 425 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #5. Store with epoxy compounds and isocyanates.
Do not store longer than 3 years. Immediately reseal container after dispensing to preserve the expanding property.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Dark brown liquid; odorless.
Solubility: Acetone and some other organic solvents.

Specific Gravity: 1.24

## Section 10 — Stability and Reactivity

Avoid contact with water, alcohols, amines, strong bases, acids and metal compounds.
Shelf life: Should not be stored for more than 3 years.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: >10000 mg/kg
IHL-RAT LC50: 370-490 mg/m3/4H
SKN-RBT LD50: >9400 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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MSDS Number: **P5521** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***01/09/06***

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# POTASSIUM ACID PHTHALATE

## 1. Product Identification

**Synonyms:** 1,2-Benzenedicarboxylic acid monopotassium salt; potassium biphthalate; potassium hydrogen phthalate; Phthalic acid, potassium salt
**CAS No.:** ç
**Molecular Weight:** 204.23
**Chemical Formula:** HOOC-C6H4COOK
**Product Codes:**
J.T. Baker: 2958, 4889
Mallinckrodt: 6704

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Potassium Acid Phthalate | 877-24-7 | 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**
---
**CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
---
Health Rating: 0 - None
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

---

**Potential Health Effects**
---

Information on the human health effects from exposure to this substance is limited.

**Inhalation:**
May cause irritation to respiratory tract because of slight acidity. Symptoms may include coughing and sore throat.
**Ingestion:**
Large doses may produce nausea, vomiting, and abnormal sensations in hands and feet. Because of slight acidity, causes irritation to the mucous membranes.
**Skin Contact:**
Contact may cause irritation, with redness and pain.
**Eye Contact:**
May cause eye irritation.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.
**Eye Contact:**
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

---

# 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

## 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
None established.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
Colorless or white crystals.
**Odor:**
Odorless.
**Solubility:**
25g/100m1 cold water
**Specific Gravity:**
1.64
**pH:**
4.0 0.05M soln.:
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Nitric Acid. Strong oxidizing agents.
**Conditions to Avoid:**
Heat, ignition sources and incompatibililites.

---

# 11. Toxicological Information

Oral rat LD50: >3200 mg/kg

--------\Cancer Lists\------------------------------------------------------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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# 14. Transport Information

Not regulated.

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# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Potassium Acid Phthalate (877-24-7) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|

```
  Potassium Acid Phthalate (877-24-7)               Yes   Yes   No     Yes

  --------\Federal, State & International Regulations - Part 1\----------------
                                              -SARA 302-    ------SARA 313------
  Ingredient                                  RQ    TPQ     List  Chemical Catg.
  ----------------------------------------  ---   -----   ----  --------------
  Potassium Acid Phthalate (877-24-7)         No    No      No         No

  --------\Federal, State & International Regulations - Part 2\----------------
                                                        -RCRA-    -TSCA-
  Ingredient                                  CERCLA    261.33     8(d)
  ----------------------------------------  ------    ------    ------
  Potassium Acid Phthalate (877-24-7)         No        No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: No   Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid breathing dust.
Avoid contact with eyes, skin and clothing.
Keep container closed.
Wash thoroughly after handling.
Use with adequate ventilation.
**Label First Aid:**
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********
**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**
**********
**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 620.00
**Revision Date:** May 22, 2001

### Section 1 — Chemical Product and Company Identification

## Potassium Chlorate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Chlorate
Synonym: chloric acid, potassium salt
CAS#: 3811-04-9

### Section 3 — Hazards Identification

White, crystals or powder. Odorless.
Slightly toxic by ingestion.
Irritating to body tissues. Avoid all body tissue contact.
Strong oxidizer, fire and explosion risk.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid. Strong oxidizer. Forms explosive mixtures with combustible materials. If only slightly contaminated, will explode when exposed to moderate shock or when heated. When heated to decomposition, emits toxic fumes of Cl and K2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
H-1
F-0
R-1
OX

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #6. Store with bromates and chlorates.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystals or powder. Odorless.
Solubility: Soluble in boiling water.
Formula: KClO3
Formula Weight: 122.56

Specific Gravity: 2.337
Melting Point: 368 C

## Section 10 — Stability and Reactivity

Avoid contact with reducers, finely powdered metals, strong acids, alcohols, organic materials, and other combustible materials.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: Anemia
Target organs: Blood, liver, kidneys

ORL-RAT LD50: 1870 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Potassium Chlorate
Hazard Class: 5.1, Oxidizer
UN Number: UN1485

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (223-289-7), RCRA code D001, D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 621.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Chloride

CAS#: 7447-40-7

### Section 3 — Hazards Identification

Colorless or white crystals. Odorless.
Slightly toxic by ingestion. Ingestion of large quantities can cause weakness, GI and circulatory disturbances. Irritating to body tissues. Avoid all body tissue content.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of K2O and Cl.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless or white crystals. Odorless.
Solubility: Soluble in water; slightly in alcohol.
Formula: KCl
Formula Weight: 74.6

Specific Gravity: 1.987
Melting Point: 772 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, strong acids.
Shelf life: Poor; hygroscopic

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: stomach, blood

ORL-RAT LD50: 2430 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-211-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 627.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Dichromate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Dichromate
Synonym: potassium bichromate
CAS#: 7778-50-9

### Section 3 — Hazards Identification

Orange crystalline powder. Odorless.
Corrosive to body tissues. Sensitizer. Known carcinogen.
Toxic by inhalation, ingestion and skin absorption. Can cause severe ulceration and inflammation of skin and mucous membranes. Avoid all body contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-3
Exposure-3
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer. Dangerous fire risk when in contact with organic materials.
When heated to decomposition, emits toxic fumes of K2O and Cr.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #8. Store with borates, chromates, manganates and permanganates.
Store in a cool dry place. Use and dispense in a hood. Store in a locked poisons cabinet.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 0.5 mg/m3 (CrO3) (ACGIH)

## Section 9 — Physical and Chemical Properties

Orange crystalline powder. Odorless.
Solubility: Soluble in water; insoluble in alcohol.
Formula: K2Cr2O7
Formula Weight: 294.22

Specific Gravity: 2.676
Melting Point: 396 C

## Section 10 — Stability and Reactivity

Avoid contact with reducers and organic materials.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Poison, corrosive, sensitizer
Chronic effects: Known carcinogen, mutagen
Target organs: Lungs, kidneys

ORL-MUS LD50: 190 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Oxidizing solid, n.o.s.
Hazard Class: 5.1, Oxidizer
UN Number: UN1479

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-906-6), RCRA code D001, D007.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 629.00
**Revision Date:** March 10, 2001

### Section 1 — Chemical Product and Company Identification

## Potassium Ferricyanide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Ferricyanide
Synonym: red prussiate of potash, potassium hexacyanoferrate
CAS#: 13746-66-2

### Section 3 — Hazards Identification

Orange/lemon yellow crystals.
Slightly toxic by ingestion. Body tissue irritant.
When heated to decomposition or in contact with strong acids, may liberate toxic hydrogen cyanide fumes.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-2
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition or in contact with strong acids, may liberate toxic fumes of CN and K2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #7. Store with arsenates, cyanides and cyanates.
Store in a cool dry place and light sensitive.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Orange/lemon yellow crystals.
Solubility: Soluble in water; slightly in alcohol.
Formula: K3Fe(CN)6
Formula Weight: 329.27

Specific Gravity: 1.85
Melting Point: 390 F (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong acids, strong oxidizers, sodium nitrite, ammonia, chromium trioxide, cupric nitrate. Reaction with strong acids may liberate toxic HCN fumes.
Shelf life: Fair.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1600 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #14 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (237-323-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 634.00
**Revision Date:** March 10, 2001

### Section 1 — Chemical Product and Company Identification

## Potassium Hydroxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Hydroxide

CAS#: 1310-58-3

### Section 3 — Hazards Identification

White pellets or flakes. Odorless.
Highly toxic by ingestion. Severely corrosive to body tissue, especially eyes. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-2
Exposure-3
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of K2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
H-3
F-0
R-1

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Use and dispense in a hood. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2 mg/m3 (NIOSH)

## Section 9 — Physical and Chemical Properties

White pellets or flakes. Odorless.
Solubility: Soluble in water, alcohol and glycerol.
Formula: KOH
Formula Weight: 56.11
Reagent potassium hydroxide contains 10-15% water.

Specific Gravity: 2.044
Melting Point: 405 C (varies with water content)
Boiling Point: 1320 C

## Section 10 — Stability and Reactivity

Avoid contact with aluminum, organic materials, acid chlorides, acid anhydrides, magnesium, and copper.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 273 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #10 is one option.

## Section 14 — Transport Information

Shipping Name: Potassium hydroxide, solid
Hazard Class: 8, Corrosive
UN Number: UN1813

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-181-3), RCRA code D002, D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 636.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Iodate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Iodate

CAS#: 7758-05-6

### Section 3 — Hazards Identification

White, crystalline powder. Strong iodine odor.
Irritating to body tissues. Moderately toxic by ingestion. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-3
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer. Fire risk when exposed to organic or combustible materials.
When heated to decomposition, emits toxic fumes of I and K2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #6. Store with chlorates, bromates, iodates, chlorites, perchloric acid, and peroxides. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White crystalline powder. Strong iodine odor.
Solubility: Soluble in water, dilute sulfuric acid; insoluble in alcohol.
Formula: KIO3
Formula Weight: 214.01

Specific Gravity: 3.9
Melting Point: 560 C

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, finely powdered metals, organic and combustible materials.
When mixed with iodate, aluminum, copper, arsenic, phosphorus, carbon and sulfur products may explode on heating.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-MUS LDLO: 531 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Oxidizing solid, n.o.s.
Hazard Class: 5.1, Oxidizer
UN Number: UN1479

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-831-9), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 638.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Iodide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Iodide

CAS#: 7681-11-0

### Section 3 — Hazards Identification

White crystals, granules or powder. Odorless.
Irritating to body tissues. Possible sensitizer. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
When heated to decomposition, emits toxic fumes of K20 and I.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Air, light and moisture sensitive. Store in a Flinn Chem-Saf bag.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White crystals, granules or powder. Odorless.
Solubility: Soluble in water, alcohol, acetone, and glycerol.
Formula: KI
Formula Weight: 166.01

Boiling Point: 1420 C
Specific Gravity: 3.123
Melting Point: 686 C

## Section 10 — Stability and Reactivity

Avoid contact with reducers, acid, steel, aluminum, alkali metals, brass, magnesium, zinc, cadmium, copper, tin, nickel and their alloys.
Shelf life: Poor.

## Section 11 — Toxicological Information

Acute effects: Irritant, possible sensitizer
Chronic effects: Possible teratogen
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-659-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 640.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Nitrate

CAS#: 7757-79-1

### Section 3 — Hazards Identification

Transparent, colorless crystals or powder. Odorless.
Slightly toxic by ingestion. Irritating to body tissues. Avoid body tissue contact.
Chronic exposure to small amounts can cause anemia, nephritis, methemoglobinemia.
Strong oxidizer: Fire risk when in contact with combustible materials.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer. Dangerous fire risk if shocked or heated. Avoid contact with organic materials.
When heated to decomposition, emits toxic fumes of NOx and K2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Use and dispense in a hood. Store in a Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Transparent, colorless crystals or powder. Odorless.
Solubility: Soluble in water; slightly in alcohol.
Formula: KNO3
Formula Weight: 101.11

Specific Gravity: 2.1062
Melting Point: 333 C

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, finely powdered metals, strong acids, organic and combustible materials.
Shelf life: Good.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: Blood, central nervous system

ORL-RAT LD50: 3750 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Potassium Nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1486

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-818-8), RCRA code D001.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 645.00

**Revision Date:** February 24, 2003

### Section 1 — Chemical Product and Company Identification

## Potassium Permanganate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Permanganate

CAS#: 7722-64-7

### Section 3 — Hazards Identification

Dark purple or blue, odorless crystals with a metallic sheen.
Slightly toxic by ingestion. Corrosive to body tissues. Avoid all body tissue contact.
Strong oxidizing agent, dangerous fire risk when heated in contact with organic materials.

**FLINN AT-A-GLANCE**

Health-1
Flammability-0
Reactivity-3
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Powerful oxidizing agent; dangerous fire and explosion risk. When heated in contact with organic or combustible materials, can explode. When heated to decomposition, emits toxic fumes of K2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**

None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #8. Store with borates, chromates, manganates and permanganates.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Dark, purple, blue, odorless crystals with a metallic sheen.
Solubility: Soluble in water, acetone and methyl alcohol.
Formula: KMnO4
Formula Weight: 158.04

Specific Gravity: 2.7032
Melting Point: Decomposes at 240 C.

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, organic and combustible materials, finely powdered metals, peroxides, aluminum, zinc, lead, copper, and their alloys.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, corrosive. Overexposure may produce anemia, swelling of the throat with possible suffocation, kidney damage and infertility in men. Chronic effects: N.A.
Target organs: Central nervous system, blood, kidneys, lungs

ORL-RAT LD50: 1090 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12a is one option.

## Section 14 — Transport Information

Shipping Name: Potassium Permanganate
Hazard Class: 5.1, Oxidizer
UN Number: UN1490

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-760-3), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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## Material Safety Data Sheet (MSDS)

**MSDS #:** 649.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Phosphate, Dibasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Phosphate, dibasic
Synonym: potassium hydrogen phosphate
CAS#: 7758-11-4

### Section 3 — Hazards Identification

White crystals or powder. Odorless.
Body tissue irritant. May cause irritation to eyes, skin, and mucous membranes.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of POx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White crystals or powder. Odorless.
Solubility: Very soluble in water.
Formula: K2HPO4
Formula Weight: 174.18

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Poor; unless stored under dry conditions.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-834-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 648.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Phosphate, Monobasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Phosphate, monobasic
Synonym: potassium dihydrogen phosphate
CAS#: 7778-77-0

### Section 3 — Hazards Identification

Colorless, odorless crystals.
Body tissue irritant. May cause irritation to eyes, skin, and mucous membranes.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, odorless crystals.
Solubility: Soluble in water; insoluble in alcohol.
Formula: KH2PO4
Formula Weight: 136.09

Specific Gravity: 2.338
Melting Point: 253 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf life: Poor; hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Eye irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-913-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 650.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Phosphate, Tribasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Phosphate, tribasic
Synonym: tripotassium phosphate
CAS#: 7778-53-2

### Section 3 — Hazards Identification

White granules or powder. Deliquescent. Odorless.
Slightly toxic by ingestion. Corrosive to body tissue. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of POx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White granules or powder. Odorless.
Solubility: Soluble in water. Insoluble in alcohol.
Formula: K3PO4 nH2O
Formula Weight: 212.27 as K3PO4

Specific Gravity: 2.564 (anhydrous)
Melting Point: 1340 C (anhydrous)

## Section 10 — Stability and Reactivity

Shelf life: Poor, unless stored under dry conditions.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1450 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-907-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 654.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Potassium Thiocyanate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Potassium Thiocyanate

CAS#: 333-20-0

### Section 3 — Hazards Identification

Colorless, odorless, transparent crystals; deliquescent.
Moderately toxic by ingestion. Irritating to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of HCN, K2O, SOx and NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #7. Store with arsenates, cyanides and cyanates.
Moisture sensitive material, store in a Flinn Chem-Saf bag. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, odorless, transparent crystals.
Solubility: Soluble in water, alcohol and acetone.
Formula: KSCN
Formula Weight: 97.18

Specific Gravity: 1.88
Melting Point: 173 C

## Section 10 — Stability and Reactivity

If heated or in contact with concentrated acids, may liberate poisonous fumes of hydrogen cyanide. Avoid contact with strong acids, oxidizing agents, and heat.
Shelf life: Fair to poor; substance deliquescent.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant, eczema
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 854 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (206-370-1).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 661.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## n-Propyl Alcohol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

n-Propyl Alcohol
Synonym: 1-propanol
CAS#: 71-23-8

### Section 3 — Hazards Identification

Colorless liquid; odor similar to ethyl alcohol.
Severe eye and skin irritant. Slightly toxic by ingestion, inhalation and skin absorption. Avoid all body contact.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-1
Flammability-3
Reactivity-1
Exposure-1
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Class 1B flammable liquid.
Flash Point: 59 F UEL: 13.7% LEL: 2.1% Autoignition Temperature: 824 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-3
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a dedicated flammables cabinet. If a flammables cabinet is not available, store in Flinn Saf-Stor can.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 200 ppm, STEL 250 ppm (OSHA, NIOSH)

## Section 9 — Physical and Chemical Properties

Colorless liquid; odor similar to ethyl alcohol
Solubility: Soluble in water, ethyl alcohol and ether.
Formula: CH3CH2CH2OH
Formula Weight: 60.11

Specific Gravity: 0.804
Melting Point: -127 F
Boiling Point: 97 C
Vapor Pressure: 14.9 mm (20 C)
Vapor Density: 2.1

## Section 10 — Stability and Reactivity

Avoid contact with oxidizers, acid chlorides, acid anhydrides, acids, halogens and aluminum.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Harmful liquid and fumes, severe eye irritant, nausea, headache, and vomiting.
Chronic effects: N.A.
Target organs: Nerves, liver

ORL-RAT LD50: 1870 mg/kg
IHL-MUS LC50: 48 gm/m3
SKN-RBT LD50: 5040 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 18b is one option.

## Section 14 — Transport Information

Shipping Name: n-Propanol
Hazard Class: 3, Flammable liquid
UN Number: UN1274

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-746-9), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

MSDS Number: **P6928** * * * * * *Effective Date:* ***07/09/08*** * * * * * *Supercedes:* ***05/19/08***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# PROPYLENE GLYCOL

## 1. Product Identification

**Synonyms:** 1,2-propanediol; 1,2-dihdroxypropane; methyl glycol; methylethylene glycol
**CAS No.:** 57-55-6
**Molecular Weight:** 76.09
**Chemical Formula:** CH3CHOHCH2OH
**Product Codes:**
J.T. Baker: 9402, 9403, U510
Mallinckrodt: 1925, 6263

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Propylene Glycol | 57-55-6 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**
---
**CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
---
Health Rating: 2 - Moderate (Life)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)
---

**Potential Health Effects**
---

**Inhalation:**
No adverse health effects via inhalation.
**Ingestion:**
Relatively non-toxic. Ingestion of sizable amount (over 100ml) may cause some gastrointestinal upset and temporary central nervous system depression. Effects appear more severe in individuals with kidney problems.
**Skin Contact:**
Mild irritant and defatting agent, especially on prolonged contact.
**Eye Contact:**
May cause transitory stinging and tearing.
**Chronic Exposure:**
Lactic acidosis, stupor and seizures have been reported following chronic ingestion.
**Aggravation of Pre-existing Conditions:**
Kidney disorders.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Not expected to require first aid measures.
**Ingestion:**
Not expected to require first aid measures. Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
**Skin Contact:**
Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
**Eye Contact:**
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

**Note to Physician:**
In case of ingestion, monitor for acidosis and central nervous system changes. Exposed persons with previous kidney dysfunction may require special treatment.

---

# 5. Fire Fighting Measures

**Fire:**
Flash point: 99C (210F) CC
Autoignition temperature: 371C (700F)
Flammable limits in air % by volume:
lel: 2.6; uel: 12.5
Material can support combustion.
**Explosion:**
Containers may explode in heat or fire.
**Fire Extinguishing Media:**
Dry chemical, foam, water or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Move exposed containers from fire area, if it can be done without risk. Use water to keep fire-exposed containers cool.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

---

# 7. Handling and Storage

Protect container from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture, and incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
AIHA Workplace Environmental Exposure Level (WEEL): TWA = 10mg/m3.
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear oily liquid.
**Odor:**
Odorless.
**Solubility:**
Miscible in water.
**Specific Gravity:**
1.0361 @ 20C/4C
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
No information found.
**Boiling Point:**
188.2C (370F)

**Melting Point:**
-59C (-74F)
**Vapor Density (Air=1):**
2.6
**Vapor Pressure (mm Hg):**
0.129 @ 25C (77F)
**Evaporation Rate (BuAc=1):**
0.01

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition. Aldehydes or lactic, pyruvic or acetic acids may also be formed.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizing agents.
**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.

---

# 11. Toxicological Information

Oral rat LD50: 20g/kg. Skin rabbit LD50: 20.8g/kg.
Irritation: Eye rabbit/Draize, 500 mg/24H mild.
Investigated as a mutagen and reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Propylene Glycol (57-55-6) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into water, this material is expected to readily biodegrade. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.
**Environmental Toxicity:**
No information found.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

# 14. Transport Information

Not regulated.

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Propylene Glycol (57-55-6) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Propylene Glycol (57-55-6) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Propylene Glycol (57-55-6) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Propylene Glycol (57-55-6) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

# 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **1** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
**Label First Aid:**
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 8.
**Disclaimer:**
**********

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**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# MATERIAL SAFETY DATA SHEET

Revised: 16/07/04
RINGER SOLUTION, AMPHIBIAN Replaces: 09/05/00
CAROLINA BIOLOGICAL Printed: 20/05/08

## 1. PRODUCT DESCRIPTION

Product Name: Ringer Solution, Amphibian
Product Code(s): 88-6501, 88-6503
Size: 500 mL, 1 L
Chemical Name: No data available
CAS Number: See section 2
Formula: See section 2
Synonyms: None
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principle Hazardous Components: Sodium Chloride(cas#7647-14-5)0.65% Potassium Chloride(cas#7447-40-7)0.014%, Calcium Chloride, Dihydrate (cas#10035-04-8)0.016%, Sodium Phosphate(cas#7558-80-7)0.0012%, Sodium Bicarbonate(cas#144-55-8)0.02%
TLV and PEL units: None established

## 3. HAZARD IDENTIFICATION

Emergency Overview: This product is not expected to be a hazard under normal conditions of use with adequate ventilation.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water. Immediately call a physician or poison control center. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm and quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): N/A
NFPA Rating: None established
Extinguisher Media:
Use media suitable to extinguish surrounding fire.
Flammable Limits in Air % by Volume: N/A
Autoignition Temperature: N/A
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Unusual Fire and Explosion Hazards: None

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Store tightly closed in an area suitable for general chemical.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.
Ventilation:
Local Exhaust: Yes
Mechanical(General): Yes
Special: No
Other: No
Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | N/A |
| Melting Point: | Approximately 0 C |
| Boiling Point: | Approximately 100 C |
| Vapor Pressure: | Approximately 17.535 at 20 C |
| Vapor Density(Air=1): | N/A |
| Specific Gravity(H2O=1): | Approximately 1 |
| Percent Volatile by Volume: | Approximately 99% |
| Evaporation Rate(H2O=1): | 1 |
| Solubility in Water: | Completely soluble, product is an aqueous solution. |
| Appearance and Odor: | Clear, colorless solution with no odor. |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: None
Incompatibility(Materials to Avoid): Water reactive materials
Hazardous Decomposition Products: None
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data:
Sodium chloride- LD50(orl-rat)- 3000 mg/kg, LD50 (ipr-mouse)-6614 mg/kg
Potassium chloride-LD50(orl-rat)-2600 mg/kg, LD50(ivn-rat)-39 mg/kg
Calcium chloride, Dihydrate-LD50(ipr-mouse)20500 mg/kg
Sodium Phosphate, Monobasic-LDLo(orl-rat)-8290 mg/kg
Sodium Bicarbonate-LD50(orl-rat)4220 mg/kg

Effects of Overexposure:
Acute: See section 3
Chronic:
Sodium chloride: Mutation data cited. Reproductive data cited. Not listed as cancer causing IARC, NTP or OSHA.
Potassium chloride: Mutation data cited. Not listed as cancer causing IARC, NTP, or OSHA.
Calcium Chloride, Dihydrate: No chronic effects data found. Not listed as
causing cancer by IARC, NTP or OSHA.
Sodium phosphate, Monobasic; No chronic effects data found. Not listed as causing cancer by IARC, NTP or OSHA.
Sodium Bicarbonate: Reproductive effects data cited. Not listed as causing
cancer by IARC, NTP or OSHA.
Conditions Aggravated by Overexposure: No data available
Target Organs: No data available
Primary Route(s) of Entry: No data available

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal,
State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Non-regulated

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Sodium Chloride | No | No | No | No | No |
| Potassium-Chloride | No | No | No | No | No |
| Calcium-Chloride, Dihydrate | No | No | No | No | No |
| Sodium-Phosphate, Monobasic | No | No | No | No | No |
| Sodium-Bicarbonate | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to

the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

Glossary

ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# MATERIAL SAFETY DATA SHEET

Revised: 05/15/08
RINGER SOLUTION, MAMMALIAN — Replaces: 11/28/07
CAROLINA BIOLOGICAL — Printed: 05/20/08

## 1. PRODUCT DESCRIPTION

Product Name: Ringer Solution, Mammalian
Product Code(s): 88-6521, 88-6523
Size: 500 mL, 1 L
Chemical Name: No data available
CAS Number: See section 2
Formula: See section 2
Synonyms: None
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principal Hazardous Components: Sodium Chloride(CAS#7647-14-5)0.684% Potassium Chloride(CAS#7447-40-7)0.035%, Calcium Chloride, Dihydrate (CAS#10035-04-8)0.037%, Magnesium Chloride(CAS#7791-18-6)0.120%, Sodium Bicarbonate(CAS#144-55-8)0.208%
TLV and PEL units: None established

## 3. HAZARD IDENTIFICATION

Emergency Overview: This product is not expected to be a hazard under normal condition of use.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush thoroughly with water. Seek medical attention if irritation persists.
Skin - Wash exposed area with soap and water. Seek medical attention if irritation persists.
Ingestion - In quantities normally handled, symptoms would not be expected. If swallowed, if conscious, give water. Seek medical attention if gastrointestinal irritation or other unexpected symptoms develop.
Inhalation - Not expected to present a problem. However, if the exposed person is having trouble breathing, remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm and quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): N/A
NFPA Rating: None established
Extinguisher Media:
Use media suitable to extinguish surrounding fire.
Flammable Limits in Air % by Volume: N/A
Autoignition Temperature: N/A
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: None

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Eliminate all sources of ignition. Remove all non-essential personnel from area. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Store tightly closed in an area suitable for general chemical storage.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
A NIOSH/MSHA chemical cartridge respirator should be worn if PEL or TLV is exceeded.
Ventilation:
Local Exhaust: No
Mechanical(General): No
Special: No
Other: No
Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | N/A |
| Melting Point: | Approximately 0 C |
| Boiling Point: | Approximately 100 C |
| Vapor Pressure: | Approximately 17.535 at 20 C |
| Vapor Density(Air=1): | N/A |
| Specific Gravity(H2O=1): | Approximately 1 |
| Percent Volatile by Volume: | Approximately 98% |
| Evaporation Rate(H2O=1): | 1 |
| Solubility in Water: | Completely soluble, product is an aqueous solution |
| Appearance and Odor: | Clear, colorless solution with no odor. |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: None
Incompatibility(Materials to Avoid): Water reactive materials.
Hazardous Decomposition Products: None
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data:
Sodium chloride- LD50(orl-rat) - 3000 mg/kg
Potassium chloride-LD50(orl-rat) - 2600 mg/kg
Calcium chloride, Dihydrate-LD50(orl-rat) - 1000 mg/kg
Magnesium chloride-LD50(orl-rat) - 8100 mg/kg
Sodium Bicarbonate-LD50(orl-rat) - 4220 mg/kg

Effects of Overexposure:
Acute: See section 3
Chronic: Components are not listed as causing cancer by IARC, NTP, or OSHA.


Effects of Overexposure:
Acute: See section 3
Chronic: Components are not listed as causing cancer by IARC, NTP, or OSHA.


## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Non-regulated

## 15. REGULATORY INFORMATION

EPA TSCA Status: On TSCA Inventory
Hazard Category for SARA Section 311/312 Reporting: Acute

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Sodium Chloride | No | No | No | No | No |
| Potassium-Chloride | No | No | No | No | No |
| Calcium-Chloride, Dihydrate | No | No | No | No | No |
| Magnesium-Chloride | No | No | No | No | No |
| Sodium-Bicarbonate | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot

# MATERIAL SAFETY DATA SHEET



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N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 672.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Rose Bengal

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Rose Bengal
Synonyms: acid red 94, C.I. 45440
CAS#: 632-69-9

### Section 3 — Hazards Identification

Bluish-pink powder. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of HCl, and Hydrogen Iodide gas.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, stains, and indicators.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Bluish-pink powder. Odorless.
Solubility: Soluble in water.
Formula: C20H4Cl4I4O5
Formula Weight: 1049.84

## Section 10 — Stability and Reactivity

Avoid strong acids, strong bases and strong oxidizing agents.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC, INC.
## Material Safety Data Sheet (MSDS)

**MSDS #:** 677.00
**Revision Date:** May 4, 2006

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

## Salicylic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261
CHEMTREC Emergency Phone Number: (800) 424-9300

### SECTION 2 — COMPOSITION, INFORMATION ON INGREDIENTS

Salicylic Acid

CAS#: 69-72-7

### SECTION 3 — HAZARDS IDENTIFICATION

White crystalline powder. Odorless.
Moderately toxic by ingestion. Irritating to body tissues. Avoid all body tissue contact.
Combustible; only as dust.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### SECTION 4 — FIRST AID MEASURES

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### SECTION 5 — FIRE FIGHTING MEASURES

Combustible solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
H-0
F-1
R-0

### SECTION 6 — ACCIDENTAL RELEASE MEASURES

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### SECTION 7 — HANDLING AND STORAGE

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool dry place. Moisture sensitive material. Protect from light. Use and dispense in a hood.

### SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

White crystalline powder. Odorless.
Solubility: Slightly soluble in water; soluble in many organic solvents.
Formula: 2-HOC6H4COOH
Formula Weight: 138.13

Specific Gravity: 1.443
Melting Point: 158-161 C
Boiling Point: 211 C @ 20 mm
Vapor Pressure: 1 mm (114 C)
Vapor Density: 4.8

## SECTION 10 — STABILITY AND REACTIVITY

Avoid strong oxidizers and strong bases.
Shelf life: Indefinite.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute effects: Toxic, irritant
Chronic effects: Possible mutagen
Target organs: Central nervous system

ORL-RAT LD50: 891 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## SECTION 12 — ECOLOGICAL INFORMATION

Data not yet available.

## SECTION 13 — DISPOSAL CONSIDERATIONS

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## SECTION 14 — TRANSPORT INFORMATION

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A
N/A = Not applicable

## SECTION 15 — REGULATORY INFORMATION

TSCA-listed, EINECS-listed (200-712-3).

## SECTION 16 — OTHER INFORMATION

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 685.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Silica Gel

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Silica Gel
Synonyms: amorphous hydrated silica
CAS#: 7631-86-9

### Section 3 — Hazards Identification

White, off-white, or blue odorless granules.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Keep container tightly closed. Moisture sensitive material. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Dry, white or blue granules, fine sized. Odorless.
Solubility: Generally insoluble.
Formula: SiO2 x H2O
Formula Weight: Varies

Specific Gravity: 2.1
Melting Point: 1710 C
Boiling Point: 2230 C

## Section 10 — Stability and Reactivity

Avoid contact with hydrogen fluoride or hydrofluoric acid.
Blue indicating silica gel will turn white upon absorption of water.
Shelf Life: Good, if kept dry.

## Section 11 — Toxicological Information

Acute effects: Possible irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: >30,000 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 691.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Silver Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Silver Nitrate

CAS#: 7761-88-8

### Section 3 — Hazards Identification

Colorless, transparent, rhombic crystals; turns color on exposure to light in presence of organic materials. Faint nitric acid odor.
Highly toxic by ingestion and inhalation. Corrosive to body tissues. Ingestion may be fatal, as little as 2 grams can be fatal to humans.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-3
Exposure-3
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non-flammable solid.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Light sensitive. Store in a Flinn Chem-Saf bag, and lock up in a poison cabinet.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).

## Section 9 — Physical and Chemical Properties

Colorless, transparent, rhombic crystals; turns color on exposure to light in presence of organic materials.
Faint nitric acid odor.
Solubility: Soluble in cold water--more so in hot water.
Formula: AgNO3
Formula Weight: 169.88

Specific Gravity: 4.352
Melting Point: 212 C
Boiling Point: 444 C (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, ammonia, strong bases, alcohols, magnesium.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Highly toxic, corrosive, abdominal pain
Chronic effects: Possible mutagen
Target organs: N.A.

ORL-RAT LD50: 50 mg/kg
ORL-MAN LDLO: 2 gm/150 lb human
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #11 is one option.

## Section 14 — Transport Information

Shipping Name: Silver nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1493

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-853-9), RCRA code D001, D011.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 697.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Soda Lime

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Soda Lime

CAS#: 8006-28-8

### Section 3 — Hazards Identification

White or grayish-white granules. Odorless.
Corrosive to body tissues. Slightly toxic by ingestion. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Moisture sensitive material. Store in a cool dry place. Must be stored in an airtight container. Store in a Flinn Chem-Saf bag.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White or grayish-white granules. Odorless.
Mixture of sodium hydroxide and lime (calcium oxide).
Solubility: Soluble in water.

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf life: Poor, unless kept tightly capped.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 3530 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #10 is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

RCRA code D002.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 700.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Acetate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Acetate

CAS#: 6131-90-4 (trihydrate); 127-09-3 (anhydrous)

### Section 3 — Hazards Identification

Colorless, crystals; efflorescent. Faint vinegar odor.
Slightly toxic by ingestion. Skin, eye and respiratory irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits acrid fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless crystals, efflorescent. Faint vinegar odor.
Formula: NaC2H3O2
Formula Weight: 82.03

Specific Gravity: 1.45
Melting Point: 58 C

## Section 10 — Stability and Reactivity

Avoid strong oxidizers.
Shelf Life: Fair to poor, substance efflorescent.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: G.I. system

ORL-RAT LD50: 3530 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (204-823-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 706.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Benzoate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Benzoate
Synonym: benzoic acid, sodium salt
CAS#: 532-32-1

### Section 3 — Hazards Identification

White, odorless, crystalline or granular powder.
Slightly toxic by ingestion.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-1
Flammability-1
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
When heated to decomposition, emits toxic fumes of Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, odorless crystalline or granular powder.
Solubility: Soluble in water and alcohol.
Formula: C6H5CO2Na
Formula Weight: 144.11

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and heat.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 4070 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (208-534-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 707.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Bicarbonate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Bicarbonate

CAS#: 144-55-8

### Section 3 — Hazards Identification

White powder or crystals (frequently in lumps). Odorless.
Slightly toxic by ingestion. Dust may be irritating to respiratory system.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non combustible solid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White powder or crystals (frequently in lumps). Odorless.
Solubility: Soluble in water, not alcohol.
Formula: NaHCO3
Formula Weight: 84.01

Specific Gravity: 2.159
Melting Point: loses carbon dioxide at 270 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and strong acids.
Shelf Life: Stable under dry storage conditions; slowly decomposes in moist air.

## Section 11 — Toxicological Information

Acute effects: Gastrointestinal disturbances, irritating dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 4220 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (205-633-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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**"Your Safer Source for Science Supplies"**

***Flinn MSDS Prevent Chemical Accidents***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 710.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Bisulfate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Bisulfate
Synonym: sodium hydrogen sulfate
CAS#: 10034-88-5

### Section 3 — Hazards Identification

Moist, white, odorless crystals.
Slightly toxic by ingestion. Corrosive to body tissues. Avoid all body tissue contact.
When heated to decomposition, emits toxic fumes of SOx.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Keep container tightly closed. Moisture sensitive material, store in a Flinn Chem-Saf bag. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Moist, white, odorless crystals.
Solubility: Soluble in water. Aqueous solution is strongly acid. Hygroscopic.
Formula: NaHSO4 H2O
Formula Weight: 138.08

Specific Gravity: 2.103
Melting Point: 58.5 C

## Section 10 — Stability and Reactivity

Avoid contact with strong bases, strong oxidizers.
Shelf Life: Hygroscopic; keep tightly closed.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-665-7).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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flinn@flinnsci.com www.flinnsci.com
P.O. Box 219 Batavia IL 60510
(800) 452-1261 Fax (866) 452-1436

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 711.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Bisulfite

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Bisulfite

CAS#: 7631-90-5

### Section 3 — Hazards Identification

White crystals or powder; slight sulfurous odor.
Slightly toxic by ingestion. Severe body tissue irritant. Possible sensitizer.
Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Keep container tightly closed. Deliquescent, store in a Flinn Chem-Saf bag. Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 5 mg/m3 (NIOSH)

## Section 9 — Physical and Chemical Properties

White crystals or powder; slight sulfurous odor.
Solubility: Soluble in water; not alcohol.
Formula: NaHSO3
Formula Weight: 104.07

Specific Gravity: 1.48
Melting Point: decomposes.

## Section 10 — Stability and Reactivity

Avoid contact with acids and oxidizing agents.
Shelf Life: Fair to poor; substance very hygroscopic. Store in a Flinn Chem-Saf bag.

## Section 11 — Toxicological Information

Acute effects: Severe irritant, possible sensitizer, coughing, chest pains, difficulty breathing, stomach pains, vomiting, diarrhea.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-548-0).

## Section 16 — Other Information

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**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **S3122** * * * * * *Effective Date:* ***02/15/08*** * * * * * *Supercedes:* ***05/06/05***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# SODIUM BORATE

## 1. Product Identification

**Synonyms:** Sodium borate decahydrate; borax; sodium pyroborate
**CAS No.:** 1330-43-4 (Anhydrous) 1303-96-4 (Decahydrate)
**Molecular Weight:** 381.37
**Chemical Formula:** Na2B4O7 . 10H2O
**Product Codes:**
J.T. Baker: 3568, 3570, 3574, 3575
Mallinckrodt: 7418, 7457, 7460, 7792

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Borates, Tetra, Sodium Salts (Anhydrous) | 1330-43-4 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate (Life)
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

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**Potential Health Effects**
---

**Inhalation:**
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
**Ingestion:**
May cause nausea, vomiting, diarrhea, muscular spasms, dullness, lethargy, circulatory depression, central nervous system depression, shock, kidney damage, coma, and death. Estimated lethal dose 15 to 20 grams.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.
**Eye Contact:**
Causes irritation, redness, and pain.
**Chronic Exposure:**
Prolonged or repeated ingestion or skin absorption may cause anorexia, weight loss, vomiting, mild diarrhea, skin rash, convulsions, and anemia.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**
Not considered to be a fire hazard.
**Explosion:**
Not considered to be an explosion hazard.
**Fire Extinguishing Media:**
Use any means suitable for extinguishing surrounding fire.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
- NIOSH Recommended Exposure Limit (REL): 1 mg/m3 (TWA)

- ACGIH Threshold Limit Value (TLV): 5 mg/m3 (TWA)

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece particulate respirator (NIOSH type N100 filters) may be worn for up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids. glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Physical and Chemical Properties

**Appearance:**
White, Gray, Bluish or Greenish White Streaked Crystals.
**Odor:**
Odorless.
**Solubility:**
6g/100g water.
**Density:**
1.73
**pH:**
Alkaline
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
320C (608F) Loses water
**Melting Point:**
75C (167F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**

No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Toxic gases and vapors may be released if involved in a fire.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acids, alkaloids, and metallic salts.
**Conditions to Avoid:**
Incompatibles.

---

# 11. Toxicological Information

Hydrate: Oral rat LD50: 2660 mg/kg. Investigated as a mutagen, reproductive effector. Anhydrous: Investigated as a reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Borates, Tetra, Sodium Salts (Anhydrous) (1330-43-4) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material may leach into groundwater.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

Not regulated.

---

# 15. Regulatory Information

```
--------\Chemical Inventory Status - Part 1\---------------------------------
Ingredient                                    TSCA  EC   Japan  Australia
--------------------------------------------  ----  ---  -----  ---------
Borates, Tetra, Sodium Salts (Anhydrous)       Yes  Yes   Yes      Yes
(1330-43-4)

--------\Chemical Inventory Status - Part 2\---------------------------------
                                                      --Canada--
Ingredient                                    Korea  DSL   NDSL  Phil.
--------------------------------------------  -----  ---   ----  -----
Borates, Tetra, Sodium Salts (Anhydrous)       Yes   Yes   No     Yes
(1330-43-4)

--------\Federal, State & International Regulations - Part 1\----------------
                                        -SARA 302-    ------SARA 313------
Ingredient                              RQ    TPQ     List  Chemical Catg.
--------------------------------------  ---   -----   ----  --------------
Borates, Tetra, Sodium Salts (Anhydrous) No    No      No         No
(1330-43-4)

--------\Federal, State & International Regulations - Part 2\----------------
                                                  -RCRA-    -TSCA-
Ingredient                              CERCLA    261.33     8(d)
--------------------------------------  ------    ------    ------
Borates, Tetra, Sodium Salts            No        No         No
(Anhydrous) (1330-43-4)


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: No  Pressure: No
Reactivity: No          (Mixture / Solid)
```

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** S5
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
No Changes.
**Disclaimer:**
**********

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**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 714.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Bromide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Bromide

CAS#: 7647-15-6

### Section 3 — Hazards Identification

White, odorless crystalline solid; absorbs air moisture becoming almost rock hard.
Slightly toxic by ingestion and skin absorption. Irritating to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid. Non combustible solid.
When heated to decomposition, emits toxic fumes of Br and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Keep container tightly closed. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White, odorless crystalline solid; absorbs air moisture becoming almost rock hard.
Solubility: Soluble in water; slightly in alcohol.
Formula: NaBr
Formula Weight: 102.89

Specific Gravity: 3.208
Melting Point: 757.7 C
Boiling Point: 1390 C

## Section 10 — Stability and Reactivity

Avoid contact with acids.
Shelf Life: Product absorbs moisture from air; keep tightly closed.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: Central nervous system

ORL-RAT LD50: 3500 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: 2000 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-599-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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***Flinn MSDS Prevent Chemical Accidents***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 716.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Carbonate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium carbonate, anhydrous
Synonym: soda ash
CAS#: 497-19-8

### Section 3 — Hazards Identification

White, odorless crystals or powder.
Slightly toxic by ingestion. Irritating to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag. Keep container tightly closed.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White, odorless crystals or powder.
Soluble in water and glycerol; not in alcohol. Hygroscopic.
Formula: Na2CO3
Formula Weight: 105.99

Specific Gravity: 2.53
Melting Point: 851 C

## Section 10 — Stability and Reactivity

Avoid contact with acids, aluminum. Reacts vigorously with fluorine.
Shelf Life: Hygroscopic, keep tightly closed.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 4090 mg/kg
IHL-RAT LC50: 2300 mg/m3/2H
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (207-838-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 721.00

**Revision Date:** March 1, 2004

### Section 1 — Chemical Product and Company Identification

## Sodium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Chloride
Synonym: table salt

CAS#: 7647-14-5

### Section 3 — Hazards Identification

White, odorless, crystals.
Very slightly toxic by ingestion. Dust may cause minor irritation to mucous membranes upon inhalation.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with soap and water.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non combustible.
When heated to decomposition, emits toxic fumes of Cl and $Na_2O$.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Keep container tightly closed.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystalline powder. Odorless.
Solubility: Soluble in water and glycerol; slightly in alcohol.
Formula: NaCl
Formula Weight: 58.44

Specific Gravity: 2.165
Melting Point: 801 C
Boiling Point: 1413 C

## Section 10 — Stability and Reactivity

Reacts violently with bromine trifluoride and lithium. Avoid contact with strong oxidizers, acids, bromine.
Shelf life: Fair, somewhat hygroscopic.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 3000 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-598-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.



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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 725.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Citrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Citrate
Synonym: citric acid, trisodium salt
CAS#: 6132-04-3

### Section 3 — Hazards Identification

White, odorless crystals or granular powder.
Body tissue irritant. Avoid body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, iodides, sulfates, sulfites, thiosulfates, phosphates, and halogens.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, odorless crystals or granular powder.
Solubility: Soluble in water; not alcohol.
Formula: Na3C6H5O7 2H2O
Formula Weight: 294.10

## Section 10 — Stability and Reactivity

Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 734.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Hydroxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Hydroxide

CAS#: 1310-73-2

### Section 3 — Hazards Identification

White pellets or flakes. Odorless.
Highly toxic by ingestion, inhalation, or skin absorption. Extremely corrosive to body tissues.
Causes severe eye burns. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-2
Exposure-3
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Hot molten sodium hydroxide can react violently with water. Contact with aluminum, tin, and zinc liberates hydrogen gas. When heated to decomposition, emits toxic fumes of Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
H-3
F-0
R-1

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool dry place. Absorbs CO2 and water from air, keep container tightly closed. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2 mg/m3 Ceiling 2 mg/m3 (OSHA, ACGIH)

## Section 9 — Physical and Chemical Properties

White pellets or flakes. Absorbs CO2 and water from air.
Odorless.
Solubility: Soluble in water, alcohol and glycerol.
Formula: NaOH
Formula Weight: 40.00

Specific Gravity: 2.13
Melting Point: 318 C

## Section 10 — Stability and Reactivity

Contact with aluminum, tin, and zinc liberates, hydrogen gas. Avoid contact with strong oxidizers, strong acids, organic material, chlorinated solvents.
Shelf life: Good.

## Section 11 — Toxicological Information

Acute effects: Toxic, corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: 50 mg/24H

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #10 is one option.

## Section 14 — Transport Information

Shipping Name: Sodium hydroxide, solid
Hazard Class: 8, Corrosive
UN Number: UN1823

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-185-5), RCRA code D002, D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 736.00

**Revision Date:** February 24, 2003

### Section 1 — Chemical Product and Company Identification

## Sodium Hypochlorite Solution

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Hypochlorite (7681-52-9) 5-12.5%, and Water (7732-18-5) 87.5-95%
Synonym: bleach solution

CAS#: None Established

### Section 3 — Hazards Identification

Colorless, lightly cloudy liquid. Bleach odor.
Moderately toxic by ingestion and inhalation. Corrosive to body tissues. Avoid all body tissue contact.
Strong oxidizer.

**FLINN AT-A-GLANCE**

Health-2
Flammability-0
Reactivity-1
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Use a triclass, dry chemical fire extinguisher.
Strong oxidizer. Fire risk in contact with organic materials.
When heated to decomposition, emits toxic fumes of Na2O and Cl.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**

None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #6. Store with bromates and chlorates.
Keep container tightly closed.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Colorless, lightly cloudy liquid. Bleach odor.

## Section 10 — Stability and Reactivity

Avoid contact with excessive heat, reducers, strong mineral acids.
Shelf life: Good.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 738.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Iodide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Iodide

CAS#: 7681-82-5

### Section 3 — Hazards Identification

White, odorless crystals or powder; slowly turns brown in air; deliquescent.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Na2O and iodine.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Light sensitive material. Store in a cool, dry place. Deliquescent, store in a Flinn Chem-Saf bag.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White, odorless crystals or powder; slowly turns brown in air; deliquescent.
Solubility: Water, alcohol and glycerol.
Formula: NaI
Formula Weight: 149.92

Specific Gravity: 3.665
Melting Point: 653 C

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf life: Fair to poor; deliquescent.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: Thyroid

ORL-RAT LD50: 4340 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-674-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 743.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Nitrate
Synonym: Chile saltpeter
CAS#: 7631-99-4

### Section 3 — Hazards Identification

Colorless, odorless, transparent crystals or white prills.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.
Strong oxidizer.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer. Fire and explosion risk when in contact with combustible materials.
When heated to decomposition, emits toxic fumes of NOx and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, odorless, transparent crystals.
Solubility: Soluble in water and glycerol; slightly in alcohol.
Formula: NaNO3
Formula Weight: 85.00

Specific Gravity: 2.267
Melting Point: 308 C
Boiling Point: 380 C (dec.)

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, strong acids, combustible materials, finely powdered metals, friction and shock.
Shelf life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant
Chronic effects: Anemia, methemolglobinemia, nephritis.
Target organs: Blood, central nervous system

ORL-RAT LD50: 3236 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Sodium nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1498

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-554-3), RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 752.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Phosphate, Monobasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Phosphate, monobasic, monohydrate
Synonym: sodium dihydrogen phosphate, monohydrate
CAS#: 10049-21-5

### Section 3 — Hazards Identification

Large transparent crystals. Odorless.
Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of POx and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Large transparent crystals. Odorless.
Solubility: Very soluble in water. Insoluble in alcohol.
Formula: NaH2PO4 H2O
Formula Weight: 137.99

Specific Gravity: 2.040
Melting Point: loses water at 100 C.

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf Life: Fair, slightly hydroscopic.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 8290 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-449-2).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 754.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Phosphate, Tribasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Phosphate, tribasic
Synonym: TSP, trisodium phosphate
CAS#: 10101-89-0

### Section 3 — Hazards Identification

Colorless, odorless crystals.
Mildly toxic by ingestion. Corrosive to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of POx and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, odorless crystals.
Solubility: Water.
Formula: Na3PO4 12H2O
Formula Weight: 380.12

Specific Gravity: 1.62
Melting Point: 75 C (decomposes).

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 6500 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: >7940 mg/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-509-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 751.10
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Phosphate, Dibasic

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Phosphate, dibasic, anhydrous
Synonym: DSP, disodium hydrogen phosphate
CAS#: 7558-79-4

### Section 3 — Hazards Identification

Colorless, translucent crystals or powder. Odorless.
Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of POx and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place. Deliquescent, store in Flinn Chem-Saf Bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless, translucent crystals or powder. Odorless.
Solubility: Soluble in water; very soluble in alcohol.
Formula: Na2HPO4
Formula Weight: 141.96

## Section 10 — Stability and Reactivity

Avoid contact with strong acids.
Shelf life: Hygroscopic, keep tightly closed.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 17 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-448-7).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 756.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Salicylate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Salicylate

CAS#: 54-21-7

### Section 3 — Hazards Identification

Fine, white powder. Odorless.
Slightly toxic by ingestion. A body tissue irritant which may affect the central nervous system. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, amino acids, anhydrides, peracids. Light sensitive. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Fine, white powder. Odorless.
Solubility: Water, alcohol and glycerol.
Formula: 2-(HO)C6H4CO2Na
Formula Weight: 160.04

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, strong acids.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1200 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-198-0).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 758.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Silicate Solution

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Silicate Solution, 40-42 Be
Synonym: water glass

CAS#: None established

### Section 3 — Hazards Identification

Slightly cloudy liquid; rather viscous. Odorless.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area and ventilate area. Contain spill with sand or absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Slightly cloudy liquid; rather viscous. Odorless.
Specific Gravity: 1.3-1.5

## Section 10 — Stability and Reactivity

Avoid contact with strong mineral acids, strong organic acids, aluminum, magnesium, and zinc.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2000-3000 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 760.00
**Revision Date:** November 25, 2002

### Section 1 — Chemical Product and Company Identification

## Sodium Sulfate, Anhydrous

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Sulfate, anhydrous

CAS#: 7757-82-6

### Section 3 — Hazards Identification

White, crystals or powder. Odorless.
Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable.
When heated to decomposition, emits toxic fumes of SOx and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive mode.

**NFPA CODE**
None Established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, crystals or powder. Odorless.
Solubility: Water and glycerol; not alcohol.
Formula: Na2SO4
Formula Weight: 142.02

Specific Gravity: 2.680
Melting Point: 884 C

## Section 10 — Stability and Reactivity

Avoid contact with strong acids, aluminum, and magnesium.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-MUS LD50: 5989 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated.
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-820-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 764.00
**Revision Date:** April 2, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Sulfite

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Sulfite

CAS#: 7757-83-7

### Section 3 — Hazards Identification

White crystals or powder. Odorless.
Moderately toxic by ingestion. Body tissue irritant. Avoid all body tissue contact. People who have allergies and/or asthma may find that they are exceptionally hypersensitive to sulfites.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Na2O and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool dark place. Keep container tightly closed. Air and moisture sensitive.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

White crystals or powder. Odorless.
Solubility: Water; sparingly in alcohol.
Formula: Na2SO3
Formula Weight: 126.05

Specific Gravity: 2.633

## Section 10 — Stability and Reactivity

Avoid contact with acids and strong oxidizers.
Shelf Life: Fair, moisture sensitive.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: Possible mutagen
Target organs: N.A.

ORL-MUS LD50: 820 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Aquatic Toxicity: 2600 ppm / 24, 48, 96hr / mosquito fish / TLM / fresh water B.O.D.: 0.12 lb/lb instantaneous

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-821-4), RCRA code D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 767.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Thiocyanate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Thiocyanate

CAS#: 540-72-7

### Section 3 — Hazards Identification

Colorless crystals or white powder; deliquescent.
Moderately toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of hydrogen sulfide, hydrogen cyanide, NOx, SOx, and Na2O.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #7. Store with arsenates, cyanides and cyanates.
Store in a cool, dry place. Light sensitive. Deliquescent, store in a Flinn Chem-Saf bag. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Colorless crystals or white powder; deliquescent.
Solubility: Water and alcohol. Hygroscopic.
Formula: NaSCN
Formula Weight: 81.08

Melting Point: 287 C

## Section 10 — Stability and Reactivity

Avoid contact with acids and strong bases. Contact with acids or heat may liberate poisonous hydrogen cyanide gas.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Toxic, irritant
Chronic effects: Possible teratogen
Target organs: N.A.

ORL-RAT LD50: 764 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (208-754-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 769.00
**Revision Date:** April 2, 2001

### Section 1 — Chemical Product and Company Identification

## Sodium Thiosulfate, Anhydrous

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sodium Thiosulfate, anhydrous

CAS#: 7772-98-7

### Section 3 — Hazards Identification

White granular powder. Odorless.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Na2O and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool, dry place. Deliquescent, store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White granular powder. Odorless.
Solubility: Water. Insoluble in alcohol.
Formula: Na2S2O3
Formula Weight: 158.11

Specific Gravity: 1.667

## Section 10 — Stability and Reactivity

Avoid contact with strong acids, strong oxidizers, lead, silver, mercury salts and iodines.
Shelf Life: Fair to poor, deliquescent.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-HUM LD50: 0.5-2.0 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-867-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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***Flinn MSDS Prevent Chemical Accidents***

**flinn@flinnsci.com www.flinnsci.com**
**P.O. Box 219 Batavia IL 60510**
**(800) 452-1261 Fax (866) 452-1436**

**MSDS #:** 768.00
**Revision Date:** October 31, 2003

## Section 1 — Chemical Product and Company Identification

# Sodium Thiosulfate, Pentahydrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

## Section 2 — Composition, Information on Ingredients

Sodium Thiosulfate, pentahydrate
Synonym: sodium hyposulfite

CAS#: 10102-17-7

## Section 3 — Hazards Identification

White, translucent crystals or powder; deliquescent. Odorless.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-1

0 is low hazard, 3 is high hazard

## Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

## Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of Na2O and SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

## Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

## Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool, dry place. Deliquescent, store in a Flinn Chem-Saf bag.

## Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, translucent crystals or powder; deliquescent. Odorless.
Solubility: Water; not alcohol.
Formula: Na2S2O3 5H2O
Formula Weight: 248.19

Specific Gravity: 1.729 (5 hydrate)
Melting Point: 48 C

## Section 10 — Stability and Reactivity

Avoid contact with strong acids, strong oxidizers, lead, silver, mercury salts and iodines.
Shelf Life: Poor, deliquescent.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-HUM LD50: 0.5-2 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #12b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

EINECS-listed (231-867-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 776.00
**Revision Date:** May 22, 2001

### Section 1 — Chemical Product and Company Identification

## Stannous Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Stannous Chloride, dihydrate
Synonym: tin (II) chloride
CAS#: 10025-69-1

### Section 3 — Hazards Identification

White powder and chunks. Slight chlorine odor.
Moderately toxic by ingestion and inhalation. Corrosive to body tissues. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-2
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of hydrogen chloride and stannic oxide.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool, dry place. Deliquescent, store in Flinn Chem-Saf bag. Keep container tightly closed.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2 mg/m3 (Sn) (ACGIH)

## Section 9 — Physical and Chemical Properties

White powder and chunks. Slight chlorine odor.
Solubility: Water, alkalies and alcohol.
Formula: SnCl2 2H2O
Formula Weight: 225.65

Specific Gravity: 2.71
Melting Point: 37.7 C
Boiling Point: 652 C

## Section 10 — Stability and Reactivity

Avoid contact with strong bases, strong oxidizers, sodium, potassium, hydrogen peroxide.
Shelf life: Poor.

## Section 11 — Toxicological Information

Acute effects: Toxic, corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 700 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-868-0).

## Section 16 — Other Information

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**(800) 452-1261 Fax (866) 452-1436**

MSDS Number: **S6506** * * * * * *Effective Date:* ***04/23/07*** * * * * * *Supercedes:* ***08/10/04***

**MSDS** Material Safety Data Sheet

*From:* Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

**NOTE:** CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# STARCH SOLUBLE

## 1. Product Identification

**Synonyms:** Amglogen; Amylodextrin; Potato starch
**CAS No.:** 9005-84-9
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** (C6H10O5) x
**Product Codes:**
J.T. Baker: 4006, 4010
Mallinckrodt: 8188

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Starch Soluble | 9005-84-9 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**
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**As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)
---
Health Rating: 0 - None
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

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**Potential Health Effects**
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**Inhalation:**
Symptoms similar to those caused by nuisance dust; coughing, sneezing.
**Ingestion:**
Not expected to be a health hazard.
**Skin Contact:**
No adverse effects expected.
**Eye Contact:**
No adverse effects expected but dust may cause mechanical irritation.
**Chronic Exposure:**
No adverse effects expected.
**Aggravation of Pre-existing Conditions:**
Persons with respiratory impairment may be sensitive to starch dust.

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# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
If large amounts were swallowed, give water to drink and get medical advice.
**Skin Contact:**
Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**
Wash thoroughly with running water. Get medical advice if irritation develops.

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# 5. Fire Fighting Measures

**Fire:**
Autoignition temperature: > 380C (> 716F)
Combustible solid.
Minimum ignition energy > 30 m (Depends on particle size, moisture content, etc.) Contact with strong oxidizers may cause fire.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Minimum ignition temperature, cloud: 430C (806F).
**Fire Extinguishing Media:**
If involved in a fire, use water spray.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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# 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

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# 7. Handling and Storage

Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities.

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# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
15 mg/m3 total dust, 5 mg/m3 respirable fraction

-ACGIH Threshold Limit Value (TLV):
10 mg/m3 (TWA) inhalable fraction
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

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# 9. Physical and Chemical Properties

**Appearance:**
White, amorphous powder or granules.
**Odor:**
Slight characteristic odor.
**Solubility:**
Dispersible in hot water.
**Specific Gravity:**
ca. 1.5
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
Not applicable.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**

No information found.
**Evaporation Rate (BuAc=1):**
No information found.

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# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Heavy, black acrid smoke.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.

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# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Starch Soluble (9005-84-9) | No | No | None |

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# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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# 14. Transport Information

Not regulated.

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# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Starch Soluble (9005-84-9) | Yes | Yes | No | Yes |

| Ingredient | -SARA 302- RQ | TPQ | List | ------SARA 313------ Chemical Catg. |
|---|---|---|---|---|
| Starch Soluble (9005-84-9) | No | No | No | No |

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Starch Soluble (9005-84-9) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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# 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **2** Reactivity: **0**
**Label Hazard Warning:**
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.
**Label Precautions:**
None.
**Label First Aid:**
Not applicable.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
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**Prepared by:** Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 781.00
**Revision Date:** April 2, 2001

### Section 1 — Chemical Product and Company Identification

## Stearic Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Stearic Acid
Synonym: octadecanoic acid
CAS#: 57-11-4

### Section 3 — Hazards Identification

White, waxy solid. Fatty acid odor.
Body tissue irritant. Avoid all body tissue contact.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Flash Point 383 F (196 C) Autoignition temp. 390 C.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-1
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn suggested chemical storage pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool, dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White, waxy solid. Fatty acid odor.
Solubility: Many common organic solvents. Insoluble in water.
Formula: CH3(CH2)16COOH
Formula Weight: 284.54

Specific Gravity: 0.8390
Melting Point: 67 C
Boiling Point: 183-184 C @ 1mm

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, bases and reducing agents.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: >10 gm/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: >5 gm/kg

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-313-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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(800) 452-1261 Fax (866) 452-1436

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 784.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Strontium Chloride

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Strontium Chloride

CAS#: 10025-70-4

### Section 3 — Hazards Identification

Odorless, white crystalline needles.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #2. Store with acetates, halides, sulfates, sulfites, thiosulfates and phosphates. Store in a cool, dry place. Deliquescent, store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Odorless, white crystalline needles.
Solubility: Water and alcohol.
Formula: SrCl2 6H2O
Formula Weight: 266.64

Specific Gravity: 1.930
Melting Point: 115 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Fair to poor.

## Section 11 — Toxicological Information

Acute effects: Stomach pains, vomiting, diarrhea
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-971-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 786.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Strontium Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Strontium Nitrate

CAS#: 10042-76-9

### Section 3 — Hazards Identification

Odorless, white powder.
Slightly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer. Fire and explosion risk when in contact with combustible materials.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool, dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Odorless, white powder.
Solubility: Water; slightly in absolute alcohol.
Formula: Sr(NO3)2
Formula Weight: 211.63

Specific Gravity: 2.98
Melting Point: 570 C

## Section 10 — Stability and Reactivity

Avoid contact with reducing agents, strong acids, and combustible materials.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 2750 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Strontium Nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1507

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (233-131-9). RCRA code D001.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 789.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Sucrose

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sucrose
Synonym: table sugar
CAS#: 57-50-1

### Section 3 — Hazards Identification

Hard, white crystals. Malt-like odor.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash with mild soap and water.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool, dry place. Store in a Flinn Chem-Saf bag.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Hard, white crystals. Malt-like odor.
Soluble in water; slightly in alcohol.
Formula: C12H22O11
Formula Weight: 342.21

Specific Gravity: 1.5877
Melting Point: decomposes at 185-187 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite, if kept dry.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 29700 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-334-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 790.00

**Revision Date:** February 24, 2003

### Section 1 — Chemical Product and Company Identification

## Sudan III

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sudan III
Synonym: solvent red 23, C.I. 26100

CAS#: 85-86-9

### Section 3 — Hazards Identification

Reddish-brown powder. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool, dry place.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Reddish-brown powder. Odorless.
Solubility: Chloroform, acetic acid, acetone, and, only slightly in alcohol. Not water.
Formula: C22H16N4O
Formula Weight: 352.40

Melting Point: 199 C (dec)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers and strong reducing agents.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (201-638-4).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 792.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Sudan IV

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sudan IV
Synonym: solvent red 24, C.I. 26105
CAS#: 85-83-6

### Section 3 — Hazards Identification

Reddish-brown powder. Odorless.
Mildly toxic by ingestion. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.
Store in a cool, dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Reddish-brown powder. Odorless.
Solubility: Chloroform, acetone acetic acid and, only slightly in alcohol. Insoluble in water.
Melting Point: 199 C (dec)

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant, stomach pains, vomiting, diarrhea
Chronic effects: Possible mutagen
Target organs: Liver

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (201-635-8).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 800.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Sulfur

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sulfur

CAS#: 7704-34-9

### Section 3 — Hazards Identification

Yellow crystals or powder. Faint odor of rotten eggs.
Slightly toxic by ingestion and inhalation. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-1
Flammability-1
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Fire and explosion risk in finely divided form. When heated, it will burn and emit highly toxic SOx fumes. Flash Point: 405 F; Autoignition Temperature: 450 F.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-2
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #10. Store with sulfur and phophorus.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Yellow crystals or powder. Faint odor of rotten eggs.
Solubility: Slightly in alcohol and other organic solvents.
Not in water.
Formula: S
Formula Weight: 32.06

Specific Gravity: 2.06
Melting Point: 119 C
Boiling Point: 444.6 C
Vapor Pressure: 10 mm (246 C)
Vapor Density: 8.9

## Section 10 — Stability and Reactivity

Avoid contact with oxidizers and moisture.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 5 gm/kg
IHL-RAT LC50: N.A.
EYE-HUM: 8 ppm

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Aquatic toxicity: TLm96: 1000 ppm

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Sulfur
Hazard Class: 9, Miscellaneous Hazardous
UN Number: NA1350

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-722-6).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 801.00
**Revision Date:** May 22, 2001

### Section 1 — Chemical Product and Company Identification

## Sulfuric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Sulfuric Acid (7664, 93-9) 48-96%, and water (7732-18-5) 4-52%
18M, 12.5M, 9M

CAS#: 7664-93-9

### Section 3 — Hazards Identification

Colorless, dense, oily liquid. Sulfurous odor.
Highly toxic by ingestion and inhalation. Severely corrosive to eye, skin, and all other body tissues.
Avoid all body tissue contact.
Very considerable heat generated when diluted with water.

**FLINN AT-A-GLANCE**
Health-3
Flammability-0
Reactivity-3
Exposure-3
Storage-3

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give 1 to 2 cups of water or milk, followed by a gastric antacid, such as milk of magnesia. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable liquid.
When heated to decomposition, emits toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-3
F-0
R-2
No water

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material, neutralize with sodium bicarbonate or calcium hydroxide and deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #9. Store with acids.
Store in a dedicated acid cabinet and away from any source of water; if an acid cabinet is not available, store in Flinn Saf-Cube.
Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1 mg/m3, STEL 3 mg/m3 (OSHA, ACGIH)

## Section 9 — Physical and Chemical Properties

Colorless, dense, oily liquid. Sulfurous odor.
Solubility: Miscible with water evolving much heat.
Formula: H2SO4
Formula Weight: 98.08
Concentration: 9-18 Molar

Specific Gravity: 1.84
Melting Point: 10.4 C
Boiling Point: 290 C

## Section 10 — Stability and Reactivity

Avoid contact with strong bases, reacts violently with water. Always add acid to water, never the reverse.
Shelf Life: Good, if stored safely.

## Section 11 — Toxicological Information

Acute effects: Severely corrosive
Chronic effects: N.A.
Target organs: Eyes, skin

ORL-RAT LD50: 2140 mg/kg
IHL-RAT LC50: 510 mg/m3/2H
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24b is one option.

## Section 14 — Transport Information

Shipping Name: Sulfuric Acid
Hazard Class: 8, Corrosive
UN Number: UN1830

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-639-5), RCRA code D002, D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 802.00
**Revision Date:** May 22, 2001

### Section 1 — Chemical Product and Company Identification

# Talc

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Talc
Synonym: hydrous magnesium silicate
CAS#: 14807-96-6

### Section 3 — Hazards Identification

White-gray powder. Odorless.
Dust is irritating to respiratory system. Avoid inhalation of dust.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool, dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2 mg/m3 (NIOSH)

## Section 9 — Physical and Chemical Properties

White-gray powder. Odorless.
Solubility: Not soluble in water or alcohol.
Hydrous magnesium silicate.
Formula: 3MgO 4SiO2 H2O
Formula Weight: Varies

Specific Gravity: 2.7-2.8

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers.
Shelf Life: Indefinite, if kept dry.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: Lung irritation, chemical pneumonitis
Target organs: Lungs

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (238-877-9).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 804.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## l-Tartaric Acid

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

l-Tartaric Acid
Synonym: 2,3-dihydrosuccinic acid
CAS#: 87-69-4

### Section 3 — Hazards Identification

White to colorless, transparent crystals or powder. Slight malt odor.
Body tissue irritant. Avoid all body tissue contact.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Auto ignition temperature: 797 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
H-0
F-1
R-0

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #1. Store with acids, anhydrides and peracids.
Store in a cool, dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations below exposure limits.

## Section 9 — Physical and Chemical Properties

White to colorless, transparent crystals or powder.
Slight malt odor.
Solubility: Water and alcohol.
Formula: HO2CCH(OH)CH(OH)CO2H
Formula Weight: 150.09

Specific Gravity: 1.76
Melting Point: 170 C

## Section 10 — Stability and Reactivity

Avoid contact with strong bases, oxidizers and reducing agents.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (201-766-0).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

MSDS Number: **T3341** * * * * * *Effective Date:* ***04/23/07*** * * * * * *Supercedes:* ***02/16/06***

**MSDS** Material Safety Data Sheet

*From*: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# THYMOL BLUE FREE ACID

## 1. Product Identification

**Synonyms:** Phenol, 4,4'-(3H-2,1-benzoxathiol-3-ylidene)bis(5-methyl-2 (1-methylethyl)-, S,S-dioxide; Thymolsulfonpthalein
**CAS No.:** 76-61-9
**Molecular Weight:** 466.60
**Chemical Formula:** C27H30O5S
**Product Codes:** V856

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Thymol Blue Free Acid | 76-61-9 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.**

**SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

**Potential Health Effects**

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Specific hazard information about this compound was not found. However, composition and structure suggest that the compound can be harmful.

**Inhalation:**
May cause irritation to the respiratory tract. Symptoms may include coughing, sore throat, labored breathing, and chest pain.
**Ingestion:**
The toxic effects of this substance have not been thoroughly investigated. Oral doses may have toxic effects.
**Skin Contact:**
May cause irritation with redness and pain.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.
**Eye Contact:**
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

---

# 5. Fire Fighting Measures

**Fire:**
As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.
**Explosion:**
Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

---

# 7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
- OSHA Permissible Exposure Limit (PEL):
15 mg/m3 total dust, 5 mg/m3 respirable fraction for nuisance dusts.
- ACGIH Threshold Limit Value (TLV)
for Particulates (insoluble or poorly soluble) Not Otherwise Specified (PNOS):
3 mg/m3 respirable particles and 10 mg/m3 inhalable particles.

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Skin Protection:**
Wear protective gloves and clean body-covering clothing.

**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Brownish-green powder.

**Odor:**
Characteristic odor.

**Solubility:**
Insoluble in water.

**Specific Gravity:**
No information found.

**pH:**
No information found.

**% Volatiles by volume @ 21C (70F):**
0

**Boiling Point:**
Not applicable.

**Melting Point:**
221 - 224C (430 - 435F)

**Vapor Density (Air=1):**
No information found.

**Vapor Pressure (mm Hg):**

No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Burning may produce carbon monoxide, carbon dioxide, sulfur oxides.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Strong oxidizers.
**Conditions to Avoid:**
Dusting and incompatibles.

---

# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a mutagen.

--------\Cancer Lists\------------------------------------------------------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Thymol Blue Free Acid (76-61-9) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

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# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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# 14. Transport Information

Not regulated.

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# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Thymol Blue Free Acid (76-61-9) | Yes | Yes | No | Yes |

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Thymol Blue Free Acid (76-61-9) | No | Yes | No | Yes |

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Thymol Blue Free Acid (76-61-9) | No | No | No | No |

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Thymol Blue Free Acid (76-61-9) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **1** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
**Label Precautions:**
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
MSDS Section(s) changed since last revision of document include: 3.
**Disclaimer:**
**********
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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 818.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Thymol

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Thymol
Synonym: 3-hydroxy-1-methyl-4-isopropylbenzene
CAS#: 89-83-8

### Section 3 — Hazards Identification

White crystals. Aromatic odor - liniment like.
Moderately toxic by ingestion. Body tissue irritant and possible allergen. Avoid all body tissue contact.
Combustible solid.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Combustible solid.
Flash Point: 216 F
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and water. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #8. Store with phenols and cresols.
Store in a cool, dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystals. Aromatic odor - liniment like.
Solubility: Soluble in many organic solvents; slightly in water.
Formula: CH3(C3H7)C6H3OH
Formula Weight: 150.11

Specific Gravity: 0.965
Melting Point: 50 C
Boiling Point: 232 C

## Section 10 — Stability and Reactivity

Avoid contact with heat, strong oxidizing agents and strong bases.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant, allergen
Chronic effects: N.A.
Target organs: Liver, kidneys, central nervous system, spleen

ORL-RAT LD50: 980 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #24a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (201-944-8).

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 822.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

# Tin

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Tin

CAS#: 7440-31-5

### Section 3 — Hazards Identification

Silver-white, ductile solid. Forms: granular, mossy, shot, and foil. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Finely divided metal may be combustible.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 2 mg/m3 (OSHA)

## Section 9 — Physical and Chemical Properties

Silver-white, ductile solid. Forms: granular, mossy, shot, and foil. Odorless.
Solubility: Acids, hot potassium hydroxide solution; not water.
Formula: Sn
Formula Weight: 118.71

Specific Gravity: 7.310
Melting Point: 232 C
Boiling Point: 2507 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, sulfur, strong bases, halogens.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #27a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-141-8), RCRA code D001.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 839.00

**Revision Date:** February 24, 2003

### Section 1 — Chemical Product and Company Identification

## Universal Indicator Solution

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Methyl Red (845-10-3) <0.1%, Bromothymol Blue (34722-90-2) <0.1%, Phenolphthalein (77-09-8) <0.1%, Ethyl Alcohol (64-17-5) 55%, and Water (7732-18-5) 45%

CAS#: None Established

### Section 3 — Hazards Identification

The color of this solution depends entirely on the pH of the solution. Characteristic odor of ethyl alcohol. Contains denatured ethyl alcohol. Moderately toxic by ingestion and inhalation. Body tissue irritant. Avoid all body tissue contact.
Flammable liquid.

**FLINN AT-A-GLANCE**
Health-2
Flammability-1
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Rinse out mouth, give 1 to 2 cups of water or milk, induce vomiting. After vomiting, give mixture of 2 Tbs. of activated charcoal mixed with one cup of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Flammable liquid.
Contains ethyl alcohol. When heated, releases flammable fumes.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all ignition sources and ventilate area. Contain spill with sand and absorbent material; deposit in sealed bag or container. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #9. Store with dyes, indicators, and stains.

### Section 8 — Exposure Controls, Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.
Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 1000 ppm as ethyl alcohol (OSHA)

## Section 9 — Physical and Chemical Properties

The color of this solution depends entirely on the pH of the solution. Characteristic odor of ethyl alcohol.

## Section 10 — Stability and Reactivity

Avoid contact with open flame, sparks or other sources of ignition.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Poison, irritant, nausea, dizziness, and headache
Chronic effects: N.A.
Target organs: Eyes, liver, kidneys, nerves

ORL-RAT LD50: 7060 mg/kg as ethyl alcohol
IHL-RAT LC50: 20000 ppm/10H as ethyl alcohol
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method 26b is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

Not listed.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

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## Material Safety Data Sheet (MSDS)

**MSDS #:** 840.00
**Revision Date:** March 14, 2001

### Section 1 — Chemical Product and Company Identification

## Urea

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Urea
Synonym: isourea, carbamide resin
CAS#: 57-13-6

### Section 3 — Hazards Identification

White crystals or powder. Slight ammonia odor.
Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-0
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable, non combustible solid.
When heated to decomposition, emits toxic fumes of NOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Organic #2. Store with alcohols, glycols, amines and amides.
Store in a cool, dry place.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

White crystals or powder. Slight ammonia odor.
Solubility: Water and alcohol.
Formula: NH2CONH2
Formula Weight: 60.07

Specific Gravity: 1.335
Melting Point: 132.7 C

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers. Reacts with sodium hypochlorite or calcium hypochlorite to form the explosive nitrogen-trichloride.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Irritant
Chronic effects: Possible mutagen
Target organs: N.A.

ORL-RAT LD50: 8471 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

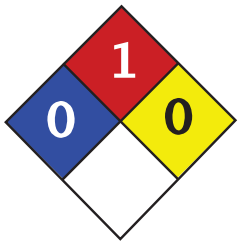
N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (200-315-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.


| | |
|---|---|
| Health | 1 |
| Fire | 1 |
| Reactivity | 0 |
| Personal Protection | A |

# Material Safety Data Sheet
## Olive oil MSDS

## Section 1: Chemical Product and Company Identification

**Product Name:** Olive oil

**Catalog Codes:** SLO1606

**CAS#:** 8001-25-0

**RTECS:** RK4300000

**TSCA:** TSCA 8(b) inventory: Olive oil

**CI#:** Not available.

**Synonym:** Olive OIl; Vegetable Oil

**Chemical Name:** Triglyercide of Fatty Acids.

**Chemical Formula:** Not available.

**Contact Information:**

**Sciencelab.com, Inc.**
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

## Section 2: Composition and Information on Ingredients

**Composition:**

| Name | CAS # | % by Weight |
|---|---|---|
| Olive oil | 8001-25-0 | 100 |

**Toxicological Data on Ingredients:** Not applicable.

## Section 3: Hazards Identification

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

## Section 4: First Aid Measures

**Eye Contact:**
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at

least 15 minutes. Get medical attention if irritation occurs.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** 343°C (649.4°F)

**Flash Points:** CLOSED CUP: 225°C (437°F).

**Flammable Limits:** Not available.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Slightly flammable to flammable in presence of heat.

**Explosion Hazards in Presence of Various Substances:**
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the

residue under a fume hood. Ground all equipment containing material. Do not breathe gas/fumes/ vapor/spray. Keep away from incompatibles such as oxidizing agents, acids.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:** Safety glasses. Lab coat.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 10 (mg/m3) Total.
Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Not available.

**Taste:**
Pleasant, delicate flavor; Faintly acrid aftertaste.
(Slight.)

**Molecular Weight:** Not available.

**Color:** greenish-yellow

**pH (1% soln/water):** Not applicable.

**Boiling Point:** Not available.

**Melting Point:** Not available.

**Critical Temperature:** Not available.

**Specific Gravity:** 0.915 (Water = 1)

**Vapor Pressure:** Not available.

**Vapor Density:** >1 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:**
Very slightly soluble in methanol, n-octanol.
Insoluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:**
Becomes rancid on exposure to air
Begins to get turbid at 5 to 10 C

**Incompatibility with various substances:** Reactive with oxidizing agents, acids.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Eye contact.

**Toxicity to Animals:**
LD50: Not available.
LC50: Not available.

**Chronic Effects on Humans:** Not available.

**Other Toxic Effects on Humans:** Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects:
Inhalation: Excessive inhalation of oil mist may affect respiratory system. Oil mist is classified as a nuisance particulate by ACGIH.
Ingestion: Generally non-hazardous unless ingested in large quantities. If ingested in large quantities, digestive tract discomfort may be encountered.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** Not available.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**
Connecticut carcinogen reporting list.: Olive oil
TSCA 8(b) inventory: Olive oil

**Other Regulations:** EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):**
This product is not classified according
to the EU regulations.
Not applicable.

**HMIS (U.S.A.):**

**Health Hazard:** 1

**Fire Hazard:** 1

**Reactivity:** 0

**Personal Protection:** A

**National Fire Protection Association (U.S.A.):**

**Health:** 0

**Flammability:** 1

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**
Not applicable.
Lab coat.
Not applicable.
Safety glasses.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:43 PM

**Last Updated:** 11/06/2008 12:00 PM

# MATERIAL SAFETY DATA SHEET

Revised: 16/07/04
WRIGHT STAIN Replaces: 09/05/00
CAROLINA BIOLOGICAL Printed: 20/05/08

## 1. PRODUCT DESCRIPTION

Product Name: Wright Stain
Product Code(s): 89-8498, 89-8500
Size: 10g, 25g
Chemical Name: Wright Stain
CAS Number: 98988-92-1
Formula: No data available
Synonyms: None
Distributor: Carolina Biological Supply Company
2700 York Road
Burlington, NC 27215
Chemical Information: 800-227-1150 (8am-5pm (ET) M-F)
Chemtrec (Transportation Spill Response 24 hours): 800-424-9300

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Principle Hazardous Components: Wright Stain(CAS#98988-92-1)100%
TLV and PEL units: None established

## 3. HAZARD IDENTIFICATION

Emergency Overview: May be harmful if inhaled, swallowed or absorbed through skin.
Potential Health Effects:
Eyes: May cause irritation.
Skin: May cause irritation.
Ingestion: May cause gastrointestinal discomfort.
Inhalation: May cause irritation to respiratory tract.

## 4. FIRST AID MEASURES

Emergency and First Aid Procedures:
Eyes - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
Skin - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.
Ingestion - If swallowed, if conscious, give plenty of water and induce vomiting immediately as directed by medical personnel. Immediately call a physician or poison control center. Never give anything by mouth to an unconscious person.
Inhalation - Remove to fresh air. Give oxygen if breathing is difficult; give artificial respiration if breathing has stopped. Keep person warm, quiet, and get medical attention.

## 5. FIREFIGHTING PROCEDURES

Flash Point(Method Used): None
NFPA Rating: Health: 2
Fire: 1
Reactivity: 0
Extinguisher Media:
Use media suitable to extinguish surrounding fire.
Flammable Limits in Air % by Volume: N/A
Autoignition Temperature: N/A
Special Firefighting Procedures:
Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: N/A

## 6. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled:
Ventilate area of spill. Clean-up personnel should wear proper protective equipment. Avoid creating dust. Sweep or scoop up and containerize for disposal.

## 7. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling or Storing: Keep container tightly closed. Store at controlled room temperature.
Other Precautions: Do not breathe dust or get in eyes, on skin, on clothing.

## 8. SPECIAL PROTECTION INFORMATION

Respiratory Protection(Specify Type):
None needed under normal conditions of use with adequate ventilation. NIOSH approved equipment should be worn if PELs are exceeded.
Ventilation:

| | |
|---|---|
| Local Exhaust: | Yes |
| Mechanical(General): | Yes |
| Special: | No |
| Other: | No |

Protective Gloves:
Rubber, neoprene, PVC, or equivalent.
Eye Protection:
Splash proof chemical safety goggles should be worn at all times.
Other Protective Clothing or Equipment:
Lab apron, eye wash, and safety shower.

## 9. PHYSICAL DATA

| | |
|---|---|
| Molecular Weight: | None |
| Melting Point: | N/A |
| Boiling Point: | N/A |
| Vapor Pressure: | N/A |
| Vapor Density(Air=1): | N/A |
| Specific Gravity(H2O=1): | N/A |
| Percent Volatile by Volume: | N/A |
| Evaporation Rate(H2O=1): | N/A |
| Solubility in Water: | Very slight |
| Appearance and Odor: | Dark green crystalline powder |

## 10. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Extreme heat, dusting
Incompatibility(Materials to Avoid): Oxidizers
Hazardous Decomposition Products: Toxic fumes (exact composition unknown)
Hazardous Polymerization: Will not occur

## 11. TOXICITY DATA

Toxicity Data: No data available
Effects of Overexposure: None
Acute: See section 3
Chronic: Material is not listed (IARC, NTP, OSHA)as cancer causing agent.

Conditions Aggravated by Overexposure: No data available
Target Organs: Eyes, skin, respiratory tract,
Primary Route(s) of Entry: Inhalation, ingestion, skin, eyes

## 12. ECOLOGICAL DATA

EPA Waste Numbers: None

## 13. DISPOSAL INFORMATION

Waste Disposal Methods: Dispose in accordance with all applicable Federal,
State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

## 14. TRANSPORT INFORMATION

Non-regulated

## 15. REGULATORY INFORMATION

EPA TSCA Status: TSCA inventory, Yes
Hazard Category for SARA Section 311/312 Reporting: Acute, chronic

| Product or Components | SARA EHS Sec. 302 TPQ | SARA Sec. 313 Chemicals Name List | Chemical Category | CERCLA Sec. 103 RQ lbs. | RCRA Sec. 261.33 |
|---|---|---|---|---|---|
| Wright Stain | No | No | No | No | No |

## 16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the Material Safety Data Sheet. Any employer must carefully assess the applicability of any information contained herein in regards to the particular use to which the employer puts the material.

Glossary
ACGIH.....American Conference of Governmental Industrial Hygienists
CAS Number..Chemical Abstracts Service Number
CERCLA.....Comprehensive Environmental Response, Compensation, and Liability Act
DOT.....U.S. Department of Transportation
IARC.....International Agency of Research on Cancer
mppcf.....million particles per cubic foot
N/A.....Not Available
NTP.....National Toxicology Program
OSHA.....Occupational Safety and Health Administration
PEL.....Permissible Exposure Limit
ppm.....parts per million
RCRA.....Resource Conservation and Recovery Act
SARA.....Superfund Amendments and Reauthorization Act
TLV.....Threshold Limit Value
TSCA.....Toxic Substances Control Act

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 862.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Zinc Nitrate

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Zinc Nitrate, hexahydrate
Synonym: zinc dinitrate
CAS#: 10196-18-6

### Section 3 — Hazards Identification

Moist, white lumps or crystals. Odorless.
Slightly toxic by ingestion and inhalation. Corrosive to body tissues. Avoid all body tissue contact.
Strong oxidizer. Fire risk when in contact with combustible materials.

**FLINN AT-A-GLANCE**
Health-1
Flammability-0
Reactivity-3
Exposure-2
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give no more than 1-2 cups of water for dilution. Do not induce vomiting. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Strong oxidizer. Fire and explosion risk when in contact with combustible materials. When heated to decomposition, emits toxic fumes of NOx and ZnO.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #3. Store with amides, nitrates and nitrites.
Store in a cool, dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron. Use exhaust ventilation to keep airborne concentrations low.

## Section 9 — Physical and Chemical Properties

Moist, white lumps or crystals. Odorless.
Solubility: Water and alcohol.
Formula: Zn(NO3)2 6H2O
Formula Weight: 297.49

Specific Gravity: 2.065
Melting Point: 36.4 C

## Section 10 — Stability and Reactivity

Avoid contact with strong reducers, organic and combustible materials.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Corrosive
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 1190 mg/kg
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Zinc Nitrate
Hazard Class: 5.1, Oxidizer
UN Number: UN1514

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (292-366-5), RCRA code D001.

## Section 16 — Other Information

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# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 864.00
**Revision Date:** May 22, 2001

### Section 1 — Chemical Product and Company Identification

## Zinc Oxide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Zinc Oxide
Synonym: zinc white
CAS#: 1314-13-2

### Section 3 — Hazards Identification

Pale-yellow granular powder. Odorless.
Moderately toxic by ingestion and inhalation. Body tissue irritant. Avoid all body tissue contact.

**FLINN AT-A-GLANCE**
Health-2
Flammability-0
Reactivity-1
Exposure-1
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #4. Store with hydroxides, oxides, silicates and carbonates.
Store in a cool, dry place. Use and dispense in a hood.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.Use ventilation to keep airborne concentrations below exposure limits. Always wear a NIOSH-approved respirator with proper cartridges or a positive pressure, air-supplied respirator when handling this material in emergency situations (spill or fire).
Exposure guidelines: TWA 5 mg/m3, STEL 10 mg/m3 (OSHA, ACGIH)

## Section 9 — Physical and Chemical Properties

Pale-yellow granular powder. Odorless.
Solubility: Acids and alkali.
Formula: ZnO
Formula Weight: 81.38

Specific Gravity: 5.47
Melting Point: 1975 C

## Section 10 — Stability and Reactivity

Zinc oxide, powder reacts violently with chlorinated rubber. Avoid heating.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Harmful dust
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: 630 mg/kg
IHL-MUS LC50: 2500 mg/m3
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-222-5).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 868.00
**Revision Date:** March 12, 2001

### Section 1 — Chemical Product and Company Identification

## Zinc Sulfide

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Zinc Sulfide

CAS#: 1314-98-3

### Section 3 — Hazards Identification

Yellowish-white powder. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated. Contact with acids liberates toxic and flammable hydrogen sulfide gas.

**FLINN AT-A-GLANCE**
Health-0
Flammability-0
Reactivity-2
Exposure-0
Storage-1

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
When heated to decomposition, emits toxic fumes of SOx.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Remove all sources of water and acids. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #5. Store with sulfides, phosphides, carbides and nitrides.
Store in a cool, dry place. Air and moisture sensitive. Store in a Flinn Chem-Saf bag. Use fume hood when heating.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Yellowish-white powder. Odorless.
Solubility: Soluble in acids; insoluble in water.
Formula: ZnS
Formula Weight: 97.45

Specific Gravity: 4.100

## Section 10 — Stability and Reactivity

Avoid contact with strong oxidizers, strong acids, and moisture. Contact with acids liberates toxic hydrogen sulfide gas.
Shelf Life: Poor; moisture sensitive.

## Section 11 — Toxicological Information

Acute effects: N.A.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (215-251-3), RCRA code D003.

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.

# FLINN SCIENTIFIC INC.

"Your Safer Source for Science Supplies"

## Material Safety Data Sheet (MSDS)

**MSDS #:** 859.00
**Revision Date:** March 15, 2001

### Section 1 — Chemical Product and Company Identification

## Zinc

Flinn Scientific, Inc. P.O. Box 219 Batavia, IL 60510 (800) 452-1261

CHEMTREC Emergency Phone Number: (800) 424-9300

### Section 2 — Composition, Information on Ingredients

Zinc

CAS#: 7440-66-6

### Section 3 — Hazards Identification

Shiny white metal with bluish-gray luster. Forms: granular, mossy dust, metal pieces, foil, sheets, shot, strips. Odorless.
Substance not considered hazardous. However, not all health aspects of this substance have been thoroughly investigated. Inhalation of zinc dust may cause lung irritations. Zinc dust can spontaneously combust when in contact with moisture.

**FLINN AT-A-GLANCE**
Health-0
Flammability-1
Reactivity-2
Exposure-0
Storage-0

0 is low hazard, 3 is high hazard

### Section 4 — First Aid Measures

Call a physician, seek medical attention for further treatment, observation and support after first aid.
Inhalation: Remove to fresh air at once. If breathing has stopped give artificial respiration immediately.
Eye: Immediately flush with fresh water for 15 minutes.
External: Wash continuously with fresh water for 15 minutes.
Internal: Give large quantities of water. Call a physician or poison control at once.

### Section 5 — Fire Fighting Measures

Non flammable solid.
Finely divided zinc dust is a severe fire hazard. Zinc dust can spontaneously combust when in contact with moisture.
**Fire Fighting Instructions:** Use triclass, dry chemical fire extinguisher. Firefighters should wear PPE and SCBA with full facepiece operated in positive pressure mode.

**NFPA CODE**
None established

### Section 6 — Accidental Release Measures

Restrict unprotected personnel from area. Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

### Section 7 — Handling and Storage

Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides.

### Section 8 — Exposure Controls , Personal Protection

Avoid contact with eyes, skin and clothing. Wear chemical splash goggles, chemical-resistant gloves and chemical-resistant apron.

## Section 9 — Physical and Chemical Properties

Shiny white metal with bluish-gray luster. Forms: granular, mossy dust, metal pieces, foil, sheets, shot, strips. Odorless.
Solubility: Soluble in acids and alkalies; not water.
Formula: Zn
Formula Weight: 65.37

Specific Gravity: 7.14
Melting Point: 419 C
Boiling Point: 908 C

## Section 10 — Stability and Reactivity

Avoid strong acids, strong bases, cadmium, sulfur chlorinated solvents, amines, and carbon disulfide. Avoid any source of flame for zinc dust only! Zinc dust can spontaneously combust when in contact with moisture.
Shelf Life: Indefinite.

## Section 11 — Toxicological Information

Acute effects: Dust may cause lung irritations.
Chronic effects: N.A.
Target organs: N.A.

ORL-RAT LD50: N.A.
IHL-RAT LC50: N.A.
SKN-RBT LD50: N.A.

N.A. = Not available, not all health aspects of this substance have been fully investigated.

## Section 12 — Ecological Information

Data not yet available.

## Section 13 — Disposal Considerations

Please consult with state and local regulations.
Flinn Suggested Disposal Method #26a is one option.

## Section 14 — Transport Information

Shipping Name: Not regulated
Hazard Class: N/A
UN Number: N/A

N/A = Not applicable

## Section 15 — Regulatory Information

TSCA-listed, EINECS-listed (231-175-3).

## Section 16 — Other Information

Consult your copy of the Flinn Scientific Catalog/Reference Manual for additional information about laboratory chemicals. This Material Safety Data Sheet (MSDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. Flinn Scientific Inc. assumes no legal responsibility for use or reliance upon this data.