

MATERIAL SAFETY DATA SHEET

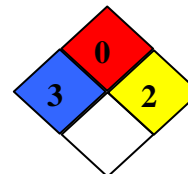
Sulfuric Acid

For more detailed information on the hazards of this product, contact Chemical Safety and Health Department or Medical Services Department at the address below. Technical Information Bulletin may also be available.

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Brand Name..... Sulfuric Acid
Chemical Name Sulfuric Acid
Common Name..... Sulfuric Acid
Formula H₂SO₄
Molecular Weight..... 98.08 (hydrogen sulfate)
Product Use Intermediate and by-product of TiO₂ manufacture
Canadian PIN 1830



MANUFACTURER

Tronox
One Leadership Square, Suite 300
211 N. Robinson Ave.
Oklahoma City, OK 73102 US

EMERGENCY TELEPHONE NUMBER

1-866-775-5009 (24 hours)

2. COMPOSITION/INFORMATION ON INGREDIENTS

	CHEMICAL NAME	CAS NUMBER	WEIGHT %
sulfuric acid		7664-93-9	77 - 98
water		7732-18-5	2 - 23

See Section 15 of this MSDS for OSHA Regulatory Status

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Colorless, odorless, liquid. Causes severe burns to eyes and skin. Swallowing sulfuric acid will cause pain and burns of mucous membranes, esophagus, and stomach. Harmful to aquatic life in very low concentrations.

In case of a spill, wear full protective equipment (see Section 8).

Reacts with most metals to produce highly flammable hydrogen gas that can form an explosive mixture with air. Generates considerable heat when mixed with water.

Will not burn in a fire. Concentrated sulfuric acid is a strong oxidizing agent.

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTE(S) OF ENTRY

Eye and skin contact; ingestion (swallowing).

DANGER! Causes severe burns. This product is corrosive to eyes, skin, mucous membranes, respiratory tract, esophagus, and stomach. Chronic or prolonged exposure may impair breathing, or may cause chronic bronchitis, dermatitis, or loss of tooth enamel.

SYMPTOMS OF EXPOSURE

Inhalation: Breathing mist may cause coughing, burning in the throat, or choking. High or prolonged exposure may cause fluid in the lungs, chest discomfort, or difficulty in breathing. Extreme overexposure can cause collapse or death. Prolonged or repeated breathing of sulfuric acid mist may cause cancer.

Eye Contact: Severe burns.

Skin Contact: Itching, severe irritation, or burns.

Ingestion: Severe burning pain in mouth, throat, chest, and stomach. Swallowing may cause vomiting or diarrhea of dark blood, possible death.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Eye or skin disease, breathing or respiratory disorders, digestive tract disorders, or cardiovascular disease.

REPORTED AS CARCINOGEN OR POTENTIAL CARCINOGEN

Not Applicable

National Toxicology Program (NTP)

OSHA

International Agency for Research on Cancer (IARC)
(See Section 11)

4. FIRST AID MEASURES

Inhalation: Remove from area to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

Eye contact: Immediately rinse eyes with water. Remove contact lenses. Hold eyelid apart to ensure rinsing of the entire surface of the eyes and lids with water. Continue flushing eyes with large amounts of running water for at least 15 minutes. If physician is not available, flush for an additional 15 minutes. Get immediate medical attention.

Skin Contact: Wash affected areas with large amounts of running water, and soap if available, for 15 minutes. Removing contaminated clothing and shoes. Get immediate medical attention. Wash clothing before reuse; discard contaminated shoes.

Ingestion: Give 3-4 glasses of water, but **DO NOT** induce vomiting. If vomiting occurs, give fluids again. Have physician determine if patient's condition allows induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person. Get immediate medical attention.

NOTE TO PHYSICIAN

Chemicals of exposure is sulfuric acid which is corrosive to eyes, skin, mucous membranes, and respiratory and gastroesophageal tracts.

5. FIRE FIGHTING MEASURES

Flash Point and Method..... N/A

GENERAL HAZARD

This product is not flammable but may be involved in a fire with other materials. Concentrated sulfuric acid is a strong oxidizing agent.

EXTINGUISHING MEDIA

For small fires, use alcohol-resistant foam, CO₂, dry chemical, or dry sand. For large fires, use water spray, fog, or alcohol-resistant foam; do not use straight water streams.

SPECIAL FIREFIGHTING INSTRUCTIONS

Move containers from area if it can be done without risk. Cool fire-exposed containers with flooding quantities of water until fire is out. Stay away from storage tank ends.

FIREFIGHTING EQUIPMENT

As in any fire, wear NIOSH approved, positive-pressure self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Wear appropriate Personal Protective Equipment. Do not touch or walk through spilled material. Stop leak if it can be done without risk. Evacuate leaker or personnel, or both, to safe area, if possible. Ventilate area. Determine whether spill notification must be made to the appropriate authorities.

ON LAND

Small Spills: Absorb with vermiculite, fuller's earth, or sand. Neutralize with limestone, slaked lime, or soda ash. Shovel up and place in a non-metal waste container for disposal. Neutralize spill area, and wash with plenty of water.

Large Spills: Dike spill area with soil or sandbags to contain it and prevent its spread. Prevent liquid from entering sewers or waterways.

Remove bulk of liquid, for example with a vacuum truck, for recovery or disposal. Then flush area with water, and neutralize washings with limestone, slaked lime, soda ash, or caustic. If permitted, flush neutralized washing to a waste treatment plant; otherwise transfer to a licensed waste disposal contractor.

Dispose of all contaminants according to federal, state, and local regulations.

IN WATER

Small pools of contaminant may be absorbed in a non-reactive absorbent and disposed of as outlined above. Spills into large bodies of water should be dispersed and neutralized with mild alkaline material.

7. HANDLING AND STORAGE

HANDLING

Wear appropriate protective equipment (See Section 8). Do not get in eyes, on skin, on clothing. Avoid breathing mist. Keep container closed. Use with sufficient ventilation to keep area below established exposure levels. Wash thoroughly after handling.

Product will react with metals and form hydrogen gas which is flammable or explosive in air. Do not mix with cyanides, sulfides, or formaldehyde.

STORAGE

Keep container tightly closed. Store in a corrosion-proof area. Isolate from incompatible materials (see Section 10).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Use local exhaust or general dilution ventilation system. In-plant operations should employ negative pressure (vacuum) techniques to keep mists inside processing equipment.

PERSONAL PROTECTION

Respirator: For exposure above the exposure limit, use a NIOSH-approved respirator that has been selected by a technically qualified person for the specific work conditions. If respirators are used, OSHA requires compliance with its respiratory protection program (29 CFR 1910.134).

Eye Protection: Wear vented safety goggles and face shield.

Clothing: Where contact is likely, wear chemical-resistant gloves, a chemical suit and chemical-resistant boots. During emergency or while making repairs, wear clothing and boots that will not allow this chemical to penetrate. Discard shoes if they have been contaminated.

Other: Eye wash; safety shower.

EXPOSURE CONTROLS

COMPONENT	OSHA PEL		ACGIH TLV	
	TWA	STEL	TWA	STEL
Sulfuric acid	1 mg/m ³	N/E	1 mg/m ³	3 mg/m ³

9. PHYSICAL AND CHEMICAL PROPERTIES

State	Liquid	Volatiles.....	ca. 64%
Color	Colorless, dense, oily	Weight Per Gallon	ca. 10.9 lbs.
Odor	None	Specific Gravity @ 4 °C.....	1.30 - 1.35
Melting Point °C.....	10	Water Solubility.....	Soluble
Boiling Point °C	330	pH @ 25 °C	< 1
Vapor Pressure.....	<0.001 mm Hg @ 20 °C	Vapor Density.....	3.4

10. STABILITY AND REACTIVITY

REACTIVITY

Generates considerable heat when mixed with water. Never add water to acid; acid should always be slowly added to water.

INCOMPATIBILITIES

Contact with Chromates, Bases, Acetaldehyde, Acetic Anhydride, Alcohols, Hydrogen peroxide, Metals, Organics, Nitromethane.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition may release toxic oxides of sulfur.

CONDITIONS TO AVOID

Avoid contact with common metals, alkali metals or active metals and water.

11. TOXICOLOGICAL INFORMATION

For Sulfuric Acid:

RTECS WS5600000:

Inhalation LC ₅₀ (rat).....	510 mg/m ³ /2H
Inhalation LC ₅₀ (mouse).....	320 mg/m ³ /2H
Oral LD ₅₀ (rat).....	2140 mg/kg

Highly irritating and corrosive to all tissues.

IARC has classified occupational exposures to sulfuric acid mist as Group 1 – Carcinogenic to Humans. ACGIH has classified sulfuric acid mists as A2 – Suspected Human Carcinogen.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:

A 24 hr exposure at 24.5 ppm is lethal to bluegill
48hr LC₅₀ (prawn): 42.5 ppm salt water

13. DISPOSAL CONSIDERATIONS

RCRA Waste Code:.....D002

Do not allow material to enter sewer systems. Sulfuric acid, including spill cleanups, is prohibited from land disposal without prior treatment. Dispose in accordance with applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

DOT Proper Shipping NameSulfuric Acid
DOT Hazard Class.....8
DOT I.D. Number.....UN 1830
Packing Group.....II
Label(s).....Corrosive

ERG - Guide No. 154
RQ (as sulfuric acid)..... 1000 lbs. (454 kg)

TDG Shipping Name Sulfuric Acid
TDG Classification 8
Product Identification Number UN1830
Packing Group II
Label Corrosive

IMDG Proper Shipping Name Sulphuric Acid
IMDG Hazard Class 8
IMDG I.D. Number UN1830
Packing Group II
Label(s) Corrosive

IATA Proper Shipping Name Sulphuric Acid
IATA Hazard Class 8
IATA I.D. Number UN1830
Packing Group II
Label(s) Corrosive

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

Hazardous Non-Hazardous

CERCLA/SUPERFUND (40 CFR 117, 302)

Chemical Name	RQ (lbs)/(kg)
Sulfuric Acid	1,000/454

SARA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355)

Chemical Name	TPQ (lbs)	RQ (lbs)
Sulfuric acid	1000	1000

SARA HAZARD CATEGORIES (40 CFR 370)

Acute Chronic Fire Pressure Reactive None

SARA TOXIC CHEMICALS (40 CFR 372)

Chemical Name	CAS Number	%
N/A		

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (CPR Section (33))

This product has been classified according to the hazard criteria of the Controlled Products Regulations, and the MSDS contains all required information.

Controlled Product; Classification: D1A, E

Not a Controlled Product

INVENTORY STATUS

This chemical is listed on the US TSCA Chemical Substance Inventory and the Canadian Domestic Substances List.

TOXIC SUBSTANCES CONTROL ACT

No specific regulations apply.

STATE REGULATIONS

California Proposition 65 Warning. This product contains a chemical known to the State of California to cause cancer.
Massachusetts Right to Know List Sulfuric acid - Extraordinarily hazardous
Minnesota Hazardous Substance List Sulfuric acid
New Jersey Right to Know List Sulfuric acid - Substance No.: 1761; Special Health Hazard: Corrosive
Pennsylvania Right to Know List Sulfuric acid - Environmental Hazard
Rhode Island Hazardous Substance List Sulfuric acid

16. OTHER INFORMATION

ABBREVIATIONS

C - Ceiling limit

CPR – Controlled Products Regulations

LC_{Lo} - The lowest concentration of a substance in air that will kill a test animal within a certain exposure period.

LC₅₀ - The concentration of a substance in air that will kill 50% of test animals within a certain exposure period.

LD₅₀ - The dose that causes death in 50% of test animals.

N/A - Not applicable

N/D - Not determined

N/E - Not established

N/K - Not known

NAERG - North American Emergency Response Guidebook

RQ - Reportable Quantity

TPQ - Threshold Planning Quantity

PREPARATION INFORMATION

Prepared by Safety and Health Department

MSDS No. S-3008

Date Prepared: March 7, 2006

Replaces: June 29, 2004

Date of Issue: March 2006

REVISION INFORMATION

Section 1: Updated company name, address, and telephone number. Updated PIN number

Section 14: IMDG/IATA added; classification changed; Updated DOT ID number