

Material Safety Data Sheet



Martrex, Inc.

Section 1: Chemical Product and Company Information

Product name: Sulfuric Acid 94%

Synonyms: Sulphuric Acid, Hydrogen Sulphate, Oil of Vitriol, Battery Acid

Supplier/ Further Information:

Martrex, Inc.

P. O. Box 1709

14525 Highway 7

Minnetonka, Minnesota 55345-3793

Web: www.martrexinc.com

Phone: 952/933-5000

Toll Free: 800/328-3627

FAX: 952/933-1889



4=Severe
3=Serious
2=Moderate
1=slight
0=minimum
W=water reactive
Health
Fire
Reactivity
Special Hazard

For Rating Explanation see Section 16

24 Hour Emergency Phone - Chemtrec Transport: 1-800-424-9300; Medical: 1-800-441-3637

Section 2: Composition/Information on Ingredients

Component	SARA Listed Hazardous?	CAS#	%
Sulfuric Acid	Yes	7664-93-9	94%
Water	No	7732-18-5	6%

Section 3: Hazards Identification

Emergency Overview: Danger! Extremely corrosive. Causes severe burns and eye damage. Mist: Causes respiratory irritation. Harmful if inhaled. Harmful or fatal if swallowed. Reacts violently with water. Concentrated Sulfuric Acid will react with many organic materials and may cause fire due to the heat of the reaction. Not flammable, but reacts with most metals to form explosive/flammable hydrogen gas. Read the entire MSDS for a more thorough evaluation of the hazards.

NFPA: Health: **3** Flammability: **0** Reactivity: **2** Reactivity: **W**

Exposure Limit	Agency	Type
1 mg/m ³ (TWA) 8 hours	ACGIH	TLV
3 mg/m (STEL) 15 minutes	ACGIH	TLV
1 mg/m ³ (TWA) 8 hours	OSHA	PEL
1 mg/m ³ (TWA) 10 hours	NIOSH	REL

Potential Health Effects: Hazardous in case of skin contact, of eye contact, of ingestion, of inhalation.

Primary Routes of Exposure / Entry: Skin contact, Inhalation, Eye contact.

Target Organs: skin, respiratory system, eyes

**Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
1-800-441-3637 Medical**

Acute Exposure Symptoms

Inhalation (breathing): Causes respiratory irritation and at high concentrations may cause severe injury, burns, or death. Effects of exposure may be delayed.

Eye Contact: Immediate pain, severe burns and corneal damage, which may result in permanent blindness.

Skin Contact: Causes burns, and brownish or yellow stains. Concentrated solutions may cause second or third degree burns with severe necrosis. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.

Ingestion (swallowing): Causes severe irritation or burns of the mouth, throat, and esophagus.

Medical Conditions Aggravated By Long-Term Exposure: Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapors or sprays (mists) may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

Chronic Exposure Symptoms:

Carcinogenicity Data: Strong inorganic acid mists containing sulfuric acid (Occupational exposures) : Proven (Human, Group 1, IARC) ; Suspected (Human Group A2, ACGIH) ; Group 3 (NTP) ; Classification not applicable to sulfuric acid and sulfuric acid solutions.

Also See: Section 11 for more Toxicological information

Section 4: First Aid Measures

General: Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. **SPEED IS ESSENTIAL. OBTAIN IMMEDIATE MEDICAL ATTENTION.**

Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY.

Eye Exposure: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Exposure: Immediately flush skin with running water for a minimum of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim unless the recommended flushing period is completed or flushing can be continued during transport.

While the patient is being transported to a medical facility, apply compresses of iced water. If medical treatment must be delayed, immerse the affected area in iced water. If immersion is not practical, compresses of iced water can be applied. Avoid freezing tissues.

Discard heavily contaminated clothing and shoes in a manner that limits further exposure. Otherwise, wash clothing separately before reuse.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give ½ to 1 glass of water to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY contact local poison control center. Vomiting may need to be induced but should be directed by a physician or a poison control centre. IMMEDIATELY transport victim to an emergency facility.

NOTE TO THE PHYSICIAN: This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pneumonitis may occur. DO NOT attempt to neutralize the acid with weak bases since the reaction will produce heat that may extend the corrosive injury.

**24 Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
1-800-441-3637 Medical**

Section 5: Fire Fighting Measures

Flammability Classification: Sulfuric Acid is not combustible.

A Flash Point: not applicable

Auto-ignition Temperature: not applicable

Lower explosion limit (LEL): not applicable

Upper explosion limit (UEL): not applicable

Extinguishing Media: **Small Fires:** Use DRY chemical powder. **Large Fires: Do not use water jet.** Use dry chemical, water spray, fog or foam.

Unusual Fire and Explosive Hazards: Not flammable but highly reactive. Strong dehydrating agent, which may cause ignition of finely divided combustible materials on contact. Reacts violently with water with evolution of heat can react with organic materials explosively (See Section 10).

Hazardous Decomposition Materials: Reacts with many metals to liberate hydrogen gas which can form explosive mixtures with air. Hydrogen, a highly flammable gas, can accumulate to explosive concentrations inside drums, or any types of steel containers or tanks upon storage. Oxides of sulfur may be produced in fire..

Fire-Fighting Instructions: Wear a NIOSH/MSHA approved self-contained breathing apparatus if vapors or mists are present and full protective clothing. For fighting fires in close proximity to spill or vapors, use acid-resistant personal protective equipment. Evacuate personnel to a safe area. Prevent unauthorized entry to fire area. Dike area to contain runoff and prevent contamination of water sources. Neutralize runoff with lime, soda ash or other suitable neutralizing agents (see Deactivating Chemicals, Section 6). Cool containers that are exposed to flame with streams of water until fire is out.

Personal Protective Equipment: See Fire-Fighting Instructions:

Section 6: Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill: Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded. Ventilate area. Use appropriate Personal Protection Equipment. Prevent liquid from entering sewers or waterways. Stop or reduce leak if safe to do so.

Spill and Leak Personal Procedures: **Small Spills:** Cover with DRY earth, sand or other non-combustible material. Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal. **Large Spills:** Prevent liquid from entering sewers or waterways. Dike with inert material (sand, earth, etc.). Collect into plastic containers for disposal. Consider insitu neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Comply with Federal, Provincial/State and local regulations on reporting releases.

Clean-up and Disposal of Spill: Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems.

Environmental and Regulatory Reporting: Note - Clean-up material may be a RCRA Hazardous Waste on disposal. - Spills are subject to CERCLA reporting requirements: RQ = 1000 lbs

Section 7: Handling and Storage

Minimum/maximum Storage Temperature: Do not store above 23°C (73.4°F).

Handling: Wear suitable protective clothing and eye protection. In case of insufficient ventilation or when dust concentrations exceed any established exposure limits (see Section 2), wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Keep dry. Urea will absorb moisture from air. If storage piles become wet, surrounding floor may be slippery. Reacts with hypochlorites to form nitrogen trichloride, which explodes spontaneously in air. Reacts with nitric acid to form urea nitrate that decomposes explosively when heated. Do not store above 23°C.

REGULATORY REQUIREMENTS: See Section 2 and 8 for employee exposure controls and Section 15 for other regulatory requirements.

**24 Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
1-800-441-3637 Medical**

Section 8: Exposure Controls / Personal Protection

Ventilation Protection: Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact with sulfuric acid. Electrical installations should be protected against the corrosive action of acid vapors. Smoking should be prohibited in areas in which sulfuric acid is stored or handled.

Respiratory Protection (specify type): A NIOSH/MSHA approved air-purifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 10 mg/m³. An air-supplied respirator if concentrations are higher or unknown. 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.

Eye Protection: Tight-fitting chemical goggles and face shield.

Skin Protection: RECOMMENDED: Impervious (i.e., neoprene, PVC) gloves, coveralls, boots and/or other acid resistant protective clothing.

Other Protective Clothing and Equipment: Where there is a danger of spilling or splashing, acid resistant aprons or suits should be worn. Trouser legs should be worn outside (not tucked in) rubber boots. Safety showers and eyewash fountains should be installed in storage and handling areas.

Pictograms:



Exposure Limit	Agency	Type
1 mg/m ³ (TWA) 8 hours	ACGIH	TLV
3 mg/m (STEL) 15 minutes	ACGIH	TLV
1 mg/m ³ (TWA) 8 hours	OSHA	PEL
1 mg/m ³ (TWA) 10 hours	NIOSH	REL

Section 9: Physical and Chemical Properties

Chemical Name: Sulfuric Acid

Percent Equivalent: 94%

Physical State: Liquid

Odor and Appearance: Odorless, clear to amber, heavy, oily liquid. A pungent odor may exist if certain impurities are present in the acid.

Odor Threshold: not applicable

pH: 0.3 (1N solution at 25°C/78°F)

Specific Gravity at 15°C / 60°F): 93.19%: 1.8354

Vapor Pressure at 40°C (102°F): 93.19%: 0.0016 mmHg

Vapor Density (Air = 1): 3.4 sulfuric acid component

Density: no data

Bulk Density: Not applicable (see specific gravity)

Volatiles by Volume: no data

Boiling Point: 93.19%: 276°C (529°F)

Freezing / Melting Point: 93.19%: -29.5°C (-21.1°F)

Evaporation Rate: not applicable

**24 Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
1-800-441-3637 Medical**

Solubility in water: Miscible in all proportions in water.

Viscosity: no data

Other Solubilities: no data

Chemical Formula: H₂SO₄

Formula Wt: 98.08

Section 10: Stability and Reactivity

Chemical Stability (under normal conditions of storage, handling, use): Stable X Unstable

Hazardous Polymerization: May Occur

Will Not Occur X

Conditions to Avoid: Keep away from heat and sources of ignition. Avoid temperatures, which may have a negative effect on the materials of construction used in equipment.

Chemical Incompatibility and Materials to Avoid: Contact with organic materials (such as alcohol, acrylonitrile, chlorates, carbides, epichlorohydrin, fulminates, isoprene, nitrates and picrates) may cause fire and explosions. Contact with metals may produce flammable hydrogen gas. When diluting, add acid to water. Do NOT add water to the acid.

Hazardous Decomposition Products: Toxic gases and vapors (e.g. sulfur dioxide, sulfuric acid vapors/mists and sulfur trioxide) may be released when sulfuric acid decomposes.

Corrosivity: The product is corrosive.

Section 11: Toxicological Information

Acute Data:

Toxicological Data:

LD₅₀ (oral, rat) = 2140 mg/kg

LC₅₀ (inhalation, rat) = 510 mg/m³ for 2 hrs

Skin effects (rabbit): Severe irritation

Eye effects (rabbit): Severe irritation

Chronic Data:

Carcinogenicity Data: The International Agency for Research on Cancer (IARC) has concluded that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to man, causing cancer of the larynx (the voice box). Although no direct link has been established between exposure to sulfuric acid, itself, and cancer in man, exposure to any mist or aerosol during the use of this product should be avoided See Section 3. Hazard Information, regarding Potential Health Effects (Long Term Exposure) for further discussion.

The National Toxicology Program (NTP) does not classify sulfuric acid or strong inorganic acid mists as known (or reasonably anticipated to be) human carcinogens.

Reproductive Effects: Slightly embryotoxic in rabbits (a minor, rare skeletal variation). The animals were exposed to 5 and 20 mg/m³ for 7 hrs/day throughout pregnancy. Slight maternal toxicity was present at the highest dose in both species.

Mutagenicity Data: Cytogenic analysis (hamster) ovaries 4 mmol/L

Teratogenicity Data: Not teratogenic in mice and rabbits.

Section 12: Ecological Information

Eco-acute Toxicity: Harmful to aquatic life in very low concentrations. May be dangerous if it enters water intake; Fish toxicity; 2.8 µg/L 96 hrs LC₅₀ Rainbow trout.

Degradation Products: These products are sulphur oxides (SO₂, SO₃)

Toxicity of the Products of Degradation: The products of degradation are more toxic than the original product.

Section 13: Disposal Considerations

Waste Disposal: Cleaned up material may be a hazardous waste as defined by Resource Conservation and Recovery Act (RCRA) on disposal due to the corrosivity characteristic. DO NOT flush to surface water or sanitary sewer system. Waste must be disposed of in accordance with federal, state, provincial and local environmental control regulations.

Section 14: Transport Information

Waste Disposal:

U.S. (Under DOT)

Shipping Name: Sulfuric acid

Hazard Class or Division: 8

Identification No.: UN1830

Packing Group: II

Reportable Quantity = 1000 pounds (454 kg)

IMO: 8

IATA/ICAO Class: 8

ER Guide: 137

Canada (Under TDG)

Shipping Name: Sulfuric acid

Classification(s): Class 8

Product Identification No. (PIN): UN1830

Packing Group: II

Regulated Limit: 50 kg

Section 15: Regulatory Information

U.S.A.

SARA Title III HAZARD CATEGORIES AND LISTS

Product Hazard Categories Lists

Acute (Immediate) Health:	Yes	Extremely Hazardous Substance	Yes
Chronic (Delayed) Health:	Yes	(40 CFR 355, SARA Title III Section 302)	
Fire:	No	CERCLA Hazardous Substance	Yes
Reactivity:	Yes	(40 CFR 302.4)	
Sudden Release of Pressure:	No	Toxic Chemical	Yes
		(40 CFR 372.65, SARA Title III Section 313)	

Reportable Quantity (RQ) under U.S. EPA CERCLA: RQ=1000 lb / 454 kg

TSCA Inventory Status: Reported/Included

Right-To-Know: Illinois, Massachusetts, New Jersey, Pennsylvania

Other Regulations/Legislation which apply to this product: New Jersey Special Health Hazard Substance List and Environmental Hazardous Substance; Minnesota, Florida, Rhode Island Hazardous Substance ; California Director's List of Hazardous Substances; Massachusetts Extraordinarily Hazardous Substance List

CANADA

Workplace Hazardous Materials Information System (WHMIS)

WHMIS Classification(s): Class D1A - Very Toxic
Class D2B – Suspected Human Carcinogen
 Class E - Corrosive

WHMIS Health Effects Index: Acute Lethality - very toxic – immediate
 Materials Causing Other Toxic Effects- Chronic
 Corrosive to animal skin

WHMIS Ingredient Disclosure List: Confirmed A; Meets criteria for disclosure at 1% or greater.
 National Pollutant Release Inventory (NPRI): Included

European:

EEC CLASSIFICATION: C, R 35

EINECS: 231-639-5

**24 Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
 1-800-441-3637 Medical**

Section 16: Other Information

- ACGIH** - American Conference of Governmental Industrial Hygienists
- ANSI** - American National Standards Institute
- CAS** - Chemical Abstracts Service
- CERCLA** - Comprehensive Environmental Response, Compensation & Liability Act of 1980
- CFR** - Code of Federal Regulations
- CHEMTREC** - Chemical Transportation Emergency Center
- DOT** - U.S. Department of Transportation
- DSL** - Canadian Domestic Substance List
- EHS** - Extremely Hazardous Substance
- EPA** - U.S. Environmental Protection Agency
- HMIS** - Hazardous Material Identification System
- IARC** - International Agency for Research on Cancer
- LEL/UEL** - Lower and Upper Explosive Limit
- mg/m³** - Milligrams per cubic meter
- MSDS** - Material Safety Data Sheet
- NAERG** - North American Emergency Response Guidebook
- NIOSH** - National Institute of Occupational Safety and Health
- NFPA** - National Fire Protection Association
- NTP** - National Toxicology Program
- OSHA** - Occupational Safety and Health Administration
- PEL** - Permissible Exposure Limit (set by OSHA)
- PPE** - Personal Protective Equipment
- RCRA** - Resource Conservation and Recovery Act of 1976
- SARA** - Superfund Amendments and Reauthorization Act
- TDG (Canadian)**: Transport of Dangerous Goods Regulations
- TLV** - Threshold Limit Value (set by ACGIH)
- TWA** - 8-hour Time Weighted Average
- TSCA** - US Toxic Substance Control Act
- WHMIS** - Workplace Hazardous Material Information System

NFPA Rating Explanation Guide					
Rating Number	Health Hazard	Flamability Hazard	Instability Hazard	Rating Symbol	Special Hazard
4	Can be lethal	Will vaporize and readily burn at normal temperatures	May explode at normal temperatures and pressures	ALK	Alkaline
				ACID	Acidic
3	Can cause serious or permanent injury	Can be ignited under almost all ambient temperatures	May explode at high temperature or shock	BIO	BioHazard
				COR	Strong Corrosive
2	Can cause temporary incapacitation or residual injury	Must be heated or high ambient temperature to burn	Violent chemical change at high temperatures or pressures	CRYO	Cryogenic
				OXY	Oxidizer
1	Can cause significant irritation	Must be preheated before ignition can occur	Normally stable. High temperatures make unstable		Radioactive
				W	Reacts violently or explosively with water
0	No Hazard	Will not burn	Stable	W OX	Reacts violently or explosively with water or oxidizer

This chart for reference only - For complete specifications consult the NFPA Standard

MSDS Issue Date: n/a
 Revised Date: 5-21-09
 Supersedes: n/a

Disclaimer: Martrex, 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. **MARTREX, 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, MARTREX, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

**24 Hour Emergency Phone - Chemtrec: 1-800-424-9300 Transportation
 1-800-441-3637 Medical**