

Material Safety Data Sheet

Sulphuric Acid

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulphuric Acid

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

Chemical Family: Inorganic acid.

Application: Water treatment. Metal pickling. Petroleum processing. Manufacture of fertilizers, explosives and other acids.

Distributed By:

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Percentage (W/W)	LD50s and LC50s Route & Species:
Sulphuric Acid 7664-93-9	70-1 00	Oral LD50 (Rat) 2140 mg/kg Inhalation LC50 (Rat) 510 mg/m ³ (2-hour exposure) LC50 (Rat): 255 mg/m ³ (equivalent 4-hour exposure) LC50 (Mouse): 160 mg/m ³ (equivalent 4-hour exposure).

Note: No additional remark.

3. HAZARDS IDENTIFICATION

Potential Acute Health Effects:

Eye Contact: Corrosive to eye tissue and may cause severe damage and blindness. Inflammation of the eye is characterized by redness, watering, and itching.

Skin Contact: Corrosive! Effects on the skin may be delayed and damage may occur without the onset of pain. Causes burns, and brownish or yellow stains. Concentrated solutions may cause second or third degree burns with severe necrosis and may cause permanent scarring. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin.

Inhalation: Inhalation of the mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. May be fatal if inhaled.

3. HAZARDS IDENTIFICATION

Ingestion: Harmful if swallowed. Causes burns to the mouth, throat and stomach.

4. FIRST AID MEASURES

Eye Contact: Immediately flush eyes with copious quantities of water for at least 20 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention. Do not transport victim until the recommended flushing period is completed, unless flushing can be continued during transport.

Skin Contact: Flush affected skin with gently flowing water for 20-60 minutes and remove contaminated clothing while rinsing. Obtain medical attention immediately. Do not transport victim until the recommended flushing period is completed, unless flushing can be continued during transport. Remove contaminated clothing and discard. Remove contaminated shoes and discard.

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air. If symptoms persist, get medical attention. If the affected person is not breathing, apply artificial respiration. If breathing is difficult, give oxygen. In situations where administering oxygen is appropriate, first aid personnel must be trained in the safe use and handling of oxygen. It is preferable to administer oxygen under a doctor's supervision or advice. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately. Immediate medical assistance is required.

Ingestion: If conscious, wash out mouth with water. Seek immediate medical attention. Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Administer artificial respiration if breathing has stopped. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation (CPR) immediately.

Notes to Physician: Aspiration may cause severe lung damage. Evacuate stomach in a way which avoids aspiration. 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.

5. FIRE FIGHTING MEASURES

Flash Point: None.

Flash Point Method: Not applicable.

Autoignition Temperature: Not Available.

Flammable Limits in Air (%): Not Available.

Extinguishing Media: Use extinguishing media appropriate for surrounding fire. If water is used, care should be taken, since it can generate heat and cause spattering if applied directly to sulphuric acid.

Special Exposure Hazards: Strong dehydrating agent, which may cause ignition of finely divided combustible materials on contact. Reacts violently with water with the evolution of heat. It can react explosively with organic materials. Reacts with metals to generate flammable hydrogen gas. Reacts violently with water with the evolution of heat. It can react explosively with organic materials. Reacts with many metals to liberate hydrogen gas that 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.

Hazardous Decomposition/Combustion Materials (under fire conditions): Oxides of sulphur.

Special Protective Equipment: Fire fighters must wear full face, positive pressure, self-contained breathing apparatus and appropriate protective clothing.

NFPA RATINGS FOR THIS PRODUCT ARE: HEALTH 3, FLAMMABILITY 0, INSTABILITY 2

HMIS RATINGS FOR THIS PRODUCT ARE: HEALTH 3, FLAMMABILITY 0, REACTIVITY 2

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures: Restrict access to unprotected personnel. Wear appropriate protective equipment.

Environmental Precautionary Measures: Prevent entry into sewers or streams, dike if needed. Consult local authorities.

Procedure for Clean Up: Isolate hazard area and restrict access. Stop leak only if safe to do so. Eliminate all ignition sources. Handling equipment must be grounded. Ventilate area. Contain spill with sand or other inert materials. Neutralize

with lime slurry, limestone, or soda ash. Absorb with an inert dry material and place in an appropriate waste disposal container.

7. HANDLING AND STORAGE

Handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment. Use extreme care when diluting with water. ALWAYS ADD ACID TO WATER. Use with adequate ventilation. CAUTION: Hydrogen, a highly flammable gas, can accumulate to explosive concentrations inside drums, or any type of steel containers or tanks upon storage. Carbon steel storage tanks must be vented. Use corrosion-resistant transfer equipment when transferring acid.

Storage: Store above freezing point. Elevated temperatures will increase the corrosion rate of most metals as well as cause build-up of pressure due to sulfur dioxide generation. Store packaged acid in a dry, well-ventilated location. Avoid storage with incompatible materials. Storage tanks should be protected from water getting in, be well ventilated, and maintained structurally in a safe and reliable condition. Sulfuric acid will attack some forms of plastics and coatings. Always add acid to water - not water to acid. If kept in upper floors of building, floors should be acid proof with drains to a recovery tank.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

Use process enclosure, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Electrical installations should be protected against the corrosive action of acid vapors.

Respiratory Protection: 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.

Gloves:

Neoprene gloves. PVC gloves.

Skin Protection: Impervious boots. Butyl rubber acid suit.

Eyes: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes.

Other Personal Protection Data: Ensure that eyewash stations and safety showers are proximal to the work-station location.

Ingredients	Exposure Limit - ACGIH	Exposure Limit - OSHA	Immediately Dangerous to Life or Health - IDLH
Sulphuric Acid	0.2 mg/m ³ TLV-TWA	1 mg/m ³ TWA	15 mg/m ³

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid. (Oily).

Colour: Clear to amber.

Odour: Odourless A pungent odour may exist if certain impurities are present in the acid.

pH 0.3

Specific Gravity: 1.7059 - 1.8437

Boiling Point: 150-330 °C / 302-626 °F

Freezing/Melting Point: -40 to -1.1 °C / -40 to 30 °F

Vapour Pressure: 1.2 to 0.002 mm Hg

Vapour Density: 3.4

% Volatile by Volume: Not Available.

Evaporation Rate: Not Available.

Solubility: Miscible in water.

VOCs: Not Available.

Viscosity: Not Available.

Molecular Weight: 98.08 g/mole

Other: Not Available.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: Avoid excessive heat, open flames and all ignition sources. Water.

10. STABILITY AND REACTIVITY

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. Reducing agents. Alkalis. Moisture.

Hazardous Decomposition Products: Toxic fumes. Sulfuric acid. Oxides of sulphur. Sulfuric acid vapors may be released upon heating and sulfur dioxide and sulfur trioxide may be released upon decomposition.

Additional Information:

When diluting, add acid to water. DO NOT add water to the acid. Sulfuric acid can be corrosive to most metals, depending on such factors as acid concentration, temperature and impurities. Concentrated sulfuric acid (containing more than 90% H₂SO₄) can be safely handled using carbon steel, cast iron, and certain stainless steel alloys. The resistance of alloys to sulfuric acid corrosion generally increases with increasing chromium, molybdenum, copper and silicon content.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure

Ingestion: Harmful if swallowed. Causes burns to the mouth, throat and stomach.

Skin Contact: Corrosive! Effects on the skin may be delayed and damage may occur without the onset of pain. Causes burns, and brownish or yellow stains. Concentrated solutions may cause second or third degree burns with severe necrosis and may cause permanent scarring. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin.

Inhalation: Inhalation of the mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. May be fatal if inhaled.

Eye Contact: Corrosive to eye tissue and may cause severe damage and blindness. Inflammation of the eye is characterized by redness, watering, and itching.

Additional Information: Repeated exposure may produce erosion and discoloration of teeth.

Acute Test of Product:

Acute Oral LD50: 2140 mg/kg (Rat)

Acute Dermal LD50: Not Available.

Acute Inhalation LC50: 510 mg/m³ (2-hour exposure) (Rat)

255 mg/m³ (equivalent 4-hour exposure) (Rat)

160 mg/m³ (equivalent 4-hour exposure) (Mouse)

Carcinogenicity:

Ingredients	IARC - Carcinogens	ACGIH - Carcinogens
Sulphuric Acid	Group 1	A2 - Suspected Human Carcinogen (contained in strong inorganic acid mists)

Carcinogenicity Comment: WHO and IARC have concluded that occupation exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to man, (Group 1) causing cancer of the larynx and, to a lesser extent, the lung. Exposure to any mist or aerosol during the use of this product should be avoided and, in any case, keep exposure below the occupational exposure limit for sulfuric acid. IARC's classification is for inorganic acid mists containing sulfuric acid only and does not apply to sulfuric acid or sulfuric acid solutions.

Reproductive Toxicity/ Teratogenicity/ Embryotoxicity/ Mutagenicity: Not Available.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Ingredients	Ecotoxicity - Fish Species Data	Acute Crustaceans Toxicity:	Ecotoxicity - Freshwater Algae Data
Sulphuric Acid	LC50 (Brachydanio rerio) 500 mg/L LC50 (Oncorhynchus mykiss) 2.8 ug/L (96hr)	Not Available.	Not Available.

Other Information:

Harmful to aquatic life at low concentrations.

13. DISPOSAL CONSIDERATIONS

Disposal of Waste Method: Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.

Contaminated Packaging: Empty containers should be recycled or disposed of through an approved waste management facility.

14. TRANSPORT INFORMATION

DOT (U.S.):

DOT Shipping Name: SULFURIC ACID

DOT Hazardous Class 8

DOT UN Number: UN1830

DOT Packing Group: II

DOT Reportable Quantity (lbs): Not Available.

Note: No additional remark.

Marine Pollutant: No.

TDG (Canada):

TDG Proper Shipping Name: SULPHURIC ACID

Hazard Class: 8

UN Number: UN1830

Packing Group: II

Note: No additional remark.

Marine Pollutant: No.

15. REGULATORY INFORMATION

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

Note: Not available.

U.S. Regulatory Rules

Ingredients	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Sulphuric Acid	Listed	Listed	Listed

WHMIS Hazardous Class:

D1A VERY TOXIC MATERIALS

D2A VERY TOXIC MATERIALS

E CORROSIVE MATERIAL



16. OTHER INFORMATION

Additional Information:

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Disclaimer:

NOTICE TO READER:

Terralink Horticulture Inc. expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis.

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*****END OF MSDS*****