

MATERIAL SAFETY DATA SHEET

1. Chemical Product And Company Information

Chemical Name: Sulphuric Acid
Synonyms/Trade Names: Sulphuric Acid, 70-100%
Chemical Family:
Formula: H₂SO₄
Molecular Weight: 98.08 g/mol
CAS No.: 7664-93-9
Uses: Water treatment, metal pickling, petroleum processing.
Manufacture of fertilizers, explosives and other acids.

Manufacturer & Supplier:
ERCO Worldwide
a division of Superior Plus LP
302 The East Mall, Suite. 200
Toronto, Ontario Canada M9B 6C7
(416) 239-7111

Transportation Emergency Telephone Numbers :
Canada: CANUTEC 1-813-996-8666
US: CHEMTREC: 1-800-424-9300

ERCO Worldwide
Wanuskewin Rd. & 71st Street
Saskatoon, Saskatchewan S7K 3R3
(306) 931-7767

Canadian WHMIS Classification (s):



D1A - Very Toxic,
immediate & serious



D2A - Very Toxic, other effects



E - Corrosive

2. Composition / Information On Ingredients

Name:
Sulphuric Acid, 70-100%

Conc. % By Weight
Range 70 - 100

CAS No.
7664-93-9

3. Hazard Identification

Emergency Overview:

Clear, colourless to dark brown, odourless, dense, oily liquid. Will not burn. Can decompose at high temperatures forming toxic gases, such as sulphur oxides. Contact with combustible materials may cause fire. Highly reactive. Contact with many organic and inorganic chemicals may cause fire or explosion. Contact with metals liberates flammable hydrogen gas. Reacts violently with water. VERY TOXIC. May be fatal if inhaled or swallowed. CORROSIVE to the eyes, skin and respiratory tract. May cause blindness and permanent scarring. Causes lung injury -- effects may be delayed. Strong inorganic acid mists containing sulphuric acid are CARCINOGENIC. Risk of cancer depends on duration and level of exposure to the sulphuric acid mist. Do not get in eyes, on skin or on clothing. Do not Ingest. Do not breathe mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of Entry:

Inhalation:

Sulphuric acid is not very volatile, and therefore workplace exposures are primarily to mists or aerosols. Sulphuric acid is corrosive and can cause severe irritation or corrosive damage if inhaled. The degree and severity of respiratory effects are influenced by factors such as the physical state and particle size of the aerosol, deposition site, concentration and humidity. Sulphuric acid can cause severe lung damage with a life-threatening accumulation of fluid (pulmonary edema).

Skin Contact:

Sulphuric acid is corrosive and can cause severe irritation and burns, which may result in permanent scarring. Extensive acid burns can result in death. The severity of injury depends on the concentration of the Sulphuric acid solution and the duration of exposure. High mist or aerosol concentrations may cause redness, irritation and burns to the skin if contact is prolonged.

Eye Contact:

Sulphuric acid is corrosive and can cause severe irritation (redness, swelling and pain) and permanent damage, including blindness. The severity of injury depends on the concentration of the Sulphuric acid solution and the duration of exposure. Sulphuric acid mists and aerosols are expected to be irritating.

Ingestion:

Sulphuric acid is corrosive and will cause burns to the mouth, throat, esophagus and stomach if ingested. Symptoms may include difficulty swallowing, intense thirst, nausea, vomiting, diarrhea, and in severe cases, collapse and death. Small amounts of acid which may enter the lungs during ingestion or vomiting (aspiration) can cause serious lung injury and death.

Symptoms of Exposure:

Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapours may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

4. First Aid Measures

Skin:

Avoid direct contact. 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 effected area in iced water. Do not apply ointments unless directed by a physician. 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 re-use.

Eyes:

Avoid direct contact. Immediately flush eyes with running water for a minimum of 20 minutes. Hold eye lids 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.

Inhalation:

Avoid direct contact. Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method. If victim has ingested or inhaled the substance: give 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.

Ingestion:

DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give 1/2 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 centre. 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.

5. Fire-Fighting Measures

Conditions Of Flammability:

Not combustible

Means To Extinguish:

Not applicable.

Hazardous Combustion Products :

Toxic gases and vapours (e.g. sulphur dioxide, sulphur trioxide and acid mists) may be released when sulphuric acid decomposes.

Flash Point & Method: Not combustible
Upper Flammability Limit: Not combustible
Lower Flammability Limit: Not combustible
Auto-Ignition Temperature: Not combustible
Mechanical Impact Sensitivity: Not sensitive
Static Discharge Sensitivity: Not sensitive

6. Accidental Release Measures

Leak Or Spill Procedures :

Small Spill and Leak: Cover with DRY earth, sand or other non-combustible absorbent material. Use clean tools to collect material and place it into loosely covered and labelled plastic containers for later disposal. Flush area with water.

Large Spill and Leak: Restrict access to area until completion of clean up. Ensure trained personnel conduct clean up. Ventilate area. Use appropriate Personal Protection Equipment. Prevent liquid from entering sewers or waterways. Stop or reduce leak only if safe to do so. Dike with Inert material (sand, earth, etc.). Consider in situ neutralization and disposal. Place recovered materials into suitable corrosion resistant labelled containers. Ensure adequate decontamination of tools and equipment following clean up. Comply with Federal, Provincial/State and local regulations on reporting releases.

Waste Control Procedures :

Will require to be transferred to a hazardous waste site. Consult appropriate Federal, State/Provincial and local regulatory authorities to determine disposal procedures.

7. Handling Storage

Handling Procedures And Equipment :

Do not ingest. Do not breathe mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Use EXTREME care when diluting with water. Always add acid to water. CAUTION: Hydrogen, a highly flammable gas, can accumulate to explosive concentrations inside drums, or inside most types of metal containers or tanks upon storage. Carbon steel storage tanks must be vented,

Storage:

If stored in non-reactive container keep container tightly closed. Metal and, specifically, carbon steel, storage tanks must be vented due to hydrogen release as noted above.

8. Exposures Controls / Personal Protection

Protective Equipment:

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have appropriate equipment available for use in emergencies such as spills or fire.

If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

Respiratory Protection Guidelines :

NIOSH RECOMMENDATIONS FOR Sulphuric acid CONCENTRATIONS IN AIR (22):

Up to 15 mg/m³ : SAR operated in a continuous-flow mode; or powered air-purifying respirator with acid gas cartridge(s) and a high-efficiency particulate filter. Full-facepiece chemical cartridge respirator with acid gas cartridge(s) and a high-efficiency particulate filter; or gas mask with acid gas canister and high-efficiency particulate filter; or full-facepiece SCBA; or full-facepiece SAR.

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

ESCAPE: Gas mask with acid gas canister and high-efficiency particulate filter; or escape-type SCBA.

NOTE: Substance causes eye irritation or damage; eye protection needed.

NOTE: The IDLH concentration for Sulphuric acid is 15 mg/m³.

NOTE: The purpose of establishing an IDLH value is to ensure that the worker can escape from a given

contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protection equipment every effort should be made to exit immediately.

The respirator use limitations specified by the approving agency and the manufacturer must be observed. Air-purifying respirators do not protect against oxygen-deficient atmospheres. Recommendations apply only to NIOSH approved respirators.

ABBREVIATIONS: SAR = supplied-air respirator; SCBA = self-contained breathing apparatus; IDLH = immediately dangerous to life or health.

Eye/Face Protection:

Chemical safety goggles. A face shield may also be necessary when handling Sulphuric acid in an open system.

Skin Protection:

Chemical protective gloves, coveralls, boots, and/or other resistant protective clothing. A chemical protective full-body encapsulating suit and respiratory protection may be required in some operations. Have a safety shower/eye-wash fountain readily available in the immediate work area.

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximate to the work-station location.

9. Physical And Chemical Properties

State: Liquid. (oily liquid.)
Odour: Odourless.
Odour Threshold: Not available.
Boiling Point: 150 to 330°C (302 to 828°F)
Melting Point:
Freezing Point: - 40 to - 1°C (-40 to 30°F)
pH: Strong Acid - (0.25% solution has pH approximately 1.0)
Coefficient Of Water/Oil Distribution: Not available
Appearance: Clear. Amber to brown. (Depending on trace impurities such as iron)
Specific Gravity: 1.7059 to 1.8437 (Water = 1)
Vapour Pressure: 0.2 to 0.0003 kPa (1.2 to 0.002 mmHg) (at 20°C)
Vapour Density: 3.4 (Air = 1)
Evaporation Rate: Not available
Solubility In Water: Miscible in water.
Bulk Density: Not applicable

10. Stability And Reactivity

Chemical Stability:

The product is stable at normal temperatures. Decomposes at ~ 340°C to form sulphur trioxide

Reactivity Conditions:

The product is stable.

Incompatible Substances:

Reactive with reducing agents, organic materials, alkalis, moisture, metals.

Sulfuric acid reacts vigorously, violently or explosively with many organic and inorganic chemicals including water, acrylonitrile, alkali solutions, carbides, chlorates, fulminates, nitrates, perchlorates, permanganates, picrates, powdered metals, metal acetylides or carbides, epichlorohydrin, aniline, ethylenediamine, alcohols with strong hydrogen peroxide, chlorosulfonic acid, cyclopentadiene, hydrofluoric acid, nitromethane, 4-nitrotoluene, phosphorus (III) oxide, potassium, sodium, ethylene glycol, isoprene, styrene.

Acetaldehyde and allyl chloride may polymerize violently in the presence of sulfuric acid. Hazardous gases, such as hydrogen cyanide, hydrogen sulfide and acetylene, are evolved on contact with chemicals such as cyanides, sulfides and carbides.

Hazardous Decomposition Products :

Toxic gases and vapours (e.g. sulphur dioxide, sulphuric acid vapours/mists and sulphur trioxide) may be released when sulphuric acid decomposes.

11. Toxicological Information

Skin Contact: Very hazardous in case of skin contact (corrosive, irritant). Skin contact may produce burns. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Skin Absorption: No information

Eye Contact: Very hazardous in case of eye contact (irritant, corrosive). Inflammation of the eye is characterized by redness, watering, and itching. Immediate pain, severe burns and corneal damage, which may result in permanent blindness.

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

Ingestion: Very hazardous in case of ingestion. May be fatal if swallowed. May cause burns to mouth, throat and stomach.

LD₅₀: 2140 mg/kg (oral, rat)

LC₅₀: 510 mg/m³ (rat, 2 hour exposure)

Exposure Limits: ACGIH (TLV)

STEL: 3 mg/m³ 15 minute(s). Form: All forms

TWA: 1 mg/m³ 8 hour(s). Form : All forms

NIOSH (REL) (United States, 2001).

TWA: 1 mg/m³ 10 hour(s). Form: All forms

OSHA (PEL) (United States, 1993).

TWA: 1 mg/m³ 8 hour(s). Form: All forms

Consult local authorities for acceptable exposure limits

Irritancy: very strong irritant

Sensitization: not available

Carcinogenicity: Sulphuric acid mists are considered to be carcinogenic

Teratogenicity & Mutagenicity: No studies exist specifically for sulphuric acid. There are known effects of mutagenicity as a result low pH.

Reproductive Toxicology: Some indication of toxicity to sulphuric acid mists at 20 mg/m³ in rabbit studies.

Toxicological Synergism: no information

12. Ecological Information

Ecological Information :

Sulphuric acid dissociates in water and will be neutralized by naturally occurring alkalinity. The acid will permeate soil, dissolving some soil material and will be somewhat neutralized.

Biodegradability:

Products of degradation are sulphur oxides (SO₂, SO₃). The products of biodegradation are more toxic than the original product.

Aquatic Toxicity:

Sulphuric acid can be acutely toxic to aquatic life via reduction of water pH. Most aquatic species do not tolerate pH lower than 5.5 for any extended period.

13. Disposal Considerations

Disposal Considerations :

Waste must be disposed of in accordance with Federal, Provincial/ State and local environmental control regulations. Recycle, if possible. Prevent entry into sewers, water courses, basements or confined areas.

14. Transportation Information

Shipping Name (TDGR)	UN Number	Hazard Class	Packing Group
SULPHURIC ACID with more than 51 percent acid	UN1830	8	II

15. Regulatory Information

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR .

**Safety:
Canada**

WHMIS Classification :

D1A - Poisonous and infectious material - Immediate and serious effects - Very toxic
D2A - Poisonous and infectious material - Other effects - Very toxic
E - Corrosive material

WHMIS Health Effects Criteria Met by this Chemical :

D1A - Acute lethality - very toxic - immediate
D2A - Chronic toxicity - very toxic - other
E - Corrosive to skin
E - TDG class 8 - corrosive substance

U.S. Federal Regulations :

OSHA Hazard Communication Evaluation :

Meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

Environmental:

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

U.S. Federal Regulations:

TSCA 8(b) inventory: Listed on inventory.

Clean Water Act (CWA) 311: Sulphuric acid

SARA302/304/311/312 extremely hazardous substances: Sulphuric acid

SARA302/304 emergency planning and notification: Sulphuric acid

SARA 302/304/311/312 hazardous chemicals: Sulphuric acid

Pennsylvania RTK: Sulphuric acid: (environmental hazard, generic environmental hazard)

Transportation:

Refer to Section 14.

16. Other Information

Prepared By:

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Summary of Changes Made in this Revision :

List of incompatible chemicals was expanded.

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