

Material Safety Data Sheet

SULFURIC ACID

Print Date: July 2008

SECTION 1 – Chemical Product and Company Identification

MSDS Name: SULFURIC ACID

MSDS Preparation Date: 07-2008, Supersedes 02-2007, 02-2004, 02-2001& 02-98

Synonyms or Generic ID: Sulphuric Acid, Oil of vitriol, hydrogen sulphate, vitriol brown oil, matting acid, battery acid.

SEASTAR™ Product Codes: S010301, S020301 S010301-SSNC03, S010301-SSEC03, S010301-SSNC04, S010301-SSEC04, S010301-SSNC06, S010301-SSEC06, S010301-SSNC09, S010301-SSEC09, S010301-SSNC41, S010301-SSEC41, S010301-SSNC61, S010301-SSEC61, S010301-SSNC63, S010301-SSEC63, S010301-SSNC65, S010301-SSEC65, S010301-SSND13, S010301-SSED13, S020301-SSNF01, S020301-SSEF01, S020301-SSNF02, S020301-SSEF02, S020301-SSNF03, S020301-SSEF03, S020301-SSNF04, S020301-SSEF04, S020301-SSNF05, S020301-SSEF05, S020301-SSNF06, S020301-SSEF06, S020301-SSNF07, S020301-SSEF07, S020301-SSNF08, S020301-SSEF08, S010301-SSNG04, S010301-SSEG04, S010301-SSNG09, S010301-SSEG09, S010301-SSNG41, S010301-SSEG41, S010301-SSNG61, S010301-SSEG61, S010301-SSNG65, S010301-SSEG65, S040301-SSND16, S040301-SSED16, IQ-03-0500, IQ-03-2500, IQ-03-25SK, BA-03-0250, BA-03-0500, BA-03-1000, BA-03-2000

Canadian TDG Classification: 8 PKG Gr II

Formula: H₂SO₄

PIN (UN# / NA#): UN1830

Molecular Wt: 98.08

Canadian WHMIS Class: Class E; Class D Div 1 Sub A; Class C.

Supplier: Seastar Chemicals Inc, 10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA

Tel: (250) 655-5880, **Fax:** (250) 655-5888

CANUTEC (CAN): (613)-996-6666

SECTION 2 – Composition/Information on Ingredients

| CAS # | Chemical Name | Percent | EINECS/ELINCS | TLV | Hazard |
|-----------|---------------|---------|---------------|---------------------|-----------|
| 7664-93-9 | Sulfuric Acid | 73-98% | 231-639-5 | 1 mg/m ³ | Corrosive |
| 7732-18-5 | Water | Balance | None | None | None |

Hazard Symbols: C Risk Phrases: 35

SECTION 3 – Hazards 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 sulfur 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 sulfuric acid are CARCINOGENIC.

Target Organs: Lungs, teeth, eyes, skin, mucous membranes.

Potential Health Effects

Primary Route(s) of Entry: Inhalation and ingestion. Skin contact. Eye contact.

Effects of Acute Exposure: Corrosive, oxidizing and sulphonating properties on contact. May be fatal by ingestion, inhalation or skin absorption.

LD50/LC50: CAS# 7664-93-3: Inhalation, mouse: LC50 = 320 mg/m³/2H, Inhalation, rat: LC50 = 510 mg/m³/2H Oral, rat: LD50 – 2140 mg/kg.

Eyes: Causes severe eye burns. May cause irreversible eye injury.

Skin: Causes skin burns. Defatting dermatitis with prolonged use.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes burns in mouth, pharynx and gastrointestinal tract. Nausea, Vomiting, Abdominal pain. Corrosive and toxic

Inhalation: Harmful if inhaled. May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Causes chemical burns to the respiratory tract. May cause respiratory inflammation. Destructive to tissues of mucous membranes. Headache, May cause delayed lung injury. Vomiting. Nausea. Pulmonary edema. Corrosive and toxic.

Effects of Chronic Exposure: Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. May cause death. CORROSIVE to body tissues. To the best of our knowledge the chronic toxicity of this substance has not been fully investigated.

SECTION 4 – First Aid Measures

Eyes: Immediately flush eyes and skin with copious amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Do NOT allow victim to rub eyes or keep eyes closed. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with copious quantities of soap and water for at least 15 minutes while removing contaminated clothing and shoes. SPEEDY ACTION IS CRITICAL! Call a physician.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Consult a physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Get medical aid immediately Remove patient from exposure to fresh air immediately. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.

Notes to Physician: Treat symptomatically and supportively.

SECTION 5 – Fire Fighting Measures

General Information: Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Contact with water can cause violent liberation of heat and splattering of the material.

Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Carbon dioxide. Dry chemical power. Do not use water.

Auto-ignition Temperature: Not available.

Flash Point: Not available.

NFPA Rating: Health – 3, Flammability – 0, Instability – 2, Water Reactive.

Explosion Limits: Lower: Not available. Upper: Not available.

Special Fire and Explosion Hazards: Oxidizing material – contributes to combustion of other materials. Reacts violently with water and organic materials with evolution of heat. Emits toxic and corrosive fumes under fire conditions.

SECTION 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Cover with sand, dry lime or soda ash, and place in a closed container for disposal.

Steps to be taken in case material is released or spilled: Evacuate. Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Cover with soda ash or lime. Place in a suitable container and mark for disposal. Use non-sparking tools. Ventilate area and wash spill site after material pick-up is complete.

Waste disposal method: According to all applicable regulations.

SECTION 7 – Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before re-use. Use with adequate ventilation. Do not get in eyes, on skin or on clothing.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from combustible substances. Do not store near alkaline substances.

Store in a cool place away from heated areas, sparks and flame. Keep tightly closed. Do not add any other material to the container. Do not store in a damp atmosphere. Do not get in eyes, on skin or on clothing. Do not store near organic substances. Do not allow smoking and food consumption while handling. In accordance with good storage and handling practices. Do not store near flammable substances.

Wash well after use.

Storage Code: White.

SECTION 8 – Exposure Control/Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits:

| <i>Chemical Name</i> | <i>ACGIH</i> | <i>NIOSH</i> | <i>OSHA</i> |
|----------------------|---------------------------------------------------|-------------------------|-------------------------|
| Sulfuric acid | 1 mg/m ³ TWA; 3 mg/m ³ STEL | 1 mg/m ³ TWA | 1 mg/m ³ TWA |

OSHA Vacated PELs Sulfuric acid: 1 mg/m³ TWA.

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.

Skin: Wear appropriate protective neoprene or polyethylene gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure. Apron or clothing to protect skin. Rubber boots. Sufficient to protect skin.

Respiratory Protection: Follow the OSHA respirator regulations found in 29CFR 1910.134. Always use a NIOSH-approved respirator when necessary.

Ventilation: Use only in a chemical fume hood.

Other Protective Equipment: Make eye bath and emergency shower available.

SECTION 9 – Physical and Chemical Properties

Physical State: Liquid

Appearance: colourless

Odour: odourless

pH: 0.3 (1 N solution); 1.2 (0.1 N solution); 2.1 (0.01 N solution)

Vapour Pressure: Less than 0.04 kPa (0.3 mm Hg) at 25 °C

Vapour Density: 3.4 (air = 1)

Evaporation Rate: Probably very slow.

Viscosity: Not available.

Boiling Point: 93% (w/w): 279 °C (534 °F); 98% (w/w): 327 °C (621 °F); 100% (w/w): 274 °C (525 °F)

Freezing/Melting Point: 93% (w/w): - 35 °C (-31 °F); 98% (w/w): - 2 °C (28 °F); 100% (w/w): 11 °C (52 °F)

Decomposition Temperature: 340 °C

Solubility: Soluble in water, in all proportions with generation of much heat. Soluble in all proportions in ethanol (decomposes).

Specific Gravity/Density: 93% (w/w): 1.835 g/cm³; 98% (w/w): 1.844 g/cm³; 100% (w/w): 1.839 g/cm³ @15 °C

Molecular Formula: H₂SO₄

Molecular Weight: 98.0716

SECTION 10 – Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, contact with water, metals, excess heat, combustible materials, organic materials, oxidizers, amines, bases.

Incompatibilities with Other Materials: Acetic Anhydride, Acetone Cyanhydrin, Acetone + Nitric Acid, Acetone + Potassium Dichromate, Acetonitrile + Sulphur Trioxide, Acrolein, Acrylonitrile, Alcohols + Hydrogen Peroxide, Allyl Alcohol, Allyl and Aldehyde compounds, Allyl Chloride, 2-Aminoethanol, Ammonium Hydroxide Ammonium Iron (III) sulfate dodecahydrate, Ammonium Triperchromate, Aniline + Glycerol + Nitrobenzene, Benzyl Alcohol, Bromates + Metals, tert-Butyl-m-xylene + Nitric Acid, 1-Chloro-2,3-epoxypropane, Bromine Pentafluoride, n-Butyraldehyde, Cesium Acetylene Carbide, 4-Chloronitrobenzene + sulphur trioxide, Copper, Dichloromethane + Ethanol + Nitrate or Nitrite, 2-Cyano-4-nitrobenzenediazonium hydrogen sulphate, 2-Cyano-2-propanol, Chlorine Trifluoride, Chlorosulfonic Acid (Cyanides), Cyclopentadiene, Cyclopentanone oxime, 1,3-Diazidobenzene, Diethylamine, Cuprous Nitride, Diisobutylene, Ephchlorohydrin, Ethylene Cyanohydrin, Ethylene Diamine, Ethylene Glycol, Dimethoxydinitroanthraquinone, 4-Dimethylaminobenzaldehyde, 2,5-Dinitro-3-Methylbenzoic acid + Sodium Azide, 1,5-Dinitronaphthalene + Sulfur, Ethoxylated nonylphenol, Fulminates, Halides, Hexalithium disilicide, Ethylenimine, Other Acids, Iodine Heptafluoride, Metals, Isoprene, Hydrofluoric acid, Hydrogen peroxide, Metal acetylides or carbides, Metal Chlorates, Metal Perchlorates, 4-Methylpyridine, Nitramide, Nitric Acid + Organic materials, Nitric Acid + Toluene, Nitrites, Nitroaryl bases and derivatives, Nitrobenzene, 3-Nitrobenzenesulfonic Acid, Nitromethane, N-Nitromethylamine, 4-Nitrotoluene, Permanganates, Phosphorus, Phosphorus (III) Oxide, Poly(silylene), Mercuric Nitride, Mesityl Oxide, P-Nitrotoluene, Pentasilver Trihydroxydiaminophosphate, Perchlorates, Permanganates + Benzene, Phosphorus Isocyanate, Picrates, Potassium t-Butoxide, Potassium, 3-Propynol, Potassium Chlorate, beta-Propiolactone, Propylene Oxide, Pyridine, Ruybidium Acetylene Carbide and Sodium, Silver Pemanganates, Silver Peroxochromate, Sodium, Sodium Carbonate, Sodium Tetrahydroborate, Sodium Thiocyanate, Sucrose, Tetramethylbenzenes, 1,2,4,5-Tetrazine, Thallium (I) azidodithiocarbonate, 1,3,5-Trinitrosohexahydro-1,3,5-triazine, Water, and Zinc Iodide. Carbonates, sulfides, sulphites, carbides, chlorates.

Hazardous Decomposition Products: Oxides of Sulphur.

Hazardous Polymerization: Has not been reported.

Reaction Product(s): Hydrogen is generated by the action of the acid on most metals.

SECTION 11 – Toxicological Information

RTECS: CAS# 7664-93-9: WS5600000.

LD50/LC50: CAS# 7664-93-9 Inhalation, mouse: LC50 = 320 mg/m³/2H. Inhalation, rat: LC50 = 51- mg/m³/2H. Oral, rat: LD50 = 2140 mg/kg.

Carcinogenicity: CAS# 7664-93-9: Not listed.

California: Not listed.

NIOSH: Not listed.
NTP: Not listed.
OSHA: Select carcinogen.
IARC: Group 1 carcinogen.
Epidemiology: Workers exposed to industrial sulfuric acid mist showed a statistical increase in laryngeal, nasal, sinus and

lung cancer. These data suggests a possible relationship between carcinogenesis and inhalation of sulfuric acid mist.
Teratogenicity: No information available.
Reproductive: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.

SECTION 12 – Ecological Information

Ecotoxicity: Sulfuric acid is harmful to aquatic life in very low concentrations. It may be dangerous if it enters water intakes. The aquatic toxicity for bluegill in fresh water was 24.5 ppm/24 hr, which was lethal.

Environmental: No information available.

Physical: No information available

Other: No information available.

SECTION 13 – Disposal Considerations

Dispose of in a manner consistent with federal, provincial/state/territorial, and local regulations.

RCRA D-Maximum Concentration of Contaminants: None of the components are on this list.

RCRA D Series – Chronic Toxicity Reference Levels: None of the components are on this list.

RCRA F Series Wastes: None of the components are on this list.

RCRA P Series Wastes: None of the components are on this list.

RCRA U Series Wastes: None of the components are on this list.

RCRA Substances Banned from Land Disposal: None of the components are on this list.

SECTION 14 – Transport Information

Proper Shipping Name: SULFURIC ACID with more than 51 percent acid

Hazard Class: 8 UN Number: UN1830 Packing Group: II

SECTION 15 – Regulatory Information

US Federal

TSCA: CAS# 7664-93-9 is listed on the TSCA Inventory.

Health and Safety Reporting List: None of the components are on this list.

Chemical Test Rules: None of the components are on this list.

TSCA Section 12b: None of the components are on this list.

TSCA Significant New Use Rule (SNUR): None of the components are on this list.

CERCLA Reportable Quantities (RQ): CAS# 7664-93-9: final RQ = 1000 pounds (454 kg).

SARA Threshold Planning Quantities (TPQ): CAS# 7664-93-9: TPQ = 1000 pounds

SARA Hazard Categories: CAS# 7664-93-9: acute, chronic, reactive.

SARA Section 313: This material contains Sulfuric acid (CAS# 7664-93-9, 95-98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

US State

State Right to Know: Sulfuric acid can be found on the following state Right-to-Know lists: New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California Prop 65: No information available.

California No Significant Risk Level: No information available.

European/International Regulations

European Labelling in Accordance with EC Directives:

Hazard Symbols: XI

Risk Phrases: R 36/38 irritating to eyes and skin.

Clean Air Act – Hazardous Air Pollutants (HAPs): None of the components are on this list.

Clean Air Act – Class 1 Ozone Depletors: None of the components are on this list.

Clean Air Act – Class 2 Ozone Depletors: None of the components are on this list.

Clean Water Act – Hazardous Substances: CAS# 7664-93-9 is listed as a Hazardous Substance under the CWA.

Clean Water Act – Priority Pollutants: None of the components are on this list.

Clean Water Act – Toxic Pollutants: None of the components are on this list.

OSHA – Highly Hazardous: None of the components are on this list.

Safety Phrases: S 2 Keep out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S30 Never add water to this product.

WGK (Water Danger/Protection): No information available.

Canadian DSL/NDSL: CAS# 7664-93-9 is listed on Canada's DSL/NDSL List.

Canadian WHMIS Classification: This product has a WHMIS classification of C, D1A, E.

Canada Ingredient Disclosure List: CAS# 7664-93-9 is listed on Canada's Ingredient Disclosure List.

Exposure Limits:

CAS# 7664-93-9: OEL-ARAB Republic of Egypt: TWA 1 mg/m³

OEL-AUSTRALIA: TWA 1 mg/m³

OEL-BELGIUM: TWA 1 mg/m³; STEL 3 mg/m³

OEL-CZECHOSLOVAKIA: TWA 1 mg/m³; STEL 2 mg/m³

OEL-DENMARK: TWA 1 mg/m³

OEL-FINLAND: TWA 1 mg/m³; STEL 3 mg/m³; Skin

OEL-FRANCE: TWA 1 mg/m³; STEL 3 mg/m³

OEL-GERMANY: TWA 1 mg/m³

OEL-HUNGARY: STEL 1 mg/m³

OEL-JAPAN: TWA 1 mg/m³

OEL-NETHERLANDS: TWA 1 mg/m³

OEL-THE PHILIPPINES: TWA 1 mg/m³

OEL-POLAND: TWA 1 mg/m³

OEL-RUSSIA: TWA 1 mg/m³; Skin

OEL-SWEDEN: TWA 1 mg/m³; STEL 3 mg/m³

OEL-SWITZERLAND: TWA 1 mg/m³; STEL 2 mg/m³

OEL-THAILAND: TWA 1 mg/m³

OEL-TURKEY: TWA 1 mg/m³

OEL-UNITED KINGDOM: TWA 1 mg/m³

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check acgi tlv

OES-United Kingdom: TWA 1 mg/m³ TWA

SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.