

# Safety Data Sheet (SDS)


## SULPHURIC ACID

### Section 1: Product and Company Identification

|  |  |                      |              |
|--|--|----------------------|--------------|
| <b>Product Name:</b>   | SULPHURIC ACID   | <b>Index Number:</b> | 016-020-00-8 |
| <b>Product Number(s):</b>  |  |                      |              |
| S010301, S010301-SSEC03, S010301-SSEC04, S010301-SSEC05, S010301-SSEC06, S010301-SSEC09, S010301-SSEC10, S010301-SSEC41, S010301-SSEC61, S010301-SSEC63, S010301-SSEC65, S010301-SSED13, S010301-SSEE03, S010301-SSEE04, S010301-SSEE05, S010301-SSEE06, S010301-SSEE09, S010301-SSEE10, S010301-SSEG03, S010301-SSEG04, S010301-SSEG09, S010301-SSEG10, S010301-SSEG41, S010301-SSEG61, S010301-SSEG65, S010301-SSNC03, S010301-SSNC04, S010301-SSNC05, S010301-SSNC06, S010301-SSNC09, S010301-SSNC10, S010301-SSNC41, S010301-SSNC61, S010301-SSNC63, S010301-SSNC65, S010301-SSND13, S010301-SSNG03, S010301-SSNG04, S010301-SSNG09, S010301-SSNG10, S010301-SSNG41, S010301-SSNG61, S010301-SSNG65, S010301-SSNQ03, S010301-SSNQ09, S020301, S020301-SSEF01, S020301-SSEF02, S020301-SSEF03, S020301-SSEF04, S020301-SSEF05, S020301-SSEF06, S020301-SSEF07, S020301-SSEF08, S020301-SSNF01, S020301-SSNF02, S020301-SSNF03, S020301-SSNF04, S020301-SSNF05, S020301-SSNF06, S020301-SSNF07, S020301-SSNF08, S020301-SSRF01, S020301-SSRF02, S020301-SSRF03, S020301-SSRF04, S020301-SSRF05, S020301-SSRF06, S020301-SSRF07, S020301-SSRF08, S040301-SSED16, S040301-SSND16 |  |                      |              |
| <b>Synonyms:</b>   | Sulfuric acid; Battery acid; Electrolyte acid; Hydrogen sulphate; Mattling acid; Oil of vitriol  |                      |              |
| <b>Chemical names:</b>   | DE Schwefelsäure; ES Ácido sulfúrico al; FR Acide sulphurique; IT Acido solforico; NL Zwavelzuur |                      |              |
| <b>Supplier:</b>   | SEASTAR CHEMICALS Inc.   |                      |              |
| <b>Address:</b>  | 10005 McDonald Park Road, Sidney, BC V8L 5Y2 CANADA  |                      |              |
| <b>Phone Number:</b>   | 250-655-5880   | <b>Fax Number:</b>   | 250-655-5888 |
| <b>CANUTEC (CAN):</b>  | 613-996-6666   |                      |              |

### Section 2: Hazards Identification

| Emergency Overview    |  |
|-----------------------|--|
| <b>Appearance:</b>    | Clear, colourless oily liquid.                           |
| <b>Target Organs:</b> | Eyes, skin, respiratory system, mucous membranes, teeth. |

| GHS                    |                              |                    |   |
|------------------------|------------------------------|--------------------|---|
| <b>Classification:</b> | Skin corrosion – Category 1A | <b>Pictograms:</b> |  |
| <b>Signal Word:</b>    | Danger                       |                    | GHS05   |

|   |  |
|---|--|
| <b>Hazard Statements:</b>   |  |
| <b>H314:</b> Causes severe skin burns and eye damage.   |  |
| <b>Precautionary Statements:</b>  |  |
| <b>P260:</b> Do not breathe fumes/gas/mist/vapours/spray.   |  |
| <b>P264:</b> Wash thoroughly after handling.  |  |
| <b>P280:</b> Wear protective gloves/protective clothing/eye protection/face protection.   |  |
| <b>P301+P330+P331:</b> IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.   |  |
| <b>P303+P361+P353:</b> IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.                       |  |
| <b>P304+P340:</b> IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.                                      |  |
| <b>P305+P351+P338:</b> IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |  |
| <b>P310:</b> Immediately call a POISON CENTER or doctor/physician.  |  |
| <b>P321:</b> Specific treatment (see P310).   |  |
| <b>P363:</b> Wash contaminated clothing before reuse.   |  |
| <b>P405:</b> Store locked up.   |  |
| <b>P501:</b> Dispose of contents/container according to federal, regional and local government requirements.  |  |

### Section 3: Composition/Information on Ingredients

| CAS No.   | Chemical Name  | Percent | EINECS / ELINCS No. |
|-----------|----------------|---------|---------------------|
| 7664-93-9 | Sulphuric acid | 93-98%  | 231-639-5           |
| 7732-18-5 | Water          | Balance | 231-791-2           |

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## Section 4: First Aid Measures

### In case of contact:

|                            |   |
|----------------------------|---|
| <b>Inhalation:</b>         | This chemical is very toxic. Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment, use the buddy system). Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. Avoid mouth-to-mouth contact by using mouth guards or shields. Quickly transport victim to an emergency care facility.  |
| <b>Skin:</b>               | Avoid direct contact. Wear chemical protective clothing, if necessary. As quickly as possible, remove contaminated clothing, shoes and leather goods. Quickly and gently blot or brush away excess chemical. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. DO NOT INTERRUPT FLUSHING. If necessary and it can be done safely, continue flushing during transport to emergency care facility. Quickly transport victim to an emergency care facility. Double bag, seal, label and leave contaminated clothing, shoes and leather goods at the scene for safe disposal.  |
| <b>Eye:</b>                | Avoid direct contact. Wear chemical protective gloves, if necessary. Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens until flushing is done. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto the face. Quickly transport victim to an emergency care facility. |
| <b>Ingestion:</b>          | NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.   |
| <b>First Aid Comments:</b> | Provide general supportive measures (comfort, warmth, rest). Consult a doctor and/or the nearest Poison Control Centre for all exposures. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its conditions of use in the workplace.   |

## Section 5: Fire Fighting Measures

### Fire Hazard Summary:

Sulphuric acid is not flammable. During a fire, irritating/toxic sulphur oxides may be generated. Sulphuric acid reacts violently with water and organic materials with the evolution of heat. Fire may result due to the heat generated by contact of concentrated sulphuric acid with combustible materials. Sulphuric acid reacts with most metals, especially when diluted with water. This reaction produces highly flammable hydrogen gas, which may explode if ignited, particularly in confined spaces. Sulphuric acid is a strong dehydrating agent, which may cause ignition of finely divided materials on contact. Containers may explode in the heat of a fire. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. A full-body encapsulating chemical protective suit with positive pressure self-contained breathing apparatus (SCBA) may be necessary.

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| <b>Extinguishing Media:</b>                         | Sulphuric acid is not combustible. Use extinguishing agents suitable for the surrounding fire. Use water only to keep non-leaking, fire-exposed containers cool. If water is used, care should be taken, since it can generate heat and cause spattering if applied directly to sulphuric acid. |
| <b>Extinguishing Media to be Avoided:</b>           | WATER REACTIVE. DO NOT use water or water-based extinguishers since it can generate heat and cause spattering if applied directly to sulphuric acid.  |
| <b>Flash Point:</b>                                 | Not combustible (does not burn).  |
| <b>Lower Flammable (Explosive) Limit (LFL/LEL):</b> | Not applicable  |
| <b>Upper Flammable (Explosive) Limit (UFL/UEL):</b> | Not applicable  |
| <b>Autoignition Temperature:</b>                    | Not combustible.  |
| <b>Sensitivity to Mechanical Impact:</b>            | Probably not sensitive. Normally stable.  |
| <b>Sensitivity to Static Charge:</b>                | Not available.  |

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| <b>Electrical Conductivity:</b>                       | Not available.  |
| <b>Minimum Ignition Energy:</b>                       | Not applicable  |
| <b>Combustion and Thermal Decomposition Products:</b> | Sulphur oxides. |

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD IDENTIFICATION

|                        |  |
|------------------------|--|
| <b>Health:</b>         | 3 – Short exposure could cause serious temporary or residual injury.   |
| <b>Flammability:</b>   | 0 – Will not burn under typical fire conditions.   |
| <b>Reactivity:</b>     | 2 – Undergoes violent chemical change at elevated temperatures and pressures, or reacts violently with water, or may form explosive mixtures with water. |
| <b>Special Hazard:</b> | WATER REACTIVE   |

## Section 6: Accidental Release Measures

### Spill Precautions:

Restrict access to area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Wear adequate personal protective equipment. Remove or isolate incompatible materials. Notify government occupational health and safety and environmental authorities.

### Clean-up:

Do not touch spilled material. Prevent material from entering confined spaces, sewers or waterways. Keep materials which can burn away from spilled material. Stop or reduce leak if safe to do so.

**SMALL SPILLS:** Soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water.

**LARGE SPILLS:** Contact fire and emergency services and supplier for assistance and advice. Contain spill with dry sand, clay, diatomaceous earth, or absorbent material which does not react with spilled material. Cautiously dilute and neutralize with lime or soda ash. Remove liquid by corrosion-resistant pumps or vacuum equipment. Place in suitable, covered, labelled containers.

Contaminated absorbent material may pose the same hazards as the spilled product.

## Section 7: Handling and Storage

### Handling:

This material is a CORROSIVE and VERY TOXIC liquid. Before handling, it is important that engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Unprotected persons should avoid all contact with this chemical including contaminated equipment.

Immediately report leaks, spills or ventilation failures. Avoid generating vapours or mists. Prevent the release of vapours or mists into the air. Use the smallest possible amounts in an area separate from the storage area. When handling large quantities, closed handling systems should be used.

This material is highly reactive. Prevent accidental contact with water. Do not use with incompatible materials such as alkali solutions, carbides, chlorates and nitrates. See Section 10 for more information. Never return contaminated material to its original container. Never add water to a corrosive. Always add corrosives to water. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation.

Inspect containers for leaks before handling. Secondary protective containers must be used when this material is being carried. Label containers. Avoid damaging containers. Keep containers tightly closed when not in use. Assume that empty containers contain residues which are hazardous. Use corrosion-resistant transfer equipment when dispensing. Whenever possible, use self-closing, portable containers for dispensing small amounts of this material. Never transfer liquid by pressurizing original container with air or inert gas.

Immediately contact the chemical manufacturer/supplier for handling instructions if drums of this material appear to be swollen. Have suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping. Maintain handling equipment. Comply with applicable regulations.

### Storage:

Store in a cool, dry area out of direct sunlight and away from heat and ignition sources. Keep quantities stored as small as possible. Avoid bulk storage indoors. It is very important that sulphuric acid be stored away from the many materials with which

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it is incompatible. See Section 10 for more information.

Inspect all incoming containers to make sure they are properly labelled and not damaged. Always store in original labelled container. Protect the label and keep it visible. Keep containers tightly closed when not in use and when empty. Protect from damage. Store containers at a convenient height for handling, below eye level if possible. Store within recommended temperature range. Keep empty containers in separate storage area. Assume that empty containers contain hazardous residues.

Inspect storage area regularly for evidence of leakage or corrosion. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Keep storage area separate from work areas. Post warning signs.

Contain spills or leaks by storing in trays made from compatible materials. Keep absorbents for leaks and spills readily available. Provide raised sills or ramps at doorways or create a trench which drains to a safe location. Floors should be sealed to prevent absorption. Drums may need to be vented. Venting should only be performed by trained personnel. If drums are swollen, contact the manufacturer/supplier immediately for assistance. Handling swollen drums requires special procedures and equipment.

In large scale storage facilities, walls, floors, shelving, lighting and ventilation systems in storage area should be made from materials that resist attack from sulphuric acid. Storage facilities should be made of fire-resistant materials. Have appropriate fire extinguishers and spill clean-up equipment in storage area. Storage tanks should be above ground and surrounded with a dike capable of holding entire contents.

## Section 8: Exposure Controls/Personal Protection

### General Exposure Precautions:

NOTE: Exposure to this material can be controlled in many ways. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. This general information can be used to help develop specific control measures. Ensure that control systems are properly designed and maintained. Comply with occupational, environmental, fire, and other applicable regulations.

### Engineering Controls:

Engineering methods to control hazardous conditions are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification (e.g. substitution of a less hazardous material). Because of the high potential hazard associated with this substance, stringent control measures such as enclosure or isolation may be necessary to control mists. Use a corrosion-resistant local exhaust ventilation system separate from other exhaust ventilation systems. Cleaning of contaminated exhaust air before release to the outdoors may be necessary. Supply sufficient replacement air to make up for air removed by exhaust systems.

### Personal 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. Refer to the CSA Standard Z94.4-11, "Selection, Use and Care of Respirators," available from the Canadian Standards Association.

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| <b>Eye / Face protection:</b>                           | Wear chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. A face shield may also be necessary when handling in an open system.   |
| <b>Skin protection:</b>                                 | Wear impervious gloves and appropriate protective clothing. Choose body protection according to the amount and concentration of the substance at the work place. 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.   |
| <b>Resistance of Materials for Protective Clothing:</b> | Guidelines for sulphuric acid concentrations above 70%:<br>RECOMMENDED (resistance to breakthrough longer than 8 hours): Butyl rubber; Viton™; Viton™/Butyl rubber; Barrier (PE/PA/PE); Silver Shield/4H™ (polyethylene/ethylene vinyl alcohol); Trelchem™ HPS and VPS; Tychem™ SL (Saranex™), CPF 3, F, BR/LV, Responder™, and TK.<br>RECOMMENDED (resistance to breakthrough longer than 4 hours): Polyethylene.<br>CAUTION, use for short periods only (resistance to breakthrough within 1 to 4 hours): Neoprene rubber; Polyvinyl chloride.<br>NOT RECOMMENDED for use (resistance to breakthrough less than 1 hour): Natural and nitrile rubber; Polyvinyl alcohol. |

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| <b>Inhalation / Ventilation:</b> | Use in a chemical fume hood. Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with acid gas cartridge(s) in combination with type N100, R100 or P100 filter (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). |
| <b>Personal Hygiene:</b>         | Remove contaminated clothing immediately. Discard or launder before re-wearing. Inform laundry personnel of contaminant's hazards. Do not eat, drink or smoke in work areas. Wash hands thoroughly after handling this material. Maintain good housekeeping.  |

## EXPOSURE GUIDELINES – Listed under Sulphuric acid, as H<sub>2</sub>SO<sub>4</sub>

|                 |   |
|-----------------|---|
| NIOSH:          | REL-TWA: 1 mg/m <sup>3</sup> ; IDLH: 15 mg/m <sup>3</sup> |
| ACGIH:          | TLV-TWA: 0.2 mg/m <sup>3</sup> (Thoracic fraction)        |
| OSHA Final PEL: | PEL-TWA: 1 mg/m <sup>3</sup>                              |

## Section 9: Physical and Chemical Properties

|                           |                                   |                                |  |
|---------------------------|-----------------------------------|--------------------------------|--|
| <b>Form:</b>              | Liquid                            | <b>Melting/Freezing Point:</b> | 93% w/w: -32 °C (-25.6 °F)<br>98% w/w: 3 °C (37.4 °F)<br>100% w/w: 10.4-10.5 °C (50.6-50.9 °F) |
| <b>Color:</b>             | Colourless                        | <b>Boiling Point:</b>          | 93% w/w: 279 °C (534.2 °F)<br>98% w/w: 310-340 °C (590-644 °F)<br>100% w/w: 290 °C (554.0 °F)  |
| <b>Odour:</b>             | Odourless                         |                                |  |
| <b>Chemical Formula:</b>  | H <sub>2</sub> SO <sub>4</sub>    | <b>pH:</b>                     | 0.3 (1N solution)  |
| <b>Formula Weight:</b>    | 98.0716 g/mol                     |                                |  |
| <b>Solubility:</b>        | Very soluble in water             |                                |  |
| <b>Density: (@ 15 °C)</b> | 93% w/w: 1.835 g/cm <sup>3</sup>  | <b>Vapour Pressure:</b>        | <0.04 kPa (0.3 mmHg) @ 25 °C   |
|                           | 98% w/w: 1.844 g/cm <sup>3</sup>  | <b>Vapour Density:</b>         | 3.38 (air=1)   |
|                           | 100% w/w: 1.839 g/cm <sup>3</sup> |                                |  |

## Section 10: Stability and Reactivity

Normally stable. Hydrogen is generated by the action of the acid on most metals. Reacts violently with water.

### Incompatibility - Materials to Avoid:

NOTE: Chemical reactions that could result in a hazardous situation (e.g. generation of flammable or toxic chemicals, fire or detonation) are listed here. Many of these reactions can be done safely if specific control measures (e.g. cooling of the reaction) are in place. Although not intended to be complete, an overview of important reactions involving common chemicals is provided to assist in the development of safe work practices.

Sulphuric acid is a very reactive substance. The concentrated acid dehydrates, or sulfonates most organic compounds. Sulphuric 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 sulphuric acid. Hazardous gases, such as hydrogen, hydrogen cyanide, hydrogen sulfide and acetylene, are evolved on contact with chemicals such as metals, cyanides, sulfides and mercaptans and carbides respectively.

|  |   |
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| <b>Hazardous Decomposition Products:</b> | Decomposes at 340 °C into sulphur trioxide and water. |
| <b>Conditions to Avoid:</b>              | Contact with water.                                   |
| <b>Hazardous Polymerization:</b>         | No information available.                             |

### Corrosivity to Metals:

Sulphuric acid (10-100%) is corrosive to aluminum alloys at room temperature. The maximum attack occurs at 80% concentration. The rate of attack of less than 10% sulphuric acid is very low. The conventional austenitic grades of stainless steels, the 300 series, show good resistance in very dilute or highly concentrated sulphuric acid. Sulphuric acid in the intermediate concentration is more corrosive. Conventional ferritic grades, such as the 400 series are attacked by sulphuric acid. Sulphuric acid is corrosive to some austenitic stainless steels (e.g. type 304 (10-80%), 310 and 312 (10-85%), 316 and 321(10-



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80%). It also attacks type 17-4PH (50-100%) stainless steel. It is also corrosive to types 1010 and 1020 carbon steel (concentration 2-100%), cast iron (7-100%), 3% nickel cast iron, nickel (70-100%), nickel-base-alloys Inconel (60-100%) and Monel (70-100%), copper (all concentrations), and copper alloys, bronze (10-100%), silicon bronze (70-100%), aluminum bronze (65-100%), copper nickel 90-10 (5-100%), copper nickel 70-30 (80-100%), brass (10-100%), naval brass (70-100%), admiralty brass (10-100%), unalloyed titanium (all concentrations except very dilute solutions) and zirconium (65-100%). Sulphuric acid is not corrosive to cast high silicon iron (Duriron) (all concentrations), Carpenter 20 Cb3 (Alloy 20), lead, Hastelloy B/B-2, Hastelloy C/C-276, Hastelloy D, Incoloy 825 (all concentrations), tantalum (up to 98%) and zirconium (0-65%). Resistance of alloys to concentrated sulphuric acid corrosion increases with increasing chromium, molybdenum, and silicon content. The corrosiveness of sulphuric acid solutions is highly dependent on concentration, temperature, acid velocity, and impurities.

## Corrosivity to Non-Metals:

Sulphuric acid attacks plastics, such as nylon (all concentrations), polyvinylidene chloride (50-100%), acrylonitrile-butadiene-styrene (ABS) (60-100%), styrene acrylonitrile (SAN) (90-100%), polyurethane (rigid) (40-100%), polyetherether ketone (PEEK) (50-100%), polyethylene terephthalate (PET) (40-100%), high-density polyethylene (80-100%) (HDPE), thermoset polyester bisphenol A fumarate (80-100%), thermoset polyester isophthalic acid (70-100%), polystyrene (80-100%) and ethylene vinyl acetate (EVA) (75-100%); elastomers, such as butyl rubber (isobutylene isoprene) (80-100%), nitrile buna N (nitrile rubber) (90-100%), chloroprene (neoprene) (75-100%), isoprene (60-100%), natural rubber (60-100%), hard rubber (60-100%), soft rubber (30-100%), chlorosulfonated polyethylene (CSM) (90-100%), styrene-butadiene (SBR) (10-100%), polyacrylate (10-100%), polyurethane (10-100%), chlorinated polyethylene (all concentrations), nylon 11 and 12 (20-100%), silicone rubbers (120-100%), flexible polyvinyl chloride (PVC) (95-100%), low density polyethylene (LDPE) (90-100%) and ethylene vinyl acetate (50-100%); and coatings, such as coal tar epoxy (10-100%), general purpose epoxy (30-100%), chemical resistant epoxy (60-100%) and vinyls (90-100%). Sulphuric acid does not attack plastics, such as Teflon and other fluorocarbons, like ethylene tetrafluoroethylene (ETFE; Tefzel), ethylene chlorotrifluoroethylene (ECTFE; Halar) and chlorotrifluoroethylene (Kel-F) (all concentrations), polyvinyl chloride (PVC) (up to 96%), chlorinated polyvinyl chloride (CPVC) (up to 96%), polypropylene (up to 98%), acrylonitrile-butadiene-styrene (ABS) (up to 50%), high-density polyethylene (up to 75%) (HDPE), ultrahigh molecular weight polyethylene (UHMWPE) (up to 100%), cross-linked polyethylene (XLPE) (up to 96%), polyetherether ketone (PEEK) (up to 50%) and polystyrene (up to 70%); elastomers, such as Viton A and other fluorocarbons, like Teflon, Chemraz Kalrez and Fluoraz, ethylene propylene (EP) (up to 100%), butyl rubber (isobutylene isoprene) (up to 80%), nitrile buna N (nitrile rubber) (up to 80%), chloroprene (neoprene) (up to 70%), flexible polyvinyl chloride (PVC) (up to 50%) and , low density polyethylene (LDPE) (up to 80%); and coatings, such as polyester (up to 80%), urethanes (up to 80%) and vinyls (up to 80%).

## Section 11: Toxicological Information

### Potential Health Effects

|                    |   |
|--------------------|---|
| <b>Inhalation:</b> | May be fatal if inhaled. Sulphuric acid is corrosive and can cause severe irritation or corrosive damage if inhaled. It is not very volatile, and therefore workplace exposures are primarily to mists or aerosols. Sulphuric acid can cause severe lung damage with a life-threatening accumulation of fluid (pulmonary edema). The symptoms of pulmonary edema include coughing, chest pain and shortness of breath and can be delayed for up to 24 or 48 hours after exposure. These symptoms are aggravated by physical exertion. Long-term lung damage may result from a severe short-term exposure. |
| <b>Skin:</b>       | Sulphuric acid is corrosive. Corrosive materials are capable of producing severe burns, blisters, ulcers and permanent scarring, depending on the concentration of the solution and the duration of contact. Extensive acid burns can result in death. High mist or aerosol concentrations may cause redness, irritation and burns to the skin if contact is prolonged.   |
| <b>Eye:</b>        | Sulphuric acid is corrosive. Corrosive materials are capable of producing severe eye burns, and permanent injury, including blindness, depending on the concentration of the solution and the duration of contact. Sulphuric acid mists and aerosols are expected to be irritating.   |
| <b>Ingestion:</b>  | May be fatal if swallowed. Sulphuric acid is corrosive depending on the concentration of the solution and will cause burns to the lips, tongue, 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 could enter the lungs during ingestion or vomiting (aspiration), can cause serious lung injury and death.  |
| <b>Chronic:</b>    | Long-term exposure to corrosive materials like sulphuric acid can cause chronic respiratory irritation. Repeated exposure to sulphuric acid aerosols has caused dental erosion. Repeated skin contact with low concentrations can cause dry, red, cracked skin (dermatitis).  |

### Effects of Long-Term (Chronic) Exposure

|                    |   |
|--------------------|---|
| <b>RTECS#:</b>     | WS5600000   |
| <b>Descriptor:</b> | Agricultural Chemical; Tumorigen; Mutagen; Reproductive Effector; Human; Primary Irritant   |
| <b>LD50/LC50:</b>  | TCLo (lowest published toxic concentration) Inhalation, human – 1 mg/m <sup>3</sup> /3H – Lungs, Thorax or Respiration: other changes INHTE5 Inhalation Toxicology. |

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|                              | LD50 (lethal dose, 50% kill) Oral, rat – 2,140 mg/kg FEREAC Federal Register.<br>LC50 (lethal concentration, 50% kill) Inhalation, guinea pig – 18 mg/m <sup>3</sup> – Lungs, Thorax or Respiration: other changes MELAAD Medicina del Lavoro.  |
| <b>Epidemiology:</b>         | Standard Draize test – Eye, rabbit – 250 µg, severe reaction AJOPAA American Journal of Ophthalmology.<br>Rinsed with water – Eye, rabbit – 5 mg/30S, severe reaction TXCYAC Toxicology.  |
| <b>Teratogenicity:</b>       | Sulphuric acid is not known to cause developmental toxicity. No human information available.  |
| <b>Reproductive Effects:</b> | TCLo Inhalation, rabbit – 20 mg/m <sup>3</sup> /7H (female 6-18D after conception) – Specific Developmental Abnormalities: musculoskeletal system JEHS DH Journal of Environmental Science and Health, Part C.  |
| <b>Neurotoxicity:</b>        | No information found.   |
| <b>Mutagenicity:</b>         | Cytogenetic analysis – Ovary, hamster – 4 mmol/L MUREAV Mutation Research.  |
| <b>Carcinogenicity:</b>      | Listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65. IARC has concluded there is sufficient evidence that occupational exposure to strong acid mists containing sulphuric acid is carcinogenic to humans (Group 1). ACGIH has designated strong inorganic acid mists containing sulphuric acid as A2 (suspected human carcinogen). The US NTP has listed strong inorganic acid mists containing sulphuric acid as a known human carcinogen. |

## Section 12: Ecological Information

**Ecotoxicity:** LC50 – *Brachydanio rerio* – 82 mg/L/24H; LC50 – *Gambusia affinis* (mosquito fish) – 42 mg/L/96H; LC50 – Prawn – 42.5 ppm/48H (salt water)

## Section 13: Disposal Considerations

Review local/regional/international regulations or requirements prior to disposal. Store material for disposal as indicated in Storage Conditions. **Contaminated packaging:** Dispose of as unused product.

## Section 14: Transport Information

US DEPARTMENT OF TRANSPORT (DOT) HAZARDOUS MATERIALS SHIPPING INFORMATION (49 CFR)

Shipping Name and Description: SULFURIC ACID with more than 51 percent acid

Identification Number: UN1830 Hazard Class or Division: 8 Packing Group: II

NOTE: This information was taken from the US Code of Federal Regulations Title 49 - Transportation and is effective April 30, 2013.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG) SHIPPING INFORMATION

Shipping Name and Description: SULPHURIC ACID with more than 51 per cent acid

UN Number: UN1830 Class: 8 Packing Group/Category: II

Special Provisions: --- Marine Pollutant: --- Passenger Carrying Road/Railway Vehicle Index: 1 kg or L

NOTE: This information incorporates the Transportation of Dangerous Goods Regulations SOR/2001-286, effective January 2, 2013.

International Maritime Dangerous Goods (IMDG)

Proper Shipping Name / Description: SULPHURIC ACID with more than 51% acid

UN Number: 1830 Class or Division (Sub Risk): 8 Packing Group: II

Special Provisions: --- Marine Pollutant: --- EMS Number: F-A, S-B

International Air Transport Association (IATA)

Proper Shipping Name / Description: Sulphuric acid with more than 51% acid

UN/ID Number: 1830 Class or Division (Sub Risk): 8 Packing Group: II

Special Provisions: --- Passenger / Cargo Aircraft: 851 Pkg Inst, 1 L Max Net Cargo Aircraft Only: 855 Pkg Inst, 30 L Max Net

## Section 15: Regulatory Information

**Sulphuric acid** CAS# 7664-93-9

**US Federal:**

**TSCA** Listed on the TSCA Inventory.

**SARA Title III: Section 302** Subject to the reporting requirement of 1,000 lbs.

**SARA Title III: Section 313** Does not exceed the threshold (De Minimis) reporting level of 1,000 lbs.

# SDS: SULPHURIC ACID

## US State:

|                                    |  |
|------------------------------------|--|
| <b>Massachusetts Right To Know</b> | Subject to this act, 50 lbs RQ.                |
| <b>Pennsylvania Right To Know</b>  | Subject to this act.                           |
| <b>New Jersey Right To Know</b>    | Subject to this act, RTK# 1761.                |
| <b>California Prop. 65</b>         | Subject to this act, type of toxicity: cancer. |

## Canada:

|                               |  |
|-------------------------------|--|
| <b>DSL/NDSL Status:</b>       | Is listed, record number: 8320             |
| <b>WHMIS Classifications:</b> | D1A – Very toxic<br>E – Corrosive material |

## Section 16: Other Information

**Revision Date:** 07-2014, Supersedes 04-2014 & 04-2011

*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.*