SAFETY DATA SHEET

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

1. IDENTIFICATION

Product name: SULFURIC ACID 98%
Recommended use: Chemical for analysis and production.
Manufacturer/Supplier: RCI LABSCAN LIMITED.
24 Rama 1 Road, Pathumwan, Bangkok 10330 Thailand
Telephone No: (662) 613-7911-4
Fax No: (662) 613-7915
Emergency Telephone No: (662) 613-7911-4

2. HAZARDS IDENTIFICATION

DANGER: Causes severe skin burns and eye damage. May be corrosive to metals.

3. COMPOSITION/INFORMATION

Chemical name: SULFURIC ACID
Synonym: Battery acid, Dihydrogen sulfate, Dipping acid, Electrolyte acid, Mattling acid, Sulphuric acid.

<table>
<thead>
<tr>
<th>CAS-No</th>
<th>EC-No</th>
<th>EC-Index-No</th>
<th>Formula</th>
<th>Molecular Weight</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>7664-93-9</td>
<td>231-639-5</td>
<td>016-020-00-8</td>
<td>H₂SO₄</td>
<td>98.08 g/mol</td>
<td>97.5 – 98.5</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

General advice: Show this safety data sheet to the doctor in attendance.
Inhalation: Move to fresh air in case of accidental inhalation of vapors. Keep patient warm. In case of shortness of breath, give oxygen. Apply artificial respiration only if patient is not breathing or under medical supervision. No artificial aspiration mouth to mouth or mouth to nose. Use suitable instruments/apparatus.
Skin contact: Remove contaminated clothing and wash affected skin with soap and water. Dab with polyethylene glycol 400. Obtain medical attention. If signs of poisoning appear, treat as for inhalation.
Eye contact: If the substance has got into the eyes, immediately wash out with plenty of water at least 15 minutes. Obtain medical attention.
Ingestion: After swallowing: make victim drink water (two glasses at the most). Avoid vomiting. Risk of perforation. Immediately call in physician. Do not attempt to neutralize.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: In adaption to materials stored in the immediate neighborhood.
Specific hazards: Non-combustible. Development of hazardous combustion gases or vapors possible in the event of fire. Hydrogen may form upon contact with metals (danger of explosion). The following may develop in event of fire: Sulfur oxide. Corrosive. Causes severe burns.
Special protective equipment for fire fighters: Do not stay in dangerous zone without self-contained breathing apparatus. In order to avoid contact with skin, keep a safety distance and wear suitable protective clothing.
Specific methods: Contain escaping vapors with water. Prevent fire-fighting water from entering surface water or ground water.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Evacuate personnel to safe areas. Do not breathe vapors or spray mist. Wear a positive-pressure supplied-air respirator, flame retardant antistatic protective clothing. Shut off leaks if without risk. Keep people away from and upwind of spill/leak.
Environmental precautions: Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and workpits. If substance has entered a water course or sewer or contaminated soil or vegetation, advise police.
Methods for cleaning up: Spillage : May react with combustible substances creating fire or explosion hazard and formation of toxic fumes. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Soak up with inert absorbent material (e.g. sand, silica gel). Prevent liquid entering sewers, basements and workpits; vapor may
PRODUCT NAME: SULFURIC ACID 98%

create explosive atmosphere. Transfer to covered steel drums. Dispose of promptly.

7. HANDLING AND STORAGE

Handling: Provision of good ventilation in the working area. The floor must be acid resistant. Suitable materials: generally resistant: Glass, Enamel. At lower temperatures: Polyethylene PE, Polyvinyl chloride, Polypropylene PP. At different concentrations and range of temperatures the resistance of metals may vary greatly. Before choosing materials of construction obtain specialized information. Unsuitable materials: non-noble metals. Do not leave container open. Avoid any contact when handling the substance.

Storage: Keep tightly closed at room temperature in a dry, cool and well-ventilated place. Keep out of direct sunlight and away from heat, water and incompatible materials. Requirements for containers, no metal containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits: OEL 1 mg/m³, TWA 1 mg/m³

Engineering measures to reduce exposure: The product should only be used in ventilation hoods and fans.

Personal protection equipment:
- Respiratory protection: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Respiratory protection: Filter P2. (acc. to DIN 3181) for solid and liquid particles of harmful substances.
- Hand protection: Handle with gloves. In case full contact wear gloves from viton material. In case splash contact wear gloves from butyl rubber material. The select protective gloves have to satisfy the specifications of EU Directive 89/686 EEC and standard EN 374 derived from it.
- Eye protection: Goggles giving complete protection to eyes.
- Skin and body protection: Chemical resistant apron / corrosive protective clothing, heavy duty work shoes.

Hygiene measures: Keep working clothes separately. Keep away from food, drink and animal feeding stuffs.
## 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>pH Value</td>
<td>(25°C) 0.3 at 49g/l H₂O</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>330 °C</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-20 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not Available</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>Not Available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>- lower: Not Available</td>
</tr>
<tr>
<td></td>
<td>- upper: Not Available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>~0.0001 hPa</td>
</tr>
<tr>
<td>Relative Density</td>
<td>(20°C) 1.84 g/ml</td>
</tr>
<tr>
<td>Relative Vapor Density</td>
<td>~3.4</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>(20°C) Soluble</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not Available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>(20°C) 24 mPa.s</td>
</tr>
</tbody>
</table>

## 10. STABILITY AND REACTIVITY


**Stability:** Stable under recommended storage conditions.

**Conditions to avoid:** Strong heating.

**Materials to avoid:** Alkali metals, alkali compounds, ammonia, alkaline earth metals, alkaline earth compounds, alkalis, acid, metals, metal alloys, combustible substances, organic solvents, halogenates, permanganate. Metals (generation of Sulfur oxide and Hydrogen).

**Hazardous decomposition products:** Sulfur oxide, Hydrogen (Hazardous decomposition products from under contact with metals, danger of explosion.)
11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity:</td>
<td>LC₅₀ (inhalation, rat): 510 mg/m³/ 2h (calculated on the pure substance).</td>
</tr>
<tr>
<td>Sensitization:</td>
<td>Property that must be anticipated on the basis from the components of the preparation. After inhalation of aerosol: damage to the affected mucous membranes. After skin contact: severe burns with formation of scabs. After eye contact: burns, corneal lesions. After swallowing: severe pain (risk of perforation), nausea, vomiting and diarrhoea. After a latency period of several weeks possibly pyloric stenosis.</td>
</tr>
<tr>
<td>Chronic toxicity:</td>
<td>Applicable to partial components: Bacterial mutagenicity; Ames test is negative. No teratogenic effect in animals experiments.</td>
</tr>
<tr>
<td>Further toxicological information:</td>
<td>The product should be handled with the care usual when dealing with chemicals.</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biologic degradation:</td>
<td>Method for the determination of biodegradability is not applicable to inorganic substance.</td>
</tr>
<tr>
<td>Behavior in environmental compartments:</td>
<td>Concentration in organisms is not to be expected.</td>
</tr>
<tr>
<td>Ecotoxicity:</td>
<td>Daphnia Toxicity; Daphnia magna EC₅₀: 29 mg/l/24h (calculated on the pure substance)</td>
</tr>
<tr>
<td>Further ecologic data:</td>
<td>Harmful effect on aquatic organisms. Harmful effect due to pH shift. Toxic effect on fish and algae. Caustic even in diluted form. Does not cause biological oxygen deficit. Endanger drinking water supplies if allowed to enter soil and/or waters in large quantities. Neutralization possible in waste water treatment plants. Do not allow to enter waters, waste water or soil.</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products:</td>
<td>There are no uniform EC Regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding law and regulations. We recommend that you contact either the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste or burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.</td>
</tr>
<tr>
<td>Packaging:</td>
<td>Disposal in compliance with official regulations. Handle contaminated packaging as hazardous waste in the same way of the substance itself. If not officially specified differently, non-contaminated packaging may be treated like household waste or recycled.</td>
</tr>
</tbody>
</table>
14. TRANSPORT INFORMATION

Transport over land ADR/RID
UN-No: 1830
Class: 8
Proper shipping name: SULPHURIC ACID

Packing group: II

River transport AND/ADNR
(Not examined)

Sea transport IMDG
UN-No: 1830
Class: 8
Proper shipping name: SULPHURIC ACID

Packing group: II

Ems: F-A S-B

Marine pollutant: No

Air transport ICAO-TI, PAX and IATA-DGR
UN-No: 1830
Class: 8
Proper shipping name: SULPHURIC ACID

Packing group: II

15. REGULATORY INFORMATION

Contains: SULFURIC ACID 98%

GHS - Labelling:

- Hazard statement(s):
  H314: Causes severe skin burns and eye damage.
  H290: May be corrosive to metals.

- Precautionary statement(s):
  P234: Keep only in original container.
  P260: Do not breathe vapors.
  P264: Wash hand thoroughly after handling.
  P280: Wear protective gloves/protective clothing/eye protection/face protection.
  P363: Wash contaminated clothing before reuse.
  P301 + P330 + P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
  P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
  P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P310: Immediately call a POISON CENTER or doctor/physician.
  P390: Absorb spillage to prevent material damage.
  P405: Store locked up.
**PRODUCT NAME:** SULFURIC ACID 98%

**Labelling according to EC Directives**

**R - phrase(s):**
- R35 - Causes severe burns.

**S - phrase(s):**
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S30 - Never add water to this product.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**16. OTHER INFORMATION**

**Recommended restrictions:** Take notice of labels and safety data sheets before working.

**Reason for alteration:** Changed, updated and corrected in this safety data sheet following Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

**Reference:**
Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

**Further information:** Contact RCI Labscan Limited.

---

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.