

## Safety Data Sheet

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### 1. Chemical product and company identification

Product name : SULFURIC ACID 98%

#### Company information

Name of manufacturer : KANTO CHEMICAL CO., INC.  
 Address : 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, Japan  
 Name of section : Electronic materials division technical department  
 Telephone number : +81-3-6214-1080  
 Facsimile number : +81-3-3241-1043  
 Mail address : el-info@kanto.co.jp  
 Reference No : GE00258 1.3  
 Recommended uses and restrictions : Electronic chemicals

### 2. Hazards identification

#### GHS classification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity (inhalation:dust/mist)	Category 2
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity (single exposure)	Category 1 (respiratory organs)
	Specific target organ toxicity (repeated exposure)	Category 1 (respiratory organs)
Environmental hazards	Aquatic acute	Category 3
	Aquatic chronic	Category 1

Hazard pictograms



Signal word : Danger

Hazard statements : May be corrosive to metals  
 Causes severe skin burns and eye damage  
 Fatal if inhaled  
 Causes damage to organs (respiratory organs)  
 Causes damage to organs (respiratory organs) through prolonged or repeated exposure  
 Harmful to aquatic life  
 Very toxic to aquatic life with long lasting effects

#### Precautionary statements

Prevention : Keep only in original container.  
 Do not breathe mist/vapors.  
 Wash hands, forearms and face thoroughly after handling.

	Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.
Response	: IF SWALLOWED: Rinse mouth. Do not induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water . IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Call a POISON CENTER or doctor. Immediately call a POISON CENTER or doctor. Get medical advice/attention if you feel unwell. Absorb spillage to prevent material-damage. Collect spillage.
Storage	: Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

### 3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Sulfuric acid	98.5	H2SO4	Listed	231-639-5	7664-93-9

### 4. First aid measures

#### First aid measures

First-aid measures after inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
First-aid measures after skin contact	: Wash the affected areas under running water, get medical treatment as soon as possible.
First-aid measures after eye contact	: Wash the affected areas under running water for at least 15 minutes. Get medical treatment.
First-aid measures after ingestion	: Rinse mouth with water. Give the victim one or two glasses of water or milk. Do not induce vomiting. Get medical treatment as soon as possible.
Personal Protection in First Aid and Measures	: Rescuers should wear proper protective equipment like rubber gloves, goggles.

#### Most Important Symptoms/Effects

Symptoms/effects	: Inhalation of sulfuric acid mist causes sore throat, cough, and shortness of breath. Dermal exposure causes redness, pain, blister, and burns.
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## 5. Fire fighting measures

- Suitable extinguishing media : This product is noncombustible.
- Unsuitable extinguishing media : Water spray
- Fire hazard : Contact with combustible material may cause fire.
- Firefighting instructions : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.
- Personal protection (Emergency response) : Firefighters should wear protective equipment.

## 6. Accidental release measures

### Personal Precautions, Protective Equipment and Emergency Procedures

- General measures : Wear proper protective equipment and avoid contact with skin and inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Keep away personnel except for authorized ones from spillage area by stretching ropes.

### Environmental precautions

- Environmental precautions : Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

### Methods and Equipment for Containment and Cleaning up

- For containment : Absorb spill with diatomaceous earth or dry sand and place in container. Neutralize residue with calcium hydroxide solution or sodium carbonate solution and then flush with copious amounts of water.
- Prevention Measures for Secondary Accidents : Do not allow contact with organic substances or combustible substances.

## 7. Handling and storage

### Handling

- Technical measures : Wear proper protective equipment to avoid contact with skin or inhalation of vapor.
- Precautions for safe handling : Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.  
The substance is an oxidizer. Avoid contact with organic substances.

### Storage

- Storage conditions : Store in a dark, cool place and tightly closed.  
Keep away from combustible materials.
- Material used in packaging/containers : Glass, Fluorine resin, Polyethylene.

## 8. Exposure controls / Personal protection equipment

ACGIH TWA	0.2 mg/m <sup>3</sup> (T)
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- Appropriate engineering controls : Use with an enclosed system or a local exhaust ventilation.
- Protective equipment

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Respiratory protection	: If necessary, wear a chemical cartridge respirator with acidic gases.
Hand protection	: Impervious protective gloves
Eye protection	: Safety goggles
Skin and body protection	: Protective clothing, protective boots

## 9. Physical and chemical properties

Physical state	: Liquid
Color	: Colorless.
Odor	: Odorless
pH	: Strong acidity
Melting point	: 3 ° C (As 98% Sulfuric acid)
Freezing point	: No data available
Boiling point	: 327 ° C
Flash point	: Non flammable.
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: No data available
Flammability	: Non flammable.
Vapor pressure	: 0.2 Pa (35°C) (As 95% Sulfuric acid)
Relative density	: No data available
Density	: 1.84 g/cm <sup>3</sup> (20°C)
Relative gas density	: 3.4
Solubility	: Water: Miscible, but generate heat. React with organic solvents.
Partition coefficient n-octanol/water (Log Pow)	: No data available
Explosive limits (vol %)	: No data available
Viscosity, dynamic:	: 23 cP (25°C)
Viscosity, kinematic:	: No data available
Particle characteristics	: No data available

## 10. Stability and reactivity

Reactivity	: Since this substance is a strong oxidizing agent, it reacts with flammable substances and reducing substances. Since this substance is a strong acid, it corrodes many metals.
Chemical stability	: Stable under normal conditions. Hygroscopic.
Possibility of hazardous reactions	: Generates heat when contacted with water or organic substances. This substance corrodes many metals. At that time, flammable hydrogen gas is generated. May produce irritating or toxic fumes or gases (sulfur oxides) on heating.
Conditions to avoid	: Light, heat.
Incompatible materials	: Alkaline substances, combustible materials, reducing substances, metals.
Hazardous decomposition products	: Sulfur oxides.



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## 11. Toxicological information

Acute toxicity (oral)	: No classification rat LD50=2140mg/kg
Acute toxicity (dermal)	: Classification not possible
Acute toxicity (inhalation)	: No classification (gas) Classification not possible (vapor) Fatal if inhaled
Acute toxicity (mist) - Description	: rat LC50=0.375mg/L/4h
Skin corrosion/irritation	: Causes severe skin burns Sulfuric acid is corrosive and irritating and produces direct local effects on the skin, eyes and gastrointestinal tract after exposure to sufficient concentrations. Exposure at high concentrations rapidly destroys tissues, resulting in severe burns. Thus, it was classified into category 1B.
Serious eye damage/irritation	: Causes serious eye damage Skin corrosion/irritation is classified as category 1B. So it was classified into category 1.
Respiratory sensitization	: Classification not possible
Skin sensitization	: No classification In general, severe skin irritation and burns are known to predispose to contact allergy, but there have been no reports of skin irritation or secondary skin sensitization due to burns after exposure to sulfuric acid. Therefore, it was classified as "No classification".
Germ cell mutagenicity	: Classification not possible In In vitro, reverse mutation tests with Salmonella typhimurium and Escherichia coli have been negative, and chromosomal aberration tests with Chinese hamster ovary (CHO) cells have been positive, but have been shown to result from low pH of the culture medium.
Carcinogenicity	: Classification not possible It was concluded that IARC is carcinogenic to humans (Group-1) following occupational exposure to strongly inorganic acid mists, including sulfuric acid. This classification applies to mists (or aerosols) and not to sulfuric acid itself. Sulfate aerosols at sufficiently high concentrations are frequently deposited in the nasopharyngeal and/or laryngeal regions, where they repeatedly cause injury, inflammation, and repair. It is presumed that this results in cell proliferation and, in conjunction with other carcinogens, effects (weak effects associated with sulfate exposure: repeated irritant effects). As an example to allow the speculation of deposition in these predilection sites and extreme local-induced effects, squamous metaplasia and persistent proliferation of the larynx have been seen in a 28-day repeated inhalation exposure study in rats.



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- Reproductive toxicity : No classification  
In a developmental toxicity study (gestational days 6-15) in mice following inhalation, no developmental effects were observed in the fetuses of dams up to high doses (19.3 mg/m<sup>3</sup>) with reduced food consumption (Day 1 only) and reduced liver weights. Also, no reports are available on the reproductive toxicity of sulfuric acid by the oral, dermal or inhalation routes of exposure in laboratory animals. However, since sulfuric acid has irritant/corrosive effects, it is not appropriate to test for reproductive effects by the oral and dermal routes. Sulfuric acid is a poison that acts directly at the site of contact. It is considered that the acid itself is not absorbed and distributed to the whole body. Therefore, it is unlikely that sulfuric acid will reach the reproductive organs of both sexes as sulfuric acid after exposure by any route. It has been reported that ionized sulfate ion may be excreted in the urine in excess as a normal metabolite of sulfur-containing amino acids and may not play a specific toxicological role. Therefore, it was classified as "No classification".
- STOT-single exposure : Causes damage to organs (respiratory organs)  
There are case reports of cough, dyspnea (sometimes with spasm of the vocal cords), and bronchitis following nasal discharge, sneezing, and burning sensation behind the throat and sternum in humans who inhaled sulfuric acid. At high exposure levels, nasal discharge and sputum mixed with blood, hemoptysis and gastritis were observed. In addition to these, there are numerous case reports of respiratory symptoms resulting from inhalation exposure to sulfuric acid. In addition, in a single inhalation exposure study in volunteers, coughing was reported in humans who exercised while deeply inhaling sulfuric acid at 0.38 mg/m<sup>3</sup> or higher during exposure, and in volunteers after 24 hours of exposure to sulfuric acid in 0.45 mg/m<sup>3</sup>, it was reported that increased respiratory tract responses were observed in those volunteers, and it was reported that throat irritation was caused by 0.45 mg/m<sup>3</sup> and 1.0 mg/m<sup>3</sup> exposure. It has been reported that exposure to sulfate levels greater than or equal to 3 mg/m<sup>3</sup> resulted in rattle and bronchoconstriction. Therefore, it was classified as category 1 (respiratory organs).
- STOT-repeated exposure : Causes damage to organs (respiratory organs) through prolonged or repeated exposure  
In a 28-day repeated inhalation (mist) exposure study (6 h/day, 5 days/week) in rats (females), squamous metaplasia of the larynx was observed at 0.3 mg/m<sup>3</sup> (guidance conversion value: 0.000067 mg/L/6h, range 1) or higher, and cellular proliferation of the laryngeal epithelium was reported at 1.38 mg/m<sup>3</sup> (guidance conversion value: 0.0003 mg/L/6h, range 1) or higher. In an 82-day repeated-dose inhalation study (8 hours/day) in male rats, it was reported that alveolar epithelial cells (mainly alveolar ducts) were hypertrophied at 2 mg/m<sup>3</sup> (guideline conversion: 0.0018 mg/L/6h, Category 1) or higher. Therefore, it was classified as category 1 (respiratory organs).
- Aspiration hazard : Classification not possible



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## 12. Ecological information

### Ecotoxicity

- Aquatic acute : Harmful to aquatic life  
Lepomis macrochirus LC50=16-28mg/L/96h (pH3.25-3.5)
- Aquatic chronic : Very toxic to aquatic life with long lasting effects  
Jordanella floridae NOEC=0.025mg/L/45-day (pH6.0)

### Persistence and degradability

No additional information available

### Bioaccumulative potential

No additional information available

### Mobility in soil

No additional information available

### Hazardous to the ozone layer

- Ozone : Classification not possible

## 13. Disposal considerations

- Ecology - waste materials : Neutralization method :  
Neutralize by adding little by little to a stirring solution such as lime milk. Then, it is diluted with a large amount of water for treatment.  
Or entrust approved waste disposal companies with the disposal.
- Contaminated container and packaging : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

## 14. Transport information

### International Regulations

#### Transport by sea (IMDG)

- UN-No. (IMDG) : 1830  
Proper Shipping Name (IMDG) : SULPHURIC ACID  
Packing group (IMDG) : II  
Transport hazard class(es) (IMDG) : 8

#### Air transport (IATA)

- UN-No. (IATA) : 1830  
Proper Shipping Name (IATA) : Sulphuric acid  
Packing group (IATA) : II  
Transport hazard class(es) (IATA) : 8

- Marine pollutant : Applicable

#### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- Pollutant category : Y  
MFAG-No : 137

## 15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.



## 16. Other information

### Data sources

- : Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
- Handbook of dangerous and hazardous chemicals, Japan Industrial Safety & Health Association. (2000-2001) .
- Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
- Handbook of Poisonous and Deleterious substances, revised and enlarged edition, Yakumu Kohosa (2000) .
- Handbook of 17322 Chemical Products, The Chemical Daily Co. (2022) .
- NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.
- Japan Soda Industry Association Soda handbook (1998) .

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully. The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements. The information herein is only provision of information, and it does not represent a guarantee the properties of the product. The Safety Data Sheet(SDS) is prepared based on JIS Z7253.

