

SDS(Safety Data Sheet)

Product	Sulfuric Acid		
MSDS Number	List No.	Issuing date	Last revised date
-	PD1084	2008-07-25	2024-01-17

1. IDENTIFICATION

1) Product name

Sulfuric Acid

2) Recommended use of the chemical and restriction on use

- Recommended use pH-regulating agents
- Restrictions on use Do not use for any other purpose.

3) Details of the supplier of the safety data sheet

○ Manufacturer

- Company name GS Caltex Corporation
- Address GS Tower, 508, Nonhyeon-ro, Gangnam-gu, Seoul, Korea
- Emergency telephone number 1544-5151

2. HAZARDS IDENTIFICATION

1) Classification of the product

- CORROSIVE TO METALS : Category 1
- ACUTE TOXICITY(Inhalation:Dust/mist) : Category 1
- SERIOUS EYE DAMAGE/EYE IRRITATION : Category 1
- CARCINOGENICITY : Category 1A
- LONG-TERM HAZARDS TO THE AQUATIC ENVIRONMENT : Category 3

2) Label elements

○ Hazard pictograms



○ Signal word

Danger

○ Hazard statements

- H290 May be corrosive to metals.
- H318 Causes serious eye damage.
- H330 Fatal if inhaled.
- H350 May cause cancer.
- H412 Harmful to aquatic life with long lasting effects.

○ Precautionary statements

1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P234 Keep only in original container.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray.
- P271 Use only outdoors or in a well-ventilated area.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
- P284 [In case of inadequate ventilation] wear respiratory protection.

2) Response

- P304 + P340 IF INHALED: Remove 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.
- P308 + P313 IF exposed or concerned: Get medical advice/attention.
- P310 Immediately call a POISON CENTER or doctor/ physician.
- P320 Specific treatment is urgent (see section 5).
- P390 Absorb spillage to prevent material damage.

3) Storage

- P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
- P405 Store locked up.
- P406 Store in corrosive resistant/... container with a resistant inner liner.

4) Disposal

- P501 Dispose of contents/container to

3) Other hazards

○ Product NFPA Level

(※ 0-Lack, 1-Low, 2-Moderate, 3-High, 4-Very High)

Product name	Health	Flammable	Reaction
Sulfuric Acid	3	0	0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	Trade names and Synonyms	CAS No.	EC No.	Contain Ratio(%)
Sulfuric acid	Hydrogensulfate	7664-93-9	231-639-5	95
Water	Oxidane;Dihydrogen oxide	7732-18-5	231-791-2	5

4. FIRST AID MEASURES

1) Eye contact

- Get medical attention immediately.
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Immediately call a POISON CENTER or doctor/physician.

- If eye irritation persists: Get medical advice/attention.
- 2) Skin contact**
 - In case of contact with substance, immediately flush skin with running water for at least 20 minutes.
 - Immediately call a POISON CENTER or doctor/physician.
 - If skin irritation occurs: Get medical advice/attention.
- 3) Inhalation**
 - If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
 - Do not use mouth-to-mouth method if victim 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.
 - Administer oxygen if breathing is difficult.
 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
 - IF exposed or concerned: Get medical advice/attention.
- 4) Ingestion**
 - Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- 5) Indication of any immediate medical attention and special treatment needed**
 - Exposures require specialized first aid with contact and medical follow-up.
 - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

- 1) Suitable (and unsuitable) extinguishing media**
 - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
 - Use dry sand or earth to smother fire.
 - High-pressure water (Unsuitable extinguishing media)
 - Direct water (Unsuitable extinguishing media)
- 2) Special hazards arising from the substance or mixture**
 - Some may produce flammable hydrogen gas upon contact with metals.
 - Fire may produce irritating, corrosive and/or toxic gases.
 - Heating may cause a fire or explosion.
 - May be corrosive to metals.
- 3) Special protective equipment and precautions for firefighters**
 - Rescuers should put on appropriate protective gear.
 - In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
 - Eliminate all ignition sources if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

- 1) Health considerations and protective equipment**
 - Clean up spills immediately, observing precautions in Protective Equipment section.
 - ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
 - Please note that materials and conditions to be avoided.
- 2) Environmental precautions**
- Large spill: Prevent entry into waterways, sewers, basements or confined areas.
 - Avoid release to the environment.

- 3) Methods and material for containment and cleaning up**
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
 - Reduce airborne dust and prevent scattering by moistening with water.
 - Absorb the liquid and scrub the area with detergent and water.
 - Large Spill: Dike far ahead of liquid spill for later disposal.
 - Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.

7. HANDLING AND STORAGE

- 1) Precautions for safe handling**
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
 - Avoid breathing vapors from heated material.
 - Please note that materials and conditions to be avoided.
 - Handling refer to engineering control/personal protection section.
 - Wash thoroughly after handling.
 - Use only outdoors or in a well-ventilated area.
- 2) Conditions for safe storage (including any incompatibilities)**
- Please note that materials and conditions to be avoided.
 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
 - Keep only in original container.
 - Store in corrosive resistant/... container with a resistant inner liner.
 - Store in a well-ventilated place. Keep container tightly closed.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Control parameters

Chemical name	Exposure limits	ACGIH TLV	OSHA PEL	Biological limit values(BLV)
Sulfuric acid	TWA : 0.2 mg/m ³ STEL : 0.6 mg/m ³	Not available	PEL: 1 mg/m ³ mg/m ³	Not available
Water	Not available	Not available	Not available	Not available

2) Appropriate engineering controls

- Install local exhaust ventilation system.
- Check legal suitability of exposure level.

3) Personal protection equipment

- **Respiratory protection** - If exposure concentration of the material is lower than 100 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate material ; such
 - If exposure concentration of the particle material is lower than 250 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate material
 - If exposure concentration of the particle material is lower than 500 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate materia
 - If exposure concentration of the particle material is lower than 10000 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate mater
 - If exposure concentration of the material is lower than 100000 ppm of the permitted exposure standards, Wear a respiratory protective device, equipped with an adequate filter by considering physicochemical properties of exposed particulate material ; su
 - If exposure concentration of the material exceeds the permitted exposure standards, Wear European Standard EN 149 approved full or half face piece (with goggles) respireatory protective equipment.

- **Eye protection** - An eye wash unit and safety shower station should be available nearby work place.
 - Wear breathable safety goggles to protect from vapour state organic material causing eye irritation or other disorder.

- **Hand protection** - Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

- **Body protection** - Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Item	Input Value
Apperance	Liquid
Color	No Data
Smell	약한 산성냄새
Smell Threshold	No Data
pH (Numerical value)	No Data
Melting/Freezing Point	10 °C
Boilling Point	No Data

Flash Point	No Data
Evaporating Rate	No Data
Flammability(Solid, Gas)	No Data
Explosibility Range	불연성
Steam Pressure	0.13 kPa @146°C
Solubility	No Data
Vapor Density	3.4
Specific Gravity	1.8
Distribution Coefficient	-1.43
Selfignition Temperature	No Data
Pyrolysis Temperature	340 °C
Viscosity	No Data
Molecular Weight	98.07

10. STABILITY AND REACTIVITY

- 1) Chemical Stability and hazardous reactivity**
- Can form explosive mixtures at temperatures at or above the flashpoint.
 - Some may produce flammable hydrogen gas upon contact with metals.
 - Fire may produce irritating, corrosive and/or toxic gases.
 - May be corrosive to metals.
- 2) Conditions to avoid**
- Ignition source(heat, spark, flame, friction, shock, contamination)
- 3) Incompatible materials**
- Metal
 - Reducing material.
 - Combustibles
- 4) Hazardous decomposition products**
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

11. TOXICOLOGICAL INFORMATION

1) Information on the likely routes of exposures

Inhalation

- Fatal if inhaled.
- Absorbable through the inhalation

Skin contact

- No effect on skin contact.

Eye contact

- Causes serious eye damage.
- Possible exposure through the eye

○ **Ingestion**

- No ingestion effect through mouth.

2) Health hazard information

○ **Acute toxicity**

* **Oral - Not classified (ATEmix > 2000 mg/kg)**

- Sulfuric acid : rat; LD50 = 2140 mg/kg bw (ECHA)
- Water : rat; LD50 > 90000 mg/kg bw (ChemIDplus)

* **Dermal - Not classified (ATEmix > 2000 mg/kg)**

- Sulfuric acid : Not available
- Water : LD50 > 2000 mg/kg bw (no toxicity)

* **Inhalation(Gas) - Not applicable**

- Sulfuric acid : Not applicable
- Water : Not applicable

* **Inhalation(Vapour) - Not classified (ATEmix > 20 mg/L)**

- Sulfuric acid : Not available
- Water : 4h-LC50 > 20 mg/L (no toxicity)

* **Inhalation(Dust, mist) - Category 1 (ATEmix = 0.39 mg/L)**

- Sulfuric acid : rat(male/female); inhalation: aerosol; LC50 = 0.375 mg/L air/4h (OECD TG 403) (ECHA)
- Water : 4h-LC50 > 5 mg/L (no toxicity)

○ **Skin corrosion/Irritation : Not classified**

- Sulfuric acid : Since pH of concentrated sulfuric acid was 1 or less, it was judged to be a corrosive. (J-GHS)
- Water : Not available

○ **Serious eye damage/irritation : Category 1 (SERIOUS EYE DAMAGE Cat. 1)**

- Sulfuric acid : Since pH of this product was two or less. So it was set as Category 1. (J-GHS)
- Water : Not available

○ **Respiratory sensitization : Not classified**

- Sulfuric acid : Not available
- Water : Not available

○ **Skin sensitization : Not classified**

- Sulfuric acid : Not available
- Water : Not available

○ **Carcinogenicity : Category 1A**

- Sulfuric acid : IARC : Group 1 (Carcinogenic to Humans)
ACGIH : A2 - Suspected Human Carcinogen (contained in strong inorganic acid mists)
- Water : IARC, EU CLP 1272/2008, OSHA, ACGIH, US EPA IRIS, NTP : not listed

○ **Germ cell mutagenicity : Not classified**

- Sulfuric acid : in vitro mammalian chromosome aberration test : positive (ECHA), in vitro Bacterial Reverse Mutation Assay : negative (ECHA)
In vivo : Not available
- Water : Five new types of drinking water could affect the body weight of mice, but had

no effect on pregnancy rate, gestation rate and birth livability of mice.
Magnetized mineral water, activated water, purified water and mineral water could increase SOD activity. (HSDB)

○ **Reproductive toxicity : Not classified**

- Sulfuric acid : Rabbit, mouse; Prenatal Developmental Toxicity Study; 0, 5, 20 mg/m³; No evidence of teratogenicity, embryotoxicity, foetotoxicity or developmental toxicity was seen under the conditions of this study, at exposure levels sufficient to cause mild maternal toxicity. (OECD TG 414) (ECHA)
- Water : Not available

○ **Specific target organ toxicity (single exposure) : Not classified**

- Sulfuric acid : inhalation: aerosol; rat(male/female); Fibrosis occurring in the rat may cause malfunction of the epiglottis and subsequently result in foreign body aspiration and subsequent pneumonia. LC50 = 0.375 mg/L air/4h (OECD TG 403) (ECHA)
- Water : Not available

○ **Specific target organ toxicity (repeated exposure) : Not classified**

- Sulfuric acid : rat(female); inhalation: aerosol; 28 days; 0.00, 0.30, 1.38, 5.52 mg/m³; Following inhalation exposure to sulphuric acid mists, treatment-related findings were limited to histopathology and cell proliferation of the larynx, consistent with a local irritant effect of the substance. (OECD TG 412, GLP) (ECHA)
- Water : Not available

○ **Aspiration hazard : Not classified**

- Sulfuric acid : 22.5 mPa · s (dynamic) at 20°C. (ECHA) & not hydrocarbons
- Water : Not available

12. ECOLOGICAL INFORMATION

1) Ecotoxicity

- Acute toxicity : Not classified (ATEmix > 1mg/L)
- LONG-TERM HAZARDS TO THE AQUATIC ENVIRONMENT : Category 3

○ **Acute (short-term) aquatic hazard:**

Fish

- Sulfuric acid : 96h-LC50(Lepomis macrochirus) > 16 - < 28 mg/L (ECHA)
- Water : 96h-LC50 = 16062.827 mg/L (estimated) (ECOSAR Class : Neutral Organic SAR) (ECOSAR)

Invertebrates

- Sulfuric acid : 48h-EC50(Daphnia magna) > 100 mg/L (OECD TG 202, GLP) (ECHA)
- Water : 48h-LC50(Daphnid) = 6675.500 mg/L (estimated) (ECOSAR Class : Neutral Organic SAR) (ECOSAR)

Aquatic algae

- Sulfuric acid : 72h-ErC50(Desmodesmus subspicatus) > 100 mg/L (OECD TG 201, GLP) (ECHA)
- Water : 96h-EC50(Green Algae) = 1368.296 mg/L (estimated) (ECOSAR Class : Neutral Organic SAR) (ECOSAR)

○ **Chronic (Long-term) aquatic hazard:**

Fish

- Sulfuric acid : 65d-NOEC(Jordanella floridae) = 0.025 mg/L (ECHA)

- Water : Not available

Invertebrates

- Sulfuric acid : Not available

- Water : Not available

Aquatic algae

- Sulfuric acid : Not available

- Water : Not available

2) Persistence and degradability

Persistence

- Sulfuric acid : log Kow = -2.20 (estimated) (EPISUITE)

- Water : log Kow = -1.38 (estimated) (EPISUITE)

Degradability

- Sulfuric acid : Not available

- Water : Not available

3) Bioaccumulative potential

Bioaccumulation

- Sulfuric acid : BCF = 3.162 (estimated) (EPISUITE)

- Water : BCF = 3.162 (estimated) (EPISUITE)

Biodegradation

- Sulfuric acid : Not available

- Water : Not available

4) Mobility in soil

- Sulfuric acid : Koc=0.7407 (EPISUITE)

- Water : Koc = 0.06337(estimated) (EPISUITE)

5) Hazard to the ozone layer

- Sulfuric acid : Not applicable

- Water : Not applicable

6) Other adverse effects

- Sulfuric acid : Not available

- Water : Not available

13. DISPOSAL CONSIDERATIONS

1) Disposal methods

- Waste must be disposed of in accordance with federal, state and local environmental control regulation.

2) Special precaution for disposal

- Consider the required attentions in accordance with waste treatment management regulation.

14. TRANSPORT INFORMATION

1) UN No.

- 1830

2) Proper shipping name

- SULPHURIC ACID with more than 51% acid

3) Transport hazard class(es)

- 8

4) Packing group

- II

5) Marine pollutant

- Not applicable

6) Special safety response for transportation or transportation measure

- Types of Emergency Measures in Case of Fire : F-A
- Types of Emergency Measures in Leakage : S-B

15. REGULATORY INFORMATION

EINECS(or ELINCS)

- Sulfuric acid : European EINECS phase-in substance
- Water : European EINECS phase-in substance

EU CLP (CLASSIFICATION) - PRODUCT : Toxic substance

- Sulfuric acid : Not applicable
- Water : Not applicable

Substances restricted under REACH

- Sulfuric acid : Not applicable
- Water : Not applicable

Substances subject to authorization under REACH

REACH SVHC List

Korea

○ Occupational Safety and Health Act

- Sulfuric acid : Substance subject to occupational exposure limits, Substance subject to permissible exposure limits, Hazardous substance subject to control, Special management substance, Harmful agents subject to work environment monitoring, Harmful agents subject to workers requiring health examination, Substance subject to submission of process safety reports
- Water : Not applicable

○ K-REACH

- Sulfuric acid : Phase-in Substances subject to Registration, Substance subject to intensive control (2019)
- Water : Not applicable

○ Chemical Control Act in Korea

- Sulfuric acid : Toxic substance, Substance requiring preparation for accidents, List of substance subjected to the PRTR
- Water : Not applicable

○ Safety Control of Dangerous Substances Act

- Sulfuric acid : Not applicable
- Water : Not applicable

U.S.A

○ US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

- Sulfuric acid : Not applicable

- Water : Not applicable
- **CERCLA Designation of hazardous substances (40 CFR 302.4)**
- Sulfuric acid : US management information(CERCLA regulation)
- Water : Not applicable
- **CERCLA Section 302 regulation**
- Sulfuric acid : US management information(CERCLA Section 302 regulation)
- Water : Not applicable
- **CERCLA Section 304 regulation**
- Sulfuric acid : US management information(CERCLA Section 304 regulation)
- Water : Not applicable
- **CERCLA Section 313 regulation**
- Sulfuric acid : US management information(CERCLA Section 313 regulation)
- Water : Not applicable

Interntional Convention on Environment

- **Rotterdam Convention list**
- Sulfuric acid : Not applicable
- Water : Not applicable
- **Stockholm Convention list**
- Sulfuric acid : Not applicable
- Water : Not applicable
- **Montreal Protocol list**
- Sulfuric acid : Not applicable
- Water : Not applicable

National Inventory

- **Korea**
- Sulfuric acid : Not applicable
- Water : Not applicable
- **U.S.A**
- Sulfuric acid : US TSCA phase-in substance
- Water : US TSCA phase-in substance
- **China**
- Sulfuric acid : China phase-in substance
- Water : China phase-in substance
- **Japan**
- Sulfuric acid : Japan ENCS phase-in substance
- Water : Not applicable

16. OTHER INFORMATION

1) Reference

- Sources of information used in preparing this SDS included one or more of the following: Internal technical data, data from OECD eChemPortal, ECHA, NITE, TOXNET, IPCS and KOSHA search results.

2) Issue Date

- 2008-07-25

3) Revision number and Last date revised

Number of revised

- 8

Date of last revision

- 2024-01-11

Last Revision History

- Hazard classification revised as a result of hazard review based on latest notification and GHS database update

4) Other

- The information contained in the Safety Data Sheet is at the date of its issuance to the best of our knowledge correct according to the data available to us. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.