

Material Safety Data Sheet

(SULFURIC ACID)

PRODUCT NAME	CAS No.	KE No.	UN No.	EU No.
SULFURIC ACID	7664-93-9	KE-32570	1830	231-639-5

1. Product and Company Identification

Product Name SULFURIC ACID

Recommended use of the chemical and restrictions on use

Recommended use of the chemical fertilizer, metallurgical, agricultural pesticide, fiber, Phosphoric acid, gunpowder, etc

Restrictions on use

Product INFORMATION

Maker Namhae Chemical Corp.

Address 1384 Yeosusandanro, Yoesu-si, Jullanam-DO, Korea

Tel +82-61-688-5772~5

2. Hazards classification

A. Hazard/Risk Classification

CORROSIVE TO METALS : Category 1

ACUTE TOXICITY_Dusts and Mists : Category 2

SKIN CORROSION/IRRITATION : Category 1A-1C

SERIOUS EYE DAMAGE /EYE IRRITATION : Category 1

CARCINOGENICITY : Category 1A

Specific Target Organ Toxicity(Single Exposure) : Category 1

Specific Target Organ Toxicity – Repeated Exposure : Category 1

Aquatic environment maleficence: Category 3

B. GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

Symbol



Signal word

Danger

Hazard statements

H290 : May be corrosive to metals

H314 : Causes severe skin burns and eye damage

H318 : Causes serious eye damage

H330 : Fatal if inhaled

H350 : May cause cancer

H370 : Causes damage to organs

H372 : Causes damage to organs through prolonged or repeated exposure

H412 : Harmful to aquatic life with long lasting effects

Precautionary statements

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.

Prevention	<p>P264 : Wash handling area thoroughly after handling.</p> <p>P270 : Do not eat, drink or smoke when using this product.</p> <p>P271 : Use only outdoors or in a well-ventilated area.</p> <p>P273 : Avoid release to the environment.</p> <p>P280 : Wear protective gloves/protective clothing/eye protection/face protection.</p> <p>P284 : Wear respiratory protection.</p>
Response	<p>301+P330+P331 : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</p> <p>P303+P361+P353 : IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.</p> <p>P304+P340 : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.</p> <p>P305+P351+P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P308+P313 : IF exposed or concerned: Get medical advice/ attention.</p> <p>P310 : Immediately call a POISON CENTER or doctor/physician.</p> <p>P320 : Specific treatment is urgent (see 4. First Aid Measures on this label).</p> <p>P321 : Specific treatment (see 4. First Aid Measures on this label).</p> <p>P363 : Wash contaminated clothing before reuse.</p> <p>P390 : Absorb spillage to prevent material damage.</p>
Storage	<p>P403+P233 : Store in a well-ventilated place. Keep container tightly closed.</p> <p>P405 : Store locked up.</p> <p>P406 : Store in corrosive resistant/... container with a resistant inner liner.</p>
Disposal	P501 : Dispose of contents/container to relevant law

C. Other Hazard/Risk which are not included in the classification criteria (NFPA)

Health Rating	3
Flammability Rating	0
Reactivity Rating	2

3. Composition/Information on Ingredients

Chemical Name	SULFURIC ACID
Other name	Oil of vitriol
CAS number	7664-93-9
Content(%)	SULFURIC ACID 98.6%(winter 96%), water 1.4%(winter 4%)

4. First Aid Measures

A. measures general	<p>Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital. First</p>
B. Eye Contact	<p>If a Sulfuric Acid contacts, do not rub or scratch exposed eye. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. GET MEDICAL ATTENTION IMMEDIATELY.</p>
C. Skin Contact:	<p>If a Sulfuric Acid contacts, do not rub or scratch exposed skin. If liquid get on the skin, immediately flush the contaminated skin with water for at least 15 minutes. If liquid penetrate through the clothing, immediately remove the clothing and shoes under a safety shower and continue to wash the skin for at least 15minutes. GET MEDICAL ATTENTION IMMEDIATELY.</p>

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| D. Inhalation: | If a Sulfuric Acid contacts, move to fresh air in case of accidental inhalation of mist. If breathing has stopped, perform artificial respiration. If breathing is difficult, give oxygen. GET MEDICAL ATTENTION AS SOON AS POSSIBLE. |
| E. Ingestion: | If a Sulfuric Acid has been swallowed and the person is conscious, give one glass of water. Vomiting may occur spontaneously, but Do Not induce vomiting. Never give anything by mouth to an unconscious person. GET MEDICAL ATTENTION IMMEDIATELY. |

5. Fire Fighting Measures

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| A. Suitable (and unsuitable) extinguishing media | Use extinguishing media appropriate for surrounding fire. If Sulfuric acid leaks, use dry chemical, soda ash, lime, sand or carbon dioxide |
| B. SPECIFIC HAZARDS ARISING FROM THE CHEMICAL | Sulfuric acid fume may be released during a fire involving the product. |
| C. SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS | Do not stay in dangerous zone without self-contained breathing apparatus. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face-piece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers. |
| D. FIRE AND EXPLOSION HAZARD | Not flammable. Contact with most metals causes formation of flammable and explosive hydrogen gas. |

6. ACCIDENTAL RELEASE MEASURES

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| A. NECESSARY MEASURES AND PROTECTIVE GEAR TO PROTECT HUMANS | If sulfuric acid leaks, avoid contact with skin, eyes and clothing. Do not touch spilled material. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). |
| B. NECESSARY MEASURES TO PROTECT ENVIRONMENT | Notify authorities and appropriate federal, state, and local agencies. Prevent the product from spreading into the environment. Avoid direct discharge into drains. |
| C. METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP | SMALL SPILLS: Collect all released material in a plastic lined metal container. If necessary neutralize the residue with a dilute solution of sodium carbonate. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by building a dike. Absorb with dry earth, sand or other non-combustible material. Neutralize the residue with a dilute solution of sodium carbonate. Dispose of all contaminated materials in accordance with current local regulations. |

7. HANDLING AND STORAGE

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| A. PRECAUTIONS FOR SAFE HANDLING | Protect from physical damage. |
| B. CONDITIONS FOR SAFE STORAGE (INCLUDING ANY INCOMPATIBILITIES) | Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, non-sparking tools must be used because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. |
| C. Hygiene measures | Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product |

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. OCCUPATIONAL EXPOSURE LIMIT(S), BIOLOGICAL EXPOSURE STANDARD	ACGIH-TLV: TWA – 0.2 mg/m ³ STEL – 0.6 mg/m ³ OSHA-PEL: STEL 3 mg/m ³ , TWA 1 mg/m ³
B. APPROPRIATE ENGINEERING CONTROLS	Use local exhaust ventilation if necessary to control airborne mist and vapor..
C. INDIVIDUAL PROTECTION MEASURES	Respiratory protection If significant mists or aerosols are generated an approved respirator is recommended. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Eye protection Wear safety glasses with side shields (or goggles). Eyewash must be installed nearby. Hand protection Wear chemical resistant gloves. Gloves should be replaced immediately if signs of degradation are observed. Body protection Use good work and personal hygiene practices to avoid exposure. Consider the provision in the work area of a safety shower and eyewash. Always wash thoroughly after handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

A. APPEARANCE (PHYSICAL STATE, COLOR etc.)	White to Brown liquid, Sour tasty and little sticky
B. ODOR	None
C. ODOR THRESHOLD	Not available
D. pH	pH < 1
E. MELTING POINT/FREEZING POINT	1.9 °C(98%) / -14.6(96%)
F. INITIAL BOILING POINT AND BOILING RANGE	Non-flammable
G. FLASH POINT	Non-flammable
H. EVAPORATION RATE	Not available
I. FLAMMABILITY (SOLID, GAS)	Not applicable
J. UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	- / - Non-flammable
K. VAPOR PRESSURE	0.13 kPa (146°C)
L. VAPOR DENSITY	100 g/100ml (20°C)
M. VAPOR DENSITY	3.4 (AIR=1)
N. Specific Gravity	1.8 (WATER=1)
O. PARTITION COEFFICIENT OF n-OCTANOL/WATER	-1.43
P. AUTO-IGNITION TEMPERATURE	Not applicable
Q. DECOMPOSITION TEMPERATURE	340 °C
R. VISCOSITY	21 cP (25°C)
S. MOLECULAR WEIGHT	98.08

10. STABILITY AND REACTIVITY

A. Reactivity	Reacts violently with (some) bases: heat release resulting in increased fire or explosion risk. Reacts with many compounds e.g.: with (strong) reducers, with organic material and with combustible materials: (increased) risk of fire/explosion. Violent exothermic reaction with water (moisture): release of corrosive gases/vapours.
B. CHEMICAL STABILITY	Stable under ordinary conditions of use and storage, Concentrated solutions react violently with water, spattering and liberating heat.
C. POSSIBILITY OF HAZARDOUS REACTIONS	Toxic fumes of oxides of sulfur when heated to decomposition will react with water or steam to produce toxic and corrosive fumes. React with carbonates to generate carbon dioxide gas. with cyanides, sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
D. CONDITIONS TO AVOID (STATIC DISCHARGE, SHOCK, VIBRATION, etc.)	Heat, moisture, incompatibles
E. SUBSTANCES TO AVOID	Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.
F. Hazardous decomposition products	Sulfur compounds

11. TOXICOLOGICAL INFORMATION

A. INFORMATION ON THE LIKELY ROUTES OF EXPOSURE Inhalation: Corrosive, Severe irritation and burns
Ingestion: Serious burns Skin: Burn and severe skin damage Eye: irreversible eye damage and severe burns, corneal damage, redness

B. DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT AND LONG TERM EXPOSURE

Acute toxicity (possible route of exposure) · Oral: LD50 = 2,140mg/kg · Skin: Not available · Inhalation: LC50 0.094mg/l 4hr

Skin corrosion/irritation pH < 1

Respiratory sensitization Skin sensitization: Not causes allergy · Inhalation sensitization: Not available

Carcinogenicity: · IARC: 1 · NTP: Not available · OSHA: Not available · WSHA: Not available · ACGIH: A2

Germ cell mutagenicity Not available

STOST-single exposure Respiratory

STOST-repeated exposure Not available

Aspiration hazard Not available

12. ECOLOGICAL INFORMATION

A. AQUATIC/TERRESTRIAL ECOLOGY TOXICITY

Fish LC50 16 mg/l 96 hr

Daphnia LC50 200 mg/l 48 hr

Algae Not available

B. PERSISTENCE AND DEGRADABILITY Not available C

C. BIOACCUMULATIVE POTENTIAL 1250µg/L 3hours BCFD Mussel 166.8µg/L

D. MOBILITY IN SOIL Not available

E. OTHER HAZARDOUS EFFECTS Not available

13. DISPOSAL CONSIDERATIONS

A. DISPOSAL METHODS Dispose of in accordance with local, state, and federal regulations. Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility.

B. PRECAUTIONS (INCLUDING DISPOSAL OF CONTAMINATED CONTAINER OR PACKAGE) Since emptied containers retain product residue, follow label warnings even after container is emptied

14. TRANSPORT INFORMATION

A. UN NUMBER UN 1830

B. UN PROPER SHIPPING NAME SULPHURIC ACID with more than 51% acid

C. TRANSPORT HAZARD CLASS (ES) 8

D. PACKING GROUP (IF APPLICABLE) PG II

E. MARINE POLLUTANT SUBSTANCES (APPLICABLE/NOT APPLICABLE) Not available

15. REGULATORY INFORMATION

A. INVENTORIES	EINECS/EU: Listed (EINECS No. 231-639-5(Sulfuric acid)) TSCA/US: Listed ENCS/JAPAN: Listed (ENCS No. 1-430(Sulfuric acid)) AICS/AUSTRALIA: Listed. DSL/CANADA: Listed. IECSC/CHINA: Listed. PICCS/PHILIPPINES: Listed. KECI/S.KOREA: Listed.
B. INTERNATIONAL ENVIRONMENTAL AGREEMENT	PIC: Not listed. POPs: Not listed. Ozone depletion: Not listed. EU. Directive 67/548/EEC on the classification, packaging, and labelling of dangerous substances, Annex I Classification: C; R35 Risk Phrases: R35 Safety Phrases: S1/2, S26, S30, S45
C. U.S. FEDERAL HEALTH AND ENVIRONMENT and U.S. FEDERAL, RIGHT-TO-KNOW	CERCLA Section 103 (40 CFR 302.4) : 1000 lb (453.599 kg) (Sulfuric acid) EPCRA (SARA Title III) Section 302 (EHS -TPQ) : 1000 lb (453.599 kg) (Sulfuric acid) EPCRA (SARA Title III) Section 304 (EHS - Reporting Quantities) : 1000 lb (453.599 kg) (Sulfuric acid) EPCRA (SARA Title III) Section 313 - Toxic chemical release reporting : Sulfuric acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size) OSHA Specifically Regulated Substances: Not applicable.
D. CANADA REGULATORY INFORMATION	WHMIS Ingredient Disclosure List: Regulated

NOTE: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

A. SOURCE OF DATA	Guideline for Globally Harmonized System of Classification and Labelling of Chemicals (GHS). International Chemical Safety Cards (ICSC) EC-ECB, International Uniform Chemical Information Database (IUCLID) Hazardous Substances Data Bank (HSDB) Registry of Toxic Effects of Chemical Substances (RTECS) National Institute of Technology and Evaluation -NITE (Japan) NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response. International Chemical Safety Cards(ICSC)(http://www.nihs.go.jp/ICSC)
B. THE DATE OF PREPARATION MSDS	2008-04-01
C. THE DATE OF PREPARATION OF THE LATEST REVISION	
Latest revision date	2017-03-23