



NUMCHAI INDUSTRY CO., LTD

Safety Data Sheet

Sulfuric acid 98%

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	: Sulfuric acid
Synonyms	: Oil of Vitriol, Brown oil, Dipping acid, Battery Fluid
Chemical Formula	: H ₂ SO ₄
Molecular Weight	: 98.08
CAS number	: 7664-93-9

1.2 Relevant identified uses of the substance or mixture and uses advised against Identified uses

Identified uses	: Laboratory chemicals, Manufacture of substances
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1.3 Details of the supplier of the safety data sheet

Manufacture	: Numchai Industry Co.,Ltd
Factory	: 84 Moo.1 Rama 2 Rd., Bangtorad Amphur Muang, Samutsakorn 74000 Thailand
Telephone number	: +66034-432518-20
Fax number	: +66034-4325-519

1.4 Emergency telephone

Emergency phone	: +66034-432518-20
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Corrosive to Metals (Category 1), H290

Skin corrosion (Category 1A), H314

Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Danger

Hazard statement(s)

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

Precautionary statement(s)

P234 Keep only in original packaging.

P260 Do not breathe dusts or mists.

P264 Wash hand thoroughly after handling.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P361 + P354 IF ON SKIN (or hair): Take off immediately all contaminated clothing.
Immediately rinse with water for several minutes.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P354 + P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P316 Get emergency medical help immediately.

P363 Wash contaminated clothing before reuse.

P390 Absorb spillage to prevent material-damage.

P405 Store locked up.

P406 Store in corrosion resistant/ container with a resistant inner liner

2.3 Other hazards None

SECTION 3: Composition/information on ingredients

3.1 Substances

Product name:	Sulfuric acid 98%
Synonyms:	Oil of Vitriol, Brown oil, Dipping acid, Battery Fluid
Formula:	H ₂ SO ₄
Molecular weight:	98.08 g/mol
CAS-No.:	7664-93-9
UN number:	1830
EC-No.:	231-639-5
Index-No.:	016-020-00-8

Ingredients

Name	CAS	Proportion
Sulphuric acid	7664-93-9	98 %
Water	7732-18-5	Balance

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of 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. If signs of poisoning appear, treat as for inhalation. Obtain medical attention. Wash contaminated clothing before reuse.
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.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in section 2.2 and section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In adaption to materials stored in the immediate neighborhood.

5.2 Special hazards arising from the substance or mixture

Non-combustible. Ambient fire may liberate hazardous vapors. Hydrogen may form upon contact with metals (danger of explosion). The following may develop in event of fire: Sulfur oxide.

5.3 Advice for firefighters

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.

5.4 Further information

Contain escaping vapors with water. Prevent fire-fighting water from entering surface water or ground water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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.

6.2 Environmental precautions

Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and work its. If substance has entered a water course or sewer or contaminated soil, advise police.

6.3 Methods and materials for containment and cleaning up

Spillage: soak up with inert absorbent material (e.g. sand, silica gel or chemical absorbent pads). Prevent liquid entering sewers, basements and work its. Transfer to covered drums. Dispose of promptly.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe 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.

7.2 Conditions for safe storage, including any incompatibilities

Keep tightly closed 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.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Derived No Effect Level (DNEL)

Application Area	Health Effects	Exposure	Value
Worker	Acute Local Effects	Inhalation	1 mg/m ³
Consumer	Long-term Local Effects	Inhalation	0.05 mg/m ³

Predicted No Effect Concentration (PNEC)

Compartment	Value
Fresh water	0.0025 mg/l
Fresh water sediment	0.002 mg/kg
Marine water	0.00025 mg/l
Marine sediment	0.002 mg/kg
Sewage treatment plant	8.8 mg/l

8.2 Exposure controls

Appropriate engineering controls

The product should only be used in ventilation hoods and fans.

Individual protection measures (Personal protective equipment, PPE)

Eye/face protection Goggles giving complete protection to eyes.

Skin protection

Chemical resistant apron / corrosive protective clothing, heavy duty work shoes. Handle with gloves

- Full contact wears gloves from viton material.
- Splash contact wears 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.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. Required when vapor/aerosols are generated filter P2 (EN 141 or EN 14387).

Environmental exposure controls

Prevent liquid entering sewers, basements and work its.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

SD-QCS-073,R04 (27/5/68) DCR No.101/68

a) Physical state	clear, liquid
b) Color	colorless
c) Odor	odorless
d) Melting point/freezing point Melting point:	10.31 °C
e) Initial boiling point and boiling range	290 °C - lit.
f) Flammability (solid, gas)	No data available
g) Upper/lower flammability or explosive limits	No data available
h) Flash point	Not applicable
i) Autoignition temperature	No data available
j) Decomposition temperature	No data available
k) pH	1.2 at 5 g/l
l) Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: 23 mPa.s at 20 °C
m) Water solubility	soluble
n) Partition coefficient: n-octanol/water	Not applicable for inorganic substances
o) Vapor pressure	1.33 hPa at 145.8 °C
p) Density	1.84 g/cm ³ at 25 °C - lit.
Relative density	No data available
q) Relative vapor density	No data available
r) Particle characteristics	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

9.2 Other safety information

Surface tension	55.1 mN/m at 20 °C
Relative vapor density	3.39 - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity

Unsuitable working materials: metals, metal alloys. Acts oxidizing with increasing temperature. Concentrated sulfuric acid can destroy organic substances by dehydration under charring.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Possibility of hazardous reactions Risk of explosion in contact with: combustible substances, potassium, potassium hydroxide, bases, sodium, sodium hydroxide, organic substances, water, hydrogen peroxide

The substance can react dangerously with: aluminium, organic substances, reducing agents, nitric acid, acetonitrile, acrylonitrile, aminoethanol, conc. Ammonia, aniline, bromine pentafluoride, calcium hydride, p-chloronitrobenzene + sulfur trioxide (heat)

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

Alkali metals, alkali compounds, ammonia, alkaline earth metals, alkaline earth compounds, alkalis, acid, combustible substances, organic solvents, halogenates, permanganate. Incompatible with various metals and metal alloys generates of sulfur oxide and Hydrogen gas.

10.6 Hazardous decomposition products

Has a corrosive effect incompatible with metals, animals, vegetable tissues. Sulfur oxide, Hydrogen (Hazardous decomposition products from under contact with metals, danger

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not Available

Acute oral toxicity

Severe pain (risk of perforation), nausea, vomiting and diarrhea. After a latency period of several weeks possibly pyloric stenosis.

Acute inhalation toxicity

Damage to the affected mucous membranes.

Skin corrosion/irritation

Severe burns with formation of scabs.

Serious eye damage/eye irritation

Burns, corneal lesions.

Respiratory or skin sensitization

Not Available

Germ cell mutagenicity

Bacterial mutagenicity; Ames test is negative.

Carcinogenicity

Not Available

Reproductive toxicity

Not Available

Teratogenicity

No teratogenic effect in animals experiments.

Specific target organ toxicity (STOT) - single exposure

Not Available

Specific target organ toxicity (STOT) - repeated exposure

Not Available

Aspiration hazard

Not Available

Further information

The product should be handled with the care usual when dealing with chemicals.

SECTION 12: Ecological information**12.1 Toxicity**

Toxicity to daphnia

LC50 Daphnia magna: 16-28 mg/l/96h

12.2 Persistence and degradability

Not Available

12.3 Bio accumulative potential

Not Available

12.4 Mobility in soil

No Available

12.5 Other adverse effects

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.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

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.

Contaminated packaging

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.

SECTION 14: Transport information

Land Transport (ADR/RID)

UN proper shipping name	SULPHURIC ACID
UN Number	1830
Transport hazard class	8
Packing group	II
Tank code standards	L4BN
Environmental hazards	No
Special precautions for user	Yes

Sea transport (IMDG)

UN proper shipping name	SULPHURIC ACID
UN Number	1830
Transport hazard class	8
Packing group	II
Marine pollutant	No
Special precautions for user	Yes

Air transport (IATA)

UN proper shipping name	SULPHURIC ACID
UN Number	1830
Transport hazard class	8
Packing group	II
Environmental hazards	No
Special precautions for user	Yes

River transport (AND/ADNR)

(Not examined)

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorizations and/or restrictions on use

Regulation (EU) 2019/1148 on the marketing and use of explosives precursors: sulphuric acid

Other regulations

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.

Reference

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

Labelling according to EC Directives 67/548 EEC and Regulation (EC) No 1272/2008.

Transportation information according to Recommendations on the Transport of Dangerous Goods, Model Regulations. Twelfth revised edition. United Nations.

Institute for Occupational Safety and Health of the German Social Accident Insurance in Sankt Augustin/Germany,

Source: IFA for Databases on hazardous substances (GESTIS).

Recommended restrictions

Take notice of labels and safety data sheets for the working.

Further information : Contact to Numchai Industry Co.,Ltd.



NUMCHAI INDUSTRY CO., LTD

Safety data sheet

Sulfuric acid 72 %

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	: Sulfuric acid 72%
Synonyms	: Oil of Vitriol, Brown oil, Dipping acid, Battery Fluid
Chemical Formula	: H ₂ SO ₄
Weight %	: 72
Molecular Weight	: 98.08
CAS number	: 7664-93-9

1.2 Relevant identified uses of the substance or mixture and uses advised against Identified uses

Identified uses	: Laboratory chemicals, Manufacture of substances
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1.3 Details of the supplier of the safety data sheet

Manufacture	: Numchai Industry Co.,Ltd.
Factory	: 84 Moo.1 Rama 2 Rd., Bangtorad Amphur Muang, Samutsakorn 74000 Thailand
Telephone number	: +66034-432518-20
Fax number	: +66034-4325-519

1.4 Emergency telephone

Emergency phone	: +66034-432518-20
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Corrosive to Metals (Category 1), H290

Skin corrosion (Category 1A), H314

SD-QCS-075,R01 (27/5/68) DCR No. 103/68

Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Danger

Hazard statement(s)

H290

May be corrosive to metals.

H314

Causes severe skin burns and eye damage.

Precautionary statement(s)

P234

Keep only in original packaging.

P260

Do not breathe dusts or mists.

P264

Wash hand thoroughly after handling.

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P361 + P354

IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Immediately rinse with water for several minutes.

P304 + P340

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P354 + P338

IF IN EYES: Immediately rinse with water for several minutes.

Remove contact

lenses, if present and easy to do. Continue rinsing.

P316

Get emergency medical help immediately.

P363

Wash contaminated clothing before reuse.

P390	Absorb spillage to prevent material-damage.
P405	Store locked up.
P406	Store in corrosion resistant/ container with a resistant inner liner

2.3 Other hazards None

SECTION 3: Composition/information on ingredients

3.1 Substances

Product name	: Sulfuric acid 72%
Synonyms	: Dihydrogen sulfate, Dipping acid, Electrolyte acid, Mattling acid, Sulphuric acid.
Formula	: H ₂ SO ₄
Weight %	: 72
Molecular weight	: 98.08 g/mol
CAS-No.	: 7664-93-9
UN number	: 1830
EC-No.	: 231-639-5
Index-No.	: 016-020-00-8

Ingredients

Name	CAS	Proportion
Sulphuric acid	7664-93-9	72 %
Water	7732-18-5	28 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of 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. If signs of poisoning appear, treat as for inhalation. Obtain medical attention. Wash contaminated clothing before reuse.

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.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in section 2.2 and section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In adaption to materials stored in the immediate neighborhood.

5.2 Special hazards arising from the substance or mixture

Non-combustible. Ambient fire may liberate hazardous vapors. Hydrogen may form upon contact with metals (danger of explosion). The following may develop in event of fire: Sulfur oxide.

5.3 Advice for firefighters

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.

5.4 Further information

Contain escaping vapors with water. Prevent fire-fighting water from entering surface water or ground water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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.

6.2 Environmental precautions

Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and work pits. If substance has entered a water course or sewer or contaminated soil, advise police.

6.3 Methods and materials for containment and cleaning up

Spillage: soak up with inert absorbent material (e.g. sand, silica gel or chemical absorbent pads). Prevent liquid entering sewers, basements and work pits. Transfer to covered drums. Dispose of promptly.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe 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.

7.2 Conditions for safe storage, including any incompatibilities

Keep tightly closed 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.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

7.4 Environmental precautions

Setting up the substance to the environment because this substance affects living things, resulting in changes in the pH of the water

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

ACGIH (TLV)	1 mg/m ³ (TWA), 3 mg/m ³ (STEL)
OSHA (PEL)	1 mg/m ³ (TWA)
NIOSH	1 mg/m ³ (TWA), 3 mg/m ³ (IDLH)
LD ₅₀	2,140 mg/kg (oral rat)

8.2 Exposure controls

Appropriate engineering controls

The product should only be used in ventilation hoods and fans.

Individual protection measures (Personal protective equipment, PPE)

Eye/face protection Goggles giving complete protection to eyes.

Skin protection

Chemical resistant apron / corrosive protective clothing, heavy duty work shoes. Handle with gloves

- Full contact wears gloves from viton material.
- Splash contact wears 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.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. Required when vapor/aerosols are generated filter P2 (EN 141 or EN 14387).

Environmental exposure controls

Prevent liquid entering sewers, basements and work its.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Physical state	liquid
b) Color	colorless
c) Odor	odorless
d) Melting point/freezing point Melting point:	-33.7 °C
e) Initial boiling point and boiling range	183 °C
f) Flammability (solid, gas)	No data available
g) Upper/lower flammability or explosive limits	No data available
h) Flash point	Not applicable
i) Autoignition temperature	No data available
j) Decomposition temperature	No data available
k) pH	<1 at 25°C
l) Viscosity	No data available
m) Water solubility	Soluble at 20°C (caution, development of heat)
n) Partition coefficient: n-octanol/water	No data available
o) Vapor pressure	No data available
p) Density	1.67 g/ml at 20°C.
Relative density	No data available
q) Relative vapor density	No data available
r) Particle characteristics	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

SECTION 10: Stability and reactivity

10.1 Reactivity

Unsuitable working materials: metals, metal alloys. Acts oxidizing with increasing temperature.

Concentrated sulfuric acid can destroy organic substances by dehydration under charring.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Possibility of hazardous reactions Risk of explosion in contact with: combustible substances, potassium, potassium hydroxide, bases, sodium, sodium hydroxide, organic substances, water, hydrogen peroxide

The substance can react dangerously with: aluminium, organic substances, reducing agents, nitric acid, acetonitrile, acrylonitrile, aminoethanol, conc. Ammonia, aniline, bromine pentafluoride, calcium hydride, p-chloronitrobenzene + sulfur trioxide (heat)

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

Alkali metals, alkali compounds, ammonia, alkaline earth metals, alkaline earth compounds, alkalis, acid, combustible substances, organic solvents, halogenates, permanganate. Incompatible with various metals and metal alloys generates of sulfur oxide and Hydrogen gas.

10.6 Hazardous decomposition products

Has a corrosive effect incompatible with metals, animals, vegetable tissues. Sulfur oxide, Hydrogen (Hazardous decomposition products from under contact with metals, danger

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not Available

Acute oral toxicity

Severe pain (risk of perforation), nausea, vomiting and diarrhea. After a latency period of several weeks

possibly pyloric stenosis.

Acute inhalation toxicity

Damage to the affected mucous membranes.

Skin corrosion/irritation

Severe burns with formation of scabs.

Serious eye damage/eye irritation

Burns, corneal lesions.

Respiratory or skin sensitization

Not Available

Germ cell mutagenicity

Bacterial mutagenicity; Ames test is negative.

Carcinogenicity

Not Available

Reproductive toxicity

Not Available

Teratogenicity

No teratogenic effect in animals experiments.

Specific target organ toxicity (STOT) - single exposure

Not Available

Specific target organ toxicity (STOT) - repeated exposure

Not Available

Aspiration hazard

Not Available

Further information

The product should be handled with the care usual when dealing with chemicals.

SECTION 12: Ecological information**12.1 Toxicity**

Toxicity to daphnia

LC50 Daphnia magna: 16-28 mg/l/96h

12.2 Persistence and degradability

Not Available

12.3 Bio accumulative potential

Not Available

12.4 Mobility in soil

No Available

12.5 Other adverse effects

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.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

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.

Contaminated packaging

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.

SECTION 14: Transport information

Land Transport (ADR/RID)

UN proper shipping name	SULPHURIC ACID 72%
UN Number	1830
Transport hazard class	8

Packing group	II
Tank code standards	L4BN
Environmental hazards	No
Special precautions for user	Yes
Sea transport (IMDG)	
UN proper shipping name	SULPHURIC ACID 72%
UN Number	1830
Transport hazard class	8
Packing group	II
Marine pollutant	No
Special precautions for user	Yes
Air transport (IATA)	
UN proper shipping name	SULPHURIC ACID 72%
UN Number	1830
Transport hazard class	8
Packing group	II
Environmental hazards	No
Special precautions for user	Yes
River transport (AND/ADNR)	
(Not examined)	

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorizations and/or restrictions on use

Regulation (EU) 2019/1148 on the marketing and use of explosives precursors: sulphuric acid

Other regulations

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

Reference

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

Labelling according to EC Directives 67/548 EEC and Regulation (EC) No 1272/2008.

Transportation information according to Recommendations on the Transport of Dangerous Goods, Model Regulations. Twelfth revised edition. United Nations.

Institute for Occupational Safety and Health of the German Social Accident Insurance in Sankt Augustin/Germany,

Source: IFA for Databases on hazardous substances (GESTIS).

Recommended restrictions

Take notice of labels and safety data sheets for the working.

Further information : Contact to Numchai Industry Co.,Ltd.



NUMCHAI INDUSTRY CO., LTD

Safety data sheet

Sulfuric acid (70 %)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	: Sulfuric acid 70%
Synonyms	: Oil of Vitriol , Brown oil , Dipping acid , Battery Fluid
Chemical Formula	: H ₂ SO ₄
Weight %	: 70
Molecular Weight	: 98.08
CAS number	: 7664-93-9

1.2 Relevant identified uses of the substance or mixture and uses advised against Identified uses

Identified uses	: Laboratory chemicals, Manufacture of substances
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1.3 Details of the supplier of the safety data sheet

Manufacture	: Numchai Industry Co.,Ltd.
Factory	: 84 Moo.1 Rama 2 Rd., Bangtorad Amphur Muang, Samutsakorn 74000 Thailand
Telephone number	: +66034-432518-20
Fax number	: +66034-4325-519

1.4 Emergency telephone

Emergency phone	: +66034-432518-20
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Corrosive to Metals (Category 1), H290

Skin corrosion (Category 1A), H314

Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Danger

Hazard statement(s)

H290

May be corrosive to metals.

H314

Causes severe skin burns and eye damage.

Precautionary statement(s)

P234

Keep only in original packaging.

P260

Do not breathe dusts or mists.

P264

Wash hand thoroughly after handling.

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P361 + P354

IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Immediately rinse with water for several minutes.

P304 + P340

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P354 + P338

IF IN EYES: Immediately rinse with water for several minutes.

Remove contact

lenses, if present and easy to do. Continue rinsing.

P316

Get emergency medical help immediately.

P363

Wash contaminated clothing before reuse.

P390

Absorb spillage to prevent material-damage.

P405	Store locked up.
P406	Store in corrosion resistant/ container with a resistant inner liner

2.3 Other hazards None

SECTION 3: Composition/information on ingredients

3.1 Substances

Product name	: Sulfuric acid 70%
Synonyms	: Dihydrogen sulfate, Dipping acid, Electrolyte acid, Mattling acid, Sulphuric acid.
Formula	: H ₂ SO ₄
Weight %	: 70
Molecular weight	: 98.08 g/mol
CAS-No.	: 7664-93-9
UN number	: 1830
EC-No.	: 231-639-5
Index-No.	: 016-020-00-8

Ingredients

Name	CAS	Proportion
Sulphuric acid	7664-93-9	70 %
Water	7732-18-5	30 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of 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. If signs of poisoning appear, treat as for inhalation. Obtain medical attention. Wash contaminated clothing before reuse.

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.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in section 2.2 and section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In adaption to materials stored in the immediate neighborhood.

5.2 Special hazards arising from the substance or mixture

Non-combustible. Ambient fire may liberate hazardous vapors. Hydrogen may form upon contact with metals (danger of explosion). The following may develop in event of fire: Sulfur oxide.

5.3 Advice for firefighters

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.

5.4 Further information

Contain escaping vapors with water. Prevent fire-fighting water from entering surface water or ground water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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.

6.2 Environmental precautions

Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and work its. If substance has entered a water course or sewer or contaminated soil, advise police.

6.3 Methods and materials for containment and cleaning up

Spillage: soak up with inert absorbent material (e.g. sand, silica gel or chemical absorbent pads). Prevent liquid entering sewers, basements and work its. Transfer to covered drums. Dispose of promptly.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe 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.

7.2 Conditions for safe storage, including any incompatibilities

Keep tightly closed 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.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

7.4 Environmental precautions

Setting up the substance to the environment because this substance affects living things, resulting in changes in the pH of the water

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

ACGIH (TLV)	1 mg/m ³ (TWA), 3 mg/m ³ (STEL)
OSHA (PEL)	1 mg/m ³ (TWA)
NIOSH	1 mg/m ³ (TWA), 3 mg/m ³ (IDLH)
LD ₅₀	2,140 mg/kg (oral rat)

8.2 Exposure controls

Appropriate engineering controls

The product should only be used in ventilation hoods and fans.

Individual protection measures (Personal protective equipment, PPE)

Eye/face protection Goggles giving complete protection to eyes.

Skin protection

Chemical resistant apron / corrosive protective clothing, heavy duty work shoes. Handle with gloves

- Full contact wears gloves from viton material.
- Splash contact wears 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.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. Required when vapor/aerosols are generated filter P2 (EN 141 or EN 14387).

Environmental exposure controls

Prevent liquid entering sewers, basements and work its.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Physical state	liquid
b) Color	colorless
c) Odor	odorless
d) Melting point/freezing point Melting point:	-40.7 °C
e) Initial boiling point and boiling range	166 °C
f) Flammability (solid, gas)	No data available
g) Upper/lower flammability or explosive limits	No data available
h) Flash point	Not applicable
i) Autoignition temperature	No data available
j) Decomposition temperature	No data available
k) pH	<1 at 25°C
l) Viscosity	No data available
m) Water solubility	Soluble at 20°C (caution, development of heat)
n) Partition coefficient: n-octanol/water	No data available
o) Vapor pressure	No data available
p) Density	1.61 g/ml at 20°C.
Relative density	No data available
q) Relative vapor density	No data available
r) Particle characteristics	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

SECTION 10: Stability and reactivity

10.1 Reactivity

Unsuitable working materials: metals, metal alloys. Acts oxidizing with increasing temperature.

Concentrated sulfuric acid can destroy organic substances by dehydration under charring.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Possibility of hazardous reactions Risk of explosion in contact with: combustible substances, potassium, potassium hydroxide, bases, sodium, sodium hydroxide, organic substances, water, hydrogen peroxide

The substance can react dangerously with: aluminium, organic substances, reducing agents, nitric acid, acetonitrile, acrylonitrile, aminoethanol, conc. Ammonia, aniline, bromine pentafluoride, calcium hydride, p-chloronitrobenzene + sulfur trioxide (heat)

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

Alkali metals, alkali compounds, ammonia, alkaline earth metals, alkaline earth compounds, alkalis, acid, combustible substances, organic solvents, halogenates, permanganate. Incompatible with various metals and metal alloys generates of sulfur oxide and Hydrogen gas.

10.6 Hazardous decomposition products

Has a corrosive effect incompatible with metals, animals, vegetable tissues. Sulfur oxide, Hydrogen (Hazardous decomposition products from under contact with metals, danger

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Not Available

Acute oral toxicity

Severe pain (risk of perforation), nausea, vomiting and diarrhorrhea. After a latency period of several weeks

possibly pyloric stenosis.

Acute inhalation toxicity

Damage to the affected mucous membranes.

Skin corrosion/irritation

Severe burns with formation of scabs.

Serious eye damage/eye irritation

Burns, corneal lesions.

Respiratory or skin sensitization

Not Available

Germ cell mutagenicity

Bacterial mutagenicity; Ames test is negative.

Carcinogenicity

Not Available

Reproductive toxicity

Not Available

Teratogenicity

No teratogenic effect in animals experiments.

Specific target organ toxicity (STOT) - single exposure

Not Available

Specific target organ toxicity (STOT) - repeated exposure

Not Available

Aspiration hazard

Not Available

Further information

The product should be handled with the care usual when dealing with chemicals.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to daphnia

LC50 Daphnia magna: 16-28 mg/l/96h

12.2 Persistence and degradability

Not Available

12.3 Bio accumulative potential

Not Available

12.4 Mobility in soil

No Available

12.5 Other adverse effects

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.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

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.

Contaminated packaging

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.

SECTION 14: Transport information

Land Transport (ADR/RID)

UN proper shipping name	SULPHURIC ACID 70%
UN Number	1830
Transport hazard class	8

Packing group	II
Tank code standards	L4BN
Environmental hazards	No
Special precautions for user	Yes
Sea transport (IMDG)	
UN proper shipping name	SULPHURIC ACID 70%
UN Number	1830
Transport hazard class	8
Packing group	II
Marine pollutant	No
Special precautions for user	Yes
Air transport (IATA)	
UN proper shipping name	SULPHURIC ACID 70%
UN Number	1830
Transport hazard class	8
Packing group	II
Environmental hazards	No
Special precautions for user	Yes
River transport (AND/ADNR)	
(Not examined)	

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorizations and/or restrictions on use

Regulation (EU) 2019/1148 on the marketing and use of explosives precursors: sulphuric acid

Other regulations

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

Reference

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

Labelling according to EC Directives 67/548 EEC and Regulation (EC) No 1272/2008.

Transportation information according to Recommendations on the Transport of Dangerous Goods,
Model

Regulations. Twelfth revised edition. United Nations.

Institute for Occupational Safety and Health of the German Social Accident Insurance in Sankt
Augustin/Germany,

Source: IFA for Databases on hazardous substances (GESTIS).

Recommended restrictions

Take notice of labels and safety data sheets for the working.

Further information : Contact to Numchai Industry Co.,Ltd.



NUMCHAI INDUSTRY CO., LTD

Safety data sheet
Sulfuric acid (50%)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	: Sulfuric acid 50%
Synonyms	: Oil of Vitriol, Brown oil, Dipping acid, Battery Fluid
Chemical Formula	: H ₂ SO ₄
Weight %	: 50
Molecular Weight	: 98.08
CAS number	: 7664-93-9

1.2 Relevant identified uses of the substance or mixture and uses advised against Identified uses

Identified uses	: Laboratory chemicals, Manufacture of substances
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1.3 Details of the supplier of the safety data sheet

Manufacture	: Numchai Industry Co.,Ltd.
Factory	: 84 Moo.1 Rama 2 Rd., Bangtorad Amphur Muang, Samutsakorn 74000 Thailand
Telephone number	: +66034-432518-20
Fax number	: +66034-4325-519

1.4 Emergency telephone

Emergency phone	: +66034-432518-20
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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Corrosive to Metals (Category 1), H290

Skin corrosion (Category 1A), H314

Serious eye damage (Category 1), H318

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Danger

Hazard statement(s)

H290

May be corrosive to metals.

H314

Causes severe skin burns and eye damage.

Precautionary statement(s)

P234

Keep only in original packaging.

P260

Do not breathe dusts or mists.

P264

Wash hand thoroughly after handling.

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P361 + P354

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.

P304 + P340

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P354 + P338

IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P316	Get emergency medical help immediately.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material-damage.
P405	Store locked up.
P406	Store in corrosion resistant/ container with a resistant inner liner
2.3 Other hazards	None

SECTION 3: Composition/information on ingredients

3.1 Substances

Product name	: Sulfuric acid 50%
Synonyms	: Dihydrogen sulfate, Dipping acid, Electrolyte acid, Mattling acid, Sulphuric acid.
Formula	: H ₂ SO ₄
Weight %	: 50
Molecular weight	: 98.08 g/mol
CAS-No.	: 7664-93-9
UN number	: 2796
EC-No.	: 231-639-5
Index-No.	: 016-020-00-8

Ingredients

Name	CAS	Proportion
Sulphuric acid	7664-93-9	50 %
Water	7732-18-5	50 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of 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. If signs of poisoning appear, treat as for inhalation. Obtain medical attention. Wash contaminated clothing before reuse.
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.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in section 2.2 and section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In adaption to materials stored in the immediate neighborhood.

5.2 Special hazards arising from the substance or mixture

Non-combustible. Ambient fire may liberate hazardous vapors. Hydrogen may form upon contact with metals (danger of explosion). The following may develop in event of fire: Sulfur oxide.

5.3 Advice for firefighters

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.

5.4 Further information

Contain escaping vapors with water. Prevent fire-fighting water from entering surface water or ground water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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.

6.2 Environmental precautions

Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and work its. If substance has entered a water course or sewer or contaminated soil, advise police.

6.3 Methods and materials for containment and cleaning up

Spillage: soak up with inert absorbent material (e.g. sand, silica gel or chemical absorbent pads). Prevent liquid entering sewers, basements and work its. Transfer to covered drums. Dispose of promptly.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe 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.

7.2 Conditions for safe storage, including any incompatibilities

Keep tightly closed 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.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

7.4 Environmental precautions

Setting up the substance to the environment because this substance affects living things, resulting in changes in the pH of the water

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

ACGIH (TLV)	1 mg/m ³ (TWA), 3 mg/m ³ (STEL)
OSHA (PEL)	1 mg/m ³ (TWA)
NIOSH	1 mg/m ³ (TWA), 3 mg/m ³ (IDLH)
LD ₅₀	2,140 mg/kg (oral rat)

8.2 Exposure controls

Appropriate engineering controls

The product should only be used in ventilation hoods and fans.

Individual protection measures (Personal protective equipment, PPE)

Eye/face protection Goggles giving complete protection to eyes.

Skin protection

Chemical resistant apron / corrosive protective clothing, heavy duty work shoes. Handle with gloves

- Full contact wears gloves from viton material.
- Splash contact wears 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.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. Required when vapor/aerosols are generated filter P2 (EN 141 or EN 14387).

Environmental exposure controls

Prevent liquid entering sewers, basements and work its.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Physical state	liquid
b) Color	colorless
c) Odor	odorless
d) Melting point/freezing point Melting point:	-36.5 °C
e) Initial boiling point and boiling range	123.3 °C
f) Flammability (solid, gas)	No data available
g) Upper/lower flammability or explosive limits	No data available
h) Flash point	Not applicable
i) Autoignition temperature	No data available
j) Decomposition temperature	No data available
k) pH	<1 at 25°C
l) Viscosity	No data available
m) Water solubility	Soluble at 20°C (caution, development of heat)
n) Partition coefficient: n-octanol/water	No data available
o) Vapor pressure	No data available
p) Density	1.390 g/ml at 27 °C

Relative density	No data available
q) Relative vapor density	No data available
r) Particle characteristics	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

SECTION 10: Stability and reactivity

10.1 Reactivity

Unsuitable working materials: metals, metal alloys. Acts oxidizing with increasing temperature. Concentrated sulfuric acid can destroy organic substances by dehydration under charring.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Possibility of hazardous reactions Risk of explosion in contact with: combustible substances, potassium, potassium hydroxide, bases, sodium, sodium hydroxide, organic substances, water, hydrogen peroxide

The substance can react dangerously with: aluminium, organic substances, reducing agents, nitric acid, acetonitrile, acrylonitrile, aminoethanol, conc. Ammonia, aniline, bromine pentafluoride, calcium hydride, p-chloronitrobenzene + sulfur trioxide (heat)

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

Alkali metals, alkali compounds, ammonia, alkaline earth metals, alkaline earth compounds, alkalis, acid, combustible substances, organic solvents, halogenates, permanganate. Incompatible with various metals and metal alloys generates of sulfur oxide and Hydrogen gas.

10.6 Hazardous decomposition products

Has a corrosive effect incompatible with metals, animals, vegetable tissues. Sulfur oxide, Hydrogen (Hazardous decomposition products from under contact with metals, danger

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity**

Not Available

Acute oral toxicity

Severe pain (risk of perforation), nausea, vomiting and diarrhorrhea. After a latency period of several weeks possibly pyloric stenosis.

Acute inhalation toxicity

Damage to the affected mucous membranes.

Skin corrosion/irritation

Severe burns with formation of scabs.

Serious eye damage/eye irritation

Burns, corneal lesions.

Respiratory or skin sensitization

Not Available

Germ cell mutagenicity

Bacterial mutagenicity; Ames test is negative.

Carcinogenicity

Not Available

Reproductive toxicity

Not Available

Teratogenicity

No teratogenic effect in animals experiments.

Specific target organ toxicity (STOT) - single exposure

Not Available

Specific target organ toxicity (STOT) - repeated exposure

Not Available

Aspiration hazard

Not Available

Further information

The product should be handled with the care usual when dealing with chemicals.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to daphnia

LC50 Daphnia magna: 16-28 mg/l/96h

12.2 Persistence and degradability

Not Available

12.3 Bio accumulative potential

Not Available

12.4 Mobility in soil

No Available

12.5 Other adverse effects

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.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

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.

Contaminated packaging

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.

SECTION 14: Transport information

Land Transport (ADR/RID)

UN proper shipping name	SULPHURIC ACID 50%
UN Number	2796
Transport hazard class	8
Packing group	II
Tank code standards	L4BN
Environmental hazards	No
Special precautions for user	Yes

Sea transport (IMDG)

UN proper shipping name	SULPHURIC ACID 50%
UN Number	2796
Transport hazard class	8
Packing group	II
Marine pollutant	No
Special precautions for user	Yes

Air transport (IATA)

UN proper shipping name	SULPHURIC ACID 50%
UN Number	2796

Transport hazard class	8
Packing group	II
Environmental hazards	No
Special precautions for user	Yes

River transport (AND/ADNR)

(Not examined)

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorizations and/or restrictions on use

Regulation (EU) 2019/1148 on the marketing and use of explosives precursors: sulphuric acid

Other regulations

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information**Full text of H-Statements referred to under sections 2 and 3.**

- H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

Reference

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

Labelling according to EC Directives 67/548 EEC and Regulation (EC) No 1272/2008.

Transportation information according to Recommendations on the Transport of Dangerous Goods, Model Regulations. Twelfth revised edition. United Nations.

Institute for Occupational Safety and Health of the German Social Accident Insurance in Sankt Augustin/Germany, Source: IFA for Databases on hazardous substances (GESTIS).

Recommended restrictions

Take notice of labels and safety data sheets for the working.

Further information : Contact to Numchai Industry Co.,Ltd.



NUMCHAI INDUSTRY CO., LTD

Safety Data Sheet
Sulfuric acid, Fuming

1.PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : **Sulfuric acid, fuming**
Product Number : 435597
Brand : NUMCHAI INDUSTRY CO., LTD
Formula : $H_2SO_4SO_3$
Molecular Weight : 258.20 g/mol
Index-No. : 016-019-00-2
CAS-No. : 8014-95-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : NUMCHAI INDUSTRY CO.,LTD
84 Moo 1. Rama 2 Rd., Bangtorad Ampur Muang Samutsakorn Samutsakorn 74000
Telephone : 034-432518-20
Fax : 034-432519

1.4 Emergency telephone number

Emergency Phone # : 034-432518-20

2. HAZARDS IDENTIFICATION

SD-QCS-083,R01 (27/5/2568) DCR No.106/68

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Corrosive to Metals (Category 1), H290

Acute toxicity, Inhalation (Category 2), H330

Skin corrosion (Category 1A), H314

Specific target organ toxicity – single exposure (Category3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(S)

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.

Precautionary statement(s)

P234	Keep only in original packaging.
P260	Do not breathe dust / fume/ gas / mist / vapours / spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well – ventilated area.
P280	Wear protective gloves / protective clothing / eye protection / face protection.
P284	Wear respiratory protection.
P301+ P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P302+P361+P354	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Immediately

	rinse with water for several minutes.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P354+P338	IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P316	Get emergency medical help immediately.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material-damage.
P403+P233	Store in a well – ventilated place. Keep container tightly closed.
P405	Store locked up.
P406	Store in corrosion resistant/ container with a resistant inner liner.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Reacts violently with water

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Product name	:	Sulfuric acid, fuming
Synonyms	:	Oleum
Formula	:	$H_2SO_4SO_3$
Molecular Weight	:	258.20 g/mol
CAS – No.	:	8014-95-7
EC-No.	:	231-976-8
Index-No.	:	016-019-00-2

Hazardous components

Component	Classification	Concentration
Oleum		
	Acute Tox. 2; Skin Corr. 1A; Eye Dam. 1;STOT SE 3; H314, H330 , H335	90 – 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. Description of first aid measures

General advice

Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Skin contact

Remove contaminated clothing and wash affected skin with soap and water. Dab with polyethylene glycol 400. If signs of poisoning appear, treat as for inhalation. Obtain medical attention. Wash contaminated clothing before reuse.

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.

4.2 Most important symptoms and effects. Both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and / or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

Not Available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

In adaptation to materials stored in the immediate neighborhood.

5.2 Special hazards arising from the substance or mixture

Non-combustible. Ambient fire may liberate hazardous vapors. Hydrogen may form upon contact with metals (danger of explosion). The following may develop in event of fire: Sulfur oxide.

5.3 Advice for firefighters

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.

5.4 Further information

Contain escaping vapors with water. Prevent fire-fighting water from entering surface water or ground water.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapour, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

6.2 Environmental precautions

Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and work pits. If substance has entered a water course or sewer or contaminated soil, advise police.

6.3 Methods and materials for containment and cleaning up

In case of spill, absorb with non-flammable chemicals such as sand, silica gel or chemical absorbent pads. Prevent spillage into water sources. Collect in covered containers, label and dispose of. Clean contaminated area with water and detergent.

6.4 Reference to other sections

For disposal see Section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

7.2 Conditions for safe storage, including any incompatibilities

Keep tightly closed 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.

7.3 Specific and use (s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

The product should only be used in ventilation hoods and fans.

Skin protection

Chemical resistant apron / corrosive protective clothing, heavy duty work shoes. Handle with gloves

- Full contact wears gloves from viton material.
- Splash contact wears 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.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment. Required when vapor/aerosols are generated filter P2 (EN 141 or EN 14387).

Environmental exposure controls

Prevent liquid entering sewers, basements and work its.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance	Form: viscous liquid
b) Odour	Not Available
Odour Threshold	Not Available
c) Color	Colorless
d) pH	<1 at 100g/l H ₂ O 20°C
e) Melting point/freezing point	Not Available
f) Initial boiling point and boiling range	Not Available
g) Flash point	Not Available
h) Evaporation rate	Not Available
i) Flammability (solid,gas)	Not Available
j) Upper/lower flammability or explosive limits	Not Available
k) Vapour pressure	7 hPa (5mmHg) at 37.7 °C (99.9 °F) 3 hPa (2 mmHg) at 25 °C (77°F)
l) Vapour density	3.39 – (Air = 1.0)
m) Relative density	1.925 g/cm ³ at 25 °C (77°F)
n) Water solubility	Not Available
o) Partition coefficient:	Not Available

n-octanol/water

p) Auto – ignition Temperature	Not Available
q) Decomposition Temperature	Not Available
r) Viscosity	Not Available
s) Explosive properties	Not Available
t) Oxidizing properties	Not Available

10. STABILITY AND REACTIVITY

10.1 Reactivity

Can absorb moisture from the air well.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

May explode on contact with alkali metals, alkaline earth metals, alkali and alkaline earth oxides, chlorates.

Organic substances, permanganates

Reacts violently with ammonia, combustible substances.

10.4 Conditions to avoid

Exposure to humidity in the air.

10.5 Incompatible materials.

alkali metals, alkaline earth metals, alkali and alkaline earth oxides, chlorates.

Organic substances, permanganates

10.6 Hazardous decomposition products

Has a corrosive effect incompatible with metals, animals, vegetable tissues. Sulfur oxide, Hydrogen Hazardous decomposition products from under contact with metals, danger

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LC₅₀ (Inhalation, rat): 0.696 mg/l/4h

Acute oral toxicity

Severe pain (risk of perforation), nausea, vomiting and diarrhoea. After a latency period of several weeks possibly pyloric stenosis.

Acute inhalation toxicity

Damage to the affected mucous membranes.

Skin corrosion/irritation

Severe burns with formation of scabs.

Serious eye damage/eye irritation

Burns, may cause blindness.

Respiratory or skin sensitization

Not Available

Germ cell mutagenicity

Not Available

Carcinogenicity

Not Available

Reproductive toxicity

Not Available

Teratogenicity

Not Available

Specific target organ toxicity (STOT) - single exposure

Not Available

Specific target organ toxicity (STOT) - repeated exposure

Not Available

Aspiration hazard

Not Available

Further information

The product should be handled with the care usual when dealing with chemicals.

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

Not Available

12.2 Persistence and degradability

Not Available

12.3 Bio accumulative potential

Not Available

12.4 Mobility in soil

Not Available

12.5 Other adverse effects

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.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

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.

Contaminated packaging

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.

14. TRANSPORT INFORMATION

Land Transport (ADR/RID)

UN proper shipping name	Sulfuric acid, fuming
UN Number	1831
Transport hazard class	8(6.1)
Packing group,	I
Environmental hazards	No
Special precautions for user	Yes

Sea transport (IMDG)

UN proper shipping name	Sulfuric acid, fuming
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UN Number	1831
Transport hazard class	8(6.1)
Packing group	I
Marine pollutant	No
Special precautions for user	Yes

Air transport (IATA)

UN proper shipping name	Sulfuric acid, fuming
UN Number	1831
Transport hazard class	8(6.1)
Packing group,	I
Environmental hazards	No
Special precautions for user	Yes

River transport (AND/ADNR)

(Not examined)

15. REGULATORY INFORMATION

This safety information is provided in accordance with the requirements of the Global Identification and Labeling of Identified Girlfriends (GHS).

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

No Available

15.2 Chemical Safety Assessment

Chemical safety assessment not conducted

16. OTHER INFORMATION

Full text of H-Statements referred to under section 2 and 3.

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
EHU014	Reacts violently with water

Reference

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

Labelling according to EC Directives 67/548 EEC and Regulation (EC) No 1272/2008.

Transportation information according to Recommendations on the Transport of Dangerous Goods, Model Regulations. Twelfth revised edition. United Nations.

Institute for Occupational Safety and Health of the German Social Accident Insurance in Sankt Augustin/Germany, Source: IFA for Databases on hazardous substances (GESTIS).

Recommended restrictions

Take notice of labels and safety data sheets for the working.

Further information : NUMCHAI INDUSTRY CO.,LTD