

SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision date 17-Apr-2024
 Revision Number 5.06

Section 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---------------------|---------------------|
| Product Name | Dimethyl Sulfate |
| Product Code | 047-08912,041-08915 |

Supplier FUJIFILM Wako Pure Chemical Corporation
 1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan
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Recommended uses For research use only

Restrictions on use Seek expert judgment when using for purposes other than those recommended.

Section 2: HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture

| | |
|---|------------------------|
| Flammable liquids | Category 4 |
| Acute toxicity - Oral | Category 3 |
| Acute toxicity - Inhalation (Vapors) | Category 1 |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/eye irritation | Category 1 |
| Germ cell mutagenicity | Category 2 |
| Carcinogenicity | Category 1B |
| Reproductive Toxicity | Category 2 |
| Specific target organ toxicity (single exposure) | Category 1, Category 3 |
| Category 1 respiratory system, central nervous system, liver, kidneys, heart | |
| Category 3 Respiratory irritation | |
| Specific target organ toxicity (repeated exposure) | Category 2 |
| Category 2 lung | |
| Acute aquatic toxicity | Category 3 |

Pictograms



Signal word

Danger

Hazard statements

- H227 - Combustible liquid
- H314 - Causes severe skin burns and eye damage
- H318 - Causes serious eye damage
- H301 - Toxic if swallowed
- H330 - Fatal if inhaled
- H341 - Suspected of causing genetic defects
- H350 - May cause cancer
- H361 - Suspected of damaging fertility or the unborn child
- H335 - May cause respiratory irritation

H402 - Harmful to aquatic life

H370 - Causes damage to the following organs: respiratory system, central nervous system, liver, kidneys, heart

H373 - May cause damage to the following organs through prolonged or repeated exposure: lung

Precautionary statements-(Prevention)

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Do not breathe dust/fume/gas/mist/vapors/spray
- Use only outdoors or in a well-ventilated area
- Avoid release to the environment
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- Keep cool

Precautionary statements-(Response)

- 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 ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- Wash contaminated clothing before reuse
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- Call a POISON CENTER or doctor/physician if you feel unwell
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- Rinse mouth
- Do NOT induce vomiting
- In case of fire: Use suitable extinguishing media for extinction

Precautionary statements-(Storage)

- Store locked up
- Store in a well-ventilated place. Keep container tightly closed

Precautionary statements-(Disposal)

- Dispose of contents/container to an approved waste disposal plant

Others

Other hazards Not available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Single Substance or Mixture Substance

Formula (CH₃)₂SO₄

| Chemical Name | Weight-% | Molecular weight | ENCS | ISHL No. | CAS RN |
|------------------|----------|------------------|----------|----------|---------|
| Dimethyl sulfate | 95.0 | 126.13 | (2)-1673 | * | 77-78-1 |

Note on ISHL No.: * in the table means announced chemical substances.

Section 4: FIRST AID MEASURES

Inhalation

Remove to fresh air. If symptoms persist, call a physician.

Skin contact

Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.

Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate medical attention is required.

Ingestion

Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice.

Protection of first-aiders

Use personal protective equipment as required.

Section 5: FIRE FIGHTING MEASURES

Suitable extinguishing media

Carbon dioxide (CO₂), Foam, Extinguishing powder, Sand

Unsuitable extinguishing media

No information available

Specific hazards arising from the chemical product

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Special extinguishing method

No information available

Special protective actions for fire-fighters

Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind.

Environmental precautions

To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for contaminant and methods and materials for cleaning up

Absorb dry sand, earth, sawdust and the waste. Collect empty container that can be sealed.

Recoverly, neutralization

No information available

Secondary disaster prevention measures

Clean contaminated objects and areas thoroughly observing environmental regulations.

Section 7: HANDLING AND STORAGE

Handling**Technical measures**

Highly flammable. Avoid contact with high temperature objects, spark, and strong oxidizing agents. Use with local exhaust ventilation.

Precautions

Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging. Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle. In places other than those specified, should not be smoking or eating and drinking. Should not be brought contaminated protective equipment and gloves to rest stops. Deny unnecessary entry of non-emergency personnel to the handling area.

Safety handling precautions

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Storage**Safe storage conditions****Storage conditions**

Store away from sunlight in well-ventilated place at room temperature (preferably cool).
Keep container tightly closed. Store locked up.

Safe packaging material

Glass

Incompatible substances

Strong oxidizing agents

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand- and eye-wash facility. And display their position clearly.

Exposure limits

| Chemical Name | JSOH (Japan) | ISHL (Japan) | ACGIH |
|-----------------------------|--|-------------------|----------------------|
| Dimethyl sulfate 77-78-1 | TWA: 0.1 ppm OEL TWA: 0.52 mg/m ³ OEL Skin ISHL/ACL: 0.1 ppm | ISHL/ACL: 0.1 ppm | TWA: 0.1 ppm Skin |

Personal protective equipment

| | |
|---------------------------------|---|
| Respiratory protection | Protective mask |
| Hand protection | chemical protective gloves (JIS T 8116) |
| Eye protection | protective eyeglasses or chemical safety goggles (JIS T 8147) |
| Skin and body protection | Long-sleeved work clothes |

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.

If this product is classified as "Chemical Substances Hazardous to Skin, etc.", use appropriate protective equipment to them.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Form

| | |
|-------------------|---------------------------|
| Color | Colorless - slight yellow |
| Turbidity | clear |
| Appearance | liquid |

Odor

characteristic odor

Melting point/freezing point

no data available

Boiling point, initial boiling point and boiling range

188 °C (dec.)

Flammability

Combustible liquid

Evaporation rate:

no data available

Flammability (solid, gas):

no data available

Upper/lower flammability or explosive limits

Upper:

23.3 vol%

Lower:

3.6 vol%

Flash point

83 °C

Auto-ignition temperature:

470 °C

Decomposition temperature:

no data available

pH

no data available

Viscosity (coefficient of viscosity)

no data available

Dynamic viscosity

no data available

Solubilities

Ethanol , acetone : Very soluble. water : practically insoluble, or insoluble .

n-Octanol/water partition coefficient:(log Pow)

0.16

Vapour pressure

no data available

Specific Gravity / Relative density

1.323 - 1.337 g/mL

Vapour density

4.35

Particle characteristics

no data available

Section 10: STABILITY AND REACTIVITY

Stability

| | |
|---------------------------|--|
| Reactivity | no data available |
| Chemical stability | Stable under recommended storage conditions. |

Hazardous reactions

Reacts with strong oxidants causing fire/explosion hazard. Reacts violently with bases, may cause fire or explosion.

Conditions to avoid

Extremes of temperature and direct sunlight, Heat, flames and sparks, static electricity, spark

Incompatible materials

Strong oxidizing agents

Hazardous decomposition products

Carbon monoxide (CO), Carbon dioxide (CO₂), Sulfur oxides (SO_x)

Section 11: TOXICOLOGICAL INFORMATION

Acute toxicity

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|------------------|-------------------|-------------|----------------------|
| Dimethyl sulfate | 188.1 mg/kg (Rat) | N/A | 0.168 mg/L (Rat) 4 h |

| Chemical Name | Acute toxicity -oral- source information | Acute toxicity -dermal- source information | Acute toxicity -inhalation gas-source information |
|------------------|---|---|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |

| Chemical Name | Acute toxicity -inhalation vapor- source information | Acute toxicity -inhalation dust-source information | Acute toxicity -inhalation mist-source information |
|------------------|--|--|--|
| Dimethyl sulfate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |

Skin irritation/corrosion

| Chemical Name | Skin corrosion/irritation source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

Serious eye damage/ irritation

| Chemical Name | Serious eye damage/irritation source information |
|------------------|--|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

Respiratory or skin sensitization

| Chemical Name | Respiratory or Skin sensitization source information |
|------------------|--|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

Reproductive cell mutagenicity

| Chemical Name | germ cell mutagenicity source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

Carcinogenicity

| Chemical Name | Carcinogenicity source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

| Chemical Name | NTP | IARC | ACGIH | JSOH (Japan) |
|-----------------------------|------------------------|----------|-------|--------------|
| Dimethyl sulfate 77-78-1 | Reasonably Anticipated | Group 2A | A3 | Group 2A |

Reproductive toxicity

| Chemical Name | Reproductive toxicity source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

STOT-single exposure

| Chemical Name | STOT -single exposure- source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

STOT-repeated exposure

| Chemical Name | STOT -repeated exposure- source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

Aspiration hazard

| Chemical Name | Aspiration Hazard source information |
|------------------|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. |

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

| Chemical Name | Algae/aquatic plants | Fish | Crustacea |
|------------------|----------------------|---|-----------|
| Dimethyl sulfate | N/A | LC50 : <i>Hypoatherina valenciennei</i> 15 mg/L 96 h | N/A |

Other data

| Chemical Name | Short-term (acute) hazardous to the aquatic environment source information | Long-term (chronic) hazardous to the aquatic environment source information |
|------------------|--|---|
| Dimethyl sulfate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |

| | |
|--------------------------------------|--------------------------|
| Persistence and degradability | No information available |
| Bioaccumulative potential | No information available |
| Mobility in soil | No information available |
| Hazard to the ozone layer | No information available |

Section 13: DISPOSAL CONSIDERATIONS

Waste from residues

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated container and contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

ADR/RID

| | |
|--------------------------------|-------------------|
| UN number | UN1595 |
| Proper shipping name: | Dimethyl sulphate |
| UN classification | 6.1 |
| Subsidiary hazard class | 8 |
| Packing group | I |
| Marine pollutant | Not applicable |

IMDG

| | |
|---|--------------------------|
| UN number | UN1595 |
| Proper shipping name: | Dimethyl sulphate |
| UN classification | 6.1 |
| Subsidiary hazard class | 8 |
| Packing group | I |
| Marine pollutant (Sea) | Not applicable |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | No information available |

IATA

| | |
|--|-------------------|
| UN number | UN1595 |
| Proper shipping name: | Dimethyl sulphate |
| UN classification | 6.1 |
| Subsidiary hazard class | 8 |
| Packing group | I |
| Environmentally Hazardous Substance | Not applicable |

Section 15: REGULATORY INFORMATION

Japanese regulations

| | |
|--|---|
| Fire Service Act | Category IV, Class III petroleums, dangerous grade 3 |
| Poisonous and Deleterious Substances Control Law | Deleterious Substances 1st. Grade |
| Industrial Safety and Health Act | Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57) Notifiable Substances (Law Art.57-2) Group 2 Specified Chemical Substance Mutagens - Existing Chemicals Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1) Substances designated by the Minister of Health, Labor and Welfare as carcinogenic(Ordinance on Industrial Safety and Health Art.577, Para.2) Chemical Substances Hazardous to Skin, etc.(Regulations Article 594-2 Paragraph 1) Priority Assessment Chemical Substances (Law Article 2, Para.5) |
| Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc | |
| Regulations for the carriage and storage of dangerous goods in ship | Toxic Substances - Poison (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1) |
| Civil Aeronautics Law | Forbidden (Ordinance Art.194) |
| Pollutant Release and Transfer Register Law (2023.4.1-) | Class 1 |
| Class 1 - No. | 754 |
| Water Pollution Control Act | Specified substances(Law Art.2 Para.4, Enforcement Order Art.3-3) |
| Export Trade Control Order | Not applicable |

| Chemical Name | Poisonous and Deleterious Substances Control Law | Industrial Safety and Health Act Substances (Law Art.57-2) | Pollutant Release and Transfer Register Law (2023.4.1-) |
|------------------------------------|--|--|---|
| Dimethyl sulfate 77-78-1 (95.0) | Applicable | Applicable | Applicable |

Section 16: OTHER INFORMATION**Key literature references and sources for data etc.**

NITE: National Institute of Technology and Evaluation (JAPAN)
://www.chem-info.nite.go.jp/chem/chrip/chrip_search/systemTop
IATA dangerous Goods Regulations
RTECS:Registry of Toxic Effects of Chemical Substances
Japan Industrial Safety and Health Association GHS Model SDS
Dictionary of Synthetic Organic Chemistry , SSOCJ, Koudansha Scientific Co.Ltd.
Chemical Dictionary, Kyouritsu Publishing Co., Ltd.
etc

Record of SDS revisions

The following contents were revised. Stability and reactivity. Transport information. Regulatory information.

Disclaimer

This SDS is according to JIS Z 7253: 2019. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

GHS Classification is according to JIS Z 7252:2019. *JIS: Japanese Industrial Standards

End of Safety Data Sheet