

## 1. IDENTIFICATION

Product name: Dimethyl sulfoxide

CAS No. : 67-68-5

Brand: Macklin

Company: Shanghai Macklin Biochemical Co.,Ltd.

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## 2. HAZARDS IDENTIFICATION

GHS classification

PHYSICAL HAZARDS

no data available

HEALTH HAZARDS

no data available

ENVIRONMENTAL HAZARDS

no data available

GHS label elements, including precautionary statements

Pictograms or hazard symbols

Signal word

no data available

Hazard statements

no data available

Precautionary statements

Prevention

no data available

Response

no data available

Storage

no data available

Disposal

no data available

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components:Dimethyl sulfoxide

CAS No.:67-68-5

Chemical Formula:C<sub>2</sub>H<sub>6</sub>SO

## 4. FIRST AID MEASURES

4.1

Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Do NOT induce vomiting. Refer for medical attention .

4.2

Most important symptoms/effects, acute and delayed

Slight eye irritation. (USCG, 1999)

4.3

Indication of immediate medical attention and special treatment needed, if necessary

In case of accidental oral ingestion, specific measures should be taken to induce emesis. Additional measures which may be considered are gastric lavage, activated charcoal and forced diuresis.

## 5. FIRE-FIGHTING MEASURES

5.1

Suitable extinguishing media

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

5.2

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Sulfur dioxide, formaldehyde, and methyl mercaptan can form (USCG, 1999)

5.3

Special protective actions for fire-fighters

Use water spray, foam, powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## 6. ACCIDENTAL RELEASE MEASURES

6.1

Personal precautions, protective equipment and emergency procedures

Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.2

Environmental precautions

Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3

Methods and materials for containment and cleaning up

Accidental Release Measures. Personal precautions, protective equipment and emergency procedure: Avoid breathing vapors, mist or gas. Remove all sources of ignition. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.; Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let products enter drains.; Methods and materials for containment and cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations. Keep in suitable, closed containers for disposal.

## 7. HANDLING AND STORAGE

Precautions for safe handling

NO open flames. Above 87°C use a closed system, ventilation and explosion-proof electrical equipment. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Separated from strong oxidants. Cool. Keep in the dark. Keep in a well-ventilated room. Store away from oxidizing agents, heat, and ignition sources.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure limit values

MAK: 160 mg/m<sup>3</sup>, 50 ppm; peak limitation category: I(2); skin absorption (H); pregnancy risk group: B

Biological limit values

no data available

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice.

Set up emergency exits and the risk-elimination area.

Personal protective equipment

Eye/face protection

Wear safety spectacles.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state

COA

Colour

odorless

Odour

Slightly sulfurous odor

Melting point/freezing point

18.5 °C.

Boiling point or initial boiling point and boiling range

189 °C. Atm. press.:1 013 hPa.

Flammability

Combustible. Gives off irritating or toxic fumes (or gases) in a fire.

Lower and upper explosion limit/flammability limit

Lower flammable limit: 2.6% by volume; Upper flammable limit: 42% by volume

Flash point

87 °C. Atm. press.:1 013 hPa.

Auto-ignition temperature

300 - 302 °C. Atm. press.:1 013 hPa.

Decomposition temperature

no data available

pH

no data available

Kinematic viscosity

dynamic viscosity (in mPa s) = 2.14. Temperature:20°C.

Solubility

greater than or equal to 100 mg/mL at 68° F (NTP, 1992)

Partition coefficient n-octanol/water

log Pow = -1.35. Temperature:20 °C.

Vapour pressure

0.417 mm Hg. Temperature:20 °C.

Density and/or relative density

1.1 g/cm<sup>3</sup>. Temperature:20 °C.;1.09 g/cm<sup>3</sup>. Temperature:30 °C.;1.08 g/cm<sup>3</sup>. Temperature:40 °C.

Relative vapour density

2.7 (vs air)

Particle characteristics

Viscosity, dynamic: 2.14 mPa.s at 20 °C

## 10. STABILITY AND REACTIVITY

10.1

Reactivity

Decomposes on heating and on burning. This produces toxic fumes including sulfur oxides. Reacts violently with strong oxidants such as perchlorates.

10.2

Chemical stability

no data available

10.3

Possibility of hazardous reactions

Combustible when exposed to heat or flame.The vapour is heavier than air and may travel along the ground; distant ignition possible.DIMETHYL SULFOXIDE decomposes violently on contact with many acyl halides and related compounds such as acetyl chloride, benzenesulfonyl chloride, benzoyl chloride, cyanuric chloride, phosphorus trichloride, phosphorus oxychloride, and thionyl chloride [Chem. Eng. News 35(9):87 (1957)].

10.4

Conditions to avoid

no data available

10.5

Incompatible materials

can react with oxidizing materials.

10.6

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /sulfur oxides/.

## 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral: LD50 - rat (male/female) - 28 300 mg/kg bw.

Remarks:Lethal doses caused ataxia, myasthenia, decreased motor activity, and bradypnea.

Inhalation: LC0 - rat (male/female) - > 5.33 mg/L air.

Dermal: LD50 - rat (male/female) - ca. 40 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes and skin. Exposure to high concentrations could

cause lowering of consciousness. May accelerate skin absorption of other materials. See Notes.

#### STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and blood. This may result in impaired functions and lesions of blood cells.

#### Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20°C.

## 12. ECOLOGICAL INFORMATION

### 12.1

#### Toxicity

Toxicity to fish: LC50 - *Danio rerio* (previous name: *Brachydanio rerio*) - > 25 g/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - 24.6 g/L - 48 h.

Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - 17 g/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge, domestic - 10 - 100 mg/L - 30 min.

### 12.2

#### Persistence and degradability

AEROBIC: Dimethyl sulfoxide, present at 100 mg/L, reached 3.1% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L in the Japanese MITI test(1). Little degradation of dimethyl sulfoxide (<20%) was noted in a screening test using an activated sludge inoculum(2). Using the OECD 301E method, 99% degradation was observed(3). Using the OECD 303A method (domestic sewage simulation), 90% degradation of dimethyl sulfoxide was observed at a concentration of 65 mg/L over a 32-day incubation period(3,4). One ready biodegradation test performed following the norm AFNOR NFT 90-312 concluded that dimethyl sulfoxide is readily biodegradable(4). Dimethyl sulfoxide, at a 500 mg/L concentration, was entirely biodegraded within about 37 hours with aerobic settling sludge obtained from the activated sludge process at an opto-electronic plant, under optimized pH/temperature conditions(4). The available biodegradation screening tests have conflicting results(3), but based on available data and weight-of-evidence approach, dimethyl sulfoxide is expected to be inherently biodegradable(4).

### 12.3

#### Bioaccumulative potential

A BCF of <4 was measured in fish for dimethyl sulfoxide using carp (*Cyprinus carpio*) which were exposed over a 6-week period(1). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

### 12.4

#### Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of dimethyl sulfoxide can be estimated to be 2(SRC). According to a classification scheme(2), this estimated Koc value suggests that dimethyl sulfoxide is expected to have very high mobility in soil.

### 12.5

#### Other adverse effects

no data available

## 13. DISPOSAL CONSIDERATIONS

#### Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

## 14. TRANSPORT INFORMATION

14.1

UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.2

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.3

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.4

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

14.5

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

14.6

Special precautions for user

no data available

14.7

Transport in bulk according to IMO instruments

no data available

## 15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question

EC number

200-664-3

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

## 16. OTHER INFORMATION

This SDS was prepared sincerely on the basis of the information we could obtained, however, any

warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling, sufficient care should be taken, in addition to the safety measures suitable for the situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.