

Shanghai Yancui Import and Export Corporation

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Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Dimethyl Sulfoxide (DMSO)
Appropriate Uses : Solvent and/or raw material for polymer manufacturing, extracting, agricultural chemicals manufacturing, dyes and pigments manufacturing, stripper and rust preventives manufacturing, drug manufacturing, precision instrument and electronic parts cleaning, thin film manufacturing, etc.
Inappropriate Uses : No information
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2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 4
Skin corrosion/irritation : Category 3
Serious eye damage/eye irritation : Category 2B

GHS Label elements, including precautionary statements

Signal word : Warning
Hazard statement(s) : Combustible liquid
May causes slight skin irritation
May causes eye irritation
Precautionary statement(s) : Keep away from ignition such as heat, spark, fire and high temperature – No smoking.
Wash skin with water and soap well after handling.
Use appropriate protective equipment.
Potential health effects / First aid : See section 4. Consult a doctor if you feel sick.
Special hazardous information : No information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture : Substance
Chemical name : Dimethyl Sulfoxide
Synonyms : DMSO
Common chemical name : Methyl sulfoxide
Composition : >99.9[%]
Chemical formula : (CH₃)₂SO
Molecular weight : 78.1
CAS No. : 67-68-5
CHINA. Inventory of Existing Chemical Substances : Conform to
EU. EINECS No. : 200-664-3
TSCA : Registered
JAPAN. ENCS No. : (2)-1553

4. FIRST AID If inhaled

Dimethyl Sulfoxide (DMSO)

Consult a doctor if you feel sick. Move person into fresh air and keep at rest in a comfortable position.

In case of skin contact

Contact a doctor. Consult a doctor if you feel sick. Wash off with soap and plenty water. Take off all contaminated clothes and wash thoroughly before reuse.

In case of eye contact

Consult a doctor. Take out contact lenses if possible. Flush eyes carefully with water for a few minutes.

If swallowed

Consult a doctor. Rinse mouth with water. Do NOT induce vomiting.

Acute and gradual effects / Potential health effects

This substance may cause eye and skin irritation. Avoid contact with this substance containing toxic materials or materials with unknown hazardous properties. This substance is readily absorbed through skin and may carry such materials into the body.

Protective equipment for first aid person

Use rubber gloves and air-tight safety goggles.

5. FIRE-FIGHTING MEASURES

Fire-fighting measures

Move out of dangerous area except authorized persons. Use appropriate protective equipments. Extinguish a fire from safety windward side. Remove all affected containers if possible. Cool all affected containers with flooding quantities of water. Remove ignition sources if safe to do so.

Extinguishing media

Mist water, "alcohol" foam, dry chemical powder, carbon dioxide and dry sand should be used.

Hazardous combustion products

Hazardous decomposition products formed under fire conditions: carbon oxide, carbon dioxide and sulfur oxides

Special hazardous

This substance may explode with heat, flames and sparks.

This substance may react violently with Strong acids, Strong oxidizing agents, Strong reducing agents, Acid chlorides and Phosphorus halides.

Special fire-fighting measures

No information

Special protective equipment for fire-fighters

Use appropriate protective equipments.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use appropriate protective equipments. Avoid skin contact. Move out of spilt area except authorized persons. Remove all sources of ignition and prevent further spillage if safe to do so.

Environmental precautions

Do not let spillage enter drains.

Methods and materials for containment and cleaning up

In case of small amount of spillage, collect with inert materials such as dry sand or soil, and

then flush trace spillage with large quantities of water. Dilute waste flushing water and may be burned in a chemical incinerator equipped with a scrubber.

In case of large amount of spillage, contain spillage with banks and/or ditch, and then collect with a pump and place in containers or lorries for recycling or disposal. Dispose spillage in accordance with local/regional/national regulations.

Secondary hazardous precautions

Use appropriate protective equipments. Remove ignition sources if safe to do so. Prevent further spillage.

7. HANDLING AND STORAGE

Precautions for safe handling

Handle with a closed system and a ventilator. For safe handling, you should well understand physicochemical properties and hazardous information of DMSO. Use safety protective glasses, protective clothing for preventing static electricity, protective gloves made from synthetic rubber to avoid skin and eye contact. Keep away from ignition sources and high temperature. Do NOT eat, drink and smoke in the workplace. Take measures to prevent static electricity. Use explosion-proof type equipments and ventilators. Avoid contaminate with vapor or mist in a workplace condition. Avoid contact with Strong acid, Strong oxidizing agents, Strong reducing agents, Acid chlorides and Phosphorus halides. Handle with care to prevent damage of containers. Prepare appropriate extinguishes and first aid equipments. Hazardous materials may remain in used containers.

Conditions for safe storage

Keep container tightly closed in a dark, a cool and well-ventilated place. Keep away from ignition sources, high temperature and sunlight. Avoid contact with Strong acid, Strong oxidizing agents, Strong reducing agents, Acid chlorides and Phosphorus halides. Prepare appropriate extinguishes and first aid equipments. Prepare appropriate equipments and materials for accidental release in storage. DMSO freezes at 18.4°C. Liquefy solid of DMSO in hot water bath. Dispose contents/containers in accordance with local/regional/national regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Workplace control parameters

CHINA MAC	:	No data Available
The former Soviet Union MAC	:	20 mg/m ³
USA. WEEL TLV-TWA	:	250 ppm

Control measures

Handle with a closed system and a ventilator. Prepare appropriate emergency shower and eye washer in the workplace.

Respiratory protection

Use appropriate respirators if the workplace air condition containing high density of dangerous substance. The type of respirator must be selected according to the density and amount of the dangerous substance at the workplace.

Hand protection

Handle with protective gloves. Protective gloves must be inspected prior to use.

Eye protection

Use appropriate safety protective glasses (ex. Safety protective glasses with side-shields).

Skin and body protection

Use appropriate impervious protective clothing (ex. Whole-body suits, full-face mask, protective boots) if necessary. The type of impervious protective clothing must be selected according to the concentration and amount of the dangerous substance at the workplace.

Hygiene measures

Do NOT eat, drink and smoke in the workplace. Wash hands after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Colorless liquid
Odor	: Characteristic odor
pH	: No data Available
Freezing point	: 18.4°C
Boiling point	: 189°C
Flash point	: 87°C closed cup
Upper explosion limit	: 28.5 %(V/V)
Lower explosion limit	: 2.6 %(V/V)
Vapor pressure	: 0.56 hPa at 20°C
Relative vapor density	: 2.7 (Air = 1.0)
Relative density	: 1.1 at 20°C (Water = 1g/mL)
Viscosity	: 2.14 mPa · s at 20°C
Water solubility	: Completely miscible at 20°C
Partition coefficient : n-octanol/water	: log Pow : -2.03
Ignition temperature	: 300~302°C
Thermal decomposition temperature	: >190°C

10. STABILITY AND REACTIVITY

Stability

This substance is stable material under normal temperature and pressure conditions.

Possibility of hazardous reactions

Hazardous decomposition products formed under fire conditions.–Toxic fumes of Sulfur oxides

Conditions to avoid

Heat, flames and sparks.

Materials to avoid

Strong acid, Strong oxidizing agents, Strong reducing agents, Acid chlorides and Phosphorus halides.

Hazardous decomposition products

Sulfur oxides, Formaldehyde, Methanethiol and Dimethyl sulfide.

Other information

Internal pressure of closed system will increase at high temperature.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral:

LD50 Oral – rat – 13,400~28,300 mg/kg

Dermal:

LD50 Dermal – rat – 40,000 mg/kg

Inhalation:

LC0 Inhalation – rat – 4h – >5.3 mg/L

LC0 Inhalation – rat – 4h – >1.6 mg/L (aerosol)

Skin corrosion/irritation

Skin – rabbit – Mild skin irritation

Serious eye damage/eye irritation

Eyes – rabbit – Mild eye irritation

Respiratory or skin sensitization

Respiratory:

No data available

Skin:

Skin – mouse/guinea pig – no skin allergy was observed.

Germ cell mutagenicity

Assessment in vitro:

Salmonella typhimurium reverse mutation assay (Ames test): negative

DMSO is a neutral solvent in the Ames mutagen test.

Assessment in vivo:

Micronucleus assay in bone marrow (chromosome aberration): negative

Carcinogenicity

Tumorigenic – mouse – subcutaneous injection – no benign tumor or malignant tumor was observed at the injection site. – Exposure 76 weeks (once a week)

Reproductive toxicity

Reproductive toxicity assay according to OECD guide-lines 413: negative

Specific target organ/systemic toxicity – single exposure

This substance may cause eye and skin irritation. Exposure to high concentrations of DMSO may cause lowering of consciousness. May accelerate skin absorption of other materials (see Notes)

Notes:

Avoid contact with DMSO containing toxic materials or materials with unknown hazardous properties. DMSO is readily absorbed through skin and may carry such materials into the body.

Specific target organ/systemic toxicity – repeated exposure

NOAEL Oral – monkey – 2,970 mg/kg bw/day

NOAEL Inhalation – monkey – 8,910 mg/kg bw/day

NOAEC Dermal – rat – 2800 mg/m³

Aspiration hazard

No data available

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish:

LC50 – Fish – 25,000~43,000 mg/L – 96h

Persistence and degradability

Low potential for ready biodegradation according to OECD guide-line 301D (Gancet C (2009a))

Bioaccumulative potential

BCF – Cyprinus carpi - <0.4/42 days (25°C)

Mobility in soil

DMSO moves in soil.

13. DISPOSAL CONSIDERATIONS

Dispose residual contents/containers in accordance with local/regional/national/international regulations. If this substance is burned in an incinerator equipped with scrubber, exhaust sulfur oxides gas is removed.

14. TRANSPORT INFORMATION

UN No. : Not applicable
UN Proper Shipping Name : Not applicable
UN Hazard Class : Not applicable
UN Packing Group : Not applicable
Marine pollutant : No

Precautions on transport:

Inspect packing conditions of container before transportation. Keep safety (No spilling, No falling and No damage) in transit. Do not transport with Strong acid, Strong oxidizing agents, Strong reducing agents, Acid chlorides, Phosphorus halides and Edible chemicals. Wash Lorry thoroughly before loading next contents. Transport contents in accordance with local/regional/national/international regulations.

15. REGULATORY INFORMATION

Regulation for safety handling of chemicals at workplace, [1996] Ministry of Labor of CHINA No. 423

Regulatory information with regard to this substance in your local/region/national should be examined by your own responsibility.

16. OTHER INFORMATION / REFERENCES

General disclaimer:

The information contained herein is accurate as far as the best of our knowledge. However, we can not assume any liability whatsoever for the accuracy or completeness of the information contained herein. The users are responsible for final decisions on suitability of any materials. All materials may present unknown hazards and should be used in caution. Although certain hazards are described herein, we cannot guarantee that there are all the hazards which exist.

References:

1. Zhou Guotai, The compendium for safe handling of Dangerous Chemicals, Chemical industry publishing house, 1997
2. Guidebook for Toxicity regulation and Environmental data of chemicals, China Environmental Science Press, 1992
3. GB/T 16483-2008 Safety data sheet for chemical products – Content and order of sections
4. GB 13690-2009 General rule for classification and hazard communication of chemicals
5. Recommendations on the TRANSPORT OF DANGEROUS GOODS 13th edit. UN
6. 2000 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
7. 2004 TLVs and BEIs. (ACGIH)
8. Ann. New York Acad. Sci. 141, 96 (1967)
9. Sax's Dangerous Properties of Industrial Materials (9th) (1997)