

MSDS

Version: 1.0

CreationDate: Dec. 5, 2018

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1. Identification

1.1 Product name

Dimethyl sulfoxide (DMSO)

1.2 Other means of identification

Product number F041912
Other names Methane, sulfinylbis-

1.3 Recommended use of the chemical and restrictions on use

Identified uses Used for research and development only. Food additives -> Flavoring Agents
Uses advised against no data available

1.4 Distributor's details

Company Ecocell Co., Ltd.
Address F226, 45, Jojeong-daero, Hanam-si, Gyeonggi-do, Korea
Telephone +82-2-457-2236
Fax +82-2-6442-2236

1.5 Emergency phone number

Emergency phone number +82-2-457-2236
Service hours Monday to Friday, 9am-6pm (Standard time zone: UTC/GMT +9 hours).

2. Hazard identification

2.1 Classification of the substance or mixture

Not classified.

2.2 GHS label elements, including precautionary statements

Pictogram(s) No symbol.
Signal word No signal word
Hazard statement(s) none
Precautionary statement(s)

Prevention	none
Response	none
Storage	none
Disposal	none

2.3 Other hazards which do not result in classification

no data available

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Dimethyl sulfoxide	Dimethyl sulfoxide (DMSO)	67-68-5	200-664-3	≥99.0%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Medical attention is required. Consult a doctor. Show this safety data sheet (SDS) to the doctor in attendance.

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 Extinguishing media

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

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

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

7.1 Precautions for safe handling

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.

7.2 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

8.1 Control parameters

Occupational Exposure limit values

Component	Dimethyl sulfoxide (DMSO)			
CAS No.	67-68-5			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m³	ppm	mg/m³
Austria	50	160		
Denmark	50	160	100	320
Finland	50			
Germany (AGS)	50	160	100 (1)	320 (1)
Germany (DFG)	50	160	100 (1)	320 (1)
Sweden	50	150	150 (1)	500 (1)
Switzerland	50	160	100	320
	Remarks			
Germany (AGS)	(1) 15 minutes average value			
Germany (DFG)	(1) 15 minutes average value			
Sweden	(1) 15 minutes average value			

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	Liquid.
Colour	-
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 20°C
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 ³ . Temperature:20 °C.;1.09 g/cm ³ . Temperature:30 °C.;1.08 g/cm ³ . Temperature:40 °C.
Relative vapour density	2.7 (vs air)
Particle characteristics	no data available

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.

Denser than water and miscible in water.

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

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

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 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - 17 g/L - 72 h.

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

13.1 Disposal methods

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: UN1993

IMDG: UN1993

IATA: UN1993

14.2 UN Proper Shipping Name

ADR/RID: FLAMMABLE LIQUID, N.O.S.

IMDG: FLAMMABLE LIQUID, N.O.S.

IATA: FLAMMABLE LIQUID, N.O.S.

14.3 Transport hazard class(es)

ADR/RID: 6.1

IMDG: 6.1

IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: III

IMDG: III

IATA: III

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 Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information**15.1 Safety, health and environmental regulations specific for the product in question**

Chemical name	Common names and synonyms	CAS number	EC number
Dimethyl sulfoxide	Dimethyl sulfoxide (DMSO)	67-68-5	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.

16. Other information**Information on revision****Creation Date** Feb. 5, 2018**Revision Date** Feb. 5, 2018**Abbreviations and acronyms**

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association

- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

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