

# MSDS

Version: 1.0

CreationDate: Dec. 5, 2018

RevisionDate: Dec. 5, 2018

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## 1. Identification

### 1.1 Product name

Dimethyl sulfoxide (DMSO)

### 1.2 Other means of identification

**Product number** F041913  
**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).

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## 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)**

<b>Prevention</b>	none
<b>Response</b>	none
<b>Storage</b>	none
<b>Disposal</b>	none

## 2.3 Other hazards which do not result in classification

no data available

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## 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%

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## 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.

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## 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.

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## **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.

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## **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.

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## **8. Exposure controls/personal protection**

### **8.1 Control parameters**

**Occupational Exposure limit values**

<b>Component</b>	Dimethyl sulfoxide (DMSO)			
<b>CAS No.</b>	67-68-5			
	<b>Limit value - Eight hours</b>		<b>Limit value - Short term</b>	
	<b>ppm</b>	<b>mg/m<sup>3</sup></b>	<b>ppm</b>	<b>mg/m<sup>3</sup></b>
<b>Austria</b>	50	160		
<b>Denmark</b>	50	160	100	320
<b>Finland</b>	50			
<b>Germany (AGS)</b>	50	160	100 (1)	320 (1)
<b>Germany (DFG)</b>	50	160	100 (1)	320 (1)
<b>Sweden</b>	50	150	150 (1)	500 (1)
<b>Switzerland</b>	50	160	100	320
	<b>Remarks</b>			
<b>Germany (AGS)</b>	(1) 15 minutes average value			
<b>Germany (DFG)</b>	(1) 15 minutes average value			
<b>Sweden</b>	(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

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## 9. Physical and chemical properties

<b>Physical state</b>	Liquid.
<b>Colour</b>	-
<b>Odour</b>	Slightly sulfurous odor
<b>Melting point/ freezing point</b>	18.5 °C.

<b>Boiling point or initial boiling point and boiling range</b>	189 °C. Atm. press.:1 013 hPa.
<b>Flammability</b>	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
<b>Lower and upper explosion limit / flammability limit</b>	Lower flammable limit: 2.6% by volume; Upper flammable limit: 42% by volume
<b>Flash point</b>	87 °C. Atm. press.:1 013 hPa.
<b>Auto-ignition temperature</b>	300 - 302 °C. Atm. press.:1 013 hPa.
<b>Decomposition temperature</b>	no data available
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	dynamic viscosity (in mPa s) = 2.14. Temperature:20°C.
<b>Solubility</b>	greater than or equal to 100 mg/mL at 20°C
<b>Partition coefficient n-octanol/water</b>	log Pow = -1.35. Temperature:20 °C.
<b>Vapour pressure</b>	0.417 mm Hg. Temperature:20 °C.
<b>Density and/or relative density</b>	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.
<b>Relative vapour density</b>	2.7 (vs air)
<b>Particle characteristics</b>	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

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## **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.

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## **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
<b>European Inventory of Existing Commercial Chemical Substances (EINECS)</b>			Listed.
<b>EC Inventory</b>			Listed.
<b>United States Toxic Substances Control Act (TSCA) Inventory</b>			Listed.
<b>China Catalog of Hazardous chemicals 2015</b>			Not Listed.
<b>New Zealand Inventory of Chemicals (NZIoC)</b>			Listed.
<b>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</b>			Listed.
<b>Vietnam National Chemical Inventory</b>			Listed.
<b>Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)</b>			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](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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