# SAFETY DATA SHEET

## SECTION 1 - SUBSTANCE IDENTITY AND COMPANY INFORMATION

**Product Name:** Dimethyl Sulfoxide (DMSO)
**ATCC Catalog #:**
**CAS #:** **67-68-5**

**COMPANY INFORMATION:** AMERICAN TYPE CULTURE COLLECTION
PO BOX 1549
MANASSAS, VA 20108
**FOR INFORMATION CALL**: 800-638-6597 or 703-365-2700
**AFTER-HOURS CONTACT**: 703-365-2710

**CHEMTREC EMERGENCY**: 800-424-9300 or 703-527-3887

## SECTION 2 - HAZARDS IDENTIFICATION

**GHS Symbol:** 

**Signal Word:** Warning

**Hazard Statement:**
H227 Combustible liquid.

**Precautionary statement(s):**
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P280 Wear protective gloves/ eye protection/ face protection.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235 Store in a well-ventilated place. Keep cool.
P501 Dispose of contents/ container to an approved waste disposal plant.

**Hazards not otherwise classified (HNOC) or not covered by GHS**
Rapidly absorbed through skin.

**HMIS Rating:** Health: 0 Flammability: 2 Reactivity:0

**NFPA Rating:** Health: 0 Flammability:2 Reactivity:0

## SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

| Ingredient/Chemical Designations | Concentration % | Classification |
|---|---|---|
| Dimethyl Sulfoxide | <=100% | Flam. Liq. 4; H227 |

## SECTION 4 - FIRST AID MEASURES

**Description of first aid measures**

**General** In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. In general, DMSO is not dangerous to people, but like any other chemical, it should be treated with care, respect and common sense.

**Inhalation** Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

**Eyes** Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.

**Skin** Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.

**Ingestion** If swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

**Most important symptoms and effects, both acute and delayed**

**Overview** EFFECTS OF OVEREXPOSURE:
General: DMSO has shown very few toxic symptoms in humans. The most common are nausea, skin rashes and an unusual garlic-onion-oyster smell on body and breathe.
Inhalation: High vapor concentrations may cause headache, dizziness, and sedation.
Eyes: Low hazard for usual industrial/ commercial handling by trained personnel.
Skin: Stinging and burning of the skin as well as rashes and vesicles have been seen. A heat reaction may occur if applied to wet skin. Avoid contact with DMSO solutions containing toxic material or materials whose toxicological properties are not known. DMSO easily penetrates the skin and may enhance the rate of skin absorption of skin-permeable substances. But because of DMSO's low toxicity and its inability to carry less-permeable substances with it through the skin, it can be concluded that DMSO does not pose a significant threat by skin absorption.
Ingestion: A low ingestion hazard. See section 2 for further details.

**Eyes** Causes serious eye irritation.

**Skin** Causes skin irritation.

## SECTION 5 - FIRE FIGHTING MEASURES

**Extinguishing media**
Recommended extinguishing media; alcohol resistant foam, CO2, powder, water spray.

**Special hazards arising from the substance or mixture**
Hazardous decomposition: Sulfur dioxide, formaldehyde, methyl mercaptan, dimethyl sulfide, dimethyl disulfide, and bis (methylthio) methane.
Keep away from heat / sparks / open flames / hot surfaces - No smoking.

**Advice for fire-fighters**
Special Exposure Hazards: Burning dimethyl sulfoxide produces poisonous gases (sulfur oxides). Wear rubber gloves, SCBA, and rubber suit.
Wear positive pressure, self-contained breathing apparatus, (SCBA) with a full face piece and protective clothing. Persons without respiratory protection should leave area. Wear SCBA during clean-up immediately after fire. No smoking.

## SECTION 6 - ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**
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.
For personal protection see section 8.

**Environmental precautions**
Do not allow spills to enter drains or waterways.
Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

**Methods and material for containment and cleaning up**
If a spill or leak occurs, immediately consult your environmental supervisor. Remove ignition sources. Ventilate the area. Do not breathe the vapor or get liquid in eyes or on skin/clothing.
Dilute and flush to wastewater treatment or absorb with inert material. Do not allow the material to enter streams or waterways.

## SECTION 7 - HANDLING AND STORAGE

**Precautions for safe handling**
Avoid inhalation of vapor or mist.
Keep away from sources of ignition - No smoking. Take measures to prevent the build-up of electrostatic charge.

**Conditions for safe storage, including any incompatibilities**
Keep container tightly closed, in a well-ventilated place. Freezes (solidifies) at 18°C (64°F).
Store in a cool dry area, away from heat, sparks and open flame. Keep containers sealed when not in use. Store out of direct sunlight.
Prolonged heating above 150°C (302°F) can cause rapid, exothermic decomposition.
Incompatible materials: Organic and inorganic acid chlorides, strong oxidizing agents, alkali metals, hydrobromic acid, acidic solutions of alkali bromides.

**Specific end use(s)**
No data available.

## SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters**

**Components with Workplace Control Parameters**

| CAS No. | Component | Basis | Control Parameters |
|---|---|---|---|
| 67-68-5 | Dimethyl sulfoxide | USA. Workplace Environmental Exposure Levels (WEEL) | 250 ppm |

**Exposure controls**

**Appropriate engineering controls**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Eye/face protection**
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 38 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)
data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method:

EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.


**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls.
If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance** | Colorless Liquid |
| **Odor** | sulphurous |
| **Odor threshold** | Not Measured |
| **pH** | NA |
| **Melting point / freezing point** | 16-19°C (61-66°F) |
| **Initial boiling point and boiling range** | 189°C (372°F) |
| **Flash Point** | 87°C (189°F)-Closed Cup-ASTM D 93 |
| **Evaporation rate (Ether = 1)** | No data available |
| **Flammability (solid, gas)** | Not Applicable |
| **Upper/lower flammability or explosive limits** | **Lower Explosive Limit:** 3.0-3.5% by volume<br>**Upper Explosive Limit:** 42-63% by volume |
| **Vapor pressure (Pa)** | 0.55 mbar (0.41 mmHg) @ 20°C (68°F) |
| **Vapor Density** | 2.7 |
| **Specific Gravity** | 1.1 g/ml |
| **Solubility in Water** | Miscible |
| **Partition coefficient n-octanol/water (Log Kow)** | log Pow: -1.349 |
| **Auto-ignition temperature** | 300-302°C (572-576°F) |
| **Decomposition temperature** | > 190 °C (>374 °F) |
| **Viscosity (cSt)** | No data available |
| **Explosive Properties** | Not explosive |
| **Oxidizing Properties** | Not classified as oxidizing |

**Other information**

| | |
|---|---|
| Solubility in other solvents | Alcohol - soluble |

| | |
|---|---|
| | Diethylether - soluble |
| Surface tension | 43.5 mN/m at 20 °C (68 °F) |
| Relative vapour density | 2.70 - (Air = 1.0) |

## SECTION 10 - STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity** | No data available. |
| **Chemical stability** | Stable under normal circumstances. |
| **Possibility of hazardous reactions** | No data available. |
| **Conditions to avoid** | Heat, flames and sparks. |
| **Incompatible materials** | Acid chlorides, Phosphorus halides, Strong acids, Strong oxidizing agents, Strong reducing agents |
| **Hazardous decomposition products** | No data available. |

## SECTION 11 - TOXICOLOGICAL INFORMATION

**Information on toxicological effects**

**Acute toxicity**
LD50 Oral - Rat - 14,500 mg/kg
LC50 Inhalation - Rat - 4 h - 40250 ppm
LD50 Dermal - Rabbit - > 5,000 mg/kg
No data available

**Skin corrosion/irritation**
Mild skin irritation

**Serious eye damage/eye irritation**
No data available

**Respiratory or skin sensitisation**
No data available

**Germ cell mutagenicity**
Mouse
lymphocyte
Cytogenetic analysis

Mouse
lymphocyte
Mutation in mammalian somatic cells.

Rat
Cytogenetic analysis

Mouse
DNA damage

**Carcinogenicity**

Carcinogenicity - Rat - Oral
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Carcinogenicity - Mouse - Oral
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Leukaemia Skin and Appendages: Other: Tumors.

| | |
|---|---|
| IARC: | No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. |
| ACGIH: | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. |
| NTP: | No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. |
| OSHA: | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. |

**Reproductive toxicity**

Reproductive toxicity - Rat - Intraperitoneal
Effects on Fertility: Abortion.

Reproductive toxicity - Rat - Intraperitoneal
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Reproductive toxicity - Rat - Subcutaneous
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Reproductive toxicity - Mouse - Oral
Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Developmental Toxicity - Mouse - Intraperitoneal
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
RTECS: PV6210000

Exposure to large amounts can cause:, redness of skin, Itching, burning, sedation, Headache, Nausea, Dizziness

Eyes - Eye disease - Based on Human Evidence
Eyes - Eye disease - Based on Human Evidence

## SECTION 12 - ECOLOGICAL INFORMATION

**Toxicity**

| | |
|---|---|
| Toxicity to fish | LC50 - Pimephales promelas (fathead minnow) - 34,000 mg/l - 96 h<br>LC50 - Oncorhynchus mykiss (rainbow trout) - 35,000 mg/l - 96 h |
| Toxicity to daphnia and other aquatic invertebrates | EC50 - Daphnia magna (Water flea) - 24,600 mg/l - 48 h<br>(OECD Test Guideline 202) |
| Toxicity to algae | EC50 - Pseudokirchneriella subcapitata (green algae) - 17,000 mg/l - 72 h<br>(OECD Test Guideline 201) |

**Persistence and degradability**

| | |
|---|---|
| Biodegradability | Result: 31 % - According to the results of tests of biodegradability this product is not readily biodegradable.<br>(OECD Test Guideline 301D) |

**Bioaccumulative potential**

No data available

**Mobility in soil**

No data available

**Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**Other adverse effects**

No data available

| | |
|---|---|
| Stability in water | - 0.12 - 1.2 h at 30 °C<br>Remarks: Hydrolyses readily. |

## SECTION 13 - DISPOSAL CONSIDERATIONS

**Waste treatment methods**

**Product**
This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.

**Contaminated packaging**
Dispose of as unused product.

## SECTION 14 - TRANSPORT INFORMATION

**DOT (US)**
NA-Number: 1993 Class: NONE Packing group: III
Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No
**IMDG**
Not dangerous goods
**IATA**
Not dangerous goods

## SECTION 15 - REGULATORY INFORMATION

**SARA 302 Components**
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Fire Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know Components**

| | | |
|---|---|---|
| Dimethyl sulfoxide | CAS-No.<br>67-68-5 | Revision Date<br>2007-03-01 |

**New Jersey Right To Know Components**

| | CAS-No. | Revision Date |
|---|---|---|
| Dimethyl sulfoxide | 67-68-5 | 2007-03-01 |

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

## SECTION 16 - OTHER INFORMATION

**Full text of H-Statements referred to under sections 2 and 3.**

| | |
|---|---|
| Flam. Liq. | Flammable liquids |
| H227 | Combustible liquid. |

DATE REVISED: JUNE 1, 2016

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