

MATERIAL SAFETY DATA SHEET**DIMETHYL SULPHOXIDE**

PRODUCT CODE NUMBER(S): 4100-1, 4100-3, 4101-2, 4103-2, CAL 1342

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** *Dimethyl sulphoxide; DMSO; Sulphinylbismethane***Chemical Family:** *Aliphatic sulphoxide***Chemical Formula:** C_2H_6OS **Product Use:** *Laboratory solvent***Manufacturer's Name and Address:***Caledon Laboratories Ltd.**40 Armstrong Avenue**Georgetown, Ontario L7G 4R9***Telephone No:** (905) 877-0101**Fax No:** (905) 877-6666**Emergency Telephone No:** CANUTEC (613) 996-6666**HAZARDOUS INGREDIENTS OF MATERIALS**

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>Dimethyl sulfoxide</i>	<i>99</i>	<i>Not established</i>	<i>67-68-5</i>

PHYSICAL DATA**Physical State:** *Liquid***Odour and Appearance:** *Clear, colourless liquid; mild sulphur or garlic odour***Odour Threshold (ppm):** *Not available***Vapour Pressure (mm Hg):** *0.42 mm Hg @ 20°C***Vapour Density (Air = 1):** *2.7***Evaporation Rate:** *Not available***Boiling Point (°C):** *189°C***Freezing Point (°C):** *18.5°C***pH:** *Not available***Specific Gravity:** *1.10 @ 20°C***Coefficient of Water/Oil distribution:** *LogP(oct)=2.03***SHIPPING DESCRIPTION****UN:** *Not regulated***T.D.G. Class:** *Not regulated***Pkg. Group:** *Not regulated***REACTIVITY DATA****Chemical Stability:** *Stable. Hygroscopic, absorbs moisture from air. Decomposes slowly above 189°C, forming methanethiol, formaldehyde, water, bis(methylthio)methane, dimethyl disulphide, dimethyl sulphone, dimethyl sulphide, sulphur dioxide.***Incompatibility with other substances:** *Incompatible with phosphorus halides, strong acids, strong reducing agents. Reacts violently or explosively with strong oxidizing agents, strong acids, acid chlorides, chlorates, perchlorates, sulphur, phosphorus and thionyl. Violent reactions or ignition with P₂O₃, potassium powder and compounds, sodium**isopropoxide, trifluoroacetic anhydride; delayed explosion with bromomethane under pressure. On mixing with KMnO₄ will flash instantaneously. Attacks many plastics.***Reactivity:** *Avoid excessive heat, sparks, flames, all ignition sources, and all incompatible materials.***Hazardous Decomposition Products:** *Formaldehyde, SO_x, CO_x, hydrogen sulphide.***FIRE AND EXPLOSION DATA****Flammability:** *Combustible liquid and vapour. Can form explosive mixtures with air at, or above 87.8°C. Contact with strong oxidizers may cause fire. Heating of liquid can release ignitable vapours. Vapours may travel to distant source of ignition and flash back.***Extinguishing Media:** *Water spray or fog, alcohol or polymer foam, dry chemical, CO₂. Use water in flooding quantities to cool containers, disperse vapours, dilute mixture. Fight fire from upwind, from a safe distance. Firefighters must wear NIOSH approved positive-pressure, full face-piece self-contained breathing apparatus, and full chemical splash suit (Bunker Gear will not be adequate). Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.***Flash Point (Method Used):** *87.8°C (CC)***Autoignition Temperature:** *215°C***Upper Flammable Limit (% by volume):** *42***Lower Flammable Limit (% by volume):** *2.6***Hazardous Combustion Products:** *SO_x, CO_x, hydrogen sulphide.***Sensitivity to Impact:** *Probably not sensitive***Sensitivity to Static discharge:** *Will probably not accumulate static charge by flow or agitation (high electrical conductivity). Probably not sensitive to static discharge (high flash point).***TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD₅₀:** *(oral, rat) 14,500 mg/kg; (oral, mouse) 7,920 mg/kg; (dermal, rat) 40 g/kg***LC₅₀:** *(rat) >1,600 mg/m³***Effects of Acute Exposure to Product:****Inhaled:** *Does not readily form vapour at room temperature. Therefore, unlikely to be a hazard unless heated or as mist. May be slightly irritating to the mucous membranes and upper respiratory tract. No human information available; animal information suggests low toxicity by inhalation. May cause headache, nausea and vomiting, and a garlic-like taste in the mouth.***In contact with skin:** *May cause skin irritation. Readily absorbed through skin, causing systemic effects; nausea, vomiting, cramps, chills, drowsiness reported from topical*

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application. May also cause more harmful chemicals to be absorbed with it.

In contact with eyes: May cause mild irritation; solutions of 50-100% caused temporary burning. Concentrations below 50% caused no symptoms.

Ingested: Amino acid studies suggest low oral toxicity. May cause gastrointestinal discomfort. Large oral doses may cause headache, garlic odour on the breath, nausea and vomiting, cramps, chills, drowsiness, blurred vision.

Effects of Chronic Exposure to Product:

Long-term skin application of high concentrations, (80-90%) may cause headache, garlic odour on the breath, fatigue, nausea, dizziness. Extensive, repeated or prolonged skin contact can cause redness, itching, scaling and hives.

Carcinogenicity: Not listed as carcinogenic by NTP, IARC, OSHA, or ACHIH

Teratogenicity: Studies inconclusive (RTECS No. PV 6210000)

Reproductive Effects: No human information available. Limited animal information; no apparent effects.

Mutagenicity: Negative in cultured human, cultured mammalian, and bacterial studies.

Synergistic Products: So readily absorbed into the bloodstream that it significantly enhances the absorption of other toxic chemicals, increasing their toxic effects.

PREVENTIVE MEASURES

Engineering Controls: Local exhaust ventilation required. If material is to be heated or misted, ventilation system should be non-sparking, grounded, separate from other exhaust ventilation systems.

Respiratory Protection: Dust/mist mask, fumehood. NIOSH/OSHA approved respirator with organic vapour cartridge for moderate concentrations. For higher or unknown concentrations, as in fire or spill conditions, full face-piece, positive-pressure self-contained breathing apparatus.

Eye Protection: Chemical safety goggles and/or face shield.

Skin Protection: Butyl rubber, Viton/butyl rubber, Barrier (PE/PA/PE), Silver Shield/4H™ (polyethylene/ethylene vinyl alcohol), Trelchem HPS™, Tychem™BR/LV, Tychem™TK gloves. Chemical resistant overalls, apron or other protective clothing sufficient to prevent contact if splash occurs.

Other Personal Protective Equipment: Safety shower and eyewash fountain in work area.

Leak and Spill Procedure: Evacuate area, provide maximum ventilation and eliminate all sources of ignition. Cleanup personnel must be thoroughly trained in the handling of hazardous chemicals, and must wear protective equipment and clothing sufficient to prevent inhalation of dust or vapours and contact with skin and eyes. Contain and cover with inert material, sand, earth, and transfer into containers for disposal. Prevent from entering sewers or waterways. Contaminated absorbent may pose the same hazards as the spilled product; treat with caution. Wash site of spillage thoroughly with water and detergent.

Waste Disposal: Follow all federal, provincial and local regulations for disposal.

Handling Procedures and Equipment: COMBUSTIBLE, TOXIC. Workers must be thoroughly trained in the hazards of this chemical and its safe use. Keep away from heat, sparks, flame, all sources of ignition, and all combustible materials. Bond and ground during liquid transfer. Use the smallest possible amount for the purpose, in designated ar-

reas with adequate ventilation. Keep work area clean and free of extraneous materials. Avoid contact with eyes, skin and clothing. Avoid any inhalation of vapours or mists. Empty containers may contain hazardous residues; treat with caution.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight and away from heat, and all ignition sources. Keep away from incompatible materials. Protect from moisture. Product may solidify at room temperature; store above 20°C. Keep containers closed when not in use and when empty. Protect from damage, and inspect frequently for signs of leaking.

FIRST AID MEASURES

Specific Measures:

Eyes: Flush eyes thoroughly with gently running water, holding eyelids open while flushing, for five to ten (5-10) minutes, or until no trace of chemical remains. Wear protective gloves to avoid contact during first aid procedures. Get medical advice if irritation develops.

Skin: Remove contaminated clothing (including shoes, belts, watches, rings). Flush skin with plenty of running water until no evidence of chemical remains. Wear protective gloves to avoid contact. Get medical attention. Decontaminate clothing before reuse, or discard.

Inhalation: Remove victim to fresh air. Give oxygen and get medical attention immediately for any breathing difficulty.

Ingestion: If person is alert and not convulsing, rinse mouth thoroughly with water and give 2 to 4 glasses of water to drink to dilute. If victim feels unwell, or if a very large amount has been ingested, get medical attention.

REFERENCES USED

CCINFO disc: Cheminfo

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 1, 1992

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: March 1, 1989

Revision: June 2009

MSDS: 4100-1, 4100-3, 4101-2, 4103-2, CAL 1342

Proposed WHMIS Designation: B3; D2B

Prepared by: Caledon Laboratories Ltd. (905) 877-0101
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