



Material Safety Data Sheet

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Phone Calls: 301-816-8129
8 a.m. to 5 p.m. EST Mon. - Fri.

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RESIDUAL SOLVENT CLASS 2 - METHYLENE CHLORIDE

Catalog Number: 1601441

Revision Date:

August 4, 2008

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Common Name: Methylene chloride

Manufacturer: U. S. Pharmacopeia

Responsible Party: Reference Standards Technical Services

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Product Use: USP Reference Standards and Authentic Substances are used for chemical tests and assays in analytical, clinical, pharmaceutical, and research laboratories.

SECTION 2 - HAZARD INFORMATION

EMERGENCY OVERVIEW - Cancer Suspect Agent. Irritant. Combustible.

This reference standard contains methylene chloride in dimethyl sulfoxide (DMSO). The mixture has not been tested to determine specific physical hazards, but is considered potentially combustible.

Dimethyl sulfoxide is an irritant and is rapidly absorbed through skin and mucous membranes and may enhance skin absorption of other chemicals.

Methylene chloride is an irritant and a possible human carcinogen.

Adverse Effects: Adverse effects of DMSO may include redness, itching, or rash on skin; garlic-like taste or odor on breath and skin; swelling of face; troubled breathing; shortness of breath; nasal congestion; gastrointestinal disturbances; drowsiness; and headache. Effects from exposure to methylene chloride may include headache, giddiness, lightheadedness, dizziness, euphoria, irritability, loss of appetite, sleepiness, weakness, fatigue, stupor, convulsions, change in heart rate, numbness or tingling of extremities, nausea, and vomiting. Possible allergic reaction to material if inhaled, ingested or in contact with skin.

Overdose Effects: Prolonged or high exposures to methylene chloride may cause seizures, shortness of breath, coughing with pain, fainting, and coma. Central nervous system depression may lead to respiratory failure and death. Methylene chloride is metabolized to carbon monoxide, resulting in carboxyhemoglobin in the blood and possible carbon monoxide poisoning.

Acute: Eye, skin, gastrointestinal and/or respiratory tract irritation; central nervous system depression; narcotic effects.

Chronic: Possible hypersensitization; delirium; delusions; hallucinations; memory loss; anemia; damage to nervous system, heart, or kidneys; cancer.

Medical Conditions Aggravated by Exposure: Hypersensitivity to material, cardiovascular disease, alcoholism, and use of smoking

tobacco.

Cross Sensitivity: n/f**Target Organs:** Central nervous system, cardiovascular system, eyes, skin**For additional information on toxicity, see Section 11.****SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS****Common Name:** Methylene chloride**Formula:** See Composition**Synonym:** Dichloromethane**Chemical Name:** Methane, dichloro- in dimethyl sulfoxide**CAS:** See Composition**RTECS Number:** See Composition**Chemical Family:** Chlorinated hydrocarbon (Methylene chloride)**Therapeutic Category:** Residual solvent**Composition:** Methylene chloride (CH₂Cl₂; CAS # 75-09-2; RTECS # PA8050000): 0.3%
Dimethyl sulfoxide (C₂H₆OS; CAS # 67-68-5; RTECS # PV6210000): 99.7%**SECTION 4 - FIRST AID MEASURES****Inhalation:** Causes irritation. Avoid inhalation. Remove to fresh air. Methylene chloride is rapidly absorbed from the lungs.**Eye:** Causes irritation. Avoid contact. Flush with copious quantities of water for at least 15 minutes.**Skin:** Causes irritation. Avoid contact. Flush with copious quantities of soap and water. Methylene chloride is absorbed through the skin sufficiently to cause systemic effects. DMSO readily penetrates the skin and can enhance absorption of other chemicals.**Ingestion:** Causes irritation. Avoid ingestion. Flush out mouth with water. Methylene chloride is rapidly absorbed from the gastrointestinal tract.**General First Aid Procedures:** Remove from exposure. Remove contaminated clothing. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention. If person is not breathing give artificial respiration. If breathing is difficult give oxygen. Obtain medical attention.**Note to Physicians****Overdose Treatment:** Treatment of methylene chloride overdose should be symptomatic and supportive and may include the following:

1. Do not induce vomiting. Consider administration of activated charcoal.
2. Consider nasogastric tube for gastric aspiration in patients with recent large ingestion; weigh benefit against risk of damaging burned gastrointestinal mucosa.
3. Determine carboxyhemoglobin concentration and liver and kidney function in symptomatic patients. Administer 100% oxygen as indicated by clinical status and carboxyhemoglobin levels.
4. For seizures, administer intravenous diazepam or lorazepam. If seizures recur, consider phenobarbital. Monitor for hypotension, dysrhythmias, respiratory depression, and need for endotracheal intubation. Evaluate for hypoglycemia, electrolyte imbalances, and hypoxia.
5. For hypotension, infuse isotonic fluid. If hypotension persists, administer dopamine or norepinephrine.
6. For acute lung injury: Maintain ventilation and oxygenation and evaluate with frequent arterial blood gas or pulse oximetry monitoring. Early use of PEEP and mechanical ventilation may be needed. [Meditext 2008]

SECTION 5 - FIREFIGHTING MEASURES**Extinguisher Media:** Alcohol foam or other appropriate media.**Fire and Explosion Hazards:** This material is combustible. It reacts violently with many acyl, aryl and non-metal halides, boron compounds and metal salts of oxoacids.**Firefighting Procedures:** As with all fires, evacuate personnel to a safe area. Firefighters should use self-contained breathing

equipment and protective clothing.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill Response: Wear approved respiratory protection, chemically compatible gloves and protective clothing. Ventilate spill site. Remove sources of ignition. Wipe up spillage. Avoid breathing vapors. Place spillage in appropriately-labelled container for disposal. Wash spill site. Place spillage and all contaminated cleanup materials in a thick plastic hazardous waste disposal bag or leakproof container and label it CAUTION: HAZARDOUS CHEMICAL WASTE.

SECTION 7 - HANDLING AND STORAGE

Handling: As a general rule, when handling USP Reference Standards avoid all contact and inhalation of dust, mists, and/or vapors associated with the material. Wash thoroughly after handling.

Storage: Store in tight, light-resistant container as defined in the USP-NF. This material should be handled and stored per label instructions to ensure product integrity.

SECTION 8 - EXPOSURE CONTROL / PERSONAL PROTECTION

Engineering Controls: Engineering controls such as exhaust ventilation are recommended.

Respiratory Protection: Use a NIOSH approved respirator, if it is determined to be necessary by an industrial hygiene survey involving air monitoring.

Gloves: Chemically compatible

Eye Protection: Safety glasses or goggles

Protective Clothing: Protect exposed skin.

Exposure Limits: Methylene chloride:
OSHA: 25 ppm; STEL 125 ppm
NIOSH: IDLH 2300 ppm
ACGIH: 50 ppm

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Properties as indicated on the MSDS are general and not necessarily specific to the USP Reference Standard Lot provided.

Appearance and Odor: Colorless liquid

Odor Threshold: n/f

pH: n/f

Melting Range: n/f

Boiling Point: n/f

Flash Point: n/f

Autoignition Temperature: n/f

Evaporation Rate: n/f

Upper Flammability Limit: n/f

Lower Flammability Limit: n/f

Vapor Pressure: n/f

Vapor Density: n/f

Specific Gravity: n/f

Solubility in Water: n/f

Fat Solubility: n/f

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Other Solubility: n/f**Partition Coefficient: n-octanol/water:** n/f**Percent Volatile:** n/f**Reactivity in Water:** n/f**Explosive Properties:** n/f**Oxidizing Properties:** n/f**Formula:** See Composition**Molecular Weight:** n/f

SECTION 10 - STABILITY AND REACTIVITY

Conditions to Avoid: Avoid exposure to light, moisture, and ignition sources.

Incompatibilities: Strong oxidizing agents, strong reducing agents, acids, acid chlorides, acid anhydrides, phosphorus halides, alkali hydrides, halides, boron compounds, metal salts of oxoacids, alkali metals, aluminum, lithium, potassium, sodium, magnesium, zinc.

Decomposition Products: When heated to decomposition material emits toxic fumes of SO_x, HCl, and phosgene. Emits toxic fumes under fire conditions.

Stable? Yes **Hazardous Polymerization?** No

SECTION 11 - TOXICOLOGICAL PROPERTIES

Oral Rat: LD50: 985 mg/kg (Methylene chloride); 14500 mg/kg (DMSO)

Oral Mouse: LD50: 873 mg/kg (Methylene chloride); 7920 mg/kg (DMSO)

Other Toxicity Data: Methylene chloride:

Inhalation Rat LC50: 76000 mg/m³/4hr; 52000 mg/m³/6 hr

Inhalation Mouse LC50: 14400 ppm/7hr; 25000 mg/m³/2 hr

Inhalation Guinea pig LC50: 40200 mg/m³/6 hr

Oral Rabbit LD50: 2000 mg/kg

Dimethyl sulfoxide:

Inhalation Rat LC50: >2.0 mg/L/40 hr

Dermal Mouse LD50: 50 grams/kg

Dermal Rat LD50: 40 grams/kg

Irritancy Data: Methylene chloride:

Rabbit/skin (Standard Draize): (100 mg/24hr) moderate, (810 mg/24 hr) severe

Rabbit/eye (Standard Draize): (500 mg/24 hr) mild, (162 mg) moderate

DMSO:

Rabbit/skin (Standard Draize, 500 mg/24 hr): mild

Rabbit/skin (Open Draize, 10 mg/24 hr): mild

Rabbit/eye (Standard Draize, 500 mg/24 hour): mild

Corrosivity: n/f

Sensitization Data: Guinea pig Buehler test: not sensitizing

Listed as a Carcinogen by: **NTP:** Yes **IARC:** Yes **OSHA:** Yes

Other Carcinogenicity Data: Methylene chloride is listed as a carcinogen by NTP, IARC, and OSHA.

Mutagenicity Data: Methylene chloride is generally mutagenic and it can cause DNA breaks and chromosomal aberrations. There are conflicting results concerning the genotoxicity of methylene chloride in vitro and in vivo.

Dimethyl sulfoxide did not show a potential to induce gene mutations in bacterial or yeast cells, and was not mutagenic in in vivo studies in *Drosophila*. Dimethyl sulfoxide did not induce micronuclei or sister-chromatid exchange in mice or chromosomal aberrations or sister chromatid exchange in mammalian cells, but did induce an increase in chromosomal aberrations in rats. [EPA 2007]

Reproductive and Developmental Effects: Methylene chloride:

Some reproductive studies in animals have shown reduced weights and minor skeletal malformations in the offspring of animals exposed to methylene chloride, but others have not shown adverse effects. In humans, two occupational studies found an increased risk of miscarriage in women exposed to methylene chloride during the first trimester of pregnancy.

DMSO:

Examination of the reproductive system during a 13-week inhalation repeated-dose toxicity study in rats revealed no abnormalities on estrus cycle in females, sperm count, motility or morphology in males, or on the reproductive organs of both sexes. In two oral developmental toxicity studies in rats, maternal effects included decreased food consumption and decreased body weight gain. Developmental effects included decreased fetal weights, higher rates of early resorptions per animal, increased total post-implantation loss, dilated renal pelvis, dilated ureters and reduced or delayed ossification of ribs. All of the fetal effects except dilated renal pelvis occurred at levels that demonstrated maternal toxicity.

SECTION 12 - ECOLOGICAL INFORMATION**Ecological Information:** n/f**SECTION 13 - DISPOSAL CONSIDERATIONS****Disposal:** Place material in a thick plastic hazardous waste disposal bag or leakproof container and label it CAUTION: HAZARDOUS CHEMICAL WASTE. Dispose of waste in accordance with all applicable Federal, State and local laws.**SECTION 14 - TRANSPORT INFORMATION****Shipping Name:** Dichloromethane 0.3% Solution**Class:** 6.1**UN Number:** UN1593**Packing Group:** III**Additional Transport Information:** n/f**SECTION 15 - REGULATORY INFORMATION****U.S. Regulatory Information:** California Proposition 65: Carcinogen (methylene chloride)
CERCLA/SARA: 1000 lb final RQ; 454 kg final RQ**International Regulatory Information:** EINECS # 200-838-9 (Methylene chloride); 200-664-3 (Dimethyl sulfoxide)
Hazard code: Xn
Risk phrase: R40**SECTION 16 - OTHER INFORMATION****Revision:** 04-Aug-08**Previous Revision Date:** 30-Sep-03