



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 - METHANOL

Catalog Number: 1601623

Revision Date:

August 19, 2010

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Common Name: Methanol

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 - Poison, Combustible, Irritant

This reference standard contains methanol in dimethyl sulfoxide (DMSO). The mixture has not been tested to determine specific physical hazards, but is considered potentially combustible. DMSO is an irritant and is rapidly absorbed through the skin and mucous membranes and may enhance skin absorption of other chemicals. Methanol is a poison and an irritant.

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 or shortness of breath; nasal congestion; gastrointestinal disturbances; drowsiness; and headache. Adverse effects of methanol may include headache, dizziness, vomiting, severe abdominal pain, back pain, trouble breathing, restlessness, cold clammy extremities, and blurred or dim vision with dilated unreactive pupils. Possible allergic reaction to material if inhaled, ingested, or in contact with skin.

Overdose Effects: In methanol toxicity, narcotic effects occur first, followed by a latent period of 10 to 48 hours, then more severe central nervous system effects; vision disturbances including irreversible blindness; seizures; metabolic acidosis; rapid, shallow breathing; fast or slow heartbeat; severe low blood pressure; coma; and death.

Acute: Eye, skin, gastrointestinal and/or respiratory tract irritation.

Chronic: Possible hypersensitization; nervous system, gastrointestinal, and vision problems.

Medical Conditions Aggravated by Exposure: Hypersensitivity to material and skin, kidney, liver, eye, respiratory, or neurological conditions.

Cross Sensitivity: n/f

Target Organs: Nervous system, eyes, respiratory system, gastrointestinal tract (methanol)

For additional information on toxicity, see Section 11.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS**Common Name:** Methanol**Formula:** See Composition**Synonym:** Methyl alcohol; wood alcohol**Chemical Name:** Methanol in dimethyl sulfoxide**CAS:** See Composition**RTECS Number:** See Composition**Chemical Family:** Alcohol (Methanol)**Therapeutic Category:** Residual solvent**Composition:** Methanol (CH₄O; CAS # 67-56-1; RTECS # PC1400000): 1.5%
Dimethyl sulfoxide (C₂H₆OS; CAS # 67-68-5; RTECS # PV6210000): 98.5%**SECTION 4 - FIRST AID MEASURES****Inhalation:** Causes irritation. Avoid inhalation. Remove to fresh air.**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. DMSO readily penetrates the skin and can enhance absorption of methanol and cause systemic toxicity.**Ingestion:** Causes irritation. Avoid ingestion. Flush out mouth with water.**General First Aid Procedures:** Remove from exposure. Remove contaminated clothing. For treatment advice, seek guidance from an occupational health physician or other licensed health-care provider familiar with workplace chemical exposures. In the United States, the national poison control center phone number is 1-800-222-1222. If person is not breathing, give artificial respiration. If breathing is difficult, give oxygen if available. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention.**Note to Physicians****Overdose Treatment:** Treatment of overdose may include the following:

1. Do not induce vomiting. Consider administration of activated charcoal to prevent absorption.
2. Acidosis may not develop until 18 to 48 hours post-ingestion. Temporize with IV sodium bicarbonate; monitor arterial blood gasses to guide dosing. Patients with metabolic acidosis need antidotal therapy (ethanol or fomepizole) and hemodialysis.
3. 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.
4. Monitor arterial blood gasses, electrolytes, acid-base status, CBC (especially MCV) and renal function tests. Monitor blood levels of methanol and formate. [Meditext 2008]

SECTION 5 - FIREFIGHTING MEASURES**Extinguisher Media:** Alcohol foam or other appropriate media.**Fire and Explosion Hazards:** DMSO 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. Remove ignition sources. Ventilate enclosed spaces. Absorb with suitable material. Do not flush into a confined space such as a sewer.

Avoid breathing vapors. Place spillage and all contaminated cleanup materials in an appropriately labeled container for disposal. Wash spill site.

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. Clean equipment and work surfaces with suitable detergent or solvent after use. After removing gloves, wash hands and other exposed skin thoroughly.

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: Airborne exposure should be controlled primarily by engineering controls such as general dilution ventilation, local exhaust ventilation, or process enclosure. Local exhaust ventilation is generally preferred to general exhaust because it can control the contaminant at its source, preventing dispersion into the work area. An industrial hygiene survey involving air monitoring may be used to determine the effectiveness of engineering controls. Effectiveness of engineering controls intended for use with highly potent materials should be assessed by use of nontoxic surrogate materials.

Respiratory Protection: Where respirators are deemed necessary to reduce or control occupational exposures, use NIOSH-approved respiratory protection and have an effective respirator program in place (applicable U.S. regulation OSHA 29 CFR 1910.134).

Gloves: Chemically compatible. For handling solutions, ensure that the glove material is protective against the solvent being used. Use handling practices that minimize direct hand contact. Employees who are sensitive to natural rubber (latex) should use nitrile or other synthetic nonlatex gloves. Use of powdered latex gloves should be avoided due to the risk of latex allergy.

Eye Protection: Safety glasses with sideshields are recommended. Face shields or goggles may be required if splash potential exists or if corrosive materials are present. Approved eye protection (e.g., bearing the ANSI Z87 or CSA stamp) is preferred. Maintain eyewash facilities in the work area.

Protective Clothing: For handling of laboratory scale quantities, a cloth lab coat is recommended. Where significant quantities are handled, work clothing may be necessary to prevent take-home contamination.

Exposure Limits: Methanol:
OSHA: 200 ppm
NIOSH: 200 ppm; STEL 250 ppm (skin); IDLH 6000 ppm
ACGIH: 200 ppm; STEL 250 ppm (skin)
Dimethyl sulfoxide:
AIHA: 250 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: Clear 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

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Vapor Pressure: n/f**Vapor Density:** n/f**Specific Gravity:** n/f**Solubility in Water:** n/f**Fat Solubility:** n/f**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.

Incompatibilities: Strong oxidizing agents, strong reducing agents, acids, acid chlorides, acid anhydrides, alkali hydrides, halides, boron compounds, metal salts of oxoacids.

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

Stable? Yes **Hazardous Polymerization?** No

SECTION 11 - TOXICOLOGICAL PROPERTIES

Oral Rat: LD50: 5628 mg/kg (Methanol); 14500 mg/kg (DMSO)

Oral Mouse: LD50: 7300 mg/kg (Methanol); 7920 mg/kg (DMSO)

Other Toxicity Data: Methanol:

Oral Monkey LD50: 7000 mg/kg

Oral Rabbit LD50: 14200 mg/kg

Inhalation Rat LC50: 64000 ppm/4 hr

Inhalation Rabbit LC50: 81000 mg/m³/14 hr

Dermal Rabbit LD50: 15800 mg/kg

Dimethyl sulfoxide:

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

Dermal Mouse LD50: 50 grams/kg

Dermal Rat LD50: 40 grams/kg

Irritancy Data: Methanol:

Rabbit/skin (Standard Draize, 20 mg/24 hr): moderate

Rabbit/eye (Standard Draize, 100 mg/24 hr): moderate

Dimethyl sulfoxide:

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

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

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

Corrosivity: n/f

Sensitization Data: Dimethyl sulfoxide:

Guinea pig Buehler test: not sensitizing

Listed as a Carcinogen by: **NTP:** No **IARC:** No **OSHA:** No

Other Carcinogenicity Data: Rats and mice exposed to up to 1000 ppm methanol 20 hr/day for 24 and 18 months, respectively, showed no evidence of carcinogenicity.

Mutagenicity Data: Methanol:

Methanol inhalation did not induce chromosome damage in mice and it was inactive in the Ames/Salmonella microsome assay with and without activation. It caused chromosomal aberrations in yeast and grasshoppers.

Dimethyl sulfoxide:

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: Methanol:

High levels of methanol (1840 and 537 mg/L) caused oral clefts and neural tube defects in offspring of exposed rats and mice. In rats, inhalation exposures of 20000 ppm for 7 hr/day during gestation caused maternal toxicity and increased the incidence of birth defects in the offspring. [NOAEL = 5000 ppm (maternal and developmental toxicity)] In mice, inhalation exposures of 5000 ppm and higher for 7 hr/day during gestation increased the incidence of cleft palate and brain defects in the offspring. [NOAEL = 1000 ppm (developmental toxicity)]

Dimethyl sulfoxide:

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. [EPA 2007]

SECTION 12 - ECOLOGICAL INFORMATION

Ecological Information: Methanol is of low toxicity to aquatic organisms and will biodegrade rapidly.

SECTION 13 - DISPOSAL CONSIDERATIONS

Disposal: Dispose of waste in accordance with all applicable Federal, State, and local laws.

SECTION 14 - TRANSPORT INFORMATION

Shipping Name: Toxic liquid, organic, n.o.s. (Methanol 1.5% solution)

Class: 6.1

UN Number: UN2810

Packing Group: II

Additional Transport Information: EQ code: E4

SECTION 15 - REGULATORY INFORMATION

U.S. Regulatory Information: n/f

International Regulatory Information: Methanol:
EINECS # 200-659-6
Dimethyl sulfoxide:
EINECS # 200-664-3

SECTION 16 - OTHER INFORMATION

Revision: 19-Aug-10

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