



Material Safety Data Sheet

12601 Twinbrook Parkway,
Rockville, MD 20852 USA

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

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RESIDUAL SOLVENT CLASS 1 - 1,2-DICHLOROETHANE

Catalog Number: 1601180

Revision Date:

September 4, 2008

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Common Name: 1,2-Dichloroethane

Manufacturer: U. S. Pharmacopeia

Responsible Party: Reference Standards Technical Services

Mailing Address: 12601 Twinbrook Parkway, Rockville, MD 20852 USA

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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. Toxic. Irritant. Combustible.

This reference standard contains 1,2-dichloroethane in dimethyl sulfoxide (DMSO). The mixture has not been tested to determine specific physical hazards, but it is considered potentially combustible.

DMSO is an irritant and is rapidly absorbed through the skin. It may carry dissolved chemicals into the body through this route.

1,2-Dichloroethane is toxic, irritant, and a cancer suspect agent.

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. Adverse effects of 1,2-dichloroethane may include headache; nausea; vomiting; loss of appetite; dizziness; watery stools; confusion; sleepiness; blue discoloration of skin, lips, and nails; and weak and rapid pulse. Possible allergic reaction to material if inhaled, ingested or in contact with skin.

Overdose Effects: In addition to the signs of toxicity listed above, overexposure to 1,2-dichloroethane may cause loss of consciousness, coma, respiratory arrest, kidney or liver damage and failure, gastrointestinal bleeding or blood disorders, and death.

Acute: Acute effects from exposure to 1,2-dichloroethane may include eye, skin, gastrointestinal and/or respiratory tract irritation; central nervous system depression; and reduced blood pressure.

Chronic: Chronic effects from 1,2-dichloroethane exposure may include possible hypersensitization, weight loss, low blood pressure, anemia, liver and kidney damage, and cancer.

Medical Conditions Aggravated by Exposure: Hypersensitivity to material; use of smoking tobacco; treatment with disulfiram; and impaired lung, liver, or kidney function.

Cross Sensitivity: n/f

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Target Organs: Central nervous system, liver, kidneys, lungs, cardiovascular system (1,2-Dichloroethane)

For additional information on toxicity, see Section 11.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Common Name: 1,2-Dichloroethane

Formula: See Composition

Synonym: Ethylene dichloride; EDC

Chemical Name: Ethane, 1,2-dichloro in dimethyl sulfoxide

CAS: See Composition

RTECS Number: See Composition

Chemical Family: Halogenated hydrocarbon (1,2-Dichloroethane)

Therapeutic Category: Residual solvent

Composition: 1,2-Dichloroethane (C₂H₄Cl₂; CAS # 107-06-2; RTECS # KI0525000): 2.5%
Dimethyl sulfoxide (C₂H₆OS; CAS # 67-68-5; RTECS # PV6210000): 97.5%

SECTION 4 - FIRST AID MEASURES

Inhalation: Causes irritation and toxicity. Avoid inhalation. Remove to fresh air. 1,2-Dichloroethane is readily absorbed by 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. DMSO readily penetrates the skin and can enhance absorption of other chemicals.

Ingestion: Causes irritation and toxicity. Avoid ingestion. Flush out mouth with water. 1,2-dichloroethane is absorbed by 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 1,2-dichloroethane overdose should be symptomatic and supportive and may include the following:

1. Do not induce vomiting because ingestion of 1,2-dichloroethane may cause oropharynx burns. Administer milk or water for dilution and activated charcoal. Gastric contents may be suctioned with a small, flexible nasogastric or orogastric tube after recent large ingestion, but risk of further mucosal injury must be considered.
2. Respiratory and cardiovascular function should be followed carefully; onset of symptoms may be delayed and sudden.
3. Monitor serum glucose, electrolytes, INR, liver and kidney function, and for central nervous system depression. In symptomatic cases with respiratory compromise, obtain chest x-ray.
4. N-acetylcysteine and vitamin E have been suggested as potential antidotes, but their efficacy have not been documented.
5. For acute lung injury, maintain ventilation and oxygenation and evaluate with frequent blood gas or pulse oximetry monitoring. Early use of PEEP and mechanical ventilation may be needed.
6. For hypotension, infuse isotonic fluid. If hypotension persists, administer dopamine or norepinephrine.

[Meditext 2008]

SECTION 5 - FIREFIGHTING MEASURES

Extinguisher Media: Alcohol foam or other appropriate media.

Fire and Explosion Hazards: DMSO is combustible and reacts violently with many acyl, aryl and non-metal halides, boron compounds and metal salts of oxoacids. Vapors may form explosive mixtures with air. Vapors may travel to sources of ignition and flash back. This mixture has not been tested.

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 a thick plastic hazardous waste disposal bag or leakproof container and label it CAUTION: HAZARDOUS CHEMICAL WASTE. 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. 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. Store in a refrigerator.

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: 1,2-Dichloroethane:
OSHA: TWA 50 ppm; CEILING 100 ppm; Peak 200 ppm (5 min. every 3 hr.)
NIOSH: TWA 1 ppm; STEL 2 ppm; IDLH 50 ppm
ACGIH: TWA 10 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
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Conditions to Avoid: Avoid exposure to light and heat.

Incompatibilities: n/f

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

Stable? Yes **Hazardous Polymerization?** No

SECTION 11 - TOXICOLOGICAL PROPERTIES
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Oral Rat: 1,2-Dichloroethane:
LD50: 500 mg/kg, 670 mg/kg

DMSO:
LD50: 14500 mg/kg

Oral Mouse: 1,2-Dichloroethane:
LD50: 413 mg/kg

DMSO:
LD50: 7920 mg/kg

Other Toxicity Data: 1,2-Dichloroethane:
Inhalation Monkey LC50: 3000 ppm/7hr
Inhalation Rat LC50: 1000 ppm/7hr
Skin Rat LD50: 2800 mg/kg
Oral Dog LD50: 2500 mg/kg, 5700 mg/kg
Oral Guinea Pig LD50: 0.5 ml/kg

DMSO:
Inhalation Rat LC50: >25 mg/L/40 hour
Skin Mouse LD50: 50 grams/kg
Skin Rat LD50: 40 grams/kg

Irritancy Data: 1,2-Dichloroethane:
Rabbit/skin (Standard Draize, 500 mg/24hr): mild
Rabbit/skin (Open Draize, 625 mg): mild
Rabbit/eye (Standard Draize, 63 mg): severe
Rabbit/eye (Standard Draize, 500 mg/24hr): mild

DMSO:
Rabbit/skin (Standard Draize, 500 mg/24 hour): mild
Rabbit/skin (Open Draize, 10 mg/24 hour): mild
Rabbit/eye (Standard Draize, 500 mg/24 hour): mild

Corrosivity: n/f

Sensitization Data: DMSO:
Guinea Pig Bueler Test: not sensitizing

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

Other Carcinogenicity Data: 1,2-Dichloroethane:
1,2-Dichloroethane administered by gavage produced benign and malignant tumors of the lung and malignant lymphomas in mice of both sexes, hepatocellular carcinomas in male mice, mammary and uterine adenocarcinomas in female mice, carcinomas of the forestomach in male rats, benign and malignant mammary tumors in female rats, and hemangiosarcomas in rats of both sexes. In two inhalation studies in mice and rats, 1,2-dichloroethane increased in the incidence of tumors at various sites including the liver, lung, and mammary gland.

Mutagenicity Data: 1,2-Dichloroethane:

1,2-Dichloroethane is mutagenic and genotoxic in bacterial and mammalian in vitro test systems, but gave no evidence of in vivo mutagenic activity (mouse micronucleus and DL assay), while some in vivo genotoxic potential was demonstrated in mice. However, evidence of DNA damaging in vivo activity/genotoxicity is presented by positive results in SCE assay and single DNA strand-break analysis. The cytochrome-P450 and glutathione-dependent pathways are assumed to be responsible for the generation of intermediates capable of binding to and damaging DNA. [Organisation for Economic Co-operation and Development, SIDS 2002]

DMSO:

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: 1,2-Dichloroethane:

There was no increase in birth defects in the offspring of pregnant rats exposed to doses that were not toxic to the dam. There was no evidence of developmental toxicity in the offspring of pregnant rats administered 1,2-dichloroethane at doses up to 240 mg/kg/day by gavage and 300 ppm by inhalation. Impaired reproductive performance did not occur in rats and mice administered repeat oral doses of 50 mg/kg/day in feed and drinking water and after exposure to up 150 ppm by inhalation. One study, in chronically exposed rats, showed a disruption of the estrus cycle and a decrease in litter size.

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. [EPA 2007]

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:** n/f**Class:** n/f**UN Number:** n/f**Packing Group:** n/f**Additional Transport Information:** n/f**SECTION 15 - REGULATORY INFORMATION****U.S. Regulatory Information:** 1,2-Dichloroethane:
EPCRA Sec. 304 RQ: 100 lb (45.4 kg)
California Proposition 65: Carcinogen

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International Regulatory Information: 1,2-Dichloroethane:
EINECS # 203-458-1
Hazard Code: T
Risk Phrases: R45DMSO:
EINECS # 200-664-3

SECTION 16 - OTHER INFORMATION

Revision: 04-Sep-08**Previous Revision Date:** 25-Sep-03