



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.

ATTENTION !

USP Reference Standards are sold for chemical test and assay purposes only, and NOT for human consumption. The information contained herein is applicable solely to the chemical substance when used as a USP Reference Standard and does not necessarily relate to any other use of the substance described, (i.e. at different concentrations, in drug dosage forms, or in bulk quantities). USP Reference Standards are intended for use by persons having technical skill and at their own discretion and risk. This information has been developed by USP staff from sources considered reliable but has not been independently verified by the USP. Therefore, the USP Convention cannot guarantee the accuracy of the information in these sources nor should the statements contained herein be considered an official expression. NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE is made with respect to the information contained herein.

RESIDUAL SOLVENT CLASS 1 - 1,1-DICHLOROETHENE

Catalog Number: 1601204

Revision Date:

October 1, 2008

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Common Name: 1,1-Dichloroethene

Manufacturer: U. S. Pharmacopeia

Responsible Party: Reference Standards Technical Services

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

Phone: 301-816-8129

Hours: 8 a.m. to 5 p.m. EST Mon. - Fri.

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 1,1-dichloroethene 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.

1,1-Dichloroethene is toxic, irritant, and a potential 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. Adverse effects of 1,1-dichloroethene may include dizziness, drowsiness, headache, trouble breathing, and abdominal pain. Possible allergic reaction to material if inhaled, ingested or in contact with skin.

Overdose Effects: Overdose effects of 1,1-dichloroethene may include central nervous system depression and unconsciousness.

Acute: Acute effects of 1,1-dichloroethene may include eye, skin, gastrointestinal and/or respiratory tract irritation; central nervous system depression.

Chronic: Chronic effects of 1,1-dichloroethene include possible hypersensitization and liver and kidney damage.

Medical Conditions Aggravated by Exposure: Hypersensitivity to material and impaired central nervous system, liver, or kidney function.

Cross Sensitivity: n/f

Target Organs: Central nervous system, liver, kidneys (1,1-Dichloroethene)

For additional information on toxicity, see Section 11.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS**Common Name:** 1,1-Dichloroethene**Formula:** See Composition**Synonym:** Vinylidene chloride**Chemical Name:** Ethene, 1,1-dichloro- in dimethyl sulfoxide**CAS:** See Composition**RTECS Number:** See Composition**Chemical Family:** Halogenated hydrocarbon (1,1-Dichloroethene)**Therapeutic Category:** Residual solvent**Composition:** 1,1-Dichloroethene (C₂H₂Cl₂; CAS # 75-35-4; RTECS # KV9275000): 4%
Dimethyl sulfoxide (C₂H₆OS; CAS # 67-68-5; RTECS # PV6210000): 96%**SECTION 4 - FIRST AID MEASURES****Inhalation:** Causes irritation and toxicity. Avoid inhalation. Remove to fresh air. 1,1-Dichloroethene is absorbed through 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. 1,1-Dichloroethene is 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 1,1-dichloroethene overdose should be symptomatic and supportive and may include the following:

1. Do not induce vomiting because of the potential for central nervous system depression and local tissue irritation.
2. Administer activated charcoal as a slurry.
3. Support respiratory and cardiovascular function.
4. Monitor liver and kidney function. [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: ACGIH: TWA 5 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

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 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

Oral Rat: 1,1-Dichloroethene:
LD50: 200 mg/kg

DMSO:
LD50: 14500 mg/kg

Oral Mouse: 1,1-Dichloroethene:
LD50: 194 mg/kg

DMSO:
7920 mg/kg

Other Toxicity Data: 1,1-Dichloroethene:
Inhalation Rat LC50: 6350 ppm/4hr, 1.6 mg/L/4hr
inhalation Mouse LC50: 40 ppm/4hr, 0.14 mg/L

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

Irritancy Data: 1,1-Dichloroethene:
Rabbit/skin: irritating
Rabbit/eye: moderate, non-irritating

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 Buehler test: non-sensitizing

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

Other Carcinogenicity Data: 1,1-Dichloroethene:
1,1-Dichloroethene is not classifiable as to its carcinogenicity in humans. Mice and rats administered oral 1,1-dichloroethene doses tested negative for carcinogenicity, rats and hamsters given doses by inhalation showed no treatment-related neoplasms, female mice in a skin-painting study tested negative for skin tumors, and mice administered doses by subcutaneous injection produced no tumors. In mice, there was a treatment-related increase in the incidence of kidney adenocarcinomas in males, an increase in mammary carcinomas in females, and an increase in pulmonary adenomas in both male and female mice.

Mutagenicity Data: 1,1-Dichloroethene:
Vinylidene chloride was found to be mutagenic for bacteria and yeast, only in the presence of a mammalian microsomal metabolic activation system (S9). The compound induced unscheduled DNA synthesis in isolated rat hepatocytes and increased the frequency of sister chromatid exchanges and chromosomal aberrations in cell cultures with S9 included. In contrast, no increase in mammalian gene mutations was seen. A small, but

statistically significant, increase in DNA binding after in vivo exposure has been reported. DNA binding was greater in mouse than in rat cells and greater in the kidneys than in the liver following 6-h exposures to 40 and 200 mg vinylidene chloride/m³ (10 and 50 ppm). Furthermore, vinylidene chloride slightly increased unscheduled DNA synthesis in mouse kidney. There was no evidence of a dominant lethal effect or cytogenetic effects after in vivo exposure of rodents, with the exception of one study showing the induction of chromosomal aberrations in the bone marrow of the Chinese hamster. [International Programme on Chemical Safety, EHC 100, 1990]

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: 1,1-Dichloroethene:

There was no evidence of an increase in general birth defects in the offspring of mice, rats, and rabbits administered 1,1-dichloroethene during pregnancy, including inhalation doses up to 160 ppm in rats and rabbits. Increased skeletal malformations occurred in rats (80 and 100 ppm) and rabbits (160 ppm), along with maternal toxicity. No alterations in fertility occurred in a 3-generation rats study at 1,1-dichloroethene concentrations up to 200 ppm in drinking water.

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:** 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:** 1,1-Dichloroethene:
EPCRA Sec. 304 RQ: 100 lb (45.4 kg)**International Regulatory Information:** 1,1-Dichloroethene:
EINECS # 200-864-0
Hazard code Xn

RESIDUAL SOLVENT CLASS 1 - 1,1-DICHLOROETHENE**Catalog Number:** 1601204**Revision Date:**October 1, 2008

Risk Phrases: R40

DMSO:

EINECS # 200-664-3

SECTION 16 - OTHER INFORMATION

Revision: 01-Oct-08**Previous Revision Date:** 25-Sep-03