



# 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 - 1,1,1-TRICHLOROETHANE

Catalog Number: 1601226

Revision Date:

September 3, 2008

### SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

**Common Name:** 1,1,1-Trichloroethane

**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: Irritant. Combustible.

This reference standard contains 1,1,1-trichloroethane 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.

1,1,1-Trichloroethane is 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; shortness of breath; nasal congestion; gastrointestinal disturbances; drowsiness; and headache. Adverse effects of 1,1,1-trichloroethane may include headache, weakness, dizziness, lightheadedness, fainting, drowsiness, hallucinations, irritability, aggression, loss of coordination or judgment, abdominal cramps, nausea, vomiting, diarrhea, low blood pressure, and coma. Possible allergic reaction to material if inhaled, ingested or in contact with skin.

**Overdose Effects:** High concentrations of 1,1,1-trichloroethane can lead to more pronounced central nervous system effects, seizures, respiratory arrest, and coma. Cardiac sensitization to epinephrine produced by exposure may lead to arrhythmias and cardiac arrest. Death may result.

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

**Chronic:** Chronic effects of 1,1,1-trichloroethane include possible hypersensitization; lethargy; and moodiness, irritability, or other neuropsychiatric effect.

**Medical Conditions Aggravated by Exposure:** Hypersensitivity to material; active alcoholism; and respiratory, liver, or cardiac disease.

**Cross Sensitivity:** n/f**Target Organs:** Central nervous system; cardiovascular system (1,1,1-Trichloroethane)**For additional information on toxicity, see Section 11.****SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS****Common Name:** 1,1,1-Trichloroethane**Formula:** See Composition**Synonym:** Methyl chloroform**Chemical Name:** Ethane, 1,1,1-trichloro- in dimethyl sulfoxide**CAS:** See Composition**RTECS Number:** See Composition**Chemical Family:** Chlorinated hydrocarbon (1,1,1-Trichloroethane)**Therapeutic Category:** Residual solvent**Composition:** 1,1,1-Trichloroethane (C<sub>2</sub>H<sub>3</sub>Cl<sub>3</sub>; CAS # 71-55-6; RTECS # KJ2975000): 5%  
Dimethyl sulfoxide (C<sub>2</sub>H<sub>6</sub>OS; CAS # 67-68-5; RTECS # PV6210000): 95%**SECTION 4 - FIRST AID MEASURES****Inhalation:** Causes irritation and adverse effects. Avoid inhalation. Remove to fresh air. 1,1,1-Trichloroethane 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. DMSO readily penetrates the skin and can enhance absorption of other chemicals.**Ingestion:** Causes irritation and adverse effects. Avoid ingestion. Flush out mouth with water. 1,1,1-Trichloroethane 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 1,1,1-trichloroethane overdose should be symptomatic and supportive and may include the following:

1. Do not induce vomiting following oral exposure because of the potential for CNS depression. Since ingestion may cause esophageal or gastrointestinal tract burns, the benefit of gastric lavage must be weighed against the potential for bleeding or perforation. Activated charcoal may be administered.
2. Institute supportive measures to treat CNS or respiratory depression.
3. Keep patient calm to minimize effect of endogenous catecholamines on myocardium. Avoid use of adrenergic agonist drugs if possible.
4. Obtain baseline liver and kidney function tests, as dysfunction may occur transiently after recovery from CNS depression.
5. For hypotension, infuse isotonic fluid. If hypotension persists, administer dopamine or norepinephrine.
6. For seizures, administer intravenous diazepam or lorazepam. If seizures recur, consider phenobarbital or propofol. Monitor for hypotension, dysrhythmias, respiratory depression, and need for endotracheal intubation. Evaluate for hypoglycemia, electrolyte disturbance, and hypoxia. [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. 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:** 1,1,1-Trichloroethane:  
OSHA: TWA 350 ppm  
NIOSH: 15-min CEILING 350 ppm; IDLH 700 ppm  
ACGIH: TWA 350 ppm; STEL 450 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

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**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:** 1,1,1-Trichloroethane:  
LD50: 9600 mg/kgDMSO:  
LD50: 14500 mg/kg**Oral Mouse:** 1,1,1-Trichloroethane:  
LD50: 6 grams/kgDMSO:  
LD50: 7920 mg/kg**Other Toxicity Data:** 1,1,1-Trichloroethane:  
Inhalation Rat LC50: 17000 ppm/4hr  
Inhalation Mouse LC50: 2911 ppm/2hr  
Inhalation Cat LC50: 24400 mg/m<sup>3</sup>  
Oral Dog LD50: 750 mg/kg  
Oral Rabbit LD50: 5660 mg/kg  
Oral Guinea Pig LD50: 8600 mg/kgDMSO:  
Inhalation Rat LC50: >25 mg/L/40 hour  
Skin Mouse LD50: 50 grams/kg  
Skin Rat LD50: 40 grams/kg**Irritancy Data:** 1,1,1-Trichloroethane:  
Rabbit/skin (Standard Draize, 20 mg/24hr): moderate  
Rabbit/skin (Standard Draize, 5 grams/12D intermittent): mild  
Rabbit/eye (Standard Draize, 2 mg/24hr): severe  
Rabbit/eye (Standard Draize, 100 mg): mildDMSO:  
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: not sensitizing**Listed as a Carcinogen by:**      **NTP:** No      **IARC:** No      **OSHA:** No**Other Carcinogenicity Data:** 1,1,1-Trichloroethane:  
There was no increase in tumor incidence in one inhalation study in mice and rats given 1,1,1-trichloroethane at doses up to 1500 ppm.**Mutagenicity Data:** 1,1,1-Trichloroethane:  
1,1,1-Trichloroethane covalently bound to DNA, RNA and protein in mice and rats but did not induce micronuclei or abnormal sperm head morphology in mice in vivo. It induced chromosomal aberrations and cell transformation in mammalian cell cultures and it showed inconclusive evidence of sister chromatid exchange

induction. It did not induce unscheduled DNA synthesis or gene mutation in mammalian cells in vitro. 1,1,1-Trichloroethane did not cause mutation in plants or sex-linked mutation in *Drosophila*. It did not induce DNA damage, gene conversion, mutation or aneuploidy in yeast or genetic crossing-over or aneuploidy in fungi, but it was mutagenic to some bacterial strains. [IARC 2008]

**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:** 1,1,1-Trichloroethane:  
There was no increase in the incidence of birth defects in the offspring of rats administered 1,1,1-trichloroethane at doses of 2100 ppm by inhalation, but embryotoxicity and fetotoxicity did not occur. In mice, there was no increase in impaired fertility or birth defects when administered up to 1000 mg/kg/day in drinking water or 875 ppm by inhalation, but developmental effects were seen in offspring at doses of 2000 ppm by inhalation. 1,1,1-Trichloroethane did not cause an increase in adverse fertility effects in rats at 1000 mg/kg/day or developmental effects at up to 30 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:** 1,1,1-Trichloroethane 5% Solution

**Class:** 6.1

**UN Number:** UN2831

**Packing Group:** III

**Additional Transport Information:** n/f

**SECTION 15 - REGULATORY INFORMATION**

**U.S. Regulatory Information:** 1,1,1-Trichloroethane:  
EPCRA Sec. 304 RQ: 1000 lb (454 kg)

**International Regulatory Information:** 1,1,1-Trichloroethane:  
EINECS # 200-756-3  
Hazard Code: Xn, N  
Risk Phrases: R20, R59

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Safety Phrases: S24/25, S59, S61

DMSO:

EINECS # 200-664-3

**SECTION 16 - OTHER INFORMATION**

**Revision:** 03-Sep-08

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