



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 - HEXANE

Catalog Number: 1601601

Revision Date:

July 22, 2010

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Common Name: Hexane

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 : Toxic. Irritant. Combustible.

This reference standard contains hexane 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.

Hexane is toxic and an irritant.

Adverse Effects: Adverse effects of DMSO may include redness, itching, or rash on skin; garlic-like taste or odor on breath or skin; swelling of face; troubled breathing; shortness of breath; nasal congestion, gastrointestinal disturbances, drowsiness, and headache. Adverse effects of hexane may include headache, dizziness, drowsiness, blurred vision, giddiness, numbness, nausea, loss of appetite, weight loss, taste of gasoline, hallucinations, and muscle weakness. Possible allergic reaction to material if inhaled, ingested, or in contact with skin.

Overdose Effects: Hexane overdose may cause paralysis and severe central nervous system depression (dizziness, confusion, giddiness, headache, and weakness). Aspiration of hexane may lead to chemical pneumonia or pulmonary edema, asphyxiation, brain damage, and cardiac arrest.

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

Chronic: Possible hypersensitization, fatigue, loss of appetite, central nervous system damage (blurred vision and memory loss), and nerve damage (muscle weakness or pain, loss of sensation, and impaired gait).

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

Cross Sensitivity: n/f

Target Organs: Central and peripheral nervous system (Hexane)

For additional information on toxicity, see Section 11.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Common Name: Hexane

Formula: See Composition

Synonym: n-Hexane

Chemical Name: Hexane in dimethyl sulfoxide

CAS: See Composition

RTECS Number: See Composition

Chemical Family: Alkanes (Hexane)

Therapeutic Category: Residual solvent

Composition: Hexane (C₆H₁₄; CAS # 110-54-3; RTECS # MN9275000): 1450 ppm
DMSO (C₂H₆OS; CAS # 67-68-5; RTECS # PV6210000): balance

SECTION 4 - FIRST AID MEASURES

Inhalation: Causes irritation. Remove to fresh air.

Eye: Causes irritation. Flush with copious quantities of water for at least 15 minutes.

Skin: Causes irritation. Flush with copious quantities of soap and water. DMSO readily penetrates the skin and can enhance absorption of other chemicals.

Ingestion: Causes irritation. 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 hexane overdose should be symptomatic and supportive and may include:

1. Do not induce vomiting.
2. Administer activated charcoal as a slurry.
3. Monitor pulse oximetry and arterial blood gasses to ensure adequate ventilation. Obtain baseline chest x-ray.
4. For acute lung injury, maintain ventilation and oxygenation. Early use of PEEP and mechanical ventilation may be needed. [Meditext 2010]

SECTION 5 - FIREFIGHTING MEASURES
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Extinguisher Media: Water spray, dry chemical, carbon dioxide, or foam as appropriate for surrounding fire and materials.

Fire and Explosion Hazards: Hexane is flammable. Contact with oxidizing materials may cause extremely violent combustion. 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
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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 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: Hexane :
OSHA : 500 ppm
NIOSH : 50 ppm; IDLH 1100 ppm
ACGIH : 50 ppm (skin)
DMSO :
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
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Conditions to Avoid: Light, ignition sources.

Incompatibilities: Hexane : strong oxidizing agents
DMSO : acyl, aryl, and non-metal halides, boron compounds, and 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
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Oral Rat: Hexane:
LD50: 25 grams/kg; 15840 mg/kg
DMSO:
LD50: 14500 mg/kg

Oral Mouse: DMSO:
LD50: 7920 mg/kg

Other Toxicity Data: Hexane:
Inhalation Rat LC50: 48000 ppm/4 hours
Inhalation Mouse LC50: 150000 mg/m³/2 hours; 48000 ppm/4 hours
DMSO:
Inhalation Rat LC50: >2.0 mg/liter/40 hours; >1600 mg/m³/4 hours
Skin Rat LD50: 40 grams/kg
Skin Mouse LD50: 50 grams/kg

Irritancy Data: Hexane:
Eye/Rabbit: (Standard Draize; 10 mg) mild
DMSO:
Skin/Rabbit: (Standard Draize; 500 mg; 24 hours) mild; (Open Draize; 10 mg; 24 hours) mild
Eye/Rabbit: (Standard Draize; 500 mg; 24 hours) 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: In a study in mice, hexane caused liver tumors when inhaled intermittently at a concentration of 9018 ppm for six hours for two years.

Mutagenicity Data: Hexane:
Hexane was negative in the Salmonella/microsome preincubation assay with and without activation, the chromosome aberration assay in Chinese hamster ovary cells, and the mouse lymphoma mutagenesis assay. It induced sister chromatid exchange in Chinese hamster ovary cells and chromosome aberrations in vivo in rat bone marrow cells, and produced sex chromosome loss/nondisjunction in yeast.
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: Hexane:
Mice gavaged with up to 2.2 grams hexane/kg/day or injected with 9.9 grams hexane/kg/day during gestation showed maternal toxicity but there was no increase in the incidence of malformations in the offspring. In rats, inhalation doses up to 5000 ppm during gestation caused maternal and fetal toxicity but did not cause an increase in intrauterine deaths or major malformations in the offspring.
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: n/f**International Regulatory Information:** Hexane:
EINECS # 203-777-6
DMSO:
EINECS # 200-664-3

SECTION 16 - OTHER INFORMATION

Revision: 22-Jul-10**Previous Revision Date:** 09-Oct-03