

MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
Bldg. 202 Rm. 211
Gaithersburg, Maryland 20899

SRM Number: 2214
MSDS Number: 2214
SRM Name: Isooctane Liquid Density
Date of Issue: 20 February 2001

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SECTION I. MATERIAL IDENTIFICATION

Material Name: Isooctane Liquid Density

Description: SRM 2214 consists of four flame-sealed ampoules, each containing approximately 5 mL of isooctane.

Other Designations: Isooctane (2, 2, 4-trimethylpentane; isobutyltrimethylmethane; trimethylpentane)

Name	Chemical Formula	CAS Registry Number
Isooctane	$(\text{CH}_3)_2\text{CHCH}_2\text{C}(\text{CH}_3)_3$	540-84-1

DOT Classification: Octane, UN1262

Manufacturer/Supplier: Available from a number of suppliers

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Components	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Isooctane	~ 100	No occupational exposure limits established
		Rat, Inhalation: LC_{50} : 33.52 mg/L/4 h
		Rat, Oral: LD_{50} : > 5000 mg/kg
		Rat, Oral: TD_{LO} : 2100 mg/kg/21 days (intermittent)

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Isooctane	
Appearance and Odor: clear, colorless liquid with gasoline odor	Vapor Pressure (@ 21 °C): 41 mm Hg
Relative Molecular Mass: 114.23	Evaporation Rate (butyl acetate = 1): 4.6
Density (@ 20 °C): 691.87 kg/m ³	Water Solubility: insoluble
Boiling Point: 99 °C	Solvent Solubility: soluble in ether, alcohol, acetone, benzene, toluene, chloroform, xylene, carbon disulfide and carbon tetrachloride.
Freezing Point: -107 °C	

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: -12 °C**Method Used:** Closed Cup**Autoignition Temperature:** 415 °C**Flammability Limits in Air (Volume %):** **UPPER:** 6.0
LOWER: 1.1

Unusual Fire and Explosion Hazards: Fire fighters should use self-contained breathing apparatus (SCBA) and protective clothing when fighting fires involving this material.

Extinguishing Media: Use carbon dioxide, dry chemical, or foam. Water is ineffective in putting out isooctane fires and the water will spread the flames. Use water, however, to cool fire-exposed containers to prevent pressure rupture.

Special Fire Procedures: Fire fighters should wear a SCBA with a full face piece in the pressure demand or positive mode and other protective clothing.

SECTION V. REACTIVITY DATA

Stability: **Stable** **Unstable**

Conditions to Avoid: Avoid contact with heat, sparks, flames, or other sources of ignition. Avoid inhalation of vapors or combustion byproducts. Avoid contact with the skin. Do not allow the material to contaminate water sources.

Incompatibility (Materials to Avoid): Keep isooctane from contact with oxidizing materials and reducing agents.

See Section IV: *Unusual Fire and Explosion Hazards*

Hazardous Decomposition or Byproducts: Thermal decomposition of isooctane may produce oxides of carbon.

Hazardous Polymerization: **Will Occur** **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **Inhalation** **Skin** **Ingestion**

Isooctane: Excessive inhalation of isooctane vapors can cause mucous membrane irritation and narcotic effects. Extreme exposure may cause unconsciousness and respiratory arrest. Repeated and/or prolonged exposure to this material may cause *polyneuropathy* (multiple abnormal and usually degenerative states of the nervous system). This material is a defatting agent. Prolonged or repeated skin contact with the liquid causes drying, cracking, and possible *dermatitis* (inflammation of the skin). If sufficient amounts are absorbed, systemic toxicity may occur. Eye contact can cause irritation.

Medical Conditions Generally Aggravated by Exposure: kidney, liver, respiratory, skin disorders, and allergies

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	<input type="checkbox"/>	<input checked="" type="checkbox"/>
In the International Agency for Research on Cancer (IARC) Monographs	<input type="checkbox"/>	<input checked="" type="checkbox"/>
By the Occupational Safety and Health Administration (OSHA)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Watch for chemical irritations and treat them accordingly. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration. Obtain medical assistance if necessary.

Ingestion: If ingested, wash out mouth with water. Obtain medical assistance immediately.

TARGET ORGAN(S) OF ATTACK: central nervous system and liver

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released or Spilled: Notify safety personnel of major spills and/or leaks. Evacuate nonessential personnel. Stop the leak if one can do so without risk. Absorb small spills with sand or other absorbent material and place into containers appropriate for disposal. **DO NOT** flush into a sewer. Keep material out of watersheds and waterways.

Waste Disposal: Follow all federal, state, and local laws governing disposal.

Handling and Storage: Persons handling this material must wear protective eyewear, clothing, and gloves to prevent contact with the material.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Sealed ampoules, as received, should be stored in the dark at temperatures lower than 30 °C.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS 2,2,4-Trimethylpentane, 02 June 1999.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data on the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.