

MATERIAL SAFETY DATA SHEET**CYCLOHEXANE**

PRODUCT CODE NUMBER(S): 3200-1, 3200-2, 3200-3, 3200-30, 3201-2, 3201-7, 3202-2

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: Cyclohexane;
Hexahydrobenzene; Hexamethylene; Hexanaphthalene
Chemical Family: Saturated alicyclic hydrocarbon

Chemical Formula: C₆H₁₂

Product Use: Laboratory solvent

Manufacturer's Name and Address:
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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	%	TLV Units	CAS No.
Cyclohexane	99	300 ppm	110-82-7

PHYSICAL DATA

Physical State: Liquid

Odour and Appearance: Clear, colourless with a slight ether-like odour

Odour Threshold (ppm): Values vary widely, 0-300 ppm (detection). Not reliable warning properties.

Vapour Pressure (mm Hg): 77 mm Hg at 20°C

Vapour Density (Air = 1): 2.9

Evaporation Rate (Bu acet = 1): 6.1

Boiling Point (°C): 81°C

Freezing Point (°C): 6.6°C

pH: Not applicable

Specific Gravity: 0.779 @ 20°C

Coefficient of Water/Oil distribution: LogP (oct) = 3.44

SHIPPING DESCRIPTION

UN: 1145

T.D.G. Class: 3

Pkg. Group: II

REACTIVITY DATA

Chemical Stability: Stable

Incompatibility with other substances: May react violently or explosively with strong oxidizers, e.g. peroxides, perchlorates, nitrates, with increased risk of fire and explosion. Not corrosive to metals.

Reactivity: Avoid heat, sparks, open flames and all sources of ignition. Do not return contaminated material to original containers.

Hazardous Decomposition Products: Carbon oxides and various hydrocarbons form when burned.

FIRE AND EXPLOSION DATA

Flammability: Extremely flammable liquid and vapour. Vapours will form explosive mixtures with air at, or above -20°C. Will readily ignite at room temperature. Vapour is heavier than air and may travel considerable distance to source of ignition and flash back. Liquid floats on water and may spread fire. Containers may explode in heat of fire.

Extinguishing Media: Dry chemical, carbon dioxide, alcohol-resistant foam, water spray or fog. Water spray or fog may be used to cool containers, disperse vapours, flush spill away from ignition source, or dilute spill to non-flammable mixture. Fight fire from upwind, from a safe distance. Firefighters must wear NIOSH/MSHA approved positive-pressure, full face-piece self-contained breathing apparatus, and full protective clothing (Bunker Gear). Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.

Flash Point (Method Used): -20°C (CC)

Autoignition Temperature: 245°C

Upper Flammable Limit (% by volume): 8

Lower Flammable Limit (% by volume): 1.3

Hazardous Combustion Products: CO_x, various hydrocarbons.

Sensitivity to Impact: None identified

Sensitivity to Static discharge: Liquid can accumulate static charge by flow or agitation. Vapour readily ignited by static discharge.

TOXICOLOGICAL PROPERTIES AND HEALTH DATA**Toxicological Data:**

LD₅₀: (oral, rat) 6,200 mg/kg, (oral, mouse) 1,300 mg/kg; (dermal, rabbit) >18,000 mg/kg

LC₅₀: (mam) 70 gm/m³

Effects of Acute Exposure to Product:

Inhaled: Low acute toxicity. May be somewhat irritating to upper respiratory tract. Severe overexposure causes central nervous system depression with dizziness, disorientation, headache, excitation, drowsiness, incoordination, anaesthesia, respiratory and cardiac effects. Very high concentrations can cause unconsciousness and death.

In contact with skin: May cause defatting, resulting in drying, redness and possibly blistering. Massive skin exposure may cause systemic effects with symptoms as in "Inhaled"

In contact with eyes: Liquid and vapour may cause slight, temporary eye irritation, including pain, inflammation of the iris and mucous membranes, redness and tearing.

Ingested: Animal testing indicates low toxicity by ingestion. Ingestion of large doses may cause nausea, vomiting, diarrhea, headache, dizziness, and other symptoms of CNS depression. Aspiration of the liquid, during ingestion or vomiting can cause pulmonary edema, which can be fatal.

Effects of Chronic Exposure to Product:

Repeated or prolonged skin contact can cause dermatitis. Peripheral neuropathy and blood disorders have been observed, but only in cases where there has been exposure to

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other solvents in combination with cyclohexane. No conclusions can be drawn regarding cyclohexane.

Carcinogenicity: Not listed as carcinogenic by IARC, NTP, OSHA.

Teratogenicity: Insufficient data available. Probably not teratogenic.

Reproductive Effects: No human or animal information available.

Mutagenicity: Negative in Ames test. Positive in one study with cultured lymphocytes.

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Local, non-sparking, grounded exhaust ventilation system required.

Respiratory Protection: Up to 1,300 ppm: NIOSH approved continuous-flow supplied-air respirator, or full facepiece chemical cartridge respirator with organic vapour cartridges or full facepiece supplied-air respirator. Higher or unknown concentrations, as in fire or spill conditions: positive pressure, full facepiece self-contained breathing apparatus, or positive pressure, full face-piece air-supplied respirator with an auxiliary positive pressure self-contained breathing apparatus.

Eye Protection: Chemical goggles and/or face shield.

Skin Protection: Nitrile rubber, Viton™, Barricade™, SilverShield/4H (polyethylene/ethylene vinyl alcohol), Responder, Tychem BR/LV, Tychem TK, gloves. Other impervious protective clothing (apron, sleeves, coveralls, splash suit, boots) sufficient to prevent contact.

Other Personal Protective Equipment: Safety shower and eye bath located close to chemical exposure area.

Leak and Spill Procedure: Eliminate all sources of ignition. Evacuate area. Cleanup personnel must be thoroughly trained in the hazards of this chemical and must wear protective equipment and clothing sufficient to prevent inhalation of vapours or mists and contact with skin and eyes. Stop or reduce discharge if safe to do so. Contain spill with inert absorbent (sand, earth). Prevent from entering sewers or waterways. Recover product and collect contaminated soil for disposal. For small spills, contain by applying inert absorbent. Collect waste for disposal. Contaminated absorbent may pose the same hazards as the spilled product. Flush area of spill with running water.

Waste Disposal: Follow all federal, provincial, and local regulations.

Handling Procedures and Equipment: EXTREMELY FLAMMABLE. Workers must be thoroughly trained in the handling of hazardous materials and in the hazards of this material and its safe use, and must wear protective equipment and clothing sufficient to prevent inhalation of mists or vapours and contact with skin and eyes. Eliminate all ignition sources. Post "No Smoking" signs. Ground and bond drums, transfer vessels, hoses and piping, during liquid transfer. Ground clips must contact bare metal. Use spark-resistant tools and avoid "splash filling" of containers. Keep storage and work areas free of combustible or incompatible materials. Avoid generating mists or vapours. Avoid all contact and inhalation. Use the smallest possible amount in a well ventilated area. Keep aisles and exits clear of obstruction. Treat empty containers with caution; may contain hazardous residues. Keep away from any incompatible materials.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight

and away from all sources of ignition and incompatible materials. Keep tightly closed when not in use. Protect from damage. Inspect regularly for signs of leaking or damage. Keep storage area clear of combustible materials. Ground and bond equipment and containers to prevent a static charge buildup. Storage area should be made of non-combustible material and should have raised sills or ramps at doorways.

FIRST AID MEASURES

Specific Measures:

Eyes: Immediately flush eyes with gently running water for five to ten (5-10) minutes, holding eyelids open during flushing, until no trace of chemical remains. Take care not to flush contaminated water into unaffected eye. Get medical attention.

Skin: Remove contaminated clothing (including shoes, watches, belts, and rings). Wash affected areas with soap and large amounts of running water for five to ten (5-10) minutes, or until no trace of chemical remains. If irritation persists, or if exposure was extensive, get medical advice. Decontaminate clothing before reuse, or discard.

Inhalation: IMMEDIATELY remove to fresh air (rescuers must use caution to avoid exposure to contaminating fumes). Give oxygen and get medical attention for any breathing difficulty. If breathing has stopped give artificial respiration. Stay with casualty until medical assistance is reached.

Ingestion: DO NOT INDUCE VOMITING. Danger of aspiration with emesis. If casualty is alert and NOT convulsing, rinse out mouth with water, and give 2 to 4 glasses of water to drink to dilute. Get medical attention. If spontaneous vomiting occurs have casualty lean forward with head down to avoid breathing in of vomitus.

REFERENCES USED

- NIOSH Pocket Guide to Chemical Hazards; Pub. # 2005-151
CCINFO disc: Cheminfo, MSDS's
Budavari: The Merck Index, 12th ed., 1997
Royal Society of Chemistry, Chemical Safety Data Sheets, Vol. 1, 1992
Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: March 1, 1989

Revision: September 2010

MSDS: 3200-1, 3200-2, 3200-3, 3200-30, 3201-2, 3201-7, 3202-2

Proposed WHMIS Designation: B2

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