

Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name Hexane
Synonyms normal hexane, n-hexane & (rarely used) hexyl hydride
CAS# 110-54-3
EC# 203-777-6
Product Uses fast evaporating solvent – oil extraction from oilseed, rubber cement, reagent, gasoline component

EMERGENCY INFORMATION

Canada Call CANUTEC (collect) (613) 996-6666
 U.S.A. Call CHEMTREC (800) 424-9300

2. HAZARDS

GHS Class (Category)	<i>flammable (2)</i>	<i>aspiration tox. (1)</i>	<i>STOT acute (3)</i>	<i>STOT chronic (2)</i>
Signal Words	DANGER	DANGER	WARNING	WARNING
Hazard Statements	<i>highly flammable liquid & vapour (H225)</i>	<i>may be fatal if swallowed & enters airways (H304)</i>	<i>may cause drowsiness or dizziness (H336)</i>	<i>may cause damage to nervous system on prolonged inhalation (H373)</i>



GHS Precautionary Statements for Labelling

P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.
 P240 Ground or bond container and receiving equipment.
 P241 Use explosion-proof electrical, ventilating and lighting equipment.
 P242 Use only non-sparking tools.
 P243 Take precautionary measures against static discharge.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear eye protection, protective gloves of nitrile or "Viton".
 P313 & P333 If skin irritation or rash occurs, get medical advice/attention.

Canada – WHMIS

Key: **B 2** – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C
D 1 – Immediately Toxic, **D 2** – Chronic Toxicity
C – Oxidising Substance, **E** – Corrosive, **F** – Reactive Substance



3. COMPOSITION

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
Hexane	100	50 / 176 (skin)	15,800	>3300	42,600

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4. FIRST AID

- SKIN: *Evaporates rapidly*. If necessary, wash with plenty of water. For pure hexane, remove clothing & allow to dry. If hexane is contaminated with other substances, remove wet clothing. Do not reuse until cleaned.
- EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. FIRE FIGHTING & FLAMMABILITY

- Flash Point -22°C / -7°F (closed cup); also -26°C / -15°F (closed cup) – **highly flammable!**
- Autoignition Temperature 225°C / 437°F
- Flammable Limits 1.1% – 7.5%
- Combustion Products carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
- Firefighting Precautions CO₂, foam, dry chemical, water fog or spray only to cool, product floats on water – water jet spreads flames; firefighters must wear SCBA
- Static Charge Accumulation accumulates a static charge on agitation or pumping; **ignites readily with static discharge**

6. ACCIDENTAL RELEASE MEASURES

Very Serious Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take extreme care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

- Leak Precaution dyke to control spillage and prevent environmental contamination
- Handling Spill ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and oxidising agents. **Always use non-sparking bronze or aluminium hand tools. All electrical and mechanical equipment (including lighting, switchgear and forklift trucks) used with or around this product must be explosion-proof.**

Always ground or electrically bond the source container, receiving container & pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container.

Avoid generating or breathing product vapour. If vapour forms in use install adequate ventilation (Part 8). If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour cartridge.

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

Hexane has a mild, pleasant odour; inadequate warning of intoxication hazard – which the victim may be unaware of!

WHEN FILLING STORAGE TANKS WITH HEXANE, IN ADDITION TO NORMAL GROUNDING PROCEDURES, READ THE FOLLOWING:

This product may form an explosive mixture inside a bulk storage tank. Prior to filling a bulk storage tank with this product, consider ventilating the headspace with nitrogen. In addition, consider asking the supplier to put an anti-static additive in the product when you order. If the bulk tank has a floating product level indicator, this should be inspected regularly. The float MUST HAVE a firmly fixed ground wire connecting it to its support cable. This connection must be free of corrosion.

Consult NFPA 77, 2007: "Recommended Practice on Static Electricity"

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8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	50ppm / 176mg/m ³ (<i>n</i> -hexane)	Ontario STEV	not listed
	500ppm / 1760mg/m ³ (<i>other isomers of hexane</i>)	Ontario STEV	1000ppm / 3520mg/m ³
ACGIH TLV	50ppm / 176mg/m ³	ACGIH STEL	not listed
OSHA PEL	500ppm / 1800mg/m ³	OSHA STEL	not listed
Ventilation	hexane is highly volatile – use in sealed equipment ; mechanical ventilation (explosion-proof) may be required to control airborne vapour to regulated limits; depending on handling procedures; respirators with organic vapour cartridges must be available for “escape” purposes should containment fail; <i>store respirators in air-tight containers (eg: “Tupperware”, “ZipLock”) to preserve cartridge “freshness”</i>		
Hands	nitrile or “Viton” gloves may be used – <i>other types also protect; consult supplier to confirm suitability</i>		
Eyes	safety glasses with side shields – <i>always protect the eyes</i>		
Clothing	no special protective clothing required		

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless, mobile liquid with pleasant gasoline odour
Odour Threshold	>60ppm – <i>the odour is a poor guide to presence of harmful concentrations</i>
Vapour Pressure	120mmHg / 16kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	8
Vapour Density (air = 1)	3
Boiling Range	63-69°C / 145-156°F
Freezing Point	-95°C / -140°F
Specific Gravity	0.67-0.68 (20/20°C)
Water Solubility	10 milligrams per litre (20°C / 68°F)
Also soluble in	most organic solvents
Log P _{O/W} (Octanol/H ₂ O partition)	not known
Viscosity	0.3centipoise (25°C / 77°F) – <i>very thin, mobile liquid</i>
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 3.52g/m ³
Molecular Weight	86grams per mole

NOTE: Physical properties may vary depending on the presence of hexane isomers.

10. REACTIVITY

Dangerously Reactive With	strong oxidising agents; chlorine, fluorine, NO ₂ & N ₂ O ₄ can cause ignition or explosion
Also Reactive With	damages certain plastics – <i>check your equipment for its ability to resist hexane</i>
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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11. TOXICITY

Effects, Acute Exposure

Skin Contact	drying, mild irritant, or not irritating ¹ – <i>rapid evaporation limits potential for skin exposure</i>
Skin Absorption	some; no toxic effects likely by this route due to low general toxicity
Eye Contact	mildly irritating, or not irritating ¹ – rapid evaporation limits exposure
Inhalation	5000ppm causes headache, dizziness, drowsiness, intoxication, anaesthesia <i>A high vapour concentration is readily achieved due to hexane's volatility.</i>
Ingestion	poorly absorbed, low toxicity; nervous system symptoms possible; nausea may result – vomiting could result in inhalation into the lungs and serious lung damage
LD ₅₀ (oral)	15,800, 28,670 & 32,290mg/kg (rat), 20,000mg/kg (mouse), >16,000mg/kg (rat) ¹
LD ₅₀ (skin)	>3300mg/kg (rabbit), >2000mg/kg (rabbit) – <i>no mortality reported</i> ¹
LC ₅₀ (inhalation)	42,600ppm (mouse), 48,000 & 74,000ppm (rat)

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis; prolonged inhalation to 30–2500ppm may cause peripheral neuropathy (numbness/tingling of hands & feet); <i>blurred vision, poor colour discrimination & visual field constriction associated with 5-yr exposure to 425-1280ppm</i>
Sensitising	not a sensitizer in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans; testicular damage observed in rats at a dose close to the LD ₅₀ ¹
Mutagen	no known effect on humans; or animals – <i>evidence of mutagenic activity in rodents is equivocal</i>
Synergistic With	effects of hexane enhanced by exposure to methyl ethyl ketone & lead acetate

12. ECOLOGICAL INFORMATION

Bioaccumulation	not a bioaccumulator ¹
Biodegradation	hexane biodegrades readily in the presence of oxygen: 17% in 72 hours (closed incubation); in aerated sewage treatment facility: 99% in 24 hours – <i>much is volatilised; % biodegraded unknown</i>
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 5hours; photodegradation in aquatic medium 50% in 24 hours
Mobility in soil, water	water insoluble; cannot move in soil or water; rapid volatilisation from soil or water limits likelihood of soil or ground water contamination
Aquatic Toxicity	<i>little data available – volatility makes testing difficult</i>
LC ₅₀ (Fish, 96hr)	4mg/litre (Carassius auratus), >1 mg/litre (Oryzias latipes) ¹ , 12.5mg/litre (OSAR estimate) ¹
EC ₅₀ (Crustacea, 24hr)	50mg/litre (Daphnia magna) – <i>this concentration must be emulsified into water</i> , 21.8mg/litre (OSAR estimate) ¹
EC ₅₀ (Algae)	9.3mg/litre (OSAR estimate) ¹ ; 500mg/litre was toxic to bacteria in sewage sludge . . .
EC ₅₀ (Microbes)	10.8 & 48.4mg/litre (OSAR estimate) ¹

13. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, or incinerate in approved facility
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

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14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN - 1208
AND	Shipping Name	hexanes
U.S.A. 49 CFR	Class & Packing Group	3 (II)
Marine Pollutant		not a marine pollutant
ERAP Required		NO

**15. REGULATIONS**

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory

U.S.A. Regulations

Immediately Dangerous to Life or Health: 1100 ppm (Based on 10% of the lower explosion limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.)

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 500 ppm (1800 mg/cu m). Vacated 1989 OSHA PEL TWA 50 ppm (180 mg/cu m) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hour Time-Weighted Average: 50 ppm (180 mg/cu m).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 50 ppm, skin. Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a work day, and under no circumstances should they exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded. Biological Exposure Index (BEI): Determinant: 2,5-hexanedion (without hydrolysis) in urine; Sampling Time: end of shift at end of workweek; BEI: 0.4 mg/L.

Atmospheric Standards: Listed as a hazardous air pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Hexane is included on this list.

State Drinking Water Standards: New Jersey 30 ug/L

State Drinking Water Guidelines: Arizona 4000 ug/L, Florida 10 ug/L, Maine 420 ug/L, Minnesota 400 ug/L, New Jersey 30 ug/L, Wisconsin 600 ug/L

CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV.D.3.b).

FDA Requirements: Hexane is an indirect food additive for use only as a component of adhesives.

16. OTHER INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

Data from **RTECS**, **HSDB** (Haz. Substance Data Base), **Cheminfo** (CCOHS), **IUCLID Datasheets** (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: **November 2003** Revision Date: **July 2006, November 2008, November 2011, November 2014**

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