Established in 1981
megaloid laboratories limited
2221 Ninth Line | Oakville, ON L6H 7G7
Phone: 905-337-7411 | Fax: 905-337-1686
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Material Safety Data for: Hexane

1. PRODUCT INDENTIFICATION

Name	**hexane**
Synonyms	**normal hexane, n-hexane**
CAS#	**110-54-3**
EC#	**203-777-6**
Product Uses	**solvent – oil extraction from oilseed, rubber cement, reagent, gasoline component**

2. INGREDIENTS

	%	TWAEV / TLV 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

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: highly flammable liquid, heavy vapour travels, distant ignition & flashback possible; nervous system toxin

Canada – WHMIS	**B 3, D 2B**
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*
U.S.A. – HMIS	**Health – 1, Fire – 4, Reactivity – 0**
Key:	***0****=minimal,* ***1****=slight,* ***2****=moderate,* ***3****=serious,* ***4****=severe*

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	drying, mild irritant – rapid evaporation limits exposure
Skin Absorption	some; no toxic effects likely by this route due to low general toxicity
Eye Contact	mildly irritating – rapid evaporation limits exposure
Inhalation	5000ppm causes headache, dizziness, drowsiness, intoxication, anaesthesia ***A high vapour concentration is readily achieved due to the high vapour pressure of Hexane.***
Ingestion	poorly absorbed, low toxicity; nervous system symptoms possible; nausea may result – vomiting could cause inhalation into the lungs ***and serious lung damage***

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis; prolonged exposure to as little as 30ppm, up to 2500ppm by inhalation may cause peripheral neuropathy (numbness/tingling of hands & feet); *blurred vision, poor colour discrimination & visual field constriction associated with 5-yr exposure to 425-1280ppm*
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 in rats at doses also producing other clear symptoms
Mutagen	no known effect on humans or animals
Synergistic With	effects of hexane enhanced by exposure to methyl ethyl ketone & lead acetate
LD_{50} (oral)	15,800, 28,670 & 32,290mg/kg (rat); 20,000mg/kg (mouse)
LD_{50} (skin)	>3300mg/kg (rabbit)
LC_{50} (inhalation)	42,600ppm (mouse), 48,000 & 74,000ppm (rat)

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4. FIRST AID

SKIN: ***Evaporates rapidly***. Wash with plenty of water. If exposed to pure hexane, remove clothing & allow to dry. If hexane is contaminated with other substances, remove wet clothing & do not reuse until thoroughly 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. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with pleasant gasoline odour
Odour Threshold	>60ppm – *above TWAEV / TLV; odour poor guide to presence of harmful concentrations*
Vapour Pressure	120mmHg / 16kPa (20°C / 68°F)
Evaporation Rate (*Butyl Acetate = 1*)	8
Vapour Density (air = 1)	3
Boiling Range	60-70°C / 140-158°F
Freezing Point	-95°C / -140°F
Specific Gravity	0.67 (20/20°C)
Water Solubility	10 milligrams per litre (20°C / 68°F)
Also soluble in	most organic solvents
Viscosity	0.3centipoise (25°C / 77°F)
pH	none – (*does not liberate hydrogen ions when dissolved*)
Conversion Factor	1ppm = 3.52g/m^3
Molecular Weight	86grams per mole

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

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	-22°C / -7°F (closed cup); also -26°C / -15°F (closed cup)
Autoignition Temperature	225°C / 437°F
Flammable Limits	1.1% – 7.5%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	CO_2, foam, dry chemical, water fog or spray only to cool, product floats on water – water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	readily accumulates a static charge on agitation or pumping; *easily ignited by static discharge*

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; chlorine, fluorine, NO_2 & N_2O_4 can cause ignition or explosion
Also Reactive With	damages certain plastics – *check your equipment for its ability to resist hexane*
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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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

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

9. 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.***

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

Avoid breathing product vapour. Use with adequate ventilation. 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, which does not warn 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"

10. SPILL PROCEDURES

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 explosion-proof pumps; absorb residue (*much of this will evaporate*) on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal	**do not flush to sewer**, recycle solvent if possible, may be incinerated 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. ***Never cut, drill, weld or grind on or near this container, even if empty***

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12. ENVIRONMENTAL INFORMATION

Bioaccumulation	*in theory* hexane is a bioaccumulator; very rapid volatilisation & low water solubility limit this
Biodegradation	hexane degrades readily in the presence of oxygen: 17% in 72 hours (closed incubation); in well-aerated sewage treatment facility: 99% in 24 hours – *much volatilised; % biodegraded unknown*
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated half-life in air is 5hours; photodegradation in aquatic medium 50% in 24 hours
Mobility in soil, water	water insoluble and cannot move in soil or water; volatilisation from soil or water is rapid, limiting the likelihood of contamination of soil or ground water
Aquatic Toxicity	
LC_{50} (Fish, 96hr)	4mg/litre (Carassius auratus)
EC_{50} (Crustacea, 24hr)	50mg/litre (Dapnia magna) – *this concentration must be emulsified into water*
EC_{50} (Algae)	not known, but 500mg/litre was toxic to bacteria in sewage sludge . . .

13. TRANSPORT REGULATIONS

Canada TDG	**PIN**	**UN-1208**
AND	**Shipping Name**	**hexanes**
U.S.A. 49 CFR	**Class**	**3**
	Packing Group	**II**
Marine Pollutant		**not a marine pollutant**

14. EMERGENCY INFORMATION

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

15. REGULATIONS

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

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 efects or impairment of escape existed only at higher concentrations.) [REF-29]
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 Hr Time-Weighted Avg: 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; In the Washington D.C. metropolitan area (202) 426-2675. 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. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577
With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available
Preparation Date: ***November 2003*** *Revision Date*: ***July 2006, November 2008***, ***November 2011***

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