

Section 1 – Chemical Product and Company Identification

MSDS Name: Dibutylmagnesium (DBM) in Hexane

Chemical Family: Alkylmagnesiums

Molecular Formula: (C₄H₉)₂Mg

Synonyms: n-Butyl-1-Methylpropylmagnesium

Use of the substance: Industrial manufacturing

Company: Optima Chemicals Group, LLC
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Emergencies: Telephone (912) 384-5101

Section 2 – Hazards Identification

Hazards:

Highly flammable liquid and vapor. Causes severe skin burns and eye damage. May cause drowsiness or dizziness. May cause damage to organs, central nervous system, peripheral nervous system through prolonged or repeated exposure. May be fatal if swallowed and enters airway. Suspected of damaging fertility or the unborn child. Toxic to aquatic life with long lasting effects.

Prevention – Keep away from heat, sparks, open flame – no smoking. Keep container tightly closed . Wear chemical splash goggles with a face shield, rubber gloves and rubber clothing. Take precautionary measures against static discharge. Ground bond container and receiving equipment. Use explosion proof electrical, ventilation and lighting equipment. Use only non-sparking tools. Do not breathe dust or mist. Wash thoroughly after handling. Use only outdoors or in well-ventilated areas. Do not breathe vapors. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid release to the environment.

Response – In case of fire , use dry chemical for extinction. DO NOT USE WATER OR CARBON DIOXIDE.

Symbols: Flame, corrosion, health hazard, environment, exclamation point.

Signal Word: Danger

Classification: Substances and mixtures, which on contact with water, emit flammable gases; 1, Flammable liquids; 2, Corrosive to skin and eyes; 1, Aspiration hazard; 1, Reproductive toxicity; 2, Specific target organ systematic toxicity-single exposure;3, repeated exposure;2, Aquatic environment-chronic;1.

Section 3 – Composition, Information on Ingredients

<u>CAS #</u>	<u>Chemical Name</u>	<u>Wt.%</u>
39881-32-8	Dibutylmagnesium	12-20
24219-37-2	Diocetyl magnesium	2-5
Not available	hexanes	70-90

Section 4 – First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, lifting upper and lower lids intermittently. See a medical doctor or ophthalmologist immediately.

Skin: Quickly wipe off as much as possible, then immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and/or shoes. Thoroughly wash with soap and water, and seek medical attention if necessary.

Ingestion: Quickly wipe material from the mouth, and rinse mouth out with plenty of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention.

Inhalation: Remove from exposure, to fresh air immediately. If breathing difficulty or discomfort persists, see a medical doctor. If not breathing give artificial respiration, and see a medical doctor immediately.

Notes to Medical Doctor: This material is expected to be corrosive to eyes, skin, and mucous membranes. Contains hydrocarbons that can produce severe pneumonia or fatal pulmonary edema if aspirated. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure followed by symptomatic and supportive care.

Section 5 – Fire Fighting Measures

Flammable Limits: Hexane- Upper: 7.7% Lower: 1.2%

General Hazard: Flammable liquids, reacts violently to water to give off flammable fumes and corrosive dust.

Fire Extinguishing Agents Recommended: DO NOT USE WATER OR CARBON DIOXIDE, use a dry chemical powder.

Hazardous Combustion Products: Carbon dioxide, carbon monoxide, magnesium oxide fumes.

Special Fire fighting Procedures: Wear self-contained breathing apparatus and full protective clothing, approved for fire fighting. This is necessary to protect against heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

Autoignition temperature: not available

Properties contributing to flammability: Water reactivity of product, and volatility of solvents.

Flashpoint: hexane is -26°C

Sensitivity to Static Discharge: Yes

Sensitivity to Impact: None

Section 6 – Accidental Release Measures

Remove all sources of ignition. Do not use water in the initial phases of clean up.. Contain spill with absorbent. Transfer to approved transport container and clean up spillage with an absorbent. Dispose of waste according to local, state and Federal laws and regulations. Before cleanup measures begin, review the entire MSDS with particular attention to Section 3, and Section 8.

Section 7 - Handling and Storage

Handling: Do not get in eyes, on skin or clothing. Do not breathe vapors or mist. Use in a closed system under argon or nitrogen.

Storage: Store in cool, dry place. Store in tightly closed container. Keep away from sources of ignition, water, air, acids and oxidizing materials.

Section 8 – Exposure Controls, Personal Protection

Exposure Limits:

n-hexane - PEL (OSHA) - 500 ppm, TWA (ACGIH) – 50ppm, STEL/Ceiling (OSHA) – None, STEL/Ceiling (ACGIH) – None.
Other hexanes- PEL (OSHA) - None, TWA (ACGIH) – 500ppm, STEL/Ceiling (OSHA) – None, STEL/Ceiling (ACGIH) – 1000ppm.
Butane(aliphatic hydrocarbon gases; C₁-C₄), Hydrolysis product of dibutylmagnesium- PEL (OSHA) - None, TWA (ACGIH) – 1000 ppm, STEL/Ceiling (OSHA) – None, STEL/Ceiling (ACGIH) –None.

Engineering Controls: Use in closed system under argon or nitrogen. If personal contact can occur, use local exhaust ventilation (explosion proof), to keep airborne concentrations below exposure limits.

Eyes and Face: Wear splash goggles with a face shield.

Skin: Chemical resistant gloves and clothing.

Respiratory: When engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for protection against organic vapors, dusts and mists.

Work Hygienic Practices: Quick-drench eyewash and safety shower.

Section 9 – Physical and Chemical Properties

Appearance and Odor: Clear, water-white to pale yellow liquid, gasoline like odor.

Melting Point: Hexane, -95°C

Boiling Point: Hexane, 62-69°C

Flash Point: : Hexane is -22°C (-9°F)

Vapor Pressure: Hexane, 5.6psi @ 38°C

Vapor Density :(Air = 1) approx. 3

pH: reacts violently with water giving mixture with PH > 12

Specific Gravity: 0.705 g/ml

Percent Volatile: 80 -88

Water Solubility: reacts violently with water

Evaporation Rate: 7.1- 8.4 (hexane)

Flammable Limits: Hexane, Upper 7.7% Lower 1.2%

Autoignition Temperature: Not available

Viscosity: Not available

Decomposition Temperature: Not available

Explosive Properties: Not explosive

Oxidizing Properties: Not an oxidizer

Molecular Weight: 138.54 (DBM);
250.74 (dioctylmagnesium)

Section 10 – Stability and Reactivity

Stability: Stable

Incompatibility: water, air , strong oxidizers and acids

Hazardous Polymerization: Does not polymerize

Hazardous Decomposition Products: Magnesium oxide fumes, butane gas

Conditions to Avoid: Contact with water and air

Section 11 – Toxicological Information

Eyes: No data available: DBM, Corrosive.

Skin: No data available: DBM, Corrosive.

Ingestion: No data available: DBM, Corrosive.

Inhalation: No data available:..DBM, Corrosive. n-Hexane: LC₅₀ = 48000 ppm/4H (rat)

Acute Effects from Overexposure: This product contains an alkylmagnesium compound which is extremely corrosive to the skin and eyes(may cause blindness), nose, throat, stomach. Inhalation of vapors may cause dizziness, nausea, anesthesia, numbness, burning sensation and motor weakness in fingers and toes, incoordination, and headache.. Low viscosity material, if swallowed may enter the lungs and cause lung damage. N-hexane; may cause peripheral nervous system disorder and/or damage. Blurred vision is associated with hexane polyneuropathy.

Chronic Effects from Overexposure: No data available.. Overexposure to n-hexane may cause progressive and potentially irreversible damage to the peripheral nervous system, particularly to the arms and legs. The neurotoxic effects of n-hexane can be enhanced in rats by both Methyl ethyl ketone and lead acetate. The available information does not suggest that n-hexane is mutagenic. Negative results were obtained in most tests using live animal and relevant routes of exposure. n-hexane has caused severe testicular damage in male rats in concentration that has produced significant other toxicity.

Sensitization: No

Carcinogenicity: Not listed by NTP, OSHA, EH40. IARC, or ACGIH.

Mutagenicity: No data available, The available information does not suggest that n-hexane is mutagenic. Negative results were obtained in most tests using live animal and relevant routes of exposure. Butane; negative results were reported on short term tests using bacteria.

Reproductive Toxicity: No, n-hexane has caused severe testicular damage in male rats in concentration that has produced significant other toxicity.

Section 12 – Ecological Information

Ecotoxicological Information: toxicity testing has not been carried out. n-hexane: 24h LC₅₀ = 4 mg/L (goldfish) [Env. Data on Org. Chem., 4th ed] 96th LC₅₀= 1079mg/L (Algae) [Env. Data on Org. Chem, 4th Ed], 48h EC₅₀ = 2.1 mg/L (daphnia) [Env. Data on Org. Chem, 4th ed].

Chemical Fate Information: No data available. Dibutylmagnesium reacts violently with water to form butane, octane and magnesiumhydroxide.

Hexane readily volatilizes, biodegrades in soil and water and wastewater treatment plants. Absorbs to organic matter in aquatic systems, has low mobility in soil. Log BCF-2.24 to 2.89

Section 13 – Disposal Considerations

Dispose of in accordance with federal, state, and local regulations.

Section 14 – Transport Information

DOT Shipping; Organometallic substance, liquid, water reactive, n.o.s.,(Dibutylmagnesium in Hexane),4.3,(3), UN3399, PG I

Labels: Dangerous when wet, flammable

Marine Pollutant: No

Custom Tariff Number: 2931.00.9160

PIH: Not designated Poison Inhalation Hazard by US DOT.

Section 15 – Regulatory Information

United States:

Section 311 Hazard Category (40CFR 370): immediate(acute) health hazard, delayed(chronic) health hazard, fire hazard, reactive.

Section 313 Reportable Ingredients (40 CFR 372): Emergency Planning and Community Right To Know Act of 1986.

Section 302 Extremely Hazardous Substances (40 CFR 355): Not listed.

CERCLA Hazardous Substance, RQ, (40 CFR 302.4): Reportable quantity is 5000 lbs.

TSCA Sec 12B Export Notification: No.

TSCA Inventory Status (40 CFR 710): Listed

Canada:

WHMIS: Hazard Classification – UN 3399, Class B, Division 6 (Reactive Flammable Materials), Class E, (Corrosive), Class D, division 2B (toxic material with chronic effects)
Ingredient Disclosure List: hexane is listed.

Section 16 – Additional Information

Creation Date: 1/28/2010

This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS) requirements.

This information is believed to be accurate and represents the best information currently available to Optima Chemical Group LLC. However, we make no warranty of merchantability, express or implied, with respect to such information and assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.