

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: n-Butyllithium in Hexane
CHEMICAL FAMILY: Alkylolithiums
MOLECULAR FORMULA: C₄H₉Li
SYNONYM(s): Normal Butyllithium
GENERAL USE: Industrial Manufacturing

MANUFACTURER
FMC CORPORATION
Lithium Division
P.O. Box 795
Bessemer City, NC 28016-0795
General Information: (704) 868-5300

Emergency Telephone Numbers:
CHEMTREC (800) 424-9300
Emergency Phone (704) 629-5361 (Plant) Call Collect 24 Hr/Day
Emergency Phone (303) 595-9048 (Medical) Call Collect

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Pyrophoric liquid; Category 1
Substances which on contact with water, emit flammable gases; Category 1
Flammable liquid; Category 2
Corrosive to skin; Category 1
Corrosive to eyes; Category 1
Aspiration hazard; Category 1
Reproductive toxicity; Category 2
Specific target organ systemic toxicity – Single exposure; Category 3
Specific target organ systemic toxicity – Repeated exposure; Category 2
Hazardous to the aquatic environment – Chronic; Category 1

LABELING:

SYMBOLS: Flame, corrosion, health hazard, environment, exclamation mark
SIGNAL WORD: Danger
HAZARD STATEMENTS: Catches fire spontaneously if exposed to air
In contact with water releases flammable gases, which may ignite spontaneously
Causes severe skin burns and eye damage
Highly flammable liquid and vapour
May be fatal if swallowed and enters airways
May cause drowsiness or dizziness
May cause damage to the central nerve system or peripheral nerve system through prolonged or repeated exposure
Suspected of damaging fertility or the unborn child
Toxic to aquatic life with long term effects

PRECAUTIONARY STATEMENTS:

Prevention:
Do not allow contact with air.
Keep from any possible contact with water, because of violent reaction and possible flash fire.
Handle under inert gas, protect from moisture.
Keep away from ignition sources such as heat/sparks/open flame- No smoking.
Keep container tightly closed.
Wear chemical splash goggles with a face shield, rubber gloves and

rubber clothing.
Wash thoroughly after handling.
Ground/Bond container and receiving equipment.
Use only outdoors or in well ventilated area.
Do not breathe vapours.
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.
Avoid release to the environment.

Response

In case of fire DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical. Collect spillage

First Aid

See Section 4 of the MSDS.

Storage

See Section 7 of the MSDS.

Disposal

See Section 13 of the MSDS.

COMMENTS:

(See Section 11, Toxicological Information)

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	<u>CAS #</u>	<u>EC No.</u>	<u>Wt.%</u>	<u>Classification, Hazard Statement Codes</u>
n-Butyllithium	109-72-8	203-698-7	10 - 30	Water-react. Cat. 1 H260 Pyr. Sol. Cat. 1 H250 Skin Corr. Cat 1A H314
hexanes*	not available	203-777-6	70 - 90	Information is for hexane, CAS# 110-54-3 Flam liq. Cat. 2 H225 Repr. Cat. 2 H361f Asp. Tox. Cat. 1 H304 STOT Rep. Cat. 2 Skin H373 Irrit. Cat. 2 H315 STOT Single Cat. 3 H336 Aquatic Chronic Cat. 2 H411

* contains n-hexane, CAS# 110-54-3

4. FIRST AID MEASURES

EYES:

Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN:

Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. Obtain immediate medical attention. Contact a medical doctor if necessary.

INGESTION:

Quickly wipe material from the mouth and rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION:

Remove to fresh air. If breathing discomfort occurs and persists,

see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately.

NOTES TO MEDICAL DOCTOR:

Product is highly alkaline and is corrosive to the eyes, skin and mucous membranes. 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.

5. FIRE FIGHTING MEASURES

FLAMMABLE LIMITS:

Not applicable for formulation. For hexane: Upper: 7.7% Lower: 1.2%

GENERAL HAZARD:

Pyrophoric. Flammable liquid.

EXTINGUISHING MEDIA:

DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.

HAZARDOUS COMBUSTION PRODUCTS:

Lithium hydroxide, carbon monoxide, carbon dioxide.

FIRE FIGHTING PROCEDURES:

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

AUTOIGNITION TEMPERATURE:

Not available

PROPERTIES CONTRIBUTING TO

Water reactivity (pyrophoricity) of product, and volatility of solvents.

FLAMMABILITY:

FLASH POINT:

Not applicable for formulation. The flashpoint of hexane is -26 C°.

SENSITIVITY TO STATIC DISCHARGE:

Yes

SENSITIVITY TO IMPACT:

Not applicable

COMMENTS:

(See Section 10, Stability and Reactivity)

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES:

Remove all sources of ignition. Spilled material can catch fire spontaneously on contact with air, moisture, acids or oxidizing materials. Cover spill with dry extinguishant. DO NOT USE WATER OR CARBON DIOXIDE. Contain spill with absorbant. Expose to air until solvent has dissipated. Sweep up and place in approved transport container. Dispose of waste according to local and Federal laws and regulations.

Before cleanup measures begin, review the entire MSDS with particular attention to Section 3, Emergency Overview and Potential Health Effects; and Section 8, Recommended Personal Protective Equipment.

7. HANDLING AND STORAGE

HANDLING:

KEEP AWAY FROM WATER, AIR AND OXIDIZING MATERIALS. Wear full face protection and gloves. Use in a closed system under argon or nitrogen.

STORAGE:

Keep away from heat, sparks and flame. Protect storage container from leaks and physical damage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

Chemical Name

TWA

STEL/Ceiling

PEL

STEL/Ceiling

	<u>(ACGIH)</u>	<u>(ACGIH)</u>	<u>(OSHA)</u>	<u>(OSHA)</u>
n-Hexane	50 ppm, skin		500 ppm	
other hexanes	500 ppm	1000 ppm		

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.

PERSONAL PROTECTIVE EQUIPMENT

Eyes And Face:

Chemical splash goggles with a face shield.

Respiratory:

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

Protective Clothing:

Rubber gloves and rubber clothing.

Work Hygienic Practices:

Quick-drench eyewash and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR:

Gasoline-like

APPEARANCE:

Clear, water-white to pale yellow liquid

pH:

Reacts violently with water giving mixture with pH >12

PERCENT VOLATILE:

70-90 varies with concentration

VAPOR PRESSURE:

Hexane: 5.6 psi @ 38°C

VAPOR DENSITY:

(air=1): Approximately 3

BOILING POINT:

Hexane: 62-69°C

MELTING POINT:

Hexane: -95. C°

SOLUBILITY IN WATER:

Reacts violently with water

EVAPORATION RATE (Butyl Acetate = 1):

7.1 – 8.4 (hexane)

SPECIFIC GRAVITY:

0.7-0.8 g.ml @ 20°C (68°F)

MOLECULAR WEIGHT:

64.06

COEFF. OIL/WATER:

Not applicable

ODOR THRESHOLD:

Not applicable

FLAMMABLE LIMITS:

Not applicable for formulation. For hexane: Upper: 7.7% Lower: 1.2%

FLASH POINT:

Not applicable for formulation. The flashpoint of hexane is -26 C°.

AUTOIGNITION TEMPERATURE:

Not available

VISCOSITY:

Not available

FLAMMABILITY:

Pyrophoric and water reactive material in flammable liquid solvent

DECOMPOSITION TEMPERATURE:

Not available

EXPLOSIVE PROPERTIES:

Not explosive

OXIDIZING PROPERTIES:

Not an oxidizer

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:

Heat, sparks or flames

STABILITY:

Stable

POLYMERIZATION:

Will not occur

HAZARDOUS DECOMPOSITION

Lithium hydroxide, lithium hydride, butane gas.

PRODUCTS:

INCOMPATIBLE MATERIALS:

Water, air, oxidizers, carbon dioxide, acids

11. TOXICOLOGICAL INFORMATION

Eye Contact:

No data available for the product.
n-Butyllithium: Corrosive.

<u>Skin Contact:</u>	No data available for the product. n-Butyllithium: Corrosive.	
<u>Skin Absorption:</u>	No data available for the product. n-Butyllithium: Corrosive.	
<u>Ingestion:</u>	No data available for the product. n-Butyllithium: Corrosive.	
<u>Inhalation:</u>	n-hexane: Oral LD ₅₀ = 25 g/kg (rat)	[RTECS]
	No data available for the product. n-Butyllithium: Corrosive.	
	n-hexane: Inhalation LC ₅₀ = 48000 ppm/4H (rat)	[RTECS]
	Butane (hydrolysis product): LC ₅₀ = 658 g/m ³ /4H (rat)	[RTECS]

Acute Effects From Overexposure:

No data available for the formulation. This product contains an alkyl lithium compound which is extremely reactive and corrosive to the skin, eyes (may cause blindness), nose, throat and 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 for product.

Hexane: Overexposure to n-hexane may cause progressive and potentially irreversible damage to the peripheral nervous system, particularly in the arms and legs. The neurotoxic effects of n-hexane vapour can be enhanced in rats by both methyl ethyl ketone (MEK) and lead acetate. The available information does not suggest that n-hexane is mutagenic. Negative results were obtained in most tests using live animals and relevant routes of exposure. n-Hexane has caused severe testicular damage in male rats at concentrations which have produced significant other toxicity.

Sensitization:

No
n-hexane: There have been no reports of skin sensitization in people occupationally exposed to n-hexane.

Carcinogenicity:

EH40: Not listed.
IARC: Not listed.
NTP: Not listed.
OSHA: Not considered a carcinogen under OSHA.
ACGIH: Not listed

Mutagenicity:

No.
Hexane: The available information does not suggest that n-hexane is mutagenic. Negative mutagenicity results were obtained in most tests using live animals and relevant routes of exposure.
Butane: Negative results were reported on short-term tests using bacteria.

Reproductive Toxicity:

No.
n-hexane: n-Hexane has caused severe testicular damage in male rats at concentrations which have produced significant other toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

Environmental toxicity testing of the product has not been carried out.

n-hexane:

24h LC₅₀ 4 mg/L (goldfish) [Handbook Env. Data on Org. Chem., 4th Ed]

48h EC₅₀ 2.1mg/L (daphnia) [Handbook Env. Data on Org. Chem., 4th Ed]
96h LC₅₀ = 1079 mg/L (algae) [Handbook Env. Data on Org. Chem., 4th Ed]

Chemical Fate Information:

n-Butyllithium: n-Butyllithium reacts violently with water to form butane and lithium hydroxide.
Hexane: Hexane readily volatilizes, biodegrades in soil, water and wastewater treatment plants, adsorbs to organic matter in aquatic systems, has low mobility in soil. Log BCF = 2.24 to 2.89.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of waste according to local and Federal laws and regulations.

14. TRANSPORT INFORMATION

UN NUMBER: UN3394
PROPER SHIPPING NAME: Organometallic substance, liquid, pyrophoric, water-reactive (n-butyllithium, hydrocarbon solution)
CLASSIFICATION: 4.2, Spontaneously combustible, (4.3, Dangerous When Wet)
LABELS: Spontaneously Combustible, Dangerous When Wet
PACKING GROUP: I
FLASH POINT: Not applicable for formulation. The flashpoint of hexane is -26 C°.
CUSTOM TARIFF NO: 2931.00.9160
MARINE POLLUTANT: No
PIH: Not designated Poison Inhalation Hazard by US DOT.

15. REGULATORY INFORMATION

UNITED STATES
SECTION 311 HAZARD CATEGORY (40 CFR 370): Immediate (acute) health hazard, delayed (chronic) health hazard, fire hazard, reactive
SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): This product contains hexane which is a substance subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986.
This information must be included in all MSDS's that are copied and distributed for this material.
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355): Not listed
CERCLA HAZARDOUS SUBSTANCE (40 CFR 302.4): n-Hexane and hexanes are listed. The reportable quantity is 5000 pounds.
TSCA SEC 12B EXPORT NOTIFICATION: This product is not subject to TSCA 12(b) Export Notification Requirements.
TSCA INVENTORY STATUS (40 CFR 710): Listed.
CANADA
WHMIS: Product Identification No.: 3394
Hazard Classification: 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

16. OTHER INFORMATION

REVISION SUMMARY: Revision # 5: Regular review conducted. Sections 2,3, 9, 11, 12 and 14 revised.

NFPA RATING

HEALTH: 3

FLAMMABILITY: 4

REACTIVITY: 3

SPECIAL: ♁

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.
type 4

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