

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: t-Butyllithium in Heptane
CHEMICAL FAMILY: Alkylolithium
MOLECULAR FORMULA: C₄H₉Li
SYNONYM(s): t-Butyllithium; 2-Lithio-2-Methylpropane
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. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	<u>CAS #</u>	<u>Wt. %</u>
tertiary-Butyllithium	594-19-4	15 - 30
Heptanes ¹	64742-49-0	70 - 85

¹ Contains predominately C7 isomers with remaining constituents C8 isomers. Contains n-heptane CAS# 142-82-5, and methylcyclohexane CAS# 108-87-2

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS:

Pyrophoric liquid. Can catch fire if exposed to air. Reacts violently with water to give off flammable gases and corrosive dusts.

POTENTIAL HEALTH EFFECTS:

Corrosive to eyes (may cause blindness), skin, nose, throat and stomach. Can catch fire on contact with body moisture or if exposed to air. Inhalation of vapors may cause dizziness, nausea, anesthesia, numbness, motor weakness in fingers and toes, incoordination, and headache. If ingested, may produce a lung aspiration hazard

COMMENTS:

(See Section 11, Toxicological Information)

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

INHALATION:

unconscious person. See a medical doctor immediately.
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 has a high pH and is corrosive to 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 heptane (approximate): Upper: 6.7% Lower: 1.1%

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 applicable

PROPERTIES CONTRIBUTING TO

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

FLAMMABILITY:

FLASH POINT:

Not applicable. The flashpoint of heptane is -7.8 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

<u>Chemical Name</u>	<u>TWA (ACGIH)</u>	<u>STEL/Ceiling (ACGIH)</u>	<u>PEL (OSHA)</u>	<u>STEL/Ceiling (OSHA)</u>
n-Heptane	400 ppm	500 ppm	500 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 vigorously to give pH > 12

PERCENT VOLATILE:

70-90

VAPOR PRESSURE:

44.6 mmHg @ 20°C (heptane, estimate)

VAPOR DENSITY:

Not available

BOILING POINT:

94-99 C° (heptane, approximate)

MELTING POINT:

Not available

SOLUBILITY IN WATER:

Reacts violently with water

EVAPORATION RATE(Butyl Acetate = 1):

5.0 (heptane, approximate)

SPECIFIC GRAVITY:

0.7 g/ml @ 20°C

MOLECULAR WEIGHT:

64.06

COEFF. OIL/WATER:

Not applicable

ODOR THRESHOLD:

Not applicable

FLAMMABLE LIMITS:

Not applicable for formulation. For heptane (approximate): Upper: 6.7% Lower: 1.1%

FLASH POINT:

Not applicable. The flashpoint of heptane is -7.8 C°

AUTOIGNITION TEMPERATURE:

Not applicable

EXPLOSIVE PROPERTIES:

Not explosive

OXIDIZING PROPERTIES:

Not an oxidizer

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:

Heat, sparks or flames

STABILITY:

Stable

POLYMERIZATION:

Does not polymerize

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.
t-Butyllithium: Corrosive.

Skin Contact: No data available for the product.
t-Butyllithium: Corrosive.

Skin Absorption: No data available for the product.
t-Butyllithium: Corrosive.

Ingestion: No data available for the product.
t-Butyllithium: Corrosive.

Inhalation: No data available for the product.
t-Butyllithium: Corrosive.
n-Heptane:
Inhalation LC₅₀ 103 gm/m³/4H (rat)

[RTECS 2005]

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.

Chronic Effects From Overexposure:

No data available for the formulation.

Heptane: Prolonged contact with heptane may cause defatting of the skin and skin irritation.

Sensitization: No

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

Mutagenicity: No

Reproductive Toxicity: No

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

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

n-Heptane:

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

24-96h LC₅₀ = 4924 mg/L (mosquito fish) [Env. Data on Org. Chem, 4th ed]

48h EC₅₀ = 1.5 mg/L (daphnia magna) [Env. Data on Org. Chem, 4th ed]

Chemical Fate Information:

This product reacts violently with water to form butane and lithium hydroxide.

n-Heptane will readily volatilize from both soil and water. If released to water the product will float. The product is insoluble in water. If released to soil it will evaporate at a rapid rate. The product is poorly absorbed onto soils or sediments. The product is expected to be readily biodegradable. Photochemical degradation in air will proceed at a moderate rate. BOD₅ = 55% of ThOD. Heptane is not expected to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

PROPER SHIPPING NAME: Organometallic substance, liquid, pyrophoric, water-reactive (tert-butyllithium, hydrocarbon solution)
CLASSIFICATION: 4.2, Spontaneously combustible, (4.3, Dangerous When Wet)
LABELS: Spontaneously Combustible, Dangerous When Wet
UN NUMBER: UN3394
PACKING GROUP: I
CUSTOM TARIFF NO: 2931.00.9060
MARINE POLLUTANT: No

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 does not contain a toxic chemical subject to the reporting requirements of Section 313 of Emergency Planning and Community Right-To-Know Act of 1986.
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355): Not listed
CERCLA HAZARDOUS SUBSTANCE (40 CFR 302.4): Not listed
TSCA SEC 12B EXPORT NOTIFICATION: This product is subject to TSCA 12(b) export notification requirements due to the presence of heptane.
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)
Ingredient Disclosure List: Heptane is listed

16. OTHER INFORMATION

REVISION SUMMARY: Revision # 4: Regular review completed. Sections 2, 5, 9, 11, 12, 14 and 15 revised.

NFPA RATING

HEALTH: 3
FLAMMABILITY: 4
REACTIVITY: 3
SPECIAL: W

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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