

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: n-Butyllithium in Toluene
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 and mixtures, which on contact with water, emit flammable gases; Category 1
Flammable liquid; Category 2
Corrosive to skin; Category 1
Toxic to reproduction, Category 2
Aspiration hazard; Category 1
Specific target organ systemic toxicity – Repeat exposure; Category 2
Specific target organ systemic toxicity – Single exposure; Category 3

LABELING:

SYMBOLS: Flame, corrosion, health hazard, 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
Highly flammable liquid and vapour
Causes severe skin burns and eye damage
Suspected of damaging the unborn child
May be fatal if swallowed and enters airways
May cause damage to organs through prolonged or repeated exposure
May cause drowsiness or dizziness
Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS:

Prevention:
Keep away from heat/sparks/open flames/hot surfaces. No smoking. Do not allow contact with air.
Wear chemical splash goggles with a face shield, rubber gloves and rubber clothing.
Keep away from any possible contact with water, because of violent reaction and possible flash fire.
Handle under inert gas. Protect from moisture.
Keep container tightly closed.
Ground/Bond container and receiving equipment.
Use explosion-proof electrical, ventilation and lighting equipment.
Use only non-sparking tools.

Take precautionary measures against static discharge.
Do not breathe dust or mist.
Wash thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Use personal protective equipment as required.
Do not breathe vapours.
Use only outdoors or in well-ventilated area.

Response

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

First Aid

See Section 4 of the MSDS.

Storage

See Section 7 of the MSDS.

Disposal

See Section 13 of the MSDS.

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	8-12	Water-react. Cat. 1 H260 Pyr. Sol. Cat. 1 H250 Skin Corr. Cat 1A H314
Toluene	108-88-3	203-625-9	88-92	Flam. liq. Cat. 2 H225 Repr. Cat 2 H361d Asp. Tox. Cat. 1 H304 STOT RE Cat 2 H373 Skin Irrit. Cat 2 H315 STOT SE Cat. 3 H336

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

<u>FLAMMABLE LIMITS:</u>	Not applicable for formulation. For toluene: Upper: 7.1% Lower: 1.1%
<u>GENERAL HAZARD:</u>	Pyrophoric. Flammable liquid.
<u>EXTINGUISHING MEDIA:</u>	DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.
<u>HAZARDOUS COMBUSTION PRODUCTS:</u>	Lithium hydroxide, carbon monoxide, carbon dioxide.
<u>FIRE FIGHTING PROCEDURES:</u>	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.
<u>AUTOIGNITION TEMPERATURE:</u>	Not available
<u>PROPERTIES CONTRIBUTING TO FLAMMABILITY:</u>	Water reactivity (pyrophoricity) of product, and volatility of solvents.
<u>FLASH POINT:</u>	Not applicable. The flashpoint of toluene is 4.4 °C.
<u>SENSITIVITY TO STATIC DISCHARGE:</u>	Yes
<u>SENSITIVITY TO IMPACT:</u>	Not applicable
<u>COMMENTS:</u>	

(See Section 10, Stability and Reactivity)

6. ACCIDENTAL RELEASE MEASURES

<u>RELEASE NOTES:</u>	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.
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7. HANDLING AND STORAGE

<u>HANDLING:</u>	KEEP AWAY FROM WATER, AIR AND OXIDIZING MATERIALS. Wear full face protection and gloves. Use in a closed system under argon or nitrogen.
<u>STORAGE:</u>	Keep away from heat, sparks and flame. Protect storage container from leaks and physical damage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<u>EXPOSURE LIMITS</u>				
<u>Chemical Name</u>	<u>TWA (ACGIH)</u>	<u>STEL/Ceiling (ACGIH)</u>	<u>PEL (OSHA)</u>	<u>STEL/Ceiling (OSHA)</u>
Toluene	50 ppm		200 ppm	300 ppm, ceiling: 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

<u>Eyes And Face:</u>	Chemical splash goggles with a face shield.
<u>Respiratory:</u>	When engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for protection against organic vapors, dusts and mists.
<u>Protective Clothing:</u>	Rubber gloves and rubber clothing.
<u>Work Hygienic Practices:</u>	Quick-drench eyewash and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

<u>ODOR:</u>	Gasoline-like
<u>APPEARANCE:</u>	Clear, water-white to pale yellow liquid
<u>pH:</u>	Reacts violently with water giving mixture with pH >12
<u>PERCENT VOLATILE:</u>	70-90 varies with concentration
<u>VAPOR PRESSURE:</u>	2.93 kPa (22 mm Hg) at 20 °C (toluene)
<u>VAPOR DENSITY:</u>	3.1 (air = 1) (toluene)
<u>BOILING POINT:</u>	110.6 °C (toluene)
<u>MELTING POINT:</u>	Not available
<u>SOLUBILITY IN WATER:</u>	Reacts violently with water
<u>EVAPORATION RATE(Butyl Acetate = 1):</u>	2.10 (toluene)
<u>SPECIFIC GRAVITY:</u>	0.7-0.8 g.ml @ 20°C (68°F)
<u>MOLECULAR WEIGHT:</u>	64.06
<u>COEFF. OIL/WATER:</u>	Not applicable
<u>ODOR THRESHOLD:</u>	Not applicable
<u>FLAMMABLE LIMITS:</u>	Not applicable for formulation. For toluene: Upper: 7.1% Lower: 1.1%
<u>FLASH POINT:</u>	Not applicable. The flashpoint of toluene is 4.4 °C.
<u>AUTOIGNITION TEMPERATURE:</u>	Not available
<u>VISCOSITY:</u>	Not available
<u>FLAMMABILITY:</u>	Pyrophoric and water reactive material in flammable liquid solvent
<u>DECOMPOSITION TEMPERATURE:</u>	Not available
<u>EXPLOSIVE PROPERTIES:</u>	Not explosive
<u>OXIDIZING PROPERTIES:</u>	Not an oxidizer

10. STABILITY AND REACTIVITY

<u>CONDITIONS TO AVOID:</u>	Heat, sparks or flames
<u>STABILITY:</u>	Stable
<u>POLYMERIZATION:</u>	Will not occur
<u>HAZARDOUS DECOMPOSITION PRODUCTS:</u>	Lithium hydroxide, lithium hydride
<u>INCOMPATIBLE MATERIALS:</u>	Water, air, oxidizers, carbon dioxide, acids

11. TOXICOLOGICAL INFORMATION

<u>Eye Contact:</u>	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. Toluene: Dermal LD ₅₀ =14100 uL/kg (rabbit)

[RTECS]

Ingestion: No data available for the product.
n-Butyllithium: Corrosive.
Toluene: Oral LD₅₀ = 636 mg/kg (rat) [RTECS]

Inhalation: No data available for the product.
n-Butyllithium: Corrosive.
Toluene: LC₅₀ = 49 gm/m³/4H (rat) [RTECS]

Acute Effects From Overexposure:

This product contains an alkyl lithium compound which is extremely reactive and corrosive to 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 product.

Toluene: Possible reproductive hazard - may cause developmental toxicity, based on animal information. Toluene was not carcinogenic in mice and rats exposed by inhalation to up to 1200 ppm for 24 months. Prolonged skin exposure may result in dermatitis. Symptoms observed in laboratory animals following subchronic inhalation exposure to toluene has caused narcosis, tremors and anesthesia in laboratory animals.

Sensitization:

No
Toluene: Not expected to be sensitizing.

Carcinogenicity:

EH40: Not listed
IARC: Toluene is listed as Group 3, unclassifiable as to carcinogenicity to humans.
NTP: Not listed
OSHA: Not considered a carcinogen under OSHA.
ACGIH: Toluene is listed as Category A4, not classifiable as a human carcinogen.

Mutagenicity:

No data available for product.

Reproductive Toxicity:

No data available for product.
Toluene: Possible reproductive hazard - may cause developmental toxicity, based on animal information.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information:

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

Toluene:

24-96 hour LC₅₀ = 56-34 mg/L (fathead minnow) [Handbook of Env Data on Organic Chem, 4th]

24-96 hour LC₅₀ = 24 mg/L (bluegill) [Handbook of Env Data on Organic Chem, 4th]

48 hr. EC₅₀ = 15 mg/L (daphnia magna) [Handbook of Env Data on Organic Chem, 4th]

Chemical Fate Information:

n-Butyllithium: n-Butyllithium reacts violently with water to form butane and lithium hydroxide.

Toluene: Toluene biodegrades slowly and volatilizes rapidly from soil. It is not expected to bioconcentrate.

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. The flashpoint of toluene is 4.4 °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 toluene which is 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): Toluene is listed. The reportable quantity is 1000 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 2A, (teratogenicity and embryotoxicity - very toxic - other)
Class D, Division 2B (toxic – other effects)
Ingredient Disclosure List: Toluene is listed

16. OTHER INFORMATION

REVISION SUMMARY: Revision # 2. Regular review conducted. Sections 2, 3, 9, 11, 14 & 16 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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