

## Material Safety Data Sheet

### 1. Identification of the Substance/Mixture and of the Company/Undertaking:

- 1.1 **Product Identifier:** n-Hexyllithium in Hexanes  
1.1.1 **Substances** Not applicable  
1.1.2 **Mixture name:** n-Hexyllithium in Hexanes  
1.2 **Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:**  
Industrial Manufacturing  
Only to be supplied for industrial uses  
For use only as a chemical intermediate under Strictly Controlled Conditions, with solvent recovery

1.3 **Details of the Supplier of the Safety Data Sheet**

**North America**  
FMC Corporation  
2801 Yorkmont Road, Suite 300  
Charlotte, NC 28208  
Phone: +1.704.426.5300  
Fax: +1.704.426.5370  
1.888.lithium

**Europe**  
FMC Chemicals  
Commercial Road  
Bromborough, Merseyside  
CH62 3NL, England  
Phone: +44.151.334.8085  
Fax: +44.151.482.7361

**Asia Pacific**  
FMC Asia Innovation Center  
No 3 Building No. 4560  
Jinke Road  
Shanghai, China 201203  
T: +86.21.2067.5888

Email: [lithium.info@fmc.com](mailto:lithium.info@fmc.com)  
Web: [www.fmclithium.com](http://www.fmclithium.com)

1.4 **Emergency Telephone Number:**

**North America**  
CHEMTREC: +1.800.424.9300  
+1.703.527.3887  
Plant: +1.704.629.5361  
Medical: +1.303.595.9048

**Europe**  
24 hr Specialist advice number:  
CHEMTREC: +44 870 8200418

**Asia Pacific**  
Phone: +86.21.2067.5888

### 2. Hazards Identification

2.1 **Classification of the Mixture:**

**2.1.1 GHS Classification [EC Regulation No 1272/2008 and US OSHA regulations]**

Flammable liquid; Category 2  
Skin corrosive; Category 1B  
Eye Damage, Category 1  
Aspiration toxicity; Category 1  
Reproductive toxicity; Category 2  
Specific target organ systemic toxicity – SE Category 3  
Specific target organ systemic toxicity – RE; Category 2  
Hazardous to the aquatic environment – Chronic; Category 2

**2.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]**

F, C, R35; Xn, R 65, R67, R48/20; Repr Cat. 3, R62; N R51/53

2.2 **Label Elements:**

**2.2.3 Hazard Pictograms:**





**2.2.4 Signal Word:**

Danger

**Hazard Statement(s):**

Causes severe skin burns and eye damage.	H314
Highly flammable liquid and vapour.	H225
May be fatal if swallowed and enters airways.	H304
May cause drowsiness or dizziness.	H336
Suspected of damaging fertility.	H361f
May cause damage to organs through prolonged or repeated exposure.	H373
Toxic to aquatic life with long lasting effects;	H411

**Precautionary Statement(s):**

Wear protective gloves/protective clothing/eye protection/ face protection.	P280
In case of fire: Use dry chemical for extinction.	P370 + P378
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.	P301 + P330 + P331
IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.	P303 + P361 + P353
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	P305 + P351 + P338
Immediately call a POISON Center or doctor/physician.	P310

**Additional Precautionary Statement(s):**

Obtain special instructions before use.	P201
Do not handle until all safety precautions have been read and understood.	P202
Keep away from heat/sparks/open flames/hot surfaces. – No smoking.	P210
Ground/bond container and receiving equipment.	P240
Use explosion-proof electrical/ventilating/lighting/.../equipment.	P241
Use only non-sparking tools.	P242
Take precautionary measures against static discharge.	P243
Do not breathe dust/fume/gas/mist/vapours/spray.	P260
Wash hands thoroughly after handling.	P264
Use only outdoors or in a well-ventilated area.	P271
Use personal protective equipment as required.	P281
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.	P304 + P340
Wash contaminated clothing before reuse.	P363
Store in a well-ventilated place. Keep cool.	P403 + P235
Store locked up.	P405
Dispose of contents/ container to an approved waste disposal plant.	P501

**2.3 Other Hazards**

Reacts violently with water	EUH014
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**3. Composition / Information on Ingredients**

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**3.1 Substances**

Not applicable.

**3.2 Mixtures**

**3.1.1 GHS Classification [EC: Regulation No 1272/2008; US: OSHA regulations]**

<u>Chemical Name</u>	<u>CAS #</u>	<u>EC No</u>	<u>EC Index No</u>	<u>REACH Req No</u>	<u>Wt.%</u>	<u>Classification, Hazard Statement Codes</u>
n-Hexyllithium	21369-64-2	404-950-0	None	01-0000015449-63-0001	25 - 40	Pyr. Liq. 1 Water-react. 1 Skin Corr. 1B H260 H250
Hydrocarbons, C6, n-alkanes, iso-	None	925-292-5	None	01-2119474209-33-0016	60 - 75	Flam. Liq. 2 H314 H225

alkanes, cyclics, n-hexane rich *						Skin Irrit. 2 Asp. Tox. 1 Repr. 2 STOT SE 3 STOT RE 2 Aquatic chronic 2	H315 H304 H361f H336 H373 H411
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\* contains n-hexane, CAS# 110-54-3

### 3.1.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]

Chemical Name	CAS #	EC No	Wt. %	Symbols	R-phrases
n-Hexyllithium	21369-64-2	404-950-0	25 - 40	F C	R35
Hydrocarbons, C6, n-alkanes, iso-alkanes, cyclics, n-hexane rich *	None	925-292-5	60 - 75	F; Xi; N; Repr. Cat. 3; Xn;	R11 R38 R51-53 R62 R65, R67, R48/20

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

(see Section 16 for R-phrases text)

## 4. First Aid Measures

### 4.1 Description of 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.

### 4.2 Most Important Symptoms and effects, both acute and delayed

Symptoms of over-exposure will typically be a result of the corrosive nature of the substance with discomfort to skin and if swallowed, local effects with discomfort to the mouth and GI tract. Inhalation of solvent vapours may lead to dizziness and impairment of normal functions.

### 4.3 Indication of any immediate medical attention and special treatment needed.

**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

- 5.1 **Extinguishing media** DO NOT USE WATER OR CARBON DIOXIDE. Use dry chemical.
- 5.2 **Special hazards arising from the substance or mixture**
- Hazardous combustion products** Lithium hydroxide, carbon monoxide, carbon dioxide.
- General Hazard** Flammable liquid. Reacts violently with water to give off flammable fumes and corrosive dusts.
- Properties contributing to**
- Flammability** Water reactivity (pyrophoricity) of product, and volatility of solvents.
- Flashpoint** -10°C for a 30 wt. % solution in aqueous solution in hexane, -1°C for a 35 wt. % solution in hexane, 1°C for a 40 wt. % solution in hexane.
- Flammable limits in air** Not applicable for formulation. For hexane: Upper: 7.7% Lower: 1.2%

**Auto ignition temperature** 520°F  
**Sensitivity to static discharge** Yes  
**Sensitivity to static impact** Not applicable

**5.3 Advice for fire-fighters**

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.

**COMMENTS:**

(See Section 10, Stability and Reactivity)

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## 6. Accidental Release Measures

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**6.1 Personal precautions, protective equipment and emergency procedures**

Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection. Remove all sources of ignition. Spilled material can catch fire spontaneously on contact with air, moisture, acids or oxidizing materials.

**6.2 Environmental precautions**

Contain spill. Do not wash into drains. Dispose of at qualified waste disposal facility.

**6.3 Methods and material for containment and cleaning up**

Remove all sources of ignition. Do not use water in the initial phases of clean up. Contain spill with absorbant. Transfer to approved transport container and clean up spillage with an absorbant. Dispose of waste according to local and Federal laws and regulations.

**6.4 Reference to other sections**

Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection.

**6.5 Additional information**

Not specified.

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## 7. Handling and Storage

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**7.1 Precautions for safe handling**

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

**7.2 Conditions for safe storage, including any incompatibilities**

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

**7.3 Specific end use(s)**

For use only as a chemical intermediate under Strictly Controlled Conditions

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## 8. Exposure Controls / Personal Protection

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**8.1 Control parameters**

Note that DNELs and PNECs have not been derived for hexyllithium as it is a strictly controlled transported intermediate

**DNEL Hexanes:**

**Hydrocarbons, C6, n-alkanes, iso-alkanes, cyclics, n-hexane rich**

Long-term exposure, systemic, inhalation 93 mg/m<sup>3</sup>

Long-term exposure, systemic, dermal 13 mg/kg/day

**PNEC Hexanes:**

Not determined for the registration process

Estimated freshwater PNEC 0.05 mg/l using default factor 100.

**EXPOSURE LIMITS**

<u>Chemical Name</u>	<u>EU</u>		<u>EH40 (UK WEL)</u>		<u>USA (ACGIH)</u>		<u>USA (OSHA)</u>	
	<u>TWA</u>	<u>STEL</u>	<u>TWA</u>	<u>STEL</u>	<u>TWA</u>	<u>STEL/Ceiling</u>	<u>PEL</u>	<u>STEL/Ceiling</u>
n-hexane	none*		20 ppm	72 mg/m <sup>3</sup>	50 ppm		50 ppm	

## 8.2 Exposure controls

Refer to appropriate Exposure Scenarios

### 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:

Wear a respirator approved for protection against organic vapours and mists when adequate ventilation is not available

US: NIOSH or MSHA approved

Europe: CEN Class A type

#### Protective Clothing:

**Gloves:** Nitrile (typical permeation breakthrough time >480 minutes)

These glove recommendations should not be used as the absolute basis for glove selection. Actual in-use conditions may vary glove performance from the controlled conditions of laboratory tests. Factors such as concentration and temperature, glove thickness and glove reuse, may affect performance. Other glove requirements, such as length, dexterity, cut, abrasion, puncture and snag resistance, or glove grip need to be considered in making your final selection. For flammable products, the recommended gloves provide chemical but not fire protection

**Other:** Rubber clothing.

#### Work Hygienic Practices:

Quick-drench eyewash and safety shower.

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## 9. Physical and Chemical Properties

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### 9.1 Information on basic physical and chemical properties

#### Appearance:

Liquid, clear yellow to orange solution

#### Odor:

Gasoline-like

#### Odor threshold:

Not available

#### pH:

Reacts violently with water giving mixture with pH >12

#### Melting point:

Hexane: -95. C°

#### Boiling point:

Hexane: 62-69°C

#### Flash point:

-10°C for a 30 wt. % solution in aqueous solution in hexane, -1°C for a 35 wt. % solution in hexane, 1°C for a 40 wt. % solution in hexane.

#### Evaporation rate(hexyl acetate = 1):

7.1 – 8.4 (hexane)

#### Flammability:

Water reactive material in flammable liquid solvent

#### Flammable limits:

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

#### Vapor pressure:

Hexane: 5.6 psi @ 38°C

#### Vapor density (air = 1):

(air=1): Approximately 3 (hexane)

#### Specific gravity:

0.73 g/mL @ 20°C for a 33 wt. % solution

#### Solubility in water:

Reacts violently with water

#### Partition coefficient n-octanol/ water:

Not available

#### Autoignition temperature:

520°F

#### Decomposition temperature:

Not available

#### Viscosity:

Not available

#### Explosive properties:

Not explosive

#### Oxidizing properties:

Not an oxidizer

### 9.2 Other information

#### Self-reactive properties

Does not meet classification criteria.

#### Pyrophoric properties

Does not meet classification criteria.

#### Self-heating properties

Does not meet classification criteria.

#### Water reactive properties

Does not meet classification criteria.

#### Corrosive to metals

Does not meet classification criteria.

#### Molecular weight:

92.11

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## 10. Stability and Reactivity

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10.1	<b>Reactivity</b>	Reactive with water and damp air
10.2	<b>Chemical stability</b>	Stable if kept away from air and moisture.
10.3	<b>Possibility of hazardous reaction</b>	Reaction with water, air, oxidizers, acids to form lithium hydroxide, lithium hydride, hexanes.
10.4	<b>Conditions to avoid</b>	Open air. Heat, sparks or flames
10.5	<b>Incompatible materials</b>	Strong acids, oxidizers, oxygen, heat, sparks, water and open flame.
10.6	<b>Hazardous decomposition products</b>	Lithium oxide, lithium hydroxide

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## 11. Toxicological Information

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### 11.1 **Information on toxicological effects**

The mixture has not been tested, but properties can be predicted based on the properties of the two components

(a) acute toxicity	Hexyllithium: Corrosive n-Hexane discriminating oral dose > 2000 mg/kg n-Hexane acute inhalation toxicity > 17.6 mg/l (5000 ppm) n-Hexane acute dermal toxicity > 2000 mg/kg
(b) skin corrosion/irritation	Classified as corrosive on the basis of hexyllithium.
(c) serious eye damage/irritation	Classified as corrosive on the basis of hexyllithium.
(d) respiratory/skin sensitisation	No components are considered to be potential sensitizing agents.
(e) germ cell mutagenicity	None of the components considered to be mutagenic.
(f) carcinogenicity	None on the components considered to be carcinogenic
(g) reproductive toxicity	n-Hexane suspected of damaging fertility or the unborn child.
(h) STOT-single exposure	n-Hexane may cause drowsiness.
(i) STOT-repeated exposure	n-Hexane may cause damage to the nervous system through inhalation
(j) aspiration hazard	n-Hexane may be fatal if swallowed and enters airways

The component n-Hexane has been extensively tested for REACH registration. Hexyllithium has been less extensively tested in view of the corrosivity and reactivity and in view of limited uses as intermediate.

#### **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.

#### **Carcinogenicity Listings**

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

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## 12. Ecological Information

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### 12.1 **Toxicity:**

The mixture has not been tested, but properties can be predicted based on the properties of the two components.

The mixture is predicted to be Toxic to aquatic organisms based on hexane

n-Hexane:

Fish 96h LC<sub>50</sub> 8.2 mg/l

Daphnia 48h EC<sub>50</sub> 4.5 mg/l

Daphnia reproduction toxicity, NOEC for reproduction 5 mg/l

Algae 96h IC<sub>50</sub> 3.1 mg/l

## 12.2 Persistence and degradability

n-Hexyllithium: n-Hexyllithium 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.

## 12.3 Bioaccumulative potential

n-Hexane : Log BCF = 2.24 to 2.89

## 12.4 Mobility in soil

Solvents not expected to be mobile.

## 12.5 Results of PBT and vPvB assessment

A PBT and vPvB assessment has been undertaken for REACH and none of the components are considered to be of concern.

## 12.6 Other adverse effects

Due to the nature of the material and the specialist applications, this product is not considered to be a risk to the environment.

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## 13. Disposal Considerations

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### 13.1 Waste treatment methods

#### Disposal method:

Do not discharge to waste water systems.

Spent solvent may be sent for recovery or used as fuel if permitted under local regulations

Dispose of waste according to local and national laws and regulations.

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## 14. Transport Information

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14.1	<u>UN Number</u>	UN2920
14.2	<u>UN proper shipping name (IMDG, ICAO, ADR, DOT)</u>	Corrosive Liquid, Flammable, N.O.S. (Hexyllithium in Hexane)
14.3	<u>Transport hazard class(es) (IMDG, ICAO, ADR, DOT)</u>	8, Corrosive (3, Flammable)
14.4	<u>Packing group (IMDG, ICAO, ADR, DOT)</u>	I
14.5	<u>Environmental hazards</u>	Marine pollutant due to presence of hexane
14.6	<u>Special precautions for user</u>	None
14.7	<u>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</u>	None

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## 15. Regulatory Information

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### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### EUROPEAN UNION:

#### German Wassergefährdungsklasse (water hazard class)

n-hexyllithium	not listed
n-hexane	2

#### 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.  
Not listed

**Section 302 Extremely Hazardous Substances (40 CFR 355):**

**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.

**NFPA Rating:**

**Health: 3 Flammability: 4 Reactivity: 3 Special: ~~W~~**

**INTERNATIONAL INVENTORY STATUS:**

<b><u>Inventory/Country</u></b>	<b><u>Product Status</u></b>
EINECS (EU)	Listed
TSCA (US)	Listed
ECL (Korea)	Listed
DSL (Canada)	Listed

**15.2 Chemical Safety Assessment**

A Chemical Safety Assessment has not been carried out for hexyllithium as it is registered for use as a strictly controlled intermediate.

A chemical safety report has been prepared for hexane

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## **16. Other Information**

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**European Union:**

**R Phrases:**

Causes burns	R34
Harmful: may cause lung damage if swallowed	R65
Harmful: danger of serious damage to health by prolonged exposure through inhalation	R48/20
Possible risk of impaired fertility	R62
Vapours may cause drowsiness and dizziness	R67
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment	R51/53

**List of Abbreviations used in this SDS:**

PBT	Persistent, Bioaccumulative and Toxic
vPvB	very Persistent, very Bioaccumulative
PEC	Predicted environmental concentration
PNEC	Predicted no effect concentration
DNEL	Derived no effect level

**Specific uses identified for Exposure Scenarios**

ES1	Receipt and use of hexyllithium in hexane as chemical intermediate
ES2	Recovery of hexane

**REVISION SUMMARY:** Revision # 0. All sections revised. New format. Regular review completed.

This SDS has been prepared to meet U. S. OSHA Hazard Communication Standard requirements.  
type 4

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