

Creation Date 06-Apr-2010

Revision Date 30-Nov-2024

Revision Number 6

Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Description: n-Butyllithium, 2.5M solution in hexanes
Cat No. : **S60100**
Molecular Formula C₄ H₉ Li

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company

Thermo Fisher (Kandel) GmbH
Erlenbachweg 2, 76870 Kandel, Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300

Swiss distributor - Fisher Scientific AG
Neuhofstrasse 11, CH 4153 Reinach
Tel: +41 (0) 56 618 41 11
<https://www.fishersci.ch/ch/en/customer-help-support/forms/email-us.html>

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

customers in Switzerland:
Tox Info Suisse Emergency Number: **145 (24hr)**
Tox Info Suisse: +41-44 251 51 51 (Emergency number from abroad)
Chemtrec (24h) Toll-Free: 0800 564 402
Chemtrec Local: +41-43 508 20 11 (Zurich)

Poison Centre - Emergency information services

Ireland : National Poisons Information Centre (NPIC) -
01 809 2166 (8am-10pm, 7 days a week)
Malta : +356 2395 2000
Cyprus : +357 2240 5611

Section 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

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CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Flammable liquids	Category 2 (H225)
Substances/mixtures which, in contact with water, emit flammable gases	Category 1 (H260)
Pyrophoric liquids	Category 1 (H250)

Health hazards

Aspiration Toxicity	Category 1 (H304)
Skin Corrosion/Irritation	Category 1 B (H314)
Serious Eye Damage/Eye Irritation	Category 1 (H318)
Reproductive Toxicity	Category 2 (H361f)
Specific target organ toxicity - (single exposure)	Category 3 (H336)
Specific target organ toxicity - (repeated exposure)	Category 2 (H373)

Environmental hazards

Chronic aquatic toxicity	Category 2 (H411)
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Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word

Danger

Hazard Statements

H225 - Highly flammable liquid and vapor
H250 - Catches fire spontaneously if exposed to air
H260 - In contact with water releases flammable gases which may ignite spontaneously
H304 - May be fatal if swallowed and enters airways
H314 - Causes severe skin burns and eye damage
H336 - May cause drowsiness or dizziness
H361f - Suspected of damaging fertility
H373 - May cause damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects
EUH014 - Reacts violently with water

Precautionary Statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P222 - Do not allow contact with air
P231 + P232 - Handle and store contents under inert gas. Protect from moisture
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician

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2.3. Other hazards

Water reactive

This product does not contain any known or suspected endocrine disruptors

Toxic to terrestrial vertebrates

Section 3: Composition/information on ingredients

3.2. Mixtures

Component	CAS No	EC No	Weight %	CLP Classification - Regulation (EC) No 1272/2008
Hexane	110-54-3	EEC No. 203-777-6	77	Flam. Liq. 2 (H225) Asp. Tox. 1 (H304) Skin Irrit. 2 (H315) STOT SE 3 (H336) Repr. 2 (H361f) STOT RE 2 (H373) Aquatic Chronic 2 (H411)
Butyl lithium	109-72-8	203-698-7	23	Pyr. Liq. 1 (H250) Water react. 1 (H260) Skin Corr. 1B (H314) Eye Dam. 1 (H318) (EUH014)

Component	Specific concentration limits (SCL's)	M-Factor	Component notes
Hexane	STOT RE 2 (H373) :: C>=5%	-	-

Components	Reach Registration Number
Butyl lithium	01-2119494906-21

Full text of Hazard Statements: see section 16

Section 4: First aid measures

4.1. Description of first aid measures

General Advice	Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Call a physician immediately.
Ingestion	Do NOT induce vomiting. Clean mouth with water. Never give anything by mouth to an unconscious person. Call a physician immediately. Call a physician or poison control center immediately. If vomiting occurs naturally, have victim lean forward.
Inhalation	If not breathing, give artificial respiration. Remove from exposure, lie down. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician immediately. Risk of serious damage to the lungs (by aspiration).

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Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

4.2. Most important symptoms and effects, both acute and delayed

Causes burns by all exposure routes. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

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

Notes to Physician Treat symptomatically. Symptoms may be delayed.

Section 5: Firefighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Water spray, fog or alcohol-resistant foam. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons

Water. Carbon dioxide (CO₂). Foam.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Reacts violently with water. Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products

Butane, Carbon monoxide (CO), Carbon dioxide (CO₂).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment as required. Ensure adequate ventilation. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Remove all sources of ignition. Take precautionary measures against static discharges.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Do not expose spill to water. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

6.4. Reference to other sections

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Refer to protective measures listed in Sections 8 and 13.

Section 7: Handling and storage

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe mist/vapors/spray. Do not ingest. If swallowed then seek immediate medical assistance. Do not allow contact with water. Handle under an inert atmosphere. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Store under an inert atmosphere. Keep away from water or moist air. Keep refrigerated. Keep away from heat, sparks and flame. Flammables area. Protect from moisture. Keep container tightly closed.

Technical Rules for Hazardous Substances (TRGS) 510
Storage Class (LGK) (Germany)

Storage Class/LGK 4.2

Switzerland - Storage of hazardous substances

Storage class - SC 4.2
<https://www.kvu.ch/de/themen/stoffe-und-produkte>
<https://www.kvu.ch/fr/themes/substances-et-produits>
<https://www.kvu.ch/it/temi/sostanze-e-prodotti>

7.3. Specific end use(s)

Use in laboratories

Section 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits

List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Forth edition. Published 2020. **IRE** - 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority. **CH** - The Government of Switzerland has set a directive on limit values for working materials (Grenzwerte am Arbeitsplatz) which is based on the Swiss Federal Regulation "Verordnung über die Verhütung von Unfällen und Berufskrankheiten". This directive is administered, periodically revised and enforced by SUVA (Swiss National Accident Insurance Fund).

Component	European Union	The United Kingdom	France	Belgium	Spain
Hexane	TWA: 20 ppm (8hr) TWA: 72 mg/m ³ (8hr)	TWA: 72 mg/m ³ TWA: 20 ppm STEL: 60 ppm STEL: 216 mg/m ³	TWA / VME: 20 ppm (8 heures). restrictive limit TWA / VME: 72 mg/m ³ (8 heures). restrictive limit TWA / VME: 1000 mg/m ³ (8 heures). STEL / VLCT: 1500 mg/m ³ .	TWA: 20 ppm 8 uren TWA: 72 mg/m ³ 8 uren	TWA / VLA-ED: 20 ppm (8 horas) TWA / VLA-ED: 72 mg/m ³ (8 horas)

Component	Italy	Germany	Portugal	The Netherlands	Finland
Hexane	TWA: 20 ppm 8 ore. Time Weighted Average TWA: 72 mg/m ³ 8 ore.	TWA: 180 mg/m ³ TWA: 50 ppm	TWA: 20 ppm 8 horas TWA: 72 mg/m ³ 8 horas Pele	STEL: 40 ppm 15 minuten STEL: 144 mg/m ³ 15	TWA: 20 ppm 8 tunteina TWA: 72 mg/m ³ 8 tunteina

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	Time Weighted Average			minuten TWA: 20 ppm 8 uren TWA: 72 mg/m ³ 8 uren	lho
Butyl lithium		TWA: 0.2 mg/m ³ (8 Stunden). MAK inorganic compounds, except Lithium and strong irritant Lithium compounds such as Lithium amide, Lithium hydride, Lithium hydroxide, Lithium nitride, Lithium oxide, Lithium tetrahydroaluminate, Lithium tetrahydroborate			

Component	Austria	Denmark	Switzerland	Poland	Norway
Hexane	MAK-KZGW: 80 ppm 15 Minuten MAK-KZGW: 288 mg/m ³ 15 Minuten MAK-TMW: 20 ppm 8 Stunden MAK-TMW: 72 mg/m ³ 8 Stunden	TWA: 20 ppm 8 timer TWA: 72 mg/m ³ 8 timer STEL: 40 ppm 15 minutter STEL: 144 mg/m ³ 15 minutter	Haut/Peau STEL: 400 ppm 15 Minuten STEL: 1440 mg/m ³ 15 Minuten TWA: 50 ppm 8 Stunden TWA: 180 mg/m ³ 8 Stunden	TWA: 72 mg/m ³ 8 godzinach	TWA: 20 ppm 8 timer TWA: 72 mg/m ³ 8 timer TWA: 40 ppm 8 timer TWA: 275 mg/m ³ 8 timer STEL: 30 ppm 15 minutter. value calculated STEL: 108 mg/m ³ 15 minutter. value calculated

Component	Bulgaria	Croatia	Ireland	Cyprus	Czech Republic
Hexane	TWA: 20 ppm TWA: 72.0 mg/m ³	kože TWA-GVI: 20 ppm 8 satima. TWA-GVI: 72 mg/m ³ 8 satima.	TWA: 20 ppm 8 hr. TWA: 72 mg/m ³ 8 hr. STEL: 60 ppm 15 min STEL: 216 mg/m ³ 15 min Skin	TWA: 20 ppm TWA: 72 mg/m ³	TWA: 70 mg/m ³ 8 hodinách. Potential for cutaneous absorption Ceiling: 200 mg/m ³

Component	Estonia	Gibraltar	Greece	Hungary	Iceland
Hexane	TWA: 20 ppm 8 tundides. TWA: 72 mg/m ³ 8 tundides.	TWA: 20 ppm 8 hr TWA: 72 mg/m ³ 8 hr	TWA: 20 ppm TWA: 72 mg/m ³	TWA: 72 mg/m ³ 8 órában. AK TWA: 20 ppm 8 órában. AK lehetséges borön keresztüli felszívódás	TWA: 20 ppm 8 klukkustundum. TWA: 72 mg/m ³ 8 klukkustundum. Ceiling: 40 ppm Ceiling: 144 mg/m ³

Component	Latvia	Lithuania	Luxembourg	Malta	Romania
Hexane	TWA: 20 ppm TWA: 72 mg/m ³	TWA: 20 ppm IPRD TWA: 72 mg/m ³ IPRD	TWA: 20 ppm 8 Stunden TWA: 72 mg/m ³ 8 Stunden	TWA: 20 ppm TWA: 72 mg/m ³	TWA: 20 ppm 8 ore TWA: 72 mg/m ³ 8 ore

Component	Russia	Slovak Republic	Slovenia	Sweden	Turkey
Hexane	TWA: 300 mg/m ³ 0780 MAC: 900 mg/m ³	Ceiling: 140 mg/m ³ TWA: 20 mg/m ³ TWA: 72 mg/m ³	TWA: 20 ppm 8 urah TWA: 72 mg/m ³ 8 urah STEL: 576 mg/m ³ 15 minutah STEL: 160 ppm 15 minutah	Binding STEL: 50 ppm 15 minuter Binding STEL: 180 mg/m ³ 15 minuter TLV: 20 ppm 8 timmar. NGV TLV: 72 mg/m ³ 8 timmar. NGV	TWA: 20 ppm 8 saat TWA: 72 mg/m ³ 8 saat

Biological limit values

List source(s):

Component	European Union	United Kingdom	France	Spain	Germany
Hexane			2,5-Hexanedione: urine end of shift	2,5-Hexanedione: 0.2 mg/L urine end of	2,5-Hexandione plus 4,5-Dihydroxy-2-hexano

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				workweek	ne (after hydrolysis): 5 mg/L urine (end of shift)
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Component	Italy	Finland	Denmark	Bulgaria	Romania
Hexane					2,5-Hexandion: 5 mg/g Creatinine urine end of shift

Component	Gibraltar	Latvia	Slovak Republic	Luxembourg	Turkey
Hexane			2,5-Hexanedione: 5 mg/L urine end of exposure or work shift 4,5-Dihydroxy-2-hexanone: 5 mg/L urine end of exposure or work shift		

Monitoring methods

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

MDHS70 General methods for sampling airborne gases and vapours

MDHS 88 Volatile organic compounds in air. Laboratory method using diffusive samplers, solvent desorption and gas chromatography

MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas chromatography

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
Hexane 110-54-3 (77)				DNEL = 11mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
Hexane 110-54-3 (77)				DNEL = 75mg/m ³

Predicted No Effect Concentration (PNEC)

No information available.

8.2. Exposure controls

Engineering Measures

Use only under a chemical fume hood. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection

Goggles (European standard - EN 166)

Hand Protection

Protective gloves

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Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Nitrile rubber	See manufacturers	-	EN 374	(minimum requirement)
Viton (R)	recommendations			

Skin and body protection Long sleeved clothing.

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Large scale/emergency use Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive pressure mode

Small scale/Laboratory use Handle within a fume cupboard or implement suitable equivalent methods to minimize exposure

Environmental exposure controls Prevent product from entering drains. Do not allow material to contaminate ground water system.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical State	Liquid	
Appearance	Yellow	
Odor	Petroleum distillates	
Odor Threshold	No data available	
Melting Point/Range	No data available	
Softening Point	No data available	
Boiling Point/Range	No information available	
Flammability (liquid)	Highly flammable	On basis of test data
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	Lower 1.2 vol % Upper 7.8 vol %	
Flash Point	-21 °C / -5.8 °F	Method - No information available
Autoignition Temperature	No data available	
Decomposition Temperature	No data available	
pH	Not applicable	
Viscosity	No data available	
Water Solubility	Reacts with water	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Component	log Pow	
Hexane	4.11	
Vapor Pressure	160 mbar @ 20 °C	
Density / Specific Gravity	0.690	
Bulk Density	Not applicable	Liquid
Vapor Density	No data available	(Air = 1.0)
Particle characteristics	Not applicable (liquid)	

9.2. Other information

Molecular Formula C4 H9 Li

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Molecular Weight 64.06
Explosive Properties Vapors may form explosive mixtures with air
Substances/mixtures which, in contact with water, emit flammable gases Emitted gas ignites spontaneously

Section 10: Stability and reactivity

10.1. Reactivity

Yes

10.2. Chemical stability

Pyrophoric: Spontaneously flammable in air. Reacts violently with water. Air sensitive. Moisture sensitive.

10.3. Possibility of hazardous reactions

Hazardous Polymerization
Hazardous Reactions

No information available.
None under normal processing. Reacts violently with water.

10.4. Conditions to avoid

Incompatible products. Heat, flames and sparks. Exposure to moist air or water. Exposure to air. Exposure to moisture. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Strong oxidizing agents. Halogens. Bases. Acids. Alcohols.

10.6. Hazardous decomposition products

Butane. Carbon monoxide (CO). Carbon dioxide (CO₂).

Section 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information

(a) acute toxicity;

Oral

Dermal

Inhalation

Based on available data, the classification criteria are not met

Based on available data, the classification criteria are not met

Based on available data, the classification criteria are not met

Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Hexane	LD50 = 25 g/kg (Rat)	LD50 = 3000 mg/kg (Rabbit)	LC50 = 48000 ppm (Rat) 4 h

(b) skin corrosion/irritation;

Category 1 B

(c) serious eye damage/irritation;

Category 1

(d) respiratory or skin sensitization;

Respiratory

Skin

No data available

No data available

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(e) germ cell mutagenicity;	No data available
(f) carcinogenicity;	No data available There are no known carcinogenic chemicals in this product
(g) reproductive toxicity; Reproductive Effects Developmental Effects Teratogenicity	Category 2 Experiments have shown reproductive toxicity effects on laboratory animals. Developmental effects have occurred in experimental animals. Teratogenic effects have occurred in experimental animals.
(h) STOT-single exposure; Results / Target organs	Category 3 Central nervous system (CNS).
(i) STOT-repeated exposure; Target Organs	Category 2 Eyes, Respiratory system, Skin, Gastrointestinal tract (GI), Central nervous system (CNS), Liver, Peripheral Nervous System (PNS).
(j) aspiration hazard; Other Adverse Effects	Category 1 Tumorigenic effects have been reported in experimental animals.
Symptoms / effects, both acute and delayed	Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

11.2. Information on other hazards

Endocrine Disrupting Properties	Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.
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Section 12: Ecological information

12.1. Toxicity

Ecotoxicity effects

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment. Reacts with water so no ecotoxicity data for the substance is available.

Component	Freshwater Fish	Water Flea	Freshwater Algae
Hexane	LC50: 2.1 - 2.98 mg/L, 96h flow-through (Pimephales promelas)	EC50: 3.87 mg/L/48h	

12.2. Persistence and degradability

Persistence	Persistence is unlikely, based on information available.
Degradability	Reacts with water.
Degradation in sewage	Contains substances known to be hazardous to the environment or not degradable in waste

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treatment plant water treatment plants. Water reactive.

12.3. Bioaccumulative potential Product does not bioaccumulate due to reaction with water

Component	log Pow	Bioconcentration factor (BCF)
Hexane	4.11	No data available

12.4. Mobility in soil The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces Reacts with water Will likely be mobile in the environment due to its volatility. Is not likely mobile in the environment. Disperses rapidly in air

12.5. Results of PBT and vPvB assessment Water reactive.

12.6. Endocrine disrupting properties
Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects
Persistent Organic Pollutant This product does not contain any known or suspected substance
Ozone Depletion Potential This product does not contain any known or suspected substance

Section 13: Disposal considerations

13.1. Waste treatment methods

Waste from Residues/Unused Products Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

European Waste Catalogue (EWC) According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Can be landfilled or incinerated, when in compliance with local regulations. Do not empty into drains. Large amounts will affect pH and harm aquatic organisms. Do not let this chemical enter the environment.

Switzerland - Waste Ordinance Disposal should be in accordance with applicable regional, national and local laws and regulations. Ordinance on the Avoidance and the Disposal of Waste (Waste Ordinance, ADWO) SR 814.600
<https://www.fedlex.admin.ch/eli/cc/2015/891/en>

Section 14: Transport information

IMDG/IMO

14.1. UN number UN3394
14.2. UN proper shipping name ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE
Technical Shipping Name (N-BUTYLLITHIUM, HEXANE)
14.3. Transport hazard class(es) 4.2
Subsidiary Hazard Class 4.3
14.4. Packing group I

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ADR

14.1. UN number	UN3394
14.2. UN proper shipping name Technical Shipping Name	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE (N-BUTYLLITHIUM, HEXANE)
14.3. Transport hazard class(es)	4.2
Subsidiary Hazard Class	4.3
14.4. Packing group	I

IATA

FORBIDDEN FOR IATA TRANSPORT

14.1. UN number	UN3394
14.2. UN proper shipping name Technical Shipping Name	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE, FORBIDDEN FOR IATA TRANSPORT (N-BUTYLLITHIUM, HEXANE)
14.3. Transport hazard class(es)	4.2
Subsidiary Hazard Class	4.3
14.4. Packing group	I

14.5. Environmental hazards	Dangerous for the environment Product is a marine pollutant according to the criteria set by IMDG/IMO
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14.6. Special precautions for user	No special precautions required.
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14.7. Maritime transport in bulk according to IMO instruments	Not applicable, packaged goods
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Section 15: Regulatory information

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

International Inventories

China, X = listed, Australia, U.S.A. (TSCA), Canada (DSL/NDL), Europe (EINECS/ELINCS/NLP), Australia (AICS), Korea (KECL), China (IECSC), Japan (ENCS), Philippines (PICCS), Taiwan (TCSI), Japan (ISHL), New Zealand (NZIoC), Japan (ISHL). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
Hexane	110-54-3	203-777-6	438-390-3	-	X	X	KE-18626	X	X
Butyl lithium	109-72-8	203-698-7	-	-	X	X	KE-04320	X	X

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDL	AICS	NZIoC	PICCS
Hexane	110-54-3	X	ACTIVE	X	-	X	X	X
Butyl lithium	109-72-8	X	ACTIVE	X	-	X	X	X

Legend: X - Listed '-' - Not Listed

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

Authorisation/Restrictions according to EU REACH

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Hexane	110-54-3	-	Use restricted. See entry 75. (see link for restriction)	-

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			details)	
Butyl lithium	109-72-8	-	-	-

REACH links

<https://echa.europa.eu/substances-restricted-under-reach>

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Hexane	110-54-3	Not applicable	Not applicable
Butyl lithium	109-72-8	Not applicable	Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?

Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

Take note of Directive 94/33/EC on the protection of young people at work

Take note of Dir 92/85/EC on the protection of pregnant and breastfeeding women at work

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification

Water endangering class = 2 (self classification)

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
Hexane	WGK3	
Butyl lithium	WGK1	

Component	France - INRS (Tables of occupational diseases)
Hexane	Tableaux des maladies professionnelles (TMP) - RG 59, RG 84

Swiss Regulations

Article 4 para. 4 of the Ordinance on the protection of young people in the workplace (SR 822.115) and Article 1 lit. f of the EAER regulation on hazardous work and young people (SR 822.115.2).

Take note on Article 13 Maternity Ordinance (SR 822.111.52) with regards expectant and nursing mothers.

Component	Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)	Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)	Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
Hexane 110-54-3 (77)	Prohibited and Restricted Substances	Group I	

15.2. Chemical safety assessment

Chemical Safety Assessment/Reports (CSA/CSR) are not required for mixtures

Section 16: Other information

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Full text of H-Statements referred to under sections 2 and 3

H225 - Highly flammable liquid and vapor
H250 - Catches fire spontaneously if exposed to air
H260 - In contact with water releases flammable gases which may ignite spontaneously
H304 - May be fatal if swallowed and enters airways
H314 - Causes severe skin burns and eye damage
H315 - Causes skin irritation
H318 - Causes serious eye damage
H336 - May cause drowsiness or dizziness
H361f - Suspected of damaging fertility
H373 - May cause damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects
EUH014 - Reacts violently with water

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

DNEL - Derived No Effect Level

RPE - Respiratory Protective Equipment

LC50 - Lethal Concentration 50%

NOEC - No Observed Effect Concentration

PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50%

POW - Partition coefficient Octanol:Water

vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

ATE - Acute Toxicity Estimate

VOC - (volatile organic compound)

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Physical hazards On basis of test data

Health Hazards Calculation method

Environmental hazards Calculation method

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

Chemical incident response training.

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**This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.
COMMISSION REGULATION (EU) 2020/878 amending Annex II to Regulation (EC) No
1907/2006 .**

**For Switzerland - Compiled in accordance with the technical provisions referred to in Annex 2,
Number 3, Chemo (SR 813.11 - Ordinance on Protection against Dangerous Substances and
Preparations).**

Disclaimer

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End of Safety Data Sheet