1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product name</th>
<th>Methylithium solution</th>
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<tbody>
<tr>
<td>Product Number</td>
<td>197343</td>
</tr>
<tr>
<td>Brand</td>
<td>Aldrich</td>
</tr>
<tr>
<td>Supplier</td>
<td>Sigma-Aldrich</td>
</tr>
<tr>
<td>Address</td>
<td>3050 Spruce Street</td>
</tr>
<tr>
<td></td>
<td>SAINT LOUIS MO 63103</td>
</tr>
<tr>
<td>Telephone</td>
<td>+1 800-325-5832</td>
</tr>
<tr>
<td>Fax</td>
<td>+1 800-325-5052</td>
</tr>
<tr>
<td>Emergency Phone #</td>
<td>(314) 776-6555</td>
</tr>
<tr>
<td>Preparation Information</td>
<td>Sigma-Aldrich Corporation</td>
</tr>
<tr>
<td></td>
<td>Product Safety - Americas Region</td>
</tr>
<tr>
<td></td>
<td>1-800-521-8956</td>
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</table>

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
- Flammable liquid, Pyrophoric, Target Organ Effect, Harmful by ingestion., Corrosive

Target Organs
- Central nervous system, Kidney, Liver, Gastrointestinal tract, Skeletal muscle.

GHS Classification
- Flammable liquids (Category 2)
- Pyrophoric liquids (Category 1)
- Substances, which in contact with water, emit flammable gases (Category 1)
- Acute toxicity, Oral (Category 4)
- Acute toxicity, Inhalation (Category 5)
- Skin corrosion (Category 1B)
- Serious eye damage (Category 1)
- Specific target organ toxicity - single exposure (Category 3)

GHS Label elements, including precautionary statements

Signal word: Danger

Hazard statement(s)
- H225: Highly flammable liquid and vapour.
- H250: Catches fire spontaneously if exposed to air.
- H260: In contact with water releases flammable gases which may ignite spontaneously.
- H302: Harmful if swallowed.
- H314: Causes severe skin burns and eye damage.
- H333: May be harmful if inhaled.
- H336: May cause drowsiness or dizziness.

Precautionary statement(s)
- P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P222 Do not allow contact with air.
P223 Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232 Handle under inert gas. Protect from moisture.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
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.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction. 
P422 Store contents under inert gas.

Other hazards
May form explosive peroxides., Repeated exposure may cause skin dryness or cracking.

HMIS Classification
Health hazard: 3
Chronic Health Hazard: *
Flammability: 4
Physical hazards: 3

NFPA Rating
Health hazard: 3
Fire: 3
Reactivity Hazard: 3

Potential Health Effects
Inhalation May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Vapours may cause drowsiness and dizziness.
Skin Harmful if absorbed through skin. Causes skin burns.
Eyes Causes eye burns.
Ingestion Harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Lithium methanide
MeLi

Formula: CH₃Li

Molecular Weight: 21.98 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethyl ether</td>
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<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>60-29-7</td>
<td>Flam. Liq. 1; Acute Tox. 4; Eye Irrit. 2; STOT SE 3; H224, H302, H319, H336, EUH019, EUH066</td>
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<tr>
<td>EC-No.</td>
<td>200-467-2</td>
<td>90 - 100 %</td>
</tr>
<tr>
<td>Index-No.</td>
<td>603-022-00-4</td>
<td></td>
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<tr>
<td>Methyllithium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>917-54-4</td>
<td>Pyr. Liq. 1; Water-react. 1; Skin Corr. 1B; H250, H260, H314</td>
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<tr>
<td>EC-No.</td>
<td>213-026-4</td>
<td>5 - 10 %</td>
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</table>

For the full text of the H-Statements and R-Phrases mentioned in this Section, see Section 16

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Conditions of flammability
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media
Dry powder

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Lithium oxides
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Lithium oxides

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Never allow product to get in contact with water during storage.

Recommended storage temperature: 2 - 8 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
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<tbody>
<tr>
<td>Diethyl ether</td>
<td>60-29-7</td>
<td>TWA</td>
<td>400 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td>Central Nervous System impairment Upper Respiratory Tract irritation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>500 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
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</table>
Central Nervous System impairment Upper Respiratory Tract irritation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>USA, OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>400 ppm</td>
<td>1.200 mg/m3</td>
</tr>
<tr>
<td>STEL</td>
<td>500 ppm</td>
<td>1,500 mg/m3</td>
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<tr>
<td></td>
<td></td>
<td>USA, OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td>TWA</td>
<td>400 ppm</td>
<td>1,200 mg/m3</td>
</tr>
</tbody>
</table>

The value in mg/m3 is approximate.

See Appendix D - Substances with No Established RELs

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Protective gloves against thermal risks
Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 30 min
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form liquid
Colour light yellow

Safety data
pH no data available
Melting point/freezing point no data available
Boiling point  no data available
Flash point  -17 °C (1 °F) - closed cup
Ignition temperature  no data available
Auto-ignition temperature  no data available
Lower explosion limit  no data available
Upper explosion limit  no data available
Vapour pressure  no data available
Density  0.732 g/mL at 25 °C (77 °F)
Water solubility  no data available
Partition coefficient: n-octanol/water  no data available
Relative vapour density  no data available
Odour  no data available
Odour Threshold  no data available
Evaporation rate  no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Vapours may form explosive mixture with air. Reacts violently with water.

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight. Exposure to moisture.

Materials to avoid
Oxygen, Oxidizing agents, acids, Alcohols, Reacts violently with water.

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Lithium oxides
Reacts with water to form: - Reacts with water to liberate flammable and/or explosive gas.
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Lithium oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity
Oral LD50  no data available
Inhalation LC50
Dermal LD50  no data available

Other information on acute toxicity  no data available

Skin corrosion/irritation  no data available

Serious eye damage/eye irritation
Eyes: no data available

Respiratory or skin sensitisation
Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)

no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Vapours may cause drowsiness and dizziness.

Ingestion Harmful if swallowed.

Skin Harmful if absorbed through skin. Causes skin burns.

Eyes Causes eye burns.

Signs and Symptoms of Exposure
burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Synergistic effects

no data available

Additional Information
RTECS: Not available

12. ECOLOGICAL INFORMATION

Toxicity

no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
no data available

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3394  Class: 4.2 (4.3)  Packing group: I
Proper shipping name: Organometallic substance, liquid, pyrophoric, water-reactive (Methyllithium, Diethyl ether)
Reportable Quantity (RQ): 105 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 3394  Class: 4.2 (4.3)  Packing group: I  EMS-No: F-G, S-M
Proper shipping name: ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE (Methyllithium, Diethyl ether)
Marine pollutant: No

IATA
UN number: 3394  Class: 4.2 (4.3)
Proper shipping name: Organometallic substance, liquid, pyrophoric, water-reactive (Methyllithium, Diethyl ether)
IATA Passenger: Not permitted for transport
IATA Cargo: Not permitted for transport

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Pyrophoric, Target Organ Effect, Harmful by ingestion., Corrosive

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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Pennsylvania Right To Know Components

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<td>Diethyl ether</td>
<td>60-29-7</td>
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New Jersey Right To Know Components

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<th>CAS-No.</th>
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<tbody>
<tr>
<td>Methylithium</td>
<td>917-54-4</td>
<td></td>
</tr>
</tbody>
</table>
California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Text of H-code(s) and R-phrase(s) mentioned in Section 3

| Acute Tox. | Acute toxicity |
| EUH019 | May form explosive peroxides. |
| EUH066 | Repeated exposure may cause skin dryness or cracking. |
| Eye Irrit. | Eye irritation |
| Flam. Liq. | Flammable liquids |
| H224 | Extremely flammable liquid and vapour. |
| H250 | Catches fire spontaneously if exposed to air. |
| H260 | In contact with water releases flammable gases which may ignite spontaneously. |
| H302 | Harmful if swallowed. |
| H314 | Causes severe skin burns and eye damage. |
| H319 | Causes serious eye irritation. |
| H336 | May cause drowsiness or dizziness. |
| Pyr. Liq. | Pyrophoric liquids |
| Skin Corr. | Skin corrosion |
| STOT SE | Specific target organ toxicity - single exposure |
| Water-react. | Substances, which in contact with water, emit flammable gases |

Further information
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