Material Safety Data Sheet
Lithium tri-sec-butylborohydride 1M solution in THF

ACC# 57119

Section 1 - Chemical Product and Company Identification

**MSDS Name:** Lithium tri-sec-butylborohydride 1M solution in THF  
**Catalog Numbers:** AC176450000, AC176451000, AC176458000  
**Synonyms:** Lithium trisobutylhydroborate  
**Company Identification:** Acros Organics N.V.  
One Reagent Lane  
Fair Lawn, NJ 07410  
For information in North America, call: 800-ACROS-01  
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>109-99-9</td>
<td>Tetrahydrofuran</td>
<td>80.99</td>
<td>203-726-8</td>
</tr>
<tr>
<td>238721-52-7</td>
<td>Lithium tri-sec-butylborohydride</td>
<td>19.01</td>
<td>254-101-1</td>
</tr>
</tbody>
</table>

Section 3 - Hazards Identification

**EMERGENCY OVERVIEW**
Appearance: colorless liquid. Flash Point: -17 deg C.  
**Danger! Extremely flammable liquid.** Corrosive. Water-reactive. Causes eye and skin burns. Causes digestive and respiratory tract burns. Dangerous when wet. Uninhibited material, or material from which the inhibitor has been removed or reacted, may form explosive peroxides. May cause central nervous system depression. May cause liver and kidney damage. Moisture sensitive.  
**Target Organs:** Kidneys, central nervous system, liver.

**Potential Health Effects**
**Eye:** Causes eye burns.  
**Skin:** Causes skin burns.  
**Ingestion:** Causes gastrointestinal tract burns. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.  
**Inhalation:** Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Causes chemical burns to the respiratory tract. May cause abdominal pain, nausea, vomiting, and inflammation of the gums and mouth.  
**Chronic:** May cause liver and kidney damage.

Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.  
**Skin:** Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.  
**Ingestion:** Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.  
**Inhalation:** Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.  
**Notes to Physician:** Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Reacts violently with water giving off flammable gas which may explode. Vapors can travel to a source of ignition and flash back. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. Containers may explode in the heat of a fire.  
**Extinguishing Media:** Do NOT use water directly on fire. Use dry chemical to fight fire.  
**Flash Point:** -17 deg C (1.40 deg F)  
**Autoignition Temperature:** Not available.  
**Explosion Limits, Lower:** Not available.  
**Upper:** Not available.  
**NFPA Rating:** 2 - health, 3 - flammability, 1 - instability

Section 6 - Accidental Release Measures
General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Use a spark-proof tool.

Section 7 - Handling and Storage

Handling: Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Use only in a chemical fume hood.


Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrofuran</td>
<td>50 ppm TWA; 100 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous route</td>
<td>200 ppm TWA; 590 mg/m³ TWA 2000 ppm IDLH</td>
<td>200 ppm TWA; 590 mg/m³ TWA</td>
</tr>
<tr>
<td>Lithium tri-sec-butylborohydride</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: Tetrahydrofuran: 200 ppm TWA; 590 mg/m³ TWA Lithium tri-sec-butylborohydride: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear safety glasses and chemical goggles if splashing is possible.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear a chemical apron.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: colorless

Odor: Not available.

pH: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: Not available.

Decomposition Temperature: Not available.

Solubility: reacts with water

Specific Gravity/Density: .8700g/cm³

Molecular Formula: C₁₂H₂₈BLi

Molecular Weight: 190.11

Section 10 - Stability and Reactivity

Chemical Stability: Prolonged exposure to air and sunlight may form unstable peroxides. Explosive peroxides may form on concentration. Peroxides can be detonated by friction, impact, or heating. Peroxide formation may occur in containers that have been opened and remain in storage. Normally stable; however, on long term storage, materials containing similar functional groups form peroxides of unknown stability.

Conditions to Avoid: Exposure to air, contact with water.

Incompatibilities with Other Materials: Oxidizing agents, oxygen, alcohols, acids, moist air or water.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of boron, hydrogen gas.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#: 

CAS# 109-99-9: LU5950000

CAS# 38721-52-7 unlisted.

LD50/LC50:

CAS# 109-99-9:
Inhalation, rat: LC50 = 21000 ppm/3H;
Oral, rat: LD50 = 1650 mg/kg;

CAS# 38721-52-7:


Carcinogenicity:
CAS# 109-99-9:
- ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans
- California: Not listed.
- NTP: Not listed.
- IARC: Not listed.

CAS# 38721-52-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Neurotoxicity: No information available.

Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. Cas# 109-00-0: LC50(96Hr.) Fathead Minnow = 2160 mg/L

Environmental: Tetrahydrofuran is expected to biodegrade under aerobic conditions but may be resistant to biodegradation in anaerobic environments.

Physical: According to a model of gas/particle partitioning of semivolatile organic compounds in the atmosphere, tetrahydrofuran, which has a vapor pressure of 162 mm Hg at 25 deg C, determined from experimentally-derived coefficients, will exist solely as a vapor in the ambient atmosphere. Vapor-phase tetrahydrofuran is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals and nitrate radicals; the half-lives for these reactions in air are estimated to be about 1 day and 3 days, respectively.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

Section 14 - Transport Information

<table>
<thead>
<tr>
<th>US DOT</th>
<th>Canada TDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping Name:</td>
<td>LITHIUM ALKYLs</td>
</tr>
<tr>
<td>Hazard Class:</td>
<td>4.2</td>
</tr>
<tr>
<td>UN Number:</td>
<td>UN2445</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>1</td>
</tr>
</tbody>
</table>

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 109-99-9 is listed on the TSCA inventory.
CAS# 38721-52-7 is listed on the TSCA inventory.

Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules
CAS# 109-99-9: Testing required by manufacturers, processors; Test for Health Effects

Section 12b
CAS# 109-99-9: Section 4

TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs
CAS# 109-99-9: 1000 lb final RQ; 454 kg final RQ

SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.

SARA Codes
CAS # 109-99-9: immediate, fire, reactive.

Section 313
No chemicals are reportable under Section 313.

Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 109-99-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 38721-52-7 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
F C
Risk Phrases:
R 11 Highly flammable.
R 15 Contact with water liberates extremely flammable gases.
R 17 Spontaneously flammable in air.
R 19 May form explosive peroxides.
R 34 Causes burns.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.
S 29 Do not empty into drains.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 7/8 Keep container tightly closed and dry.

WGK (Water Danger/Protection)
CAS# 109-99-9: 1
CAS# 38721-52-7: No information available.

Canada - DSL/NDSL
CAS# 109-99-9 is listed on Canada’s DSL List.
CAS# 38721-52-7 is listed on Canada’s NDSL List.

Canada - WHMIS
This product has a WHMIS classification of B2, D2B, E.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List
CAS# 109-99-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/02/1999
Revision #4 Date: 10/03/2005

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.