

Printing date 07/19/2021

Reviewed on 07/19/2021

## 1 Identification

- **Product name**
- **Trade name:** CALSELECT™ Lithium tri-sec-butylborohydride, 1M in tetrahydrofuran
- **Item number:** 03-1400
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**  
Strem Chemicals, Inc.  
7 Mulliken Way  
NEWBURYPORT, MA 01950  
USA  
info@strem.com
- **Information department:** Technical Department
- **Emergency telephone number:**  
EMERGENCY: CHEMTREC: + 1 (800) 424-9300  
During normal opening times: +1 (978) 499-1600

## 2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.

Water-react. 1 H260 In contact with water releases flammable gases, which may ignite spontaneously.



GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.



GHS05 Corrosion

Skin Corr. 1C H314 Causes severe skin burns and eye damage.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

STOT SE 3 H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

- **Label elements**
- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**



GHS02

GHS05

GHS07

GHS08

- **Signal word** Danger

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**Trade name: CALSELECT™ Lithium tri-sec-butylborohydride, 1M in tetrahydrofuran**

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· **Hazard-determining components of labeling:**

Tetrahydrofuran [109-99-9]

· **Hazard statements**

H225 Highly flammable liquid and vapor.

H260 In contact with water releases flammable gases, which may ignite spontaneously.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H351 Suspected of causing cancer.

H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

· **Precautionary statements**

P223 Do not allow contact with water.

P231+P232 Handle under inert gas. Protect from moisture.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/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/doctor.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 3

Fire = 4

Reactivity = 2

The substance demonstrates unusual reactivity with water.

· **HMIS-ratings (scale 0 - 4)**



Health = \*4

Fire = 4

Reactivity = 2

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

**3 Composition/information on ingredients**

· **Chemical characterization: Mixtures**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

|            |                                  |       |
|------------|----------------------------------|-------|
| 109-99-9   | Tetrahydrofuran [109-99-9]       | 78.0% |
| 38721-52-7 | lithium tri-sec-butylhydroborate | 19.0% |
| 1113-78-6  | tri-sec-Butylborane              | 3.0%  |

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**4 First-aid measures**

- **Description of first aid measures**
- **General information:**  
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** Immediately call a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**  
No further relevant information available.

**5 Fire-fighting measures**

- **Extinguishing media**
- **Suitable extinguishing agents:**  
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** No special measures required.

**6 Accidental release measures**

- **Personal precautions, protective equipment and emergency procedures**  
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Use neutralizing agent.  
Dispose contaminated material as waste according to item 13.  
Ensure adequate ventilation.  
Do not flush with water or aqueous cleansing agents
- **Reference to other sections**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

|                 |                            |           |
|-----------------|----------------------------|-----------|
| · <b>PAC-1:</b> |                            |           |
| 109-99-9        | Tetrahydrofuran [109-99-9] | 100 ppm   |
| · <b>PAC-2:</b> |                            |           |
| 109-99-9        | Tetrahydrofuran [109-99-9] | 500 ppm   |
| · <b>PAC-3:</b> |                            |           |
| 109-99-9        | Tetrahydrofuran [109-99-9] | 5000* ppm |

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**7 Handling and storage**

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**  
Keep ignition sources away - Do not smoke.  
Protect against electrostatic charges.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**  
Keep receptacle tightly sealed.  
Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

**8 Exposure controls/personal protection**

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**
- **Components with limit values that require monitoring at the workplace:**  
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.  
At this time, the other constituents have no known exposure limits.

**109-99-9 Tetrahydrofuran [109-99-9]**

|     |  |
|-----|--|
| PEL | Long-term value: 590 mg/m <sup>3</sup> , 200 ppm   |
| REL | Short-term value: 735 mg/m <sup>3</sup> , 250 ppm<br>Long-term value: 590 mg/m <sup>3</sup> , 200 ppm        |
| TLV | Short-term value: 295 mg/m <sup>3</sup> , 100 ppm<br>Long-term value: 147 mg/m <sup>3</sup> , 50 ppm<br>Skin |

- **Ingredients with biological limit values:**

**109-99-9 Tetrahydrofuran [109-99-9]**

|     |   |
|-----|---|
| BEI | 2 mg/L<br>Medium: urine<br>Time: end of shift<br>Parameter: Tetrahydrofuran |
|-----|---|

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:** Wear protective clothing
- **General protective and hygienic measures:**  
Keep away from foodstuffs, beverages and feed.  
Immediately remove all soiled and contaminated clothing.  
Wash hands before breaks and at the end of work.  
Avoid contact with the eyes and skin.
- **Breathing equipment:** Not required.

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· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.  
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**



Tightly sealed goggles

**9 Physical and chemical properties**

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

**Form:** Liquid  
**Color:** Various colors  
**Odor:** Characteristic  
**Odor threshold:** Not determined.

· **pH-value:** Not determined.

· **Change in condition**

**Melting point/Melting range:** Undetermined.  
**Boiling point/Boiling range:** 65 °C (149 °F)

· **Flash point:** -21.2 °C (-6 °F)

· **Flammability (solid, gaseous):** Not determined.

· **Ignition temperature:** 230 °C (446 °F)

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not selfigniting.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· **Explosion limits:**

**Lower:** 1.5 Vol %  
**Upper:** 12.0 Vol %

· **Vapor pressure at 20 °C (68 °F):** 200 hPa (150 mm Hg)

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- **Density:** *Not determined.*
  - **Relative density** *Not determined.*
  - **Vapor density** *Not determined.*
  - **Evaporation rate** *Not determined.*
- 
- **Solubility in / Miscibility with Water:** *Not miscible or difficult to mix.*
- 
- **Partition coefficient (n-octanol/water):** *Not determined.*
- 
- **Viscosity:**
  - **Dynamic:** *Not determined.*
  - **Kinematic:** *Not determined.*
- 
- **Solvent content:**
  - **Organic solvents:** *78.0 %*
  - **VOC content:** *78.0 %*
  - 780.0 g/l / 6.51 lb/gl*
  - **Other information** *No further relevant information available.*

**10 Stability and reactivity**

- **Reactivity** *No further relevant information available.*
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** *No decomposition if used according to specifications.*
- **Possibility of hazardous reactions** *Contact with water releases flammable gases.*
- **Conditions to avoid** *No further relevant information available.*
- **Incompatible materials:** *No further relevant information available.*
- **Hazardous decomposition products:** *No dangerous decomposition products known.*

**11 Toxicological information**

- **Information on toxicological effects**
- **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**109-99-9 Tetrahydrofuran [109-99-9]**

Oral LD50 2500 mg/kg (rat)

- **Primary irritant effect:**
- **on the skin:** *No irritant effect.*
- **on the eye:** *No irritating effect.*
- **Sensitization:** *No sensitizing effects known.*
- **Additional toxicological information:**

*The product shows the following dangers according to internally approved calculation methods for preparations:  
Harmful*

- **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

*None of the ingredients is listed.*

· **NTP (National Toxicology Program)**

*None of the ingredients is listed.*

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· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

**12 Ecological information**

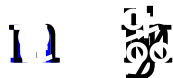
- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Water hazard class 1 (Self-assessment): slightly hazardous for water  
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.  
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

**13 Disposal considerations**

- **Waste treatment methods**
- **Recommendation:**  
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

**14 Transport information**

- **UN-Number**
- **DOT, IMDG, IATA** UN3129
- **UN proper shipping name**
- **DOT** Water-reactive liquid, corrosive, n.o.s.
- **IMDG, IATA** WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.
- **Transport hazard class(es)**
- **DOT**
- **Class** 4.3 Substances which, in contact with water, emit flammable gases



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|   |  |
|---|--|
| · <b>Label</b>  | 4.3, 8   |
| · <b>IMDG</b>   |  |
|  |  |
| · <b>Class</b>  | 4.3 Substances which, in contact with water, emit flammable gases      |
| · <b>Label</b>  | 4.3/8  |
| · <b>IATA</b>   |  |
|  |  |
| · <b>Class</b>  | 4.3 Substances which, in contact with water, emit flammable gases      |
| · <b>Label</b>  | 4.3 (8)  |
| · <b>Packing group</b>  |  |
| · <b>DOT, IMDG, IATA</b>  | I  |
| · <b>Environmental hazards:</b>   | Not applicable.  |
| · <b>Special precautions for user</b>   | Warning: Substances which, in contact with water, emit flammable gases |
| · <b>EMS Number:</b>  | F-G,S-N  |
| · <b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b> | Not applicable.  |
| · <b>UN "Model Regulation":</b>   | UN 3129 WATER-REACTIVE LIQUID, CORROSIVE, N.O.S., 4.3 (8), I           |

**15 Regulatory information**

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Sara**

· **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

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· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

|            |                                  |          |
|------------|----------------------------------|----------|
| 109-99-9   | Tetrahydrofuran [109-99-9]       | SC       |
| 38721-52-7 | lithium tri-sec-butylhydroborate | I (oral) |

· **TLV (Threshold Limit Value established by ACGIH)**

|          |                            |    |
|----------|----------------------------|----|
| 109-99-9 | Tetrahydrofuran [109-99-9] | A3 |
|----------|----------------------------|----|

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS02   GHS05   GHS07   GHS08

· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

Tetrahydrofuran [109-99-9]

· **Hazard statements**

- H225      *Highly flammable liquid and vapor.*
- H260      *In contact with water releases flammable gases, which may ignite spontaneously.*
- H302      *Harmful if swallowed.*
- H314      *Causes severe skin burns and eye damage.*
- H351      *Suspected of causing cancer.*
- H335-H336 *May cause respiratory irritation. May cause drowsiness or dizziness.*

· **Precautionary statements**

- P223              *Do not allow contact with water.*
- P231+P232       *Handle under inert gas. Protect from moisture.*
- P303+P361+P353 *If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/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/doctor.*
- P403+P233       *Store in a well-ventilated place. Keep container tightly closed.*
- P501              *Dispose of contents/container in accordance with local/regional/national/international regulations.*

· **National regulations:**

- **Water hazard class:** *Water hazard class 1 (Self-assessment): slightly hazardous for water.*
- **Chemical safety assessment:** *A Chemical Safety Assessment has not been carried out.*

**16 Other information**

*This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.*

· **Department issuing SDS:** *Technical Department.*

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· **Contact:** Technical Director

· **Date of preparation / last revision** 07/19/2021 / -

· **Abbreviations and acronyms:**

*ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)*

*IMDG: International Maritime Code for Dangerous Goods*

*DOT: US Department of Transportation*

*IATA: International Air Transport Association*

*ACGIH: American Conference of Governmental Industrial Hygienists*

*EINECS: European Inventory of Existing Commercial Chemical Substances*

*ELINCS: European List of Notified Chemical Substances*

*CAS: Chemical Abstracts Service (division of the American Chemical Society)*

*NFPA: National Fire Protection Association (USA)*

*HMIS: Hazardous Materials Identification System (USA)*

*VOC: Volatile Organic Compounds (USA, EU)*

*LC50: Lethal concentration, 50 percent*

*LD50: Lethal dose, 50 percent*

*PBT: Persistent, Bioaccumulative and Toxic*

*vPvB: very Persistent and very Bioaccumulative*

*NIOSH: National Institute for Occupational Safety*

*OSHA: Occupational Safety & Health*

*TLV: Threshold Limit Value*

*PEL: Permissible Exposure Limit*

*REL: Recommended Exposure Limit*

*BEI: Biological Exposure Limit*

*Flam. Liq. 2: Flammable liquids – Category 2*

*Water-react. 1: Substances and mixtures which in contact with water emit flammable gases – Category 1*

*Acute Tox. 4: Acute toxicity – Category 4*

*Skin Corr. 1C: Skin corrosion/irritation – Category 1C*

*Carc. 2: Carcinogenicity – Category 2*

*STOT SE 3: Specific target organ toxicity (single exposure) – Category 3*