

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

Product Description: Lithium tri-tert-butoxyaluminumhydride, 1.1M solution in THF  
 Cat No. : 377581000; 377588000; 377580000

### 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

**UK entity/business name**  
 Fisher Scientific UK  
 Bishop Meadow Road,  
 Loughborough, Leicestershire LE11 5RG, United Kingdom

**EU entity/business name**  
 Thermo Fisher Scientific  
 Janssen Pharmaceuticaaan 3a, 2440 Geel, Belgium

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

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

#### CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

##### Physical hazards

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

##### Health hazards

|                                   |                     |
|-----------------------------------|---------------------|
| Skin Corrosion/Irritation         | Category 1 B (H314) |
| Serious Eye Damage/Eye Irritation | Category 1 (H318)   |
| Carcinogenicity                   | Category 2 (H351)   |

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Specific target organ toxicity - (single exposure)

Category 3 (H335) (H336)

## **Environmental hazards**

Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

## **2.2. Label elements**



Signal Word

Danger

## **Hazard Statements**

- H225 - Highly flammable liquid and vapor
- H260 - In contact with water releases flammable gases which may ignite spontaneously
- H314 - Causes severe skin burns and eye damage
- H335 - May cause respiratory irritation
- H336 - May cause drowsiness or dizziness
- H351 - Suspected of causing cancer
- EUH014 - Reacts violently with water
- EUH019 - May form explosive peroxides

## **Precautionary Statements**

- P280 - Wear protective gloves/protective clothing/eye protection/face protection
- P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- 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
- P231 + P232 - Handle and store contents under inert gas. Protect from moisture
- P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower
- P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

## **2.3. Other hazards**

Reacts violently with water

Toxic to terrestrial vertebrates

This product does not contain any known or suspected endocrine disruptors

## **SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

### **3.2. Mixtures**

| Component       | CAS No   | EC No     | Weight % | CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567                   |
|-----------------|----------|-----------|----------|-----------------------------------------------------------------------------------------------------------|
| Tetrahydrofuran | 109-99-9 | 203-726-8 | 70       | Flam. Liq. 2 (H225)<br>Acute Tox. 4 (H302)<br>Eye Irrit. 2 (H319)<br>STOT SE 3 (H335)<br>STOT SE 3 (H336) |

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|                                          |            |                   |    |                                                                                                     |
|------------------------------------------|------------|-------------------|----|-----------------------------------------------------------------------------------------------------|
|                                          |            |                   |    | Carc. 2 (H351)<br>(EUH019)                                                                          |
| Lithium aluminum tri-tert-butoxy-hydride | 17476-04-9 | EEC No. 241-490-8 | 30 | Flam Sol. 1 (H228)<br>Skin Corr. 1B (H314)<br>Eye Dam. 1 (H318)<br>Wat. React. 1 (H260)<br>(EUH014) |

| Component       | Specific concentration limits<br>(SCL's)                                 | M-Factor | Component notes |
|-----------------|--------------------------------------------------------------------------|----------|-----------------|
| Tetrahydrofuran | Acute Tox. 4 :: C>82.5%<br>Eye Irrit. 2 :: C>=25%<br>STOT SE 3 :: C>=25% | -        | -               |

| Components                               | Reach Registration Number |  |
|------------------------------------------|---------------------------|--|
| Tetrahydrofuran                          | 01-2119444314-46          |  |
| Lithium aluminum tri-tert-butoxy-hydride | 01-2120138355-58          |  |

Full text of Hazard Statements: see section 16

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

|                                           |                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Advice</b>                     | Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.                                                                                                                                                                                                                              |
| <b>Eye Contact</b>                        | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.                                                                                                                                                                                              |
| <b>Skin Contact</b>                       | 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.                                                                                                                                        |
| <b>Ingestion</b>                          | Do NOT induce vomiting. Clean mouth with water. Never give anything by mouth to an unconscious person. Call a physician immediately.                                                                                                                                                                                           |
| <b>Inhalation</b>                         | 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. |
| <b>Self-Protection of the First Aider</b> | 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. Symptoms of overexposure may be 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: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Causes central nervous system depression

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

|                           |                                                 |
|---------------------------|-------------------------------------------------|
| <b>Notes to Physician</b> | Treat symptomatically. Symptoms may be delayed. |
|---------------------------|-------------------------------------------------|

## SECTION 5: FIREFIGHTING MEASURES

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## 5.1. Extinguishing media

### **Suitable Extinguishing Media**

Dry chemical, soda ash, lime or sand. approved class D extinguishers.

### **Extinguishing media which must not be used for safety reasons**

Water. Carbon dioxide (CO<sub>2</sub>). 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**

Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), Burning produces obnoxious and toxic fumes, Hydrogen.

## 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

Ensure adequate ventilation. Use personal protective equipment as required. 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

Should not be released into the environment.

### 6.3. Methods and material for containment and cleaning up

Keep in suitable, closed containers for disposal. Soak up with inert absorbent material. 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

Refer to protective measures listed in Sections 8 and 13.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Do not get in eyes, on skin, or on clothing. Wear personal protective equipment/face protection. 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. If peroxide formation is suspected, do not open or move container. 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

Keep away from heat, sparks and flame. Keep from any possible contact with water. Flammables area. Keep under nitrogen. Shelf life 12 months. May form explosive peroxides on prolonged storage. Containers should be dated when opened and tested

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periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area.

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

Class 4.3

## 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, Fourth edition. Published 2020. **IRE** - 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

| Component       | The United Kingdom                                                                                                        | European Union                                                                                                              | Ireland                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Tetrahydrofuran | STEL: 100 ppm 15 min<br>STEL: 300 mg/m <sup>3</sup> 15 min<br>TWA: 50 ppm 8 hr<br>TWA: 150 mg/m <sup>3</sup> 8 hr<br>Skin | TWA: 50 ppm (8h)<br>TWA: 150 mg/m <sup>3</sup> (8h)<br>STEL: 100 ppm (15min)<br>STEL: 300 mg/m <sup>3</sup> (15min)<br>Skin | TWA: 50 ppm 8 hr.<br>TWA: 150 mg/m <sup>3</sup> 8 hr.<br>STEL: 100 ppm 15 min<br>STEL: 300 mg/m <sup>3</sup> 15 min<br>Skin |

#### Biological limit values

List source(s):

#### 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) |
|------------------------------------|------------------------------|---------------------------------|--------------------------------|-----------------------------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) |                              |                                 |                                | DNEL = 12.6mg/kg<br>bw/day        |

| Component                          | Acute effects local (Inhalation) | Acute effects systemic (Inhalation) | Chronic effects local (Inhalation) | Chronic effects systemic (Inhalation) |
|------------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) | DNEL = 300mg/m <sup>3</sup>      | DNEL = 96mg/m <sup>3</sup>          | DNEL = 150mg/m <sup>3</sup>        | DNEL = 72.4mg/m <sup>3</sup>          |

#### Predicted No Effect Concentration (PNEC)

See values below.

| Component                          | Fresh water     | Fresh water sediment            | Water Intermittent | Microorganisms in sewage treatment | Soil (Agriculture)          |
|------------------------------------|-----------------|---------------------------------|--------------------|------------------------------------|-----------------------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) | PNEC = 4.32mg/L | PNEC = 23.3mg/kg<br>sediment dw | PNEC = 21.6mg/L    | PNEC = 4.6mg/L                     | PNEC = 2.13mg/kg<br>soil dw |

| Component                          | Marine water     | Marine water sediment           | Marine water intermittent | Food chain             | Air |
|------------------------------------|------------------|---------------------------------|---------------------------|------------------------|-----|
| Tetrahydrofuran<br>109-99-9 ( 70 ) | PNEC = 0.432mg/L | PNEC = 2.33mg/kg<br>sediment dw |                           | PNEC = 67mg/kg<br>food |     |

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## 8.2. Exposure controls

### Engineering Measures

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

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

#### Skin and body protection

Long sleeved clothing.

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves.

(Refer to manufacturer/supplier for information)

Ensure 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.

Remove 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

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

**Recommended Filter type:** low boiling organic solvent Type AX Brown conforming to EN371 or Organic gases and vapours filter Type A Brown conforming to EN14387

#### Small scale/Laboratory use

Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Recommended half mask:-** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141

When RPE is used a face piece Fit Test should be conducted

#### Environmental exposure controls

No information available.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

#### Physical State

Liquid

#### Appearance

Clear

#### Odor

Irritating

#### 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

No data available

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|                                         |                             |                                   |
|-----------------------------------------|-----------------------------|-----------------------------------|
| Flash Point                             | -17 °C / 1.4 °F             | Method - No information available |
| Autoignition Temperature                | No data available           |                                   |
| Decomposition Temperature               | No data available           |                                   |
| pH                                      | No information available    |                                   |
| Viscosity                               | No data available           |                                   |
| Water Solubility                        | Reacts violently with water |                                   |
| Solubility in other solvents            | No information available    |                                   |
| Partition Coefficient (n-octanol/water) |                             |                                   |
| Component                               | log Pow                     |                                   |
| Tetrahydrofuran                         | 0.45                        |                                   |
| Vapor Pressure                          | No data available           |                                   |
| Density / Specific Gravity              | 0.900                       |                                   |
| Bulk Density                            | Not applicable              | Liquid                            |
| Vapor Density                           | No information available    | (Air = 1.0)                       |
| Particle characteristics                | Not applicable (liquid)     |                                   |

## 9.2. Other information

|                                                                        |                                                         |
|------------------------------------------------------------------------|---------------------------------------------------------|
| Explosive Properties                                                   | Vapors may form explosive mixtures with air             |
| Substances/mixtures which, in contact with water, emit flammable gases | Emitted gas ignites spontaneously<br>Gas(es) = Hydrogen |

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

Yes Contact with water liberates extremely flammable gases

### 10.2. Chemical stability

May form explosive peroxides. Moisture sensitive. Reacts violently with water, liberating extremely flammable gases.

### 10.3. Possibility of hazardous reactions

|                          |                                                            |
|--------------------------|------------------------------------------------------------|
| Hazardous Polymerization | No information available.                                  |
| Hazardous Reactions      | None under normal processing. Reacts violently with water. |

### 10.4. Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Do not allow evaporation to dryness. Exposure to light. Incompatible products. Exposure to moist air or water. Exposure to moisture.

### 10.5. Incompatible materials

Acids. Strong oxidizing agents. Alcohols. oxygen. Water. Carbon dioxide (CO<sub>2</sub>).

### 10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Burning produces obnoxious and toxic fumes. Hydrogen.

## 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

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## Toxicology data for the components

| Component       | LD50 Oral          | LD50 Dermal           | LC50 Inhalation                               |
|-----------------|--------------------|-----------------------|-----------------------------------------------|
| Tetrahydrofuran | 1650 mg/kg ( Rat ) | > 2000 mg/kg (Rabbit) | 180 mg/L ( Rat ) 1 h<br>53.9 mg/L ( Rat ) 4 h |

(b) skin corrosion/irritation; Category 1 B

(c) serious eye damage/irritation; Category 1

(d) respiratory or skin sensitization;

Respiratory No data available  
Skin No data available

| Component                          | Test method                                       | Test species | Study result    |
|------------------------------------|---------------------------------------------------|--------------|-----------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) | Local Lymph Node Assay<br>OECD Test Guideline 429 | mouse        | non-sensitising |

(e) germ cell mutagenicity; No data available

| Component                          | Test method                                             | Test species          | Study result |
|------------------------------------|---------------------------------------------------------|-----------------------|--------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) | OECD Test Guideline 476<br>Gene cell mutation           | in vivo<br>Mammalian  | negative     |
|                                    | OECD Test Guideline 473<br>Chromosomal aberration assay | in vitro<br>Mammalian | negative     |

(f) carcinogenicity; Category 2

The table below indicates whether each agency has listed any ingredient as a carcinogen  
Limited evidence of a carcinogenic effect

| Component       | EU | UK | Germany | IARC     |
|-----------------|----|----|---------|----------|
| Tetrahydrofuran |    |    |         | Group 2B |

(g) reproductive toxicity; No data available

| Component                          | Test method             | Test species / Duration | Study result      |
|------------------------------------|-------------------------|-------------------------|-------------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) | OECD Test Guideline 416 | Rat<br>2 Generation     | NOAEL = 3,000 ppm |

(h) STOT-single exposure; Category 3

Results / Target organs Respiratory system, Central nervous system (CNS).

(i) STOT-repeated exposure; No data available

Target Organs No information available.

(j) aspiration hazard; No data available

Other Adverse Effects The toxicological properties have not been fully investigated.

Symptoms / effects, both acute and delayed Symptoms of overexposure may be 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. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. Causes central nervous system depression.

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## 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.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1. Toxicity

**Ecotoxicity effects** Do not empty into drains. Reacts with water so no ecotoxicity data for the substance is available.

| Component                                | Freshwater Fish                                                                     | Water Flea                                   | Freshwater Algae |
|------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------|------------------|
| Tetrahydrofuran                          | 2160 mg/l LC50 = 96 h<br>Pimephales promelas<br>Leuciscus idus: LC50: 2820 mg/L/48h | EC50 48 h 3485 mg/l<br>EC50: >10000 mg/L/24h |                  |
| Lithium aluminum tri-tert-butoxy-hydride |                                                                                     | 19.1 mg/L 48h                                |                  |

### 12.2. Persistence and degradability

**Persistence** Soluble in water, Persistence is unlikely, based on information available.  
**Degradability** Reacts with water.  
**Degradation in sewage treatment plant** Reacts violently with water.

**12.3. Bioaccumulative potential** Bioaccumulation is unlikely; Product does not bioaccumulate due to reaction with water

| Component       | log Pow | Bioconcentration factor (BCF) |
|-----------------|---------|-------------------------------|
| Tetrahydrofuran | 0.45    | No data available             |

**12.4. Mobility in soil** The product is water soluble, and may spread in water systems Reacts violently with water . Will likely be mobile in the environment due to its water solubility. Is not likely mobile in the environment. Highly mobile in soils

**12.5. Results of PBT and vPvB assessment** Reacts violently with water.

### 12.6. Endocrine disrupting properties

#### Endocrine Disruptor Information

| Component       | EU - Endocrine Disruptors Candidate List | EU - Endocrine Disruptors - Evaluated Substances |
|-----------------|------------------------------------------|--------------------------------------------------|
| Tetrahydrofuran | Group III Chemical                       |                                                  |

### 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.

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|                                       |                                                                                                                                                                                                                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contaminated Packaging</b>         | 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.                                                   |
| <b>European Waste Catalogue (EWC)</b> | According to the European Waste Catalog, Waste Codes are not product specific, but application specific.                                                                                                                                                                                   |
| <b>Other Information</b>              | 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. |

## SECTION 14: TRANSPORT INFORMATION

### IMDG/IMO

|                                         |                                                             |
|-----------------------------------------|-------------------------------------------------------------|
| <b>14.1. UN number</b>                  | UN3399                                                      |
| <b>14.2. UN proper shipping name</b>    | ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE |
| <b>Technical Shipping Name</b>          | Tetrahydrofuran, Lithium aluminum tri-tert-butoxy-hydride   |
| <b>14.3. Transport hazard class(es)</b> | 4.3                                                         |
| <b>Subsidiary Hazard Class</b>          | 3                                                           |
| <b>14.4. Packing group</b>              | I                                                           |

### ADR

|                                         |                                                             |
|-----------------------------------------|-------------------------------------------------------------|
| <b>14.1. UN number</b>                  | UN3399                                                      |
| <b>14.2. UN proper shipping name</b>    | ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE |
| <b>Technical Shipping Name</b>          | Tetrahydrofuran, Lithium aluminum tri-tert-butoxy-hydride   |
| <b>14.3. Transport hazard class(es)</b> | 4.3                                                         |
| <b>Subsidiary Hazard Class</b>          | 3                                                           |
| <b>14.4. Packing group</b>              | I                                                           |

### IATA

|                                         |                                                             |
|-----------------------------------------|-------------------------------------------------------------|
| <b>14.1. UN number</b>                  | UN3399                                                      |
| <b>14.2. UN proper shipping name</b>    | Organometallic substance, liquid, water-reactive, flammable |
| <b>Technical Shipping Name</b>          | Tetrahydrofuran, Lithium aluminum tri-tert-butoxy-hydride   |
| <b>14.3. Transport hazard class(es)</b> | 4.3                                                         |
| <b>Subsidiary Hazard Class</b>          | 3                                                           |
| <b>14.4. Packing group</b>              | I                                                           |

|                                                                      |                                  |
|----------------------------------------------------------------------|----------------------------------|
| <b>14.5. Environmental hazards</b>                                   | No hazards identified            |
| <b>14.6. Special precautions for user</b>                            | No special precautions required. |
| <b>14.7. Maritime transport in bulk according to IMO instruments</b> | Not applicable, packaged goods   |

## SECTION 15: REGULATORY INFORMATION

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

#### International Inventories

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

| Component | CAS No | EINECS | ELINCS | NLP | IECSC | TCSI | KECL | ENCS | ISHL |
|-----------|--------|--------|--------|-----|-------|------|------|------|------|
|-----------|--------|--------|--------|-----|-------|------|------|------|------|

# SAFETY DATA SHEET

**Lithium tri-tert-butoxyaluminumhydride, 1.1M solution in THF**

**Revision Date** 09-Feb-2024

|                                          |            |           |   |   |   |   |                 |   |   |
|------------------------------------------|------------|-----------|---|---|---|---|-----------------|---|---|
| Tetrahydrofuran                          | 109-99-9   | 203-726-8 | - | - | X | X | KE-33454        | X | X |
| Lithium aluminum tri-tert-butoxy-hydride | 17476-04-9 | 241-490-8 | - | - | - | X | 2015-3-64<br>23 | - | - |

| Component                                | CAS No     | TSCA | TSCA Inventory notification - Active-Inactive | DSL | NDSL | AICS | NZIoC | PICCS |
|------------------------------------------|------------|------|-----------------------------------------------|-----|------|------|-------|-------|
| Tetrahydrofuran                          | 109-99-9   | X    | ACTIVE                                        | X   | -    | X    | X     | X     |
| Lithium aluminum tri-tert-butoxy-hydride | 17476-04-9 | 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) |
|------------------------------------------|------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Tetrahydrofuran                          | 109-99-9   | -                                                                   | Use restricted. See item 75.<br>(see link for restriction details)            | -                                                                                                     |
| Lithium aluminum tri-tert-butoxy-hydride | 17476-04-9 | -                                                                   | -                                                                             | -                                                                                                     |

## 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 |
|------------------------------------------|------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Tetrahydrofuran                          | 109-99-9   | Not applicable                                                                            | Not applicable                                                                           |
| Lithium aluminum tri-tert-butoxy-hydride | 17476-04-9 | 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

## National Regulations

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

## WGK Classification

Water endangering class = 1 (self classification)

| Component                                | Germany - Water Classification (AwSV) | Germany - TA-Luft Class |
|------------------------------------------|---------------------------------------|-------------------------|
| Tetrahydrofuran                          | WGK1                                  |                         |
| Lithium aluminum tri-tert-butoxy-hydride | WGK1                                  |                         |

| Component | France - INRS (Tables of occupational diseases) |
|-----------|-------------------------------------------------|
|-----------|-------------------------------------------------|

# SAFETY DATA SHEET

Lithium tri-tert-butoxyaluminumhydride, 1.1M solution in THF

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|                 |                                                      |
|-----------------|------------------------------------------------------|
| Tetrahydrofuran | Tableaux des maladies professionnelles (TMP) - RG 84 |
|-----------------|------------------------------------------------------|

| 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 |
|------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Tetrahydrofuran<br>109-99-9 ( 70 ) |                                                                                                                | Group I                                                                         |                                                                                             |

## 15.2. Chemical safety assessment

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

## SECTION 16: OTHER INFORMATION

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

H260 - In contact with water releases flammable gases which may ignite spontaneously  
H314 - Causes severe skin burns and eye damage  
H318 - Causes serious eye damage  
H335 - May cause respiratory irritation  
H336 - May cause drowsiness or dizziness  
H351 - Suspected of causing cancer  
EUH014 - Reacts violently with water  
EUH019 - May form explosive peroxides  
H225 - Highly flammable liquid and vapor  
H228 - Flammable solid  
H302 - Harmful if swallowed  
H319 - Causes serious eye irritation

### 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/NDL** - 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

# SAFETY DATA SHEET

Lithium tri-tert-butoxyaluminumhydride, 1.1M solution in THF

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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.

Revision Date

09-Feb-2024

Revision Summary

Not applicable.

**This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.**

## Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of Safety Data Sheet**