

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

### 1.1. Product identifier

Product Description: n-Butylmagnesium chloride, 20 wt% solution in THF/Toluene  
Cat No. : 331680000; 331681000; 331688000

### 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

#### GHS 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**

|                                   |                     |
|-----------------------------------|---------------------|
| Aspiration Toxicity               | Category 1 (H304)   |
| Skin Corrosion/Irritation         | Category 1 B (H314) |
| Serious Eye Damage/Eye Irritation | Category 1 (H318)   |
| Carcinogenicity                   | Category 2 (H351)   |

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Reproductive Toxicity  
Specific target organ toxicity - (single exposure)  
Specific target organ toxicity - (repeated exposure)

Category 2 (H361d)  
Category 3 (H335) (H336)  
Category 2 (H373)

## **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  
H304 - May be fatal if swallowed and enters airways  
H314 - Causes severe skin burns and eye damage  
H335 - May cause respiratory irritation  
H336 - May cause drowsiness or dizziness  
H351 - Suspected of causing cancer  
H361d - Suspected of damaging the unborn child  
H373 - May cause damage to organs through prolonged or repeated exposure  
EUH014 - Reacts violently with water  
EUH019 - May form explosive peroxides

## **Precautionary Statements**

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking  
P231 + P232 - Handle and store contents under inert gas. Protect from moisture  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P301 + P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting  
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a POISON CENTER or doctor/physician

## **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**

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| Component               | CAS No   | EC No             | Weight % | GHS Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567   |
|-------------------------|----------|-------------------|----------|---|
| Toluene                 | 108-88-3 | 203-625-9         | 30       | Flam. Liq. 2 (H225)<br>Asp. Tox. 1 (H304)<br>Skin Irrit. 2 (H315)<br>STOT SE 3 (H336)<br>Repr. 2 (H361d)<br>STOT RE 2 (H373)            |
| Tetrahydrofuran         | 109-99-9 | 203-726-8         | 50       | Flam. Liq. 2 (H225)<br>Acute Tox. 4 (H302)<br>Eye Irrit. 2 (H319)<br>STOT SE 3 (H335)<br>STOT SE 3 (H336)<br>Carc. 2 (H351)<br>(EUH019) |
| Butylmagnesium chloride | 693-04-9 | EEC No. 211-739-5 | 20       | Flam. Liq. 2 (H225)<br>Water-react.1 (H260)<br>Skin Corr. 1B (H314)<br>Eye Dam. 1 (H318)<br>(EUH014)                                    |

| Component       | Specific concentration limits (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 |
|-------------------------|---------------------------|
| Toluene                 | 01-2119471310-51          |
| Tetrahydrofuran         | 01-2119444314-46          |
| Butylmagnesium chloride | 01-2120065579-42          |

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. Call a physician or poison control center immediately. If vomiting occurs naturally, have victim lean forward.   |
| <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. Risk of serious damage to the lungs (by aspiration). |

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

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

Causes burns by all exposure routes. 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**

**Notes to Physician** Treat symptomatically. Symptoms may be delayed.

## **SECTION 5: FIREFIGHTING MEASURES**

### **5.1. Extinguishing media**

#### **Suitable Extinguishing Media**

Dry sodium chloride. Limestone powder. Dry sand. Water mist may be used to cool closed containers.

#### **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**

Reacts violently with water. Flammable. The product causes burns of eyes, skin and mucous membranes. 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>), Hydrogen chloride gas, Butane.

### **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. Do not flush into surface water or sanitary sewer system.

### **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.

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## 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 under nitrogen. Flammables area. Keep from any possible contact with water. Keep away from heat, sparks and flame. Keep containers tightly closed in a dry, cool and well-ventilated place. Shelf life 12 months. May form explosive peroxides on prolonged storage. Containers should be dated when opened and tested 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.

**Technical Rules for Hazardous Substances (TRGS) 510**      Class 4.3  
**Storage Class (LGK) (Germany)**

### 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   |
|-----------------|---|---|---|
| Toluene         | STEL: 100 ppm 15 min<br>STEL: 384 mg/m <sup>3</sup> 15 min<br>TWA: 50 ppm 8 hr<br>TWA: 191 mg/m <sup>3</sup> 8 hr<br>Skin | TWA: 50 ppm (8hr)<br>TWA: 192 mg/m <sup>3</sup> (8hr)<br>STEL: 100 ppm (15min)<br>STEL: 384 mg/m <sup>3</sup> (15min)<br>Skin | TWA: 192 mg/m <sup>3</sup> 8 hr.<br>TWA: 50 ppm 8 hr.<br>STEL: 384 mg/m <sup>3</sup> 15 min<br>STEL: 100 ppm 15 min<br>Skin |
| 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

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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) |
|------------------------------------|------------------------------|---------------------------------|--------------------------------|-----------------------------------|
| Toluene<br>108-88-3 ( 30 )         |                              |                                 |                                | DNEL = 384mg/kg<br>bw/day         |
| Tetrahydrofuran<br>109-99-9 ( 50 ) |                              |                                 |                                | DNEL = 12.6mg/kg<br>bw/day        |

| Component                          | Acute effects local (Inhalation) | Acute effects systemic (Inhalation) | Chronic effects local (Inhalation) | Chronic effects systemic (Inhalation) |
|------------------------------------|----------------------------------|-------------------------------------|------------------------------------|---------------------------------------|
| Toluene<br>108-88-3 ( 30 )         | DNEL = 384mg/m <sup>3</sup>      | DNEL = 384mg/m <sup>3</sup>         | DNEL = 192mg/m <sup>3</sup>        | DNEL = 192mg/m <sup>3</sup>           |
| Tetrahydrofuran<br>109-99-9 ( 50 ) | 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)          |
|------------------------------------|-----------------|----------------------------------|--------------------|------------------------------------|-----------------------------|
| Toluene<br>108-88-3 ( 30 )         | PNEC = 0.68mg/L | PNEC = 16.39mg/kg<br>sediment dw | PNEC = 0.68mg/L    | PNEC = 13.61mg/L                   | PNEC = 2.89mg/kg<br>soil dw |
| Tetrahydrofuran<br>109-99-9 ( 50 ) | 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 |
|------------------------------------|------------------|----------------------------------|---------------------------|------------------------|-----|
| Toluene<br>108-88-3 ( 30 )         | PNEC = 0.68mg/L  | PNEC = 16.39mg/kg<br>sediment dw |                           |                        |     |
| Tetrahydrofuran<br>109-99-9 ( 50 ) | PNEC = 0.432mg/L | PNEC = 2.33mg/kg<br>sediment dw  |                           | PNEC = 67mg/kg<br>food |     |

## 8.2. Exposure controls

### Engineering Measures

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

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 recommendations | -               | EN 374      | (minimum requirement) |
| Neoprene gloves |                                   |                 |             |                       |

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**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** Prevent product from entering drains. Do not allow material to contaminate ground water system.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

|  |                             |  |
|--|-----------------------------|--|
| <b>Physical State</b>                          | Liquid                      |  |
| <b>Appearance</b>                              | Green                       |  |
| <b>Odor</b>                                    | No information available    |  |
| <b>Odor Threshold</b>                          | No data available           |  |
| <b>Melting Point/Range</b>                     | No data available           |  |
| <b>Softening Point</b>                         | No data available           |  |
| <b>Boiling Point/Range</b>                     | No information available    |  |
| <b>Flammability (liquid)</b>                   | Highly flammable            | On basis of test data                    |
| <b>Flammability (solid,gas)</b>                | Not applicable              | Liquid                                   |
| <b>Explosion Limits</b>                        | No data available           |  |
| <b>Flash Point</b>                             | -21 °C / -5.8 °F            | <b>Method -</b> No information available |
| <b>Autoignition Temperature</b>                | No data available           |  |
| <b>Decomposition Temperature</b>               | No data available           |  |
| <b>pH</b>                                      | No information available    |  |
| <b>Viscosity</b>                               | No data available           |  |
| <b>Water Solubility</b>                        | Reacts violently with water |  |
| <b>Solubility in other solvents</b>            | No information available    |  |
| <b>Partition Coefficient (n-octanol/water)</b> |                             |  |
| <b>Component</b>                               | <b>log Pow</b>              |  |
| Toluene  | 2.73                        |  |
| Tetrahydrofuran                                | 0.45                        |  |
| <b>Vapor Pressure</b>                          | No data available           |  |
| <b>Density / Specific Gravity</b>              | 1.000                       |  |
| <b>Bulk Density</b>                            | Not applicable              | Liquid                                   |
| <b>Vapor Density</b>                           | No data available           | (Air = 1.0)                              |
| <b>Particle characteristics</b>                | Not applicable (liquid)     |  |

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## 9.2. Other information

**Explosive Properties**  
**Substances/mixtures which, in contact with water, emit flammable gases**

Vapors may form explosive mixtures with air  
Emitted gas ignites spontaneously  
Gas(es) = Butane

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity

Yes: Reacts violently with water

### 10.2. Chemical stability

May form explosive peroxides. Moisture sensitive. Air sensitive.

### 10.3. Possibility of hazardous reactions

**Hazardous Polymerization**  
**Hazardous Reactions**

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

### 10.4. Conditions to avoid

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

### 10.5. Incompatible materials

Acids. Alcohols. Bromine.

### 10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Hydrogen chloride gas. Butane.

## SECTION 11: TOXICOLOGICAL INFORMATION

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

#### Product Information

#### (a) acute toxicity;

**Oral**

Based on available data, the classification criteria are not met

**Dermal**

Based on available data, the classification criteria are not met

**Inhalation**

Based on available data, the classification criteria are not met

#### Toxicology data for the components

| Component       | LD50 Oral            | LD50 Dermal                   | LC50 Inhalation                               |
|-----------------|----------------------|-------------------------------|---|
| Toluene         | > 5000 mg/kg ( Rat ) | LD50 = 12000 mg/kg ( Rabbit ) | 26700 ppm ( Rat ) 1 h                         |
| 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



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**(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 ( 50 ) | 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 ( 50 ) | 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  
Limited evidence of a carcinogenic effect

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

**(g) reproductive toxicity;** Category 2

| Component                          | Test method             | Test species / Duration | Study result      |
|------------------------------------|-------------------------|-------------------------|-------------------|
| Tetrahydrofuran<br>109-99-9 ( 50 ) | OECD Test Guideline 416 | Rat<br>2 Generation     | NOAEL = 3,000 ppm |

**Teratogenicity** Teratogenic effects have occurred in experimental animals.

**(h) STOT-single exposure;** Category 3  
**Results / Target organs** Respiratory system, Central nervous system (CNS).

**(i) STOT-repeated exposure;** Category 2  
**Target Organs** Neuropsychological effects, Eyes, Ears.

**(j) aspiration hazard;** Category 1  
**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.

**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**

ACR33168



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retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

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

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

## SECTION 14: TRANSPORT INFORMATION

### IMDG/IMO

|  |  |
|--|--|
| <b>14.1. UN number</b>   | UN3399   |
| <b>14.2. UN proper shipping name</b><br>Technical Shipping Name    | ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE<br>n-Butylmagnesium chloride, Tetrahydrofuran, Toluene |
| <b>14.3. Transport hazard class(es)</b><br>Subsidiary Hazard Class | 4.3<br>3   |
| <b>14.4. Packing group</b>   | I  |

### ADR

|  |  |
|--|--|
| <b>14.1. UN number</b>   | UN3399   |
| <b>14.2. UN proper shipping name</b><br>Technical Shipping Name    | ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE<br>n-Butylmagnesium chloride, Tetrahydrofuran, Toluene |
| <b>14.3. Transport hazard class(es)</b><br>Subsidiary Hazard Class | 4.3<br>3   |
| <b>14.4. Packing group</b>   | I  |

### IATA

|  |  |
|--|--|
| <b>14.1. UN number</b>   | UN3399   |
| <b>14.2. UN proper shipping name</b><br>Technical Shipping Name    | ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE<br>n-Butylmagnesium chloride, Tetrahydrofuran, Toluene |
| <b>14.3. Transport hazard class(es)</b><br>Subsidiary Hazard Class | 4.3<br>3   |
| <b>14.4. Packing group</b>   | I  |

**14.5. Environmental hazards** No hazards identified

**14.6. Special precautions for user** No special precautions required.

**14.7. Maritime transport in bulk according to IMO instruments** 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/NDL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

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| Component               | CAS No   | EINECS    | ELINCS | NLP | IECSC | TCSI | KECL     | ENCS | ISHL |
|-------------------------|----------|-----------|--------|-----|-------|------|----------|------|------|
| Toluene                 | 108-88-3 | 203-625-9 | -      | -   | X     | X    | KE-33936 | X    | X    |
| Tetrahydrofuran         | 109-99-9 | 203-726-8 | -      | -   | X     | X    | KE-33454 | X    | X    |
| Butylmagnesium chloride | 693-04-9 | 211-739-5 | -      | -   | -     | X    | -        | X    | X    |

| Component               | CAS No   | TSCA | TSCA Inventory notification - Active-Inactive | DSL | NDSL | AICS | NZIoC | PICCS |
|-------------------------|----------|------|---|-----|------|------|-------|-------|
| Toluene                 | 108-88-3 | X    | ACTIVE  | X   | -    | X    | X     | X     |
| Tetrahydrofuran         | 109-99-9 | X    | ACTIVE  | X   | -    | X    | X     | X     |
| Butylmagnesium chloride | 693-04-9 | X    | ACTIVE  | -   | 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) |
|-------------------------|----------|---|--|---|
| Toluene                 | 108-88-3 | -   | Use restricted. See entry 48.<br>(see link for restriction details)<br>Use restricted. See entry 75.<br>(see link for restriction details) | -   |
| Tetrahydrofuran         | 109-99-9 | -   | Use restricted. See entry 75.<br>(see link for restriction details)  | -   |
| Butylmagnesium chloride | 693-04-9 | -   | -  | -   |

### 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 |
|-------------------------|----------|---|--|
| Toluene                 | 108-88-3 | Not applicable  | Not applicable   |
| Tetrahydrofuran         | 109-99-9 | Not applicable  | Not applicable   |
| Butylmagnesium chloride | 693-04-9 | 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

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

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

# SAFETY DATA SHEET

n-Butylmagnesium chloride, 20 wt% solution in THF/Toluene

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## National Regulations

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

**WGK Classification** Water endangering class = 2 (self classification)

| Component               | Germany - Water Classification (AwSV) | Germany - TA-Luft Class |
|-------------------------|---------------------------------------|-------------------------|
| Toluene                 | WGK3                                  |                         |
| Tetrahydrofuran         | WGK1                                  |                         |
| Butylmagnesium chloride | WGK1                                  |                         |

| Component       | France - INRS (Tables of occupational diseases)               |
|-----------------|---|
| Toluene         | Tableaux des maladies professionnelles (TMP) - RG 4bis, RG 84 |
| 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 |
|------------------------------------|--|---|---|
| Toluene<br>108-88-3 ( 30 )         | Prohibited and Restricted Substances   | Group I   |   |
| Tetrahydrofuran<br>109-99-9 ( 50 ) |  | 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

H225 - Highly flammable liquid and vapor  
H260 - In contact with water releases flammable gases which may ignite spontaneously  
H302 - Harmful if swallowed  
H304 - May be fatal if swallowed and enters airways  
H314 - Causes severe skin burns and eye damage  
H315 - Causes skin irritation  
H318 - Causes serious eye damage  
H319 - Causes serious eye irritation  
H335 - May cause respiratory irritation  
H336 - May cause drowsiness or dizziness  
H351 - Suspected of causing cancer  
H361d - Suspected of damaging the unborn child  
H373 - May cause damage to organs through prolonged or repeated exposure  
EUH014 - Reacts violently with water  
EUH019 - May form explosive peroxides

### Legend

**CAS** - Chemical Abstracts Service

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

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**IECSC** - Chinese Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

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

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

**ENCS** - Japanese Existing and New Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

# SAFETY DATA SHEET

n-Butylmagnesium chloride, 20 wt% solution in THF/Toluene

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**WEL** - Workplace Exposure Limit

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DNEL** - Derived No Effect Level

**RPE** - Respiratory Protective Equipment

**LC50** - Lethal Concentration 50%

**NOEC** - No Observed Effect Concentration

**PBT** - Persistent, Bioaccumulative, Toxic

**TWA** - Time Weighted Average

**IARC** - International Agency for Research on Cancer

Predicted No Effect Concentration (PNEC)

**LD50** - Lethal Dose 50%

**EC50** - Effective Concentration 50%

**POW** - Partition coefficient Octanol:Water

**vPvB** - very Persistent, very Bioaccumulative

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

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

**OECD** - Organisation for Economic Co-operation and Development

**BCF** - Bioconcentration factor

## Key literature references and sources for data

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

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

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

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**ATE** - Acute Toxicity Estimate

**VOC** - (Volatile Organic Compound)

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

**Physical hazards** On basis of test data

**Health Hazards** Calculation method

**Environmental hazards** Calculation method

## Training Advice

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

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

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

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

Chemical incident response training.

**Creation Date** 23-Jun-2008

**Revision Date** 06-Dec-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**