SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers
Product name: Benzyl chloride
Product Number: 185558
Brand: Aldrich
Index-No.: 602-037-00-3
REACH No.: 01-2119487137-31-XXXX
CAS-No.: 100-44-7

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet
Company: Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO  63103
UNITED STATES

Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone
Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification according to Regulation (EC) No 1272/2008
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 3), H331
Skin irritation (Category 2), H315
Serious eye damage (Category 1), H318
Skin sensitization (Category 1), H317
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

The life science business of Merck operates as MilliporeSigma in the US and Canada
The life science business of Merck operates as MilliporeSigma in the US and
Canada

Specific target organ toxicity - repeated exposure, Oral (Category 2), Heart, forestomach, H373
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal Word
Danger

Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.
H340 May cause genetic defects.
H350 May cause cancer.
H373 May cause damage to organs (Heart, forestomach) through prolonged or repeated exposure if swallowed.

Precautionary statement(s)
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Supplemental Hazard Statements
none

Restricted to professional users.

Reduced Labeling (<= 125 ml)

Pictogram

Signal Word
Danger

Hazard statement(s)
H331 Toxic if inhaled.
H317 May cause an allergic skin reaction.
H340 May cause genetic defects.
H350 May cause cancer.
H318 Causes serious eye damage.
Precautionary statement(s)
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Supplemental Hazard Statements
none

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.
Lachrymator.

SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzyl chloride</td>
<td>Acute Tox. 4; Acute Tox. 3; Skin Irrit. 2; Eye Dam. 1; Skin Sens. 1; Carc. 1B; STOT SE 3; STOT RE 2; H302, H311, H315, H318, H317, H350, H335, H373</td>
<td>&lt;= 100 %</td>
</tr>
<tr>
<td>propylene oxide</td>
<td>Flam. Liq. 1; Acute Tox. 4; Acute Tox. 3; Eye Irrit. 2; Muta. 1B; Carc. 1B; STOT SE 3; H224, H302, H331, H311, H319, H340, H350, H335</td>
<td>&gt;= 0,1 - &lt; 1 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

The life science business of Merck operates as MilliporeSigma in the US and Canada
SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Hydrogen chloride gas
Mixture with combustible ingredients.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.
5.4  **Further information**
Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

**SECTION 6: Accidental release measures**

6.1  **Personal precautions, protective equipment and emergency procedures**
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2  **Environmental precautions**
Do not let product enter drains.

6.3  **Methods and materials for containment and cleaning up**
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4  **Reference to other sections**
For disposal see section 13.

---

**SECTION 7: Handling and storage**

7.1  **Precautions for safe handling**

*Advice on safe handling*
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

*Advice on protection against fire and explosion*
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

*Hygiene measures*
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2  **Conditions for safe storage, including any incompatibilities**

*Storage conditions*
Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Light sensitive. Moisture sensitive.

*Storage class*
Storage class (TRGS 510): 6.1A: Combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3  **Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.
SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

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

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Viton®
Minimum layer thickness: 0,7 mm
Break through time: 480 min
Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Splash contact
Material: Chloroprene
Minimum layer thickness: 0,65 mm
Break through time: 30 min
Material tested: KCL 720 Camapren®

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Respirator.

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Physical state: liquid
b) Color: colorless
c) Odor: stinging
d) Melting point/freezing point: Melting point/range: -43 °C - lit.
e) Initial boiling point and boiling range: 177 - 181 °C - lit.
f) Flammability (solid, gas): No data available
g) Upper/lower flammability or explosive limits: Upper explosion limit: 14 % (V)
   Lower explosion limit: 1,1 % (V)
h) Flash point: 67 °C - c.c.
i) Autoignition temperature: 585 °C
   at 1.013 hPa
j) Decomposition temperature: No data available
k) pH: Not applicable
l) Viscosity: Viscosity, kinematic: No data available
   Viscosity, dynamic: 1,380 mPa.s at 20 °C
m) Water solubility: 0,46 g/l at 30 °C
n) Partition coefficient: n-octanol/water: log Pow: 2,3 - (IUCLID), Bioaccumulation is not expected.
o) Vapor pressure: 1,6 hPa at 25 °C
p) Density: 1,1 g/cm3 at 25 °C - lit.
   Relative density: 1,1 at 20 °C
q) Relative vapor density: 4,36
r) Particle characteristics: No data available
s) Explosive properties: No data available
t) Oxidizing properties: none

9.2 Other safety information

Relative vapor density: 4,36
SECTION 10: Stability and reactivity

10.1 Reactivity
Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).
Contains the following stabilizer(s):
propylene oxide (<1 %)

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Strong oxidizing agents
amides
substances with a catalytic effect
numerous inorganic and/or organic compounds
Risk of explosion with:
polymerisation initiators
Acids
A risk of explosion and/or of toxic gas formation exists with the following substances:
Alkali metals
Alkaline earth metals
Metals
Exothermic reaction with:
Water
Release of:
Hydrogen chloride gas

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
various plastics, Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Acute toxicity estimate Oral - 1.192,37 mg/kg
(Calculation method)
Acute toxicity estimate Oral - 560 mg/kg
(Calculation method)
LD50 Oral - Rat - male and female - 560 mg/kg
(OECD Test Guideline 401)
Symptoms: Possible damages:, Bloody vomiting
Acute toxicity estimate Inhalation - 0,74 mg/l(Calculation method)
Acute toxicity estimate Inhalation - 4 h - 4,98 mg/l - vapor (Calculation method)

Acute toxicity estimate Inhalation - 4 h - 5 mg/l - vapor (Calculation method)

(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Symptoms: Cough, Shortness of breath, mucosal irritations, Possible damages:, damage of respiratory tract, Lung edema, Symptoms may be delayed.
Acute toxicity estimate Dermal - 124.400 mg/kg (Calculation method)
Acute toxicity estimate Dermal - > 2.000 mg/kg (Calculation method)

**Skin corrosion/irritation**
Remarks: Causes skin irritation.
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Serious eye damage/eye irritation**
Comments: Lacrimal irritation due to vapours.
Remarks: Causes serious eye damage.
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Respiratory or skin sensitization**
Local lymph node assay (LLNA) - Mouse
Result: positive
(OECD Test Guideline 429)

**Germ cell mutagenicity**
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

**Carcinogenicity**
Presumed to have carcinogenic potential for humans

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
Inhalation - May cause respiratory irritation. - Respiratory system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Specific target organ toxicity - repeated exposure**
Oral - May cause damage to organs through prolonged or repeated exposure.
- Heart, forestomach
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Aspiration hazard**
No data available
11.2 Additional Information

Endocrine disrupting properties

**Product:**

Assessment The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

RTECS: XS8925000
burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Systemic effects:

Unconsciousness
CNS disorders

Damage to:

Kidney
Liver

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Liver - Irregularities - Based on Human Evidence

---

**SECTION 12: Ecological information**

12.1 Toxicity

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>static test LC50 - Danio rerio (zebra fish) - 4 mg/l - 96 h (OECD Test Guideline 203)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>static test EC50 - Daphnia magna (Water flea) - 6,1 mg/l - 48 h (OECD Test Guideline 202)</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 14 d
Result: 71 % - Readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

No data available
12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:
Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
Discharge into the environment must be avoided.
Stability in water
Test substance: Water
Remarks: Rapid degradation.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product
See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

14.1 UN number
ADR/RID: 1738
IMDG: 1738
IATA: 1738

14.2 UN proper shipping name
ADR/RID: BENZYL CHLORIDE
IMDG: BENZYL CHLORIDE
IATA: Benzyl chloride

14.3 Transport hazard class(es)
ADR/RID: 6.1 (8)
IMDG: 6.1 (8)
IATA: 6.1 (8)

14.4 Packaging group
ADR/RID: II
IMDG: II
IATA: II

14.5 Environmental hazards
ADR/RID: no
IMDG Marine pollutant: no
IATA: no

14.6 Special precautions for user
Tunnel restriction code: (D/E)
Further information: No data available

The life science business of Merck operates as MilliporeSigma in the US and Canada.
SECTION 15: Regulatory information

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

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorisations and/or restrictions on use

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).
- propylene oxide

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)
- Benzyl chloride
- propylene oxide

National legislation


Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

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

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out.

SECTION 16: Other information

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

H224 Extremely flammable liquid and vapor.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H315 Causes skin irritation.
H317 Harmful if swallowed.
H318 Causes skin irritation.
H319 May cause an allergic skin reaction.
H331 Causes serious eye damage.
H335 Toxic if inhaled.
H340 May cause respiratory irritation.
H350 May cause cancer.
H373 May cause damage to organs (Heart, forestomach) through prolonged or repeated exposure if swallowed.
Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Copyright 2020 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.
The life science business of Merck operates as MilliporeSigma in the US and Canada