

## SAFETY DATA SHEET

Version 6.3  
Revision Date 04/27/2021  
Print Date 05/28/2022

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : (S)-(-)-Propylene oxide

Product Number : 540021  
Brand : Aldrich  
CAS-No. : 16088-62-3

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Laboratory chemicals, Synthesis 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****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquids (Category 1), H224  
Acute toxicity, Oral (Category 4), H302  
Acute toxicity, Inhalation (Category 4), H332  
Acute toxicity, Dermal (Category 4), H312  
Skin irritation (Category 2), H315  
Eye irritation (Category 2A), H319  
Germ cell mutagenicity (Category 1B), H340  
Carcinogenicity (Category 1B), H350  
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335  
Short-term (acute) aquatic hazard (Category 3), H402

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

**2.2 GHS Label elements, including precautionary statements**

Aldrich - 540021

Page 1 of 10

Pictogram



Signal word

Danger

Hazard statement(s)

|                    |                                                           |
|--------------------|-----------------------------------------------------------|
| H224               | Extremely flammable liquid and vapor.                     |
| H302 + H312 + H332 | Harmful if swallowed, in contact with skin or if inhaled. |
| H315               | Causes skin irritation.                                   |
| H319               | Causes serious eye irritation.                            |
| H335               | May cause respiratory irritation.                         |
| H340               | May cause genetic defects.                                |
| H350               | May cause cancer.                                         |
| H402               | Harmful to aquatic life.                                  |

Precautionary statement(s)

|                    |                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------|
| P201               | Obtain special instructions before use.                                                                                          |
| P202               | Do not handle until all safety precautions have been read and understood.                                                        |
| P210               | Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.                                                              |
| P233               | Keep container tightly closed.                                                                                                   |
| P240               | Ground/bond container and receiving equipment.                                                                                   |
| P241               | Use explosion-proof electrical/ ventilating/ lighting/ equipment.                                                                |
| P242               | Use only non-sparking tools.                                                                                                     |
| P243               | Take precautionary measures against static discharge.                                                                            |
| P261               | Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.                                                                            |
| P264               | Wash skin thoroughly after handling.                                                                                             |
| P270               | Do not eat, drink or smoke when using this product.                                                                              |
| P271               | Use only outdoors or in a well-ventilated area.                                                                                  |
| P273               | Avoid release to the environment.                                                                                                |
| P280               | Wear protective gloves/ protective clothing/ eye protection/ face protection.                                                    |
| P301 + P312 + P330 | IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.                                                      |
| P303 + P361 + P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.                             |
| P304 + P340 + P312 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.      |
| 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.                                                                          |
| P332 + P313        | If skin irritation occurs: Get medical advice/ attention.                                                                        |
| P337 + P313        | If eye irritation persists: Get medical advice/ attention.                                                                       |
| P362               | Take off contaminated clothing and wash before reuse.                                                                            |
| P370 + P378        | In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.                                             |
| P403 + P233        | Store in a well-ventilated place. Keep container tightly closed.                                                                 |
| P403 + P235        | Store in a well-ventilated place. Keep cool.                                                                                     |
| P405               | Store locked up.                                                                                                                 |
| P501               | Dispose of contents/ container to an approved waste disposal plant.                                                              |

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Synonyms : (S)-(-)-1,2-Epoxypropane  
(S)-(-)-Methyloxirane

Formula : C<sub>3</sub>H<sub>6</sub>O  
Molecular weight : 58.08 g/mol  
CAS-No. : 16088-62-3  
EC-No. : 240-241-0

| Component                                                  | Classification                                                                                                                                                                         | Concentration |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>(S)-(-)-1,2-propylene oxide; S-(-)-1,2-epoxypropane</b> |                                                                                                                                                                                        |               |
|                                                            | Flam. Liq. 1; Acute Tox. 4;<br>Skin Irrit. 2; Eye Irrit. 2A;<br>Muta. 1B; Carc. 1B; STOT<br>SE 3; Aquatic Acute 3;<br>H224, H302, H332, H312,<br>H315, H319, H340, H350,<br>H335, H402 | <= 100 %      |

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

## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

#### General advice

Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air. Call in physician.

#### 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. 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

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## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

#### **Suitable extinguishing media**

Foam Carbon dioxide (CO<sub>2</sub>) 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

Combustible.

Pay attention to flashback.

Vapors are heavier than air and may spread along floors.

Development of hazardous combustion gases or vapours possible in the event of fire.

Forms explosive mixtures with air at ambient temperatures.

### 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. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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## 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. Risk of explosion.

### 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.

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## 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**

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

Refrigerate before opening.

Storage class (TRGS 510): 3: Flammable liquids

## **7.3 Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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## **SECTION 8: Exposure controls/personal protection**

### **8.1 Control parameters**

#### **Ingredients with workplace control parameters**

Contains no substances with occupational exposure limit values.

### **8.2 Exposure controls**

#### **Appropriate engineering controls**

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

#### **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). Safety glasses

##### **Skin protection**

required

##### **Body Protection**

Flame retardant antistatic protective clothing.

##### **Respiratory protection**

required when vapours/aerosols are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

##### **Control of environmental exposure**

Do not let product enter drains. Risk of explosion.

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## **SECTION 9: Physical and chemical properties**

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

- |                   |                   |
|-------------------|-------------------|
| a) Appearance     | Form: liquid      |
| b) Odor           | No data available |
| c) Odor Threshold | No data available |

|                                                 |                                                                   |
|-------------------------------------------------|-------------------------------------------------------------------|
| d) pH                                           | No data available                                                 |
| e) Melting point/freezing point                 | No data available                                                 |
| f) Initial boiling point and boiling range      | 33 - 34 °C 91 - 93 °F - lit.                                      |
| g) Flash point                                  | -37 °C (-35 °F) - c.c.                                            |
| h) Evaporation rate                             | No data available                                                 |
| i) Flammability (solid, gas)                    | No data available                                                 |
| j) Upper/lower flammability or explosive limits | Upper explosion limit: 37 %(V)<br>Lower explosion limit: 1.9 %(V) |
| k) Vapor pressure                               | No data available                                                 |
| l) Vapor density                                | No data available                                                 |
| m) Relative density                             | No data available                                                 |
| n) Water solubility                             | No data available                                                 |
| o) Partition coefficient: n-octanol/water       | No data available                                                 |
| p) Autoignition temperature                     | No data available                                                 |
| q) Decomposition temperature                    | No data available                                                 |
| r) Viscosity                                    | No data available                                                 |
| s) Explosive properties                         | No data available                                                 |
| t) Oxidizing properties                         | No data available                                                 |

## 9.2 Other safety information

No data available

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Vapors may form explosive mixture with air.

### 10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

### 10.3 Possibility of hazardous reactions

No data available

### 10.4 Conditions to avoid

Heat.  
Warming.

### 10.5 Incompatible materials

No data available

### 10.6 Hazardous decomposition products

In the event of fire: see section 5

Aldrich - 540021

Page 6 of 10

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## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

LD50 Oral - Rat - 380 mg/kg

Remarks: (racemate)(RTECS)Symptoms: Vomiting, Nausea

Symptoms: Shortness of breath, Cough, mucosal irritationsInhalation: Irritating to respiratory system.

LD50 Dermal - Rabbit - 1,244 mg/kg

Remarks: (racemate)

(IUCLID)

Dermal: absorption

#### Skin corrosion/irritation

Skin - Rabbit

Result: Severe irritations

Remarks: (RTECS)

#### Serious eye damage/eye irritation

Eyes - Rabbit

Result: Severe irritations

Remarks: (racemate)

(RTECS)

Risk of corneal clouding.

#### Respiratory or skin sensitization

Sensitisation test: - Guinea pig

Result: negative

Remarks:

(racemate)

(IUCLID)

#### Germ cell mutagenicity

May cause genetic defects.

Test Type: Mutagenicity (mammal cell test):

Result: positive

Remarks: (racemate)

(IUCLID)

#### Carcinogenicity

Presumed to have carcinogenic potential for humans

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is

on OSHA's list of regulated carcinogens.

### **Reproductive toxicity**

#### **Specific target organ toxicity - single exposure**

May cause respiratory irritation.

#### **Specific target organ toxicity - repeated exposure**

#### **Aspiration hazard**

## **11.2 Additional Information**

RTECS: UJ2651000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea

After absorption:

Headache  
Nausea  
Vomiting  
Diarrhea  
ataxia (impaired locomotor coordination)  
confusion  
Unconsciousness

Toxic effect on:

Kidney  
Liver

Further data:

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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## **SECTION 12: Ecological information**

### **12.1 Toxicity**

|                                                     |                                                                                                |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------|
| Toxicity to fish                                    | LC50 - Oncorhynchus mykiss (rainbow trout) - 52 mg/l - 96 h<br>Remarks: (racemate)<br>(IUCLID) |
| Toxicity to daphnia and other aquatic invertebrates | EC50 - Daphnia magna (Water flea) - 350 mg/l - 48 h<br>Remarks: (racemate)<br>(IUCLID)         |

Toxicity to algae IC50 - Pseudokirchneriella subcapitata (green algae) - 240 mg/l - 96 h  
Remarks: (racemate)  
(IUCLID)

## 12.2 Persistence and degradability

Biodegradability Result: 12 - 14 % - Not readily biodegradable.  
(OECD Test Guideline 301D)

## 12.3 Bioaccumulative potential

## 12.4 Mobility in soil

## 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

## 12.6 Other adverse effects

Discharge into the environment must be avoided.

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# SECTION 13: Disposal considerations

## 13.1 Waste treatment methods

### Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See [www.retrologistik.com](http://www.retrologistik.com) for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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# SECTION 14: Transport information

## DOT (US)

UN number: 1280 Class: 3 Packing group: I  
Proper shipping name: Propylene oxide  
Reportable Quantity (RQ):  
Poison Inhalation Hazard: No

## IMDG

UN number: 1280 Class: 3 Packing group: I EMS-No: F-E, S-D  
Proper shipping name: PROPYLENE OXIDE

## IATA

UN number: 1280 Class: 3 Packing group: I  
Proper shipping name: Propylene oxide

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# SECTION 15: Regulatory information

## SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

## SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

No components are subject to the Massachusetts Right to Know Act.

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know Components**

|                                                     |                       |               |
|-----------------------------------------------------|-----------------------|---------------|
| (S)-(-)-1,2-propylene oxide; S-(-)-1,2-epoxypropane | CAS-No.<br>16088-62-3 | Revision Date |
|-----------------------------------------------------|-----------------------|---------------|

**New Jersey Right To Know Components**

|                                                     |                       |               |
|-----------------------------------------------------|-----------------------|---------------|
| (S)-(-)-1,2-propylene oxide; S-(-)-1,2-epoxypropane | CAS-No.<br>16088-62-3 | Revision Date |
|-----------------------------------------------------|-----------------------|---------------|

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**SECTION 16: Other information****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](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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