# SAFETY DATA SHEET

Version 8.6
Revision Date 01/24/2022
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## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifiers

Product name : 1,2-Propylene oxide for synthesis

Product Number : 8.07027
Catalogue No. : 807027
Brand : Millipore
Index-No. : 603-055-00-4
CAS-No. : 75-56-9

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

Identified uses : Chemical for synthesis

### 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 3), H331
Acute toxicity, Dermal (Category 3), H311
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

| | |
|---|---|
| Pictogram |  |
| Signal word | Danger |

Hazard statement(s)

| | |
|---|---|
| H224 | Extremely flammable liquid and vapor. |
| H302 | Harmful if swallowed. |
| H311 + H331 | Toxic in contact with skin or if inhaled. |
| 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 + 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. |
| 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

| | | |
|---|---|---|
| Formula | : | C3H6O |
| Molecular weight | : | 58.08 g/mol |
| CAS-No. | : | 75-56-9 |
| EC-No. | : | 200-879-2 |
| Index-No. | : | 603-055-00-4 |

| Component | Classification | Concentration |
|---|---|---|
| **propylene oxide** | | |
| | Flam. Liq. 1; Acute Tox. 4; Acute Tox. 3; Eye Irrit. 2A; Muta. 1B; Carc. 1B; STOT SE 3; Aquatic Acute 3; H224, H302, H331, H311, H319, H340, H350, 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**
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. Call a physician immediately.

**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

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

**Suitable extinguishing media**
Carbon dioxide (CO2) Foam 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.

## 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.

## 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.

Recommended storage temperature see product label.

**Storage class**
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

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

**Ingredients with workplace control parameters**

| Component | CAS-No. | Value | Control parameters | Basis |
|---|---|---|---|---|
| propylene oxide | 75-56-9 | TWA | 2 ppm | USA. ACGIH Threshold Limit Values (TLV) |
| | Remarks | Dermal Sensitization<br>Confirmed animal carcinogen with unknown relevance to humans | | |
| | | Potential Occupational Carcinogen | | |
| | | TWA | 100 ppm<br>240 mg/m3 | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
| | | PEL | 2 ppm<br>4.75 mg/m3 | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

### 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**
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: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 30 min
Material tested:Butoject® (KCL 898)

**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.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| a) | Appearance | Form: liquid<br>Color: colorless |
| b) | Odor | sweet, ether-like |
| c) | Odor Threshold | No data available |
| d) | pH | No data available |
| e) | Melting point/freezing point | Melting point: ca.-112 °C (ca.-170 °F) at 1,013 hPa |
| f) | Initial boiling point and boiling range | 34.3 °C 93.7 °F at 1,013 hPa |
| g) | Flash point | -38 °C (-36 °F) - Equilibrium method - closed cup |
| h) | Evaporation rate | No data available |
| i) | Flammability (solid, gas) | No data available |
| j) | Upper/lower flammability or explosive limits | Upper explosion limit: 36 - 45 %(V)<br>Lower explosion limit: 1.9 %(V) |
| k) | Vapor pressure | 2,028.5 hPa at 55 °C (131 °F) |
| l) | Vapor density | 2.01 - (Air = 1.0) |
| m) | Density | 0.83 g/cm3 at 20 °C (68 °F) - OECD Test Guideline 109 |
| | Relative density | 0.8320 °C - Regulation (EC) No. 440/2008, Annex, A.3 |
| n) | Water solubility | 425 g/l at 20 °C (68 °F) - OECD Test Guideline 105 |
| o) | Partition coefficient: n-octanol/water | log Pow: 0.03 - Bioaccumulation is not expected. |
| p) | Autoignition temperature | > 400 °C (> 752 °F) at 1,005 - 1,018 hPa - Tested according to Directive 92/69/EEC. |

| | | |
|---|---|---|
| q) | Decomposition temperature | No data available |
| r) | Viscosity | 0.44 mm2/s at 0 °C (32 °F) - OECD Test Guideline 114 - 0.37 mm2/s at 20 °C (68 °F) - OECD Test Guideline 114 - |
| s) | Explosive properties | No data available |
| t) | Oxidizing properties | none |

### 9.2 Other safety information

| | |
|---|---|
| Surface tension | 71.5 mN/m at 1.06g/l at 21 °C (70 °F) - Surface tension |
| Relative vapor density | 2.01 - (Air = 1.0) |

## 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
Risk of ignition or formation of inflammable gases or vapours with:
Hydrogen fluoride
Oxidizing agents
Nitric acid
Risk of explosion with:
polymerisation initiators
Oxygen
Exothermic reaction with:
Strong oxidizing agents
Ammonia
halogens
alkali hydroxides
polymerization
alkalines
Amines
metallic oxides
metallic chlorides
chlorosulfonic acid
Hydrogen chloride gas
fuming sulfuric acid
aluminium chloride
acids

### 10.4 Conditions to avoid
Heat.
Warming.

### 10.5 Incompatible materials
rubber, various plastics, Copper

### 10.6 Hazardous decomposition products

Peroxides
In the event of fire: see section 5

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

**Acute toxicity**
LD50 Oral - Rat - male and female - 382 - 587 mg/kg
(OECD Test Guideline 401)
LC50 Inhalation - Rat - male and female - 4 h - 9.95 mg/l - vapor

(OECD Test Guideline 403)
LD50 Dermal - Rabbit - 950 mg/kg
Remarks: (ECHA)
No data available

**Skin corrosion/irritation**
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: Severe irritations
(Draize Test)
Remarks: (RTECS)

**Respiratory or skin sensitization**
Split adjuvant test - Guinea pig
Result: negative
Remarks: (ECHA)

**Germ cell mutagenicity**
May cause genetic defects.
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
Test Type: In vitro mammalian cell gene mutation test
Test system: Mouse lymphoma test
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 476
Result: positive
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473
Result: positive

Test Type: Mutagenicity (mammal cell test): micronucleus.
Species: Rat
Cell type: Red blood cells (erythrocytes)
Application Route: inhalation (vapor)
Method: OECD Test Guideline 474

Result: negative

Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Species: Rat

Application Route: inhalation (vapor)
Method: OECD Test Guideline 475
Result: negative

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

| | |
|---|---|
| IARC: | 2B - Group 2B: Possibly carcinogenic to humans (propylene oxide) |
| 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**
No data available

**Specific target organ toxicity - single exposure**
Inhalation - May cause respiratory irritation. - Respiratory system

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

### 11.2 Additional Information

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

## SECTION 12: Ecological information

### 12.1 Toxicity

| | |
|---|---|
| Toxicity to fish | static test LC50 - Oncorhynchus mykiss (rainbow trout) - 52 mg/l - 96 h<br>(US-EPA) |
| Toxicity to daphnia and other aquatic invertebrates | static test EC50 - Daphnia magna (Water flea) - 350 mg/l - 48 h<br>(US-EPA) |
| Toxicity to algae | static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 240 mg/l - 96 h<br>(US-EPA) |
| Toxicity to bacteria | EC10 - Bacteria - 10 mg/l - 17 h |

### 12.2 Persistence and degradability

| | |
|---|---|
| Biodegradability | aerobic - Exposure time 28 d<br>Result: 96 % - Readily biodegradable.<br>(OECD Test Guideline 301C) |

**12.3 Bioaccumulative potential**
Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

**12.4 Mobility in soil**
No data available

**12.5 Results of PBT and vPvB assessment**
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

**12.6 Endocrine disrupting properties**
No data available

**12.7 Other adverse effects**
Biological effects:
Forms toxic mixtures in water, dilution measures notwithstanding.
Discharge into the environment must be avoided.

| | |
|---|---|
| Stability in water | - 15.7 yr<br>Remarks: reaction with hydroxyl radicals(calculated)<br>- ca.11 d<br>Remarks: Hydrolysis |

## 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 for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

## SECTION 14: Transport information

**DOT (US)**
UN number: 1280 Class: 3 Packing group: I
Proper shipping name: Propylene oxide
Reportable Quantity (RQ): 100 lbs
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

## SECTION 15: Regulatory information

### SARA 302 Components

| | CAS-No. | Revision Date |
|---|---|---|
| propylene oxide | 75-56-9 | 2008-11-03 |

### SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

| | CAS-No. | Revision Date |
|---|---|---|
| propylene oxide | 75-56-9 | 2008-11-03 |

### Massachusetts Right To Know Components

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

## 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 and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.


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