

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

Product identifier

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

Stock number: B22341

CAS Number:
16088-62-3

EINECS Number:
240-241-0

Index number:
603-055-00-4

Relevant identified uses of the substance or mixture and uses advised against.

Sector of Use SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:

During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Hazards identification

Classification of the substance or mixture



GHS02 Flame

H224 Extremely flammable liquid and vapour.



GHS06 Skull and crossbones

H301 Toxic if swallowed.

H311 Toxic in contact with skin.



GHS08 Health hazard

H340 May cause genetic defects.

H350 May cause cancer.



GHS07

H332 Harmful if inhaled.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC



T; Toxic

R45-46: May cause cancer. May cause heritable genetic damage.



Xn; Harmful

R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.



Xi; Irritant

R36/37/38: Irritating to eyes, respiratory system and skin.



F+; Extremely flammable

R12: Extremely flammable.

(Contd. on page 2)

-USA-

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

(Contd. of page 1)

Information concerning particular hazards for human and environment: Not applicable

Label elements**Labelling according to EU guidelines:****Code letter and hazard designation of product:**

T Toxic

F+ Extremely flammable

Risk phrases:

45 May cause cancer.

46 May cause heritable genetic damage.

12 Extremely flammable.

20/21/22 Also harmful by inhalation, in contact with skin and if swallowed.

36/37/38 Irritating to eyes, respiratory system and skin.

Safety phrases:

53 Avoid exposure - obtain special instructions before use.

45 In case of accident or if you feel unwell, seek medical advice immediately.

Hazard description:**WHMIS classification**

B2 - Flammable liquid

D2A - Very toxic material causing other toxic effects

**Classification system**

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH	2	Health (acute effects) = 2
FIRE	4	Flammability = 4
REACTIVITY	1	Reactivity = 1

Other hazards**Results of PBT and vPvB assessment**

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances**(CAS#) Description:**

16088-62-3 (S)-(-)-Propylene oxide

Identification number(s):

EINECS Number: 240-241-0

Index number: 603-055-00-4

4 First aid measures

Description of first aid measures**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek immediate medical advice.

Information for doctor**Most important symptoms and effects, both acute and delayed**

No further relevant information available.

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

5 Firefighting measures

Extinguishing mediaSuitable extinguishing agents CO₂, sand, extinguishing powder. Do not use water.

(Contd. on page 3)

- USA -

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

(Contd. of page 2)

For safety reasons unsuitable extinguishing agents Water

Special hazards arising from the substance or mixture

In case of fire, the following can be released:

Carbon monoxide and carbon dioxide

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Keep away from ignition sources

Environmental precautions:

Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

Keep away from ignition sources.

Reference to other sections

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

Handling

Precautions for safe handling

Handle under dry protective gas.

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Keep away from heat and direct sunlight.

Ensure good ventilation at the workplace.

Open and handle container with care.

Information about protection against explosions and fires:

Keep ignition sources away.

Protect against electrostatic charges.

Fumes can combine with air to form an explosive mixture.

Conditions for safe storage, including any incompatibilities

Storage

Requirements to be met by storerooms and receptacles: Store in a cool location.

Information about storage in one common storage facility:

Store away from oxidizing agents.

Store away from water/moisture.

Further information about storage conditions:

Store under dry inert gas.

This product is moisture sensitive.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

Protect from heat and direct sunlight.

Protect from humidity and water.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Propylene oxide

	ppm
ACGIH TLV	20; Confirmed animal carcinogen
Austria	Carcinogen
Belgium TWA	20
Denmark TWA	5 (skin)
Finland TWA	5; Carcinogen
France VME	20; C2 Carcinogen

(Contd. on page 4)

USA

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

(Contd. of page 3)

Germany	Carcinogen
Netherlands MAC-TGG	100; Carcinogen
Norway TWA	1
Russia	1 mg/m ³ -STEL (skin)
Sweden NGV	5; 10-KTV
Switzerland MAK-W	2.5; Carcinogen
United Kingdom TWA	5; Carcinogen
USA PEL	100

Control parameters

Components with limit values that require monitoring at the workplace: Not required.

Additional information: No data

Exposure controls**Personal protective equipment****General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes and skin.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

Material of gloves

The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information**Appearance:**

Form:	Liquid
Color:	Colorless
Odor:	Not determined
Odour threshold:	Not determined.

pH-value:	Not determined.
------------------	-----------------

Change in condition

Melting point/Melting range:	Not determined
Boiling point/Boiling range:	34-35°C (93-95 °F)
Sublimation temperature / start:	Not determined

Flash point:	-37°C (-35 °F)
---------------------	----------------

Flammability (solid, gaseous)	Not applicable.
--------------------------------------	-----------------

Ignition temperature:	Not determined
------------------------------	----------------

Decomposition temperature:	Not determined
-----------------------------------	----------------

Auto igniting:	Not determined.
-----------------------	-----------------

Explosion limits:

Lower:	Not determined
Upper:	Not determined

Vapor pressure:	Not determined
------------------------	----------------

Density at 20°C (68 °F):	0.83 g/cm ³ (6.926 lbs/gal)
---------------------------------	--

Relative density	Not determined.
-------------------------	-----------------

Vapour density	Not determined.
-----------------------	-----------------

Evaporation rate	Not determined.
-------------------------	-----------------

Segregation coefficient (n-octanol/water):	Not determined.
---	-----------------

Viscosity:

dynamic:	Not determined.
kinematic:	Not determined.

Other information	No further relevant information available.
--------------------------	--

USA

(Contd. on page 5)

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

(Contd. of page 4)

10 Stability and reactivity

Reactivity

Chemical stability

Thermal decomposition / conditions to be avoided:

Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions No dangerous reactions known

Incompatible materials:

Oxidizing agents

Heat

Water/moisture

Hazardous decomposition products: Carbon monoxide and carbon dioxide

11 Toxicological information

Information on toxicological effects

Acute toxicity:

Primary irritant effect:

on the skin: Irritant to skin and mucous membranes.

on the eye: Irritating effect.

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity:

Propylene oxide may cause central nervous system depression and liver damage. Causes mutagenic, tumorigenic and reproductive effects.

Additional toxicological information:

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

Danger through skin absorption.

EPA-B2: Probable human carcinogen, sufficient evidence from animal studies; inadequate evidence or no data from epidemiologic studies.

IARC-2B: Possibly carcinogenic to humans: limited evidence in humans in the absence of sufficient evidence in experimental animals.

NTP-2: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals.

ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

12 Ecological information

Toxicity

Aquatic toxicity: No further relevant information available.

Persistence and degradability No further relevant information available.

Behavior in environmental systems:

Bioaccumulative potential No further relevant information available.

Mobility in soil No further relevant information available.

Additional ecological information:

General notes:

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

Do not allow material to be released to the environment without proper governmental permits.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods

Recommendation Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation: Disposal must be made according to official regulations.

USA

(Contd. on page 6)

Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

(Contd. of page 5)

14 Transport information

DOT regulations:



Hazard class: 3
Identification number: UN1280
Packing group: I
Proper shipping name (technical name): PROPYLENE OXIDE
Label: 3

Land transport ADR/RID (cross-border)



ADR/RID class: 3 (F1) Flammable liquids
Danger code (Kemler): 339
UN-Number: 1280
Packaging group: I
UN proper shipping name: 1280 PROPYLENE OXIDE

Maritime transport IMDG:



IMDG Class: 3
UN Number: 1280
Label: 3
Packaging group: I
Marine pollutant: No
Proper shipping name: PROPYLENE OXIDE

Air transport ICAO-TI and IATA-DGR:



ICAO/IATA Class: 3
UN/ID Number: 1280
Label: 3
Packaging group: I
Proper shipping name: PROPYLENE OXIDE

UN "Model Regulation": UN1280, PROPYLENE OXIDE, 3, I
Special precautions for user Warning: Flammable liquids
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.

15 Regulatory information

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

Product related hazard informations:

Hazard symbols:

T Toxic
 F+ Extremely flammable

Risk phrases:

45 May cause cancer.
 46 May cause heritable genetic damage.
 12 Extremely flammable.
 20/21/22 Also harmful by inhalation, in contact with skin and if swallowed.
 36/37/38 Irritating to eyes, respiratory system and skin.

(Contd. on page 7)

USA

Material Safety Data Sheet
According to OSHA and ANSI

Printing date 03/17/2011

Reviewed on 03/16/2011

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

(Contd. of page 6)

Safety phrases:

53 Avoid exposure - obtain special instructions before use.
45 In case of accident or if you feel unwell, seek medical advice immediately.

National regulations

This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only.

Some or all of the components of this product are not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use: For use only by technically qualified individuals.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.

Contact:

Zachariah C. Holt
Global EHS Manager

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

- USA -