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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Propylene oxide, 99%+
Code P 2657

2. Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 1
Acute toxicity - Oral, Category 4
Acute toxicity - Dermal, Category 3
Eye irritation, Category 2
Acute toxicity - Inhalation, Category 3
Specific target organ toxicity \u2013 single exposure, Category 3
Germ cell mutagenicity, Category 1B
Carcinogenicity, Category 1B

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word

Hazard statement(s)

Precautionary statement(s)

Prevention

Response



Danger

H224 Extremely flammable liquid and vapour
H302 Harmful if swallowed
H311 Toxic in contact with skin
H319 Causes serious eye irritation
H331 Toxic if inhaled
H335 May cause respiratory irritation
H340 May cause genetic defects
H350 May cause cancer

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/\u2026if you feel unwell.
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P312 Call a POISON CENTER/doctor/\u2026if you feel unwell.
P321 Specific treatment (see ... on this label).
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P311 Call a POISON CENTER/doctor/\u2026

Storage P308+P313 IF exposed or concerned: Get medical advice/ attention.
 P403+P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.
 P403+P233 Store in a well-ventilated place. Keep container tightly closed.
 P501 Dispose of contents/container to ...

Disposal
 2.3 Other hazards which do not result in classification
 none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
1,2-epoxypropane	1,2-epoxypropane	75-56-9	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Seek medical attention if you feel unwell.

In case of skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower.

In case of eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer for medical attention.

If swallowed

Rinse mouth. Do NOT induce vomiting. Refer for medical attention if breathing difficulties and/or fever develop.

4.2 Most important symptoms/effects, acute and delayed

This material is moderately toxic by inhalation and ingestion. It may cause irreversible and reversible changes. Skin contact with the material or solutions of the material cause irritation; diluted solutions are more irritating than undiluted materials. Exposure may cause mild depression of the central nervous system and eye, nasal, and lung irritation. Contact with the liquid can cause blindness and death. Pulmonary edema may recur up to 2 weeks after exposure. (EPA, 1998)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Provide a low-stimulus environment. Monitor for shock and treat if necessary Anticipate seizures and treat if necessary For eye contamination, flush eyes immediately with water.

Irrigate each eye continuously with normal saline during transport Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Treat frostbite by rapid rewarming /Ethers and related compounds/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

If material on fire or involved in fire: Do not extinguish fire unless flow can be stopped. Use water in flooding quantities as a fog. Solid streams of water may be ineffective. Cool all effective containers with flooding quantities of water. Apply water from as far away as possible. Use "alcohol" foam, dry chemical or carbon dioxide.

5.2 Specific hazards arising from the chemical

Vapor is heavier than air and may travel considerable distance to source of ignition and flash back. Vapors form explosive mixture with air. If polymerization takes place in container, there may be a violent rupture of container. Explosion hazard is severe when exposed to flame. Violently reacts with acetylide-forming metals such as copper or copper alloys, ammonium hydroxide; chlorosulfonic acid; hydrochloric acid; hydrofluoric acid; nitric acid; oleum and sulfuric acid. Hazardous polymerization may occur. Avoid active catalytic surfaces such as anhydrous chlorides of iron, tin, and aluminum; peroxides of iron and aluminum; and alkali metal hydroxides, high temperatures; alkalis; aqueous acids; amines and acidic alcohols. (EPA, 1998)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Evacuate danger area! Consult an expert! Remove all ignition sources. Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking liquid in sealable dry containers. Absorb remaining liquid in dry sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Evacuation: If material leaking (not on fire) consider evacuation from downwind area based on amount of material spilled, location and weather conditions.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from acids, bases and strong oxidants. Dry. Cool. Well closed. Keep in the dark. Use glass or metal containers sealed with nitrogen.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

NIOSH considers propylene oxide to be a potential occupational carcinogen.

NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concentration.

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state

Colour

colourless liquid with an ether-like odour

Odour

Colorless liquid ... [Note: A gas above 94 degrees F.]

Melting point/ freezing point

ODOR IS SWEET, ALCOHOLIC, & LIKE ETHER OR BENZENE

Boiling point or initial boiling point and boiling range

-112°C

34°C (lit.)

Flammability

Class IA Flammable Liquid: F.I.P. below 22.78°C and BP below 37.78°C. Extremely flammable

Heating will cause rise in pressure with risk of bursting.

Lower and upper explosion limit / flammability limit

Lower flammable limit: 2.3% by volume; Upper flammable limit: 36% by volume

Flash point

-37°C

Auto-ignition temperature

747.78°C

Decomposition temperature

no data available

pH

no data available

Kinematic viscosity

0.28 centipoise at 25°C

Solubility

greater than or equal to 100 mg/mL at 18.89°C

Partition coefficient n-octanol/water (log value)

log Kow= 0.03.

Vapour pressure

445 mm Hg at 20°C (EPA, 1998)

Density and/or relative density

0.83g/mL at 25°C (lit.)

Relative vapour density

2 (vs air)

Particle characteristics

no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

It polymerizes exothermically.

10.3 Possibility of hazardous reactions

FLAMMABLE, DANGEROUS FIRE RISK The vapour is heavier than air and may travel along the ground; distant ignition possible.

As a result of flow, agitation, etc., electrostatic charges can be generated. 1,3-PROPYLENE OXIDE react with oxidizing agents and strong acids. Reacts with Grignard reagents and organolithium compounds. An explosion occurred when propylene oxide was added to an epoxy resin. It was concluded that polymerization was catalyzed by an amine accelerator in the resin [Bretherick, 5th Ed., 1995]. Underwent polymerization when mixed with sodium hydroxide causing ignition and explosion of a drum of the crude product. [Combust Sci. Technol., 1983].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

No acetylide-forming metals such as copper or copper alloys should be in contact with propylene oxide.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and fumes.

11. Toxicological information

Acute toxicity

Oral: LD50 Guinea pig /oral/ 0.69 g/kg

Inhalation: LC50 Mouse inhalation 1740 ppm/4 hr

Dermal: LD50 Rabbit percutaneous 1.5 ml/kg

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group B2 Probable Human Carcinogen

Reproductive toxicity

No information is available on the reproductive or developmental effects of propylene oxide in humans. A study with rats and rabbits exposed to propylene oxide by inhalation prior to and during gestation concluded that propylene oxide was harmful to the developing fetus but did not cause birth defects. In rats, some degree of fetotoxicity was observed in all exposed groups (including a significant reduction in the number of corpora lutea, implants, and live fetuses) and minor skeletal malformations in some; there was no maternal mortality. Increased resorptions per litter were observed in rabbits.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: TLm Bluegill 215 mg/l/96 hr at 24°C, static bioassay.

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: 1,2-Propylene oxide, present at 100 mg/l, reached 95% of its theoretical BOD in 3 weeks using an activated sludge inoculum at 30 mg/l and the Japanese MITI test(1); therefore, this compound is expected to biodegrade rapidly. In another study, using the standard dilution method, a 5 day theoretical BOD of 8% was measured for propylene oxide using a filtered effluent seed from a biological sanitary waste treatment plant while a 5 day theoretical BOD of 9% was measured using an adapted seed(2).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated for 1,2-propylene oxide(SRC), using a log Kow of 0.03(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The Koc of 1,2-propylene oxide is estimated as 25(SRC), using a measured log Kow of 0.03(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that 1,2-propylene oxide is expected to have very high mobility in soil(SRC).

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1280

IMDG: UN1280

IATA: UN1280

14.2 UN Proper Shipping Name

ADR/RID: PROPYLENE OXIDE

IMDG: PROPYLENE OXIDE

IATA: PROPYLENE OXIDE

14.3 Transport hazard class(es)

ADR/RID: unknown

IMDG: unknown

IATA: unknown

14.4 Packing group, if applicable

ADR/RID: unknown

IMDG: unknown

IATA: unknown

14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
1,2-epoxypropane	1,2-epoxypropane	75-56-9	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

