Safety Data Sheet

Version 7.0
Revision Date: 08/02/2019

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name:	**Ethylene-d_4 oxide**
Product abbreviation:	d4EO
Product use:	For laboratory research purposes.
Supplier / Manufacturer:	Polymer Source, Inc.
Address:	124 Avro street, Dorval (Montreal), Quebec H9P 2X8, Canada
Telephone:	(+1) 514-421-5517
Toll free:	1-866-422-9842
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Emergency phone:	(+1) 514-887-5517
E-mail:	info@polymersource.com

2. HAZARDS IDENTIFICATION

Emergency overview:

Target organs: Nerves, lungs, kidney, eyes.

WHMIS classification:

A. Compressed gas.

B1. Flammable gas.

D1A. Very toxic material causing immediate and serious toxic effects. Highly toxic by inhalation.

D1B. Toxic material causing immediate and serious toxic effects: Toxic by ingestion.

D2A. Very toxic material causing other toxic effects: Carcinogen.

D2B. Toxic material causing other toxic effects: Moderate eye irritant; Mutagen.

GHS classification:

Flammable gases (Category 1).

Acute toxicity, Oral (Category 3).

Acute toxicity, Inhalation (Category 3).

Eye irritation (Category 2A).

Germ cell mutagenicity (Category 1B).

Carcinogenicity (Category 1B).

Specific target organ toxicity – Single exposure (Category 3), Respiratory system.

Acute aquatic toxicity (Category 3).

Chronic aquatic toxicity (Category 3).

GHS Label elements, including precautionary statements:

Pictogram: 

Signal word: Danger

Hazard statements:
- H220. Extremely flammablegas.
- H301 + H331. Toxic if swallowed or if inhaled.
- H319. Causes sereious eye irritation.
- H335. May cause respiratory irritation.
- H340. May cause genetic defects.
- H350. May cause cancer.
- H412. Harmful to aquatic life with long lasting effects.

Precautionary statements:
- P201. Obtain special instructions before use.
- P210. Keep away from heat/sparks/open flames / hot surfaces. - No smoking.
- P261. Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
- P273. Avoid release to the environment.
- P301 + P310. *If swallowed*: Immediately call a POISON CENTER or doctor/ physician.
- P305 + P351 + P338. *If in eyes:* Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P311. Call a POISON CENTER or doctor / physician.

HMIS classification:
- Health hazard: 2
- Chronic health hazard: *
- Flammability: 4
- Physical hazards: 3

Potential health effects:
- Inhalation: Toxic if inhaled. Causes respiratory tract irritation.
- Skin: May be harmful if absorbed through skin. Causes skin irritation.
- Eyes: Causes eye irritation.
- Ingestion: Toxic if swallowed.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Formula:	Ethylene-d_4 oxide:	C_2D_2O
Synonyms:	Ethylene-d_4 oxide; Oxirane-d_4	
Concentration:	≤ 100 %	
CAS registry number:	Ethylene-d_4 oxide:	6552-57-4

4. FIRST AID MEASURES

General advice:	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled:	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact:	Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
In case of eye contact:	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.
If swallowed:	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Conditions of flammability:	Flammable in the presence of an oxidizing gas (*e.g.* air), a source of ignition, and when the concentration of the gas is between the lower and upper explosive limits. Keep away from heat/sparks/open flame/hot surface/oxidizing gas. No smoking.
Suitable extinguishing media:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for firefighters:	Wear self contained breathing apparatus for firefighting if necessary.
Hazardous combustion products:	Hazardous decomposition products formed under fire conditions: Carbon oxides.
Explosion data:	Sensitivity to mechanical impact: no data available
	Sensitivity to static discharge: no data available
Further information:	Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Environmental precautions:	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up: Clean up promptly by sweeping or vacuum.

7. HANDLING AND STORAGE

Precautions for safe handling:	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition – No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store under inert gas. Hygroscopic.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal protective equipment:

• Respiratory protection:	Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
• Hand protection:	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.
• Eye protection:	Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
• Skin and body protection:	Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
• Hygiene measures:	Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.
• Specific engineering controls:	Use mechanical exhaust or laboratory fumehood to avoid exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Form:	Compressed gas
	Colour:	no data available
Safety data:	pH:	no data available
	Melting point / Freezing point:	m.p.(lit.): –111 °C
	Boling point:	b.p.(lit.): 10.7 °C (51.3 °F)
	Flash point:	(lit.): –20.0 °C (–4.0 °F) - closed cup
	Ignition temperature:	no data available
	Auto-ignition temperature:	no data available
	Lower explosion limit:	no data available
	Upper explosion limit:	no data available
	Vapour pressure:	no data available
	Density:	no data available
	Water solubility:	no data available

Partition coefficient: n-octanol/water:	no data available
Relative vapour density:	no data available
Odour:	no data available
Odour threshold:	no data available
Evaporation rate:	no data available

10. STABILITY AND REACTIVITY

Chemical stability:	Stable under recommended storage conditions.
Radioactivity:	Stable isotope compound. Not radioactive.
Possibility of hazardous reactions:	no data available
Conditions to avoid:	Heat, flames and sparks. Extremes of temperature and direct sunlight.
Materials to avoid:	Alcohols, Alkali metals, Ammonia, Oxidizing agents, Chemically active metals, and its salts.
Hazardous decomposition products:	Hazardous decomposition products formed under fire conditions: Carbon oxides.
	Other decomposition products: no data available.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	Oral LD50:	Rat: 72 mg/kg
	Inhalation LC50:	Rat: 4.0 h – 800 ppm
	Dermal LD50:	no data available
	Other information on acute toxicity:	no data available
Skin corrosion/irritation:	no data available	
Serious eye damage/eye irritation:	Eyes – Rabbit: Eye irritation – 6.00 h	
Respiratory or skin sensitization:	no data available	
Germ cell mutagenicity:	In vivo tests showed mutagenic effects	
Carcinogenicity:	Possible human carcinogen.	
	IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.	
	ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.	
Reproductive toxicity:	no data available	
Teratogenicity:	no data available	
Specific target organ toxicity:	Single exposure (GHS):	May cause respiratory irritation
	Repeated exposure (GHS):	no data available
Aspiration hazard:	no data available	

Potential health effects:	Inhalation:	Toxic if inhaled. Causes respiratory tract irritation.
	Ingestion:	Toxic if swallowed.
	Skin:	May be harmful if absorbed through skin. Causes skin burns.
	Eyes:	Causes eye burns.
Signs and symptoms of exposure:	Burning sensation, Cough, Wheezing, Laryngitis, Shortness of breath, Headache, Nausea, Vomiting.	
	Exposure to large amounts can cause: Pulmonary edema.	
	Effects may be delayed.	
	Convulsions, Lung irritation.	
	To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.	
Synergistic effects:	no data available	
Additional information:	RTECS:	not available

12. ECOLOGICAL INFORMATION

Toxicity:	Toxicity to fish.
	LC50 – Pimephales promelas (fathead minnow): 84 mg/l – 96.0 h
Persistence and degradability:	no data available
Bioaccumulative potential:	no data available
Mobility in soil:	no data available
PBT and vPvB assessment:	no data available
Other adverse effects:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

Product:	Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging:	Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US):

UN number: 1040
Class: 2.3 (2.1)
Proper shipping name: Ethylene oxide
Reportable Quantity (RQ): -
Marine pollutant: No
Poison Inhalation Hazard: Hazard zone D

IMDG:	UN number: 1040 Class: 2.3 (2.1) EMS-No: F-D, S-U Proper shipping name: Ethylene oxide Marine pollutant: No
IATA:	UN number: 1040 Class: 2.3 (2.1) Proper shipping name: Ethylene oxide IATA Passenger: Not permitted for transport IATA Cargo: Not permitted for transport

15. REGULATORY INFORMATION

WHMIS classification:	A.	Compressed gas.
	B1.	Flammable gas.
	D1A.	Very toxic material causing immediate and serious toxic effects. Highly toxic by inhalation.
	D1B.	Toxic material causing immediate and serious toxic effects: Toxic by ingestion.
	D2A.	Very toxic material causing other toxic effects: Carcinogen.
	D2B.	Toxic material causing other toxic effects: Moderate eye irritant; Mutagen.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. OTHER INFORMATION

Date of the latest revision:	8 February 2019
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. Polymer Source, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product. See www.polymersource.ca for additional terms and conditions of sale.