US EPA RECORDS CENTER REGION 5
487389

Chemical Fact Sheet* Version 2

PROPYLENE OXIDE

The information in this sheet applies to workplace exposure resulting from processing, manufacturing, storing or handling and is not designed for the population at large. Any generalization beyond occupational exposures should not be made. The best industrial hygiene practice is to maintain concentrations of all chemicals at levels as low as is practical.

Chemical Names: 1,2-Epoxypropane, methyloxirane, methyl ethylene oxide, propene oxide; CAS 75-56-9.

Trade Names: None found.

Uses: Intermediate in preparation of polyurethanes, propylene and dipropylene glycols; in lubricant, surfactant, and oil demulsifier preparations; as a solvent, fumigant, and soil sterilant.

PHYSICAL INFORMATION

Appearance: Colorless liquid.

Odor: Ether-like. Minimum Detectable by Odor: 35 ppm.

Behavior in Water: Soluble.

Evaporation: Rapid.

HEALTH HAZARD INFORMATION

OSHA Standard: Average 8 hour exposure -- 100 ppm.

NIOSH Recommended Limit: None established.

ACGIH Recommended Limit: Average 8 hour -- 20 ppm.

Short Term Exposure:

Inhalation: Studies in animals indicate that vapors can cause nasal and lung irritation, difficulty in breathing, drowsiness and weakness at concentrations above the OSHA standard. Rats and dogs exposed to concentrations of 4000 ppm for 4 hours experienced nasal irritation, gasping for breath, vomiting and death.

Skin: Can produce irritation and severe burns. Dilute solutions of less than 10% can cause more severe effects than concentrated solutions.

Eyes: Vapors and solutions can cause tearing, severe irritation and burns.

Ingestion: Swallowing of liquid can cause severe throat and stomach irritations.

Long Term Exposure:

Repeated exposure of animals by inhalation to 100 ppm did not produce harmful effects. Propylene oxide has caused localized tumors in laboratory animals when injected under the skin. Whether it does so in humans is not known.

*Prepared by the Bureau of Toxic Substance Assessment, New York State Department of Health. For an explanation of the terms and abbreviations used, see "Toxic Substances: How Toxic is Toxic" available from the New York State Department of Health.

EMERGENCY AND FIRST AID INSTRUCTIONS

Inhalation: Move exposed person to fresh air. Give artificial respiration or oxygen as required. Seek medical attention, if necessary.

Skin: Remove any soaked clothing immediately and wash skin with water for five minutes. Seek medical attention, if necessary.

Eyes: Wash immediately with water for 15 minutes. Get medical attention as soon as possible.

Ingestion: Do not induce vomiting. Get medical attention immediately.

Note to Physician: For eye injury, stain for evidence of corneal injury. If burns are present, instill antibiotic steroid preparation frequently. For skin, treat as any contact dermatitis or thermal burn. For inhalation, bronchodilators, expectorants and antitussives may be of help.

FIRE AND EXPLOSION INFORMATION

General: Extremely flammable. Will ignite at -20°F (-29°C). Will release toxic gases such as carbon monoixde in a fire.

Explosive Limits: Upper -- 36%, Lower -- 2.1%.

Extinguisher: Water fog, alcohol foam or carbon dioxide.

REACTIVITY

Materials to Avoid: Oxidizing materials (such as dichromate, permanganate and chlorine) and strong acids and bases. Hazardous polymerization may occur when in contact with anhydrous chlorides or iron, tin, and aluminum, perioxides of iron and aluminum, and alkali metal hydroxides.

Conditions to Avoid: Heat, sunlight and sources of ignition.

PROTECTIVE MEASURES

Storage and Handling: Store in a cool area preferably in a detached building away from direct sun.

Engineering Controls: Enclosed process preferred with local exhaust and general dilution ventilation as necessary. Eyewash stations, sinks and showers should be readily available.

Protective Clothing (Should not be substituted for proper handling and engineering controls): Wear neoprene gloves, safety glasses and plastic protective clothing if contact is likely. Porpylene oxide will attack some forms of plastics, rubber and coatings so protective gear should be inspected frequently for deterioration.

Protective Equipment: For levels up to 200 ppm use a supplied-air respirator or a self-contained breathing apparatus. For levels up to 500 ppm use a supplied-air respirator operated in continuous flow mode. For levels up to 1000 ppm use a supplied-ai respirator with a full facepiece or a self-contained breathing apparatus with a full facepiece. For levels up to 2000 ppm use a supplied-air respirator with a full facepiece operated in a positive pressure mode. For levels above 2000 ppm or use in areas of unknown concentrations use a self-contained breathing apparatus with a full facepiece operated in a positive pressure mode or a combination Type C supplied-air respirator and an auxiliary self-contained breathing apparatus, both with a full facepiece and operated in a positive pressure mode. For escape from a contaminated area use a gas mask with a canister providing protection against propylene oxide or an escape self-contained breathing apparatus.

PROCEDURES FOR SPILLS AND LEAKS

Get all workers out of spill area. Put on proper protective clothing and equipment before entering area of spill. Remove all sources of ignition and ventilate area. For small quantities, allow to evaporate. For large leaks or spills, dissolve in alcohol and place in suitable container. For final disposal contact your regional office of the New York State Department of Environmental Conservation.

For more information:
Contact the Industrial Hygienist or Safety Officer at your worksite or the New York State Department of Health, Bureau of Toxic Substance Assessment, 2 University Place, Albany, New York 12203.