Laboratory Safety Bulletin

Phone: 519-253-3000 Ext. 3523 • E-mail: ccc@uwindsor.ca • Web: www.uwindsor.ca/ccc
Location: Essex Hall / B-37 • Hours: 8:30 am to 4:30 pm (M-F)

DESIGNATED SUBSTANCE: ETHYLENE OXIDE

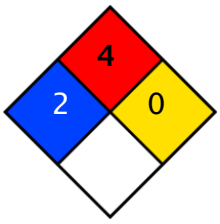
What is interesting about Ethylene Oxide?

Ethylene oxide is a colorless gas at normal room temperature and pressure. It is extremely flammable and DANGEROUSLY REACTIVE. It may polymerize or decompose violently when exposed to high temperatures or contaminants (e.g. acids and metals). Ethylene oxide is VERY TOXIC. Ethylene oxide gas kills bacteria, mold and fungi. It is used to chemically sterilize heat-sensitive materials in medical and dental settings. Ethylene oxide can be used in chemistry as an intermediate to synthesize other chemicals. The most common chemical made from ethylene oxide is ethylene glycol which is used in automobiles and is generally named antifreeze.

Hazard Classification – Ethylene Oxide

WHMIS

NFPA



Health: 2
Flammability: 4
Reactivity: 0
Specific:

How can Ethylene Oxide affect your body?

The short term effects of breathing ethylene cause irritation of the nose, and respiratory tract as well as headaches, nausea and vomiting. With high exposures, drowsiness, headache, weakness, irregular gait and loss of consciousness may occur. Ethylene oxide may be fatal if inhaled. Solutions of ethylene oxide are corrosive to the skin and eyes. Severe skin burns may not be immediately painful or visible.

Ethylene oxide is a known carcinogen. The main forms of cancer connected with ethylene oxide are lymphatic and hematopoietic cancer. Ethylene oxide may harm reproductive capability, based on animal information, and may cause inheritable genetic damage.

How do you work safely with Ethylene Oxide?

Ethylene oxide is extremely flammable, very toxic, and dangerously reactive gas. Only properly trained laboratory personnel may handle this chemical. Closed handling systems for processes involving ethylene

oxide should be used. If a closed handling system is not possible, use the smallest possible amount in an appropriated labeled and efficient fume hood. If engineering controls and work practices are not effective in controlling exposure to ethylene oxide then wear suitable personal protection equipment including approved respiratory protection. Unprotected persons should avoid all contact with this chemical including contaminated equipment. While handling, eliminate all ignition sources including sparks, open flames, hot surfaces and prevent exposure to elevated temperatures, and contact with even trace amounts of incompatible materials such as oxidizing agents, acids, bases and alcohols.

Metal fittings containing copper, silver, mercury and magnesium should not be used with ethylene oxide as they are capable of detonating ethylene oxide vapor. Ethylene oxide comes in the form of a compressed gas therefore gas cylinders must be secured to either a wall or a fixed immovable object at all times. In addition a proper gas regulator should be used (CGA 510).

First Aid Procedures:

Inhalation: Ethylene oxide is extremely hazardous chemical. Take special precautions before attempting any kind of rescue. Remove the victim to fresh air and seek medical attention immediately. If the victim has stopped breathing, remove them to fresh air and begin CPR while waiting for medical help.

Skin Contact: If your skin or eyes come into contact with ethylene oxide flushes your skin or eyes with lukewarm water for 15- 20 minutes. If irritation persists seek medical attention. If your skin or eyes come in contact with this chemical in a mixture that is in a liquid state, remove contaminated clothing and wash skin or eyes for at least 15 minutes. Then transport victim to an emergency care facility. Seal and label all contaminated clothing inside of two plastic bags. Bring the bag to the Chemical Control Centre for disposal.

Where do you keep Ethylene Oxide and its empty containers?

Supply cylinders of ethylene oxide can be stored at ambient temperatures. They should be stored in a distant outdoor container protected from direct sunlight, lined with insulating material, and equipped with adequate cooling and water sprinkling systems. Indoor storage should be restricted to small quantities that are placed in a combustible liquid cabinet. The gas cylinder is no longer in service when it has a pressure of 20 PSI. Using the cylinder with a pressure of less than 20 PSI can result in the contamination of the gas with external air. Once the cylinder has reached the 20 PSI mark, please return the gas cylinder to the Chemical Control Centre.

What happens if Ethylene Oxide is released into the air?

In case of accidental release of ethylene oxide, if it is safe to do so, remove all possible ignition sources and evacuate yourself from the area immediately. Contact Campus Community Police by dialing 911 from any campus phone. Clean up of a spill of ethylene oxide should be done only by trained personnel.

This lab safety bulletin is not a complete source on the safe handling of ethylene oxide at the University of Windsor. You should always check the SDS of your ethylene oxide product at www.uwindsor.ca/msds before you work.

For more information on ethylene oxide please, visit the Chemical Control Centre's University of Windsor Designated Substance Program at www.uwindsor.ca/ccc or contact the CCC by phone (ext. 3523).

For more information on spills visit the University of Windsor Spill Response Manual at www.uwindsor.ca/ccc.

References:

1. Cheminfo, *Chemical Profile – Ethylene Oxide,* Canadian Centre for Occupational Health and Safety, Hamilton ON 2004.
2. *Hazardous Materials Spill Response Guidelines,* Chemical Control Centre, University of Windsor ON 2008.
3. Luttrell, W.E., *Ethylene Oxide,* Journal of Chemical Health & Safety, Elsevier Inc, November/December 2008.