

Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Ethylene oxide

CAS No: 75-21-8

GHS symbols:



GHS05
Corrosive



GHS06
Acute toxicity



GHS08
Health hazard

Signal word: Danger

Hazard statements:

H314	Causes severe skin burns and serious eye damage.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H372	Damages organs (nervous system) through prolonged or repeated exposure.
H301+H331	Toxic if swallowed or inhaled.
H360FD	May impair fertility. May damage the unborn child.

Overview

- There is no danger from contact with patients who have only been exposed to ethylene oxide gas. However, a patient who is wet with liquid ethylene oxide or solutions containing ethylene oxide, or whose clothing is contaminated, may endanger other people through direct contact or through ethylene oxide gas emissions.
- Ethylene oxide can impair central nervous system functions, causing seizures, coma or respiratory paralysis, and immediate irritation of the eyes, skin and respiratory tract. Signs of fluid accumulation in the lungs (shortness of breath, blue-red discoloration of the skin and mucous membranes, sputum, coughing) may also occur with a delay of 12 or more hours after exposure.
- There is no known specific antidote. Treatment depends on the extent of exposure and the symptoms.

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1. Information about the substance

Ethylene oxide ($[\text{CH}_2]_2\text{O}$), CAS 75-21-8,
Synonyms: epoxyethane, ETO, oxirane

Ethylene oxide is a colorless gas at room temperature and a colorless liquid at temperatures below 11°C. It is extremely reactive and water-soluble. Both the gas and the liquid are flammable and explosive. Ethylene oxide has a sweet, ether-like odor at air concentrations of 500 ppm and above. Nevertheless, ethylene oxide can pose a hazard even at concentrations below the perception threshold. Ethylene oxide reacts with strong acids, alkalis and oxidants.

Ethylene oxide is important in the chemical industry as a solvent, plasticizer and intermediate product. It is used to sterilize medical instruments, food and cosmetics, and to disinfect spices, tobacco, furs and bedding.

2. Exposition

2.1. Inhalation

Inhalation is the main route of exposure to ethylene oxide. Even low concentrations that cannot be detected can pose a hazard. The irritant effect can be mild and delayed, meaning that ethylene oxide can have a long-term effect without being noticed. As ethylene oxide is heavier than air, there is a risk of suffocation in poorly ventilated, low-lying or enclosed spaces.

2.2. Skin/eye contact

Gaseous and liquid ethylene oxide can also be absorbed through the skin and eyes; however, direct contact with the gas or a concentrated solution can cause severe irritation.

2.3. Ingestion

Ingestion of ethylene oxide is unlikely as it is a gas at room temperature.

3. Acute health effects

Ethylene oxide can cause impairment of central nervous system functions with convulsions, coma or respiratory paralysis and immediate irritation of the eyes, skin and respiratory tract. Large quantities can cause signs of fluid accumulation in the lungs immediately or up to 12 or more hours after exposure.

Skin contact with gaseous or liquid ethylene oxide can cause skin irritation with redness, blistering, pus formation and scabbing. Skin reactions occasionally occur 12 or more hours after exposure. Contact with pressurized liquid ethylene oxide can result in frostbite.

High gas concentrations or splashes of concentrated solutions can cause eye redness and tears, as well as damage the cornea.

4. Measures

4.1. Self-protection for first aiders

If there is suspicion that the area the helper must enter contains gaseous ethylene oxide, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used. There is no danger from contact with patients who have only been exposed to ethylene oxide gas. A patient who is wet with liquid ethylene oxide (ambient temperature below 11°C) or solvents containing ethylene oxide, or whose clothing is wet with these substances, may endanger other people through direct contact or through ethylene oxide gas emissions.

4.2. Rescue

Patients should be rescued from the danger zone immediately. If they are unable to walk unaided, they should be removed from the danger zone quickly using appropriate means, taking care to protect themselves. The "A, B, C procedure" then has absolute priority.

- A) Clear the airways** (check for blockages caused by the tongue or foreign objects)
B) Ventilation (check the patient's breathing, if necessary, begin ventilation with adequate self-protection, e.g. breathing mask)
C) Circulation (begin resuscitation for any person who does not respond to verbal commands and is not breathing normally)

4.3. Cleaning

Patients who have only been exposed to ethylene oxide gas and show no signs of skin or eye irritation do not require any special cleaning measures, unlike all others. If possible, patients should assist in their own cleaning.

If liquid ethylene oxide (ambient temperature below 11°C) or solvents containing ethylene oxide have been exposed and clothing has been contaminated, it must be removed and securely wrapped. Ensure that affected areas of skin and hair are rinsed with water for at least 15 minutes. Continue other important emergency measures during this time. Protect eyes while rinsing. Ensure that eyes are rinsed with water or neutral saline solution for at least 15 minutes in the event of ethylene oxide exposure. Remove any contact lenses, if possible, without additional risk to the eyes. Continue other important first aid measures during this time.

4.4. Further measures

Anyone who may have been exposed to ethylene oxide should seek medical attention immediately.

4.5. Instructions for further rules of conduct

Consult your family doctor or the emergency department of the nearest hospital immediately if any of the following symptoms occur within 24 hours:

- Coughing, wheezing or whistling breath
- Difficulty breathing, shortness of breath or breathlessness
- Increased pain, redness/burning or abnormalities in the affected skin areas or eyes
- Pain or tightness in the chest

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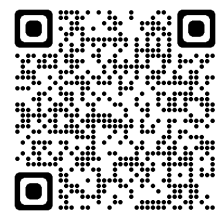
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BASF has taken every possible care to ensure that the information presented in this document is accurate and up to date but does not claim that this document comprehensively covers all possible situations in this regard. This document is intended as an additional source of information for doctors in hospitals and is designed to assist in the assessment of the condition and treatment of patients exposed to ethylene oxide. However, it does not replace the professional assessment of the respective situation by physicians in hospitals and must be interpreted in accordance with legal regulations and provisions as well as specific information available about the respective patients.