

Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Ethyleneimine

CAS No: 151-56-4

GHS symbols:



GHS05
Corrosive



GHS07
Acute toxicity



GHS08
Health hazard

Signal word: Danger

Hazard statements:

H302	Harmful if swallowed.
H317	May cause allergic skin reactions.
H318	Causes serious eye damage
H341	May cause genetic defects (through skin contact, ingestion, inhalation).
H373	May cause damage to organs (digestive system, circulatory system) through prolonged or repeated exposure. (through skin contact, if swallowed, if inhaled).

Overview

- There is no danger from contact with patients who have only been exposed to ethyleneimine vapors. A patient who is wet with liquid ethyleneimine or whose clothing is contaminated with liquid ethyleneimine may endanger other persons through direct contact or through evaporating ethyleneimine.
- Ethyleneimine can cause immediate irritation of the eyes, skin and respiratory tract, as well as nausea and vomiting. Such symptoms, as well as signs of pulmonary oedema (shortness of breath, cyanosis, sputum, coughing), may occur several hours after exposure.
- Immediate cleaning by rinsing the affected skin areas or eyes with large amounts of water is urgently necessary to prevent permanent damage.
- 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

Ethyleneimine (C₂H₅N) CAS No.: 151-56-4

Synonyms: Azacyclopropane, aziridine, dimethyleneimine

Ethyleneimine is a colorless liquid at room temperature with a boiling point of 56°C. Vapor and liquid are flammable and explosive. Ethyleneimine has an ammonia-like odor at air concentrations of 1.5 ppm. Ethyleneimine can be hazardous even at concentrations below the perception threshold.

Ethyleneimine is a highly reactive chemical used as an intermediate and monomer for oilfield chemicals, ion exchange resins, paint raw materials, pharmaceutical products, adhesives, polymer stabilizers and surface-active substances. Polymerisation products of ethyleneimine are used in paper manufacturing.

2. Exposition

2.1. Inhalation

Inhalation is a significant route of exposure to ethyleneimine. Irritation of the eyes and nose has been reported at concentrations above 100ppm. The odor of ethyleneimine does not provide adequate warning of hazardous exposure.

2.2. Skin/eye contact

Liquid ethyleneimine is readily absorbed through the skin and eyes and quickly causes severe burns and blisters. Fatal poisoning due to predominant absorption of ethyleneimine through the skin has been observed. Ethyleneimine may cause irritation to the eyes and skin.

2.3. Ingestion

Involuntary ingestion of ethyleneimine is unlikely.

3. Acute health effects

Ethyleneimine vapors can cause immediate severe irritation of the eyes, nasopharynx, lungs and moist skin areas. High concentrations can cause fluid accumulation in the lungs (shortness of breath, blue-red discoloration of the skin and mucous membranes, sputum, coughing) either immediately or several hours after exposure.

Skin contact with liquid ethyleneimine can cause chemical burns with redness, blistering and tissue damage that heals slowly. Skin reactions may occur several hours after exposure. Liquids and vapors can cause red eyes, tears and severe corneal damage.

In most cases, exposure to ethyleneimine occurs through inhalation of the vapor or through contact of the skin or eyes with liquid ethyleneimine. Even exposure to small amounts can cause irritation of the eyes, nose, throat and skin. More severe exposure can cause severe breathing difficulties, skin burns, serious eye damage, agitation, convulsions and loss of consciousness. Significant skin and respiratory problems as well as coughing may develop up to 24 hours after exposure.

A single, short-term exposure to low concentrations of ethyleneimine vapors, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health. Persistent respiratory problems have been reported after inhalation of relevant amounts of ethyleneimine.

After severe exposure, skin or eye burns may result in permanent damage or heal only very slowly; liver or kidney damage may occur. Coughing may persist for months.

After prolonged (chronic) exposure to high concentrations, carcinogenic effects cannot be ruled out.

4. Measures

4.1. Self-protection of first aiders

If there is a suspicion that the area the helper must enter contains ethyleneimine, 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 ethyleneimine vapors. A patient who is wet with liquid ethyleneimine or whose clothing is wet with liquid ethyleneimine may endanger other people through direct contact or through evaporating ethyleneimine.

4.2. Rescue

Patients should be removed 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" 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 ethyleneimine vapor show no signs of skin or eye irritation do not require any special cleaning measures, unlike all others.

If possible, patients should assist with their own cleaning. If liquid ethyleneimine has come into contact with clothing, it must be removed and securely wrapped. Rinse affected skin and hair with water for at least 15 minutes. Protect eyes while rinsing. Continue other important first aid measures during this time. If the eyes have been exposed to ethyleneimine or if there is eye irritation, rinse with water or neutral saline solution for 15 minutes. Remove any contact lenses, if possible, without additional risk to the eye. Continue other important first aid measures during this time.

4.4. Further measures

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

4.5. Further procedure and rules of conduct

Consult your family doctor or the emergency department of the nearest hospital if any abnormalities or symptoms occur within the next 24 hours, in particular:

- Coughing, wheezing or whistling breath
- Breathing difficulties or shortness of breath
- Increased pain or abnormalities in the affected skin areas or eyes
- Pain or tightness in the chest
- Fever
- Numbness or weakness in the arms or legs
- Fatigue, headache
- Stomach ache, vomiting, diarrhoea

5. References

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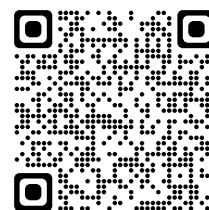
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BASF has taken every possible care to ensure that the information presented in this document is accurate and up to date but does not claim that this document comprehensively covers all possible situations in this regard. This document is intended as 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 ethyleneimine. 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.