Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Acrylic acid

CAS No: 79-10-7

GHS symbols:

GHS05
Corrosive

GHS07
Acute toxicity

Signal word: Danger

Hazard statements:

H314	Causes severe skin burns and serious eye damage.
H317	May cause allergic skin reactions.
H302+H312+H332	Harmful if swallowed, in contact with skin or if inhaled.

Overview

- A patient who is covered in liquid acrylic acid or whose clothing is covered in liquid acrylic acid may endanger other people through direct contact or through acrylic acid vapors. There is no danger from contact with patients who have only been exposed to acrylic acid vapors.
- Acrylic acid is highly corrosive to all tissues. Exposure to the eyes can cause severe burns and subsequent permanent damage to the eye. Skin contact can cause severe burns, which may occur with a delay. Vapors irritate the skin, eyes, nose, throat and respiratory tract, causing irritation, coughing, chest pain and breathing difficulties. Laryngeal spasm and fluid accumulation in the lungs (shortness of breath, blue discoloration of the skin and mucous membranes, sputum, coughing) may occur.
- There is no known specific antidote. Treatment depends on the extent of exposure and the symptoms.

Table of Contents

1. Information about the substance

Acrylic acid ($C_3H_4O_2$), CAS 79-10-7
Synonyms: Propionic acid
At room temperature, acrylic acid is a yellowish liquid with a pungent odor. Acrylic acid is the basic building block to produce acrylic resins, especially acrylates. Polymer emulsions are used in leather processing, in paints, polishes and adhesives, as binders and for surface treatment.

2. Exposition

2.1. Inhalation

Inhalation is a possible route of exposure. The odor of acrylic acid and its irritating effects on the upper respiratory tract provide a clear warning of dangerous concentrations.

2.2. Skin/eye contact

Exposure to acrylic acid occurs mainly through direct contact with the skin and eyes. Skin and eye contact causes severe burns, which may also occur with a delay.

2.3. Ingestion

Ingestion of acrylic acid causes severe burns to the mucous membranes in the throat and esophagus.

3. Acute health effects

In most cases, exposure to acrylic acid occurs when the liquid comes into contact with the skin or eyes. Skin and eye contact causes severe burns, which may occur with a delay, accompanied by watery eyes, nasal irritation, throat irritation and coughing. Prolonged exposure can cause severe breathing difficulties and ultimately lead to chemical lung damage and death.

Acrylic acid usually causes irritation of the eyes and mucous membranes, throat irritation and coughing. This can quickly lead to breathing difficulties with chest pain, shortness of breath, laryngospasm and fluid accumulation in the lungs (shortness of breath, cyanosis, sputum, coughing). The symptoms may increase over several hours. Exposure to acrylic acid can lead to respiratory failure. The irritant or corrosive effect of liquid or vapors is the main concern; systemic absorption is of secondary importance.

Direct exposure to liquid acrylic acid causes severe burns to the skin and mucous membranes, which can lead to scarring. Low vapor concentrations or mists can cause pain, redness, inflammation and blistering.

Direct exposure to liquid acrylic acid causes severe burns and subsequent permanent damage to the eyes. Low vapor concentrations and mists cause burning, redness, tearing and eyelid closure.

Single, short-term exposure, from which the affected person recovers quickly, does not normally result in delayed or lasting damage to health. Some people who have inhaled large amounts of acrylic acid have developed permanent respiratory problems and have subsequently been more susceptible to infectious lung diseases.

4. Measures

4.1. Self-protection for first aiders

If there is suspicion that the area the helper must enter contains acrylic acid, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used.
A patient who is wet with liquid acrylic acid or whose clothing is wet with liquid acrylic acid may endanger other people through direct contact or through acrylic acid vapors. There is no danger from contact with patients who have only been exposed to acrylic acid vapors.

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 yourself. The "A, B, C procedure" has absolute priority in this case.

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 acrylic acid vapors and 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 acrylic acid has been exposed and clothing is contaminated, it must be removed immediately and securely wrapped.
If the eyes have been exposed to acrylic acid or if there is eye irritation, rinse with water or neutral saline solution for 15 minutes. Remove any contact lenses, if possible, without causing additional danger to the eye. Other important first aid measures must be continued during this time.
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.

4.4. Further measures

Anyone who may have been exposed to acrylic acid 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 if any abnormalities or symptoms occur within the next 24 hours, in particular:

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

5. References

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