Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Phosphorus trichloride

CAS No.: 7719-12-2

GHS symbols:

GHS05
Corrosive

GHS06
Acute toxicity

GHS08
Health hazard

Signal word: Danger

Hazard statement:

H300	Fatal if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and serious eye damage.
H330	Fatal if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.

Overview

- Before first responders approach a patient, they must ensure that there is no danger to themselves from phosphorus trichloride.
- There is no danger from contact with patients who have only been exposed to phosphorus trichloride gas. However, a patient who is wet with liquid phosphorus trichloride (boiling point 76°C) or whose clothing is wet with it may endanger other people through direct contact or through phosphorus trichloride gas emissions. Forms hydrogen chloride after contact with moisture.
- Phosphorus trichloride and hydrogen chloride formed with moisture have a strong corrosive effect on moist skin, the eyes and the upper respiratory tract, leading to eye irritation, coughing, chest pain and breathing difficulties. Laryngospasm and signs of fluid accumulation in the lungs (shortness of breath, blue-red discoloration of the skin, lips and mucous membranes, sputum, coughing) may occur.

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1. Information about the substance

Phosphorus trichloride (PCl_3), CAS 7719-12-2
Synonyms: phosphorus chloride, phosphorus-(III)-chloride
At room temperature, phosphorus trichloride is a colorless to slightly yellowish liquid (boiling point 76° C) with a sharp or pungent odor. Any vapors formed are corrosive. Forms hydrogen chloride when exposed to moisture.
It is used in the production of pesticides, fuel additives, plasticizers, paints and textile auxiliaries.

2. Exposition

2.1. Inhalation

Inhalation is the main route of exposure to phosphorus trichloride. The odor of phosphorus trichloride and its irritating effect on the upper respiratory tract serve as a clear warning of dangerous concentrations. As phosphorus trichloride is heavier than air, there is a risk of suffocation in poorly ventilated, low-lying or enclosed spaces. Forms hydrogen chloride when exposed to moisture.

2.2. Skin/eye contact

Direct exposure of wet or damp skin or eyes to phosphorus trichloride/hydrogen chloride causes severe chemical burns. Only small amounts are absorbed through the skin.

2.3. Ingestion

Ingestion of phosphorus trichloride in the workplace is unlikely. However, aqueous solutions can cause severe burns to the esophagus and mucous membranes.

3. Acute health effects

In most cases, exposure to phosphorus trichloride/hydrogen chloride occurs through inhalation of the gas. Low concentrations of phosphorus trichloride/hydrogen chloride cause irritation of the eyes, nose and throat, with watering eyes, coughing and a feeling of suffocation. Higher concentrations can cause severe breathing difficulties and ultimately lead to chemical lung damage and death.

Phosphorus trichloride/hydrogen chloride usually causes 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 time.

Concentrated phosphorus trichloride/hydrogen chloride can cause severe burns to the skin and mucous membranes, which can lead to scarring. Low concentration can cause burning, redness, inflammation and blistering.

Low concentrations cause burning, redness, tearing and eyelid closure in the eye. Exposure to high concentrations can lead to cloudy surface and subsequent permanent damage to the eye.

A single, short-term exposure to low concentrations of phosphorus trichloride/hydrochloric acid, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health. Some people who have inhaled larger amounts have developed persistent respiratory problems and were subsequently more susceptible to infectious diseases of the lungs.

4. Measures

4.1. Self-protection of first aiders

If there is a suspicion that the area the helper must enter contains phosphorus trichloride, 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 phosphorus trichloride gas. A patient who is wet with liquid phosphorus trichloride or whose clothing is wet with it may endanger other people through direct contact or through phosphorus trichloride gas emissions.

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 phosphorus trichloride 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 with their own decontamination. If liquid phosphorus trichloride has been exposed to and clothing is contaminated, 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 phosphorus trichloride 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 phosphorus trichloride 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 the eyes
- Pain or tightness in the chest

5. References

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