

ANNEX A-7:

GUIDELINES FOR PHOSPHINE GAS EXPOSURE FIRST AID

SYMPTOMS OF PHOSPHINE GAS POISONING AND RESPONSE

Source: First Aid in Case of Phosphine Poisoning

(<http://www.fao.org/docrep/x5042e/x5042E0a.htm>).

Develop an emergency action plan to know what needs to be done and where to seek medical care in case of poisoning.

According to the amount of phosphine inhaled, symptoms may occur immediately or several hours after exposure.

Slight or mild poisoning may give a feeling of fatigue, ringing in the ears, nausea, pressure in the chest and uneasiness. Wear Self-Contained Breathing Apparatus and move person to fresh air. Medical attention is important even in mild cases of poisoning.

Greater quantities will quickly lead to general fatigue, nausea, gastrointestinal symptoms with vomiting, stomachache, diarrhea, disturbance of equilibrium, strong pains in the chest and dyspnea (difficulty in breathing).

Very high concentrations rapidly result in strong dyspnea, cyanosis (bluish-purple skin color), agitation, ataxia (difficulty in walking or reaching), anoxia (subnormal blood oxygen content), unconsciousness and death.

Death can be immediate or occur several days later due to edema and collapse of the lungs, paralysis of the respiratory system or edema of the brain. Disturbances of kidney and liver functions (hematuria, proteinuria, uremia, jaundice) and cardiac arrhythmia may occur.

There is no specific antidote for phosphine poisoning, and treatment is symptomatic.

Do not administer milk, butter or castor oil, and alcohol to affected person.

If breathing stops or shows signs of failing, resuscitation must commence immediately.

ADVICE TO THE PHYSICIAN

Manufacturers suggest the following measures for use by the physician.

- In its milder forms, symptoms of poisoning may take some time (up to 24 hours) to make their appearance, and the following measures are suggested:
 1. Complete rest for one or two days, during which the patient is kept quiet and warm.
 2. Should the patient suffer from vomiting or increased blood sugar, appropriate intravenous solutions should be administered. Treatment with oxygen breathing equipment is recommended as is the administration of cardiac and circulatory stimulants.
- In cases of severe poisoning intensive care in a hospital is recommended:
 1. Where pulmonary edema is observed, steroid therapy should be considered and close medical supervision is recommended. Blood transfusions may be necessary.
 2. In case of manifest pulmonary edema, venesection should be performed under vein pressure control, and intravenous administration of glycosides (in case of hemoconcentration, venesection may result in shock). On progressive edema of the lungs, perform immediate incubation with

constant removal of edema fluid and establishment of oxygen positive pressure respiration, as well as any measures required for shock treatment. In case of kidney failure, extracorporeal hemodialysis is necessary. There is no specific antidote known for this poison.

- In cases where solid phosphide is ingested, empty the stomach by inducing vomiting and flush it with a dilute potassium permanganate solution or a solution of magnesium peroxide until the flushing liquid ceases to smell of carbide. Thereafter, administer medicinal charcoal.
- Scientific research has shown that phosphine poisoning is not chronic; the action of phosphine is reversible and symptoms will disappear by themselves.

EXAMPLES OF DIFFERENT FIRST AID PROCEDURES IN CASE OF ACCIDENTS RESULTING FROM ALUMINUM PHOSPHIDE OR PHOSPHINE GAS

IF INHALED



1. Move person to fresh air.
2. If person is not breathing, call 911 or an ambulance, then give artificial respiration immediately, preferably by mouth-to-mouth if possible.
3. Keep warm and make sure person can breathe freely.
4. Call a poison control center or doctor for further treatment advice.

IF ON SKIN OR CLOTHING

1. Brush or shake material off clothes and shoes in a well-ventilated area.
2. Allow clothes to aerate in a ventilated area prior to laundering.
3. Do not leave contaminated clothing in occupied and/or confined areas such as automobiles, vans, motel rooms, etc.
4. Wash contaminated skin thoroughly with soap and water.

IF SWALLOWED

1. Call a poison control center or doctor immediately for treatment advice.
2. Have person drink one or two glasses of water. Do not induce vomiting unless told by a poison control center or doctor.
3. Do not give anything by mouth to an unconscious person.



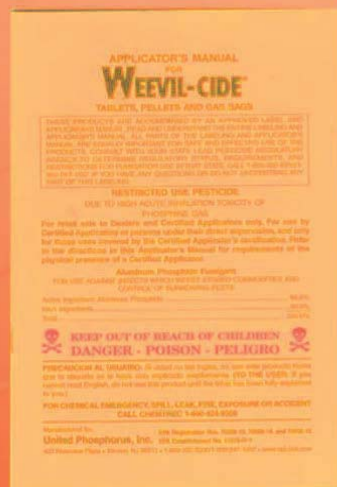
IF IN EYES



1. Hold eye open and rinse slowly and gently with water for 15 – 20 minutes.
2. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
3. Call poison control center or doctor for further treatment advice.

Have a copy of the Applicator's Manual with you.

- ◆ If you have to take someone for medical attention. Make sure you take a current copy of the brand of aluminum phosphide you are using with you for the doctor or medical attendant.



Sources:

- Photo and Illustrations courtesy of Kansas State University, Department of Grain Science and Technology from Lecture 9, Part I on *Fumigation Safety Considerations* by Brayn Giroux, Central States Enterprises, USA
- United Phosphorous, Inc. Rev 4/10. Applicators Manual for Aluminum Phosphide Fumigant- Tablets, Pellets and Gas Bags. s.n. USA