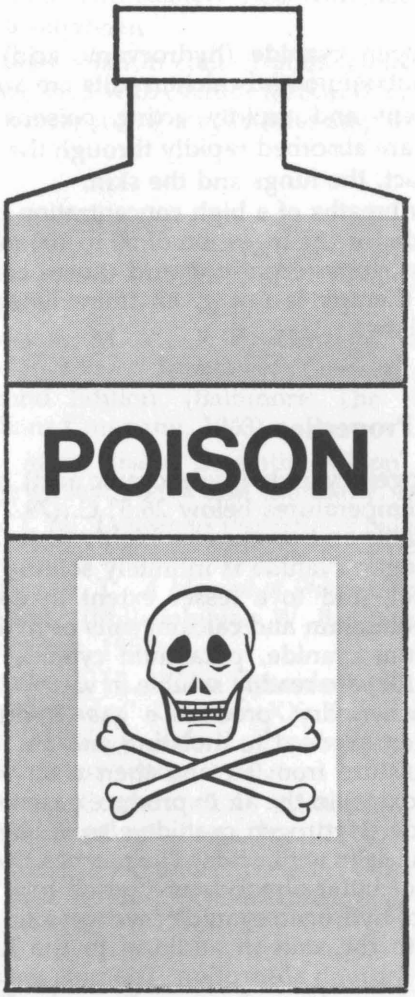
HYDROGEN CYANIDE SAFETY TIPS



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Hydrogen Cyanide Safety Tips

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Hydrogen cyanide (hydrocyanic acid) and its sodium, potassium and calcium salts are among the most potent and rapidly acting poisons known. Cyanides are absorbed rapidly through the gastrointestinal tract, the lungs and the skin.

A few breaths of a high concentration of hydrogen cyanide, or the ingestion of 50 to 100 milligrams of its salts, stops respiration and causes collapse. If adequate therapy is not given immediately, death quickly follows.

Physical Properties

Hydrogen cyanide (hydrocyanic acid) is a white liquid at temperatures below 26.5° C. (79.7°F.). The acid is volatile and produces a highly toxic, colorless gas. Hydrogen cyanide is infinitely soluble in water and alcohol, and to a lesser extent in ether. The sodium, potassium and calcium salts of hydrocyanic acid (sodium cyanide, potassium cyanide and calcium cyanide) are readily soluble in water. The salts, odorless when dry, produce a gas (hydrogen cyanide) when exposed to moisture and air. The salts absorb moisture from air and then react with CO_2 (carbon dioxide) in the air to produce gaseous hydrogen cyanide. Hydrogen cyanide also is liberated by treating the salts with acids. The gas has the distinctive odor of bitter almonds or "peach pits." Strong solutions of hydrogen cyanide (hydrocyanic acid) are corrosive to the skin in addition to the hazard of poisoning through absorption. The salts are available in various forms (granules, powder and solid).

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	Calcium cyanide	Potassium cyanide	Sodium cyanide
Physical state	**white powder (amorphous)**	**white crystalline solid**	**white crystalline solid**
Formula	**$Ca(CN)_2$**	**KCN**	**NaCN**
Estimated fatal dose	**not reported**	**0.25 gram***	**0.25 gram***

***Approximate; fatalities reportedly have resulted from one-fourth of this amount (reference 8).**

Symptoms of Poisoning

Poisoning symptoms in humans include an increased respiration followed by slow, shallow, irregular breathing, unconsciousness and convulsions. Other symptoms include constriction of the throat, fullness or flushing of the head, anxiety, confusion, dizziness, nausea and sometimes vomiting. Low concentrations produce nausea, headache, dizziness and a feeling of suffocation. A bitter, acrid, burning taste sometimes is noted upon ingestion.

Death occurs with asphyxial symptoms since the cyanide acts as a chemical asphyxiant, depriving tissues of necessary oxygen.

Care, Handling, Storage

1. Be familiar with all information on the product label. Use all protective measures and follow directions carefully. If gas mask protection is suggested, obtain an appropriate type of mask and use it properly.
2. Handle only the amount of cyanide required at a given time.
3. Do not get in eyes or on skin or clothing. In case of contact, remove clothing and wash thoroughly.
4. Avoid contact with the skin—use gloves. If gloves are exposed to cyanides through spills etc., destroy them. Contaminated gloves can be a source of continuous exposure while worn.
5. Goggles will afford protection to the eyes.
6. A long-sleeved shirt or jacket buttoned at the collar minimizes skin exposure.
7. In the event of skin exposure, remove contaminated clothing immediately and thoroughly wash exposed areas of the skin with soap and water.
8. Good habits of personal hygiene are essential. Do not smoke, eat or chew while working with cyanide salts.
9. Wash thoroughly with soap and water following the use of cyanides.
10. The cyanide salts emit hydrocyanic acid easily. The gas is highly toxic and flammable. Maintain cyanides in sound, tightly closed containers in a dry, cool, well-ventilated storage unit out of direct sunlight and away from fire hazards. Secure and identify the storage unit.
11. Inventory all cyanides.

Emergency Treatment

The success of first aid efforts or other treatment is related to the speed of handling the emergency situation. The following is quoted from the label of a sodium cyanide salt:

"If swallowed or inhaled, prompt treatment is of

the utmost importance. Carry patient to fresh air, have him lie down. Patient should breathe the contents of an Amyl Nitrite pearl 15-30 seconds each minute if necessary, until five pearls have been used. Use artificial respiration if breathing has stopped. Remove contaminated clothing, but keep patient warm.

CALL A PHYSICIAN IMMEDIATELY.

If on skin, immediately flush with plenty of water.

If in eyes, immediately flush with plenty of water and call a physician."

You may wish to contact your family physician about your work with cyanide salts and for additional information regarding amyl nitrite ampuls.

Selected References

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