Cyanide, Facts

Cyanide is a rapidly acting, potentially deadly chemical that can exist in various forms. Cyanide can be a colorless gas, such as hydrogen cyanide (HCN) or cyanogen chloride (CNCl), or a crystal form such as sodium cyanide (NaCN) or potassium cyanide (KCN). Cyanide sometimes is described as having a “bitter almond” smell, but it does not always give off an odor, and not everyone can detect this odor. Cyanide is also known by the military designations AC (for hydrogen cyanide) and CK (for cyanogen chloride).

WHERE CYANIDE IS FOUND AND HOW IT IS USED

Hydrogen cyanide, under the name Zyklon B, was used as a genocidal agent by the Germans in World War II. Reports have indicated that during the Iran-Iraq War in the 1980s, hydrogen cyanide gas may have been used along with other chemical agents against the inhabitants of the Kurdish city of Halabja in northern Iraq.

Cyanide is released from natural substances in some foods and in certain plants such as cassava. Cyanide is also found in apricot pits. Cyanide is contained in cigarette smoke and the combustion products of synthetic materials such as plastics. Combustion products are substances given off when things burn.

In manufacturing, cyanide is used to make paper, textiles and plastics. It is present in the chemicals used to develop photographs. Cyanide salts are used in metallurgy for electroplating, metal cleaning and removing gold from its ore. Cyanide gas is used to exterminate pests and vermin in ships and buildings.

If accidentally *ingested* (swallowed), chemicals found in acetonitrile-based products (chemicals used to remove artificial nails) can produce cyanide.

HOW YOU COULD BE EXPOSED TO CYANIDE

- You could be exposed to cyanide by breathing air, drinking water, eating food or touching soil that contains cyanide.
- Cyanide enters water, soil or air as a result of both natural processes and industrial activities. In air, cyanide is present mainly as gaseous hydrogen cyanide.
- Smoking cigarettes is probably one of the major sources of cyanide exposure for people who do not work in cyanide-related industries.

HOW CYANIDE WORKS

The extent of poisoning caused by cyanide depends on the amount of cyanide a person is exposed to, the route of exposure and the length of time that a person is exposed.

- Breathing cyanide gas causes the most harm, but ingesting cyanide can be toxic as well.
- Cyanide gas is most dangerous in enclosed places where the gas will be trapped.
- Cyanide gas evaporates and disperses quickly in open spaces, making it less harmful outdoors.
- Cyanide gas is less dense than air, so it will rise.
- Cyanide prevents the cells of the body from using oxygen. When this happens, the cells die.
- Cyanide is more harmful to the heart and brain than to other organs because the heart and brain use a lot of oxygen.

IMMEDIATE SIGNS AND SYMPTOMS OF EXPOSURE TO CYANIDE

People exposed to a small amount of cyanide by breathing it, absorbing it through their skin or eating foods that contain it may have some or all of the following symptoms within minutes:

- Rapid breathing.
- Restlessness.
- Dizziness.
- Weakness.
- Headache.

- Nausea and vomiting.
- Rapid heart rate.

Exposure to a large amount of cyanide by any route may cause these other health effects as well:
- Convulsions.
- Low blood pressure.
- Slow heart rate.
- Loss of consciousness.
- Lung injury.
- Respiratory failure leading to death.

Showing these signs and symptoms does not necessarily mean that a person has been exposed to cyanide.

LONG-TERM HEALTH EFFECTS OF EXPOSURE TO CYANIDE

Survivors of serious cyanide poisoning may develop heart and brain damage.

HOW YOU CAN PROTECT YOURSELF, AND WHAT TO DO IF YOU ARE EXPOSED TO CYANIDE

- Since inhalation is likely to be the primary route of exposure to cyanide, leave the area where the cyanide gas were released and get to fresh air. Quickly moving to an area where fresh air is available is highly effective in reducing exposure to cyanide gas.
- If the cyanide gas was released outdoors, move away from the area where it was released.
- If you cannot get out of the area where the cyanide gas was released, stay as low to the ground as possible.
- If the release of cyanide gas was indoors, get out of the building.
- If you are near a release of cyanide gas, emergency coordinators may tell you to either evacuate the area or “shelter in place” (stay put and take cover) inside a building to avoid being exposed to the chemical.

For more information on evacuation during a chemical emergency, see ExitCare title, "Evacuation Facts, Chemical, CDC". For more information on sheltering in place during a chemical emergency, see ExitCare title, "Sheltering in Place from Chemical Agents".

IF YOU THINK YOU MAY HAVE BEEN EXPOSED TO CYANIDE:

- Remove your clothing, rapidly wash your entire body with soap and water, and get medical care as quickly as possible.
- Quickly take off clothing that may have cyanide on it. Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head.
- If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.
- Wash yourself as quickly as possible, washing any cyanide from your skin with large amounts of soap and water. Washing with soap and water will help protect people from any chemicals on their bodies.
- If your eyes are burning or your vision is blurred, rinse your eyes with plain water for 10 to 15 minutes. If you wear contacts, remove them and put them with the contaminated clothing. Do not put the contacts back in your eyes (even if they are not disposable contacts). If you wear eyeglasses, wash them with soap and water. You can put your eyeglasses back on after you wash them. If you are wearing jewelry that you can wash with soap and water, you can wash it and put it back on. If it cannot be washed, it should be put with the contaminated clothing.
- After you have washed yourself, place your clothing inside a plastic bag. Avoid touching contaminated areas of the clothing. If you cannot avoid touching contaminated areas, or you are not sure where the contaminated areas are, wear rubber gloves or turn the bag inside out and use it to pick up the clothes, inverting the bag over the clothes when you have all the clothes picked up. An alternative method is to put the clothes in the bag using tongs, tool handles, sticks or similar objects. Anything that touches the contaminated clothing should also be placed in the bag. If you wear contacts, put them in the plastic bag, too.

- Seal the bag, and then seal that bag inside another plastic bag. Disposing of your clothing in this way will help protect you and other people from any chemicals that might be on your clothes.
- When the local or state health department or emergency personnel arrive, tell them what you did with your clothes. The health department or emergency personnel will arrange for further disposal. Do not handle the plastic bags yourself.

Seek medical attention right away. Dial 911 and explain what has happened.

TREATMENT

Cyanide poisoning is treated with specific antidotes and supportive medical care in a hospital setting. The most important thing is for victims to seek, or be taken, for medical treatment as soon as possible.

HOW YOU CAN GET MORE INFORMATION ABOUT CYANIDE:

You can contact one of the following:
Regional poison control center (1-800-222-1222)

Centers for Disease Control and Prevention
Public Response Hotline (CDC)
English (888) 246-2675
Español (888) 246-2857
TTY (866) 874-2646

Emergency Preparedness and Response Website

E-mail inquiries: cdcresponse@ashastd.org

Mail inquiries:
Public Inquiry c/o BPRP
Bioterrorism Preparedness and Response Planning
Centers for Disease Control and Prevention
Mailstop C-18
1600 Clifton Road
Atlanta, GA 30333

Agency for Toxic Substances and Disease Registry (ATSDR) (1-888-422-8737)

E-mail inquiries: atsdric@cdc.gov

Mail inquiries:
Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop E-29
Atlanta, GA 30333

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