

TALKING Gas

Hydrogen Cyanide

Hydrogen Cyanide, which has the chemical formula HCN, commonly exists as a gas that is volatile, flammable and highly toxic – it has been used as a chemical weapon.

Hydrogen Cyanide gas is usually colourless or pale blue, and while it may have a faint, bitter odour of almonds, 30 to 40% of people cannot detect it, with one in five unable to smell HCN even at high concentrations.

Hydrogen Cyanide occurs naturally – for example, when humans eat fruit seeds and almonds – but the vast majority is produced industrially. It is liquid at temperatures below 25.6°C (78°F) and a gas at more than 25.6°C (78°F). Its vapours are slightly lighter than air, so tend to accumulate at height.

What are the applications of Hydrogen Cyanide?

Hydrogen Cyanide is manufactured for use in many industrial processes, where it may be mixed with water to form hydrocyanic acid, often called prussic acid. It is important to note that even its non-gaseous forms, including prussic acid, HCN can evolve hydrogen cyanide vapour/gas.

Hydrogen Cyanide is also used in fumigation, electroplating, PCB manufacture, the production of plastics, adhesives, paints and synthetic fibres, and for the extraction of metals – including gold – from ore.

Hydrogen Cyanide is a main constituent of fire smoke, so fire service personnel must be equipped to monitor it.

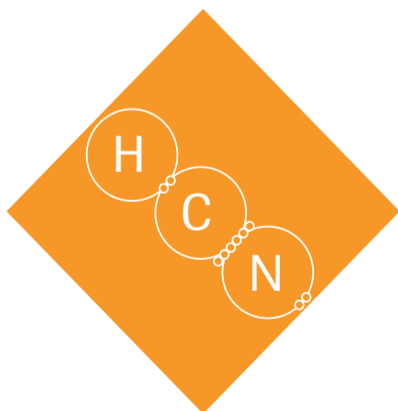
What are the dangers of Hydrogen Cyanide?

Hydrogen Cyanide gas is extremely toxic by all routes, including inhalation.

When inhaled, the gas is absorbed within seconds and is very persistent, being swiftly distributed by the blood throughout the body. It kills by interfering with the transfer of oxygen from the blood to cells and tissues, effectively suffocating the victim. The inhalation of a significant volume of hydrogen cyanide gas generally kills within minutes.

Symptoms include headaches, dizziness, altered heart rate, convulsions and finally, respiratory failure.

Hydrogen Cyanide is also flammable and becomes an explosion risk at 5.6% volume. Chronic low-level exposure is associated with a range of adverse effects.



CROWCON
Detecting Gas Saving Lives

HCN

Hydrogen Cyanide

Hydrogen

N

Carbon
Dioxide

Cl₂

Chlorine

Nitrogen
Dioxide

H₂S

Hydrogen
Sulfide

Carbon
Monoxide

O₃

Ozone

What should you do if you are exposed to Hydrogen Cyanide?

Ideally, immediately remove the victim to fresh air, but if that is impossible, they should remain at low level (because Hydrogen Cyanide gas accumulates at height).

Call for emergency help, meanwhile remove clothing and jewellery but cut off anything that would usually be pulled over the head. Dispose of clothing in a bag (using gloves or protecting hands with the bag turned inside-out), seal that bag then place it in a second bag, which should also be sealed. Proceed to wash the body with plenty of soap and water.

How do you detect, measure and report on Hydrogen Cyanide?

In many regions, Hydrogen Cyanide is regulated, and occupational exposure limits apply. Monitoring of this gas is therefore imperative, to ensure safety and compliance.

Hydrogen Cyanide is detected with electromechanical sensor technology, which can be found in a variety of Crowcon's detectors – including both fixed and portable detection systems.

Fixed systems can be used for system over-rides and ventilation control. When installing a fixed system, the unit's location is important since the density of hydrogen cyanide means it will accumulate at height and pose a toxic risk at breathing level.



Portable detectors

Gasman, T3 and Gas-Pro can monitor an individual's real time and time weighted average (TWA) exposures to Hydrogen Cyanide.



Fixed point detectors

The Xgard Type 1 fixed detection system includes a combination of toxic and flammable level detectors, according to the application - making it an effective detector of Hydrogen Cyanide.

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