Hydrogen cyanide

Where is it found?

Hydrogen cyanide (HCN) is a colorless, highly volatile, and flammable liquid that evaporates quickly. It occurs both naturally and as a result of industrial activities. It is found in mines, specifically, gold mining operations; combustion processes, such as vehicle exhaust, biomass burning; and at industrial applications, especially in the production of plastics (like acrylonitrile), synthetic fibers, dyes, pesticides, and electroplating.

Why is it harmful?

HCN is extremely toxic due to its interference with the body's ability to use oxygen. Acute exposure can lead to headache, dizziness, nausea, confusion, rapid breathing, and loss of consciousness. High concentrations can cause seizures, respiratory failure, cardiac arrest, and death within minutes. Besides, long-term, low-level exposure can lead to neurological problems, respiratory issues, and thyroid dysfunction.

Due to its high toxicity and volatility, hydrogen cyanide is classified as a highly hazardous air pollutant and is strictly regulated in occupational and environmental settings.

HCN cartridge

The HCN cartridge features an integrated electrochemical sensor capable of detecting both low concentrations of HCN (below 1 ppm) and higher levels, up to 50 ppm, with an accuracy of ±0.10 ppm. However, the HCN sensor exhibits significant cross-sensitivity to SO_2 and NO_2.

To ensure maximum accuracy when high concentrations of NO_2 and SO_2 are expected, it is recommended to use NO_2, O_3, and SO_2 cartridges alongside the HCN cartridge. This setup allows the Kunak algorithm to compensate for cross-sensitivity and deliver more precise measurements.

Type	Electrochemical
Unit of measurement	mg/m³, ppm
Measurement range (1)	0 - 50 ppm
Resolution (2)	0.01 ppm
Operating temp. range (3)	-20 to 45ºC
Operating RH range (4)	0 to 99 %RH
Recommended RH range (4)	15 to 90 %RH
Operating life (5)	> 24 months
Guarantee range (6)	200 ppm

Limit of Detection (LOD) (7)	0.02 ppm
Repeatability (8)	0.03 ppm
Response time (9)	< 160 sec
Typical accuracy (11) (12)	± 0.1 ppm
Typical precision R² (10)	-
Typical slope (10)	-
Typical intercept (a) (10)	-
DQO - Typical U(exp) (13)	-
Typical Intra-model variability (14)	< 0.1 ppm

* See notes on page 24