CYANIDE

EZ Series: Continuous Monitoring of Cyanide

Key Applications: Monitoring of source and surface water, treatment of mining and industrial wastewater

Cyanides are compounds containing a carbon atom triple-bonded to a nitrogen atom. Many Cyanides are highly toxic; Hydrogen Cyanide for example, is a gas which can be fatal following inhalation. However, Cyanides are also toxic when consumed orally.

Cyanides are produced by combustion processes and are present in the effluents from electroplating processes, gold and silver extraction and from the production of some medicines and plastics. Water resources can be contaminated by Cyanides in industrial and mining effluent, and in wash down from industrial and urban areas.

Watch the Video

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More Resources

Features of the EZ Series Cyanide Analyser

- **Continuously monitor Free and Total Cyanide to detect trends, peaks, and excursions**
- **Accurate at low levels starting at 1 µg/L**
- **Multiple stream analysis (1 - 8 streams)**
- **Analogue and digital communication options**

Explore the full range of parameters and technologies. Call your Hach representative today, or visit hach.com/ez-series

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Be Right™

The Why, Where and How of Cyanide Monitoring

About

Cyanide is utilised in the manufacture of paper, textiles, and plastics. It is present in the chemicals that develop photographs, and cyanide salts are used in electroplating, metal cleaning, and precious metal extraction. Cyanide can be one of the products of combustion processes, as well as in vehicle exhausts and cigarette smoke. It also exists in some common fruits that contain chemicals which are metabolized to Cyanide.

The toxicity of Cyanide is due to the inhibition of enzyme function in aerobic respiration in vital organs such as the brain and heart.

Cyanide in Water

Cyanide may be found in discharge water from organic chemical industries, iron and steel works, and wastewater treatment facilities. In water, Cyanides exist in the free state (CN- & HCN), as simple Cyanides that easily dissociate, and as complex (organic or metal) Cyanides. Some complexes readily dissociate to form toxic free Cyanide ions, whereas others are more stable. The toxicity of Cyanide is mostly determined by the concentration of undissociated HCN in water.

Regulatory – Wastewater

In Europe, under Directive 2010/75/EU the Best Available Technology - Associated Emission Level (BAT-AEL) of free Cyanide to water from wastewater treatment has been set at 20 - 100 µg/L.

Cyanide is also listed in the Environmental Quality Standards Directive 2008/105/EC Annexe III for substances subject to review for possible identification as priority substances or priority hazardous substances.

In the USA, Cyanide is listed as a toxic pollutant (CFR 401.15), and the US EPA publishes criteria which provide guidance for States and Tribes to establish water quality standards and provide a basis for controlling discharges of pollutants. The US Clean Water Act prohibits anybody from discharging pollutants unless they have a NPDES (National Pollutant Discharge Elimination System) permit, which contains discharge limits as well as monitoring and reporting requirements. Each permit is written to reflect the site-specific conditions of the discharger and may include limits for Cyanide.

The US EPA has set 5.2 µg/L total Cyanide as the continuous discharge limits for publicly owned treatment works (POTW) and 22 µg/L as the maximum discharge to fresh water.

Regulatory – Drinking Water

The WHO has not set a Guideline Value for Cyanide in drinking water because concentrations are normally below those of health concern, except where a supply has become contaminated. However, the European Drinking Water Directive (EU) 2020/2184 lists a parametric value for Cyanide of 50 µg/L, and the US EPA set the Maximum Contaminant Level Goal (MCLG) and the MCL for Cyanide at 200 µg/L in the Chemical Phase Rule V, which applies to free Cyanide.

Cyanide Monitoring Solutions

EZ Series Cyanide Analysers are available in two models:

EZ1012	Cyanide, free
EZ2500	Cyanide, total

Options

- Selection of measuring ranges to match your application
- Monitoring of up to 8 sample streams per analyser, reducing cost per sampling point
- Analogue and digital communication options
- Self-cleaning sample preconditioning panel

DOC063.52.30680.Feb21

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