

# Method Abstract

**Summary:** Cyanide ion (CN<sup>-</sup>), hydrogen cyanide in water (HCN(aq)), and the cyano-complexes of zinc, copper, cadmium, mercury, nickel, and silver may be determined by this method. Cyanide is released from metallo-cyanide complexes by off-line addition of two ligand-exchange reagents at a pH >12. The free cyanide is injected into the analyzer, and acid is added to convert cyanide into hydrogen cyanide gas (HCN). The HCN is directed into a gas diffusion cell where the gas diffuses through a hydrophobic membrane into an alkaline acceptor solution and is converted back to cyanide ion. The cyanide ion is monitored amperometrically with a silver working electrode, silver/silver chloride reference electrode, and platinum/stainless steel counter electrode at an applied potential of zero volt.

**Interferences:** Eliminate sulfide interference by adding lead carbonate. Treat water soluble aldehydes with ethylenediamine solution. Remove oxidizing agents by adding ascorbic acid. High concentrations of carbonate can be treated with hydrated lime.

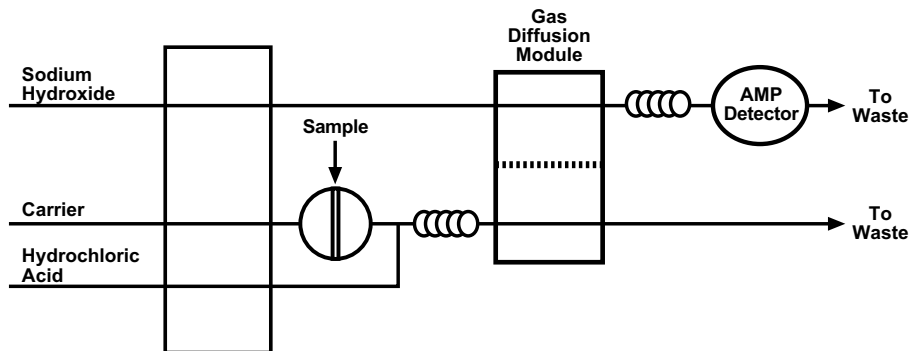
**Performance Specifications:**

Range:	2.0 µg/L–5.0 mg/L CN <sup>-</sup>
Throughput:	40 samples/hour
Precision:	
2.0 µg/L	<2% RSD
5.0 mg/L	<1% RSD
Method Detection Limit (MDL):	0.5 µg/L CN <sup>-</sup>

**Chemicals:**

Acetone, C <sub>3</sub> H <sub>6</sub> O	WAD Cyanide Reagent A
Ascorbic Acid, C <sub>6</sub> H <sub>8</sub> O <sub>6</sub>	(OI Analytical Part #A001416)
5-[4-(Dimethylamino)benzylidene]-rhodanine, C <sub>12</sub> H <sub>12</sub> N <sub>2</sub> OS <sub>2</sub>	WAD Cyanide Reagent B
Ethylenediamine, C <sub>2</sub> H <sub>8</sub> N <sub>2</sub>	(OI Analytical Part #A001417)
Hydrochloric Acid, concentrated, HCl	Mercury(II) Cyanide, Hg(CN) <sub>2</sub>
Lead Carbonate, PbCO <sub>3</sub>	Potassium Cyanide, KCN
	Silver Nitrate, AgNO <sub>3</sub>
	Sodium Hydroxide, NaOH

**Basic Flow Diagram:**



**Note:** This method complies with USEPA Method OIA-1677.

**Selected Reference:** Milosavljev, E.B.; Solujic, L.; Hendrix, J.L. *Environmental Science and Technology* **1995**, 29 (No. 2), 426–430.