

Method

Cyanide is used in many chemical and refining processes. It is found in effluent from electroplating and metal cleaning operations, coke ovens, steel manufacturing facilities, and gas scrubbers. Although cyanide can be safely removed by alkaline chlorination, its acute toxicity to aquatic life necessitates routine monitoring of effluents. The Maximum Contaminant Level for free cyanide in drinking water is 0.2 mg/L.

CHEMetrics' cyanide test kits are applicable to the monitoring of effluents and surface water supplies. It is recommended, however, that the sample be distilled and hydrogen sulfide be removed prior to analysis.

The Isonicotinic-Barbituric Acid Method

Reference: S. Nagashima, Spectrophotometric Determination of Cyanide with Isonicotinic Acid and Barbituric Acid, International Journal of Environ. Anal. Chem., 1981, Vol. 10, pp. 99-106.

In the Cyanide CHEMetrics and Vacu-vials Kit, chlorine is added to a sample that has been buffered to pH 6. The resulting cyanogen chloride reacts with isonicotinic and barbituric acids to form a blue color. Results are expressed as ppm (mg/L) CN.

This chemistry provides two advantages over the more commonly used pyridine methods: (1) the shelf life of the reagent is extended, and (2) the analyst is not exposed to noxious and hazardous fumes from the pyridine reagent.

Visual Kit

Range: 0-0.1 & 0.1-1 ppm MDL: 0.005 ppm / Method: Isonicotinic-Barbituric Acid	
CHEMetrics Kit	Cat# K-3810
CHEMetrics Refill, 30 ampoules	R-3810
Accessory Solution Pack, Shelf life 8 months: A-3801 Activator Solution, two 10 mL bottles A-3805 Neutralizer Solution, four 20 mL bottles	A-3810 ¹
Low Range Comparator, Shelf life 12 months 0, 0.01, 0.02, 0.03, 0.04, 0.06, 0.08, 0.1 ppm	C-3801
High Range Comparator, Shelf life 12 months 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 ppm	C-3810
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Low and High Range Comparators, Neutralizer Solution, Activator Solution, 25 mL sample cup, 1 mL syringe, and instructions.	

Instrumental Kit

Multi-Analyte Photometers

V-2000 / V-3000
(See page 14 for instrumental features)

Range: 0-0.400 ppm Method: Isonicotinic-Barbituric Acid	
Vacu-vials Kit , Shelf life 8 months	Cat# K-3803
Kit comes in a cardboard box and contains everything needed to perform up to 29 tests (except distilled water): thirty ampoules, Neutralizer Solution, Activator Solution, 25 mL sample cup, 3.0 mL syringe, ampoule blank and instructions.	

Vacu-vials Kits require the use of a CHEMetrics Direct-Readout Photometer (photometers sold separately) or a spectrophotometer capable of accepting a 13 mm diameter round cell. See page 14 for details.

Components and Accessories

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Ampoule Blank Pack (5 ea)	A-0023
Syringe Pack, 1.0 mL (6 ea)	A-0027
Syringe Pack, 3.0 mL (6 ea)	A-0063
* Sample Zeroing Accessory Pack	A-0503

¹ The A-3810 Accessory Solution Pack supplies enough Cyanide Activator and Neutralizer Solutions to perform approximately 60 tests.

* For use when testing colored or turbid samples. See page 13 for details.

Instructions and SDSs are posted on our website.

If no shelf life is listed for a product, then the shelf life is at least 1 year.

Methods

Dissolved oxygen in boiler system water causes corrosion and pitting of metal surfaces, which can lead to boiler inefficiency, equipment failure, and system downtime. DEHA (N,N-Diethylhydroxylamine) is added to boiler system water as an oxygen scavenger to keep the dissolved oxygen levels as low as possible.

The PDTS Method

Reference: G. Frederick Smith Chemical Co., The Iron Reagents, 3rd ed., p. 47 (1980).

The test kits employ the PDTS chemistry, in which DEHA reduces iron III (ferric state) to iron II (ferrous state), which readily reacts with PDTS (3-(2-pyridyl)-5,6-bis(4-phenylsulfonic acid)-1,2,4-triazine disodium salt) to form a pink-purple colored complex in direct proportion to the DEHA concentration. Test results are expressed in ppb (µg/L) or ppm (mg/L) DEHA.

The Ceric Sulfate Titrimetric Method

Reference: Developed by CHEMetrics.

CHEMetrics developed a titrimetric method that employs a ceric sulfate titrant and ferroin end point indicator. DEHA reduces ferric iron to the ferrous state, and the resulting ferrous iron is titrated with the ceric sulfate titrant. Test results are expressed in ppm (mg/L) DEHA.

Visual Kits

Range: 0-400 & 400-3000 ppb MDL: 15 ppb / Method: PDTS	
CHEMetrics Kit	Cat# K-3902
CHEMetrics Refill, 30 ampoules	R-3902
Activator Solution Pack, six 10 mL bottles	A-3900 ¹
Low Range Comparator, Shelf life 18 months 0, 50, 100, 150, 200, 250, 300, 400 ppb	C-3901
High Range Comparator, Shelf life 18 months 400, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000 ppb	C-3902
Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Low and High Range Comparator, Activator Solution, 25 mL sample cup and instructions.	

Range: 25-250 ppm MDL: 25 ppm / Method: Ceric Sulfate Titrant with Ferroin Indicator	
Titrets Kit	Cat# K-3925
Increments: 25, 27.5, 30, 32.5, 35, 37.5, 40, 45, 50, 62.5, 75, 87.5, 100, 125, 175, 250 ppm	
Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules with valve assemblies, Activator Solution, titrettor, 25 mL sample cup and instructions.	

Instrumental Kit

Multi-Analyte Photometers

V-2000 / V-3000
(See page 14 for instrumental features)

Range: 0-2.00 ppm Method: PDTS	
Vacu-vials Kit	Cat# K-3903
Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Activator Solution, 25 mL sample cup, ampoule blank, and instructions.	

Vacu-vials Kits require the use of a CHEMetrics Direct-Readout Photometer (photometers sold separately) or a spectrophotometer capable of accepting a 13 mm diameter round cell. See page 14 for details.

Components and Accessories

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Ampoule Blank Pack (5 ea)	A-0023
Titrettor Pack (1 ea)	A-0053
* Sample Zeroing Accessory Pack	A-0503

¹ The accessory pack supplies enough solution to perform at least 200 tests.

* For use when testing colored or turbid samples. See page 13 for details.

Instructions and SDSs are posted on our website.

If no shelf life is listed for a product, then the shelf life is at least 1 year.