

Cyanide Vacu-vials® Kit

K-3803: 0.040 - 0.400 ppm

Instrument Set-up

For CHEMetrics photometers, follow the instrument specific **Setup and Measurement Procedures** in the Operator's manual. For spectrophotometers capable of accepting a 13 mm diameter round cell, follow the manufacturer's specifications to set the wavelength to 600 nm and to use the ZERO ampoule supplied with this test kit to zero the instrument.

Safety Information

Read MSDS before performing this test procedure. Wear safety glasses and disposable gloves.

Sample Pretreatment

Before analysis, adjust sample pH to between 7.5 and 11 using a solution of sodium hydroxide or hydrochloric acid. Use extreme caution not to go below pH 7.0 for samples that may contain cyanide as this could result in the evolution of toxic cyanide gas.

Test Procedure

1. Fill the sample cup to the 10 mL mark with the sample to be tested (fig 1).
2. Using the syringe, add 1.5 mL of A-3804 Neutralizer Solution to the contents of the sample cup. Stir to mix the contents of the cup.
3. Shake the A-3801 Activator Solution, then add 5 drops to the sample cup (fig 2). Stir to mix the contents of the cup.

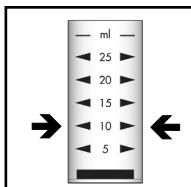


Figure 1

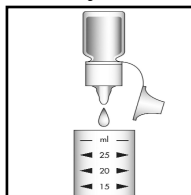


Figure 2

4. Place the Vacu-vial ampoule in the sample cup. Snap the tip by pressing the ampoule against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing (fig 3).

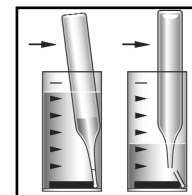


Figure 3

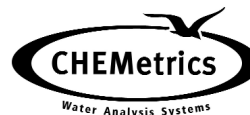
5. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end. Dry the ampoule and wait **15 minutes** for color development.
6. Read the Vacu-vial ampoule in your photometer. If applicable, use the calibration table to obtain test results in ppm (mg/Liter) cyanide as CN. Accuracy may be compromised if test results are outside the stated test range.

Test Method

The Cyanide Vacu-vials®¹ test kit employs the isonicotinic/barbituric acid chemistry.² Cyanide reacts with chlorine to form cyanogen chloride (CNCl), which in turn reacts with a stabilized isonicotinic-barbituric acid reagent to form a blue colored complex in direct proportion to the cyanide concentration. Results are expressed in ppm (mg/Liter) CN.

Sulfides, aldehydes and heavy metals will cause low test results. Thiocyanate will cause high test results. To determine total cyanide and to remove most interfering substances a preliminary distillation step is required.

1. Vacu-vials is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038
2. Nagashima, S., "Spectrophotometric Determination of Cyanide with Isonicotinic Acid and Barbituric Acid", Environ. Anal. Chem., Vol. 10, pp. 99-106, 1981



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