



## Technical Data Sheet

### Cyanide (free) Isonicotinic-Barbituric Acid Method

**Applications and Industries:** Drinking water, fresh surface waters. NOT recommended for seawater. Pre-distillation is recommended for wastewater samples.

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

**Chemistry:** Free cyanide reacts with chlorine to form cyanogen chloride (CNCl), which then reacts with a stabilized isonicotinic-barbituric acid reagent to form a blue colored complex in direct proportion to the cyanide concentration. Results are expressed as ppm (mg/L) CN<sup>-</sup>. A preliminary distillation can be performed to determine total cyanide.

#### Interference Information:

Thiocyanate is measured quantitatively with this chemistry.

Sulfides and aldehydes will cause low test results.

Nitriles may interfere.

Low test results are obtained with seawater and brackish waters.

Chloride, nitrate, sulfite, and sulfate up to 100 ppm do not interfere.

Acetate, ferricyanide, and ferrocyanide at up to 10 ppm do not interfere.

Nitrite and cyanate at or above 100 ppm and ferric iron at or above 10 ppm may interfere.

Sample pHs must be adjusted to between 7.5 and 11 to obtain accurate test results. Extreme caution must be used to ensure that the sample pH is not adjusted to below 7, as toxic cyanide gas may be released at lower pHs.

Distillation removes most interferences except sulfide. Pretreatment with zinc acetate may be performed to prevent interference from sulfide.

The ampoule reagent may contain a milky white precipitate. The precipitate does not impact product performance unless the product has expired or has been stored improperly.

**Safety Information:** Safety Data Sheets (SDS) are available upon request and at [www.chemetrics.com](http://www.chemetrics.com). Read SDS before using these products. Breaking the tip of an ampoule in air rather than water may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.

**Available Analysis Systems:** Visual colorimetric: CHEMets®. Instrumental colorimetric: Vacu-vials®

**Storage Requirements:** Products should be stored in the dark and at room temperature.

**Shelf Life:** *When stored in the dark and at room temperature:* Visual colorimetric: The CHEMets refill and the neutralizer solution (A-3800) have shelf lives of 2 years. The activator solution (A-3801) has an 8-month shelf life. Color comparators have shelf lives of 12 months. Instrumental colorimetric: The Vacu-vials kit has a shelf life of 8 months.

**Accuracy:** CHEMets kit: ± 1 color standard increment; Vacu-vials kit: ± 30% error at 0.300 ppm, ± 40% error at 0.100 ppm, ± 40% error at 0.040 ppm.

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