

# Chloride Vacu-vials® Kit

**K-2103:** 0 - 40.0 ppm (Prog. # 26)

## Sample Pretreatment

Turbid samples must be filtered prior to performing this test.

## Instrument Set-up

For CHEMetrics photometers, follow the **Setup and Measurement Procedures** in the operator's manual. For spectrophotometers, set the wavelength to 455 nm and zero the instrument with the reagent blank ampoule generated below.

For improved accuracy with colored samples, Sample Zeroing Accessory Pack, Cat. # A-0503 is available for use with **CHEMetrics Photometers only**. Using the sample cup, snap the tip of the A-0503 ampoule in sample (see figure 2 below). Invert the ampoule to mix. Dry the ampoule and use it in place of the supplied ZERO ampoule to zero the photometer.

## Generating Reagent Blank

A fresh reagent blank must be generated for each series of tests and for each new lot of Chloride Vacu-vials. Use a reagent blank ampoule from the same lot as the test Chloride Vacu-vials. To generate the reagent blank ampoule, perform **Steps # 1-5** of the test procedure using **distilled water** in place of sample in **Step # 1**.

## Test Procedure

1. Fill the sample cup to the 20 mL mark with the sample to be tested (fig 1).
2. Using the syringe, add 1.0 mL of A-2100 Activator Solution. Stir to mix the contents of the cup.
3. Place the Vacu-vial ampoule, tip first, into the sample cup. Snap the tip. The ampoule will fill leaving a bubble for mixing (fig 2).
4. To mix the ampoule, invert it several times, allowing the bubble to travel from end to end.

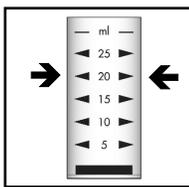


Figure 1

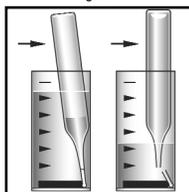


Figure 2

5. Dry the ampoule. Obtain a test result **1 minute** after snapping the tip.
6. Insert the Vacu-vial ampoule into the photometer, flat end first, and obtain a reading in ppm (mg/Liter) chloride (Cl<sup>-</sup>).

**NOTE: If using a spectrophotometer** that is not pre-calibrated for CHEMetrics products, then use the **equation below** or the **Concentration Calculator** found under the Support tab at [www.chemetrics.com](http://www.chemetrics.com).

$$\text{ppm} = 29.68 (\text{abs})^2 + 10.10 (\text{abs}) + 0.23$$

## Test Method

The Chloride Vacu-vials®<sup>1</sup> test kit employs the ferric thiocyanate chemistry<sup>2,3,4</sup>. Chloride reacts with mercuric thiocyanate to liberate thiocyanate ion. Ferric ion reacts with thiocyanate ion to produce an orange-brown thiocyanate complex in proportion to the chloride concentration.

1. Vacu-vials is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038.
2. APHA Standard Methods, 23<sup>rd</sup> ed., Method 4500-Cl<sup>-</sup> E - 1997.
3. Zall, David; Fisher, Donald; Garner, Mary; "Photometric Determination of Chlorides in Water", Analytical Chemistry; Vol. 28, No. 11, pp 1665-1668; November 1956.
4. O'Brien, James; "Automatic Analysis of Chlorides in Sewage", Wastes Engineering, pp 670-672, December 1962.

## Important Note

The Vacu-vial ampoules contain a light sensitive reagent. Store in the dark when not in use.

## Safety Information

Read SDS (available at [www.chemetrics.com](http://www.chemetrics.com)) before performing this test procedure. Wear safety glasses and protective gloves.

Visit [www.chemetrics.com](http://www.chemetrics.com) to view product demonstration videos.  
Always follow the test procedure above to perform a test.



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