

# Chloride Vacu-vials® Kit

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

## Instrument Set-up

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

## Sample Pretreatment

If the sample is turbid, it must be filtered prior to performing this test procedure.

## 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.

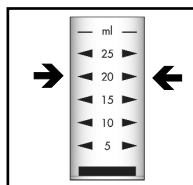


Figure 1

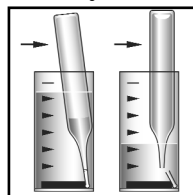


Figure 2

5. Dry the ampoule and wait **1 minute** for color development.
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, 22<sup>nd</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.**



[www.chemetrics.com](http://www.chemetrics.com)  
4295 Catlett Road, Midland, VA 22728 U.S.A.  
Phone: (800) 356-3072; Fax: (540) 788-4856  
E-Mail: [orders@chemetrics.com](mailto:orders@chemetrics.com)

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