Chlorine Vacu-vials® Kit

K-2513: 0 - 5.00 ppm (Prog. # 32)

K-2523: 0 - 5.00 ppm (Prog. # 32 or 33)

Instrument Set-up

For CHEMetrics photometers, follow the **Setup and Measurement Procedures** in the operator's manual.

For spectrophotometers, follow the manufacturer's instructions to set the wavelength to 515 nm and to zero the instrument using the ZERO ampoule supplied.

Safety Information

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

Free Chlorine Procedure

1. Fill the sample cup to the 25 mL mark with the sample to be tested (fig 1).
2. 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).
3. To mix the ampoule, invert it several times, allowing the bubble to travel from end to end. Tap the bottom of the ampoule on a hard surface to cause any tiny bubbles that have collected on the ampoule wall to rise to the top of the liquid in the ampoule.
4. Dry the ampoule and wait **1 minute** for color development.
5. Insert the Vacu-vial ampoule into the photometer, flat end first, and obtain a reading in ppm (mg/Liter) chlorine (Cl_2).

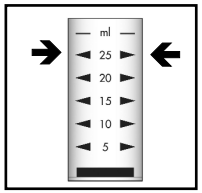

Figure 1

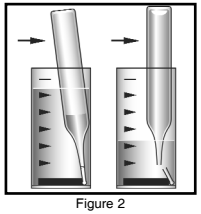
Figure 2

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*.

$$ppm = 0.50\ (abs)^2 + 3.54\ (abs) - 0.02$$

Total Chlorine Procedure (K-2513 only)

1. Add 5 drops of A-2500 Activator Solution to the empty sample cup.
2. Fill the sample cup to the 25 mL mark with the sample to be tested.
3. Immediately perform the **Free Chlorine Procedure** starting with Step 2.

Test Method

The Chlorine Vacu-vials®[1] test kit employs the DPD chemistry.[2,3] Free chlorine oxidizes DPD (N,N-diethyl-p-phenylenediamine) to form a pink colored species in direct proportion to the chlorine concentration. Other halogens, ozone and halogenating agents will produce high test results. Chlorine at concentrations significantly above the test range may prevent proper color development causing low test results.

K-2513 only: Total chlorine, the sum of free and combined chlorine, is determined by adding an excess of potassium iodide to the sample. Chloramines (combined chlorine) oxidize the iodide to iodine. The iodine then oxidizes DPD to the pink colored species.

1. Vacu-vials is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038
2. APHA Standard Methods, 22nd ed., Method 4500-Cl G - 2000
3. EPA Methods for Chemical Analysis of Water and Wastes, Method 330.5 (1983)

Visit www.chemetrics.com to view product demonstration videos.
Always follow the test procedure above to perform a test.

CHEMetrics
Water Analysis Systems

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

Feb. 16, Rev. 22