



July 14, 2014

### CERTIFICATE OF CONFORMANCE

CHEMetrics, Inc., hereby certifies that the following water analysis products have been manufactured and evaluated in accordance with strict Quality Control (QC) and Quality Assurance (QA) protocols. Laboratory test results as well as retention samples for each production batch are on file at CHEMetrics.

**Hydrogen Peroxide VACUettes® Test Kit - Cat. No. K-5510D**

**Range:** 0 - 30 & 30 - 300 ppm

**Refill Catalog No.:** R-5510D

**Refill Lot No.:** 80680

**Reagent Color:** Colorless (Test Frequency: 100%)

**Reagent Height:** 16 - 20 mm (Test Frequency: 100%)

**Bubble Size:**  $\geq 2$  - 5 mm in diameter (Test Frequency:  $> 1\%$ )

**Refill Shelf Life:** The Hydrogen Peroxide VACUettes® refill has a shelf life of 4 years if stored in the dark and at room temperature.

**Comparator Catalog Nos.:** C-5501D & C-5510D

**Comparator Lot Nos.:** 80605 & 80606

**Comparator Shelf Life:** The Hydrogen Peroxide color comparators will remain stable (unchanged) for a period of 2 years if stored in the dark and at room temperature.

### QUALITY CONTROL PROTOCOL

**Standard Solution:** 3% Hydrogen Peroxide Solution (commercially prepared)

**To determine the actual concentration of the 3% standard, perform the following titration:**

Into a 250 mL beaker add (volumetrically):

- 1 mL** - 3% Hydrogen Peroxide Solution
- 29 mL** - Deionized water
- 50 mL** - 10% Sulfuric Acid Solution

Using a 10 mL buret, titrate the contents of the 250 mL beaker with 1 N Potassium Permanganate (commercially prepared) to a tinge of pink endpoint.

**Note:** Swirl to mix after each addition (do not stir). The endpoint must last for 30 seconds.

Repeat the titration until a constant value is obtained. This is the SAMPLE value.

Perform the same titration using 1 mL deionized water in place of the 3% Hydrogen Peroxide Solution. Repeat the titration until a constant value is obtained. This value is the BLANK value.

**Note:** This should require only 1 - 2 drops of titrant.

**To calculate the actual Hydrogen Peroxide concentration:**

$$\text{ppm Hydrogen Peroxide} = \frac{(\text{SAMPLE value} - \text{BLANK value}) \times \text{permanganate normality} \times 17,000}{1 \text{ mL sample}}$$

**Working Standards:** Prepare working standards from the approximate 3% solution based on the actual calculated concentration of hydrogen peroxide.

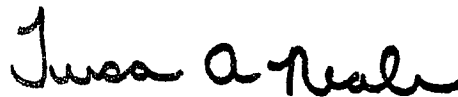
**Test Procedure:** (Test Frequency: 0.2%)

1. Fill a dilutor snapper cup to the -ml- mark with distilled water.
2. Fill a micro-test tube approximately halfway with the sample to be tested.
3. Make sure the VACUette tip is firmly attached to the ampoule tip. Holding the VACUette almost horizontally, touch the tip to the contents of the micr-test tube.
4. Pull the VACUette™ ampoule into a vertical position. A small portion of the collected sample should fall into the sleeve of the VACUette tip.
5. Place the VACUette tip between the vertical tip guides on the inside of the dilutor snapper cup. Snap the ampoule tip. The ampoule will fill leaving a bubble for mixing.
6. To mix the ampoule, invert it several times, allowing the bubble to travel from end to end.
4. Dry the ampoule. Obtain a test result within 1 minute, by comparing the test ampoule to the color standards.

**System Accuracy:** +/- 2.5 ppm in the 5 - 10 ppm range  
+/- 5 ppm in the 10 - 30 ppm range  
+/- 25 - 30 ppm in the 30 - 200 ppm range  
+/- 50 ppm in the 200 - 300 ppm range

**Method Detection Limit:** 5 ppm

**References:** D. F. Boltz and J. A. Howell, eds., Colorimetric Determination of Nonmetals, 2<sup>nd</sup> ed., Vol. 8, p.304 (1978)



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