Iron Vacu-vials® Kit

K-6003: 0 - 6.00 ppm (Prog. #100)

Instrument Set-up

The following method revisions are required: Method Rev. 20 (V-2000) and Software Ver. 2.72/Program Ver. 2.09C (V-3000).

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 **505 nm** and to zero the instrument using the ZERO ampoule supplied.

Sample Temperature

Sample temperatures that deviate significantly from 20°C (68°F) may introduce test result bias.

Soluble Iron 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.
4. Dry the ampoule. Obtain a test result **4 minutes** after snapping tip.
5. Insert the Vacu-vial ampoule into the photometer, flat end first, and obtain a reading in ppm (mg/Liter) iron (Fe).

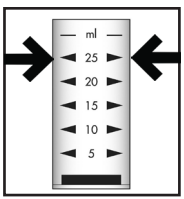

Figure 1

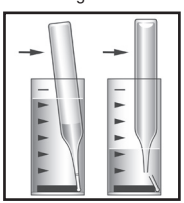
Figure 2

NOTE: If using a spectrophotometer that is not pre-calibrated for CHEMetrics products, then use the **equation below** or the **Concentration Calculator** on the website.

$$ppm = 5.87 (abs) - 0.01$$

Total Iron Procedure

1. Fill the sample cup to the 25 mL mark with the sample to be tested.
2. Add 5 drops of S-6000 Activator Solution. Stir briefly. Wait **4 minutes.**
3. After 4 minutes, stir the sample once again and then perform the **Soluble Iron Procedure** using this pretreated sample. Obtain a test result **1 minute** after snapping the tip (Step # 4).

Test Method

The Iron Vacu-vials®[1] test kit employs the phenanthroline chemistry.[2,3,4] Ferrous iron reacts with 1,10-phenanthroline to form an orange colored complex in direct proportion to the soluble iron concentration. Total iron (ferrous plus ferric) is determined by adding a mixture of thioglycolic acid and ammonia to the sample.

This mixture dissolves most forms of particulate iron. Certain forms of very insoluble iron (magnetite, ferrite, etc.) require a digestion procedure in place of the Total Iron test procedure.

1. Vacu-vials is a registered trademark of AquaPhoenix Scientific, LLC U.S. Patent No. 3,634,038
2. APHA Standard Methods, 23rd ed., Method 3500-Fe B - 1997
3. ASTM D 1068 - 77, Iron in Water, Test Method A
4. J.A. Tetlow and A.L. Wilson, "The Absorptiometric Determination of Iron in Boiler Feed-water," Analyst. Vol. 89, p 442 (1964)

Sampling and Preservation

For soluble iron, analyze sample immediately upon collection. For total iron, analyze sample at the time of collection if possible. Otherwise, adjust the sample pH to less than 2 with nitric or hydrochloric acid. If the pH of the preserved sample is <1, adjust to pH 2-3 prior to analysis. If necessary, adjust test results for sample dilution resulting from preservation and pH adjustment.

Safety Information

Read SDS before performing this test procedure. Wear safety glasses and protective gloves.

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