

Iron Vacu-vials® Kit

K-6203: 0 - 6.00 ppm (Prog. # 103)

Instrument Set-up

For CHEMetrics photometers, follow the **Setup and Measurement Procedures** in the operator's manual. For spectrophotometers, set the wavelength to 505 nm. A sealed ZERO ampoule is supplied in this kit for zeroing when the sample is colorless and not turbid. For improved accuracy with colored or turbid samples, Sample Zeroing Accessory Pack, Cat. # A-0503 is recommended. Using the sample cup, snap the tip of the A-0503 ampoule in the 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 instrument.

Ferrous 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 **1 minute** 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).

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.

$$\text{ppm} = 5.87 (\text{abs}) - 0.01$$

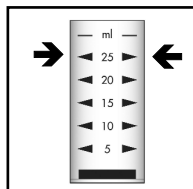


Figure 1

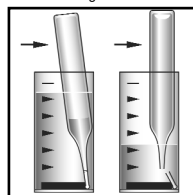


Figure 2

Total Iron Procedure

1. Fill the sample cup to the 25 mL mark with the sample to be tested.
2. Add 5 drops of A-6000 Activator Solution. Stir briefly. Wait **4 minutes**.
3. After 4 minutes, stir the sample once again and then perform the **Ferrous Iron Procedure** using this pretreated sample.

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 ferrous 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. Contact technical@chemetrics.com for details.

1. Vacu-vials is a registered trademark of CHEMetrics, 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)

Safety Information

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

Sampling and Preservation

For ferrous 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.



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