

Iron Vacu-vials® Kit

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

K-6203: 0 - 6.00 ppm (Prog. # 100 or 103)

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

Soluble Iron Procedure: K-6003

Ferrous Iron Procedure: K-6203

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 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) 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.

$$\text{ppm} = 6.35 (\text{abs}) - 0.03$$

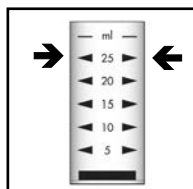


Figure 1

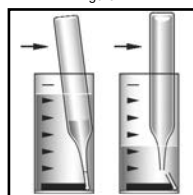


Figure 2

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 **Soluble/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 or soluble iron concentration. Total iron is determined by adding a mixture of thioglycolic acid and ammonia to the sample. This mixture dissolves most forms of particulate iron.

Various metals will produce high test results. Certain forms of very insoluble iron (magnetite, ferrite, etc.) require the following digestion procedure in place of the Total Iron test procedure:

- a. Fill a heat-resistant, glass container to 25 mL with the sample to be tested.
- b. Add 5 drops of A-6000 Solution. Stir briefly.
- c. Gently boil the sample to reduce volume to 10-15 mL.
- d. Cool the sample and dilute to 25 mL with iron-free water.
- e. Perform the **Soluble/Ferrous Iron Procedure** using this pretreated sample.

1. Vacu-vials is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038
2. APHA Standard Methods, 22nd 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.



Simplicity in Water Analysis

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