

Iron Vacu-vials® Kit

K-6003: 0.20 - 6.00 ppm

K-6013: 1.0 - 25.0 ppm

Instrument Set-up

For CHEMetrics photometers, follow the instrument specific **Setup and Measurement Procedures** in the Operator's manual. For spectrophotometers capable of accepting a 13 mm diameter round cell, follow the manufacturer's specifications to set the wavelength (505 nm for K-6003; 420 nm for K-6013) and to use the ZERO ampoule supplied with this test kit to zero the instrument.

Safety Information

Read MSDS before performing this test procedure. Wear safety glasses and disposable gloves.

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 in the sample cup. Snap the tip by pressing the ampoule against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing (fig 2).
3. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end. Dry the ampoule and wait **1 minute** for color development.
4. Read the Vacu-vial ampoule in your photometer. If applicable, use the calibration table to obtain test results in ppm (mg/Liter) iron as Fe. Accuracy may be compromised if test results are outside the stated test ranges.

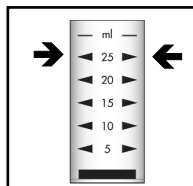


Figure 1

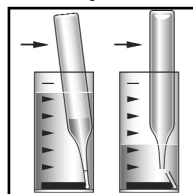


Figure 2

Total Iron Procedure

1. Fill the sample cup to the 25 mL mark with the sample.
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 Iron Procedure** using this pretreated sample.

Test Method

The Iron Vacu-vials®¹ test kit employs the phenanthroline chemistry.^{2,3} Ferrous iron reacts with 1,10-phenanthroline to form an orange colored complex in direct proportion to the ferrous 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. Results are expressed in ppm (mg/Liter) Fe.

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 sample.
- 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 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, 20th ed., p. 3-76, method 3500-Fe B (1998)
3. ASTM D 1068 - 77, Iron in Water, Test Method A



CHEMetrics, Inc., 4295 Catlett Road, Calverton, VA 20138-0214 U.S.A.
Phone: (800) 356-3072; Fax: (540) 788-4856; E-Mail: orders@chemetrics.com
www.chemetrics.com

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