

# Iron ezSample™ Test Kit (EZ-2331)

## 1.5-8.0 ppm (mg/L) Fe<sup>2+</sup>

### Instrument Set-up

The PASPort Water Quality Colorimeter is specifically designed to support PASCO's ezSample™ chemical test kits. Set up the PASPort Water Quality Colorimeter according to the equipment instructions. The calibration procedure is listed in the equipment instruction manual. Calibration may be appropriate, depending on the application or intended use. Choose the appropriate test routine from the PASPort Water Quality Colorimeter menu.

### Safety Information

Read the Material Safety Data Sheet (MSDS) before performing this test procedure. Wear safety glasses and disposable gloves.

### Ferrous Iron Test Procedure

1. Fill the sample cup to the 25 mL mark with the sample (Figure 1).
2. Immediately snap the tip by pressing the ezSample Snap Vial (ampoule) against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing (Figure 2).
3. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end, each time. Wipe all liquid from the exterior of the ampoule.
4. Wait **1 minute** for color development.
5. Read the concentration value of the ezSample ampoule in the PASPort Water Quality Colorimeter.

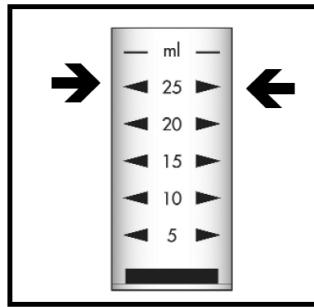


Figure 1

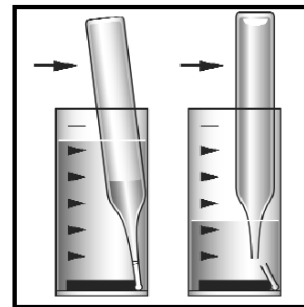


Figure 2

### 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 (Figure 3). Stir briefly. Wait 4 minutes.
3. After 4 minutes, stir the sample once again and then perform the Ferrous Iron Test Procedure using this pretreated sample.

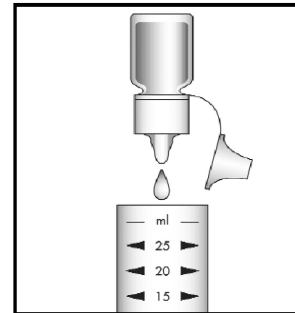


Figure 3

### Test Method Description

The iron ezSample test method employs the phenanthroline chemistry. <sup>1,2</sup> 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/L) Fe<sup>2+</sup>.

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.

### **Digestion procedure for insoluble iron:**

- 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. Using this pretreated sample, perform the **Ferrous Iron Procedure** beginning with **Step 2**.

### **Accuracy and practical detection limit (PDL)**

The lower limit of the stated test range is the “Practical Detection Limit (PDL)”, defined as the lowest concentration at which less than  $\pm 30\%$  error is routinely obtained. Accuracy may be compromised if test results are outside of the test range. Test results obtained at or below the PDL should be further confirmed for best accuracy.

### **References**

1. Method 3500-Fe B. APHA Standard Methods, 20th ed., p. 3-76, (1998).
2. Iron in Water, Test Method A. ASTM D. p. 1068-77.