

# Zinc Vacu-vials® Kit

**K-9903:** 0 - 3.00 ppm (Prog. # 187)

**K-9923:** 0 - 15.0 ppm (Prog. # 188)

## 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 **620 nm** and to zero the instrument using the reagent blank generated below.

## Sample Preparation for K-9923 Only

Using the syringe, dispense 5 mL of the sample to be tested into the empty sample cup. Dilute to the 25 mL mark with distilled water. Perform the procedure below beginning with Step # 2.

## Sample Temperature

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

## Generating Reagent Blank

A fresh reagent blank must be generated for each series of tests and for each new lot of Zinc Vacu-vials. Use a reagent blank ampoule from the same lot as the test Zinc Vacu-vials. To generate the reagent blank ampoule, perform **Steps # 1-5** of the test procedure using **distilled water** in place of sample in **Step # 1**.

## Test Procedure

1. Fill the sample cup to the 25 mL mark with the sample to be tested (fig. 1).
2. Add 8 drops of S-9900 Indicator Solution (fig. 2). Stir to mix the contents of the cup.
3. Place the Vacu-vial ampoule, tip first, into the sample cup. Snap the tip. The ampoule will fill leaving a bubble for mixing (fig. 3).
4. To mix the ampoule, invert it several times, allowing the bubble to travel from end to end.
5. Dry the ampoule. Obtain a test result **1 minute** after snapping tip.

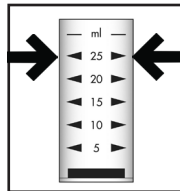


Figure 1

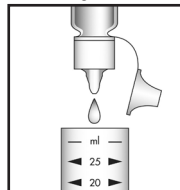


Figure 2

6. Insert the Vacu-vial ampoule into the photometer, flat end first, and obtain a reading in ppm (mg/Liter) zinc (Zn).

**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.

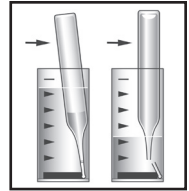


Figure 3

**K-9903:** ppm = 3.36 (abs)

**K-9923:** ppm = 16.91 (abs)

## Test Method

The Zinc Vacu-vials®<sup>1</sup> test kit employs the zincon chemistry.<sup>2,3</sup> In an alkaline solution, dissolved zinc reacts with zincon (2-carboxy- 2'-hydroxy-5'-sulfoformazyl benzene) to produce a blue colored complex in direct proportion to the dissolved zinc concentration.

Other heavy metals also form colored complexes with zincon. This test method determines **soluble zinc** only. To obtain test results for total zinc, perform the following pretreatment procedure:

- a. Add 1 mL of concentrated hydrochloric acid to 50 mL of the sample to be tested. Mix thoroughly.
- b. Adjust the sample pH to between 3 and 7 using 6 N sodium hydroxide. Use caution not to exceed pH 7.
- c. Allow sample to cool to 30°C (86°F) if necessary.
- d. Perform the test procedure on this pretreated sample.

1. Vacu-vials is a registered trademark of AquaPhoenix Scientific, LLC U.S. Patent No. 3,634,038.

2. APHA Standard Methods, 23<sup>rd</sup> ed., Method 3500-Zn B - 1997

3. ASTM D 1691 - 84, Zinc in Water, Test Method A

## Safety Information

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