

Silica Vacu-vials® Kit

K-9003 (V-2000 Photometer): 0.50 - 10.00 ppm

K-9003 (Spectrophotometer): 0.25 - 4.00 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 to 815 nm and to zero the instrument (using the ZERO ampoule supplied with this test kit). A generic spectrophotometer calibration equation is supplied below, however, for best accuracy an instrument specific calibration should be generated.

Test Procedure

1. Fill the sample cup to the 15 mL mark with the sample to be tested (fig 1).
2. Add 10 drops of A-9001 Activator Solution (fig 2). Cap the sample cup and shake it to mix the contents. Wait **4 minutes**.
3. Add 5 drops of A-9000 Neutralizer Solution (fig 2). Cap the sample cup and shake it to mix the contents. Wait **1 minute**.
4. 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 3).
5. 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 **2 minutes** for color development.

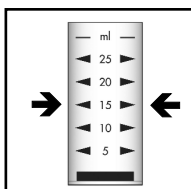


Figure 1

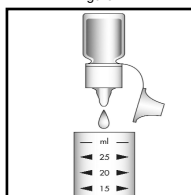


Figure 2

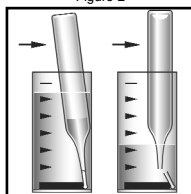


Figure 3

6. Read the Vacu-vial ampoule in your photometer. If applicable, use the calibration equation below to obtain test results in ppm (mg/Liter) silica as SiO₂. Accuracy may be compromised if test results are outside the stated test range.

$$\text{ppm} = 3.62 (\text{abs})$$

Test Method

The Silica Vacu-vials®¹ test kit employs the heteropoly blue chemistry.^{2,3,4} Silica reacts with ammonium molybdate at a pH of 1.2 to form molybdosilicic acid, which is then reduced by aminophtholsulfonic acid to form heteropoly blue. The resulting blue color is directly proportional to the silica concentration in the sample. Interferences from phosphate (up to 50 ppm) are masked by the addition of A-9000 Neutralizer Solution (citric acid). This method determines "molybdate reactive" silica. Results are expressed in ppm (mg/Liter) SiO₂.

1. Vacu-vials is a registered trademark of CHEMetrics, Inc. U.S. Patent No. 3,634,038
2. APHA Standard Methods, 21st ed., method 4500-SiO₂ D (2005)
3. EPA Methods for Chemical Analysis of Water and Wastes, method 370.1 (1983)
4. ASTM D 859-05, Silica in Water

Safety Information

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



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