Method

Silica (SiO_2) is the oxide of silicon, the second most abundant element in the earth's crust. Silica is present as silicates in most natural waters. Typical concentrations lie between 1 and 30 mg/L. Higher concentrations may exist in brackish waters and brines. The silica content of water should be determined prior to its use in a variety of industrial applications. Silica can form a harmful scale on equipment and heat transfer surfaces, particularly steam turbine blades.

The Heteropoly Blue Method

References: APHA Standard Methods, 23rd ed., Method 4500-SiO_2 D - 1997. ASTM D 859-05, Silica in Water. USEPA Methods for Chemical Analysis of Water and Wastes, Method 370.1 (1983).

CHEMetrics' test method determines *molybdate reactive silica*. The heteropoly blue chemistry is employed. Silica reacts with ammonium molybdate under acidic conditions to produce heteropoly acids, which are then reduced to form a blue color. Phosphate interferences are masked with the addition of citric acid. Results are expressed as ppm (mg/L) SiO_2.

Visual Kits

Range: 0-0.20 ppm
MDL: 0.02 ppm / Method: Heteropoly Blue

ULR CHEMets Kit	Cat# K-9011
ULR CHEMets Refill, 30 ampoules, Shelf life 18 months	R-9011
Neutralizer Solution Pack, six 10 mL bottles	A-9000[1]
Activator Solution Pack, six 20 mL bottles	A-9001[1]
Comparator 0, 0.02, 0.04, 0.06, 0.08, 0.12, 0.16, 0.20 ppm	C-9011

Kit comes in a cardboard box and contains everything needed to perform 30 tests: Refill, Comparator, Neutralizer Solution, Activator Solution, 25 mL sample cup, sample cup top and instructions.

Range: 0-1 & 1-10 ppm
MDL: 0.05 ppm / Method: Heteropoly Blue

CHEMets Kit	Cat# K-9010
CHEMets Refill, 30 ampoules, Shelf life 11 months	R-9010[2]
Neutralizer Solution Pack, six 10 mL bottles	A-9000[1]
Activator Solution Pack, six 20 mL bottles	A-9001[1]
Low Range Comparator 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0 ppm	C-9001
High Range Comparator, Shelf life 18 months 1, 2, 3, 4, 5, 6, 7, 8, 10 ppm	C-9010

Kit comes in a plastic case and contains everything needed to perform 30 tests: Refill, Low and High Range Comparators, Neutralizer Solution, Activator Solution, 25 mL sample cup, sample cup top and instructions.

Instrumental Kit

Multi-Analyte Photometers
V-2000 / V-3000
(See page 14 for instrumental features)

Range: 0-10.00 ppm / Spec: 0-4.00 ppm
Method: Heteropoly Blue

Vacu-vials Kit	Cat# K-9003

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Neutralizer Solution, Activator Solution, 25 mL sample cup, sample cup top, ampoule blank and instructions.

Vacu-vials Kits require the use of a CHEMetrics Direct-Readout Photometer (photometers sold separately) or a spectrophotometer capable of accepting a 13 mm diameter round cell. See page 14 for details.

Components and Accessories

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Sample Cup Top Pack for 25 mL Cup (6 ea)	A-0014
Ampoule Blank Pack (5 ea)	A-0023
*Sample Zeroing Accessory Pack	A-0503

[1] The accessory pack supplies enough solution to perform at least 200 tests.

[2] Shelf life is based on storage at room temperature and in the dark. This shelf life can be extended by 18 months if the ampoules are stored in the refrigerator when not in use.

*** For use when testing colored or turbid samples. See page 13 for details.**

Instructions and SDSs are posted on our website.
If no shelf life is listed for a product, then the shelf life is at least 1 year.

⚠ WARNING! The ULR product employing the Heteropoly Blue method can expose you to chemicals including methanol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Method

Sulfate is present at widely varying concentrations in natural waters. The USEPA has established a Secondary Drinking Water Standard of 250 mg/L for sulfate in potable water, as higher concentrations affect odor and taste. Sulfate levels are also measured in the beverage industry due to its effect on odor and taste. Sulfate levels must be monitored in cooling water and ion exchange systems in order to prevent calcium sulfate scale formation.

The Turbidimetric Method

References: APHA Standard Methods, 15th ed., Method 426 C (1980). USEPA Methods for Chemical Analysis of Water and Wastes, Method 375.4 (1983). ASTM D 516-07, Sulfate Ion in Water.

The Sulfate Vacu-vials test kit employs the turbidimetric method. Sulfate ion reacts with barium chloride in an acidic solution to form a suspension of barium sulfate crystals of uniform size. The resulting turbidity is proportional to the sulfate concentration of the sample. Results are expressed as ppm (mg/L) SO_4.

Instrumental Kit

Multi-Analyte Photometers
V-2000 / V-3000
(See page 14 for instrumental features)

Range: 0-100.0 ppm
Method: Turbidimetric

Vacu-vials Kit	Cat# K-9203

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, Acidifier Solution, Activator Powder, 25 mL sample cup, ampoule blank and instructions.

Vacu-vials Kits require the use of a CHEMetrics Direct-Readout Photometer (photometers sold separately) or a spectrophotometer capable of accepting a 13 mm diameter round cell. See page 14 for details.

Components and Accessories

Description	Cat#
Sample Cup Pack, 25 mL (6 ea)	A-0013
Ampoule Blank Pack (5 ea)	A-0023

Instructions and SDSs are posted on our website.
If no shelf life is listed for a product, then the shelf life is at least 1 year.