

## Method

References: APHA Standard Methods, 20<sup>th</sup> ed., pp. 4-178, Method 4500-SO<sub>4</sub><sup>2-</sup> E (1998). USEPA Methods for Chemical Analysis of Water and Wastes, Method 375.4 (1983). ASTM D 516-90 (1995), Sulfate Ion in Water.

Sulfate is present at widely varying concentrations in natural waters. It causes off odor and taste in drinking water. 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 Sulfate Vacu-vials<sup>®</sup> test method 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<sub>4</sub>.



## Instrumental Kits

### V-2000 Multi-Analyte Photometer (See page 8 for instrumental features)

Range: 8-100 ppm  
Method: Turbidimetric

	Cat#
Vacu-vials Kit	K-9203

Kit comes in a cardboard box and contains everything needed to perform 30 tests: thirty ampoules, ampoule blank, instructions, calibration table, and MSDS.

*Vacu-vials Kits require the use of the V-2000 Photometer or a spectrophotometer capable of accepting a 13 mm diameter round cell. Instrument sold separately.*

### V-1000 Multi-Analyte Photometer (See page 10 for instrumental features)

Range: 8-100 ppm  
Method: Turbidimetric

	Cat#
VVR Module	V-9203
Vacu-vials Refill, 30 ampoules	R-9203
VVR Filter, Shelf-life 2 years	F-9203

Module comes in a cardboard box and contains everything needed to perform 30 tests: Refill, VVR Filter, instructions, and MSDS.

*VVR Modules require the use of the V-1000 Photometer. Instrument sold separately.*

#### Kit Components common to Sulfate

Description	Cat#
Ampoule Blank Pack (5 ea)	A-0023
VVR Zero Ampoule Pack (5 ea)	A-0128
VVR Zero Test Tube Pack (5 ea)	A-0129

*If no shelf-life is listed for a product, then the shelf-life is at least 2 years.*