

1.00617.0001

## Spectroquant® Sulfate Cell Test



### 1. Method

Sulfate ions react with barium ions to form slightly soluble barium sulfate. The resulting turbidity is measured in the photometer (turbidimetric method).

The method is analogous to EPA 375.4, APHA 4500-SO<sub>4</sub><sup>2-</sup> E, and ASTM D516-16.

### 2. Measuring range and number of determinations

Measuring range	Number of determinations
50 - 500 mg/l SO <sub>4</sub> <sup>2-</sup>	25

For programming data for selected photometers / spectrophotometers see [www.sigmaaldrich.com/photometry](http://www.sigmaaldrich.com/photometry).

### 3. Applications

#### Sample material:

Groundwater and surface water, seawater  
Drinking water and mineral water  
Wastewater  
Nutrient solutions for fertilization  
Soils after appropriate sample pretreatment  
Water for concrete in the construction industry

### 4. Influence of foreign substances

This was checked individually in solutions containing 250 and 0 mg/l SO<sub>4</sub><sup>2-</sup>. The determination is not yet interfered with up to the concentrations of foreign substances given in the table. Cumulative effects were not checked; such effects can, however, not be excluded.

Concentrations of foreign substances in mg/l or %					
<b>Ag<sup>+</sup></b>	<b>10</b>	<b>Hg<sup>2+</sup></b>	<b>1000</b>	<b>S<sub>2</sub>O<sub>3</sub><sup>2-</sup></b>	<b>25</b>
Al <sup>3+</sup>	1000	Mg <sup>2+</sup>	1000	Zn <sup>2+</sup>	1000
Ca <sup>2+</sup>	250	Mn <sup>2+</sup>	1000		
Cd <sup>2+</sup>	1000	NH <sup>+</sup>	1000		
CN <sup>-</sup>	1000	Ni <sup>2+</sup>	1000		
CO <sub>3</sub> <sup>2-</sup>	1000	NO <sub>2</sub> <sup>-</sup>	1000		
Cr <sup>3+</sup>	100	Pb <sup>2+</sup>	100		
Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	100	PO <sub>4</sub> <sup>3-</sup>	1000		
Cu <sup>2+</sup>	1000	<b>S<sup>2-</sup></b>	<b>25</b>		
F <sup>-</sup>	1000	SiO <sub>3</sub> <sup>2-</sup>	1000		
Fe <sup>3+</sup>	1000	SO <sub>3</sub> <sup>2-</sup>	100		
				EDTA	1000
				Hydrazine	1000
				Anionic surfactants	100
				Cationic surfactants	500
				Nonionic surfactants	1000
				Na-acetate	10 %
				NaCl	10 %
				<b>NaNO<sub>3</sub></b>	<b>0.1 %</b>

### 5. Reagents and auxiliaries

#### Please note the warnings on the packaging materials!

The test reagents are stable up to the date stated on the pack when stored closed at +15 to +25 °C.

#### Package contents:

1 bottle of reagent SO<sub>4</sub>-1K  
25 reaction cells  
1 sheet of round self-adhesive stickers for numbering the cells

#### Other reagents and accessories:

MQuant® Sulfate Test, Cat. No. 1.10019,  
measuring range <200 - >1600 mg/l SO<sub>4</sub><sup>2-</sup>  
MQuant® Universal indicator strips pH 0 - 14, Cat. No. 1.09535  
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 1.09137  
Hydrochloric acid 1 mol/l Titripur®, Cat. No. 1.09057  
Membrane filters 0.45 µm  
Spectroquant® CombiCheck 10, Cat. No. 1.14676  
Sulfate standard solution CRM, 125 mg/l SO<sub>4</sub><sup>2-</sup>, Cat. No. 1.25051  
Sulfate standard solution CRM, 400 mg/l SO<sub>4</sub><sup>2-</sup>, Cat. No. 1.25052  
Pipettes for pipetting volumes of 2.0 and 5.0 ml

### 6. Preparation

- Analyze immediately after sampling.
- Check the sulfate content with the MQuant® Sulfate Test. Samples containing more than 500 mg/l SO<sub>4</sub><sup>2-</sup> must be diluted with distilled water.
- The pH must be within the range 2 - 10.** Adjust, if necessary, with sodium hydroxide solution or hydrochloric acid.
- Filter turbid samples through a 0.45 µm membrane filter.

### 7. Procedure

Pretreated sample (20 - 40 °C)	2.0 ml	Pipette into a reaction cell and mix.
Reagent SO <sub>4</sub> -1K	1 level green microspoon (in the cap of the SO <sub>4</sub> -1K bottle)	Add, close the cell tightly, and shake <b>vigorously until the reagent is completely dissolved.</b>
<b>Leave to stand for exactly 2 min (reaction time),</b> then measure the sample in the photometer.		

#### Notes on the measurement:

- For turbidimetric measurement the cells must be clean. Wipe, if necessary, with a clean dry cloth.
- The pH of the measurement solution must be within the range 1.0 - 2.0.

### 8. Analytical quality assurance

recommended before each measurement series  
To check the photometric measurement system (test reagent, measurement device, handling) and the mode of working, the sulfate standard solutions CRM (see section 5) or Spectroquant® CombiCheck 10 can be used. Besides a **standard solution** with 100 mg/l SO<sub>4</sub><sup>2-</sup>, CombiCheck 10 also contains an **addition solution** for determining sample-dependent interferences (**matrix effects**).  
Additional notes see under [www.qa-test-kits.com](http://www.qa-test-kits.com).

#### Characteristic quality data:

For quality and batch certificates for Spectroquant® test kits see the website, where you will find all data in production control, that are determined in accordance with ISO 8466-1 and DIN 38402 A51.

### 9. Notes

- Reclose the reagent bottle immediately after use.
- Information on disposal can be obtained at [www.disposal-test-kits.com](http://www.disposal-test-kits.com).**

