

Supelco®

1.14411.0001

## MQuant® Sulfate Test

SO<sub>4</sub><sup>2-</sup>

### 1. Method

#### Determination with color-card comparator

Sulfate ions react with barium iodate, liberating iodate ions in the process. These oxidize tannin to a brown-red compound. The sulfate concentration is measured **semiquantitatively** by visual comparison of the color of the measurement solution with the color fields of a color card.

### 2. Measuring range and number of determinations

Measuring range / color-scale graduation	Number of determinations
25 - 50 - 80 - 110 - 140 - 200 - 300 mg/l SO <sub>4</sub> <sup>2-</sup>	90

### 3. Applications

#### Sample material:

Groundwater and surface water  
Drinking water and mineral water  
Wastewater  
This test is **not suited** for seawater.

### 4. Influence of foreign substances

This was checked individually in solutions containing 140 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 %							
Ag <sup>+</sup>	20	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	5	Ni <sup>2+</sup>	200	EDTA	0
Al <sup>3+</sup>	1000	Cu <sup>2+</sup>	20	NO <sub>2</sub> <sup>-</sup>	20	NaCl	0.2 %
Ca <sup>2+</sup>	1000	Fe <sup>3+</sup>	20	Pb <sup>2+</sup>	20	NaN <sub>3</sub>	0.2 %
Cd <sup>2+</sup>	500	Mg <sup>2+</sup>	200	PO <sub>4</sub> <sup>3-</sup>	200		
CN <sup>-</sup>	20	Mn <sup>2+</sup>	200	SiO <sub>3</sub> <sup>2-</sup>	20		
Cr <sup>3+</sup>	0.2	NH <sub>4</sub> <sup>+</sup>	1000	Zn <sup>2+</sup>	200		

### 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>-1  
1 bottle of reagent SO<sub>4</sub>-2  
1 bottle of reagent SO<sub>4</sub>-3  
1 bottle of reagent SO<sub>4</sub>-4  
2 graduated 3-ml plastic syringes  
1 plastic funnel  
1 box of round filters (100 pcs)  
2 test tubes with screw caps (in comparator block)  
1 color card

#### Other reagents and accessories:

MQuant® Sulfate Test, Cat. No. 110019, measuring range <200 - >1600 mg/l SO<sub>4</sub><sup>2-</sup>  
MQuant® Universal indicator strips pH 0 - 14, Cat. No. 109535  
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 109137  
Hydrochloric acid 1 mol/l Titripur®, Cat. No. 109057  
Sulfate standard solution Certipur®, 1000 mg/l SO<sub>4</sub><sup>2-</sup>, Cat. No. 119813

Water bath

### 6. Preparation

- Analyze immediately after sampling.
- Check the sulfate content with the MQuant® Sulfate Test. Samples containing more than 300 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.

### 7. Procedure

Open the box and set up with both test tubes **on the left**.

Slide the comparator block all the way to the left, so that the end holding the test tubes protrudes laterally over the bottom part of the box.

Unfold the color card and insert it, colored end first, into the slit at the lower **right-hand** edge of the box.

	Measurement sample tube nearer to the tester (A)	Blank tube farther from the tester (B)	
Pretreated sample (15 - 40 °C)	-	2.5 ml	Inject into the test tube with the syringe.
Reagent SO <sub>4</sub> -1	-	2 drops <sup>1)</sup>	Add, close the tube, and mix.
Reagent SO <sub>4</sub> -2	-	1 level green microspoon (in the cap of the SO <sub>4</sub> -2 bottle)	Add, close the tube, and mix.

Heat the tube **at 40 °C** in the water bath **for 5 min (reaction time 1)**, shaking occasionally.

Reagent SO <sub>4</sub> -3	-	2.5 ml	Add with the second syringe, close the tube, and mix.
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Filter the contents of the tube through a round filter into the tube nearer to the tester (tube **A**): **filtrate**

Reagent SO <sub>4</sub> -4	4 drops <sup>1)</sup>	-	Add <b>to the filtrate</b> , close the tube, and mix.
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Rinse the tube farther from the tester (tube **B**) several times with the pre-treated sample.

Pretreated sample	-	2.5 ml	Inject into the tube with the first used syringe.
Distilled water	-	2.5 ml	Add with the same syringe, close the tube, and mix.

Heat both tubes **at 40 °C** in the water bath **for 7 min (reaction time 2)**, shaking occasionally, then wipe dry and return to the comparator.

Slide the color card through to the left until the closest possible color match is achieved between the two open test tubes when viewed from above.

Read off the result in mg/l SO<sub>4</sub><sup>2-</sup> from the color card at the lower right-hand edge of the comparator block within the bottom part of the box.

<sup>1)</sup> Hold the bottle vertically while adding the reagent!

#### Notes on the measurement:

- The color of the measurement solution remains stable for at least 60 min after the end of the reaction time 2 stated above.
  - Turbidity in the measurement solution makes the color comparison more difficult.
  - If the color of the measurement solution is equal to or more intense than the darkest color on the scale, repeat the measurement using **fresh**, diluted samples until a value of less than 300 mg/l SO<sub>4</sub><sup>2-</sup> is obtained.
- Concerning the result of the analysis, the dilution (see also section 6) must be taken into account:

$$\text{Result of analysis} = \text{measurement value} \times \text{dilution factor}$$

### 8. Method control

To check test reagents, measurement device, and handling: Dilute the sulfate standard solution with distilled water to 110 mg/l SO<sub>4</sub><sup>2-</sup> and analyze as described in section 7. Additional notes see under **www.qa-test-kits.com**.

### 9. Notes

- Reclose the reagent bottles immediately after use.
- Rinse the test tubes, the syringes, and the funnel **with distilled water only**.
- Information on disposal can be obtained at [www.disposal-test-kits.com](http://www.disposal-test-kits.com).**

