Supelco®

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1.01813.0001 1.01813.0002
1.01813.0007

Spectroquant®

Silicate (Silicic Acid) Test Si

1. Method

In sulfuric solution silicate ions react with molybdate ions to form a yellow heteropoly acid. This is reduced to silicomolybdenum blue that is determined photometrically.
The method is analogous to APHA 4500-SiO_2 D+E, DIN 38 405-21, and ASTM D859-16.

2. Measuring range and number of determinations

Cell mm	Measuring range µg/l SiO_2	µg/l Si	Number of determinations
100	**0.25** - 250.00	**0.12** - 116.85	50 (Cat. No. 1.01813.0001 and .0007) or 450 (Cat. No. 1.01813.0002)
50	0.5 - **500.0**	0.2 - **233.7**	100 (Cat. No. 1.01813.0001 and .0007) or 900 (Cat. No. 1.01813.0002)

For programming data for selected photometers / spectrophotometers see www.sigmaaldrich.com/photometry.

3. Applications

Sample material:
Groundwater and surface water
Drinking water and mineral water
Industrial water
Boiler water and boiler feed water
This test is **not suited** for seawater.

4. Influence of foreign substances

This was checked individually in solutions containing 250 and 0 µg/l SiO_2. 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 %					
Al^{3+}	1000	**Pb^{2+}**	**10**	EDTA	200
AsO_4^{3-}	20	**PO_4^{3-}**	**0.5**	Free chlorine	1000
Ca^{2+}	1000	Zn^{2+}	500	Anionic surfactants[1]	1000
Cd^{2+}	1000			**Cationic surfactants[2]**	**1**
Cr^{3+}	50			Nonionic surfactants[3]	100
Cu^{2+}	**1**			Na-acetate	0.2 %
Fe^{3+}	50			NaCl	0.5 %
Mg^{2+}	1000			$NaNO_3$	1 %
Mn^{2+}	1000			Na_2SO_4	0.2 %
NH_4^+	1000				
Ni^{2+}	100				
NO_2^-	1000				

[1] tested with Na-dodecyl sulfate
[2] tested with N-cetyl-N,N,N-trimethylammonium bromide
[3] tested with Triton® X-100

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:
Reagent Si-1: 1 bottle
Reagent Si-2: 1 bottle
Reagent Si-3: 1 bottle (Cat. Nos. 1.01813.0001 and 1.01813.0007) or 2 bottles (Cat. No. 1.01813.0002)
1 AutoSelector

Other reagents and accessories:
MQuant® Universal indicator strips pH 0 - 14, Cat. No. 1.09535
Sodium hydroxide solution 1 mol/l Titripur® (approx. 4 %), Cat. No. 1.09137
Sulfuric acid 0.5 mol/l Titripur®, Cat. No. 1.09072
MQuant® pH-indicator strips pH 0 - 6.0, Cat. No. 1.09531
Water Ultrapur, Cat No. 1.01262
Silicate standard solution CRM, 0.1000 mg/l SiO_2 (100.0 µg/l SiO_2 / 47.0 µg/l Si), Cat. No. 1.32244

Pipettes for pipetting volumes of 0.10, 0.50 and 10 ml (no glass pipettes!)
Rectangular cells 50 mm (2 pcs), Cat. No. 1.14944
Rectangular cell 100 mm (1 pc), Cat. No. 1.74011

Also required:
Plastic vessels
approx. 15 ml, e.g. MQuant® Flat-bottomed tubes with screw caps for MQuant® tests with color disk comparator (12 pcs), Cat. No. 1.17988
or approx. 40 ml, e.g. plastic beakers

6. Preparation

- All glass surfaces coming into contact with the blue complex must be cleansed from time to time as follows:
  Fill the test tubes and the cells with sodium hydroxide solution (approx. 0.4 %) and leave to stand for max. 1 hour.
- Analyze immediately after sampling.
- **The pH must be within the range 2 - 10.**
  Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter turbid samples.
- The procedure **may not** be performed **in glass vessels**!

7. Procedure

	Measuring sample	**Blank** (only 1x per series)	
Pretreated sample (**15 - 40 °C**)	10 ml	-	Pipette into a **suitable plastic vessel**.
Distilled water[1] (**15 - 40 °C**)	-	10 ml	Pipette into a second **plastic vessel**.
Reagent Si-1	0.10 ml	0.10 ml	Add with pipette and mix. **The pH must be within the range 1.2 - 1.6.** Check with MQuant® pH-indicator strips. Adjust the pH, if necessary, with reagent Si-1.
Leave to stand for 5 min (reaction time A).			
Reagent Si-2	0.10 ml	0.10 ml	Add with pipette and mix.
Reagent Si-3	0.50 ml	0.50 ml	Add with pipette and mix.
Leave to stand for 5 min (reaction time B), then fill the measurement sample and the blank into two separate cells and measure **immediately** in the photometer.			

[1] It is recommended to use Water Ultrapur, Cat. No. 1.01262.

For measurement in the **100-mm cell** both the sample volume as well as the quantities of reagents Si-1, Si-2, and Si-3 must be **doubled. For the procedure, all instructions must be observed in section 7.**

Notes on the measurement:

- For photometric measurement the cells must be clean.
  Wipe, if necessary, with a clean dry cloth.
- Measurement of turbid solutions yields false-high readings.
- The color of the measurement solution remains stable for at least 60 min after the end of the reaction time B stated above, as long as the solution remains in the plastic vessel.

8. Analytical quality assurance

recommended before each measurement series
To check the photometric measurement system (test reagents, measurement device, handling) and the mode of working, the silicate standard solution CRM (see section 5) can be used.
Sample-dependent interferences (matrix effects) can be determined by means of standard addition.
Additional notes see under **www.qa-test-kits.com**.
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 bottles immediately after use.
- **Information on disposal can be obtained at www.disposal-test-kits.com.**

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