

1.14410.0001
1.14410.0007MQuant®
Silicate (Silicic Acid)
Test

Si

1. Method

Determination with color-card comparator

In sulfuric solution silicate ions react with molybdate ions to form a yellow heteropoly acid. This is reduced to silicomolybdenum blue. The silicate 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 ¹⁾	Number of determinations
0.01-0.02-0.04-0.06-0.08-0.10-0.15-0.20-0.25 mg/l Si	150
0.021-0.043-0.086-0.13-0.17-0.21-0.32-0.43-0.53 mg/l SiO ₂	

¹⁾ for conversion factors see section 8

3. Applications

Sample material:

Groundwater, surface water, and seawater
Drinking water and mineral water
Industrial and process water
Boiler water and boiler feed water
Wastewater and percolating water

4. Influence of foreign substances

This was checked individually in solutions containing 0.1 and 0 mg/l Si. 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 ⁺	10	Hg ²⁺	100	Surfactants ¹⁾	100
AsO ₄ ³⁻	1	Mg ²⁺	1000	Na-acetate	10 %
Ca ²⁺	1000	Mn ²⁺	10	NaCl	5 %
Cd ²⁺	1000	NH ₄ ⁺	1000	NaNO ₃	10 %
CN ⁻	1000	Ni ²⁺	1000	Na ₂ SO ₄	5 %
Cr ³⁺	100	NO ₂ ⁻	1000		
Cr ₂ O ₇ ²⁻	100	Pb ²⁺	10		
Cu ²⁺	10	PO ₄ ³⁻	50		
F ⁻	1000	Zn ²⁺	100		
Fe ³⁺	10				

¹⁾ tested with nonionic, cationic, and anionic surfactants

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 Si-1
1 bottle of reagent Si-2
3 bottles of reagent Si-3
2 test tubes with screw caps (in comparator block)
1 color card usable for Cat. Nos. 1.14410.0001 and 1.14410.0007

Other reagents and accessories:

MQuant® Universal indicator strips pH 0 - 14, Cat. No. 1.09535
Sodium hydroxide solution 1 mol/l Titipur® (approx. 4 %), Cat. No. 1.09137
Sulfuric acid 0.5 mol/l Titipur®, Cat. No. 1.09072
MQuant® pH-indicator strips pH 0 - 6.0, Cat. No. 1.09531
Silicon standard solution Certipur®, 1000 mg/l Si, Cat. No. 1.70236

MQuant® Flat-bottomed long tubes with screw caps for MQuant® tests with color-card comparator (12 pcs), Cat. No. 1.14901

Refill pack:

Cat. No. 1.18323

Silicate (Silicic Acid) Test

Refill pack for 1.14792 and 114410

(Reagents **without technical accessories** for the number of determinations stated in section 2)

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6. Preparation

- Analyze immediately after sampling.
- The pH must be within the range 2 - 8.** Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter turbid samples.

7. Procedure

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

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 <u>nearer</u> to the tester (A)	Blank tube <u>farther</u> from the tester (B)	
Pretreated sample (20 - 40 °C)	20 ml	20 ml	Fill the test tube to the mark (= 20 ml).
Reagent Si-1	3 drops ¹⁾	-	Add, close the tube, 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 3 min (reaction time 1).

Reagent Si-2	3 drops ¹⁾	-	Add, close the tube, and mix.
Reagent Si-3	10 drops ¹⁾	-	Add, close the tube, and mix.

Leave to stand for 2 min (reaction time 2).

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 Si or SiO₂ from the color card at the lower right-hand edge of the box.

¹⁾ 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 0.25 mg/l Si (0.53 mg/l SiO₂) is obtained.

Concerning the result of the analysis, the dilution must be taken into account:

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

8. Conversions

Units required	=	units given	x	conversion factor
mg/l SiO ₂		mg/l Si		2.14
mg/l Si		mg/l SiO ₂		0.467

9. Method control

To check test reagents, measurement device, and handling:

Dilute the silicon standard solution with distilled water to 0.10 mg/l Si and analyze as described in section 7.

Additional notes see under **www.qa-test-kits.com**.

10. Notes

- Reclose the reagent bottles immediately after use.
- Rinse the test tubes **with distilled water only**.
- Cleanse the test tubes from time to time as follows: Fill with sodium hydroxide solution (approx. 0.4 %) and leave to stand for max. 1 hour.
- Information on disposal can be obtained at www.disposal-test-kits.com.**

