

1.14792.0001

MColorTest™

Silicate (Silicic Acid) Test

Si

1. Method

Determination with color-disk 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 disk.

2. Measuring range and number of determinations

Measuring range / color-scale graduation ¹⁾	Number of determinations
0.3 - 0.6 - 1.0 - 1.5 - 2 - 3 - 5 - 7 - 10 mg/l Si	150
0.64 - 1.3 - 2.1 - 3.2 - 4.3 - 6.4 - 11 - 15 - 21 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 in solutions containing 5 and 0 mg/l Si. The determination is not yet interfered with up to the concentrations of foreign substances given in the table.

Concentrations of foreign substances in mg/l or %					
AsO ₄ ³⁻	1	Mg ²⁺	1000	Surfactants ¹⁾	100
Ca ²⁺	1000	Mn ²⁺	10	Na-acetate	10 %
Cd ²⁺	1000	NH ₄ ⁺	1000	NaCl	5 %
Cr ³⁺	100	Ni ²⁺	1000	NaNO ₃	10 %
Cr ₂ O ₇ ²⁻	100	NO ₂ ⁻	1000	Na ₂ SO ₄	5 %
Cu ²⁺	10	Pb ²⁺	10		
Fe ³⁺	10	PO ₄ ³⁻	50		
Hg ²⁺	100	Zn ²⁺	100		

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
1 graduated 6-ml plastic syringe
2 test tubes with screw caps
1 color-disk comparator

Other reagents and accessories:

MColorpHast™ Universal indicator strips pH 0 - 14, Cat. No. 109535
Sodium hydroxide solution 1 mol/l TitriPUR® (approx. 4 %), Cat. No. 109137
Sulfuric acid 0.5 mol/l TitriPUR®, Cat. No. 109072
MColorpHast™ pH-indicator strips pH 0 - 6.0, Cat. No. 109531
Silicon standard solution CertiPUR®, 1000 mg/l Si, Cat. No. 170236

MColorTest™ Flat-bottomed tubes with screw caps for MColorTest™ with color-disk comparator (12 pcs), Cat. No. 117988

Refill pack:

Cat. No. 118323

Silicate (Silicic Acid) Test

Refill pack for 114792 and 114410

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

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 strongly turbid samples.

7. Procedure

	Measurement sample right-hand tube (A) behind the color disk	Blank left-hand tube (B) behind the color disk	
Pretreated sample (20 - 40 °C)	6 ml	6 ml	Inject into the test tube with the syringe. Add, close the tube, and mix. The pH must be within the range 1.2 - 1.6. Check with MColorpHast™ pH-indicator strips. Adjust the pH, if necessary, with reagent Si-1.
Reagent Si-1	3 drops 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).			
Hold the comparator to the light, keeping it upright, and rotate the disk until the closest possible color match is achieved between the two large windows. Read off the result in mg/l Si shown in the small window.			

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 10 mg/l Si 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 5 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 and the syringe **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.**

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