Supelco®

www.sigmaaldrich.com

1.14792.0001
1.14792.0007

MQuant®

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** **0.64** - 1.3 - 2.1 - 3.2 - 4.3 - 6.4 - 11 - 15 - **21 mg/l SiO_2**	150

[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 5 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 %					
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 %
$Cr_2O_7^{2-}$	100	NO_2^-	1000	Na_2SO_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:
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
Silicon standard solution Certipur®, 1000 mg/l Si, Cat. No. 1.70236

MQuant® Flat-bottomed tubes with screw caps for MQuant® tests with color disk comparator (12 pcs), Cat. No. 1.17988

Refill pack:

Cat. No. 1.18323
Silicate (Silicic Acid) Test
Refill pack for 1.14792 and 1.14410
(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.
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).			
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:

Result of analysis = measurement value x 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.**

Merck KGaA, 64271 Darmstadt, Germany, Tel. +49(0)6151 72-2440
www.sigmaaldrich.com/mobile-laboratory
EMD Millipore Corporation, 400 Summit Drive, Burlington MA 01803, USA, Tel. +1-978-715-4321
Sigma-Aldrich Canada Co. or Millipore (Canada) Ltd. 2149 Winston Park, Dr. Oakville, Ontario, L6H 6J8, Phone: +1 800-565-1400