

1.14815.0001

## Spectroquant® Calcium Test

Ca

### 1. Method

In alcoholic-alkaline solution calcium ions react with modified glyoxal-bis(2-hydroxyanil) to form a red-violet complex that is determined photometrically.

### 2. Measuring range and number of determinations

Cell mm	Measuring range			Number of determinations
	mg/l Ca	mg/l CaO	mg/l CaCO <sub>3</sub>	
10	1.0 - 15.0	1.4 - 21.0	2.5 - 37.5	100
10	10 - <b>160</b>	14 - <b>224</b>	25 - <b>400</b>	
20	5 - 80	7 - 112	12 - 200	

For programming data for selected photometers / spectrophotometers see [www.sigmaldrich.com/photometry](http://www.sigmaldrich.com/photometry).

### 3. Applications

#### Sample material:

Groundwater and surface water  
Seawater  
Drinking water and mineral water  
Boiler water  
Soils after appropriate sample pretreatment

### 4. Influence of foreign substances

This was checked individually in solutions containing 100 (10) and 0 mg/l Ca. 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. The values in parentheses apply for the measuring range 1.0 - 15.0 mg/l Ca.

Concentrations of foreign substances in mg/l or %					
Al <sup>3+</sup>	1000	Mg <sup>2+</sup>	500 (100)	EDTA	0
Cr <sup>3+</sup>	5 (1)	Mn <sup>2+</sup>	50 (10)	Surfactants <sup>1)</sup>	1000
Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	1000	NH <sub>4</sub> <sup>+</sup>	1000	Na-acetate	1 % (0.2 %)
Cu <sup>2+</sup>	0.5 (0.1)	Ni <sup>2+</sup>	500 (100)	NaCl	20 % (4 %)
F <sup>-</sup>	500 (100)	NO <sub>2</sub> <sup>-</sup>	1000	NaNO <sub>3</sub>	20 % (4 %)
Fe <sup>3+</sup>	5 (1)	PO <sub>4</sub> <sup>3-</sup>	5 (1)	Na <sub>2</sub> SO <sub>4</sub>	10 % (2 %)
K <sup>+</sup>	1000	Zn <sup>2+</sup>	50 (10)		

<sup>1)</sup> 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 Ca-1  
1 bottle of reagent Ca-2  
1 bottle of reagent Ca-3  
1 AutoSelector (for measuring range 1.0 - 15.0 mg/l Ca)  
1 AutoSelector (for measuring range 5 - 160 mg/l Ca)

#### Other reagents and accessories:

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  
Calcium standard solution Certipur®, 1000 mg/l Ca, Cat. No. 119778  
Hydrochloric acid 25 % for analysis EMSURE®, Cat. No. 100316  
2-Propanol for analysis EMSURE®, Cat. No. 109634

Pipettes for pipetting volumes of 0.10, 0.50 and 5.0 ml  
Rectangular cells 10 and 20 mm (2 of each), Cat. Nos. 114946 and 114947

### 6. Preparation

- The glassware and the cells must be free from surfactants!** It is thus recommended to leave these items to stand filled with alcoholic hydrochloric acid (25 ml of hydrochloric acid 25 % + 75 ml of 2-propanol) for several hours and subsequently rinse them thoroughly with distilled water.
- Analyze immediately after sampling.
- The pH must be within the range 4 - 10.** Adjust, if necessary, with sodium hydroxide solution or hydrochloric acid.
- Filter turbid samples.

### 7. Procedure

#### Measuring range 1.0 - 15.0 mg/l Ca:

Pretreated sample (20 - 35 °C)	0.50 ml	Pipette into a test tube.
Reagent Ca-1	5.0 ml	Add with pipette and mix.
Reagent Ca-2	4 drops <sup>1)</sup>	Add and mix.
Reagent Ca-3	4 drops <sup>1)</sup>	Add and mix.

**Leave to stand for exactly 8 min (reaction time)**, then fill the sample into a 10-mm cell, and measure in the photometer.

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

#### Measuring range 5 - 160 mg/l Ca:

Pretreated sample (20 - 35 °C)	0.10 ml	Pipette into a test tube.
Reagent Ca-1	5.0 ml	Add with pipette and mix.
Reagent Ca-2	4 drops <sup>1)</sup>	Add and mix.
Reagent Ca-3	4 drops <sup>1)</sup>	Add and mix.

**Leave to stand for exactly 8 min (reaction time)**, then fill the sample into the cell, and measure in the photometer.

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

#### Notes on the measurement:

- Certain photometers may require a blank** (preparation as per measurement sample, but with distilled water instead of sample).
- 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 pH of the measurement solution must be above 12.
- The color of the measurement solution remains stable for only a short time after the end of the reaction time stated above.** (After 10 min the measurement value would have diminished by 5 %, after 30 min by 25%).

### 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, a dilute calcium standard solution containing 7.5 or 80 mg/l Ca 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](http://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](http://www.disposal-test-kits.com).**

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