

1.14825.0001

# Spectroquant® Aluminium Test

AI

## 1. Method

In weakly acidic, acetate-buffered solution aluminium ions react with chromazurol S to form a blue-violet compound that is determined photometrically. **The method is analogous to APHA 3500-AI-B and DIN ISO 10566 E30.**

## 2. Measuring range and number of determinations

Cell mm	Measuring range mg/l Al	Number of determinations
50	0.020 - 0.200	350
20	0.05 - 0.60	
10	0.10 - 1.20	

For programming data for selected photometers / spectrophotometers see [www.service-test-kits.com](http://www.service-test-kits.com).

## 3. Applications

### Sample material:

Groundwater, surface water, and seawater  
Drinking water  
Industrial water  
Wastewater and percolating water

## 4. Influence of foreign substances

This was checked in solutions containing 0.3 and 0 mg/l Al. 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 %							
Ag <sup>+</sup>	1	F <sup>-1</sup>	1	PO <sub>4</sub> <sup>3-</sup>	500	EDTA <sup>2)</sup>	0 %
Cd <sup>2+</sup>	500	Fe <sup>3+</sup>	100	S <sup>2-</sup>	100	Surfactants <sup>3)</sup>	0 %
CN <sup>-</sup>	1000	Mn <sup>2+</sup>	500	Sn <sup>2+</sup>	10	NaCl	20 %
Co <sup>2+</sup>	50	NH <sub>4</sub> <sup>+</sup>	500	SO <sub>3</sub> <sup>2-</sup>	1000	NaNO <sub>3</sub>	20 %
Cr <sup>3+</sup>	50	NO <sub>2</sub> <sup>-</sup>	50	Zn <sup>2+</sup>	500	Na <sub>2</sub> SO <sub>4</sub>	20 %
Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	5	OCN <sup>-</sup>	500				
Cu <sup>2+</sup>	1	Pb <sup>2+</sup>	500				

<sup>1)</sup> Fluoride can be removed by fuming off with sulfuric acid 95 - 97 % (**Wear eye protection!**) (application see the website).

<sup>2)</sup> EDTA can be destroyed with Spectroquant® Crack Set 10 or Spectroquant® Crack Set 10C.

<sup>3)</sup> tested with nonionic, cationic, and anionic surfactants

## 5. Reagents and auxiliaries

The test reagents are stable up to the date stated on the pack when stored closed at +15 to +25 °C.

### Package contents:

2 bottles of reagent AI-1  
1 bottle of reagent AI-2  
1 bottle of reagent AI-3  
1 AutoSelector

### Other reagents and accessories:

Sulfuric acid 95 - 97 % for analysis EMSURE®, Cat. No. 100731  
Spectroquant® Crack Set 10, Cat. No. 114687 or  
Spectroquant® Crack Set 10C, Cat. No. 114688  
MColorpHast™ Universal indicator strips pH 0 - 14, Cat. No. 109535  
MColorpHast™ pH-indicator strips pH 5.0 - 10.0, Cat. No. 109533  
Sodium hydroxide solution 1 mol/l TitriPUR®, Cat. No. 109137  
Sulfuric acid 0.5 mol/l TitriPUR®, Cat. No. 109072  
Spectroquant® CombiCheck 40, Cat. No. 114692  
Hydrochloric acid 25 % for analysis EMSURE®, Cat. No. 100316  
2-Propanol for analysis EMSURE®, Cat. No. 109634

Pipettes for pipetting volumes of 0.25, 1.2, and 5.0 ml  
Rectangular cells 10, 20, and 50 mm (2 of each), Cat. Nos. 114946, 114947, and 114944  
Semi-microcells 50 mm (2 pcs), Cat. No. 173502

## 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 3 - 10.** Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter turbid samples.

## 7. Procedure

Pretreated sample (15 - 40 °C)	5.0 ml	Pipette into a test tube.
Reagent AI-1	1 level blue microspoon (in the cap of the AI-1 bottle)	Add and shake <b>vigorously until the reagent is completely dissolved.</b>
Reagent AI-2	1.2 ml	Add with pipette and mix.
Reagent AI-3	0.25 ml	Add with pipette and mix.
<b>Leave to stand for 2 min (reaction time),</b> then fill the sample into the cell, and measure in the photometer.		

For measurement in the **50-mm cell** both the sample volume as well as the quantities of reagents AI-1, AI-2, and AI-3 must be doubled. Alternatively, the semi-microcell Cat. No. 173502 can be used.

### 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 within the range 5.5 - 6.0.
- The color of the measurement solution remains stable for 15 min after the end of the reaction time stated above.

## 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, Spectroquant® CombiCheck 40 can be used. Besides a **standard solution** with 0.75 mg/l Al, this article also contains an **addition solution** for determining sample-dependent interferences (matrix effects).

Additional notes see under [www.qa-test-kits.com](http://www.qa-test-kits.com).

### Characteristic quality data:

In the production control, the following data were determined in accordance with ISO 8466-1 and DIN 38402 A51 (10-mm cell):

Standard deviation of the method (mg/l Al)	± 0.012
Coefficient of variation of the method (%)	± 1.7
Confidence interval (mg/l Al)	± 0.03
Number of lots	36

### Characteristic data of the procedure:

	Measuring range mg/l Al	
	0.020 - 0.200	0.10 - 1.20
Sensitivity: Absorbance 0,010 A corresponds to (mg/l Al)	0.001	0.01
Accuracy of a measurement value (mg/l Al)	max. ± 0.008	max. ± 0.04

For quality and batch certificates for Spectroquant® test kits see the website.

## 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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Tel. +49(0)6151 72-2440  
[www.analytical-test-kits.com](http://www.analytical-test-kits.com)

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