

1.09717.0001

Spectroquant® Lead Test

Pb

1. Method

In alkaline solution lead(II) ions react with 4-(2'-pyridylazo)resorcinol (PAR) to form a red complex that is determined photometrically.

2. Measuring range and number of determinations

Cell mm	Measuring range mg/l Pb	Number of determinations
50	0.010 - 1.000	50
20	0.05 - 2.50	
10	0.10 - 5.00	

For programming data for selected photometers / spectrophotometers see www.service-test-kits.com.

3. Applications

This test measures only lead(II) ions. Samples must be decomposed by digestion before undissolved or complex-bound lead can be measured (see section 6).

Sample material:

Groundwater and surface water
Drinking water and mineral water
Industrial water
Wastewater and percolating water
Sewage sludge
Soils after appropriate sample pretreatment
This test is **not suited** for seawater.

4. Influence of foreign substances

This was checked in solutions containing 2,5 and 0 mg/l Pb. 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 % or °e					
Ag ⁺	50	Fe ³⁺	2	PO ₄ ³⁻	50
Al ³⁺	500	Hg ²⁺	50	Zn ²⁺	25
Ca ²⁺	250	Mg ²⁺	250	EDTA	0.25
Cd ²⁺	25	Mn ²⁺	0.1	Surfactants ¹⁾	500
Cr ³⁺	25	NH ₄ ⁺	1000	Na-acetate	20 %
Cr ₂ O ₇ ²⁻	10	Ni ²⁺	100	NaCl	20 %
Cu ²⁺	100	NO ₂ ⁻	1000	NaNO ₃	5 %
				Na ₂ SO ₄	15 %
				Total hardness	37.5°e

¹⁾ tested with nonionic, cationic, and anionic surfactants

5. Reagents and auxiliaries

Please note the warnings on the packaging materials! Caution! Reagent Pb-1 contains potassium cyanide!

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 Pb-1
1 bottle of reagent Pb-2
1 AutoSelector

Other reagents and accessories:

Nitric acid 65 % for analysis EMSURE®, Cat. No. 100456
Spectroquant® Crack Set 10C, Cat. No. 114688
+ thermoreactor

or

Spectroquant® Crack Set 10, Cat. No. 1.14687.0001
+ empty cells 16 mm with screw caps (25 pcs), Cat. No. 114724
+ thermoreactor

MColorpHast™ Universal indicator strips pH 0 - 14, Cat. No. 109535

Ammonia solution 25 % for analysis EMSURE®, Cat. No. 105432

Nitric acid Titrisol® for 1 mol/l, Cat. No. 109966

Spectroquant® CombiCheck 40, Cat. No. 114692

Pipettes for pipetting volumes of 0.50 and 8.0 ml

Rectangular cells 10, 20, and 50 mm (2 of each), Cat. Nos. 114946, 114947, and 114944

6. Preparation

- Analyze immediately after sampling. Otherwise preserve with nitric acid 65 % (1 ml nitric acid per 1 l of sample solution).
- Undissolved or complex-bound lead can be determined after pretreatment of the sample using one of the Spectroquant® Crack Sets.
- Samples containing more than 5.00 mg/l Pb must be diluted with distilled water prior to digestion.
- The pH must be within the range 3 - 6.** Adjust, if necessary, with dilute ammonia solution or nitric acid.
- Filter turbid samples.

7. Procedure

Caution! Reagent Pb-1 contains potassium cyanide! At all costs adhere to the specified dosage sequence!

Reagent Pb-1	0.50 ml	Pipette into a test tube.
Reagent Pb-2	0.50 ml	Add with pipette and mix.
Pretreated sample (10 - 40 °C)	8.0 ml	Add with pipette and mix.

Fill the measurement sample into the cell and measure in the photometer.

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 8.0 - 8.3.
- The color of the measurement solution remains stable for at least 60 min.

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 2.00 mg/l Pb²⁺, this article also contains an **addition solution** for determining sample-dependent interferences (matrix effects).

Additional notes see under 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 Pb)	± 0.021
Coefficient of variation of the method (%)	± 0.81
Confidence interval (mg/l Pb)	± 0.05
Number of lots	20

Characteristic data of the procedure:

	Measuring range mg/l Pb	
	0.010 - 1.000	0.10 - 5.00
Sensitivity: Absorbance 0.010 A corresponds to (mg/l Pb)	0.013	0.06
Accuracy of a measurement value (mg/l Pb)	max. ± 0.028	max. ± 0.14

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

9. Notes

- Reclose the reagent bottles immediately after use.
- The test reagents must not be run off with the wastewater! Information on disposal can be obtained at www.disposal-test-kits.com.**

