

1.14549.0001

Spectroquant® Iron Cell Test

Fe

1. Method

All iron ions are reduced to iron(II) ions by ascorbic acid. In a thioglycolate-buffered medium these react with a triazine derivative to form a red-violet complex that is determined photometrically.

2. Measuring range and number of determinations

Measuring range	Number of determinations
0.05 - 4.00 mg/l Fe	25

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

3. Applications

This test measures bivalent and trivalent iron in its dissolved form as well as fresh colloidal iron(III) hydroxide. Samples must be decomposed by digestion before iron oxides, aged iron hydroxide, and complex-bound iron can be measured (see section 6).

Sample material:

Groundwater, surface water, and seawater
Drinking water
Industrial water
Wastewater and percolating water
Food after appropriate sample pretreatment

4. Influence of foreign substances

This was checked in solutions containing 2 and 0 mg/l Fe. 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 %					
Al ³⁺	1000	Cu ²⁺	10 (100 ¹⁾)	NO ₂ ⁻	100
Ca ²⁺	1000	Hg ²⁺	10	Pb ²⁺	10
Cd ²⁺	1000	Mg ²⁺	1000	PO ₄ ³⁻	1000
CN ⁻	100	Mn ²⁺	1000	SiO ₃ ²⁻	1000
Co ²⁺	5	MoO ₄ ²⁻	50	Zn ²⁺	1000
Cr ³⁺	100	NH ₄ ⁺	1000		
Cr ₂ O ₇ ²⁻	50	Ni ²⁺	10	EDTA	10 %
				Surfactants ²⁾	1 %
				Na-acetate	5 %
				NaCl	20 %
				NaNO ₃	20 %
				Na ₂ SO ₄	20 %

¹⁾ when approx. 100 mg of thiourea is placed in the reaction cell before the sample is added

²⁾ 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 Fe-1K
25 reaction cells
1 sheet of round stickers for numbering the cells

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. 114687
+ empty cells 16 mm with screw caps (25 pcs), Cat. No. 114724
+ thermoreactor

MQuant™ Iron Test, Cat. No. 110004,

measuring range 3 - 500 mg/l Fe²⁺

MColorpHast™ 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

Thiourea GR for analysis, Cat. No. 107979

Spectroquant® CombiCheck 30, Cat. No. 114677

Pipette for a pipetting volume of 5.0 ml

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 iron can be determined after pretreatment of the sample using one of the Spectroquant® Crack Sets. **Do not add reagent R-3 (from Crack Set 10) or, respectively, reagent R-2K (from Crack Set 10C) during digestion!**
- Check the iron content with the MQuant™ Iron Test. Samples containing more than 4.00 mg/l Fe must be diluted with distilled water **prior** to digestion.
- The pH must be within the range 1 - 10.** Adjust, if necessary, with sodium hydroxide solution or hydrochloric acid.
- Filter turbid samples.

7. Procedure

Pretreated sample (10 - 40 °C)	5.0 ml	Pipette into a reaction cell and mix.
Reagent Fe-1K	1 level blue microspoon (in the cap of the Fe-1K bottle)	Add, close the cell tightly, and shake vigorously until the reagent is completely dissolved.
Leave to stand for 3 min (reaction time), then measure the sample in the photometer.		

Notes on the measurement:

- 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 3.2 - 4.5.
- The color of the measurement solution remains stable for at least 60 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 30 can be used. Besides a **standard solution** with 1.00 mg/l Fe, 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:

Standard deviation of the method (mg/l Fe)	± 0.016
Coefficient of variation of the method (%)	± 0.77
Confidence interval (mg/l Fe)	± 0.04
Number of lots	36

Characteristic data of the procedure:

Sensitivity: Absorbance 0.010 A corresponds to (mg/l Fe)	0.02
Accuracy of a measurement value (mg/l Fe)	max. ± 0.06

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

9. Notes

- Reclose the reagent bottle 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.**

