1.14761.0001
1.14761.0002

Spectroquant®

Iron Test

Fe

1. Method

All iron ions are reduced to iron(II) ions. 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

Cell mm	Measuring range mg/l Fe	Number of determinations
50 20 10	**0.005** - 1.000 0.03 - 2.50 0.05 - **5.00**	250 (Cat. No. 1.14761.0002) or 1000 (Cat. No. 1.14761.0001)

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 and surface water, 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 1.5 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	EDTA	10 %
Ca^{2+}	1000	**Hg^{2+}**	**10**	**Pb^{2+}**	**10**	Surfactants[2]	1 %
Cd^{2+}	1000	Mg^{2+}	1000	PO_4^{3-}	1000	Na-acetate	5 %
CN^-	100	Mn^{2+}	1000	SiO_3^{2-}	1000	NaCl	20 %
Co^{2+}	**5**	**MoO_4^{2-}**	**10**	Zn^{2+}	1000	$NaNO_3$	20 %
Cr^{3+}	100	NH_4^+	1000			Na_2SO_4	20 %
$Cr_2O_7^{2-}$	50	**Ni^{2+}**	**10**				

[1] when approx. 100 mg of thiourea is placed into the test tube before the sample
[2] tested with nonionic, cationic, and anionic surfactants

5. Reagents and auxiliaries

Please note the warnings on the packaging materials!
The test reagent is stable up to the date stated on the pack when stored closed at +15 to +25 °C.

Package contents:
Reagent Fe-1 (in aluminium container):
1 bottle (Cat. No. 1.14761.0002) or
4 bottles (Cat. No. 1.14761.0001)
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. 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 Fe^{2+}
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
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 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 5.00 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 test tube.
Reagent Fe-1	3 drops[1]	Add and mix.
Leave to stand for 3 min (reaction time), then fill the sample into the cell, and measure in the photometer.		

[1] **Hold the bottle vertically while adding the reagent!**

For measurement in the **50-mm cell** both the sample volume as well as the quantity of reagent Fe-1 must be doubled.

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 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 reagent, 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 (10-mm cell):

Standard deviation of the method (mg/l Fe)	± 0.016
Coefficient of variation of the method (%)	± 0.65
Confidence interval (mg/l Fe)	± 0.04
Number of lots	83

Characteristic data of the procedure:

	Measuring range mg/l Fe	
	0.005 - 1.000	**0.05 - 5.00**
Sensitivity: Absorbance 0,010 A corresponds to (mg/l Fe)	0.004	0.02
Accuracy of a measurement value (mg/l Fe)	max. ± 0.014	max. ± 0.07

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

9. Notes

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

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www.analytical-test-kits.com

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