Supelco®

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1.14420.0001
1.14420.0007

MQuant®

Nickel Test

Ni

1. Method

Determination with color-card comparator
Nickel(II) ions are oxidized by iodine and then transformed with dimethylglyoxime in an ammoniacal solution into a red-brown complex. The nickel concentration is measured **semiquantitatively** by visual comparison of the color of the measurement solution with the color fields of a color card.

2. Measuring range and number of determinations

Measuring range / color-scale graduation	Number of determinations
0.02 - 0.04 - 0.07 - 0.10 - 0.15 - 0.2 - 0.3 - 0.4 - **0.5 mg/l Ni**	125

3. Applications

This test measures only nickel(II) ions.

Sample material:
Groundwater and surface water
Drinking water
Industrial water
Wastewater and percolating water
Electroplating wastewater
This test is **not suited** for seawater.

4. Influence of foreign substances

This was checked individually in solutions containing 0.2 and 0 mg/l Ni. 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.

Concentrations of foreign substances in mg/l or %							
Al^{3+}	1000	F^-	250	Pb^{2+}	1000	**EDTA**	**1**
Ca^{2+}	1000	**Fe^{3+}**	**10**	PO_4^{3-}	1000	Surfactants[1]	5 %
Cd^{2+}	50	Hg^{2+}	100	S^{2-}	50	Na-acetate	10 %
CN^-	500	Mg^{2+}	100	SO_3^{2-}	1000	NaCl	20 %
Cr^{3+}	50	**Mn^{2+}**	**1**	Zn^{2+}	1000	$NaNO_3$	20 %
$Cr_2O_7^{2-}$	**10**	NH_4^+	1000			Na_2SO_4	20 %
Cu^{2+}	50	NO_2^-	1000				

Reducing agents interfere with the determination.
[1] 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 Ni-1
2 bottles of reagent Ni-2
1 bottle of reagent Ni-3
2 test tubes with screw caps (in comparator block)
1 color card usable for Cat. Nos. 1.14420.0001 **and** 1.14420.0007

Other reagents and accessories:
Nitric acid 65 % for analysis EMSURE®, Cat. No. 1.00456
Charcoal activated for analysis, Cat. No. 1.02186
Ammonia solution 25 % for analysis EMSURE®, Cat. No. 1.05432
MQuant® Universal indicator strips pH 0 - 14, Cat. No. 1.09535
MQuant® pH-indicator strips pH 7.5 - 14, Cat. No. 1.09532
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 1.09137
Sulfuric acid 0.5 mol/l Titripur®, Cat. No. 1.09072
Nickel standard Titrisol® for 1000 mg/l Ni^{2+}, Cat. No. 1.09989

MQuant® Flat-bottomed long tubes with screw caps for MQuant® tests with color-card comparator (12 pcs), Cat. No. 1.14901

Refill pack:

Cat. No. 1.18461
Nickel Test
Refill pack for 1.14783 and 1.14420
(Reagents **without technical accessories** for the number of determinations stated in section 2)

6. Preparation

- Analyze immediately after sampling. Otherwise preserve with nitric acid 65 % (1 ml nitric acid per 1 l of sample solution).
- Decolorize any yellow stained samples by filtering through activated charcoal at pH 4. In the event that iron is the cause of the colouration, precipitate this with ammonia solution as iron hydroxide and separate from the solution.
- **The pH must be within the range 3 - 8.**
  Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter turbid samples.

7. Procedure

Open the box and set up with both test tubes **on the left**.
Unfold the color card and insert it, colored end first, into the slit at the lower **right-hand** edge of the box.

	Measurement sample tube nearer to the tester (**A**)	**Blank** tube farther from the tester (**B**)	
Pretreated sample (**10 - 40 °C**)	20 ml	20 ml	Fill the test tube to the mark (= 20 ml).
Reagent Ni-1	4 drops[1]	-	Add, close the tube, and mix. **A slight yellow coloration must persist.** If necessary, add reagent Ni-1 dropwise until the color remains stable.
Leave to stand for 1 min (reaction time 1).			
Reagent Ni-2	8 drops[1]	-	Add, close the tube, and mix. **The pH must be within the range 10 - 12.** Check with MQuant® pH-indicator strips. Adjust the pH, if necessary, with sodium hydroxide solution or sulfuric acid.
Reagent Ni-3	8 drops[1]	-	Add, close the tube, and mix.
Leave to stand for 3 min (reaction time 2).			

Slide the color card through to the left until the closest possible color match is achieved between the two open test tubes when viewed from above.
Read off the result in mg/l Ni from the color card at the lower right-hand edge of the box.

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

Notes on the measurement:

- The color of the measurement solution remains stable for 30 min after the end of the reaction time 2 stated above. (After 60 min the measurement value would have diminished by 5 %.)
- Turbidity in the measurement solution makes the color comparison more difficult.
- If the color of the measurement solution is equal to or more intense than the darkest color on the scale, repeat the measurement using **fresh**, diluted samples until a value of less than 0.5 mg/l Ni is obtained.
  Concerning the result of the analysis, the dilution must be taken into account:

Result of analysis = measurement value x dilution factor

8. Method control

To check test reagents, measurement device, and handling:
Dilute the nickel standard solution with distilled water to 0.2 mg/l Ni^{2+} and analyze as described in section 7.
Additional notes see under **www.qa-test-kits.com**.

9. Notes

- Reclose the reagent bottles immediately after use.
- Rinse the test tubes **with distilled water only**.
- **Information on disposal can be obtained at www.disposal-test-kits.com.**

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