

## Overview

The test is suitable for the photometric determination of nickel.

The test is suitable for surface water, ground- and drinking water and production water.

- Measuring range:  
0.10 – 7.00 mg/L Ni<sup>2+</sup> (method 0711 / 0712 / 0713)
- 50-mm semi-micro cuvette:  
0.02 – 1.00 mg/L Ni<sup>2+</sup> (method 1711)

- Number of tests: 20
- Wavelength for photometric determination: 470 nm
- Shelf life: 24 months
- Reaction time: 3 minutes
- Storage temperature: 20 – 25 °C
- Storage conditions: upright

## Method

In the presence of an oxidizing agent, nickel ions react with dimethylglyoxime in an alkaline solution to form a reddish-brown complex.

## Interferences

The following contaminants do not interfere with the test up to the indicated concentrations. The cumulative effect of different interfering ions has not been tested.

Data in mg/L:

- Co<sup>2+</sup>, Cu<sup>2+</sup>: 1
- Cr, Mn<sup>2+</sup>, Ni<sup>2+</sup>, Zn<sup>2+</sup>: 10
- Ca<sup>2+</sup>, Cr<sup>3+</sup>, Fe<sup>3+</sup>, Pb<sup>2+</sup>: 50

Complexed nickel is not detected. For the total nickel determination, a digestion with NANOCOLOR® NanOx Metal (918978) or with the Crack set (91808) must be performed.

If there is uncertainty regarding the range of the concentration of the sample, a preliminary test with QUANTOFIX® Nickel (REF 91305) will provide information regarding the necessary dilution for the determination.

Complexing agents interfere with the determination and should be excluded by a preliminary test with NANOCOLOR® organic complexing agent 10 (985052).

The method is suitable for the analysis of seawater after 1 + 9 dilution.

Turbidities cause higher measurement values.

## Reagents and accessories

Contents of reagents set:

- 20 test tubes R0
- 2 reagent R2

Required devices:

- MACHEREY-NAGEL photometer
- Digital piston pipette 1 – 5 mL (REF 916909) with pipette tips (REF 916916)
- Digital piston pipette 200 – 1000 µL (REF 91671) with pipette tips (REF 91667)

## Standards

- NANOCONTROL Multistandard Metals 2 (REF 925016)

## Sampling and preparation

See DIN EN ISO 5667-3-A21.

Adjust to pH 3 – 8 prior to analysis.

## Quality control

The measurement of a blank value and a standard is recommended before every measuring series as quality control measure.

Quality data:

The following data were determined during production according to ISO 8466-1 and DIN 38402-A51:

- Number of LOTs: 36
- Standard deviation of the method: ± 0.03 mg/L Ni<sup>2+</sup>
- Coefficient of variation of the process: ± 0.67 %
- Confidence interval: ± 0.06 mg/L Ni<sup>2+</sup>

Specified data for procedure:

- Sensitivity (absorbance of 0.010 A corresponds to):  
0.04 mg/L Ni<sup>2+</sup>
- Accuracy of a measurement value: ± 0.07 mg/L Ni<sup>2+</sup>

LOT-specific certificates are available at [www.mn-net.com](http://www.mn-net.com).

## Procedure

1. Open test tube. Pipette 4 mL of sample into test tube
2. Seal test tube and shake
3. Add 1 mL R2
4. Seal test tube and shake
5. Wait 3 min
6. Clean outside of test tube
7. Measure

### Measurement in a 50-mm semi-micro cuvette

Measurement against zero value (distilled water instead of sample) necessary

1. Open test tube. Pipette 4 mL of sample into test tube
2. Seal test tube and shake vigorously
3. Add 1 mL R2
4. Seal test tube and shake vigorously
5. Transfer the contents of the test tube into a 50-mm semi-micro cuvette
6. Wait 3 min
7. Measure

## Notes

When using other photometers, make sure measurements are possible in test tubes (16 mm OD) and calibrate the method.

Use the correction value when measuring cloudy or colored samples (see photometer handbook).

Smaller concentrations can be determined by using 50-mm semi-micro cuvettes (REF 91950).

09/2023

