

Overview

The test is suitable for the photometric determination of total phosphate after acidic hydrolysis in accordance with EPA 365.2 + 3, APHA 4500-P E, DIN EN ISO 6878-D11.

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

Measuring range:

0.05–1.50 mg/L PO₄-P (method 0761)

0.2–5.0 mg/L PO₄-P (method 0762)

0.010–0.800 mg/L PO₄-P (method 1761)

0.03–2.50 mg/L PO₄³⁻ (method 1762)

- Number of tests: 20
- Wavelength for photometric determination: 690 nm
- Shelf life: 12 months
- Storage temperature: 15–25 °C
- Storage conditions: upright

Method

Photometric determination as molybdenum blue after acidic hydrolysis and oxidation at 100–120 °.

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.

- As, NO₂⁻, S²⁻: 2
- Cu²⁺, Fe, Cr: 20
- Si: 100
- COD: 150

The ortho-P method is suitable for the analysis of seawater.

Turbidities cause higher measurement values.

Reagents and accessories

Contents of reagents set:

- 20 test tubes R0
- 1 NANOFIX R2
- 1 NANOFIX R3
- 1 reagent R4

Required devices:

- MACHEREY-NAGEL photometer
- MACHEREY-NAGEL heating block
- Digital piston pipette 1–5 mL (REF 916909) with pipette tips (REF 916916)
- Digital piston pipette 50–200 µL (REF 916914) with pipette tips (REF 916915)
- Tweezers for sampling NANOFIX capsules (REF 916114)

Standards

- Text EN
- NANOCNTROL Multistandard Sewage outflow 2 (REF 925010)
- NANOCNTROL ortho-Phosphate (REF 92576)

Sampling and preparation

See DIN EN ISO 5667-3-A21 and DIN EN ISO 6878-D11.

Adjust to pH 0–10 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: 59
- Standard deviation of the method: ± 0.03 mg/L PO₄³⁻
- Coefficient of variation of the process: ± 1.09 %
- Confidence interval: ± 0.13 mg/L PO₄³⁻

Specified data for procedure:

- Sensitivity (absorbance of 0.010 A corresponds to): 0.06 mg/L PO₄³⁻
- Accuracy of a measurement value: ± 0.10 mg/L PO₄³⁻

LOT-specific certificates are available at www.mn-net.com.

Procedure

Total phosphate

1. Open test tube. Pipette 4 mL of sample into test tube
2. Add 1 NANOFIX R2
3. Seal test tube and shake vigorously
4. Heat for 1 h at 100 °C or for 30 min at 120 °C
5. Add 1 NANOFIX R3
6. Add 200 µL R4
7. Seal test tube and shake vigorously
8. Wait 10 min
9. Clean outside of test tube
10. Measure

Orthophosphate

1. Open test tube. Pipette 4 mL of sample into test tube
2. Add 1 NANOFIX R3
3. Add 200 µL R4
4. Seal test tube and shake vigorously
5. Wait 10 min
6. Clean outside of test tube
7. Measure

Notes

To increase the accuracy, it is recommended to perform the measurement with reagent blank value.

Test a sample of distilled water (REF 918932) to generate a blank value for the reagent.

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

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

When using a standard, the measured value is constant over a period of min. 30 min.

If there is uncertainty regarding the range of the concentration of the sample, a preliminary test with QUANTOFIX® phosphate (REF 91320) or with VISOCOLOR® ECO phosphate (REF 931084) will provide information regarding the necessary dilution for the determination.

Rapid cooling of the cuvette under cold water can cause plug formation by the NANOFIX capsules.

The concentration of the condensed phosphates is determined as the difference between total phosphate without phosphate R2 addition and ortho-phosphate.

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