Supelco®

1.10428.0001

# MQuant® Phosphate Test

$PO_4^{3-}$

## 1. Method

In sulfuric solution orthophosphate ions ($PO_4^{3-}$) react with molybdate ions to form molybdophosphoric acid, which is reduced to phosphomolybdenum blue (PMB). The phosphate concentration is measured **semiquantitatively** by visual comparison of the reaction zone of the test strip with the fields of a color scale.

## 2. Measuring range and number of determinations

| Measuring range / color-scale graduation [1] | Number of determinations |
|---|---|
| **10** - 25 - 50 - 100 - 250 - **500 mg/l $PO_4^{3-}$** | 100 |
| **3.3** - 8.2 - 16 - 33 - 82 - **163 mg/l $PO_4$-P** | |
| **7.5** - 19 - 37 - 75 - 187 - **374 mg/l $P_2O_5$** | |

[1] for conversion factors see section 8

## 3. Applications

This test measures only orthophosphate. Samples must be decomposed by digestion before total phosphorus can be measured.

**Sample material:**
Wastewater
Soils and fertilizers after appropriate sample pretreatment
Food after appropriate sample pretreatment

## 4. Influence of foreign substances

This was checked individually in solutions with 50 and 0 mg/l $PO_4^{3-}$. 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 | | | | | |
|---|---|---|---|---|---|
| $Ag^+$ | 100 | $Fe^{3+}$ | 100 | Anionic Surfactants [1] | 500 |
| $Al^{3+}$ | 1000 | $K^+$ | 1000 | Cationic Surfactants [2] | 100 |
| $Ca^{2+}$ | 1000 | $Mg^{2+}$ | 1000 | Nonionic Surfactants [3] | 100 |
| $Cd^{2+}$ | 1000 | $Mn^{2+}$ | 1000 | $H_2O_2$ | 500 |
| $Cl^-$ | 1000 | $NH_4^+$ | 1000 | | |
| $CN^-$ | 1000 | $Ni^{2+}$ | 1000 | | |
| $Cr^{3+}$ | 250 | **$NO_2^-$** | **10** | | |
| $CrO_4^{2-}$ | 250 | $NO_3^-$ | 1000 | | |
| $Cu^{2+}$ | 250 | $SO_3^{2-}$ | 1000 | | |
| $Fe^{2+}$ | 100 | | | | |

[1] tested with Na-dodecyl sulfate
[2] tested with N-cetylpyridinium chloride
[3] tested with polyvinylpyrrolidone

## 5. Reagents and auxiliaries

**Please note the warnings on the packaging materials!**

The test strips and the test reagent are stable up to the date stated on the pack when stored closed at +15 to +25 °C.

**Package contents:**
Tube containing 100 test strips
1 bottle of reagent $PO_4$-1
1 test vessel

**Other reagents:**
MQuant® Universal indicator strips pH 0 - 14, Cat. No. 109535
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 109137
Sulfuric acid 0.5 mol/l Titripur®, Cat. No. 109072
Phosphate standard solution Certipur®, 1000 mg/l $PO_4^{3-}$, Cat. No. 119898

## 6. Preparation

- Extract solid sample materials by an appropriate method.
- Samples containing more than 500 mg/l $PO_4^{3-}$ must be diluted with distilled water.
- **The pH must be within the range 4 - 10.** Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.

## 7. Procedure

Immerse the reaction zone of the test strip in the pretreated sample (**15 - 30 °C**) **for 1 sec**.
Allow excess liquid to run off via the long edge of the strip onto an absorbent paper towel.

| | | |
|---|---|---|
| Reagent $PO_4$-1 | 1 drop [1] | Place on the reaction zone and allow to react **for 15 sec**. |

Allow excess liquid to run off via the long edge of the strip onto an absorbent paper towel **(Caution! Reagent contains sulfuric acid!)** and **after 1 min** determine with which color field on the label the color of the reaction zone coincides most exactly.
Read off the corresponding result in mg/l $PO_4^{3-}$ or $PO_4$-P.

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

**Notes on the measurement:**

- The color of the reaction zone may continue to change after the specified reaction time has elapsed. This must not be considered in the measurement.
- If the color of the reaction zone 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 500 mg/l $PO_4^{3-}$ is obtained.
  Concerning the result of the analysis, the dilution (see also section 6) must be taken into account:

Result of analysis = measurement value x dilution factor

## 8. Conversions

| required / given | mg/l $PO_4^{3-}$ | mg/l $PO_4$-P | mg/l $P_2O_5$ |
|---|---|---|---|
| **1 mg/l $PO_4^{3-}$** | 1 | 0.326 | 0.747 |
| **1 mg/l $PO_4$-P** | 3.07 | 1 | 2.29 |
| **1 mg/l $P_2O_5$** | 1.34 | 0.436 | 1 |

## 9. Method control

To check test strips, test reagent, and handling: Dilute the phosphate standard solution with distilled water to 100 mg/l $PO_4^{3-}$ and analyze as described in section 7.
Additional notes see under **www.qa-test-kits.com**.

## 10. Notes

- **Reclose** the reagent bottle and **the tube containing the test strips immediately after use**.
- Rinse the test vessel **with distilled water only**.

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