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Spectroquant®

Phosphate Cell Test

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for the determination of orthophosphate and total phosphorus

USEPA approved for drinking water and wastewater

1. Method

In sulfuric solution orthophosphate ions react with molybdate ions to form molybdophosphoric acid. Ascorbic acid reduces this to phosphomolybdenum blue (PMB) that is determined photometrically.
The method is analogous to EPA 365.2+3, APHA 4500-P E, and DIN EN ISO 6878.

2. Measuring range and number of determinations

Measuring range	Number of determinations
0.05 - 5.00 mg/l PO_4-P	25
0.2 - 15.3 mg/l PO_4^{3-} 0.11 - 11.46 mg/l P_2O_5	

For programming data for selected photometers / spectrophotometers see www.service-test-kits.com.

3. Applications

This test measures only orthophosphate. Samples must be decomposed by digestion before total phosphorus can be measured (see section 6).

Sample material:
Groundwater and surface water, seawater
Drinking water
Wastewater
Nutrient solutions for fertilization
Soils after appropriate sample pretreatment
Food after appropriate sample pretreatment

4. Influence of foreign substances

This was checked in solutions containing 2 and 0 mg/l PO_4-P. 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 %							
Ag^+	1000	F^-	50	Pb^{2+}	25	EDTA	1000
AsO_4^{3-}	**0.2**	Fe^{3+}	1000	**S^{2-}**	**2.5**	Surfactants [1]	100
Ca^{2+}	1000	**Hg^{2+}**	**10**	SiO_3^{2-}	1000	COD (K-hydrogen	
Cd^{2+}	1000	Mg^{2+}	1000	SO_3^{2-}	1000	phthalate)	150 [2]
CN^-	1000	Mn^{2+}	1000	Zn^{2+}	1000	Na-acetate	1 %
Cr^{3+}	1000	NH_4^+	1000			NaCl	5 %
$Cr_2O_7^{2-}$	**5**	Ni^{2+}	500			$NaNO_3$	10 %
Cu^{2+}	250	NO_2^-	1000			Na_2SO_4	10 %

Reducing agents interfere with the determination.

[1] tested with nonionic, cationic, and anionic surfactants

[2] **A higher COD may impair the efficacy of the digesting mixture in the determination of total phosphorus and thus result in false-low readings. Up to a maximum of 300 mg/l COD, this can be avoided by adding 2 doses of reagent P-1K instead of 1.**

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 P-1K
1 bottle of reagent P-2K
1 bottle of reagent P-3K
25 reaction cells
1 green dose-metering cap
1 blue dose-metering cap
1 sheet of round stickers for numbering the cells

Other reagents and accessories:
Pipette for a pipetting volume of 5.0 ml

6. Procedure

Pretreated sample (10 - 35 °C)	5.0 ml	Pipette into a reaction cell and mix or - after digestion for total phosphorus - shake the tightly closed cell vigorously after cooling.
Reagent P-2K [1]	5 drops [2]	Add, close the cell tightly, and mix.
Reagent P-3K [1]	1 dose	Add, close the cell tightly, and shake vigorously until the reagent is completely dissolved.
Leave to stand for 5 min (reaction time), then measure the sample in the photometer.		

[1] In the case of high chloride contents, it is recommended to switch the sequence of the reagents P-2K and P-3K.

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

Notes on the measurement:

- 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 0.80 - 0.95.
- The color of the measurement solution remains stable for at least 60 min after the end of the reaction time stated above.

7. Notes

- Reclose the reagent bottles immediately after use.

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