1.14449.0001

MColortest™

Phosphate Test

P

for the determination of orthophosphate

1. Method

Determination with color-card comparator
In sulfuric solution orthophosphate ions react with ammonium vanadate and ammonium heptamolybdate to form orange-yellow molybdovanadophosphoric acid. The phosphate 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 [1]	Number of determinations
1.0 - 2.0 - 3.5 - 6.0 - 10 - 20 - **40** **mg/l PO_4-P**	190
3.1 - 6.1 - 11 - 18 - 31 - 61 - **123** **mg/l PO_4^{3-}**	
2.3 - 4.6 - 8.0 - 14 - 23 - 46 - **92** **mg/l P_2O_5**	

[1] for conversion factors see section 8

3. Applications

This test measures only orthophosphate.

Sample material:
Groundwater and surface water, seawater
Drinking water and mineral water
Waters from aquaculture
Industrial water
Boiler water
Process water
Wastewater
Electroplating wastewater
Nutrient solutions for fertilization
Soils after appropriate sample pretreatment

4. Influence of foreign substances

This was checked in solutions containing 20 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 %							
AsO_4^{3-}	50	Cu^{2+}	1000	Ni^{2+}	100	NaCl	20 %
Ca^{2+}	1000	**Fe^{3+}**	**10**	NO_2^-	1000	$NaNO_3$	20 %
Cd^{2+}	1000	Hg^{2+}	1000	**Pb^{2+}**	**10**	Na_2SO_4	20 %
CN^-	1000	Mg^{2+}	1000	**S^{2-}**	**10**		
Cr^{3+}	50	Mn^{2+}	1000	SiO_3^{2-}	100		
$Cr_2O_7^{2-}$	**5**	NH_4^+	1000	Zn^{2+}	1000		

5. Reagents and auxiliaries

Please note the warnings on the packaging materials!

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

Package contents:
1 bottle of reagent PO_4-1
1 graduated 12-ml plastic syringe
1 graduated 3-ml plastic syringe
2 test tubes with screw caps (in comparator block)
1 color card

Other reagents:
MQuant™ Phosphate Test, Cat. No. 110428,
measuring range 10 - 500 mg/l PO_4^{3-} (3.3 - 163 mg/l PO_4-P)
MColorpHast™ Universal indicator strips pH 0 - 14, Cat. No. 109535
Sulfuric acid 0.5 mol/l TitriPUR®, Cat. No. 109072
Phosphate standard solution CertiPUR®, 1000 mg/l PO_4^{3-}, Cat. No. 119898
Hydrochloric acid 25 % for analysis EMSURE®, Cat. No. 100316

Refill pack:
Cat. No. 118466
Phosphate Test
Refill pack for 118388 and 114449
(Reagent **without technical accessories** for the number of determinations stated in section 2)

6. Preparation

- Use only phosphate-free detergents to rinse test tubes and syringes. Otherwise fill with hydrochloric acid (approx. 10 %) and leave to stand for several hours.
- Analyze immediately after sampling.
- Check the phosphate content with the MQuant™ Phosphate Test. Samples containing more than 123 mg/l PO_4^{3-} (40 mg/l PO_4-P) must be diluted with distilled water.
- **The pH must be within the range 0 - 10.** Adjust, if necessary, with sulfuric acid.
- Filter turbid samples.

7. Procedure

Open the box and set up with both test tubes **on the left**.

Slide the comparator block all the way to the left, so that the end holding the test tubes protrudes laterally over the bottom part of the box.

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**)	10 ml	10 ml	Inject into the test tube with the syringe.
Reagent PO_4-1	1.2 ml	-	Add with the syringe, close the tube, and mix.

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 PO_4-P or PO_4^{3-} from the color card at the lower right-hand edge of the comparator block within the bottom part of the box.

Notes on the measurement:

- The color of the measurement solution remains stable for at least 60 min.
- 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 40 mg/l PO_4-P 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-P	mg/l PO_4^{3-}	mg/l P_2O_5
1 mg/l PO_4-P	1	3.07	2.29
1 mg/l PO_4^{3-}	0.326	1	0.747
1 mg/l P_2O_5	0.436	1.34	1

9. Method control

To check test reagent, measurement device, and handling:
Dilute the phosphate standard solution with distilled water to 6.0 mg/l PO_4-P (18 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 immediately after use.
- **Information on disposal can be obtained at www.disposal-test-kits.com.**

Merck KGaA, 64271 Darmstadt, Germany,
Tel. +49(0)6151 72-2440
www.analytical-test-kits.com

EMD Millipore Corporation, 290 Concord Road,
Billerica, MA 01821, USA, Tel. +1-978-715-4321