

TUBETESTS® TOTAL PHOSPHORUS/12

TEST FOR PHOSPHATE COMPOUNDS
IN NATURAL AND WASTE WATER

Photometer Method

**AUTOMATIC
WAVELENGTH
SELECTION**

0 – 12 mg/l P

Total Phosphorus is composed of orthophosphates, polyphosphates and organic phosphorus compounds. Ortho and polyphosphates are extensively used in detergent formulations and washing powders. Phosphates also find widespread application in the food processing industry and in industrial water treatment processes. Agricultural fertilisers normally contain phosphate minerals. Phosphates also arise from the breakdown of plant materials and are found in animal wastes. Organic phosphate compounds are used in industrial and water treatment applications; and arise from certain manufacturing processes.

Phosphorus compounds can therefore enter water courses through a variety of routes - particularly domestic and industrial effluents and run-off from agricultural land. Phosphates are associated with eutrophication of water and with rapid unwanted plant growth in rivers and lakes.

The Total Phosphorus test is a vital test for assessing the quality of effluents and waste water prior to discharge. In the UK the Urban Waste Water Treatment Regulations make provision for the control of discharge of total phosphorus to sensitive bodies of natural waste water. The monitoring of the rate of phosphorus removal is therefore of great importance in waste water treatment. The Palintest Tubetests Total Phosphorus Test provides a simple method of measuring total phosphorus compounds over the range 0 – 12 mg/l P.

Method

The Palintest Tubetests Total Phosphorus/12 test is a simple two-stage procedure. The sample is first digested with acid persulphate to break down polyphosphates and organic phosphorus compounds and convert them to orthophosphate. The resulting orthophosphate, together with that originally present in the sample, is then determined by reaction with ammonium molybdate and ascorbic acid to form the intensely coloured 'molybdenum blue' complex. In this way, the total phosphorus content of the sample can be determined. A catalyst is incorporated to ensure complete and rapid colour development, and an inhibitor is used to prevent interference from silica.

The intensity of the colour produced in the test is proportional to the total phosphorus concentration, and is measured using a Palintest Photometer.

Reagents and Equipment - Digestion Stage

Palintest Tubetests Total Phosphorus/12 Tubes

Palintest Digest Ox Tablets

Palintest Tubetests Heater Palintest Pipettor, 2 ml (PT 572)

Reagents and Equipment - Colour Development Stage

Palintest Tubetests PhosNeut Solution

Palintest Tubetests Phos No 1 Tablets

Palintest Tubetests Phos No 2 Tablets

Palintest Automatic Wavelength Selection Photometer

Test Instructions - Digestion Stage

- 1 Turn on Tubetests Heater, set the control to 100 - 105°C (212 - 221°F) and allow to heat up to temperature.
- 2 Remove the cap of the Tubetests Total Phosphorus/12 Tube and add 2.0 ml of sample using a pipettor.
- 3 Add two Digest Ox tablets, crush and mix to dissolve.
- 4 Replace the cap tightly and invert tube gently to mix. Label the tube and place in the Tubetests heater. Ensure the safety screen is in position.
- 5 Digest the tube for one hour (minimum 45 minutes) then turn off the heater unless it is required for further tests.
- 6 Carefully remove the tube, transfer to a test tube rack and allow to cool to room temperature.

Test Instructions - Colour Development Stage

- 1 Carefully remove the cap from the cooled tube and add 2.0 ml of PhosNeut Solution using a pipettor.
 - 2 Add one Tubetests Phos No 1 tablet, and crush and mix to dissolve. Ensure all particles of the tablet have dissolved.
 - 3 Add one Tubetests Phos No 2 tablet, crush and mix to dissolve. Cap tube and gently invert several times to mix.
 - 4 Stand tube for 10 minutes to allow colour development.
 - 5 Select Phot 92 on Photometer.
 - 6 Take the photometer reading in usual manner (see Photometer instructions). Use an unused Tubetests Total Phosphorus/12 Tube to set the blank on the photometer. Alternatively, a Tubetests tube containing deionised water only may be used.
 - 7 The result is displayed as mg/l P.
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