Phosphate 3

Range(s): 0-3.00 ppm PO_4^{3-}, 0-0.98 ppm P, 0-2.24 ppm P_2O_5
20-3000 ppb PO_4^{3-}, 0-980 ppb P, 0-2240 ppb P_2O_5

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Procedure

Note: When testing multiple samples simultaneously, a separate sample cell with an unreacted sample of the water tested must be used to zero the colorimeter. Please note that varying the test procedure from the original can affect the precision of the test.

Note: Glassware that has not been properly cleaned may contaminate the sample and affect test results. Clean glassware thoroughly before use with phosphate-free detergent (available in local stores); then rinse with Hydrochloric Acid 3N (R-0737) followed by DI Water (R-0833) or sample water.

Note: Turbidity in sample may cause inaccurate results. If source water is turbid, filtration is recommended. Boiler water should be filtered for turbidity prior to testing.

1. Turn on the Colorimeter.
2. For results to be displayed in terms of ppm, select a test menu (ALL TESTS, RECENT TESTS, or FAVORITES) containing Phosphate 3 using ◀▶.
   For results to be displayed in terms of ppb, select a test menu (ALL TESTS, RECENT TESTS, or FAVORITES) containing Phosphate 3000 using ◀▶.
3. Select the appropriate test (Phosphate 3 or Phosphate 3000) using ▲▼; then press ENTER ⊙.
4. Select a chemical form (PO_4, P, or P_2O_5) for expression of test results using ▲▼.
5. Rinse and fill 25 mm sample cell to 10 mL mark with sample; then cap.
6. Insert sample cell into sample cell compartment. Align marks per User's Manual.
7. Select ZERO using ◀▶; then press ENTER ⊙. Zero will be displayed.
8. Remove sample cell from sample cell compartment; then remove cap.
9. Add 1 mL Phosphate 3 - Reagent A; then swirl to mix.
10. Using the 0.05 g dipper spoon, add 1 level dipper Phosphate 3 - Reagent B; then cap and swirl to mix for 30 seconds.
11. Insert sample cell into sample cell compartment. Align marks.
12. Select TIMER using ◀▶; then press ENTER ⊙.
13. Select START using ◀▶; then press ENTER ⊙. (A 5-minute [05:00] countdown will begin.) Immediately select AUTO using ◀▶; then press ENTER ⊙.
14. When the timer beeps, the instrument will read the sample and the result will be displayed.

Interferences

Arsenate, all levels – positive interference
Biguanide (as product) > 20 ppm – negative interference
Nitrite > 250 ppm – negative interference

The following analytes were tested to the levels listed and found not to cause any interference up to the specified values:

Alkalinity, Total ($CaCO_3$) – 500 ppm
Azole (BT) – 5 ppm
Azole (TT) – 5 ppm
Chloride – 3600 ppm
Copper – 5 ppm
Fluoride – 10 ppm
Hardness, Calcium ($CaCO_3$) – 1000 ppm
Iron, Ferric – 10 ppm
Iron, Ferrous – 10 ppm
Molybdenum – 10 ppm
Nitrate – 2000 ppm
Phosphonate (HEDP) – 20 ppm
Polymer – 20 ppm
Silica – 150 ppm
Sulfate – 1000 ppm
Sulfite – 100 ppm
Zinc – 10 ppm

(over)

Test Method

Molybdenum Blue

Under acidic conditions, phosphate reacts with ammonium molybdate producing a heteropoly acid, which is then reduced with ascorbic acid to produce an intense blue color proportional to the concentration of phosphate in a sample.

Estimated Detection Limit

0.02 ppm PO_4^{3-} (20 ppb PO_4^{3-})

Precision

Using two lots of reagent and a standard solution of 1.5 ppm PO_4^{3-} (1500 ppb PO_4^{3-}), an individual analyst obtained a standard deviation with the instrument of ± 0.01 ppm PO_4^{3-} (10 ppb PO_4^{3-}).

Application

Industrial Water, Potable Water, Recreational Water, and Wastewater

Ordering Info

Reagent Pack

K-8005 Phosphate 3

Formulated for exclusive use with Taylor's TTi® Colorimeter.

Reagent Pack Components

R-8005A Phosphate 3 - Reagent A

R-8005B Phosphate 3 - Reagent B

Optional Reagents & Accessories

R-0737 Hydrochloric Acid 3N

R-0833 DI Water

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31 Loveton Circle, Sparks, MD 21152 U.S.A.
800-TEST KIT (837-8548) • 410-472-4340
customerservice@taylortechnologies.com