



AUXILIARY PHOSPHORUS KIT

CODE 7884

QUANTITY	CONTENTS	CODE
60 mL	*Sulfuric Acid, 36%	*7885-H
15 mL	*Phenolphthalein Indicator, 1%	*2246-E
120 mL	*Sodium Hydroxide, 15%	*7886-J
30 g	*Ammonium Persulfate Reagent	*6566-G
120 mL	Deionized Water	5115PT-J
10 g	Boiling Stones	7888-D
2	Pipets, 1 mL, plastic	0354
1	Spoon, 0.5 g, plastic	0698
1	Funnel	0459
2	Erlenmeyer Flasks, 125 mL, glass	0431
1	Filter paper, 100 sheets	0463
1	Graduated Cylinder, 50 mL, glass	0418

*WARNING: Reagents marked with an * are considered to be potential health hazards. To view or print a Safety Data Sheet (SDS) for these reagents go to www.lamotte.com. Search the four digit reagent code number listed on the reagent label, in the contents list or in the test procedures. Omit any letter that follows or precedes the four digit code number. For example, if the code is 4450WT-H, search 4450. To obtain a printed copy, contact LaMotte by e-mail, phone or fax.

Emergency information for all LaMotte reagents is available from Chem-Tel: (US, 1-800-255-3924) (International, call collect, 813-248-0585)

To order individual reagents or test kit components, use the specified code number.

All phosphorus determinations measure orthophosphate only. To determine other forms of phosphorus in a sample, they must be separated and converted to orthophosphate. The Auxiliary Phosphorus test equipment is required to effect these separations and must be used in conjunction with one of the standard phosphorus test kits such as Dual Range Phosphate Kit (1-100 ppm PO_4^{3-} , Code 4408-01), or Low Range Phosphate Kit (0.05-1.0 ppm PO_4^{3-} , Code 7416-02).

WARNING! This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

INTRODUCTION

The determination of orthophosphate (A), is made by testing a filtered water sample. The determination of hydrolyzable phosphorus (polyphosphate) and orthophosphate is made by testing a filtered water sample which has been treated with a sulfuric acid digestion. This converts hydrolyzable phosphorus (polyphosphate) to orthophosphates. This determination (B) minus the orthophosphate determination (A) will give the hydrolyzable or polyphosphate concentration.

$$\mathbf{A = Orthophosphate}$$

$$\mathbf{B = Hydrolyzable Phosphorus + Orthophosphate}$$

$$\mathbf{Hydrolyzable Phosphorus = B - A}$$

The determination of total phosphorus (C) is made by testing a filtered water sample which has been treated with a sulfuric acid/ammonium persulfate digestion. This converts organic phosphorus and hydrolyzable phosphorus to orthophosphates.

$$\mathbf{C = Total Phosphorus}$$

$$\mathbf{Organic Phosphorus = C - B}$$

The determination of particulate phosphorus and total phosphorus is made by determining total phosphorus on an unfiltered water sample.

All of the comparator readings are given as PO_4^{-3} . To convert this to phosphorus, multiply by the factor 0.326.

PROCEDURE

A. ORTHOPHOSPHATE

Filter the sample and test it for orthophosphate according to the procedure given for the particular phosphate test kit being used. This is reading A.

$$\mathbf{Orthophosphate = Reading A}$$

B. HYDROLYZABLE PHOSPHORUS (POLYPHOSPHATES) & ORTHOPHOSPHATES

1. Fill a 50 mL graduated cylinder (0418) to 50 mL line with filtered water. Pour into a 125 mL Erlenmeyer flask.
2. Use a 1 mL pipet (0354) to add 1 mL of *Sulfuric Acid, 36% (7885) to flask. Swirl to mix.
3. Add a few boiling stones (7888). Place flask on hot plate and boil gently for 30 minutes. Add Deionized Water (5115PT) to the sample during the boiling step to maintain a volume between 10 and 50 mL. Or microwave on high power for 2 minutes. Permit the volume to decrease to approximately 10 mL (about ¼ inch of water) by the end of the boiling step. Do not allow the sample to go to dryness or to dense white sulfur trioxide fumes. Remove from heat and cool.
4. Add one drop of *Phenolphthalein Indicator, 1% (2246) to the cooled sample.
5. While swirling flask, use a 1 mL pipet (0354) to add *Sodium Hydroxide, 15% (7886) dropwise until the solution turns faint pink. A volume of slightly less than 3 mL is required.

6. While swirling flask, add *Sulfuric Acid, 36% (7885), one drop at a time, until pink color disappears.
7. Quantitatively transfer the sample, which should be at room temperature, to the 50 mL graduated cylinder (0418). After transferring the solution from the flask to the graduated cylinder, wash the flask with a little Deionized Water (5115PT) and add to the solution in the graduated cylinder. Now dilute exactly to 50 mL using Deionized Water (5115PT) and mix well.
8. Test the solution, from Step 7, for orthophosphate according to the procedure given for the particular test outfit being used. This is Reading B. Reading B represents hydrolyzable phosphorus (polyphosphates) and orthophosphates.

Hydrolyzable Phosphorus = Reading B - Reading A

C. TOTAL PHOSPHORUS

1. Fill a 50 mL graduated cylinder (0418) to 50 mL line with filtered water. Pour into a 125 mL Erlenmeyer flask.
2. Use a 1 mL pipet (0354) to add 1 mL of *Sulfuric Acid, 36% (7885) to flask. Swirl to mix.
3. Use the 0.5 g spoon (0698) to add one measure of *Ammonium Persulfate Reagent (6566). Swirl to dissolve.
4. Add a few boiling stones (7888). Place flask on hot plate and boil gently for 30 minutes. Add Deionized Water (5115PT) to the sample during the boiling step to maintain a volume between 10 and 50 mL. Or microwave on high power for 2 minutes. Permit the volume to decrease to approximately 10 mL (about ¼ inch of water) by the end of the boiling step but do not allow the sample to go to dryness or to dense white sulfur trioxide fumes. Remove from heat and cool.
5. Add one drop of *Phenolphthalein Indicator, 1% (2246) to the cooled sample.
6. While swirling flask, use a 1 mL pipet (0354) to add *Sodium Hydroxide (7886) dropwise until the solution turns faint pink. A volume of slightly less than 3 mL is required.
7. While swirling flask, add *Sulfuric Acid, 36% (7885), one drop at a time, until pink color disappears.
8. Quantitatively transfer the sample, which should be at room temperature, to the 50 mL graduated cylinder (0418). After transferring the solution from the flask to the graduated cylinder, wash the flask with a little Deionized Water (5115PT) and add to the solution in the graduated cylinder. Now dilute exactly to 50 mL using Deionized Water (5115PT) and mix well.
9. Test the solution, from Step 8, for orthophosphate according to the procedure given for the particular test outfit being used. This is Reading C.

Reading C represents the total recoverable phosphorus including organic phosphorus, but excluding particulate phosphorus.

Organic Phosphorus = Reading C - Reading B

D. PARTICULATE PHOSPHORUS

Follow the procedure for total phosphorus but do not filter the sample. This is Reading D. Reading D represents particulate phosphorus.

Particulate Phosphorus = Reading D - Reading C

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