Assay Not less than 99.0% and not more than 100.5% of $Na_2S_2O_3$ after drying.
Lead Not more than 2 mg/kg.
Selenium Not more than 0.003%.
Water Between 32.0% and 37.0%.

TESTS

Assay Accurately weigh about 500 mg of the dried sample obtained in the test for *Water* (below), dissolve it in 30 mL of water, and titrate with 0.1 *N* iodine, using starch TS as the indicator. Each milliliter of 0.1 *N* iodine is equivalent to 15.81 mg of $Na_2S_2O_3$.
Lead Determine as directed in the *APDC Extraction Method* under *Lead Limit Test*, Appendix IIIB.
Selenium Determine as directed in *Method I* under *Selenium Limit Test*, Appendix IIIB, using a 200-mg sample.
Water Dry about 1 g of sample, accurately weighed, in a vacuum at 40° to 45° for 16 h, cool, and weigh.

Packaging and Storage Store in tight containers.

Sodium Trimetaphosphate

$(NaPO_3)_3$ Formula wt 305.89

CAS: [7785-84-4]

DESCRIPTION

Sodium Trimetaphosphate occurs as white crystals or as a white, crystalline powder. It is a cyclic polyphosphate composed of three metaphosphate units. It is freely soluble in water. The pH of a 1:100 aqueous solution is about 6.0.

Function Starch-modifying agent.

REQUIREMENTS

Identification

A. A 1:20 aqueous solution gives positive tests for *Sodium*, Appendix IIIA.

B. Dissolve about 100 mg of sample in 5 mL of hot 1.7 *N* nitric acid, warm on a steam bath for 10 min, and cool. Neutralize to litmus paper with 1 *N* sodium hydroxide, and add silver nitrate TS. A yellow precipitate forms that is soluble in 1.7 *N* nitric acid.
Assay Between 68.0% and 70.0% of P_2O_5.
Arsenic Not more than 3 mg/kg.
Fluoride Not more than 0.005%.
Insoluble Substances Not more than 0.1%.
Lead Not more than 4 mg/kg.

TESTS

Assay Transfer about 800 mg of sample, accurately weighed, into a 400-mL beaker, add 100 mL of water and 25 mL of nitric acid, cover with a watch glass, and boil for 10 min on a hot plate. Rinse any condensate from the watch glass into the beaker, cool the solution to room temperature, transfer it quantitatively to a 500-mL volumetric flask, dilute to volume with water, and mix thoroughly. Pipet 20.0 mL of this solution into a 500-mL Erlenmeyer flask, add 100 mL of water, and heat just to boiling. While stirring, add 50 mL of quimociac TS, then cover with a watch glass, and boil for 1 min in a well-ventilated hood. Cool to room temperature, swirling occasionally while cooling, then filter through a tared, sintered-glass filter crucible of medium porosity, and wash the precipitate with five 25-mL portions of water. Dry the precipitate at about 225° for 30 min, cool, and weigh. Each milligram of precipitate thus obtained is equivalent to 32.074 μg of P_2O_5.
Arsenic Determine as directed under *Arsenic Limit Test*, Appendix IIIB, using a solution of 1 g of sample in 35 mL of water.
Fluoride Determine as directed in *Method IV* under *Fluoride Limit Test*, Appendix IIIB, using a 2-g sample.
Insoluble Substances Dissolve 10 g of sample in 100 mL of hot water, and filter the solution through a tared filtering crucible. Wash the insoluble residue with hot water, dry at 105° for 2 h, cool, and weigh.
Lead Determine as directed in the *APDC Extraction Method* under *Lead Limit Test*, Appendix IIIB.

Packaging and Storage Store in tight containers.

Sodium Tripolyphosphate

Pentasodium Triphosphate; Triphosphate; Sodium Triphosphate

$Na_5P_3O_{10}$ Formula wt, anhydrous 367.86
$Na_5P_3O_{10}·6H_2O$ Formula wt, hexahydrate 475.96

INS: 451(i) CAS: anhydrous [7758-29-4]
CAS: hexahydrate [15091-98-2]

DESCRIPTION

Sodium Tripolyphosphate occurs as white, slightly hygroscopic granules, or as a powder. It is anhydrous or contains six molecules of water of hydration. It is freely soluble in water, but insoluble in alcohol. The pH of a 1:100 aqueous solution is about 9.5.

Function Emulsifier; sequestrant.

REQUIREMENTS

Identification

A. A 1:20 aqueous solution gives positive tests for *Sodium*, Appendix IIIA.

B. Add a few drops of silver nitrate TS to 1 mL of a 1:100 aqueous solution. A white precipitate forms that is soluble in 1.7 *N* nitric acid.

Assay *Anhydrous*: Not less than 85.0% of $Na_5P_3O_{10}$; *Hexahydrate*: Not less than 65.0% of $Na_5P_3O_{10}$.

Arsenic Not more than 3 mg/kg.

Fluoride Not more than 0.005%.

Insoluble Substances Not more than 0.1%.

Lead Not more than 2 mg/kg.

TESTS

Assay

Potassium Acetate Buffer (pH 5.0) Dissolve 78.5 g of potassium acetate in 1000 mL of water, and adjust the pH of the solution to 5.0 with glacial acetic acid. Add a few milligrams of mercuric iodide to inhibit mold growth.

0.3 M *Potassium Chloride Solution* Dissolve 22.35 g of potassium chloride in water, add 5 mL of *Potassium Acetate Buffer*, dilute to 1000 mL with water, and mix. Add a few milligrams of mercuric iodide to inhibit mold growth.

0.6 M *Potassium Chloride Solution* Dissolve 44.7 g of potassium chloride in water, add 5 mL of *Potassium Acetate Buffer*, dilute to 1000 mL with water, and mix. Add a few milligrams of mercuric iodide to inhibit mold growth.

1 M *Potassium Chloride Solution* Dissolve 74.5 g of potassium chloride in water, add 5 mL of *Potassium Acetate Buffer*, dilute to 1000 mL with water, and mix. Add a few milligrams of mercuric iodide to inhibit mold growth.

Chromatographic Column Use a standard chromatographic column, 20- to 40-cm long with a 20- to 28-mm id that has a sealed-in, coarse-porosity, fritted disk. If a stopcock is not provided, attach a stopcock having a 3- to 4-mm diameter bore to the outlet of the column with a short length of flexible vinyl tubing.

Procedure Close the column stopcock, fill the space between the fritted disk and the stopcock with water, and connect a vacuum line to the stopcock. Prepare a 1:1 water slurry of Dowex 1 × 8, chloride form, 100- to 200- or 200- to 400-mesh, or a comparable grade of styrene–divinylbenzene ion exchange resin, and decant off any very fine particles and any foam. Do this two or three times or until no more finely suspended material or foaming is observed. Fill the column with the slurry, and open the stopcock to allow the vacuum to pack the resin bed until the water level is slightly above the top of the resin, then immediately close the stopcock. Do not allow the liquid level to fall below the resin level at any time. Repeat this procedure until the packed resin column is 15 cm above the fritted disk. Place one circle of tightly fitting glass-fiber filter paper on top of the resin bed, then place a perforated polyethylene disk on top of the paper. Alternatively, place a loosely packed plug of glass wool on top of the bed. Close the top of the column with a rubber stopper in which a 7.6-cm length of capillary tubing (1.5-mm id, 7-mm od), or equivalent, has been inserted through the center, so that about 12 mm of the tubing extends through the bottom of the stopper. Connect the top of the capillary tubing to the stem of a 500-mL separator with flexible vinyl tubing, and clamp the separator to a ring stand above the column. Wash the column by adding 100 mL of water to the separator with all stopcocks closed. First open the separator stopcock, then open the column stopcock. The rate of flow should be about 5 mL/min. When the separator is empty, close the column stopcock, then close the separator stopcock.

Transfer about 500 mg of sample, accurately weighed, into a 250-mL volumetric flask, dissolve in and dilute to volume with water, and mix. Transfer 10.0 mL of this solution into the separator, open both stopcocks, and allow the solution to drain into the column, rinsing the separator with 20 mL of water. Discard the eluate.

Add 370 mL of *0.3* M *Potassium Chloride Solution* to the separator, and allow this solution to pass through the column, discarding the eluate. Add 250 mL of *0.6* M *Potassium Chloride Solution* to the column, allow the solution to pass through the column, and receive the eluate in a 400-mL beaker. (To ensure a clean column for the next run, pass 100 mL of *1* M *Potassium Chloride Solution* through the column, and then follow with 100 mL of water. Discard all washings.) Add 15 mL of nitric acid to the beaker, mix, and boil for 15 to 20 min. Add methyl orange TS, and neutralize the solution with ammonium hydroxide. Add 1 g of ammonium nitrate crystals, stir to dissolve, and cool. While stirring, add 15 mL of ammonium molybdate TS, and stir vigorously for 3 min, or allow to stand with occasional stirring for 10 to 15 min. Filter the contents of the beaker by means of suction through a 6- to 7-mm paper-pulp filter pad supported in a 25-mm porcelain disk. The filter pad should be covered with a suspension of infusorial earth. After the contents of the beaker have been transferred to the filter, wash the beaker with five 10-mL portions of a 1:100 aqueous solution of sodium or potassium nitrate, passing the washings through the filter, then wash the filter with five 5-mL portions of the wash solution. Return the filter pad and the precipitate to the beaker, wash the funnel thoroughly with water into the beaker, and dilute to about 150 mL. Add 0.1 *N* sodium hydroxide from a buret until the yellow precipitate is dissolved, then add 5 to 8 mL in excess. Add phenolphthalein TS, and titrate the excess alkali with 0.1 *N* nitric acid. Finally, titrate with 0.1 *N* sodium hydroxide to the first appearance of a pink color. The difference between the total volume of 0.1 *N* sodium hydroxide added and the volume of nitric acid required represents the volume, *V*, in milliliters, of 0.1 *N* sodium hydroxide consumed by the phosphomolybdate complex. Calculate the quantity, in milligrams, of $Na_5P_3O_{10}$ in the sample taken by the formula

$$0.533 \times 25V.$$

Arsenic Determine as directed under *Arsenic Limit Test*, Appendix IIIB, using a solution of 1 g of sample in 35 mL of water.

Fluoride Determine as directed in *Method IV* under *Fluoride Limit Test*, Appendix IIIB, using a 2-g sample.

Insoluble Substances Dissolve 10 g of sample in 100 mL of hot water, and filter the solution through a tared filtering crucible. Wash the insoluble residue with hot water, dry at 105° for 2 h, cool, and weigh.

Lead Determine as directed in the *APDC Extraction Method* under *Lead Limit Test*, Appendix IIIB.

Packaging and Storage Store in tight containers.

Solin Oil

Low Linolenic Acid Flaxseed Oil (Unhydrogenated); Low Linolenic Acid Linseed Oil

DESCRIPTION

Solin Oil occurs as a light yellow oil. It is obtained from the seed of certain varieties of the flaxseed plant *Linum usitatissimum* L. (Fam. Linaceae) by mechanical expression and/or solvent extraction, differing from linseed oil in having a linolenic acid (C18:3) content of less than 5%. The oil is refined, bleached, and deodorized to remove free fatty acids, phospholipids, color, odor and flavor components, and miscellaneous non-oil materials. It is liquid and free from visible foreign material at 21° to 27°, but traces of wax may cause the oil to cloud at refrigeration temperatures (2° to 5°) unless removed by winterization.

Function Coating agent; texturizer.

REQUIREMENTS

Identification Solin Oil exhibits the following composition profile of fatty acids as determined under *Fatty Acid Composition*, Appendix VII.

Fatty Acid:	<14:0	14:0	16:0	16:1	18:0	18:1	18:2
Weight % (Range):	<0.1	<0.5	2–9	<0.5	2–5	8–60	40–80
Fatty Acid:	18:3	20:0	20:1	22:0	22:1	24:0	
Weight % (Range):	<5.0	<0.3	<0.3	<0.3	<0.2	<0.2	

Cold Test Passes test.
Color (AOCS-Wesson) Not more than 5.0 red.
Free Fatty Acids (as oleic acid) Not more than 0.1%.
Iodine Value Between 100 and 160.
Lead Not more than 0.1 mg/kg.
Linolenic Acid Not more than 5.0%.
Peroxide Value Not more than 10 meq/kg.
Unsaponifiable Matter Not more than 1.5%.
Water Not more 0.1%.

TESTS

Cold Test Determine as directed under *Cold Test*, Appendix VII.
Color (AOCS-Wesson) Determine as directed under *Color (AOCS-Wesson)*, Appendix VII.
Free Fatty Acids (as oleic acid) Determine as directed under *Free Fatty Acids*, Appendix VII, using the following equivalence factor (*e*) in the formula given in the procedure:

Free fatty acids as oleic acid, e = 28.2.

Iodine Value Determine as directed under *Iodine Value*, Appendix VII.
Lead Determine as directed for *Method II* in the *Atomic Absorption Spectrophotometric Graphite Furnace Method* under *Lead Limit Test*, Appendix IIIB.
Linolenic Acid Determine as directed under *Fatty Acid Composition*, Appendix VII.
Peroxide Value Determine as directed in *Method II* under *Peroxide Value*, Appendix VII.
Unsaponifiable Matter Determine as directed under *Unsaponifiable Matter*, Appendix VII.
Water Determine as directed under *Water Determination*, Appendix IIB. However, in place of 35 to 40 mL of methanol, use 50 mL of chloroform to dissolve the sample.

Packaging and Storage Store in tightly closed containers blanketed in an inert gas.

Sorbic Acid

2,4-Hexadienoic Acid

$$CH_3CH{=}CHCH{=}CHCOOH$$

$C_6H_8O_2$ Formula wt 112.13

INS: 200 CAS: [110-44-1]

DESCRIPTION

Sorbic Acid occurs as colorless needles or as a white to off white, free-flowing powder. It is slightly soluble in water. One gram dissolves in about 10 mL of ethanol and in about 20 mL of ether.

Function Preservative; mold inhibitor.

REQUIREMENTS

Identification

A. Add a few drops of bromine TS to 2 mL of a 1:10 solution in alcohol. The color disappears.

B. A 1:400,000 solution in isopropanol exhibits an absorbance maximum at 254 ± 2 nm.

Assay Not less than 99.0% and not more than 101.0% of $C_6H_8O_2$, calculated on the anhydrous basis.
Lead Not more than 2 mg/kg.
Melting Range Between 132° and 135°.
Residue on Ignition Not more than 0.2%.
Water Not more than 0.5%.

TESTS

Assay Dissolve about 250 mg of sample, accurately weighed, in 50 mL of anhydrous methanol that previously