Sodium Tripolyphosphate
Pentasodium Triphosphate; Triphosphate; Sodium Triphosphate

$\text{Na}_5\text{P}_3\text{O}_{10}$
Formula wt 367.86

INS: 451(i) CAS: [7758-29-4]

DESCRIPTION

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

Functional Use in Foods  Texturizer; sequestrant.

REQUIREMENTS

Identification
A. A 1 in 20 solution gives positive tests for Sodium, Appendix IIIA.
B. To 1 mL of a 1 in 100 solution add a few drops of silver nitrate TS. A white precipitate is formed that is soluble in 1.7 N nitric acid.

Assay
Anhydrous: not less than 85.0% of $\text{Na}_5\text{P}_3\text{O}_{10}$; hexahydrate: not less than 65.0% of $\text{Na}_5\text{P}_3\text{O}_{10}$.

Arsenic (as As)  Not more than 3 mg/kg.
Fluoride  Not more than 0.005%.
Heavy Metals (as Pb)  Not more than 10 mg/kg.
Insoluble Substances  Not more than 0.1%.
Lead  Not more than $\frac{5}{2}$ 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 mg 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 with water to 1000 mL, and mix. Add a few mg of mercuric iodide.

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

and connect a vacuum line to the stopcock. Prepare a 1:1 water slurry of Dowex 1 mm diameter bore to the outlet of the column with a short length of flexible vinyl tubing. 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 mm diameter bore to the outlet of the column with a short length of flexible vinyl tubing. 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.

A solution of 1 g in 35 mL of water meets the requirements of the Arsenic Test, Appendix IIIB.

Fluoride Determine on a 2-g sample as directed in Method IV under the Fluoride Limit Test, Appendix IIIB, using Buffer Solution A and 0.1 mL of Fluoride Standard Solution.

Heavy Metals A solution of 2 g in 25 mL of water meets the requirements of the Heavy Metals Test, Appendix IIIB, using 20 µg of lead ion (Pb) in the control (Solution A).

Insoluble Substances Dissolve 10 g in 100 mL of hot water, and filter through a tared filtering crucible. Wash the insoluble residue with hot water, dry at 105° for 2 h, cool, and weigh.
A solution of 1 g in 20 mL of water meets the requirements of the Lead Limit Test, Appendix IIIB, using 5 µg of lead ion (Pb) in the control. A 10-g sample meets the requirements of the APDC Extraction Method for Lead, Appendix IIIB.

Packaging and Storage  Store in tight containers.