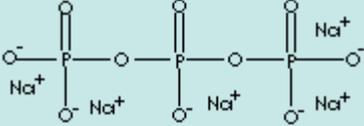


SODIUM TRIPOLYPHOSPHATE

PRODUCT IDENTIFICATION

CAS NO.	7758-29-4	
EINECS NO.	231-838-7	
FORMULA	Na ₅ P ₃ O ₁₀	
MOL WT.	367.86	
H.S. CODE	2835.31	
TOXICITY	Oral rat LD50: 3120 mg/kg	
SYNONYMS	Sodium triphosphate; Triphosphoric acid, pentasodium salt; Sodium Phosphate Tripoly; STPP; Tripolyphosphate de sodium; Pentasodium triphosphate; Pentasodium Tripolyphosphate; Natriumtripolyphosphat; Pentanatriumtriphosphat (German); Trifosfato de pentasodio (Spanish); Triphosphate de pentasodium (French);	
DERIVATION	Phosphoric acid with a sodium alkali (usually sodium carbonate)	

CLASSIFICATION

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	white powder
MELTING POINT	620 C (Decomposes)
BOILING POINT	
SPECIFIC GRAVITY	> 1.5
SOLUBILITY IN WATER	20% at 25 C
pH	9.7 - 9.8 (1% soln)
VAPOR DENSITY	
AUTOIGNITION	
NFPA RATINGS	
REFRACTIVE INDEX	
FLASH POINT	
STABILITY	Stable under ordinary conditions

APPLICATIONS

The alkaline phosphates offer detergency activity in combination with the properties of sequestration, dispersion and buffering ability. STPP is used in water softening, industrial cleaners, food uses, detergent, emulsifier of oil and grease, peptizing agent, deflocculating agent in oil well, sequester in cotton boiling.

SALES SPECIFICATION

H GRADE

APPEARANCE	free flowing white powder
PURITY	96.0% min
P ₂ O ₅	57.0% min
WATER INSOLUBLES	0.1% max
IRON as Fe	0.007% max
WHITENESS	90.0% min
HEAVY METAL as Pb	0.003% max
ARSENIC as As	0.001% max
pH VALUE	9.2 - 10.0

G GRADE

APPEARANCE	free flowing white powder
PURITY	90.0% min
P ₂ O ₅	56.0% min

WATER INSOLUBLES	0.1% max
IRON as Fe	0.002% max
WHITENESS	80.0% min
FOOD GRADE	
APPEARANCE	free flowing white powder
PURITY	95.0% min
P ₂ O ₅	57.0% min
WATER INSOLUBLES	0.05% max
WHITENESS	90.0% min
FLUORIDE as F	0.003% max
CHLORIDE as Cl	0.03% max
SULPHATE as SO ₄	0.4% max
HEAVY METAL as Pb	0.001% max
ARSENIC as As	0.0003% max
pH VALUE	9.5 - 10.0

TRANSPORTATION

PACKING	50kgs in bag
HAZARD CLASS	
UN NO.	

GENERAL DESCRIPTION OF PHOSPHORIC ACID

Phosphoric acid is a phosphorus-containing inorganic acid made up of phosphorus, oxygen, and hydrogen. In a broadened term, it includes the monomeric (orthophosphoric acid), dimeric (pyrophosphoric acid), and polymeric (metaphosphoric acid) forms of the acid. Phosphoric acid commonly indicates the monomeric form orthophosphoric acid. On heating to about 225 C, it dehydrates to form pyrophosphoric acid and to metaphosphoric acid ($2\text{HPO}_3 = \text{P}_2\text{O}_5 \cdot \text{H}_2\text{O}$) at higher temperatures. Pyrophosphates are salts of pyrophosphoric acid and metaphosphates are salts of metaphosphoric acid. Two molecules of orthophosphoric acid are formed when three molecules of water are added to one molecule of phosphorus pentoxide ($2\text{H}_3\text{PO}_4 = \text{P}_2\text{O}_5 \cdot 3\text{H}_2\text{O}$). The pyrophosphates are formed by the loss of 1 molecule of water from 2 moles of an orthophosphate. Pure orthophosphoric acid is a crystalline solid; melting point 42 C; soluble in alcohol, and very soluble in water. Phosphoric Acid violently polymerizes under the influence of azo compounds, epoxides and other polymerizable compounds. It forms toxic fumes of phosphorous oxides when combusted. It is a medium strong acid and attacks metals to release flammable hydrogen gas. Decomposition may occur on contacting with alcohols, aldehydes, cyanides, ketones, phenols, esters, sulfides, halogenated organics compounds.

Phosphoric acid is essential in the body organism as the constituent of bones and teeth as well as in many metabolic process of carbohydrate, fat and protein. Phosphoric acid is abundant in natural foods as the form of free phosphoric acid itself or as the mineral salts (potassium, sodium or calcium). Phosphoric acid is used to acidify foods and beverages. But the continuous and excessive absorption of beverages particularly Coca Cola and Pepsi Cola which contain large amount of phosphoric acid should be limited. Phosphate excretion takes place in the form of calcium phosphate. The excessive amounts of phosphoric acid in the body may cause calcium deficiency which causes poor teeth and weak bone density (osteoporosis). Phosphoric acid is used in pharmaceutical preparations as a solvent and as a gastric acidifier orally. Phosphoric acid is important raw material in industrial field. It is a tribasic acid (having three replaceable hydrogen atoms) which can forms phosphates with either one, two, or all three of the hydrogens by replacing with some other positive ion. It is used in making fertilizers, electrolytes, electroplating and derusting solutions. It is used in the manufacture of industrial cleaning products, other inorganic and organic phosphoric

chemicals, foundry resins, paints, enamels and refractory, antifreeze productions, and textile process materials. It is used in water treatment. Food grade phosphoric acid is used; as a acidulation in soft drink (particularly cola); ph control in imitation jellies; nutrient in production of yeast; bacteria growth control in selected processed foods; flocculating agent for clarification of sugar juices after liming process.

- Phosphorous acid: a diprotic acid which contains one hydrogen bonded directly to the central phosphorus atom and two hydrogens bonded to oxygen
- Phosphite: any salt, ester or anion of phosphorous acid
- Phosphate: any salt, ester or anion of phosphoric acid
- Phosphide: any binary compound of phosphorus with another element or radical
- Phosphine: binary compound of phosphorus with hydrogen or organic compounds derived from this

One of the important phosphates is calcium phosphate, $\text{Ca}_3(\text{PO}_4)_2$. The most important phosphorus fertilizer is monobasic calcium phosphate, called superphosphate $[\text{Ca}(\text{H}_2\text{PO}_4)_2]$, derived by treating rock phosphate with sulfuric acid (or phosphoric acid). Superphosphate is soluble in water and acts as a carrier of phosphorus needed by plants. Dibasic calcium phosphate (CaHPO_4) is used in pharmaceuticals, animal feeds, and toothpastes. Tribasic calcium phosphate, $[\text{Ca}_3(\text{PO}_4)_2]$ is used as a fertilizer and as a plastics stabilizer. Other important inorganic phosphates include ammonium phosphate $[(\text{NH}_4)_2\text{HPO}_4]$ used as a fertilizer and fire retardant; trisodium phosphate used in detergents and for softening water; mono and disodium phosphate used for dispersion, sequestration, scale inhibition and preparing baking powders. The salt forms of phosphate polymers is used as a sequestering agent. As phosphate polymers themselves are hydrated in water at high temperature or high pH, and thereby revert to a more simple and stable phosphate form, which can no longer sequester metal ions. Industrial phosphates are used in many applications including dispersion, sequestration and scale inhibition. Detergent application is important also, with products such as sodium tripolyphosphate being key ingredients in detergents. Phosphates are used in a wide range of food products to perform several functions like retention of natural fluids in the muscle that would otherwise be lost in the aging, cooking, or freeze-thaw processes. Polyphosphates also act in solubilization of myofibrillar proteins that aid in the binding of meat particles. Their presence results in stabilised texture, flavour, and colour.

Mono and dibasic phosphate esters produced by the reaction of either alcohols, alcohol ethoxylates or phenyl ethoxylates with polyphosphoric acid or phosphorous pentoxide are anionic surfactants which have the main feature of the stability in alkaline conditions over other surfactants. They have a wide range of properties including outstanding wetting, emulsification, lubrication, coupling activity and detergency. They exhibit the properties of anti-wear and corrosion inhibition either as free esters or in the forms of metal and amine salts. They are used in:

- Heavy duty alkaline cleaning products
- Laundry Detergents
- Emulsion polymerisation
- Textile auxiliaries
- Acid cleaners
- Metal working fluids
- Emulsifiers
- Wetters
- Dispersants

- Water based lubricants
- Intermediate for the synthesis of other anionic surfactants

Phosphoric acid alkyl esters are also used as alkylation agent for nitrogen heterocyclic compounds and as catalysts to produce phenolic and urea resins. They are used flame retarding plasticizers for cellulose esters, lacquers, plastic and vinyl resins as well as as dispersing agents in plastisols. They are used as solvents in liquid-liquid extractants or separation agent of metals. They are is used as heat exchange media and as pigment grinding assistants and antifoam agents.