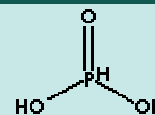


PHOSPHOROUS ACID

PRODUCT IDENTIFICATION

CAS NO.	13598-36-2
EINECS NO.	237-066-7
FORMULA	(HO) ₂ HPO
MOL WT.	82.00
HS CODE	2811.19
TOXICITY	Oral, rat LD50: 1895 mg/kg
SYNONYMS	Orthophosphorous acid; Dihydroxyphosphine oxide; Phosphorus; Trihydroxide; Trihydroxyphosphine; Phosphonsäure (Dutch); ácido fosfónico (Spanish); Acide phosphonique (French);



DERIVATION

CLASSIFICATION

GENERAL DESCRIPTION

Phosphorous acid is a clear to yellowish crystalline solid with a garlic like odour melting at 73 C, decomposes at 200 C. It is very soluble in water and in alcohol. This compound contains one direct P-H bond (which is not very acidic) and only two hydrogens bonded to oxygen (which are acidic). The structure of this material is more correctly written (HO)₂HPO. For this reason, this dibasic acid forms two series of salts, one containing the dihydrogen phosphite ion, H₂PO₃⁻, and the other containing the hydrogen phosphite ion, HPO₃²⁻. It is prepared by hydrolysis of phosphorus trichloride (or tetraphosphorus hexaoxide) with alcohols or phenols. Phosphorous acid esters are called phosphite with the formula (RO)₃P. Phosphorous acid and phosphite are used as reducing agents in chemical industry because of easy oxidation property to phosphoric acid. They are used as antioxidant, stabilizer and chelating agent in plastic system. They are used as solvent in paint and as flame retardant on fibres. They are used as a chemical intermediate in the production of pharmaceutical ingredients, pesticides, optical brighteners and in lubricant additives and adhesives.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Clear to yellowish Crystal
MELTING POINT	73 C
BOILING POINT	200 C (Decomposes)
SPECIFIC GRAVITY	1.651
SOLUBILITY	easily soluble
pH	
VAPOR DENSITY	
AUTOIGNITION	
NFPA RATINGS	
REFRACTIVE INDEX	
FLASH POINT	
STABILITY	Has not been fully evaluated. Hygroscopic, air sensitive.

APPLICATIONS

Raw material to prepare phosphites; stabilizers for plastics; Water treatment; Bleaching and Cleaning industry; Chemical manufacturing

SALES SPECIFICATION

APPEARANCE	Clear to yellowish Crystal
PHOSPHOROUS ACID	98.5% min
PHOSPHATE	0.2% max
CHLORIDE	0.015% max
SULFATE	0.008% max
HEAVY METALS	15ppm max
IRON	15ppm max

TRANSPORTATION

PACKING	50kgs in bag
HAZARD CLASS	8 (Packing group)
UN NO.	2834

DESCRIPTION OF PHOSPHORUS

Phosphorus is a nonmetallic chemical element in group 15 (nitrogen family, formerly Va) of periodic table; atomic number 15 atomic mass 30.9738; melting point ca 44.1 C (white); boiling point ca 280 C (white); specific gravity 1.82 (white), 2.34 (red), 2.70 (black); valence -3, +3, or +5 ; electronic config. 2-8-5 or 1s 2s 2p 6s 2p 3. The phosphorus molecule is composed of four phosphorus atoms, P₄. Phosphorus exists in a number of allotropic forms [white (alpha and beta), red, black and/or violet] in the same physical state. White phosphorus is a white to yellow waxy substance which ignites spontaneously in air to form white fumes of phosphorus pentoxide and glows without emitting heat. Phosphorus is stored underwater as it is extremely poisonous, insoluble in water (but soluble in carbon disulfide). Commercial production of elemental phosphorus is prepared from phosphorite or phosphate rock (apatite, an impure calcium phosphate mineral) reacting with coke and sand or silica pebbles or at high temperatures in an electric furnace. Calcium silicate is produced as a by-product. White phosphorus is used as a deoxidizing agent in the preparation of steel and phosphor bronze. It is also used in rat poisons and to make smoke screens (by burning) for warfare. When white phosphorus is heated to about 250 C with air absence, it changes into the red phosphorus. Red phosphorus, a dark redish powder or crystal, does not ignite spontaneously unless heated to 200 C, does not phosphoresce and it is a little less dangerous than white phosphorus. It is used to make matches. Red phosphorus is prepared commercially by heating calcium phosphate with sand and coke in an electric furnace. Black allotrope is obtained industrially by heating at 300 C under pressure with a mercury catalyst. It has a layer structure and is stable. The major use of phosphorus compounds is in fertilizers, mainly as a mixture called superphosphate (calcium hydrogen phosphate), obtained from phosphate minerals by sulfuric acid treatment; and in nitrophosphates. Phosphorus is burned to make phosphorus pentoxide [phosphorus(V) oxide], a white solid used as a chlorinating agent in organic chemistry, as a drying agent and mainly converted to phosphoric acid used to make phosphates for fertilizers, electro chemical polishing and shaping, electroplating, metal cleaning and pickling in metal treatment by reaction with water. Phosphorus is highly reactive. A wide range of compounds is formed for uses in detergents, water softeners, pharmaceuticals, dentifrices, and in many other important applications. It forms metal phosphides and covalently bonded phosphorus(III) and phosphorus(V) compounds. Phosphoric acid can combine with certain alkaline elements to form salts called phosphates.