# Triphenyl Phosphine

## Product Identification
- **CAS NO.**: 603-35-0; 112771-47-8; 630403-25-7
- **EINECS NO.**: 210-036-0
- **Formula**: \((\text{C}_6\text{H}_5)_3\text{P}\)
- **Mol WT.**: 262.29
- **H.S. Code**: 2931.00.9999
- **Toxicity**: Oral rat LD50: 700 mg/kg
- **Synonyms**: Triphenylphosphorus; Trifenylfosfin; Triphenylphosphide; Triphenylphosphane;

## Physical and Chemical Properties
- **Physical State**: White powder, odorless
- **Melting Point**: 80°C
- **Boiling Point**: 377°C
- **Specific Gravity**: 1.132
- **Solubility in Water**: Insoluble (0.279 mg/l)
- **Vapor Density**: 9
- **pK\(a\)**: (Dissociation Constant at 20°C)
- **log Pow**: 5.69 (Octanol-water)
- **Vapor Pressure**: (mmHg at 25°C)
- **Henry's Law**: 2.26E-08 (atm-m³/mole at 25°C)
- **OH Rate**: 5.85E-12 (cm³/molecule-sec at 25°C Atmospheric)
- **Autoignition**:
- **Refractive Index**:
- **NFPA Ratings**: Health: 2; Flammability: 1; Reactivity: 0
- **Flash Point**: 181
- **Stability**: Stable under ordinary conditions

## General Description & External Links
Phosphine, also called Hydrogen Phosphide, PH\(\text{}_3\), is a colourless, poisonous, spontaneously flammable gas, with a disagreeable, garlic-like odour; melting point -133.5°C, boiling point -87.4°C. Phosphine is manufactured by the hydrolysis of metal phosphides, by the electrolysis of phosphorus in the presence of hydrogen, or by the phosphorus-steam reaction. Phosphine has the structure of ammonia (NH\(\text{}_3\)) but with phosphorus in place of nitrogen. It is slightly soluble in cold water and soluble in alcohol. Phosphine is less soluble in water than ammonia. Phosphine is used in the synthesis of organophosphines and phosphonium derivatives and as a dopant in the manufacture of semiconductors. Aluminium or magnesium phosphide are used as formulations prepared for fumigation in pest control, and zinc phosphide is used as a rodenticide. Phophene is a starting material for the preparation of pesticides and flame retardants. Organophosphines are used as solvents for the extraction and separation processes, flame retardants, and in formulating fumigants and electronics applications of semiconductor manufacturing. Tertiary alkylphosphines act as chemical intermediate and catalyst in the production of industrial acids, alcohols, flavors &
Fragrances, and pharmaceuticals. Phosphonium describes a univalent radical, PH₄. Quaternary phosphonium salts, obtained from tertiary alkylphosphines with the treatment with alkyl or aromatic halides, are replacing phase transfer catalysts and biocides functions for quaternary ammonium salts due to more effective performance and higher thermal stability. Phosphonium salts are used as epoxy curing agents. A variety of phosphine transition metal complexes including chiral complexes are synthesized as the very reactive and versatile homogeneous catalysts and stereospecific as well. Triphenylphosphine is used as a catalyst for organic synthesis, intermediate for phase transfer catalysts and Wittig reactions.

Molecules containing a tertiary phosphine have played an important role in the development of organic reactions, predominantly in catalysis. The electronic and steric properties of these molecules have made them a prime choice for the synthesis of ligands that are used in the design of metal-based catalysts. Furthermore, they stabilize a wide variety of metal complexes and are relatively inert to many reaction conditions. These properties can be systematically tuned with predictable results. They are used in a variety of catalytic reactions such as cross-coupling and asymmetric synthesis.

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<thead>
<tr>
<th>SALES SPECIFICATION</th>
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<tbody>
<tr>
<td>APPEARANCE</td>
<td>White powder</td>
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<tr>
<td>ASSAY</td>
<td>99.0% min</td>
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<tr>
<td>MELTING POINT</td>
<td>78.5°C min</td>
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<tr>
<td>RESIDUE ON IGNITION</td>
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