



## Triphenyl Phosphine (TPP)

PRODUCT INFORMATION

### TYPE

PMC Organometallix, Inc. Triphenylphosphine [CAS# 603-35-0] is a white to light tan flaked solid with the following properties:

TYPICAL PROPERTIES	
Formula	C <sub>18</sub> H <sub>15</sub> P
Molecular Weight	262.28
EINECS No.	2100360
Melting Point (°C)	78.5-81.5
Boiling Point (°C @ 760 mm hg)	377
Density (g/mL)	1.2
Bulk Density (lbs/ft <sup>3</sup> )	31
% Triphenylphosphine	99.0 (min)
% Triphenylphosphine Oxide	1.0 (max)
Solubility	Insoluble in water. Slightly soluble in petroleum ether and alcohol. Soluble in xylene, toluene, acetone, carbon tetrachloride and ethers.

### OTHER LIGANDS

Ligand	q <sup>a</sup>	pK <sub>a</sub> <sup>b</sup>
Triphenylphosphine	145	2.73
Diphenylcyclohexylphosphine	153	5.05
Dicyclohexylphenylphosphine	161	7.38
Tricyclohexylphosphine	170	9.70
Tribenzylphosphine	165	6.00
Tri- <i>o</i> -tolylphosphine	194	3.08
Tri- <i>p</i> -tolylphosphine	145	3.84

<sup>a</sup> Cone angle data taken from references (1) and (2)

<sup>b</sup> pK<sub>a</sub> data taken from references (1), (3), (4), (5), (6)

### REFERENCES – OTHER LIGANDS

- Rahman, M.M.; Liu, H.Y.; Prock, A.; Giering, W.P. *Organometallics*. 1987, 6, 650-58.
- Tolman, C.A. *Chem. Rev.* 1977, 77, 313-48.
- Simal, F.; Démonceau, A.; Noels, A.F. *Angew. Chem. Int. Ed.* 1999, 38, 538-40.
- Henderson, W.A.; Streuli, C.A. *J. AM. Chem. Soc.* 1960, 82, 5791-94.
- Allman, T.; Goel, R.G. *Can. J. Chem.* 1982, 60, 716-22.
- Jackson, R.A.; Kanlun, R.; Poe, A. *Inorg. Chem.* 1984, 23, 523-27.

### APPLICATIONS

GENERAL AREA	REACTION/APPLICATION	REAGENT	REMARKS
Reagents for Organic Synthesis	Wittig	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P = CHR	Stereoselective olefin synthesis applications in preparation of pharmaceuticals (Vitamin A, prostaglandins steroids), food enhancers (beta- carotene, fruit flavors) and agricultural chemicals (pheromones, juvenile hormone mimics, synthetic pyrethroids).
	Reduction	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P	Reduction of quinones, deoxygenation of epoxides, amine oxides and sulfoxides. Also desulfurization and reduction of sulfur containing organic compounds.
	Halogenation	[(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> PX <sub>2</sub> ] (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P / CCl <sub>4</sub> (X = Br, Cl)	Selective conversions of alcohols, phenols and oxides to organic halides under mild conditions.
Additives	Homogeneous Catalysis	[(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P] <sub>x</sub> M (ligand) y (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P <sup>+</sup> RX <sup>-</sup>	Transition metal complexes of TPP for catalyzing a wide variety of organic reactions including hydroformylation, hydrogenation, isomerization and polymerization of olefins. TPP and phosphonium salts for catalyzing numerous polymerization reactions including epoxy resin curing and photopolymerizations.
	Phase Transfer Catalysts	(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> P <sup>+</sup> RX <sup>-</sup>	Phosphonium salts for catalyzing organic reactions between reactants in separate liquid phases.

### PRODUCT FEATURES

Triphenylphosphine has excellent shelf stability.

### PACKAGING

Triphenylphosphine is available in 50 lb pails, 220 lb drums and 750 lb tote bags.

### RECOMMENDED USES

Triphenylphosphine can be used in Wittig synthesis.

Triphenylphosphine is a standard ligand in homogeneous catalysis.

**NOTE:** Please consult MSDS for updated and detailed safety and health information.

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**In US:**

PMC Organometallics, Inc.  
The PMC Group Building  
1288 Route 73, Suite 401  
Mount Laurel, NJ 08054  
Customer Service: 1-855-638-2549  
(1-855-METALIX)  
Customer Service Fax: 1-856-638-2157  
[www.pmcorganometallics.com](http://www.pmcorganometallics.com)

**In Europe:**

PMC Vlissingen B.V.  
C/o PMC OUVRIE  
44 rue Albert Einstein  
62220 CARVIN  
FRANCE  
Customer service phone: 33(0)3.91.83.71.56  
Customer service fax: 33(0)3.91.83.71.92

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