



Tri-*t*-BUTYLPHOSPHONIUM • TETRAFLUOROBORATE SALT CAS No. 131274-22-1

QS-PDS-024 Revision: 01

Product Names Tri-*tert*-butylphosphine tetrafluoroborate salt, Tri-*tert*-butylphosphine tetrafluoroboric acid salt, TTBP•BF₄

Formula $(((\text{CH}_3)_3\text{C})_3\text{PH})\text{BF}_4$

Appearance White solid.

Application Tri-*t*-butylphosphonium tetrafluoroborate (TTBP•BF₄) is a **DEVELOPMENTAL** product. This air stable salt has been shown to be an excellent ligand for palladium catalyzed Suzuki, Stille and Heck reactions. Addition of a Brønsted base to this salt affords tri-*t*-butylphosphine (TTBP). TTBP is such a powerful ligand that aryl chlorides can be employed as substrates and the reactions can be run at ambient temperatures. For a recent application of this salt in stoichiometric and catalytic processes, consult: M. R. Netherton and G. C. Fu, *Org. Letters*, **2001**, 3, 4295.

Product Specification		<u>Guaranteed*</u>
	TTBP•BF ₄ , wt%	98.0 min.

* This product can be made to agreed upon customer specifications.

Physical Properties	Molecular weight	290.1
	Density @20°C	1.0 g/mL
	Bulk density @20°C	0.45 g/ml
	Melting point	261 °C (dec)
	Pyrophoricity	Non-pyrophoric

Solubility Essentially insoluble in aliphatic and aromatic hydrocarbon solvents. Sparingly soluble in water and lower alcohols. Readily soluble in methylene chloride or chloroform.

Thermal Stability TTBP•BF₄ is stable at ambient temperature.

Toxicity/Safety Data TTBP•BF₄ is corrosive to eyes, mucous membranes, skin, nose, and throat. Care should be taken to avoid breathing dust, contact with eyes and mucous membranes, and prolonged contact with the skin. Should the product contact the skin, the loose particles should be brushed off and the contacted area washed with water. In case of eye contact, flush with plenty water for at least 15 minutes and obtain immediate medical attention. For other body contact, immediately

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Toxicity/Safety Data (cont.) wash affected area with plenty of water and seek medical attention if irritation occurs and persists.

ADDITIONAL INFORMATION ON SAFETY IS CONTAINED IN THE OPTIMA NEW PRODUCT DATA SHEET (NPDS) AVAILABLE FOR THIS PRODUCT.

Handling/Storage/Disposal Due to the corrosive nature of TTBP•BF₄, where personal contact can occur, face shield, gloves, and a NIOSH/MSHA-approved respirator should be worn.

Containers of TTBP•BF₄ should be stored away from heat, sparks, or open flame, preferably in fire-resistant buildings. Containers should be checked regularly for leaks. Any leaking container should be moved to a dry, well-ventilated area and the contents transferred to another approved container.

Spills should be abandoned by all but persons wearing protective equipment. Spills should be swept up, placed in a dry metal container, and tightly covered. Waste material should be stored in steel drums and disposed of in accordance with local, state, and federal waste disposal regulations. Neutralize and flush area with water.

Shipping Containers	Bulk containers	100 kilos net in polyethylene lined steel drum
	Drums	5 kilogram net polyethylene bags in steel drum
	Glass bottles	125 mL, 500 mL and 1L

Shipping Limitations Shipments of TTBP•BF₄ are described as "Corrosive Solid, Acidic, Organic, N.O.S., (*TRI-TERT-BUTYLPHOSPHINE TETRAFLUOROBORATE*), 8, UN3261, PG II." Shipments require "Corrosive" labels.

Post, Parcel	Not acceptable
Sea	Class 8 (IMDG)
Road, Rail	Class 8 (DOT, RID/ADR)
Air	Class 8 (IATA)
	50 kg maximum per outer container.
	Cargo aircraft only.

For shipments within Europe, labeling for supply requirements are:

C	Corrosive
R&S Phrases	See Material Safety Data Sheet

Responsible Care® initiative dictates that all shipments must be transported in a DOT-approved vehicle in a responsible manner (i.e., no flat bed trucks).

Additional Resources Refer to Organometallics and Reactive Specialty Organics Safe Handling Guide.