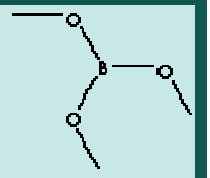
TRIMETHYL BORATE



PRODUCT IDENTIFICATION

CAS NO.	121-43-7
EINECS NO.	204-468-9
FORMULA	$(CH_3O)_3B$
MOL WT.	103.91
H.S. CODE	2920.90
TOXICITY	Oral rat LD50: 6140 mg/kg
SYNONYMS	methyl borate; Boric acid Trimethyl Ester; Trimethoxyborane; Boron methoxide; Trimethoxyborane; Trimethoxyborine; Trimethoxyboron; Trimethyl Borate; Trimethylester Kyseliny Borite; Borato de trimetilo (Spanish); Borate de triméthyle (French);
DERIVATION	
CLASSIFICATION	

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	clear liquid
MELTING POINT	-34 C
BOILING POINT	68 - 69 C
SPECIFIC GRAVITY	0.915
SOLUBILITY IN WATER	Decomposes
pH	
VAPOR DENSITY	
AUTOIGNITION	
NFPA RATINGS	Health: 2; Flammability: 3; Reactivity: 1
REFRACTIVE INDEX	
FLASH POINT	
STABILITY	Stable under normal conditions

APPLICATIONS

Trimethyl Borate is used as a solvent or catalyst for the production of resins, waxes, paints and varnishes. It is used as a methylation agent or as a boron source in organic reaction to manufacture biocides, flame retardants, anti-oxidants, corrosion inhibitors, tackifiers for elastomers and rubbers, cross-linking agents for polymer, dehydrating agents and plastic stabilizers. It is used as a component of flame retardant for textile and in welding fluxes.

Trimethylborate is used as a precursor of borate esters which are used in Suzuki coupling reaction. Suzuki reaction is an efficient, cost effective and environment-friendly methodology for the selective carbon-carbon couplings of organoboranes (organic boronic acids, boronate esters and diboron esters) to (aryl, benzyl, or vinyl) halides, diazonium salts or trifaltes in the presence of a transition-metal catalyst (particularly palladium catalysts) and in a basic solution which is necessary to neutralize the liberated acid. The mechanism is similar to that of Heck reaction. Suzuki coupling reactions undergo under milder condition than Heck reactions. The Suzuki reaction permit the use of cyano-, ester-, carbonyl-, and nitro aryl rings. The Suzuki reaction is preferred in the pharmaceutical synthesis due to non-toxicity of boron species. Examples of palladium catalysts are;

- Bis(dibenzylideneacetone)palladium [CAS #: 32005-36-0]
- Tetrakis(triphenylphosphine)palladium(0) [CAS #: 14221-01-3]
- Hexakis(μ-acetato)tripalladium(II) [Trimer of Palladium(II) acetate] [CAS #: 3375-31-3]

Triflate, trifluoromethanesulfonate, is one of the strongest acids known as a super acid. Substituted trifluoroborates are alternatives to boronic acids in C-C bond forming (rhodium catalyzed) and Suzuki reactions. These salts are stable in air and water. They are excellent leaving groups. They ususally don't require to add either additional ligands or base for cross coupling. Whereas they do not form cyclic anhydrides which boronic acids readily.

SALES SPECIFICATION	
APPEARANCE	clear liquid
PURITY (GC)	99.0% min
COLOR,APHA	20 max

TRANSPORTATION	
PACKING	170kgs in drum
HAZARD CLASS	3 (Packing Group: II)
UN NO.	2416

OTHER INFORMATION

Hazard Symbols: XN, Risk Phrases: 10/21, Safety Phrases: 2/23/25

GENERAL DESCRIPTION OF BORIC ACID

Boric acid refers to 3 compounds; orthoboric acid (also called boracic acid, H_3BO_3 or $B_2O_3 \cdot 3H_2O$), metaboric acid (HBO_2 or $B_2O_3 \cdot H_2O$), and tetraboric acid (also called pyroboric, $H_4B_4O_7$ or $B_2O_3 \cdot H_2O$). Orthoboric acid dehydrates to form metaboric acid and tetraboric acid above 170 C and 300C respectively. Orthoboric acid is derived from boric oxide in the form of white, triclinic crystals. It is poorly soluble in cold water but dissolves readily in hot water, in alcohol and glycerine. Metaboric acid is a white, cubic crystalls. It is soluble in water slightly. Tetraboric acid is a white solid soluble in water. When tetraboric and metaboric acid are dissolved, it reverts to orthoboric acid. The main uses of boric acid is to make borate salts such as borax and other boron compounds. Boric acid is also used in heat resistant glass, in fireproofing fabrics, in electroplating baths, in leather manufacturing, porcelain enamels and in hardening steels. Boric acid has antiseptic and antiviral activity. Aqueous solutions have been used as mouth-washes, eye-drops, skin lotions and cosmetics. Boric acid and its salts are components of many commercial insecticides and wood preservatives.