Entegris

ULTRAPUR™ TEB

Triethylborate

Overview

Triethylborate (TEB) is an organic boron ester compound which is widely used as a boron source in the deposition of doped silicate glass in a low pressure and plasma-enhanced CVD. Boron and phosphorus act as glass flow temperature modifiers and gettering agents. The softening temperature of the silicate glass is modified with varying concentrations of doping constituents. The boron source of doped glass has traditionally been diborane.

TEB has been considered a replacement for diborane and trimethylborate. Its benefits include ease of handling a liquid source, reduced health hazards, improved purity levels and improved performance characteristics over diborane. TEB is a liquid at room temperature and has a relatively high vapor pressure that allows for bubbling with a carrier gas, vacuum processing or direct liquid injection.

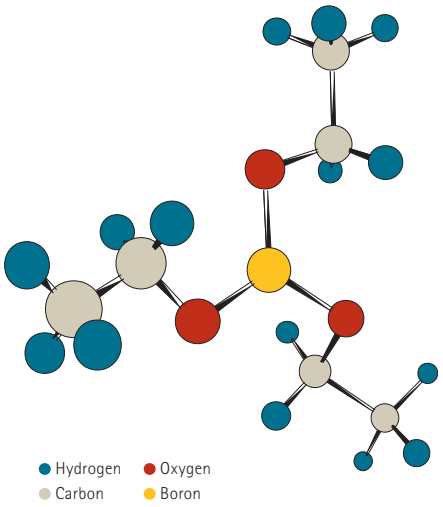
Entegris offers TEB in an ultrapure grade which is purified using proprietary techniques allowing us to supply the most consistent, high-purity chemical available.

Canisters and Delivery Systems

Entegris UltraPur™ TEB is available in a wide variety of stainless steel canisters and ampoules to fit all tools and delivery systems. Standard sizes include 5-gallon, 10-gallon and 200-liter. Options include manual or air–operated valves, level sensors and keyed configurations.

Entegris offers the Unichem™ 3100 and Unichem 3200 dual-canister chemical delivery systems for BPSG applications.

Entegris is a leading industry supplier that provides a complete line of advanced materials, delivery systems and control/monitoring systems which enable comprehensive material lifecycle management solutions for OEMs and end users.



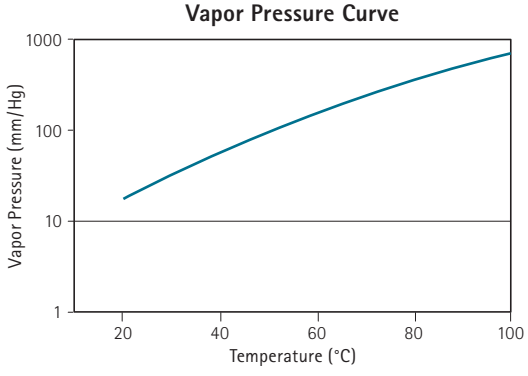
Features and Benefits

- Improved performance characteristics over diborane
- Replaces diborane and trimethylborate
- Ease of handling a liquid source
- Reduced health hazards
- Improved purity levels
- Standard shelf life of 24 months

Application

- Plasma-enhanced CVD Deposition

Performance Data



Specifications

PHYSICAL PROPERTIES

Chemical formula:	$C_6H_{15}O_3B$
Molecular weight:	146.02
Density:	0.8546 gm/mL
Boiling point:	118.5°C (245.3°F) @ 0.1 mm Hg
Melting point:	-84.8°C (-120.64°F)
Flash point (closed cup):	11°C (51.8°F)

PURITY ANALYSIS

Element	Detection Limit (ppb)	Specification (ppb)	Analytical Method
Aluminum	0.012	0.200	ICP-MS
Antimony	0.018	0.100	ICP-MS
Arsenic	0.018	0.100	ICP-MS
Barium	0.003	0.100	ICP-MS
Beryllium	0.005	0.100	ICP-MS
Bismuth	0.004	0.100	ICP-MS
Cadmium	0.005	0.050	ICP-MS
Calcium	0.043	0.800	ICP-MS
Cerium	0.003	0.050	ICP-MS
Chromium	0.007	0.100	ICP-MS
Cobalt	0.005	0.050	ICP-MS
Copper	0.008	0.100	ICP-MS
Gallium	0.004	0.050	ICP-MS
Germanium	0.010	0.050	ICP-MS
Gold	0.006	0.100	ICP-MS
Hafnium	0.005	0.050	ICP-MS
Indium	0.004	0.050	ICP-MS
Iridium	0.004	0.050	ICP-MS
Iron	0.014	0.300	ICP-MS
Lead	0.004	0.100	ICP-MS
Lithium	0.006	0.050	ICP-MS
Magnesium	0.005	0.200	ICP-MS
Manganese	0.038	0.100	ICP-MS
Mercury	0.032	0.100	ICP-MS
Molybdenum	0.008	0.100	ICP-MS
Nickel	0.007	0.200	ICP-MS
Niobium	0.003	0.050	ICP-MS
Palladium	0.010	0.050	ICP-MS
Platinum	0.012	0.050	ICP-MS
Potassium	0.072	0.200	ICP-MS
Rhenium	0.003	0.050	ICP-MS
Rhodium	0.002	0.050	ICP-MS
Rubidium	0.003	0.050	ICP-MS
Silver	0.013	0.050	ICP-MS
Sodium	0.032	0.500	ICP-MS
Strontium	0.004	0.050	ICP-MS

Specifications (continued)

PURITY ANALYSIS (CONTINUED)

Element	Detection Limit (ppb)	Specification (ppb)	Analytical Method
Tantalum	0.003	0.050	ICP-MS
Thallium	0.003	0.050	ICP-MS
Thorium	0.004	0.050	ICP-MS
Tin	0.033	0.100	ICP-MS
Titanium	0.015	0.100	ICP-MS
Tungsten	0.006	0.050	ICP-MS
Uranium	0.004	0.100	ICP-MS
Vanadium	0.010	0.500	ICP-MS
Zinc	0.028	0.200	ICP-MS
Zirconium	0.004	0.050	ICP-MS

Particle Size	Specification (mL)	Analytical Method
>0.2 µm	10	PMS
>0.3 µm	7	PMS
>0.5 µm	5	PMS
>1.0 µm	1	PMS

Parameter	Detection Limit	Specification	Analytical Method
Assay	–	99.99%	GC
Chloride	–	50 ppb	Typical
Color	–	5	Typical
Purity	–	99.9999995%	ICP-MS
Water	1.3 ppm	20 ppm	KF Titrator

MAXIMUM TEB FILL WEIGHTS FOR ENTEGRIS CANISTERS

5-gallon	15,750 grams
10-gallon	30,500 grams
200-liter	100,000 grams

For More Information

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