Searles Valley Minerals

THREE ELEPHANT®

Boric Acid
Coarse Grade

Technical Information
Bulletin 2202

Brand Name: THREE ELEPHANT® Boric Acid
Chemical Name: Boric acid
Also known as: Orthoboric acid, boracic acid
Formula: H_3BO_3
Molecular Weight: 61.83
CAS / TSCA No.: 10043-35-3 ***REACH:*** 01-2119486683-25-0001
Description: White, granular, crystalline solid, fairly dustless, with a slippery or soapy feel
Grades: Technical Coarse

If you require guidance in developing product specifications, please contact Quality Assurance at (760) 372-2243

Properties

Chemical Analysis	Specification
Boric Acid (H_3BO_3)	99.8 % min
Boric Oxide (B_2O_3)	56.2 % min
Sulfate (*as* SO_4)	0.10 % max
Sodium Sulfate (*as* Na_2SO_4)	0.20 % max
Chloride (Cl)	90 ppm max

Physical Analysis	Specification
U.S. Standard Sieve No.	*(% cum. retained)*
+20	2 % max
+45	65 % min 85 % max
+100	95 % min

Note: All data in the above specification are determined by Searles Valley Minerals analytical methods.

Packaging

Semi-bulk Bags: 2,400 lb
Bulk: Trucks and hopper cars

Handling

Information concerning the handling and use of this product is provided in a safety data sheet (SDS). The SDS must be fully read and understood prior to any exposure, handling, or use of the product.

The information herein is believed to be reliable. However, no warranty, expressed or implied, is made as to its accuracy or completeness and none is made as to **MERCHANTABILITY** of the material or its **FITNESS FOR ANY PURPOSE**. The manufacturer shall not be liable for consequential damages or for damage to persons or property resulting from its use. Nothing herein shall be construed as a recommendation for use in violation of any patent.

SVM's QMS is Certified to ISO 9001:2015

Theoretical Properties

The following properties are textbook theoretical data and are provided for convenience and reference only. These properties are not normally tested for the commercial product and no representation is made relative to the commercial product.

Theoretical Composition

Boron	(B)	17.49 %
Boric oxide	(B_2O_3)	56.30 %
Water	(H_2O)	43.70 %

Melting Point *(heated in closed space)*

169°C (366°F)

Specific Gravity @ 15°C

1.435

Specific Heat @ 25°C

19.45 cal/deg-mol

Heat of Solution *(absorbed)* @ 18°C

-5.40 Kcal/g-mol

Heat of Formation @ 25°C

-261.55 Kcal/g-mol

Solubility

The solubility of boric acid is influenced by the presence of other salts. Lithium and sodium chlorides and mineral acids decrease the solubility, while potassium and rubidium chlorides increase it. Potassium nitrate, potassium sulfate, sodium nitrate and sodium sulfate also increase the solubility. The presence of borax raises the solubility due to the formation of polyborate ions.

Solubility in Water as H_3BO_3 (Boric Acid)

Temperature as °C	Temperature as °F	Parts per 100 parts water	Percent by weight of saturated solution	Pounds per U.S. gallon of water	Grams per liter of water
0	32	2.77	2.70	0.231	27.2
10	50	3.65	3.52	0.304	36.5
15	59	4.35	4.17	0.363	43.5
20	68	4.88	4.65	0.407	48.7
30	86	6.77	6.34	0.562	67.4
40	104	8.90	8.17	0.736	88.3
50	122	11.40	10.23	0.939	112.6
60	140	14.90	12.67	1.221	146.5
70	158	18.69	15.75	1.523	182.8
80	176	23.54	19.06	1.907	228.8
90	194	30.33	23.27	2.441	292.8
100	212	37.99	27.53	3.035	364.1
103.3*	217.9*	41.38	29.27	3.306	395.6

* *boiling point*

Solubility in other Solvents

	°C	°F	Percent by weight
Methyl alcohol	25	77	20.20
Ethyl alcohol, 95%	25	77	11.20
Propyl alcohol	25	77	7.18
Iso-butyl alcohol	25	77	5.26
Iso-amyl alcohol	25	77	4.31
Glycerol, 99%	20	68	18.2
Acetone	15.5	59.9	0.6

pH in Water @ 20°C (68°F)

Percent by Weight	pH
0.5	5.4 ± 0.4
1.0	5.1 ± 0.2
2.0	4.6 ± 0.2
3.0	4.2 ± 0.2
4.0	3.9 ± 0.2
4.65	3.7 ± 0.2

Angle of Repose, *horizontal*

34 degrees

Stability

Boric acid is stable at ordinary temperatures. Upon heating it gradually loses water, changing to metaboric acid HBO_2. On continued heating all water is lost, and the anhydrous oxide B_2O_3 is formed.

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