

Boric Acid

Insulation Grade

Brand Name: THREE ELEPHANT® Boric Acid
Chemical Name: Boric Acid
Also known as: Orthoboric acid, boracic acid
Formula: H₃BO₃
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: Insulation



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

Properties

Chemical Analysis

| | Specification |
|--|---------------|
| Boric Acid (H ₃ BO ₃) | 99.5 % min |
| Boric Oxide (B ₂ O ₃) | 56.0 % min |
| Sulfate (as SO ₄) | 0.13 % max |
| Sodium Sulfate (as Na ₂ SO ₄) | 0.20 % max |
| Chloride (Cl) | 150 ppm max |

Physical Analysis

| U.S. Standard Sieve No. (% cum. retained) | Specification |
|---|---------------|
| +20 | 4 % max |

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

Packaging

Multiwall Paper Bags: 25 kg
Semi-bulk Bags: 2,000 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.



Searles Valley Minerals
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 Sales/Service: 800.637.2775 / 913.344.9500

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 ₂ O ₃) | 56.30 % |
| Water | (H ₂ O) | 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 H₃BO₃ (Boric Acid)

| Temperature | | Parts per 100 parts water | Percent by weight of saturated solution | Pounds per U.S. gallon of water | Grams per liter of water |
|-------------|--------|---------------------------|---|---------------------------------|--------------------------|
| °C | °F | | | | |
| 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, 50 Vol% | 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 HBO₂. On continued heating all water is lost, and the anhydrous oxide B₂O₃ is formed.



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