

PRODUCT DATA SHEET

BORIC ACID (ORTHO BORIC ACID) chemical pure grade

1. MOLECULAR FORMULA : H_3BO_3
2. MOLECULAR WEIGHT : 61.84

Physical and chemical properties

<u>COMPOSITION</u>	<u>THEORETICAL</u>	<u>TYPICAL</u>
BORIC OXIDE (B_2O_3)	56.30%	56.%
WATER (H_2O)	43.70%	43.66%
BORIC ACID(H_3BO_3)	100.00%	99.8%
<u>IMPURITIES</u>	<u>MAXIMUM</u>	<u>TYPICAL</u>
SULPHATE (as SO_4)	0.045%	0.040%
CHLORIDE(as Cl)		0.005%
HEAVY METAL		
ARSENIC (as As)	0.001%	0.0008%
LEAD (as pb)	0.002%	0.001%
IRON(AS Fe)		0.0010%
INSOLUBLE MATTER		Traces

APPEARANCE

WHITE CRYSTALLINE AMORPHOUS SOLID, FREE FROM DIRT, FOREIGN MATTER AND VISIBLE IMPURITIES CRYSTAL WITH NO ODOUR

MELTING POINT : $176.09^{\circ}C \pm 0.2^{\circ}C$ ($340^{\circ}F$)
(HEATED IN CLOSED SPACE)

SPECIFIC GRAVITY : 1.51 @ $14^{\circ}C$ ($57^{\circ}F$)

HEAT OF SOLUTION : -87.2 Cal/ gm @ $18^{\circ}C$ ($64^{\circ}F$)

STABILITY

BORIC ACID IS STABLE AT ORDINARY TEMPERATURES. IT IS VOLITILE IN STEAM WITHOUT DECOMPOSITION.

DEHYDRATION CHARACTERISTICS

WHEN HEATED ABOVE $100^{\circ}C$ IN THE OPEN, IT GRADUALLY LOSES WATER, FIRST CHANGING TO METABORIC ACID- HBO_2 OF WHICH THREE MODIFICATIONS EXIST. THESE HAVE MELTING POINTS RESPECTIVELY OF $176^{\circ}C$, $210^{\circ}C$ AND $236^{\circ}C$. DEHYDRATION STOPS AT THE COMPOSITION HBO_2 UNLESS THE TIME OF HEATING IS EXTENDED OR THE TEMPERATURE RAISED ABOVE $150^{\circ}C$. ON CONTINUED HEATING AT HIGHER TEMPERATURE ALL THE WATER IS REMOVED LEAVING THE ANHYDROUS OXIDE, B_2O_3 THE CRYSTALLINE FORM OF WHICH MELTS AT $450^{\circ}C$. THE AMORPHOUS FORM, WHICH IS PRODUCED BY NORMAL DEHYDRATION AND WHICH IS THE COMMERCILLY AVAILABLE TYPE, HAS NO DEFINITE MELTING POINT. IT STARTS TO SOFTEN AT ABOUT $325^{\circ}C$ BECOMING FULLY FLUID AT ABOUT $500^{\circ}C$.

HYDROGEN ION CONCENTRATION

AQUEOUS SOLUTIONS OF BORIC ACID ARE MILDLY ACIDIC, THE pH DECREASING WITH INCREASING CONCENTRATION.

<u>% H_3BO_3 (BY WEIGHT OF SOLUTION)</u>	<u>pH</u>
0.1%	6.1
0.5%	5.6
1.0%	5.1
2.0%	4.5
3.0%	4.2
4.0%	3.9
4.65%(Saturated @ $20^{\circ}C$)	3.7

SOLUBILITY IN WATER

Temperature °C	°F	Parts Boric Acid per 100 parts water by weight	% Boric Acid by weight Ph of saturated solution
0	32	2.59	2.52
5	41	3.07	2.98
10	50	3.62	3.49
20	68	4.95	4.72
30	86	6.64	6.23
40	104	8.79	8.08
50	122	11.45	10.27
60	140	14.90	12.97
80	176	23.61	19.10
90	194	30.33	23.27
100	212	37.99	27.53

(103.3, 217.9 boiling point of saturated solution containing 29.27% H₃BO₃)

NOTE : the solubility of boric acid in water is influenced by the presence of certain other substances such as Sodium Chloride, Lithium Chloride and Mineral acids decreases the solubility. Potassium Nitrate, Sulphate and Chloride and Sodium Nitrate and Sulphate increases the solubility. Borax raises the solubility of Boric Acid due to formation of Sodium Polyborates.

SOLUBILITY IN OTHER SOLVENTS

	Temperature	% Boric Acid by Weight
Glycerol (98.5%)	@20 °C	19.9
Glycerol (86.5%)	@20 °C	12.1
Ethylene Glycol	@25 °C	18.5
Di-ethylene glycol	@25 °C	13.6
Ethly acetate	@25 °C	1.5
Acetone	@25 °C	0.6
Glacial Acetic Acid	@30 °C	6.3
Ethyl Alcohol	@25 °C	94.9
Methyl Alcohol	@25 °C	179.3
n-propyl Alcohol	@25 °C	59.4
iso-Butyl Alcohol	@25 °C	42.8
iso-Amyl Alcohol	@25 °C	35.3

BULK DENSITY

Granular – 800 -1000Kg/m³

Powder - 500 -700 Kg/m³

INDUSTRIAL USES

COSMETICS, SOAPS & DETERGENTS CERAMICS, PHARMACEUTICAL PRODUCTS

HEALTH AND SAFETY

REFER MATERIAL SAFETY DATA SHEET ON BORIC ACID.

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