ETİMADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ

PRODUCT TECHNICAL DATA SHEET

ETİBOR-48

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Disodium Tetraborate Pentahydrate ($Na_2B_4O_7.5H_2O$)

CAS Number: 12179-04-3

Technical Grade: Granular and powder

Packaging: 25 kg, 50 kg, 1000 kg, 1200 kg

(with or without pallet)



General Information:

Etibor-48 (Borax Pentahydrate) ($Na_2B_4O_7.5H_2O$) is a form of sodium borate containing 5 mol H_2O molecules which are widely used in the industry. It is obtained in powder or crystal form from Tincal ($Na_2B_4O_7.10H_2O$) ore extracted by the Kırka Boron Works. Production process includes dissolving, settlement with various flocculants (anionic, etc.), centrifugation, filtration, crystallization and drying stages.

Usage and Benefits:

Glass: Etibor-48 is added to glass products used for heat insulation as it increases viscosity, surface hardness and durability when added to molten glass intermediates. The most important use of borax pentahydrate is glass fiber in the insulation sector.

Agriculture: Boron is an element that must be present in soil for the growth and development of plants. Etibor-48 is used to increase agricultural productivity and to obtain higher quality products. It is used as the boron source in fertilizers containing boron.

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For more information:
Technology Development Department
EYS FRM-ETİ-00 17 /23/9/2014-02
Rev. 2023/01

Ceramics: Etibor-48, which has a high water solubility, is used as the glazing raw material in ceramics.

Fire retardants: Borates are used as fire retardants in various materials. They cover the material by melting and prevent the material from catching fire by severing the contact between the oxygen and the flame.

Metallurgy: Etibor-48 is used as a protective slag-former and fusing accelerator in the non-ferrous metal industry due to the property of forming a smooth, adhesive, protective, clean and burr-free liquid at high temperatures.

Construction: Etibor-48 is used as a plastering material in the construction industry for the purpose of heat and sound insulation.

Anti-freeze: Etibor-48 is used as an additive to the antifreeze mixture in the cooling systems of vehicles.

Adhesive: Etibor-48 is used in the regulation of the viscosities of starchy adhesives and the solvents of casein-based adhesives.

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Physical Properties:

Specific weight	: 1.815 g/cm^3
Pour (bulk) density[a]	: 0.966 g/cm^3 (Granular)
Molecular weight	: 291.35 g/mol
Melting point	: 741^{o}C
Boiling point	: 1575^{o}C
Heat capacity	: 7.6 J/g^{o}C
Thermal conductivity	: 0.647 W/mK
Specific surface area	: < 1 m^2/g
Diffusion coefficient	: 1.0x10^{-5} cm^2/s
Surface tension	: 67.19 mN/m (1.0% aqueous solution by weight)
Colorimetry test	: 91.92 (average L value)

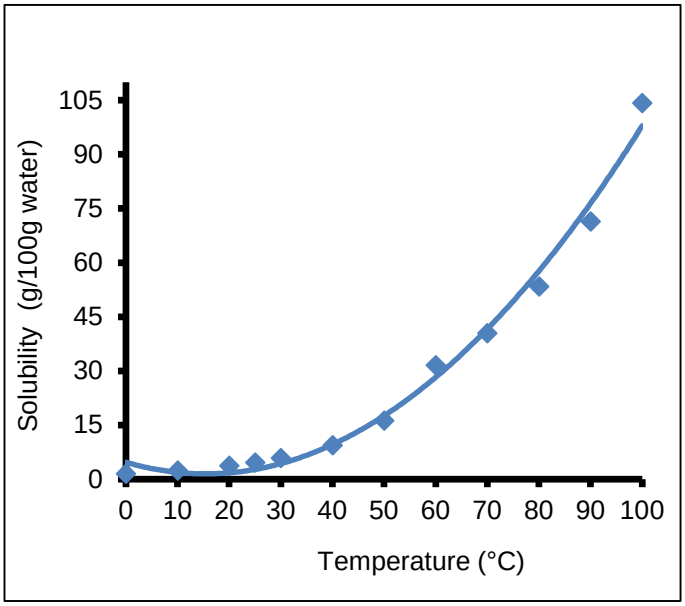
[a] Applies to a representative sample.

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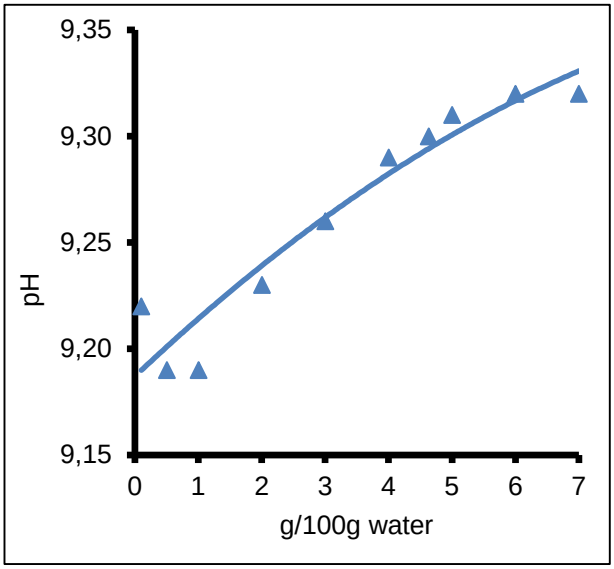
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Solubility[b,c] :



Temperature (ºC)	Solubility (g/100g water)
0	1.53
10	2.41
20	3.72
25	4.63
30	5.83
40	9.41
50	16.20
60	31.56
70	40.39
80	53.35
90	71.39
100	104.20

Solution pH values:



Solution (g/100g water)	pH (±0.03 / 25ºC)
0.1	9.22
0.5	9.19
1	9.19
2	9.23
3	9.26
4	9.29
4.63[c]	9.30
5	9.31
6	9.32
7	9.32

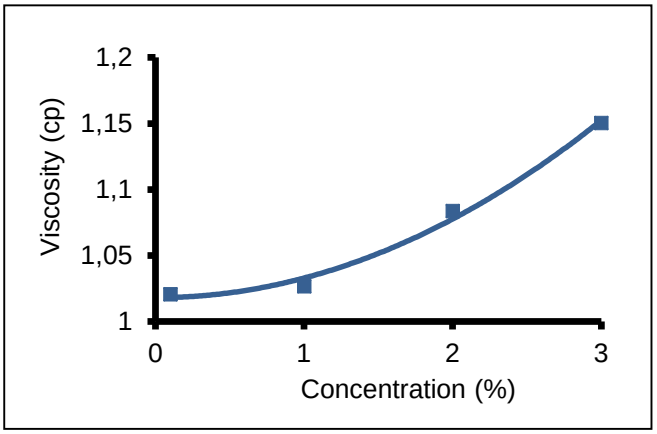
[b] Factors affecting the dissolution rate, such as the particle size of material to be dissolved, the mixing speed of the solution are effective on the time to reach the saturation point. The values on the table should be evaluated by taking this into account.

[c] Saturation value of Etibor-48 at 25ºC in 100g water is 4.63g.

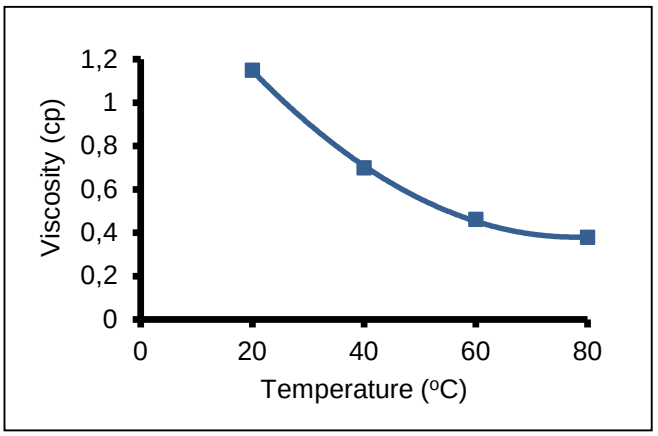
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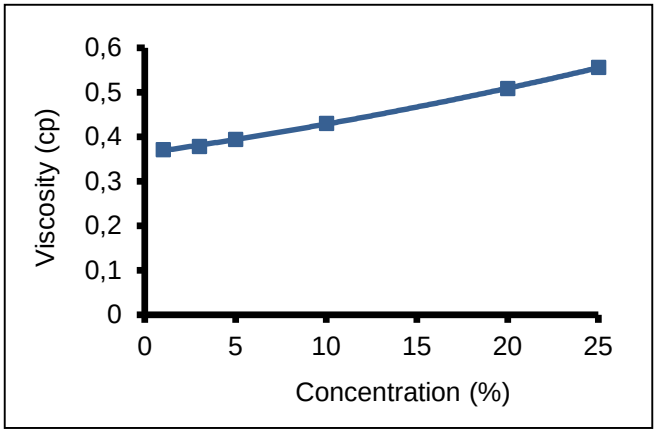
Solution viscosity values:



Temp. (°C)	Conc. (%)	Viscosity (cp)
20	0.1	1.02
20	1	1.03
20	2	1.08
20	3	1.15



Temp. (°C)	Conc. (%)	Viscosity (cp)
20	3	1.15
40	3	0.70
60	3	0.46
80	3	0.38



Temp. (°C)	Conc. (%)	Viscosity (cp)
80	1	0.37
80	3	0.38
80	5	0.39
80	10	0.43
80	20	0.51
80	25	0.56

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Chemical content:

Components	Content	
	Granular	Powder
B_2O_3	48.00 - 49.35%	47.80 - 49.00%
Equivalent $Na_2B_4O_7.5H_2O$	100.42 - 103.24%	100.00 - 102.51%
B	14.91 - 15.33%	14.85 - 15.22%
Water-soluble B	14.91 - 15.33%	14.85 - 15.22%
Na_2O	21.37 - 21.95%	21.36 - 21.81%
SO_4	135 ppm max	200 ppm max
Cl	70 ppm max	70 ppm max
Fe	3 ppm max	3 ppm max
Non-water solubles	150 ppm max	150 ppm max

Heavy metal content:

Components	Content (mg/kg)
As	<0.010
Cd	<0.005
Pb	<0.010
Cr	<0.005
Hg	<0.010

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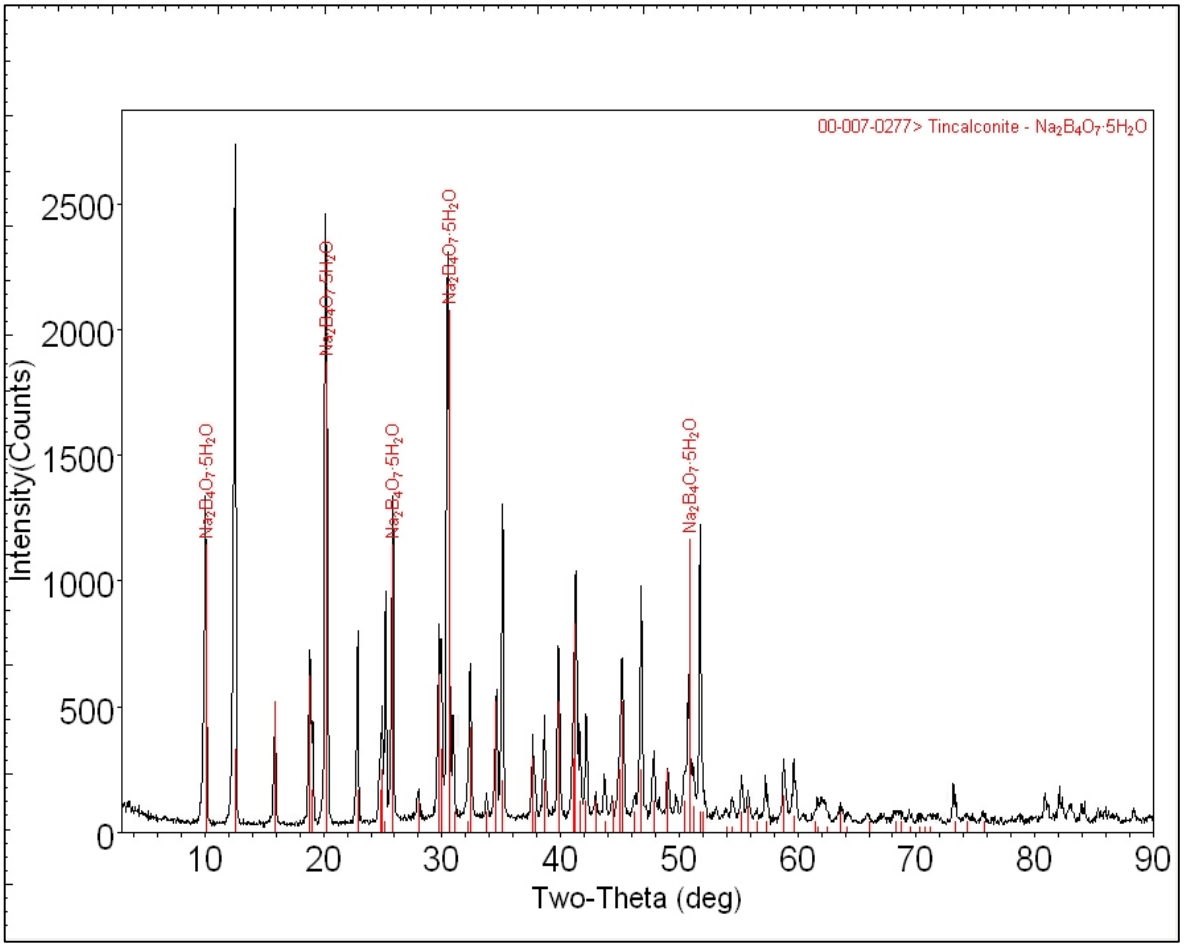
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Particle size:

Size	Content	
	Granular	Powder
+1.180mm	4% max	2% max
-0.075mm	5% max	50% max

X-Ray Diffraction Analysis:



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