



GROUND COLEMANITE

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ETiMADEN

Di-Calcium Hexaborate Pentahydrate ($2CaO \cdot 3B_2O_3 \cdot 5H_2O$)

CAS Number: 1318-33-8

Technical Grade: Powder

Packaging: 1000 kg, 2000 kg

[with or without pallet]



etimaden.gov.tr

General Information:

Colemanite is the most commonly available boron mineral. Its B_2O_3 content is $40 \pm 0.50\%$. It dissolves slowly in water and rapidly in acidic medium.

The ore is enriched in concentrator plant to obtain concentrated product. The concentrated product is passed through crushing and grinding processes respectively to obtain milled product. It is then packaged in a packaging unit and ready for sale.

Usage and Benefits:

Glass and ceramics: It is used as an agent to lower the fusing point and to increase resistance against thermal shocks and the thermal expansion coefficient in glass production. Furthermore, it is used in ceramic and enamel glaze formulations. Due to the fusing temperature being close to those of the other components in the blend, it provides a

stable structure, homogeneous fusing and low segregation. Colemanite is also used for the production of glass fiber [textile grade glass fiber].

Since sodium is not desired in the production of textile grade glass fibers, boric acid and colemanite are preferred over other boron products.

The colemanite used for this purpose:

- Decreases the mixture fusing temperature.
- Enables low viscosity at fusing temperature.
- Prevents crystallization.
- Has positive effects on the physical and chemical properties of the glass product.

Metallurgy: Due to its nature of acting as a solvent for almost all metal oxides, it is used as flux in the metallurgy industry. In the gold refinery industry, on the other hand, it is used in the slag formula to dissolve metal oxides.

Another area of use for the boron products is the addition of colemanite to powdered slag in the iron-steel industry in order to obtain slag with a glassy, compact structure. Slag which is formed in the ladle metallurgy and which becomes powdered after cooling can cause problems in terms of handling, storing; can be harmful to the environment and lead to additional costs for the business, as it does not have much wetting and compacting properties. Addition of colemanite to the ladle furnace during steel production provides a compact structure to slag and this problem is reduced. The use of colemanite in the iron-steel industry is becoming widespread. In the ladle metallurgy, about 10-30 kg slag is formed per a ton of steel. It is estimated that 30 million tons of powdered ladle slag is formed globally on average.

Fertilizer: Because of its low solubility, ground colemanite is preferred in fertilizers produced for sandy soils in fertilizer industry.

Miscellaneous: Ground colemanite is also used in the detergent and cosmetic industries. Boric acid is produced by the reaction of colemanite and sulfuric acid.

Physical Properties:

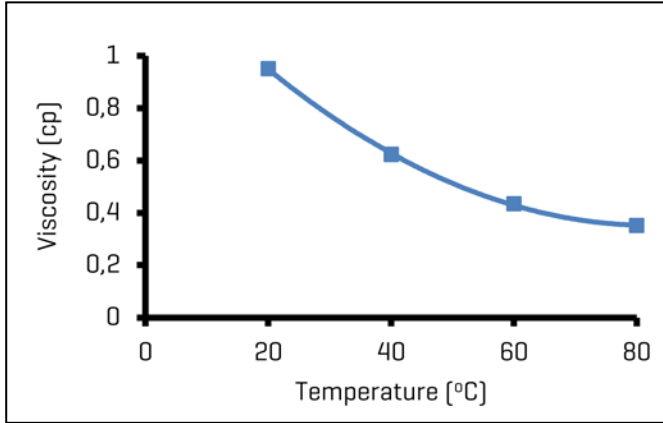
Specific weight^a	: 2.50 g/cm ³
Pour (bulk) density^a	: 0.971 g/cm ³
Molecular weight	: 411.08 g/mol
Heat capacity	: 15.4 J/g°C
Thermal conductivity	: 0.526 W/mK
Specific surface area	: 3.30 m ² /g
Surface tension	: 64.78 mN/m [1.0% aqueous solution by weight]
Colorimetry test	: 88.53 [average L value]

^a Applies to a representative sample.

Solubility:

It is slightly soluble in water.

Solution viscosity values:



Temp. [°C]	Conc. [%]	Viscosity [cp]
20	0.05	0.95
40	0.05	0.62
60	0.05	0.43
80	0.05	0.35

Chemical Content:

Component	Content	
	- 45 Micron	-75 Micron
B ₂ O ₃	40.00 ± 0.50 %	40.00 ± 0.50 %
CaO	27.00 ± 1.00 %	27.00 ± 1.00 %
SiO ₂	4.00 - 6.50 %	4.00 - 6.50%
SO ₄	0.60% max	0.60% max
As	35 ppm max	35 ppm max
Fe ₂ O ₃	0.08% max	0.08% max
Al ₂ O ₃	0.40% max	0.40% max
MgO	3.00% max	3.00% max
SrO	1.50% max	1.50% max
Na ₂ O	0.50% max	0.50% max
Heat loss	25.00% max	25.00% max
Humidity	1.00% max	1.00% max
Bulk density	1.00 ton/m ³ max	1.00 ton/m ³ max

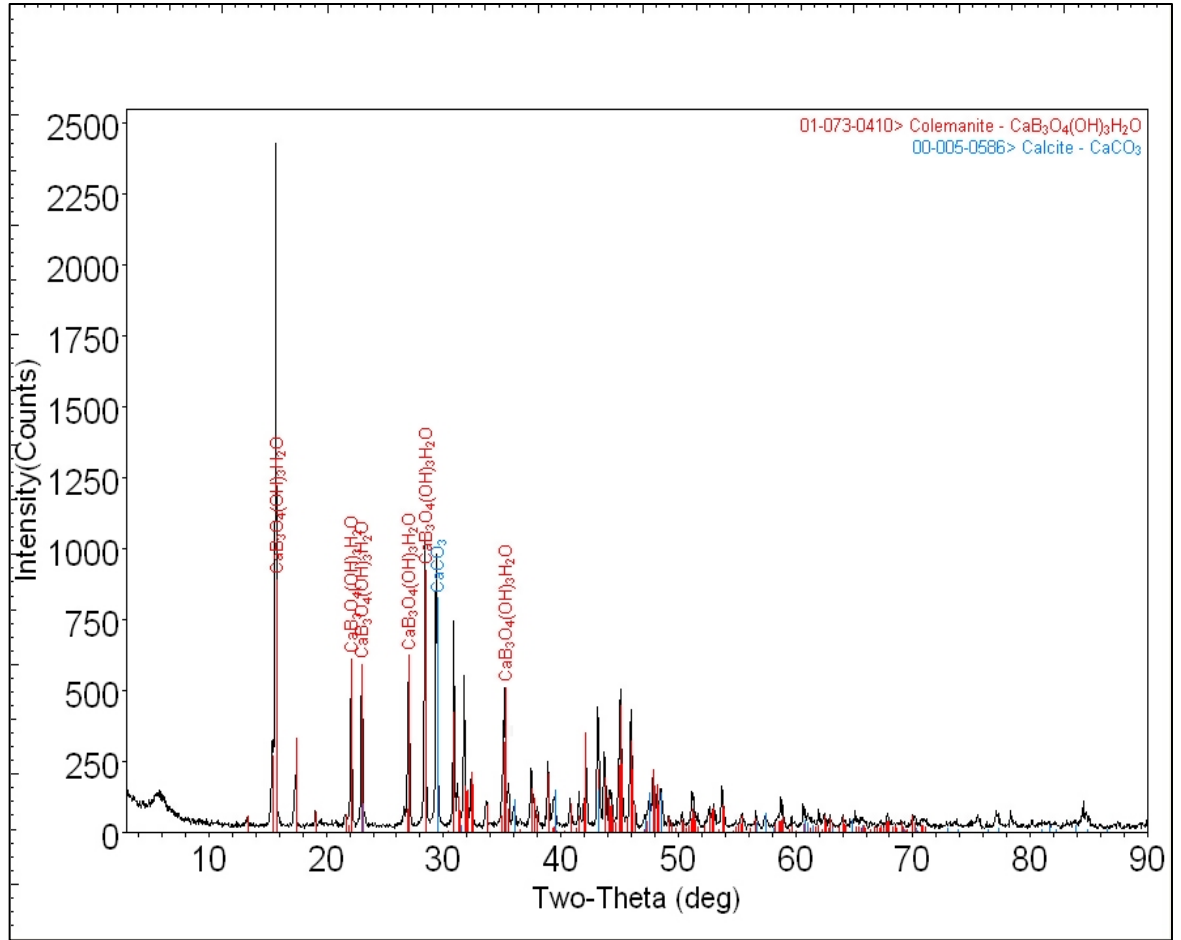
Heavy metal content:

Component	Content (mg/kg)
As	35 max
Cd	<0.005
Pb	<0.010
Cr	<0.005
Hg	<0.010

Particle size:

Size	Content	
	-45 Micron	-75 Micron
+150 µm	0.25% max	0.50% max
-45 µm	75% min	82% min

X-Ray Diffraction Analysis:



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