

Dumortierite

Al₇(BO₃)(SiO₄)₃O₃

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Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As fibrous or columnar crystals, having generally poor face development, to 6 cm; as coarsely crystalline to intimate parallel aggregates of needles; massive. *Twinning:* Common on {110}, which may produce trillings.

Physical Properties: *Cleavage:* Distinct on {100}, poor on {110}; parting on {001}. Hardness = 7–8.5 D(meas.) = 3.21–3.41 D(calc.) = 3.45

Optical Properties: Transparent to translucent. *Color:* Bright smalt-blue to greenish blue, violet, red-violet, purple, brown. *Luster:* Vitreous to dull.

Optical Class: Biaxial (–). *Pleochroism:* Strong; X = deep blue or violet; Y = yellow to red-violet or nearly colorless; Z = colorless or very pale blue. *Orientation:* X = c; Y = b; Z = a. *Dispersion:* $r > v$, strong. $\alpha = 1.659$ – 1.686 $\beta = 1.684$ – 1.722 $\gamma = 1.686$ – 1.723 2V(meas.) = 13°–55°

Cell Data: *Space Group:* Pmcn. $a = 11.828(1)$ $b = 20.243(3)$ $c = 4.7001(5)$ Z = 4

X-ray Powder Pattern: Sri Lanka.

5.85 (s), 2.09 (ms), 5.06 (m), 3.43 (m), 3.22 (m), 2.91 (mb), 4.26 (mw)

Chemistry:

	(1)	(2)
SiO ₂	29.99	31.52
TiO ₂	1.56	
B ₂ O ₃	[6.09]	6.09
Al ₂ O ₃	61.49	62.39
Fe ₂ O ₃	0.06	
MgO	0.10	
CaO	0.02	
H ₂ O	[0.60]	
Total	[99.91]	100.00

(1) Dehesa, California, USA; by electron microprobe, B₂O₃ and H₂O inferred from structure determination. (2) Al₇(BO₃)(SiO₄)₃O₃.

Occurrence: In aluminum-rich regionally metamorphosed rocks, disseminated and in veinlets cutting schists; also in pegmatitic veins.

Association: Quartz, cordierite, kyanite, andalusite, sillimanite, muscovite, rutile.

Distribution: In France, from near Beaunant and at Chaponost, near Lyon, Rhône. At Wolfshau, near Schmiedeberg, Silesia, Poland. From Kaňk, near Kutná Hora, Czech Republic. In the USA, from the Champion mine, near Oreana, Sacramento district, Humboldt Co., Nevada, once mined commercially; at Clip, near Yuma, and Quartzsite, La Paz Co., Arizona; Petaca, Rio Arriba Co., New Mexico; in California, from near Dehesa, San Diego Co., and from near Ogilby, Imperial Co. In Canada, from Ashby Township, Addington Co., Ontario. From the Erongo Mountains, Namibia. On Madagascar, many places for fine examples, as at Soavina, north of Atofinandrahana; Saharina; Ambatolahinanahary; Ambositra; and Riamfotsy. In India, at Mogra, Bhandara district, Maharashtra. Many other minor localities are known.

Name: For Eugène Dumortier (1802–1873?), French paleontologist, of Lyons, France.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 558. (2) Claringbull, G.F. and M.H. Hey (1958) New data for dumortierite. Mineral. Mag., 31, 901–907. (3) Moore, P.B. and T. Araki (1978) Dumortierite, Si₃B[Al_{6.75}□_{0.25}O_{17.25}(OH)_{0.75}]: a detailed structure analysis. Neues Jahrb. Mineral., Abh., 132, 231–241. (4) Alexander, V.D., D.T. Griffen, and T.J. Martin (1986) Crystal chemistry of some Fe- and Ti-poor dumortierites. Amer. Mineral., 71, 786–794.

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