

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals pseudo-hexagonal tabular to blocky, to 3 mm; commonly flat nodular, spherulitic, fibrous to earthy, massive. *Twining:* Common, by rotation about $[1\bar{1}0]$.

Physical Properties: *Cleavage:* On $\{010\}$, fair. Hardness = ~ 2 $D(\text{meas.}) = 2.05$
 $D(\text{calc.}) = 2.204$

Optical Properties: Translucent. *Color:* White to brownish white, colorless.

Luster: Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.520\text{--}1.522$ $\beta = 1.54\text{--}1.541$ $\gamma = 1.545\text{--}1.549$
 $2V(\text{meas.}) = 63^\circ$ $2V(\text{calc.}) = 62^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.3475(6)$ $b = 9.8027(11)$ $c = 6.2976(5)$
 $\alpha = 84.456(9)^\circ$ $\beta = 106.402(8)^\circ$ $\gamma = 96.400(9)^\circ$ $Z = 1$

X-ray Powder Pattern: Lüneburg, Germany. (ICDD 25-1155).

4.98 (100), 4.85 (70), 2.964 (60), 2.819 (45), 3.23 (40), 2.507 (35), 3.027 (30)

Chemistry:	(1)	(2)	(3)
P_2O_5	29.61	29.96	28.70
B_2O_3	12.90	12.63	14.08
MgO	25.13	25.47	24.44
CaO	0.15	0.25	
H_2O	32.16	31.61	32.78
Total	99.95	99.92	100.00

(1) Lüneburg, Germany. (2) Bela Stena, Serbia; corresponds to $\text{Mg}_{3.2}\text{B}_{1.8}(\text{PO}_4)_{2.1}(\text{OH})_{5.5} \cdot 6.1\text{H}_2\text{O}$. (3) $\text{Mg}_3\text{B}_2(\text{PO}_4)_2(\text{OH})_6 \cdot 6\text{H}_2\text{O}$.

Occurrence: In marine evaporite sequences.

Association: Boracite, gypsum (Lüneburg, Germany); colemanite, howlite, searlesite, magnesite, dolomite (Bela Stena, Serbia); halite, sylvite, polyhalite (Permian Basin, USA).

Distribution: From Lüneburg, 40 km south-southeast of Hannover, Lower Saxony, Germany. At Bela Stena, Serbia. From Kerch, Crimean Peninsula, Ukraine. At Kara-Bogaz-Gol and Uzun-Su, Turkmenistan. In the Permian Basin, around Carlsbad, Eddy Co., New Mexico and into Culbertson Co., Texas, USA. At Mejillones, Tarapaca, Chile.

Name: For its first-noted occurrence at Lüneburg, Germany.

Type Material: Wrocław University, Wrocław, Poland, II-5734; National Museum of Natural History, Washington, D.C., USA, 162602.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 385. (2) Sen Gupta, P.K., G.H. Swihart, R. Dimitrijević, and M.B. Hossain (1991) The crystal structure of lüneburgite, $\text{Mg}_3(\text{H}_2\text{O})_6[\text{B}_2(\text{OH})_6(\text{PO}_4)_2]$. *Amer. Mineral.*, 76, 1400-1407.