

Lukrahnite**CaCuFe³⁺(AsO₄)₂[(H₂O)(OH)]**

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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(meas.) = 2.05 D(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(meas.) = 63° 2V(calc.) = 62°

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 ₂ O ₅ | 29.61 | 29.96 | 28.70 |
| B ₂ O ₃ | 12.90 | 12.63 | 14.08 |
| MgO | 25.13 | 25.47 | 24.44 |
| CaO | 0.15 | 0.25 | |
| H ₂ O | 32.16 | 31.61 | 32.78 |
| Total | 99.95 | 99.92 | 100.00 |

(1) Lüneburg, Germany. (2) Bela Stena, Serbia; corresponds to Mg_{3.2}B_{1.8}(PO₄)_{2.1}(OH)_{5.5}•6.1H₂O. (3) Mg₃B₂(PO₄)₂(OH)₆•6H₂O.

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, Lower Saxony, Germany. At Bela Stena, Serbia. From Kerch, Crimean Peninsula, Ukraine. At Kara-Bogaz-Gol and Uzun-Su, Turkmenistan. In the Carlsbad potash district, Eddy Co., New Mexico and into Culbertson Co., Texas, USA. At Mejillones, Tarapacá, 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, Mg₃(H₂O)₆[B₂(OH)₆(PO₄)₂]. Amer. Mineral., 76, 1400–1407.