## Uralolite $Ca_2Be_4(PO_4)_3(OH)_3 \cdot 5H_2O$



**Crystal Data:** Monoclinic. *Point Group:* $2/m$. Bladed crystals, elongated and striated ‖ [100], flattened on {010}, with {010}, {001}, {101}, {021}; typically in radial fibrous spherulites and matted aggregates, to 5 mm. *Twinning:* May show multiple twinning.

**Physical Properties:** *Cleavage:* {010}, {100}, indistinct. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 2.05–2.14 D(calc.) = 2.197 Pale yellowish green fluorescence under LW UV, deep green under SW UV.

**Optical Properties:** Transparent to translucent. *Color:* White, colorless. *Luster:* Vitreous, silky for fibrous aggregates.
*Optical Class:* Biaxial (–). *Orientation:* $X = b$; $Z \wedge a = 9°$–$20°$. $\alpha = 1.510$–$1.512$ $\beta = 1.525$–$1.526$ $\gamma = 1.533$–$1.536$ 2V(meas.) = 66° 2V(calc.) = 70°

**Cell Data:** *Space Group:* $P2_1/n$. $a = 6.550(1)$ $b = 16.005(3)$ $c = 15.969(4)$ $\beta = 101.64(2)°$ Z = 4

**X-ray Powder Pattern:** Boevskoye deposit, Russia; spacings from a calculated pattern, intensities estimated visually.
3.562 (10), 7.12 (7), 5.59 (5), 3.03 (5), 5.25 (3), 3.203 (3), 7.82 (2)

**Chemistry:**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| $P_2O_5$ | 39.57 | 38.26 | 40.1 | 39.27 |
| $Al_2O_3$ | 0.95 | | | |
| BeO | 19.28 | 18.31 | 17.5 | 18.45 |
| CaO | 18.02 | 20.15 | 21.2 | 20.68 |
| $H_2O$ | 24.10 | 21.17 | 21.0 | 21.60 |
| insol. | 0.11 | | | |
| Total | [102.03] | 97.89 | 99.8 | 100.00 |

(1) Boevskoye deposit, Russia; $H_2O$ taken as LOI, original total given as 102.05%; corresponding to $Ca_{1.73}Be_{4.11}(PO_4)_{3.00}(OH)_{2.94} \cdot 5.69H_2O$. (2) Dunton quarry, Maine, USA; corresponding to $Ca_{2.00}Be_{4.07}(PO_4)_{3.00}(OH)_3 \cdot 5H_2O$. (3) Weinebene Pass, Austria; by electron microprobe, $H_2O$ by LOI. (4) $Ca_2Be_4(PO_4)_3(OH)_3 \cdot 5H_2O$.

**Occurrence:** In complex zoned granite pegmatites (Boevskoye deposit, Russia; Dunton quarry, Maine, USA); in a spodumene-rich pegmatite in high-grade metamorphic rocks (Weinebene Pass, Austria).

**Association:** Moraesite, beryllonite, apatite, carbonate-apatite, crandallite, beryl, fluorite (Boevskoye deposit, Russia); roscherite, hydroxyl-herderite, elbaite, beryllonite, lepidolite, albite (Dunton quarry, Maine, USA).

**Distribution:** In the Boevskoye beryllium deposit, 35 km southwest of Kamensk–Ural'skii, Middle Ural Mountains, Russia. At the Dunton quarry, Newry, Oxford Co., Maine, USA. From near Taquaral, Minas Gerais, Brazil. In the Weinebene Pass, Carinthia, Austria.

**Name:** For the Ural Mountain region, Russia, in which it was first found.

**Type Material:** Il'menskii Preserve Museum, Miass, 5523; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 75439.

**References:** (1) Grigor'ev, N.A. (1964) Uralolite – a new mineral. Zap. Vses. Mineral. Obshch., 93, 156–162 (in Russian). (2) (1964) Amer. Mineral., 49, 1776 (abs. ref. 1). (3) Dunn, P.J. and R.V. Gaines (1978) Uralolite from the Dunton gem mine, Newry, Maine: a second occurrence. Mineral. Record, 9, 99–100. (4) Mereiter, K., G. Niedermayr, and F. Walter (1994) Uralolite, $Ca_2Be_4(PO_4)_3(OH)_3 \cdot 5H_2O$: new data and crystal structure. Eur. J. Mineral., 6, 887–896.
(5) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union, 222.