

# Lermontovite

# U<sup>4+</sup>(PO<sub>4</sub>)(OH)•H<sub>2</sub>O(?)

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**Crystal Data:** Orthorhombic. *Point Group:* 2/m 2/m 2/m. Fibrous, in veinlets, or radially fibrous botryoidal aggregates, to 1.5 mm.

**Physical Properties:** *Tenacity:* Very brittle. Hardness = n.d. D(meas.) = 4.00–4.50  
D(calc.) = [4.08] Radioactive.

**Optical Properties:** Transparent. *Color:* Grayish green, green; grassy green in transmitted light. *Luster:* Dull, silky on fractures.

*Optical Class:* Biaxial (-). *Pleochroism:* In shades of green to greenish gray. *Orientation:* Z = c || elongation.  $\alpha = 1.686\text{--}1.690$   $\beta = 1.707$   $\gamma = 1.724\text{--}1.726$  2V(meas.) = n.d.  
2V(calc.) = 88(6)°

**Cell Data:** *Space Group:* Ccca (probable). a = 9.74(1) b = 19.00(1) c = 10.10(1)  
Z = [12]

**X-ray Powder Pattern:** Beshtau deposit, Russia, by X-ray and electron diffraction; decomposes rapidly under the electron beam.

3.92 (100), 3.29 (95), 4.87 (80), 4.12 (80), 3.83 (80), 3.58 (80), 4.69 (70)

## Chemistry:

	(1)	(2)
UO <sub>2</sub>	65.63	73.38
P <sub>2</sub> O <sub>5</sub>	18.54	19.28
TiO <sub>2</sub>	9.46	
CaO	0.27	
H <sub>2</sub> O	[6.10]	7.34
Total	[100.00]	100.00

(1) Beshtau deposit, Russia; by electron microprobe, average of four analyses, H<sub>2</sub>O by difference; corresponding to (U<sub>0.93</sub>Tl<sub>0.17</sub>Ca<sub>0.02</sub>)<sub>Σ=1.12</sub>(PO<sub>4</sub>)(OH)<sub>0.93</sub>•0.8H<sub>2</sub>O. (2) U(PO<sub>4</sub>)(OH)•H<sub>2</sub>O.

**Occurrence:** In uranium-bearing veins in a granite porphyry stock.

**Association:** Halloysite, vrbaite, lorandite, evansite, uraninite, marcasite, molybdenum sulfate.

**Distribution:** From the Beshtau uranium deposit, near Pyatigorsk, northern Caucasus Mountains, Russia.

**Name:** Honors Mikhail Yur'evich Lermontov (1814–1841), Russian poet.

**Type Material:** n.d.

**References:** (1) Soboleva, M.V. and I.A. Pudovkina (1957) Uranium Minerals Handbook. Moscow, 404 pages, esp. 181–182 (in Russian). (2) Getseva, R.V. and K.T. Salev'eva (1956) Handbook for the determination of uranium minerals, Moscow, 260 pages, esp. 199–200 (in Russian). (3) (1958) Amer. Mineral., 43, 379–380 (abs. refs. 1 and 2). (4) Melkov, V.G., L.N. Belova, A.I. Gorshkov, O.A. Ivanova, A.V. Sivtsov, and V.A. Boronikhin (1983) New data on lermontovite. Mineral. Zhurnal, 5(1), 82–87 (in Russian with English abs.). (5) (1984) Amer. Mineral., 69, 214–215 (abs. ref. 3). (6) (1983) Mineral. Abs., 34, 475 (abs. ref. 3). (7) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union, 128.