Beshtauite \((\text{NH}_4)_2(\text{UO}_2)(\text{SO}_4)_2 \cdot 2\text{H}_2\text{O}\)

Crystal Data: Monoclinic. \textit{Point Group:} 2/m. Crystals are blocky prismatic, to 0.2 mm.


Optical Properties: Transparent. \textit{Color:} Light green, colorless in thin section. \textit{Streak:} White. \textit{Luster:} Vitreous. \textit{Optical Class:} Biaxial (+). \(\alpha = 1.566(3)\) \(\beta = 1.566(3)\) \(\gamma = 1.592(3)\) \(2V\text{ (meas.)} = < 10^\circ\) \(2V\text{ (calc.)} = 0^\circ\)

Cell Data: \textit{Space Group:} \(P\overline{2}_1/c\). \(a = 7.7360(8)\) \(b = 7.3712(5)\) \(c = 20.856(2)\) \(\beta = 102.123(8)^\circ\) \(Z = 4\)

X-ray Powder Pattern: Beshtau uranium deposit, Mount Beshtau, Northern Caucasus, Russia. 6.86 (100), 3.410 (38), 5.307 (36), 5.005 (35), 3.081 (24), 2.881 (20), 5.997 (19)

Chemistry:

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\begin{array}{ccc}
\text{(NH}_4)_2\text{O} & (1) & 10.33 \\
\text{UO}_3 & & 9.75 \\
\text{SO}_4 & 53.21 & 53.53 \\
\text{H}_2\text{O} & 29.40 & 29.97 \\
\text{Total} & [7.06] & 6.75 \\
\end{array}
\]

(1) Beshtau uranium deposit, Mount Beshtau, Northern Caucasus, Russia; average of 7 electron microprobe analyses supplemented by FTIR spectroscopy. \(\text{H}_2\text{O}\) calculated by difference, \((\text{NH}_4)_2\text{O}\) calculated from measured N (5.56 wt. %); corresponds to \((\text{NH}_4)_2\text{U}_{0.99}\text{S}_{1.96}\text{O}_{9.99}(\text{H}_2\text{O})_{2.09}\).

(2) \((\text{NH}_4)_2(\text{UO}_2)(\text{SO}_4)_2 \cdot 2\text{H}_2\text{O}\).

Occurrence: A secondary mineral in the oxidation zone of a hydrothermal vein-type uranium deposit in porphyritic granite.

Association: Rozenite, gypsum, lermontovite, marcasite, pyrite, halloysite, opal.

Distribution: From the Beshtau uranium deposit, Mount Beshtau, Stavropol region, Northern Caucasus, Russia.

Name: For the mine that produced the first specimens.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (93775).

References: (1) Pekov, I.V., S.V. Krivovichev, V.O. Yapaskurt, N.V. Chukanov, and D.I. Belakovskiy (2014) Beshtauite, \((\text{NH}_4)_2(\text{UO}_2)(\text{SO}_4)_2 \cdot 2\text{H}_2\text{O}\), a new mineral from Mount Beshtau, Northern Caucasus, Russia. Amer. Mineral., 99, 1183-1787.