Carlosbarbosaite

\[(\text{UO}_2)_2\text{Nb}_2\text{O}_6(\text{OH})_2\cdot2\text{H}_2\text{O}\]

Crystal Data: Orthorhombic.  \textit{Point Group}: 2/m 2/m 2/m.  As bent fibrous crystals to 0.12 mm, elongated along [001] and flattened on (100), and displaying {001}, {100} and {010}.


Optical Class: Biaxial (+).  \(\alpha = 1.760\)  \(\beta = 1.775\)  \(\gamma = 1.795\)  \(2V(\text{meas.}) = 70(1)^\circ\)

2V(calc.) = 83° Pleochroism: Weak, shades of yellowish green.  Orientation: \(X = a, Y = b, Z = c\).

Cell Data:  \textit{Space Group}: Cmcm.  \(a = 14.150(6)\)  \(b = 10.395(4)\)  \(c = 7.529(3)\)  \(Z = 4\)

X-ray Powder Pattern: Jaguaraçu pegmatite, Minas Gerais, Brazil.  7.081 (100), 4.201 (90), 8.405 (80), 3.053 (80), 2.931 (70), 3.333 (60), 2.803 (60)

Chemistry:

\[
\begin{array}{cc}
\text{Species} & \text{Substoichiometry} \\
\text{UO}_3 & 54.52 \\
\text{CaO} & 2.07 \\
\text{Ce}_2\text{O}_3 & 0.33 \\
\text{Nd}_2\text{O}_3 & 0.49 \\
\text{Nb}_2\text{O}_5 & 14.11 \\
\text{Ta}_2\text{O}_5 & 15.25 \\
\text{TiO}_2 & 2.20 \\
\text{SiO}_2 & 2.14 \\
\text{Fe}_2\text{O}_3 & 1.08 \\
\text{Al}_2\text{O}_3 & 0.73 \\
\text{H}_2\text{O} & 11.49 \\
\text{Total} & 104.41 \\
\end{array}
\]

(1) Jaguaraçu pegmatite, Minas Gerais, Brazil; average of 7 electron microprobe analyses, \(\text{H}_2\text{O}\) calculated, \(\text{OH}\) and \(\text{H}_2\text{O}\) confirmed by IR spectroscopy; corresponds to \((\text{CO}_0.68\text{Ca}_0.28\text{Nd}_0.05\text{Ce}_0.02\text{Ta}_0.01\text{Si}_0.09\text{Ti}_0.02\text{Fe}_0.01\text{Al}_0.01\text{H}_2\text{O})_2\text{UO}_2\) \[\text{H}_2\text{O}\].

(2) Same as above; corresponding to \((\text{CO}_0.67\text{Ca}_0.27\text{Nd}_0.05\text{Ce}_0.01\text{Ta}_0.01\text{Si}_0.42\text{Ti}_0.08\text{Al}_0.10\text{Fe}_0.08\text{H}_2\text{O})_2\text{UO}_2\).

Polymorphism & Series: Forms a series between end members \((\text{UO}_2)_2\text{Nb}_2\text{O}_6(\text{OH})_2(\text{H}_2\text{O})_2\) and \((\text{H}_2\text{O})_2\text{Nb}_2\text{O}_6\text{H}_2\text{O}\).

Occurrence: A late-stage cavity filling in albite in a complex pegmatite.

Association: Albite, muscovite, zircon, kaolinite, columbite-(Fe).

Distribution: From the Jaguaraçu pegmatite, Minas Gerais, Brazil.

Name: Honors Carlos do Prado Barbosa (1917-2003), a chemical engineer, who as a dealer in mineral specimens, promoted the discovery and scientific study of rare mineral species.

Type Material: Museu de Geociências, Instituto de Geociências, Universidade de São Paulo, São Paulo, Brazil (DR707) and in the Systematic Reference Series, National Mineral Collection, Geological Survey, Ottawa, Ontario, Canada.