Béhierite

\((\text{Ta}, \text{Nb})\text{BO}_4\)

Crystal Data: Tetragonal. Point Group: \(4/m\ 2/m\ 2/m\). Crystals are pseudo-octahedral \(\{011\}\), to 7 mm; may be intergrown with schiavinatoite.

Physical Properties: Cleavage: On \{110\} and \{010\}, distinct. Fracture: Subconchoidal. Hardness = 7–7.5 \(D(\text{meas.}) = 7.86(5)\) \(D(\text{calc.}) = 7.91\)

Optical Properties: Translucent. Color: Grayish pink. Streak: White. Luster: Adamantine. Optical Class: Uniaxial (+), high birefringence. \(\omega > 2.00\) \(\epsilon > 2.00\)

Cell Data: Space Group: \(I4_1/\text{amd}\). \(a = 6.206(5)\) \(c = 5.472(5)\) \(Z = 4\)

X-ray Powder Pattern: Manjaka, Madagascar; very close to schiavinatoite. 4.10 (100), 3.10 (71), 2.327 (71), 2.478 (50), 1.600 (50), 1.939 (35)

Chemistry:

\[
\begin{array}{ccc}
\text{B}_2\text{O}_3 & [15.77] & 16.44 \\
\text{Nb}_2\text{O}_5 & 21.73 & 31.38 \\
\text{Ta}_2\text{O}_5 & 63.95 & 52.18 \\
\text{Total} & [101.45] & 100.00 \\
\end{array}
\]

(1) Antsongombato, Madagascar; by electron microprobe, \(\text{B}_2\text{O}_3\) calculated from stoichiometry; corresponds to \((\text{Ta}_{0.64}\text{Nb}_{0.36})\Sigma=1.00\text{BO}_4\). The original X-ray fluorescence analysis of type material from Manjaka, Madagascar is stated to have shown \(\text{Ta}:\text{Nb}:\text{Zr} = 18:1:0.4\). (2) \((\text{Ta}, \text{Nb})\text{BO}_4\) with \(\text{Ta}:\text{Nb} = 1:1\).

Occurrence: Very rare, in granite pegmatites.

Association: Elbaite, pollucite, manganoan apatite, lepidolite, quartz, albite (Manjaka, Madagascar); schiavinatoite, rhodizite, elbaite–liddicoatite, quartz, feldspar (Antsongombato, Madagascar).

Distribution: From Manjaka and Antsongombato, south of Betafo, Madagascar. In the Animikie Red Ace pegmatite, near Pine River, Florence Co., Wisconsin, USA.

Name: To honor Jean Béhier (1903–1965), French mineralogist, Geological Survey of Madagascar, who discovered the mineral.
