Veatchite-A

\[ \text{Sr}_2\text{B}_{11}\text{O}_{16}(\text{OH})_5\cdot\text{H}_2\text{O} \]

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Crystal Data:  Triclinic.  Point Group:  \( \overline{1} \) or 1.  Crystals are platy on \{100\}, with rhombic outline showing \{100\}, \{011\}, \{01\overline{1}\}, to 2 mm, in stacked aggregates.  Twinning:  On \{100\}, polysynthetic lamellae observed optically.

Physical Properties:  Cleavage:  Perfect on \{100\}; good on \{011\} and \{01\overline{1}\}.  Hardness = n.d.  \( D(\text{meas.)} = 2.73(2) \)  \( D(\text{calc.)} = 2.77 \)

Optical Properties:  Transparent.  Color:  Colorless.  Luster:  Pearly on cleavages.  Optical Class:  Biaxial (+).  Orientation:  \( X = c; Z = b \).  Dispersion:  \( r < v \), strong.  \( \alpha = 1.549(2) \)  \( \beta = [1.551] \)  \( \gamma = 1.621(2) \)  \( 2V(\text{meas.)} = 25(1)^\circ \)

Cell Data:  Space Group:  \( \text{A}1 \) or \( \text{A}1 \).  \( a = 20.80(62) \)  \( b = 11.72(35) \)  \( c = 6.63(20) \)  \( \alpha = 90^\circ 00(05)^\prime \)  \( \beta = 90^\circ 48(5)^\prime \)  \( \gamma = 91^\circ 57(5)^\prime \)  \( Z = 4 \)

X-ray Powder Pattern:  Emet, Turkey.  10.40 (vs), 3.32 (vs), 2.592 (vs), 3.45 (s), 2.84 (s), 4.09 (m), 2.191 (m)

Chemistry:

\begin{align*}
\text{B}_2\text{O}_3 & \quad 58.15 & \quad 58.62 \\
\text{MgO} & \quad 0.04 \\
\text{CaO} & \quad 0.25 \\
\text{SrO} & \quad 30.88 & \quad 31.73 \\
\text{H}_2\text{O}^+ & \quad 9.63 \\
\text{H}_2\text{O}^- & \quad 0.15 \\
\text{H}_2\text{O} & \quad 9.65 \\
\text{rem.} & \quad 0.06 \\
\text{Total} & \quad 99.16 & \quad 100.00
\end{align*}

(1) Emet, Turkey; MgO and CaO by AA. (2) \( \text{Sr}_2\text{B}_{11}\text{O}_{16}(\text{OH})_5\cdot\text{H}_2\text{O} \).

Polymorphism & Series:  Trimorphous with \( p \)-veatchite and veatchite.

Occurrence:  Uncommon in evaporite borate deposits formed by volcanic activity.

Association:  Realgar, orpiment, colemanite, hydroboracite, montmorillonite.

Distribution:  From the Killik, Hisarcık, and Espey borate mines, near Emet, Kütahya Province, Turkey.

Name:  As a polytype of veatchite, crystallizing in the anorthic (triclinic) system.

Type Material:  Mining Department, Istanbul Technical University, Istanbul, Turkey; National Museum of Natural History, Washington, D.C., USA, 145911.