Biringuccite

\[ \text{Na}_2\text{B}_5\text{O}_8(\text{OH})\cdot\text{H}_2\text{O} \]

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**Crystal Data:** Monoclinic.  *Point Group:* 2/m. Tiny crystals and microcrystalline clusters, in earthy masses.

**Physical Properties:** Hardness = n.d.  \( \text{D(meas.)} = 2.32(1) \) (synthetic).  \( \text{D(calc.)} = 2.297 \) Soluble in \( \text{H}_2\text{O} \).

**Optical Properties:** Transparent.  *Color:* White to pale yellow.  
*Optical Class:* Biaxial (−) (synthetic).  *Orientation:*  \( Y = b; \ Z \wedge a = 5.4(6)° \)  \( \alpha = 1.496(2) \)  \( \beta = 1.539(2) \)  \( \gamma = 1.557(2) \)  \( 2V(\text{meas.}) = 62.7° \)  \( 2V(\text{calc.}) = 64.6° \)

**Cell Data:**  
*Space Group:* \( \text{P2}_{1}/c \) (synthetic).  
\( a = 11.1955(7) \)  \( b = 6.5607(4) \)  \( c = 20.7566(9) \)  \( \beta = 93.891(6)° \)  \( Z = 4 \)

**X-ray Powder Pattern:** Synthetic.
\( 3.45 \ (100), 10.32 \ (80), 3.05 \ (55), 3.03 \ (55), 2.589 \ (45), 5.18 \ (40), 2.853 \ (40) \)

**Chemistry:** (1) Larderello, Italy; identification depended on the chemical analysis interpreted as a mixture with nasinite, and the correspondence of lines in the mixture’s X-ray powder pattern with those of synthetic material.

**Occurrence:** As scales on piping in a geothermal field.

**Association:** Nasinite, thénardite, orpiment, quartz.

**Distribution:** From Larderello, Val di Cecina, Tuscany, Italy.

**Name:** To honor Vannoccio Biringuccio (1480–1538/9), alchemist and metallurgist, author of the *Pirotechnia*.

**Type Material:** University of Florence, Florence, Italy, 16802/703; National Museum of Natural History, Washington, D.C., USA, 163785.