Favreauite

\[ \text{PbBiCu}_6\text{O}_4(\text{SeO}_3)_4(\text{OH})\cdot\text{H}_2\text{O} \]

**Crystal Data:** Tetragonal. \textit{Point Group:} 4\textit{m}. As square tabular crystals to 0.1 mm, flattened on \{001\} and combined in subparallel and divergent groups.

**Physical Properties:** 
- \textit{Cleavage:} Perfect on \{001\}. 
- \textit{Fracture:} Irregular. 
- \textit{Tenacity:} Brittle. 
- Hardness = \textit{~} 3 
- D(meas.) = n.d. 
- D(calc.) = 4.851

**Optical Properties:** 
- Transparent. 
- \textit{Color:} Green. 
- \textit{Streak:} n.d. 
- \textit{Luster:} Vitreous. 
- \textit{Optical Class:} Uniaxial (−). 
- n(calc.) = 1.854. 
- \textit{Pleochroism:} Slight, in green tints. 
- \textit{Absorption:} O < E.

**Cell Data:** 
- \textit{Space Group:} \textit{P}4/\textit{n}. 
- \(a = 9.860(4)\) 
- \(c = 9.700(5)\) 
- \(Z = 2\)

**X-ray Powder Pattern:** El Dragón mine, Antonio Quijarro Province, Potosí Department, Bolivia. 
- 5.67 (100), 3.470 (76), 2.961 (40), 2.247 (36), 3.190 (35), 2.632 (34), 2.709 (33)

**Chemistry:**

\begin{tabular}{lcc}
\text{Chemistry} & (1) & (2) \\
\hline
\text{CaO} & 0.64 & \\
\text{CuO} & 30.63 & 33.99 \\
\text{PbO} & 14.08 & 15.89 \\
\text{Bi}_2\text{O}_3 & 13.95 & 16.59 \\
\text{SeO}_2 & 30.16 & 31.60 \\
\text{H}_2\text{O} & [1.79] & 1.92 \\
\text{Total} & 91.25 & 100.00 \\
\end{tabular}

(1) El Dragón mine, Antonio Quijarro Province, Potosí Department, Bolivia; average of 6 electron microprobe analyses supplemented by IR spectroscopy, \text{H}_2\text{O} from charge balance; corresponding to \text{Pb}_{0.95}\text{Ca}_{0.17}\text{Bi}_{0.96}\text{Cu}_{5.81}\text{Se}_{4.10}\text{O}_{16}(\text{OH})\cdot\text{H}_2\text{O}. 

(2) \text{PbBiCu}_6\text{O}_4(\text{SeO}_3)_4(\text{OH})\cdot\text{H}_2\text{O}.

**Occurrence:** A secondary mineral formed by the oxidation of a selenide-bearing hydrothermal vein hosted by sandstones and shales.

**Association:** Ahlfeldite, allophane, calcite, chalcomenite, malachite, molybdemenite, alfredopetrovite.

**Distribution:** From the El Dragón mine, Antonio Quijarro Province, Potosí Department, Bolivia.

**Name:** Honors Georges Favreau, amateur mineralogist and professional engineer, President of the Association Française de Microminéralogie (1993-2007) and co-discoverer of this new mineral, for his contributions to mineralogy.

**Type Material:** Geosciences collections, Museum Victoria, Melbourne, Victoria, Australia (M53004) and the Natural History Museum of Los Angeles County, Los Angeles, USA (64111-64113).

**References:**
