Julgoldite-(Fe$^{2+}$)  \(\text{Ca}_2\text{Fe}^{2+}(\text{Fe}^{3+}, \text{Al})_2(\text{SiO}_4)(\text{Si}_2\text{O}_7)(\text{OH})_2\cdot\text{H}_2\text{O}\)

Crystal Data:  Monoclinic.  \(\text{Point Group: } 2/m\).  Crystals flat prismatic to bladed, to 2 mm, elongated along \(\{010\}\) and flattened \(\{100\}\).  In fan-shaped, plumose crystal groups; granular.  Twinning: Twin plane \(\{001\}\), typically repeated, common.

Physical Properties:  Cleavage: Perfect on \(\{100\}\) and \(\{001\}\).  Tenacity: Brittle.  Hardness = 4.5  \(D\text{(meas.)} = 3.58-3.60\)  \(D\text{(calc.)} = 3.56\)


Optical Class:  Biaxial (-).  Pleochroism: Strong; \(X = \) pale brown; \(Y = \) pale brownish green; \(Z = \) deep emerald-green.  Orientation: \(Y = b\).  Absorption: \(Z \gg Y > X\).  \(\alpha = 1.776(4)\)  \(\beta = 1.814(4)\)  \(\gamma = 1.836(4)\)  \(2V\text{(meas.)} = 50°-70°\)  \(2V\text{(calc.)} = 73°\)

Cell Data:  \(\text{Space Group: } A2/m\).  \(a = 8.922(4)\)  \(b = 6.081(3)\)  \(c = 19.432(9)\)  \(\bar{\beta} = 97.60(6)°\)  \(Z = 4\)

X-ray Powder Pattern: Scotland.  \(2.958 \text{ (100), } 2.780 \text{ (80), } 2.574 \text{ (80), } 1.519 \text{ (80), } 4.817 \text{ (70), } 3.859 \text{ (70), } 2.501 \text{ (60)}\)

Chemistry:

\[
\begin{array}{cccc}
\text{SiO}_2 & 34.0 & 32.04 & \text{MnO} & 0.2 \\
\text{TiO}_2 & 0.1 & 0.23 & \text{MgO} & 0.2 \\
\text{Al}_2\text{O}_3 & 1.3 & 0.68 & \text{CaO} & 22.0 \\
\text{Fe}_2\text{O}_3 & 29.6 & 30.28 & \text{BaO} & 0.01 \\
\text{FeO} & 8.7 & 9.5 & \text{H}_2\text{O} & 4.69 \\
\end{array}
\]

Total 100.8  [100.00]

Polymorphism & Series: Forms two series, with pumpellyite-(Fe$^{2+}$), and with pumpellyite-(Mg).

Mineral Group: Pumpellyite group.

Occurrence: In hematite-magnetite ore (Långban, Sweden); in quartz-diabase (Scotland).

Association: Apophyllite, barite, hematite, magnetite, ilvaite, calcite, quartz, chlorite, prehnite, epistilbite, stilbite, pectolite, laumontite, babingtonite, titanite.


Name: For Professor Julian Royce Goldsmith (1918– ), mineralogist and geochemist, University of Chicago, Chicago, Illinois, USA, and its ferrous iron content.

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