Ferrilotharmeyerite \( \text{Ca(Fe}^{3+}, \text{Zn, Cu})_{2} (\text{AsO}_{4})_{2} (\text{OH}, \text{H}_{2}\text{O})_{2} \)

Crystal Data: Monoclinic. Point Group: \( 2/m \). As subhedral crystals, to 0.6 mm, tabular on \{T01\}, slightly elongated along [010], wedge- or lozenge-shaped, terminated by \{T11\}, composed of multiple crystallites.


Optical Properties: Transparent to translucent. Color: Yellow, brownish yellow, yellowish brown. Streak: Very pale yellow. Luster: Adamantine to greasy. Optical Class: Biaxial (+). Pleochroism: Strong; X = olive-green or orange; Y = pale green or yellow; Z = colorless. Orientation: X = b; Y \( \wedge \) c = \( \sim 22^\circ \). Dispersion: \( r \geqslant v \), distinct, inclined. Absorption: X \( \gg \) Y \( \gg \) Z.

Cell Data: Space Group: \( C_{2}/m \). \( a = 8.997–9.010 \) \( b = 6.236–6.246 \) \( c = 7.387–7.391 \) \( \beta = 115.52–115.74^\circ \). \( Z = 2 \)

X-ray Powder Pattern: Tsumeb, Namibia. 3.398 (100), 3.175 (100), 2.938 (100), 2.544 (100), 4.95 (70), 2.823 (70), 2.702 (70)

Chemistry: (1) (2)

\[
\begin{array}{ll}
\text{As}_2\text{O}_5 & 48.66 \quad 48.73 \\
\text{Al}_2\text{O}_3 & 0.13 \quad < 0.1 \\
\text{Fe}_2\text{O}_3 & 13.96 \quad 15.68 \\
\text{CuO} & 5.75 \quad < 0.1 \\
\text{ZnO} & 13.94 \quad 17.88 \\
\text{PbO} & 2.13 \quad 0.14 \\
\text{CaO} & 10.86 \quad 12.07 \\
\text{H}_2\text{O} & 5.85 \quad [5.80]
\end{array}
\]

(1) Tsumeb, Namibia; by electron microprobe, \( \text{H}_2\text{O} \) by CHN analyzer; corresponds to \((\text{Ca}_{0.92}\text{Pb}_{0.05})_{2} (\text{Fe}_{0.87}\text{Zn}_{0.01})_{2} (\text{Cu}_{0.03}\text{A}_{0.01})_{2} (\text{AsO}_{4})_{2} (\text{OH}, \text{H}_{2}\text{O})_{2} \). (2) Do.; by electron microprobe, average of 20 analyses, total Fe as \( \text{Fe}_2\text{O}_3 \), \( \text{H}_2\text{O} \) calculated from theory; corresponds to \((\text{Ca}_{1.02}\text{Fe}_{0.93}\text{Zn}_{0.04})_{2} (\text{AsO}_{4})_{2} (\text{OH}, \text{H}_{2}\text{O})_{2} \)

Mineral Group: Tsumcorite group.

Occurrence: Very rare, on museum specimens from a dolostone-hosted hydrothermal polymetallic ore deposit.

Association: Conichalcite, scorodite, schneiderhöhlnite, beudantite, tennantite, calcite.

Distribution: From Tsumeb, Namibia.

Name: As the ferric iron analog of lotharmeyerite.

Type Material: Canadian Geological Survey, Ottawa, Canada, NMC 64573; Museum Victoria, Melbourne, Australia, M38092.


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