Ferrisicklerite \( \text{Li(Fe}^{3+},\text{Mn}^{2+})\text{PO}_4 \)

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Crystal Data: Orthorhombic. Point Group: \(2/m 2/m 2/m\). Rare crystals, to 1 mm, in spherical or radial aggregates; usually massive, may be monocrystalline, in nodules, and as rims around crystals and masses of triphylite-lithiophiolite.

Physical Properties: Cleavage: \{010\}, perfect; \{100\}, good. Hardness = \(\sim 4\)

\(D(\text{meas.}) = 3.2-3.4\) \(D(\text{calc.}) = 3.257\)


Optical Class: Biaxial (-). Orientation: \(X = c; \ Y = a; \ Z = b\). Pleochroism: Faint; \(X = \) golden yellow to yellow-orange; \(Z = \) pale yellow to golden yellow. \(\alpha = 1.790(5)\) \(\beta = 1.805(5)\) \(\gamma = 1.820(5)\) \(2V(\text{meas.}) = \sim 85^\circ\)

Cell Data: Space Group: \(\text{Pmn}b\). \(a = 5.918(3)\) \(b = 10.037(6)\) \(c = 4.799(3)\) \(Z = 4\)

X-ray Powder Pattern: Sidi Bou Othmane, Morocco. 2.959 (100), 5.01 (70), 4.33 (40), 2.49 (35), 3.49 (30), 3.82 (20), 2.444 (15)

Chemistry: (1) (2) (3)

\begin{align*}
\text{P}_2\text{O}_5 & 44.80 & 43.73 & 47.03 & \text{CaO} & 1.36 & 0.62 & 0.10 \\
\text{SiO}_2 & 0.12 & 0.16 & \text{Li}_2\text{O} & 3.72 & 3.95 & [1.20] \\
\text{Fe}_2\text{O}_3 & 27.20 & 32.22 & 44.76 & \text{Na}_2\text{O} & 0.81 & 0.40 & 0.01 \\
\text{Mn}_2\text{O}_3 & 0.00 & \text{H}_2\text{O}^+ & 0.51 & 1.48 & \text{n.d.} \\
\text{FeO} & 0.59 & 0.34 & \text{H}_2\text{O}^- & 0.51 & 0.63 \\
\text{MnO} & 19.13 & 15.66 & 1.97 & \text{insol.} & 1.66 \\
\text{MgO} & 0.11 & 0.96 & 3.57 & \text{Total} & 100.40 & 100.11 & [98.80] \\
\end{align*}

(1) Varuträsk, Sweden. (2) Sidi Bou Othmane, Morocco; corresponds to \((\text{Li}_{0.49}\text{Na}_{0.02}\text{Fe}_{0.01})\Sigma_{=0.43} (\text{Fe}^{3+}_{0.62}\text{Mn}^{2+}_{0.38})\Sigma_{=1.00}([\text{PO}_4]_{0.94}([\text{OH}]_{0.06})\Sigma_{=1.00}\). (3) Angarf-Sud pegmatite, Morocco; by electron microprobe, \(\text{Li}_2\text{O}\) calculated for charge balance; corresponds to \(\text{Li}_{0.12}(\text{Fe}^{3+}_{0.84}\text{Mg}_{0.13}\text{Mn}^{2+}_{0.04})\Sigma_{=1.01}(\text{PO}_4)\).

Polymorphism & Series: Forms a series with sicklerite.

Occurrence: Formed by late hydrothermal alteration or weathering of triphylite-lithiophiolite in complex zoned granite pegmatites.

Association: Triphylite-lithiophiolite, heterosite, aluhaudite, phosphosiderite, cyrilovite.

Distribution: In Sweden, from the Varuträsk pegmatite, 15 km northwest of Skellefteå, Västerbotten; at the Norrográf pegmatite, on Rånö Island, and on Utö Island. At Tammela, Finland. From Hüblnerkobel, near Zwiesel, and crystallized from Hagendorf, Bavaria, Germany. From pegmatites around Sidi Bou Othmane, Jebilet, and the Angarf-Sud pegmatite, Tazenakht Plain, Anti-Atlas Mountains, Morocco. At the Souchoన pegmatite, Lamativi, and Portree mine, Odzi, Zimbabwe. In the Buranga pegmatite, Gatumba district, Rwanda. From the Tsaoibismund pegmatite, 60 km south of Karibib, Namibia. In the USA, from Strafford and Rochester, Strafford Co., and in the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire; from Newry and Paris, Oxford Co., Maine; in the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota; from the Foote mine, near Kings Mountain, Cleveland Co., North Carolina. Probably present at many other pegmatites.

Name: For its dominant ferric iron content and relation to sicklerite.

Type Material: n.d.


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