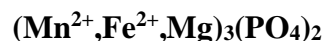


Zavalíaite

Crystal Data: Monoclinic. *Point Group:* 2/m. As exsolution lamellae to 70 μm thick and 1.5 mm long in lithiophilite nodules.

Physical Properties: *Cleavage:* Perfect on {100} and {001}. *Fracture:* n.d. *Tenacity:* Brittle. Hardness = ~4 D(meas.) = n.d. D(calc.) = 3.68

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous to resinous.

Optical Class: Biaxial (-). $n = 1.66(1)$ $2V(\text{meas.}) = 15(5)^\circ$ *Orientation:* $X \perp$ the cleavage plane at 45° to elongation.

Cell Data: *Space Group:* $P2_1/c$. $a = 6.088(1)$ $b = 4.814(2)$ $c = 10.484(2)$ $\beta = 89.42(3)^\circ$
 $Z = 2$

X-ray Powder Pattern: La Empleada pegmatite, Totoral pegmatite field, Argentina. 6.75 (vs), 1.894 (vs), 1.848 (vs), 1.652 (vs), 2.964 (s), 2.537 (s), 3.54 (w)

Chemistry:	(1)	(2)
MgO	6.09	6.04
MnO	27.08	26.90
FeO	24.94	25.34
<u>P₂O₅</u>	<u>41.38</u>	<u>41.72</u>
Total	99.49	100.00

(1) La Empleada pegmatite, Totoral pegmatite field, Argentina; average of 27 electron microprobe analyses, absence of CO₂ and H₂O confirmed by structure analysis; corresponding to $(\text{Mn}^{2+}_{1.31}\text{Fe}^{2+}_{1.19}\text{Mg}_{0.52})_{\Sigma=3.02}(\text{P}_{1.00}\text{O}_4)_2$. (2) $(\text{Mn}^{2+}_{1.29}\text{Fe}^{2+}_{1.20}\text{Mg}_{0.51})_{\Sigma=3.00}(\text{PO}_4)_2$.

Mineral Group: Sarcopsidite group.

Occurrence: In the core margin of a zoned granitic pegmatite (beryl-columbite-phosphate subtype) as exsolution lamellae in ellipsoidal phosphate nodules.

Association: Lithiophilite, reddingite (by hydration).

Distribution: From the La Empleada granitic pegmatite, Totoral pegmatite field, San Luis Province, Argentina.

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Type Material: Laboratory of Mineralogy, University of Liège, Belgium (# 20384).

References: (1) Hatert, F., E. Roda-Robles, P. De Parseval, and J. Wouters (2012) Zavalíaite, $(\text{Mn}^{2+}, \text{Fe}^{2+}, \text{Mg})_3(\text{PO}_4)_2$, a new member of the sarcopsidite group from the La Empleada pegmatite, San Luis Province, Argentina. *Can. Mineral.*, 50(6), 1445-1452. (2) (2014) *Amer. Mineral.*, 99, 2156-2157 (abs. ref. 1).