Fianelite

\[ \text{Mn}^{2+}\text{V}^{5+}(\text{V}^{5+}, \text{As}^{5+})\text{O}_7 \cdot 2\text{H}_2\text{O} \]

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Crystal Data: Monoclinic. Point Group: \(2/m\). Rare crystals, platy, prominent \(\{010\}\), with \(\{100\}\), \(\{001\}\), \(\{041\}\) (?), intergrown and striated || \(\{100\}\), to 0.2 mm; in rosettes and polycrystalline crusts.

Physical Properties: Cleavage: Parallel \(\{001\}\) (?) and \(\{100\}\) (?), good. Hardness = \(\sim 3\) VHN = 84–89, average 86.5 (15 g load). \(\text{D( meas.)} = 3.21(1)\) \(\text{D(calc.)} = 3.217(2)\)

Optical Properties: Transparent. Color: Red-orange. Streak: Orange. Luster: Vitreous. Optical Class: Biaxial. Pleochroism: Strong; yellow to red on \(\{010\}\) (?). \(n = 1.82(2)\) \(2V\text{(meas.)} = < 10^\circ\)

Cell Data: Space Group: \(P2_1/n\). \(a = 7.809(2)\) \(b = 14.554(4)\) \(c = 6.705(4)\) \(\beta = 93.27(3)^\circ\) \(Z = 4\)

X-ray Powder Pattern: Fianel mine, Switzerland.

Chemistry:

\[
\begin{array}{cc}
\text{As}_2\text{O}_5 & 13.57 \\
\text{V}_2\text{O}_5 & 38.23 \\
\text{SiO}_2 & 0.12 \\
\text{MnO} & 37.49 \\
\text{H}_2\text{O} & [9.64] \\
\hline
\text{Total} & [99.05]
\end{array}
\]

(1) Fianel mine, Switzerland; by electron microprobe, average of eight analyses on three grains, total Mn as MnO, \(\text{H}_2\text{O}\) calculated from crystal-structure analysis; corresponds to \(\text{Mn}_{1.98}(\text{V}_{1.57}\text{As}_{0.44}\text{Si}_{0.01})\Sigma=2.02\text{O}_7 \cdot 2\text{H}_2\text{O}\).

Occurrence: In fractures crosscutting veinlets in metamorphosed Fe–Mn ores.

Association: Medaite, palenzonaite, saneroite, pyrobelonite, parsettensite, rhodochrosite, kutnohorite, aegirine, quartz.

Distribution: From the Fianel mine, Val Ferrera, Graubünden, Switzerland.

Name: For its occurrence in the Fianel mine, Switzerland.

Type Material: Natural History Museum, Basel, Switzerland.

References: (1) Brugger, J. and P. Berlepsch (1996) Description and crystal structure of fianelite, \(\text{Mn}_2\text{V(V, As)}\text{O}_7 \cdot 2\text{H}_2\text{O}\), a new mineral from Fianel, Val Ferrera, Graubünden, Switzerland. Amer. Mineral., 81, 1270–1276.