Franciscanite

\[ \text{Mn}_3^{2+}\text{V}^{5+}_{1-x}(\text{SiO}_4)(\text{O, OH})_3 (x = 0.5) \]

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Crystal Data: Hexagonal. Point Group: 3. As irregular grains to 1.0 mm.


D(calc.) = 3.97 May be weakly magnetic, possibly resulting from tiny opaque inclusions.

Optical Properties: Transparent. Color: Cherry-red when fresh, darkening to brownish red

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Optical Class: Uniaxial (+). Pleochroism: Strong; O = wine-red; E = dark red to nearly black.

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Absorption: Intense; E > O. \(\omega = 1.856(3)\) \(\epsilon = 1.882(3)\)

Cell Data: Space Group: P3. \(a = 8.1518(3)\) \(c = 4.8091(2)\) Z = 2

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X-ray Powder Pattern: Pennsylvania mine, California, USA.

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2.331 (100), 3.105 (90), 2.844 (90), 1.785 (70), 1.538 (50), 2.668 (40), 3.97 (30)

Chemistry:

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\begin{align*}
\text{SiO}_2 & \quad 18.4 \\
\text{Fe}_2\text{O}_3 & \quad 0.0 \\
\text{Al}_2\text{O}_3 & \quad 0.0 \\
\text{WO}_3 & \quad 0.0 \\
\text{Sb}_2\text{O}_5 & \quad 0.0 \\
\text{As}_2\text{O}_5 & \quad 0.0 \\
\text{V}_2\text{O}_5 & \quad 13.5 \\
\text{MnO} & \quad 64.9 \\
\text{MgO} & \quad 0.0 \\
\text{H}_2\text{O} & \quad [3.4] \\
\text{Total} & \quad [100.2]
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corresponds to Mn\(_{2.08}\)V\(_{0.49}\)(SiO\(_4\))(O, OH)\(_{3.9}\).

Occurrence: As sparse, irregular segregations within a sheared sonolite-bearing assemblage in

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chert.

Association: Sonolite, hausmannite, braunite, gageite.

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Distribution: From the Pennsylvania mine, San Antonio Valley, Santa Clara Co., California,

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Name: For the Franciscan complex of California, USA, where it was found.

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References: (1) Dunn, P.J., D.R. Peacor, R.C. Erd, and R.A. Ramik (1986) Franciscanite and

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örebroite, two new minerals from California and Sweden, related to redefined welinite.

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Amer. Mineral., 71, 1522–1526. (2) Pertlik, F. (1986) The crystal structure of franciscanite,

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Mn\(_3\)(V\(_x\)\square\(_{1-x}\))(SiO\(_4\))(O, OH)\(_{3.1}\), \([x \approx 0.5]\). Neues Jahrb. Mineral., Monatsh., 493–499.

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