Saneroite \( \text{Na}_2(\text{Mn}^{2+}, \text{Mn}^{3+})_{10}(\text{Si}_{11}, \text{V}^{5+})\text{O}_{34}(\text{OH})_4 \)

Crystal Data: Triclinic. Point Group: \( \overline{1} \). Tabular crystals, rarely prismatic to stocky, to 1 cm, in compact aggregates. Twinning: Present.

Physical Properties: Cleavage: Perfect in two perpendicular directions. Hardness = n.d. \( D(\text{meas.}) = 3.47 \quad D(\text{calc.}) = 3.51 \)


Optical Class: Biaxial (−). Pleochroism: Strong; \( X = \) deep orange; \( Y = \) lemon-yellow; \( Z = \) yellow-orange. \( \alpha = 1.715\text{−}1.725 \quad \beta = 1.740\text{−}1.745 \quad \gamma = 1.745\text{−}1.750 \quad 2V(\text{meas.}) = 40°\text{−}48° \)

Cell Data: Space Group: \( P\overline{1} \). \( a = 9.741(5) \quad b = 9.974(7) \quad c = 9.108(5) \quad \alpha = 92.70(4)^\circ \quad \beta = 117.11(4)^\circ \quad \gamma = 105.30(4)^\circ \quad Z = 1 \)

X-ray Powder Pattern: Val Graveglia, Italy. 3.06 (s), 2.83 (s), 2.70 (s), 3.01 (m), 2.98 (m), 2.62 (m), 2.20 (m)

Chemistry:

\[
\begin{align*}
\text{SiO}_2 & \quad 39.33 \\
\text{Fe}_2\text{O}_3 & \quad 0.36 \\
\text{As}_2\text{O}_5 & \quad 0.29 \\
\text{V}_2\text{O}_5 & \quad 6.60 \\
\text{MnO} & \quad 40.13 \\
\text{CaO} & \quad 0.25 \\
\text{Na}_2\text{O} & \quad 4.53 \\
\text{H}_2\text{O}^+ & \quad 5.00 \\
\text{Total} & \quad 96.49
\end{align*}
\]

(1) Val Graveglia, Italy; by electron microprobe, average of data collected on two zones of differing color, \( \text{H}_2\text{O} \) by TGA, valences from crystal structure analysis; corresponds to \( \text{Na}_{2.40} (\text{Mn}_{5.32}^{2+} \text{Fe}_{0.07}^{3+} \text{Ca}_{0.07}) (\text{Si}_{10.77} \text{V}_{1.19}^{5+} \text{As}_{0.04})_{\Sigma=12.06} \text{O}_{35.30} \cdot 4.57\text{H}_2\text{O} \).

Occurrence: In veins in manganese ores associated with low-grade prehnite-pumpellyte facies metamorphic recrystallization of siliceous-hematitic sediments (Val Graveglia, Italy).

Association: Quartz, barite, caryopilite, ganophyllite (Val Graveglia, Italy); medaite, palenzenaite, pyrobelonite, fanelite, parsettensite, rhodochrosite, kutahorite, aegirine, quartz (Fianel mine, Switzerland).

Distribution: In Italy, at the Gambatesa and Molinello manganese mines, near Chiavari, Val Graveglia, Liguria, Italy. From the Fianel mine, Val Ferrera, Graubünden, Switzerland.

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Type Material: University of Genoa, Genoa; Municipal Museum of Natural History, Genoa, Italy.


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