

Crystal Data: Monoclinic. Point Group: 2/m. Platy crystals, to 0.1 mm, elongated along [010] and tabular on {001}; fine granular.

Physical Properties: Cleavage: One perfect, presumably {001}, seen in thin section. Hardness = ~5 in aggregate. D(meas.) = n.d. D(calc.) = 3.34


Optical Class: Biaxial (-). Pleochroism: Strong; X = pale pink; Y = Z = brownish pink. α = 1.752(2) β = 1.795(5) γ = 1.800(5) 2V(meas.) = ~40°

Cell Data: Space Group: A2/m. a = 8.923 b = 5.995 c = 19.156 β = 97°8’ Z = 4

X-ray Powder Pattern: Ochiai mine, Japan.
2.930 (100), 2.725 (90), 4.75 (65), 3.844 (65), 2.654 (55), 2.533 (50), 2.205 (45)

Chemistry:

\[
\begin{array}{c|c}
\text{SiO}_2 & 35.66 \\
\text{TiO}_2 & 0.02 \\
\text{Al}_2\text{O}_3 & 13.40 \\
\text{Fe}_2\text{O}_3 & 2.43 \\
\text{Mn}_2\text{O}_3 & 7.74 \\
\text{MnO} & 13.41 \\
\text{MgO} & 0.89 \\
\text{CaO} & 20.69 \\
\text{Na}_2\text{O} & 0.01 \\
\text{H}_2\text{O} & [5.75] \\
\hline
\text{Total} & [100.00]
\end{array}
\]

(1) Ochiai mine, Japan; by electron microprobe, H$_2$O by difference; corresponds to 
\((\text{Ca}_{1.89}\text{Mn}^{2+}_{0.08}\text{Mg}_{0.11})\Sigma=1.97(\text{Mn}^{2+}_{0.85}\text{Mg}_{0.11})\Sigma=1.00(\text{Al}_{1.34}\text{Mn}^{3+}_{0.50}\text{Fe}^{3+}_{0.16})\Sigma=2.00\text{Si}_{2.03}\text{O}_{11}(\text{OH})_2\cdot1.26\text{H}_2\text{O}.

Mineral Group: Pumpellyite group.

Occurrence: In braunite ore in a syngenetic bedded manganese deposit developed in low-grade metamorphic rocks.

Association: Braunite, piemontite, clinozoisite, caryopilite, johannsenite, rhodochrosite, albite, quartz, cakite.

Distribution: In the Ochiai mine, 3.5 km west of Barazawa, Yamanashi Prefecture, Japan.

Name: For its membership in the pumpellyite group and dominant manganous manganese content.

Type Material: National Science Museum, Tokyo, Japan, M23125; National Museum of Natural History, Washington, D.C., USA, 147159, 147160.