Tinzenite

\((\text{Ca}, \text{Mn}^{2+}, \text{Fe}^{2+})_3\text{Al}_2\text{BSi}_4\text{O}_{15}(\text{OH})\)

Crystal Data: Tridinic. Point Group: \(\overline{1}\). As aggregates of prismatic crystals, to 5 mm; massive.

Physical Properties: Cleavage: {100} good; {001}, {110}, {011}, poor (by analogy to the axinite group). Fracture: [Uneven to conchoidal] Tenacity: [Brittle] Hardness = 6.5

Optical Properties: [Transparent to translucent.] Color: Yellow, brownish yellow-green; orange to red in thin section. Luster: [Vitreous.]

Optical Class: Biaxial (−). Pleochroism: In thick sections, weak; \(X = \) light brown; \(Y = \) violet; \(Z = \) light yellow or colorless. \(\alpha = 1.690(2)\) \(\beta = 1.698(3)\) \(\gamma = 1.705(3)\) 2\(V(\text{meas.}) = 80°–84°\)

Cell Data: Space Group: \(\text{P}\overline{1}\). \(a = 7.095–7.162\) \(b = 9.103–9.129\) \(c = 8.874–8.946\)

Chemistry:

\begin{align*}
\text{SiO}_2 & : 40.80 & 41.20 & \text{CaO} & : 12.51 & 13.50 \\
\text{TiO}_2 & : 0.08 & & & \text{BaO} & : 0.06 \\
\text{B}_2\text{O}_3 & : 5.65 & 4.98 & \text{Na}_2\text{O} & : 0.27 & 0.38 \\
\text{Al}_2\text{O}_3 & : 16.23 & 16.20 & \text{K}_2\text{O} & : 0.13 & 0.50 \\
\text{Fe}_2\text{O}_3 & : 1.59 & 1.60 & \text{H}_2\text{O}^+ & : 1.20 & 1.15 \\
\text{MnO} & : 21.19 & 19.15 & \text{H}_2\text{O}^- & : 0.10 & \\
\text{MgO} & : 0.17 & 0.90 & & & \\
\end{align*}

Total: 99.84; 99.70

Polymorphism & Series: Forms a series with manganaxinite.

Mineral Group: Axinite group; \(\text{Ca} < 1.5\) per formula unit, \(\text{Mn} > \text{Fe}\).

Occurrence: In metamorphosed manganese-bearing ophiolites (Liguria, Italy); in quartz veins in cherts of the greenschist facies (Akatore, New Zealand).

Association: Braunit, quartz.

Distribution: From near Tinzen, in the Val d’Err, Graubünden, Switzerland. In the Cassagna and Gambatesa mines, Val Graveglia, near Chiavari, Liguria, Italy. From Akatore, New Zealand.

Name: For the locality near Tinzen, Switzerland.

Type Material: Federal Institute of Technology, Zurich, Switzerland, 194804; The Natural History Museum, London, England, 1926,499–501; Harvard University, Cambridge, Massachusetts, USA.


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