

Akatoreite



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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Rarely as sheaves, to 1 cm, of radiating prisms, elongated and striated \parallel [100]; fibrous, fine granular, massive. *Twinning:* On $\{0\bar{2}1\}$; twin axis $\perp \{0\bar{2}1\}$, lamellar in thin section.

Physical Properties: *Cleavage:* Good on $\{010\}$, poor on $\{0\bar{1}2\}$. Hardness = 6
D(meas.) = 3.48 D(calc.) = 3.47

Optical Properties: Transparent. *Color:* Yellow-orange to orange-brown. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Pleochroism:* X = colorless; Y = pale yellow; Z = light canary-yellow. *Orientation:* $X \wedge \{010\} = 58^\circ$; $Y \wedge \{010\} = 30^\circ$. $\alpha = 1.698(1)$ $\beta = 1.704(1)$ $\gamma = 1.720(1)$ $2V(\text{meas.}) = 65.5^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 8.337(2)$ $b = 10.367(2)$ $c = 7.629(1)$ $\alpha = 104.46(1)^\circ$ $\beta = 93.81(2)^\circ$ $\gamma = 104.18(1)^\circ$ $Z = 1$

X-ray Powder Pattern: Akatore Creek, New Zealand.

4.665 (100), 3.310 (90), 2.214 (80), 9.681 (60), 3.466 (50), 3.063 (50), 2.866 (50)

Chemistry:

| | (1) | (2) |
|--------------------------------|--------|---------|
| SiO ₂ | 36.4 | 36.9 |
| TiO ₂ | 0.03 | 0.1 |
| Al ₂ O ₃ | 8.3 | 6.2 |
| FeO | 1.0 | 0.9 |
| MnO | 47.7 | 44.2 |
| MgO | 0.3 | 0.8 |
| CaO | 0.2 | 0.2 |
| H ₂ O | 6.21 | [10.7] |
| Total | 100.14 | [100.0] |

(1) Akatore Creek, New Zealand; by electron microprobe, corresponding to $(\text{Mn}_{8.61}\text{Fe}_{0.19}\text{Mg}_{0.09}\text{Ca}_{0.05})_{\Sigma=8.94}\text{Al}_{2.09}\text{Si}_{7.75}\text{O}_{23.17}(\text{OH})_{8.83}$. (2) Norberg, Sweden; by electron microprobe, average of eight analyses, H₂O by difference; corresponds to $(\text{Mn}_{8.29}\text{Mg}_{0.27}\text{Fe}_{0.19}\text{Ca}_{0.05})_{\Sigma=8.80}\text{Al}_{1.64}\text{Si}_{8.16}\text{O}_{23.17}(\text{OH})_8$.

Occurrence: In a mangiferous metachert and carbonate lens in schists (Akatore Creek, New Zealand); in mangiferous potassium-rich felsic metavolcanics (Norberg, Sweden).

Association: Rhodochrosite, pyroxmangite, rhodonite, spessartine, quartz, tinzenite, apatite, todorokite, alabandite, hübnerite (Akatore Creek, New Zealand); ganophyllite, rhodochrosite, pyrolusite (Norberg, Sweden).

Distribution: In New Zealand, three km south of Akatore Creek, east Otago, South Island. From Norberg, Sweden.

Name: For the locality near Akatore Creek, New Zealand.

Type Material: University of Otago, Dunedin; Geological Survey of New Zealand, Lower Hutt, New Zealand; National Museum of Natural History, Washington, D.C., USA, 137285, 142541.

References: (1) Read, P.B. and A. Reay (1971) Akatoreite, a new manganese silicate from Eastern Otago, New Zealand. *Amer. Mineral.*, 56, 416–426. (2) Ounchanum, P. and S. Morad (1987) Paragenesis of akatoreite and ganophyllite in the mangiferous rocks of the Häste field, Norberg ore district, central Sweden. *Neues Jahrb. Mineral., Abh.*, 157, 225–244. (3) Burns, P.C. and F.C. Hawthorne (1993) Edge-sharing Mn^{2+}O_4 tetrahedra in the structure of akatoreite, $\text{Mn}_9^{2+}\text{Al}_2\text{Si}_8\text{O}_{24}(\text{OH})_8$. *Can. Mineral.*, 31, 321–329.

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