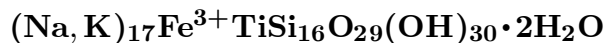


Tiettaite

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. As acicular crystals, elongated along [001] and flattened \perp {100}; in rounded aggregates, to 1 cm.

Physical Properties: *Cleavage:* On {100} and {010}, perfect. *Fracture:* Steplike. *Tenacity:* Friable, in aggregate. Hardness = 3 D(meas.) = 2.42(2) D(calc.) = 2.39 Tarnishes on exposure to air.

Optical Properties: Transparent. *Color:* Grayish white; colorless in thin section. *Streak:* [White.] *Luster:* Vitreous or silky. *Optical Class:* Biaxial (-). *Orientation:* $X = a; Y = b; Z = c$. *Dispersion:* $r < v$. $\alpha = 1.532(2)$ $\beta = 1.548(2)$ $\gamma = 1.559(2)$ $2V(\text{meas.}) = 79(1)^\circ$ $2V(\text{calc.}) = 79^\circ$

Cell Data: *Space Group:* $Cmcm$, $Cmc2_1$, or $C2cm$. $a = 29.77(1)$ $b = 11.03(2)$ $c = 17.111(5)$ $Z = 4$

X-ray Powder Pattern: Khibiny massif, Russia.
10.38 (100), 2.773 (90), 3.097 (80), 4.516 (75), 3.220 (65), 2.972 (65), 3.702 (60)

Chemistry:	(1)
SiO ₂	47.65
TiO ₂	3.91
Fe ₂ O ₃	4.05
CaO	0.30
Na ₂ O	19.21
K ₂ O	9.93
H ₂ O	14.95
Total	[100.00]

(1) Khibiny massif, Russia; by electron microprobe, total Fe as Fe₂O₃, recalculated to 100.00% after deduction of rasvumite inclusions; corresponding to $(\text{Na}_{12.51}\text{K}_{4.25}\text{Ca}_{0.11})_{\Sigma=16.87}\text{Fe}_{1.02}\text{Ti}_{0.99}\text{Si}_{16}\text{O}_{29.10}(\text{OH})_{29.80} \cdot 1.84\text{H}_2\text{O}$.

Occurrence: In unweathered ultra-alkalic pegmatites in an alkalic massif.

Association: Nepheline, orthoclase, sodalite, aegirine, rasvumite, natrite, many others.

Distribution: On Mts. Koashva and Rasvumchorr, Khibiny massif, Kola Peninsula, Russia.

Name: From the Saamsk word *tietta*, for *science* or *knowledge*, also after the name of the first Khibiny research laboratory founded by A.E. Fersman.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, r723/1.

References: (1) Khomyakov, A.P., V.P. Pavlov, D.L. Rogacheva, O.A. Zalkind, and A.V. Martynova (1993) Tiettaite $(\text{Na, K})_{17}\text{FeTiSi}_{16}\text{O}_{29}(\text{OH})_{30} \cdot 2\text{H}_2\text{O}$ – a new mineral. *Zap. Vses. Mineral. Obshch.*, 122(1), 121–125 (in Russian). (2) (1994) *Amer. Mineral.*, 79, 1012–1013 (abs. ref. 1). (3) (1994) *Mineral. Abs.*, 45, 378 (abs. ref. 1).