

Cafetite

$\text{Ca}(\text{Fe}^{3+}, \text{Al})_2\text{Ti}_4\text{O}_{12} \cdot 4\text{H}_2\text{O}$

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Crystal Data: Monoclinic, pseudo-orthorhombic. *Point Group:* n.d. Crystals columnar to acicular, elongated along [001], with striated prism faces; forms are {100}, {520}, {210}, several other minor. In fibrous aggregates, radial to tangled masses.

Physical Properties: *Cleavage:* In two directions, prismatic. *Tenacity:* Brittle, needles elastic. Hardness = 4–5 D(meas.) = 3.28 D(calc.) = 3.19 Some data presented here may be that of kassite.

Optical Properties: Semitransparent. *Color:* Pale yellow to colorless. *Luster:* Adamantine. *Optical Class:* Biaxial (-). *Orientation:* $Z \wedge c = 2^\circ\text{--}4^\circ$. *Dispersion:* Strong. $\alpha = 1.95$ $\beta = 2.08$ $\gamma = 2.11$ $2V(\text{meas.}) = 36.5^\circ\text{--}39^\circ$

Cell Data: *Space Group:* n.d. $a = 31.34(5)$ $b = 12.12(3)$ $c = 4.96(1)$ $\beta = [90^\circ]$
 $Z = 16$

X-ray Powder Pattern: Afrikanda massif, Russia.
7.86 (10), 3.27 (8), 2.562 (8), 1.914 (7), 2.63 (4), 2.108 (4), 1.573 (4)

Chemistry:

	(1)
TiO ₂	54.11
Al ₂ O ₃	2.02
Fe ₂ O ₃	22.00
FeO	0.49
MnO	0.20
MgO	1.44
CaO	6.23
Na ₂ O	0.28
K ₂ O	0.40
H ₂ O ⁺	8.83
H ₂ O ⁻	3.46
Total	100.46

(1) Afrikanda massif, Russia; corresponds to $(\text{Ca}_{0.67}\text{Mg}_{0.21}\text{Na}_{0.06}\text{K}_{0.05}\text{Mn}_{0.02})_{\Sigma=1.01}(\text{Fe}_{1.68}^{3+}\text{Al}_{0.24}\text{Ti}_{0.05}^{4+}\text{Ti}_{0.03}^{3+})_{\Sigma=2.00}(\text{Ti}_{3.92}\text{Si}_{0.09})_{\Sigma=4.01}\text{O}_{12} \cdot 4\text{H}_2\text{O}$.

Occurrence: A late mineral in miarolitic cavities in pegmatites cutting a pyroxenite massif.

Association: Ilmenite, titanomagnetite, titanite, anatase, perovskite, baddeleyite, phlogopite, clinocllore, kassite.

Distribution: In the Afrikanda pyroxenite massif, Kola Peninsula, Russia.

Name: For Calcium, iron (FERRum), and TITanium in the composition.

Type Material: Mineralogical Museum, St. Petersburg University, St. Petersburg, 13420-21; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 72024.

References: (1) Kukhareno, A.A., V.V. Kondrat'eva, and V.M. Kovyazina (1959) Cafetite, a new hydrous titanate of calcium and iron. Zap. Vses. Mineral. Obshch., 88, 444–453 (in Russian). (2) (1960) Amer. Mineral., 45, 476 (abs. ref. 1). (3) Evans, H.T., Jr., E.J. Dwornik, and C. Milton (1986) Kassite from the Diamond Jo quarry, Magnet Cove, Hot Springs County, Arkansas: The problem of cafetite and kassite. Amer. Mineral., 71, 1045–1048. (4) Self, P.G. and P.R. Buseck (1991) Structure model for kassite, $\text{CaTi}_2\text{O}_4(\text{OH})_2$. Amer. Mineral., 76, 283–287.