

Ferri-fluoro-katophorite**Na(NaCa)(Mg₄Fe³⁺)(Si₇Al)O₂₂F₂**

Crystal Data: Monoclinic. *Point Group:* 2/m. As prismatic to lamellar crystals.

Physical Properties: *Cleavage:* Perfect on {110}. *Tenacity:* Brittle. *Fracture:* n.d.
Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.19

Optical Properties: Translucent. *Color:* Greenish gray. *Streak:* Gray. *Luster:* Vitreous.
Optical Class: Biaxial (-). $\alpha = 1.640(2)$ $\beta = 1.652(2)$ $\gamma = 1.658(2)$ $2V(\text{meas.}) = 68.9(5)^\circ$
 $2V(\text{calc.}) = 70.1^\circ$ *Orientation:* $X \wedge a = 45.4^\circ$ (in β obtuse), $Y \parallel b$, $Z \wedge c = 30.7^\circ$ (in β acute).
Pleochroism: $X =$ very light gray, $Y =$ medium gray, $Z =$ light gray. *Absorption:* $Y > Z > X$.

Cell Data: *Space Group:* C2/m. $a = 9.887(3)$ $b = 18.023(9)$ $c = 5.292(2)$ $\beta = 104.66(3)^\circ$ $Z = 2$

X-Ray Diffraction Pattern: Bear Lake diggings, Bancroft area, Ontario, Canada.
2.708 (100), 2.388 (74), 3.139 (72), 8.449 (69), 2.540 (65), 2.591 (53), 2.739 (47)

Chemistry:	(1)	(2)
SiO ₂	50.46	49.33
Al ₂ O ₃	4.02	5.98
TiO ₂	0.74	
Li ₂ O	0.04	
Fe ₂ O ₃	[2.84]	9.36
FeO	[9.68]	
MnO	0.40	
ZnO	0.03	
MgO	15.06	18.90
CaO	5.53	
Na ₂ O	4.70	7.27
K ₂ O	1.69	
F	2.66	4.46
H ₂ O	[0.79]	
<u>-O = F₂</u>	<u>1.12</u>	<u>1.88</u>
Total	99.52	100.00

(1) Bear Lake diggings, Bancroft area, Ontario, Canada; average electron microprobe analysis supplemented by SIMS for Li, Fe³⁺/Fe_{total} and H₂O calculated; corresponding to ^A(Na_{0.55}K_{0.32})_{Σ=0.87}^B(Na_{0.79}Ca_{1.18}Mn²⁺_{0.03})_{Σ=2.00}^C(Mg_{3.29}Mn²⁺_{0.02}Fe²⁺_{1.19}Fe³⁺_{0.31}Al_{0.09}Ti⁴⁺_{0.08}Li_{0.02})_{Σ=5.00}^T(Si_{7.39}Al_{0.61})_{Σ=8.00}O₂₂^W[F_{1.23}(OH)_{0.77}]_{Σ=2.00}. (2) Na(NaCa)(Mg₄Fe³⁺)(Si₇Al)O₂₂F₂.

Mineral Group: Amphibole supergroup, sodium-calcium subgroup.

Occurrence: In carbonatite dikes.

Association: Phlogopite, microcline perthite, titanite, augite, zircon, fluorapatite.

Distribution: From the Bear Lake diggings, 8.4 km west of Tory Hill, Monmouth Township, Bancroft area, Ontario, Canada.

Name: Signifies an amphibole of the *katophorite* group with Fe³⁺ in the *C* site and fluorine greater than OH and/or Cl in the *W* site.

Type Material: Department of Natural History, Royal Ontario Museum, Canada (M57071).

References: (1) Oberti, R., M. Boiocchi, F.C. Hawthorne, N.A. Ball, and R.F. Martin (2019) Ferri-fluoro-katophorite from Bear Lake diggings, Bancroft area, Ontario, Canada: a new species of amphibole, ideally Na(NaCa)(Mg₄Fe³⁺)(Si₇Al)O₂₂F₂. *Mineral. Mag.*, 83, 413-417. (3) Hawthorne, F.C., R. Oberti, G.E. Harlow, W.V. Maresch, R.F. Martin, J.C. Schumacher, and M.D. Welch (2012) Nomenclature of the amphibole supergroup. *Amer. Mineral.*, 97, 2031-2048.