Ferro-barroisite $[NaCa][(Fe^{2+},Mg)_3Al_2](Si_7Al)O_{22}(OH)_2$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Prismatic; also as rims and cores of mixed amphibole crystals.

Physical Properties: *Cleavage:* [Perfect on {110}, intersecting at ∼56° and ∼124°; partings on {100}, {001}.] *Tenacity:* [Brittle.] Hardness = [5–6] D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* Deep bluish green to blue in thin section.
Luster: [Vitreous.]
Optical Class: [Biaxial.] *Pleochroism:* Strong in blues and bluish green. α = n.d. β = n.d. γ = n.d. 2V(meas.) = n.d.

Cell Data: *Space Group:* [$C2/m$.] a = n.d. b = n.d. c = n.d. β = n.d. Z = n.d.

X-ray Powder Pattern: n.d.

Chemistry:

	(1)	(2)	(3)
SiO_2	49.2	42.14	46.71
TiO_2	0.14	1.15	1.81
Al_2O_3	8.86	3.75	2.05
FeO	21.9	35.14	34.08
MnO	0.27	1.28	0.94
MgO	7.03	0.13	0.93
CaO	5.55	6.86	5.56
Na_2O	4.20	2.71	4.12
K_2O	0.55	0.87	1.21
Total	97.70	94.03	97.41

(1) Klamath Mountains, California, USA; by electron microprobe, Fe^{2+}:Fe^{3+} from stoichiometry and charge balance; corresponding to $(Na_{1.19}Ca_{0.87}K_{0.10})_{\Sigma=2.16}(Fe^{2+}_{1.69}Mg_{1.53}Mn_{0.03})_{\Sigma=3.25}(Fe^{3+}_{1.00}Al_{0.73}Ti_{0.02})_{\Sigma=1.75}(Si_{7.20}Al_{0.80})_{\Sigma=8.00}O_{22}(OH)_2$. (2) Cauro-Bastelica, Corsica; by electron microprobe. (3) Iskou ring complex, Niger; by electron microprobe.

Polymorphism & Series: Forms a series with barroisite.

Mineral Group: Amphibole (sodic-calcic) group: $Mg/(Mg+Fe^{2+}) < 0.5$; $(Na+K)_A < 0.5$; $0.67 \; Na_B \;\; 1.33$; $(Ca+Na)_B \geq 1.34$; $Si < 7.5$.

Occurrence: A primary mineral in some alkalic granites and syenite ring complexes; from blueschist facies metavolcanic rocks.

Association: Crossite (metavolcanic).

Distribution: On Condrey Mountain, Klamath Mountains, Del Norte Co., California, USA. From Cauro-Bastelica, Corsica. In the Iskou ring complex, Aïr, Niger.

Name: For *ferroan* iron in its composition and similarity to *barroisite*.

Type Material: n.d.

References: (1) Giret, A., B. Bonin, and J.-M. Leger (1980) Amphibole compositional trends in oversaturated alkaline plutonic ring-complexes. Can. Mineral., 18, 481–495. (2) Helper, M.A. (1986) Deformation and high P/T metamorphism in the central portion of the Condrey Mountain window, north-central Klamath Mountains, California and Oregon. In: B.W. Evans and E.H. Brown, Eds., Blueschists and eclogites. Geol. Soc. Amer. Mem. 164, 125–141.