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

Crystal Data: Monoclinic. *Point Group:* $2/m$. As rims on, or cores of, other mixed-species 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.) = 3.21

Optical Properties: Semitransparent. *Color:* Green; dark green in thin section.
Luster: [Vitreous.]
Optical Class: [Biaxial.] α = n.d. β = n.d. γ = n.d. 2V(meas.) = n.d.

Cell Data: *Space Group:* $[C2/m.]$ $a = 9.759(1)$ $b = 17.921(2)$ $c = 5.290(1)$ $\beta = 104.49(1)°$ Z = [2]

X-ray Powder Pattern: n.d.

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	53.26	49.32	MgO	17.84	7.93
TiO_2	0.24	0.22	CaO	7.41	5.94
Al_2O_3	7.90	9.05	Na_2O	3.84	4.30
Cr_2O_3	0.04		K_2O	0.39	0.21
FeO	5.80	19.97	F	0.04	
MnO	0.03	0.35	Cl	0.03	
NiO	0.11		$-O = (F,Cl)_2$	0.03	
			Total	96.90	97.29

(1) Nordfjord, Norway; by electron microprobe, Fe^{2+}:Fe^{3+} by diffraction; corresponds to $Na_{1.04}Ca_{1.10}(Mg_{3.82}Al_{0.70}Fe^{2+}_{0.42}Fe^{3+}_{0.20}K_{0.07}Ti_{0.03})_{\Sigma=5.24}(Si_{7.40}Al_{0.60})_{\Sigma=8.00}O_{22}(OH)_2$. (2) Anglesey, Wales; by electron microprobe, corresponds to $Na_{1.07}Ca_{0.93}(Mg_{1.73}Fe^{2+}_{1.58}Fe^{3+}_{0.86}Al_{0.77}Mn_{0.04}K_{0.04}Ti_{0.02})_{\Sigma=5.04}(Si_{7.21}Al_{0.79})_{\Sigma=8.00}O_{22}(OH)_2$.

Polymorphism & Series: Forms a series with ferro-barroisite.

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

Occurrence: In blueschist facies metamorphic rocks.

Association: Omphacite, glaucophane, crossite, actinolite, calcite.

Distribution: Along Cleary Creek, 20 km north of Fairbanks, and on the northwest side of Kodiak Island, Alaska, USA. In Wales, on Anglesey, near Llanfairpwllgwyngyll. From the Nybö eclogite pod, Nordfjord, Norway.

Name: n.d.

Type Material: n.d.

References: (1) Murgoci, G. (1922) Sur les propriétés des amphiboles bleues. Compt. Rendus Acad. Sci. Paris, 175, 373 (in French). (2) Murgoci, G. (1922) Sur le classification des amphiboles bleues et de certaines hornblendes. Compt. Rendus Acad. Sci. Paris, 175, 426 (in French). (3) Heritsch, H., P. Paulitsch, and E.M. Walitzi (1957) Die Struktur von Karinthin und einer barroisitischen Hornblende. Tschermaks Mineral. Petrog. Mitt., 6, 215–225 (in German). (4) Ungaretti, L., D.C. Smith, and G. Rossi (1981) Crystal-chemistry by X-ray structure refinement and electron microprobe analysis of a series of sodic-calcic to alkali-amphiboles from the Nybö eclogite pod, Norway. Bull. Minéral., 104, 400–412. (5) Gibbons, W. and M. Gyopari (1986) A greenschist protolith for blueschist in Anglesey, U.K. In: B.W. Evans and E.H. Brown, Eds., Blueschists and eclogites, Geol. Soc. Amer. Memoir 164, 217–228.