

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals are flattened on {010}, elongated along [100], and obliquely terminated by {101}, {100}, {101}, {102}; generally, as spherulites of bladed to fibrous crystals, to 3 mm.

Physical Properties: *Cleavage:* Very good on {010}. *Tenacity:* Brittle. Hardness = 4.5-5
D(meas.) = 3.15-3.27 D(calc.) = 3.29 Fluoresces blue under LW UV.

Optical Properties: Translucent. *Color:* White, buff, pale pink. *Luster:* Silky (fibers), slightly pearly (plates).

Optical Class: Biaxial (+). $a = 1.590(2)$ $\beta = 1.595(2)$ $\gamma = 1.615(2)$ $2V(\text{meas.}) = 51.5(2)^\circ$
Orientation: $Z = b$; $X \wedge c = 32^\circ$. *Dispersion:* $r > v$.

Cell Data: *Space Group:* C2/c. $a = 6.5109(3)$ $b = 8.7301(5)$ $c = 6.9046(5)$ $\beta = 112.246(2)^\circ$ $Z = 4$

X-ray Powder Pattern: Nkombwa Hill, Zambia; nearly identical to panasqueiraite.
3.185 (vvs), 3.023 (vvs), 2.630 (vvs), 2.301 (s), 1.720 (s), 2.784 (m), 2.586 (m)

Chemistry:	(1)	(2)		(1)	(2)
P ₂ O ₅	38.68	39.79	SrO	1.66	
RE ₂ O ₃	0.16		BaO	0.22	
FeO	0.42		F	9.86	10.65
MnO	0.13		H ₂ O ⁺	0.48	
MgO	21.93	22.60	- O = F ₂	4.15	4.48
CaO	30.61	31.44	Total	[100.00]	100.00

(1) Nkombwa Hill, Zambia; from an original total of 100.07%, after deduction of 2.14% ankeritic dolomite and 0.99% strontian apatite, then corresponds to (Ca_{0.98}Sr_{0.03})_{Σ=1.01}(Mg_{0.98}Fe_{0.01})_{Σ=0.99}(P_{0.98}O_{3.94})[F_{0.93}(OH)_{0.10}]_{Σ=1.03}. (2) CaMg(PO₄)F.

Mineral Group: Titanite group.

Occurrence: A late-stage metasomatic mineral in ankeritic carbonatite (Nkombwa Hill); replacing wagnerite in a pegmatite dike in sillimanite grade gneiss (Benson mines); an alteration product of triplite in granite pegmatite (Mangualde and Ribeira, Portugal; Horní Slavkov, Czech Republic).

Association: Dolomite, strontian fluorapatite, monazite, daqingshanite-(Ce), strontianite, quartz, phlogopite, pyrochlore (Nkombwa Hill, Zambia).

Distribution: On Nkombwa Hill, 24 km east of Isoka, Zambia. At the Benson Mines, near Star Lake, St. Lawrence Co., New York, USA. From Horní Slavkov (Schlaggenwald), Czech Republic. In Portugal, at the Mangualde pegmatite, near Mesquitela, from Folgorinho, from Senhora de Assunção quarry, at Aldeia Nova, Satao, and in the Ribeira and Panasqueira Sn-W deposits. From the Bayan Obo Fe-Nb-RE deposit, 130 km north of Baotou, Inner Mongolia, China. At Brumado, Bahia, Brazil. From Kjørrestad, near Bamle, Norway.

Name: For *Isoka*, Zambia, the town near which the first specimens were collected.

Type Material: The Natural History Museum, London, England, 1957,3 and 1957,4.

References: (1) Deans, T. and J.D.C. McConnell (1955) Isokite, CaMgPO₄F, a new mineral from Northern Rhodesia. *Mineral. Mag.*, 30, 681-690. (2) (1956) *Amer. Mineral.*, 41, 167 (abs. ref. 1). (3) Jaffe, H.W., L.M. Hall, and H.T. Evans, Jr. (1992) Wagnerite and isokite from the Benson Mines, west-central Adirondack Highlands, New York. *Mineral. Mag.*, 56, 227-233. (4) Yang, H., J. Zwick, R.T. Downs, and G. Costin (2007) Isokite, CaMg(PO₄)F_{0.8}(OH)_{0.2}, isomorphous with titanite. *Acta Crystallogr.*, C63, i89-i90. (5) (2008) *Amer. Mineral.*, 93, 1689-1690 (abs. ref. 4). (6) Hochleitner, R. and K.T. Fehr (2005) Isokite, CaMg[F|PO₄], from Senhora de Assunção, Portugal: new find and new data. *Neues Jahrb. Mineral. Abh.*, 182, 103-108. (7) (2006) *Amer. Mineral.*, 91, 1208 (abs. ref. 6).