Bariopyrochlore $(Ba,Sr)_2(Nb,Ti)_2(O,OH)_7$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. As crude to anhedral crystals, to 1 mm, showing cube and octahedron faces; granular, porous due to alteration or recrystallization.

Physical Properties: *Cleavage:* {111}, very poor. *Fracture:* Conchoidal. *Tenacity:* [Brittle] (by analogy to the pyrochlore group). Hardness = 4.5–5 VHN = 550 (100 g load). D(meas.) = 3.85–4.15 D(calc.) = 4.01

Optical Properties: Translucent to opaque with inclusions. *Color:* Yellowish gray, light olive-gray to very pale orange; white with many fine, colorless inclusions; internal reflections are colorless to white, occasionally brownish to reddish. *Luster:* [Vitreous to resinous.] *Optical Class:* Isotropic. n = 2.07–2.11

Cell Data: *Space Group:* $Fd3m$. a = 10.562(6) Z = 8

X-ray Powder Pattern: Panda Hill, Tanzania.
3.044 (100), 6.09 (80), 1.864 (70), 1.590 (70), 1.0164 (60), 3.18 (50), 1.210 (50)

Chemistry:	(1)	(2)		(1)	(2)		(1)	(2)
Nb_2O_3	69.06	65.60	FeO	0.44		PbO		0.23
Ta_2O_5	0.23	0.57	MgO		0.57	Na_2O	0.28	0.23
TiO_2	3.87	4.63	CaO	0.86	1.37	K_2O	0.15	0.23
ThO_2	0.62	0.92	BaO	12.88	15.31	F	trace	
ΣCe_2O_3	2.06	2.17	SrO	6.60	trace	H_2O^+	4.11	8.17
						Total	[101.16]	[100.00]

(1) Panda Hill, Tanzania; by spectrographic methods, Na and K by flame photometry, H_2O by the Penfield method; then corrected for zircon 0.42%, phlogopite 0.27%, orthoclase 0.42%, apatite 0.92%, cassiterite 0.32%, quartz 0.33%, rutile 0.15%, CuO 0.01%, PbO 0.01%, and CO_2 0.01%; corresponds to $(Ba_{0.30}Sr_{0.22}Ca_{0.05}Ce_{0.04}Na_{0.03}Fe_{0.02}K_{0.01}Th_{0.01})_{\Sigma=0.68}(Nb_{1.83}Ti_{0.17})_{\Sigma=2.00}O_{5.61}(H_2O)_{0.80}$. (2) Mrima Hill, Kenya; H_2O by loss on ignition; after deduction of gorceixite 9.8%, barite 0.6%, quartz 1.1%, hematite 1.0%, Al_2O_3 0.2%, corresponds to $(Ba_{0.36}Ca_{0.09}Mg_{0.05}Ce_{0.05}Na_{0.03}K_{0.02}Th_{0.01})_{\Sigma=0.61}(Nb_{1.78}Ti_{0.21}Ta_{0.01})_{\Sigma=2.00}O_{5.52}(H_2O)_{1.64}$.

Mineral Group: Pyrochlore group and subgroup; $Ba_A > 20\%$; $(Nb + Ta)_B > 2Ti_B$; $Nb_B > Ta_B$.

Occurrence: At the contact zone of a highly weathered, biotite-rich rock in a roof pendant in a carbonatite (Panda Hill, Tanzania); in weathered carbonatite (Araxá,Brazil); in an alkalic aegerine-albite-microcline metasomatite in nepheline syenite (Stettin, Wisconsin, USA).

Association: Biotite, kaolinized feldspar, fluorite, quartz, apatite, zircon, chlorite, plagioclase, rutile, hematite, "limonite" (Panda Hill, Tanzania); aegirine, zircon (Wisconsin, USA).

Distribution: From the Mbeya carbonatite, Panda Hill, near Mbeya, Tanzania. In the Mrima Hill carbonatite, Kenya. From the Bingo deposit, Kivu Province, Congo (Zaire). In a deposit of several hundred million tons at Araxá, Minas Gerais, and in the Catalão II carbonatite, Goiás, Brazil. From Dehnel's pit, Stettin, Marathon Co., Wisconsin, USA. At an undefined locality in Primorskiy Kray, Russia. Known from a few other carbonatites.

Name: Assigned by the IMA Committee on pyrochlore nomenclature for the predominant *barium* content and membership in the *pyrochlore* group.

Type Material: n.d.

References: (1) Hogarth, D.D. (1977) Classification and nomenclature of the pyrochlore group. Amer. Mineral., 62, 403–410, esp. 407 [pandaite = bariopyrochlore]. (2) Jäger, E., E. Niggli, and A.H. van der Veen (1959) A hydrated barium-strontium pyrochlore [bariopyrochlore] in a biotite rock from Panda Hill, Tanganyika. Mineral. Mag., 32, 10–25. (3) (1959) Amer. Mineral., 44, 1324 (abs. ref. 2). (4) Harris, P.M. (1965) Pandaite [bariopyrochlore] from the Mrima Hill niobium deposit (Kenya). Mineral. Mag., 35, 277–290.