Plumbobetafite $(Pb, U, Ca)(Nb, Ti)_2O_6(OH, F)$

Crystal Data: Cubic; may be metamict. *Point Group:* $[4/m\ \overline{3}\ 2/m]$ (by analogy to betafite). As octahedra, with curved faces, or as rounded cubic grains, to 3 mm.

Physical Properties: *Fracture:* Irregular. *Tenacity:* [Brittle.] Hardness = [~3–5.5] D(meas.) = 4.64 D(calc.) = [4.13] Radioactive.

Optical Properties: Semitransparent. *Color:* Pale yellowish, may have brownish black cores. *Luster:* Adamantine.
Optical Class: Isotropic. n = n.d.

Cell Data: *Space Group:* $[Fd3m.]$ a = 10.33(1) Z = [8]

X-ray Powder Pattern: n.d.

Chemistry:

	(1)	(2)		(1)	(2)
UO_3	13.73		Fe_2O_3	1.14	
WO_3		6.71	MnO	0.34	
Nb_2O_5	30.96	7.81	PbO	20.70	67.15
Ta_2O_5	1.64	0.81	CaO	2.11	0.11
SiO_2	2.15		Na_2O	0.83	
TiO_2	13.30	15.51	K_2O	0.14	
SnO_2		1.12	F	1.51	
ThO_2	0.15		H_2O^+	2.62	
UO_2	1.70		SO_3	0.55	
B_2O_3	0.23		$-O = F_2$	0.63	
RE_2O_3	4.63		LOI	1.75	
			Total	[99.55]	99.22

(1) Burpala massif, Russia; original total given as 99.71%, RE = La 20.6%, Ce 61.0%, Pr 4.4%, Nd 10.5%, Sm 1.0%, Gd 0.5%, Dy 0.5%, Y 1.5%; after deduction of SiO_2, corresponds to $(Pb_{0.44}U_{0.25}Ca_{0.18}Na_{0.12}RE_{0.12})_{\Sigma=1.11}(Nb_{1.12}Ti_{0.78}Fe_{0.07}Ta_{0.02})_{\Sigma=1.99}O_6[(OH)_{0.58}F_{0.42}]_{\Sigma=1.00}$.
(2) Keivy massif, Russia; by electron microprobe, corresponding to $(Pb_{2.05}Ca_{0.01})_{\Sigma=2.06}(Ti_{1.32}Nb_{0.39}W_{0.20}Sn_{0.05}Ta_{0.03}Fe_{0.01})_{\Sigma=2.00}O_6(OH)$.

Mineral Group: Pyrochlore group, betafite subgroup; $Pb_A > 20\%$; $2Ti_B \geq (Nb + Ta)_B$.

Occurrence: An accessory mineral in a pegmatitic dike in nepheline syenite (Burpala massif, Russia).

Association: Microcline, quartz, albite, aegirine, riebeckite (Burpala massif, Russia).

Distribution: In the Burpala massif, 120 km north of Lake Baikal, eastern Siberia, and from the Keivy massif, Kola Peninsula, Russia.

Name: Ostensibly for its content of lead, PLUMBum, and relation to other *betafite* members of the pyrochlore group.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Ganzeev, A.A., A.F. Efimov, and G.V. Lyubomilova (1969) Plumbobetafite – a new mineral variety of the pyrochlore group. Trudy Mineral. Muzeya Akad. Nauk SSSR, 19, 135–137 (in Russian). (2) (1970) Amer. Mineral., 55, 1068–1069 (abs. ref. 1). (3) Hogarth, D.D. (1977) Classification and nomenclature of the pyrochlore group. Amer. Mineral., 62, 403–410. (4) Voloshin, A.V., Y.A. Pakhomovskii, and A.Y. Bakhchisaraytsev (1993) Plumbobetafite in amazonite pegmatites of western Keivy (Kola Peninsula). Mineral. Zhurnal, 15(2), 76–80 (in Russian with English abs.).