Uranpyrochlore $(U, Ca, Ce)_2(Nb, Ta)_2O_6(OH, F)$

Crystal Data: Cubic; commonly metamict. *Point Group:* $4/m\ \overline{3}\ 2/m$. Crystals are octahedra, modified by {001} and {113}; also massive. *Twinning:* Rarely on {111}.

Physical Properties: *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = 4–5 D(meas.) = 4.51–4.90 D(calc.) = [4.88] Radioactive.

Optical Properties: Transparent. *Color:* Black, yellowish brown, or amber-yellow; deep red-brown in transmitted light. *Luster:* Resinous to adamantine.
Optical Class: Isotropic. $n = 1.89$–1.98

Cell Data: *Space Group:* $Fd3m$. $a = 10.33$–10.44 $Z = 8$

X-ray Powder Pattern: Berere, Madagascar.
3.01 (10), 1.84 (8), 1.575 (6), 7.3 (4), 2.61 (3), 1.202 (2), 1.168 (2)

Chemistry:

	(1)	(2)		(1)	(2)
UO_3	15.50		Fe_2O_3		0.64
Nb_2O_5	34.24	32.30	FeO	2.19	
Ta_2O_5	29.83	15.76	PbO	trace	
TiO_2	1.61	9.27	MgO	0.15	
ZrO_2		0.28	CaO	8.87	8.69
SnO_2	0.30		SrO		0.16
ThO_2		0.07	Na_2O	1.37	5.29
UO_2		26.44	K_2O	trace	
Y_2O_3		0.17	F		0.19
La_2O_3		0.12	H_2O	4.49	
Ce_2O_3		0.21	$-O = F_2$		[0.08]
			Total	98.55	[99.43]

(1) Mitchell Co., North Carolina, USA. (2) Near Kasenda, Uganda; by electron microprobe, total Fe as FeO, original total given as 99.51%; corresponding to $(Na_{0.78}Ca_{0.70}U_{0.44}Ce_{0.01}Y_{0.01}Sr_{0.01})_{\Sigma=1.95}(Nb_{1.10}Ti_{0.53}Ta_{0.32}Fe_{0.04}Zr_{0.01})_{\Sigma=2.00}O_6(OH, F)$.

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

Occurrence: In cemented calcareous tuffs associated with carbonatite (near Kasenda, Uganda).

Association: Calcite, feldspars, quartz, magnetite, ilmenite, almandine, apatite, epidote, diopside, "hypersthene", pyrite, rutile, anatase, pyrochlore, zircon, titanite, monazite (near Kasenda, Uganda).

Distribution: From Mitchell Co., North Carolina, USA. In the Antsakoa I pegmatite, Berere, 40 km northeast of Tsaratanana, Madagascar. Near Kasenda, Fort Portal area, Uganda. In Germany, from Hagendorf, Bavaria.

Name: As a member of the *pyrochlore* subgroup with significant *uranium* content.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 748–757 [pyrochlore, part]. (2) Hogarth, D.D. (1977) Classification and nomenclature of the pyrochlore group. Amer. Mineral., 62, 403–410. (3) Mücke, A. and H. Strunz (1978) Petscheckite and liandratite, two new pegmatite minerals from Madagascar. Amer. Mineral., 63, 941–946. (4) Hogarth, D.D. and J.E.T. Horne (1989) Non-metamict uranoan pyrochlore and uranpyrochlore from tuff near Ndale, Fort Portal area, Uganda. Mineral. Mag., 53, 257–262.