Cesium kupletskite

$(Cs,K,Na)_3(Mn^{2+},Fe^{2+})_7$
$(Ti,Nb)_2Si_8O_{24}(O,OH,F)_7$

Crystal Data: Triclinic. *Point Group:* n.d. As rosettelike intergrowths of curved platy crystals, forming aggregates, to 3 cm.

Physical Properties: *Cleavage:* {001}, perfect. Hardness = ∼4 VHN = 186
D(meas.) = 3.68 D(calc.) = [3.62]

Optical Properties: Semitransparent. *Color:* Golden brown. *Luster:* Dull.
Optical Class: Biaxial (+). *Pleochroism:* X = yellow-green; Y = yellow to brown; Z = brown.
Orientation: $Z = a$; $Y \wedge b \simeq 10°$. α = n.d. $\beta = 1.726$ $\gamma = 1.758$ 2V(meas.) = 75°

Cell Data: *Space Group:* n.d. $a = 5.41(1)$ $b = 11.74(2)$ $c = 21.16(4)$ $\alpha = 89°$ $\beta = 90°$ $\gamma = 102°23'$ Z = 2

X-ray Powder Pattern: Alai Range, Tajikistan.
10.4 (100), 3.54 (80), 2.79 (80), 2.66 (80), 2.58 (60), 1.772 (40), 4.09 (30)

Chemistry:

	(1)		(1)
SiO_2	33.00	CaO	0.35
TiO_2	8.28	Li_2O	0.46
ZrO_2	1.01	Na_2O	2.46
Al_2O_3	0.52	K_2O	1.15
Fe_2O_3	3.05	Rb_2O	0.18
Nb_2O_5	4.95	Cs_2O	11.60
Ta_2O_5	0.06	F	1.26
FeO	10.00	H_2O^+	1.47
MnO	19.66	$-O = F_2$	0.54
MgO	trace	Total	98.92

(1) Alai Range, Tajikistan; corresponds to $(Cs_{1.22}Na_{1.14}K_{0.35}Ca_{0.09})_{\Sigma=2.80}(Mn_{3.99}Fe^{2+}_{2.00}Fe^{3+}_{0.55}Li_{0.44})_{\Sigma=6.98}(Ti_{1.49}Nb_{0.54}Zr_{0.12})_{\Sigma=2.15}(Si_{7.92}Al_{0.15})_{\Sigma=8.07}O_{24}[O_{3.69}(OH)_{2.35}F_{0.96}]_{\Sigma=7.00}$.

Polymorphism & Series: Forms a series with kupletskite.

Mineral Group: Astrophyllite group.

Occurrence: At the border of aegirine-microcline-quartz pegmatites, and in polylithionite-quartz replacement complexes in pegmatites.

Association: Pyrochlore, stillwellite, tienshanite, sogdianite, thorite.

Distribution: In the Dara-i-Pioz massif, Alai Range, Tien Shan, Tajikistan.

Name: For the *cesium* in the composition and similarity to *kupletskite*.

Type Material: Mineralogical Museum, St. Petersburg University, St. Petersburg, 16537; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 74170.

References: (1) Efimov, A.F., V.D. Dusmatov, A.A. Ganzeev, and Z.T. Kataeva (1971) Cesium kupletskite, a new mineral. Doklady Acad. Nauk SSSR, 197, 1394–1397 (in Russian). (2) (1972) Amer. Mineral., 57, 328 (abs. ref. 1).