Titantaramellite $\mathbf{Ba_4(Ti,Fe^{3+},Fe^{2+},Mg)_4(B_2Si_8O_{27})O_2Cl_x}$

Crystal Data: Orthorhombic. *Point Group:* [$2/m$ $2/m$ $2/m$] (by analogy to taramellite). As well-formed crystals, equidimensional to tabular ∥ {100}; in anhedral grains, up to 10 cm.

Physical Properties: *Cleavage:* {100}, perfect. Hardness = 6 D(meas.) = 4.05 D(calc.) = [3.93]

Optical Properties: Transparent to translucent or opaque. *Color:* Dark brown to black. *Optical Class:* Biaxial (+). *Pleochroism:* Strong; $X = Y$ = yellow-brown; Z = opaque. *Orientation:* $X = c$; $Y = b$; Z = a. α = 1.739–1.753 β = 1.749–1.761 γ = 1.770–1.782 2V(meas.) = 45°–77°

Cell Data: *Space Group:* [*Pnmm.*] a = 12.053–12.220 b = 13.938–14.005 c = 7.127–7.141 Z = [2]

X-ray Powder Pattern: n.d.

Chemistry:

	(1)
SiO_2	33.03
TiO_2	10.63
B_2O_3	3.64
Fe_2O_3	6.79
FeO	3.60
MnO	0.09
MgO	0.55
BaO	40.45
Cl	1.83
H_2O^+	< 0.01
H_2O^-	< 0.01
$-O = Cl_2$	0.41
Total	100.20

(1) Rush Creek, California, USA; corresponds to $Ba_{3.86}(Ti_{1.94}Fe^{2+}_{0.96}Fe^{3+}_{0.37}Mg_{0.20}Mn_{0.02})_{\Sigma=3.49}B_{1.52}Si_8O_{29}Cl_{0.75}$.

Polymorphism & Series: Forms a series with taramellite.

Occurrence: In the contact zones around granite, quartz monzonite, and quartz diorite intrusives.

Association: Sanbornite, quartz, macdonaldite, walstromite, fresnoite, verplanckite, muirite, traskite, benitoite, pabstite, bazirite (Rush Creek and Big Creek areas, California, USA); tremolite, celsian, pabstite, galena, cassiterite, quartz (Kalkar quarry, California, USA).

Distribution: In the USA, in California, at Rush Creek and Big Creek, Fresno Co., at Chickencoop Canyon, Tulare Co., on Trumbull Peak, near Incline, Mariposa Co., and in the Kalkar quarry, Santa Cruz Co. From near Ross River [Gunn claim, Itsy Mountains, near Macmillan Pass], Yukon Territory, Canada. In the La Madrelena mine, Tres Pozos, Baja California, Mexico.

Name: For its TITANium content and relation to *taramellite*.

Type Material: n.d.

References: (1) Alfors, J.T. and A. Pabst (1984) Titanian taramellites in western North America. Amer. Mineral., 69, 358–373.