Yafsoanite $Ca_3Zn_3(Te^{6+}O_6)_2$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. Crystals are cubo-octahedra or dodecahedra, to 0.5 mm; also radiating, forming spherical aggregates.

Physical Properties: Hardness = ∼6 VHN = 696 (30 g load). D(meas.) = 5.40–5.55 D(calc.) = 5.54

Optical Properties: Transparent to translucent. *Color:* Colorless, pale to dark brown. *Luster:* Vitreous.
Optical Class: Isotropic. $n = 1.800(5)$

Cell Data: *Space Group:* $Ia3d$. $a = 12.632(2)$ Z = 8

X-ray Powder Pattern: Kuranakh deposit, Russia.
2.581 (10), 1.683 (10), 2.821 (9), 3.16 (8), 1.024 (5), 4.47 (3), 1.751 (3)

Chemistry:

	(1)	(2)	(3)
TeO_3	42.11	39.91	46.00
SiO_2	0.21	1.56	
ZnO	24.65	27.38	31.97
PbO	12.82	8.88	
CaO	16.79	18.47	22.03
excess O	2.02	2.77	
Total	98.60	98.97	100.00

(1) Kuranakh deposit, Russia; by electron microprobe, here calculated to oxides; corresponds to $(Ca_{2.62}Pb_{0.50})_{\Sigma=3.12}Zn_{2.64}(Te_{1.04}O_6)_2$. (2) Do.; corresponds to $(Ca_{2.84}Pb_{0.52})_{\Sigma=3.36}Zn_{2.92}(TeO_6)_2$. (3) $Ca_3Zn_3(TeO_6)_2$.

Occurrence: Very rare in a tellurium-bearing gold quartz deposit in dolomite–calcite (Kuranakh deposit, Russia); in the oxidized zone of a hydrothermal ore deposit (Empire mine, Arizona, USA).

Association: Gold, tiemannite, naumannite, clausthalite, altaite, cinnabar, orpiment, kuranakhite, Si-rich dugganite, cheremnykhite, kuksite, descloizite, calcite, quartz, iron oxides (Kuranakh deposit, Russia).

Distribution: From the Kuranakh gold deposit, near Aldan, southern Sakha, Russia. At the Empire mine, Tombstone, Cochise Co. Arizona, USA. In the Moctezuma (Bambolla) mine, 12 km south of Moctezuma, Sonora, Mexico.

Name: For the *Yakutskii Filial Sibirskogo Otdeleniya Akademii Nauk* (Yakut Filial, Siberian Branch, Academy of Sciences, YAFSOAN in Russian).

Type Material: Geological Museum, Yakutsk Scientific Center, Academy of Sciences, Yakutsk, mk-111; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 84397.

References: (1) Kim, A.A., N.V. Zayakina, and Y.G. Lavrent'ev (1982) Yafsoanite – $(Zn_{1.38}Ca_{1.36}Pb_{0.26})_3TeO_6$, a new tellurium mineral. Zap. Vses. Mineral. Obshch., 111, 118–121 (in Russian). (2) (1983) Amer. Mineral., 68, 282–283 (abs. ref. 1). (3) Jarosch, D. and J. Zemann (1989) Yafsoanite: a garnet type calcium-tellurium(VI)-zinc oxide. Mineral. Petrol., 40, 111–116.