

Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. Forms thin regular growth zones, to 5 μm , and irregular spots in an Fe³⁺-dominant analog of kimzeyite. Also, as pseudomorphs after zircon.

Physical Properties: *Cleavage:* n.d. *Tenacity:* n.d. *Fracture:* n.d. *Hardness =* n.d. *D(meas.) =* n.d. *D(calc.) =* 4.49

Optical Properties: *Color:* Light-brown or yellow. *Streak:* White with a cream tint. *Luster:* n.d. *Optical Class:* Isotropic.

Cell Data: *Space Group:* $Ia\bar{3}d$. $a \approx 12.55$

X-ray Powder Pattern: Calculated pattern.

2.562 (100), 1.677 (91), 3.138 (74), 4.437 (67), 1.146 (31), 1.046 (25), 1.984 (23)

Chemistry:	(1)	(2)		(1)	(2)
UO ₃	n.d.	1.83	Cr ₂ O ₃	0.01	n.d.
V ₂ O ₅	0.02	n.d.	Sc ₂ O ₃	n.d.	0.46
Nb ₂ O ₅	0.03	0.18	Fe ₂ O ₃	19.27	15.96
Sb ₂ O ₅	7.77	n.d.	FeO	0.53	0.07
SiO ₂	4.90	4.95	MnO	n.d.	0.04
TiO ₂	4.24	5.95	CaO	24.78	24.98
ZrO ₂	0.24	1.51	MgO	0.02	n.d.
SnO ₂	32.58	38.51	SrO	<0.1	n.d.
HfO ₂	0.01	0.08	Y ₂ O ₃	<0.1	n.d.
Al ₂ O ₃	4.59	4.85	Total	98.99	99.37

(1) Upper Chegem caldera, Northern Caucasus, Kabardino-Balkaria, Russia; average of 21 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to $(\text{Ca}_{2.989}\text{Fe}^{2+}_{0.011})_{\Sigma=3}(\text{Sn}_{1.463}\text{Sb}^{5+}_{0.325}\text{Ti}^{4+}_{0.193}\text{Zr}_{0.013}\text{Mg}_{0.003}\text{Nb}_{0.002}\text{Cr}_{0.001})_{\Sigma=2}(\text{Fe}^{3+}_{1.633}\text{Al}_{0.609}\text{Si}_{0.552}\text{Ti}^{4+}_{0.166}\text{Fe}^{2+}_{0.039}\text{V}^{5+}_{0.001})_{\Sigma=3}\text{O}_{12}$. (2) Do.; electron microprobe analysis supplemented by Raman spectroscopy; corresponds to $(\text{Ca}_{3.016}\text{Mn}^{2+}_{0.004})_{\Sigma=3.02}(\text{Sn}_{1.731}\text{Zr}_{0.083}\text{Ti}^{4+}_{0.066}\text{Sc}_{0.045}\text{U}^{6+}_{0.043}\text{Nb}_{0.009}\text{Hf}_{0.003})_{\Sigma=1.980}(\text{Fe}^{3+}_{1.353}\text{Al}_{0.644}\text{Si}_{0.558}\text{Ti}^{4+}_{0.438}\text{Fe}^{2+}_{0.007})_{\Sigma=3}\text{O}_{12}$.

Polymorphism & Series: Endmember of a complex continuous solid solution of Ca-garnet $\text{Ca}_3(\text{Sn}, \text{Zr}, \text{Ti}^{4+}, \text{Sb}^{5+}, \text{U}^{6+} \dots)_2(\text{Fe}^{3+}, \text{Al}, \text{Si}, \text{Fe}^{2+}, \text{Ti}^{4+} \dots)_3\text{O}_{12}$.

Mineral Group: Garnet supergroup, schorlomite group.

Occurrence: An accessory mineral in high-temperature skarn at the contact between altered carbonate-silicate xenoliths and ignimbrite.

Association: Larnite, rondorfite, wadalite, magnesioferrite, lakargiite, cuspidine, ellestadite-OH, Fe³⁺-dominant analog of kimzeyite, andradite.

Distribution: From near Lakargi Mountain, Upper Chegem caldera, Northern Caucasus, Kabardino-Balkaria, Russia.

Name: For the *Totur* River situated in Eltyubyu village (the starting point for the climb to Lakargi Mountain where the mineral is found), also *Totur* is the name of a Balkarian god, and an ancient warrior.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (3839/1).

References: (1) Galuskina, I.O., E.V. Galuskin, P. Dzierzanowski, V.M. Gazeev, K. Prusik, N.N. Pertsev, A. Winiarski, A.E. Zadov, and R. Wrzalik (2010) Toturite Ca₃Sn₂Fe₂SiO₁₂ - A new mineral species of the garnet group. *Amer. Mineral.*, 95, 1305-1311.