

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As pseudo-cubic crystals to 35 μm bounded by {100} and {111}, as skeletal crystals and spherulite-like forms <200 μm , in aggregates to 200 μm . As pseudomorphs after zircon.

Physical Properties: *Cleavage:* on {110} and {001}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 8-9 VHN = 1392-1708, 1545 average (100 g load). D(meas.) = n.d. D(calc.) = 4.587

Optical Properties: Transparent. *Color:* Red-brown (high Ti) to yellowish, almost colorless; in thin section, light-brown to colorless; red-brown and pink internal reflections in reflected light. *Streak:* Light-brown to cream-white. *Luster:* Vitreous to adamantine, submetallic for dark varieties. *Optical Class:* Biaxial(+) synthetic. $\alpha = 2.1(1)$ $\beta = 2.1(1)$ $\gamma = 2.1(1)$ $2V(\text{meas.}) = \sim 0^\circ$ *Orientation:* X = a, Y = c, Z = b. Non-pleochroic.

Cell Data: *Space Group:* Pbnm. $a = 5.556(1)$ $b = 5.715(1)$ $c = 7.960(1)$ $Z = 4$

X-ray Powder Pattern: Upper Chegem caldera, North Caucasus, Kabardino-Balkaria, Russia. 2.807 (100), 1.610 (36), 1.988 (34), 3.970 (28), 2.850 (25), 2.771 (22), 1.640 (18)

Chemistry:	(1)		(1)
UO ₃	2.24	Sc ₂ O ₃	0.38
Nb ₂ O ₅	0.56	Cr ₂ O ₃	0.34
Ta ₂ O ₅	0.09	Al ₂ O ₃	0.04
ZrO ₂	40.34	Ce ₂ O ₃	0.53
SnO ₂	11.14	La ₂ O ₃	0.58
TiO ₂	7.89	Nd ₂ O ₃	0.14
HfO ₂	0.90	CaO	31.08
ThO ₂	0.84	SrO	0.10
SiO ₂	0.04	<u>MgO</u>	<u>0.01</u>
Fe ₂ O ₃	2.46	Total	99.70

(1) Upper Chegem caldera, North Caucasus, Kabardino-Balkaria, Russia; average of 24 electron microprobe analyses supplemented by IR and Raman spectroscopy; corresponding to $(\text{Ca}_{0.985}\text{Sr}_{0.002})_{\Sigma=0.987}(\text{Ce}_{0.006}\text{La}_{0.006}\text{Th}_{0.006}\text{Nd}_{0.001})_{\Sigma=0.019}(\text{Zr}_{0.582}\text{Ti}^{4+}_{0.176}\text{Sn}_{0.131}\text{Fe}^{3+}_{0.055}\text{U}^{6+}_{0.014}\text{Sc}_{0.010}\text{Cr}^{3+}_{0.008}\text{Hf}_{0.008}\text{Nb}^{5+}_{0.007}\text{Si}_{0.001}\text{Ta}^{5+}_{0.001}\text{Al}_{0.001})_{\Sigma=0.986}\text{O}_3$.

Polymorphism & Series: Belongs to the ternary solid solution CaZrO₃-CaTiO₃-CaSnO₃.

Mineral Group: Perovskite group.

Occurrence: In high-temperature skarns formed in sanidinite-facies conditions of contact metamorphism in carbonate-silicate rocks occurring as xenoliths in ignimbrites.

Association: Spurrite, larnite, calcio-olivine, calcite, cuspidine, rondorfite, reinhardbraunsite, wadalite, perovskite, minerals of the ellestadite group.

Distribution: From between the Lakargi and Vorlan mountain peaks, Upper Chegem (Verkhniy Chegem) caldera, North Caucasus, Kabardino-Balkaria, Russia.

Name: For *Lakargi* Mountain, Russia.

Type Material: Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow (3590/1).

References: (1) Galuskin, E.V., V.M. Gazeev, T. Armbruster, A.E. Zadov, I.O. Galuskina, N.N. Pertsev, P. Dzierzanowski, M. Kadiyski, A.G. Gurbanov, R. Wrzalik, and A. Winiarski (2008) Lakargiite CaZrO₃: A new mineral of the perovskite group from the North Caucasus, Kabardino-Balkaria, Russia. *Amer. Mineral.*, 93, 1903-1910. (2) Stoch, P., J. Szczerba, J. Lis, D. Madej, and Z. Pędzich (2012) Crystal structure and *ab initio* calculations of CaZrO₃. *J. Eur. Ceramic Soc.*, 32, 665-670.