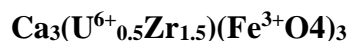


**Elbrusite**

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . As skeletal crystals to 15  $\mu\text{m}$  with dominant {110} and minor {211}. Often as zones and spots within  $\text{Fe}^{3+}$ -dominant kimzeyite crystals.

**Physical Properties:** *Cleavage:* None. *Tenacity:* Brittle. *Fracture:* Irregular. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.801 Radioactive and nearly completely metamict.

**Optical Properties:** Transparent to translucent. *Color:* Dark-brown to black. *Streak:* Brown. *Luster:* Vitreous to dull, resinous. *Optical Class:* [Isotropic.]  $n = \text{n.d.}$

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

**X-ray Powder Pattern:** n.d.

<b>Chemistry:</b>	(1)		(1)
	UO <sub>3</sub>	25.14	Al <sub>2</sub> O <sub>3</sub>
	V <sub>2</sub> O <sub>5</sub>	0.05	Cr <sub>2</sub> O <sub>3</sub>
	ThO <sub>2</sub>	0.65	Y <sub>2</sub> O <sub>3</sub>
	HfO <sub>2</sub>	0.25	Fe <sub>2</sub> O <sub>3</sub>
	SnO <sub>2</sub>	5.13	FeO
	ZrO <sub>2</sub>	17.11	CaO
	TiO <sub>2</sub>	2.12	<u>MgO</u>
	SiO <sub>2</sub>	0.79	<u>Total</u>
			99.87

(1) Upper Chegem caldera, Northern Caucasus, Russia; average of 6 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to  $(\text{Ca}_{3.040}\text{Th}_{0.018}\text{Y}_{0.001})_{\Sigma=3.059}(\text{U}^{6+}_{0.658}\text{Zr}_{1.040}\text{Sn}_{0.230}\text{Hf}_{0.009}\text{Mg}_{0.004})_{\Sigma=1.941}(\text{Fe}^{3+}_{1.575}\text{Fe}^{2+}_{0.559}\text{Al}_{0.539}\text{Ti}^{4+}_{0.199}\text{Si}_{0.099}\text{Sn}_{0.025}\text{V}^{5+}_{0.004})_{\Sigma=3}\text{O}_{12}$ .

**Polymorphism & Series:** Complex solid solutions with kimzeyite and toturite described by  $\text{Ca}_3(\text{U,Zr,Sn,Ti,Sb,Sc,Nb...})_2(\text{Fe,Al,Si,Ti})_3\text{O}_{12}$ .

**Mineral Group:** Garnet supergroup, bitikleite group.

**Occurrence:** In spurrite zones in skarn developed in xenoliths in ignimbrite.

**Association:** Spurrite, rondorfite, wadalite, kimzeyite, perovskite, lakargiite, ellestadite-(OH), hillebrandite, afwillite, hydrocalumite, ettringite group minerals, hydrogrossular.

**Distribution:** From the Upper Chegem caldera, near Mt. Lakargi, on the interfluvium between the Chegem and Kenstanty Rivers, Kabardino-Balkaria, Northern Caucasus, Russia.

**Name:** For the highest peak in Europe, Mt. *Elbrus* (5642 m), Northern Caucasus, Russia.

**Type Material:** A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (3840/1).

**References:** (1) Galuskina, I.O., E.V. Galuskin, T. Armbruster, B. Lazic, J. Kusz, P. Dzierżanowski, V.M. Gazeev, N.N. Pertsev, K. Prusik, A.E. Zadov, A. Winiarski, R. Wrzalik, and A.G. Gurbanov (2010) Elbrusite-(Zr) - A new uranian garnet from the Upper Chegem caldera, Kabardino-Balkaria, Northern Caucasus, Russia. *Amer. Mineral.*, 95, 1172-1181. (2) Grew, E.S., A.J. Locock, S.J. Mills, I.O. Galuskina, E.V. Galuskin, and U. Hålenius (2013) Nomenclature of the garnet supergroup. *Amer. Mineral.*, 95, 785-811.