Chukhrovite-(Ce) $Ca_3(Ce,Y)Al_2(SO_4)F_{13}\cdot 10H_2O$

Crystal Data: Cubic. *Point Group:* $2/m\ \overline{3}$. Octahedral crystals, to 1.5 mm.

Physical Properties: *Cleavage:* [On {111}, distinct.] [by analogy to chukhrovite-(Y)]. *Fracture:* [Irregular.] *Tenacity:* [Brittle.] Hardness = [∼3] D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Semitransparent. *Color:* [Colorless.]
Optical Class: Isotropic. $n = 1.443(2)$

Cell Data: *Space Group:* $Fd3$. $a = 16.74(4)$ $Z = 8$

X-ray Powder Pattern: Clara mine, Germany.
9.75 (10), 5.93 (8), 3.22 (7), 2.56 (6), 2.17 (6), 4.20 (5), 2.24 (5)

Chemistry: (1) Clara mine, Germany; by electron microprobe, Ce determined as the dominant rare-earth element, with Y absent. (2) Yaroslavsk deposit, Russia; $RE_2O_3 = Y_2O_3$ 20.7%, La_2O_3 8.9%, Ce_2O_3 27.1%, Pr_2O_3 6.3%, Nd_2O_3 14.8%, Sm_2O_3 7.0%, Gd_2O_3 6.6%, Dy_2O_3 4.0%, Er_2O_3 2.2%, Yb_2O_3 1.4%; identity established by X-ray powder pattern and physical properties.

Occurrence: In a hydrothermal barite–fluorite vein deposit (Clara mine, Germany); from the oxidized zone of a banded sellaite–tourmaline–fluorite deposit (Yaroslavsk deposit, Russia).

Association: Fluorite, jarosite, pyrite, sulfur (Clara mine, Germany); sellaite, gearksutite, yaroslavite (Yaroslavsk deposit, Russia).

Distribution: From the Clara mine, near Oberwolfach, Black Forest, Germany. At the Yaroslavsk tin deposit, 50 km south of Lake Khanka, Primorskiy Kray, Siberia, Russia.

Name: For its relation to *chukhrovite*-(Y) and content of *cerium* as the dominant rare-earth element.

Type Material: n.d.

References: (1) Walenta, K. (1979) Chukhrovit-(Ce) and Rhabdophan-(Ce) aus der Grube Clara bei Oberwolfach im mittlern Schwarzwald. Chem. Erde, 38, 331–339 (in German with English abs.). (2) (1980) Amer. Mineral., 65, 1065 (abs. ref. 2). (3) Novikova, M.I. (1973) Occurrence of chukhrovite in Siberia. Zap. Vses. Mineral. Obshch., 102, 200–202 (in Russian). (4) Mathew, M., S. Takagi, K.R. Waerstad, and A.W. Frazier (1981) The crystal structure of synthetic chukhrovite, $Ca_4AlSi(SO_4)F_{13}\cdot 12H_2O$. Amer. Mineral., 66, 392–397. (5) Pekov, I.V. (1998) Minerals first discovered on the territory of the former Soviet Union. Ocean Pictures, Moscow, 65–66.