

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . As minute short prismatic crystals, and as grains, to 0.5 mm.

**Physical Properties:** Hardness = n.d. VHN = 80–125, 105 average (10 g load).  
D(meas.) = 5.6 D(calc.) = 5.64

**Optical Properties:** Semitransparent. *Color:* Grayish green, bluish green, blue to pale blue; in reflected light, gray, bluish gray. *Streak:* Pale bluish green.

*Optical Class:* Biaxial (-). *Pleochroism:* Weak; in greens. *Orientation:*  $X = a$ ;  $Y = b$ ;  $Z = c$ .  
 $\alpha = 2.11$   $\beta = 2.18$   $\gamma = 2.22$   $2V(\text{meas.}) = > 80^\circ$  *Anisotropism:* Slight.

**Cell Data:** *Space Group:*  $Pm\bar{c}n$ .  $a = 7.604(6)$   $b = 5.837(4)$   $c = 12.705(6)$   $Z = 8$

**X-ray Powder Pattern:** Russia.

2.85 (10), 2.84 (8), 3.09 (5), 1.711 (5), 4.34 (4), 3.18 (4), 2.28 (3.5)

**Chemistry:**

|                                | (1)    | (2)    |
|--------------------------------|--------|--------|
| TeO <sub>2</sub>               | 67.54  | 66.74  |
| SeO <sub>2</sub>               | 0.03   |        |
| Sb <sub>2</sub> O <sub>3</sub> | 1.12   |        |
| FeO                            | 0.08   |        |
| CuO                            | 33.42  | 33.26  |
| PbO                            | 0.62   |        |
| Ag <sub>2</sub> O              | 0.26   |        |
| Total                          | 103.07 | 100.00 |

(1) Russia; by electron microprobe, calculated from average of three elemental analyses; corresponding to  $(\text{Cu}_{1.01}\text{Ag}_{0.01}\text{Pb}_{0.01})_{\Sigma=1.03}(\text{Te}_{1.02}\text{Sb}_{0.02})_{\Sigma=1.04}\text{O}_{2.93}$ . (2) CuTeO<sub>3</sub>.

**Occurrence:** A rare mineral formed in the oxidation zone as an alteration product of Cu–Te sulfides.

**Association:** Tetrahedrite, chalcopyrite, tellurite, bilibinskite, bogdanovite, teineite, quartz (Aginsk deposit, Russia).

**Distribution:** In Russia, from the Pionersk deposit, eastern Sayan, and the Aginsk gold telluride deposit, Kamchatka, Far Eastern Region.

**Name:** To honor Tat'yana Stepanovna Balyakina (1906–1986), Geology Instructor, Moscow University, Moscow, Russia.

**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 80669.

**References:** (1) Spiridonov, E.M. (1980) Balyakinite, CuTeO<sub>3</sub>, a new mineral from the oxidation zone. *Doklady Acad. Nauk SSSR*, 253, 1448–1450 (in Russian). (2) (1981) *Amer. Mineral.*, 66, 436 (abs. ref. 1). (3) Lindqvist, O. (1972) The crystal structure of CuTeO<sub>3</sub>. *Acta Chem. Scand.*, 26, 1423–1430.