

**Crystal Data:** Tetragonal. *Point Group:*  $\bar{4}m2$ . As rounded grains, to 100  $\mu\text{m}$ , which may be included in tetrahedrite.

**Physical Properties:** Hardness = n.d. VHN = 258–287 (20 g load). D(meas.) = n.d. D(calc.) = 5.00

**Optical Properties:** Opaque. *Color:* Pale rose in reflected light. *Anisotropism:* Weak, in shades of brown.

$R_1$ – $R_2$ : (400) —, (420) —, (440) 24.4–25.0, (460) 25.0–25.6, (480) 25.6–26.2, (500) 26.2–26.7, (520) 26.7–27.2, (540) 27.2–27.6, (560) 27.6–28.1, (580) 27.9–28.6, (600) 28.3–29.0, (620) 28.5–29.3, (640) 28.6–29.4, (660) 28.6–29.5, (680) 28.4–29.3, (700) 27.9–28.6

**Cell Data:** *Space Group:*  $P\bar{4}m2$ .  $a = 7.61(1)$   $c = 5.373(5)$   $Z = 1$

**X-ray Powder Pattern:** Kochbulak deposit, Uzbekistan.

1.904 (100), 3.11 (80), 1.625 (40), 1.568 (40), 2.87 (30), 1.058 (30), 2.70 (20)

**Chemistry:**

	(1)	(2)
Cu	41.17	40.95
Ag	0.41	
Fe	4.31	6.00
Zn	2.10	
Sn	19.11	25.50
Mo	1.08	
Sb	2.97	
As	0.80	
S	28.77	27.55
Total	[100.72]	100.00

(1) Kochbulak deposit, Uzbekistan; by electron microprobe, total originally given as 100.22%; corresponding to  $(\text{Cu}_{5.97}\text{Ag}_{0.03})_{\Sigma=6.00}(\text{Fe}_{0.65}\text{Zn}_{0.30}\text{Cu}_{0.05})_{\Sigma=1.00}(\text{Sn}_{1.34}\text{As}_{0.27}\text{As}_{0.26}\text{Fe}_{0.07}\text{Mo}_{0.05})_{\Sigma=1.99}\text{S}_{7.95}$ . (2)  $\text{Cu}_6\text{FeSn}_2\text{S}_8$ .

**Occurrence:** As rounded disseminations in tetrahedrite, from a sulfide-bearing quartz vein (Kochbulak deposit, Uzbekistan).

**Association:** Cassiterite, hemusite, hessite, tetrahedrite (Kochbulak deposit, Uzbekistan); pyrite, sphalerite, marcasite, galena, chalcopyrite, stannite, tetrahedrite–tennantite, canfieldite, arsenopyrite, digenite, covellite, chalcocite, Au–Ag alloy (Cove deposit, USA).

**Distribution:** From the Kochbulak gold deposit, Chatkal-Kuramin Mountains, eastern Uzbekistan [TL]. In the Cove gold deposit, McCoy district, Lander Co., Nevada, USA. At the Bitin Cu–Au–Ag deposit, Fujian Province, China.

**Name:** For the occurrence in the Chatkal-Kuramin Mountains, Russia.

**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 81595.

**References:** (1) Kovalenker, V.A., T.L. Evstigneeva, V.S. Malov, and L.N. Vyal'sov (1981) Chatkalite,  $\text{Cu}_6\text{FeSn}_2\text{S}_8$ , a new mineral. *Mineral. Zhurnal*, 3, 79–86 (in Russian with English abs.). (2) (1982) *Amer. Mineral.*, 67, 621–622 (abs. ref. 1). (3) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 90.