

**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$ . As irregular grains, to 600  $\mu\text{m}$ , commonly striated.

**Physical Properties:** *Tenacity:* Malleable. Hardness = 1.6 VHN = 294 (20 g load). D(meas.) = n.d. D(calc.) = 14.67

**Optical Properties:** Opaque. *Color:* Golden yellow; copper-red with a yellow tint in reflected light. *Luster:* Metallic. *Anisotropism:* Weak, with colors from gray to light gray.

R: (405) 44.6, (436) 46.8, (480) 50.3, (526) 55.8, (546) 61.2, (578) 74.4, (589) 76.6, (622) 83.6, (644) 84.9, (656) 85.4, (664) 86.6, (700) 91.3

**Cell Data:** *Space Group:*  $C4/mmm$ .  $a = 3.98\text{--}3.89$  Chem.Abs.??  $c = 3.72$   $Z = 2$

**X-ray Powder Pattern:** Sardala, China.

2.24 (10), 1.195 (10), 0.797 (9b), 0.877 (7b), 1.125 (6b), 0.832 (6), 1.99 (5)

**Chemistry:**

	(1)	(2)
Au	75.18	75.61
Cu	23.74	24.39
Total	98.92	100.00

(1) Sardala, China; by electron microprobe, corresponding to  $\text{Au}_{1.01}\text{Cu}_{0.99}$ . (2) AuCu.

**Occurrence:** In mafic to ultramafic rocks that also contain platinum group elements.

**Association:** Pyrrhotite, pyrite, chalcopyrite, gold, silver, platinum group minerals, magnetite, chromite, tremolite, diopside, serpentine, chlorite, epidote, apatite, zircon.

**Distribution:** From Sardala [Saar-Dala ??syn ck??in 2004 MFG - upper Qingshui River, Malas (Manas?, Marneshi) Co.], Xinjiang Uygur Autonomous Region, China [TL]. [??and attribute other statements if additional localities are accepted] In the [better loc??] Noril'sk region, western Siberia, Russia. Additional localities are attributed for this species, but analyses are not given or do not approximate AuCu.

**Name:** In allusion to the composition and symmetry.

**Type Material:** Geological Museum, Ministry of Geology, Beijing, China.

**References:** (1) Chen Keqiao, Yu Tinggao, Zhang Yongge, and Peng Zhizhong (1982) Tetraauricupride, CuAu, discovered in China. *Scientia Geologica Sinica*, 111–116 (in Chinese with English abs.). (2) (1983) *Amer. Mineral.*, 68, 1250–1251 (abs. ref. 1). (3) Johannsen, C.H. and J.O. Linde (1936) Röntgenographische und elektrische Untersuchungen des CuAu-Systems. *Ann. Phys. (Leipzig)*, 25(1), 1–48 (in German).