Daomanite $CuPtAsS_2$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. As tabular crystals, to 0.3 mm across, with prominent {010}, {100}, {001}, {011}, commonly with curved faces. *Twinning:* On {010}, forming "elbow twins", which may be multiple.

Physical Properties: *Cleavage:* Perfect on {010}, distinct on {100}, {001}, less distinct on {110}. *Fracture:* Steplike or uneven. *Tenacity:* Brittle. Hardness = n.d. VHN = 169–175 (10 to 20 g load). D(meas.) = n.d. D(calc.) = 7.57

Optical Properties: Opaque. *Color:* Steel-gray with yellow tint; in polished section, pale greenish yellow. *Luster:* Metallic. *Pleochroism:* Distinct; yellowish with green tint. *Anisotropism:* Strong. *Bireflectance:* Distinct.
R_1–R_2: (400) 37.0–44.0, (420) 37.9–44.6, (440) 39.1–45.0, (460) 40.4–45.3, (480) 41.5–45.5, (500) 42.2–45.6, (520) 42.8–38.6, (540) 42.9–45.3, (560) 42.8–45.2, (580) 42.4–45.0, (600) 41.8–44.8, (620) 41.2–44.7, (640) 40.6–44.5, (660) 40.1–44.4, (680) 39.8–44.0, (700) 39.7–43.7

Cell Data: *Space Group:* $Amam$, $Amam$, or $Ama2_1$. $a = 5.852$ $b = 15.876$ $c = 3.756$
$Z = 4$

X-ray Powder Pattern: Yanshan Mountains, China.
2.93 (10), 3.29 (6), 7.95 (5), 1.63 (5), 1.006 (5), 0.9299 (5), 2.72 (4)

Chemistry:

	(1)	(2)	(4)
Cu	15.68	15.57	15.98
Pt	49.73	50.64	49.06
As	18.30	17.74	18.84
S	16.31	16.43	16.12
Total	100.02	100.38	100.00

(1) China; by electron microprobe, corresponds to $Cu_{0.97}Pt_{1.00}As_{0.96}S_{2.00}$. (2) Do.; by electron microprobe, corresponds to $Cu_{0.96}Pt_{1.01}As_{0.92}S_{2.00}$. (3) Do.; by electron microprobe, average of three analyses, not given, stated to correspond to $Cu_{0.96}(Pt_{0.96}Rh_{0.01})_{\Sigma=0.97}As_{1.08}S_{2.00}$. (4) $CuPtAsS_2$.

Occurrence: A replacement of bornite in contact metasomatic platinum-bearing Co–Cu sulfide mineralization in peridotite-pyroxenite at the contact with anorthosite or granite-gneiss.

Association: Bornite, chalcopyrite, carrolite, pyrite, tetrahedrite, galena, molybdenite; minor sperrylite, cooperite, moncheite, cobaltian malanite, yixunite, damiaoite.

Distribution: In China, from Sandao and Tiema villages [TL] and near Damiao village and the Yixun River, about 270 km north of Beijing, Yanshan Mounains, Hebei Province.

Name: From the last syllables of its two Chinese localities, SanDAO and TieMA villages.

Type Material: n.d.

References: (1) Yu Tsu-Hsiang [Yu Zuxiang], Lin Shu-Jen, Chao Pao, Fang Ching-Sung, and Huang Chi-Shun (1974) A preliminary study of some new minerals of the platinum group and another associated new one in platinum-bearing intrusions in a region of China. Acta Geol. Sinica, 2, 202–218 (in Chinese with English abs.). (2) (1976) Amer. Mineral., 61, 184 (abs. ref. 1). (3) Yu Zuxiang, Ding Kuishou and Zhou Jianxiong (1978) Daomanite, a new platinum mineral. Acta Geol. Sinica, ??4, 320–327 (in Chinese with English abs.). [Yu Zuxiang formerly Yu Tsu-Hsiang]. (4) (1980) Amer. Mineral., 65, 408 (abs. ref. 3). (5) Yu Zuxiang (1986) Some new minerals from platinum-bearing rocks in Yanshan and Tibet regions, China. Bull. Inst. Geol., Chinese Acad. Geol. Sci., 15, 49–57 (in Chinese with English abs.). (6) Yu Zuxiang (2001) New data for daomanite. Acta Geol. Sinica, 75(3), 396–399 (in Chinese with English abs.).