Colusite $Cu_{26}V_2(As,Sn,Sb)_6S_{32}$

Crystal Data: Cubic. *Point Group:* $\bar{4}3m$. Granular, massive; also as complex aggregates of modified tetrahedral crystals, to 5 mm. *Twinning:* Rare on {111}.

Physical Properties: *Tenacity:* Brittle. Hardness = 3–4 VHN = 322–379 (100 g load). D(meas.) = 4.2 D(calc.) = [4.78]

Optical Properties: Opaque. *Color:* Bronze, bronze-brown to bronzy gray; cream colored in reflected light. *Streak:* Black. *Luster:* Metallic.
R: (400) 25.1, (420) 25.5, (440) 25.9, (460) 26.4, (480) 27.0, (500) 27.7, (520) 28.6, (540) 29.6, (560) 30.5, (580) 31.2, (600) 31.7, (620) 32.0, (640) 31.9, (660) 31.6, (680) 31.3, (700) 31.0

Cell Data: *Space Group:* $P\bar{4}3n$. $a = 10.538(6)$ $Z = 1$

X-ray Powder Pattern: Tramway mine, Butte, Montana, USA.
3.07 (100), 1.881 (60), 1.600 (40), 1.222 (30), 1.085 (30), 2.65 (20), 1.324 (20)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Cu	47.99	47.8	50.1	Sn	6.71	8.4	0.26
Zn		0.3		Ge			0.63
V	2.28	2.9	3.3	Te	1.26		
Fe	1.09	0.4		Sb	0.19	2.8	1.4
As	9.54	7.0	13.6	S	30.65	30.5	31.2
				Total	99.71	100.1	100.49

(1) Butte, Montana, USA; corresponds to $Cu_{25.26}V_{1.50}(As_{4.31}Sn_{1.89}Fe_{0.65}Te_{0.33}Sb_{0.05})_{\Sigma=7.23}S_{32.00}$. (2) Do.; by electron microprobe, corresponds to $(Cu_{25.31}Zn_{0.15})_{\Sigma=25.46}V_{1.92}(As_{3.14}Sn_{2.38}Sb_{0.77}Fe_{0.24})_{\Sigma=6.53}S_{32.00}$. (3) Lorano, Italy; by electron microprobe, corresponds to $Cu_{25.93}V_{2.13}(As_{5.97}Sb_{0.38}Te_{0.33}Ge_{0.28}Sn_{0.07})_{\Sigma=7.03}S_{32.00}$.

Mineral Group: Colusite group.

Occurrence: Widespread in small amounts with other sulfides and sulfosalts, typically in hydrothermal vein and disseminated copper deposits.

Association: Pyrite, tetrahedrite–tennantite, enargite, luzonite, stannoidite, goldfieldite, germanite, reniérite, bornite, chalcocite, covellite, chalcopyrite, sphalerite, galena.

Distribution: In the USA, in Montana, from the Leonard mine [TL] and other mines, Butte, Silver Bow Co.; in Arizona, from the Magma mine, Superior, Pinal Co., and the Campbell mine, Bisbee, Cochise Co.; from Red Mountain Pass, San Juan, Ouray Co., and in the Buffalo Boy mine, near Silverton, San Juan Co., Colorado. In the Kidd Creek mine, near Timmins, Ontario, Canada. From Chuquicamata, Antofagasta, Chile. At Cerro de Pasco, Peru. From Lorano, 5 km from Carrara, and in the Costa and Pitone quarries, near Seravezza, 20 km southwest of Carrara, from the La Facciata quarry, Carrara, Tuscany, Italy. At Chizeuil, Saône-et-Loire, France. From Bor, Serbia. In the Medet and Assarel deposits, and at the Chelopech deposit, Sofia, Bulgaria. In the Gay Cu–Zn deposit, Southern Ural Mountains, Russia. From the Grasberg Cu–Au deposit, Irian Jaya. At the Shin-Ohtoyo Cu–Ag deposit, Harukayama district, Hokkaido, Japan. Numerous minor localities are now known.

Name: For the Colusa claim, Butte, Montana, USA, near which it occurs in the Leonard mine.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 386–387. (2) Orlandi, P., S. Merlino, G. Duchi, and G. Vezzalini (1981) Colusite: a new occurrence and crystal chemistry. Can. Mineral., 19, 423–427. (3) Spry, P.G., S. Merlino, S. Wang, X. Zhang, and P.R. Busek (1994) New occurrences and refined crystal chemistry of colusite, with comparisons to arsenosulvanite. Amer. Mineral., 79, 750–762. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 107. (5) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. Geol. Soc. Amer. Mem. 85, 58.