Calaverite $AuTe_2$

Crystal Data: Monoclinic. *Point Group:* $2/m$ or 2. Bladed and short to slender prisms elongated ‖ [010], striated ‖ [010], to 1 cm; also massive, granular. *Twinning:* Common on {110}, less common on {031} and {111}.

Physical Properties: *Fracture:* Uneven to subconchoidal. *Tenacity:* Brittle. Hardness = 2.5–3 VHN = 197–213 (100 g load). D(meas.) = 9.10–9.40 D(calc.) = 9.31

Optical Properties: Opaque. *Color:* Grass-yellow to silver-white; white in reflected light. *Streak:* Greenish to yellowish gray. *Luster:* Metallic. *Pleochroism:* Weak. *Anisotropism:* Weak.
R_1–R_2: (400) 45.7–54.4, (420) 48.4–57.1, (440) 51.1–59.6, (460) 53.6–61.8, (480) 56.0–63.6, (500) 57.9–65.2, (520) 59.4–66.4, (540) 60.6–67.3, (560) 61.3–68.0, (580) 61.8–68.3, (600) 62.2–68.4, (620) 62.5–68.6, (640) 62.7–68.5, (660) 62.8–68.4, (680) 62.9–68.2, (700) 63.0–68.1

Cell Data: *Space Group:* $C2/m$ or $C2$. $a = 7.1947(4)$ $b = 4.4146(2)$ $c = 5.0703(3)$ $\beta = 90.038(4)^\circ$ $Z = 2$

X-ray Powder Pattern: Cripple Creek, Colorado, USA.
3.02 (10), 2.09 (8), 2.20 (4), 2.93 (3), 1.758 (3), 1.689 (3), 1.506 (3)

Chemistry:

	(1)	(2)	(3)
Au	41.66	42.15	43.59
Ag	0.77	0.60	
Te	57.87	57.00	56.41
Total	100.30	99.75	100.00

(1) Cripple Creek, Colorado, USA. (2) Kalgoorlie, Australia. (3) $AuTe_2$.

Polymorphism & Series: Dimorphous with krennerite.

Occurrence: Typically in veins in low-temperature hydrothermal deposits, but also in medium- and high-temperature deposits.

Association: Altaite, coloradoite, krennerite, rickardite, other tellurides, pyrite, arsenopyrite, tetrahedrite, tennantite, sphalerite, stibnite, other sulfides.

Distribution: In the USA, in California, at the Stanislaus [TL], Morgan, and Melones mines, Carson Hill district, Calaveras Co.; at the Spotted Horse mine, Maiden, Fergus Co., and the Mayflower mine, Tobacco Root Mountains, Madison Co., Montana; in Colorado, fine examples in the Cripple Creek district, Teller Co.; the Central City district, Gilpin Co.; Gold Hill, Boulder Co.; and the Bessie G and Mayday mines, La Plata Co. From the San Francisco mine, 145 km north of Hermosillo, Sonora, Mexico. At the El Indio mine, east of La Serena, Coquimbo, Chile. In several mines in the Kirkland Lake area, and in the Hemlo gold deposit, Thunder Bay district, Ontario; and the Robb-Montbray mine, Quebec, Canada. From the Lake View and North Kalgoorlie mines, Kalgoorlie, Western Australia. At Nishizaki, Gifu Prefecture,in the Date mine, Hokkaido, and the Susaki mine, Shizuoka Prefecture, Japan. In the Emperor mine, Vatukoula, and in the Tuvatu Au–Ag–Te deposit, Viti Levu, Fiji Islands. At the Bulawan deposit, Negros Occidental, Phillipines. From Klyuchi, eastern Siberia, and in the Bereznyakov gold deposit, Southern Ural Mountains, Russia.

Name: For its occurrence in Calaveras Co., California, USA.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 335–338. (2) Schutte, W.J. and J.L. de Boer (1988) Valence fluctuations in the incommensurately modulated structure of calaverite $AuTe_2$. Acta Cryst., 44, 486–494. (3) Reithmayer, K., W. Steurer, H. Schulz, and J.L. de Boer (1993) High-pressure single-crystal structure study on calavrite, $AuTe_2$. Acta Cryst., 49, 6–11. (4) Sindeeva, N.D. (1964) Mineralogy and types of deposits of selenium and tellurium, 107–110. (5) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. Geol. Soc. Amer. Mem. 85, 112. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 69.