

Goldfieldite**Cu₁₂(Te, As, Sb)₄S₁₃**

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Crystal Data: Cubic. *Point Group:* $\bar{4}3m$. Massive; as crusts.**Physical Properties:** *Tenacity:* Brittle. Hardness = 3–3.5 VHN = 291–342 (100 g load). D(meas.) = 4.95 D(calc.) = 4.935**Optical Properties:** Opaque. *Color:* Dark lead-gray. *Luster:* Metallic.

R: (400) 30.7, (420) 30.7, (440) 30.7, (460) 30.7, (480) 30.7, (500) 30.7, (520) 30.6, (540) 30.6, (560) 30.6, (580) 30.6, (600) 30.6, (620) 30.7, (640) 30.9, (660) 31.0, (680) 31.1, (700) 31.2

Cell Data: *Space Group:* $I\bar{4}3m$. $a = 10.263\text{--}10.38$ $Z = 2$ **X-ray Powder Pattern:** Goldfield, Nevada, USA. (ICDD 29-531).

2.97 (100), 1.819 (60), 3.64 (30), 1.552 (30), 2.58 (20), 2.43 (20), 5.15 (10)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Cu	43.38	44.3	46.5	Te	25.74	14.5	18.0
Ag		0.6		Sb	0.23	7.1	2.3
Fe		0.1		As	5.30	5.3	7.1
Zn		0.2		S	25.56	27.8	25.8
				Total	100.21	99.9	99.7

(1) Yelshishche [Elshitsa] deposit, Bulgaria; by electron microprobe, corresponds to $\text{Cu}_{10.92}(\text{Te}_{3.23}\text{As}_{1.13}\text{Sb}_{0.03})_{\Sigma=4.39}\text{S}_{12.75}$. (2) Goldfield, Nevada, USA; by electron microprobe, corresponds to $(\text{Cu}_{11.12}\text{Ag}_{0.09}\text{Zn}_{0.05}\text{Fe}_{0.03})_{\Sigma=11.29}(\text{Te}_{1.81}\text{As}_{1.13}\text{Sb}_{0.93})_{\Sigma=3.87}\text{S}_{13.84}$. (3) Tramway mine, Montana, USA; by electron microprobe, corresponds to $\text{Cu}_{11.85}(\text{Te}_{2.28}\text{As}_{1.53}\text{Sb}_{0.93})_{\Sigma=4.74}\text{S}_{12.41}$.

Mineral Group: Tetrahedrite group.**Occurrence:** In epithermal gold-bearing veins; less commonly in porphyry copper and volcanogenic massive sulfide deposits.**Association:** Marcasite, famatinite, tennantite, hessite, petzite, sylvanite, altaite, chalcostibite, emplectite, gold, kuramite, bismuthinite, pyrite, sphalerite.

Distribution: In the USA, in Nevada, from Goldfield, Esmeralda Co., in the Mohawk [TL] and Claremont mines; at the Tramway mine, Butte, Silver Bow Co., Montana; in the Campbell mine, Bisbee, Cochise Co., Arizona; and at the Sweethome mine, Lake City, Hinsdale Co., Colorado. From the Moctezuma (Bambolla) mine, 12 km south of Moctezuma, Sonora, Mexico. In the El Indio mine, El Indio-Tambo district, east of La Serena, Coquimbo, Chile. From the Kochbulak gold deposit, Chatkal-Kuramin Mountains, eastern Uzbekistan. In the Bittibulakhsk Cu–As deposit, Lesser Caucasus Mountains, Russia. In the Elshitsa massive sulfide deposit, Srena Gora district, and the Assarel porphyry copper deposit, Bulgaria. At Kremnica (Kremnitz), Slovakia. From the Kawazu mine, Shizuoka Prefecture, and in the Iriki mine, Kagoshima Prefecture, Japan. At Ufuo, Left April River area, Papua New Guinea. From the Marian gold deposit, Luzon, Philippines. In the Peak Hill Au–Cu deposit, New South Wales, Australia.

Name: After the type locality, Goldfield, Nevada, USA.**Type Material:** n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 384. (2) Dmitriyeva, M.T., Y.A. Yefremov, and V.A. Kovalenker (1987) Crystal structure of As-goldfieldite. Doklady Acad. Nauk SSSR, 297, 687–690 (in Russian). (3) Pohl, D., W. Liessmann, and V.M. Okrugin (1996) Rietveld analysis of selenium-bearing goldfieldites. Neues Jahrb. Mineral., Monatsh., 1–8. (4) Trudu, A.G. and U. Knittel (1998) Crystallography, mineral chemistry and chemical nomenclature of goldfeldite, the tellurian member of the tetrahedrite solid-solution series. Can. Mineral., 36, 1115–1137. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 209.

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