

Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. As octahedra, dodecahedra, and cubes, typically crude or rounded, to about 5 cm; also elongated || [111]. In twinned and parallel crystal groups; reticulated, dendritic, arborescent, platy, filiform, spongy; massive, and in rounded nuggets; scales and flakes. *Twining:* Common on {111}; repeated to form reticulated and dendritic aggregates.

Physical Properties: *Fracture:* Hackly. *Tenacity:* Very malleable and ductile. Hardness = 2.5–3 VHN = 30–34, 44–58 (argentian) (10 g load). D(meas.) = 19.3 D(calc.) = 19.302

Optical Properties: Opaque in all but thinnest foils. *Color:* Gold-yellow with a reddish tint when pure, silver-white to copper-red when impure; blue and green in transmitted light. *Luster:* Metallic. R: (400) 36.8, (420) 36.8, (440) 36.4, (460) 36.1, (480) 36.7, (500) 45.3, (520) 62.5, (540) 75.0, (560) 82.2, (580) 86.8, (600) 89.7, (620) 91.9, (640) 93.3, (660) 94.1, (680) 94.8, (700) 95.3

Cell Data: *Space Group:* $Fm\bar{3}m$. $a = 4.0786$ $Z = 4$

X-ray Powder Pattern: Synthetic. 2.355 (100), 2.039 (52), 1.230 (36), 1.442 (32), 0.9357 (23), 0.8325 (23), 0.9120 (22)

Chemistry:	(1)	(1)
	Au 99.6	Ag 0.1
	Cu 0.1	Total 99.8

(1) Porthcurnick Beach, Cornwall, England; by electron microprobe. Commonly contains Ag, Cu, Fe; rarely Pb, Ti, Sb, Hg, V, Bi, Mn, As, Sn, Zn, Pd, Pt, Cd, many other elements.

Polymorphism & Series: Forms a series with silver.

Occurrence: Widespread in very small quantities in rocks of many kinds throughout the world, and in sea water. In veins of epithermal origin, typically in quartz with pyrite and other sulfides, and with tellurides; in pegmatites; in contact metamorphic deposits. Common in placers.

Association: Pyrite, chalcopyrite, arsenopyrite, pyrrhotite, sylvanite, krennerite, calaverite, altaite, tetradymite, scheelite, ankerite, tourmaline, quartz.

Distribution: Many localities for fine specimens. In Russia, in Siberia, along the eastern slope of the Ural Mountains; important localities near Yekaterinburg (Sverdlovsk), as at Beresovsk; in the Miass district; large crystal groups from along the Lena River, Sakha. Sharply crystallized from Romania, at Roşia Montană (Verespatak) and Săcărîmb (Nagyág). In Australia, many occurrences, as at Bendigo, Ballarat, and Matlock, Victoria; along the Palmer River and at Gympie, Queensland; from Kalgoorlie, Western Australia, with gold telluride ores, also very large alluvial nuggets. At the Porgera mine, Mt. Kare, Papua New Guinea. The world's most important gold district is the Witwatersrand, Transvaal, South Africa, which, however, only rarely produces crystalline material. In Canada, especially in Ontario, in the Porcupine and Hemlo districts. In the USA, in California, in the Mother Lode belt of the Sierra Nevada, with fine examples from both lode and placer deposits. In South Dakota, from the Homestake mine at Lead, Lawrence Co.; in Colorado, wire and leaf gold from Breckenridge, Summit Co.; in Lake Co., at Leadville; in Alaska, in lode mines in the Juneau district and placers along the Yukon River. Near Santa Elena, in the Grand Savannah River region, Venezuela, a placer producing exceptional skeletal crystals. A bonanza gold rush occurred at Serra Pelada, Pará, Brazil.

Name: An Old English word for the metal; perhaps related to the Sanskrit *jval*; chemical symbol from the Latin *aurum*, *shining dawn*.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 90–95. (2) Jones, R.S. and M. Fleischer (1969) Gold in minerals and the composition of native gold. U.S. Geol. Surv. Circ. 612, 17 pp. (3) Ewald, P.P. and C. Hermann, Eds. (1931) Gold, *Au*. *Strukturbereich*, 1, 38–40 (in German). (3) (1953) NBS Circ. 539, 1, 33. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 204.

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