

# Idaite

# Cu<sub>3</sub>FeS<sub>4</sub>(?)

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**Crystal Data:** Hexagonal. *Point Group:* n.d. Massive, as rare discrete anhedral grains, as rims on chalcopyrite and as fracture fillings in chalcopyrite; also as exsolution lamellae in bornite.

**Physical Properties:** Hardness = 2.5–3.5 VHN = n.d. D(meas.) = 4.20 D(calc.) = 4.21

**Optical Properties:** Opaque. *Color:* Coppery red to pinchbeck-brown, bornitelike but not tarnished. *Luster:* Metallic. *Anisotropism:* Strong, reddish orange to reddish brown.

R<sub>1</sub>–R<sub>2</sub>: (400) 13.9–17.7, (420) 14.8–18.5, (440) 15.7–19.3, (460) 16.9–21.0, (480) 18.4–23.2, (500) 20.5–25.5, (520) 23.2–27.8, (540) 26.1–29.4, (560) 28.9–30.6, (580) 30.6–31.4, (600) 31.9–31.6, (620) 32.8–31.9, (640) 33.5–32.2, (660) 34.1–32.8, (680) 34.7–33.2, (700) 35.2–33.7

**Cell Data:** *Space Group:* n.d. *a* = 3.90 *c* = 16.95 *Z* = 1

**X-ray Powder Pattern:** Ida mine, Khan, Namibia.

3.14 (100), 2.82 (100), 1.89 (100), 1.85 (100), 1.564 (100), 2.70 (80), 1.317 (80)

## Chemistry:

	(1)	(2)
Cu	51.34	50.87
Fe	14.5	14.90
S	33.66	34.23
Total	99.50	100.00

(1) Skouriotissa, Cyprus; by electron microprobe, average of five analyses. (2) Cu<sub>3</sub>FeS<sub>4</sub>.

**Occurrence:** A lamellar decomposition product of bornite, commonly associated with fine spindles of chalcopyrite; apparently of secondary origin, a first product of enrichment.

**Association:** Chalcopyrite, bornite, pyrite, sphalerite, chalcocite, pyrrhotite, mackinawite (Skouriotissa, Cyprus).

**Distribution:** Now noted at numerous localities world-wide. In Namibia, from the Ida mine, Khan River Valley, Swakopmund district [TL]; and at Tsumeb. Found near Bou Azzer, Morocco. At Nchanga, Zambia. From Skouriotissa, Cyprus. In Switzerland, near Grimetz, Valais. From the Clara mine, near Oberwolfach, Black Forest, Germany. At the Repparfjord copper deposit, Finnmark, Norway. From Gruvberget, Sweden. At Sasca Montană and Ciresu, Mehedinti Mountains, Romania. From the Radka deposit, Pazardzhik, and the Chelopech deposit, Sofia, Bulgaria. In the USA, at upper White Canyon, San Juan Co., Utah. From Canada, at Algoma, Jarvis Township, Ontario. In Brazil, at Caraiba, Bom Fin, Bahia. In Chile, from several mines in the Copiapó district, Atacama, and at El Indio, east of Coquimbo. In the Kaikita mine, Aomori Prefecture; the Ojamine mine, Yamagata Prefecture; and other localities in Japan.

**Name:** For the Ida mine in Namibia.

**Type Material:** n.d.

**References:** (1) Frenzel, G. (1958) Ein neues Mineral: Idait. Neues Jahrb. Mineral., Monatsh., 142 (in German). (2) (1958) Amer. Mineral., 43, 1219 (abs. ref. 1). (3) Frenzel, G. (1959) Ein neues Mineral: Idait, natürliches Cu<sub>5</sub>FeS<sub>6</sub>. Neues Jahrb. Mineral., Abh., 93, 87–114 (in German). (4) (1959) Amer. Mineral., 44, 1327 (abs. ref. 3). (5) Yund, R.A. (1963) Crystal data for synthetic Cu<sub>5.5x</sub>Fe<sub>x</sub>S<sub>6.5x</sub> (idaite). Amer. Mineral., 48, 472–476. (6) Sillitoe, R.H. and A.H. Clark (1969) Copper and copper-iron sulfides as the initial products of supergene oxidation, Copiapó mining district, northern Chile. Amer. Mineral., 54, 1684–1710. (7) Constantinou, G. (1975) Idaite from the Skouriotissa massive sulfide orebody, Cyprus: Its composition and conditions of formation. Amer. Mineral., 60, 1013–1018. (8) Rice, C.M., D. Atkin, J.F.W. Bowles, and A.J. Criddle (1979) Nukundamite, a new mineral, and idaite. Mineral. Mag., 43, 194–200.

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