Isocubanite $CuFe_2S_3$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. Euhedral grains and cubo-octahedra, to 400 μm, intergrown with chalcopyrite; rimming cubanite.

Physical Properties: Hardness = n.d. VHN = 175 (100 g load). D(meas.) = n.d. D(calc.) = [3.93]

Optical Properties: Opaque. *Color:* Bronze; in reflected light, pinkish brown. *Luster:* Metallic.
R: (400) 20.9, (420) 22.7, (440) 24.6, (460) 26.9, (480) 29.2, (500) 31.4, (520) 33.2, (540) 34.8, (560) 36.2, (580) 37.4, (600) 38.2, (620) 39.1, (640) 39.7, (660) 40.3, (680) 40.9, (700) 41.3

Cell Data: *Space Group: Fm3m.* $a = 5.303(3)$ $Z = [4/3]$

X-ray Powder Pattern: East Pacific Rise (21°N).
3.059 (100), 1.876 (70), 1.602 (50), 2.647 (20), 1.327 (20)

Chemistry:

	(1)	(2)
Cu	21.23	23.42
Fe	41.64	41.15
Zn	0.96	
S	35.57	35.43
Total	99.40	100.00

(1) East Pacific Rise (21°N); by electron microprobe. (2) $CuFe_2S_3$.

Polymorphism & Series: Dimorphous with cubanite, from which it can be formed by heating to between 200 °C and 270 °C.

Occurrence: In mixtures of sulfides formed around modern undersea "black smoker" chimneys; in hydrothermal copper sulfide deposits; in pumice from volcanic eruptions.

Association: Chalcopyrite, pyrrhotite, pyrite, sphalerite, wurtzite, anhydrite.

Distribution: From the East Pacific Rise (21°N [TL], 23°N, 13°N) and the Mid-Atlantic Ridge (14°45′N, 29°N, 36°14′N). On Axial Seamount, Juan de Fuca Ridge, northeast Pacific Ocean. In the Atlantis II Deep of the Red Sea. At Kilauea, Hawaii, USA. From the Talnakh area, Noril'sk region, western Siberia, Russia. At Tunaberg, Sweden. In the Mooihoek mine, Lydenburg district, Transvaal, South Africa. From the Strathcona mine, Sudbury, Ontario, Canada.

Name: For the cubic structure and relation to cubanite.

Type Material: National School of Mines, Paris, France.

References: (1) Caye, R., B. Cervelle, F. Cesbron, E. Oudin, P. Picot, and F. Pillard (1988) Isocubanite, a new definition of the cubic polymorph of cubanite $CuFe_2S_3$. Mineral. Mag., 52, 509–514. (2) (1989) Amer. Mineral., 74, 503 (abs. ref. 1). (3) Mozgova, N.N., S.N. Nenasheva, Y.S. Borodayev, and A.J. Tsepin (1996) Compositional range and isomorphism of isocubanite. Geochem. Internat., 33, 1–21. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 259.