

Faustite**(Zn, Cu)Al₆(PO₄)₄(OH)₈·4H₂O**

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$ (by analogy to turquoise). Fine-grained massive, as veinlets, to 8 mm thick, and as nuggets and nodules.

Physical Properties: *Fracture:* Small conchoidal to smooth. *Tenacity:* Brittle. Hardness = 5.5 D(meas.) = 2.92, corrected for admixed montmorillonite. D(calc.) = [2.88]

Optical Properties: Opaque, translucent on thin edges. *Color:* Apple-green; in transmitted light, brown with a greenish cast. *Streak:* White to pale yellow-green. *Luster:* Waxy to dull. *Optical Class:* [Biaxial (+)] (by analogy to turquoise); birefringence medium. $n = 1.613$ $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $[P\bar{1}]$ (by analogy to turquoise). $a = 7.44$ $b = 9.89$ $c = 7.67$ $\alpha = 107^\circ 43'$ $\beta = 115^\circ 39'$ $\gamma = 69^\circ 39'$ $Z = 1$

X-ray Powder Pattern: Copper King mine, Nevada, USA; nearly identical to turquoise. 3.68 (10), 2.89 (8), 6.70 (7), 6.14 (7), 2.05 (7), 3.44 (6), 3.28 (6)

Chemistry:	(1)	(2)
P ₂ O ₅	34.83	34.11
Al ₂ O ₃	35.31	36.74
Fe ₂ O ₃	1.73	
CuO	1.61	4.78
ZnO	7.74	4.89
H ₂ O ⁺	18.78	19.48
Total	[100.00]	100.00

(1) Copper King mine, Nevada, USA; after deduction of montmorillonite ~20%; stated to then correspond to (Zn_{0.8}Cu_{0.2})_{Σ=1.0}Al₆(PO₄)₄(OH)₈·4.5H₂O. (2) (Zn, Cu)Al₆(PO₄)₄(OH)₈·4H₂O with Zn:Cu = 1:1.

Mineral Group: Turquoise group.

Occurrence: In argillized shales associated with copper mineralization (Copper King mine, Nevada, USA).

Association: Montmorillonite, apatite, chrysocolla, azurite, malachite, cuprite, kaolinite, quartz, alunite (Copper King mine, Nevada, USA).

Distribution: In the USA, from the Copper King mine, about 16 km northwest of Carlin, Maggie Creek district, Eureka Co., and the Rain mine, Carlin district, Elko Co., Nevada; at the Bingham mine, Salt Lake Co., Utah. In the Iron Monarch quarry, Iron Knob, South Australia. At the Phoenix United mines, Linkinhorne, Cornwall, England. In the Virneberg mine, near Rheinbreitbach, Rhineland-Palatinate, and at Rengersdorf, Lausitz, Saxony, Germany.

Name: To honor Dr. George Tobias Faust (1908–1985), mineralogist and geologist, U.S. Geological Survey.

Type Material: Harvard University, Cambridge, Massachusetts, 106377; National Museum of Natural History, Washington, D.C., USA, 106879, 113171.

References: (1) Erd, R.C., M.D. Foster, and P.D. Proctor (1953) Faustite, a new mineral, the zinc analogue of turquoise. Amer. Mineral., 38, 964–972.