Guildite $Cu(Fe^{3+}, Al)(SO_4)_2(OH)\cdot 4H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. As short prismatic pseudocubic to platy crystals, to 5 mm, showing {001}, {100}, {110}, {540}, {011}, {101}, {$\overline{1}$01}.

Physical Properties: *Cleavage:* Perfect on {001} and {100}. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 2.695–2.72 D(calc.) = 2.717

Optical Properties: Translucent to transparent in thin fragments. *Color:* Honey-yellow, deep chestnut-brown. *Streak:* Pale canary-yellow. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Pleochroism:* X = Y = pale yellow; Z = greenish yellow.
Orientation: $X = a$; $Y = b$; $Z = c$. α = 1.622–1.623 β = 1.628–1.630 γ = 1.681–1.684
2V(meas.) = 62(2)°

Cell Data: *Space Group:* $P2_1/m$. a = 9.786(2) b = 7.134(1) c = 7.263(1)
β = 105.28(1)° Z = 2

X-ray Powder Pattern: United Verde mine, Arizona, USA.
3.144 (100), 9.46 (35), 4.998 (27), 3.606 (20), 2.076 (12), 2.909 (11), 2.355 (10)

Chemistry:

	(1)	(2)	(3)
SO_3	39.68	38.6	39.97
Al_2O_3	2.11	2.0	
Fe_2O_3	19.12	21.8	19.93
FeO	1.49		
CuO	15.78	16.4	19.86
Na_2O	1.23	0.0	
H_2O	22.15	21.7	20.24
Total	101.56	100.5	100.00

(1) United Verde mine, Arizona, USA. (2) Do.; Cu, Fe, and Na by AA, Al by electron microprobe, H_2O by moisture analyzer; total Fe as Fe_2O_3. (3) $CuFe(SO_4)_2(OH)\cdot 4H_2O$.

Occurrence: A rare secondary mineral formed in mine workings by burning pyritic ores.

Association: Coquimbite, ransomite.

Distribution: From the United Verde mine, Jerome, Yavapai Co., Arizona, USA.

Name: Honors Professor Frank Nelson Guild (1870–1939), American mineralogist and economic geologist, University of Arizona, Tucson, Arizona, USA.

Type Material: National School of Mines, Paris, France; University of Arizona, Tucson, Arizona, M47; Harvard University, Cambridge, Massachusetts, 90540; National Museum of Natural History, Washington, D.C., USA, 95950.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 619. (2) Laughon, R.B. (1970) New data on guildite. Amer. Mineral., 55, 502–505. (3) C. Wan, S. Ghose, and G.R. Rossman (1978) Guildite, a layer structure with a ferric hydroxy-sulphate chain and its optical absorption spectra. Amer. Mineral., 63, 478–483.