Sonoraite $Fe^{3+}Te^{4+}O_3(OH)\cdot H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Bladelike crystals, to 2 mm, flattened on {100}, in subparallel sheaves and rosettes.

Physical Properties: Hardness = ∼3 D(meas.) = 3.95(1) D(calc.) = 4.18

Optical Properties: Transparent. *Color:* Dark yellowish green. *Luster:* Vitreous. *Optical Class:* Biaxial (–). $\alpha = 2.018(3)$ $\beta = 2.023(3)$ $\gamma = 2.025(3)$ 2V(meas.) = 20°–25°

Cell Data: *Space Group:* $P2_1/c$. $a = 10.984(2)$ $b = 10.268(1)$ $c = 7.917(2)$ $\beta = 108.49(2)°$ Z = 8

X-ray Powder Pattern: Moctezuma mine, Mexico.
10.4 (10), 4.66 (8), 3.110 (8), 3.290 (7), 3.66 (6), 5.18 (5), 3.035 (5)

Chemistry:

	(1)	(2)
TeO_2	52.5	59.90
Fe_2O_3	27.9	29.96
H_2O	18.2	10.14
Total	98.6	100.00

(1) Moctezuma mine, Mexico; H_2O taken as loss on ignition. (2) $FeTeO_3(OH)\cdot H_2O$.

Occurrence: A very rare mineral in the oxide zone of a hydrothermal Au–Te ore deposit (Moctezuma mine, Mexico).

Association: Emmonsite, anglesite, "limonite", quartz (Moctezuma mine, Mexico); emmonsite (Mohawk mine, Nevada, USA); rodalquilarite, emmonsite, jarosite, limonite (Tombstone, Arizona, USA).

Distribution: From the Moctezuma (Bambolla) mine, 12 km south of Moctezuma, Sonora, Mexico. In the USA, in the Mohawk mine, Goldfield, Esmeralda Co., Nevada; from the Joe shaft, near Tombstone, Cochise Co., Arizona; in the Wilcox district, Catron Co., New Mexico; in Colorado, at the Good Hope mine, Vulcan district, Gunnison Co., and the Hoosier mine, Cripple Creek district, Teller Co.

Name: For the state of Sonora, Mexico, in which the mineral was first found.

Type Material: The Natural History Museum, London, England, 1967,390; National Museum of Natural History, Washington, D.C., USA, 119271, 164343, 164344.

References: (1) Gaines, R.V., G. Donnay, and M.H. Hey (1968) Sonoraite. Amer. Mineral., 53, 1828–1832. (2) Donnay, G., J.M. Stewart, and H. Preston (1970) The crystal structure of sonoraite, $Fe^{3+}Te^{4+}O_3(OH)\cdot H_2O$. Tschermaks Mineral. Petrog. Mitt., 14, 27–44.