Sonoraite  \( \text{Fe}^{3+}\text{Te}^{4+}\text{O}_3(\text{OH})\cdot\text{H}_2\text{O} \)

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

Physical Properties:  
Hardness = \(\sim3\)  
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:  
\(\begin{array}{c|cc}
\text{Element} & (1) & (2) \\
\hline
\text{TeO}_2 & 52.5 & 59.90 \\
\text{Fe}_2\text{O}_3 & 27.9 & 29.96 \\
\text{H}_2\text{O} & 18.2 & 10.14 \\
\hline
\text{Total} & 98.6 & 100.00 \\
\end{array} \)

(1) Moctezuma mine, Mexico; H\(_2\)O taken as loss on ignition. (2) FeTeO\(_3\)(OH)\cdot H\(_2\)O.

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 Mohock 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.


References:  