Ojuelaite $\mathbf{ZnFe_2^{3+}(AsO_4)_2(OH)_2 \cdot 4H_2O}$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Acicular crystals or fibers, elongated ‖ [001], to 4 mm, commonly in divergent sprays.

Physical Properties: *Cleavage:* On {010}, observable. Hardness = 3 D(meas.) = 3.39 D(calc.) = 3.39

Optical Properties: Semitransparent. *Color:* Chartreuse to pale yellow-green. *Streak:* Pale yellow. *Luster:* Silky to vitreous.
Optical Class: Biaxial (+). *Pleochroism:* In yellows. *Orientation:* X = b; Z = c.
Absorption: $Z = X > Y$. $\alpha = 1.696$ $\beta = 1.730$ $\gamma = 1.798$ 2V(meas.) = n.d. 2V(calc.) = 73°

Cell Data: *Space Group:* $P2_1/c$. $a = 10.237(1)$ $b = 9.662(3)$ $c = 5.562(1)$ $\beta = 94.36(1)°$ Z = 2

X-ray Powder Pattern: Ojuela mine, Mexico.
4.251 (100), 2.871 (90), 7.03 (82), 4.83 (78), 10.23 (65), 2.630 (63), 2.901 (62)

Chemistry:

	(1)	(3)
As_2O_5	40.5	40.97
Fe_2O_3	27.5	28.47
ZnO	14.6	14.51
H_2O	16.8	16.05
Total	99.4	100.00

(1) Ojuela mine, Mexico; Zn and Fe by AA, As by UV spectrophotometry, H_2O by the Penfield method; corresponds to $Zn_{1.02}Fe^{3+}_{1.96}(AsO_4)_{2.00}(OH)_{1.92} \cdot 3.37H_2O$. (2) Do.; by electron microprobe, analysis not given, stated to correspond to $(Zn_{0.77}Fe^{2+}_{0.23})_{\Sigma=1.00}$ $Fe^{3+}_{2.00}(AsO_4)_{1.94}(OH)_2 \cdot 3.75H_2O$. (3) $ZnFe_2(AsO_4)_2(OH)_2 \cdot 4H_2O$.

Mineral Group: Arthurite group.

Occurrence: A rare mineral in the oxidized zone of arsenic-rich polymetallic hydrothermal ore deposits.

Association: Paradamite, scorodite, smithsonite, "limonite" (Ojuela mine, Mexico); smithsonite, tennantite, goethite (Tsumeb, Namibia).

Distribution: In the Ojuela mine, Mapimí, Durango, and at Pitiquito, Sonora, Mexico. From Sterling Hill, Ogdensburg, New Jersey, USA. At Tsumeb, Namibia.

Name: For the Ojuela mine, Mexico, in which the first specimens were found.

Type Material: University of Pierre and Marie Curie, Paris, France; National Museum of Natural History, Washington, D.C., USA, 145679.

References: (1) Cesbron, F., M. Romero, and S.A. Williams (1981) La mapimite et l'ojuelaïte, deux nouveaux arséniates hydratés de zinc et de fer de la mine Ojuela, Mapimi, Mexique. Bull. Minéral., 104, 582–586 (in French with English abs.). (2) (1982) Amer. Mineral., 67, 623–624 (abs. ref. 1). (3) Keller, P. and W. Bartelke (1982) Tsumeb! – new minerals and their associations. Mineral. Record, 13, 137–147, esp. 144. (4) Hughes, J.M., E.S. Bloodaxe, K.D. Kobel, and J.W. Drexler (1996) The atomic arrangement of ojuelaite, $ZnFe^{3+}_2(AsO_4)_2(OH)_2 \cdot 4H_2O$. Mineral. Mag., 60, 519–521.