Mapimite $Zn_2Fe_3^{3+}(AsO_4)_3(OH)_4 \cdot 10H_2O$

Crystal Data: Monoclinic. *Point Group:* m. As rectangular tabular crystals dominated by {001}, {110}, {$\bar{1}$11}, to 4 mm. *Twinning:* Polysynthetic on {001} with [104] pseudoaxis.

Physical Properties: *Cleavage:* On {001} and {010}. Hardness = 3 D(meas.) = 2.95(3) D(calc.) = 3.02(4)

Optical Properties: Translucent. *Color:* Blue, blue-green, green; variable due to trichroism. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Pleochroism:* Strong; X = pale yellow; Y = greenish yellow; Z = deep Prussian blue. *Orientation:* $Y = b$; $Z \wedge a = 13°$. *Dispersion:* $r < v$; strong. $\alpha = 1.672$ $\beta = 1.678$ $\gamma = 1.712$ 2V(meas.) = 50°

Cell Data: *Space Group:* Cm. $a = 11.415(5)$ $b = 11.259(5)$ $c = 8.661(3)$ $\beta = 107.74(4)°$ Z = 2

X-ray Powder Pattern: Ojuela mine, Mexico.
8.24 (100), 7.83 (94), 4.662 (61), 3.883 (46), 3.217 (41), 2.826 (37), 3.451 (36)

Chemistry:

	(1)	(2)
As_2O_5	35.6	35.79
Fe_2O_3	25.6	24.87
FeO	0.9	
ZnO	15.8	16.90
H_2O	21.6	22.44
Total	99.5	100.00

(1) Ojuela mine, Mexico; Zn and Fe^{3+} by AA, Fe^{2+} by colorimetry, As by spectrophotometry, H_2O by the Penfield method; corresponding to $(Zn_{1.88}Fe^{2+}_{0.12})_{\Sigma=2.00}Fe^{3+}_{3.10}O_{2.15}(AsO_4)_{3.00} \cdot 11.61H_2O$. (2) $Zn_2Fe_3(AsO_4)_3(OH)_4 \cdot 10H_2O$.

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

Association: Scorodite, adamite, smithsonite, "limonite".

Distribution: From the Ojuela mine, Mapimí, Durango, Mexico.

Name: For the Mapimí mining district in Mexico that produced the first specimens.

Type Material: University of Pierre and Marie Curie, Paris, France.

References: (1) Cesbron, F., M. Romero, and S.A. Williams (1981) La mapimite et l'ojuélaïte, 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) Ginderow, D. and F. Cesbron (1981) Structure de la mapimite, $Zn_2Fe_3(AsO_4)_3(OH)_4 \cdot 10H_2O$. Acta Cryst., 37, 1040–1043 (in French with English abs.).