Miguelromeroite $Mn_5(AsO_3OH)_2(AsO_4)_2(H_2O)_4$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Prismatic crystals to 4 cm, display {10$\bar{1}$}, {100}, and {110} are elongate along [001]; as sprays.

Physical Properties: *Cleavage*: Good on {100}. *Tenacity*: Brittle. *Fracture*: Conchoidal. Hardness = ~4 D(meas.) = 3.69(3) D(calc.) = 3.698 Easily soluble in dilute HCl.

Optical Properties: Transparent. *Color*: Orange-pink. *Streak*: Very pale pink. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α = 1.713(2) β = 1.723(2) γ = 1.729(2) 2V(meas.) = 70(5)° 2V(calc.) = 75° *Orientation*: $X = b$, $Z \wedge c = 40°$ in obtuse β. *Pleochroism*: Pale pink. *Absorption*: $Z >> X > Y$.

Cell Data: *Space Group*: *C*2/*c*. a = 18.030(1) b = 9.2715(5) c = 9.7756(5) β = 96.266(2)° Z = 4

X-ray Powder Pattern: San Judas Chimney, Ojuela mine, Mapimi, Durango, Mexico. 3.234 (100), 3.074 (68), 2.973 (39), 3.357 (33), 8.279 (28), 1.680 (26), 2.676 (21)

Chemistry:

	(1)	(2)
CaO	0.47	
FeO	0.08	
MnO	36.23	39.22
ZnO	2.85	
As_2O_5	50.62	50.82
H_2O	[9.87]	9.96
Total	100.12	100.00

(1) San Judas Chimney, Ojuela mine, Mapimi, Durango, Mexico; average of 5 electron microprobe analyses, water by moisture-evolution analysis; corresponds to $(Mn^{2+}_{4.63}Zn_{0.32}Ca_{0.08}Fe^{2+}_{0.01})_{\Sigma=5.04}(H_2O)_4(AsO_3OH)_{1.94}(AsO_4)_{2.06}$. (2) $Mn_5(AsO_3OH)_2(AsO_4)_2(H_2O)_4$.

Polymorphism & Series: Mn-dominant member of a series with sainfeldite.

Occurrence: In secondary oxidation zones of arsenic-rich base metal deposits.

Association: Arseniosiderite, ogdensburgite, chalcophanite, adamite.

Distribution: From the San Judas Chimney, Ojuela mine, Mapimi, Durango, Mexico [TL]. At the Veta Negra mine, Tierra Amarilla, Copiapó Province, Chile; at Sterling Hill, Ogdensburg, Sussex County, New Jersey, USA; and at the Gozaisho mine, Iwaki, Fukushima Prefecture, Honshu, Japan.

Name: *Miguel Romero* Sanchez (1926-1997) for his dedication to documenting and preserving Mexico's rich mineral heritage.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (25414).

References: (1) Kampf, A.R. (2009) Miguelromeroite, the Mn analogue of sainfeldite, and redefinition of villyaellenite as an ordered intermediate in the sainfeldite-miguelromeroite series. Amer. Mineral., 94, 1535-1540.