Manganoquadratite $AgMnAsS_3$

Crystal Data: Tetragonal. *Point Group:* 422. As grains to 0.5 mm.

Physical Properties: *Cleavage:* None observed. *Tenacity*: Brittle. Hardness = 2-2.5
VHN = 81 (75-96) (10 g load). D(meas.) = n.d. D(calc.) = 4.680

Optical Properties: Opaque. *Color:* Dark gray. *Streak*: Reddish brown. *Luster*: Metallic.
Optical Class: Anisotropic. Moderately bireflectant. *Pleochroism*: Weak, dark gray to blue-gray.
R_1-R_2: (471.1) 29.5-31.8, (548.3) 28.1-30.5, (586.6) 27.3-29.3, (652.3) 26.0-28.2

Cell Data: *Space Group: P*$4_3$22. a = 5.4496(5) c = 32.949(1) Z = 8

X-ray Powder Pattern: Uchucchacua deposit, Oyon Province, Catajambo, Lima Department, Peru.
2.710 (100), 1.927(70), 3.14 (60), 2.739 (50), 1.645 (25), 1.573 (20), 3.74 (10)

Chemistry:	(1)	(2)
Ag	29.69	32.31
Cu	0.91	
Pb	2.37	
Mn	15.28	16.45
Sb	4.89	
As	18.91	22.44
S	27.67	28.80
Total	99.72	100.00

(1) Uchucchacua deposit, Oyon Province, Lima Department, Peru; average of 9 electron microprobe analyses; corresponds to $(Ag_{0.95}Cu_{0.05})_{\Sigma=1.00}(Mn_{0.96}Pb_{0.04})_{\Sigma=1.00}(As_{0.87}Sb_{0.14})_{\Sigma=1.01}S_{2.99}$. (2) $AgMnAsS_3$.

Occurrence: In a complex vein-type polymetallic hydrothermal deposit.

Association: Alabandite, Mn-rich calcite, Mn-rich sphalerite, proustite, pyrite, pyrrhotite, tennantite, argentotennantite, stannite.

Distribution: From the Uchucchacua polymetallic deposit, Oyon Province, Catajambo Region, Lima Department, Peru.

Name: For the essential manganese content and the close analogy of the formula and unit-cell dimensions with quadratite.

Type Material: Natural History Museum, Mineralogy and Lithology Section, University of Florence, Italy (3108/I).

References: (1) Bonazzi, P., F.N. Keutsch, and L. Bindi (2012) Manganoquadratite, $AgMnAsS_3$, a new manganese-bearing sulfosalt from the Uchucchacua polymetallic deposit, Lima Department, Peru: Description and crystal structure. Amer. Mineral., 97, 1199-1205.