Argandite $Mn_7(VO_4)_2(OH)_8$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As isolated anhedral grains to 60 μm.

Physical Properties: *Cleavage*: Distinct on {001}, by analogy with allactite. *Fracture*: n.d. *Tenacity*: Brittle. Hardness = 3.5-4 D(meas.) = 3.71(5) D(calc.) = 3.676

Optical Properties: Transparent. *Color*: Orange. *Streak*: Pale orange. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α = ~1.74 β = 1.762(2) γ = ~1.77 2V(calc.) = ~62° *Pleochroism*: Distinct, orange-yellow to orange.

Cell Data: *Space Group*: $P2_1/n$. a = 5.5038(2) b = 12.2665(5) c = 10.1055(5) β = 95.559(4)° Z = 2

X-ray Powder Pattern: Pipji glacier, Turtmann Valley, Central Alps, Switzerland. 3.074 (100), 2.687 (70), 3.395 (60), 3.708 (50), 2.945 (50), 2.522 (50), 2.324 (40)

Chemistry:

	(1)
V_2O_5	17.27
As_2O_5	8.16
CaO	0.16
MgO	2.02
MnO	60.49
NiO	0.36
ZnO	0.10
SrO	0.09
H_2O	[9.40]
Total	98.05

(1) Pipji glacier, Turtmann Valley, Central Alps, Switzerland; average of 23 electron microprobe analyses supplemented by FTIR spectrometry, H_2O calculated for charge balance; corresponds to $(Mn_{6.54}Mg_{0.38}Ni_{0.04}Ca_{0.02}Zn_{0.01}Sr_{0.01})_{\Sigma=7.00}(V_{1.46}As_{0.54})_{\Sigma=2.00}O_8(OH)_{8.00}$.

Occurrence: In a metamorphosed (upper greenschist facies) lens of synsedimentary exhalative Mn-Fe ore enriched in V relative to As in dolomitic marble.

Association: Pyrobelonite, reppiaite.

Distribution: From underneath the Pipji glacier, Turtmann Valley, Central Alps, Switzerland.

Name: Honors Swiss geologist Émile *Argand* (1879-1940) for his contribution to understanding Alpine geology in general and the geology of Turmanntal in particular.

Type Material: Geological Museum, Lausanne, Switzerland (MGL90369) and the South Australian Museum, Adelaide, South Australia (G32923).

References: (1) Brugger, J., P. Elliott, N. Meisser, and S. Ansermet (2011) Argandite, $Mn_7(VO_4)_2(OH)_8$, the V analogue of allactite from the metamorphosed Mn ores at Pipji, Turtmann Valley, Switzerland. Amer. Mineral., 96, 1894-1900.