Ambrinoite $[K, (NH_4)]_2(As, Sb)_6(Sb, As)_2S_{13}\cdot H_2O$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As lamellar aggregates, to 1 mm, of tabular crystals elongated on [100] to 100 μm.

Physical Properties: *Cleavage*: Perfect on {001} and {010}, poor on {100}. *Fracture*: Splintery. *Tenacity*: Brittle. Hardness = < 2 VHN = 30 (10 g load). D(meas.) = n.d. D(calc.) = 3.276

Optical Properties: Transparent. *Color*: Cinnabar-red. *Streak*: Reddish. *Luster*: Vitreous to resinous.
Optical Class: Biaxial. n(calc.) = 2.5(3) Parallel extinction to the cleavage traces and negative elongation. *Pleochroism*: Strong, yellow along [100], orange-red $\perp$ [100].

Cell Data: *Space Group*: $P\bar{1}$. $a = 9.704(1)$ $b = 11.579(1)$ $c = 12.102(2)$ $\alpha = 112.82(1)°$ $\beta = 103.44(1)°$ $\gamma = 90.49(1)°$ $Z = 2$

X-ray Powder Pattern: Cumbë Sûrdë quarry, Upper Susa Valley, Torino, Piedmont, Italy.
10.7 (vs), 5.75 (s), 2.875 (s), 2.762 (s), 2.537 (s), 5.33 (m), 4.155 (m)

Chemistry:

	(1)
K	4.57
Na	0.05
Tl	0.13
N	0.48
As	35.69
Sb	21.69
S	34.69
O	1.52
H	[0.33]
Total	99.14

(1) Cumbë Sûrdë quarry, Upper Susa Valley, Torino, Piedmont, Italy; electron microprobe and Raman spectroscopic analyses; corresponds to $[K_{1.43}(NH_4)_{0.42}Na_{0.02}Tl_{0.01}]_{\Sigma=1.88}(As_{5.82}Sb_{2.18})_{\Sigma=8.00}S_{13.22}\cdot 1.2H_2O$.

Occurrence: In an evaporite deposit probably formed by highly alkaline, low-temperature hydrothermal fluids.

Association: Sulfur, orpiment, gypsum.

Distribution: From the Cumbë Sûrdë quarry, Signols, Oulx, Upper Susa Valley, Torino, Piedmont, Italy.

Name: Honors Pierluigi *Ambrino* (b. 1947), the mineral collector who provided the specimens.

Type Material: Natural History Museum, University of Pisa (19500) and the Natural Science Museum, Turin (M/15824), Italy.

References: (1) Biagioni, C., E. Bonaccorsi, M. Pasero, Y. Moëlo, M.E. Ciriotti, D. Bersani, A.M. Callegari, and M. Boiocchi (2011) Ambrinoite, $(K,NH_4)_2(As,Sb)_8S_{13}\cdot H_2O$, a new mineral from Upper Susa Valley, Piedmont, Italy: The first natural (K,NH_4)-hydrated sulfosalt. Amer. Mineral., 96, 878-887.