Tillmannsite $HgAg_3(VO_4)$

Crystal Data: Tetragonal. *Point Group*: $\bar{4}$. Pseudo-octahedral crystals to 50 μm show {111}, {110}, {100}, {101}, and minor {001}. *Twinning*: Contact twins on (100).

Physical Properties: *Cleavage*: None. *Fracture*: Conchoidal. *Tenacity*: Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 7.769

Optical Properties: Translucent. *Color*: Red to brownish red. *Streak*: Brownish red. *Luster*: Adamantine.
Optical Class: Uniaxial (+). ω(calc.) = ~2.3 ε(calc.) = ~2.5 *Pleochroism*: Intense, *E* = red-orange, *O* = orange-brown. *Absorption*: *E* > *O*.

Cell Data: *Space Group*: $I\bar{4}$. a = 7.731(2) c = 4.647(2) Z = 2

X-ray Powder Pattern: Roua copper deposit, Var Valley, Alpes-Maritimes department, France. 2.772 (100), 2.324 (30), 5.45 (25), 2.54 (20), 1.740 (15), 1.683 (15), 2.735 (10)

Chemistry:

	(1)	(2)
Ag	49.82	50.07
Hg	30.40	31.04
V	5.32	5.51
As	4.23	3.48
O	9.90	9.90
Total	99.67	100.00

(1) Roua copper deposit, Var Valley, Alpes-Maritimes department, France; average of 14 electron microprobe analyses; corresponding to $Hg_{0.99}Ag_{3.01}(V_{0.68}As_{0.36})_{\Sigma=1.04}O_{4.03}$. (2) $HgAg_3(V_{0.7}As_{0.3})O_4$.

Occurrence: Supergene product in the oxidized zone of a copper deposit hosted in dolomite, calcite, and aragonite.

Association: Pecoraite, vésigniéite, olivenite, kolfanite, janggunite, chlorargyrite, cuprite, native copper, native silver, domeykite, djurleite, algodonite.

Distribution: At the Roua copper deposit, Var Valley (the Daluis gorge), northwest Alpes-Maritimes department, France.

Name: Honors Ekkhart *Tillmanns* (b. 1941) of the Institute of Mineralogy and Crystallography, Vienna, Austria.

Type Material: Natural History Museum of Geneva, Switzerland (478.006).

References: (1) Sarp. H., D.Yu. Pushcharovsky, E.J. MacLean, S.J. Teat, and N.V. Zubkova (2003) Tillmannsite, $(Ag_3Hg)(V,As)O_4$, a new mineral: its description and crystal structure. Eur. J. Mineral., 15, 177-180. (2) (2003) Amer. Mineral., 88, 1839 (abs. ref. 1).