

Crystal Data: Tetragonal. *Point Group:* $\bar{4}$. Pseudo-octahedral crystals to 50 μm show {111}, {110}, {100}, {101}, and minor {001}. *Twining:* 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 (+). $\omega(\text{calc.}) = \sim 2.3$ $\varepsilon(\text{calc.}) = \sim 2.5$ *Pleochroism:* Intense, $E = \text{red-orange}$, $O = \text{orange-brown}$. *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 $\text{Hg}_{0.99}\text{Ag}_{3.01}(\text{V}_{0.68}\text{As}_{0.36})_{\Sigma=1.04}\text{O}_{4.03}$. (2) $\text{HgAg}_3(\text{V}_{0.7}\text{As}_{0.3})\text{O}_4$.

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

Association: Pecoraite, vésigniéite, olivenite, kolfanite, janggunitite, 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.

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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, $(\text{Ag}_3\text{Hg})(\text{V},\text{As})\text{O}_4$, a new mineral: its description and crystal structure. *Eur. J. Mineral.*, 15, 177-180. (2) (2003) *Amer. Mineral.*, 88, 1839 (abs. ref. 1).