

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As millimetric aggregates of acicular crystals, or as prismatic crystals elongated along [001] to 400 μm .

Physical Properties: *Cleavage:* Perfect on {010}. *Tenacity:* Brittle (prismatic) to flexible (acicular). *Fracture:* n.d. Hardness = n.d. $D(\text{meas.}) = 3.10$ $D(\text{calc.}) = 3.15$

Optical Properties: Transparent. *Color:* Honey yellow-brown and brown (prismatic crystals) to pale straw-yellow (acicular aggregates). *Streak:* Nearly white. *Luster:* Vitreous to silky (acicular aggregates).

Optical Class: Biaxial (+). $\alpha = 1.684(2)$ $\beta(\text{calc.}) = 1.691$ $\gamma = 1.700(3)$ $2V(\text{meas.}) = 85(2)^\circ$
Pleochroism: $X = \text{yellow-brown}$, $Y = \text{n.d.}$, $Z = \text{yellow-pinkish}$. Negative elongation.

Cell Data: *Space Group:* $Ccca$. $a = 13.830(2)$ $b = 20.681(3)$ $c = 5.188(1)$ $Z = 8$

X-ray Powder Pattern: Molinello mine, Liguria, Italy.

5.746 (100), 2.641 (26), 3.075 (22), 5.150 (18), 3.460 (15), 4.720 (14), 2.872 (8)

Chemistry:	(1)	(2)
K ₂ O	0.98	
MnO	18.10	20.09
MgO	1.02	
FeO	0.30	
V ₂ O ₃	20.94	21.23
Al ₂ O ₃	14.53	14.44
SiO ₂	33.61	34.03
H ₂ O	[10.52]	10.21
Total	100.00	100.00

(1) Molinello mine, Liguria, Italy; average electron microprobe analysis, H₂O by difference; corresponds to $\text{K}_{0.07}(\text{Mn}_{0.90}\text{Mg}_{0.09}\text{Fe}_{0.01})(\text{V}^{3+}_{0.98}\text{Al}_{1.00})(\text{Si}_{1.97}\text{O}_6)(\text{O}_4\text{H}_{4.11})$. (2) $\text{MnVAl}[\text{Si}_2\text{O}_6](\text{OH})_4$.

Polymorphism & Series: Solid solution with carpholite.

Mineral Group: Carpholite group.

Occurrence: Remobilized components were concentrated in veins and open fissures in silicified wood during metamorphism of Mn-ore bearing cherts.

Association: Volborthite, quartz.

Distribution: In the Molinello mine, Liguria, Italy.

Name: Prefix, *vanadio*, identifies essential vanadium in the composition of a phase of the *carpholite* group.

Type Material: Dipartimento per lo Studio del Territorio e delle sue Risorse, University of Genoa, Italy.

References: (1) Basso, R., R. Cabella, G. Lucchetti, A. Martinelli, and A. Palenzona (2005) Vanadiocarpholite, $\text{Mn}^{2+}\text{V}^{3+}\text{Al}[\text{Si}_2\text{O}_6](\text{OH})_4$, a new mineral from Molinello mine, northern Apennines, Italy. *Eur. J. Mineral.*, 3, 501-507.