

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As needle-like, steep bipyramidal crystals, elongated along [100] and truncated by {100}, to 60 μm.

Physical Properties: *Cleavage:* None. *Fracture:* n.d. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = 3.08(2) D(calc.) = 3.116

Optical Properties: Transparent to translucent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (+). $\alpha = 1.379(4)$ $\beta = 1.384(4)$ $\gamma = 1.390(4)$ $2V(\text{meas.}) = 83(2)^\circ$ $2V(\text{calc.}) = 85.1^\circ$

Cell Data: Space Group: *Pnma*. $a = 7.665(2)$ $b = 6.993(1)$ $c = 9.566(2)$ $Z = 4$

X-ray Powder Pattern: “Cotunnite pit”, eastern rim of Vesuvius, Naples, Italy. 3.499 (100), 3.563 (85), 2.899 (55), 2.255 (52), 3.840 (45), 2.173 (36), 2.750 (30)

Chemistry:	(1)	(2)
Ca	33.41	33.38
Mg	0.26	
Al	10.97	11.24
F	54.67	55.38
Total	99.31	100.00

(1) “Cotunnite pit”, eastern rim of the crater of Vesuvius, Naples, Italy; average of 10 EDS analyses; corresponds to Ca_{2.02}Mg_{0.03}Al_{0.99}F_{6.97}. (2) Ca₂AlF₇.

Occurrence: As a high-temperature encrustation formed by the extraction of aluminum and calcium from the underlying rocks by HF activity around a volcanic fumarole.

Association: Gearsksutite, usovite, creedite, opal.

Distribution: At the “cotunnite pit”, eastern rim of the crater of Vesuvius, Naples, Italy.

Name: Honors Dr. Massimo Sbacchi (b. 1958), biologist and mineral collector, for his long-time field collaboration and continuous supply of interesting material for study.

Type Material: Reference collection, Department of Chemistry, University of Milan (2017-01) and the Museum of the Vesuvius Observatory, Naples (2018-01), Italy.

References: (1) Campostrini, I., F. Demartin, and M. Russo (2019) Sbacchiite, Ca₂AlF₇, a new fumarolic mineral from the Vesuvius volcano, Napoli, Italy. *Eur. J. Mineral.*, 31(1), 153-158. (2) (2020) *Amer. Mineral.*, 105(10), 1604 (abs. ref. 1).