Sbacchiite Ca_2AlF_7

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 (+). α = 1.379(4) β = 1.384(4) γ = 1.390(4) 2V(meas.) = 83(2)° 2V(calc.) = 85.1°

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) Ca_2AlF_7.

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: Gearksutite, 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, Ca_2AlF_7, 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).