

Crystal Data: Hexagonal. *Point Group:* $\bar{3}$. As stout prismatic crystals terminated by rhombohedral faces, to 0.1 mm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle.
Hardness = n.d. D(meas.) = 2.08 D(calc.) = 2.075

Optical Properties: Transparent. *Color:* Colorless. *Streak:* White. *Luster:* Vitreous.
Optical Class: n.d. $n = 1.49(1)$

Cell Data: *Space Group:* $R\bar{3}$. $a = 22.010(2)$ $c = 9.238(1)$ $Z = 3$

X-ray Powder Pattern: La Fossa crater, Vulcano, Aeolian Islands, Sicily, Italy.
4.15 (100), 3.87 (70), 11.00 (50), 4.58 (25), 2.770 (20), 2.166 (20), 2.345 (17)

Chemistry:	(1)
MgO	1.4
Al ₂ O ₃	19.5
SO ₃	34.7
F	5.7
H ₂ O	40.85
<u>-O=F</u>	<u>2.4</u>
Total	99.75

(1) La Fossa crater, Vulcano, Aeolian Islands, Sicily, Italy; average of 6 electron microprobe analyses, H₂O from structural analysis; corresponding to Mg_{0.56}Al_{6.19}S_{7.01}H_{73.37}F_{4.85}O_{65.15}.

Occurrence: A rare phase formed at approximately 350°C by vapor alteration of volcanic breccia in a strongly acidic, fluorine-rich environment.

Association: Thermessaite, vlodavetsite, sassolite, salammoniac.

Distribution: From the rim of the La Fossa crater, Vulcano, Aeolian Islands, Sicily, Italy.

Name: Honors Alfonso Cossa (1833–1902), an Italian chemist and mineralogist.

Type Material: Reference Collection of the Dipartimento di Chimica Strutturale e Stereochimica Inorganica, Università degli Studi, Milan, Italy; 2009-1.

References: (1) Demartin, F., C.M. Gramaccioli, I. Campostrini, and C. Castellano (2011) Cossaite, (Mg_{0.5}, □)Al₆(SO₄)₆(HSO₄)F₆·36H₂O, a new mineral from La Fossa crater, Vulcano, Aeolian Islands, Italy. *Mineral. Mag.*, 75(6), 2847-2855. (2) (2013) *Amer. Mineral.*, 98, 1078-1079 (abs. ref. 1).