

**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)

<b>Chemistry:</b>	(1)
MgO	1.4
Al <sub>2</sub> O <sub>3</sub>	19.5
SO <sub>3</sub>	34.7
F	5.7
H <sub>2</sub> 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, H<sub>2</sub>O from structural analysis; corresponding to Mg<sub>0.56</sub>Al<sub>6.19</sub>S<sub>7.01</sub>H<sub>73.37</sub>F<sub>4.85</sub>O<sub>65.15</sub>.

**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<sub>0.5</sub>, □)Al<sub>6</sub>(SO<sub>4</sub>)<sub>6</sub>(HSO<sub>4</sub>)F<sub>6</sub>·36H<sub>2</sub>O, 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).