Therasiaite $(NH_4)_3KNa_2Fe^{2+}Fe^{3+}(SO_4)_3Cl_5$

Crystal Data: Monoclinic. *Point Group*: *m*. Displaying forms {012},{210},{101},{$\bar{1}$ 01} and {010}, crystals are well-formed equant to short prismatic, to 0.1 mm.

Physical Properties: *Cleavage*: None. *Fracture*: n.d. *Tenacity*: n.d. Hardness = 1.5-2 D(meas.) = 2.41(1) D(calc.) = 2.397

Optical Properties: Translucent. *Color*: Brown to dark brown. *Streak*: Brown. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α =1.585(3) β = 1.615(3) γ = 1.630(3)

Cell Data: *Space Group*: *Cc*. a = 18.284(4) b = 12.073(2) c = 9.535(2) Z = 4

X-ray Powder Pattern: La Fossa crater, Vulcano, Aeolian Islands, Sicily, Italy.
2.812 (100), 2.664 (77), 3.297 (28), 3.208 (14), 3.008 (12), 2.942 (11), 7.36 (8)

Chemistry:

	(1)	(2)
$(NH_4)_2O$	[9.64]	10.91
K_2O	8.61	6.58
Na_2O	8.72	8.65
FeO	[8.75]	10.03
Fe_2O_3	[9.72]	11.15
MnO	1.21	
Al_2O_3	0.87	
SO_3	32.93	33.53
Cl	24.70	24.74
–O=Cl	5.58	5.59
Total	99.57	100.00

(1) La Fossa crater, Vulcano, Sicily, Italy; average of 12 electron microprobe analyses, $(NH_4)_2O$ calculated from stoichiometry and confirmed by IR spectroscopy, Fe^{2+}/Fe^{3+} calculated from structure analysis; corresponding to $(NH_4)_{2.68}K_{1.32}Na_{2.04}Fe_{1.76}Al_{0.12}Mn_{0.12}S_{2.98}O_{11.95}Cl_{5.05}$.
(2) $(NH_4)_3KNa_2Fe^{2+}Fe^{3+}(SO_4)_3Cl_5$.

Occurrence: A sublimate on pyroclastic breccia in a medium temperature (~250ºC) intracrater active volcanic fumarole.

Association: Salammoniac, kremersite, adranosite.

Distribution: (Fumarole FA) at La Fossa crater, Vulcano, Aeolian Islands, Sicily, Italy.

Name: For the type locality, *Therasia*, one of the ancient names for Vulcano island (from the Greek for "warm earth").

Type Material: In the Reference Collection, Department of Chemistry, University of Milan, Italy (specimen number 2013-01).

References: (1) Demartin, F., C. Castellano, and I. Campostrini (2014) Therasiaite, $(NH_4)_3KNa_2Fe^{2+}Fe^{3+}(SO_4)_3Cl_5$, a new sulfate chloride from La Fossa Crater, Vulcano, Aeolian islands, Italy. Mineral. Mag., 78(1), 203-213. (2) (2014) Amer. Mineral., 99, 1811 (abs. ref. 1).