Eldfellite $NaFe(SO_4)_2$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Crystals, platy on {001}, to 0.02 mm; as rosettes.

Physical Properties: *Cleavage*: Perfect on {001, inferred from structure analysis. *Fracture*: n.d. *Tenacity*: n.d. Hardness = Soft. D(meas.) = n.d. D(calc.) = 3.062

Optical Properties: Transparent to translucent. *Color*: Yellowish-green to greenish-white. *Streak*: White. *Luster*: Vitreous.
Optical Class: n.d.

Cell Data: *Space Group*: *C2/m*. a = 8.043(4) b = 5.139(2) c = 7.115(4) β = 92.13(2)° Z = 2

X-ray Powder Pattern: Eldfell volcano, Heimaey Island, Iceland.
2.77 (100), 3.72 (80), 2.72 (60), 2.370 (60), 3.64 (50), 3.43 (50), 2.57 (30)

Chemistry:

	(1)	(2)
P_2O_5	1.79	
SO_3	62.37	59.09
TiO_2	0.50	
Fe_2O_3	25.36	29.47
Al_2O_3	0.69	
MnO	0.22	
MgO	1.24	
Na_2O	9.20	11.44
K_2O	0.24	
Total	101.60	100.00

(1) Eldfell volcano, Heimaey Island, Iceland; average of 4 EDS analyses, corresponding to $(Na_{0.77}K_{0.01})_{\Sigma=0.78}(Fe_{0.82}Mg_{0.08}Al_{0.03}Mn_{0.01}Ti_{0.02})_{\Sigma=0.96}(S_{2.01}P_{0.07})_{\Sigma=2.08}O_{8.00}$. (2) $NaFe(SO_4)_2$.

Occurrence: As a near surface fumarolic encrustation.

Association: Tamarugite, ralstonite, anhydrite, gypsum, bassanite, hematite, opal, cryptohalite, chessexite, unnamed $Na_3Fe(SO_4)_3$ phase.

Distribution: Eldfell volcano, Heimaey Island, Iceland.

Name: For the first locality, the Eldfell volcano, Iceland.

Type Material: Icelandic Institute of Natural History, Reykjavík, Iceland, (NI 13556).

References: (1) Balić-Žunić, T., A. Garavelli, P. Acquafredda, E. Leonardsen, and S.P. Jakobsson (2009) Eldfellite, $NaFe(SO_4)_2$, a new fumarolic mineral from Eldfell volcano, Iceland. Mineral. Mag., 73, 51–57. (2) (2010) Amer. Mineral., 95, 204-205 (abs. ref. 1).