Leonardsenite $MgAlF_5(H_2O)_2$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As earthy crusts of flattened prismatic crystals dominated by {011} and {101}, to 20 μm.

Physical Properties: *Cleavage*: n.d. *Fracture*: n.d. *Tenacity*: n.d. Hardness = n.d.
D(meas.) = n.d. D(calc.) = 2.31

Optical Properties: Translucent. *Color*: White. *Streak*: White. *Luster*: Earthy (aggregates).
Optical Class: n.d. n = 1.38 [calculated]
R_1-R_2: (470) 15.3-16.8, (546) 14.1-15.9, (589) 13.8-15.3, (650) 13.4-14.8

Cell Data: *Space Group*: *Imma*. *a* = 7.055(1) *b* = 10.117(2) *c* = 6.813(1) Z = 4

X-ray Powder Pattern: Eldfell volcano, Heimaey island, Iceland.
5.66 (100), 3.00 (38), 3.03 (31), 4.92 (29), 3.53 (27), 1.76 (24), 1.77 (19)

Chemistry:

	(1)	(2)
Mg	14.66	13.33
Al	16.16	14.80
F	52.98	52.11
O	[15.88]	17.55
H	[1.78]	2.22
Total	101.46	100.00

(1) Eldfell volcano, Iceland; average of 6 electron microprobe analyses, O calculated from the OH^- required for charge neutrality plus remaining O as H_2O; corresponding to $Mg_{1.00}Al_{1.00}[F_{4.64}(OH)_{0.36}]_{\Sigma=5.00}(H_2O)_{1.29}$. (2) $MgAlF_5(H_2O)_2$.

Occurrence: A sublimated encrustations from fluorine-rich fumarolic gas.

Association: Jakobssonite, anhydrite, ralstonite, jarosite, anhydrous AlF_3, opal-A, oskarssonite (Heimaey); ralstonite, opal-A, jakobssonite, malladrite, fluorite (Heckla).

Distribution: From the northeast rim of the main crater, Eldfell volcano, Heimaey island, and from Heckla volcano, Iceland.

Name: Honors Erik Leonardsen (b. 1934), the former leader of the X-ray Diffraction Laboratory of the Geological Institute, University of Copenhagen, Denmark, for his work on the characterization of the fumarolic minerals from Icelandic volcanoes by X-ray diffraction.

Type Material: Mineral collection, Icelandic Institute of Natural History, Gardabaer, Iceland (NI 12256) and in the "C.L. Garavelli" Museum, Dipartimento di Scienze della Terra e Geoambientali, Università di Bari, Italy (14/nm-V28).

References: (1) Mitolo, D., A. Garavelli, T. Balić-Žunić, P. Acquafredda, and S.P. Jakobsson (2013) Leonardsenite, $MgAlF_5(H_2O)_2$, a new mineral species from Eldfell volcano, Heimaey island, Iceland. Can. Mineral., 51(3), 377-386. (2) (2015) Amer. Mineral., 100, 661 (abs. ref. 1).