Currierite $Na_4Ca_3MgAl_4(AsO_3OH)_{12}\cdot 9H_2O$

Crystal Data: Hexagonal. *Point Group*: 622. As divergent sprays of hexagonal prisms, needles and hair-like fibers to ~200 μm. Crystals display {100} and {001}.

Physical Properties: *Cleavage*: Parallel [001], good. *Tenacity*: Brittle, elastic as thin fibers. *Fracture*: Irregular. Hardness = ~ 2 D(meas.) = 3.08(1) D(calc.) = 3.005 Soluble in dilute HCl.

Optical Properties: Transparent. *Color*: Colorless to white. *Streak*: White. *Luster*: Vitreous to silky.
Optical Class: Uniaxial (-). ω = 1.614(1) ε = 1.613(1)

Cell Data: *Space Group*: *P*622. a = 12.2057(9) c = 9.2052(7) Z = 1

X-ray Powder Pattern: Torrecillas mine, Salar Grande, Iquique Province, Tarapacá Region, Chile. 10.63 (100), 3.021 (96), 4.002 (35), 3.474 (29), 1.5227 (29), 4.61 (24), 6.12 (20)

Chemistry:	(1)	(2)
K_2O	0.17	
Na_2O	5.65	5.67
MgO	2.39	1.84
CaO	7.10	7.70
CoO	0.09	
CuO	0.47	
Fe_2O_3	6.95	
Al_2O_3	6.97	9.33
Sb_2O_5	2.42	
As_2O_5	62.03	63.10
Cl	0.07	
H_2O	[12.82]	12.36
-O=Cl	0.02	
Total	102.48	100.00

(1) Torrecillas mine, Salar Grande, Iquique Province, Tarapacá Region, Chile; average of 5 electron microprobe analyses, H_2O calculated; corresponds to $(Na_{3.95}Al_{2.96}Ca_{2.74}Mg_{1.28}Fe^{3+}_{0.63}Cu_{0.13}K_{0.08}Co_{0.03})_{\Sigma=11.80}(As^{5+}_{11.68}Sb^{5+}_{0.32})_{\Sigma=12}(O_{56.96}Cl_{0.04})_{\Sigma=57}H_{30.81}$. (2) $Na_4Ca_3MgAl_4(AsO_3OH)_{12}\cdot 9H_2O$.

Occurrence: A secondary alteration phase from the oxidation of native arsenic and other As-bearing primary phases, followed by later alteration by saline fluids derived from evaporating meteoric water under hyperarid conditions.

Association: Anhydrite, canutite, chudobaite, halite, lavendulan, magnesiokoritnigite, quartz, scorodite, torrecillasite.

Distribution: From the Torrecillas mine, Salar Grande, northern Atacama Desert, Iquique Province, Tarapacá Region, Chile.

Name: Honors Rock Henry Currier (1940-2015), American mineral dealer, collector, author and lecturer for his unrelenting efforts to benefit the greater mineralogical community.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (66266, 64057 and 64080).

References: (1) Kampf, A.R., S.J. Mills, B.P. Nash, M. Dini, and A.A. Molina Donoso (2017) Currierite, $Na_4Ca_3MgAl_4(AsO_3OH)_{12}\cdot 9H_2O$, a new acid arsenate with ferrinatrite-like heteropolyhedral chains from the Torrecillas mine, Iquique Province, Chile. Mineral. Mag., 81(5), 1141-1149. (2) (2018) Amer. Mineral., 103, 658 (abs. ref. 1).