Magnesiofluckite $CaMg[AsO_3(OH)]_2(H_2O)_2$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As tablets and blades to ~1 mm, often grouped in tightly intergrown aggregates. Crystals are flattened on {010}, slightly elongate along [001], and exhibit {100}, {010}, {001}, {1$\bar{1}$ 0}, {101} and {10$\bar{1}$ }.

Physical Properties: *Cleavage*: Good on {100}, perfect on {010}. *Tenacity*: Brittle. Hardness = 2.5 *Fracture*: Irregular, stepped. D(meas.) = 2.93(2) D(calc.) = 2.950 Easily soluble in dilute HCl.

Optical Properties: Transparent. *Color*: Colorless. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (+). α = 1.588(2) β = 1.599(2) γ = 1.622(2) 2V(meas.) = 70(2)° 2V(calc.) = 70.2° *Orientation*: $X \wedge c$ = 35°, $Y \wedge a$ = 16°, $Z \wedge b$ = 18°. *Dispersion*: Slight, $r > v$. Nonpleochroic.

Cell Data: *Space Group*: $P\bar{1}$. a = 8.4143(6) b = 7.5321(5) c = 6.8917(4) α = 82.477(6)° β = 97.682(6)° γ = 95.379(6)° Z = 2

X-Ray Diffraction Pattern: Torrecillas mine, Iquique Province, Tarapacá Region, Chile. 3.511 (100), 3.248 (81), 7.46 (78), 2.679 (75), 2.953 (62), 2.796 (51), 4.191 (45)

Chemistry:

	(1)
Na_2O	0.12
CaO	14.53
MgO	10.59
As_2O_5	60.32
H_2O	[14.20]
Total	99.76

(1) Torrecillas mine, Iquique Province, Tarapacá Region, Chile; average electron microprobe analysis supplemented by Raman spectroscopy, H_2O calculated from structure; corresponds to $(Ca_{0.99}Na_{0.01})_{\Sigma=1.00}Mg_{1.00}[AsO_3(OH)]_2(H_2O)_2$.

Occurance: A low-temperature secondary phase on massive quartz-hematite veins and formed under hyperarid conditions from the oxidation of native arsenic, and possibly other As-bearing primary phases by reaction with fluids (derived from fog) rich in dissolved Na, Ca, and Mg.

Association: Camanchacaite, anhydrite, gypsum, halite, talmessite.

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

Name: The prefix indicates the magneium analogue of *fluckite*.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (67257).

References: (1) Kampf, A.R., B.P. Nash, A.J. Celestian, M. Dini, and A.A. Molina Donoso (2019) Camanchacaite, chinchorroite, espadaite, magnesiofluckite, picaite and ríosecoite: six new hydrogen-arsenate minerals from the Torrecillas mine, Iquique Province, Chile. Mineral. Mag., 83, 655-671.