Camaronesite $[Fe^{3+}(H_2O)_2(PO_3OH)]_2(SO_4)\cdot 1\text{-}2H_2O$

Crystal Data: Hexagonal. *Point Group*: 32. As tabular crystals flattened on {0001} and exhibiting {0001}, {10$\bar{1}$ 4}, {01$\bar{1}$ 5}, and {01$\bar{1}$ 8}, in dense aggregates to several mm.

Physical Properties: *Cleavage*: Perfect on {0001}. *Fracture*: Irregular, conchoidal and stepped. *Tenacity*: Brittle. Hardness = 2.5 D(meas.) = 2.43(1) D(calc.) = 2.383

Optical Properties: Transparent. *Color*: Lavender, pink. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (+). ω = 1.612 ε = 1.621 *Pleochroism*: *O* = pale lavender, *E* = colorless. Absorption: *O* > *E*.

Cell Data: *Space Group*: *R*32. *a* = 9.0833(5) *c* = 42.944(3) Z = 9

X-ray Powder Pattern: Camarones Valley, Arica Province, Chile.
7.415 (100), 3.298 (93), 4.545 (72), 7.74 (45), 3.862 (32), 4.426 (26), 3.179 (25)

Chemistry:	(1)	(2)	(3)
Fe_2O_3	31.84	32.60	31.45
P_2O_5	29.22	28.98	27.95
SO_3	15.74	16.35	15.77
H_2O	23.94	22.07	24.83
Total	100.74	100.00	100.00

(1) Camarones Valley, Arica Province, Chile; average of 10 electron microprobe analyses, H_2O by EMP and structural analysis, OH, SO_4, PO_4 and H_2O confirmed by Raman spectroscopy; corresponding to $Fe_{1.94}(PO_3OH)_2(S_{0.96}O_4)(H_2O)_4\cdot 1.46\ H_2O$.
(2) $Fe_{1.94}(PO_3OH)_2(S_{0.96}O_4)(H_2O)_4\cdot 1.00\ H_2O$. (3) $Fe_{1.94}(PO_3OH)_2(S_{0.96}O_4)(H_2O)_4\cdot 2.00\ H_2O$.

Occurrence: A secondary mineral in boulders from a weathered copper sulfide deposit exposed in an arid region.

Association: Anhydrite, botryogen, chalcanthite, copiapite, halotrichite, hexahydrite, römerite, rozenite, szomolnokite.

Distribution: On the valley floor 9 km NE of the village of Cuya, Camarones Valley, Arica Province, Chile.

Name: For the valley from which the first samples were collected.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (64023-64027).

References: (1) Kampf, A.R., S.J. Mills, B.P. Nash, R.M. Housley, G.R. Rossman, and M. Dini (2013) Camaronesite $[Fe^{3+}(H_2O)_2(PO_3OH)]_2(SO_4)\cdot 1\text{-}2H_2O$, a new phosphate-sulfate from the Camarones Valley, Chile, structurally related to taranakite. Mineral. Mag., 77(4), 453-465.
(2) (2015) Amer. Mineral., 100, 2005 (abs. ref. 1).