Petersite-(La) $Cu_6La(PO_4)_3(OH)_6 \cdot 3H_2O$

Crystal Data: Hexagonal. *Point Group*: 6/*m*. As radial aggregates of acicular to hexagonal columnar crystals elongated along [001] to 200 μm.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = ~3 D(meas.) = n.d. D(calc.) = 3.33 Nonfluorescent.

Optical Properties: [Translucent.] *Color*: Yellowish green. *Streak*: n.d. *Luster*: [Vitreous.] *Optical Class*: Uniaxial (+). ω = 1.680(3) ε = 1.767(3) *Pleochroism*: Light green to yellowish green.

Cell Data: *Space Group*: $P6_3/m$. a = 13.367(2) c = 5.872(2) Z = 2

X-Ray Diffraction Pattern: Ohgurusu, Kiwa-cho, Kumano City, Mie Prefecture, Japan. 11.578 (100), 4.377 (28), 2.438 (25), 3.509 (18), 2.898 (14), 2.526 (11), 3.211 (10)

Chemistry:

	(1)	(2)
CuO	50.35	49.65
FeO	0.08	
CaO	0.09	
Y_2O_3	0.33	
La_2O_3	2.68	16.95
Ce_2O_3	2.22	
Nd_2O_3	2.18	
Sm_2O_3	0.42	
P_2O_5	14.92	22.15
As_2O_5	10.21	
SiO_2	2.08	
H_2O	[13.70]	11.25
Total	102.24	100.00

(1) Ohgurusu, Kiwa-cho, Kumano City, Mie Prefecture, Japan; average electron microprobe analysis, H_2O calculated; corresponds to $(Cu_{5.692}Fe_{0.010})_{\Sigma=5.702}[(La_{0.148}Ce_{0.122}Nd_{0.117}Y_{0.086}Sm_{0.022})_{\Sigma=0.495}Ca_{0.372}]_{\Sigma=0.866}(P_{1.890}As_{0.799}Si_{0.311})_{\Sigma=3}O_{10.320}(OH)_{7.680} \cdot 3H_2O$. (2) $Cu_6La(PO_4)_3(OH)_6 \cdot 3H_2O$.

Mineral Group: Mixite group.

Occurrence: A secondary phase derived by weathering copper sulfides. In small cavities coated by chrysocolla in quartz veins.

Association: Pseudomalachite, malachite.

Distribution: From Ohgurusu, Kiwa-cho, Kumano City, Mie Prefecture, Japan.

Name: La-dominant analogue of petersite-(Y) and petersite-(Ce).

Type Material: National Museum of Nature and Science, Japan (NSM-M45621).

References: (1) Nishio-Hamane, D., M. Ohnishi, N. Shimobayashi, K. Momma, R. Miyawaki, and S. Inaba (2020) Petersite-(La), a new mixite-group mineral from Ohgurusu, Kiwa, Kumano City, Mie Prefecture, Japan. Journal of Mineralogical and Petrological Sciences, 115, 286-295.