Paratacamite-(Mg) $Cu_3(Mg,Cu)Cl_2(OH)_6$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}$ As pseudo-octahedral crystals exhibiting a $\{20\bar{2}\ 1\}$ rhombohedron and {0001} to 0.3 mm; twinned crystals are prismatic elongated on [212].

Twinning: Common by reflection on $\{10\bar{1}\ \bar{1}\}$.

Physical Properties: *Cleavage*: Perfect on {201}. *Fracture*: Conchoidal. *Tenacity*: Brittle. Hardness = 3-3.5 D(meas.) = 3.50(2) D(calc.) = 3.551 Easily soluble in dilute HCl.

Optical Properties: Transparent. *Color*: Medium to dark green. *Streak*: Light green. *Luster*: Vitreous.
Optical Class: Uniaxial (-). ε = 1.785(5) ω > 1.8 *Pleochroism*: Slight, *O* = bluish green, *E* = green. *Absorption*: *O* > *E*.

Cell Data: *Space Group*: $R\bar{3}$. a = 13.689(1) c = 14.025(1) Z = 12

X-ray Powder Pattern: Cuya, Camarones Valley, Arica Province, Chile.
2.762 (100), 5.469 (87), 2.265 (81), 2.904 (34), 1.710 (34), 4.686 (26), 1.819 (26)

Chemistry:	(1)
CuO	69.34
NiO	0.10
MnO	0.17
MgO	6.29
CoO	0.08
Cl	15.47
H_2O	[13.52]
$-O = Cl_2$	3.50
Total	101.47

(1) Cuya, Camarones Valley, Arica Province, Chile; average of 22 electron microprobe analyses, H_2O from stoichiometry; corresponding to $Cu_{3.00}(Mg_{0.62}Cu_{0.49}Mn_{0.01}Ni_{0.01})_{\Sigma=1.13}Cl_{1.74}(OH)_6$.

Occurrence: A secondary mineral in near-surface, low-temperature, oxidation zones under increasingly arid conditions.

Association: Anhydrite, atacamite, chalcopyrite, copiapite, dolomite, epsomite, haydeeite, hematite, magnesite, quartz.

Distribution: From a deposit 5 km NE of the village of Cuya, Camarones Valley, Arica Province, Chile.

Name: As the magnesium analogue of *paratacamite*.

Type Material: Natural History Museum of Los Angeles County, California, USA (64041-64043).

References: (1) Kampf, A.R., M.J. Sciberras, P. Leverett, P.A. Williams, T. Malcherek, J. Schlüter, M.D. Welch, M. Dini, and A.A. Molina Donoso (2013) Paratacamite-(Mg), $Cu_3(Mg,Cu)Cl_2(OH)_6$; a new substituted basic copper chloride mineral from Camerones, Chile. Mineral. Mag., 77(8), 3113-3124. (2) (2015) Amer. Mineral., 100, 2357 (abs. ref. 1).