

Decrespignyite-(Y)**Y₄Cu(CO₃)₄Cl(OH)₅·2H₂O**

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Crystal Data: Monoclinic. *Point Group:* 2/m, 2, or m. Rarely as thin pseudo-hexagonal crystals, to 50 μm, commonly curved; in stellate rosettes and as massive crusts and coatings.

Physical Properties: Hardness = ~4 D(meas.) = 3.64(2) D(calc.) = [3.92]

Optical Properties: Transparent. *Color:* Deep Royal blue to turquoise-blue; very pale blue in transmitted light. *Streak:* Pale blue. *Luster:* Vitreous to pearly.

Optical Class: Biaxial (-). *Pleochroism:* Medium strong; X = very pale blue; Y = Z = greenish blue. *Absorption:* Z ≈ Y ≫ X. α = 1.604(4) β = ≈ 1.638 γ = 1.638(3) 2V(meas.) = Very small.

Cell Data: *Space Group:* P2/m, P2, or Pm. a = 8.899(6) b = 22.77(2) c = 8.589(6) β = 120.06(5)° Z = 4

X-ray Powder Pattern: Paratoo mine, Australia.

6.241 (100), 7.086 (50), 3.530 (40), 22.8 (30), 7.463 (30), 4.216 (30), 3.336 (30)

Chemistry:	(1)		(1)	
	CO ₂	19.8	Ho ₂ O ₃	2.6
	Y ₂ O ₃	42.2	Er ₂ O ₃	2.5
	La ₂ O ₃	0.3	CuO	10.9
	Pr ₂ O ₃	0.1	CaO	0.5
	Nd ₂ O ₃	1.3	Cl	3.0
	Sm ₂ O ₃	1.0	H ₂ O	10.8
	Gd ₂ O ₃	4.8	-O = Cl ₂	0.7
	Tb ₂ O ₃	0.4	<hr/>	
	Dy ₂ O ₃	3.7	Total	103.2

(1) Paratoo mine, Australia; by electron microprobe, average of seven analyses, CO₂ and H₂O by CHN analyzer, presence of CO₃²⁻ and H₂O confirmed by IR; corresponds to (Y_{3.32}Gd_{0.24}Dy_{0.18}Ho_{0.11}Er_{0.12}Ca_{0.08}Nd_{0.07}Sm_{0.05}Tb_{0.02}La_{0.02})_{Σ=4.22}Cu_{1.22}(CO₃)_{4.00}Cl_{0.75}(OH)_{6.27}·2.20H₂O.

Occurrence: A rare secondary mineral in the oxidized zone of a copper deposit, the source of rare-earths enigmatic, perhaps from surrounding sediments.

Association: Caysichite-(Y), donnayite-(Y), kamphaugite-(Y), malachite, nontronite, calcite, gypsum, "limonite".

Distribution: From the Paratoo copper mine, 30 km southwest of Yunta, Olary district, South Australia.

Name: Honors Robert James Champion de Crespigny (1950–), Chairman of Normandy Mining Limited and Chairman of the South Australian Museum, for his contributions to Australian education.

Type Material: South Australian Museum, Adelaide, Australia, G25453–G25455.

References: (1) Wallwork, K., U. Kolitsch, A. Pring, and L. Nasdala (2002) Decrespignyite-(Y), a new copper yttrium rare earth carbonate chloride hydrate from Paratoo, South Australia. *Mineral. Mag.*, 66, 181–188. (2) (2002) *Amer. Mineral.*, 87, 1731 (abs. ref. 1).