Barlowite $Cu_4FBr(OH)_6$

Crystal Data: Hexagonal. *Point Group*: 6/*m* 2/*m* 2/*m*. As platy hexagonal crystals to 0.5 mm; as aggregates to 3 mm.

Physical Properties: *Cleavage*: Perfect on {0001}. *Fracture*: Irregular. *Tenacity*: Brittle. Hardness = 2-2.5 D(meas.) = > 3.8 D(calc.) = 4.21 Soluble in dilute HCl.

Optical Properties: Transparent to translucent. *Color*: Blue. *Streak*: Sky-blue. *Luster*: Vitreous. *Optical Class*: Uniaxial (-). ω = 1.840(4)-1.845(4) ε = 1.833(4)-1.840(4)

Cell Data: *Space Group*: $P6_3/mmc$. a = 6.6786(2) c = 9.2744(3) Z = 2

X-ray Powder Pattern: Great Australia mine, northwest Queensland, Australia.
5.790 (100), 2.707 (55), 2.889 (40), 2.452 (40), 1.668 (30), 1.778 (20), 3.338 (15)

Chemistry:

	(1)
CuO	70.08
F	4.64
Cl	0.73
Br	16.79
H_2O	[11.59]
$-O = F_2$	1.95
$-O = Cl_2$	0.16
$-O = Br_2$	1.68
Total	100.04

(1) Great Australia mine, northwest Queensland, Australia; average of 20 electron microprobe analyses supplemented by IR spectroscopy, H_2O calculated for charge balance; corresponding to $Cu_{4.00}F_{1.11}Br_{0.95}Cl_{0.09}(OH)_{5.85}$.

Occurrence: A secondary mineral in the weathering zone of a copper deposit.

Association: Gerhardtite, brochantite, cuprite, quartz, goethite.

Distribution: From the Great Australia mine, 2 km south of Cloncurry, northwest Queensland, Australia.

Name: Honors William Barlow (1845-1934), the English amateur geologist and crystallographer who independently enumerated the 230 space groups and proposed several crystal structures in the 1880s that were later validated by X-ray crystallography.

Type Material: South Australian Museum, Adelaide, Australia (G17449).

References: (1) Elliott, P., M.A. Cooper and A. Pring (2015) Barlowite, $Cu_4FBr(OH)_6$, a new mineral isostructural with claringbullite: description and crystal structure. Mineral. Mag., 78(7), 1755-1762. (2) (2016) Amer. Mineral., 101, 1012-1013 (abs. ref. 1).