Ashburtonite $HPb_4Cu_4Si_4O_{12}(HCO_3)_4(OH)_4Cl$

Crystal Data: Tetragonal. *Point Group:* $4/m$. Prismatic along [001], to 0.4 mm, showing {110}, {100}, {001}, and {301}.

Physical Properties: *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = n.d. D(meas.) = > 4.07 D(calc.) = 4.69

Optical Properties: Transparent. *Color:* Blue. *Streak:* Light blue. *Luster:* Vitreous. *Optical Class:* Uniaxial (+). $\omega = 1.786(3)$ $\epsilon = 1.800(4)$

Cell Data: *Space Group:* $I4/m$. $a = 14.1852(8)$ $c = 6.0759(8)$ $Z = 2$

X-ray Powder Pattern: Anticline prospect, Western Australia.
10.2 (100), 4.495 (100), 3.333 (100), 3.013 (90), 5.644 (70), 2.611 (50), 2.805 (30)

Chemistry:

	(1)
SiO_2	14.07
CuO	18.66
PbO	52.17
Cl	2.28
H_2O	[4.22]
CO_2	[10.31]
$-O = Cl_2$	0.51
Total	[101.20]

(1) Anticline prospect, Western Australia; by electron microprobe, average of four analyses, OH and CO_2 confirmed present by infrared spectroscopy, H_2O and CO_2 calculated from stoichiometry; corresponds to $Pb_{3.99}Cu_{4.01}HSi_{4.00}O_{12.03}(HCO_3)_{4.00}(OH)_{4.00}Cl_{1.10}$.

Occurrence: In a weathered shear zone cutting shales and graywackes, as an alteration of galena and probably chalcopyrite.

Association: Diaboleite, duftite, beudantite, caledonite, plattnerite, cerussite, malachite, brochantite.

Distribution: From the Anticline prospect, 11 km west-southwest of Ashburton Downs homestead, Capricorn Range, Western Australia.

Name: For its occurrence near the Ashburton Downs pastoral lease and homestead, Western Australia.

Type Material: Canadian Museum of Nature, Ottawa, Canada, 58391; Museum Victoria, Melbourne, Australia, M40712.

References: (1) Grice, J.D., E.H. Nickel, and R.A. Gault (1991) Ashburtonite, a new bicarbonate-silicate mineral from Ashburton Downs, Western Australia: description and structure determination. Amer. Mineral., 76, 1701–1707.