Hylbrownite $Na_3MgP_3O_{10}\cdot 12H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m.* As sprays of thin prismatic to acicular crystals, to 0.12 mm, elongated along [001] and showing {010}, {100}, {001}, {210}, and {201}.

Physical Properties: *Cleavage*: Good parallel {001} and {100}. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = n.d. D(meas.) = 1.81(4) D(calc.) = 1.82

Optical Properties: Transparent. *Color*: Colorless to white. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α = 1.390(4) β = 1.421(4) γ = 1.446(4) 2V(calc.) = 82.2°

Cell Data: *Space Group*: $P2_1/n$. a = 14.722(3) b = 9.240(2) c = 15.052(3) β = 90.01(3)° Z = 4

X-ray Powder Pattern: Dome Rock mine, Olary Province, South Australia, Australia. 6.951 (100), 7.357 (80), 10.530 (60), 3.510 (45), 3.934 (40), 4.754 (35), 3.336 (35)

Chemistry:	(1)	(2)
Na_2O	16.08	16.53
MgO	7.08	7.17
CaO	0.43	
P_2O_5	37.60	37.86
H_2O	[38.45]	38.45
Total	99.64	100.00

(1) Dome Rock mine, Olary Province, South Australia, Australia; average of 9 electron microprobe analyses, presence of OH, PO_3 and H_2O confirmed by IR spectroscopy, H_2O from structure analysis; corresponding to $Na_{2.93}Mg_{0.99}Ca_{0.04}P_{2.99}O_{9.97}\cdot 12.03H_2O$. (2) $Na_3MgP_3O_{10}\cdot 12H_2O$.

Occurrence: A secondary mineral in the oxidized zone of a polymetallic sulfide deposit**.**

Association: Conichalcite, chrysocolla, cuprite, malachite, azurite, quartz, goethite.

Distribution: From the Dome Rock mine, Boolcoomatta Reserve, 42 km north of Mingary railway siding and ~470 km northeast of Adelaide, Olary Province, South Australia, Australia.

Name: Honors Henry Yorke Lyell Brown (1844-1928), Government Geologist of South Australia from 1882 to 1912, who authored the first geological map of the whole colony in 1899.

Type Material: South Australian Museum, Adelaide, South Australia, Australia (G33088).

References: (1) Elliott, P., J. Brugger, T. Caradoc-Davies, and A. Pring (2013) Hylbrownite, $Na_3MgP_3O_{10}\cdot 12H_2O$, a new triphosphate mineral from the Dome Rock Mine, South Australia: description and crystal structure. Mineral. Mag., 77(3), 385-398. (2) (2015) Amer. Mineral., 100, 2353-2354 (abs. ref. 1).