Burgessite $Co_2(H_2O)_4[AsO_3(OH)]_2(H_2O)$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. Crystals, prismatic, to 0.1 mm, forms {011} and {*hol*} observed; typically as rosettes, to 0.8 mm.

Physical Properties: *Cleavage*: Good on {010}; fair on {001}. *Fracture*: Hackly. *Tenacity*: Brittle. Hardness = ~ 3 D(meas.) = 2.93(2) D(calc.) = 2.94

Optical Properties: Transparent. *Color*: Purplish pink with a brown tint. *Streak*: Colorless to pale pink. *Luster*: Vitreous to adamantine.
Optical Class: Biaxial (+). $\alpha = 1.596(2)$ $\beta = 1.604(2)$ $\gamma = 1.628(2)$ 2V(meas.) = 70(2)°
2V(calc.) = 61° *Orientation*: X = *b*; Y ∧ *c* = 29° (in β obtuse); Z ∧ *a* = 20° (in β acute).

Cell Data: *Space Group*: $P2_1/n$. $a = 4.7058(12)$ $b = 9.299(3)$ $c = 12.738(4)$
$\beta = 98.933(8)°$ $Z = 2$

X-ray Powder Pattern: Keeley mine, Timiskaming District, Ontario, Canada.
7.446 (100), 6.267 (44), 2.998 (31), 3.725 (29), 3.260 (25), 2.596 (23), 2.970 (21)

Chemistry:

	(1)
As_2O_5	47.91
P_2O_5	0.03
CoO	27.31
NiO	3.52
ZnO	0.04
CaO	0.18
SO_3	0.13
H_2O	22.65
Total	101.77

(1) Keeley mine, South Lorraine Township, Timiskaming District, Ontario, Canada; average of 8 electron microprobe analyses, H_2O by difference, structure analysis and IR confirm OH and H_2O, corresponding to $(Co_{1.75}Ni_{0.23}Ca_{0.02})_{\Sigma=2.00}(AsO_3OH)_{\Sigma=2.00}(H_2O)_5$.

Occurrence: A secondary mineral along fractures in the weathering zone of a polymetallic sulfarsenate deposit.

Association: Skutterudite, cobaltite, bismuth, arsenolite, bismuthoferrite, erythrite.

Distribution: Keeley mine, South Lorraine Township, Timiskaming District, Ontario, Canada.

Name: For David Burgess (b. 1951), of Newington, Connecticut, USA, who brought the sample to the authors' attention.

Type Material: Canadian Museum of Nature, Ottawa, Ontario (CNMMC 86051).

References: (1) Sejkora, J., F.C. Hawthorne, M.A. Cooper, J.D. Grice, J. Vadak, and J.L. Jambor (2009) Burgessite, $Co_2(H_2O)_4[AsO_3(OH)]_2(H_2O)$, a new arsenate mineral species from the Keeley mine, South Lorrain Township, Ontario, Canada. Can. Mineral., 47, 159–164. (2) Cooper, M.A. and F.C. Hawthorne (2009) The crystal structure of burgessite, $Co_2(H_2O)_4[AsO_3(OH)]_2(H_2O)$, and its relation to erythrite. Can. Mineral., 47, 165–172. (3) (2009) Amer. Mineral., 94, 1495-1496 (abs. refs. 1 and 2).