Mundrabillaite $(NH_4)_2Ca(PO_3OH)_2 \cdot H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$, 2, or m. In aggregates of tiny crystals.

Physical Properties: *Tenacity:* Fragile [*sic*]. Hardness = Very soft. D(meas.) = n.d. D(calc.) = 2.09 Soluble in H_2O.

Optical Properties: Semitransparent. *Color:* Colorless. *Streak:* White. *Luster:* Dull. *Optical Class:* Biaxial (–). *Orientation:* Extinction angle +26(1)°. $\alpha = 1.522(2)$ $\beta = 1.544(2)$ $\gamma = 1.552(2)$ 2V(meas.) = n.d. 2V(calc.) = 61°

Cell Data: *Space Group:* $P2/m$, $P2$, or Pm. $a = 8.643$ $b = 8.184$ $c = 6.411$ $\beta = 98.0°$ Z = 2

X-ray Powder Pattern: Petrogale Cave, Australia.
4.279 (100), 3.106 (60), 8.60 (30), 3.687 (30), 2.873 (30), 2.728 (20), 2.116 (15)

Chemistry:

	(1)	(2)
SO_3	0.04	
P_2O_5	48.6	49.61
Fe_2O_3	0.05	
MgO	0.04	
CaO	20.4	19.60
K_2O	0.85	
$(NH_4)_2O$		18.20
H_2O		12.59
Total		100.00

(1) Petrogale Cave, Australia; by electron microprobe, average of nine partial analyses, presence of NH_4 and H_2O confirmed; formula derived by correspondence of X-ray and optical data with synthetic material. (2) $(NH_4)_2Ca(PO_3OH)_2 \cdot H_2O$.

Polymorphism & Series: Dimorphous with swaknoite.

Occurrence: Derived from bat guano and urine in caves.

Association: Biphosphammite, archerite, aphthitalite, halite, syngenite, stercorite, oxammite, weddellite, whitlockite, guanine, newberyite, calcite (Petrogale Cave, Australia); swaknoite, dittmarite, arcanite (Arnhem Cave, Namibia).

Distribution: In Petrogale Cave, near Madura, Western Australia. In Arnhem Cave, 150 km east of Windhoek, Namibia.

Name: For Mundrabilla Station, nearby the Petrogale Cave, Western Australia.

Type Material: Western Australian Museum, Perth, MDC5902.

References: (1) Bridge, P.J. and R.M. Clarke (1983) Mundrabillaite – a new cave mineral from Western Australia. Mineral. Mag., 47, 80–81. (2) (1984) Amer. Mineral., 69, 407 (abs. ref. 1).