

# Mundrabillaite



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

**Physical Properties:** *Tenacity:* Fragile [*sic*]. Hardness = Very soft.  $D(\text{meas.}) = \text{n.d.}$   
 $D(\text{calc.}) = 2.09$  Soluble in  $\text{H}_2\text{O}$ .

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

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

**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)
$\text{SO}_3$	0.04	
$\text{P}_2\text{O}_5$	48.6	49.61
$\text{Fe}_2\text{O}_3$	0.05	
MgO	0.04	
CaO	20.4	19.60
$\text{K}_2\text{O}$	0.85	
$(\text{NH}_4)_2\text{O}$		18.20
$\text{H}_2\text{O}$		12.59
Total		100.00

(1) Petrogale Cave, Australia; by electron microprobe, average of nine partial analyses, presence of  $\text{NH}_4$  and  $\text{H}_2\text{O}$  confirmed; formula derived by correspondence of X-ray and optical data with synthetic material. (2)  $(\text{NH}_4)_2\text{Ca}(\text{PO}_3\text{OH})_2 \cdot \text{H}_2\text{O}$ .

**Polymorphism & Series:** Dimorphous with swaknoite.

**Occurrence:** Derived from bat guano and urine in caves.

**Association:** Biphosphammite, archerite, apthitalite, 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).