

**Crystal Data:** Orthorhombic. *Point Group:*  $mm2$ . As small crystals.

**Physical Properties:** Hardness = "Low"  $D(\text{meas.}) = 2.15$   $D(\text{calc.}) = 2.19$

**Optical Properties:** Transparent. *Color:* Colorless.

*Optical Class:* Biaxial (-).  $\alpha = 1.549$   $\beta = 1.569$   $\gamma = 1.571$   $2V(\text{meas.}) = 40^\circ$

**Cell Data:** *Space Group:*  $Pmn2_1$ .  $a = 5.606$   $b = 8.758$   $c = 4.788$   $Z = 2$

**X-ray Powder Pattern:** Skipton lava tube caves, Australia. (ICDD 20-663).

8.77 (100), 2.80 (50), 2.92 (40), 4.72 (30), 4.20 (25), 2.50 (20), 2.28 (10)

**Chemistry:**

	(1)	(2)
$\text{P}_2\text{O}_5$	46.51	45.69
FeO	0.38	
MnO	0.08	
MgO	25.67	25.95
$(\text{NH}_4)_2\text{O}$	3.94	16.76
$\text{H}_2\text{O}$	23.42	11.60
Total	100.00	100.00

(1) Skipton lava tube caves, Australia. (2)  $(\text{NH}_4)\text{Mg}(\text{PO}_4)\cdot\text{H}_2\text{O}$ .

**Occurrence:** In dryer parts of bat guano in caves.

**Association:** Struvite, newberyite, hannayite, schertelite (Skipton lava tube caves, Australia); swaknoite, mundrabillaite, arcanite (Arnhem Cave, Namibia).

**Distribution:** From the Skipton lava tube caves, 40 km southwest of Ballarat, Victoria, Australia. In the Arnhem Cave, 150 km east of Windhoek, Namibia. From Gcwihaba Cave, 280 km west of Maun, northwestern Botswana.

**Name:** Honoring William Dittmar (1833–1892), Professor of Chemistry, University of Glasgow, Glasgow, Scotland.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 699. (2) Mrose, M.E. (1971) New mineral data for hydrated phosphates and sulfates. U.S. Geol. Surv. Prof. Paper 750-A, A115. (3) Frazier, A.W., J.P. Smith, and J.R. Lehr (1966) Precipitated impurities in fertilizers prepared from wet-process phosphoric acid. J. Agricultural Food Chemistry, 14(5), 522–529.