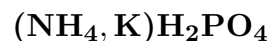


Biphosphammite



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Crystal Data: Tetragonal. *Point Group:* $\bar{4}2m$. As crystals, to 2 mm, tapering, prismatic, in radiating groups; stalactitic and in crusts; fine granular, powdery.

Physical Properties: Hardness = Very soft. $D(\text{meas.}) = 2.04(2)$ $D(\text{calc.}) = [2.02]$ for $\text{NH}_4:\text{K} = 1:1$.

Optical Properties: Semitransparent. *Color:* White, pale buff, to deep shades of brown; colorless in transmitted light. *Streak:* White to pale buff. *Luster:* Dull, earthy; crystals rarely vitreous.

Optical Class: Uniaxial (-). $\omega = 1.525$ $\epsilon = 1.480$

Cell Data: *Space Group:* $I\bar{4}2d$. $a = 7.4935(5)$ $c = 7.340(3)$ $Z = [4]$

X-ray Powder Pattern: Murra-el-elevyn Cave, Australia.

3.75 (10), 5.24 (9), 3.02 (9b), 1.993 (8), 2.650 (7), 2.368 (7), 1.593 (6)

Chemistry:

	(1)	(2)
SO_3	5.59	
P_2O_5	51.1	56.52
Na_2O	0.16	
K_2O	14.2	18.76
$(\text{NH}_4)_2\text{O}$	12.3	10.37
H_2O		14.35
insol.	0.81	
rem.	[16.14]	
Total	[100.3]	100.00

(1) Murra-el-elevyn Cave, Australia; partial analysis, remainder mostly CaO and H_2O ; stated to correspond to $[(\text{NH}_4)_{0.62}\text{K}_{0.38}]_{\Sigma=1.00}\text{H}_2\text{PO}_4$ 88%, syngenite 11.5%, insolubles in H_2O , 0.81%.

(2) $(\text{NH}_4, \text{K})\text{H}_2\text{PO}_4$ with $\text{NH}_4:\text{K} = 1:1$.

Occurrence: An alteration product of phosphammite in guano, due to loss of NH_4 (Guañape Island, Peru); a byproduct of the reaction between the liquid fraction of bat guano and urea (Murra-el-elevyn Cave, Australia).

Association: Phosphammite (Guañape Island, Peru); syngenite (Murra-el-elevyn Cave, Australia).

Distribution: On Guañape Island, south of Trujillo, Peru. In Murra-el-elevyn Cave, Cocklebiddy, and in Petrogale Cave, near Madura, Western Australia. From Gcwihaba Cave, 280 km west of Maun, northwestern Botswana.

Name: As a BIPHOSPHate of AMMonium.

Type Material: Western Australian Museum, Perth, MDC3977.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 807. (2) Pryce, M.W. (1972) Biphosphammite: a second occurrence. *Mineral. Mag.*, 38, 965-967.