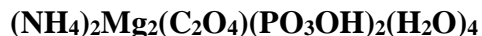


Phoxite

Crystal Data: Monoclinic. *Point Group:* 2/m. As blades to 0.4 mm, elongated and striated along [001], flattened on {100}, and exhibiting {100}, {120}, {110}, {011}, and {111̄}; commonly in composite intergrowths.

Physical Properties: *Cleavage:* Fair on (100). *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 1.98(2) D(calc.) = 1.965

Optical Properties: Transparent. *Color:* Colorless (light brown to beige from inclusions). *Streak:* White. *Luster:* Vitreous to oily. *Optical Class:* Biaxial (-). $\alpha = 1.499(1)$ $\beta = 1.541(1)$ $\gamma = 1.542(1)$ $2V(\text{meas.}) = 16(1)^\circ$ $2V(\text{calc.}) = 17.2^\circ$ *Dispersion:* Slight, $r < v$. *Orientation:* $Y = b$, $X \wedge a \approx 9^\circ$ in obtuse β . *Pleochroism:* None.

Cell Data: Space Group: $P2_1/c$. $a = 7.2962(3)$ $b = 13.5993(4)$ $c = 7.8334(6)$ $\beta = 108.271(8)^\circ$ $Z = 2$

X-ray Powder Pattern: Calculated pattern.

6.17 (100), 5.57 (85), 2.914 (72), 2.275 (63), 3.799 (60), 3.377 (59), 2.425 (37)

Chemistry:	(1)	(2)	(3)
(NH ₄) ₂ O		[10.44]	11.92
K ₂ O	2.74	2.45	
MgO	20.43	18.25	18.46
P ₂ O ₅	35.98	32.15	32.50
C ₂ O ₃		[16.31]	16.49
H ₂ O		[20.40]	20.63
Total		100.00	100.00

(1) Rowley mine, Painted Rock district, Maricopa County, Arizona, USA; average of 7 electron microprobe analyses supplemented by Raman spectroscopy and CHN analysis, (NH₄)₂O, C₂O₃, and H₂O calculated from structure; corresponds to [(NH₄)_{1.77}K_{0.23}]_{Σ=2.00}Mg_{2.00}(C₂O₄)(PO₃OH)₂(H₂O)₄.

(2) Do., Normalized. (3) (NH₄)₂Mg₂(C₂O₄)(PO₃OH)₂(H₂O)₄.

Occurrence: In a hot and humid area of an abandoned Cu-Pb-Au-Ag-Mo-V-barite-fluorspar mine in an unusual bat-guano-related, post-mining assemblage in portions of the interiors and rims of circular masses, presumably related to relatively recent/fresh bat excrement.

Association: Antipinite, aphthitalite, bassanite, struvite, thenardite, weddellite.

Distribution: From depth (125 feet) in the Rowley mine, near Theba, Painted Rock district, Maricopa County, Arizona, USA.

Name: Reflects the fact that the mineral contains essential phosphate (*ph*) and oxalate (*ox*) groups.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (66697, 66698, 66699, and 66700).

References: (1) Kampf, A.R., A. J. Celestian, B.P. Nash, and J. Marty (2019) Phoxite, (NH₄)₂Mg₂(C₂O₄)(PO₃OH)₂(H₂O)₄, the first phosphate-oxalate mineral. *Amer. Mineral.*, 104(7), 973-979.