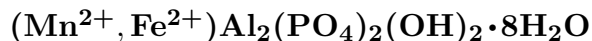


Mangangordonite



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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals nearly equant to tabular on {010}, slightly elongated along [001], to 2 mm; dominant forms include {010}, {100}, {001}, {1 $\bar{1}$ 0}, {0 $\bar{1}$ 1}; as fanlike to radial aggregates of bladed crystals.

Physical Properties: *Cleavage:* Perfect on {010}. *Tenacity:* Brittle. *Hardness:* = \sim 3
D(meas.) = 2.36(3) D(calc.) = [2.35]

Optical Properties: Transparent to translucent. *Color:* Colorless, white, may be stained yellow, tan, or brown; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Orientation:* $Z \simeq c$. *Dispersion:* $r < v$, distinct. $\alpha = 1.556(1)$
 $\beta = 1.561(2)$ $\gamma = 1.571(2)$ $2V(\text{meas.}) = 70^\circ$ $2V(\text{calc.}) = 71^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 5.257(3)$ $b = 10.363(4)$ $c = 7.040(3)$ $\alpha = 105.44(3)^\circ$
 $\beta = 113.07(3)^\circ$ $\gamma = 78.69(4)^\circ$ $Z = 1$

X-ray Powder Pattern: Kings Mountain, North Carolina, USA.
4.77 (10), 6.39 (8), 3.18 (7), 9.96 (6), 2.86 (5), 2.59 (4), 3.90 (3)

Chemistry:

	(1)	(2)
P ₂ O ₅	33.96	29.57
Al ₂ O ₃	25.38	22.09
FeO	3.88	3.44
MnO	12.43	10.79
MgO	0.4	0.34
H ₂ O		[33.77]
Total		[100.00]

(1) Kings Mountain, North Carolina, USA; by electron microprobe, average of three partial analyses, total Fe as FeO, total Mn as MnO, H₂O rapidly lost in the electron beam. (2) Analysis (1) recalculated to 100% with H₂O from structure analysis and by analogy to gordonite; then corresponding to $(\text{Mn}_{0.73}\text{Fe}_{0.23}\text{Mg}_{0.04})_{\Sigma=1.00}\text{Al}_{2.08}(\text{PO}_4)_{2.00}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$.

Polymorphism & Series: Dimorphous with kastningite.

Occurrence: A very rare secondary mineral in complex zoned granite pegmatites.

Association: Jahnsite, beraunite, strunzite, strengite, spodumene, quartz, muscovite, fluorapatite (Foote mine, North Carolina, USA); tourmaline, siderite, muscovite, quartz (Dunton quarry, Maine, USA).

Distribution: From the Foote mine, Kings Mountain, Cleveland Co., North Carolina and the Dunton quarry, Newry, Oxford Co., Maine, USA. On Mt. Vasin-Myl'k, Voron'i massif, Kola Peninsula, Russia. From Hagendorf, Bavaria, Germany.

Name: As the *manganese* analog of *gordonite*.

Type Material: Canadian Museum of Nature, Ottawa, Canada, 54513; National Museum of Natural History, Washington, D.C., USA, 162695.

References: (1) Leavens, P.B., J.S. White, Jr., G.W. Robinson, and J.A. Nelen (1991) Mangangordonite, a new phosphate mineral from Kings Mountain, North Carolina and Newry, Maine, USA. *Neues Jahrb. Mineral., Monatsh.*, 169–176. (2) (1991) *Amer. Mineral.*, 76, 2022–2023 (abs. ref. 1). (3) Leavens, P.B. and A.L. Rheingold (1988) Crystal structures of gordonite, $\text{MgAl}_2(\text{PO}_4)_2(\text{OH})_2(\text{H}_2\text{O})_6 \cdot 2\text{H}_2\text{O}$, and its Mn analog. *Neues Jahrb. Mineral., Monatsh.*, 265–270.