

Manganosegelerite $(\text{Mn}^{2+}, \text{Ca})(\text{Mn}^{2+}, \text{Fe}^{2+}, \text{Mg})\text{Fe}^{3+}(\text{PO}_4)_2(\text{OH}) \cdot 4\text{H}_2\text{O}$

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Subhedral prismatic crystals, to 0.05 mm, in granular aggregates.

Physical Properties: *Cleavage:* Imperfect on {001}. *Hardness* = 3–4 *D*(meas.) = 2.76(3) *D*(calc.) = 2.74

Optical Properties: Transparent to translucent. *Color:* Yellow to yellow-green.

Streak: Yellow. *Luster:* Vitreous.

Optical Class: Biaxial (+). *Pleochroism:* *X* = yellow; *Z* = pale yellow. *Orientation:* *X* = *c*; *Y* = *a*; *Z* = *b*. *Dispersion:* $r < v$, marked. $\alpha = 1.657(1)$ $\beta = 1.668(1)$ $\gamma = 1.691(2)$ $2V(\text{meas.}) = 75(5)^\circ$ $2V(\text{calc.}) = 70^\circ$

Cell Data: *Space Group:* [*Pbca*] (by analogy to overite). $a = 14.89(1)$ $b = 18.79(1)$ $c = 7.408(5)$ $Z = 8$

X-ray Powder Pattern: Mt. Vasin-Myl'k, Kola Peninsula, Russia.

9.39 (10), 2.86 (9), 4.70 (5), 1.966 (5), 1.880 (5), 2.97 (4), 2.60 (4)

Chemistry:

	(1)
P ₂ O ₅	33.21
Al ₂ O ₃	1.48
Fe ₂ O ₃	22.61
MnO	16.37
MgO	2.83
CaO	5.14
H ₂ O	[18.36]
Total	[100.00]

(1) Mt. Vasin-Myl'k, Kola Peninsula, Russia; by electron microprobe; total Fe as Fe₂O₃, total Mn as MnO, H₂O by difference, Fe²⁺:Fe³⁺ for charge balance, (OH)¹⁻ and H₂O confirmed by IR; then corresponding to $(\text{Mn}_{0.61}\text{Ca}_{0.39})_{\Sigma=1.00}(\text{Mn}_{0.38}\text{Fe}_{0.33}\text{Mg}_{0.30})_{\Sigma=1.01}(\text{Fe}_{0.88}\text{Al}_{0.12})_{\Sigma=1.00}(\text{PO}_4)_{2.00}(\text{OH})_{1.02} \cdot 4.04\text{H}_2\text{O}$.

Mineral Group: Overite group.

Occurrence: In fractures in granite pegmatite.

Association: Mitridatite, lun'okite, eosphorite, kingsmountite, manganoan gordonite.

Distribution: On Mt. Vasin-Myl'k, Voron'i massif, Kola Peninsula, Russia.

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

Type Material: Mining Institute, St. Petersburg, 1592/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia.

References: (1) Voloshin, A.V., Y.A. Pakhomovskii, and F.N. Tyusheva (1992) Manganosegelerite $(\text{Mn}, \text{Ca})(\text{Mn}, \text{Fe}, \text{Mg})\text{Fe}^{3+}(\text{PO}_4)_2(\text{OH}) \cdot 4\text{H}_2\text{O}$ – a new phosphate of the overite group from granitic pegmatites of the Kola Peninsula. *Zap. Vses. Mineral. Obshch.*, 121(2), 95–103 (in Russian). (2) (1994) *Amer. Mineral.*, 79, 185–186 (abs. ref. 1).