

Segelerite

CaMgFe³⁺(PO₄)₂(OH)·4H₂O

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Crystals are long prismatic and striated || [001], to 1 mm, showing {100}, {010}, {110}, {121}, with a nearly square cross-section.

Physical Properties: *Cleavage:* On {010}, perfect. Hardness = 4 D(meas.) = 2.67
D(calc.) = 2.610

Optical Properties: Semitransparent. *Color:* Pale green, yellow-green, brownish yellow, chartreuse, may be colorless. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* X = Y = colorless; Z = yellow. *Orientation:* X = b; Y = a; Z = c. *Absorption:* Z > X = Y. $\alpha = 1.618(3)$ $\beta = 1.635(3)$ $\gamma = 1.650(3)$
2V(meas.) = Large.

Cell Data: *Space Group:* Pbca. a = 14.826(5) b = 18.751(4) c = 7.307(1) Z = 8

X-ray Powder Pattern: Tip Top mine, South Dakota, USA.
2.868 (10), 9.31 (9), 5.34 (6), 3.729 (5), 3.421 (5), 4.97 (4), 4.65 (4)

| Chemistry: | (1) | (2) |
|--------------------------------|------|--------|
| P ₂ O ₅ | 33.1 | 35.55 |
| Al ₂ O ₃ | 0.4 | |
| Fe ₂ O ₃ | 16.4 | 20.00 |
| MnO | 0.0 | |
| MgO | 9.5 | 10.10 |
| CaO | 13.6 | 14.05 |
| H ₂ O | 19.1 | 20.30 |
| Total | 92.1 | 100.00 |

(1) Tip Top mine, South Dakota, USA; by electron microprobe, total Fe as Fe₂O₃, H₂O by loss on ignition; corresponds to Ca_{1.04}Mg_{1.00}(Fe_{0.89}Al_{0.05})_{Σ=0.94}(PO₄)_{2.00}(OH)_{0.89}·3.84H₂O.

(2) CaMgFe(PO₄)₂(OH)·4H₂O.

Mineral Group: Overite group.

Occurrence: A rare alteration product of triphylite in zoned complex granite pegmatites.

Association: Ferrisicklerite-rockbridgeite, collinsite, hydroxylapatite, robertsite (Tip Top mine, South Dakota, USA).

Distribution: From the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota, USA. On Milgun Station, Western Australia. In the Mangualde pegmatite, near Mesquitela, and at Belmonte, south of Guarda, Portugal. From Hagendorf, Bavaria, Germany.

Name: Honoring Curt George Segeler (1901–1989), American engineer and amateur mineralogist, Brooklyn, New York, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA, 127154.

References: (1) Moore, P.B. (1974) I. Jahnsite, segelerite, and robertsite, three new transition metal phosphate species. II. Redefinition of overite, an isotype of segelerite. III. Isotypy of robertsite, mitridatite, and arseniosiderite. *Amer. Mineral.*, 59, 48–59. (2) Moore, P.B. and T. Araki (1977) Overite, segelerite, and jahnsite; a study in combinatorial polymorphism. *Amer. Mineral.*, 62, 692–702.