

**Goedkenite****(Sr, Ca)<sub>2</sub>Al(PO<sub>4</sub>)<sub>2</sub>(OH)**

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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . Crystals are lozenge- to spearhead-shaped, to 1 mm, flattened on {001}, slightly elongated along [100], showing prominent {001}, {111}, with {011}, {012},  $\{\bar{1}01\}$ ; {001} commonly warped, with feathered ends; in bunched aggregates.

**Physical Properties:** *Cleavage:* On {100}, fair. Hardness = 5 D(meas.) = n.d.  
D(calc.) = 3.83

**Optical Properties:** Semitransparent. *Color:* Colorless to pale yellow.  
*Luster:* Subadamantine.

*Optical Class:* Biaxial (+). *Orientation:*  $X = b$ .  $\alpha = 1.669(2)$   $\beta = 1.673(2)$   $\gamma = 1.692(3)$   
 $2V(\text{meas.}) = 45^\circ\text{--}50^\circ$

**Cell Data:** *Space Group:*  $P2_1/m$ .  $a = 8.45(2)$   $b = 5.74(2)$   $c = 7.26(2)$   $\beta = 113.7(1)^\circ$   
 $Z = 2$

**X-ray Powder Pattern:** Palermo #1 mine, New Hampshire, USA.  
3.061 (10), 2.585 (7), 2.841 (6), 7.76 (5), 4.33 (4), 3.423 (4), 2.813 (4)

<b>Chemistry:</b>	(1)	(2)
P <sub>2</sub> O <sub>5</sub>	34.9	38.15
Al <sub>2</sub> O <sub>3</sub>	13.7	13.70
MgO	0.17	
CaO	11.4	11.76
SrO	32.7	33.97
H <sub>2</sub> O	n.d.	2.42
<b>Total</b>		<b>100.00</b>

(1) Palermo #1 mine, New Hampshire, USA; by electron microprobe. (2)  $(\text{Sr}_{1.22}\text{Ca}_{0.78})_{\Sigma=2.00}\text{Al}(\text{PO}_4)_2(\text{OH})$ .

**Mineral Group:** Brackebuschite group.

**Occurrence:** A rare late-stage secondary hydrothermal mineral in a complex granite pegmatite.

**Association:** Palermoite, childrenite, bjarebyite, goyazite, whitlockite, carbonate apatite, siderite, quartz.

**Distribution:** From the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire, USA.

**Name:** To honor Dr. Virgil Linus Goedken (1940–1992), Department of Chemistry, University of Chicago, Chicago, Illinois, USA.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 128070.

**References:** (1) Moore, P.B., A.J. Irving, and A.R. Kampf (1975) Foggite,  $\text{CaAl}(\text{OH})_2(\text{H}_2\text{O})[\text{PO}_4]$ ; goedkenite,  $(\text{Sr}, \text{Ca})_2\text{Al}(\text{OH})[\text{PO}_4]_2$ ; and samuelsonite,  $(\text{Ca}, \text{Ba})\text{Fe}_2^{2+}\text{Mn}_2^{2+}\text{Ca}_8\text{Al}_2(\text{OH})_2[\text{PO}_4]_{10}$ : three new species from the Palermo No. 1 pegmatite, North Groton, New Hampshire. Amer. Mineral., 60, 957–964.