Goedkenite $(Sr,Ca)_2Al(PO_4)_2(OH)$

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}, {$\overline{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(meas.) = 45°–50°

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

Chemistry:

	(1)	(2)
P_2O_5	34.9	38.15
Al_2O_3	13.7	13.70
MgO	0.17	
CaO	11.4	11.76
SrO	32.7	33.97
H_2O	n.d.	2.42
Total		100.00

(1) Palermo #1 mine, New Hampshire, USA; by electron microprobe. (2) $(Sr_{1.22}Ca_{0.78})_{\Sigma=2.00}$ $Al(PO_4)_2(OH)$.

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, $CaAl(OH)_2(H_2O)[PO_4]$; goedkenite, $(Sr,Ca)_2Al(OH)[PO_4]_2$; and samuelsonite, $(Ca,Ba)Fe_2^{2+}Mn_2^{2+}Ca_8Al_2(OH)_2[PO_4]_{10}$: three new species from the Palermo No. 1 pegmatite, North Groton, New Hampshire. Amer. Mineral., 60, 957–964.