

Gordonite

MgAl₂(PO₄)₂(OH)₂•8H₂O

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Crystal Data: Triclinic. *Point Group:* 1. Rare prismatic to platy crystals, to 2 mm, with dominant basal pedions, many lesser forms, elongated and striated along [001]; typically in bundles and sheaflike aggregates.

Physical Properties: *Cleavage:* {010}, perfect; {100}, fair; {001}, poor.
Fracture: Conchoidal. *Tenacity:* Brittle. Hardness = 3.5 D(meas.) = 2.23 D(calc.) = 2.22

Optical Properties: Transparent. *Color:* Smoky white, buff, to colorless, crystals pale pink or pale green on tips; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous, pearly on {010}.

Optical Class: Biaxial (+). *Orientation:* $X \simeq \perp \{010\}$. *Dispersion:* $r > v$. $\alpha = 1.534$
 $\beta = 1.543$ $\gamma = 1.558$ $2V(\text{meas.}) = 73^\circ$

Cell Data: *Space Group:* P1. $a = 5.246(2)$ $b = 10.532(5)$ $c = 6.975(3)$ $\alpha = 107.51(3)^\circ$
 $\beta = 111.03(3)^\circ$ $\gamma = 72.21(3)^\circ$ $Z = 1$

X-ray Powder Pattern: [Little Green Monster mine, near] Fairfield, Utah, USA.
9.78 (10), 3.17 (8), 2.83 (7), 2.56 (6), 6.32 (5), 4.76 (5), 3.07 (5)

Chemistry:	(1)	(2)
P ₂ O ₅	32.80	31.80
Al ₂ O ₃	20.68	22.84
MgO	10.01	9.03
H ₂ O ⁺	16.80	
H ₂ O ⁻	18.20	
H ₂ O		36.33
Total	98.49	100.00

(1) [Little Green Monster mine, near] Fairfield, Utah, USA. (2) MgAl₂(PO₄)₂(OH)₂•8H₂O.

Mineral Group: Paravauxite group.

Occurrence: Rare in variscite-rich phosphate nodules in limestones ([Little Green Monster mine, near] Fairfield, Utah, USA); a late-stage hydrothermal mineral in a complex granite pegmatite (Tip Top mine, South Dakota, USA).

Association: Variscite, crandallite, wardite ([Little Green Monster mine, near] Fairfield, Utah, USA); robertsite, collinsite (Tip Top mine, South Dakota, USA); montgomeryite, hydroxylapatite (Milgun Station, Western Australia).

Distribution: In the USA, from the Little Green Monster mine, Clay Canyon, about nine km west of Fairfield, Utah Co., Utah, and at the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota. From Rapid Creek, Yukon Territory, Canada. At the Sapucaia pegmatite mine, about 50 km east-southeast of Governador Valadares, Minas Gerais, Brazil. In Australia, from 15 km northwest of Milgun Station, Western Australia, and in Oliver's quarry, near Noarlunga, Mount Lofty Ranges, South Australia. On Mt. Vasin-Myl'k, Voron'i massif, Kola Peninsula, Russia.

Name: To honor Samuel George Gordon (1897–1953), American mineralogist, Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA, 137128.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 975–976. (2) Leavens, P.B. and A.L. Rheingold (1988) Crystal structures of gordonite, MgAl₂(PO₄)₂(OH)₂(H₂O)₆•2H₂O, and its Mn analog. Neues Jahrb. Mineral., Monatsh., 265–270. (3) Hurlbut, C., Jr. and R. Honea (1962) Sigloite, a new mineral from Llallagua, Bolivia. Amer. Mineral., 47, 1–8 [X-ray data].

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