

Keckite**Ca(Mn²⁺, Zn)₂Fe₃³⁺(PO₄)₄(OH)₃•2H₂O**

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Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals are elongated along [001], to 2 mm; in tufted or fan-shaped groups. *Twinning:* Reported, probably on {111} and {110}.

Physical Properties: *Cleavage:* Poor on {001}, and poorer on {100}. *Tenacity:* Flexible but not elastic. Hardness = 4.5 D(meas.) = 2.60 D(calc.) = 2.649

Optical Properties: Translucent. *Color:* Dirty gray-brown to brown, yellow-brown.

Luster: Dull.

Optical Class: Biaxial (-); undulatory extinction. *Pleochroism:* X = reddish brown; Y = yellow; Z = paler yellow. *Orientation:* Z = b; X ∧ c = 15–22°. *Absorption:* X ≫ Y ≥ Z. α = n.d. β = 1.692 γ = 1.699 2V(meas.) = n.d.

Cell Data: *Space Group:* P2₁/a. a = 15.02(1) b = 7.19(5) c = 19.74(2) β = 110°30(1)' Z = 2

X-ray Powder Pattern: Hagendorf, Germany.

2.86 (10), 9.3 (8), 4.98 (5), 3.51 (5d), 2.59 (4), 1.879 (4), 4.63 (3)

Chemistry:

	(1)
P ₂ O ₅	35.75
Fe ₂ O ₃	30.02
MnO	14.85
ZnO	2.24
MgO	0.66
CaO	5.88
H ₂ O	[10.60]
Total	[100.00]

(1) Hagendorf, Germany; by electron microprobe, total Fe as Fe₂O₃, total Mn as MnO, H₂O by difference, (OH)¹⁻ determined by IR; corresponding to (Ca_{0.83}Mg_{0.13})_{Σ=0.96}(Mn_{1.66}Zn_{0.22})_{Σ=1.88}Fe_{2.99}³⁺(PO₄)₄(OH)_{2.65}•2.03H₂O.

Mineral Group: Whiteite group.

Occurrence: A weathering product of phosphate minerals in a complex granite pegmatite.

Association: Rockbridgeite, phosphophyllite, scholzite, fairfieldite, vivianite, reddingite, huréaulite, strengite, apatite.

Distribution: In Germany, in Bavaria, from Hagendorf, at the Silbergrube quarry, near Waidhaus, and at Hühnerkobel, near Zwiesel. In the Bendada pegmatite, near Guarda, Portugal.

Name: Honors Erich Keck, Etzenricht, Germany, collector of Hagendorf minerals.

Type Material: National Museum of Natural History, Washington, D.C., USA, 145616, 145617.

References: (1) Mücke, A. (1979) Keckit, (Ca, Mg)(Mn, Zn)₂Fe₃³⁺[(OH)₃(PO₄)₄]•2H₂O, ein neues Mineral von Hagendorf/Opf. und seine genetische Stellung. Neues Jahrb. Mineral., Abh., 134, 183–192 (in German with English abs.). (2) (1979) Amer. Mineral., 64, 1330–1331 (abs. ref. 1).