

Hendricksite**K(Zn, Mg, Mn²⁺)₃(Si₃Al)O₁₀(OH)₂**

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Crystal Data: Monoclinic. *Point Group:* 2/m. Euhedral crystals, to 14 cm, rare. Forms interlocking aggregates and anhedral plates, to over 30 cm, commonly bent, or showing other signs of mechanical deformation.

Physical Properties: *Cleavage:* {001}, perfect. Hardness = 2.5–3 D(meas.) = 2.86–3.43 D(calc.) = 3.30–3.37

Optical Properties: Translucent. *Color:* Coppery brown, bronze-brown, dark reddish brown to reddish black.

Optical Class: Biaxial (-). *Pleochroism:* X = pale yellow; Y = Z = light chestnut-brown.

Orientation: X = b; Z ∧ c = 36°. *Dispersion:* r < v, slight. *Absorption:* Z = Y > X. α = 1.598–1.624 β = 1.658–1.686 γ = 1.660–1.697 2V(meas.) = 2°–8°

Cell Data: *Space Group:* C2/m. a = 5.340(2) b = 9.254(2) c = 10.235(3) β = 100.07(2)° Z = 2

X-ray Powder Pattern: Franklin, New Jersey, USA; 1M.

10.20 (100), 3.398 (60), 5.094 (36), 2.546 (35), 1.696 (17), 2.652 (13), 1.554 (10)

Chemistry:	(1)	(2)	(1)	(2)
SiO ₂	31.58	31.9	BaO	0.65
TiO ₂	0.32	0.35	Li ₂ O	0.04
Al ₂ O ₃	13.72	13.6	Na ₂ O	0.24
Fe ₂ O ₃	2.25	4.9	K ₂ O	7.91
FeO	0.34		F	0.45
MnO	12.28	12.5	H ₂ O ⁺ + F	3.95
ZnO	22.97	19.8	H ₂ O ⁺	3.65
MgO	3.69	2.7	H ₂ O ⁻	0.95
CaO		0.02	-O = F ₂	0.19
			Total	[99.86] [99.71]

(1) Franklin, New Jersey, USA; original total given as 99.57%, corresponds to (K_{0.85}Na_{0.04}Ba_{0.02})_{Σ=0.91}(Zn_{1.43}Mn_{0.88}Mg_{0.46}Fe_{0.14}³⁺Ti_{0.04}Al_{0.02}Fe_{0.02}²⁺)_{Σ=3.00}(Si_{2.66}Al_{1.34})_{Σ=4.00}O₁₀[(OH)_{1.98}F_{0.02}]_{Σ=2.00}. (2) Do.; original total given as 99.6%, corresponds to (K_{0.94}Na_{0.02}Li_{0.02}Ba_{0.01})_{Σ=0.99}(Zn_{1.24}Mn_{0.90}Mg_{0.34}Fe_{0.32}³⁺Al_{0.08}Ti_{0.02})_{Σ=2.90}(Si_{2.72}Al_{1.28})_{Σ=4.00}O₁₀[(OH), F]_{Σ=2.05}.

Polymorphism & Series: 1M, 2M₁, 3A polytypes.

Mineral Group: Mica group.

Occurrence: Restricted to irregular lens- or sheetlike skarn bodies in a metamorphosed stratiform zinc deposit.

Association: Andradite, rhodonite, calcite, barium feldspars, franklinite, willemite, axinite, hancockite.

Distribution: From Franklin, Sussex Co., New Jersey, USA.

Name: For Dr. Sterling B. Hendricks (1902–), American crystallographer and chemist, a student of micas.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 89818, 133712; The Natural History Museum, London, England, 1966,209.

References: (1) Frondel, C. and J. Ito (1966) Hendricksite, a new species of mica. Amer. Mineral., 51, 1107–1123. (2) Evans, B.W. and R.G.J. Strens (1966) Zinc mica from Franklin Furnace, New Jersey. Nature, 211, 619. (3) Robert, J.-L. and M. Gaspérin (1985) Crystal structure refinement of hendricksite, a Zn- and Mn-rich trioctahedral potassium mica: a contribution to the crystal chemistry of zinc-bearing minerals. Tschermaks Mineral. Petrog. Mitt., 34, 1–14.

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