

Goldichite

KFe³⁺(SO₄)₂•4H₂O

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Crystal Data: Monoclinic. *Point Group:* 2/*m*. As singly- or doubly-terminated lathlike crystals, to 4 mm, flattened on {100} and elongated along [001], with dominant {011}, {100}, and {110}; the latter two may be striated || [001]; in parallel and radiating clusters, aggregated into incrustations.

Physical Properties: *Cleavage:* On {100}, perfect. *Tenacity:* Brittle. Hardness = ~2.5 D(meas.) = 2.43 D(calc.) = 2.461 Slightly soluble in cold H₂O; soluble in hot H₂O with hydrolysis.

Optical Properties: Transparent. *Color:* Pale yellowish green, with a lavender tint under artificial light. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Biaxial (+). *Pleochroism:* X = colorless; Y = colorless to very pale yellow; Z = very pale yellow. *Orientation:* X = b; Y ≈ a; Z ∧ c = 9°–11°. *Dispersion:* r > v, strong. *Absorption:* Z > Y > X. α = 1.582–1.584 β = 1.602(2) γ = 1.629–1.639 2V(meas.) = n.d. 2V(calc.) = 75°–82°

Cell Data: *Space Group:* P2₁/c. a = 10.387(6) b = 10.486(6) c = 9.086(5) β = 101.68(7)° Z = 4

X-ray Powder Pattern: Dexter No. 7 mine, Utah, USA. 3.068 (10), 7.35 (9), 10.29 (8), 6.85 (7), 4.00 (6), 3.403 (6), 2.656 (6)

Chemistry:	(1)	(2)	(1)	(2)
SO ₃	43.65	44.59	K ₂ O	12.87
TiO ₂	0.02		Rb ₂ O	0.03
Al ₂ O ₃	0.32		H ₂ O	20.35
Fe ₂ O ₃	22.16	22.23	insol.	0.23
Na ₂ O	0.09		Total	99.72
				100.00

(1) Dexter No. 7 mine, Utah, USA; Al₂O₃ from alunogen impurity. (2) KFe(SO₄)₂•4H₂O.

Occurrence: Cementing fragments in slope debris from an oxidizing pyritiferous Colorado Plateau-type uranium deposit (Dexter No. 7 mine, Utah, USA); coating mine walls in an argillized sulfur deposit formed by underground fumarole activity (Santa Bárbara mine, Argentina).

Association: Alunogen, coquimbite, copiapite, halotrichite (Dexter No. 7 mine, Utah, USA); metavoltine, hexahydrate, ferrinatriite, krausite, halotrichite, voltaite, sulfur, sideronatriite, alunogen, halite (Santa Bárbara mine, Argentina).

Distribution: From the Dexter No. 7 mine, Calf Mesa, San Rafael district, Emery Co., Utah, USA. At the Santa Bárbara sulfur mine, El Palmar district, Jujuy Province, Argentina. From the Lanjarón mineral springs, Granada Province, Spain. On the island of Saba, Netherland Antilles.

Name: Honors Dr. Samuel Stephen Goldich (1909–2000), American mineralogist, petrologist, and analytical isotope chemist, Professor of Geology, University of Minnesota, Minneapolis, Minnesota, USA, who analyzed the mineral.

Type Material: National Museum of Natural History, Washington, D.C., USA, 106903.

References: (1) Rosenzweig, A. and E.B. Gross (1955) Goldichite, a new hydrous potassium ferric sulfate from the San Rafael Swell, Utah. *Amer. Mineral.*, 40, 469–480. (2) Zavalía, M.F.M. and M.A. Galliski (1995) Goldichite of fumarolic origin from the Santa Bárbara mine, Jujuy, northwestern Argentina. *Can. Mineral.*, 33, 1059–1062. (3) Graeber, E.J. and A. Rosenzweig (1971) The crystal structures of yavapaiite, KFe(SO₄)₂, and goldichite, KFe(SO₄)₂•4H₂O. *Amer. Mineral.*, 56, 1917–1933.

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