

Dickite**Al₂Si₂O₅(OH)₄**

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Crystal Data: Monoclinic. *Point Group:* *m*. As pseudo-hexagonal crystals, to 2 mm, which may be elongated along [100]. As aggregates of platelets resembling books; commonly as compact masses of microscopic crystals.

Physical Properties: *Cleavage:* Perfect on {001}. *Tenacity:* Flexible but inelastic. Hardness = 2–2.5 D(meas.) = 2.60 D(calc.) = [2.62]

Optical Properties: Transparent. *Color:* White, but will assume coloration from included impurities. *Luster:* Satiny.

Optical Class: Biaxial (+). *Orientation:* $X \wedge c = 8^\circ\text{--}14^\circ$; $Y \wedge a = 14^\circ\text{--}20^\circ$. *Dispersion:* $r > v$. $\alpha = 1.560\text{--}1.564$ $\beta = 1.561\text{--}1.566$ $\gamma = 1.566\text{--}1.570$ $2V(\text{meas.}) = 50^\circ\text{--}80^\circ$

Cell Data: *Space Group:* *Cc*. $a = 5.150(1)$ $b = 8.940(1)$ $c = 14.424(2)$ $\beta = 96^\circ 44(1)'$
Z = 4

X-ray Powder Pattern: Schuylkill, Pennsylvania, USA. (ICDD 10-446).
7.15 (100), 3.580 (100), 2.326 (90), 4.124 (70), 3.799 (60), 2.510 (50), 1.975 (50)

Chemistry:	(1)	(2)		(1)	(2)
SiO ₂	46.86	46.14	MgO	0.09	
TiO ₂	0.51		CaO	0.22	
Al ₂ O ₃	37.12	39.61	Na ₂ O	0.07	
Fe ₂ O ₃	1.43		K ₂ O	0.60	
FeO	0.06		H ₂ O	13.06	13.91
			<u>Total</u>	<u>100.02</u>	<u>99.66</u>

(1) Anglesey, Wales. (2) Pine Knot colliery, Pennsylvania, USA; corresponds to Al_{2.02}Si_{1.99}O₅(OH)_{4.00}.

Polymorphism & Series: Halloysite, kaolinite, and nacrite are polymorphs.

Mineral Group: Kaolinite-serpentine group.

Occurrence: Commonly of hydrothermal origin along veins derived in part from the alteration of aluminosilicate minerals; also as an authigenic sedimentary mineral.

Association: Quartz, "chalcedony."

Distribution: Widespread; some localities for studied materials follow: at Amlwch and the Pant-y-Gaseg quarry, Trwynbychan, Anglesey, Wales. From Mád, Hungary. In the Iza Cave, Mt. Rodna, Romania. From Mas D'Alary, Lodève, Hérault, France. At Postmasburg and Barkly East, Cape Province, and in the Middelburg district, Transvaal, South Africa. In the USA, on Red Mountain, near Ouray, San Juan Co., Colorado; in the Mineral Mountain area, near St. George, Washington Co., Utah; the Pine Knot colliery, Schuylkill, Schuylkill Co., Pennsylvania; and on Bruin Creek, Elliott Co., Kentucky. At San Juanito and Cusihuiríachic, Chihuahua, Mexico.

Name: For Allan Brugh Dick (1833–1926), Scottish metallurgical chemist, who first described the species.

Type Material: n.d.

References: (1) Ross, C.S. and P.F. Kerr (1930) Dickite, a kaolin mineral. *Amer. Mineral.*, 15, 34–39. (2) Newnham, R.E. (1961) A refinement of the dickite structure and some remarks on polymorphism in kaolin minerals. *Mineral. Mag.*, 32, 683–704. (3) Grim, R.E. (1953) *Clay Mineralogy*. McGraw Hill, 370. (4) Deer, W.A., R.A. Howie, and J. Zussman (1963) *Rock-forming minerals*, v. 3, sheet silicates, 194–212. (5) Sen Gupta, P.K., E.O. Schlemper, W.D. Johns, and F. Ross (1984) Hydrogen positions in dickite. *Clays and Clay Minerals*, 32, 483–485.

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