

Lawsonite

CaAl₂Si₂O₇(OH)₂·H₂O

©2001 Mineral Data Publishing, version 1.2

Crystal Data: Orthorhombic. *Point Group:* 2 2 2 Crystals commonly prismatic, tabular, to 5 cm; also granular, massive. *Twining:* Common on {101}, may be lamellar.

Physical Properties: *Cleavage:* Perfect on {100} and {010}, imperfect on {101}. *Tenacity:* Brittle. Hardness = 6 D(meas.) = 3.05–3.12 D(calc.) = 3.084–3.091

Optical Properties: Translucent. *Color:* Colorless, white, pale blue to grayish blue; colorless to bluish green in thin section. *Streak:* White. *Luster:* Vitreous, greasy.

Optical Class: Biaxial (+). *Pleochroism:* Weak; X = blue, pale brownish yellow; Y = deep bluish green, yellowish green; Z = colorless, yellowish. *Orientation:* X = c; Y = a; Z = b. *Dispersion:* very strong. $\omega = 1.663\text{--}1.665$ $\epsilon = 1.672\text{--}1.675$ $\gamma = 1.682\text{--}1.686$
2V(meas.) = 76°–87°

Cell Data: *Space Group:* a = 8.795(3) b = 5.847(1) c = 13.142(6) Z = 4

X-ray Powder Pattern: Tiburon Peninsula, California, USA.

2.624 (100), 1.550 (80), 2.726 (70), 4.84 (60), 3.66 (60), 2.433 (60), 2.129 (60)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO ₂	38.45	37.80	38.24	CaO	17.52	16.10	17.84
TiO ₂	0.38	0.69		Na ₂ O	0.06	0.51	
Al ₂ O ₃	31.35	32.56	32.45	K ₂ O	0.23	0.24	
Fe ₂ O ₃	0.86	0.05		F		0.02	
FeO	0.10	0.34		H ₂ O ⁺	11.21	11.26	11.47
MnO	trace	trace		H ₂ O ^Γ		0.04	
MgO	0.17	0.32		Total	100.33	99.93	100.00

(1) Tiburon Peninsula, California, USA; corresponds to (Ca_{0.98}K_{0.02}Mg_{0.01}Na_{0.01})_{Σ=1.02}(Al_{1.94}Fe_{0.03}³⁺Ti_{0.02})_{Σ=1.99}Si_{2.02}O₇(OH)_{1.92}·H₂O (2) Santa Clara, Cuba; corresponds to (Ca_{0.91}Na_{0.05}Mg_{0.02}Fe_{0.02}²⁺K_{0.02})_{Σ=1.02}(Al_{2.00}Ti_{0.03})_{Σ=2.03}(Si_{1.98}Al_{0.02})_{Σ=2.00}O₇(OH)_{1.94}·H₂O
(3) CaAl₂Si₂O₇(OH)₂·H₂O

Polymorphism & Series: Dimorphous with parthéite.

Occurrence: Formed at high pressures and low temperatures, especially in low-grade regionally metamorphosed glaucophane schists; formed from plagioclase during saussuritization of gabbros and diabases; rarely in eclogites.

Association: Pumpellyite, epidote, garnet, crossite, muscovite, jadeite, glaucophane, quartz, calcite.

Distribution: In the USA, in California, numerous localities, as near Reed Station and elsewhere on the Tiburon Peninsula, Marin Co.; at Arroyo Mocho, Alameda Co.; on Porter Creek, Sonoma Co.; Panoche Pass, San Benito Co.; in the Pacheco Pass area, Santa Clara Co.; large crystals from Covelo, Mendocino Co., etc. At Darrington, Snohomish Co., Washington. Other localities for well-crystallized or studied materials include many in the French and Italian Alps. Near Tavşanlı, Turkey. At Ogose, Saitama Prefecture; Ubusan, Akita Prefecture; Kamba, Okayama Prefecture; and Kamuikotan, Hokkaido, Japan. From the Ouégoa district and elsewhere on New Caledonia. In the southeast part of Celebes Island.

Name: For Professor Andrew Cowper Lawson (1861–1952), Scottish-American geologist, University of California, Berkeley, California, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA, 83635; The Natural History Museum, London, England, 1933,239–240.

References: (1) Dana, E.S. (1899) Dana's system of mineralogy, (6th edition), app. I, 41. (2) Deer, W.A., R.A. Howie, and J. Zussman (1986) Rock-forming minerals, (2nd edition), v. 1B, disilicates and ring silicates, 180–200. (3) Davis, G.A. and A. Pabst (1960) Lawsonite and pumpellyite in glaucophane schist, north Berkeley Hills, California. Amer. J. Sci., 258, 689–704. (4) Baur, W.H. (1978) Crystal structure refinement of lawsonite. Amer. Mineral., 63, 311–315.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.