

Leucophanite

(Ca, Ce)CaNa₂Be₂Si₄O₁₂(F, OH)₂

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Crystal Data: Orthorhombic or triclinic. *Point Group:* 222 or 1. Short prismatic to tabular pseudotetragonal crystals, to 3 cm. In radiating fibrous spherulites; massive. *Twinning:* Penetration fourlings; polysynthetic || {110}.

Physical Properties: *Cleavage:* {001}, perfect; {100}, {010}, and {201}, distinct. *Fracture:* Conchoidal to uneven. *Tenacity:* Very brittle. *Hardness* = 3.5–4 *D*(meas.) = 2.96–3.07 *D*(calc.) = 2.961 May fluoresce pink or violet-blue in SW and LW UV; strongly phosphorescent; pyroelectric.

Optical Properties: Semitransparent. *Color:* Whitish green, greenish white, deep green with a yellow tinge, wine-yellow. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Orientation:* X = c; Y = a; Z = b. *Dispersion:* r > v, weak. $\alpha = 1.565\text{--}1.573$ $\beta = 1.590\text{--}1.595$ $\gamma = 1.593\text{--}1.598$ $2V(\text{meas.}) = 36^\circ\text{--}50^\circ$ $2V(\text{calc.}) = 38^\circ$

Cell Data: *Space Group:* P2₁2₁2₁. *a* = 7.401(2) *b* = 7.412(2) *c* = 9.990(2) *Z* = 2, or *Space Group:* P1. *a* = 7.417(4) *b* = 7.398(4) *c* = 9.986(4) $\alpha = 90.00(2)^\circ$ $\beta = 90.00(2)^\circ$ $\gamma = 90.00(2)^\circ$ *Z* = 2

X-ray Powder Pattern: Eikaholmen, Langesundsfjord, Norway. (ICDD 18-711). 2.75 (100), 3.60 (50), 2.97 (50), 1.69 (50), 2.31(40), 2.20 (40), 1.98 (40)

Chemistry:	(1)	(2)	(1)	(2)	
SiO ₂	48.50	45.98	Na ₂ O	12.42	10.79
Al ₂ O ₃	0.45	2.32	K ₂ O		0.70
FeO		0.22	F	5.94	7.04
BeO	10.03	11.52	H ₂ O ⁺	1.08	0.84
MgO	0.27	0.30	-O = F ₂	[2.50]	2.96
CaO	22.94	23.65	Total	[99.13]	100.40

(1) Arø Island, Langesundsfjord, Norway; corresponds to (Ca_{1.01}Mg_{0.02})_{Σ=1.03}Na_{0.99}Be_{0.98}(Si_{1.98}Al_{0.02})_{Σ=2.00}O_{5.96}[F_{0.77}(OH)_{0.30}]_{Σ=1.07}. (2) Lovozero massif, Russia; corresponds to (Ca_{1.04}Mg_{0.02})_{Σ=1.06}(Na_{0.86}K_{0.04})_{Σ=0.90}Be_{1.14}(Si_{1.89}Al_{0.11})_{Σ=2.00}O₆[F_{0.91}(OH)_{0.23}]_{Σ=1.14}.

Occurrence: In pegmatites in augite syenite (Langesundsfjord, Norway); in albitization zones in pegmatites at the contact of alkalic massifs intruding Proterozoic carbonaceous quartz-sericite schists (Baikal massif, Russia).

Association: Albite, orthoclase, natrolite, analcime, sérandite, aegirine, polythionite, ancylite, astrophyllite, catapleite, epididymite, rhodochrosite, fluorite.

Distribution: In Norway, on Låven, Arø, Stokkø and other islands in the Langesundsfjord; at Morje, Telemark; and in the Vevja and Saga quarries, Tvedalen. In Russia, in the Lovozero massif, Kola Peninsula; in the Baikal massif, eastern Siberia; and in several other poorly specified localities. From Narssârssuk, Greenland. At Mont Saint-Hilaire, Quebec, Canada.

Name: From the Greek for *white* and *to appear*, its common color.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 417–418. (2) Vlasov, K.A., M.V. Kuz'menko, and E.M. Es'kova (1966) The Lovozero alkali massif. Akad. Nauk SSSR, 432–433 (in English). (3) Portnov, A.M. (1964) The northern Baikal leucophanite. Trudy Mineral. Muzeya Akad. Nauk SSSR, 15, 229–231 (in Russian). (4) (1964) Chem. Abs., 14372 (abs. ref. 3). (5) Mandarino, J.A. and V. Anderson (1989) Monteregian Treasures. Cambridge Univ. Press, 126. (6) Grice, J.D. and F.C. Hawthorne (1989) Refinement of the crystal structure of leucophanite. Can. Mineral., 27, 193–197. (7) Cannillo, E., G. Giuseppetti, F. Mazzi, and V. Tazzoli (1992) The crystal structure of a rare earth bearing leucophanite: (Ca, RE)CaNa₂Be₂Si₄O₁₂(F, O)₂. Zeits. Krist., 202, 71–79.

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