

Oligoclase

Na_{0.9-0.7}Ca_{0.1-0.3}Al_{1.1-1.3}Si_{2.9-2.7}O₈

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals uncommon, flattened and tabular along [010], to 6 cm; more commonly cleavable to compact, massive. *Twinning:* Typically twinned according to the Albite, Carlsbad, and Pericline laws.

Physical Properties: *Cleavage:* Perfect on {001}, less perfect on {010}, imperfect on {110}, (001) \wedge (010) $\sim 94^\circ$. *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. *Hardness* = 6–6.5 D(meas.) = 2.63–2.66 D(calc.) = 2.624–2.652

Optical Properties: Transparent to translucent. *Color:* White, may be tinted gray, green, red; colorless in thin section; may be opalescent or iridescent. *Streak:* White. *Luster:* Vitreous to pearly.

Optical Class: Biaxial (+) or (-). *Dispersion:* $r > v$, weak. $\alpha = 1.533\text{--}1.545$ $\beta = 1.537\text{--}1.548$ $\gamma = 1.542\text{--}1.552$ 2V(meas.) = 84° to -87° to 90° (low); -52° to -73° (high).

Cell Data: *Space Group:* $C\bar{1}$ (low). $a = 8.152$ $b = 12.821$ $c = 7.139$ $\alpha = 93.99^\circ$ $\beta = 116.46^\circ$ $\gamma = 88.58^\circ$ $Z = 4$, or *Space Group:* $C\bar{1}$ (high). $a = 8.163$ $b = 12.875$ $c = 7.107$ $\alpha = 93.39^\circ$ $\beta = 116.27^\circ$ $\gamma = 90.29^\circ$ $Z = 4$

X-ray Powder Pattern: Petrick quarry, Llano Co., Texas, USA (low). 3.18 (100), 4.03 (80), 3.20 (80), 3.76 (70), 2.93 (70), 6.38 (60), 3.69 (60)

X-ray Powder Pattern: Synthetic Na_{0.7}Ca_{0.3}Al_{1.3}Si_{2.7}O₈. 3.20 (100), 4.02 (80), 3.74 (80), 3.17 (80), 4.69 (60), 3.63 (70), 3.36 (60)

Chemistry:	(1)	(2)	(3)	(1)	(2)	(3)
SiO ₂	64.92	66.04	60.76	K ₂ O	0.68	
Al ₂ O ₃	22.20	21.26	24.82	H ₂ O	0.09	
CaO	2.64	2.13	6.30	Total	100.25	100.00
Na ₂ O	9.72	10.57	8.12			100.00

(1) Monteagle, Ontario, Canada. (2) Na_{0.90}Ca_{0.10}Al_{1.10}Si_{2.90}O₈. (3) Na_{0.70}Ca_{0.30}Al_{1.30}Si_{2.70}O₈.

Polymorphism & Series: Low- and high-temperature structural modifications are recognized.

Mineral Group: Feldspar group, plagioclase series.

Occurrence: Common in granite, syenite, nepheline syenite, and their pegmatites; in diorite, rhyolite, andesite. In serpentinite and gneiss; in amphibolite facies metamorphic rocks; as clastic grains in sedimentary rocks.

Association: Quartz, orthoclase, sanidine, tourmaline, corundum.

Distribution: A widespread mineral. Fine material from Danviken, near Stockholm, Sweden. At Arendal, on Tromøy Island at Alve, Tvedestrand, and elsewhere in Norway. In Sweden, at Ytterby. From Kemiö (Kimito) Island, Finland. At Silberberg, near Bodenmais, Bavaria, Germany. On Tenerife, Canary Islands. In the USA, at Fine and Macomb, St. Lawrence Co., New York; on Corundum Hill, Chester Co., and at Media, Delaware Co., Pennsylvania; near Hawk, east of Bakersville, Mitchell Co., North Carolina. At Lake Harbour, Baffin Island, Northwest Territories, Canada.

Name: From the Greek for *little* and *fracture*, for cleavages believed inferior to albite.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 325–327, 332–333. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 94–165. (3) Phillips, W.R. and D.T. Griffen (1981) Optical mineralogy, 352–360. (4) Goodyear, J. and W.J. Duffin (1954) The identification and determination of plagioclase feldspars by the X-ray powder method. Mineral. Mag., 30, 306–326. (5) Smith, J.V. (1956) The powder patterns and lattice parameters of plagioclase feldspars. I. The soda-rich plagioclases. Mineral. Mag., 31, 47–68. (6) Phillips, M.W., A.A. Colville, and P.H. Ribbe (1971) The crystal structures of two oligoclases: a comparison with low and high albite. Zeits. Krist., 133, 43–65.

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