

Anorthite**Na_{0.1-0.0}Ca_{0.9-1.0}Al_{1.9-2.0}Si_{2.1-2.0}O₈**

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals commonly short, prismatic on [001], rarely on [010], to 2 cm; lamellar, coarse granular, massive. *Twinning:* Commonly polysynthetic on the Albite law; also after the Pericline, Carlsbad, Manebach, and Baveno laws.

Physical Properties: *Cleavage:* Perfect on {001}, less so on {010}, imperfect on {110}. *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. Hardness = 6–6.5 D(meas.) = 2.74–2.76 D(calc.) = 2.760

Optical Properties: Transparent to translucent. *Color:* White, grayish, reddish; colorless in thin section. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Dispersion:* $r < v$, weak. $\alpha = 1.573\text{--}1.577$ $\beta = 1.580\text{--}1.585$ $\gamma = 1.585\text{--}1.590$ $2V(\text{meas.}) = 78^\circ\text{--}83^\circ$

Cell Data: *Space Group:* $P\bar{1}$ (low). $a = 8.1768$ $b = 12.8768$ $c = 14.1690$ $\alpha = 93.17^\circ$ $\beta = 115.85^\circ$ $\gamma = 92.22^\circ$ $Z = 8$

X-ray Powder Pattern: Monte Somma, Italy (low). 3.19 (100), 3.18 (91), 3.21 (63), 3.26 (52), 4.04 (48), 3.12 (39), 3.62 (33)

Chemistry:	(1)	(2)	(3)
SiO ₂	45.88	45.62	43.19
TiO ₂	0.04		
Al ₂ O ₃	34.31	35.02	36.65
Fe ₂ O ₃	0.83		
CaO	18.28	18.24	20.16
Na ₂ O	0.82	1.12	
K ₂ O	0.11		
H ₂ O ⁺	0.14		
Total	100.41	100.00	100.00

(1) Crookdene, Northumberland, England. (2) Na_{0.10}Ca_{0.90}Al_{1.90}Si_{2.10}O₈. (3) CaAl₂Si₂O₈.

Polymorphism & Series: Trimorphous with dmisteinbergite and svyatoslavite; low- and high-temperature structural modifications are recognized.

Mineral Group: Feldspar group, plagioclase series.

Occurrence: A rare constituent of mafic plutonic and volcanic rocks. In some granulite facies metamorphic rocks; in metamorphosed carbonate rocks; with corundum deposits. Known from meteorites.

Association: Olivine, pyroxene, corundum.

Distribution: A widely distributed rock-forming mineral. Classic occurrences include: from Monte Somma and Vesuvius, Campania; on Mt. Monzoni, Val di Fassa, Trentino-Alto Adige; and from the Cyclopean Islands, Italy. At Tunaberg, Södermanland, Sweden. From near Lojo, Finland. At Bogoslovsk and Barsowka, Ural Mountains, Russia. On Miyakejima Island, Tokyo Prefecture; at Toshinyama, Tochigi Prefecture; the Zao volcano, Yamagata Prefecture; Otaru, Hokkaido; and other places in Japan. In the USA, on Great Sitkin Island, Aleutian Islands, Alaska; from Grass Valley, Nevada Co., California. On Amitok Island, Labrador, Newfoundland, Canada.

Name: From the Greek for *oblique*, for its triclinicity.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 325–327, 337–341. (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) Kempster, C.J.E., H.D. Megaw, and E.W. Radoslovich (1962) The structure of anorthite, CaAl₂Si₂O₈. I. Structure analysis. Acta Cryst., 15, 1005–117. (5) Megaw, H.D., C.J.E. Kempster, and E.W. Radoslovich (1962) The structure of anorthite, CaAl₂Si₃O₈. II. Description and discussion. Acta Cryst., 15, 117–135.

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