Anorthoclase $(Na, K)AlSi_3O_8$

Crystal Data: Triclinic. *Point Group:* $\overline{1}$. Short prismatic crystals; also tabular, rhombic, flattened along [010], to 5 cm. *Twinning:* Baveno, Carlsbad, and Manebach laws; polysynthetic albite and pericline law twinning produce a grid pattern on {100}.

Physical Properties: *Cleavage:* Perfect on {001}, less perfect on {010}; partings on {100}, {110}, {$\overline{1}$10}, and {$\overline{2}$01}. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 6
D(meas.) = 2.57–2.60 D(calc.) = 2.57

Optical Properties: Transparent. *Color:* Colorless, also white, pale creamy yellow, red, green. *Streak:* White. *Luster:* Vitreous, may be pearly on cleavages.
Optical Class: Biaxial (–). *Orientation:* $Z \wedge b \simeq 5°$. *Dispersion:* $r > v$, weak.
$\alpha = 1.524$–1.526 $\beta = 1.529$–1.532 $\gamma = 1.530$–1.534 2V(meas.) = 42°–52°

Cell Data: *Space Group:* $C\overline{1}$. $a = 8.287$ $b = 12.972$ $c = 7.156$ $\alpha = 91.05°$ $\beta = 116.26°$ $\gamma = 90.15°$ Z = 4

X-ray Powder Pattern: Grande Caldeira, Azores. (ICDD 9-478).
3.211 (100), 3.243 (90), 4.106 (16), 2.162 (16), 6.49 (14), 3.768 (14), 3.726 (14)

Chemistry:

	(1)
SiO_2	62.79
Al_2O_3	22.12
Fe_2O_3	0.36
FeO	0.41
CaO	3.76
Na_2O	7.35
K_2O	2.98
H_2O^+	0.19
H_2O^-	0.07
Total	100.03

(1) Mt. Erebus, Ross Island, Antarctica; corresponds to $(Na_{0.64}Ca_{0.18}K_{0.17})_{\Sigma=0.99}(Al_{0.98}Fe^{2+}_{0.02}Fe^{3+}_{0.01})_{\Sigma=1.01}(Si_{2.81}Al_{0.19})_{\Sigma=3.00}O_8$.

Mineral Group: Feldspar (alkali) group; intermediate between low sanidine and high albite.

Occurrence: In high-temperature sodic volcanic and hypabyssal rocks.

Association: Typically in a fine-grained groundmass or weathered out as loose crystals.

Distribution: Rather abundant worldwide. Some localities for well-characterized material include: on Pantelleria and Ustica Islands, Italy. At Larvik, Norway. From Berkum, North Rhine-Westphalia, Germany. On Grande Caldeira Island, Azores. At Ropp, Nigeria. On Mt. Kenya, Kenya. From Kilimanjaro, Tanzania. At Chilposan, near Minchon, North Korea. From Ogaya, Toyama Prefecture, and Madarajima, Saga Prefecture, Japan. At Kakanui, New Zealand. From Mt. Anakie and Mt. Franklin, Daylesford, Victoria, Australia. Large crystals from Mt. Erebus, Ross Island, Antarctica. At Boron, Kern Co., California, USA.

Name: From the Greek for *oblique* and *fracture*, descriptive of the cleavage.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 324–325. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 6–93. (3) Phillips, W.R. and D.T. Griffen (1981) Optical mineralogy, 342–344. (4) Carmichael, I.S.E. and W.S. MacKenzie (1964) The lattice parameters of high-temperature triclinic sodic feldspars. Mineral. Mag., 33, 949–962. (5) Harlow, G.E. (1982) The anorthoclase structures: the effects of temperature and composition. Amer. Mineral., 67, 975–996.