

## Sanidine

(K, Na)(Al, Si)<sub>4</sub>O<sub>8</sub>

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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . Crystals commonly tabular on {010}, with a square cross section, to 50 cm. Acicular in spherulites. *Twinning:* Carlsbad twins are common, Baveno and Manebach twins rarer.

**Physical Properties:** *Cleavage:* Perfect on {001}, distinct on {010}; parting on {100}. *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. Hardness = 6 D(meas.) = 2.56–2.62 D(calc.) = [2.56]

**Optical Properties:** Transparent. *Color:* Colorless to white; colorless in thin section. *Streak:* White. *Luster:* Vitreous, pearly on cleavage. *Optical Class:* Biaxial (-). *Orientation:*  $Y = b$ ;  $Z \wedge c \simeq -20^\circ$  (low);  $Z = b$ ;  $Y \wedge c \simeq -21^\circ$  (high). *Dispersion:*  $r < v$  or  $r > v$ , weak.  $\alpha = 1.518$ – $1.524$   $\beta = 1.522$ – $1.529$   $\gamma = 1.522$ – $1.530$   $2V(\text{meas.}) = 18^\circ$ – $42^\circ$  (low);  $15^\circ$ – $63^\circ$  (high)

**Cell Data:** *Space Group:*  $C2/m$  (high).  $a = 8.603(2)$   $b = 13.036(4)$   $c = 7.174(2)$   $\beta = 116.03(2)^\circ$   $Z = 4$

**X-ray Powder Pattern:** Locality unknown. 3.326 (100), 3.284 (60), 3.788 (57), 4.235 (53), 3.225 (52), 2.584 (35), 3.458 (31)

Chemistry:	(1)	(2)	(1)	(2)
SiO <sub>2</sub>	64.79	67.27	Na <sub>2</sub> O	6.45
Al <sub>2</sub> O <sub>3</sub>	18.50	18.35	K <sub>2</sub> O	16.79
FeO + Fe <sub>2</sub> O <sub>3</sub>		0.92	H <sub>2</sub> O <sup>+</sup>	0.08
CaO		0.15	H <sub>2</sub> O <sup>-</sup>	0.08
			Total	100.08
				100.35

(1) Buck claims, Bernic Lake, Canada; by electron microprobe, average of analyses on six crystals; corresponds to  $\text{K}_{0.99}\text{Al}_{1.01}\text{Si}_{3.00}\text{O}_8$ . (2) Mitchell Mesa rhyolite, Texas, USA; corresponds to  $(\text{Na}_{0.56}\text{K}_{0.40}\text{Ca}_{0.01})_{\Sigma=0.97}(\text{Al}_{0.97}\text{Fe}_{0.03}^{3+})_{\Sigma=1.00}\text{Si}_{3.01}\text{O}_8$ .

**Polymorphism & Series:** High sanidine forms a series with high albite.

**Mineral Group:** Feldspar (alkali) group; (Al,Si) completely disordered.

**Occurrence:** Most common in felsic volcanic and hypabyssal rocks as rhyolites, phonolites, trachytes; as spherulites in volcanic glass. Also from ultrapotassic mafic, high-temperature contact metamorphic (sanidinite facies), and hydrothermally altered rocks. From eclogite nodules in kimberlite.

**Association:** Quartz, sodic plagioclase, muscovite, biotite, “hornblende,” magnetite.

**Distribution:** Not uncommon, but rare in crystals of any size. In Germany, from Drachenfels, Siebengebirge, Rhine; and at Hohenfels, Mendig, Mayen, and elsewhere around the Laacher See, Eifel district. In France, at Mt. Dore, Auvergne, and Puy Gros du Laney, Puy-de-Dôme. From Vesuvius and Monte Somma, Campania, and Monte Cimino, Lazio, Italy. At Daichi, Wakayama Prefecture, Japan. From Kanchin-do, Meisem-gun, northeast Korea. In the USA, at Tooele, Tooele Co., Utah; Cottonwood Canyon, Peloncillo Mountains, Cochise Co., Arizona; as large crystals in Rabb Canyon and near the crest of the Black Range, Grant Co., New Mexico. From Bernic Lake, Manitoba, and Mont Saint-Hilaire, Quebec, Canada. In the Sierra de San Francisco, Durango, Mexico.

**Name:** From the Greek for *tablet* or *board*, in allusion to the mineral’s common habit.

**References:** (1) Dana, E.S. (1892) Dana’s system of mineralogy, (6th edition), 318. (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) Ferguson, R.B., N.A. Ball, and P. Černý (1991) Structure refinement of an adularian end-member high sanidine from the Buck Claim pegmatite, Bernic Lake, Manitoba. Can. Mineral., 29, 543–552. (5) Scheel, H.J. (1971) Lead feldspar. Zeits. Krist., 133, 264–272.

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