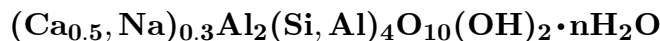


Beidellite



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Crystal Data: Monoclinic, pseudohexagonal. *Point Group:* $2/m$. As thin plates, laths, and ribbons, to 30 μm ; in veinlets filling fractures and as claylike masses.

Physical Properties: *Cleavage:* Perfect on $\{001\}$. Hardness = 1–2 $D(\text{meas.}) = 2\text{--}3$ depending on hydration. $D(\text{calc.}) = \text{n.d.}$ Positive identification of minerals in the smectite group may need data from DTA curves, dehydration curves, and X-ray powder patterns before and after treatment by heating and with organic liquids.

Optical Properties: Translucent. *Color:* White, reddish brown, brownish gray. *Luster:* Waxy to vitreous.

Optical Class: Biaxial (–). $\alpha = 1.494$ $\beta = 1.536$ $\gamma = 1.536$ $2V(\text{meas.}) = 9^\circ\text{--}16^\circ$

Cell Data: *Space Group:* $C2/m$. $a = 5.179$ $b = 8.970$ $c = 17.57$ $\beta = [\sim 90^\circ]$
 $Z = \text{n.d.}$

X-ray Powder Pattern: Black Jack mine, Idaho, USA; glycolated, diffuse pattern. 17.6 (100), 4.42 (100), 3.95 (100), 3.54 (100), 2.50 (100), 1.498 (100), 2.57 (80)

Chemistry:	(1)	(2)		(1)	(2)
SiO ₂	45.32	45.83	CaO	2.76	1.41
TiO ₂		0.46	Na ₂ O	0.10	0.16
Al ₂ O ₃	27.84	22.79	K ₂ O	0.12	0.09
Fe ₂ O ₃	0.70	5.71	H ₂ O ⁺	14.48	9.79
FeO		0.28	H ₂ O [–]	8.16	12.55
MgO	0.16	0.86	Total	99.64	99.93

(1) Black Jack mine, Idaho, USA; corresponds to $(\text{Ca}_{0.23}\text{Na}_{0.02}\text{K}_{0.01})_{\Sigma=0.26}(\text{Al}_{1.96}\text{Fe}_{0.04}^{3+}\text{Mg}_{0.02})_{\Sigma=2.02}(\text{Si}_{3.46}\text{Al}_{0.54})_{\Sigma=4.00}\text{O}_{10}(\text{OH})_2$. (2) Velka Kopan, Ukraine; corresponds to $(\text{Ca}_{0.12}\text{Na}_{0.02}\text{K}_{0.01})_{\Sigma=0.15}(\text{Al}_{1.62}\text{Fe}_{0.33}^{3+}\text{Mg}_{0.10}\text{Ti}_{0.03}\text{Fe}_{0.02}^{2+})_{\Sigma=2.10}(\text{Si}_{3.54}\text{Al}_{0.46})_{\Sigma=4.00}\text{O}_{10}(\text{OH})_2$.

Mineral Group: Smectite group.

Occurrence: A constituent of bentonitic clays; an alteration product in hydrothermal mineral deposits, especially porphyry Cu-Mo systems; in soils derived from mafic rocks.

Association: Plagioclase, quartz, orthoclase, montmorillonite, kaolin, allophane, muscovite.

Distribution: Of worldwide occurrence, but pure and well-characterized materials are uncommon. In the USA, from Beidell, Saguache Co., and at Wagon Wheel Gap, Mineral Co., Colorado; in the Black Jack mine, Carson district, Owyhee Co., Idaho; from Arizona, at Morenci, Greenlee Co., Ajo, Pima Co., in the San Manuel mine, Pinal Co., and in the Globe-Miami district, Gila Co.; at Boron, Kern Co., California. In the Princess mine, Namiquipa, Chihuahua, Mexico. From Sibert, Rhône, France. At Unterrupstoth, Bavaria, Germany. From Velka Kopan, Khust, Ukraine.

Name: For Beidell, Colorado, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA, R4762 (Black Jack mine, Idaho, USA); R4761 (Beidell, Colorado, USA, material determined to be a mixture in part).

References: (1) Larsen, E.S. and E.T. Wherry (1925) Beidellite, a new mineral name. *J. Wash. Acad. Sci.*, 15, 465–466. (2) Ross, C.S. and E.V. Shannon (1925) The chemical and optical properties of beidellite. *J. Wash. Acad. Sci.*, 15, 467–468. (3) (1926) *Amer. Mineral.*, 11, 167 (abs. refs. 1 and 2). (4) Deer, W.A., R.A. Howie, and J. Zussman (1963) *Rock-forming minerals*, v. 3, sheet silicates, 226–245. (5) Weir, A.H. and R. Greene-Kelly (1962) Beidellite. *Amer. Mineral.*, 47, 137–146.

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