Hyalophane $(K, Ba)Al(Si, Al)_3O_8$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals similar to adularia or orthoclase, to 20 cm; also granular or massive. *Twinning:* Commonly simple twins according to the Carlsbad, Manebach, or Baveno laws.

Physical Properties: *Cleavage:* Perfect on {001}, good on {010}, intersecting at 90°. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 6–6.5 D(meas.) = 2.58–2.82 D(calc.) = [2.88]

Optical Properties: Transparent to translucent. *Color:* Colorless, white, also flesh-red; colorless in thin section. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Orientation:* $Z = b$; $Y \wedge c = -25°$ to $-45°$; $X \wedge a = 1°$ to $-19°$. *Dispersion:* $r > v$, weak. $\alpha = 1.520–1.542$ $\beta = 1.524–1.545$ $\gamma = 1.526–1.547$ 2V(meas.) = 48°–79°

Cell Data: *Space Group:* $C2/m$. $a = 8.557$ $b = 13.040$ $c = 7.200$ $\beta = 115.69°$ Z = 4

X-ray Powder Pattern: Busovača, Bosnia-Herzegovina. (ICDD 19-2).
3.24 (100), 3.31 (90), 3.00 (70), 3.46 (50), 3.78 (45), 2.57 (45b), 2.91 (40)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2	59.85	49.54	CaO	0.86	0.19
TiO_2		trace	BaO	6.92	19.01
Al_2O_3	20.64	23.14	Na_2O	0.93	1.65
Fe_2O_3		0.11	K_2O	11.07	6.37
MgO	0.21	0.04	H_2O	0.24	
			Total	100.72	100.05

(1) Slyudyanka, Russia; corresponding to $(K_{0.67}Ba_{0.13}Na_{0.09}Ca_{0.04}Mg_{0.01})_{\Sigma=0.94}(Si_{2.85}Al_{1.16})_{\Sigma=4.01}O_8$. (2) Busovača, Bosnia-Herzegovina; by electron microprobe, corresponding to $(K_{0.43}Ba_{0.39}Na_{0.17}Ca_{0.01})_{\Sigma=1.00}(Si_{2.59}Al_{1.42})_{\Sigma=4.01}O_8$.

Polymorphism & Series: Intermediate member of the series orthoclase-celsian.

Mineral Group: Feldspar group.

Occurrence: Typically associated with metamorphosed manganiferous rocks or in mineral deposits rich in manganese.

Association: Manganiferous epidote, rhodonite, rhodochrosite, spessartine, manganiferous tremolite, plagioclase, analcime.

Distribution: From the Lengenbach quarry, Binntal, Valais, Switzerland. At Jakobsberg, Långban, and in the Harstigen mine, near Persberg, Värmland, and in the Sjö mine, near Grythyttan, Örebro, Sweden. From Slyudyanka, near Lake Baikal, Siberia, Russia. Large crystals from Zagradski Creek, near Busovača, Bosnia-Herzegovina. At Aberfeldy, Scotland. In the USA, from Franklin, Sussex Co., New Jersey, and Johnsburg, Warren Co., New York. At Nisikkatch Lake, Saskatchewan, Canada. From Piggery Creek, Broken Hill, New South Wales, Australia. In the Kaso mine, Tochigi Prefecture, and at Minakami, Gumma Prefecture, Japan. From Otjosondu, Namibia. A few other localities are known.

Name: From the Greek for *glass* and *to appear*, in reference to its transparency in crystals.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 321–322. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 166–178. (3) De Pieri, R., S. Quareni, and K.M. Hall (1977) Refinement of the structures of low and high hyalophanes. Acta Cryst., 33, 3073–3076. (4) Phillips, W.R. and D.T. Griffen (1981) Optical mineralogy, 360–363.