Heulandite-Ba $(Ba,Ca,Sr,K,Na)_5Al_9Si_{27}O_{72}\cdot 22H_2O$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As thick tabular, trapezoidal crystals, to 4 mm, displaying {100}, {010}, {001}, {$\bar{1}$ 11} and {20$\bar{1}$ }; as aggregates to several cm.

Physical Properties: *Cleavage*: Perfect on {010}. *Fracture*: Uneven to subconchoidal. *Tenacity*: Brittle. Hardness = 3.5 D(meas.) = 2.35(1) D(calc.) = 2.350

Optical Properties: Transparent to translucent. *Color*: Colorless to white, pale yellowish white or beige. *Streak*: White. *Luster*: Vitreous, pearly on {010} cleavage surfaces. *Optical Class*: Biaxial (+). α = 1.5056(5) β = 1.5064(5) γ = 1.5150(5) 2V(meas.) = 38(1)° 2V(calc.) = 34.1° *Pleochroism*: None. *Dispersion:* Distinct, *r* > *v*. Orientation: *X* ^ *c* varies between 39 and 51°; *Z* = *b*.

Cell Data: *Space Group*: *C*2/*m*. *a* = 17.738(3) *b* = 17.856(2) *c* = 7.419(1) β = 116.55(2)° *Z* = 1

X-ray Powder Pattern: Northern Ravnås prospect, Kongsberg ore district, Norway. 2.973 (100), 3.978 (97), 7.941 (66), 4.650 (66), 2.807 (65), 5.116 (59), 3.181 (56)

Chemistry:

	(1)
SiO_2	54.26
Al_2O_3	15.27
MgO	<0.1
CaO	2.65
SrO	1.03
BaO	12.76
Na_2O	0.34
K_2O	0.58
H_2O	13.1
Total	99.99

(1) Northern Ravnås prospect, Kongsberg ore district, Norway; average of 14 electron microprobe analyses, H_2O by thermogravimetric analysis and confirmed by IR spectroscopy, corresponding to $(Ba_{2.49}Ca_{1.41}Sr_{0.30}K_{0.37}Na_{0.33})_{\Sigma=4.90}Al_{8.96}Si_{27.00}O_{72.00}\cdot 21.75H_2O$.

Occurrence: A late stage mineral in hydrothermal quartz-calcite veins.

Association: Acanthite, barite, chalcopyrite, fluorite, galena, sphalerite, silver, brewsterite, other heulandite-series zeolites, calcite, harmotome.

Distribution: From the Northern Ravnås prospect, southern Vinoren, Kongsberg ore district, Flesberg community, Buskerud county, and from the Bratteskjerpet mine, Saggrenda, and at Sjoa in Sel community, Oppland county, Norway.

Name: For its chemical composition and relationship to other heulandite minerals.

Type Material: Geological Museum, University of Oslo, Norway (33929).

References: (1) Larsen, A.O., F.S. Nordrum, N. Döbelin, T. Armbruster, O.V. Petersen, and M. Erambert. (2005) Heulandite-Ba, a new zeolite species from Norway. Eur. J. Mineral., 17, 143-153. (2) (2005) Amer. Mineral., 90, 1945-1946 (abs. ref. 1).