Hexacelsian $BaAl_2Si_2O_8$

Crystal Data: Hexagonal. *Point Group*: 6/*m* 2/*m* 2/*m*. As thin elongate crystals to 50 μm in isolated oval polymineralic inclusions to 2 cm in rankinite. Also in angular aggregates interstitial to grains in paralava.

Physical Properties: *Cleavage*: Very good on {0001}. *Tenacity*: n.d. *Fracture*: Irregular. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.305

Optical Properties: Transparent. *Color*: Colorless. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial. *n*(calc.) = 1.561 *Pleochroism*: None.

Cell Data: *Space Group*: $P6_3/mcm$. a = 5.2920(4) c =15.557(2) $\alpha = \beta = 90°$ γ=120° Z = n.d.

X-ray Powder Pattern: Calculated pattern from synthetic analog.
3.949 (100), 2.965 (75), 2.646 (44), 2.198 (30), 7.779 (28), 1.582 (22), 1.852 (20)

Chemistry:	(1)
SiO_2	33.06
Fe_2O_3	1.55
Al_2O_3	26.07
CaO	0.64
BaO	37.76
K_2O	0.75
Na_2O	0.08
Total	99.91

(1) Gurim Anticline, near Arad, Negev Desert, Israel; average of 14 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to $(Ba_{0.911}K_{0.059}Ca_{0.042}Na_{0.010})_{\Sigma=1.022}$ $Al_{1.891}Fe^{3+}_{0.072}Si_{2.034}O_8$.

Occurrence: A common accessory mineral in thin veins of paralava cutting gehlenite-flamite hornfels and formed at > 1100° C from the relatively fast crystallization of residual melt.

Association: Gurimite, rankinite, gehlenite, pseudowollastonite, schorlomite, fluorapatite-fluorellestadite, minerals of the zadovite-aradite series, walstromite.

Distribution: Found at the Gurim Anticline, near Arad, Negev Desert, Israel.

Name: Historical name of the synthetic phase with structure and composition analogous to the mineral described in this paper and named after Anders Celsius (1701-1744), Swedish astronomer, physicist, and naturalist.

Type Material: Mineralogical Museum, University of Wroclaw, Poland (MMUWr II-20465).

References: (1) Galuskina, I.O., E.V. Galuskin, Ye. Vanek, K. Prusik, M. Stasiak, P. Dzierżanowski, and M. Murashko (2017) Gurimite, $Ba_3(VO_4)_2$ and hexacelsian, $BaAl_2Si_2O_8$ - two new minerals from schorlomite-rich paralava of the Hatrurim Complex, Negev Desert, Israel. Mineral. Mag., 81(4), 1009-1019. (2) (2018) Amer. Mineral., 103, 2526-2527 (abs. ref. 1).