Hexacelsian  \( \text{BaAl}_2\text{Si}_2\text{O}_8 \)

**Crystal Data:** Hexagonal.  \( \text{Point Group: 6}_h \text{mm} 2/\text{mm} \)  \( 2/\text{mm} \). As thin elongate crystals to 50 \( \mu \text{m} \) in isolated oval polyminerallc inclusions to 2 cm in rankinite. Also in angular aggregates interstitial to grains in paralava.

**Physical Properties:**  
- Cleavage: Very good on \( \{001\} \).  
- Tenacity: n.d.  
- Fracture: Irregular.  
- Hardness = n.d.  
- \( \text{D(meas.)} = \text{n.d.} \)  
- \( \text{D(calc.)} = 3.305 \)

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

**Cell Data:**  
- \( \text{Space Group: P6}_3/\text{mmc} \).  
- \( a = 5.2920(4) \)  
- \( c = 15.557(2) \)  
- \( \alpha = \beta = 90^\circ \)  
- \( \gamma = 120^\circ \)  
- \( Z = \text{n.d.} \)

**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:**

\[
\begin{align*}
\text{SiO}_2 & \quad 33.06 \\
\text{Fe}_2\text{O}_3 & \quad 1.55 \\
\text{Al}_2\text{O}_3 & \quad 26.07 \\
\text{CaO} & \quad 0.64 \\
\text{BaO} & \quad 37.76 \\
\text{K}_2\text{O} & \quad 0.75 \\
\text{Na}_2\text{O} & \quad 0.08 \\
\text{Total} & \quad 99.91 
\end{align*}
\]

(1) Gurim Anticline, near Arad, Negev Desert, Israel; average of 14 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to \( (\text{Ba}_{0.911}\text{K}_{0.059}\text{Ca}_{0.042}\text{Na}_{0.010})\Sigma=1.022 \)  
\( \text{Al}_{1.891}\text{Fe}^{3+}_{0.072}\text{Si}_{2.034}\text{O}_8 \).

**Occurrence:** A common accessory mineral in thin veins of paralava cutting gehlenite-flamite hornfels and formed at > 1100 \(^\circ\) 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).