

# Hillesheimite $(K, Ca, \square)_2(Mg, Fe, Ca, \square)_2[(Si, Al)_{13}O_{23}(OH)_6](OH) \cdot 8H_2O$

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**Crystal Data:** Orthorhombic. *Point Group:* 2/m 2/m 2/m. As flattened, square to lath-like crystals to 1.5 mm and in near parallel or sheaf-like clusters to 2 mm.

**Physical Properties:** *Cleavage:* Perfect on (010), less perfect on (100) and (001). *Tenacity:* Brittle. *Fracture:* n.d. *Hardness* = 4 *D(meas.)* = 2.16(1) *D(calc.)* = 2.174

**Optical Properties:** Transparent to translucent. *Color:* Colorless, yellow, brown. *Streak:* White. *Luster:* n.d. *Optical Class:* Biaxial (-).  $\alpha = 1.496(2)$   $\beta = 1.498(2)$   $\gamma = 1.499(2)$   $2V_{meas} = 80^\circ$   $2V_{calc.} = 70^\circ$  *Orientation:*  $Y = b$ .

**Cell Data:** *Space Group:* Pmmn.  $a = 6.979(11)$   $b = 37.1815(18)$   $c = 6.5296(15)$   $Z = 2$

**X-Ray Diffraction Pattern:** Graulai quarry, near Hillesheim, Rhineland-Palatinate, Germany. 6.545 (100), 4.787 (96), 3.065 (86), 2.958 (62), 2.767 (62), 4.499 (59), 6.857 (58)

Chemistry:	(1)
Na <sub>2</sub> O	0.24
K <sub>2</sub> O	4.15
MgO	2.14
CaO	2.90
BaO	2.20
FeO	2.41
Al <sub>2</sub> O <sub>3</sub>	15.54
SiO <sub>2</sub>	52.94
<u>H<sub>2</sub>O</u>	[19.14]
Total	101.65

(1) Graulai quarry, near Hillesheim, Rhineland-Palatinate, Germany; average electron microprobe analysis supplemented by IR spectroscopy, H<sub>2</sub>O calculated from structure; corresponds to K<sub>0.96</sub>Na<sub>0.08</sub>Ba<sub>0.16</sub>Ca<sub>0.56</sub>Mg<sub>0.58</sub>[Si<sub>9.62</sub>Al<sub>3.32</sub>O<sub>23</sub>(OH)<sub>6</sub>][(OH)<sub>0.82</sub>(H<sub>2</sub>O)<sub>0.18</sub>]·8H<sub>2</sub>O.

**Mineral Group:** Phyllosilicate, günterblassite group.

**Occurrence:** Encrusts the walls of miarolitic cavities in alkali basalt.

**Association:** Nepheline, augite, fluorapatite, magnetite, perovskite, priderite, götzenite, lampophyllite group minerals, åkermanite.

**Distribution:** From the Graulai basalt quarry, near Hillesheim, Eifel Mountains, Rhineland-Palatinate (Rheinland-Pfalz), Germany.

**Name:** For the town of *Hillesheim*, near where the studied samples were collected.

**Type Material:** A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (4174/1).

**References:** (1) Chukanov, N.V., N.V. Zubkova, I.V. Pekov, D.I. Belakovskiy, W. Schüller, B. Ternes, G. Blass, and D.Y. Pushcharovsky (2013) Hillesheimite,  $(K, Ca, \square)_2(Mg, Fe, Ca, \square)_2[(Si, Al)_{13}O_{23}(OH)_6](OH) \cdot 8H_2O$ , a new phyllosilicate mineral of the günterblassite group. *Geology of Ore Deposits* 55, 549-557.