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

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 (-). α = 1.496(2) β = 1.498(2) γ = 1.499(2) 2Vmeas = 80° 2V(calc.) = 70° *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_2O	0.24
K_2O	4.15
MgO	2.14
CaO	2.90
BaO	2.20
FeO	2.41
Al_2O_3	15.54
SiO_2	52.94
H_2O	[19.14]
Total	101.65

(1) Graulai quarry, near Hillesheim, Rhineland-Palatinate, Germany; average electron microprobe analysis supplemented by IR spectroscopy, H_2O calculated from structure; corresponds to $K_{0.96}Na_{0.08}Ba_{0.16}Ca_{0.56}Mg_{0.58}[Si_{9.62}Al_{3.32}O_{23}(OH)_6][(OH)_{0.82}(H_2O)_{0.18}]\cdot 8H_2O$.

Mineral Group: Phyllosilicate, günterblassite group.

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

Association: Nepheline, augite, fluorapatite, magnetite, perovskite, priderite, götzenite, lamprophyllite 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.