Gmelinite-K $Na_4(Si_8Al_4)O_{24}\cdot 11H_2O$

Crystal Data: Hexagonal. *Point Group*: 6/*m* 2/*m* 2/*m*. As granular or radial aggregates of columnar to acicular crystals, to 3 mm, commonly with a hexagonal outline, showing {10*0}, {10*1}, and {00*1}.

Physical Properties: [*Cleavage*: {10*0}, distinct; parting on {00*1}.] *Fracture*: Conchoidal. *Tenacity*: Brittle. VHN = 247-280, 258 average (30 g load). Hardness = 4 D(meas.) = 2.00(2) D(calc.) = 2.01

Optical Properties: Transparent. *Color*: Colorless to brownish. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (-). ω = 1.477(1) ε = 1.471(1)

Cell Data: *Space Group*: $P6_3/mmc$. a = 13.715(2) c = 10.256(2) Z = 2

X-ray Powder Pattern: Mount Alluaiv, Lovozero alkaline massif, Kola Peninsula, Russia. 4.11 (100), 2.719 (100), 11.9 (80), 2.971 (80), 2.852 (80), 5.16 (70), 3.27 (70)

Chemistry:

	(1)
SiO_2	50.54
Al_2O_3	18.53
CaO	1.56
Na_2O	2.63
K_2O	7.54
H_2O	19.20
Total	100.00

(1) Mount Alluaiv, Lovozero alkaline massif, Kola Peninsula, Russia; by electron microprobe and TGA, corresponds to $(K_{1.62}Na_{0.86}Ca_{0.28})_{\Sigma=2.75}(Al_{3.67}Si_{8.49})_{\Sigma=12.16}O_{24}\cdot 10.76H_2O$.

Mineral Group: Zeolite group.

Occurrence: As drusy aggregates in cavities within brecciated pegmatite.

Association: K-feldspar, nepheline, sodalite, cancrinite, amphibole, pyroxene.

Distribution: At Mount Alluaiv, Lovozero alkaline massif, Kola Peninsula, Russia [TL]. From Fara Vicentina, Vicenza, Italy.

Name: For Christian Gottlob *Gmelin* (1792-1860), mineralogist and chemist of Tübingen, Germany. The suffix indicates the predominance of K as the extra-framework cation.

Type Material: A.E. Fersman Mineralogical Museum, Moscow, Russia.

References: (1) Khomyakov, A.P., L.I. Polezhaeva, and Yu.A. Malinovsky (2001) Gmelinite-K, $(K,Na,Ca)_6[Al_7Si_{17}O_{48}]\cdot 22H_2O$, a new zeolite mineral from the Lovozero alkaline massif, Kola Peninsula, Russia. Zap. Vseross. Mineral. Obshch., 130(3), 65-71 (in Russian, English abs.). (2) (2002) Amer. Mineral., 87, 1510 (abs. ref. 1). (3) Coombs, D.S., A. Alberti, T. Armbruster, G. Artioli, C. Coltella, E. Galli, J.D. Grice, F. Liebau, J.A. Mandarino, H. Minato, and others (1997) Recommended nomenclature for zeolite minerals: Report of the Subcommittee on Zeolites of the IMA, Commission on New Minerals and Mineral Names. Can. Mineral., 35, 1571-1606.