Na/K and Na/Li substituted aluminosilicate nitrate cancrinites

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Cancrinites are the original class of microporous materials with so called ε-cages of sixring and fourring formed by TO_4-units (here T = Al, Si) and thereby including larger channels through the structures. We report here on synthesis and characterisation of the new forms of Na/K, Na/Li substituted cancrinites. The sodium form $Na_{6+x}[Al_6Si_6O_{24}](NO_3)_x(H_2O)_y$ (TG => x ≈ 1, y ≈ 3) was directly prepared by soft chemical methods [1]. This form has been used as mother compound together with $LiNO_3$ and KNO_3 solutions under synthesis conditions obtaining the appropriate Li and K form. The lattice parameter (Tab. 1) show increased values with increasing cation size. This is explained by a decrease of the tilt angle of rigid TO_4-unit as defined here and supported by results of Rietveld refinements of X-ray powder data and infrared investigations.

Table 1: Lattice parameter of the different cancrinite forms

Cancrinite form	a /pm	c /pm	V /10^6pm^3
Na/Li	1246.76(5)	501.92(3)	675.66(7)
Na	1265.89(2)	518.15(1)	719.08(3)
Na/K	1303.56(5)	535.65(2)	788.27(7)

[1] Buhl J.-Ch., Stief F., Fechtelkord M., Gesing Th.M., Taphorn U., Taake C., *J. Alloys Compd.,* 2000, **305**, 93.

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