Crystal Structure of β-$KU_2(PO_4)_3$ – a Member of the Group with NZP Structure Type

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The study of synthetic double Potassium-Uranium orthophosphate $KU_2(PO_4)_3$ is part of a program on the crystal chemistry of double orthophosphates with general formula $(M1)_{0\rightarrow1}(M2)_{0\rightarrow3}\{[L_2(PO_4)_3]^{p-}\}_{3\infty}$, where $(M1)_{0\rightarrow1}$ and $(M2)_{0\rightarrow3}$ are types of extraframework cation positions in holes with the indications of position numbers and L is the framework position, that includes determination of phases obtained by sol-gel technique. The $NaZr_2(PO_4)_3$ (NZP) structural type [1] is widely distributed among them. The distinguishing characteristic feature of the NZP structure is that the same crystallographic positions in this structure can accommodate elements, both small and large, in oxidation states from +1 to +5 with retention of the principal framework. In this work the compound β-$KU_2(PO_4)_3$ was recently studied by x-ray powder diffraction and Rietved method in space group R-3c. The synthesis of new framework phosphates belonging to the NZP structural type, as well as detailed analysis of the geometric and topological features of the structures of new and known NZP-type phosphates aimed at revealing correlations between the crystal structures of these compounds and the practically valuable physicochemical properties, have attracted considerable attention in recent years [2].

[1] Hong H.Y.-P., *Mat. Res. Bull.*, 1976, **11**(2), 173-182. [2] Alamo J., *Solid State Ionics.*, 1993, **63-65**, 547.

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