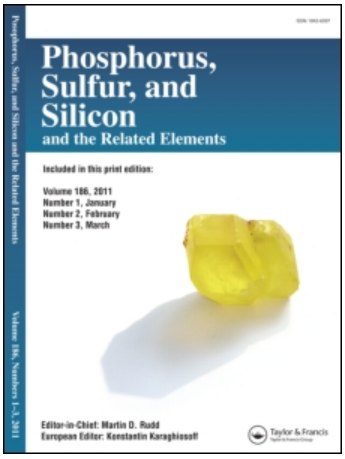

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Investigation of Systems (A, A') 2 O-TiO 2 -P 2 O 5 with Mutually Different Alkali Elements

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INVESTIGATION OF SYSTEMS (A, A′)$_2$O-TiO$_2$-P$_2$O$_5$ WITH MUTUALLY DIFFERENT ALKALI ELEMENTS

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The interest in the $NaZr_2(PO_4)_3$ (NZP) structural family arises due to its potential use as host for radioactive wastes. In comparison with other waste forms the advantages of the NZP ceramics lie in its ability to accommodate a large number of multivalent ions into a single crystalline phase and chemical bonding of alkali elements. Introduction in a host phase of cheaper and lighter titanium instead of the commonly used zirconium permits us to obtain cheaper ceramic with larger content of alkali elements.

Single phase phosphates corresponding to crystalline solution (continuous or limited) with the structure similar to NZP were found in the series of compounds with the general formula $A_{1-x+4n}A'_xTi_{2-n}(PO_4)_3$, with $n = 0$, 0.5 and 1, and $0 \leq x \leq 1 + 4n$ containing Li-Na, Li-K, Li-Rb, Li-Cs, Na-K, Na-Cs, K-Rb, K-Cs, Rb-Cs in pairs.

The phosphates were prepared by direct solid state reactions in air and studied by powder x-ray diffraction, infrared absorption spectroscopy, and electron microprobe analyses. Leach studies were performed at 25°C for 3 weeks in deionized water.

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