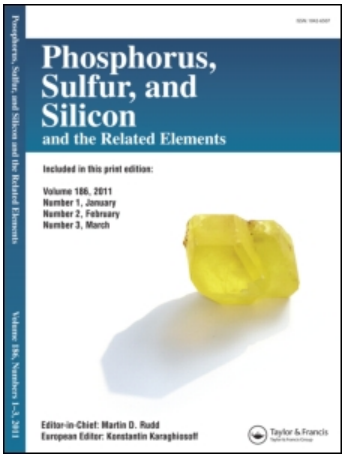

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Systems on Gallium Polyphosphate Base and Classification of Diagrams

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SYSTEMS ON GALLIUM POLYPHOSPHATE BASE AND CLASSIFICATION OF DIAGRAMS

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The interaction of gallium polyphosphate with phosphates of alkali and alkali-earth metals has been studied for the first time. Synthesis of $Ga(PO_3)_3$ was accomplished by solid phase reaction. IR-spectra of $Ga(PO_3)_3$ shows it to belong to polyphosphates. Diagrams have been studied by the differential-thermal method. The systems - $Ga(PO_3)_3$ - $LiPO_3$ and $Ga(PO_3)_3$ - $NaPO_3$ are eutactic. New compounds with composition of 1:1, melting with decomposition $KGa(PO_3)_4$ at 760°C, $RbGa(PO_3)_4$ at 810°C, $CsGa(PO_3)_4$ at 745°C have been revealed in systems $Ga(PO_3)_3$ - KPO_3, $Ga(PO_3)_3$ - $RbPO_3$, $Ga(PO_3)_3$ - $GsPO_3$. Analysis of IR-spectra of the isolated compounds made it possible to consider them as polyphosphates. The results of paper chromatography confirm polymer structure of anions of these compounds. The interaction of gallium polyphosphate with polyphosphates of alkali-earth metals shows the formation of eutactic type diagram. The data obtained as well as available in literature on diagrams of double systems from phosphates of univalent and three valent metals have been compared and analysed. The difference in properties of cations (charge, radius, polarization properties, covalency of bonds of metal-oxygen, crystal-chemical characteristics) are taken as a criterion of the interaction of components. This approach made it possible to compose the classification of systems where two groups are distinguished: the one where Al, Ga, Gn, Tl are three valent cation (systems with Fe(III) and Mn(III) belong to them); the other - Sc, Y, La and Ln. The classification given permits to make prognosis of uninvestigated systems.