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Interaction in Systems $\text{Ln}_2\text{O}_3\text{-CsPO}_3$ and $\text{Ln}_2\text{O}_3\text{-UO}_3\text{-CPO}_3$

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INTERACTION IN SYSTEMS $\text{Ln}_2\text{O}_3\text{-CsPO}_3$ AND $\text{Ln}_2\text{O}_3\text{-UO}_3\text{-CsPO}_3$

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The systems $\text{Ln}_2\text{O}_3\text{-CsPO}_3$ and $\text{Ln}_2\text{O}_3\text{-UO}_3\text{-CsPO}_3$ were investigated and three sets of compounds A, B, C were isolated.

The compounds of series: $\text{Cs}_7\text{Ln}_4(\text{P}_2\text{O}_7)_4\text{PO}_4$, Ln:Sm-Tb, are formed at molar ratio of the components CsPO_3 : $\text{Ln}_2\text{O}_3=6\text{-}10$, and temperatures from $500\text{-}700^\circ\text{C}$. Two types of different anion formation P_2O_7 and PO_4 were detected by paper chromatography method.

The compounds of the isostructural series B - CsLnP_2O_7 , Ln:Sm-Lu, were formed by reaction of LnPO_4 with CsPO_3 at $600\text{-}700^\circ\text{C}$.

The compounds of isostructural series C: $\text{Cs}_{12}\text{Ln}_4(\text{UO}_2)_2(\text{P}_2\text{O}_7)_7$ Ln:Nd-Er, are obtained by reaction of UO_3 and Ln_2O_3 with molten CsPO_3 at $700\text{-}740^\circ\text{C}$.

Phases of A, B, C series decompose when melted into solid LnPO_4 and liquid.

Temperatures ($^\circ\text{C}$) of thermal decomposition of the A set of compounds are:

625 (Nd), 910 (Sm), 930 (Eu), 930 (Tb),
for the B set the temperatures are:

1000 (Eu), 1240 (Ho),
and these for the C set are 900 (Nd), 980 (Sm), 1020 (Eu),
970 (Er).