

Lead phosphate glasses modified by additions of gallium(III) oxide

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Lead phosphate glasses doped with Ga_2O_3 were prepared and studied in the compositional series A: $(50-x)\text{PbO}-x\text{Ga}_2\text{O}_3-50\text{P}_2\text{O}_5$ within the concentration range of $x=0-15$ mol

The structure of the glasses was studied by Raman spectroscopy. Optical properties were studied using critical angle method. Differential thermal analysis, thermodilatometry and heating microscopy have been used to study thermal behaviour of the glasses.

According to the Raman spectra, the glass structure consist of tetrahedral PO_4 metaphosphate (Q^2) units and increasing Ga_2O_3 content leads to their transformation to Q^1 units. In the glasses with high Ga_2O_3 content we can see vibrational bands belonging to GaO_6 and GaO_4 structural units.

Index of refraction decreases and Abbe number increases with increasing Ga_2O_3 content in B series. DSC studies showed that all of glasses crystallize on heating within the temperature region of $365-800^\circ$ C. Compounds formed by crystallization were $\text{Ga}(\text{PO}_3)_3$ and GaPO_4 . Glass transition temperature and crystallization temperature increase with increasing Ga_2O_3 content. The thermal stability of glasses in A series has a maximum at 10 mol

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