

Physical Properties and Elastic Studies of Fluoroaluminate Glasses Based on Alkali

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Abstract : Fluoroaluminate glasses have been reported as the earliest heavy metal fluoride glasses. By comparison with fluoroaluminate glasses, they offer a set of similar optical features, but also some differences in their elastic and chemical properties. In practice they have been less developed because their stability against devitrification is smaller than that of the most stable fluorozirconates. The purpose of this study was to investigate glass formation in systems $\text{AlF}_3\text{-YF}_3\text{-PbF}_2\text{-MgF}_2\text{-MF}_2$ ($M = \text{Li, Na, K}$). Synthesis was implemented at room atmosphere using the ammonium fluoride processing. After fining, the liquid was into a preheated brass mold, then annealed below the glass transition temperature for several hours. The samples were polished for optical measurements. Glass formation has been investigated in a systematic way, using pseudo ternary systems in order to allow parameters to vary at the same time. We have chosen the most stable glass compositions for the determination of the physical properties. These properties including characteristic temperatures, density and proprieties elastic. Glass stability increases in multicomponent glasses. Bulk samples have been prepared for physical characterization. These glasses have a potential interest for passive optical fibers because they are less sensitive to water attack than ZBLAN glass, mechanically stronger. It is expected they could have a larger damage threshold for laser power transmission.

Keywords : fluoride glass, aluminium fluoride, thermal properties, density, proprieties elastic

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