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# Glass transition and fragility of polyionic glasses

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## Abstract

We study the glass transition region of ionic fluoride-phosphate (FPS), and fluoride-sulfophosphate (NAFPS) glass series. Considering these glasses as structures which consist of heterogeneous set of environments, and using differential scanning calorimetry (DSC) we discuss length scale of heterogeneity and dependence of dynamic heterogeneity on the ionic bonding. We also comment on influence of these heterogeneities on relaxation from the glassy state towards equilibrium. In order to understand the relaxation process in these glasses, we comment on fragility index at the glass transition temperature, estimated from the heating rate dependence of the glass transition temperature using non-isothermal DSC measurements. We also comment on relation between fragility index and heterogeneity length scale, as well as correlation between ionic conductivity and heterogeneity length scale. Using low-frequency vibrational spectrum, we are able to estimate the Boson peak frequency, and discuss its relation to fragility index and the size of heterogeneous domains estimated using DSC.

**Keywords:** Glass transition, heterogeneity, fragility

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