

Glasses of binary colloidal mixtures in equilibrium and under shear

T. Sentjabrskaya, M. Laurati and S.U. Egelhaaf

We investigate the rheological response of dynamically asymmetric binary colloidal mixtures in the glass state, in relation to their microscopic structure and dynamics. The linear response and equilibrium dynamics close to and in the glass show that mixing induces a softening of the glass state as a result of an effective polydispersity, as predicted by Mode-Coupling Theory. Analysis of the structure reveals a homogeneous mixing of the species and no evidence of depletion effects. The non-linear rheological response to flow and large amplitude oscillatory shear evidence a single yielding point with values of the yield strain and stress which reduce at intermediate mixing volume fractions of the two species, in agreement with the glass softening scenario and the absence of depletion.