

Abstract Submitted
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The dependence of fragility of glass forming liquids on interparticle interactions and density SRIKANTH SASTRY, SHILADITYA SENGUPTA, Jawaharlal Nehru Centre for Advanced Scientific Research, FREDERIC AFFOUARD, FILIPE VASCONCELOS, Universite Lille, JNCASR COLLABORATION — The fragility of a glass forming liquid quantifies the rapidity of the change in viscosity and relaxation times with temperature and is an important material property. We study the influence of interparticle interactions on the fragility of a set of model glass formers using computer simulations. We consider both the kinetic fragility, given by the temperature variation of relaxation times, and the thermodynamic fragility obtained by the temperature variation of the configurational entropy. The Adam-Gibbs relation describes the temperature variation of relaxation times in terms of the variation of the configurational entropy, and thus we expect the kinetic and thermodynamic fragilities to be consistent with each other. We however find that the kinetic fragility increases with increasing softness of the interaction potential, with thermodynamic fragility showing the opposite trend. We rationalize our results by considering the full form of the Adam-Gibbs relation, which requires knowledge in addition of the high temperature activation energies, and explore the role of recent ideas on the scaling of temperature and density in systems exhibiting behavior akin to those with inverse power law interactions.

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