

Abstract Submitted
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Understanding Fragility in Polymers KUMAR KUNAL, The University of Akron, CHRISTOPHER ROBERTSON, Bridgestone Americas Center for Research and Technology, ALEXEI SOKOLOV, The University of Akron, THE UNIVERSITY OF AKRON TEAM, BRIDGESTONE AMERICAS CENTER FOR RESEARCH AND TECHNOLOGY COLLABORATION — Glass transition in polymeric liquids is an important phenomenon that still remains poorly understood. It is accompanied by strongly non-Arrhenius temperature variations of segmental relaxation time τ_α . The deviations of τ_α from Arrhenius behavior is described by the fragility parameter, m : $m = \delta \log \tau_\alpha / \delta(T_g/T)|_{T=T_g}$ where T_g is the glass transition temperature. It appears that polymers are very fragile compared to small molecular weight liquids. However, there are some polymers that have intermediate fragility too. The reason for high fragility of polymers remains a topic of active discussion. We have studied various polymer systems using dielectric spectroscopy and dynamic mechanical analysis, and present an analysis of the results in the framework of chain flexibility, symmetry of the monomer and the packing efficiency of the polymer melt.

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