

Abstract Submitted  
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**The Influence of Additives on Polymer Matrix Mobility and Tg<sup>1</sup>**

JANE LIPSON, JEFFREY DEFELICE, Dartmouth College — In this talk, we model the effects of additives on a polymer matrix and demonstrate how they can shift the physical properties of the matrix relative to those of its pure bulk state. Experimental measurements indicate that different additive species, such as: small organic molecules, gases, ionomers, and nanoparticles, can have a range of effects on the segmental relaxation time and glass transition temperature, Tg, of the polymer matrix. For example, additives can cause Tg suppression (plasticization) or Tg enhancement (antiplasticization) relative to the pure bulk Tg. We have applied a simple kinetic lattice model, the Limited Mobility (LM) model, to probe the connection between Tg and the influence of additives on the local mobility of a polymer matrix. Using our LM model characterizations of additives and their effects on the matrix, we analyze trends in our results and make comparisons with experimental data for a variety of real polymer/additive mixtures.

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