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**Confinement Effects of Neighboring Polymer Domains on the Tgs of Infinitely Dilute Blend Components and Ultrathin Film Layers** CHRISTOPHER EVANS, ROBERT SANDOVAL, JOHN TORKELSON, Northwestern University — Using fluorescence, we study the glass transition temperature (Tg) of a polymer species near the limit of infinite dilution. In blends with very dilute polystyrene (PS), intrinsic (unlabeled) and extrinsic dye-labeled fluorescence exhibit quantitative agreement for PS component Tgs. Dilute (0.1 wt%) PS Tg is strongly perturbed towards the matrix Tg; e.g., 38 C in PnBMA and 119 C in PMMA. These dilute component Tgs yield a range of self-concentrations (0.18-0.47) in the framework of the Lodge-McLeish model. We also study multilayer, nanoconfined films with neighboring polymer domains by fluorescence. For PS supported on a bulk underlayer, the Tg of sub-100 nm PS is perturbed towards the underlayer Tg. For example, the 45 C Tg of a 14-nm PS layer on bulk PnBMA approaches the Tg for 0.1 wt% PS in PnBMA. These results underscore the role of neighboring polymer domains on the dynamics of an infinitely dilute species or an ultrathin polymer film layer and indicate that Tg-confinement effects in blends and thin films can be viewed as variations of the same physical phenomenon.

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