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The Glass Transition of Miscible Binary Polymer-Polymer Thin Films PETER GREEN, The University of Michigan, BRIAN BESANCON, The University of Texas at Austin, CHRISTOPHER SOLES, NIST Polymers Division — Studies of the glass transition temperatures, T_g, of completely miscible thin film blends of tetramethyl bisphenol-A polycarbonate (TMPC) and deuterated polystyrene (dPS), supported by SiO_x/Si, were examined using spectroscopic ellipsometry (SE) and incoherent elastic neutron scattering (INS). While both sets of measurements independently reveal that T_g exhibits qualitatively similar trends with film thickness, h, there were important quantitative differences, which depended on composition. The T_gs measured by INS were consistently larger than those determined by SE for PS weight fractions ϕ>0.1. These observations are rationalized in terms of theory based on the notion of a self- concentration and reveal evidence of heterogeneous component behavior in these miscible polymer-polymer systems.

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