

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Two DSC Glass Transitions in Miscible Blends of Polyisoprene / Poly(4-*tert*-butyl styrene) JUNSHU ZHAO, YE SUN, LIAN YU, MARK EDIGER, University of Wisconsin-Madison — Conventional and temperature modulated differential scanning calorimetry experiments have been carried out on miscible blends of polyisoprene (PI) and poly(4-*tert*-butyl styrene) (P4tBS) over a broad composition range. This system is characterized by an extraordinarily large component T_g difference (~ 215 K) between the two homopolymers. Two distinct calorimetric T_g s were observed in blends with an intermediate composition range (25%~50% PI) by both conventional and temperature modulated DSC. Good agreement was found between the T_g values measured by the two methods. Fitting of the measured T_g s to the Lodge-McLeish model gives a ϕ_{self} of 0.62~0.64 for PI in this blend and 0.02~0.05 for P4tBS. The extracted ϕ_{self} for PI is comparable to reported values for PEO in blends with PMMA and is significantly larger than those reported for other PI blends with smaller component T_g differences. This observation suggests the presence of a confinement effect in PI/P4tBS blends, which results in enhanced fast component dynamics below the effective T_g of the slow component.

Junshu Zhao
University of Wisconsin-Madison

Date submitted: 21 Nov 2008

Electronic form version 1.4