

Abstract Submitted  
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**Entanglement Dynamics in Miscible Polyisoprene / Poly(*p-tert*-butyl styrene) Blends** HIROSHI WATANABE, Kyoto University — Viscoelastic and dielectric behavior was examined for well entangled, miscible blends of high- $M$  *cis*-polyisoprene (PI) and poly(*p-tert*-butyl styrene) (PtBS). The dielectric data of the blends, reflecting the global motion of the PI chains having the type-A dipoles, indicated that PI and PtBS were the fast and slow components therein. At high temperatures  $T$ , the blends exhibited two-step entanglement plateau. The high frequency ( $\omega$ ) plateau height was well described by a simple mixing rule of the entanglement length based on the number fraction of the Kuhn segments. At low  $T$ , the blend exhibited the Rouse-like power-law behavior of storage and loss moduli,  $G' = G'' \sim \omega^{0.5}$ , in the range of  $\omega$  where the high- $\omega$  plateau was supposed to emerge. This lack of the high- $\omega$  plateau was attributed to retardation of the Rouse equilibration of the PI chain over the entanglement length due to the hindrance from the slow PtBS chains: The PI and PtBS chains were equilibrated cooperatively, and the retardation due to PtBS shortened the plateau for PI to a width not resolved experimentally. A simple model for this cooperative equilibration formulated on the basis of the dielectric data described the viscoelastic data surprisingly well.

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