

Abstract Submitted
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Dynamic Heterogeneity in Interacting Miscible Polymer Blends¹

ASHISH GAIKWAD, TIMOTHY LODGE, University of Minnesota — Dynamic heterogeneity leading to time-temperature superposition (tTS) failure has been widely reported in non-interacting/weakly interacting miscible polymer blends. However, coupling of the component dynamic response in blends, even with a huge dynamic asymmetry in the pure components, is possible with H-bonding interactions. This study is focused on finding the minimum level of interaction necessary for thermo-rheological simplicity in blends. Blends of styrene-*co*-vinylphenol (PSVPh) and poly(vinyl methyl ether) (PVME) were chosen. Incorporation of styrene provides an effective way to modulate H-bonding interactions in the system. Linear viscoelastic data indicate that tTS fails for PS/PVME blends, whereas data obtained for different PVPPh/PVME blends showed that tTS was obeyed over a wide temperature range. For PSVPh/PVME blends with low PSVPh content, tTS was successful. This suggests that the presence of alternating styrene and vinyl phenol units was insufficient for dynamic response decoupling. Further studies are in progress, with varying vinyl phenol content in PSVPh, to explore the influence of H-bonding on dynamic heterogeneity and blend dynamics.

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