

Abstract Submitted  
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**Component Dynamics and the Corresponding Compositional Heterogeneity in Bulk and Thin Film Miscible Polymer Blends** HENGXI YANG, PETER GREEN, University of Michigan — Miscible polymer blends are known to be compositional heterogeneous, due to self-concentration and thermally driven compositional fluctuation. In this work we investigate the segmental dynamics of poly(vinyl methyl ether) (PVME) in miscible polymer blends of polystyrene (PS) and PVME, using broadband dielectric spectroscopy, and manifest the correspondence between the component dynamics and the compositional heterogeneity in miscible blends. A single  $\alpha$ -relaxation is observed at high temperatures,  $T$ , obeying Vogel-Fulcher relation, whereas two separate relaxations exist at low  $T$ . One relaxation, slower and exhibiting a strong  $T$ -dependence, is associated with an average local composition with smaller PVME fraction. The other relaxation, known as  $\alpha'$ -relaxation, is weakly  $T$ -dependent and Arrhenius-like at low  $T$ ; it reflects the PVME-rich domains within the confines of glassy PS-rich domains. In PVME/PS thin films confined between aluminum (Al) substrates, an additional relaxation process, due to PVME chains that preferentially segregated to Al interfaces, emerges.

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