

Abstract Submitted  
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**Mechanical Hole Burning Spectroscopic Investigation** QIAN QIN, GREGORY MCKENNA, Texas Tech University — Mechanical spectral hole burning (MSHB) was previously applied to a densely entangled block copolymer and successfully distinguishes the heterogeneous from the homogeneous state. Here, we chose polystyrene (PS) solutions to further investigate the effect of entanglement density on mechanical spectral hole burning. The entanglement density was varied by changing either solution concentration or molecular weight of the PS. Dynamics in different regimes ranging from close to the Rouse regime into the terminal region were also examined. Our results are consistent with a heterogeneous dynamics over both entanglement (or plateau) and Rouse regimes. Terminal relaxation dynamics, on the other hand, were always found to be homogeneous for the PS/diethyl phthalate solutions investigated. In addition, no significant dependence of the hole burning event on entanglement density was observed.

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