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The Effect of Copolymer Composition on the Dynamics of Random Copolymers in a Homopolymer Matrix. SUDESH KAMATH, MARK DADMUN, University of Tennessee — Copolymers can be used as interfacial modifiers in phase separated polymer blends and selective surface segregation. Important parameters in both processes include the amount of copolymer that migrates to the surface and the rate of this segregation, both of which are altered by changing the copolymer composition. The dynamics of random copolymers in a homopolymer matrix are studied using Neutron Reflectivity (NR), Quasi-Elastic Neutron Scattering (QENS) and Lattice Monte Carlo simulations. We have carried out NR and QENS measurements on blends containing 10% Poly(S-ran-MMA) random copolymers with 3 different copolymer compositions dispersed in a PMMA matrix. We have also carried out lattice Monte-Carlo simulations on blends of A-B random copolymers containing 33%, 50% and 66% A in a matrix of a homopolymer melt containing only A monomers using the bond-fluctuation model for polymer melts. Our results indicate that the copolymer composition has a significant impact on the dynamics of the copolymer. Our simulation results also indicate that copolymer composition has a significant impact on the conformation of the copolymer in the homopolymer melt, which in turn has an impact on the system dynamics.

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