

Abstract Submitted  
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**Marker Motion Measurements of Nanoparticles in Polymer Matrices** ALETA HAGMAN, Northwestern University & Argonne National Laboratory, KENNETH R. SHULL, Northwestern University, JIN WANG, XUEFA LI, DONG RYEOL LEE, SURESH NARAYANAN, Argonne National Laboratory — Marker motion can be used to infer the ordering kinetics and nanoparticle dynamics in model polymer/metal nanocomposite thin films. In current experiments, the thermally evaporated gold particles (few nanometers in diameter) act as a marker layer between two polymer layers with different mobilities. The disparity in the mobility causes a marker movement towards the layer with the higher mobility. X-ray standing waves (XSWs), generated by total external reflection above a mirror surface, are used to monitor the time evolution of the gold nanoparticle distribution as the nanocomposite ultrathin films are heated above the polymer glass transition temperatures. Diffusion coefficients are obtained from the time-dependence of the nanoparticle distribution evolution. Polymer/gold interactions has shown to be system dependent, with pol(tert-butyl acrylate) (PtBa) showing weak interactions while poly(2-vinyl pyridine) (PVP) shows strong interactions as expected. Free surface effects relating to mobility will also be discussed.

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