

Abstract Submitted
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Using in-Situ Ellipsometry to Monitor Self-Assembly of Polymer Nanocomposites during Solvent Annealing¹ MELISSA J. VETTLESON, CHEN LI, ETHAN C. GLOR, ROBERT C. FERRIER, RUSSELL J. COMPOSTO, ZAHRA FAKHRAAI, Univ of Pennsylvania — The solvent vapor annealing (SVA) process can efficiently drive the self-assembly of block copolymers and polymer nanocomposites (PNCs); a variety of morphologies and arrangements may be achieved. Unfortunately, due to a lack of simple and effective in-situ characterization methods, little is known of the details of the process. We have developed an in-situ method of analyzing dispersity and orientational anisotropy of gold nanorods as well as other anisotropic nanoparticles in PNCs using spectroscopic ellipsometry. This method can be used to track changes in PNC films during the SVA process. While monitoring changes in the thickness and optical properties of the films in-situ, we assess the changes in particle arrangement and alignment due to the swelling process by tracking the changes in the samples index of refraction and optical birefringence. Using this method we study the effect of brush/media interactions on the final dispersion state and study the effects of both swelling and drying processes on the kinetically trapped states of dispersion in PNC samples.

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