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Combinatorial Investigation of Crazes in Polymer Nanocomposites JONG-YOUNG LEE, UMass-Amherst, ALFRED CROSBY, UMass-Amherst — Self-assembled block copolymer nanocomposite thin films aligned by external fields or surface energetics have potential applications as photonic crystals as well as magnetic storage media. However, the presence of surface terraces and embedded nanoparticles can initiate defects such as crazes which can alter the materials' intended functions. We combine the copper grid technique and combinatorial approaches to quantify craze growth in these systems. We present results on the effects of film thickness, surface terraces, and nanoparticles on crazing phenomena in polystyrene and model poly(styrene-b-2-vinyl pyridine) copolymers. These results guide the future design of advanced nanocomposite films while providing fundamental insight into the molecular interactions of polymers and inorganic nanoparticles under mechanical strain.

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