

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Competing Phase Separation and Dewetting in Nanofilled Polymer Blend Films DIYA BANDYOPADHYAY, The University of Akron, Akron, OH, USA, JACK DOUGLAS, National Institute of Standards and Technology, Gaithersburg, MD, USA, ALAMGIR KARIM, The University of Akron, Akron, OH, USA — The simultaneous phase separation and dewetting of polymer blend films provides for an interesting interplay between the two thermodynamic transitions. Previously we have shown that polystyrene (PS) and polybutadiene (PB) polymer film dewetting can be suppressed by the addition of nanoparticles that segregate to the polymer substrate interface. In the current work, we report the effects of fullerene (C_{60}) nanoparticles on PS/PB blend thin film morphology in both the single phase and two phase regions of phase separation. The incorporation of the nanoparticles leads to distinct effects in the different regimes of phase stability. In the blend one phase region we see film dewetting and contact line pinning of the growing holes in a fashion similar to former homopolymer observations; whereas, in the phase separated regime we see complex patterns that apparently reflect the competitive segregation of the nanoparticles to the polymer-polymer and polymer-substrate interfaces.

Diya Bandyopadhyay
The University of Akron, Akron, OH, USA

Date submitted: 19 Nov 2009

Electronic form version 1.4