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**Morphological stability of thin film PS/TMPC mixtures on SiO<sub>x</sub>-Si substrates** JAMIE KROPKA, PETER GREEN, University of Texas at Austin — Thin homopolymer liquid films may exist in a morphologically unstable or metastable state. The morphological stability is determined by the nature of long- and short-range intermolecular forces. For the case of PS on SiO<sub>x</sub>-Si substrates ( $\sim 2$  nm oxide layer), the potential is predicted to exhibit a minimum at thicknesses,  $h^* \sim 2$  nm, and a maximum at larger  $h$ . The maximum represents a barrier to nucleation of holes. The addition of TMPC, with which PS is miscible, stabilizes the mixture at sufficiently large TMPC concentrations. This stabilization is associated with an increase of the energy barrier to nucleation and a decrease in the magnitude of the potential minimum. These effects are implied by the film morphology through measurements of thickness uniformity, wetting layer thickness ( $h^*$ ), and contact angle. The changes in the interface potential described by the morphology are dictated by the change in long- range (VdW) forces alone. These results are discussed in light of morphological instabilities observed in other thin film polymer-polymer mixtures.

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