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**Role of molecular motion in the Dewetting of Diblock Copolymer Thin Films** GANG CHENG, DVORA PERAHIA, Materials Science and Engineering and Chemistry Department, Clemson University, Clemson, SC 29634-0973 — The dewetting kinetics of polystyrene-block-polyisoprene (PS-PI) thin films on silicon has been studied as a function of temperature using Atomic Force Microscopy (AFM). Thin films of  $\sim 100\text{\AA}$  were annealed above the glass transition temperature for the separate blocks and the surface morphology was followed as a function of annealing time. It has been found that the surface morphology of dewetted samples resembles a bicontinuous spinodal-like pattern. The dominant length scale, characterized by the inverse of the wave vector  $q^*$  shows apparent power law dependence on annealing time. Several distinctive stages with of power law dependencies are observed at each temperature. Current theory such as Cahn-Hilliard equation that describes spinodal kinetics of binary alloys and thin film equation that has been adapted from liquid theory cannot predict the observed various stages of power law dependence with increasing time. The differences observed as a function of temperature show that the molecular motions play an important role in the dewetting kinetics.

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