

Carnegie Mellon

Materials Science and Engineering Seminar Series

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“Self-organization & Structural Instabilities in Thin Films”

Friday, February 16, 2007

11:00 A.M. Seminar in Baker Hall 136A

A-b-B diblock copolymers, composed of two dissimilar chains, A and B, joined together by covalent bonds, typically exhibit a tendency to self-organize into a range of symmetries (spheres, cylinders lamellae etc.). This disorder-to-order transition temperature is determined by the relative volume fractions of the A and B components, a thermodynamic interaction parameter and by the total number of monomers that compose the chain. Thin film diblock copolymers constitute a technologically important class of materials: coatings and patterning applications, device applications such as organic transistors, light emitting diodes and photodiodes applications. In this presentation we will discuss the manner in which the self-organization process is influenced by film thickness and by processing environments. Interfacial instabilities, analogous to spinodal decomposition in bulk mixtures, will also be discussed.

Peter F. Green is currently Professor and Chair of the Department of Materials Science and Engineering at the University of Michigan, Ann Arbor, MI. He is also Professor of Macromolecular Science and Engineering and of Applied Physics. He earned his MS and PhD degrees in Materials Science and Engineering from Cornell University in 1983 and 1985, respectively. His Bachelors degree is in Physics, from Hunter College, NY in 1981. Professor Green is the 2006 President, Materials Research Society. He is a Fellow of the American Physical Society and of the American Ceramic Society. He was a Divisional Associate Editor, Physical Review Letters, 2001-2006. His current research interests include phase behavior of mixtures, self-assembly of block copolymers, interfacial instabilities and confinement effects in thin films. He is author of the textbook “Kinetics Transport and Structure in Hard and Soft Materials,” Taylor and Francis, CRC Press.