Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Surface Directed Phase Separation and Ordering in Semi-flexible Polymer Solution under Confinement PARESH CHOKSHI, VENKAT GANESAN, University of Texas at Austin — For a solution of semi-flexible polymers confined between two parallel walls, we study the kinetics of phase separation accompanied by thermally induced ordering in the nematic regime. The mean-field free energy functional is expansion in two order parameters - the conserved local composition and the non-conserved orientation (tensor), with coefficients appropriate for the semi-flexible polymer molecules. By solving the coupled time-dependent Ginzburg-Landau equations for two order parameters, we examine the morphology development and validity of the dynamical scaling in confined geometries in two-dimensions. The homeotropic anchoring at the walls enhances the overall ordering kinetics. The competition between the thermodynamic potential in the bulk and at the surface results into variety of morphological patterns. The role of surface potential in anisotropy of domain growth will be elucidated for a range of polymer concentrations and quench depths.

Paresh Chokshi
University of Texas at Austin

Date submitted: 19 Nov 2009 Electronic form version 1.4