

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Fabrication of Complex Three-Dimensional Nanostructures from Self-Assembling Block Copolymer Materials on Patterned Surfaces: A computational Study** XIANGGUI YE, BRIAN J. EDWARDS, BAMIN KHOMAMI, Materials Research and Innovative Laboratory (MRAIL), Department of Chemical and Biomolecular Engineering, University of Tennessee, Knoxville, TN — Chemically patterned substrates can direct the assembly of adsorbed layers or thin films of block copolymers. Here, we consider the self-assembly of a lamella-forming diblock copolymer on periodically stripe-patterned substrates. The morphology of the block copolymer follows the pattern at the substrate; however, with an increasing degree of mismatch between the width of the stripe-pattern and the periodic spacing of bulk block copolymer, novel morphologies have been found. Therefore, it is possible to adjust the morphologies in thin block copolymer films by adjusting the mismatch between the width of the stripe-pattern and the periodic spacing of the bulk block copolymer. These results demonstrate a promising strategy for fabrication of complex interfacial nanostructures from chemically patterned templates.

Xianggui Ye  
Materials Research and Innovative Laboratory (MRAIL), Dept of Chemical  
and Biomolecular Engineering, University of Tennessee, Knoxville, TN

Date submitted: 28 Nov 2009

Electronic form version 1.4