Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Directed Assembly of Lamellae Forming Block Copolymer Thin Films near the Order-Disorder Transition[1] SANGWON KIM, University of Minnesota, PAUL NEALEY, University of Chicago, FRANK BATES[2], University of Minnesota — The impact of thin film confinement on the ordering of a lamellar morphology was investigated using partially epoxidized poly(styrene-*b*-isoprene) diblock copolymers bound by non-preferential wetting interfaces. Even in the 2-dimensional limit ($<L> \rightarrow L_0$, where $<L>$ and L_0 denote the average film thickness and the periodicity, respectively), the composition fluctuations are observed at the crossover from the ordered to the disordered states, establishing the order-disorder transition temperature (T_{ODT}) in thin films. While the minimum feature size of block copolymers achievable for nanolithography is set effectively by the T_{ODT}, the dimensionality reduction leaves the T_{ODT} unaffected compared to the bulk limit within experimental error. Directed self-assembly with the half pitch ($L_0/2$) <8 nm has been accomplished using chemical patterning near T_{ODT}.

[1]Financial support for this work was provided by the National Science Foundation - Nanoscale Science and Engineering Center.
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Date submitted: 04 Nov 2013 Electronic form version 1.4