Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Raster solvent vapor annealing of block copolymer thin films JONATHAN SEPPALA, RONALD LEWIS, THOMAS EPPS, University of Delaware — Nanoscale phase separation in block copolymer (BCP) thin films makes them attractive for a variety of applications such as membranes, organic electronics, and nanoscale templating. Annealing BCP thin films (thermal or solvent) promotes ordering of their microphase-separated structures into useful patterns. Solvent vapor annealing (SVA) is an attractive approach as it avoids thermal degradation and provides greater flexibly in morphology control compared to thermal annealing through overall film swelling and preferential swelling of one or more blocks. SVA is typically conducted in an annealing chamber that permits exposure of the film to a controlled vapor environment. However, control over the vapor environment locally may be more desirable for nano-patterning applications. In this work we introduce raster solvent vapor annealing, a method that gives us precise control over the annealed region and excellent point control of the resulting morphology allowing for specific mixed morphologies on a single sample. The simplest setup, needle directed solvent vapor with controlled solvent flow rate and rastering speed, allows "drawn" ordered parallel and perpendicular cylinders in a cylinder forming BCP thin film. The efficacy of this method will be discussed in the oral presentation.

Jonathan Seppala
University of Delaware

Date submitted: 08 Dec 2011 Electronic form version 1.4