Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Nanoporous Polymer Films via the Self-Assembly of Triblock Copolymers SEUNG HYUN KIM, University of Massachusetts, Amherst, JOONA BANG, University of Califonia, Santa Barbara, ERIC DROCKENMULLER, University of Califonia, Santa Barbara, MATTHEW J. MISNER, University of Massachusetts, Amherst, CRAIG J. HAWKER, University of Califonia, Santa Barbara, THOMAS P. RUSSELL, University of Massachusetts, Amherst — Diblock copolymer films of polystyrene-*b*-poly(ethylene oxide) (PS-PEO) exhibiting cylindrical microdomains, where PS is the major component, demonstrate a high degree of long range lateral order by solvent casting or solvent annealing. However, to generate nanoporous films of these materials we have incorporated a third, center block that is photodegradable by ultra violet radiation. This provides for a robust route to generating highly ordered, nanoporous arrays polymer films. Triblock copolymers of polystyrene-*b*-poly(methyl methacrylate)-*b*-poly(ethylene oxide) (PS-PMMA-PEO) were synthesized by ATRP. Three different molecular weights and compositions were used, where PS is the major component, and PMMA and PEO are the minor components. After casting and solvent annealing, all three copolymers exhibit similar cylindrical microdomains. Subsequently, PMMA block can be UV degraded and by rinsing in acetic acid and water, only the PS block remains in the nanoporous films.

Seung Hyun Kim
Dept.of Polymer Science and Engineering

Date submitted: 01 Dec 2004

Electronic form version 1.4