

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Effective Control of Pore Size in the Block Copolymer by Matrix Crosslinking¹ E. KIM, C. SHIN, D.Y. RYU, Yonsei University, J. BANG, Korea University, C. HAWKER, UC Santa Barbara, T. RUSSELL, Univ. of Mass., Amherst — Thin films of block copolymer with nano-sized morphology have great attention for their potential use. Especially, the control of block copolymer pore size in the cylindrical microdomain has been studied by many research groups. Previously, pores of PS-b-PMMA thin films with diameters as low as 3nm only via crosslinking by ozone the matrix surrounding the cylindrical microdomains are reported, in which the diameters of the pores are found to increase by increasing ozone exposure with the pore size limitation, only to 8 nm. The main objective of our study is to find out the condition of controlling the pore size widely as well as tunability by using BCB crosslinking unit. PS-b-PMMA copolymers were synthesized with reactive benzocyclobutene (BCB) functionality which is randomly incorporated into the PS backbone, having PMMA volume fraction of ~ 0.3 with various BCB amount from 3% to 16%. We investigated the optimal thermal annealing condition, time dependence to get the ordered cylindrical nanostructure with controlled size, where nanostructures of block copolymer are oriented normal to the substrate due to balanced interfacial interaction on the surface.

¹This work was supported by Ministry of Commerce, Industry and Energy (10024135-2005-11), the Nuclear R&D Programs funded by the Ministry of Science & Technology (MOST), and Seoul Research and Business Development Program, Korea.

Du Yeol Ryu
Yonsei University

Date submitted: 26 Nov 2006

Electronic form version 1.4