Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Control of P(S-b-PMMA) Orientation on Organosilicate Substrates by Thermal Treatment KOOKHEON CHAR, HYOSEON SUH, Seoul National University — One of most important factors to control the orientation of microdomains in block copolymer films is the wetting behavior of a block copolymer at an interface. From this perspective, we studied the wetting behavior of P(S-b-MMA) block copolymer (BCP) thin films on silsesquioxane-based organosilicate (OS) substrates, which have potential applications as interlayer dielectrics (ILDs) for next generation semiconductor devices. We controlled the surface energy of OS substrates by changing the treatment temperature. As the treatment temperature was increased, the wetting behavior of a P(S-b-MMA) film on OS substrates changed from the asymmetric to the symmetric wetting, which allowed us to find the optimum treatment temperature for the neutral wetting behavior. Changes in the orientation of BCP microdomains on OS substrates were analyzed by AFM, FE-SEM, and GI-SAXS. These results show the potential that the OS ILDs prepared in this study do not require any additional surface modifications such as random copolymer brushes or SAMs for BCP microdomains to orient perpendicular to the substrate, which could ultimately be applied to BCP lithography.

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Date submitted: 26 Nov 2007 Electronic form version 1.4