Abstract Submitted
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Directed Self-assembly of Block Copolymer Thin Films on 2D Chemical Patterns Made by Electro-oxidation Nanolithography[1] JI XU, THOMAS RUSSELL, University of Massachusetts Amherst, ANTONIO CHECCO, BENJAMIN OCKO, Brookhaven National Lab — We have studied the wetting and self-assembly behavior of block copolymer thin films on chemical patterns. Carboxylic-terminated, mesh-like patterns were generated on OTS modified silicon wafers by AFM electro-oxidation lithography. The films were pinned on the carboxylic regions due to the strong interaction of the minor component block with the surface which was also found to suppress film dewetting over the unpatterned methyl regions. We have found that the cylindrical microdomains orient normal to the methyl-terminated patterns and remain laterally confined within them. Defect-free, hexagonally packed cylindrical microdomains could be obtained thanks to the "corralling" action of the patterns. Point defects arose when the dimensions or shapes of the patterns were not commensurate with the natural packing of the copolymers. Tetragonal packing of microdomains was observed when a square-shaped confinement geometry, with dimension comparable to $2L_0$ (natural period), was used.

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