

Block Copolymer Nanolithography

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Block copolymer nanolithography has been highlighted as a “bottom-up” alternative to “top-down” photolithographic processes, due to its ability to create sub-30 nm features. Block copolymers consist of two or more chemically different polymer chains, and can self-assemble into spherical, cylindrical, or lamellar nanodomains, with periodicities typically in the 10^1 – 10^2 nm range, tunable through polymer molecular weight. These periodic structures have been used as nanofabrication templates for a broad range of materials and structures. In this talk, application of block copolymers in thin films will be reviewed and limitations and challenges of the block copolymer lithography will be discussed.

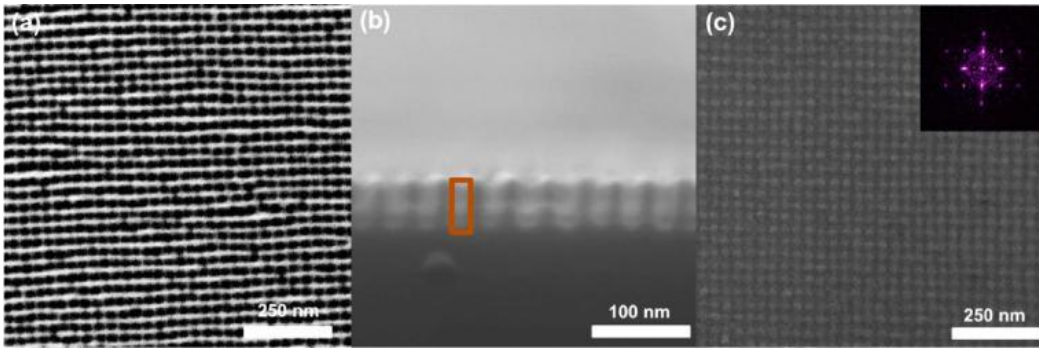


Figure 1: SEM images showing (a) top view of square array of nanowells, (b) cross-sectional view of the same nanowell array with the orange rectangle outlining the vertical cross-section of the “bore” of one of the wells (55 nm deep, 20 nm across), and (c) square array of PFS-residue posts created by controlled wet etching of the bilayer template prepared by O₂ RIE.¹

¹ S. Y. Kim *et al.*, *Nano Letters*, 14, 5698 (2014)