Self-assembly of block-copolymer structures for in-situ nano-lithography

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In this paper we report how block-copolymer (BCP) self-assembly of polystyrene–b–polydimethylsiloxane (PS–PDMS) is used for in-situ nano-lithography to fabricate hexagonally ordered nanostructures on the surface of Si.[1] This is done by forming an in-situ etch mask on the Si surface by spin coating of the BCP in solution and subsequent solvent annealing, and reactive ion-etching (RIE) steps. The wetting properties of the fabricated structures are studied to reveal a multitude of possible wetting and anti-wetting configurations, depending on the subsequent fabrication and surface coating steps. [2]

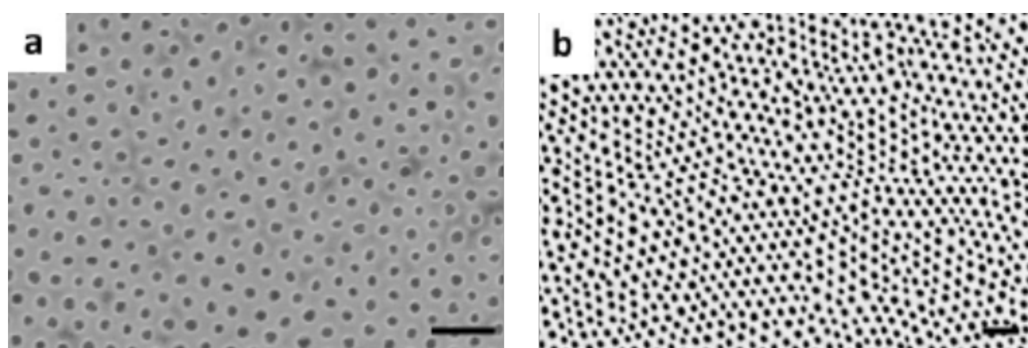

Figure 1. a) In-situ etch mask fabricated SF_6/O_2 RIE after solvent annealing of a thin PS-PDMS block-copolymer spin-coated film on a polished Si wafer surface. b) Pattern transferred by Cl_2 RIE into Si. Scale bar is 200 nm in both panels.

References.

[1] T. Li, Z. L. Wang, L. Schulte and S. Ndoni, *Nanoscale*, **8**, 136-140, (2016).
[2] A. Telecka, T. Li, S. Ndoni, and R. Taboryski, *RSC Adv.* **8**, 4204 (2018).