Abstract Submitted
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Highly-Ordered Thin Films from Photocleavable Block Copolymers[1] WEIYIN GU, University of Massachusetts at Amherst, HUI ZHAO, University of Hamburg, E. BRYAN COUGHLIN, University of Massachusetts at Amherst, PATRICK THEATO, University of Hamburg, THOMAS RUSSELL, University of Massachusetts at Amherst, UNIVERSITY OF MASSACHUSETTS AT AMHERST TEAM, UNIVERSITY OF HAMBURG TEAM — A robust route for the preparation of nanoscopic dot/line patterns with long range lateral order from poly(styrene-block-ethylene oxide) (PS-b-PEO) with an o-nitrobenzyl ester junction (PS-hν-PEO) is demonstrated. Solvent annealing condition is optimized to achieve the highly ordered cylindrical block copolymer (BCP) microdomains oriented normal or parallel to the silicon substrates. Following a very mild UV exposure and successive washing with methanol, PS-hv-PEO thin films were transformed into highly ordered porous or trench templates. Afterwards the pores or trenches were either filled with PDMS by spin-coating or exposed to direct metal deposition of Au. After a plasma etching or lift-off process to remove the polymer templates, highly ordered arrays of silica or Au nanopatterns were obtained. This represents the first template application example from highly ordered nanoporous thin films derived from block copolymers featuring a photocleavable junction.

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Weiyin Gu
University of Massachusetts at Amherst

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