

## Improving the Manufacturability and Structural Control of Block Copolymer Lithography

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Nanoporous materials derived from block copolymers have attracted considerable attention, due to their potential application as nano-templates, membranes, high surface area support for catalysis, etc. For this purpose, living free radical polymerization, including RAFT and NMP techniques, has been successfully used to design the materials with the desired functionality. Two novel functional polymers, photo-crosslinkable random copolymers, PS-*r*-P(S-azide)-*r*-PMMA, and ABC type triblock copolymers, PEO-*b*-PMMA-*b*-PS, were synthesized by RAFT polymerization technique. Photo-crosslinkable random copolymer was used to modify the surface with the balanced surface interaction via photo-crosslinking of the azide group. PEO-*b*-PMMA-*b*-PS triblock copolymers were prepared to cleave the PMMA middle block by deep UV radiation. After solvent annealing and degradation of PMMA block, the highly-ordered nanoporous templates were obtained.