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Fabrication of Highly Ordered Nanostructured Block Copolymer Templates using Supramolecular Assembly Approach E. BHOJE GOWD, MANFRED STAMM, LEIBNIZ INSTITUTE OF POLYMER RESEARCH DRESDEN, HOHE STRASSE 6, 01069 DRESDEN, GERMANY TEAM — The ability to create reactive nanoporous templates using polymer thin films is important for such applications as antibody or enzyme immobilization, separation of biomolecules, and nanofabrication. Self-assembly of polymeric supramolecules could be an elegant method to this end. The present approach consists in supramolecular assembly of vinylpyridine fragments of polysterene-block-poly(4-vinylpyridine) (PS-b-P4VP) with various additives. Thin films of PS-b-P4VP + additive revealed cylindrical morphology with the cylinders formed by the minor-block of the assembly. Extraction of these additives with selective solvent results in nanoporous templates where the reactive P4VP chains are constituted on the walls of the channels. The periodicity of the hexagonal lattice remains same irrespective of the additive used and on the other hand, the pore diameter was found to be dependent upon the additive. In addition, switching between different alignments of the cylindrical domains was also dependent on the nature of the additive used. The templates obtained using different additives were compared with the surface reconstructed block copolymer (PS-b-P4VP) templates in order to understand the bottom P4VP layer, which is located at the film-substrate interface.

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