Abstract Submitted
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Surface Modification for Controlling the Orientation of Block Copolymers in thin film and in Cylindrical Nanopores[1] XIN-GUAN LIN, FENG-CHENG LIN, SHIH-HUANG TUNG, Institute of Polymer Science and Engineering National Taiwan University, SOFT NANOMATERIALS GROUP TEAM — A series of benzocyclobutene-functionalized random copolymers of styrene and 4-vinylpyridine were synthesized by nitroxide-mediated controlled radical polymerization with BPO and TEMPO. Our research was to use these random copolymers of P(S-r-BCB-r-4VP) to control the orientation of microdomains in block copolymers(BCPs) of poly(styrene-*b*-4-vinylpyridine)(PS-*b*-P4VP) thin films and in cylindrical nanopores of anodized aluminum oxide (AAO) membranes. On P(S-r-BCB-r-4VP)-modified substrate,we found that in some particular compositions of random copolymer ,the parallel orientation of the microdomains is switched to be perpendicular in PS-*b*-P4VP thin film. We also introduced P(S-r-BCB-r-4VP) solution into the nanopores of the AAO and nanotubes formed after solvent evaporation and pyrolysis. And then BCPs of PS-*b*-P4VP were drawn into the P(S-r-BCB-r-4VP)-modified nanopores in the melt via capillary action to form P(S-r-BCB-r-4VP) coated nanorods of PS-*b*-P4VP.Similarly,in some particular compositions of random copolymer, we observed that the interactions of the blocks with the walls are not strong or if the interactions are balanced, then the orientation of the microdomains will change from being parallel to being perpendicular to the confining walls.

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