

Abstract Submitted
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Controlled orientation and ordering of nanostructured thin films from degradable block copolymer. RONG-MING HO, MING-SHIUAN SHE, TING-YA LO, YI-HSIU WU, Natl Tsing Hua Univ — The fabrication of nanostructured thin films from the self-assembly of degradable block copolymers (BCPs) has attracted extensive attention. To create useful BCP thin films for practical uses, controlling the orientation of self-assembled nanostructures is essential. Here, we present a new method for forming well-ordered and oriented nanostructured thin films on a functionalized SiO₂ surface, using homopolymers with hydroxyl group at the chain end to functionalize SiO₂ surface, to give neutral substrate for the BCPs. To demonstrate the feasibility of suggested approaches, a series of degradable BCPs, polystyrene-*b*-poly(L-lactide) (PS-PLLA) with hexagonally packed cylinder and double gyroid phases, are used as model systems for creating nanostructured thin films with controlled orientation and ordering of BCP nanostructures. Different methods such as thermal and solvent annealing are utilized to exploit the fabricated neutral substrate for creating expected nanostructured thin films. By taking advantage of degradable character of PLLA, nanoporous PS thin film can be fabricated by hydrolysis and used as a template for synthesis of various nanohybrids and nanoporous materials.

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