

Abstract Submitted
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Impact of stereocomplexation on the directed self-assembly poly (styrene-*b*-(*rac*)-lactide) on chemically patterned surfaces XIAO LI, University of Chicago, Institute for Molecular Engineering, YADONG LIU, Changchun Institute of Applied Chemistry, ABELARDO RAMIREZ-HERNANDEZ, Argonne National Laboratory, JUAN J. DE PABLO, University of Chicago, Institute for Molecular Engineering, SHENGXIANG JI, Changchun Institute of Applied Chemistry, PAUL NEALEY, University of Chicago, Institute for Molecular Engineering, UNIVERSITY OF CHICAGO, INSTITUTE FOR MOLECULAR ENGINEERING TEAM, CHANGCHUN INSTITUTE OF APPLIED CHEMISTRY COLLABORATION — Poly (styrene) - block - poly (*rac*- lactide) (PS-*b*(*rac*)PLA) with bulk lamellar period, L_o , was directed to assemble on chemically patterned surfaces with period, L_s . The surface energies of the blocks are similar enabling thermal annealing of the films. The racemic PLA block including short sequences of L- and D-lactide acid chains formed stereocomplexes. PS-*b*(*rac*)PLA could be directed to assemble with a high degree of perfection over the entire range of $1 < L_s/L_o < 2$. As the L_o increased to accommodate the larger L_s , the width of the PS domain increased faster than PLA domain. This behavior contrasts sharply with the lamellae-forming systems without strong inter-chain interactions for which assembly occurs for $1 < L_s/L_o < 1.1$. Experimental and molecular simulation results will be discussed in the context of non-equilibrium assembly behavior of triblock copolymers, and the potential for chemical complexity and chain architecture to improve the function block polymer materials for lithographic applications.

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