

Abstract Submitted
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Utilizing low surface energy moieties to control surface composition of a polystyrene-b-poly(2-vinylpyridine) block copolymer MICHAEL DIMITRIOU, Materials UC Santa Barbara, DANIEL FISCHER, NIST, CRAIG HAWKER, EDWARD KRAMER, Materials UC Santa Barbara — During processing the interaction of a block copolymer film with a free surface affects its final orientation and surface composition. A strategy to control this interaction and hence tailor the final structure of a polymer film is to introduce low surface energy moieties to the system. A lamellar forming polystyrene-b-poly(2-vinylpyridine) (PS-b-P2VP) block copolymer was synthesized with varying amounts of 1-[(3-butenyloxy)methyl]-4-vinylbenzene copolymerized with the 2VP block. Utilizing thiol-ene chemistry the pendant alkene of 1-[(3-butenyloxy)methyl]-4-vinylbenzene was functionalized with 1H,1H,2H,2H-perfluorooctanethiol to efficiently and selectively incorporate fluorinated hydrocarbons into the 2VP block. Near edge X-ray absorption fine structure spectroscopy (NEXAFS) and X-ray photoelectron spectroscopy were used to characterize the polymer surface as a function of 1H,1H,2H,2H-perfluorooctanethiol incorporation. At molar incorporations of the fluorinated monomer in P2VP greater than 4% dynamic secondary ion mass spectrometry and NEXAFS indicate a P2VP rich surface.

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