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Directed Assembly of Block Copolymer on Tunable Surface Energy Flexible Substrate ARZU HAYIRLIOGLU, ALAMGIR KARIM, Department of Polymer Engineering, The University of Akron, Akron, OH, USA — We examine the ordering properties of micro-phase separated block copolymer (BCP) films on flexible substrates. In particular, we investigated the wettability characteristics and morphology of the BCP films before and after annealing on tunable surface energy PDMS substrates. The surface energy of PDMS substrates was modified to vary from 20 to 68 mJ/m² by exposing them to UV-ozone (UVO). Two types of block copolymer systems were examined on these UVO exposed PDMS substrates. Our experiments were carried out with surface energy above 42 mJ/m² because the BCP dewets on the PDMS substrate below that surface energy. Atomic Force Microscope (AFM) and Optical Microscope (OM) were used to study of the surface morphology of the BCP films. It was observed that the BCP morphology exhibits perpendicular orientation on PDMS substrate with surface energy in the range of 42 to 66 mJ/m² and parallel orientation above 67 mJ/m². BCP film morphology on other types of soft substrates and different BCP systems as a function of annealing temperatures and film thickness will be presented.

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