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Hierarchical buckling of block copolymer thin films on PDMS substrates DOKYEONG KWON, HYO SEON SUH, KOOKHEON CHAR, Seoul National University, THE NATIONAL CREATIVE RESEARCH INITIATIVE CENTER FOR INTELLIGENT HYBRIDS TEAM — Buckling of thin films on low modulus substrates such as polydimethylsiloxane (PDMS) is the well-known phenomenon in buckling instability originating from moduli mismatch between the substrate and a top film. Recently, many studies on the microstructure created by the buckling have been reported but most of the work has typically employed either metal or semiconductor thin films and few utilized the block copolymers (BCP) as the covering films. Here, we present the buckling of oriented BCP thin films, placed by a novel off-set printing, on PDMS substrates. Buckling instability was induced by either swelling of the PDMS substrate with chemical vapor or the mechanical strain, resulting in the hierarchical structure of BCP microdomains. Due to the buckling of the BCP thin films, we observed the structural change or transitions of the films depending on the alignment of BCP domains with respect to the buckled direction of the substrates.

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