

Abstract Submitted
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Nanoscale pattern fidelity and transfer of hierarchically patterned thermoplastics films YING CHEN, MANISH KULKARNI, the University of Akron, ALLAN MARSHALL, Omnova Solution Inc., JACK DOUGLAS, National Institute of Standards and Technology, ALAMGIR KARIM, the University of Akron, THE UNIVERSITY OF AKRON TEAM — We demonstrate a versatile and inexpensive method for controlling the surface relief structure of both flexible elastomeric and glassy polymer films over large areas through a two-step imprinting process. First, nanoscale patterns were formed by nanoimprinting polymer films with a pattern on a DVD disk, obtained originally by nanoimprinting from a lithographically etched master pattern on a silicon wafer; micron-scale patterns were then superimposed on the nanoimprinted films by exposing them to ultraviolet radiation in oxygen (UVO) through a TEM grid mask having variable micron-scale patterning. This simple two-stage imprinting method allows for facile fabrication of hierarchically structured elastomer and thermoplastic polymer films. Besides, the thermodynamic properties of dewetting phenomenon of polystyrene film under the confinement of hierarchically patterned PDMS is studied.

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