

Abstract Submitted
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Molecular Transfer Printing Using Block Copolymers SHENGXIANG JI, CHI-CHUN LIU, GUOLIANG LIU, PAUL NEALEY, Department of Chemical & Biological Engineering, University of Wisconsin-Madison — We report a new parallel patterning technique, molecular transfer printing (MTP), for replicating geometrically complex patterns over macroscopic areas with sub-15 nm feature dimensions, and the ability to replicate the same pattern multiple times. In MTP, inks are mixed with block copolymers (BCPs) and deposited as films on a substrate. The inks are compatible with only one block of the BCP, and sequestered into domains of nanometer scale dimensions after microphase separation. A second substrate is then placed in contact with the surface of the film. By designing the inks to react, adsorb, or otherwise interact with the second substrate, inks are transferred to the second substrate in the exact pattern of domains present at the surface of the “master” BCP film. Here we demonstrate high degrees of perfection on both line and dot patterns. We also show that 1) the master template can be regenerated, 2) the resultant replica can be used to direct the assembly of BCPs and as a daughter master for MTP, and 3) the master and daughter templates can be reused tens of times.

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