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New approach for producing chemical templates over large area by Molecular Transfer Printing TAKEJIRO INOUE, University of Chicago, DUSTIN JANES, University of Texas at Austin, JIAXING REN, University of Chicago, GRANT WILLSON, CHRISTOPHER ELLISON, University of Texas at Austin, PAUL NEALEY, University of Chicago — Fabrication of well-defined chemically patterned surfaces is crucially important to the development of next generation microprocessors, hard disk memory devices, photonic/plasmonic devices, separation membranes, and biological microarrays. One promising patterning method in these fields is Molecular Transfer Printing (MTP), which replicates chemical patterns with feature dimensions of the order of 10nm utilizing a master template defined by the microphase separated domains of a block copolymer thin film. The total transfer printing area achievable by MTP has so far been limited by the contact area between two rigid substrates. Therefore, strategies to make conformal contact between substrates could be practically useful because a single lithographically-defined starting pattern could be used to fabricate many replicates by a low-cost process. Here we show a new approach that utilizes a chemically deposited SiN layer and a liquid conformal layer to enable transfer printing of chemical patterns upon thermal annealing over large, continuous areas. We anticipate that our process could be integrated into Step and Flash Imprint Lithography (SFIL) tools to achieve conformal layer thicknesses thin and uniform enough to permit pattern transfer through a dry-etch protocol.

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