Abstract Submitted for the MAR17 Meeting of The American Physical Society

Thin film self-assembly of PVMS-b-PMMA block copolymer¹ BARAKA LWOYA, MD UDDIN, SOURAV CHATTERJEE, JULIE ALBERT, Tulane University — Self-assembly of block copolymers has been explored for numerous years with a primary emphasis on nanolithographic templates and membrane applications. Block copolymers (BCPs) hold great promise as next-generation patterning materials for sub-10 nm nano-electronic applications. However, the inherent properties to develop smaller more ordered thin films ($^{10-100}$ nm) is greatly hindered by the inability of the low segregation strength of conventional polymers such as poly(styrene-block-methylmethacrylate). We aim at addressing this issue by firstly synthesizing strongly segregating BCPs of poly(vinylmethylsiloxane-block-methyl methacrylate) (PVMS-b-PMMA) with different block volume fractions. Second, we induce self-assembly by either thermal or solvent annealing and characterize the morphology by atomic force microscopy (AFM). In addition, the use of a block with a pendant vinyl group provides the ability to functionalize the PVMS segment by thiol-ene reaction, either to further control of the segregation strength or to impart desirable surface chemical properties (e.g., adhesion/lift-off in templating or functionality in membranes).

¹Gulf Research Program Early-Career Research Fellowship

Baraka Lwoya Tulane Univ

Date submitted: 11 Nov 2016

Electronic form version 1.4