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**Orientation of Microdomains in Cylinder-Forming PS-PHMA Thin Films** RALEIGH DAVIS, RICHARD REGISTER, Princeton University, PAUL CHAIKIN, New York University — There is much interest in the study of self-assembled block copolymer thin films for uses in nanofabrication. For many applications control of the microdomain order is required. One method to achieve long-range orientational order in thin films is through the use of shear, which has been shown to orient block copolymer microdomains in the direction of the applied shear. A particular interest is shear-alignment of cylinder-forming poly(styrene)-poly(hexylmethacrylate) (PS-PHMA) thin films, which are effective masks for nanofabrication via reactive-ion etching. The present work examines the effects of changing PS block volume fraction, within the cylinder-forming region of the phase diagram, to both modulate the range of film thicknesses over which in-plane vs. out-of-plane cylinders are observed as well as improve the quality of in-plane alignment post-shear. Increasing the volume fraction of PS, away from the cylinder-sphere boundary, increased the range of film thicknesses over which the cylinders orient in-plane. The effects of the substrate wetting condition on cylinder orientation were also examined through grafting of PS and PHMA brushes to the substrate before deposition of the PS-PHMA film.

Raleigh Davis
Princeton University

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