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Hole growth in free-standing block copolymer films: does lamellar structure imitate a support? MATTHEW J. FARRAR, ANDREW B. CROLL, KARI DALNOKI-VERESS, McMaster University — We will discuss how the lamellar structure of a symmetric polystyrene-poly (methyl methacrylate) diblock co-polymer can affect the hole formation of free-standing films. It is found that ordered films (with lamellae aligned parallel to the film surface) exhibit a dramatically enhanced stability over disordered films. This stability is shown to be directly related to the lamellar structure through atomic force microscopy and optical microscopy. Secondly we note how the rim structure of the holes in these two experiments is extremely different. In particular, the steep rims observed in the ordered samples show a striking similarity to holes grown in supported films, which is difficult to reconcile with current theory.

Kari Dalnoki-Veres
McMaster University

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