Abstract Submitted
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An *in situ* grazing incidence x-ray scattering study of block copolymer thin films during solvent vapor annealing[1] XIAODAN GU, University of Massachusetts Amherst, ILJA GUNKEL, ALEXANDER HEXEMER, Lawrence Berkeley National Laboratory, THOMAS RUSSELL, University of Massachusetts Amherst — Although solvent vapor annealing (SVA) has been widely applied to block copolymer (BCP) thin films to obtain well-ordered microdomains, the mechanism of enhancing lateral order is not well understood. Here, we used real time *in situ* grazing-incidence small-angle x-ray scattering (*in situ* GISAXS) to study the self-assembly of PS-b-P2VP BCP BCPs with different molecular weights thin films in THF vapor, a near neutral solvent for both blocks. Both swelling and deswelling behavior of BCP thin films were examined. The extent of swelling and the solvent removal rate not only affect the domain spacing of BCPs but also dictate the extent of lateral ordering of the BCP microdomains. Larger grains were observed at higher values of the swelling ratio (close to disordering). To preserve the maximal lateral ordering of the microdomains in the swollen state, the fastest solvent removal rate is required to freeze in the ordered microdomain structure of the swollen BCP film.

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