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Salt Complexation in Cleavable Polystyrene-b-poly (ethylene oxide) Thin Films LING YANG, MINGFU ZHANG, Dept. of Polymer Science and Engineering, University of Massachusetts at Amherst, SERKAN YURT, Dept. of Chemistry, University of Massachusetts at Amherst, MATTHEW MISNER, E. BRYAN COUGHLIN, Dept. of Polymer Science and Engineering, University of Massachusetts at Amherst, D. VENKATARAMAN, Dept. of Chemistry, University of Massachusetts at Amherst, THOMAS RUSSELL, Dept. of Polymer Science and Engineering, University of Massachusetts at Amherst, BENJAMIN OCKO, Condensed Matter Physics and Materials Science, Brookhaven National Laboratory, XUEFA LI, Advanced Photon Source, Argonne National Laboratory — Salt complexation in a newly developed cylinder forming Polystyrene-b-polyethylene (PS-b-PEO) with a cleavable linker between two blocks was investigated. Highly oriented, close-packed arrays of nanoscopic cylindrical domains with a high degree of long-range lateral order was obtained in the copolymer thin films during solvent annealing and solvent evaporation at relatively low humidity or extremely dry condition. The orientation and lateral ordering of cylindrical microdomains were found to strongly depend on salt concentration. With the addition of certain amount of salt, we observed that the copolymer microdomains remained ordered at high degree of swelling by in-situ grazing incidence small angle X-ray scattering. With the ability to rapidly cleave the PEO block through the designed cleavable linker under mild condition, highly ordered porous structures are readily generated.

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