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Long-Lived Metastable bcc Phase during Ordering of Micelles JOONA BANG, University of Minnesota, TIMOTHY P. LODGE, University of Minnesota — We report a metastable bcc phase that intervenes between a disordered micellar suspension and an fcc crystal in a block copolymer solution. A symmetric poly(styrene-*b*-isoprene) diblock copolymer in the isoprene-selective solvent squalane at a volume fraction of 0.20 was investigated using small angle x-ray scattering and rheology. Upon heating, the metastable bcc phase nucleates first, and then transforms over the course of hours to the stable fcc phase. At still higher temperatures the fcc phase transforms to an equilibrium bcc phase. The metastability of the bcc phase was confirmed by oscillatory shear and annealing using small angle x-ray scattering. These results constitute an interesting experimental manifestation of Ostwald's step rule, and also support recent theory and simulation results whereby bcc nucleates more readily from a melt of spheres.

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