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Self-assembled surface patterns from organometallic-containing triblock terpolymers VIVIAN CHUANG, CAROLINE ROSS, Massachusetts Institute of Technology, JESSICA GWYTHER, IAN MANNERS, University of Bristol — Block copolymers are useful in nanotechnology because they can self-assemble to form periodic nanoscale structures. Here, we demonstrate the formation of hollow ring arrays with a period of 54 nm from a core-shell cylindrical-morphology poly(styrene-b-ferrocenyldimethylsilane-b-2-vinyl pyridine) (PS-b-PFS-b-P2VP) triblock terpolymer thin film. By spin-coating and solvent annealing, thin films of the polymer were self-assembled into arrays of core-shell structures oriented perpendicular to the top surface of the film. Various chemically modified substrates were employed to investigate the effects of interfacial interaction between the substrate and the film, as well as the effects of solvent annealing, on the film morphology. Results will be compared with those obtained from a poly(butadiene-b-styrene-b-methyl methacrylate) triblock terpolymer [1]. The PS core and P2VP matrix blocks were partly removed simultaneously using oxygen plasma, and the remaining PFS ring pattern was successfully transferred into a PS layer by imprinting.

[1] Chuang et al., ACS Nano, 2008, 2, 2007.

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