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Electrospinning Semicrystalline Block Copolymer Assemblies into Microfibers KRISTEN ROSKOV, North Carolina State University, IAN MANNERS, University of Bristol, RICHARD SPONTAK, North Carolina State University — Cylindrical micelles consisting of a diblock copolymer composed of poly(ferrocenyldimethylsilane) (PFDMS)-*b*−poly(2-vinylpyridine) (P2VP) develop in dimethylformamide (DMF), a P2VP-selective solvent, with lengths exceeding one micron. These self-assembled micelles are then incorporated into P2VP homopolymer solution and electrospun. Addition of the cylindrical micelles is found to improve the ability of P2VP to be electrospun and dramatically decrease the bead density that appears in the electrospun microfiber mat. Scanning and transmission electron microscopies are used to investigate both the surface and internal morphology of these fibers, along with the robustness of the micelles. The combination of self-assembled structures within a polymer matrix can lead to fascinating response behavior dependent on temperature; if the sample is heated and the melting point of PFS is surpassed, the micelles will melt and then form classical morphologies. In the case of self-assembled, conductive cylinders of PFS block copolymers, heating the sample destroys conductive pathways. The PFS-*b*-P2VP self-assembled cylinders have also been incorporated into other DMF-selective polymers to verify that the micelles remain intact upon electrospinning.

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