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Multigeometry micelles made from self-assembly of block copolymer mixtures via kinetic control JIAHUA ZHU, University of Delaware, SHIYI ZHANG, YUN LIN, KE ZHANG, Texas A&M University, CAROLINE MIESCH, TODD EMRICK, University of Massachusetts-Amherst, KAREN WOOLEY, Texas A&M University, DARRIN POCHAN, University of Delaware — Multicompartment/multigeometry micellar structures, due to segregation of unlike hydrophobic domains trapped within the same micelle core, have been produced via self-assembly of block copolymer mixtures in tetrahydrofuran/water solution. The mixture is composed of two/or more block copolymers with distinctive hydrophobic blocks but the same poly(acrylic acid) (PAA) hydrophilic block. By taking advantage of the complexation in the hydrophilic corona between the acid side chains of the PAA block and added organoamine molecules, unlike hydrophobic blocks are trapped in the same micelle core and, consequently, locally segregate into compartments. Through designed kinetic pathways, block copolymer design and mixing ratios, both micelle compartment size and shape could be controlled to form multicompartment spheres, sphere-cylinder hybrid micelles and multicompartment cylinders. New mixtures using PAA-containing block copolymers with additional hydrophilic blocks or end-group functionalization produce multigeometry/multicompartment micelles with patterned surfaces in addition to multicompartment cores.

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