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Blending of Diblocks and Triblocks with identical hydrophilic block for multicompartment and multigeometry nanostructures ZHENG ZENG, JIAHUA ZHU, YINGCHAO CHEN, University of Delaware, SHIYI ZHANG, Texas A&M University, DARRIN POCHAN, University of Delaware, KAREN WOOLEY, Texas A&M University, POCHAN'S GROUP TEAM, WOOLEY'S GROUP TEAM — Unique micellar morphologies, such as toroids, disks, and helices, have been obtained from a single triblock copolymer PAA-PMA-PS poly(acrylic acid)-b-poly(methyl acrylate)-b-poly(styrene) (PAA-PMA-PS) through a self-assembly process in dilute water/THF(tetrahydrofuran) solvent mixtures in the presense of organic multiamine molecules. Aiming to better understand their formation and explore novel structures, diblock copolymers, e.g. PAA-PMA and PAA-PS, were mixed with PAA-PMA-PS to co-assemble at desired solution conditions to produce known nanostructures (e.g. toroid, disk, helix fomations). By taking advantage of the kinetic pathway of assembly and mulitamine-PAA complexation, the additional diblock copolymers can be trapped in the same micelle with the triblock PAA-PMA-PS. Interesting transitions were found in toroid/disk/helix fomations by changing the amount of the added diblock copolymers. The morphologies of the blended nanoparticles was characterized with cryogenic and conventional transmission electron microscopy, dynamic light scattering, and small angle neutron scattering.

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