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Morphological Control of Charged Block Copolymer Micelle Complexes in Dilute Aqueous Media KOOKHEON CHAR, MISOOK LEE, KYUNG JEE MIN, Seoul National University, JINKEE HONG, Kyunghee University — Amphiphilic block copolymers dispersed in a selective solvent can be self-assembled into various aggregates such as spherical and cylindrical micelles and bilayer vesicles. Block copolymers typically possess hundred repeat units, leading to kinetically stable or trapped assemblies due to the lack of molecular chain exchange between aggregates in solution; thus, aggregated morphologies are highly path dependent. Here, we demonstrate the amphiphilic block copolymer micelle (BCM) complexes with pH-tunable electrostatic interactions between two differently charged corona blocks in aqueous media. The combination of preformed micellization of each BCM with the dissociation control of the corona blocks provides a distinct assembly pathway. This is to say that the sequential mixing of charged BCMs reveals the effects of both corona complexation (through inter-component interactions) and the manipulation of interfacial curvature between core and corona within a micelle (through the intra-molecular block conformations), resulting in unique complex morphologies such as crystal-like hexagonal prisms, hierarchical spheres, and twisted peapods.

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