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Crystal-like Complex Formation with Binary Charged Block Copolymer Micelles in Dilute Aqueous Media MISOOK LEE, KYUNG JEE MIN, Seoul National University, JINKEE HONG, Kyunghee University, KOOKHEON CHAR, Seoul National University — The morphology of charged block copolymer micelle (BCM) complexes, consisting of polystyrene-*block*-poly(acrylic acid) (PS-*b*-PAA) and polystyrene-*block*-poly(4-vinyl pyridine) (PS-*b*-P4VP) micelles, was controlled by pH of aqueous solvent as well as solvent quality. To determine the effective pH range for the inter-corona combination of PAA and P4VP blocks in aqueous media, we studied the dissociation behavior of both coronas using Fourier Transform Infrared Spectroscopy. Lower pH region (pH<5.0) in aqueous media offers stronger interactions between oppositely charged corona blocks, resulting in polymeric hexagonal prism complexes. In the higher pH region (pH>5.5), they first self-assembled into hierarchical spheres induced by the simple adsorption of small PS-*b*-PAA BCMs on the surfaces of PS-*b*-P4VP large compound micelles since the degree of ionization of P4VP blocks is relatively low. However, the crew-cut BCM complex morphology with high aggregation number does not allow the hexagonal prism structure to be formed without rearranging strongly aggregated core blocks. We note that the crew-cut BCM complexation in higher DMF content of a mixed solvent induces inter-corona association leading to the hexagonal prism structure due to the decrease in selectivity of water for PS blocks.

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