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The Effect of Counterion Valency and Solvent Properties on Charged Amphiphilic Triblock Copolymer Assembly into Disks, Cylinders, or Spheres ZHIBIN LI, Material Science and Engineering, University of Delaware, ZHIYUN CHEN, Department of Chemistry, Washington University in Saint Louis, HONGGANG CUI, KELLY HALES, Material Science and Engineering, University of Delaware, KAI QI, KAREN WOOLEY, Department of Chemistry, Washington University in Saint Louis, DARRIN Pochan, Material Science and Engineering, University of Delaware — Amphiphilic triblock copolymer with one charged/ion-containing block, polystyrene-*b*-polymethacrylate-*b*-polyacrylic acid (PS-PMA-PAA), was studied in a water/THF cosolvent system. By adding an amine-based divalent counterion, polymeric disc micelles were formed. Discs or cylinders can be purposefully formed by choosing the type and amount of the divalent counterions in the system. In comparison, systems without counterion or with monovalent amine counterions will also be discussed. In addition to the counterion effect, the charges and the ionization along the PAA chain can also be tuned by changing the water ratio in the solvent system. This PAA tunability through counterions and solvent content allows one to directly tune the micellar structure formed during assembly. The system was studied using dynamic light scattering (DLS), transmission electron microscopy (TEM), cryogenic transmission electron microscopy (cryo-TEM), and small angle neutron scattering.

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