Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Tunable helical micelles via kinetic assembly of charged block copolymer SHENG ZHONG, Department of Materials Science and Engineering and Delaware Biotechnology Institute, University of Delaware, Newark, DE 19716, USA, KE ZHANG, KAREN WOOLEY, Center for Materials Innovation, Department of Chemistry and Department of Radiology, Washington University in Saint Louis, Saint Louis, Missouri, 631, DARRIN POCHAN, Department of Materials Science and Engineering and Delaware Biotechnology Institute, University of Delaware, Newark, DE 19716, USA — Helical cylinder micelles are made from the assembly of poly(acrylic acid)-*block*-poly(methyl acrylate)-*block*-polystyrene with organic multiamines in a THF/H_2O mixtures. Single- and double-stranded helices and left- and right-handed helices are found. Cryo-TEM study shows that the kinetic pathway for formation of helical cylinders follows a complex nanostructure evolution which involves the stacking of bended cylinders at early stages and the subsequent interconnection of these bended cylinders. Spherical micelles bud off of the interconnected nanostructure as the final step towards a defect-free helix. The stable pitch distance of the helices, which is due to unevenly distributed amine molecules in the corona, can be efficiently tuned.

Sheng Zhong
Department of Materials Science and Engineering and Delaware
Biotechnology Institute, University of Delaware, Newark, DE 19716, USA

Date submitted: 11 Dec 2009 Electronic form version 1.4