Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Reversible morphological transitions of polystyrene-b-polyisoprene micelles[1] ISAAC LARUE, SERGEI SHEIKO, MIREILLE ADAM, MICHAEL RUBINSTEIN, University of North Carolina at Chapel Hill, MARINOS PITSIKALIS, NIKOS HADJICHRISTIDIS, University of Athens — Morphological transitions of polymer micelles have long been sought after. Until now, the only way to change morphology was through the addition of a co-solvent or homopolymer. We have demonstrated for the first time that reversible morphological transitions can be caused solely through changes in temperature. Two polystyrene-b-polyisoprene samples with the same sized PS block of 20kDa were purposefully synthesized with PI blocks of 4 and 6kDa to be near the spherical-cylindrical and cylindrical-vesicle boundaries. It was found that only small changes in temperature are needed to cause the morphological change. The cylindrical sample adopted a spherical morphology after heating from 25-35 $^\circ$C and the vesicle sample became cylindrical upon heating from 25-40 $^\circ$C. While cylindrical and vesicle micelles were once again observed after cooling the samples back to 25 $^\circ$C, the fraction and size of the micelles were still increasing after several weeks.

[1]This research program is supported by the National Science Foundation (ECS 0103307 and DMR 0306787)

Sergei Sheiko
University of North Carolina at Chapel Hill

Date submitted: 16 Jan 2006 Electronic form version 1.4