

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Directing Hierarchical Assembly of Block Copolymer-Based Supramolecules Using Small Molecule Blends PAUL TILLBERG, MATTHEW RICHARDS, TING XU, Dept. of Materials Science and Engineering, UC Berkeley — Block copolymer-based supramolecules can be obtained by selectively hydrogen-bonding amphiphilic small molecules to one block of a diblock copolymer. Through interactions between small molecules and the polymer backbone, and between separate polymer blocks, hierarchical self-assembled structures are achieved on length scales unavailable through traditional top-down engineering methods. We aim to introduce an additional independent design parameter by hydrogen-bonding a mixture of small molecules to the polymer backbone. The phase behavior of the small molecules can be tailored to obtain an extra level of molecular control and generate novel hierarchical structures within block copolymer domains. Ultimately, this principle can be used to generate tri- or multi-block copolymer behavior by hydrogen-bonding different small molecules to simple homo or diblock copolymers. We will present preliminary data obtained by adding fluorinated alkyl phenols to the model block copolymer-based supramolecular system consisting of polystyrene-block-poly(4-vinylpyridine) with alkyl phenols hydrogen-bonded to pyridine groups.

Paul Tillberg
Dept. of Materials Science and Engineering, UC Berkeley

Date submitted: 21 Nov 2008

Electronic form version 1.4