

Small-angle Studies of an Inorganic-Organic Block Copolymer Nanocomposite

Adam Finnefrock

University of Pennsylvania

An amphiphilic diblock copolymer, poly(isoprene-*b*-ethylene oxide) (PI-*b*-PEO), was used as a structure-directing agent for an inorganic aluminosilicate precursor. The resulting inorganic-organic nanocomposites are highly ordered and take many interesting composition-dependent forms (spheres, cylinders, lamella, and ordered continuous structures) with dimensions up to hundreds of nanometers. The mesoporous microstructures resemble periodic minimal surfaces; discriminating amongst these similar yet distinct morphologies can be a subtle task. This talk concentrates on the phase identification of the ordered continuous structures using a combination of small-angle x-ray scattering (SAXS) and transmission electron microscopy (TEM). The strain in these thin polymer-derived films is analyzed quantitatively.

Reference:

A.C. Finnefrock et al., *Angewandte Chemie Int. Ed.*, 40(7):1207-1211 (2001).

