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

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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: