

Abstract Submitted
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Bicontinuous Mesostructured Inorganic Films from Gold Nanoparticle Induced Phase Transitions in Self-Assembled Polystyrene-*b*-poly(2-vinylpyridine) Diblock-Copolymer Templates JOSHUA PETRIE, UCSB, BUMJOON KIM, GLENN FREDRICKSON, CRAIG HAWKER, ED KRAMER, UCSB — Gold nanoparticles modified by short chain polymers can lead to strong localization at interfaces between blocks in a polystyrene-*b*-poly(2-vinylpyridine) [PS-PVP] block copolymer. The presence of small volume fractions of these nanoparticles in symmetric PS-PVP films lead to a decrease in the domain spacing of lamellar layers, due to the lowering of interfacial tension. When the volume fraction of nanoparticles is larger than a critical value, the diblock copolymer adopts a bicontinuous morphology. We demonstrate that we can selectively cross-link the PVP domain using diiodobutane with the goal of using these self-assembled films as templates for mesostructured inorganic films by introducing the inorganic precursor into the crosslinked but swellable PVP domain. [R.C.Hayward, B.F. Chmelka and E.J. Kramer, *Adv. Materials*, 17, 2591 (2005).]

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