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Thermally Crosslinkable Diblock Copolymer Templates JULIE LEISTON-BELANGER, THOMAS RUSSELL, University of Massachusetts-Amherst, ERIC DROCKENMULLER, IBM Almaden Research Center, CRAIG HAWKER, University of California- Santa Barbara — The ability to create robust nanoporous templates using polymeric thin films is important for such applications as nanofabrication and selective filtration. Thermally crosslinkable diblock copolymers based on benzocylcobutene chemistry were synthesized that could be used to this end. Poly[(styrene-stat-benzocyclobutene)-b-(D,L-lactic acid)] (PSBCB-b-PLA) was made using living free radical and ring-opening polymerization techniques. This diblock copolymer was shown to microphase separate into a cylindrical morphology that could be stabilized by heating. The minor PLA component was then removed using base to create a nanoporous crosslinked template that was 30 nm thick, with pores about 14 nm in diameter. These nanoporous templates resisted pore collapse when subjected to harsh thermal and solvent conditions. Since the base degradation of PLA produces hydroxyl groups along the pore walls, the ability to access these groups, in conjuction with the thermal and solvent resistance, opens a wide range of organic reaction possibilities.

Julie Leiston-Belanger
UMass-Amherst

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