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Nanoporous Materials Formed in Condensed Carbon Dioxide WILLIAM EDMONDS, Department of Chemical Engineering and Materials Science, University of Minnesota, TIMOTHY LODGE, Department of Chemistry and Department of Chemical Engineering and Materials Science, University of Minnesota, MARC HILLMYER, Department of Chemistry, University of Minnesota — We propose a strategy utilizing condensed carbon dioxide as a selective–solvent for creating nanoporous materials from block copolymer templates. Cylinder–forming polystyrene–*b*–polylactide ($f_{PLA} = 0.37$) monoliths were annealed in carbon dioxide at constant temperature and various solvent densities. The swollen structures were then quenched at low temperature isochorically. Small-angle X-ray scattering measurements indicated the domain spacing increased with increasing CO_2 density. This result is consistent with the formation of cylindrical pores within the intact polylactide domains, a conclusion confirmed by scanning electron micrographs of the processed monoliths. This controlled, non-destructive technique allows for creating tunable pore structures from a single block copolymer.

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