

Abstract Submitted
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Bottlebrush Copolymer Morphology Transition: Influence of Side Chain Length and Block Volume Fraction¹ YUE GAI, DONG-PO SONG, JAMES WATKINS, Univ of Mass - Amherst — Brush block copolymers synthesized via living ring-opening metathesis polymerization (ROMP) offer unique advantages as templates for functional hybrid materials. Unlike linear block copolymer, the bottlebrush polymer phase transition not only depends on volume fractions of the two blocks but also on side chain length. Here we report the morphology transitions of PS-*b*-PEO bottlebrush copolymer (BBCP) as a function of PEO side chain length and block volume fraction. For the BBCPs with similar side chain lengths, highly ordered lamellar morphologies were observed with PEO volume fractions in a wide range from 32 vol% to 72 vol%, which is significantly different from that of traditional linear block copolymers. This study will lay the groundwork for nanostructure fabrications using the BBCPs and provides new insights into the phase behavior of the new type of materials.

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