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Chirality Effect on Self-Assembly of Chiral Triblock Copolymer
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— A series of triblock copolymers composed of a chiral segment, poly(L-lactide) (PLLA), (referred as chiral triblock copolymers) is synthesized. Starting with a diblock, addition of asymmetric amounts of the chiral block to a symmetric diblock creates competing packing constraints. A smaller additional block should favor a finite spontaneous curvature while the equal-sized diblocks prefer a flat interface. With the introduction of chiral block that drives twisting of the flat interface, the curvature at the saddle surface becomes significant. Consequently, a transformation from two-domain lamellae to cylinder phase can be found in the isopleths of triblock, reflecting chirality effect on the self-assembly of the chiral triblock copolymers. Accordingly, the chirality effect will lead the helical steric hindrance at the interface of achiral and chiral blocks to give the microdomain with large curvature, giving the potential to create network nanostructure from self-assembly.

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