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Tailor-Made Onion-Like Stereocomplex Crystals in Incompatible Enantiomeric Polylactide Containing Block Copolymer Blends[1] LEI ZHU, LU SUN, Institute of Material Science and Department of Chemical, Materials and Bimolecular Engineering, University of Connecticut, Storrs, CT 06269-3136, LIXIA RONG, BENJAMIN HSIAO, Department of Chemistry, State University of New York at Stony Brook, Stony Brook, NY 11794-3400 — Stereocomplexes formed by blending enantiomeric PLA block copolymers have demonstrated great potential for applications in biomedical devices. Here, we successfully synthesized well-defined enantiomeric PLA containing block copolymers by living ring-opening polymerization of L- and D-lactides from hydroxyl-terminated hydrophilic [poly(ethylene oxide) or PEO] and hydrophobic [poly(ethylene-co-1,2-butylene) or PEB] oligomers. Quantitative stereocomplex formation was achieved by equimolar mixing of the incompatible PEO-*b*-PLLA and PEB-*b*-PDLA. Intriguingly, in the blend of PEB-b-PDLA and PEO-b-PLLA with different PEB and PEO molecular weights, onion-like stereocomplex crystals were observed because of unbalanced surface stresses caused by different PEO and PEB molecular weights.

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Lei Zhu
Institute of Material Science and Department of Chemical,
Materials and Bimolecular Engineering, University of Connecticut, Storrs, CT 06269-3136

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