Abstract Submitted
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Generation of Complex Morphologies in Diblock Copolymers via Blending[1] RONALD LEWIS, MORGAN SCHULZE, SEAMUS JONES, HALEY BEECH, ROBERT HICKEY, JAMES LETTOW, FRANK BATES, Univ of Minnesota - Twin Cities — Low molar mass, highly segregated diblock copolymers have received recent attention due to their capacity to form new and complicated ordered morphologies, such as the Frank-Kasper sigma phase. However, the current materials in which these structures form are few and therefore non-ideal for investigating broader applications which require specific chemistries or length scales. Recent theoretical work suggests that increasing compositional and molar mass dispersity through blending relatively well-defined block polymers can induce these complicated structures in conformationally symmetric systems that do not typically exhibit complex phase behavior. Our experimental findings validate these predictions, with the discovery of the Frank-Kasper sigma phase and hexagonally close packed spheres in blends of poly(ethylene-alt-propylene-b-lactic acid) diblock copolymers. These results establish blending as a concrete method for the generation of complex morphologies in diblock copolymer systems where they are otherwise inaccessible.

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