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Phase behavior of particle-forming polyisoprene-*b*-polylactide diblock copolymers KYUNGTAE KIM, RONALD LEWIS, MORGAN SCHULZE, AKASH ARORA, KEVIN DORFMAN, FRANK BATES, Univ of Minn - Minneapolis — Low-symmetry phases including the dodecagonal quasicrystal and tetrahedral close-packed Frank-Kasper σ phase recently have been identified in various forms of soft materials including dendrimers, surfactants, and block polymers. In block polymers these complex phases emerge from the supercooled fluctuating disordered state, comprised of well-formed micelles. Rapid cooling to sufficiently low temperatures below the order-disorder transition extinguishes molecular exchange resulting in non-ergodic liquid-like packing. Here we present fresh findings obtained as a function of temperature and time from polyisoprene-*b*-polylactide (PI-*b*-PLA) diblock copolymers containing 15 to 25 % PLA based on time dependent synchrotron X-ray scattering and draw connections with the thermal processing of metal alloys.

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