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Architectural effect on the self-assembly of supramolecular triblock copolymer melts WON BO LEE, RICHARD ELLIOTT, KIRILL KATSOV, GLENN H. FREDRICKSON, University of California, Santa Barbara — Thermoreversible, supramolecular self-assembly in multi-block copolymer melts is studied within the framework of self-consistent field theory. This approach is adapted to study a system composed of two chemically distinct, but reactive homopolymer species: a linear A-homopolymer with a single reactive group at one of the ends, and a linear B-homopolymer with reactive groups at both ends. Reversible bonding occurs between the functional groups from different polymer species so that the reacting system can contain A, B, AB and ABA (co)polymer species whose overall volume fractions are controlled by the segmental incompatibility, bonding strength and homopolymer chain lengths. Architectural variations of these copolymers, arising from the differing lengths of A and B homopolymers, have a dramatic effect on not only the micro-phase separation but also on the extent of reversible bonding. Two characteristic phase diagrams are constructed to illustrate this behavior and possible technological applications are discussed.

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