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Investigation of Ternary Multiblock Copolymer Melts using Self-consistent Field Theory[1] DACHUAN SUN, JUNHAN CHO, Department of Polymer Science and Engineering, Dankook University, South Korea — Recently, A-b-(B-b-A)n-b-C multiblock copolymers have drawn attention due to their hierarchical nanostructures. Several phase diagrams for these copolymers using an analytical method have been made by G. ten Brinke et al. Here, we performed numerical self-consistent field calculations on the same copolymers to reconstruct the phase diagrams. The perpendicular lamellae phase disappears and is replaced by the parallel lamellae phase in our phase diagrams. For the parallel lamellae phase, there are only two A layers rather than three. Moreover, one B layer is located between the two A layers, with another two thin B layers located near the interface between the A and C chunks. The interfacial energy between the C and A chunks is reduced dramatically due to the existence of the B layers between them. Because thus formed parallel lamellae phase has much lower free energy, the perpendicular lamellae phase is replaced by the parallel ones.

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