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Efficacy of Different Block Copolymers in Facilitating Microemulsion Phases in Polymer Blend Systems GUNJA PANDAV, VENKAT GANESAN, University of Texas at Austin — Polymeric microemulsions are formed in a narrow range of phase diagram when a blend of immiscible homopolymers is compatibilized by copolymers. In this study, we consider the ternary blend system of A and B homopolymers mixed with block copolymers containing A and B segments, and probe the efficacy of different copolymer configurations in promoting the formation of microemulsion phases. Specifically, we consider: (a) Monodisperse diblock copolymers; (b) Diblock copolymers with bidisperse molecular weights (MW); (c) Block copolymers having MW polydispersity in one of the blocks; (d) Diblock copolymers having monodisperse MW but bidispersity in average composition; and (e) Gradient copolymers exhibiting a linear variation in the average composition. Using single chain in mean field simulations effected in two dimensions, we probe the onset of formation and the width of the bicontinuous microemulsion channel in the ternary phase diagram of homopolymer blended with compatibilizer. We rationalize our results by explicitly quantifying the interfacial activity and the influence of fluctuation effects in the respective copolymer systems.

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