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An Analysis of the Solidification Process in Immiscible and Crystallizable Polymer Blends. YOUNG GYU JEONG, NATALIA POGODINA, SHAW LING HSU, Polymer Science and Engineering Department, University of Massachusetts Amherst — Despite the tremendous number of studies in this area, the solidification process of binary and ternary blends is not clearly understood. Here we report the solidification process of immiscible and crystallizable blends, composed of crystallizable polyester and noncrystallizable polyether, in terms of crystallization kinetics, morphological features, and interaction between domains and matrix. All blends exhibited phase-separated morphology with polyester-rich dispersed domains and polyester-poor continuous matrix. The local composition, morphological features, crystallization and solidification process were characterized using $^1\text{H-NMR}$, optical microscopy, DSC, and small-amplitude oscillatory viscometry, respectively. The local composition and crystallinity in polyester-rich and -poor phases were varied, depending on blend composition and/or crystallization temperature. The solidification process of blends with low polyester content of 10-30 wt% was dominated by crystallization of the polyester-poor phase. The ultimate viscosity of the overall blend was also lower than that of the polyester-poor phase. The high ultimate viscosity in the polyester-poor phase was associated with the percolated morphology of ‘curved leaf’-shape crystallites.

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