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Non-Isothermal Crystallization of PET/PLA Blends¹ HUIPENG CHEN, Texas Tech University, MAREK PYDA, Rzeszow University of Technology, PEGGY CEBE, Tufts University — Binary blends of poly(ethylene terephthalate) with poly(lactic acid), PET/PLA, were studied by differential scanning calorimetry. The solution cast blends were miscible in the melt over the entire composition range. We report the non-isothermal crystallization of: a.) PET, with and without presence of PLA crystals, and b.) PLA, with and without presence of PET crystals. PET can crystallize in all blends, regardless of whether PLA is amorphous or crystalline, and crystallinity of PET decreases as PLA content increases. PLA crystallization is strongly affected by the mobility of the PET. When PET is wholly amorphous, PLA can crystallize weakly even in 70/30 blends. When PET is crystalline, PLA cannot crystallize when its own content is below 0.90. The different behaviors may be related to the tendency of each polymer to form constrained chains, i.e., to form rigid amorphous fraction, RAF. PET is capable of forming a large amount of RAF, whereas relatively smaller amount of RAF forms in PLA. Like the crystals, rigid amorphous fraction of one component may inhibit growth of crystals of the other blend partner.

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