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Rate of Formation of Trigonal Phase in Blends of Homogeneous Propylene 1-Hexene Copolymers HAMED JANANI, GABRIEL TRUJILLO, RUFINA ALAMO, Florida State University, FAMU-FSU College of Engineering — Blends of polyolefins such as polyethylenes, polypropylenes or their copolymers are often used to balance the strengths of each component towards improving processing, physical properties and performance. The final properties depend on the semicrystalline state acquired upon melt-solidification which is highly impacted by the state of melt miscibility. In this work we have assessed the critical composition difference for melt miscibility of propylene 1-hexene copolymers (PH) and selected a miscible pair with 11 and 21 mol% of 1-hexene respectively. PH21 crystallizes in a trigonal packing, while PH11 develops monoclinic crystallites (at low undercooling) or the mesomorphic form (at high undercooling). In situ DSC and WAXD analysis indicate that while the content of trigonal phase decreases with increasing PH11, the rate of formation of trigonal phase in the whole range of undercooling increases with addition of PH11, which as a pure component does not form trigonal phase. The unexpected enhanced kinetics of formation of trigonal phase with blending is attributed to the increasing composition of 1-hexene in the melt during isothermal crystallization of the blend.

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