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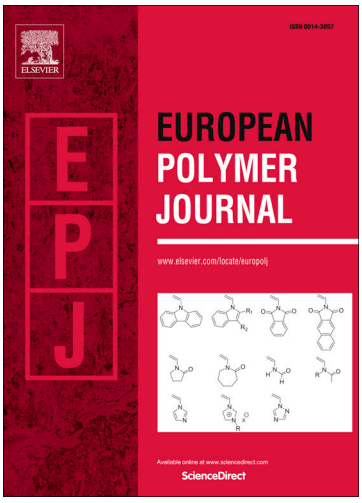

Crystallization kinetics of ethylene-*co*-propylene rubber/isotactic polypropylene blend investigated via chip-calorimeter measurement

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Crystallization kinetics of ethylene-*co*-propylene rubber/isotactic polypropylene blend investigated via chip-calorimeter measurement

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Abstract Differential scanning calorimetry measurement via fast-scan chip-calorimeter Flash DSC1 has been widely applied to investigate the crystallization kinetics of homopolymer and random copolymers. We expanded the measurement to the crystallization kinetics of isotactic polypropylene (iPP) blending with 29.3wt% ethylene-co-propylene rubber (EPR) that contains 39.5wt% ethylene monomers (toughening iPP). The temperature dependence of half-crystallization times of the blend show three regions of deviations from the parallel results of pure iPP, reflecting the effect of interplay between phase separation and crystallization. We attributed faster crystallization in the high-temperature region to crystal nucleation accelerated by the interfaces of two incompatible components, attributed slower crystallization in the middle-temperature region to crystal nucleation retarded by the crystallization of ethylene sequences in the minor EPR component, and attributed faster crystallization in the low-temperature region to crystal nucleation accelerated by the crystallization of propylene sequences in the minor EPR component. The suppression of crystallization on fast cooling as well as the variation of Avrami indexes support the scenario of crystallization competition in the middle temperature region.

Keywords Crystallization kinetics; Polymer blends; Fast-scan chip-calorimeter;

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