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Effect of compositional heterogeneity on the phase structure and crystallization behavior of polypropylene in-reactor alloys.¹ DUJIN WANG, HAIJIN ZHU, BENJAMIN MONRABAL, CHARLES C. HAN — Although the compositional heterogeneity and chain structure of PP/EPR in-situ blends have been extensively investigated, little is known about the conclusive relationship among the molecular/phase structure and the ultimate mechanical properties due to its complex compositions in such system. A systematic study was conducted on the compositional heterogeneity, phase structure, the crystallization and subsequent melting behavior of two in-reactor alloys EB-P and EP-P. The composition of the alloys and the chain structure of each component were characterized by preparative TREF and ¹³C-NMR technique. The results showed that the excellent balance between toughness and rigidity of EB-P primarily benefits from the polyethylene homopolymer (HPE) phase and the ethylene- α -olefin copolymer (EC) component, which is enriched at the interface between the dispersed phase (HPP) and the matrix (HPE). As for EP-P, the amorphous EC and the interpenetrating phase are mainly responsible for the outstanding low temperature impact toughness.

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