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Interplay Between Two Phase Transitions: Crystallization and Liquid-Liquid Phase Separation in a Polyolefin Blend CHARLES C. HAN, XIAOHUA ZHANG, PPCL, Joint Lab. of Polymer Science and Materials, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100080, China — The correlation between liquid-liquid phase separation (LLPS) and crystallization at several compositions in statistical copolymer blends of poly (ethylene-co-hexene) (PEH) and poly (ethylene-co-butene) (PEB) has been examined by optical microscopy (OM), atomic force microscopy (AFM) and differential scanning calorimetry (DSC). The overwhelming change in the crystallization kinetics due to the density fluctuation caused by the spontaneous spinodal LLPS is observed. This coupling mechanism suggests a new mechanism in the nucleation-crystallization process. All evidences are pointing to a cross-over mechanism from the spinodal fluctuations (of liquid-liquid phase separation) to the nucleation and than crystallization. The detailed experimental evidences and a suggested physical model will be presented.

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