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Melting in Copolymer Blends BUCKLEY CRIST, Northwestern University — It is observed that the melting temperature T_m of polyethylene is insensitive to blending with a melt-miscible random ethylene copolymer. On the other hand, the T_m of an ethylene-rich copolymer is depressed strongly when blended with a less ethylene-rich copolymer. If A is a homopolymer that does not cocrystallize with B, the standard thermodynamic prediction for T_m employs the small entropy of mixing of entire chains. The situation is quite different if A and B are random copolymers with different amounts of non-crystallizable comonomers. Copolymer melting is based on the mixing of crystallizable and non-crystallizable monomers during fusion, calculated for sequences, not for entire chains. In essence, T_m for the copolymer blend depends on the total concentration of crystallizable monomers from both blend components, regardless of the chain to which a particular sequence belongs. This concept adequately accounts for the observations above.

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