

CRYSTALLIZATION, MORPHOLOGY AND PROPERTIES OF ISODIMORPHIC RANDOM COPOLYMERS

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The properties of semi-crystalline random copolymers depend on how similar the chemical structure of the parent homopolymers is. Figure 1 shows a schematic plot of melting point versus composition for a PA-*ran*-PB copolymer. Three possible cases are illustrated. Isomorphism occurs when the chemical structures are so similar that total comonomer inclusion or miscibility in the crystalline state is obtained. On the contrary, when the chemical structures are very different, the exclusion of comonomer B from the lattice of PA and vice-versa is obtained. The most interesting cases are the so-called isodimorphic copolymers, where partial inclusion of comonomers occurs, and crystallization is achieved in the entire composition range. A pseudo-eutectic point is observed because the crystal structure of the PA-type is formed to the left of this point and the PB-type crystal structure to the right of this point. Hence, melting temperature can be tailored by composition, as well as crystallinity and crystal structure. In this lecture, the effects of chemical structure, molecular weight, and composition on the structure, morphology, nucleation, and crystallization will be presented for a wide range of isodimorphic copolyesters and copolycarbonates. [1-3].

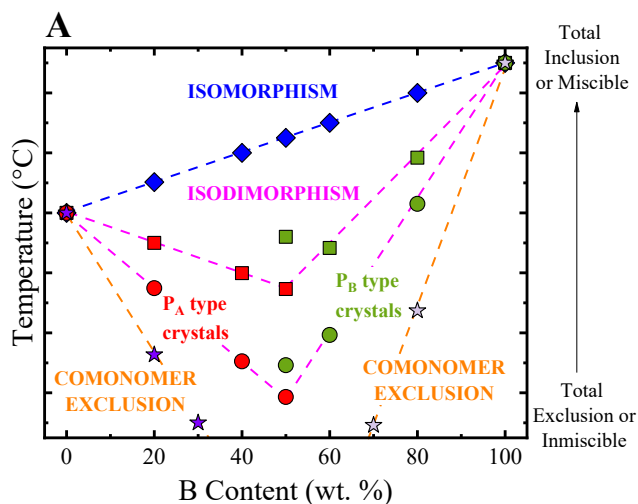


Figure 1. Melting temperature versus composition for PA-*ran*-PB copolymers [1].

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