IN-SITU STRUCTURAL STUDIES OF SEMICRYSTALLINE POLYMER BLENDS USING SYNCHROTRON RADIATION

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Due to their biocompatibility and amphiphilic character polyanhydrides are being studied as potential vehicles for controlled drug delivery. The design of drug delivery devices based on multicomponent polymer systems requires a detailed understanding of their phase behavior and microstructure. Hence we investigated the phase behavior of a binary polyanhydride blend composed of poly[1,6-bis(p-carboxyphenoxy)hexane] (poly(CPH)) and poly(sebacic acid) (poly(SA)) by \textit{in situ} SAXS at different temperatures. Based on the measured segmental interaction parameter from SAXS a phase diagram was predicted. The predicted phase diagram exhibits an upper critical solution temperature (UCST) of 114\textdegree C. From a time-resolved SAXS study of the isothermal crystallization kinetics of a series of polyanhydride copolymers information on the long period, lamellar thickness, and degree of crystallinity were obtained.

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