Interfacial Activity of a Diblock Copolymer in Immiscible Tetramethyl Polycarbonate/Phenoxy Blends

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The addition of a block copolymer to immiscible polymer blends has often become a valuable method to control the phase separation process and thus to avoid the detrimental effects of immiscibility of the components on the morphology and the other physical properties of the blends. In this study, the interfacial activity of a block copolymer poly(styrene-*b*-methyl methacrylate) in an immiscible poymer blend system, tetramethyl polycarbonate(TMPC) and poly(hydroxy ether of bisphenol A) (Phenoxy), was investigated by examining phase morphology, thermal behavior and mechanical properties. The block copolymer was prepared by sequential anionic polymerization of styrene and methyl methacrylate using *n*-BuLi as an initiator at -78℃. The blends were prepared by dissolving the component polymers, TMPC, Phenoxy, and block copolymer in tetrahydrofuran. The solutions were precipitated in a large quantity of methanol and dried in vacuum oven. Then, samples were molded into sheets by using hot press. Scanning electron micrographs of fractured surface show that domain size of dispersed phase is significantly reduced when a small amount of block copolymer is added, while the blends without block copolymer have larger domain size. Using DSC, thermal analysis was carried out to support the fact that the block copolymer is properly located at the interface. Mechanical properties are also related with phase morphology.