

Baroplastic Properties for Polymer Processing

이용훈, 조성준, 이우섭, 류두열†

연세대학교 화공생명공학과

(dyryu@yonsei.ac.kr†)

The manufacturing of polymer traditionally involves thermal processing or molding under pressure. So, polymer baroplasticity is a desirable property for the recycling and regenerating material industries, since it allows the polymers to flow at relatively mild pressure. In the baroplastic block copolymers (BCPs), the compressibility issue pertaining to the enhanced miscibility with pressure has been an attractive topic, because an ordered state of the baroplastic BCPs becomes a phase-mixed state (or disordered phase) between the two dissimilar blocks upon pressurizing. In this study, we produced various phase transitions in the miscible BCP blends composed of polystyrene-*b*-poly(*n*-butyl methacrylate) (PS-*b*-P*n*BMA) / deuterated-polystyrene-*b*-poly(*n*-hexyl methacrylate) (*d*PS-*b*-P*n*HMA). Together, with thermodynamic analysis of baroplasticity based on the values of enthalpic and volumetric changes at various phase transitions, we demonstrated that baroplastic nature for the miscible BCP was attributed dominantly to the entropic compressibility.