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Phase Behavior of a Weakly Interacting Polystyrene and Poly(n-hexyl methacrylate) System HYUNGJU AHN, SUDHAKAR NAIDU, DU YEOL RYU, Yonsei University, Korea, JUNHAN CHO, Dankook University, Korea — Understanding the phase behavior of multi-component polymeric materials has been of great concern in polymer community, since this provides us a key to the compatibility in most applications involving polymer blends and block copolymers. In the weakly interacting binary blends, UCST-type polymer blends generally undergo a transition from the homogeneous to phase- separated state by the nonfavorable segmental interactions, while LCST-type blends show an opposite tendency as a consequence of thermal compressibility (or thermal expansion) difference between two components. We report an experimental evidence for the coexistence of both UCST and LCST behavior in a weakly interacting deuterated PS (dPS) and PnHMA blend system. A new phase diagram involving both UCST and LCST was obtained by the delicate control of molecular weights between dPS and PnHMA. Whereas for the block copolymers such as deuterated polystyrene-b-poly(n-hexyl methacrylate) (dPS-b- PnHMA) and PS-b-PnHMA, an order-to-disorder transition (ODT) on heating was observed within experimental temperature range depending on the molecular weight.

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