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The Order-to-Disorder Transition of A Symmetric Polystyrene-block-Poly(2-vinyl pyridine) Copolymers with various amounts of Cadnium Chloride[1] DONG HYUN LEE, POSTECH, DU YEOL RYU, University of Mesachusetts, JIN KON KIM, POSTECH — The order-to-disorder transition [ODT] of a symmetric polystyrene-block-poly(2-vinyl pyridine) [PS-P2VP] copolymer with various amounts of cadmium chloride [$CdCl_2$] was investigated by rheometry, synchrotron small angle X-ray scattering (SAXS), and transmission electron microscopy. PS-P2VP was synthesized by the sequential anionic polymerization. The $CdCl_2$ can coordinate with the nitrogen in P2VP. Even though the amount of $CdCl_2$ was very small (less than 0.01 vol %), the T_{ODT} of PS-P2VP coordinated with $CdCl_2$ increased drastically. When the volume fraction of $CdCl_2$ is just 0.0023 (thus the molar ratio of [$CdCl_2$]/[P2VP] = 0.01), the T_{ODT} was increased as large as about 10 ^{o}C compared with that of neat PS-P2VP. This is because the chain motion of P2VP block is severely restricted by coordination of $CdCl_2$ with P2VP. The order-to-disorder transition temperatures for [$CdCl_2$] / [2VP] = 0, 0.01, 0.02, 0.03 and 0.04 are 199.2, 209.9, 234.6, 260.2 and 279.8 ^{o}C, respectively. In addition to the large increase of domain spacing of microstructure was also found in this study even though the amount of $CdCl_2$ was very small.

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