

Abstract Submitted  
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**Origin of the Difference in Order-Disorder Transition Temperature Between Polystyrene-block-Poly(2-vinylpyridine) and Polystyrene-block-Poly(4-vinylpyridine) Copolymers** JIN KON KIM, DONG HYUN LEE, SUNG HYUN HAN, Pohang Univ. of Science and Technology, WEIBIN ZHA, CHANG DAE HAN, The University of Akron, JIN HO KANG, CHEOL PARK, National Institute of Aerospace, C.D. HAN COLLABORATION, C. PARK COLLABORATION — The order-disorder transition temperatures ( $T_{ODT}$ ) of polystyrene-block-poly(2-vinylpyridine) (S2VP diblock) and polystyrene-block-poly(4-vinylpyridine) (S4VP diblock) copolymers were determined using oscillatory shear rheometry and small-angle X-ray scattering (SAXS). It has been found that for comparable molecular weight and block composition, the  $T_{ODT}$  of S4VP diblock copolymer is exceedingly high compared with that of S2VP diblock copolymer. This observation is attributable to the stronger polarizability of P4VP in S4VP diblock copolymer compared with the polarizability of P2VP in S2VP diblock copolymer. With the SAXS profiles obtained in the disordered state of low-molecular-weight S2VP and S4VP diblock copolymers, we determined, with the aid of the Leibler theory, the temperature-dependent segmental interaction parameter ( $\alpha$ ) for PS/P2VP and PS/P4VP pairs. The values of  $\alpha$  for PS/P2VP pair were found to be much smaller than those for PS/P4VP pair.

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