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The Study of Interpenetration Length between dPS Films and PS-grafted Layers HOYEON LEE, SEONGJUN JO, Yonsei University, TOYOAKI HIRATA, Kyushu University, NORIFUMI L. YAMADA, J-PARC, KEIJI TANAKA, Kyushu University, DU YEOL RYU¹, Yonsei University — In polymer thin film system, the type of interfacial interaction is a critical parameter to determining the thermal and physical properties of polymer films. Interestingly, the interfacial energy of grafted substrates with polymer chains is remarkably altered by simply controlling grafting density, which has been referred to as auto-phobicity. In this study, we investigated the interpenetrating interfaces between deuterated polystyrene (dPS) and grafted substrates with the same chemical identity. PS-grafted substrates were prepared using a grafting-to approach with hydroxyl end-functionalized polystyrene (PSOH) in a dry brush regime, where the brush thickness and grafting density were determined based on the chain length (or molecular weight, M_n) of PSOHs. The interpenetration lengths (ξ) at interfaces between dPS and PS-grafted layers were characterized using neutron reflectivity (NR) measurements (performed at the SOFIA beam-line at J-PARC, Japan).

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