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Interaction between the hydroxyl functionalized PS and dPS in dry brush system

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Polymer brushes using end-functionality were studied for modifying the substrate to control interfacial interactions between the substrate and melt polymer layer. Interfacial interaction is a critical parameter for polymer thin film system, which determines the thermal and physical properties of polymer films. With the different chemical structures of modified polymer brushes, the thermal dynamics of polymer films dynamically change, such as adhesion, lubrication, slip, and the wettability. Interestingly, the interfacial energy of grafted substrates with polymer chains are remarkably altered by simply controlling the grafting density, which has been referred to as autophobicity.

In this study, we controlled the molecular weight of hydroxyl-functionalized polystyrene (HO-PS) to modify the surface on a standard Si wafer. Grafting HO-PSs to a native oxide layer was performed simply by thermal annealing, followed by rinsing with toluene to thoroughly remove the un attached (or unreacted) polymer chains. Deutrated polystyrene (dPS) was prepared on the PS brush layer to develop the neutron contrast between the brush layer and top polymer films, and the double-layed films were subjected to Neutron Reflectivity (NR) experiments. Interfacial penetration and autophobicity will be discussed to characterize the interface between the PS brush layer and top dPS polymer films.

Biography

Seongjun, Jo has completed his undergraduate course in 2015 from Chungnam National University, Korea and is currently studying for his combined PhD program in Yonsei University, Korea.

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