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Thin Film Stability of Polystyrene with a Functional End Group KEIJI TANAKA, SHINICHIRO SHIMOMURA, MANABU INUTSUKA, Kyushu University, KOICHIRO TAJIMA, MASAAKI NABIKA, SATORU MORITOMI, Sumitomo Chemical Co., Ltd., HISAO MATSUNO, Kyushu University, KYUSHU UNIV. TEAM, SUMITOMO CHEMICAL CO., LTD. COLLABORATION — The thin film stability of omega-N-(3-(dimethylamino)propyl)propylamide-terminated polystyrene (PS-N) and its mixture with conventional polystyrene (PS-H) spincoated on silicon wafers with a native oxide layer was studied. While a 20 nm-thick film of PS-H with a number-average molecular weight of approximately 50k was broken at 423 K, a comparable PS-N film and blend films with a PS-N fraction higher than 40 wt% were stable. Although the local conformation of chains at the substrate interface was not the same for PS with/without the functionalized terminal group, the glass transition temperature at the interface was identical for PS-H and PS-N. The residual adsorbed layer on the substrate after washing the films with toluene was thicker for PS-N than for PS-H. This implies that the end functionalization impacts chain movement on a large scale rather than via segmental dynamics.

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