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**Grafting reactions between end-functional polymers at polymer interfaces** E.J. KRAMER, B.J. KIM, K. KATSOV, G.H. FREDRICKSON, UCSB, H. KANG, K. CHAR, Seoul National University — Reactions to produce graft copolymers at polymer interfaces during extruder mixing are important for controlling dispersed phase size by retarding droplet coalescence and reducing interfacial tension while providing interface reinforcement. We investigate such reactions at various temperatures in a model bilayer film system consisting of amine end-functional deuterated polystyrene (dPS-NH<sub>2</sub>) in PS and anhydride end-functional poly(2-vinylpyridine) (P2VP-anh) in P2VP as a function of molecular weight  $M$  and initial volume fraction  $\phi_0$  of the end functional chains. After various times of reaction the interfacial excess  $z^*$  of block copolymer formed at the interface is determined by detecting the <sup>2</sup>H<sup>-</sup> ion using dynamic SIMS depth profiling. At low  $\phi_0$  ( $\sim 0.01$ ) of dPS-NH<sub>2</sub> and P2VP-anh, such that the normalized interface excess  $z^*/R_g < 1$  and the blocks are unstretched, the forward reaction rate constant  $k^+$  decreases as  $M^{-0.68}$  in rough agreement with theoretical predictions ( $k^+ \sim M^{-0.55}$ ) for this regime. The rate constant is thermally activated with an activation enthalpy 165 kJ/mol that is independent of  $M$ .

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