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Effects of shear flow on reactive coupling of polymer chains at melt interfaces JIANBIN ZHANG, Department of Chemical Engineering and Materials Science, University of Minnesota, TIMOTHY LODGE, Department of Chemical Engineering and Materials Science and Department of Chemistry, University of Minnesota, CHRISTOPHER MACOSKO, Department of Chemical Engineering and Materials Science, University of Minnesota — The coupling reaction of functional polymers at static polymer-polymer interfaces is typically much slower than that at interfaces formed during mixing (see, for example, Reference 1). We have demonstrated that the imposed simple shear can accelerate coupling reactions at flat interfaces. For amine-terminal polystyrene (PS-NH_2)/anhydride terminal poly(methyl methacrylate) (PMMA-anh), the PMMA-anh conversion under dynamic oscillation even at strain amplitude as small as 1% is seven times that under static conditions. Reaction time and temperature and the total interfacial area were maintained the same. Similar behavior was found for both bilayer and multilayer samples. Under steady simple shear, the reaction conversion and the rate of interfacial area generation are comparable to that of batch mixing.

1. Macosko, C. W.; Jeon. H. K.; Hoye, T. R. *Prog. Polym. Sci.* **2005**, 30, 939.

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