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**Gelation, Dynamics and Mechanics of Associating Polymers: Exploring Parameter Space** ROBERT S. HOY, GLENN H. FREDRICKSON, Materials Research Laboratory, University of California, Santa Barbara — We present simulation studies of associating polymer melts, where a fraction of the monomers are “sticky.” A coarse grained hybrid MD/MC model is used to accurately model polymer dynamics and qualitatively capture chemical kinetics. The effects of varying sticky bond strength, sticky monomer concentration and placement along chains, chain length  $N$ , temperature  $T$ , and chemical kinetics are examined. All have independent and interesting effects on the dynamics and mechanics. We focus on the “reversible” gel regime where almost all chains are instantaneously connected to the network, yet chains are delocalized and the system displays complex time and strain-dependent properties.

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