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**Effect of Hydrogen Bonding End Groups on the Bulk Diffusion of Polymers** KATHLEEN SCHAEFER, CRAIG HAWKER, EDWARD KRAMER, UCSB — Multiple hydrogen bonding (MHB) groups are being incorporated into an increasingly wide variety of polymer architectures, from short difunctional oligomers to high molecular weight multifunctional random copolymers. The addition of even weakly binding groups can have a drastic effect on rheological properties; generally this is due to dimerization of complementary groups, but these can also interact with the surrounding polymer matrix. To better understand this process we have synthesized linear polymers with a single hydrogen bonding end group and compared their bulk diffusion behavior to non-functional linear polymers. Deuterated poly(benzyl methacrylate) was synthesized via RAFT polymerization; the dithioester chain end was displaced by heating in the presence of an excess of radicals derived from AIBN or a functional azo compound. Thin films ($\sim$100nm) of deuterated polymer were cast onto thick films (>500nm) of protonated polymer and these bilayers annealed at various temperatures. The depth profiles of the bilayers were measured by dSIMS and fit to the solution of the diffusion equation to determine diffusion coefficients and the effect of a single hydrogen bonding end group on motion through the polymer matrix.

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