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Molecular Weight Changes and Crosslinking Kinetics in Glassy and Elastomeric Thin Films[1] NICHOLAS CARBONE, MADA ENE, JEFFREY LANCASTER, JEFFREY KOBERSTEIN, Columbia University — The quantitative and qualitative kinetics of molecular bridging through hydrogen extraction from the tertiary carbon in Polymer backbones are explored through HPLC with MALLS in 300nm films of Polystyrene, Poly(n-butyl acrylate), and other polymers above and below the glass transition temperature. Changes in molecular weight distribution and the appearance of peaks at double and triple the original molecular weight allow the study of the initial stages of network formation. The relative merits of multiple bridging molecules are explored, as well as their effects on kinetics and distribution. When our compounds are mixed into a polymer and exposed to UV radiation, they abstract hydrogen atoms from any chains in proximity, thereby initiating a cascade of free radical reactions that include several mechanisms that can lead to covalent polymer crosslinking.

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