

Abstract Submitted
for the PSF09 Meeting of
The American Physical Society

EPR Study of Frontally Polymerized Acrylate Polymer Systems¹

A. THOMA, A. VALENCIA, B. BAKER, P. BUNTON, William Jewell College, J. POJMAN, V. VINER, Louisiana State University — Trimethylolpropane trimethacrylate (TMPTMA), 1,6-hexanediol diacrylate (HDODA), and trimethylolpropane triacrylate (TMPTA-n) were frontally polymerized and analyzed via electron paramagnetic resonance (EPR) spectroscopy. A comparison of radical concentration was performed for individual polymers and copolymers. Samples were mapped down the EPR tube to observe behavior of radicals down the polymerization front. During the frontal method, a large spike in intensity is observed at the point of initiation. Within a few centimeters, the signal diminishes into a steady state. As the concentration of TMPTMA was increased linearly in mixtures with TMPTA-n, an exponential growth of the radical concentration was observed. This exponential growth was not observed in the TMPTA-n-HDODA copolymer; increasing the HDODA concentration led to a linear growth of radical concentration. Frontal polymerization was also compared to bulk polymerization. The bulk method produced a larger number of radicals than the frontal method.

¹Supported in part by Research Corporation and by the E.S. Pillsbury Foundation.

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Date submitted: 19 Oct 2009

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