Supplemental Information

Determination of molecular weight by static light scattering

Static light scattering (SLS) experiments were performed with a 10 W Lexel Model 95 argon ion laser at a wavelength of 514.5 nm and at a power of 150-1000 mW. A Brookhaven Instruments BI-200 goniometer was used to measure the scattered light intensity at scattering angles from 50° to 130° in 10° increments. Fully hydrolyzed prepolymer samples were prepared at concentrations of 13, 16, 22, and 25 mg/mL in 18 MΩ deionized water and filtered through a 0.22 μm cellulose filter into Fisherbrand 10 mm o.d. glass tubes prior to the experiment. The temperature of the sample was maintained at a constant value (± 0.2 °C) by recirculating water from a temperature-controlled water bath through the sample holder. The weight-average molecular weight (Mw) extracted from Zimm plots was determined to be ~49,000 g/mol.

Kinetics of prepolymer reactions with NTA and MTP

The kinetics of the amidation reactions of the NTA and MTP functional groups with the prepolymer were determined using UV-vis spectroscopy to follow the free NHS chromophore concentration at 260 nm. The typical assay procedure was to dissolve 50 mg of the prepolymer in 4 ml of deionized water and then add 50 μL of this solution to 3 ml of primary amine (0.01 M, pH 10.8), or 3 mL of PBS (0.1 M, pH 10.8), and then record absorbance values. The absorbance values were normalized to an experimentally determined linear calibration curve of NHS absorbance with a molar absorptivity of 8900 $cm^{-1}M^{-1}$. The aminolysis rates were calculated to be 9.63×10^{-3} for MTP and 9.65×10^{-3} for NTA assuming pseudo first order kinetics compared to 8.7×10^{-7} for the hydrolysis reaction.

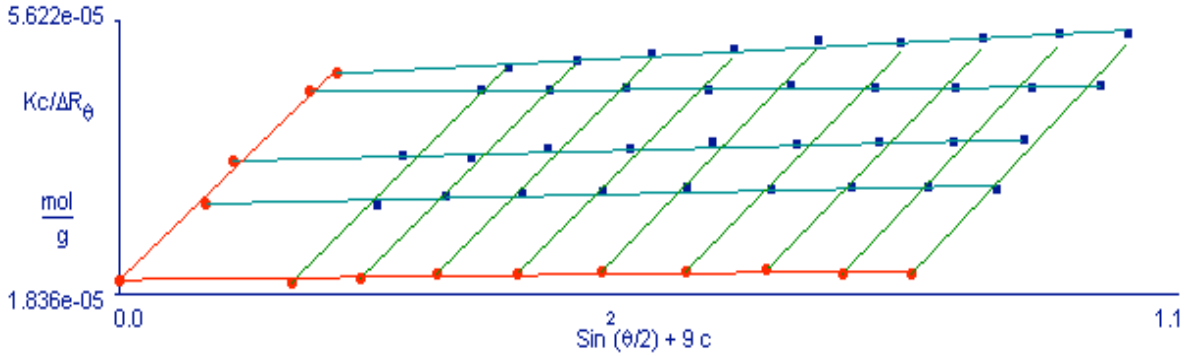

Figure S1: Zimm plot from static light scattering experiment to determine the molecular weight of the fully hydrolyzed Polyacrylamide-co-n-acryloxysuccinimide. The results of this experiment gave an average molecular mass of 49,000 g/mol for the hydrolyzed polymer.

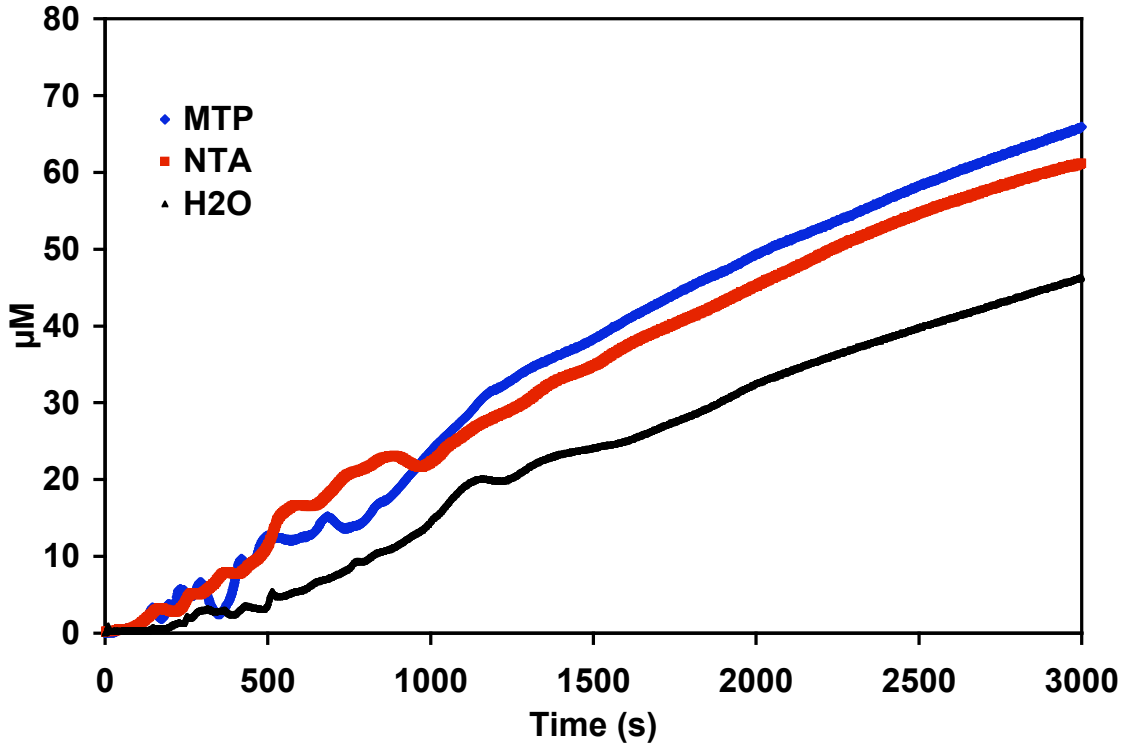

Figure S2: Kinetics of primary amines MTP (blue) and NTA (red) reacting with the polyacrylamide-co-n-acryloxysuccinimide active ester prepolymer followed by the increasing absorption of free succinimide at 260 nm.