

## **598f Cure Kinetics of Cross-Linked Copolymers of Dgeba Vinyl Ester and 2-Acrylamido 2-Methyl Propane Sulfonic Acid**

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In this work, we discuss recent efforts elucidating the kinetic behavior of a system consisting of diglycidyl ether of bisphenol A (DGEBA) vinyl ester (VE) and 2-acrylamido 2-methyl propane sulfonic acid (AMPS). This is a cross-linked system that can potentially be used as proton exchange membranes in fuel cell applications. The hydrophobic VE is copolymerized with hydrophilic AMPS in a common solvent, dimethyl formamide (DMF) via a free radical polymerization mechanism that is thermally initiated by benzoyl peroxide. Transmission mode Near Infra Red (NIR) Spectroscopy is utilized to monitor the consumption of methacrylate and acrylate C=C bonds in the VE and AMPS respectively. Pure component peaks appear at 6163 cm<sup>-1</sup> and 6154 cm<sup>-1</sup> while various molar ratios of VE to AMPS gives a neatly dependant peak position in between these limits. On the basis of this peak shift, a technique of monitoring the copolymerization behavior has been established. Initial results show that the method can compute individual conversion profiles. Determination of the reactivity ratios using the copolymerization composition equation is contemplated in order to better understand the copolymer structure being formed.