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A Quantitative Determination of Parameters Governing Reaction Products in Emulsion Based Systems CASEY KIMBALL, SHAW LING HSU, University of Massachusetts — Investigation of reacting blends containing an aqueous latex base (Poly(Styrene-co-Butadiene), Poly (Methyl Methacrylate) and Poly(Ethylene-co-Vinyl Acetate) respectively) and Poly(Vinyl Alcohol) as a crosslinking agent with a multifunctional isocyanate shows the formation of different chemical products using Time Resolved Fourier Transform Infrared Spectroscopy. The formation of functional groups that contribute to crosslinking (i.e. the urethane and urea linkages from the resultant urethane chemistry) is dependent upon the miscibility of the three reactive functional groups in the blends, namely, the water, the hydroxyl and the isocyanate groups. For the first time, using an internal standard, it is possible to determine the relative composition of the products formed in a quantitative fashion as well as the reaction kinetics. The differences in observed reactivity can be accounted for by different dispersion states of the reactive groups in the blend. Dispersion on the molecular level is governed by the miscibility of the components and therefore is different in each of the three systems depending on their latex base.

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