

Abstract Submitted  
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**Modeling of water-borne coating: stress relaxation of suspensions of colloids linked by telechelic HEUR polymers.**<sup>1</sup> SHIHU WANG, RONALD G. LARSON, Univ of Michigan - Ann Arbor — In water-borne coatings, the rheology of colloidal suspensions is modified by the presence of rheological modifiers, such as Hydrophobic Ethoxylated Urethane (HEUR) polymers. HEUR is a telechelic polymer with two hydrophobic tails (hydrophobes) and a long hydrophilic interblock consisting of poly(ethylene oxide), and its thickening effect is largely determined by the self-association of hydrophobes as well as their adsorption onto latex particles. Here we describe a model that simulates the complex interactions among latex particles due to the formation of bridges or superbridges via model HEURs. We calculate the stress relaxation of the system and identify different relaxation modes. We explore the relaxation time at different latex volume fractions, HEUR concentrations and energies of association between hydrophobes and latex particles, and discuss its relationship with the bridge or latex cluster formation. These results provide important insights for HEUR adsorption and water-borne coating rheology.

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