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Modeling the Adsorption of Hydrophobic Ethoxylated Urethane (HEUR) Thickeners onto Latex Surfaces using Self-Consistent Field Theory[1] VALERIY GINZBURG, ANTONY VAN DYK, TIRTHA CHATTERJEE, Dow Chemical Co, SHIHU WANG, RONALD LARSON, University of Michigan — Hydrophobic Ethoxylated Urethane (HEUR) polymers are widely used as rheology modifiers (thickeners) in waterborne latex paints. Recently, it has been shown that the thickening effect of HEURs in paints is largely determined by their adsorption onto latex surfaces, this adsorption being a function of polymer structure, latex surface chemistry, and total available latex surface. Here, we describe the application of Self-Consistent Field Theory (SCFT) to calculate adsorption isotherms of several model HEURs onto ideal hydrophobic latex surfaces. Unlike earlier SCFT studies of adsorption, we explicitly take into account the role of HEUR micelles and competition between adsorption and micellization. The results are compared with experimental data and coarse-grained molecular dynamic (CG-MD) simulations, and good qualitative and semi-quantitative agreement is found.

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