

UNH Materials Science Seminar

11:10-12:00, Thursday, February 1, 2007

Murkland Hall 202 (**New Location**)

University of New Hampshire

Waterborne Hybrid Alkyd/Acrylic Polymer Latex: Advantages and Potential Application Challenges

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Hybrid materials are prevalent throughout the range of products we use every day. New material properties often come from the combination of existing materials into a new composite; a hybrid material. The incentive to do so is an attempt to gain a synergy of characteristics or function that would otherwise not be fully realized from the comprising components alone. In light of the growing environmental awareness and responsibility of our society, efforts are being made to reduce or eliminate the level and need for solvent (volatile organic compounds, VOC) in consumer products. In the field of coatings, solvent-borne systems (e.g. alkyd, polyurethane, and polyester resins) have typically had levels of chemical resistance or barrier properties that were not observed in water-borne paints (e.g. acrylic latex). This work describes efforts toward synthesis of a hybrid composite of alkyd resin and acrylic latex, polymerized in a single water-borne system. The appropriate synthesis reaction environments will be explored as well as the mechanism describing how the alkyd and acrylic components interact in

those environments. The focus will be on miniemulsion polymerization. The formation of and resulting hybrid polymer particle morphology will also be described, including how those morphologies might impact the properties of the resulting polymers in application. Finally, this type of system will be used as an example of the challenges involved with introducing and manufacturing new products on the industrial scale.