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Surface Plasmon Resonance Studies of Polysaccharide Self-Assembly on Cellulose ABDULAZIZ KAYA, ALAN R. ESKER, Virginia Tech Department of Chemistry (0212) Blacksburg, VA 24061, WOLFGANG G. GLASSER, Virginia Tech Department of Wood Science and Forest Products (0323) Blacksburg, VA 24061 — Wood is a multiphase material consisting of cellulose crystals embedded within a non-crystalline heteropolysaccharide (hemicellulose) and lignin rich phase. The hierarchical arrangement of these three chief components in wood produces excellent properties like resistance to fracture and toughness. Through the study of polysaccharide self-assembly onto a model cellulose surface, further insight into the interactions between hemicelluloses and cellulose can be gained. In our study, we synthesized pullulan cinnamates with different degrees of substitution of cinnamoyl groups as a model for a hemicellulose with lignin-like moieties. Surface plasmon resonance measurements probe the self-assembly behavior of pullulan and pullulan cinnamate onto a cellulose coated gold surface. Our results suggest that pullulan does not adsorb onto the model cellulose surface, whereas pullulan cinnamate does. These preliminary results signify the important role that lignin-like substituents play on hemicellulose self-assembly onto cellulose surfaces.

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