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Surface Plasmon Resonance Studies of Hydroxypropyl Xylan Self-Assembly on Cellulose DANIEL A. DRAZENOVICH, 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 hetereopolysaccharide (hemicellulose) and lignin rich phase. The hierarchial arrangement of these three chief components in wood produces excellent properties like resistance to fracture and toughness. Through the study of self-assembly of hemicellulose onto a model cellulose surface, further insight into the interactions between hemicelluloses and cellulose can be gained. In our study, we used xylans with different degrees of substitution of hydroxypropyl groups. Surface plasmon resonance measurements (SPR) probe the self-assembly behavior of hydroxypropyl xylans (HPX) onto a cellulose coated gold surface. In addition, tensiometry provides the critical aggregation concentration (CAC) of different HPX samples. CAC results can be correlated to adsorption observed by SPR. Increasing the degree of hydroxypropyl substitution decreases the CAC and increases adsorption onto cellulose surfaces.

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