ADSORPTION OF COMPLEXES FORMED BY NATURAL AND SYNTHETIC POLYELECTROLYTES ONTO RECYCLED UNBLEACHED FIBERS

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ABSTRACT

The surface of cellulosic fibers can be conveniently modified by the adsorption of polyelectrolyte complexes (PECs) in order to improve papermaking properties and expand their potential uses. Complexes of poly(allylamine hydrochloride) (PAH) and polyacrylic acid (PAA), and complexes of PAH and O-acetyl-4-O-methylglucuronoxylan (Xyl) were formed at different ionic strength and neutral pH. Turbidity curves were built, and the charge densities of the cationic complexes prepared were determined by using the polyelectrolyte titration method. The colloidal stability was determined using the Turbiscan optical analyser. It was found that, after 48h, the stirring reverses the effects of sedimentation of the PAH/Xyl complex. Adsorption isotherms of the cationic complexes at different conditions were built by using the polyelectrolyte adsorption method. It was found that the use of PECs, allows reaching level of cationic additive retention. Compared to the control treatment, the tensile strength increased 50%, and the compressive strength 140-150% due to the PECs adsorbed.