SEM Characterisation of the Cellulose Material treated with Polycarboxylic Acid and Zeolite Nanoparticles

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ABSTRACT

Coating of zeolite nanoparticles, previously dispersed in Polycarboxylic acid (PCA) solution, on cellulose textile surface has several advanced technological applications. One of the possible usages is for the Durable Press finishing enabling simultaneous enhanced antimicrobial or flame retardant properties. In this study, one of the polycarboxylic acid crosslinking agents, Citric acid (CA) is used to coat cotton fabric in the presence of synthesized zeolite applied as a catalyst. Cotton fabric samples were padded with a suspension containing zeolite powder in aqueous solution of CA crosslinking agent. Drying and curing of coated samples was performed at different curing conditions, either in a microwave oven or at conventional tenter. Scanning electron microscope is used to characterize the surface morphology and confirm bonding of zeolite particles to cellulose fibers. Further characterization of coated surface is performed by attenuated total reflectance (ATR) Fourier transform infrared (FT-IR) spectroscopy while the effect of microwave irradiation time on zeolite nanoparticles bonding is estimated by thermogravimetric analysis.

Key Words: SEM, nanoparticles, zeolite, citric acid, microwave treatment