

Preparation of nanosilver loaded chitosan–starch coating and its application for paper

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Paper is an excellent biodegradable material for packaging. However, paper has disadvantages of poor mechanical, barrier and antimicrobial properties. To overcome these challenges and consider the environmental concerns, biopolymer coatings in combination with antimicrobial agents were applied to paper. Chitosan, natural abundant polysaccharide, forms bond easily and improve the mechanical and barrier properties of paper when applied. However, chitosan is expensive. So, starch, one of the cheapest biopolymer is applied in combination with chitosan to reduce the cost of the coatings. Silver has been reported to be an effective antimicrobial agent combating wide range of micro-organisms. Hence, in the current investigation silver was chosen to impart antibacterial properties to the paper. The silver nanoparticles were synthesized by ultrasonication method. To improve the paper properties, various formulations of chitosan–starch blend coatings were prepared and coated to paper. The samples were characterized with UV–vis, FTIR, SEM–EDS, TEM, tensile and burst strength, water and oil resistance and antibacterial properties.