

Handle Improvement and antimicrobial finishing of wool using acid and alkaline protease followed by application of nano silver and natural dyes

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ABSTRACT

Wool is commonly treated with alkaline protease enzyme to improve handle and shrink resistance. The limitations associated with the usage of this enzyme on wool are excessive weight and strength losses and pH sensitive enzyme activity etc. In this study acid protease enzyme is applied on the acid and the alkaline peroxide bleached wool fabrics using optimized process parameters and the results are compared with alkaline protease enzyme treated wool fabric. The acid protease treated fabrics show better properties except whiteness index and shrink resistance than alkaline protease treated fabric. To improve the above properties, alkaline peroxide bleaching process prior to acid protease treatment has been proposed and the treated fabrics have been characterized. It was found that bleached and enzyme treated wool materials need antimicrobial finishing treatment due to the damage to wool cuticle during such treatments. Also attempt has been made to develop antimicrobial finishing process for wool based on nano silver and natural dyes. The results show that the acid peroxide bleached and the acid protease pretreated will fabrics absorb 27% and 8% higher silver and exhibit increased antimicrobial efficacy compared to their alkaline counterparts.