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Innovative Textile Design Using in-situ Ag NPs incorporation into Natural Fabric Matrix

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Abstract : In this work, we will study a simple highly efficient technique to impart multi functional properties to different fabric substrates by in situ Ag NPs incorporation into fabric matrix. Ag NPs as a coloration and antimicrobial agent were prepared in situ incorporation into fabric matrix (Cotton and Wool) by using trisodium citrate as reducing and stabilizing agent. The Ag NPs treated fabric (Cotton and Wool) showed different color because of localized surface Plasmon resonance (LSPR) property of Ag NPs. The formation of Ag NPs was confirmed by UV/Vis spectra for the supernatant solutions and The Ag NPs treated fabric (Cotton and Wool) were characterized by scanning electron microscopy (SEM) and X-ray photo electron spectroscopy (XPS). The dependence of color properties characterized by colorimetric, fastness and antibacterial properties evaluated by Escherichia coli using counting method and the reaction parameters were studied. The results indicate that, the in situ Ag NPs incorporation into fabric matrix approach can simultaneously impart colorant and antimicrobial properties into different fabric substrates.

Keywords : Ag NPs, coloration, antibacterial, wool, cotton fabric
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