# Chemically bound Silver Nanoparticles on Cotton Textiles Exhibiting Efficient Inhibition of *Escherichia coli* and *Staphylococcus aureus*

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This study describes a convenient method for production of highly durable antimicrobial textile against laundering. The method involves layer-by-layer electrostatic self-assembly process. Here, natural cellulose substrate was modified with chloroacetic acid in the presence of sodium hydroxide, followed by drying and curing. Then it was immersed in silver nitrate solution for reducing the electrostatically attached silver ions into nanosized silver coatings on textile using sodium citrate as the reducing agent. Average particle size obtained was approximately 16.54 nm. The modified textile was tested for Gram positive *Staphylococcus aureus* and Gram negative *Escherichia coli* and showed antimicrobial activity even after 30 washing cycles. Antimicrobial activities were tested for the silver nanoparticles chemically bound on textile subjected to 5, 10, 15, 20, 30 washing cycles and found that a constant inhibition zone of 2 mm was obtained in each case. Control experiments done with silver nanoparticles physically entrapped in cotton showed progressive decrease in the inhibition zone due to excessive washing cycles.

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