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# Conductivity and Antibacterial Properties of Wool Fabrics Finished by Polyaniline/Chitosan

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## Abstract:

Chitosan/polyaniline (CTS/PANI) were deposited onto the surface of wool fabric in one step by in-situ polymerization method, carboxylic acid and hydrochloric acid as doping acid and chitosan exited. Oxygen plasma pretreatment was used to etch the scale layer of wool and to introduce active free radicals which can form hydrogen bonds with the -OH of CTS, and this was beneficial to improve the binding force and fastness among CTS, PANI and wool, and form a more uniform conductive layer. Various characterizations were chosen to evaluate the performances of the fabrics, including field emission scanning electron microscopy (FESEM), Fourier transform infrared spectrum (FT-IR), X-ray photoelectron spectroscopy (XPS), thermal gravimetric analysis (TGA), resistance measurement and antibacterial test. The prepared PANI/CTS/Wool composite conductive fabric showed high conductivity up to 11.32 S/cm, homogeneous color as well as good antibacterial properties. The antibacterial effect of *Escherichia coli* and *Staphylococcus aureus* was more than 99.99 % even after 10 washes.

**Keywords:** polyaniline; chitosan; conductivity; wool; antibacterial properties

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