Functionalization of cellulose with metal nanoparticles for polymers foreseen as medicine materials

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Textile, pharmaceutical, food, beverage and paper industry consume large quantities of metal nanoparticles due to their excellent antimicrobial properties. After their application, new functionalized materials have antimicrobial activity against gram-positive and gram-negative bacteria, as well as against fungi. In this research, we have modified cellulose polymers with Ag, Pt and ZnO nanoparticles by dip coating methodology and then characterized by FTIR, SEM-EDX, NTA and TEM techniques. The antimicrobial properties were tested against *Escherichia coli, Staphylococcus aureus* and *Candida albicans* strains by dilution and diffusion methods for determination of minimal inhibitory concentrations (MIC) and minimal bactericidal concentrations (MBC). The results have shown that dip-coating process is an efficient technique to modify cellulose layer and obtain strong antimicrobial property. Therefore, such modified materials can be used as medical textiles in hospitals for prevention of antimicrobial infections.

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[2] Rezić, Iva, Determination of Engineered Nanoparticles on Textiles and in Textile Wastewaters, Trac-trends in analytical chemistry, 201130.7. pp. 1159-1167