

Hydrogels with silver nanoparticles for wound treatment

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In recent years, the study and preparation of nanoparticles have attracted considerable interest for both fundamental and applied research. In biomedical area, silver nanoparticles have been a vast field of study, although antimicrobial properties have originated from their medical application since 19th century. Since silver has had several uses and its enormous potential for the treatment of injuries. Silver-containing topcoats are an excellent option for topical microbial combat on wounds that present infection, as well as being an essential tool for controlling bacterial load. Among these coatings are the hydrogel dressings with silver nanoparticles that have broad spectrum of antimicrobial action. In vitro studies have demonstrated bactericidal activity in strains of antibiotic resistant microorganisms. The objective of this work is characterize hydrogels with silver nanoparticles, prepared using polyvinylpyrrolidone (PVP), carboxymethylcellulose (CMC), used to treat wounds. A gamma radiation source cobalt-60 was used to crosslink the hydrogels, sterilize and form the silver nanoparticles simultaneously. Irradiation is recognized as a very viable tool because there is no need to add possibly harmful primers or crosslink that are difficult to remove. The results showed uniform distribution of the nanoparticles on the surface of the hydrogels, making it feasible for topical application.

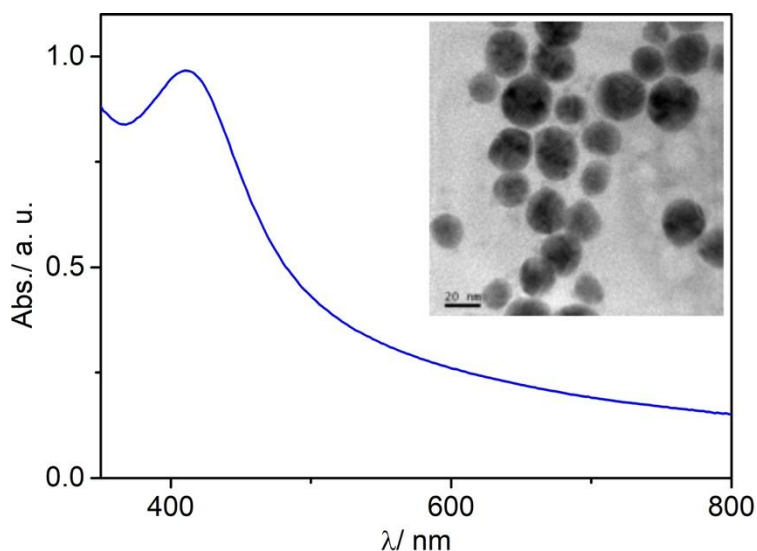


Figure 1. Electronic spectrum of the silver nanoparticles immobilized in hydrogel and transmission electron microscopy of the nanoparticles (inserted).