7th African Conference on Non Destructive Testing (ACNDT) & the 5th International Conference on NDT and Materials Industry and Alloys (IC-WNDT-MI)

2016

Synthesis and characterization of antibacterialsilver-alginate - chitosan bionanocomposite filmsusing UV irradiation method

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Abstract : A simple, UV-based method for the preparation of alginate-silvernanoparticles-chitosan composite films is described herein. Alginate,a polysaccharide was simultaneously used as a natural stabilizer andreducing agent of silver ions (Ag+) delivered from silver nitratesolution. The properties of silver nanoparticles (Ag NPs) in alginateand alginate-Ag NPs-chitosan (Alg-Ag NPs-CTS) composite filmswere investigated in terms of their surface plasmon resonance (SPR),crystalline structure and morphology. The average diameter size, thedegree of swelling and functional groups distribution were alsoaddressed. Antibacterial activities were carried out against bothGram+ and Gram- bacteria cells; the synthesized nanocompositefilms displayed an interesting antibacterial activity. The perspectivesfor a potential use of these nano-composite films in areas such asbiomedical engineering may seriously be considered.

Keywords : alginate, silver nanoparticles, green synthesis, chitosan.