Synthesis and Characterization of Silver Nanoparticles Stabilized With Hydrolyzed Collagen

Silvania Siqueira Nogueira, Juhly Freitas Vieira, Maria Adelaide Guimarães, Durcilene Alves da Silva, Carla Eiras, Alyne Rodrigues de Araújo, Vinicius Saura Cardoso

Introdução: The construction of nanomaterial with improved or entirely new properties comes up with great impact in the over next decades. Does it with a natural or biocompatible material as a base form to build it; can be the new revolution in science because it brings together different properties in order to shows up an interesting application. The construction of nanomaterial with improved or entirely new properties comes up with great impact in the over next decades. Does it with a natural or biocompatible material as a base form to build it; can be the new revolution in science because it brings together different properties in order to shows up an interesting application. Silver nanoparticles are established as example of a well-studied nanomaterial. In addition, the antibacterial activity of silver and its compounds is well established it has wide antibacterial application. As is well known collagen is a protein and natural polymer, which exhibits favorable characteristics for promoting cell proliferation. It has been used in the nanotechnology field as scaffolding to stabilize the silver nanoparticles. The main propose of this work is to make a synthesis and characterization of silver nanoparticles using hydrolyzed collagen (AgNPCol) in aqueous solution and in an acid solution Materiais e Métodos: The syntheses were conducted using sodium borohydride (NaBH4) as the reducing agent and the collagen as stabilizer. It was used the concentrations of 1%, 0.5%, 0.3% and 0.1% following the 1:1 ratio metal/stabilizer and 1:6 AgNO3/NaBH4. The spectroscopic characterization was made by using Uv-vis spectrophotometer UV-1800 Shimadzu in the wavelength of 300 to 800 nm to look at the Plasmon spectrum that indicated the nanoparticle forming after nucleation reduction process. The size and zeta potential measures were obtained in triplicate by DLS (Dynamic Light Scattering) in Malvern Zetasizer Nano using the equipment configuration in the measurements: dispersant: water (25°C) temperature: 25°C; calibration: 60s; measurement: 173; runs: 20 min. Resultados e Discussão: The 1%, 0.5%, 0.3% had an absorbance in region of 420nm which indicates a silver nanoparticle formation. It has been found low PDI values indicating a good colloidal stability in solution. The Samples 1%, 0.5%, 0.3% had PDI ranging from 0.2 to 0.3 demonstrating a distribution homogeneous. The zeta potential were negative to samples that was used an acid solution synthesis and positive for an aqueous solution synthesis. Conclusão: The synthesis of silver
nanoparticles using hydrolyzed was well performed. The results demonstrated that the use of a hydrolyzed collagen can be a new source of material stabilizer for silver nanoparticles synthesis. New studies will be performed in order to explore more characteristics and evaluation of a possible application in antibacterial field.