

عنوان مقاله:

Green synthesis of silver nanoparticle using echinops extract and its antibacterial activity

محل انتشار:

مجله علوم نانو، دوره 4، شماره 2 (سال: 1396)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

Objective(s): Silver nanoparticles (Ag NPs) are not only specific physical and chemical properties but also are considered for their antibacterial activity and ecofriendly. Materials and Methods: In this study a simple, cost effective biologically method for Ag⁺ reducing to Ag NPs using Echinops extract as a stabilizer, and reducing agent. Ag NPs were analyzed using UV-Vis spectrometry, TEM, XRD and FTIR. The role of Echinops concentration, silver nitrate concentration, pH and reaction time on the synthesis of nanoparticles were studied. Antibacterial activity of the Ag NPs were carried out by disc diffusion method against Staphylococcus aureus and Escherichia coli. Also the amount of MBC and MIC for AgNPs against bacteria were investigated. Results: The AgNPs formation were observed as a color change of the mixture from colorless to dark-brownish. The UV-Vis spectroscopy absorbance peak at 420 nm confirmed the presence of Ag NPs. TEM analysis, showed Ag NPs were spherical, triangle and bar particles in shape with size range within 1.32-36.41 nm. XRD study showed particles were crystalline in nature. FTIR analysis detected that Ag NPs are functionalized with biomolecules that are present in the aqueous Echinops extract as the reducing agents and stabilizing the nanoparticles. The results showed that the time of reaction, temperature, pH, Echinops extract concentration and AgNO₃ concentration could accelerate the formation of AgNPs. Conclusion: In this study, synthesized Ag NPs have the efficient antibacterial activity against pathogenic bacteria. Ag NPs have an important function in the field of nanotechnology and nanomedicine.

کلمات کلیدی:

Antibacterial activity, Echinops extract, Green synthesis, Silver nanoparticle

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