

عنوان مقاله:

The synthesis of silver nanoparticles using the water-in-oil biomicroemulsion method

محل انتشار:

مجله علوم نانو، دوره 7، شماره 3 (سال: 1399)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Objective(s): A combination of biological and microemulsion methods was used to synthesize silver nanoparticles for the first time. The applied method could be referred to as the biomicroemulsion method, which has the advantages of both biological and the microemulsion methods. **Materials and Methods:** In the present study, silver nanoparticles were synthesized in a water-in-oil biomicroemulsion using silver nitrate, which was solubilized in the water core of one microemulsion as the source of silver ions. In addition, a bacterial culture supernatant solubilized in the water core of another microemulsion was employed as the biological reducing agent, dodecane was used as the oil phase, and sodium bis(2-ethylhexyl) sulfosuccinate was applied as the surfactant. Moreover, the antibacterial activity of the nanoparticles was investigated against gram-positive and gram-negative bacteria by disc-diffusion method. **Results:** The UV-Vis absorption spectra, dynamic light scattering, and transmission electron microscopy were employed to characterize the presence, size distribution, and morphology of the nanoparticles, respectively. According to the results, the nanoparticles had the optimal conditions in terms of the size and distribution at the silver nitrate concentration of 0.001 M. In addition, the analysis of antibacterial activity indicated that the inhibition zone diameter of *Staphylococcus aureus* was higher compared to *Escherichia coli*. **Conclusion:** Silver nanoparticles were synthesized successfully using biomicroemulsion method and showed significant anti-bacterial activities against *S. aureus* and *E. coli*.

کلمات کلیدی:

Antibacterial, Biomicroemulsion, Synthesis, Silver nanoparticles

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