

Fabrication and characterization of gelatin stabilized silver nanoparticles under UV-light.

ABSTRACT

Silver nanoparticles (Ag-NPs) were successfully synthesized using the UV irradiation of aqueous solutions containing AgNO₃ and gelatin as a silver source and stabilizer, respectively. The UV irradiation times influence the particles' diameter of the Ag-NPs, as evidenced from surface plasmon resonance (SPR) bands and transmission electron microscopy (TEM) images. When the UV irradiation time was increased, the mean size of particles continuously decreased as a result of photoinduced Ag-NPs fragmentation. Based on X-ray diffraction (XRD), the UV-irradiated Ag-NPs were a face-centered cubic (fcc) single crystal without any impurity. This study reveals that the UV irradiation-mediated method is a green chemistry and promising route for the synthesis of stable Ag-NPs for several applications (e.g., medical and surgical devices). The important advantages of this method are that it is cheap, easy, and free of toxic materials.

Keyword: Silver nanoparticles; Gelatin; UV-light; Stabilizer; UV-Vis spectroscopy.