

Time-dependent effect in green synthesis of silver nanoparticles.

ABSTRACT

The application of "green" chemistry rules to nanoscience and nanotechnology is very important in the preparation of various nanomaterials. In this work, we successfully developed an eco-friendly chemistry method for preparing silver nanoparticles (Ag-NPs) in natural polymeric media. The colloidal Ag-NPs were synthesized in an aqueous solution using silver nitrate, gelatin, and glucose as a silver precursor, stabilizer, and reducing agent, respectively. The properties of synthesized colloidal Ag-NPs were studied at different reaction times. The ultraviolet-visible (UV-vis) spectra were in excellent agreement with the obtained nanostructure studies performed by transmission electron microscopy (TEM) and their size distributions. The prepared samples were also characterized by X-ray diffraction (XRD) and atomic force microscopy (AFM). The use of eco-friendly reagents, such as gelatin and glucose, provides green and economic attributes to this work.

Keyword: Silver nanoparticles; Gelatin; Green chemistry; Time-dependent effect; Ultravioletvisible spectra.