

Effect of accelerator in green synthesis of silver nanoparticles

ABSTRACT

Silver nanoparticles (Ag-NPs) were successfully synthesized in the natural polymeric matrix. Silver nitrate, gelatin, glucose, and sodium hydroxide have been used as silver precursor, stabilizer, reducing agent, and accelerator reagent, respectively. This study investigated the role of NaOH as the accelerator. The resultant products have been confirmed to be Ag-NPs using powder X-ray diffraction (PXRD), UV-vis spectroscopy, and transmission electron microscopy (TEM). The colloidal sols of Ag-NPs obtained at different volumes of NaOH show strong and different surface plasmon resonance (SPR) peaks, which can be explained from the TEM images of Ag-NPs and their particle size distribution. Compared with other synthetic methods, this work is green, rapid, and simple to use. The newly prepared Ag-NPs may have many potential applications in chemical and biological industries.

Keyword: Silver nanoparticles; Green synthesis; Stabilizer; Gelatin; glucose; Accelerator