

Abstract

Surface plasmon resonance technique has been highly employed in determination of the sizes of metallic nanoparticles (NPs). Generally, NP size has been viewed as a function of SPR wavelength value only, with every value of this wavelength being associated with one particular size. In this paper, gold NPs (AuNPs) prepared through the citrate reduction method with a variation in the amount of citrate used on gold (III) chloride precursor was studied. Using UV-Vis spectra analysis of the synthesized NPs in colloidal form, SPR absorption band with a wavelength ranging from 518 to 520 nm was detected. At 518 and 519 nm peaks, the recorded average NP size was 12 nm while 520 nm coincided with NPs of diameters 11 and 13 nm. This indicated that small and large AuNPs within the plasmonic size can present similar high resonance. We attribute this observation to the atomic interactions within the NPs solution hence the availability of the high density of the surface (resonance) electrons from the NPs surface atoms.