Wet chemical preparation and characterization of metallic (Au, Ag, Ni) and their bimetallic version (AuAg, AuNi, AgNi) nanoparticle-attached indium tin oxide

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Abstract

Metallic and bimetallic nanoparticles with specific morphologies and structures have been attracting much attention in recent years due to new bifunctional applications in electronics, optical, catalysis, biotechnology, optoelectronics and other areas.

Gold and gold-based bimetallic (Au, AuAg, AuNi) nanoparticles have been attracting much attention in recent years due to their stable preparation to be adaptable according to the application within size ranges extending from 4 to 100 nm which gives them a good biocompatibility and bioavailability. They are prospective substrates for surface-enhanced Raman spectroscopy (SERS). This work describes a refined seed-mediated method to produce Au, AuAg and AuNi nanoparticles in a continuous media and their grown on indium tin oxide (ITO) without disturbing theirs characteristics. The size, shape and homogeneity of the as prepared gold and gold-based bimetallic nanoparticles on the ITO surface have been observed from the Field Emission Scanning Electron (SEM) and analyzed by UV-visible absorbance spectroscopy.