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Name of the Department/Centre: Department of Chemistry

Topic of the Research: Synthesis and characterization of Ag- and Au- nanoparticles using plant extracts in absence/presence of ionic surfactants

Findings

The concerned Ph.D. thesis entitled “*Synthesis and characterization of Ag- and Au-nanoparticles using plant extracts in absence/presence of ionic surfactants*” consisted of six chapters. Characterization techniques like UV-visible spectrophotometry, Fourier transform infrared spectrometry, dynamic light scattering, transmission electron microscopy, scanning electron microscopy, Zeta potential, Conductivity, Fluorescence spectroscopy and X-ray diffraction were employed. In **Chapter 1** the brief idea about the historical background, classification, properties, and applications of the nanomaterials were conferred. The role of surfactants and the advantages of green synthesis have also been briefly explained. **Chapter 2** described the silver nanoparticles (Ag NPs) synthesis using *Cassia siamea* flower petal extract and the correlative effects of Sodium dodecyl sulphate (SDS). The data revealed that synthesized Ag NPs were of FCC crystalline nature and the synthesis followed pseudo-first order kinetics. **Chapter 3** comprised the Ag NPs synthesis using *Acacia leucophloea* leaf extract. The crystallinity analysis revealed that the dislocation density, uniform stress and energy density increased for the Ag NPs synthesized in presence of cetyltrimethylammonium bromide (CTAB). **Chapter 4** included *Mimusops elengi* leaf extract mediated Ag NPs and the textural effect of CTAB. The Ag NPs showed more spherical and oval shaped textural feature in presence of CTAB. **Chapter 5** involved gold nanoparticles (Au NPs) synthesis by *Cassia fistula* flower extract (CFFE) and the textural and crystallinity effects of Sodium dodecylsulphate (SDS). The nanoparticle dispersity increased while the textural polydispersity decreased in presence of SDS. **Chapter 6** included biological studies of synthesized Ag and Au NPs. Ag NPs depicted promising antimicrobial potency whereas Au NPs exhibited stable protein complex formation.