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Green Synthesis of Gold Nanoparticles using *Crinum asiaticum* Leaf Extract and their Application in Size Dependent Catalytic Activity

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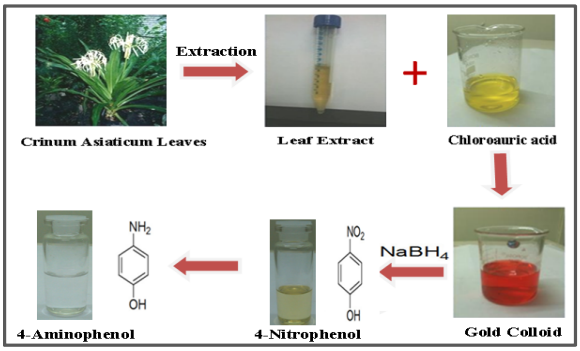
ABSTRACT

Use of non-toxic reagent, environmentally benign solvents and renewable materials are the key points of green methods. The present work explores green synthesis of gold nanoparticles (AuNPs) using crinum asiaticum aqueous leaf extract. In AuNPs synthesis Crinum asiaticum aqueous leaf extract is applied as a reducing as well as stabilizing agent. In the presence of sodium borohydride, synthesized gold nanoparticles exhibited size-dependent catalytic activity for reduction of 4-nitrophenol to 4-aminophenol. The effect of particle size on catalytic reduction of 4-nitrophenol was studied using UV-Visible spectrophotometers. The average particle size of AuNPs was found to be ~13 nm calculated using Scherrer equation. The formation of AuNPs was confirmed by various techniques as follows UV-Visible spectroscopy, X-ray diffraction, energy dispersive X-ray spectroscopy (EDX) and scanning electron microscopy (SEM).

Graphical Abstract



Process for the Synthesis of gold nanoparticles

Keywords: Gold nanoparticles, Crinum asiaticum, Green synthesis, Catalysis.