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Synthesis and characterization of gold nanoparticles and their functionalization using dodecanethiol

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Abstract content (Max 300 words) **Formatting & Special chars**

Surface enhancement Raman spectroscopy (SERS) has been widely studied for decades, and has attracted many researchers in various fields due to its advantageous characteristics such as low limit of detection, easy sample preparation, non-destructive nature and high sensitivity. Recent studies have focused more on enhancing the Raman signal by manipulating various parameters of SERS. The SERS substrates (metal nanoparticles) and Raman reporters (ligands) are the main parameters which play a major role in Raman signal enhancement. Noble metallic nanostructures are the most targeted substrate since they exhibit a strong surface plasmon. Amongst all, gold nanoparticles (AuNPs) have added more advantage in various applications due to their stability, biocompatibility, and easily controllable size and shape. However the effect of gold nanoparticles sizes on Raman signal enhancement has been a question mark in various fields including biomedical and pharmaceuticals. Current studies have put more focus on evaluating the capacity of AuNPs as substrates for developing and improving analytical applications based on SERS measurements. Furthermore, functionalizing gold nanoparticles with alkanethiols improve the application of SERS, since they are Raman active and possess strong chemical affinity to gold. Therefore, the aim of this study is to synthesize and functionalize AuNPs of various sizes with Dodecanethiol and evaluate enhancement factor dependency. Herein we report on the synthesis of various sizes of gold nanoparticles and evaluate their enhancement effect on the Raman spectrum of Dodecanethiol.

Key words: nanoparticles, SERS, alkanethiol

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yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

Main supervisor (name and email) and his / her institution

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