

### Electrochemistry on gold nanoparticles modified electrode: a thin layer model approach

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Metal nanoparticles have attracted an extensive interest due to their unique optical, electronic, and catalytic properties. The electrode surface modified with metal nanoparticles can be used for various applications such as electrochemical sensors and optoelectronic and electrical devices. In this research, we focused on a study of a surface interaction of modified electrode. Cyclic voltammetry (CV) was carried out and experimental results demonstrated that the oxidation of ferrocyanide on an indium tin oxide (ITO) glass electrode modified with layers of gold nanoparticles(GNPs) occurs. First, the oxidation at the bare planar electrode was modeled using a semi-infinite diffusion model. Second, we applied a thin layer model to modified electrode surface since they can be considered to be a porous layer, resulting in the entrapment of the electroactive species in between nanoparticles . They were verified through experiments and simulations. The results included a comparison in a potential separation (peak-to-peak) and a change in the current of CV with respect to both bare ITO and GNPs deposited electrodes.