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**Growth and characterisation of gold thin film layer using an ebeam  
evaporation system for surface plasmon resonance applications**

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**Abstract**

Gold thin metal layers have been seen to be the most important signal amplification components in electrochemical and optical sensor applications. In surface plasmon resonance (SPR) applications, gold thin metal film possess electron densities that have the plasmon frequencies in the visible light range. In this study, gold thin film layer coating was deposited onto a glass substrate by using the ebeam physical vapour deposition technique. The structural and morphological investigations of the thin film layer coating were investigated using the X-ray diffraction system (XRD) while the scanning electron microscope (SEM) was used to investigate the morphology of the thin film layer coating. The optical analysis using different thicknesses, showed good absorption and transmission spectra that is required in determining the appropriate layer to be used for surface plasmon resonance. Using the XRD, SEM as well as transmission and absorption spectroscopy, the findings indicated that gold thin film layer deposition using the ebeam evaporation system is perfect for thin film layer coating for surface plasmon resonance applications.