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Embedding of noble metal nanoparticles and study of optical and photoluminescence properties induced by ion irradiation

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Abstract content
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Recent advances in nanotechnology resulted in a new class of nanomaterials with optical as well as luminescence properties called noble metal fluorescent nanoparticles. These noble metal nanoparticles have shown potential applications in many fields like optical memory, catalysis and sensor technologies [1]. The present work reports on 150 keV Ar ion beam irradiation of thin Au film on polymer substrates including dewetting in thin film and subsequent formation of spherical Au nanoparticles that at a proper fluence eventually become embedded into the substrate [2]. Au nanoparticles embedded in and located on the surface were characterised and studied by scanning electron microscopy (SEM), atomic force microscopy (AFM), transmission electron microscopy (TEM) and Rutherford backscattering spectrometry (RBS) [3]. These Au nanoparticles exhibit the presence of absorption peaks in the visible regions due to the surface plasmon resonance (SPR) oscillations as investigated by UV-Vis spectroscopy. Photoluminescence study using the 325 nm He-Cd laser excitation will also be discussed.

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