

Research Title: Fabrication of Silver nanoparticles-Polyaniline Composite Thin Films using Layer-by-Layer Technique for Ammonia sensing

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ABSTRACT

The layer-by-layer deposition technique was used to prepare composite thin films of silver nanoparticles and polyaniline. The multilayer composite thin films are constructed by alternating of anionic and cationic polyelectrolyte. Anionic water soluble polyaniline was prepared by interfacial polymerization of aniline monomer in presence of poly (styrene sulfonic acid co maleic acid), (CoPSS). Silver nanoparticles stabilized with anionic water soluble polyaniline were then deposited in thin film and characterized for optical properties. The optical properties of thin films were measured by UV-Vis spectroscopy. The surface of the film was measured by Atomic force microscopy (AFM). As these films are to be used as sensor for the ammonia detection, the changes in optical properties of the film were evaluated for various ammonia concentrations. A strong color shift from orange to yellow was visible when exposed to ammonia. This composite of polyelectrolyte, silver nanoparticles and polyaniline is a promising composite film for ammonia sensing that could be used as freshness indicator for seafood and meats packaging

Keywords: Silver nanoparticles, Polyaniline, Layer-by-Layer Technique, Ammonia