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Title: **Synthesis, Characterization and Fluorescence Studies of Amine Based Conducting Polymers and Copolymers**

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ABSTRACT

For the past few decades, modification of conducting polymers has attracted considerable attention as it can enhance the solubility as well as processability of conducting polymers. Various chemical and electrochemical polymerization techniques have been adopted to design copolymers and doped polymers of conducting polymers. The thesis highlights the unique characteristics of dealing with the synthesis and properties of conducting polymers, their copolymers and their doping via some luminescent compounds or dyes and the various methods that have been adopted to tailor the functionality of these materials for their potential application in sensors, solar cells, corrosion resistance, bioimaging, photovoltaic devices etc. In the trend Poly(1-naphthylamine), Poly(o-anisidine) and Poly(o-phenyenediamine) and their copolymers were synthesized via microwave assisted technique. A water soluble homopolymer and a copolymer were tested for the deactivation of bovine serum albumin's fluorescence and the former was found to effectively quench the fluorescence emission of the later. The studies reveal that the copolymer holds potential for use in bioimaging and also as a protein sensor. Homopolymers and copolymers of PCz and POPD were synthesized ultrasonically and found applicable in photovoltaic devices while copolymers and

luminol and anisidine had immense potential in protein biosensor. Doping is one of the most facile techniques adopted to improve the optoelectronic properties of conducting polymers. Doping of POPD and PNA was done by luminol in acidic, basic and neutral medium. Studies revealed that doping of PNA by lumniol have potential for near infrared fluorescence imaging while luminl doped POPD was found potentially non cytotoxic and exhibited immense potential to be used as a biomarker for *Leishmania donovani.*