

## Synthesis and Characterization of Self-doped Conductive Polymers

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Self-doped conductive polymers of ferrocene were synthesized and characterized. The polymers were prepared via Suzuki-Miyaura coupling reaction in biphasic mixture of o-xylene and sodium carbonate solution at 180 °C. Chemical structures of the polymers were identified using several spectroscopic techniques including FTIR, C<sup>13</sup>- and H<sup>1</sup>- NMR. The electrochemical behaviors were investigated by cyclic voltammetry at ambient temperature in reference to Ag/Ag<sup>+</sup>. Electrical conductivities of the polymers were examined for metal-polymer-metal (MPM) film structure, and the measurements showed 1.0x10<sup>-5</sup> to 1.0x10<sup>-4</sup> S/cm. The current-voltage (I-V) characteristics were studied on both single-layer and bi-layer films with Poly(3,4-ethylenedioxythiophene). I-V results indicated non-ohmic behaviors, and resistance switching from low-conductance state to high-conductance state was observed in bi-layer MPM devices.