

551d Deposition and Characterization of Controlled Conductive Polymer Framework for Power Generation

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Polypyrrole (PPy) and its derivatives remain attractive as conductive polymers for applications that include batteries, fuel cells, and double layer electrochemical capacitors. PPy is particularly suited for systems that require deposition from aqueous solutions, such as in buffered bio-fuel cells. Herein we report novel observations regarding the potentiostatic or galvanostatic deposition of PPy on nickel substrates. In particular, the effect of pyrrole (Py) monomer concentration and deposition rates on film morphology will be discussed. Films were found to be more homogeneous at lower concentration of monomer and/or current density, whilst rougher, less homogenous films, were observed with increasing monomer concentration and/or current density. The film microstructure was also found to be affected by Py monomer concentration. At lower concentrations of Py more fibrous films were created under potentiostatic deposition, whilst a cauliflower-like morphology was observed at higher concentrations. More in-situ observations with imaging ellipsometry will be discussed. As the initial deposition condition varied, different morphology and microstructure were developed.