Oxidative Polymerization of Pyrrole in Polymer Matrix

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The oxidative matrix polymerization of pyrrole (Py) by Ce(IV) in the presence of Polyacrylic acid (PAA) has been studied to obtain water-soluble and insoluble products. The role of the PAA, Pyrrole, and Ce(IV) concentration, order of component addition, the structure of polymer matrix [PAA, Hydroxy Ethyl Cellulose (HES), Poly-N-vinylpyrrolidone (PVP)], and model unit of PAA (propionic acid), on the polymerization system were investigated. Interaction of PAA with insoluble polypyrrole (PPy) and the interpolymer complex formation were investigated along with the aggregation of PPy onto the matrix polymer followed by spectral shifts. FTIR results of insoluble products obtained from the PAA-Py-Ce(IV) system and solubility of the system is explained in light of the mechanism of the polymerization of pyrrole on the polymer matrix.

Keywords: POLYPYRROLE; COMPOSITES; COMPLEXES