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The Effect of Preparation conditions on the Growth Rate of Films, the Yield of Precipitated Powder and the DC Conductivity of Polypyrrole

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Abstract: Polypyrrole (PPy) was prepared by a chemical method by using oxidizing agents ferric chloride and potassium persulphate, both as films and pellets. The effect of various variables-such as aging of the films, film thickness, ratios of the reactants and type of the sample (film or disc)-on DC conductivity were investigated. The results from samples prepared with ferric chloride exhibited an increase in conductivity with increasing concentration of oxidizing agent to a certain ratio, above which a slight decrease occurs. Whereas in the case of using potassium persulphate as the oxidizing agent, a decrease in conductivity occurs with increasing its concentration. Moreover, aging of the samples caused a loss of conductivity. In additional to the DC conductivity, both the growth rate of PPy films and the yield of the powder samples were investigated and were found to be dependent on the concentration of the oxidants.

Key Words: DC Conductivity, Conducting Polymers, Polypyrrole, Quartz Crystal Microbalance Technique.

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