

12. FACTORS AFFECTING THE IN-SITU CONDUCTIVITY OF ELECTRONICALLY CONDUCTING POLYMERS

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In recent years the discovery of doped organic polymers with high electronic conductivities has generated substantial research interest among physicists and chemists. Conjugated polymers such as polyacetylene, polypyrrole, polythiophene, polyparaphenylene with doped derivatives reported to have conductivities larger than 1 S/cm. The films obtained in organic media exhibit superior characteristics in favour of their conductivity and mechanical properties. However, the use of organic solvent is costly and hazardous. Hence the use of water as a solvent for the polymerization is evidently advantageous. Therefore, in this study, investigations have been carried out to find the effect of pH of the electrolyte, effect of the size of the dopant ion, effect of the electrolyte concentration and the effect of the current density used in the polymerization on the *in-situ* conductivity of poly N methyl pyrrole in aqueous media. The polymerization current density has the largest influence on the conductivity. The conductivity increase with the decreasing current density. pH of the electrolyte also effects the conductivity. The films formed using higher acidic media seems to have high conductivity. As seen in the non aqueous media, the conductivity changes with the size of the anion and the concentration of electrolyte.

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