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Preparation and characterization of chemically and electrochemically synthesized 3,4-ethylenedioxy pyrrole/pyrrole (EDOP/Py) copolymers

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Abstract. In this study, 3,4-ethylenedioxypyrrole (EDOP) and pyrrole (Py) copolymers were prepared by chemical and electrochemical polymerization methods. The properties of the polymers obtained by both methods were compared. Chemical synthesis of copolymers was carried out with ferric chloride ($FeCl_3$) in the acetonitrile (ACN) environment. The electrochemical synthesis was carried out with lithium perchlorate ($LiClO_4$) electrolyte and suitable oxidation potential range in ACN solution. The properties of polypyrrole (PPy) copolymers were performed with Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), thermogravimetric analysis (TGA) and conductivity measurements. Depending on the polymerization method and pyrrole amount in copolymer, thermal stability, conductivity and surface morphology were varied.

***Keywords*:** pyrrole; 3,4-ethylenedioxypyrrole; copolymer; chemical polymerization; electrochemical polymerization.

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