**Coating of Poly(aniline-co-o-toluidine) Copolymer on FTO Glasses in Acetonitrile**

***Asuman ÜNAL1***

*1Cankiri Karatekin University, Science Faculty, Department of Chemistry, Cankiri, Turkiye*

**Abstract**

Electrochemical and physical properties of conjugated polymers are strongly affected by the type of electrolyte, counterion, solvent and electrode and the pH of the environment as well as the voltage/current applied during electrochemical polymerization [1]. However, the most important parameter to obtain an electroactive polymer film under good conditions is the monomer selection. Polyaniline is the most common electroactive polymer, showing high electroactivity in acidic environment, and its physical properties can vary over a wide range with changing counterions and solvent [2]. For example, by changing the type of acid used, the growth rate of polyaniline is increased, and a more porous film is formed [3]. On the other hand, the electroactivity of polyaniline is mostly affected by high pH because it loses its electroactivity as the pH increases [4]. Copolymerization is a convenient way to enhance its electroactivity in higher pH environments. Additionally, it is possible to synthesize copolymer with new electrochemical and physical properties by adding other monomers to aniline monomer solution [5]. According to a study previously reported in the literature [6], poly(aniline-co-o-toluidine) shows more electroactive properties than polyaniline and poly-o-toluidine in neutral environments. Also, this study emphasizes that the copolymer is more compact and uniform than its homopolymers. On the other hand, as mentioned before, the electrochemical and physical properties of a (co)polymer can be changed using different solvent and electrodes, and the coating of this copolymer on FTO glasses in acetonitrile has not been studied. In this study, the coating of this copolymer on FTO glasses in acetonitrile was carried out for the first time. Later, electroactivity and morphological properties of the copolymer films was investigated.

***Keywords: Polyaniline, Poly-o-toluidine, Copolymer, Acetonitrile, FTO***

1. Hussain, A.M.P., and Kumar, A. (2003) Electrochemical synthesis and characterization of chloride doped polyaniline. *Bulletin of Materials Science*.

2. Syed, A.A., and Dinesan, M.K. (1991) Review: Polyaniline-A novel polymeric material. *Talanta*.

3. Unal, A. (2022) *Advances in Materials Science Research. Volume 49*, Nova Science Publishers, New York.

4. Unal, A., Hillman, A.R., Ryder, K.S., and Cihangir, S. (2021) Highly Efficient Defluoridation of Water through Reusable poly(aniline-co-o-aminophenol) Copolymer Modified Electrode Using Electrochemical Quartz Crystal Microbalance. *J Electrochem Soc*, **168** (2).

5. Bilal, S., and Holze, R. (2006) Electrochemical copolymerization of m-toluidine and o-phenylenediamine. *Electrochim Acta*.

6. Unal, A., Robert Hillman, A., Ryder, K.S., and Cihangir, S. (2021) Electrogravimetric analysis of poly(aniline-co-o-toluidine) copolymer films in the presence of fluoride ions. *Journal of Electroanalytical Chemistry*, **895**.