ELECTROPOLYMERIZATION OF THIOPHENE CONTAINING POLYOXY GROUP

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Conducting polymers with conjugated double bonds such as polypyrrole and polythiophene have attracted great attention as advanced materials. The features of conducting polymers, such as reversibility, availability in film form and good environmental stability, enhance their potential use in practical applications [1]. Polythiophene can be used as electrical conductors, polymer light-emitting diodes (PLED), sensors, batteries, solar cells, optical devices and transistors [2]. Polymers could be synthesized by either chemical or electrochemical polymerization methods. Electropolymerization is more advantageous. These reactions can be performed at room temperature and films thickness can be controlled.

In this work, we describe the synthesis of thiophene monomer containing polyoxy group. The molecular structure of monomer was characterized by ¹H NMR. Electrochemical polymerization of this monomer was also carried out and electrochemical behaviors were investigated. Polymer films can be directly formed at the electrode surface, and it is possible to obtain homogeneous films. The molecule described here possesses polyoxyethylene substituent group. Polyoxyethylene chains were chosen in order to increase solubility of molecule and to improve film forming capacity.

Scheme 1. Synthesis of thiophene monomer.

References