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Fabrication of Poly (3,4-ethylenedioxythiophene) Thin Films by Vapor Phase Polymerization on Patterned Ferric Chloride

Youn-Hee Cho, Myung-Mo Sung*

Department of Chemistry, Kookmin University

Π -Conjugated organic polymers having heterocyclic structures (polypyrrole, polythiophene, etc.) are electrically conductive and have attracted a great attention because of their potential applications to displays, smart windows, sensors, capacitors, and secondary batteries . Optoelectronic devices often require polymeric transparent electrodes for improving device performance and furthermore fabricating devices with only polymer components .Ethylene dioxythiophene (EDOT) had been previously showed to be a good candidate. This monomer could also be polymerised chemically inside the pores of a 'track-etch' membrane to form a thin layer of highly conducting polyethylene dioxythiophene (PEDOT). Among them, poly(3,4-ethylenedioxythiophene) (PEDOT) can be a good material for optoelectronic devices owing to its high conductivity up to 500 S/cm and electrochemical stability with maintaining moderate transparency. Iron(III) salts can be conveniently used as "dopant" ions for-conjugated organic polymers having the heteroaromatic structures such as PEDOT. We studied the conductive thin films of patterned ferric chloride doped PEDOT were obtained by in situ vapor-phase polymerization method under ambient conditions.