URN etd-0407109-183720-1628
Author Liang-Ren Huang
Author's Email Address No Public.
Statistics This thesis had been viewed 49 times. Download 0 times.
Department
Year 2006
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Electrochemical Leveling Effect on Multi-Aromatic Monomer Films to Prepare Robust Conducting Polymer Nano/Micro
Films by Vapor Deposition Combined with Electropolymerization
Date of Defense 0000-00-00
Page Count 94

Keyword
multi-aromatic conducting polymer
electrochemical rubbing effect
vapor deposition
cyclic voltammetry
hole-transporting material
electrochromic

Abstract
Multi-aromatic conducting polymer films, poly(N-phenyl-1-naphthylamine) (PPNA), were prepared by using a combination of vapor deposition and electrochemical polymerization. The PNA monomer film was vapor deposited on an indium-tin oxide (ITO) glass, and was then electropolymerized using cyclic voltammetry in 1N HClO4 aqueous solution. An electrochemical rubbing effect happened on the monomer film using the above combined process, producing a robust electrode material of PPNA film in the electrochromic device: ITO / PPNA film // PU-LiClO4 // PEDOT:PSS / ITO, where poly(3,4-ethylenedioxythiophene):poly(4-styrenesulfonate) is PEDOT:PSS, and polyurethane is PU. Short response time (ca. 10 s) was attained from coloring to bleaching processes. After 200 switching, the stable coulombic efficiency and optical contrast possess the values of 108 and 28%, respectively.
On the othe hand ,we report the electrochromic charateristics of a triphenylamine-based hole-transporting material, N, N’-diphenyl-N, N’-bis(3-methylphenyl)-1, 1’-biphenyl-4, 4’-diamine (TPD) employing the cyclic voltammetry and spectroelectrochemical methods. To assemble the dual-type electrochromic devices using different thickness (250, 400, and 1000 nm) of TPD films: ITO/TPD//PU-LiClO4//PEDOT/ITO, the optical contrast of the devices increases with increasing the TPD film thickness, whereas the 1000 nm TPD film showed relatively excellent stability; the color of the film changed from orange-brown, transparent, and dark blue at -2.0, 0.0, and +2.0 V (vs. PEDOT), respectively, where PEDOT is poly(3,4-ethylenedioxythiophene) -poly(4-styrenesulfonate).
Advisory Committee Yang Chien-Hsin - advisor

Files No Any Full Text File.
Date of Submission 2007-07-30