

Dual effect enhancing electrical and optical properties of solution-processed PEDOT:PSS by ultrafiltration with acid dopant

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Poly(3,4-thylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS) is a promising next-generation transparent electrode material. PEDOT:PSS can be dispersed in water, so it can be easily utilized through solution processing. However, it has relatively lower conductivity than other inorganic materials. In this work, PEDOT:PSS was first synthesized by emulsion polymerization. Thereafter it was treated by ultrafiltration using unimolecular acid dopant to enhance significantly conductivity. The XPS, Raman spectra, Optical properties(Transmittance, Haziness, b^* ... etc.), absorption, AFM, UPS and electrical conductivity of the PEDOT:PSS were evaluated. Because of these dual effects of structural and chemical changes, The electrical conductivity of PEDOT:PSS was increased from 1100 S/cm to 1400 S/cm.