

Abstract Submitted
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Surface Plasmon Peak Resonance Discovered in Sulfuric Acid Treated PEDOT-PSS Conductive Polymers WIL ANDAHAZY, ASHLEIGH BABER, COSTEL CONSTANTIN, James Madison University — Poly(3,4-ethylenedioxythiophene) poly(4-styrenesulfonate) (PEDOT-PSS) is one of the most promising transparent conductors which has applications in flexible electronics including organic light emitting diodes (OLEDs), organic photovoltaics (OPVs), and organic field transistors (OFETs). Recently, scientists discovered that post-treatment with sulfuric acid of PEDOT-PSS thin films result in electrical conductivity increase and a UV absorption decrease due to the replacement of majority of PSS with sulfate ions (SO_4^{2-}). However, the optical properties of the acid treated PEDOT-PSS thin films are not very well understood. In this project, PEDOT-PSS thin films were deposited by either drop casting or spin coating onto microscopic slides, and then submerged into sulfuric acid for 10 minutes. We performed optical spectroscopy by using a HS-190 variable angle spectroscopic ellipsometer with a wavelength range of 200-2500 nm, and for the electrical properties we used a home-made van der Pauw set up. Our preliminary dielectric constants measurements show the existence of a plasmon resonance peak (PRP) present at ~ 1100 nm. We will discuss the correlation between the PRP position and film thickness.

Costel Constantin
james madison university

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