

## Synthesis and Electrochemical Characterization of a Copolymer (PANI/PEDOT:PSS) for Application in Supercapacitors

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**Abstract :** The aim of this study is to synthesis of a copolymer PANI/PEDOT:PSS by electrochemical means to apply in supercapacitors. Polyaniline (PANI) is a conductive polymer; it was synthesized by electrochemical polymerization. It exhibits very stable properties in different environments, whereas PEDOT:PSS is a conductive polymer based on poly(3,4-ethylenedioxythiophene) (PEDOT) and poly(styrene sulfonate)(PSS). It is commonly used with polyaniline to improve its electrical conductivity. Several physicochemical and electrochemical techniques were used for the characterization of PANI/PEDOT:PSS: cyclic voltammetry (VC), electrochemical impedance spectroscopy (EIS), open circuit potential, SEM, X-ray diffraction, etc. The results showed that the PANI/PEDOT:PSS composite is a promising material for supercapacitors due to its high electrical conductivity and high porosity. Electrochemical and physicochemical characterization tests have shown that the composite has high electrical and structural performances, making it a material of choice for high-performance energy storage applications.

**Keywords :** energy storage, supercapacitors, SIE, VC, PANI, poly(3,4-ethylenedioxythiophene, PEDOT, polystyrene sulfonate

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