

**SYNTHESIS AND CHARACTERIZATION OF ACTIVATED
CARBON DOPED TITANIUM DIOXIDE NANOPARTICLES
FOR SUPERCAPACITOR**

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ABSTRACT

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AC doped TiO₂ nanoparticles were synthesis via ultrasonic assisted sol-gel method which are utilized as supercapacitor materials. The electrochemical properties of the AC/TiO₂ nanoparticles were investigate using Cyclic Voltammetry (CV) analysis. The crystal structure of the composite has been characterized by X-ray diffraction analysis (XRD) and Fourier transform infrared spectroscopy (FTIR). The electrochemical measurements reveal that the specific capacitance of 267.910 and 226.190 Fg⁻¹ have been obtained for 20% TiO₂ loading at 50 and 100 mVs⁻¹ respectively with good capacity retention, as it maintained 90% of its original capacitance after 100th subsequent cycles. The XRD pattern confirmed the purity of AC/TiO₂ nanoparticles and the crystallite sizes of AC/TiO₂ in composites were smaller than the undoped samples. The FTIR analysis reveal that the presence of carbonyl group of AC/TiO₂ nanoparticles is advantageous to fast faradaic reactions resulted good capacitance. Therefore, results demonstrated that the AC/TiO₂ nanoparticles is a promising electrode material for supercapacitor application.

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