

# Graphene : Electrochemical Production and its Energy Storage Properties

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## ABSTRACT

Graphene oxide was prepared by Hummers' method and then electrochemically reduced to produce graphene nanosheets. Physicochemical characterizations were performed using XRD, FTIR, FESEM, TEM, Raman and UV-Vis techniques to elucidate the structure and morphology of the prepared material. The electrochemical studies had been conducted on graphene by cyclic voltammetry, galvanostatic charge-discharge and impedance spectra measurements, indicating its superb energy storage properties. Cyclic voltammetry show rectangular voltammograms indicating ideal electrodouble layer performance. The specific capacitance of graphene was found to be  $131 \text{ F g}^{-1}$  at  $0.1 \text{ A g}^{-1}$ . Impedance spectra showed low resistance of electrochemically produced graphene, supporting its suitability for energy storage applications, such as supercapacitor.

**KEYWORDS:** Electrochemical reduction, Graphene, Supercapacitor, Cyclic Voltammetry, Impedance.