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# Effective and High Performance Graphene Electrode for Acidic Electrolyte Supercapacitors Prepared from Commercial Sugar by One-pot Procedure

Mohamed A. Yassin<sup>1</sup>, Ibrahim M A Mohamed<sup>1</sup>, Fahad S Al-Mubaddel<sup>2</sup>, Nasser A. M. Barakat<sup>\*,1,3</sup>

<sup>1</sup>Bionanosystem Engineering Department, Chonbuk National University, Jeonju 561-756, Republic of Korea

<sup>2</sup>Department of Chemical Engineering, King Saud University, PO Box 800, Riyadh 11421, Saudi Arabia

<sup>3</sup>Chemical Engineering Department, Faculty of Engineering, Minia University, Minia, Egypt

Tel: 0082632702363, Fax: 0082632702363, E-mail nasser@jbnu.ac.kr

## Abstract

One-pot procedure is introduced to prepare effective and highly stable graphene electrode for acidic electrolyte supercapacitors. Calcination of commercial sugar and ammonium acetate solid mixture at 1100°C under argon atmosphere leads to produce few layers graphene sheets. The utilized characterizations conform formation of few layers graphene. The electrochemical measurements indicated that the sugar/ammonium acetate weight ratio should be optimized to get the best results. Typically, the estimated specific capacitances were 371, 111 and 82 F/g for the graphene obtained from ammonium acetate/sugar solid mixtures having weight ratios of 1:1, 1:0.5 and 1:2, respectively. Moreover, determining the specific capacitance from charge/discharge test indicated that the proposed electrode exhibits high specific capacitance of 453.2 F/g at 1 A/g and excellent cycle life. The curves of the galvanostatic charge-discharge were almost triangular shapes, reflecting an excellent charge/discharge capacitive performance.

**Keywords:** Supercapacitors; Electronic materials; Acidic electrolyte; Graphene Sheet

## 1. Introduction

Currently, supercapacitors are a class of electrochemical energy storage devices that captivated scientists and researchers due to have higher power density, long cycle stability and able to bridge the gap in energy density between batteries and traditional electric double-layer capacitors

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