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## Partially Graphitic Nanoporous Activated Carbon Prepared from Biomass for Supercapacitor Application

Sivagaami Sundari Gunasekaran<sup>a</sup>, Senthil Kumar Elumalai<sup>a</sup>, Thileep Kumar Kumaresan<sup>a</sup>, Ramya Meganathan<sup>a</sup>, Ashwini Ashok<sup>a</sup>, Varsha Pawar<sup>1</sup>, Kumaran VEDIAPPAN<sup>c</sup>, Gnanamuthu Ramasamy<sup>c</sup>, Smagul Zh. Karazhanov<sup>d</sup>, Kalaivani Raman<sup>\*a</sup>, Raghu Subashchandra Bose<sup>\*b</sup>,

<sup>a</sup>*Department of Chemistry, Vels Institute of Science, Technology & Advanced Studies (VISTAS), Chennai -117.*

<sup>b</sup> *Centre for Advanced Research and Development (CARD), Vels Institute of Science, Technology & Advanced Studies, Chennai -117.*

<sup>c</sup> *SRM University, Kattankulathur-603203*

<sup>d</sup>*Institute for Energy Technology, P.O Box 40, NO 2027-Kjeller, Norway.*

Corresponding Author Email: subraghu\_0612@yahoo.co.in; rakvani@yahoo.co.in

### Abstract

In this present work, the preparation of partially graphitic nanoporous carbon from biomass (bamboo bagasse) is carried out using potassium ferrocyanide and -KOH as activating agent with controlled temperature and gas flow rates. The physico-chemical properties of biomass-derived graphitic nano-porous carbon were characterized by X-ray Diffraction (XRD), Fourier Transform Infra-Red Spectroscopy (FTIR), Thermal Gravimetric Analysis (TGA), Raman spectroscopy, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM) and electrochemical measurements. It is interesting that the activation with the iron salts plays a significant role in the formation of graphitic structures. The graphitic nanoporous carbonaceous materials show high specific surface area of  $1360 \text{ m}^2 \text{ g}^{-1}$ , low impedance, large pore volume and high specific capacitance. Thus, the iron-catalyzed graphitic carbon is excellent candidate for the supercapacitor applications. This contemporary- novel method to synthesis of nanoporous carbon represents a great potential for apparent and diversified applications in energy storage materials.

Keywords: Graphene; Supercapacitor; Energy storage materials; Carbonization

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