

Electrochemical characteristics of EDLC with walnut shell-based carbon electrodes

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This paper deals with preparation of walnut shell-based activated carbons (ACs) and their application to electrode materials for electrical double layer capacitors (EDLCs). Furthermore the sample carbons are grinded under air atmosphere for 8h in a ball-milling with zirconia balls. Nitrogen adsorption analysis shows that the prepared carbon materials possess higher portion of mesoporous pores that is a good property for EDLCs. The surface functional groups on the ACs are confirmed by X-ray photoelectric spectroscopy (XPS). The electrochemical properties of the ACs are assessed by using cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS), and constant current charge/discharge method. From the results, it is found that the electrochemical properties of the EDLCs are highly dependent on the surface function groups as well as textural properties of the ACs.