

Activated carbons from orange peel waste of as supercapacitor electrodes

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Abstract

In this present work, activated carbons were synthesized by $ZnCl_2$ activation of orange peel waste and then followed by surface modification method using HNO_3 . The pore properties of as-prepared activated carbons, including the BET surface area, pore volume, and pore size distribution were examined by the N_2 adsorption isotherms. The surface functional groups were identified by Fourier transforms infrared (FTIR) spectroscopy. The activated carbon was investigated as electrodes for supercapacitors and exhibited good electrochemical performance. The effects of modification conditions on the specific capacitance were further investigated. The presence of oxygen-containing groups improved the performance of the activated carbon-based electrode. As a result, the specific capacitance of the HNO_3 modified electrode showed a larger specific capacitance. The results indicate that orange peel waste may become as one alternative material for the production of low cost activated carbon electrode materials for supercapacitors.

Keywords. Orange Peel, Supercapacitors, Surface Modification, Specific capacitance