

Synthesis and electrochemical property of nitrogen-doped activated carbon by urea for supercapacitors

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In this study, we propose a simple approach for the synthesis of nitrogen-doped activated carbon (N-doped AC) via thermal annealing with urea, to improve the cycle stability and rate capability of electric double layer capacitor (EDLC) by minimizing the oxygen functional group of AC. In order to confirm chemical structure and composition of the materials, XPS and Raman analysis were conducted. The pore structures were characterized by N₂ adsorption/desorption isotherm at 77 K using the BET equation and BJH method. The electrochemical properties of N-doped ACs were accumulated by cyclic voltammetry, impedance spectra, and charge-discharge cycling performance in non-aqueous electrolyte. As a result, Electrochemical measurements indicated that N-doped AC exhibits enhanced rate capability and cycle performance as compared with pristine AC.