Abstract

The purpose of this study was to investigate the effect of carbonization temperature of biogas slurry on specific capacitance. The biogas derived mesoporous carbon materials were synthesized through carbonization of biogas slurry at 450, 550, and 650 °C followed by activation using KOH at 700 °C for 1 h. The physical characterization done by nitrogen adsorption and desorption, scanning electron microscope, transmission electron microscope and X-ray diffraction shows that pyrolysis temperature has influence on the textural and structural properties of the biogas slurry derived carbon. BET specific surface area of 567, 521 and 499 $m^2 g^{-1}$ were obtained for samples carbonized at 450, 550, and 650 °C, respectively. The electrochemical performance of the samples in 6 M KOH electrolyte exhibited high gravimetric capacitance of 262, 272, and 238 F g^{-1} for samples carbonized at 450, 550 and 650 °C, correspondingly at scan rate of 5 mV s^{-1}. Moderate carbonization temperature of 550 °C therefore afforded the highest capacitance.