Preparation of Porous Carbon with macropores via Spray Pyrolysis and Evaluation of Electrochemical Properties for Capacitive Deionization Application

조나래, 임미자, 정경열*, 최재환
공주대학교
(kyjung@kongju.ac.kr*)

In this work, the porous carbon particles were synthesized by spray pyrolysis and their physical and electrochemical properties were characterized by nitrogen adsorption-desorption isotherm, FT-IR, zeta potential, cyclic voltammetry (CV), and electrical impedance spectroscopy (EIS) analysis. Especially, we tried to increase the specific surface area via forming meso- and macropores in order to improve the specific capacitance for capacitive deionization (CDI) application. The carbon particles prepared had macropores (40 ~ 50 nm) as well as mesopores with specific surface areas of 669 and 825 m^2/g when the ratio of $NaHCO_3$ to sucrose was 1.0 and 3.0, respectively. The FT-IR measurement showed that the prepared carbon particles have many surface functional groups such as C=O, C-O, and OH. The prepared carbon particles have a graphite-like structure that was confirmed by the observation of G and D bands in Raman spectroscopy. It was confirmed that the porous carbon particles synthesized by spray pyrolysis had an improved capacitance about 45% compared with the ACPs electrode.