

Aligned carbon nanofiber as supercapacitor electrodes with Co_3O_4 coating by pulse electrodeposition

이은수, 김민재, 황소산, 심상은†

인하대학교

(seshim@inha.ac.kr†)

Cobalt oxide (Co_3O_4) nanostructure were prepared using pulsed electrodeposition(PED) on aligned activated carbon nanofibers (ACNFs) to use as a supercapacitor electrode. The ACNFs were fabricated by electrospinning of polyacrylonitrile (PAN) and aligned by controlling the rotary collector's rpm. The prepared PAN nanofibers were carbonized under CO_2 atmosphere in order to activate the nanofibers. Aligned ACNFs have higher specific surface area and electrical conductivity than ordinary ANCFs. As the collector's rpm increases, the pulling force between the collector and fibers also rises. As a result, the unique aligned nanostructure of CNFs is fabricated. These ACNFs were coated by Co_3O_4 using PED. PED makes it possible to control the deposited material composition, and it is useful to regulate the particle size and uniform distribution. For these Co_3O_4 coated ACNFs, the electrode shows ideal pseudo capacitive behavior.

Acknowledgment

This study was supported by the National Research Foundation of Korea (grant no.: 2013R1A2A2A04013913 and 2015R1A4A1042434).