Low temperature solution processed cobalt doped manganese oxide for high performance supercapacitor

BUI THI MY PHUONG, 양오봉†, M. shaheer Akhtar, Khursheed Ahmada, Zhen Yu Li
전북대학교
(obyang@jbnu.ac.kr†)

Cobalt doped manganese oxide (Co-Mn_3O_4) nanoparticles were synthesized by a facile low temperature solution process at 80 oC using cobalt chloride, potassium permanganate, urea and cetyltrimethylammonium bromide (CTAB). The synthesized Co-Mn3O4 nanoparticles were well characterized in terms of morphology, crystallinity, structural, surface and electrochemical properties. The X-ray diffraction (XRD) revealed that the synthesized Co-Mn3O4 showed slightly shifting as compared to undoped Mn3O4, confirming the Co doping in Mn3O4. From UV-Vis observations, the significant change in band gaps (Eg) from 2.07 eV to 3.1 eV was seen after Co doping in Mn3O4. Thermogravimetric analysis (TGA) results of Co-Mn3O4 displayed the large weight loss as compared to undoped Mn3O4, indicating the evaporation of oxygen at higher temperature and doping of Co into these defects. The synthesized Co-Mn3O4 nanoparticles were applied as working electrode for the fabrication of supercapacitors, which exhibited the good electrochemical and electrical properties as compared to undoped Mn3O4.