High surface-area nickel oxide on the three-dimensional graphene foam (3DGF) as a hybrid electrode for supercapacitors

이소정, 정찬화†
성균관대학교
(chc.skku@gmail.com†)

Nowadays, the three-dimensional metal oxide and carbon-based materials have been shown promising performance as a hybrid electrode for supercapacitors because of their structural superiority and synergistic contribution effects. In this work, the three-dimensional graphene foam (3DGF) has been prepared via an electrochemical reduction process of graphene oxide powder obtained by the modified Hummer's method. Further, the hybridized electrode of nickel oxide and ERGO has been prepared by hydrogen evolution reaction (HER) to electrodeposit dendritic nickel oxide on 3DGF. The 3D graphene structures and dendritic nickel oxide structures have high surface area to exhibit excellent electrochemical performance. Most importantly, the nickel oxide deposited 3DGF improve its capacitance as compared to the nickel oxide deposited on bare nickel foam. It was due to large surface area and good electrical conductivity of graphene oxide. The highlight of our work is unique three-dimensional dendritic structures and easy method such as electrochemical reduction process and electro-deposition method compared to the hydrothermal method and CVD process.