N-doped 3D rGO-CNT structure using microwave for Energy storage

박범진, 박호석†
성균관대학교
(phs0727@skku.edu†)

The hybridization of CNT with graphene structure has researched due to large specific surface area and high electronic conductivity. These 3D archtitures have been studied in various applications because their synergy on the energy storage systems. 3D structure consisting graphene and CNT have been apllied in photocatalysis, supercapacitors, fuel cells and lihthium-ion batteries. In addition, the performance has been further improved by doping with different heteroatoms such as S, B, P and N because they can play a vital role in changing the local electronic density leading to improved electronic conductivity.
In this work, we synthesize 3D N-doped rGO branched by CNT for applications into energy storage. The hierarchical architecture consisting of the CNT growth on 3D N-doped rGO was characterized by SEM and TEM images. BET data show the presence of mesoporous structure with average pore diameter of nanosize with 400 m^2/g surface area. The XPS data has indicated the existence of C, O, Fe and N. The electrochemical properties were characterized by cyclic voltametry, impedance spectroscopy, and galvanic charge/discharge curve for lithium ion battery application.