Fabrication of Three-Dimensional Hollow Graphene Ball for Energy Storage Applications

최원묵*, Bao Trung Nguyen
울산대학교
(wmchoi98@ulsan.ac.kr*)

Recently scientists are noticing that the performance of those devices can obtain a critical enhancement by the utilization of three-dimensional (3D) architectures because of the boost of active material per projected area. However, the fabrication of 3D nanostructure graphene is still a tough obstacle. Herein, we describe a facile method to synthesize 3D hollow graphene ball (HGB) by using poly(methylmethacrylate) (PMMA) colloidal particles as template materials. PMMA particles easily assembled with graphene oxide dispersion through electrostatic interaction because of opposite charge, followed by electrophoretic deposition to constructing completely 3D structured graphene after hydrazine reduction and PMMA-sacrificial template removal. Benefiting from the unique porous structure, 3D HGB exhibits outstanding specific surface area, resulting to remarkable specific capacitance and high rate capability in electrochemical capacitor applications.