Pulse Potentiostatic Deposition of Polyaniline Nanobumps on 3D Graphene Hydrogel for High-Performance Supercapacitor Electrode

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The facile pulse potentiostatic method (PPM) was employed to deposit polyaniline (PANI) nanobumps on the framework of hydrothermal graphene hydrogel (GH) in this work. The obtained GH/PANI composite shows larger accessible surface area and higher electrochemical activity than the previous one by the potentiostatic method, thus resulting in the further improvement of electrochemical capacitive properties. The PPM GH/PANI composite exhibits a high specific capacitance (864 F g^{-1} at 2 A g^{-1}), good rate capability (66% capacitance retention even at 100 A g^{-1}), and excellent stability (83% retention after 1000 cycles at 4 A g^{-1}). These results suggest a great advantage of PPM GH/PANI composite electrode for the high performance supercapacitor.

Keywords: Graphene hydrogel; Polyaniline nanobumps; Pulse potentiostatic method; Supercapacitor

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