Porous N-doped Carbon Derived from ZIF-8/Reduced Graphene oxide/Polypyrrole Composite for High Performance Supercapacitor

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Porous N-doped carbon nanomaterials have great potential in supercapacitor owing to their high surface area, excellent chemical stability and good hydrophilic property. In this work, ZIF-8 nanocrystals were well grown on the surface of polypyrrole/reduced graphene oxide composite (ZIF-8/PPy/rGO). After carbonization of ZIF-8/PPy/rGO and chemical etching of the product, a porous carbon with N-doping (PNC) and proper structure was obtained. In comparison with the carbonized ZIF-8 and PPy/rGO, the ZIF-8/PPy/rGO derived carbon possesses much higher electrochemical performance. As electrodes in supercapacitor, the PNC exhibits a significantly enhanced specific capacitance (236 F g^{-1} at 1 A g^{-1}), superior rate capability (retained 86.1 % from 1 to 20 A g^{-1}) and excellent cycling stability (over 96.8% capacity retained after 10000 cycles), exhibiting its potential for electrode materials with high performance.

Keywords: ZIF-8; Supercapacitor; Porous carbon; Graphene; N-doping

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