Nickel-organic Frameworks with Hierarchical Flowers Structure Fabricated by Surfactant-assisted Solvothermal Method for High-performance Supercapacitors

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In this work, Ni-MOF (R-160) with a hierarchical flower-like structure is fabricated by a facile solvothermal method with surfactant assistance. Benefiting from its structure, R-160 has a very high specific surface area and a large number of exposed active sites. Electrochemical research results show that the electrochemical performance of R-160 prepared with sodium dodecyl sulfate (SDS) is superior to that of B-160 prepared without SDS assistance. For instance, the specific capacitance of B-160 is only 808 F g⁻¹ at a current density of 1 A g⁻¹. Nevertheless, the specific capacitance of R-160 reaches 1036 F g⁻¹ under the same conditions, which is 28.2% higher than that of B-160. Moreover, the energy density of an asymmetric device assembled with R-160 and AC is 38.3 W h kg⁻¹ at a power density of 749.9 W kg⁻¹.

Keywords: nickel-metal-organic framework; surfactant; solvothermal method; supercapacitor

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