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Synthesis of NiGa₂S₄-rGO on nickel foam as advanced electrode for flexible solid-state supercapacitor with superior energy density

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Abstract

Pseudocapacitive electrode materials employed in supercapacitors may bring in high energy density (ED) and specific capacitance (C_{sc}), which are critical for their practical applications. Accordingly, logical design of advanced electrode materials is highly demanded to progress high-performance supercapacitors. Here, for the first time, we suggest a straightforward route for the synthesis of NiGa₂S₄-rGO as an advanced cathode material supported on nickel foam (NF) for employed in flexible solid-state asymmetric supercapacitors (FSASCs). Due to an abundant ratio of active sites and large surface area of the NiGa₂S₄-rGO advanced material, the as-prepared NiGa₂S₄-rGO/NF electrode illustrates considerable electrochemical properties including remarkable specific capacitance (C_{sc}) of 2124.34 F g⁻¹ with excellent rate capability of 73%, and exceptional durability, which are better than NiGa₂S₄/NF and previously reported transition metal sulfides (TMSs). Furthermore, for the first time a pseudocapacitive advanced anode material of FeSe₂-rGO have been successfully fabricated on a nickel foam (NF) substrate by a facile strategy. Element Selenium as the favorable element was offered into the Fe for

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