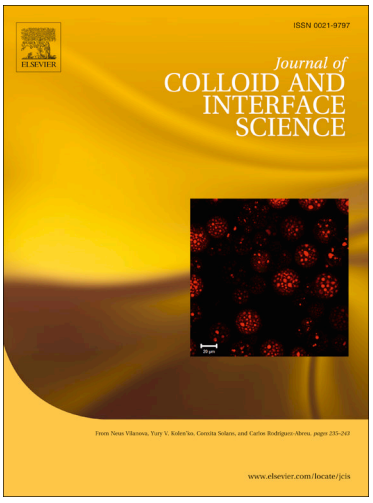

Regular Article

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Synthesis of $NiGa_2S_4$-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 $NiGa_2S_4$-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 $NiGa_2S_4$-rGO advanced material, the as-prepared $NiGa_2S_4$-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 $NiGa_2S_4$/NF and previously reported transition metal sulfides (TMSs). Furthermore, for the first time a pseudocapacitive advanced anode material of $FeSe_2$-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