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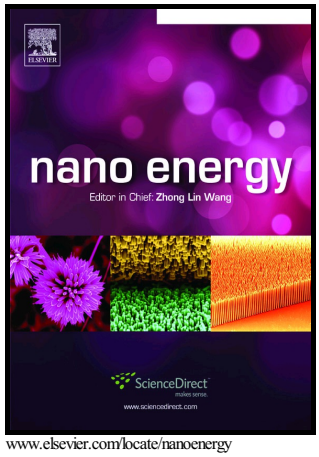

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Enabling redox chemistry with hierarchically designed bilayered nanoarchitectures for pouch-type hybrid supercapacitors: A sunlight-driven rechargeable energy storage system to portable electronics

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Abstract

An essential key to enhance the redox chemistry of battery-type materials is to construct rational design of nanoarchitectures with high electrochemical activity. Herein, we reported a hierarchical composite consisting of bilayered nickel hydroxide carbonate nanoplates decorated nanoflowers on nickel foam (NHC NPs@NFs/Ni foam) *via* a facile homogeneous precipitation method for use as an effective cathode in hybrid supercapacitor (HSC). Under controlled growth time (4 h), the bilayered NHC NPs@NFs with hierarchical alignment were spontaneously crystallized on Ni foam, which substantially enhance the electroactive surface area and enabled the rapid redox chemistry in alkaline electrolyte. Notably, the hybrid NHC NPs@NFs/Ni foam