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Annealing temperature dependent ZnCo_2O_4 nanosheet arrays supported on Ni foam for high-performance asymmetric supercapacitor

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Abstract

Porous network ZnCo_2O_4 nanosheets are successfully achieved by a simple hydrothermal process and adjusting the annealing temperature. The electrochemical performance of ZnCo_2O_4 nanosheets is significantly influenced by different annealing temperatures. It has been discovered that electrode of ZnCo_2O_4 that has been annealed at 200 °C shows an ultrahigh areal capacitance of 3.19 F cm⁻² at a current density of 2 mA cm⁻². An asymmetric supercapacitor device was assembled by ZnCo_2O_4 annealed at 200 °C as positive electrode and activated carbon as negative electrode, which exhibits the energy densities of 50.7 and 37.7 Wh kg⁻¹ at power densities of 187.6 and 2950.4 W kg⁻¹, respectively.

Keywords: ZnCo_2O_4 ; nanosheets; annealing; asymmetric supercapacitor.

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