Morphology-tuned Synthesis of MgCo_2O_4 Arrays on Graphene Coated Nickel Foam for High-Rate Supercapacitor Electrode

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Rational design of advanced electrode materials is highly desirable and technically important for developing high-performance electrochemical supercapacitors. In this work, we have successfully synthesized MgCo_2O_4 nanosheet, nanobelt, and nanowire arrays on graphene-coated nickel foam by a facile three-step synthesis method. The morphologies of MgCo_2O_4 arrays can be readily tuned by changing the volume ratio of DEG and deionized water. Moreover, when explored as supercapacitor electrode, the MgCo_2O_4 nanowire arrays electrode exhibits superior high-rate electrochemical performance, which delivers an optimal specific capacitance of 500 F g^{-1} at a high current density of 50 A g^{-1} and exhibits good cycling performance. This work provides alternative strategies for constructing advanced supercapacitor electrode with superior high-rate performance.

Keywords: Morphology control; MgCo_2O_4 arrays; Graphene; Supercapacitors

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