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The Bamboo Leaf-like NiCo2O4 nanobelts with Surface Pore Defects Supported on rGO as Advanced Anode Material for Lithium Ion Batteries

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The rGO-supported NiCo2O4 nanobelts (SPD-NiCo2O4/rGO) with surface pore defects and preferred orientation growth of the (311) plane are successfully constructed by a low-temperature hydrothermal method combined with a subsequent calcination treatment. The results show that as-obtained SPD-NiCo2O4/rGO nanoarchitectures possess abundant pore defects on the surface of NiCo2O4 nanobelts with an average diameter of 3.5 nm. Moreover, NiCo2O4 nanobelts loaded on the surface of rGO has a preferred orientation with exposed (311) plane. It is found that the SPD-NiCo2O4/rGO nanoarchitectures as a LIBs anode material exhibit a high specific capacity (1393 mAh g−1 at a current density of 0.1 A g−1), excellent rate capability (1132, 1066, 993 and 869 mAh g-1 at 200, 300, 500 and 1000 mA g-1, respectively.), and a superior cycling stability (only 0.4% capacity decay after 50 cycles). The remarkable Li storage performance of the SPD-NiCo2O4/rGO nanoarchitectures can be mainly attributed to the unique NiCo2O4 nanobelts morphology with surface pore defects and preferred orientation growth of the (311) plane, and the synergistic effect between the NiCo2O4 nanobelts and rGO.

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