

Synthesis of nickel phosphide-ordered mesoporous carbon composite as an anode material for LIBs

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Lithium ion batteries (LIBs) are the most dominant power sources for not only portable electronics but also electric vehicles and energy storage systems. Recently, various anode materials have been studied as an alternative to graphite which has a low theoretical capacity. Among them, nickel phosphide has drawn extensive attention due to its high capacity and relatively low polarization compared to other transition metal compounds. However, large volume expansion during cycling and low electronic conductivity of the nickel phosphide anode materials can bring about a severe fade in capacity and poor cycling performance. To solve these problems, combining nickel phosphide with various carbons is envisioned as an effective method. In this work, nickel phosphide-ordered mesoporous carbon (OMC) composites were synthesized via nano-replication method. OMC has a large surface area, high porosity and controllable regular pore structure. With this composite, it can be expected to have high conductivity and upgrade the performance of LIBs.