Short Communication

Solid octahedral NiO micro-particles prepared by a calcination method in the presence of an ionic liquid and their application as anode for lithium ion batteries

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A novel finding, that solid octahedral NiO micro-particles can be prepared via an ionic liquid (IL)-present calcination method using nickel acetate as the starting material, was reported for the first time in this communication. In the absence of IL, NiO particles with a porous cauliflower-like morphology were produced. The crystal structure and the morphologies of all synthesized samples were respectively characterized by using X-ray diffraction (XRD) and scanning electron microscopy (SEM). The formation of NiO phase in sample a was further verified via HRTEM and XPS. Also, it was revealed by the galvanostatic charge-discharge measurement that the initial discharge capacity of the solid octahedral NiO micro-particles was 757.3 mAh g⁻¹ at 100 mA g⁻¹, much larger than that of sample b (436.3 mAh g⁻¹). And even after 50 cycles, the discharge capacities of all prepared samples were all maintained higher than 210 mAh g⁻¹ at 100 mA g⁻¹. The successful preparation of solid octahedral NiO micro-particles was very favorable not only for the development of lithium ions anode materials but also for the exploration of micro-scale devices.

Keywords: solid octahedral NiO; microstructure; calcination; ionic liquid; energy storage and conversion.

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