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Simple and Low Price of Monodispersed Rice-like Fe₂O₃ supported by modified bamboo charcoal with Enhanced Lithium Storage

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Abstract: Bamboo charcoal (BC) shows similar structure and property to the onion fullerene carbon and carbon nanotubes with hierarchical porous, microporous tunnel structure and good electrical conductivity. By simple treatment, a carbon substrate material with good electrochemical properties can be obtained. Monodispersed rice-like Fe₂O₃ supported by modified bamboo charcoal (MBC) are prepared via a facile precipitation of FeOOH anchored on carbon charcoal substrate combined with a high temperature calcination. The SEM results show that rice-like Fe₂O₃ uniformly anchored on hierarchical porous carbon-based microscopic structure with a size distribution between 80 and 100 nm. In addition, the hybrids exhibit good lithium storage property as anode materials. MBC shows stable cycle performance and the reversible capacity can still be maintained at 327 mAh g⁻¹ after 150 cycles under 200 mA g⁻¹. When incorporated with rice-like Fe₂O₃, the composite delivered a specific capacity of 1094 mAh g⁻¹ after 150 cycles at 200 mA g⁻¹ and a high capacity of 765 mAh g⁻¹ even at 1600 mA g⁻¹.

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