

Synthesis and electrochemical analysis of α -Fe₂O₃ hollow sphere for lithium ion batteries

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α -Fe₂O₃ hollow spheres with different sizes were prepared through a glycerol emulsion template method, and the carbon coated α -Fe₂O₃ hollow spheres are obtained by facile hydrothermal method using glucose as anode for lithium ion battery. The carbon coated α -Fe₂O₃ shows higher discharge capacity of ca. 1800 mAh g⁻¹ than non-carbon coated α -Fe₂O₃ hollow spheres ca. 1464 mAh g⁻¹ on the first cycle, and also cycling performance, rate capability, and cycling performance were greatly improved by carbon layer. Stability improvement of small-sized α -Fe₂O₃ hollow spheres by thin carbon can be promising process for advanced high performance anode in lithium batteries. [This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIP) (No. 2014R1A2A1A11052414) and the Core Technology Development Program for Next-generation Solar Cells of Research Institute for Solar and Sustainable Energies (RISE), GIST.]