

## Synthesis of Fe<sub>2</sub>O<sub>3</sub>/Graphene Composite Anode Materials with Good Cycle Stability for Lithium-ion Batteries

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Fe<sub>2</sub>O<sub>3</sub>/graphene composite anode materials have been successfully synthesized by a PVP-assisted homogeneous precipitation method. The size of Fe<sub>2</sub>O<sub>3</sub> nanoparticles on the surface of graphene sheets was less than 35 nm. Fe<sub>2</sub>O<sub>3</sub> nanoparticles and graphene sheets formed a network structure. Electrochemical properties were evaluated in two-electrode cells versus metallic lithium. The Fe<sub>2</sub>O<sub>3</sub>/graphene composite exhibited excellent electrochemical lithium storage performances. The first discharge and charge capacities were 1600 and 1053 mA h g<sup>-1</sup> at a current density of 100 mA g<sup>-1</sup>, and the first coulomb efficiencies was 65.8%. The reversible specific capacity remained 893 mA h g<sup>-1</sup> and the capacity retention was 84.8% after 100 cycles.

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**Keywords:** Fe<sub>2</sub>O<sub>3</sub>; graphene; composite; anode; lithium-ion batteries

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