Short Communication

Synthesis of $0.4\text{Li}_2\text{MnO}_3 \cdot 0.6\text{LiNi}_{2/3}\text{Mn}_{1/3}\text{O}_2$ /graphene Nano-Composite Materials with Cross-Linked Structure and Enhanced Rate Performance for Lithium-Ion Batteries

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doi: 10.20964/2018.11.80

Received: 12 March 2018 / Accepted: 16 May 2018 / Published: 1 October 2018

Nano $0.4\text{Li}_2\text{MnO}_3 \cdot 0.6\text{LiNi}_{2/3}\text{Mn}_{1/3}\text{O}_2$ /graphene composites have been synthesized by a facile sol-gel method and temperature programmed calcination route. The as-obtained products exhibited a nice morphology which was nano-sized cross-linked structure. And it showed an excellent rate performance when it was used as cathode materials for lithium ion batteries. When it was at the current density of 2 C, the discharge capacity could reach to 205 mAh g^{-1} for the first cycle and the capacity retention stayed over 97 % after 100 cycles. The superior electrochemical behavior of $0.4\text{Li}_2\text{MnO}_3 \cdot 0.6\text{LiNi}_{2/3}\text{Mn}_{1/3}\text{O}_2$ /graphene nanocomposite materials could be ascribed to the unique nano-sized cross-linked structure, the maintaining of electrode integrity, the short diffusion distance, and continuously and rapidly electron conducting.

Keywords: $0.4\text{Li}_2\text{MnO}_3 \cdot 0.6\text{LiNi}_{2/3}\text{Mn}_{1/3}\text{O}_2$ /grapheme; microstructure; cross-linked structure; nanocomposite; cathode; lithium ion batteries.

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