

Short Communication

## Potassium Permanganate (KMnO<sub>4</sub>) Can be Employed as Anode Material for Lithium Ion Batteries

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For the first time, a novel finding, that potassium permanganate (KMnO<sub>4</sub>) can be directly employed as anode material for lithium ion batteries (LIBs), is reported in this short communication. To improve the electrical conductivity of KMnO<sub>4</sub>, graphene is doped into the pure KMnO<sub>4</sub> by a very simple method of milling, which leads to the formation of graphene-doped KMnO<sub>4</sub>. The samples of graphene-doped KMnO<sub>4</sub> having 1 wt. %, 2 wt.% and 3 wt.% graphene are denoted as sample a, b and c, respectively. The characteristics of the prepared samples are mainly examined by using scanning electron microscopy (SEM), cyclic voltammometry (CV), galvanostatic charge-discharge tests and electrochemical impedance spectroscopy (EIS). The results of the electrochemical measurements indicate that the discharge capacities of pure KMnO<sub>4</sub>, sample a, b and c are evaluated to be approximately 82, 92, 110 and 126 mAh g<sup>-1</sup> after 20 cycles at a current density of 100 mA g<sup>-1</sup>. This work has not only developed a novel anode material but also proposed a novel mechanism for the lithiation/delithiation process.

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**Keywords:** anode material; KMnO<sub>4</sub>; graphene; electrochemical measurements; Li ion battery

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