

论文

中热固相法 $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$  正极材料的制备及性能

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摘要:

以 $\text{Li}_2\text{CO}_3$ 和 $\text{V}_2\text{O}_5$ 为原料,用中热固相法制备了掺杂不同氟离子含量的锂离子电池正极材料 $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$ ,采用XRD衍射对其结构进行表征,并通过充放电测试、循环伏安及电导率测试对其性能进行了研究.测试结果表明,中热固相法制得的 $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$ 产品较纯,没有杂质相存在;当 $y = 0.1$ 时产品的电化学循环性能最好,首次放电比容量达252.08 mAh/g,以0.2c倍率循环25次之后比容量仍保持在210.93 mAh/g,容量保持率达92.72%.

**关键词:**  $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$  F<sup>-</sup>掺杂 锂离子电池 正极材料 中热固相法

Preparation and electrochemical properties of  $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$  synthesized by solid state reaction method at moderate-heating temperature

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Abstract:

F<sup>-</sup>-doped lithium vanadium oxides  $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$  was synthesized by a solid state reaction at moderate-heating temperature with  $\text{Li}_2\text{CO}_3$  and  $\text{V}_2\text{O}_5$  as raw materials. Crystal structures were characterized by XRD and electrochemical properties were studied by charge-discharge performance test, cyclic voltammetry test, and conductance test. The XRD results indicate that the products are pure without any impurities.  $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$  ( $y=0.1$ ) shows the best electrochemical cyclability. The first discharge specific capacity is 252.08mAh/g, and the attractive specific capacity of 210.93 mAh/g is obtained after 25 cycles at 0.2c.

**Keywords:**  $\text{Li}_{1+x}\text{V}_3\text{O}_{8-y}\text{F}_y$  Fluorine doping Lithium ion batteries cathode material solid state reaction at moderate-heating temperature

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