$LiMn_2O_4$/C 纳米复合材料的制备及其电化学性能研究

Study on preparation and electrochemical properties of $LiMn_2O_4$/C nanocomposites

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二．成果简介：

Spinel $LiMn_2O_4$ is considered as a promising cathode material for lithium ion batteries because of its rich resources, low cost, nontoxicity, high safety and good rate capability. However, due to the dissolution of manganese and phase transformation during charge/discharge process, its capacity fades rapidly, which makes its cycling performance and large rate stability poor. The spinel $LiMn_2O_4$ could be stabilized by surface coating and lattice doping, so as to effectively improve its cycling performance and rate stability.

三．主要研究内容及创新点：

Contents and innovations： The controllable preparation of $LiMn_2O_4$ nanocrystalline particles was realized, and then the $LiMn_2O_4$ surface was coated with carbon material in situ to improve its stability, and the effect of carbon coating on the performance of $LiMn_2O_4$ was analyzed. Nanostructured $LiMn_2O_4$ was prepared to improve its rate performance. The crystal structure of $LiMn_2O_4$ was stabilized and the agglomeration of nanoparticles was inhibited by carbon materials doping. In order to avoid the surface hypoxia caused by the introduction of carbon, it was coated by CVD, a high temperature and short time treatment.

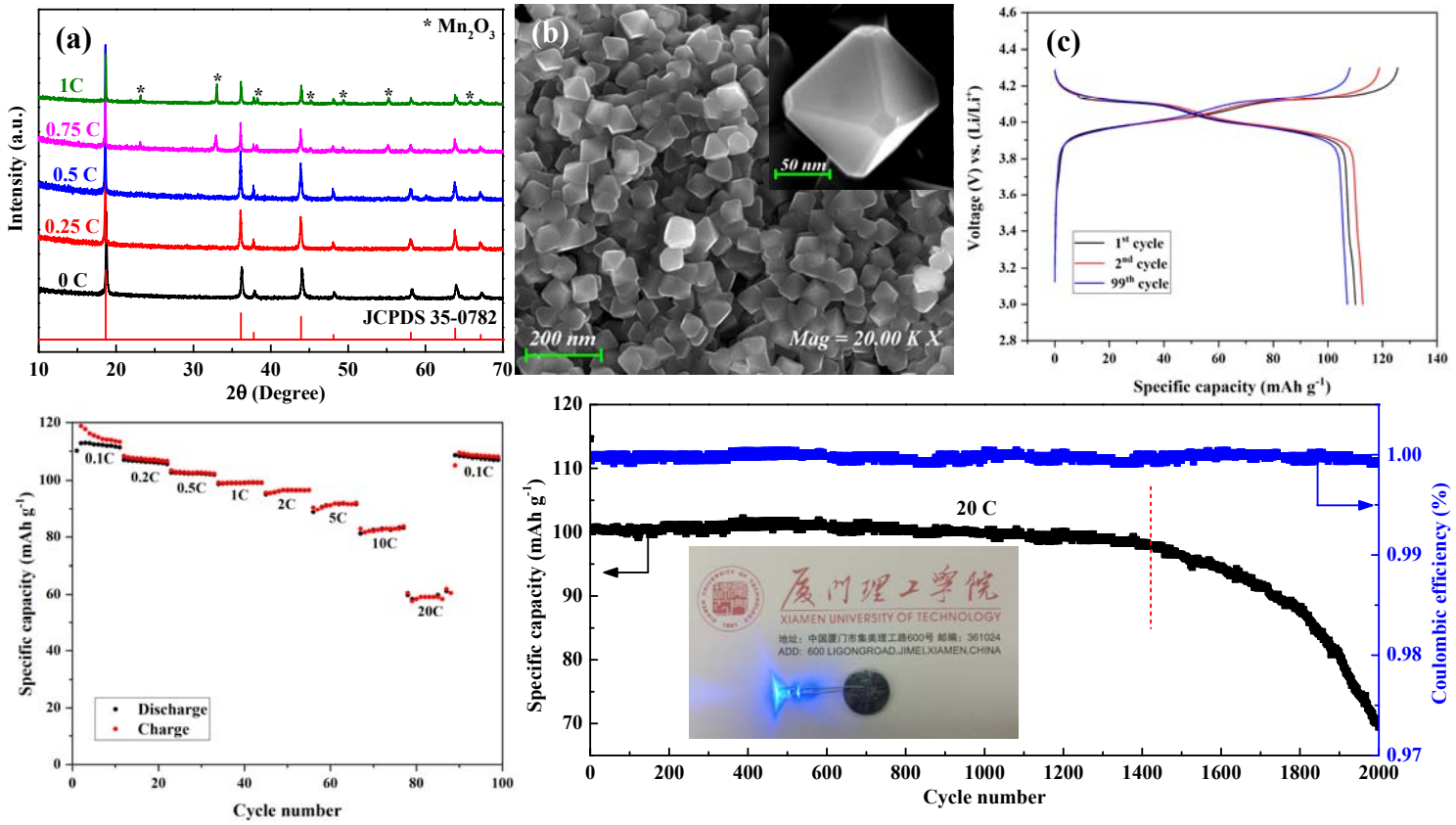


Fig. 1 Physicochemical and electrochemical properties and of $LiMn_2O_4$/C

四．主要研究成果及应用情况

申请（授权）专利 2 项：

1. 一种高性能空气电极催化剂及其制备方法
2. 一种空气电极用石墨烯基催化剂及其制备方法

发表 SCI 论文 1 篇：Zhuang S, Wang Z, **He J**, et al. Sustain. Mater. Techno., 2021, 29: e00282. (IF=7.05)

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