锂离子电池正极材料单晶 NCM811 的制备及其电化学性能研究

Study on preparation and electrochemical properties of monocrystal NCM811 cathode material for Lithium ion batteries

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二．成果简介：

In this study, coprecipitation-ball mill method was adopted to prepare $Ni_{0.8}Co_{0.1}Mn_{0.1}(OH)_2$ precursor, which was calcined under different oxygen atmosphere at specific temperature to obtain monocrystal NCM811 cathode material. In order to circumvent the Li^+ and Ni^{2+} cations mixing, NCM811 nanoparticles were coated directly by organics or polymers that were calcined at specific temperature into the amorphous carbon. This study is of great significance for improving the cycle life and rate performance of NCM811 cathode materials.

三．主要研究内容及创新点：

Contents and innovations: The morphology of $Ni_{0.8}Co_{0.1}Mn_{0.1}(OH)_2$ precursor can be regulated by coprecipitation-ball milling method. And the cyclic stability and rate performance of NCM811 were improved by carbon-coating. The relationship between its physicochemical property, coated-carbon amount and electrochemical performance were revealed.

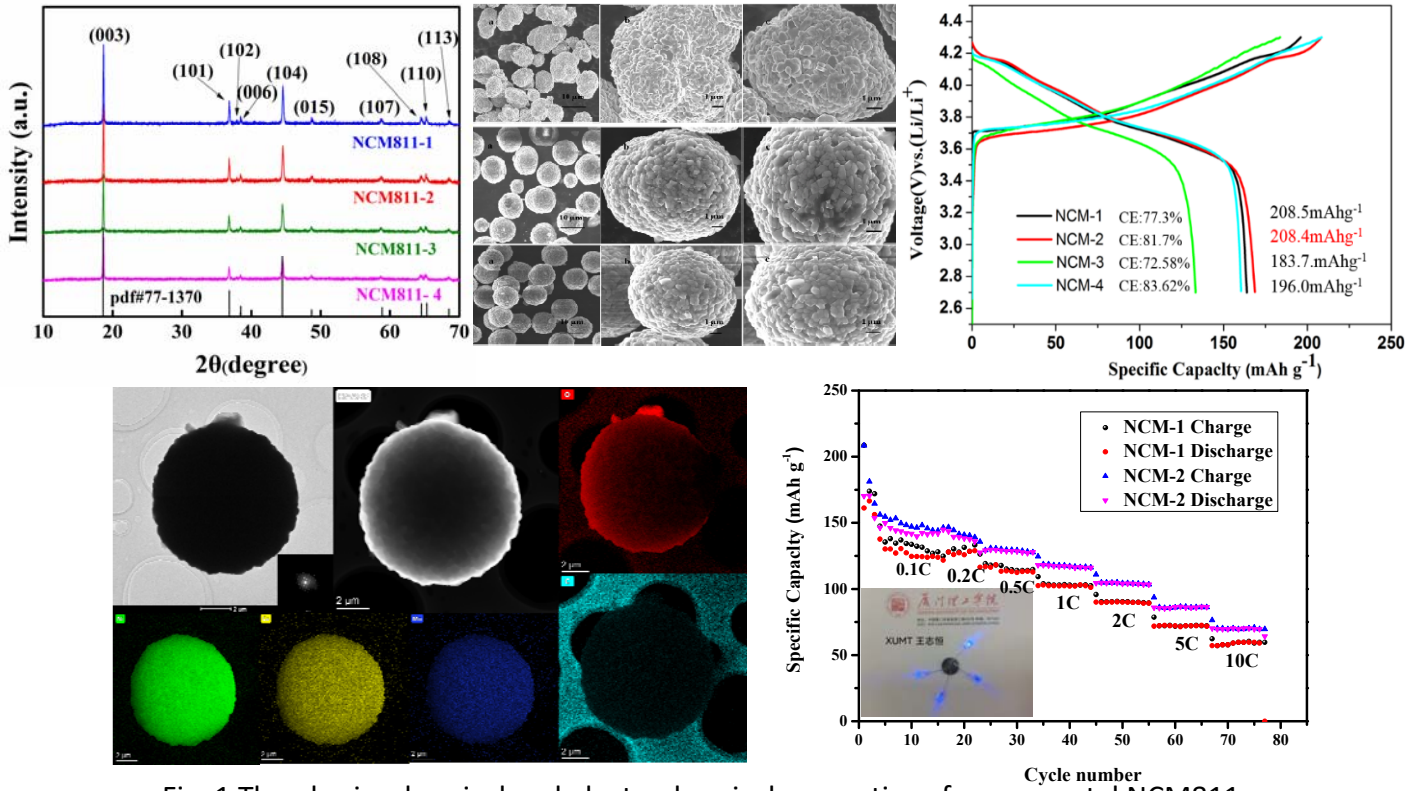


Fig. 1 The physicochemical and electrochemical properties of monocrystal NCM811

四．主要研究成果及应用情况

发表 SCI 论文 1 篇: Zhuang S, **Wang Z**, He J, et al. Perovskite $La_{0.5}Ca_{0.5}CoO_{3-\delta}$ nanocrystals on graphene as a synergistic catalyst for rechargeable zinc-air batteries. Sustain. Mater. Techno., 2021, 29: e00282.

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