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LiMn₂L(Ac)₂热分解制备的尖晶石LiMn₂O₄及其电化学性能

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摘要: 通过XRD、SEM及电化学测试等手段研究了前驱体LiMn₂L(Ac)₂ (L为柠檬酸根)的焙烧工艺条件对尖晶石LiMn₂O₄产物的结构、形貌及电化学性能的影响。结果表明: 提高前驱体的焙烧温度有利于获得晶相结构、微观形貌及电化学性能均较好的LiMn₂O₄样品。在500℃焙烧2h再于750℃下保温8-16h的分段焙烧工艺所得样品的初始容量达到126.0mAh/g, 循环50次后容量衰减了14.5%。

关键词: 尖晶石LiMn₂O₄; 低热固相反应; 锂离子电池; 晶胞参数

Preparation of spinel LiMn₂O₄ by thermo-decomposition of LiMn₂L(Ac)₂ and its electrochemical properties

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Abstract: The effects of thermo-decomposing process of LiMn₂L(Ac)₂ on the structures, micromorphologies and electrochemical properties of the LiMn₂O₄ product were studied by XRD, SEM and charge/discharge tests. The results suggest that the LiMn₂O₄ samples, which were obtained at the higher sintering temperature, exhibit the more perfect crystal structure, more regular micromorphology and better electrochemical properties. When the sintering temperature is higher than 750℃, the subsect-heating technology should be used to avoid the Li₂MnO₃ impurities. The LiMn₂O₄ sample prepared by sintering the precursor first at 500℃ for 2h and then at 750℃ for 8-16h has the first capacity of 126.0mAh/g, and the capacity fading 14.5% after 50 cycles.

Key words: spinel LiMn₂O₄; low-heating solid-state reaction; Li-ion batteries; lattice parameter

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