

Low Temperature Synthesis of LiMO_2 (M=Co, Ni or Mn) and Its Electrochemical Characteristics

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The layered LiCoO_2 , LiNiO_2 , LiMnO_2 have been intensively studied as promising cathode materials for lithium-ion batteries because of their large electrochemical capacity and good cycling behavior.

Usually the preparation of LiMO_2 (M=Co, Ni or Mn) oxides is based on high temperature solid state reactions, which is a tedious and time consuming process involving prolonged heating and intermittent cooling and grinding of the powders. This often results in formation of the poor dispersed product with insufficient electrochemical activity. Therefore, it is important to find novel low-temperature routes to prepare the high quality materials.

A mechanochemical route through grinding a multi-component solid mixture is becoming a new technique of solid state synthesis as the activation of ceramic powders by grinding enhances the development of solid state processes[1-3]. On the other hand, hydrothermal synthesis offers a low temperature route to submicrometer oxide powders with a narrow size distribution avoiding the calcinations step required in sol-gel processing[4].

In this study, we prepared LiMO_2 powders by the combinational method of ball milling and hydrothermal treatment and investigate the electrochemical properties as cathode materials of Li-ion battery.

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