

LiMn₂O₄ particles prepared from nano-sized manganese oxide

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Lithium manganese oxide (LiMn₂O₄) is an important cathode material used in lithium secondary batteries. The electrochemical performance of the cathode material in lithium secondary battery is strongly affected by the properties of the particles, such as morphology, specific surface area, crystallinity and phase homogeneity. In recent years, nano-sized cathode materials have been investigated to achieve the high capacity in lithium secondary batteries. The nano-sized cathode materials had high capacity because of high surface area and the raised lithium intercalation efficiency. Nano-sized cathode materials were prepared by various liquid solution methods. In this work, nano-sized LiMn₂O₄ particles were prepared by conventional solid-state reaction method. Nano-sized Mn₂O₃ particles with uniform morphology and narrow size distribution obtained by spray pyrolysis were used as the source of the manganese component. The submicron size LiMn₂O₄ particles had slightly aggregated morphology and narrow size distribution even without milling process. The discharge capacity of the submicron size LiMn₂O₄ particles prepared by solid state reaction method was 120 mAh/g.