

# Influences of $\text{Li}_2\text{MnO}_3$ Domain Size and Current Rate on the Electrochemical Properties of $0.5\text{Li}_2\text{MnO}_3 \cdot 0.5\text{LiCoO}_2$ Cathode Material

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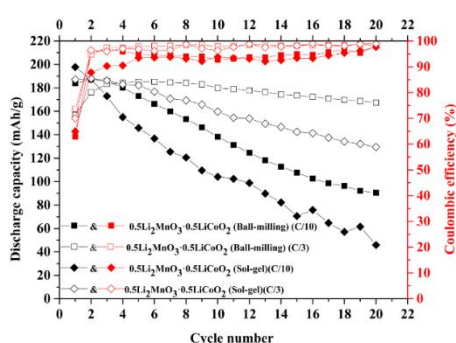
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Li and Mn rich layered oxide ( $x\text{Li}_2\text{MnO}_3 \cdot (1-x)\text{LiCoO}_2$ ,  $M = \text{Mn, Ni, Co, and Fe}$ ) materials have been considered as a cathode material for lithium ion batteries. Their high specific capacities of 200-250 mAh/g [1]. However, they often exhibit structural transformation from a layered to a spinel structure during cycling, leading to capacity and voltage decay as cycle number increases. To enhance their electrochemical performance, the structural stability of these materials must be improved. Currently, much research has reported that the structural characteristics of these cathode materials are largely dependent on preparation methods and testing conditions [2-3]. In this study, the impacts of  $\text{Li}_2\text{MnO}_3$  domain size and current rate on electrochemical properties of  $0.5\text{Li}_2\text{MnO}_3 \cdot 0.5\text{LiCoO}_2$  material was investigated. The results presented that a ball-milled cathode revealed higher structural stability than a sol-gel cathode, resulting from a larger  $\text{Li}_2\text{MnO}_3$  domain size of the ball-milled cathode can retard structural transition of the cathode. Moreover, a fast cycling rate can also reduce possible the structural transformation from the layered structure to the spinel structure taken place upon cycling. The retarding structural transformation leads to high cycling stability.



**Figure 1** Cycling stability of the prepared materials cycled at different C-rates.

## References:

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