

Structural and performance characteristics of lithium-rich cathode materials prepared by spray pyrolysis

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The LiCoO_2 used in commercial Li-ion battery has excellent electrochemical properties. But due to high cost and toxicity, especially not suitable to meet requirements for EV application, various efforts for improving cathode materials with appropriate high energy density, high power density and safety have been studied extensively. It is reported that Li-rich cathode exhibits high capacity at high voltage region of $\sim 4.6\text{V}$. This cathode material is normally prepared by solid-state reaction or liquid phase method. However, it is difficult to prepare the composite cathode materials of precise composition. At the same time, it is even more difficult to control the size and morphology along with composition control because morphology and size are also affected by the composition. Recently, spray pyrolysis has been widely investigated to prepare cathode materials due to its various advantages such as simple system, ease of controlling particle size and preparing spherical particle of multi-components and high purity. Thus, in this work, we report the preparation of the Li-rich cathode in spray pyrolysis and the relationship between cycle stability and rate capability as a function of sintering temperature.