Effect of Carbon Nanotube Dispersion on Electrochemical Behavior of the CNTs/LiCoO₂ Composite Cathode

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Carbon nanotubes (CNTs) are utilized as conductive additives in lithium ion battery. Particularly, the effect of surfactant type on the CNTs' dispersion as well as corresponding electrochemical behavior of LiCoO₂ cathode is investigated. The results demonstrate that the dispersion of CNTs can be improved by both cationic and anionic surfactants, but the resulted electrodes show poor wettability with electrolyte. As a result, the electrochemical performance of corresponding LiCoO₂-based cathode is worsened. Non-ionic polymer polyvinylpyrrolidone (PVP) act as an effective dispersant for promoting the dispersion of CNTs and improving the electrochemical performance of LiCoO₂ cathode. In addition, CNTs after ball-milling show damaged structure and more agglomerates, which are not suitable for forming a continuous conductive network.

Keywords: Carbon nanotubes; Conductive additives; Dispersion; Lithium ion battery

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