

**Synthesis and Electrochemical Properties of Cathode Materials
for Lithium Secondary Batteries Prepared by Ultrasonic
Spray Pyrolysis**

초음파 분무 열분해법을 이용한
리튬이차전지용 양극활물질의 합성 및 전기화학적 특성

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Layered LiMO_2 ($M = \text{Ni}, \text{Co}, \text{Mn}$) and spinel $\text{LiMn}_{2-x}\text{M}_x\text{O}_4$ materials are of great interesting for use in the application of lithium rechargeable batteries as positive electrode materials. Considerable improvements of cathode materials with good battery performance have been made by use of solution methods such as sol-gel, co-precipitation, emulsion drying, and spray pyrolysis method. Among the solution methods, the spray pyrolysis is a useful method for the synthesis of homogeneous precursors, narrow particle size distributions, short production time, good stoichiometry and ultimately uniform particle distribution in the final products.

In this work, layered and spinel oxide materials were synthesized by an ultrasonic spray pyrolysis method. We reported that the synthesis condition and electrochemical properties of various cathode materials, such as $\text{Li}[\text{Ni}_{1/2}\text{Mn}_{1/2}]\text{O}_2$, $\text{Li}[\text{Ni}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}]\text{O}_2$, $\text{Li}[\text{Ni}_{1/2}\text{Mn}_{3/2}]\text{O}_4$, and their derivative materials. Structural and electrochemical properties of the various cathode materials were characterized by means of X-ray diffraction, Rietveld refinements, and galvanostatic charge/discharge test.

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