

LiMn_xCr_{1-x}O₂ 합성과 XANES와 *In Situ* XRD를 이용한
전기화학적 특성 및 구조변화에 대한 연구
Preparation of LiMn_xCr_{1-x}O₂ and Its Electrochemical
Characterization by Means of XANES and *In Situ* XRD
Measurements

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Emulsion drying method has been successfully applied to the synthesis of LiMn_xCr_{1-x}O₂ (0 ≤ x ≤ 0.6) powders. LiMn_xCr_{1-x}O₂ powders were formed by a direct calcination of the emulsion-dried precursors. Rietveld refinement of the X-ray diffraction patterns and the gradual decrease of lattice parameters with increasing the amount of Mn substitution demonstrated a wide range of solid solutions LiMn_xCr_{1-x}O₂ (space group; R-3m, 0 ≤ x ≤ 0.6). The prepared crystallite size was less than 300 nm in diameter. The charge and discharge curves greatly depended on the Mn substitution amount. The reversibility between charge and discharge capacities as a Li-ion battery cathode was enhanced by higher level Mn substitution. The initial discharge capacity was about 175 mA h (g-oxide)⁻¹ for LiMn_{0.6}Cr_{0.4}O₂, and the material showed two charge potential stages; 3.5 - 3.9 and 3.9 - 4.3 V. The charge and discharge processes of LiMn_{0.6}Cr_{0.4}O₂ will be discussed in the presentation.