

Li[Ni_xLi_{1/3-2x/3}Mn_{2/3-x/3}]O₂ (x=1/2) based cathode active material for Lithium-secondary Batteries

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Li[Ni_xLi_{1/3-2x/3}Mn_{2/3-x/3}]O₂ (x=1/2) cathode active materials were synthesized at 600°C and treated at 900°C. To prepare the active material at low temperature, sol-gel and molten-salt synthesis methods were used. In sol-gel method, a polyvinyl alcohol(PVA) was used as a chelating agent, and the eutectic mixtures of LiOH and Li(NO₃) molten salts were used at the molten-salt synthesis method. It was also found that the nano-sized particles of about 40~50 nm was obtained by fabrication at 600 °C 24 h. It was also identified from Rietveld refinements of XRD data that the Li and Ni ions were coexisted in 3a and 3b sites, respectively. It was found that the cathode contained of 40 wt% acetylene black as electric conductor showed higher discharge capacity than contained acetylene black of 15 wt% in the cathode. The best discharge capacity of the cathodes using Li [Ni_xLi_{1/3-2x/3}Mn_{2/3-x/3}]O₂ (x=1/2) was 220 mAh/g after 70 cycles.