

### The enhanced ionic conductivity of Li-rich layered cathode material by Na ion doping

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Recently, the interest in Hybrid Electric Vehicles (HEV) and Electric Vehicles (EVs) has been increased, and lithium ion batteries have consequently been globally studied as a possible remedy by many groups. In this respect,  $x\text{Li}_2\text{MnO}_3 \cdot (1-x)\text{LiMO}_2$  ( $M = \text{Ni, Co, Mn}$ ) cathode materials have been attracted interest as promising cathode materials due to their advantages compared to conventional cathode materials. However, these cathode materials face some challenges for application to HEVs and EVs because of their poor rate capability and cycle performance resulting from low electric and ionic conductivity and structure instability. In order to compensate for these critical problems, many groups have explored possible remedies. However, adopted methods include complex and energy consuming steps.

In this work, Na-doped Li-rich cathode materials were prepared by using spray pyrolysis. The structure characteristics and surface morphology of prepared composite particle were analyzed by XRD and SEM. In addition, the electrochemical performance assemble coin cell was conducted within the potential range of 2.5–4.6 V (vs. Li/Li<sup>+</sup>) at various current densities.