Determination of Coprecipitation pH for Preparing the Nickel-Manganese-Cobalt Mixed hydroxides

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Lithium nickel-manganese-cobalt oxides ($LiNi_xMn_yCo_{1-x-y}O_2$) have been extensively studied as a promising cathode material for high-energy density lithium-ion battery systems. Lithium nickel-manganese-cobalt oxides synthesized by solid-state method often result in an inhomogeneous elemental distribution or the presence of impurity phase, leading to inferior electrochemical cycling performance. To obtain an ideal cathode material with high-capacity and high-performance, the use of a homogeneous precursor of mixed-hydroxides ($(Ni_xMn_yCo_{1-x-y})(OH)_2$) is widely adopted. Coprecipitation processes often use ammonia water producing a plenty of nitrogen compounds that are characteristic of pungent smell and environmentally unfriendly. In this presentation, we report a novel non-ammonia coprecipitation method using a chelating agent and the method for calculration and determination of optimum pH condition for the preparation of homogeneous mixed-hydroxides.