Supplementary Materials

The Effects of a Mixed Precipitant on the Morphology and Electrochemical Performance of LiNi_{0.5}Mn_{1.5}O_{4} Cathode Materials

Yang Shu, Wenchao Yan, Haisong Wang, Jicheng Jiang, Deye Sun, Xiaodi Ma, Yongcheng Jin

Thermalgravimetric Analysis

As Figure S1 shows, the weight loss of the mixture of Ni_{0.25}Mn_{0.75}CO_3 precursors and Li_2CO_3 can be divided into three periods: firstly, weight loss with 4.09% below 350 °C is related to water loss; secondly, the main weight loss with 28.71% between 350 and 500 °C attributes to the decomposition of carbonate and the formation of the spinel LNMO; lastly, slight weight loss with 3.71% over 500 °C is ascribed to the oxygen loss and lithium evaporation, which implies that there will be no violent chemical reactions occurring over 500 °C. Therefore, we preheated the samples at 550 °C and annealed them at 800 °C.

Figure S1. TG curve of heating the mixture of precursor and lithium source for mixed precipitants of (NH_4)_2CO_3 and Na_2CO_3 with a molar ratio of 1:2.
Figure S2. High-resolution SEM images of spherical precursors prepared by mixed precipitants of (NH$_4$)$_2$CO$_3$ and Na$_2$CO$_3$ with different molar ratios: (a) 0:1; (b) 1:2; (c) 1:1; (d) 2:1; (e) 1:0.

Figure S3. High-resolution SEM images of spherical precursors before (a) and after (b) hydrothermal treatment prepared by mixed precipitants of (NH$_4$)$_2$CO$_3$ and Na$_2$CO$_3$ with a molar ratio of 2:1.