Supplementary Information

**Facile synthesis and performances of nanosized Li$_2$TiO$_3$ shell encapsulated LiMn$_{1/3}$Ni$_{1/3}$Co$_{1/3}$O$_2$ microsphere**

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Figure S1. Cross-sectional SEM images of the TiO$_2$@Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ hybrid prepared with different content of concentrated ammonia: (a) 0.4 mL, (b) 0.6 mL.
Figure S2. XRD patterns of the (a) TiO$_2$@Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ hybrid prepared with 0.4 mL of concentrated ammonia and (b) pristine Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ microsphere.
Figure S3. The optical photograph of the resulted mixture prepared with 0.6 mL of concentrated ammonia for 24 h of reaction time.
Figure S4. SEM images of the TiO$_2$@Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ hybrid prepared in a typical reaction system of Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ powers (2.2 g), ethanol (50 mL), tetrabutyl titante (0.34 mL), and ammonia (0.4 mL) with different reaction duration: (a, b) 12 h, (c, d) 36 h.
Figure S5. SEM images of the TiO$_2$@Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ hybrid prepared in a typical reaction system of Ni$_{1/3}$Co$_{1/3}$Mn$_{1/3}$CO$_3$ powers (2.2 g), ethanol (50 mL), ammonia (0.4 mL), and reaction duration (24 h) with different volume of tetrabutyl titante: (a, b) 0.51 mL, (c, d) 1.13 mL.
Figure S6. (a) Cycling performance and (b, c) corresponding continuous discharge curves of the Li/NCM cell and Li/LTO@NCM cell in the voltage range of 3.0-4.3 V at a rate of 10 C.