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Supplementary Information

Facile synthesis and performances of nanosized Li_2TiO_3 shell encapsulated $LiMn_{1/3}Ni_{1/3}Co_{1/3}O_2$ microsphere

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Keywords: Lithium ion batteries, Layered lithium cathode materials, Hierarchical structure, Rate capability, Cyclic stability

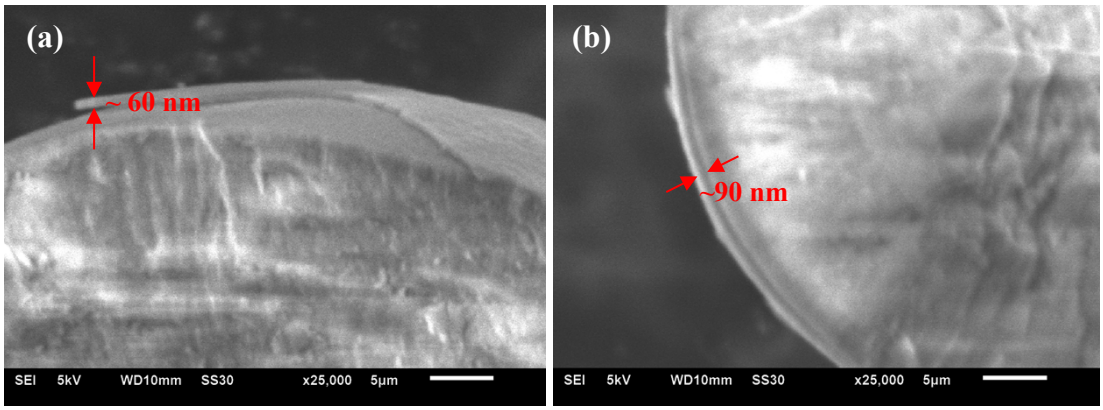

Figure S1. Cross-sectional SEM images of the TiO_2@$Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ hybrid prepared with different content of concentrated ammonia: (a) 0.4 mL, (b) 0.6 mL.

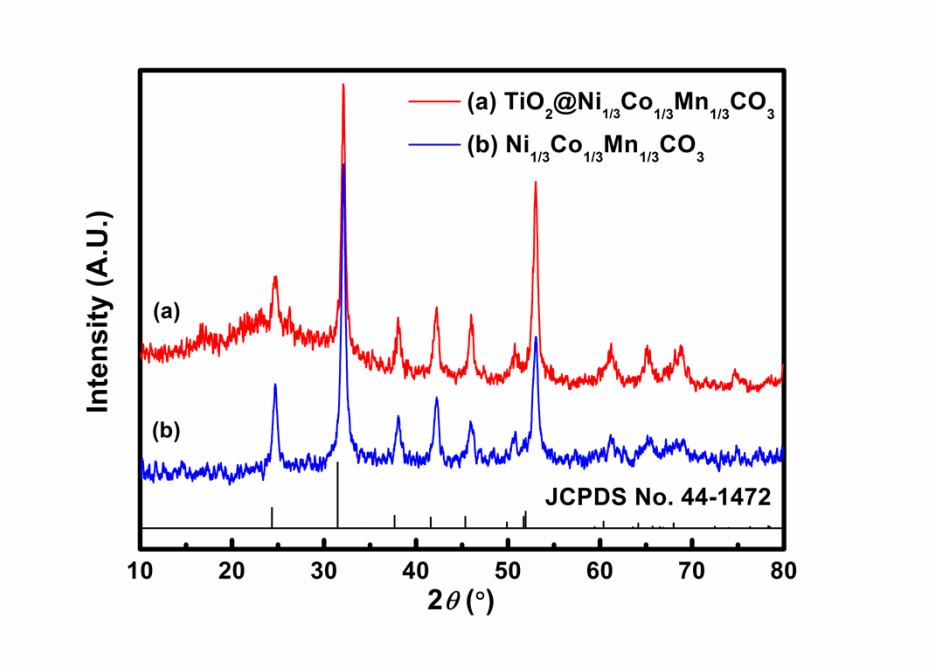

Figure S2. XRD patterns of the (a) $TiO_2@Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ hybrid prepared with 0.4 mL of concentrated ammonia and (b) pristine $Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ microsphere.

Figure S3. The optical photograph of the resulted mixture prepared with 0.6 mL of concentrated ammonia for 24 h of reaction time.

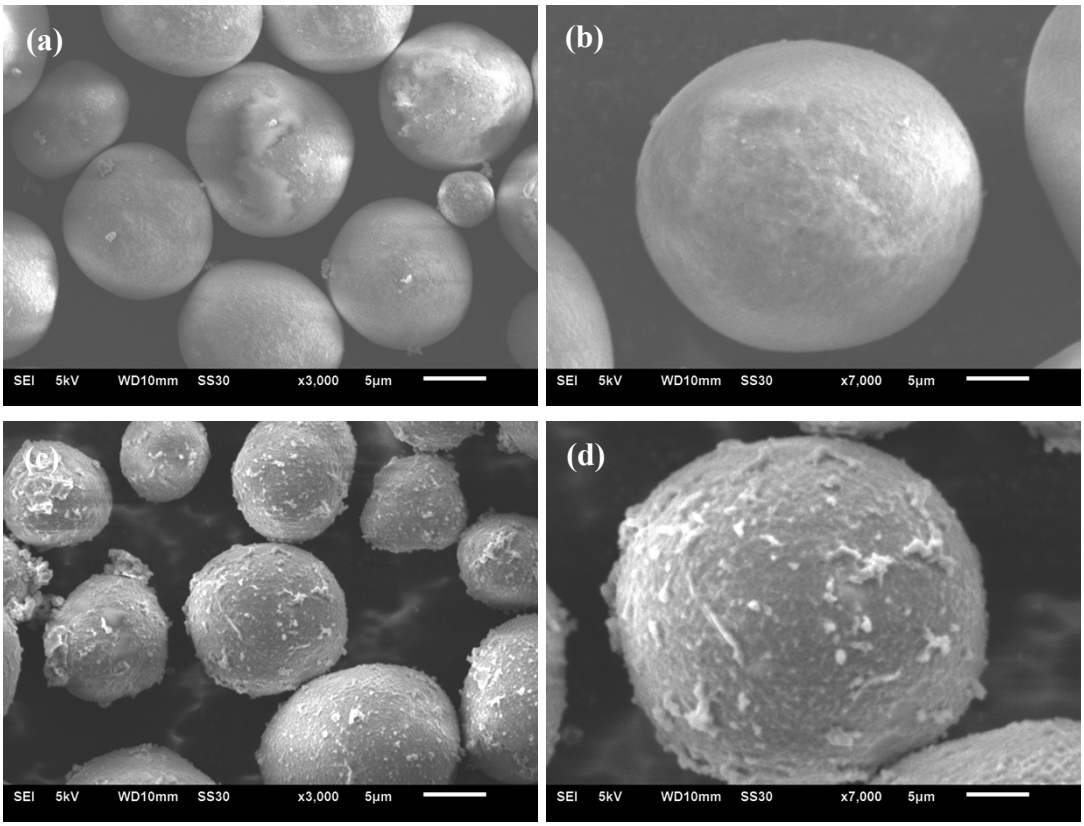

Figure S4. SEM images of the TiO_2@$Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ hybrid prepared in a typical reaction system of $Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ powers (2.2 g), ethanol (50 mL), tetrabutyl titante (0.34 mL), and ammonia (0.4 mL) with different reaction duration: (a, b) 12 h, (c, d) 36 h.

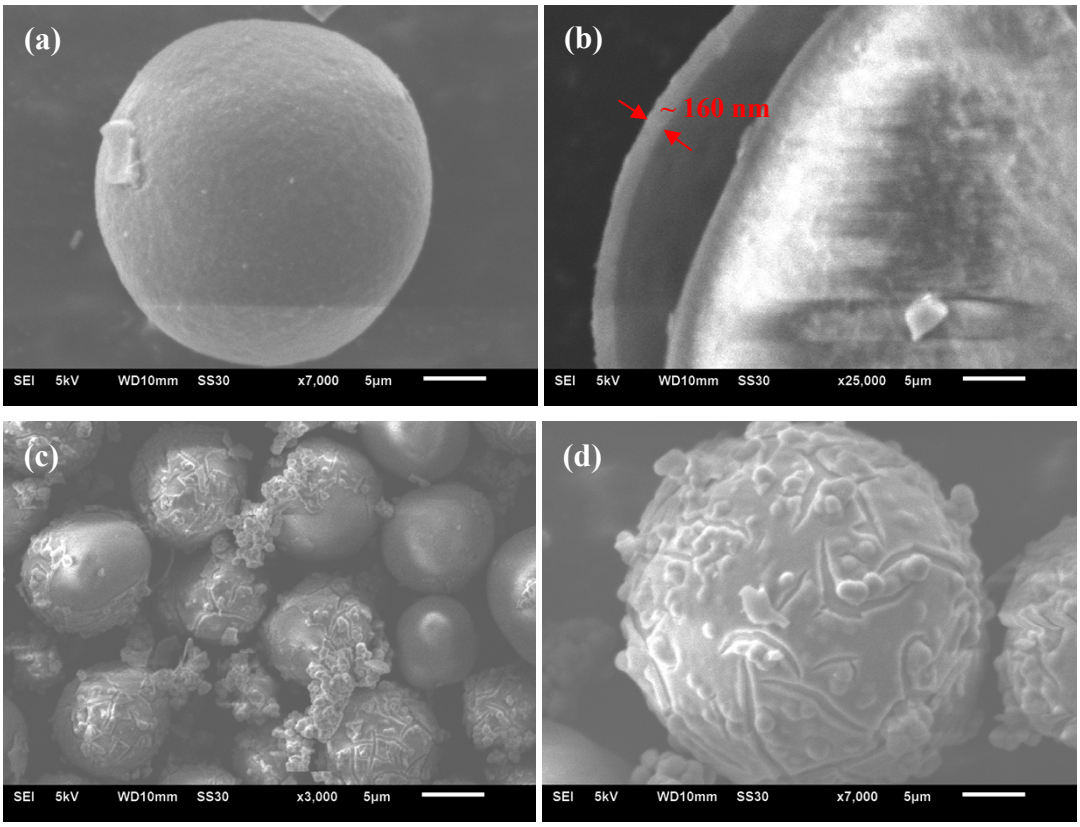

Figure S5. SEM images of the TiO_2@$Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ hybrid prepared in a typical reaction system of $Ni_{1/3}Co_{1/3}Mn_{1/3}CO_3$ powers (2.2 g), ethanol (50 mL), ammonia (0.4 mL), and reaction duration (24 h) with different volume of tetrabutyl titante: (a, b) 0.51 mL, (c, d) 1.13 mL.

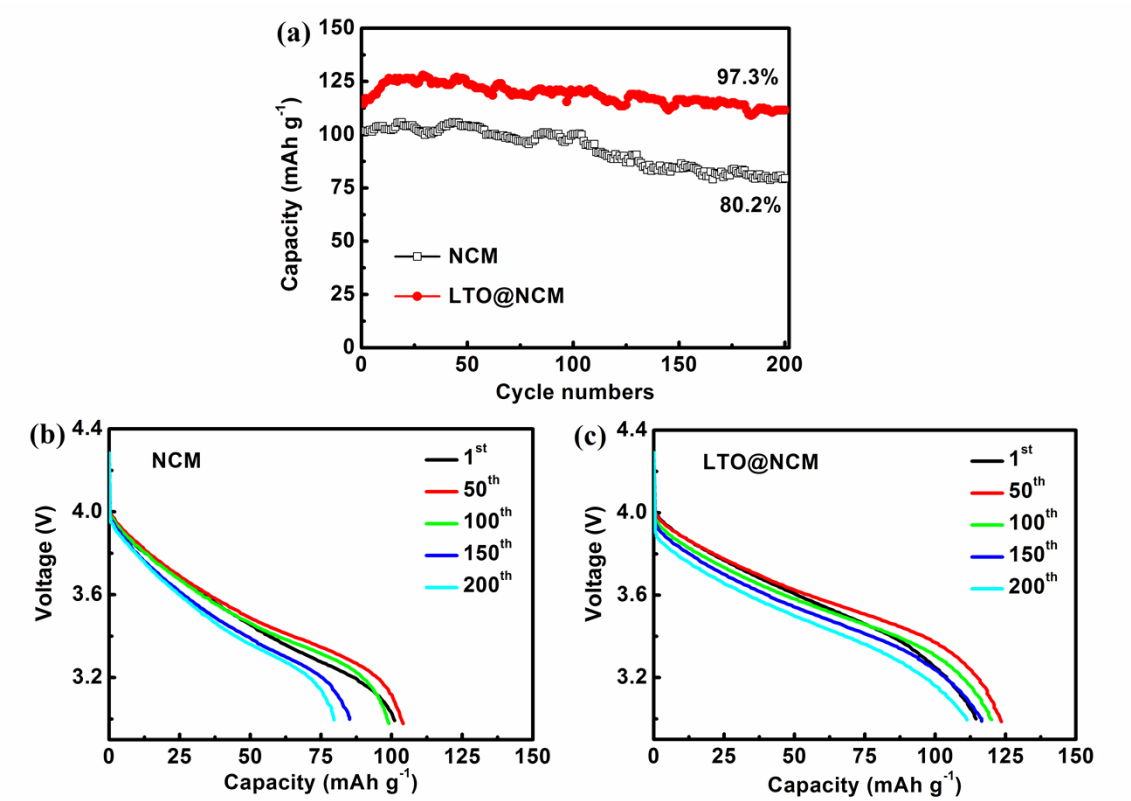

Figure S6. (a) Cycling performance and (b, c) corresponding continuous discharge curves of the Li/NCM cell and Li/LTO@NCM cell in the voltage range of 3.0-4.3 V at a rate of 10 C.