

Supplementary Information

Highly stable SnO₂-Fe₂O₃-C hollow spheres for reversible lithium storage with extremely long cycle life

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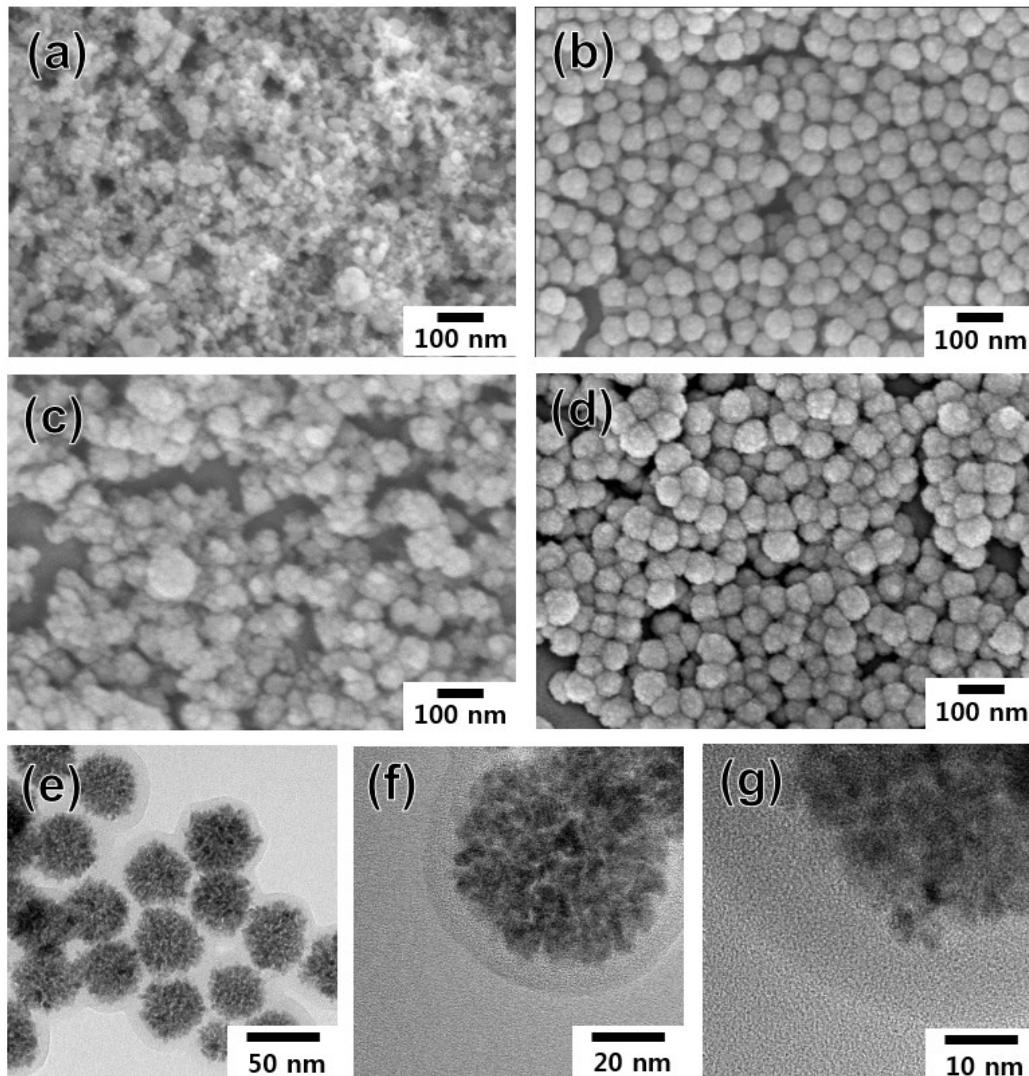


Fig. S1 SEM images of (a) SnO₂ commercial nano-powder, (b) SnO₂ solid spheres, (c) Fe₂O₃ solid spheres, (d) SnO₂-Fe₂O₃-C solid spheres and TEM images of (e)-(g) SnO₂-Fe₂O₃-C solid spheres.

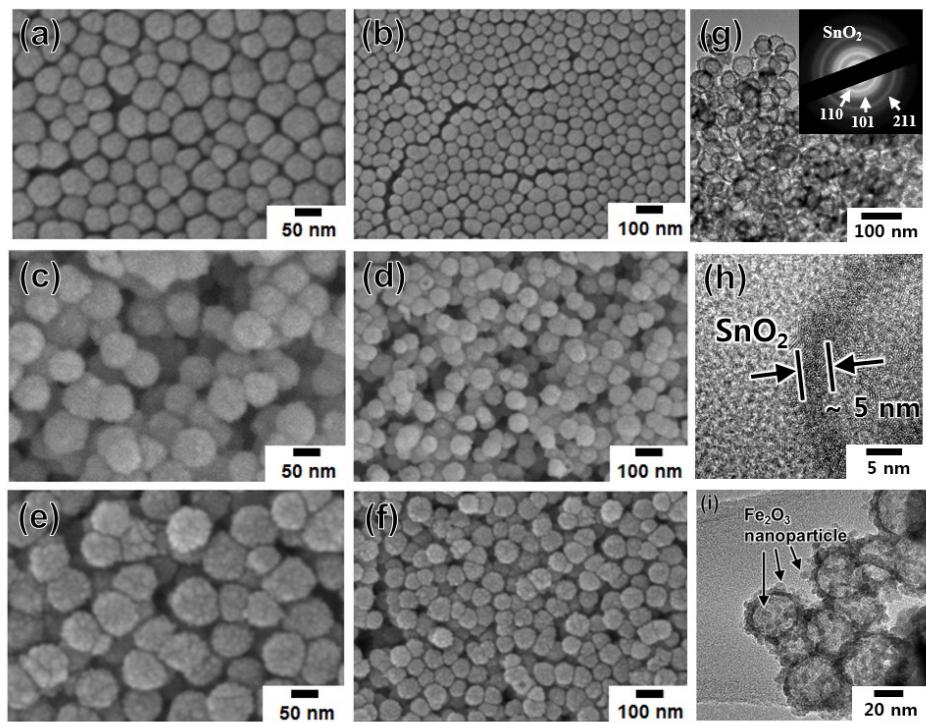


Fig. S2 SEM images: (a),(b) SiO_2 spheres; (c),(d) SnO_2 hollow spheres; (e),(f) $\text{SnO}_2\text{-Fe}_2\text{O}_3$ hollow spheres. TEM images of (g),(h) SnO_2 hollow spheres; (i) $\text{SnO}_2\text{-Fe}_2\text{O}_3$ hollow spheres.

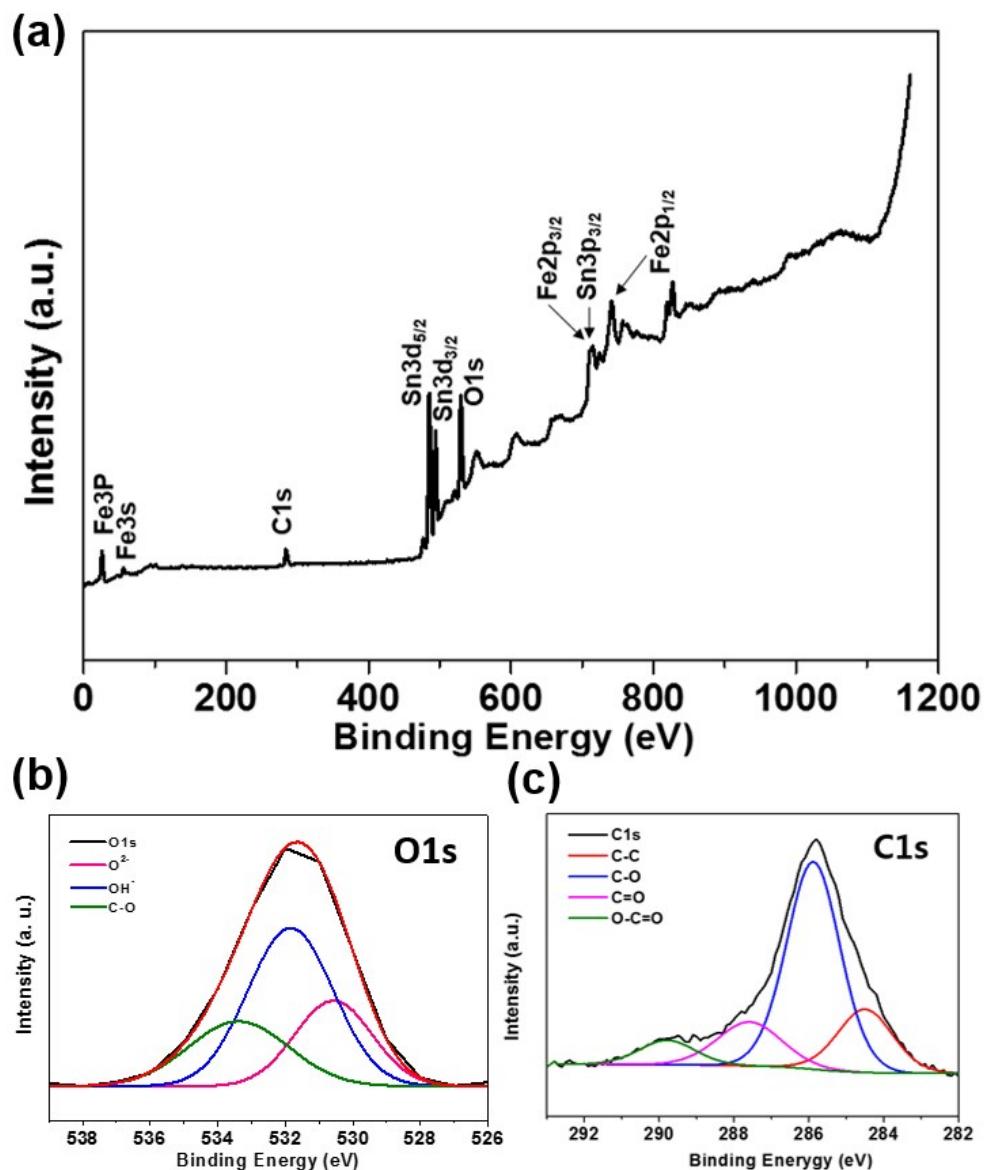


Fig. S3 Full survey scan and O1s and C1s XPS spectra of $\text{SnO}_2\text{-Fe}_2\text{O}_3\text{-C}$ hollow spheres.

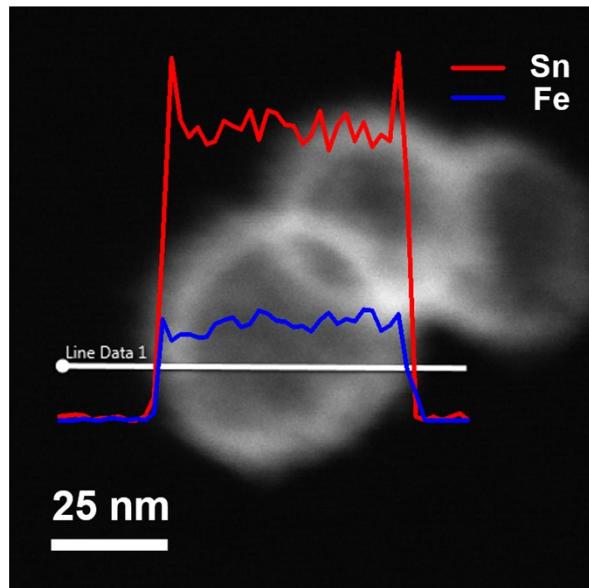


Fig. S4 STEM images and EDS line profile of $\text{SnO}_2\text{-Fe}_2\text{O}_3\text{-C}$ hollow spheres.

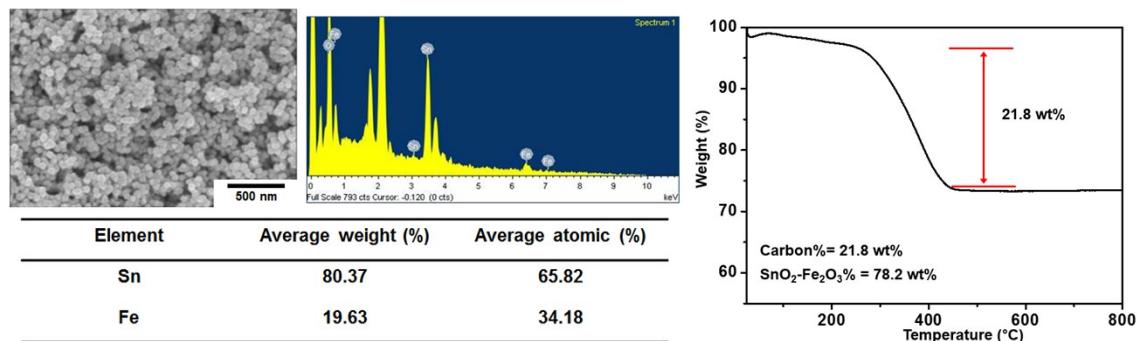


Fig. S5 EDS analysis and TGA for the $\text{SnO}_2\text{-Fe}_2\text{O}_3\text{-C}$ hollow spheres.

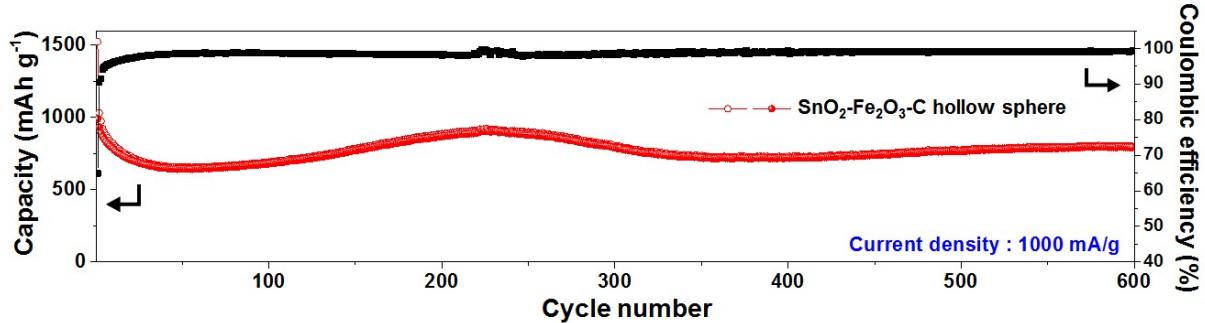


Fig. S6 Cycling stability test of $\text{SnO}_2\text{-Fe}_2\text{O}_3\text{-C}$ hollow spheres at $1,000 \text{ mA g}^{-1}$.

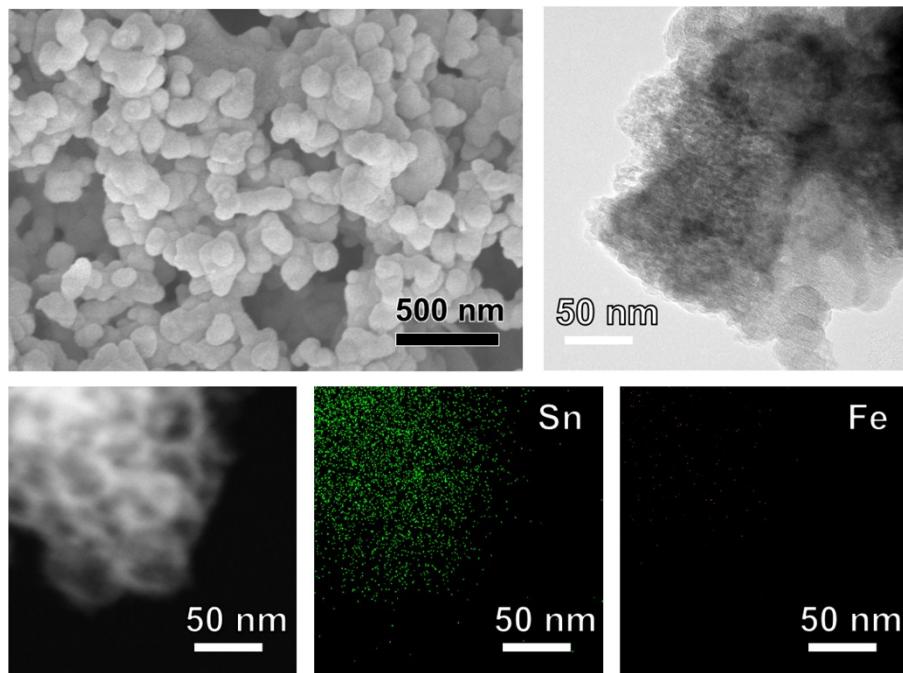


Fig. S7 (a) SEM image, (b) TEM image, (c) STEM image, and EDS mapping of (d) Sn and (e) Fe of $\text{SnO}_2\text{-Fe}_2\text{O}_3$ hollow sphere electrode after 100 cycles.

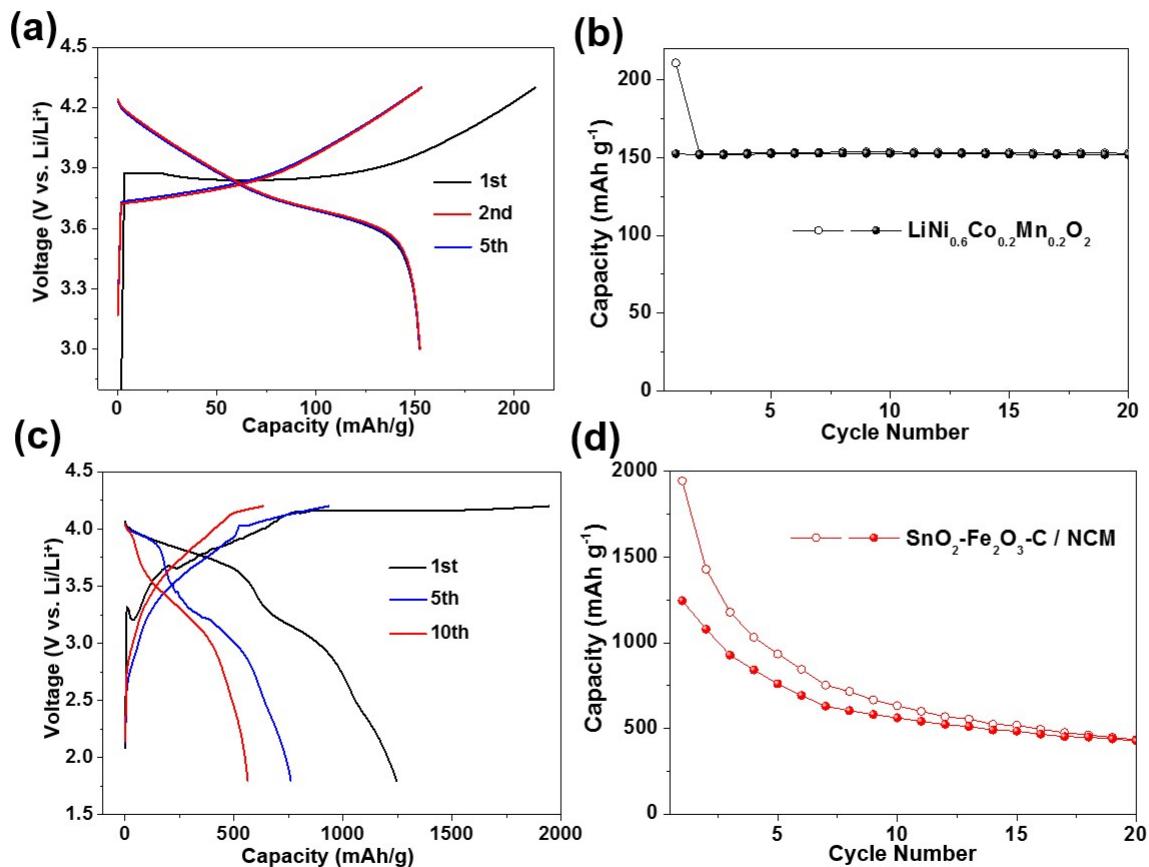


Fig. S8 (a) Voltage profiles and (b) cycle performance of $\text{LiNi}_{0.6}\text{Mn}_{0.2}\text{Co}_{0.2}\text{O}_2$ (NCM) cathode half-cell between 3.0 and 4.3 V at the current density of 150 mA g^{-1} , (c) voltage profiles and (d) cycle performance of $\text{SnO}_2\text{-Fe}_2\text{O}_3\text{-C}$ hollow sphere/NCM full cell between 1.8 and 4.2 V at the current density of 100 mA g^{-1} based on the weight of $\text{SnO}_2\text{-Fe}_2\text{O}_3\text{-C}$ anode.