Supporting Information

Hierarchical LiMn$_2$O$_4$ Hollow Cubes with Exposed {111} Planes as High-Power Cathodes for Lithium-Ion Batteries

Yu Wu, Chuanbao Cao,* Junting Zhang, Lin Wang, Xilan Ma and Xingyan Xu

Research Center of Materials Science, Beijing Key Laboratory of Construction Tailorable Advanced Functional Materials and Green Applications, Beijing Institute of Technology, Beijing 100081, China

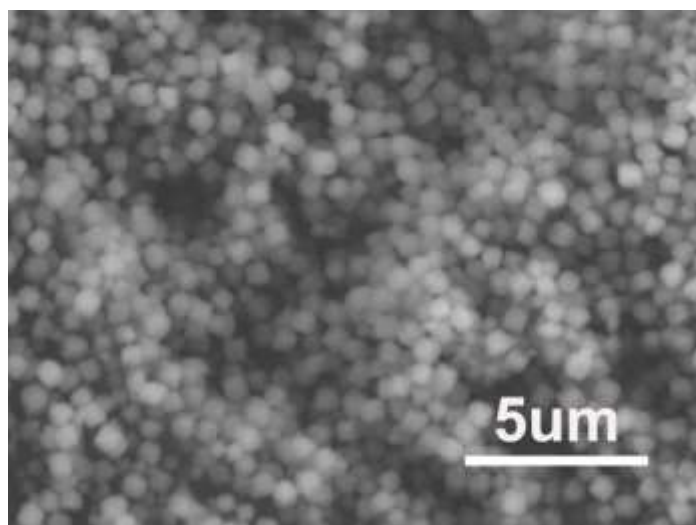Corresponding author: Chuanbao Cao

E-mail: cbcao@bit.edu.cn
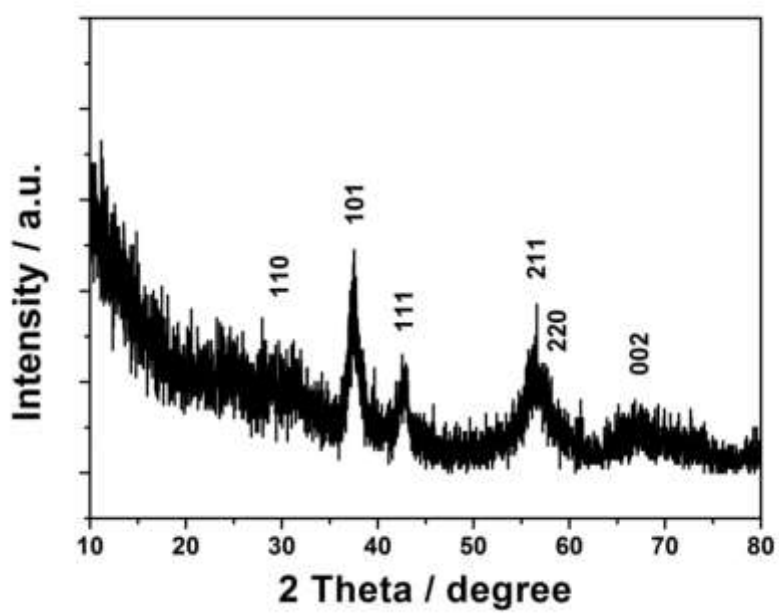
Figure S1. SEM image of MnCO$_3$ cubes.

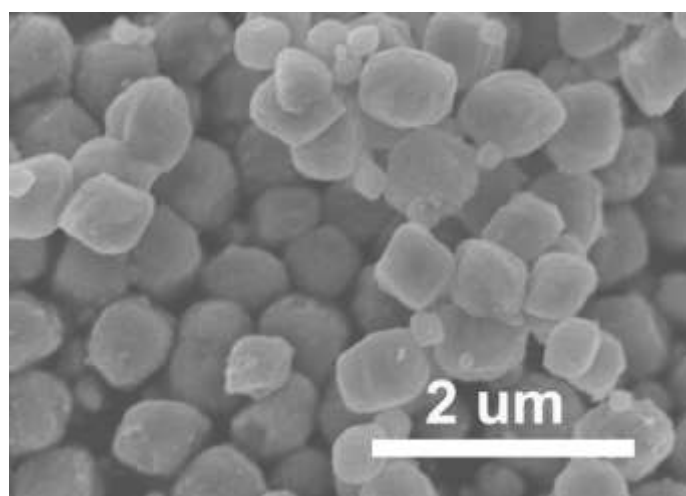Figure S2. XRD pattern of MnO$_2$ cubes (JCPDS Card No.: 24-0735).
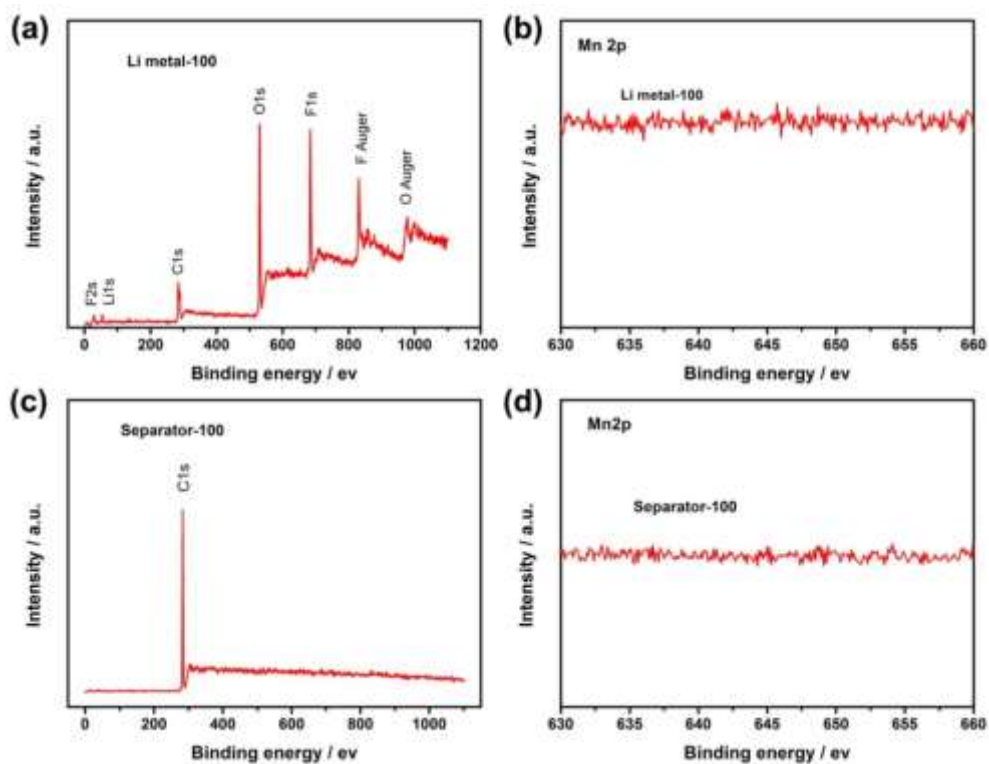
Figure S3. SEM image of MnO$_2$ cubes.

Figure S4. (a) and (c) XPS spectra of the lithium metal and separator collected after 100 cycles. (b) and (d) The Mn XPS spectra of the lithium metal and separator collected after 100 cycles.
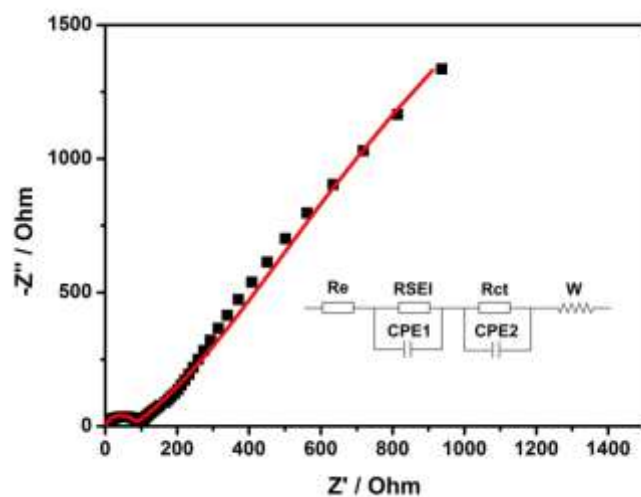
Figure S5. Nyquist plot for the as-prepared LiMn$_2$O$_4$. The symbols are the experimental data, whereas the continuous lines are the fitted data.

Table S1. Electrochemical performances for several advanced LiMn$_2$O$_4$ cathode materials

Structure	Temperature (^{o}C)	Capacity retention	Reference
Hierarchical hollow cubes	25	98.4% (5C, 100 cycles)	This work
	60	90.7% (5C,100 cycles)	
Porous nanorods	25	90% (1C, 100 cycles)	5
Nanotubes	25	80% (5C, 100 cycles)	6
Epitaxial coating with a hierarchical atomic structure	60	82% (1C, 100 cycles)	9
Grown with epitaxial layered nanostructure	60	85% (1C, 100 cycles)	11
Epitaxial coating with lithium titanate	25	97.0% (1C, 100 cycles)	14
	60	90.6% (1C, 100 cycles)	
Porous microspheres	25	90.4% (1C, 100 cycles)	32
Hollow microspheres	25	96.6% (1C, 105 cycles)	33
Yolk-structured microspheres	25	96% (2C, 100 cycles)	34
Truncated octahedral	25	97.1% (1C, 60 cycles)	35