

Supporting Information

High Power Lithium-ion Battery based on LiMn_2O_4 -nanorods

Cathode and Carbon-coated $\text{Li}_4\text{Ti}_5\text{O}_{12}$ -nanowires Anode

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Experimental Section

Preparation of Micro-sized LMO ($Li_{1.1}Mn_2O_4$): LMO sample was also synthesized by solid-state method. Stoichiometric amount of Li_2CO_3 and MnO_2 were mixed together and reacted at 530 °C for 5 h, followed by heating at 850 °C for 24 h in air and then the sample was cooled over a six-hour period. The contents of Li and Mn in the as-prepared LMO product was analyzed by inductively coupled plasma (ICP) technology. The result shows that the molar ratios of Li and Mn is about 1.07: 2. The slight loss of Li could be attributable to the Li-salt evaporation over heat treatment process. XRD pattern and SEM image of as-prepared LMO is given in Fig. S1 and Fig. S2, respectively.

Preparation of Micro-sized $Li_4Ti_5O_{12}$: In typical synthesis, LTO sample was prepared by reacting stoichiometric amounts of Li_2CO_3 and TiO_2 (Anatase) at 800 °C for 10 hours with air atmosphere. XRD pattern and SEM image of as-prepared LTO is given in Fig. S3 and Fig. S4, respectively.

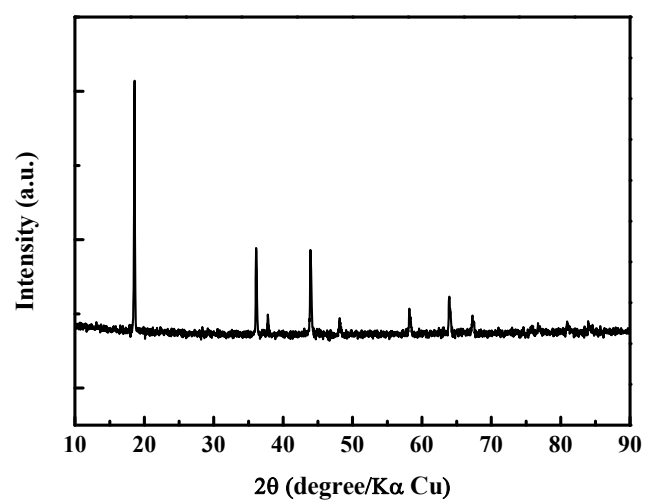


Fig. S1 XRD pattern of as-prepared LMO sample.

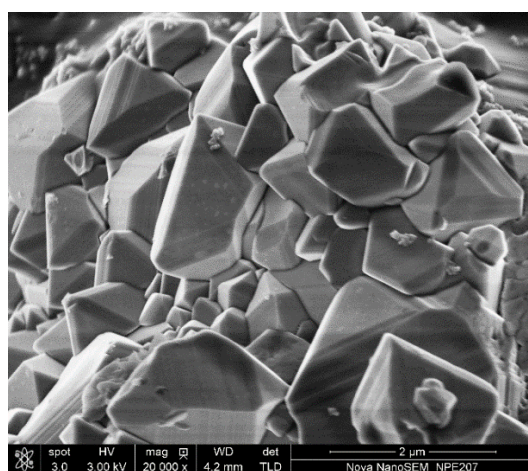


Fig. S2 SEM image of as-prepared LMO sample.

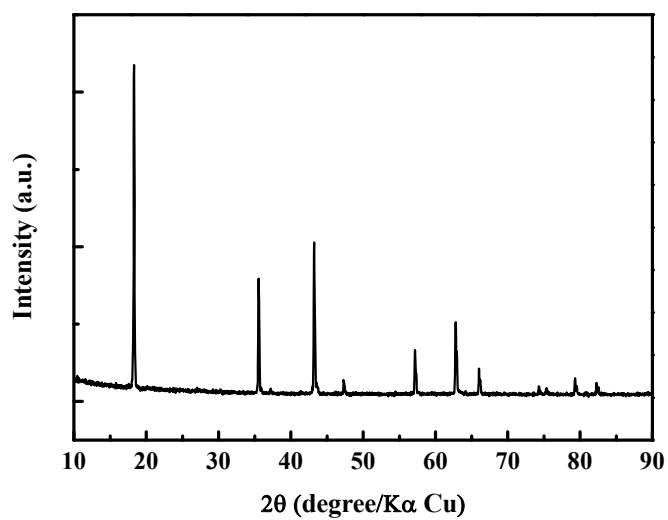


Fig. S3 XRD pattern of as-prepared LTO sample.



Fig. S4 SEM image of as-prepared LMO sample.

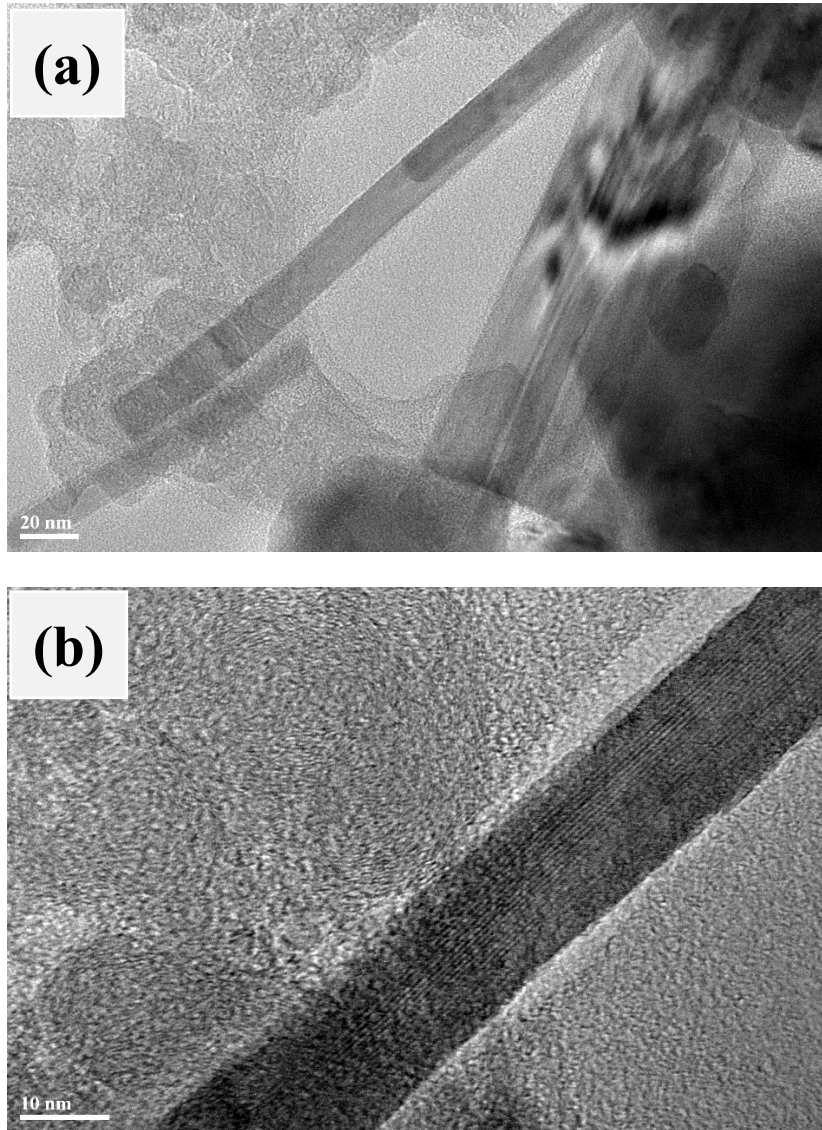


Fig. S5 TEM image of LMO-nanorods after cycling test.

[In this experiment, the cycled LMO-nanorods electrode was washed with dimethyl carbonate (DMC) in glove-box full with Ar atmosphere. Then, the film electrode (LMO + carbon additive + binder) was removed from the current collector (i.e. Cu foil), which was dispersed in DMC for TEM test.]

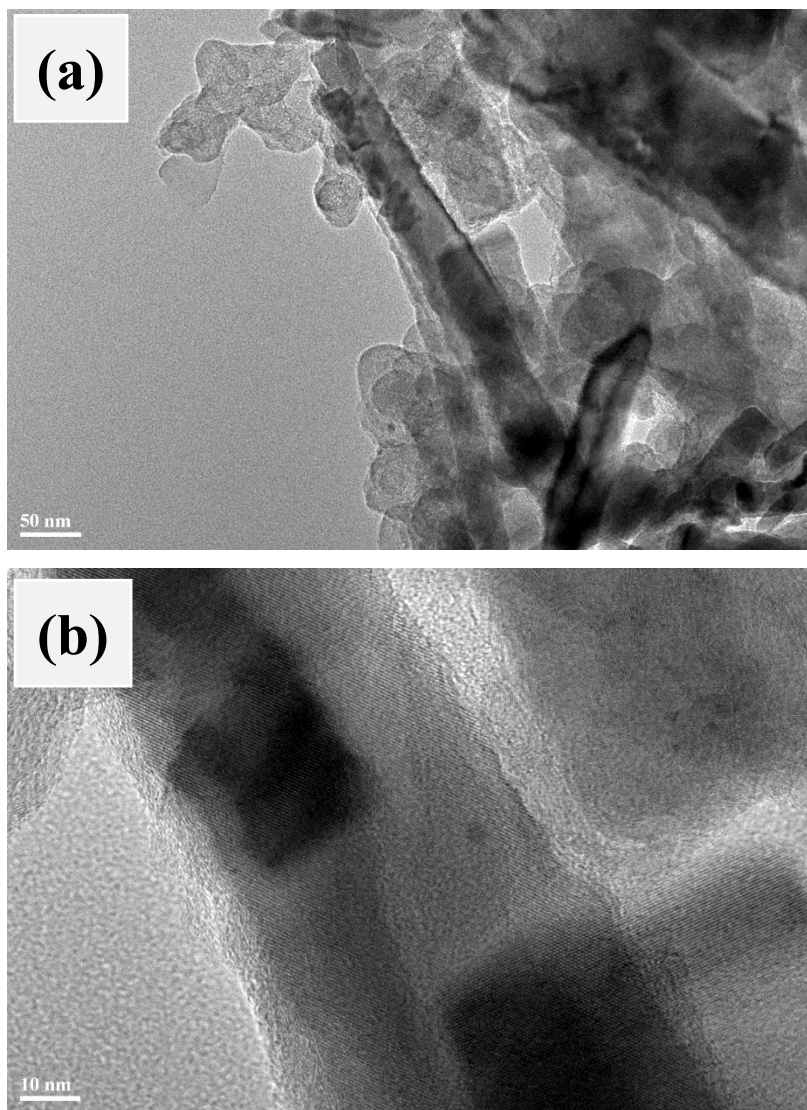


Fig. S6 TEM image of carbon coated LTO-nanowires after cycling test.

[In this experiment, the cycled LTO-nanowires electrode was washed with dimethyl carbonate (DMC) in glove-box full with Ar atmosphere. Then, the film electrode (LTO + carbon additive + binder) was removed from the current collector (i.e. Cu foil), which was dispersed in DMC for TEM test.]