Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Facile synthesis of $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtubes and their application as anode materials for lithium-ion batteries

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Figure S1 showed the XRD pattern of the $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtubes obtained under pH of 8 and 240 °C for 6 h. All of the reflections could be readily indexed to pure phase of $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ with the hexagonal structure [JCPDS Card No. 50-1796]. No other impurities were detected, indicating the high purity of the product and completed reaction during the process.

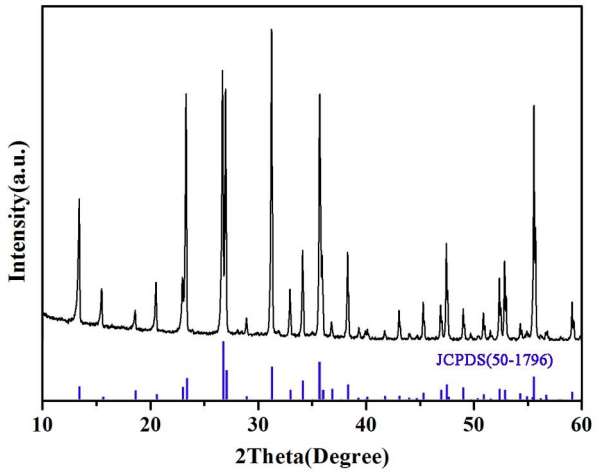

Figure S1. The XRD pattern of the sample obtained at 240 °C for 6 h.

The FESEM image in Figure S2 indicated that the sample was present in straight tubular structure. The outer diameter of the open-ended microtube was approximately 4 μm, the wall thickness of the microtubes was about 500 nm.

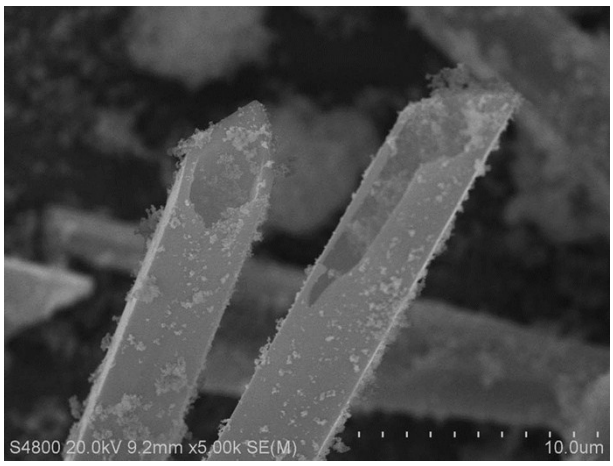

Figure S2. FESEM image of the sample obtained at 240 °C for 6 h.

Figure S3 showed the XRD pattern of the $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtubes obtained by using $MnCl_2$ as manganese salt. All of the reflections could be readily indexed to pure phase of $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ with the hexagonal structure [JCPDS Card No. 50-1796]. Figure S4 displayed the FESEM images of the as-prepared $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtube at different magnification. It indicated that the sample was present in straight tubular structure. The outer diameter of the open-ended microtube was approximately 4 μm, the wall thickness of the microtubes was about 600 nm.

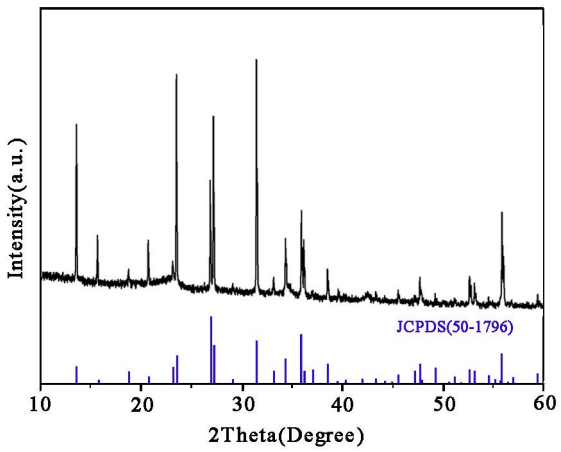

Figure S3. The XRD pattern of the sample obtained at 260 °C for 6 h.

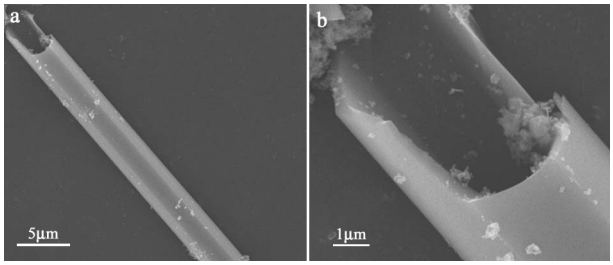

Figure S4. FESEM images of the sample obtained at 260 °C for 6 h.

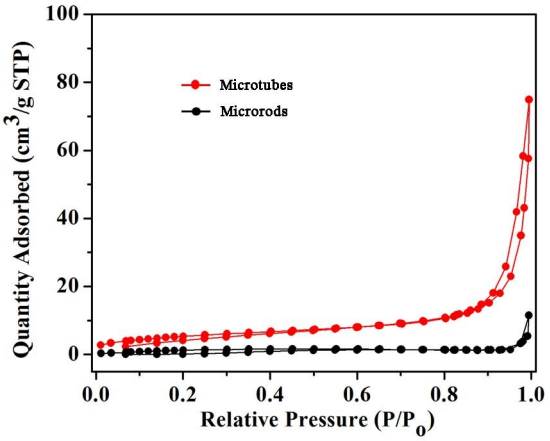

Figure S5. N_2 adsorption/desorption isotherms of the as-prepared $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtubes and microrods.

Table S1 BET data derived from the N_2 adsorption/desorption isotherms of the $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtubes and microrods.

Sample	Total pore volume ($cm^3\ g^{-1}$)	BET surface area ($m^2\ g^{-1}$)
Microtubes	0.1159	19.4
Microrods	0.0177	5.4

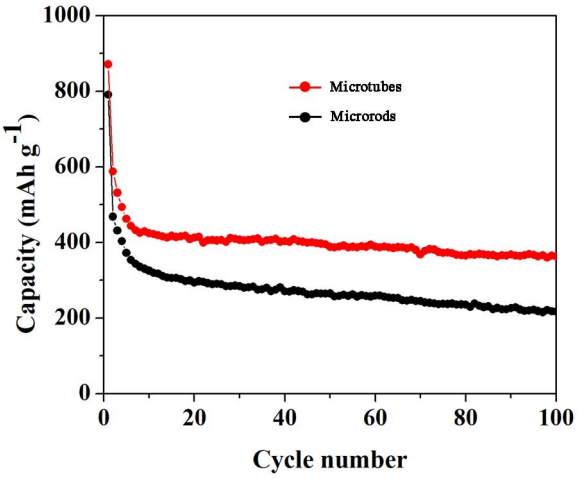

Figure S6. Cycling performance of the $Mn_{6.87}(OH)_3(VO_4)_{3.6}(V_2O_7)_{0.2}$ microtubes and microrods at a current density of 200 mA g^{-1}.