Electronic Supplementary Material (ESI) for RSC Advances.

Excellent lithium ion storage property of porous $MnCo_2O_4$ nanorods

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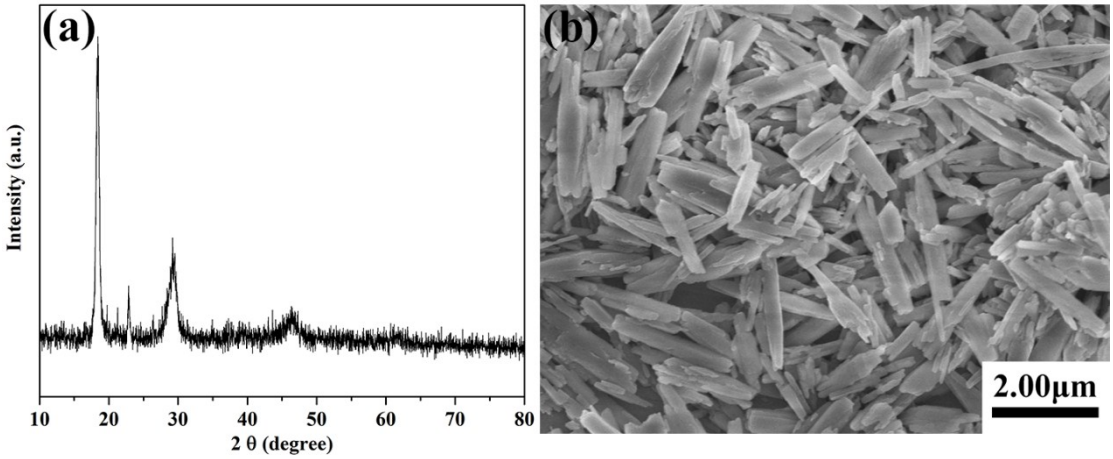

Figure S1. (a) XRD pattern of the precursor. (b) SEM image of as-prepared precursor.

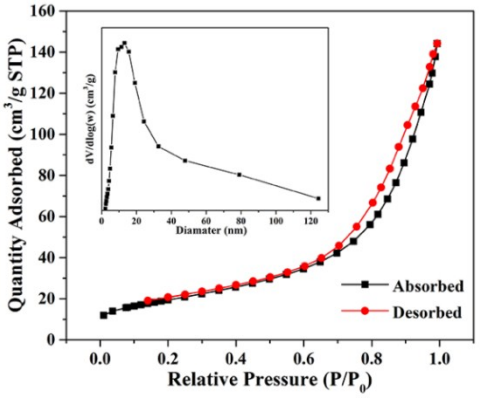

Figure S2. Nitrogen adsorption−desorption isotherm and the corresponding pore size distribution (inset) of the as-prepared $MnCo_2O_4$ nanorods.

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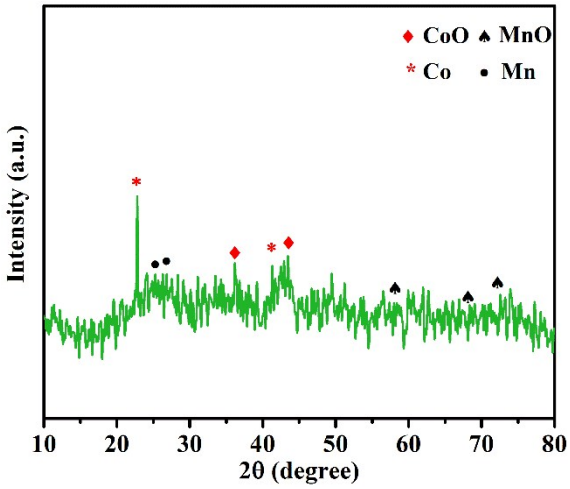

Figure S3. XRD pattern of MCO after discharge/charge.

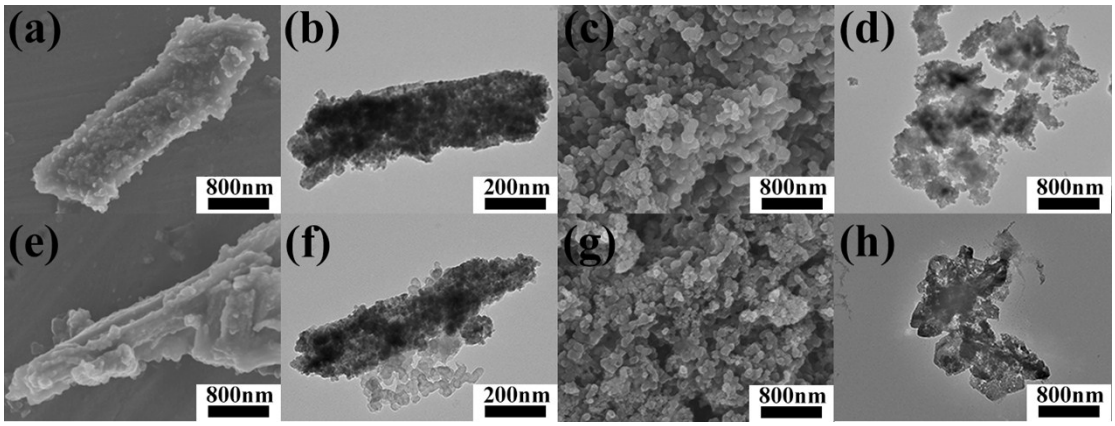

Figure S4. SEM and TEM images of MCO before and after discharge/charge with various binders. (a) and (b) are SEM and TEM images before cycle with CMC/SBR binder. (c) and (d) are SEM and TEM images after test with CMC/SBR binder. (e) and (f) are SEM and TEM images before cycle with PVDF binder. (g) and (h) are SEM and TEM images after cycles with PVDF binder.

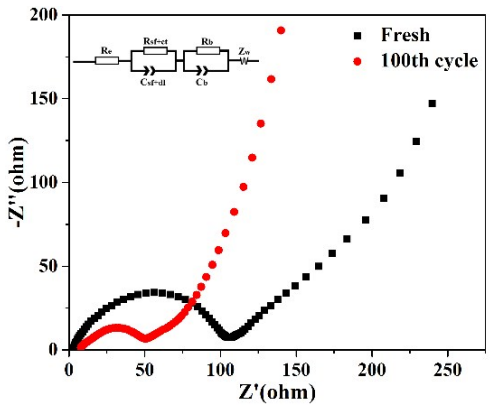

Figure S5. Nyquist plots of porous $MnCo_2O_4$ nanorods before discharging and after

100 cycles of charging/discharging at a current density of 0.4 $A \cdot g^{-1}$ in the frequency range from 100 kHz to 0.01 Hz (inset image is equivalent electric circuit).

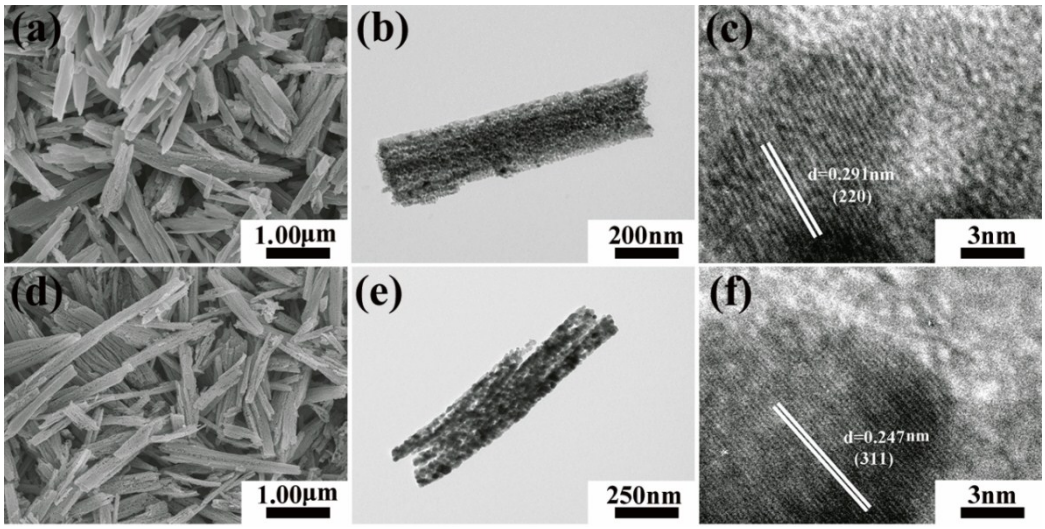

Figure S6. SEM images of MCO-1 (a) and MCO-2 (d). TEM and HRTEM images of MCO-1 (b and c) and MCO-2 (e and f).

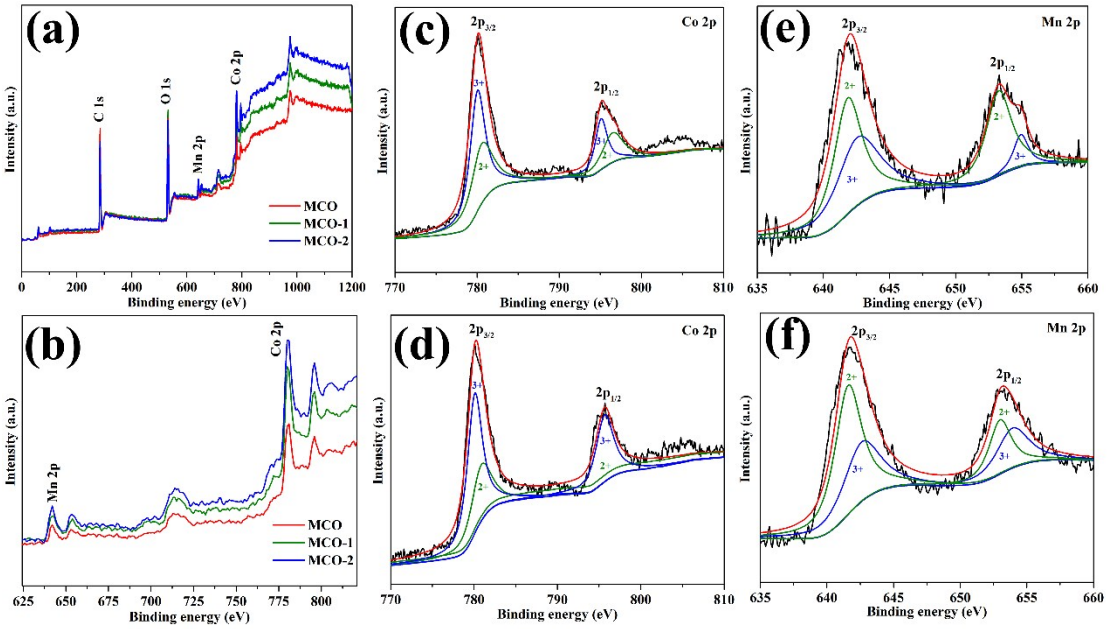

Figure S7. XPS spectra: (a) survey spectrum of three samples. (b) Magnification of survey spectrum in (a). (c) and (e) are Co 2p and Mn 2p for MCO-1. (d) and (f) are Co 2p and Mn 2p for MCO-2.

Material	Ion	Total area of the fitted peaks	The ratio of M (III)/M (II)	Average cation charge

MCO	Co (III)/Co (II)	36898/44645	0.826	2.46
	Mn (III)/Mn (II)	7953/8160	0.975	
MCO-1	Co (III)/Co (II)	49488/38934	1.270	2.50
	Mn (III)/Mn (II)	7529/12167	0.619	
MCO-2	Co (III)/Co (II)	41434/43970	0.940	2.51
	Mn (III)/Mn (II)	19451/16166	1.203	

Table S1. Calculated atom ratios from the XPS data for samples MCO, MCO-1 and MCO-2.

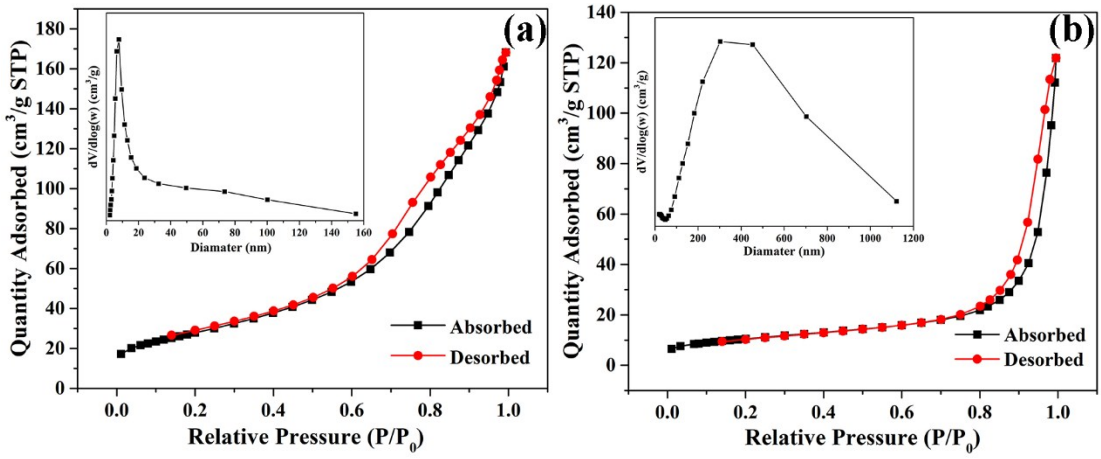

Figure S8. Nitrogen adsorption−desorption isotherm and the corresponding pore size distribution (insert) of MCO-1 (a) and MCO-2 (b).

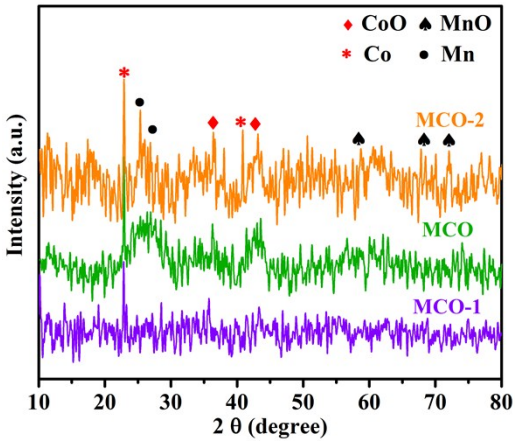

Figure S9. XRD pattern of MCO, MCO-1 and MCO-2 after discharge/charge.

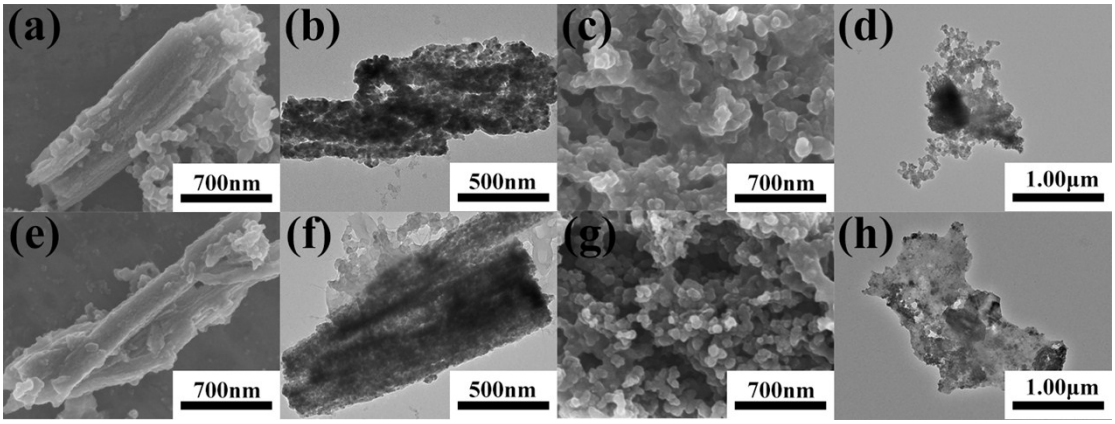

Figure S10. The SEM and TEM images of samples MCO-1 and MCO-2 before and after test. (a) and (b) are the SEM and TEM images of sample MCO-1 before the discharge/charge process. (c) and (d) are the SEM and TEM images of MCO-1 after the discharge/charge process. (e) and (f) are the SEM and TEM images of sample MCO-2 before the discharge/charge process (g) and (h) are the SEM and TEM images of sample MCO-2 after the discharge/charge process.