Supporting Information

Hierarchical porous $MnCo_2O_4$ yolk-shell microspheres from MOFs as secondary nanomaterials for high power lithium ion batteries

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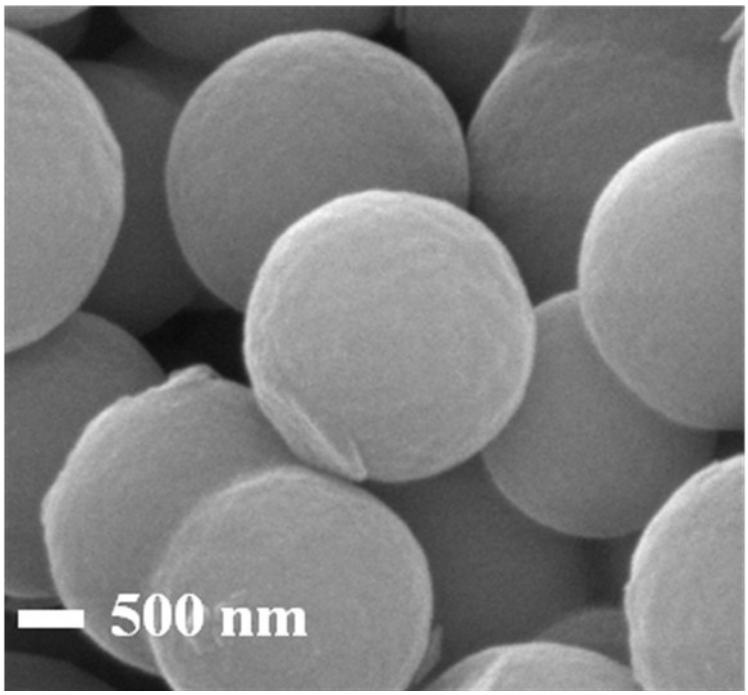

Fig. S1 SEM images of MnCo-MOF precursor.

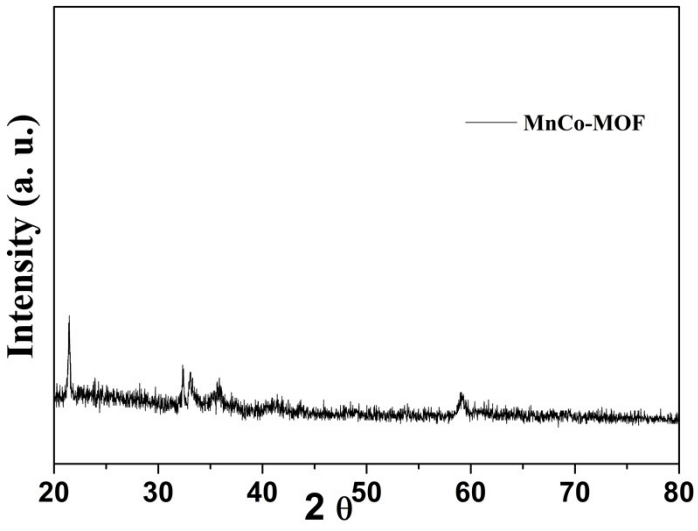

Fig. S2 XRD patterns of MnCo-MOF precursor.

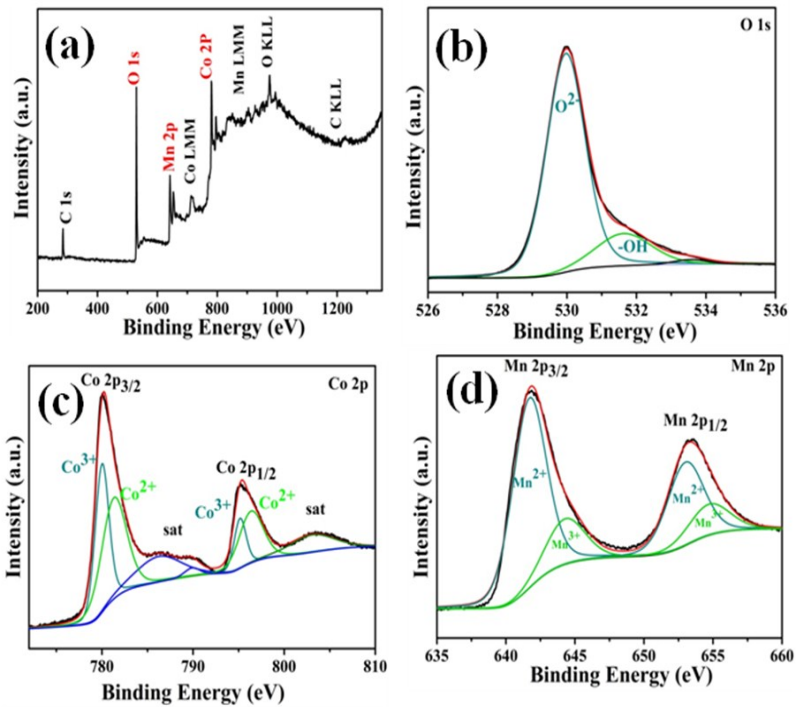

Fig. S3. (a) XPS survey scan of $MnCo_2O_4$ microspheres. (b) XPS of O1s. (c) XPS of the Co2p. (d) XPS of Mn2p.

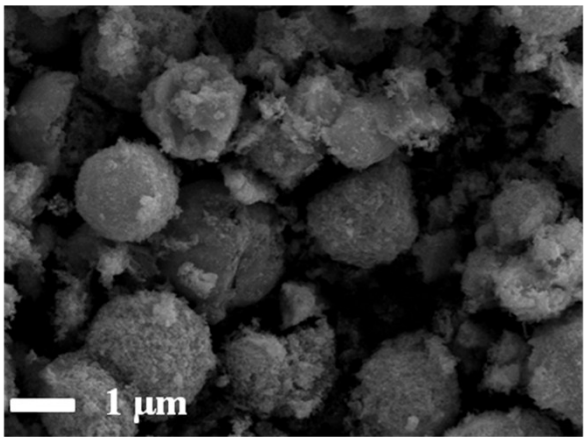

Fig. S4 SEM images of porous $MnCo_2O_4$ yolk-shell microspheres at low magnification.

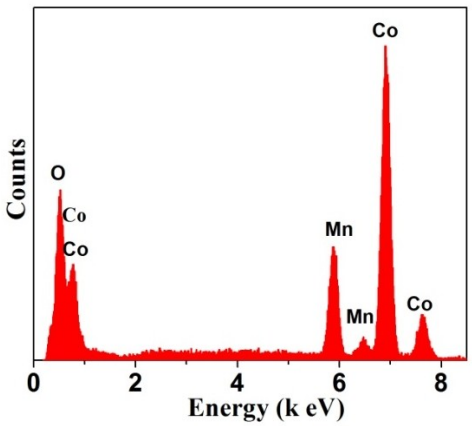

Figure S5. EDS spectrum of the hierarchical porous $MnCo_2O_4$ yolk-shell microspheres.

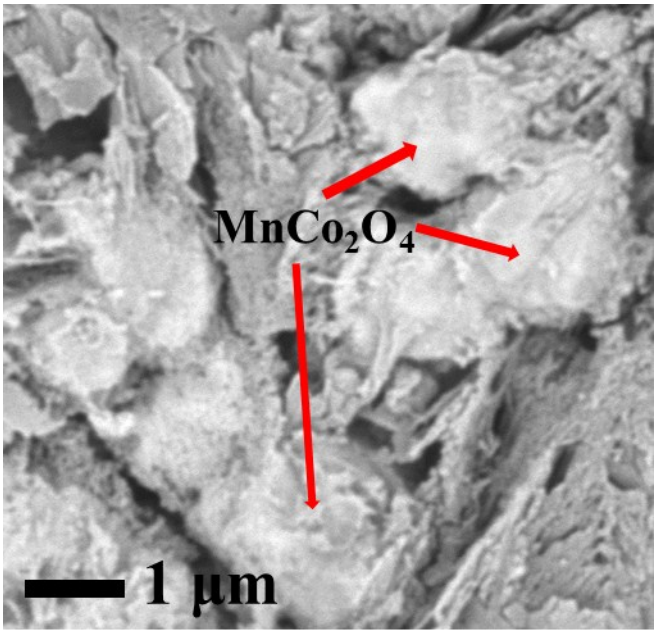

Figure S6. SEM images of the hierarchical porous $MnCo_2O_4$ yolk-shell microspheres after 70^{th} cycle at 0.1 C.

Table S1. Comparison of the cycling performance of $MnCo_2O_4$ between our work and previous reports.

Materials	Capacity (mAhg^{-1})	Current density (mA g^{-1})	Cycle number	Refs
$MnCo_2O_4$ yolk-shell microspheres	998.4	100	50	This work
	910.1	100	70	This work
	691.3	1000	500	This work
$MnCo_2O_4$ nanowires	800	200	50	14
$MnCo_2O_4$ hollow nanofibers	997	100	50	15
$CoMn_2O_4$ hollow microcubes	624	200	50	18
$MnCo_2O_4$ power 1-2 um	863	60	45	20
$MnCo_2O_4$ microspheres	722	200	25	21
$MnCo_2O_4$ submicrospheres	670	400	100	23
$MnCo_2O_4$/graphene	584.3	2000	250	24
Porous $MnCo_2O_4$	690.1	500	100	25
$MnCo_2O_4$ nanoparticles	431.1	500	100	25
Porous $MnCo_2O_4$	226.2	1000	100	25
$MnCo_2O_4$ microellipses	616.7	400	50	26
hierarchical $MnCo_2O_4$ nanosheets	460	800	30	28
$MnCo_2O_4$ quasi-hollow microspheres	610	400	100	29
	755	200	25	29
$MnCo_2O_{4.5}$	413	300	100	45
$MnCo_2O_4$ microspheres	894	100	65	47
$CoMn_2O_4$ powders	515	69	50	47

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