Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Facile template-free synthesis of 3D porous MnO/C microspheres with controllable pore size for high-performance lithium-ion battery anodes

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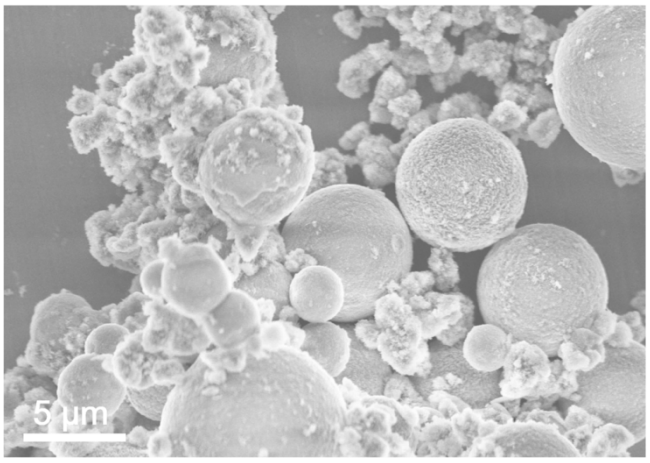

Fig. S1 SEM image of $Mn_{2/3}Zn_{1/3}CO_3$ prepared without the aid of ultrasonic.

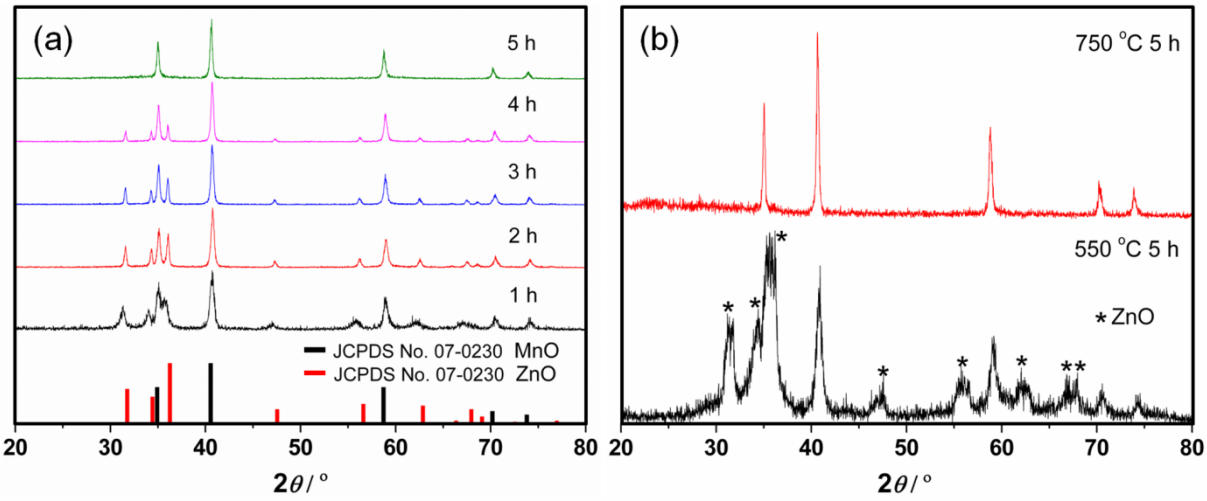

Fig. S2 XRD patterns of the calcined products of $Mn_{2/3}Zn_{1/3}CO_3$ obtained at (a) 650 °C for different annealing time, and (b) 550 °C and 750 °C for 5 h.

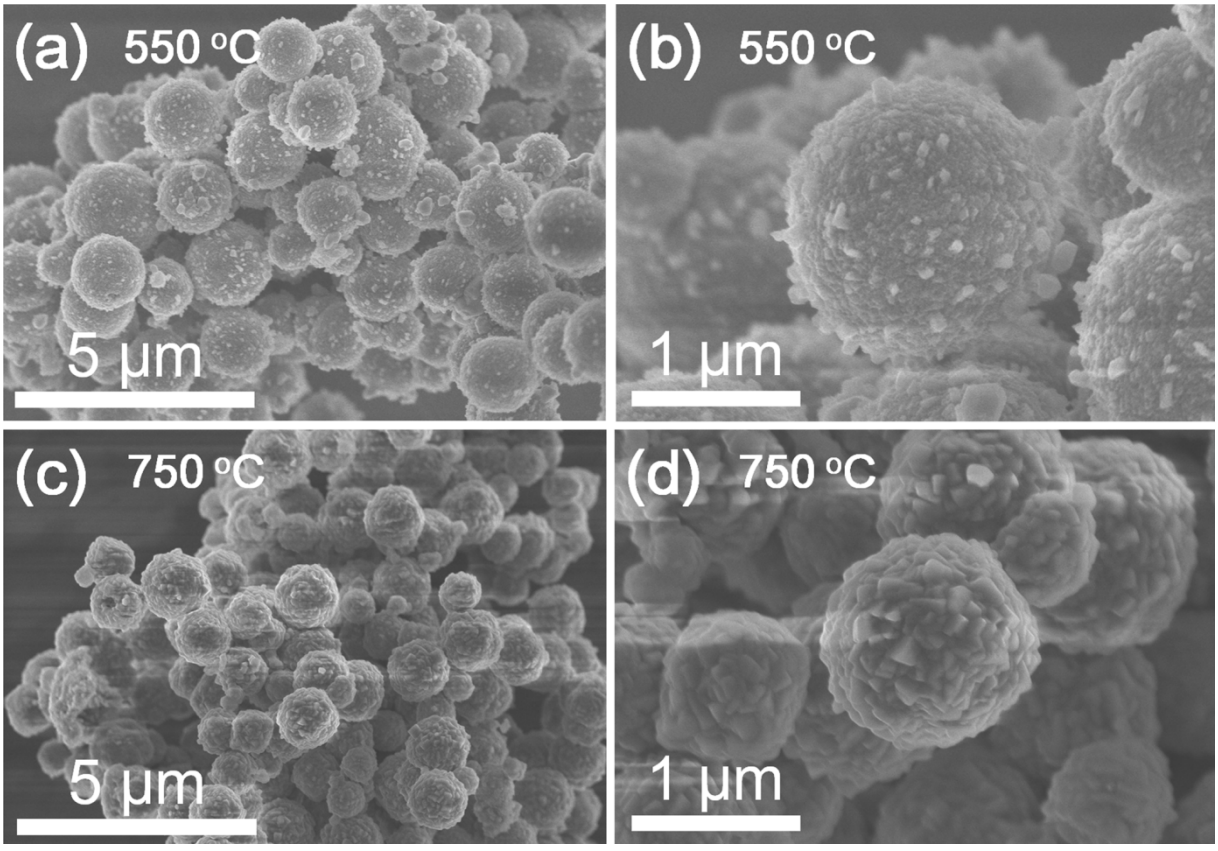

Fig. S3 SEM images of the calcined products of $Mn_{2/3}Zn_{1/3}CO_3$ obtained at 550 °C and 750 °C for 5 h.

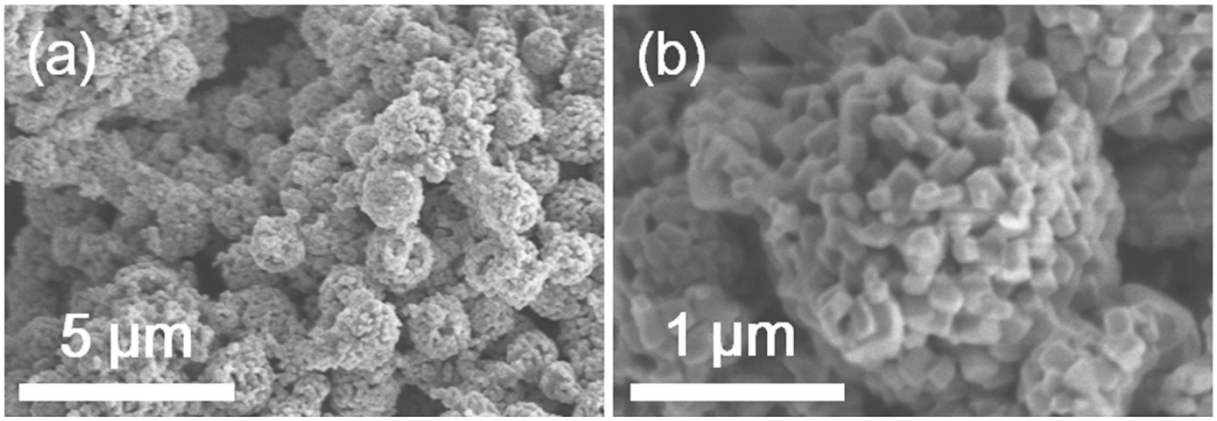

Fig. S4 SEM images of bare MnO prepared from $Mn_{1/2}Zn_{1/2}CO_3$ in the absence of glucose.

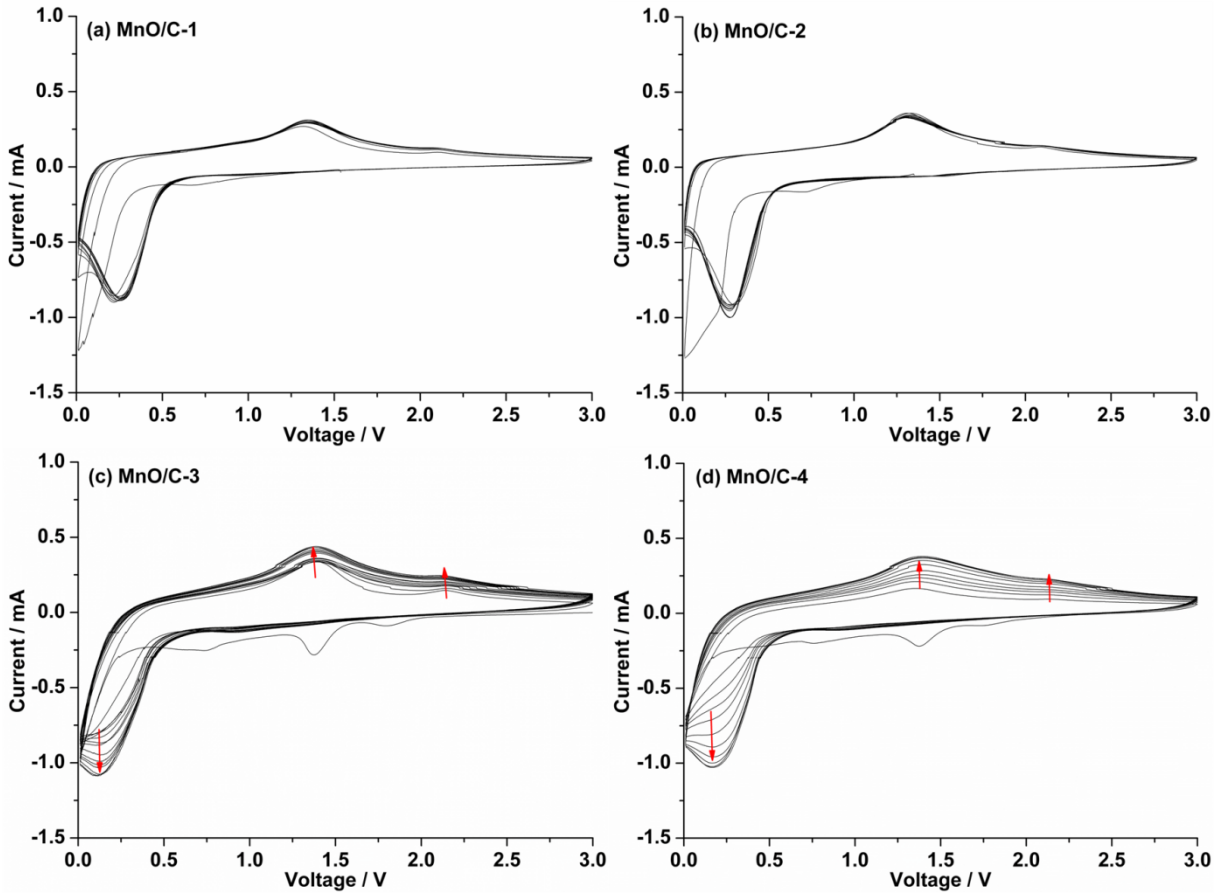

Fig. S5 Cyclic voltammograms of four MnO/C materials obtained at a scan rate of 0.5 mV s^{-1} between 0.01 and 3 V.

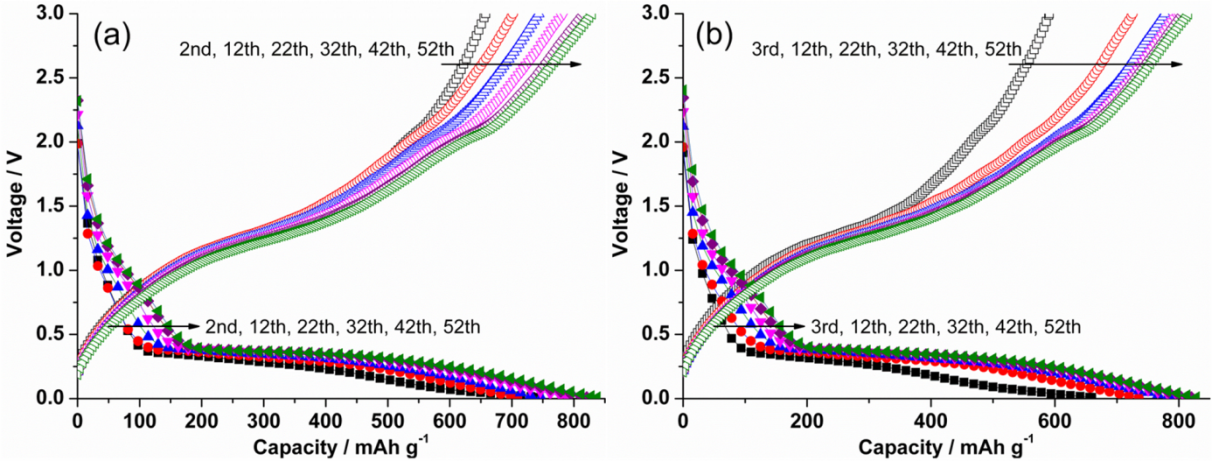

Fig. S6 The discharge-charge curves of MnO/C-3 (a) and MnO/C-4 (b) at the charge and discharge current densities of 200 and 800 mA g^{-1}, respectively.

Table S1 BET surface areas and pore sizes of the reported porous MnO materials.

Sample	Specific surface area (m^2 g^{-1})	Pore size (nm)	Ref.
MnO/graphite nanosheet	58.1	–	1
MnO	52.5	20/60	2
MnO@C core-shell nanowire	6.86	13.2	3
MnO@1-D carbon composite	64	24.57	4
MnO/graphene	50.3	2.6	5
Mesoporous MnO/C network	82.7	2.8/7.6	6
Porous C–MnO disk	75.3	~13	7
Porous MnO/C nanotube	40	7.7	8
Hollow porous MnO/C microsphere	76.9	10.9/86.8	9

Table S2 Electrochemical performances of the reported MnO anode materials.

Sample	Reversible capacity (mAh g^{-1}) (Current density (mA g^{-1}))	Ref.
MnO/graphite nanosheet	750(100), 230(600)	1
MnO	776.5(100), 350(1600)	2
MnO@C core-shell nanowire	816(100), 462(2000)	3
MnO@1-D carbon composite	850(200), 350(3000)	4
MnO/graphene	921.7(200), 625.8(3000)	5
Mesoporous MnO/C network	1224(200), 731(1500)	6
Porous C–MnO disk	1044.2(100), 534.6(1000)	7

Porous MnO/C nanotube	744.1(200), 302.5(3200)	8
Hollow porous MnO/C microsphere	741.8(100), 234.7(3000)	9
MnO nanorod	627(0.1 mA cm^{-2})	10
C/MnO	585(100), 210(1600)	11
MnO/C core-shell nanorod	790(200)	12
Coaxial MnO/C nanotube	500(188.9)	13
MnO/C	440(150), 235(755)	14
MnO/graphene nanosheet	650(151), 410(3778)	15
N-MnO/graphene nanosheet	700(100), 260(2000)	16
MnO@C core-shell nanoplate	770(200)	17
MnO/graphene nanosheet	670(100), 402(1000)	18
MnO/reduced graphene oxide sheet	542.5(200), 325.6(800)	19
MnO/carbon nanotubes	605.0(100), 424.9(1000)	20
Multi-walled carbon nanotubes/MnO/C	670(100), 390(2580)	21
MnO/multi-walled carbon nanotubes	532.3(180.12)	22
MnO/C	200(25)	23
MnO/C	688.5(100)	24
MnO/N-doped carbon webs	900(200), 600(2500)	25
Porous MnO/C microsphere	730(100), 410(1600)	26
Porous MnO nanoflake	568.7(246), 376.4(2460)	27
Porous MnO@C microsphere	560(200), 308(800)	28
MnO@C core–shell composites	839(200), 644(3000)	29
Porous MnO microsphere	769(151), 577.2(1510)	30
3D MnO/carbon nanosheets	890(200), 685(2000)	31
Carbon nanofiber@MnO	750(200)	32

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