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Controllable synthesis of spinel nano-$ZnMn_2O_4$ via a single source precursor route and its high capacity retention as anode material for lithium ion batteries

Yuanfu Deng[1,2], *Shidi Tang*[1], *Qiumei Zhang*[2,4], *Zhicong Shi*[2,4], *Leiting Zhang*[2,3], *Guohua Chen*[2,3]

Shuzhong Zhan[1]

[1] Department of Chemistry, School of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou, 510640, China

[2]Center for Green Products and Processing Technologies, Guangzhou HKUST Fok Ying Tung Research Institute, Guangzhou 511458, China

[3] *Department of Chemical and Biomolecular Engineering*, The Hong Kong University of Science and Technology, Hong Kong, China

[4] State Key Laboratory of Fine Chemicals, School of Chemical Engineering, Dalian University of Technology, Dalian 116023, China

E-mail: chyfdeng@scut.edu.cn; kechengh@ust.hk

Figure S1. EDS of the Zn-Mn citrate precursor (SSPs-1).

Figure S2. X-ray powder diffraction pattern of the product obtained from calcinations of Zn-Mn citrate precursor (the metal ions:citric acid = 3:1) at 700 ^{o}C for 2 h.

Figure S3. X-ray powder diffraction pattern of the product obtained from calcinations of Zn-Mn citrate precursor (the metal ions:citric acid = 1:1) at 700 ^{o}C for 2 h.

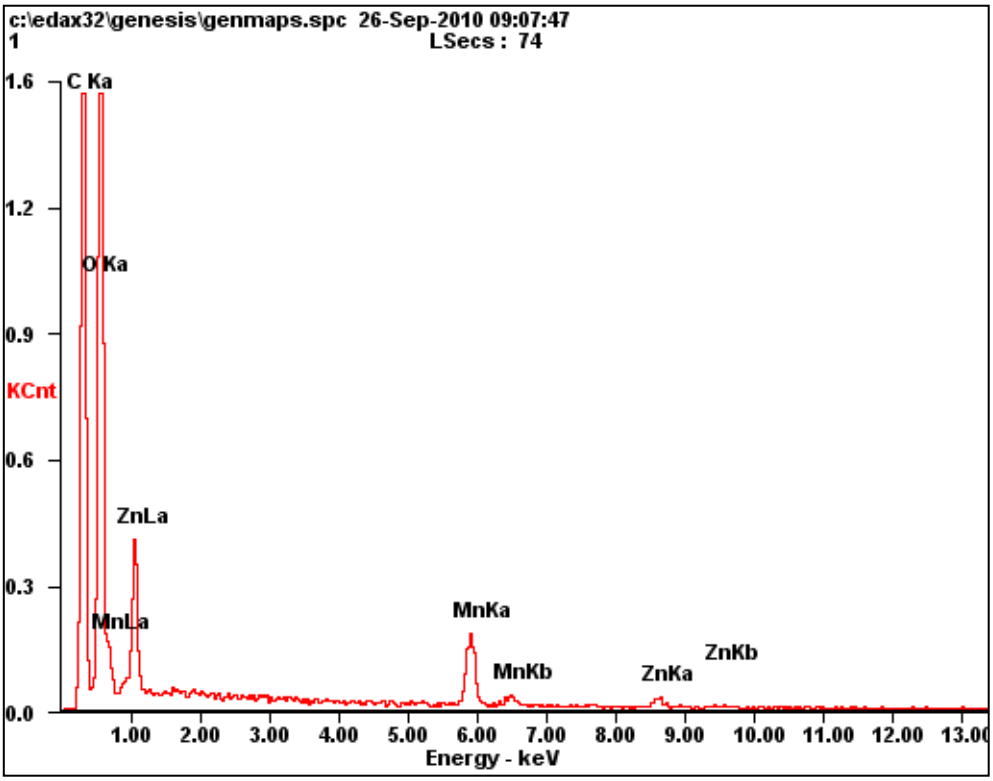
Figure S4. SEM of the Zn-Mn citrate complex precursor .

Figure S5. N_2 adsorption/desorption istherm of $ZnMn_2O_4$-700°C and the corresponding pore size distribution.

Figure S6. The discharge and charge curves of the $ZnMn_2O_4$-600°C/Li cell at a current density of 100 mA g^{-1}. The cycle numbers are indicated in the graph.

Figure S7. The discharge and charge curves of the $ZnMn_2O_4$-800°C/Li cell at a current density of 100 mA g^{-1}. The cycle numbers are indicated in the graph.

Figure S1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1
LSecs : 74
1.6
1.2
0.9
KCnt
0.6
0.3
0.0
C Ka
O Ka
ZnLa
MnLa
MnKa
MnKb
ZnKa
ZnKb
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
Energy - keV

Figure S2

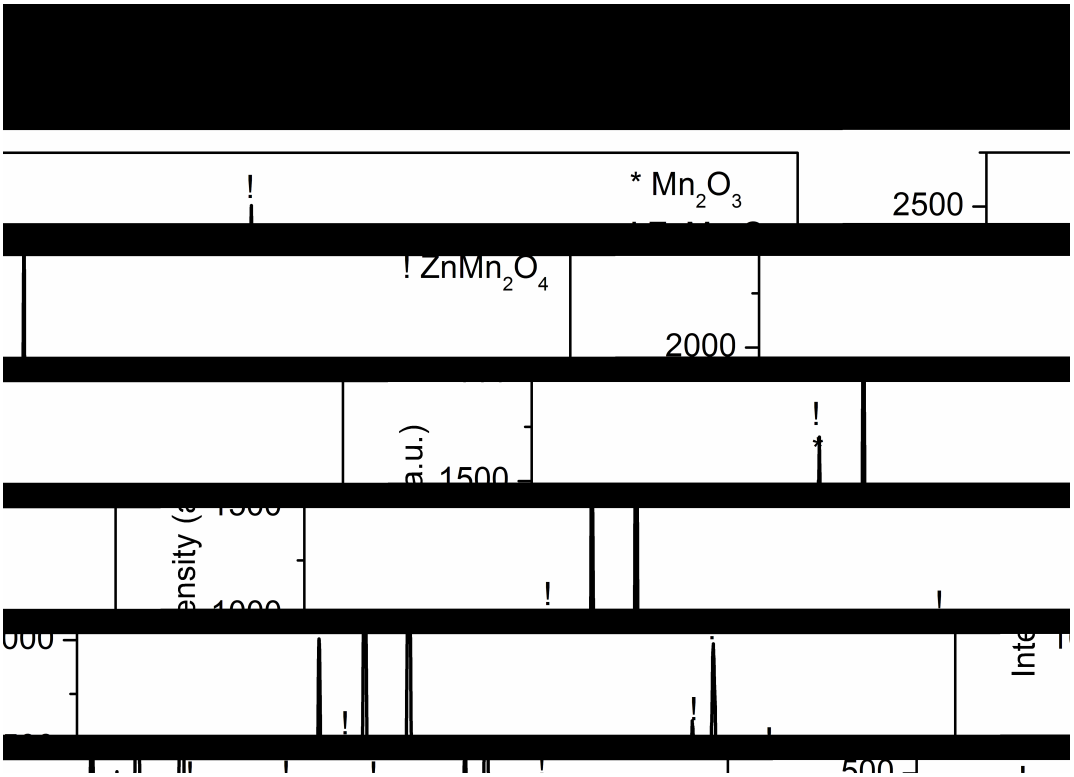


Figure S3

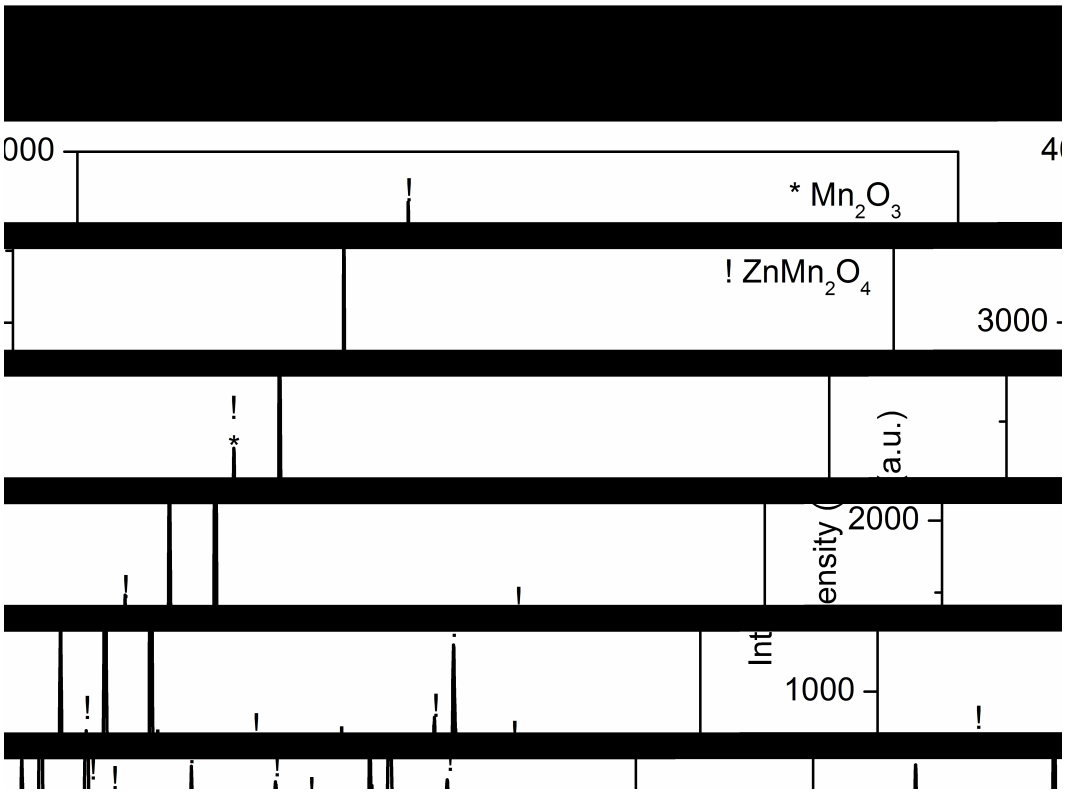


Figure S4

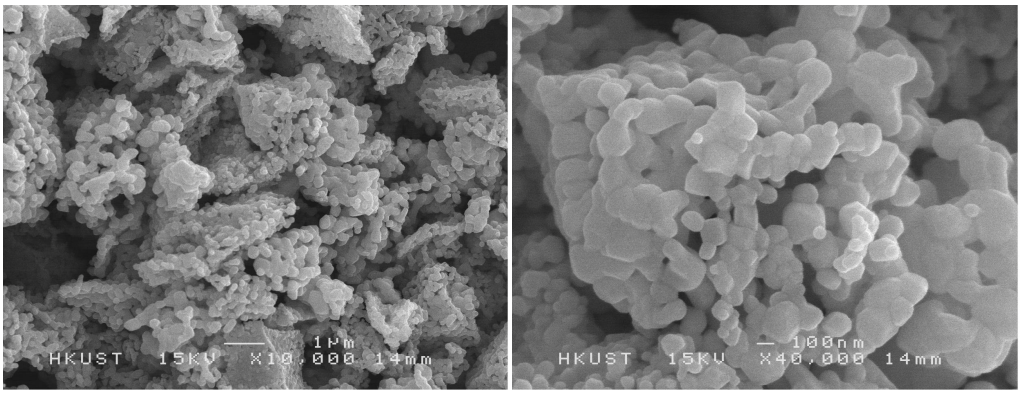


Figure S5

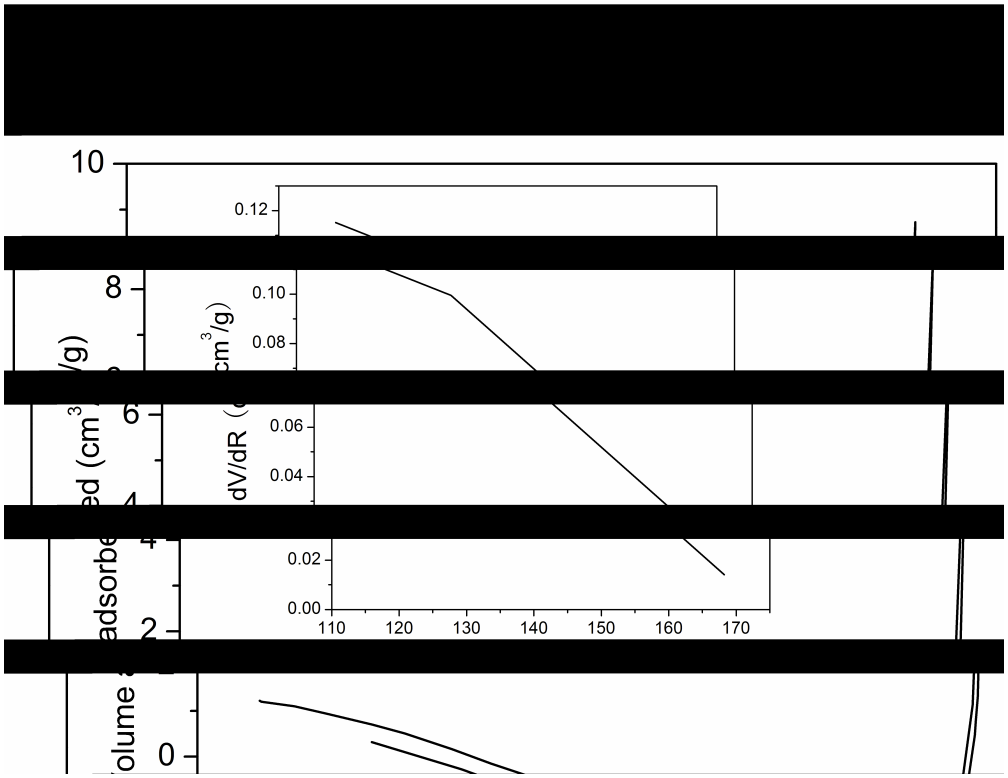


Figure S6

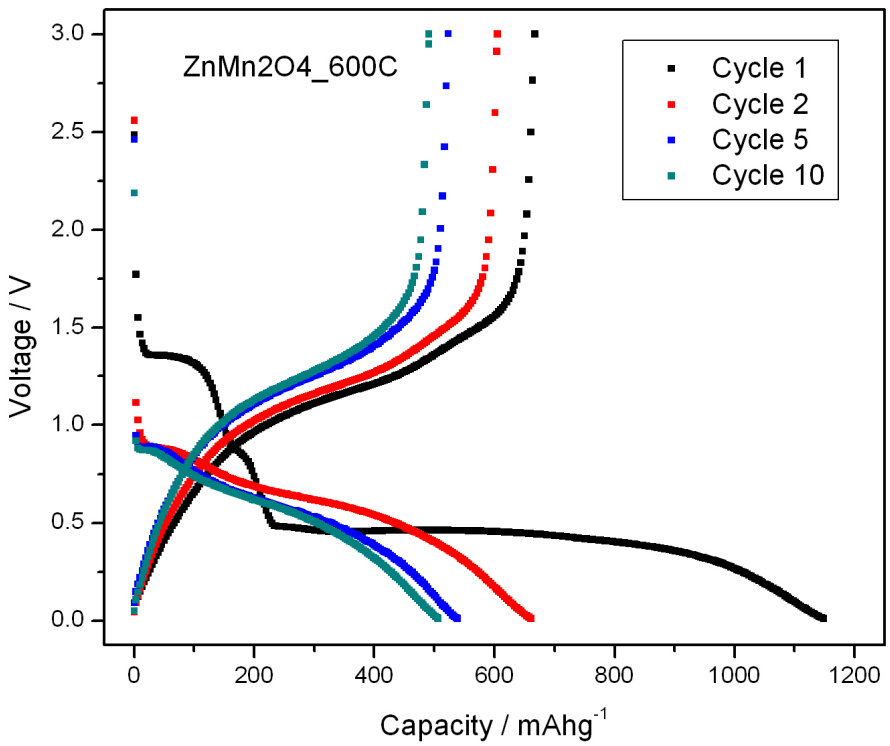
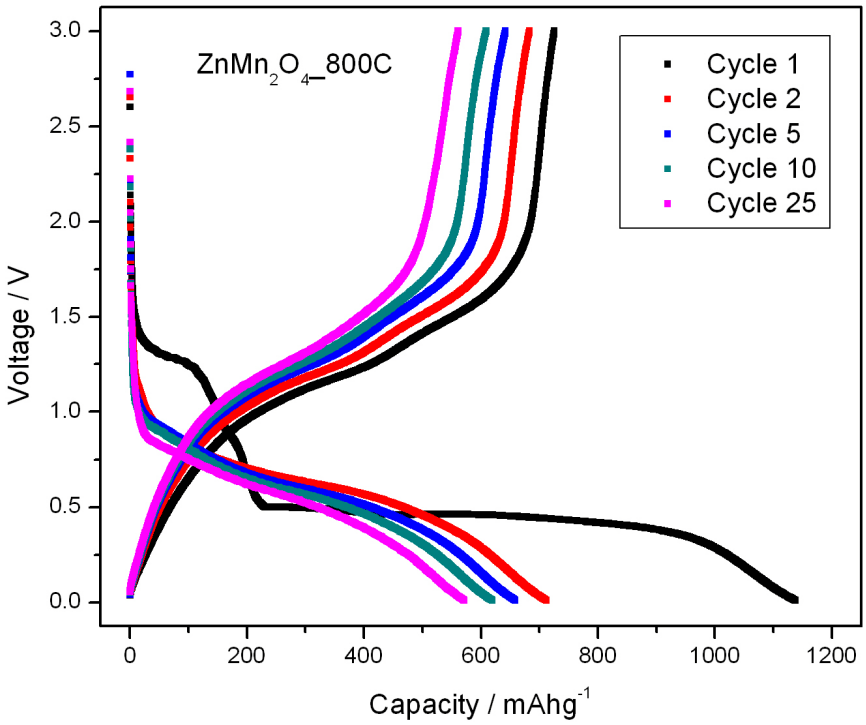

ZnMn2O4_600C
Cycle 1
Cycle 2
Cycle 5
Cycle 10
Voltage / V
Capacity / mAhg-1
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200

Figure S7


ZnMn2O4_800C
Cycle 1
Cycle 2
Cycle 5
Cycle 10
Cycle 25
Voltage / V
Capacity / mAhg-1
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200