Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.


# Electronic Supplementary Information

## Porous $ZnCo_2O_4$ nanoparticals derived from a Mixed-Metal Organic Framework for supercapacitors

Siru Chen, Ming Xue*, Yanqiang Li, Liangkui Zhu, Ying Pan, Qianrong Fang and Shilun Qiu*

State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, Jilin University, Changchun 130012 (P. R. China)
E-mail: sqiu@jlu.edu.cn; xueming@jlu.edu.cn.

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# 1. X-ray Structure determination

**Table S1** Selected bond lengths (Å) and angles (deg) for **JUC-155**[a]

| | | | |
|---|---|---|---|
| Zn(1)-O(8) | 2.064(4) | Zn(1)-O(7) | 2.089(4) |
| Zn(1)-O(4)#1 | 2.089(3) | Zn(1)-O(4)#2 | 2.089(3) |
| Zn(1)-O(1) | 2.097(3) | Zn(1)-O(1)#3 | 2.097(3) |
| | | | |
| Co(1)-O(6)#4 | 1.937(4) | Co(1)-O(2) | 1.952(3) |
| Co(1)-O(7) | 1.9692(17) | Co(1)-O(3)#2 | 2.003(3) |
| | | | |
| O(8)-Zn(1)-O(7) | 172.11(19) | O(8)-Zn(1)-O(4)#1 | 88.96(14) |
| O(7)-Zn(1)-O(4)#1 | 96.81(12) | O(8)-Zn(1)-O(4)#2 | 88.96(14) |
| O(7)-Zn(1)-O(4)#2 | 96.81(12) | O(4)#1-Zn(1)-O(4)#2 | 85.8(2) |
| O(8)-Zn(1)-O(1) | 87.41(13) | O(7)-Zn(1)-O(1) | 87.48(11) |
| O(4)#1-Zn(1)-O(1) | 172.32(14) | O(4)#2-Zn(1)-O(1) | 87.38(14) |
| O(8)-Zn(1)-O(1)#3 | 87.41(13) | O(7)-Zn(1)-O(1)#3 | 87.48(11) |
| O(4)#1-Zn(1)-O(1)#3 | 87.38(14) | O(4)#2-Zn(1)-O(1)#3 | 172.32(14) |
| O(1)-Zn(1)-O(1)#3 | 99.20(16) | | |
| | | | |
| O(6)#4-Co(1)-O(2) | 122.76(15) | O(6)#4-Co(1)-O(7) | 115.29(15) |
| O(2)-Co(1)-O(7) | 104.53(15) | O(6)#4-Co(1)-O(3)#2 | 102.82(14) |
| O(2)-Co(1)-O(3)#2 | 104.52(14) | O(7)-Co(1)-O(3)#2 | 105.11(15) |

[a] Symmetry transformations used to generate equivalent atoms:

#1 -x+3/2, y-1/2, z+0; #2 -y+2, x, z; #3 -y+3/2, -x+3/2, z+0; #4 x, -y+2, z-1/2.

## 2. SEM images and EDS mapping images of as-synthesized JUC-155

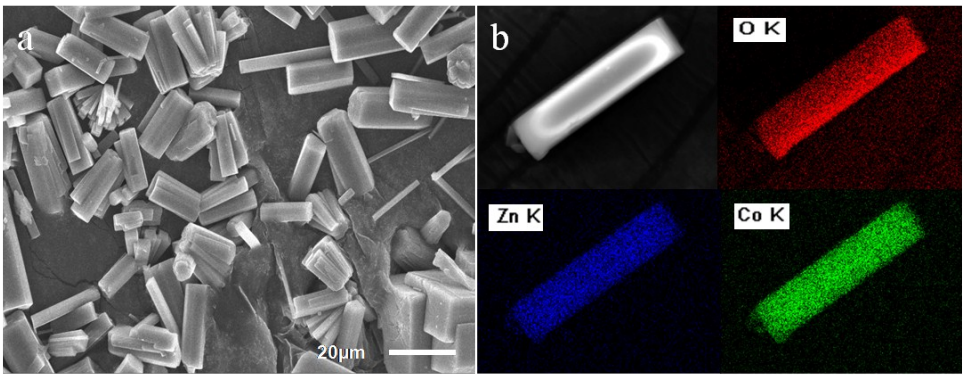


**Fig. S1** (a) SEM images and (b) EDS mapping images of as-synthesized JUC-155.

## EDS of as-synthesized JUC-155

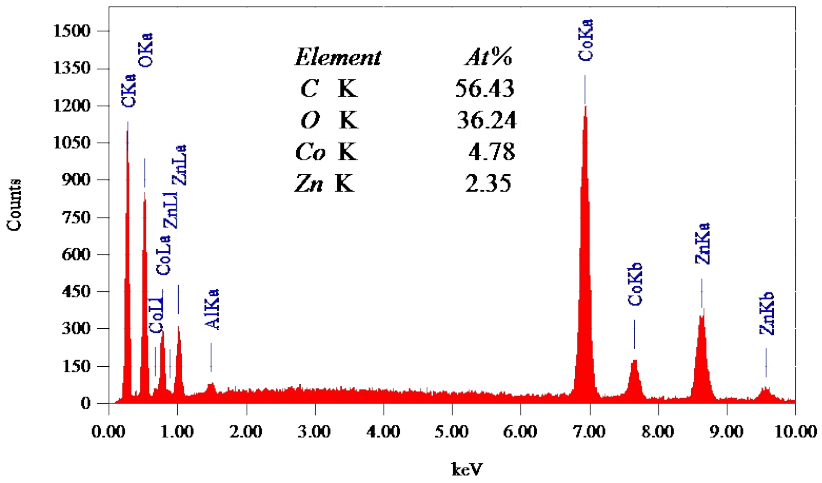


**Fig. S2** EDS of as-synthesized JUC-155

## 3. FTIR spectra of as-synthesized JUC-155

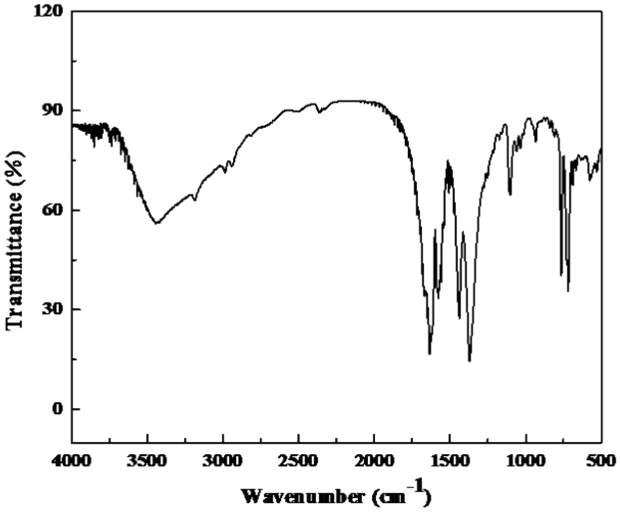


**Fig. S3** FTIR spectra of as-synthesized JUC-155.

## 4. SEM images and EDS mapping images of compounds 1, 2 and 3

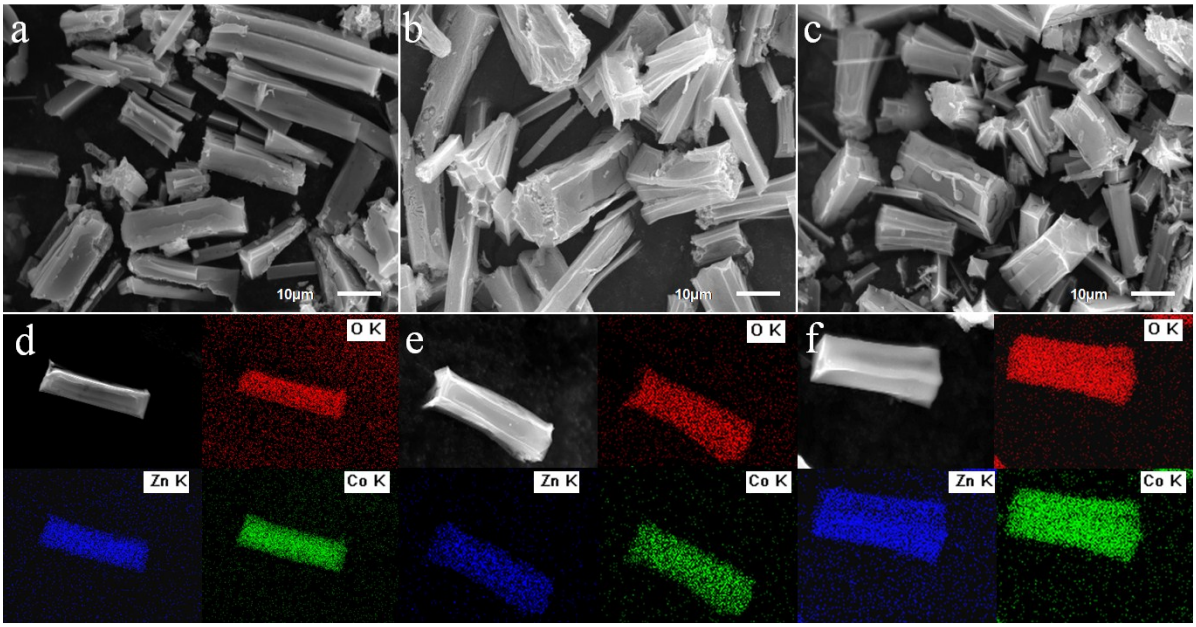


**Fig. S4** SEM images and EDS mapping images of compound **1** (a, d), compound **2** (b, e) and compound **3** (c, f).

## EDS spectra of compounds 1, 2 and 3

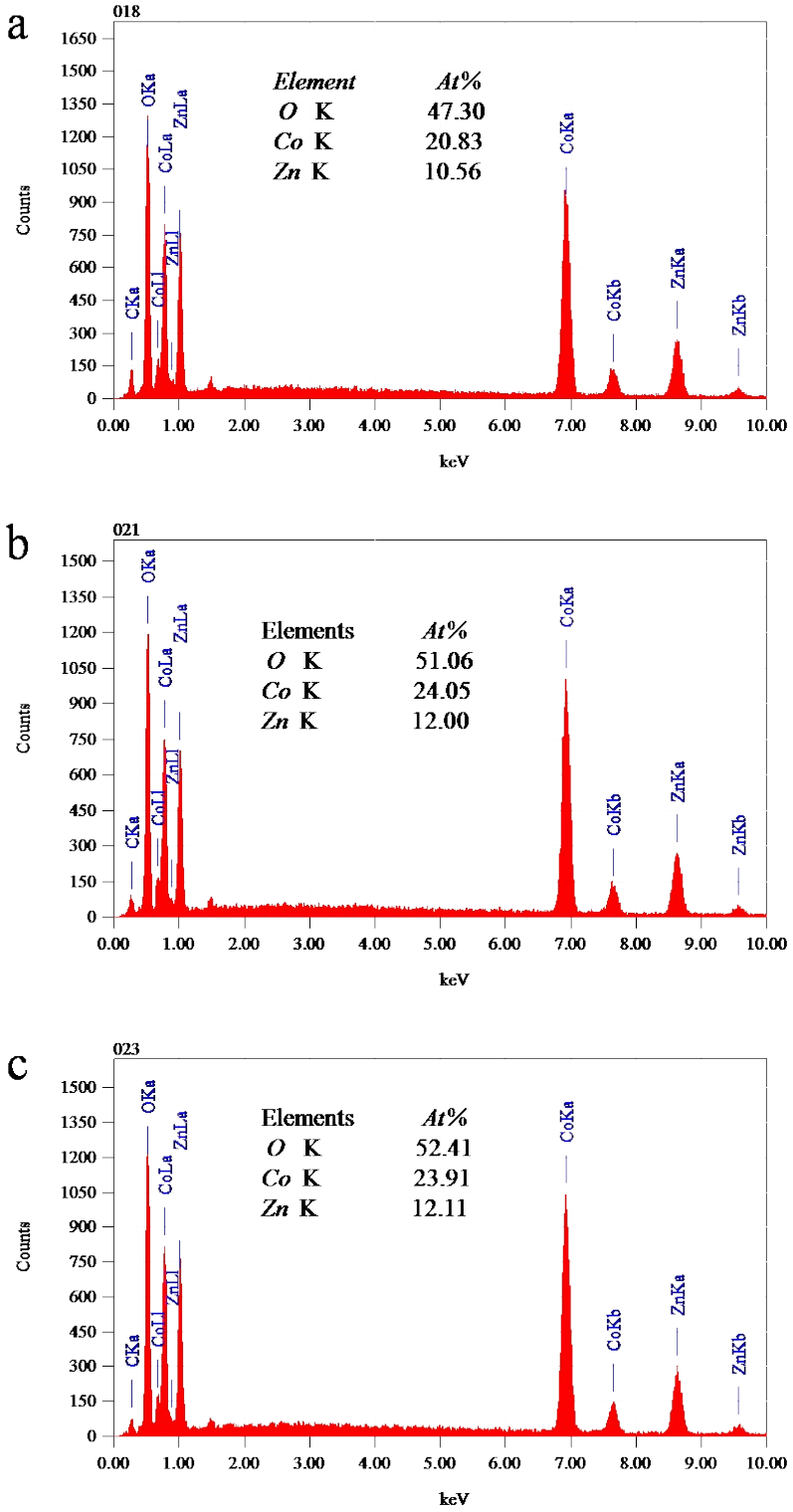


**Fig. S5** EDS spectra of (a) compound **1**, (b) compound **2** and (c) compound **3**.

## 5. Gas Adsorption Measurements

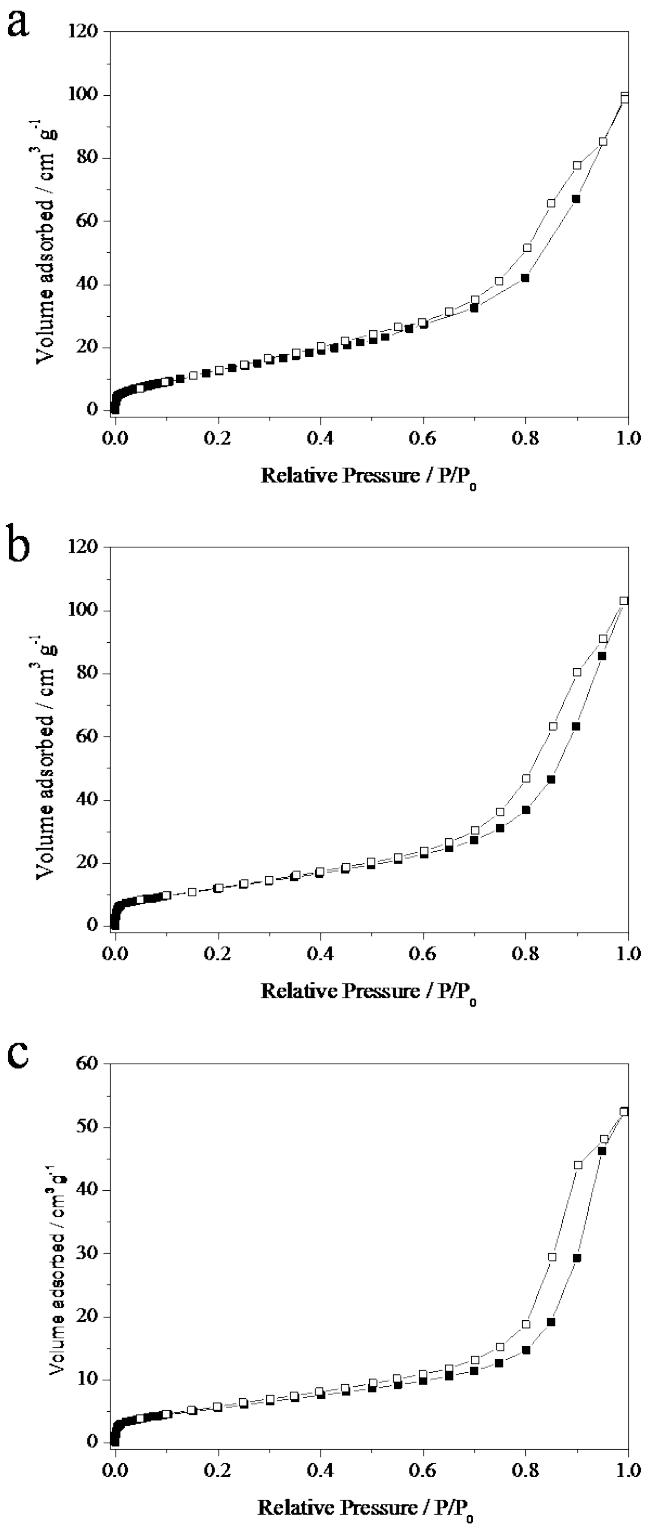


**Fig. S6** $N_2$ adsorption-desorption isotherms of (a) compound **1**, (b) compound **2** and (c) compound **3** (solid symbols, adsorption; open symbols, desorption).

## 6. Electrochemical test

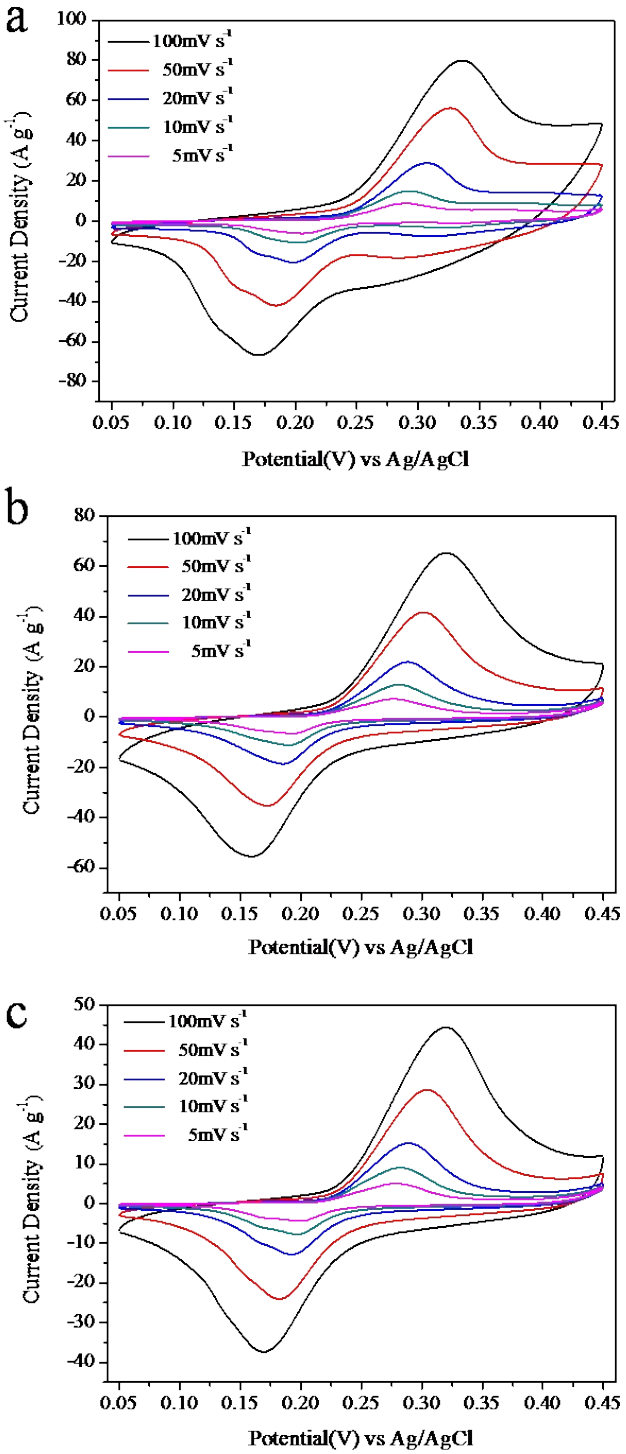


**Fig. S7** Cyclic voltammetry (CV) at different scan rates of (a) **1** electrode, (b) **2** electrode and (c) **3** electrode in 6M KOH aqueous electrolyte.

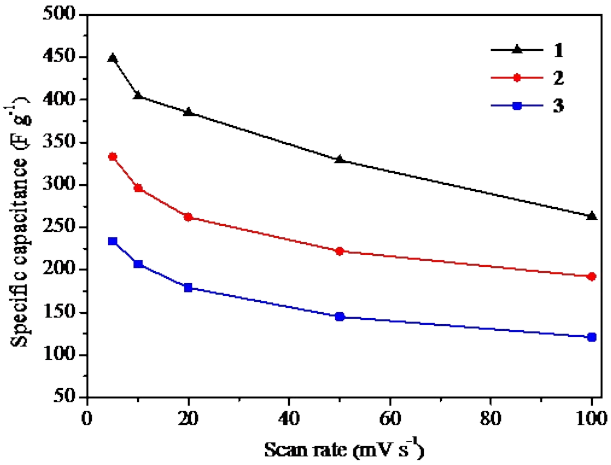


**Fig. S8** Specific capacitance derived from the Cyclic voltammetry (CV) measurement of the **1**, **2** and **3** electrodes.

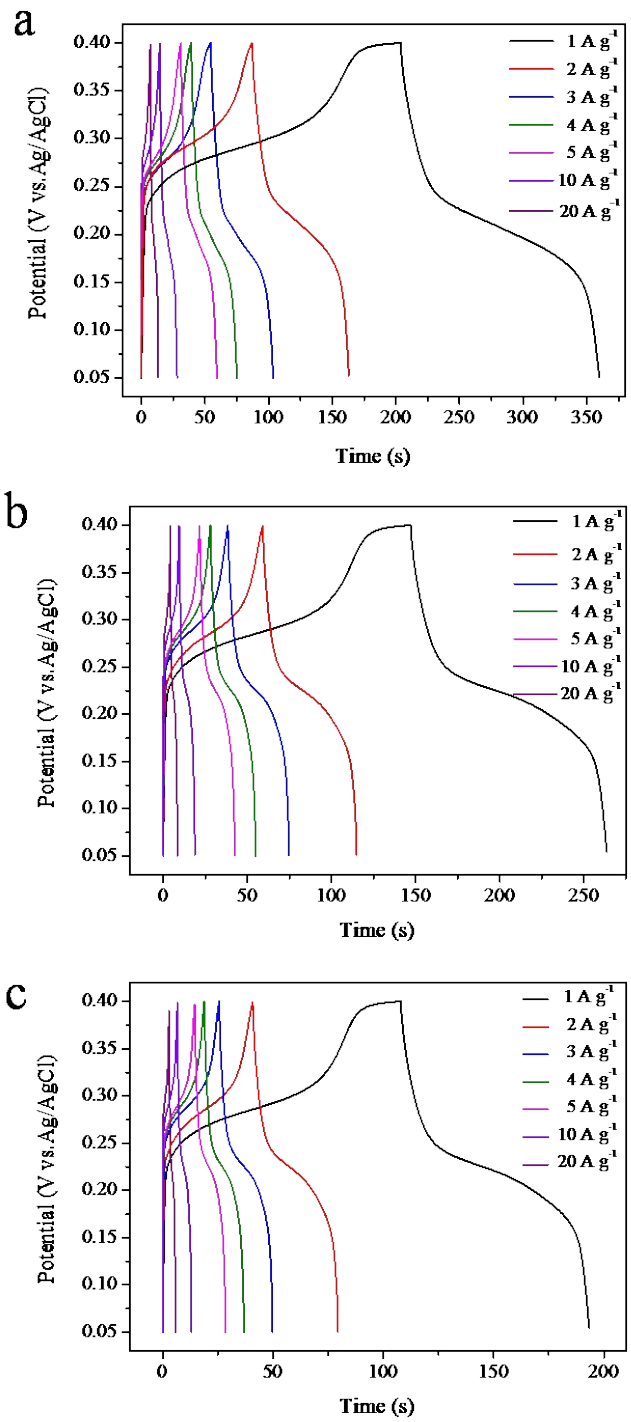


**Fig. S9** Charge-discharge curves at different current densities of (a) **1** electrode, (b) **2** electrode and (c) **3** electrode in 6M KOH aqueous electrolyte.

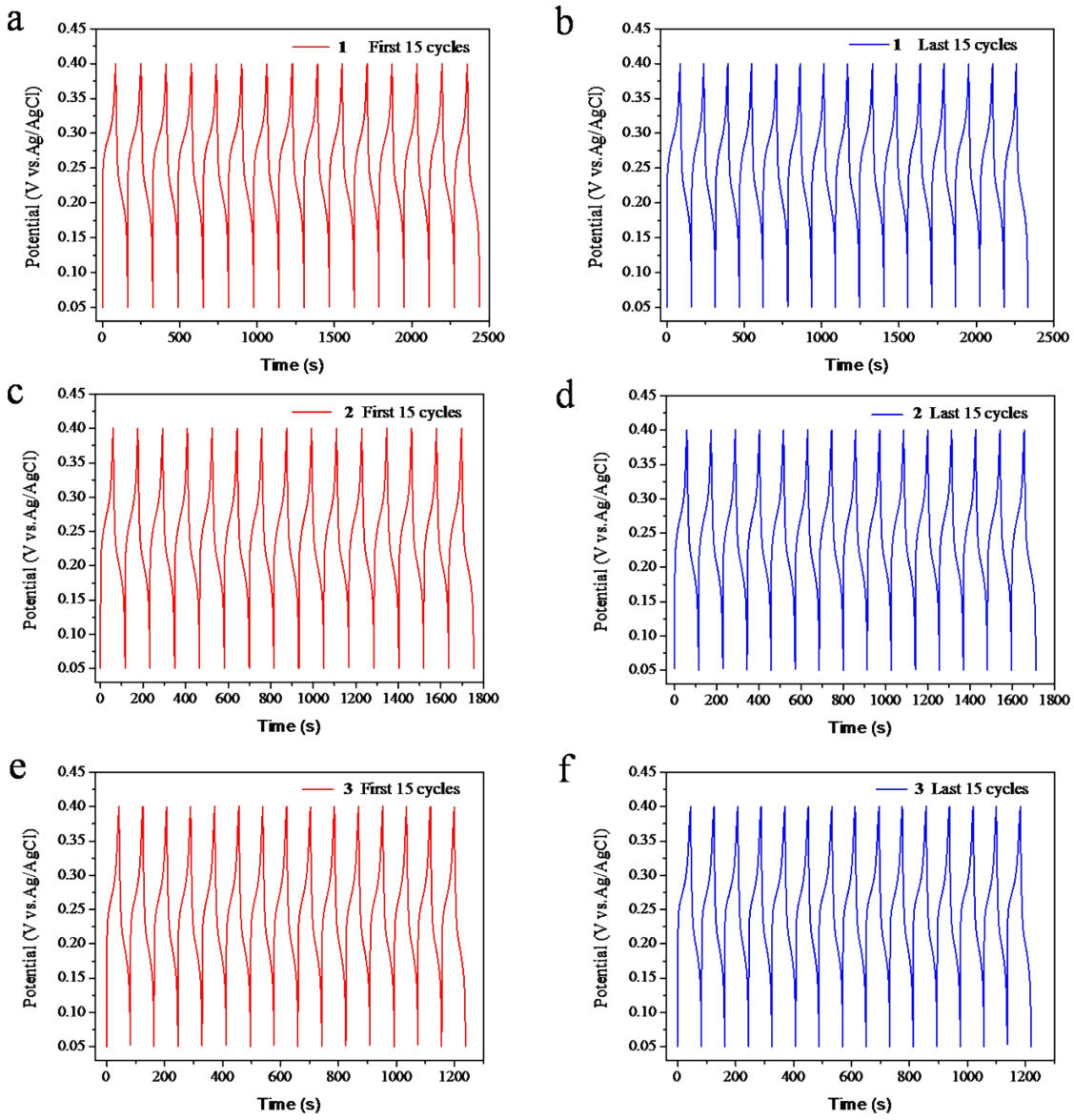


**Fig. S10** The first 15th cycles galvanostatic charge-discharge curves and the last 15th cycles galvanostatic charge-discharge curves of (a, b) **1** electrode, (c, d) **2** electrode and (e, f) **3** electrode at 2 A $g^{-1}$.