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


Supporting Information for

# Sn-Co nano alloy embedded in porous N-doped carbon microboxes as a stable anode material for lithium-ion batteries

Xiao Shi, Huaihe Song*, Ang Li, Xiaohong Chen, Jisheng Zhou, Zhaokun Ma

State Key Laboratory of Chemical Resource Engineering, Beijing Key Laboratory of Electrochemical Process and Technology for Materials, Beijing University of Chemical Technology, 100029, Beijing, P. R. China.
E-mail: songhh@mail.buct.edu.cn.

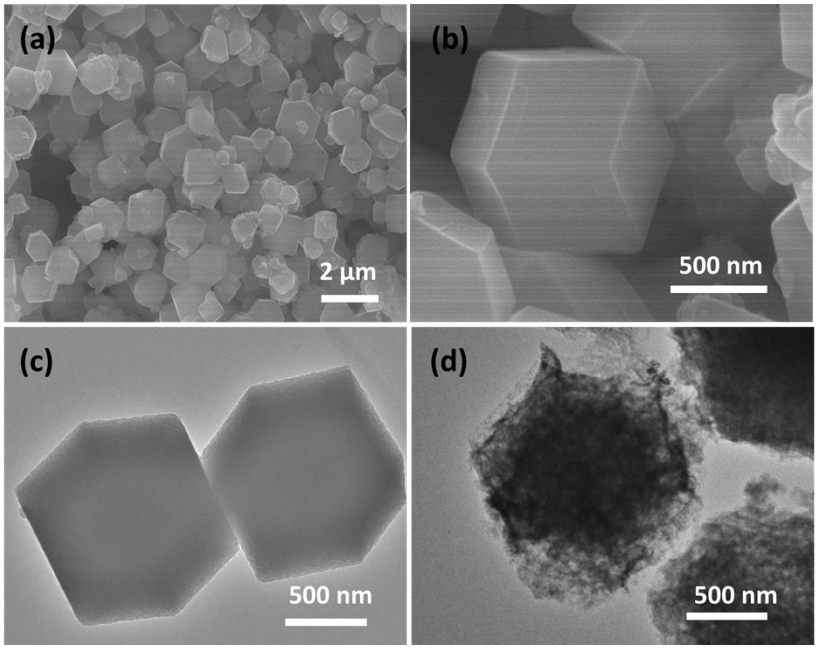


**Fig. S1.** SEM images of ZIF67 (a) and (b); TEM image of ZIF-67 (c); TEM image of concentrated HCl washed Sn-Co@C-2 –Porous carbon (d).

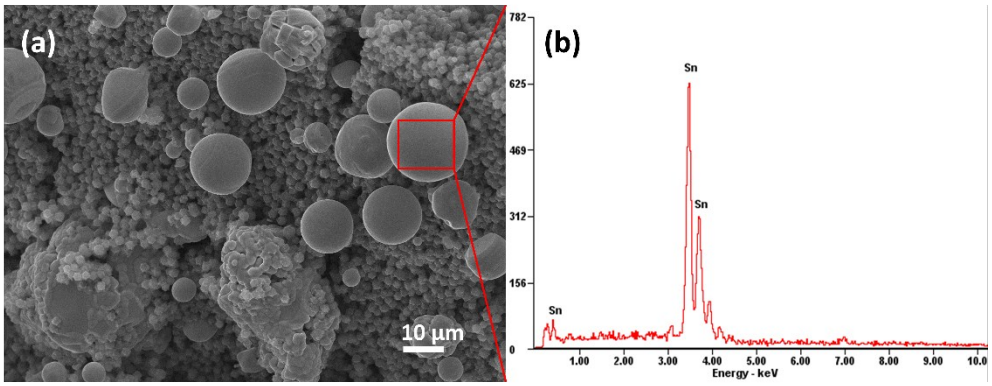


**Fig. S2.** SEM image (a) and the EDX spectra (b) of the selected area of the sample Sn-

Co@C-650 (carbonization at 650℃).

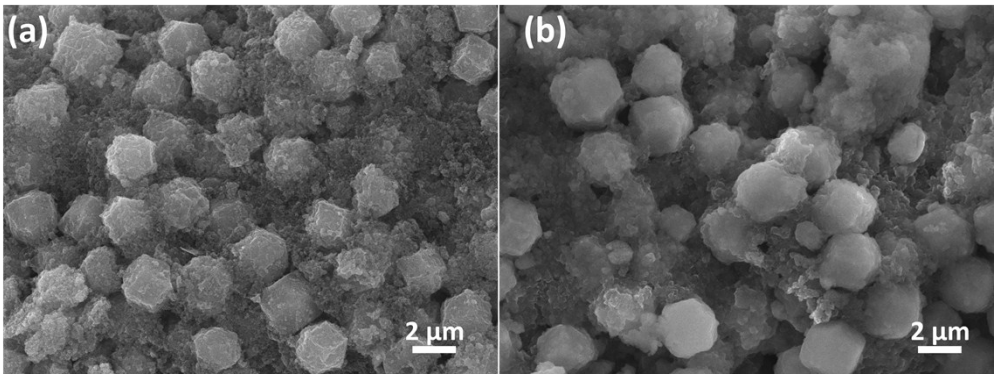


**Fig. S3.** SEM image of the Sn-Co@C-2 electrode before (a) and after 100 cycles (b).

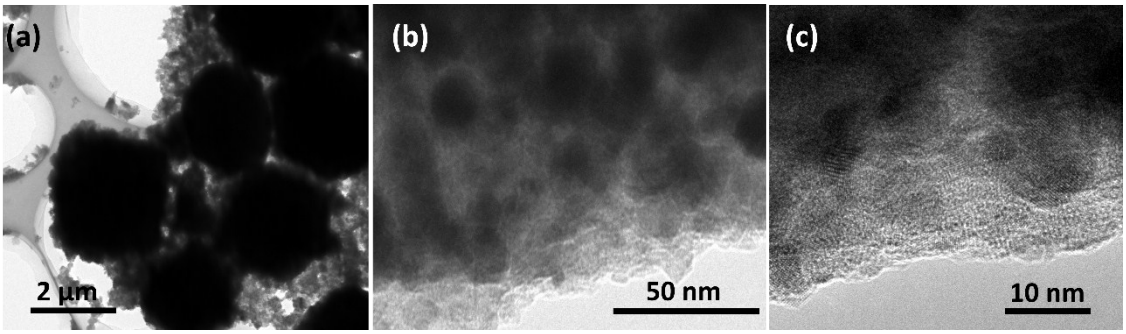


**Fig. S1.** TEM and HRTEM images of Sn-Co@C-2 after 100 charge/dischare cycles.

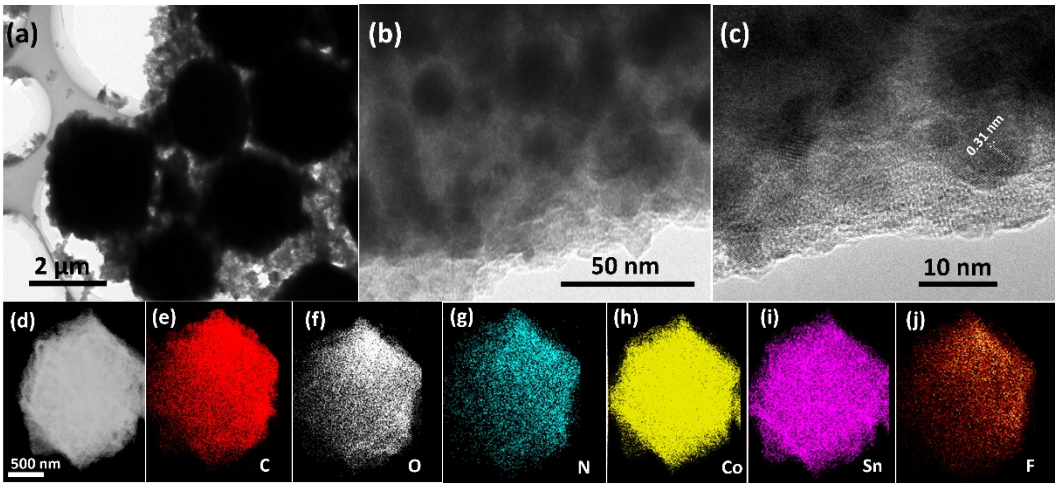


**Fig. S4.** TEM images (a,b), HR-TEM image (c), STEM image (d), and corresponding elemental mapping images (e-j) of Sn-Co@C-2 after 100 charge-discharge cycles.

**Table S1.** Electrochemical performances of various Sn-contained anode materials for lithium-ion batteries.

| Material | Voltage range (V) | Current density (mA $g^{-1}$) | First charge capacity (mAh $g^{-1}$) | Capacity after (x) cycles[a] | Capacity at high current density (mAh $g^{-1}$)[b] | Reference |
|---|---|---|---|---|---|---|
| **Sn-Co@C** | **0.01-3** | **100** | **945** | **818 (100)** | **472 (2 A $g^{-1}$)** | **This work** |
| Sn-Co@graphene | 0.01-3 | 72 | 1117 | 571 (60) | 720 (922 mA $g^{-1}$) | 1 |
| Sn-Co@graphene | 0.01-3 | 500 | 644 | 560 (60) | ~500 (800 mA $g^{-1}$) | 2 |
| rod-shaped Cu/SnCo | 0.01-2 | 249 | 1342 | 660 (80) | ~450 (3976 mA $g^{-1}$) | 3 |
| SnCo film on nickel | 0.02-2 | 148 | ~ 900 | 663 (60) | _ | 4 |
| porous Sn–Co alloy | 0.02-1.5 | 100 | 528.7 | 511 (70) | _ | 5 |
| SnCo@ordered mesoporous carbon | 0.01-3 | 100 | 1338 | 562 (60) | 351 (1 A $g^{-1}$) | 6 |
| $SnO_2$@C | 0.01-3 | 100 | 1208 | 880 (200) | 450 (1 A $g^{-1}$) | 7 |
| $SnO_2$@carbon hierarchical tubular structures | 0.05-1.5 | 200 | – | 700 (50) | 505 (1 A $g^{-1}$) | 8 |

[a]Capacity after a certain cycle number (in brackets)

[b]Capacity at a certain current density (in brackets)

## Reference


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