

Supporting Information

Ion Exchange for Synthesis of Porous $\text{Cu}_x\text{O}/\text{SnO}_2/\text{ZnSnO}_3$ Microboxes as High-Performance Lithium-ion Battery Anode

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The X-ray photoelectron spectroscopy (XPS) survey spectrum (Figure S1a) suggested that the presence of Zn, Sn and O elements in $\text{ZnSn}(\text{OH})_6$ sample. There are two peaks at 1021.4 and 1044.8 eV in Zn 2p spectra (Figure S1b), which correspond to the binding energy (BE) values of Zn 2p 3/2, Zn 2p 1/2 for Zn^{2+} state.¹ In the Sn 3d region, two obvious peaks at 486.6 and 495.0 eV are assigned to Sn 3d 5/2 and Sn 3d 3/2 of Sn^{4+} ion (Figure S2c).²

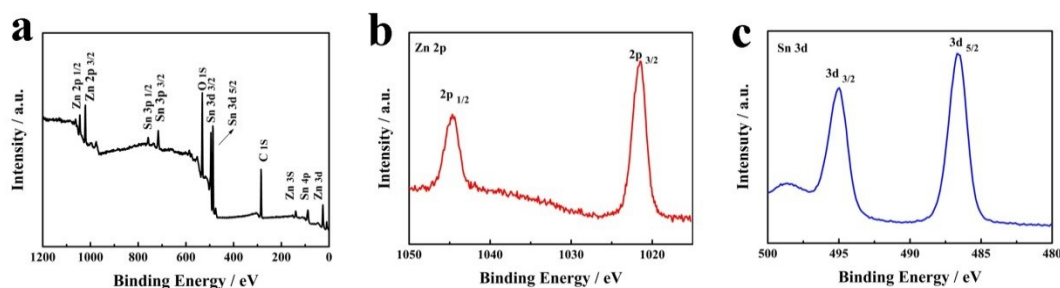


Figure S1(a) XPS survey scan spectra, (b) Zn (2p), (c) Sn (3d) regions for $\text{ZnSn}(\text{OH})_6$

As shown in Figure S2a, the XPS survey spectrum of $\text{CuSn}(\text{OH})_6/\text{ZnSn}(\text{OH})_6$ indicated the sample contained Zn, Sn, Cu and O elements. In the Zn 2p region (Figure S2b), two peaks

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at 1021.3 and 1044.6 eV were assigned to Zn 2p 3/2, Zn 2p 1/2 for Zn²⁺ state. Figure S2c showed two peaks at 486.5 and 494.9 eV, which correspond BE values of Sn 3d 5/2 and Sn 3d 3/2 of Sn⁴⁺ ion. The Cu 2p spectra showed two peaks at 933.4 and 953.5 eV (Figure S2d), which were attributed to the Cu 2p 3/2 and Cu 2p 1/2. In addition to, the shake-up satellite peaks were detected at 942.5 and 962.2 eV, corresponding to the characteristic of d⁹ Cu (II) compounds.³

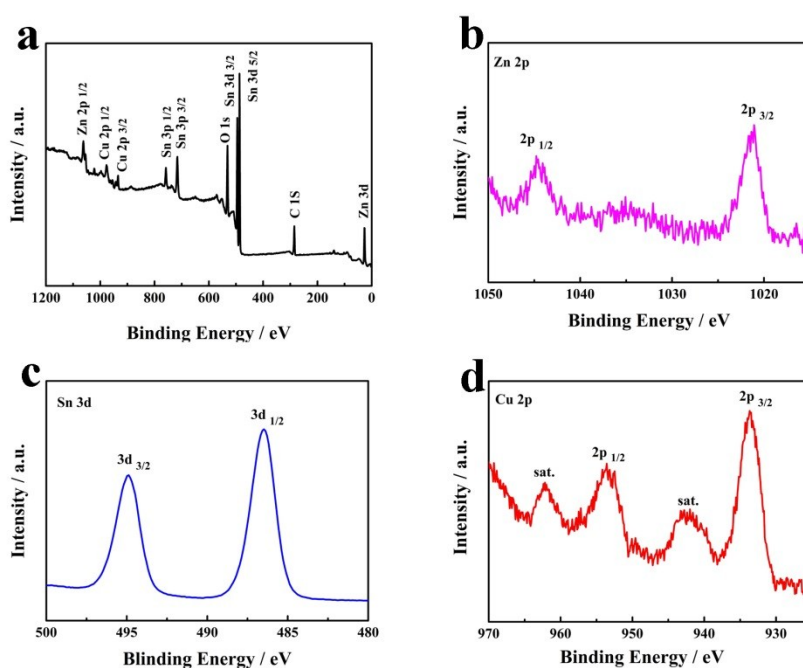


Figure S2 (a) XPS survey scan spectra, (b) Zn (2p), (c) Sn (3d), (d) Cu (2p) regions for CuSn(OH)₆/ZnSn(OH)₆.

References

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