Supporting Information

A high-volumetric-capacity and high-areal-capacity $ZnCo_2O_4$ anode for Li-ion battery enabled by a robust biopolymer binder

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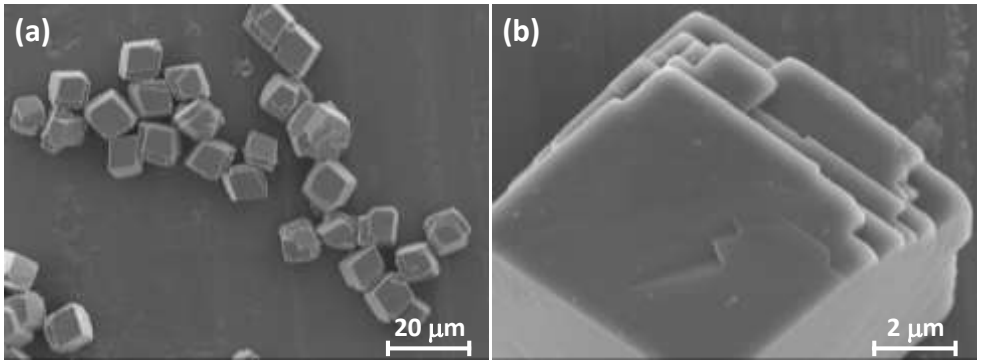

Figure S1. (a) low-magnification and (b) high-magnification SEM images of ZCO precursors.

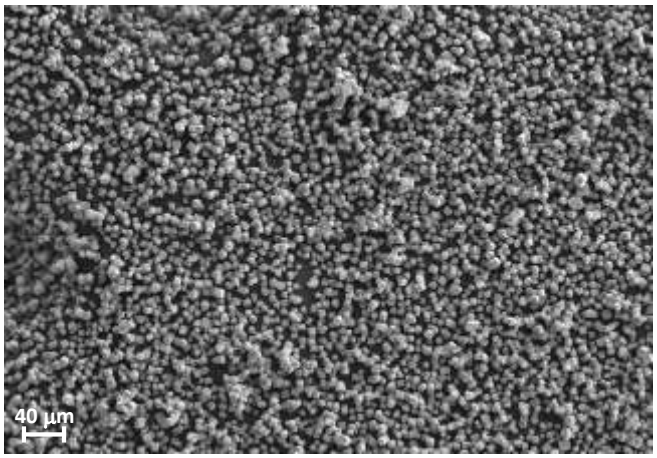

Figure S2. Large-area SEM image of ZCO.

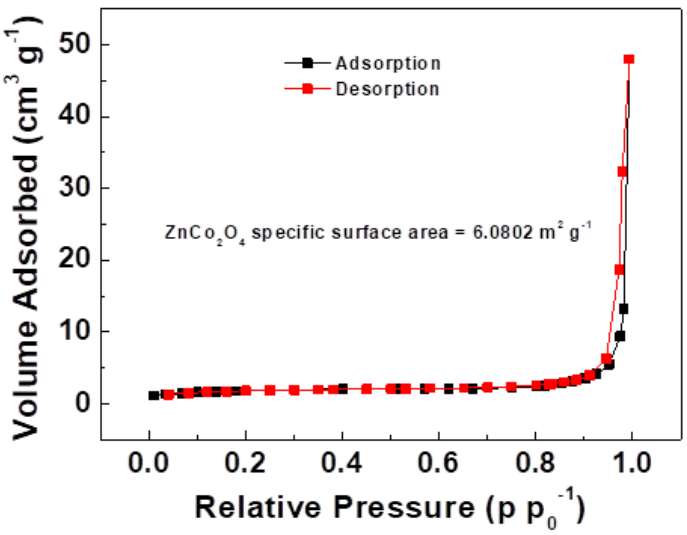

Figure S3. Nitrogen adsorption-desorption isotherms of ZCO, showing enhanced specific surface area of ZCO compared with ZCO precursors (0.0988 m^2 g^{-1}).

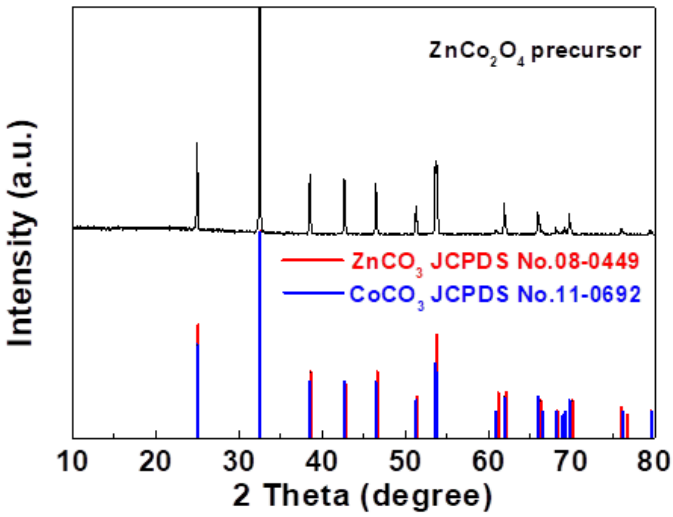

Figure S4. XRD pattern of ZCO precursors.

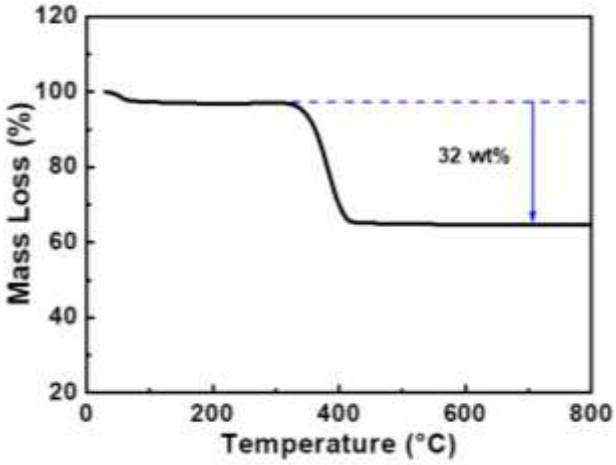

Figure S5. TGA curve of ZCO precursors in air.

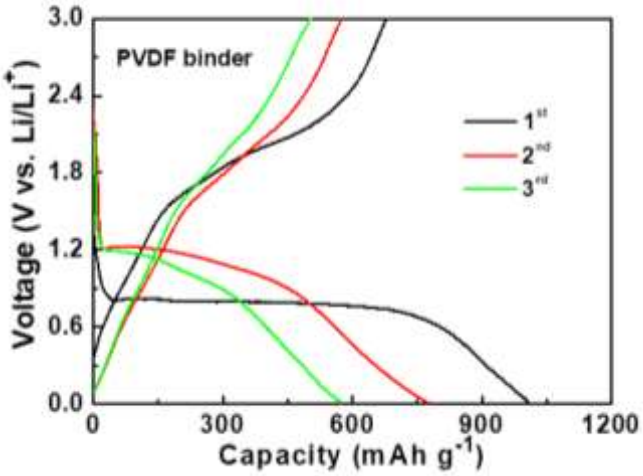

Figure S6. Charge-discharge curves of ZCO anode with PVDF binder.

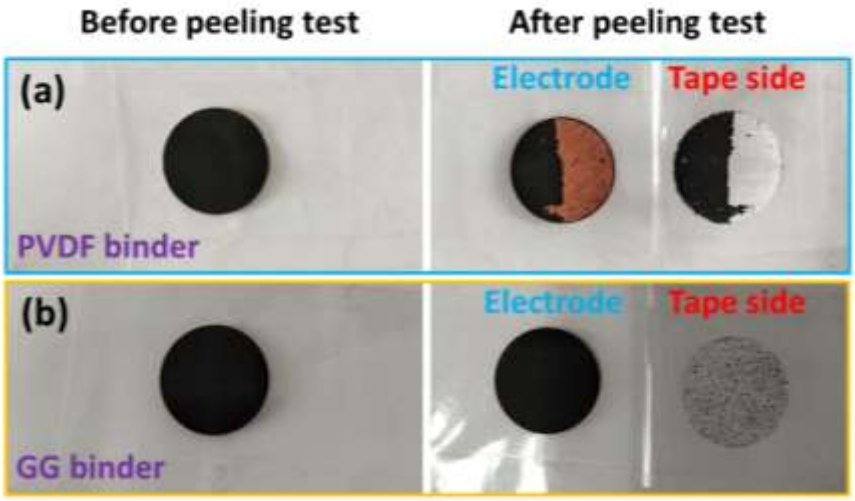

Figure S7. Peeling tests of ZCO electrodes with (a) PVDF binder and (b) GG binder, showing high adhesive force of GG binder on copper current collector.

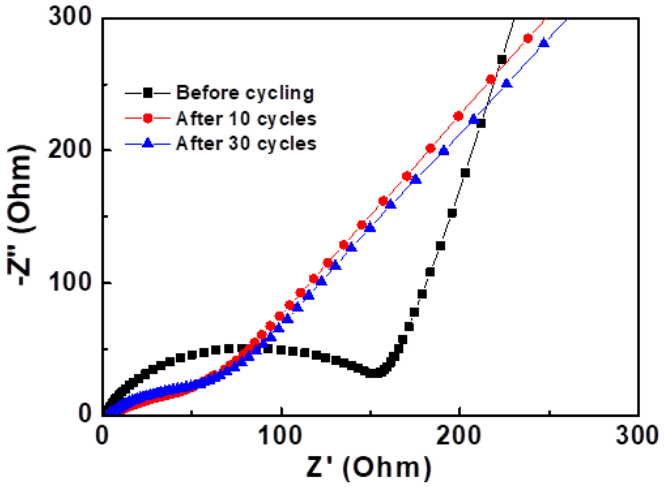

Figure S8. Nyquist plots of ZCO anode with GG binder, showing the stable electrode structure during cycling.

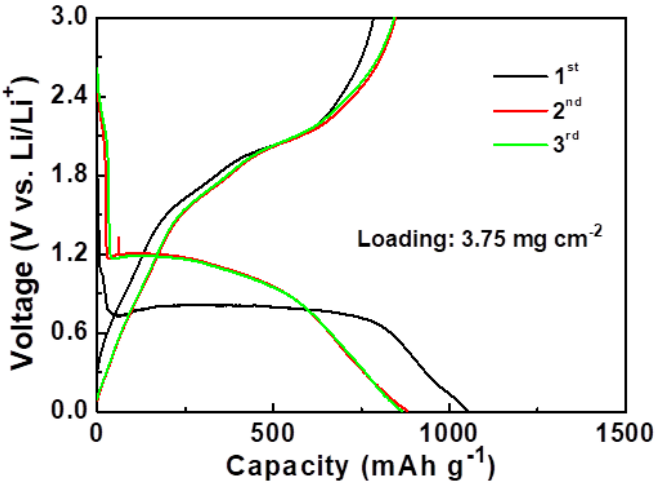

Figure S9. Charge-discharge curves of ZCO anode with GG binder with a high loading of 3.75 mg cm^{-2}.

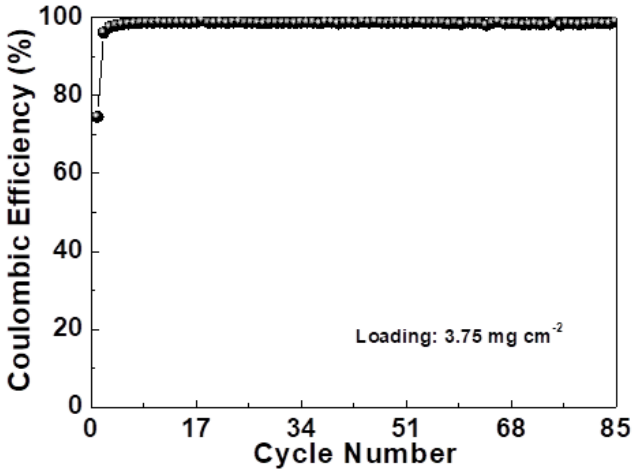

Figure S10. Coulombic efficiency of ZCO anode with GG binder with a high loading of 3.75 mg cm^{-2}.

Table S1. Comparison of the loading of ZCO-based active materials in Li-ion batteries, showing that an ultrahigh-loading ZCO anode has been obtained in this work.

Ref.	Active material	Mass loading (mg cm^{-2})
This work	**$ZnCo_2O_4$**	**6.7**
49	$ZnCo_2O_4$	1.0
14	$ZnCo_2O_4$	1.0
50	$Zn_{1-x}Co_xO/ZnCo_2O_4$	0.78, 1.69
51	$ZnCo_2O_4$	1.77
52	$ZnCo_2O_4$	0.9-1.1
10	$ZnCo_2O_4$	1.3-1.6
53	$Te@ZnCo_2O_4$	1.0-1.2[1]
54	$ZnCo_2O_4$	0.3-0.6
55	$ZnCo_2O_4$	0.8
56	$ZnCo_2O_4$	1.1
57	$ZnCo_2O_4$@Ag	0.56
58	N-doped carbon-coated $ZnO/ZnCo_2O_4/CuCo_2O_4$	0.81

[1] The mass loading on the electrode is 1.0-1.2 mg.