Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Facile fabrication of reduced graphene oxide covered $ZnCo_2O_4$ porous nanowire arrays hierarchical structure on Ni-foam as a high performance anode for lithium-ion battery

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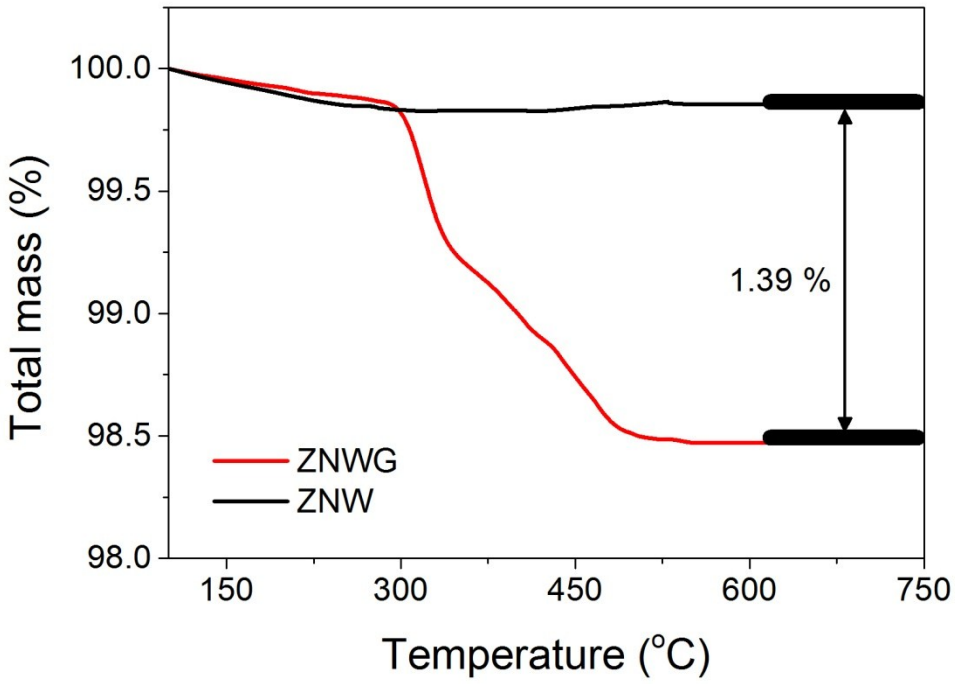

Fig. S1 TGA curves of ZNWG and ZNW.

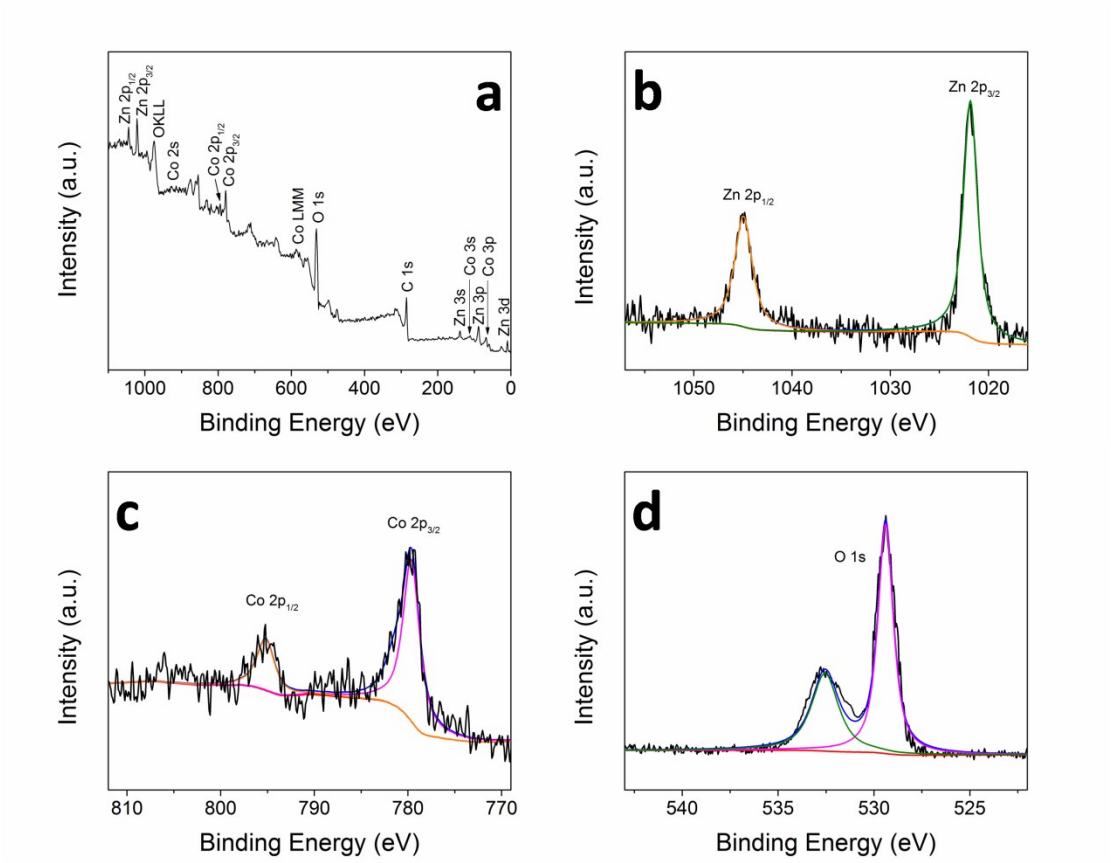

Fig. S2 XPS spectra of ZNW: (a) survey spectrum and high resolution (b) Zn 2p, (c) Co 2p, (d) O 1s spectra.

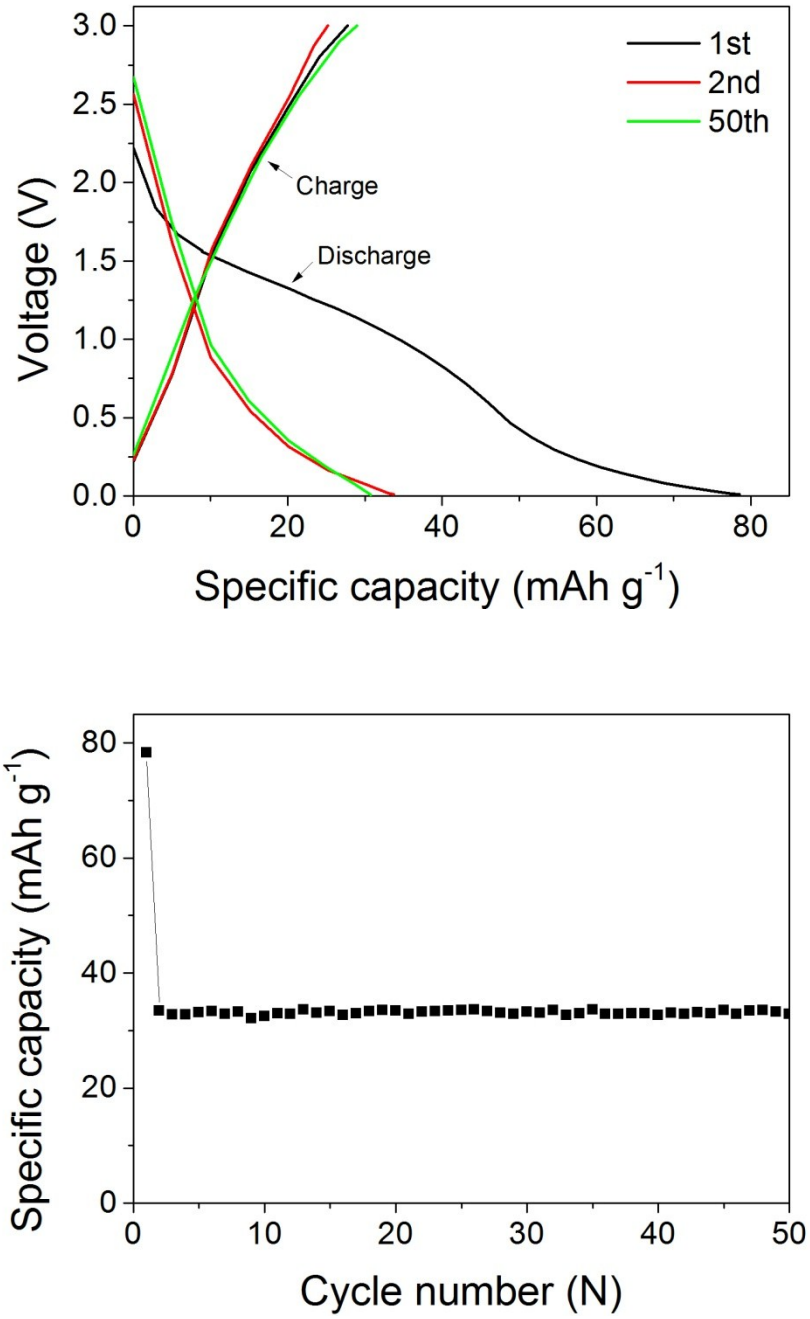

Fig. S3 Discharge-charge profile and cycling performance of pure GO acting as anode for LIB at a current density of 0.2 A g^{-1}.

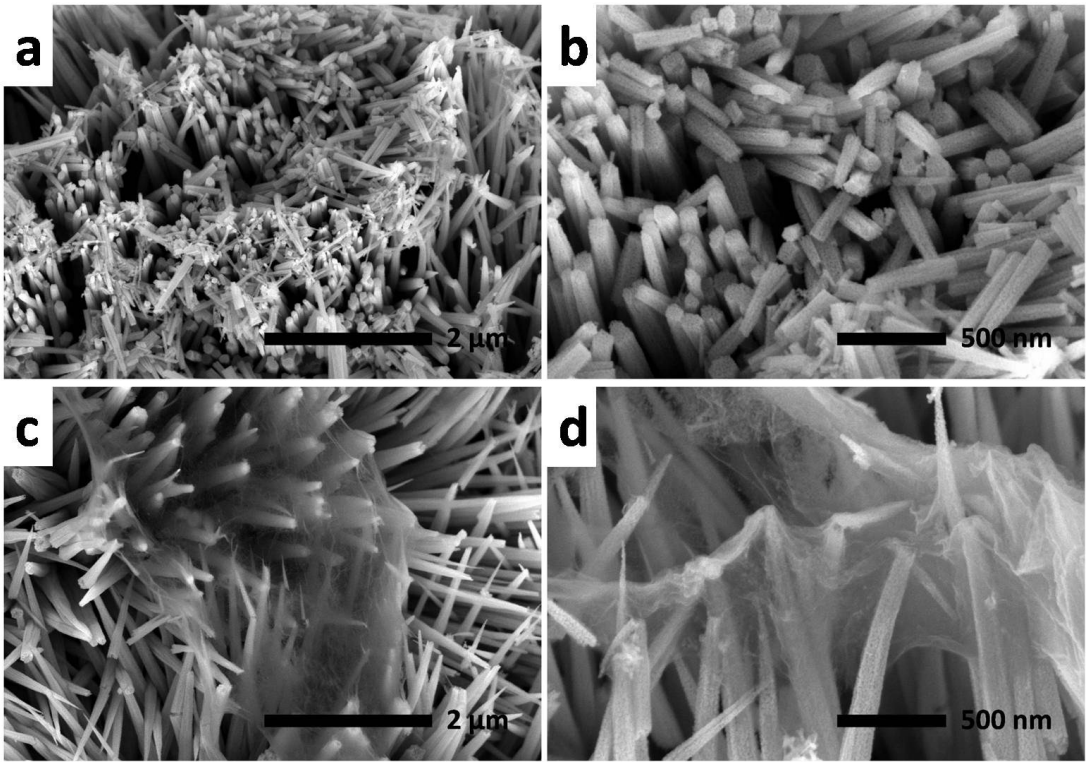

Fig. S4 SEM images of ZNW (a, b) and ZNWG (c, d) on Ni-foam after 50 cycles at a current density of 0.5 A g^{-1}.

Table. S1 Corresponding active material loadings for each electrode in Fig. 6.

Electrode	**a**	**b**	**c**	**d**	**e**
Loading (mg cm^{-2})	1.32	1.13	1.26	1.05	1.76
Electrode	**f**	**g**	**h-ZNWG**	**h-ZNW**	**h-ZP**
Loading (mg cm^{-2})	1.52	1.39	1.25	1.20	1.44

Table. S2 Electrochemical performances of the ZNWG electrode in this work compared with other works reported previously.

Electrode material	Initial reversible capacity (mA h g^{-1})	Current density (A g^{-1})	Cycling performance
ZNWG (this work)	**1371**	**0.1**	**1208 mA h g^{-1} after 100 cycles**
	1170	**0.5**	**1032 mA h g^{-1} after 100 cycles**
Porous $ZnCo_2O_4$ Nanowires[1]	1092.9	0.1	1197.9 mA h g^{-1} after 20 cycles
ZnO/$ZnCo_2O_4$ submicron rod arrays[2]	1071	0.045	~900 mA h g^{-1} after 30 cycles
Electrospun porous $ZnCo_2O_4$ nanotubes[3]	~1100	0.5	1011 mA h g^{-1} after 30 cycles
rGO/$ZnCo_2O_4$ nanocomposite[4]	1071.1	0.09	960.8 mA h g^{-1} after 100 cycles
$ZnCo_2O_4$/NiO core/shell nanowire arrays[5]	776	0.1	357 mA h g^{-1} after 50 cycles
Wrinkled-Paper-like Co-ZnO@C[6]	862	0.1	538 mA h g^{-1} after 50 cycles

Table. S3 Relevant solution resistance (R_s), charge transfer resistance (R_{ct}) for 1st and 100th cycles, R_{ct} increase of ZNWG, ZNW and ZP electrode, respectively.

Electrode	**ZNWG**	**ZNW**	**ZP**
R_s (Ω)	2.36	4.47	12.7
R_{ct} for 1st cycle (Ω)	80.2	90.0	315
R_{ct} for 100th cycle (Ω)	232	337	1472
R_{ct} increase (%)	289	374	467

References

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