

Supporting Information

Cobalt Hydroxide Carbonate/Reduced Graphene Oxide Anodes Enabled by a Confined Step-by-Step Electrochemical Catalytic Conversion Process for High Lithium Storage Capacity and Excellent Cyclability with a Low Variance Coefficient

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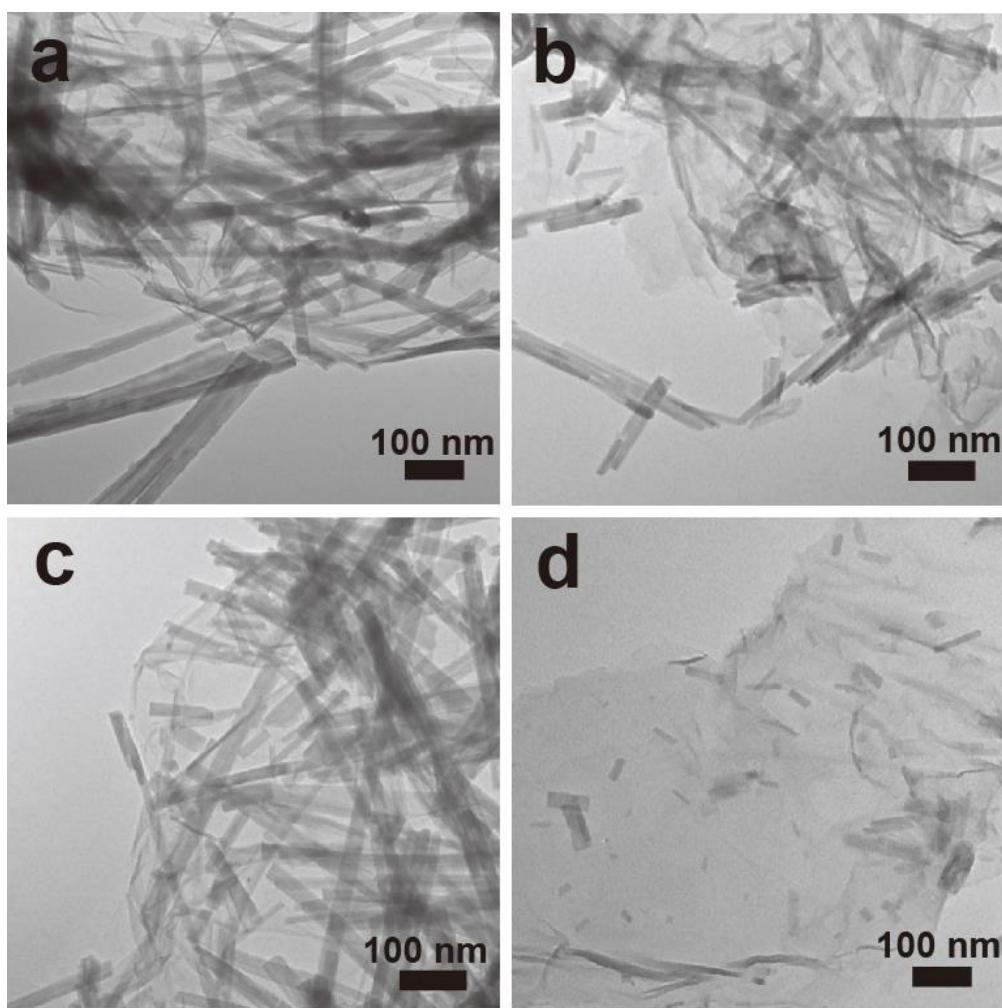


Fig S1. TEM images of (a) CHC/RGO (30%), (b) CHC/RGO (40%), (c) CHC/RGO (50%), and (d) CHC/RGO (60%) hybrids.

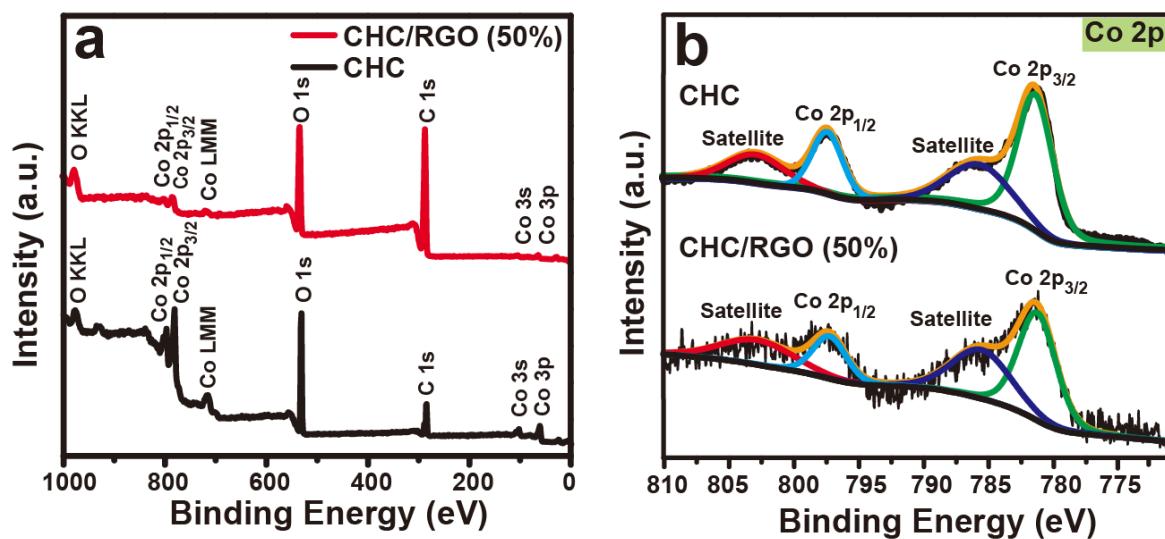


Fig S2. (a) Survey scan and (b) Co 2p XPS spectra of CHC and CHC/RGO (50%) hybrid.

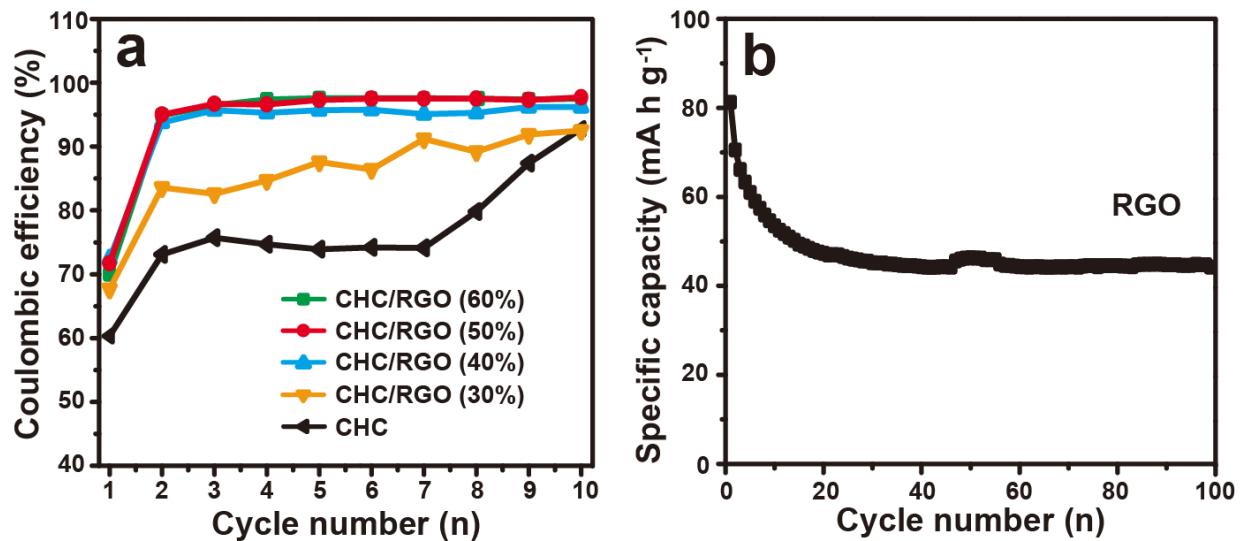


Fig S3. (a) Coulombic efficiencies of CHC and CHC/RGO hybrids during the initial 10 cycles.
(b) Cycling performances of RGO at the current density of 0.1 A g^{-1} .

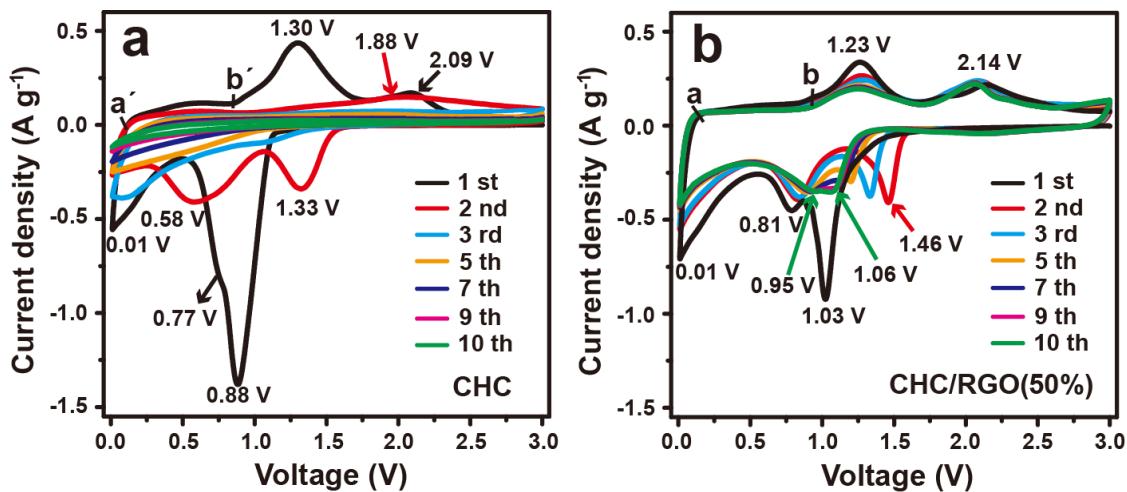


Fig S4. CV curves of (a) CHC and (b) CHC/RGO (50%) hybrid at a scanning rate of 0.1 mV s^{-1} from 0.01 to 3.0 V.

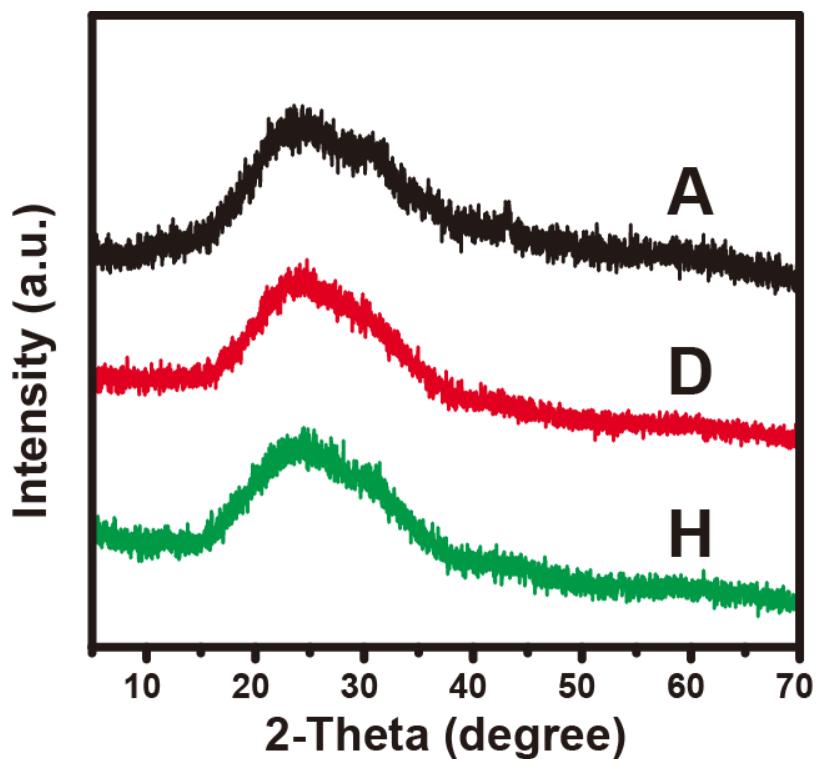


Fig S5. XRD patterns of CHC/RGO (50%) hybrid at various voltage states: point A, point D, and point H.

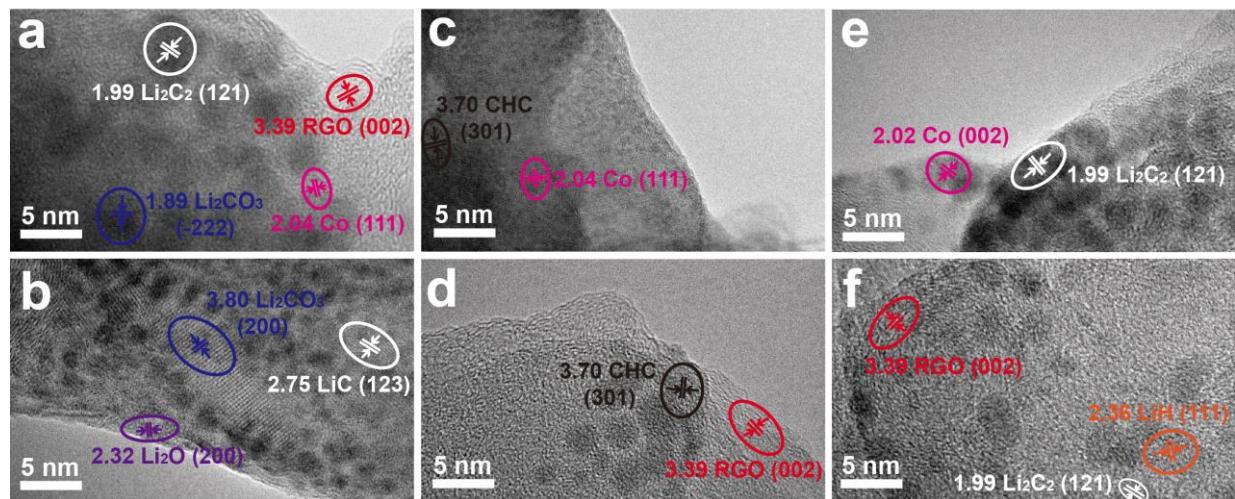


Fig S6. TEM images of CHC/RGO (50%) hybrid at various voltage states: (a, b) point A, (c, d) point D, and (e, f) point H.

Table S1. Comparison of the electrochemical performances of CHC/RGO hybrid with representative Co-based anode materials reported in the literature.

Samples	Current density (A g ⁻¹)	Cycle (n)	Reversible capacity (mA h g ⁻¹)	Coefficient of variance (%)	Refs.
CoCO ₃ /graphene	0.2	40	744	/	S1
CoCO ₃ -PPy	0.1 1	100 100	1070.7 811.2	22.3	S2
CoCO ₃ /graphene aerogel	0.1	80	1102	/	S3
Co ₂ (OH) ₃ Cl/RGO	1	200	1186	20.93	S4
Co ₂ (OH) ₂ CO ₃ sheets	0.2 1	200 200	800 400	68.36	S5
CoCO ₃ dumbbells	0.2 1	100 500	1042 824	11.85	S6
LHCA//GNS sheets	0.2 1	40 200	1035 1050	15.87	S7
Mn _{0.7} Co _{0.3} CO ₃ /RGO	0.1	130	1454	/	S8
I-Co(OH) ₂ sheets	1	250	870	29.66	S9
CHC/RGO	0.1 1	100 200	1110 755	9.4	This work

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