Electronic Supplementary Information (ESI) for nanoscale
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Supporting Information

Porous $CuCo_2O_4$ Nanocubes wrapped by Reduced Graphene Oxide as High-Performance Lithium-Ion Battery Anodes

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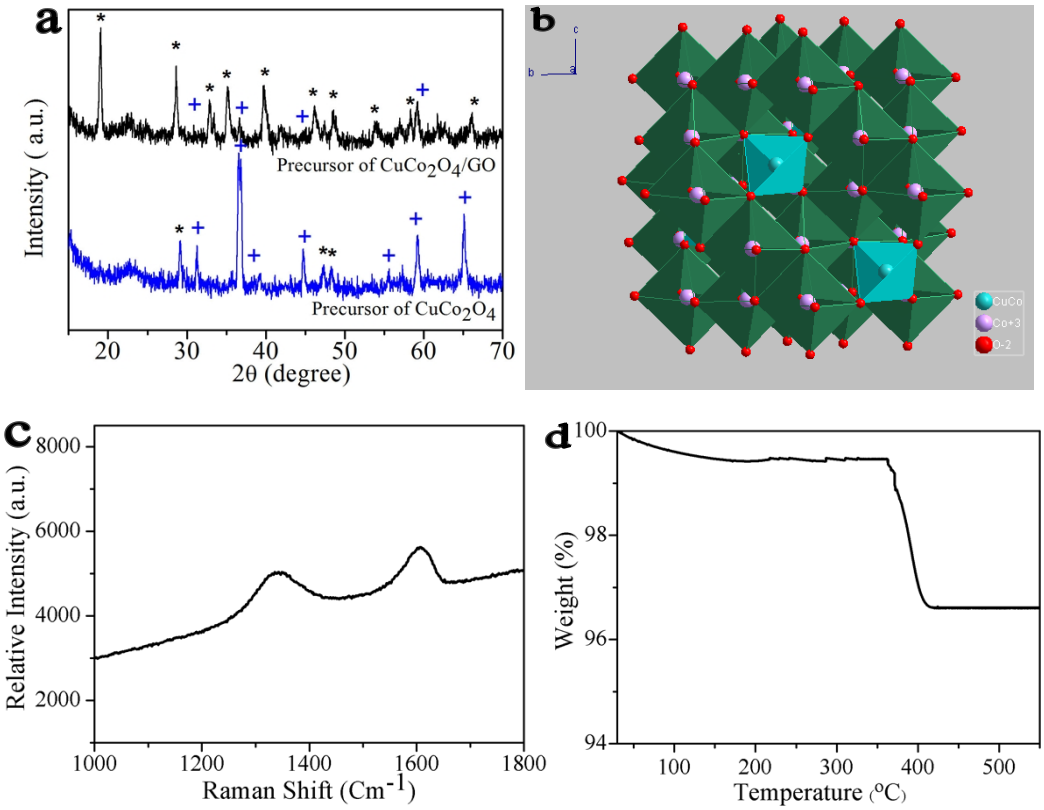

Fig. S1 (a) XRD patterns of the precursors of $CuCo_2O_4$/GO and $CuCo_2O_4$; (b) crystal structure of $CuCo_2O_4$. (Peaks from cubic $CuCo_2O_4$ and metal glycolates are marks with + and * respectively. So the precursors are mixtures of copper-cobalt oxide and copper-cobalt poly alcohol salts with or without GO); (c) Ramman spectra of GO, the I_D/I_G ratio of $CuCo_2O_4$/rGO composite is 0.9; (d) TGA patterns of porous $CuCo_2O_4$ nanocubes/rGO composite measured in the air.

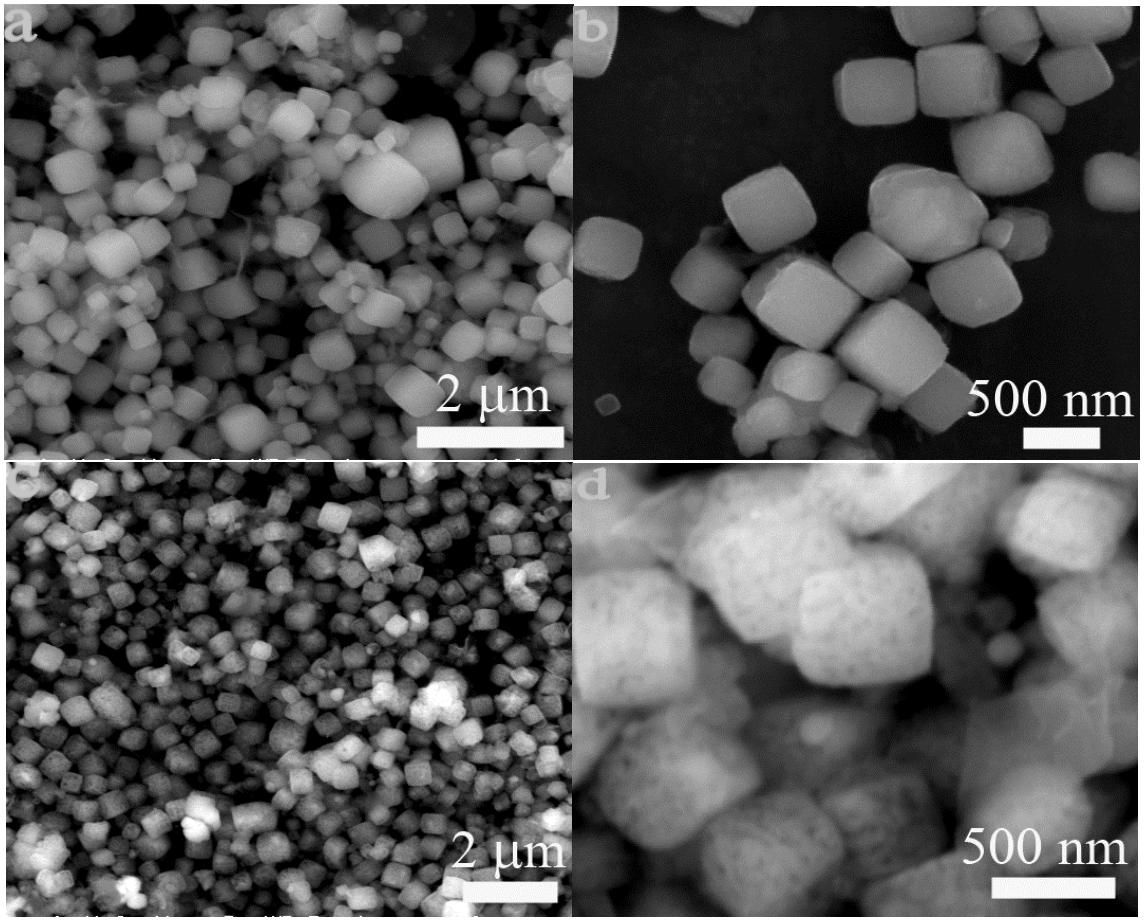

Fig. S2 SEM images of (a, b) $CuCo_2O_4$ precursors and (c, d) the pristine $CuCo_2O_4$ after calcination.

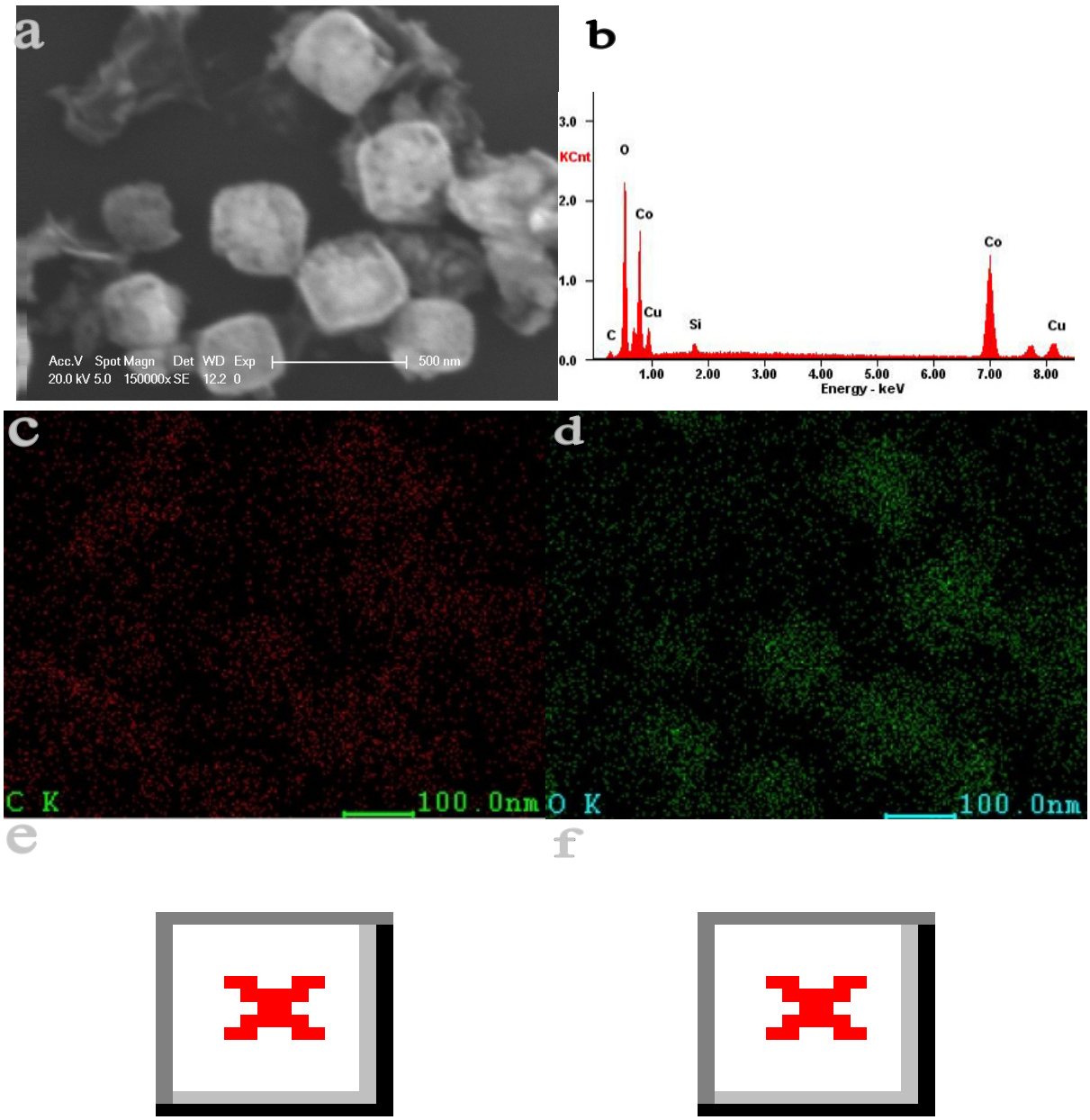

Fig. S3 (a) SEM image, (b) EDX spectrum (signal of Si is originated from the Si substrate), and (c) carbon, (d) oxygen, (e) cobalte, and (f) copper element mapping images of the $CuCo_2O_4$/rGO composite

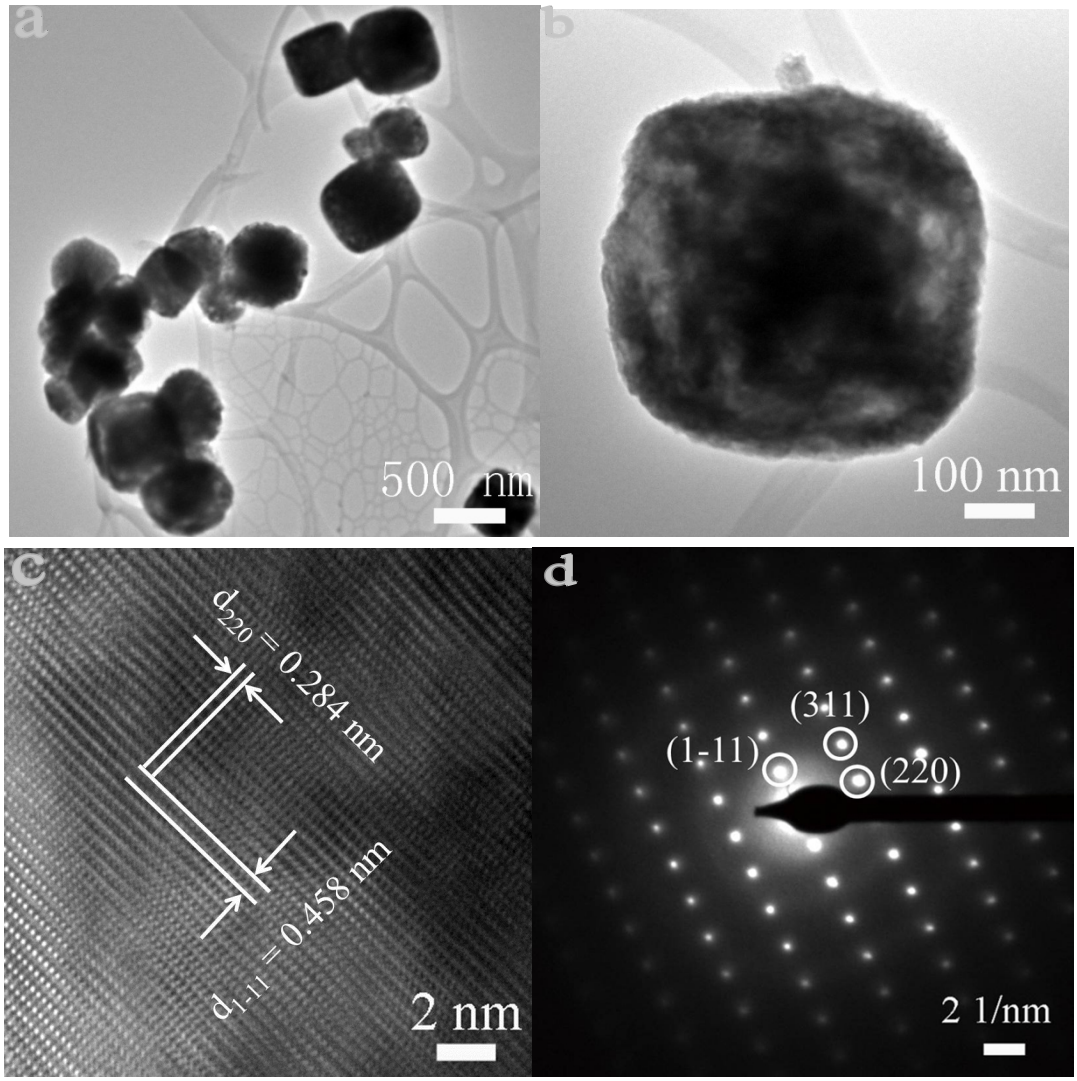

Fig. S4 a) and b)TEM image, c) HRTEM image, and d) SAED pattern of porous $CuCo_2O_4$ nanocubes.

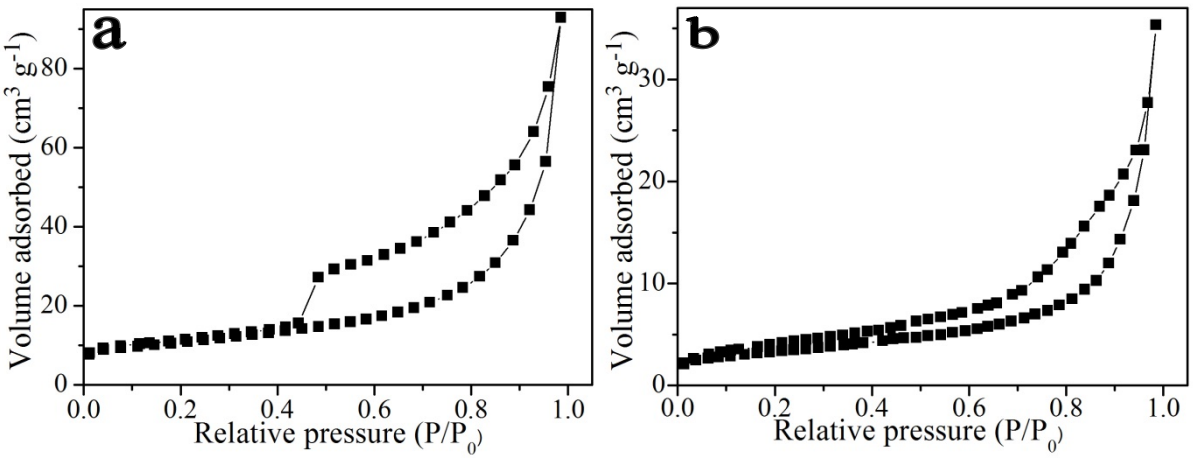

Fig. S5 N_2 adsorption-desorption isotherms of (a) $CuCo_2O_4$/GO composite and (b) pristine $CuCo_2O_4$.

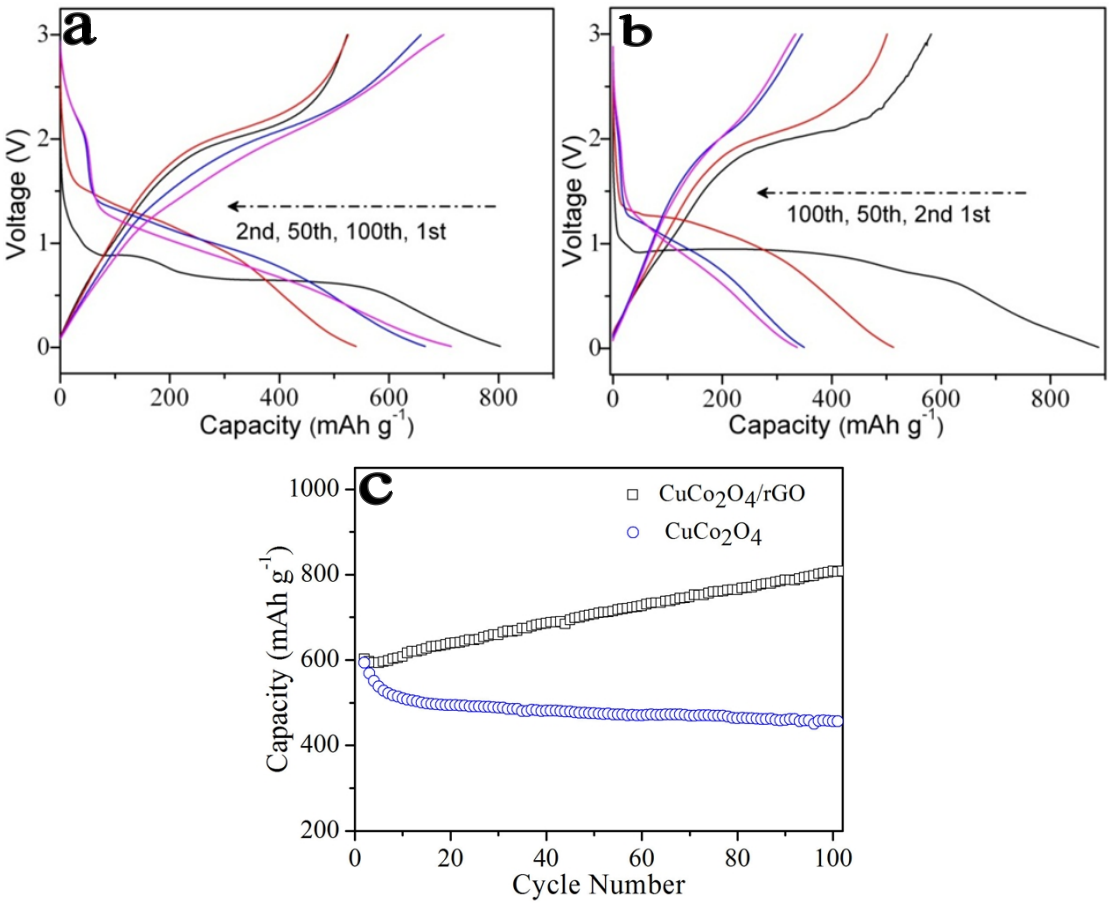

Fig. S6 Discharge-charge profiles of (a) $CuCo_2O_4$/rGO composite and (b) pristine $CuCo_2O_4$ electrodes at current density of 1 A g^{-1}; (c) Cycling performance at the current density of 0.2 A g^{-1}.

Tab. S1 A summary for the lithium storage capabilities of as-prepared porous $CuCo_2O_4$ nanocubes/rGO composite, and other Co-based binary metal oxide anode materials reported previously.

Material	Morphology	Residual capacity ($mAh\ g^{-1}$)	Current ($A\ g^{-1}$)	*Ref.*
$CuCo_2O_4$/GO	Porous cube	572.1/350th cycle	1.0	This
		471.7/350th cycle	2.0	work
		807.8/100th cycle	0.2	
$CuCo_2O_4$	Porous cube	298.1/350th cycle	1.0	This
		250.6/350th cycle	2.0	work
$CuCo_2O_4$	Nanoparticle	~750/50th cycle	0.06	19
		380/rate capability	0.75	
$CuCo_2O_4$	Nanoparticle	742/40th cycle	0.06	22
CuCo2O4	Porous structures	900/6th cycle	0.06	23
		246/rate capability	0.87	
$MnCo_2O_4$	Microspheres	610/100th cycle	0.4	17
$FeCo_2O_4$	Nanoparticle	~750/50th cycle	0.06	18
$MgCo_2O_4$	Nanorod	< 750/50th cycle	0.06	18
$ZnCo_2O_4$	Porous nanoflake	~750/50th cycle	0.08	38
Co_3O_4	Nanocages	864/50th cycle	~0.18	50
		450/rate capability	1.8	
Co_3O_4	Octahedron	714/50th cycle	1.0	51
	Cube	387/50th cycle		
Co_3O_4	Chrysanthemum-Like structures	~550/70th cycle	0.1	52