Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Oxygen Defects Engineering Endows Co_3O_4 Nanosheets with Advanced Aluminum Ions Storage

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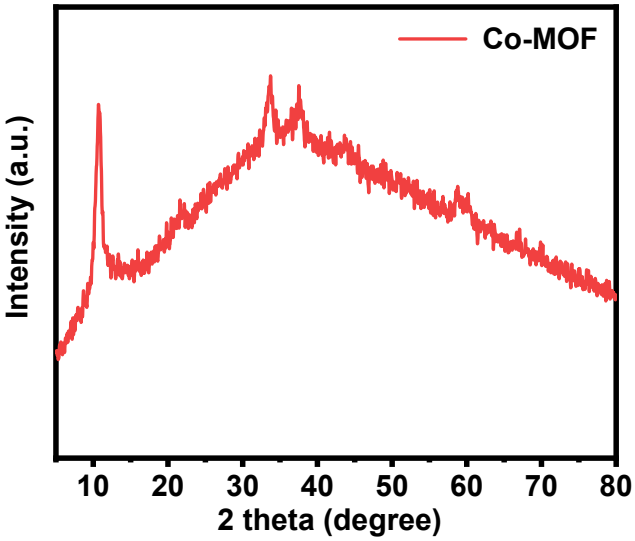

Figure S1. The XRD pattern of Co-MOF.

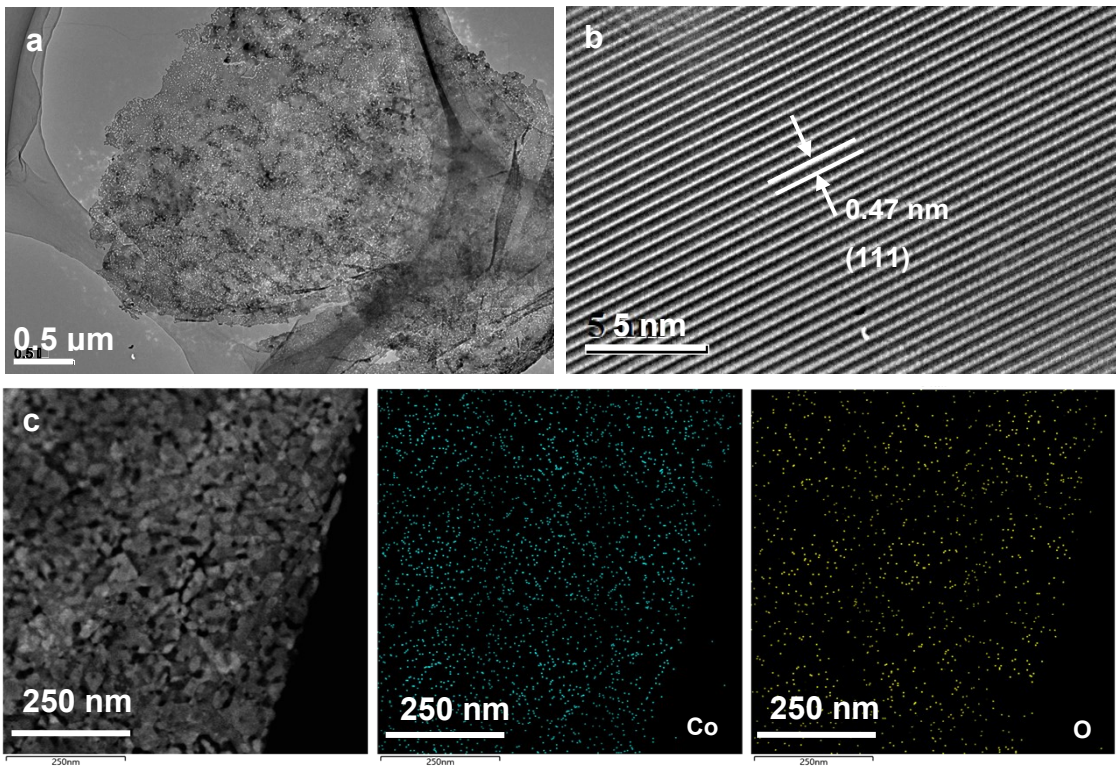

Figure S2. (a) TEM, and (b) HRTEM images of Co_3O_4. (c) Elemental mapping images of Co_3O_4.

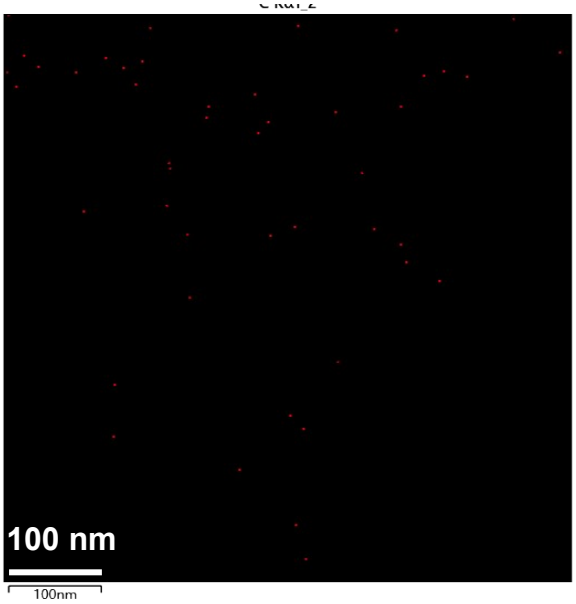

Figure S3. EDX elemental mapping image of carbon in Co_3O_{4-x}.

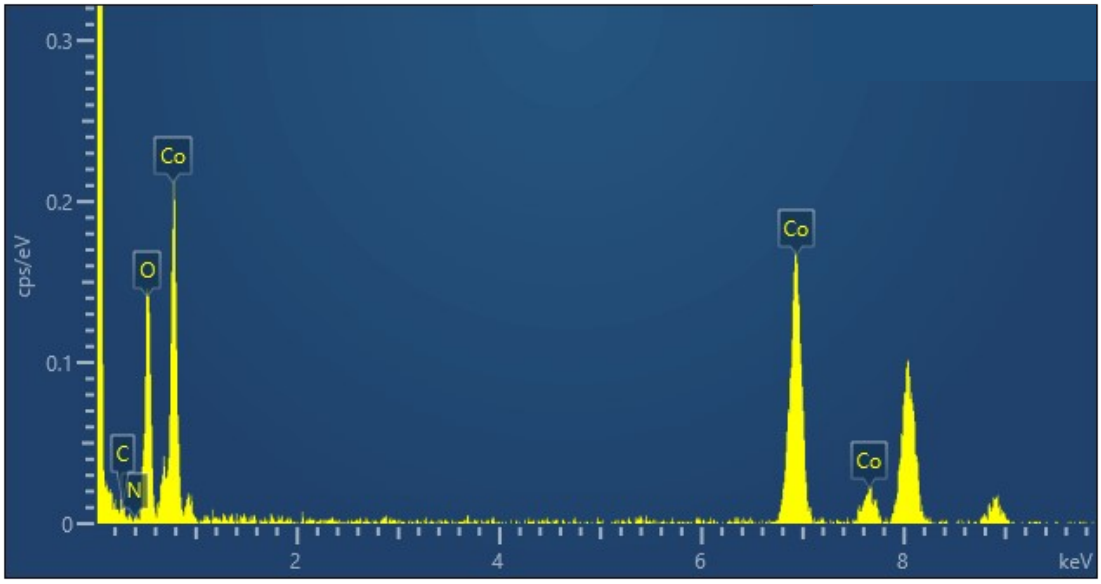

Figure S4. The EDS pattern of Co_3O_{4-x}.

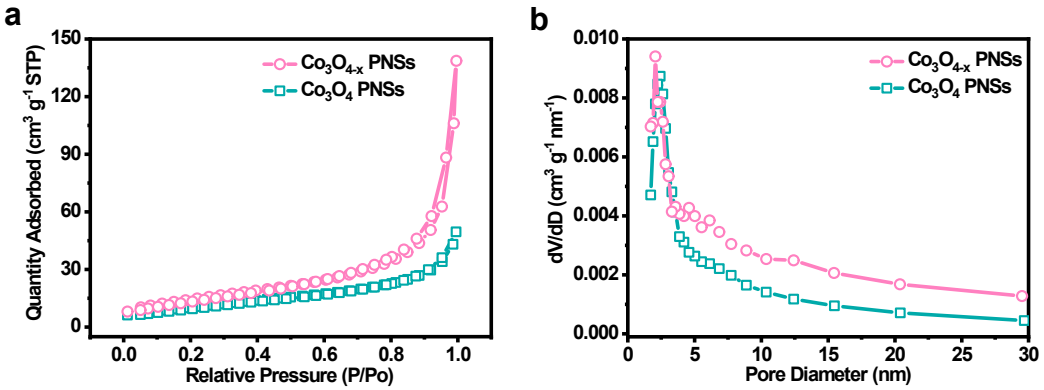

Figure S5. (a) N_2 adsorption–desorption isotherm and (b) the pore size distribution curve of the Co_3O_{4-x} and Co_3O_4 porous nanosheets.

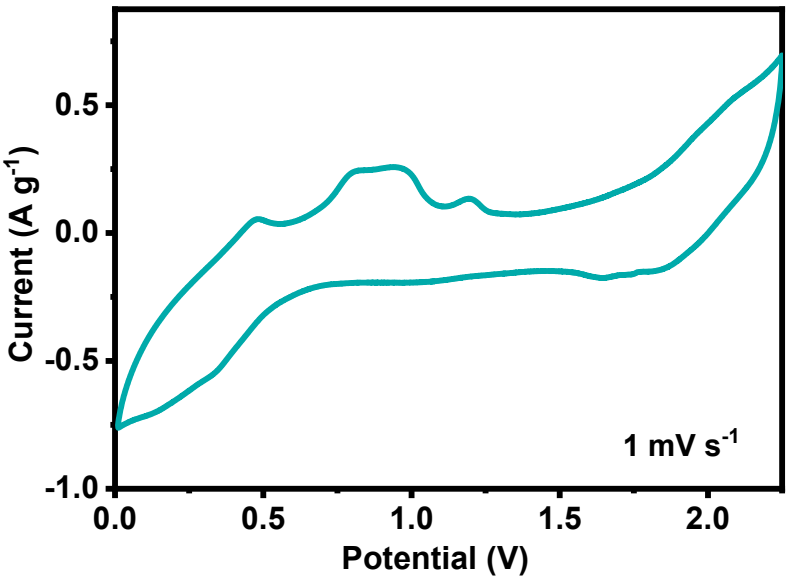

Figure S6. CV curve of Co_3O_4 obtained at a scanning rate of 1.0 mV s^{-1}

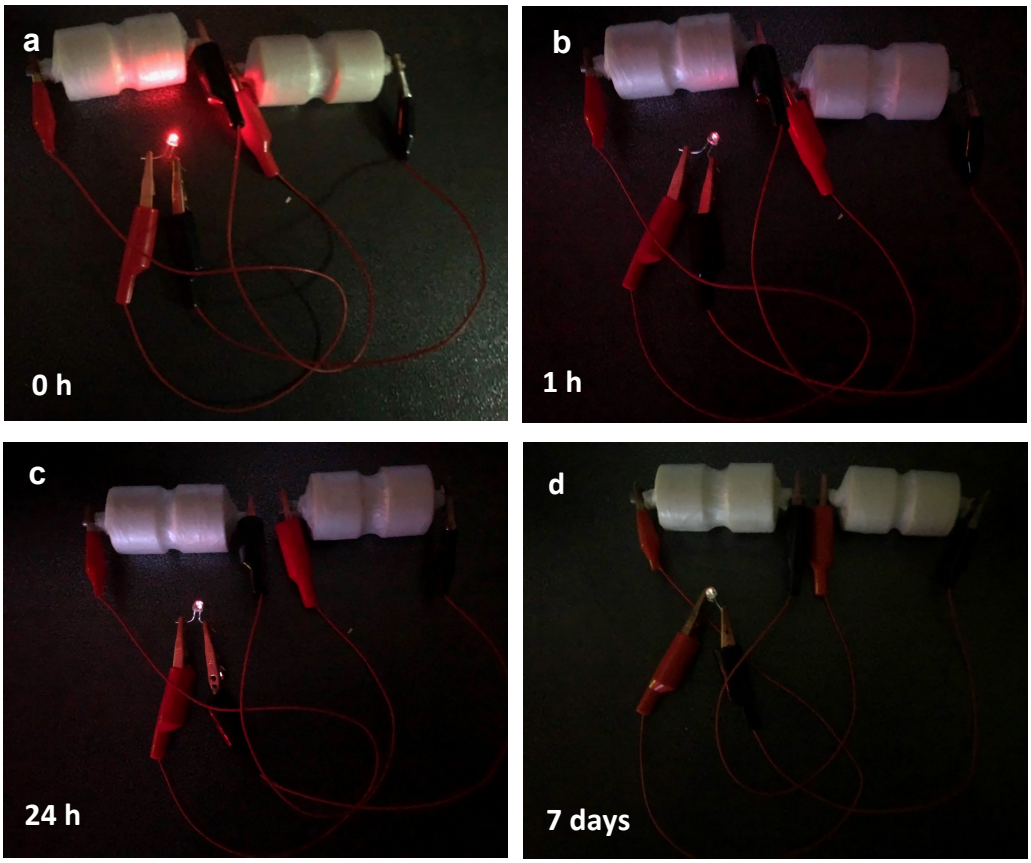

Figure S7. (a-d) The 3 V LED lamp lighted by two serially-connected Co_3O_{4-x}/Al.

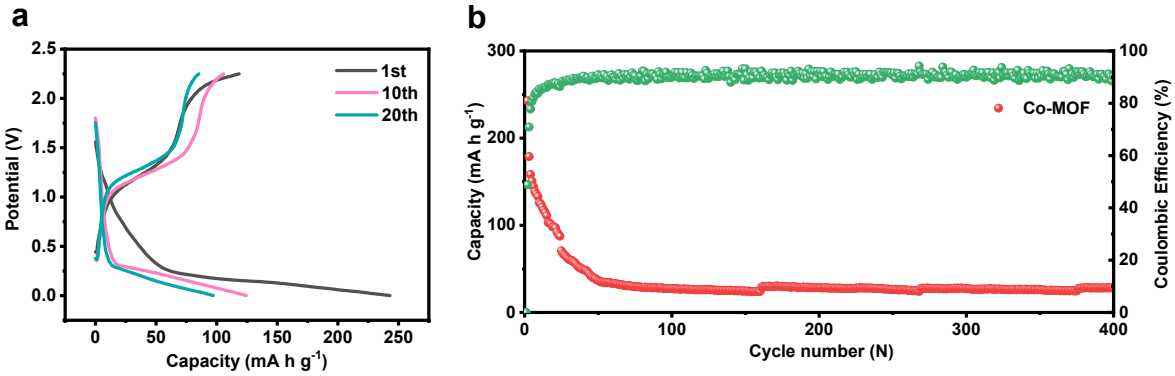

Figure S8. (a) The selected galvanostatic discharge–charge profiles and (b) cycling performance of the Co-MOF precursor at 1000 mA g^{-1}.

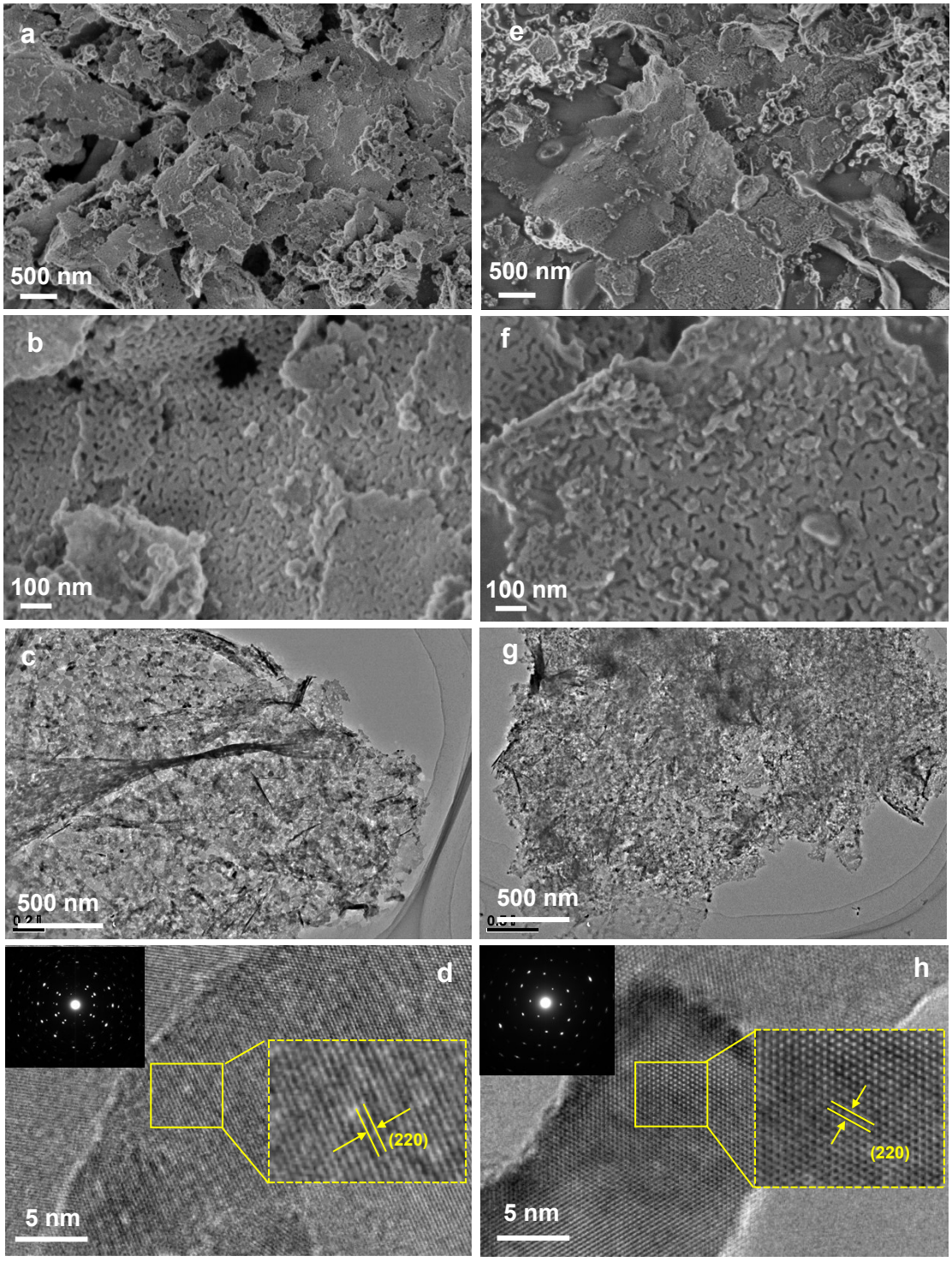

Figure S9. SEM, TEM, HRTEM, and SAED images of (a-d) discharged state and (e-h) charged state of Co_3O_{4-x} in the initial cycle.

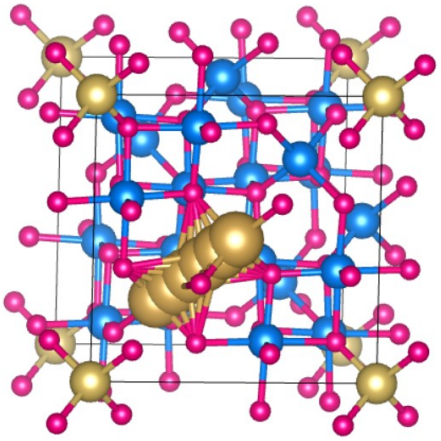

Figure S10. Migration path of Al^{3+} in Co_3O_4.

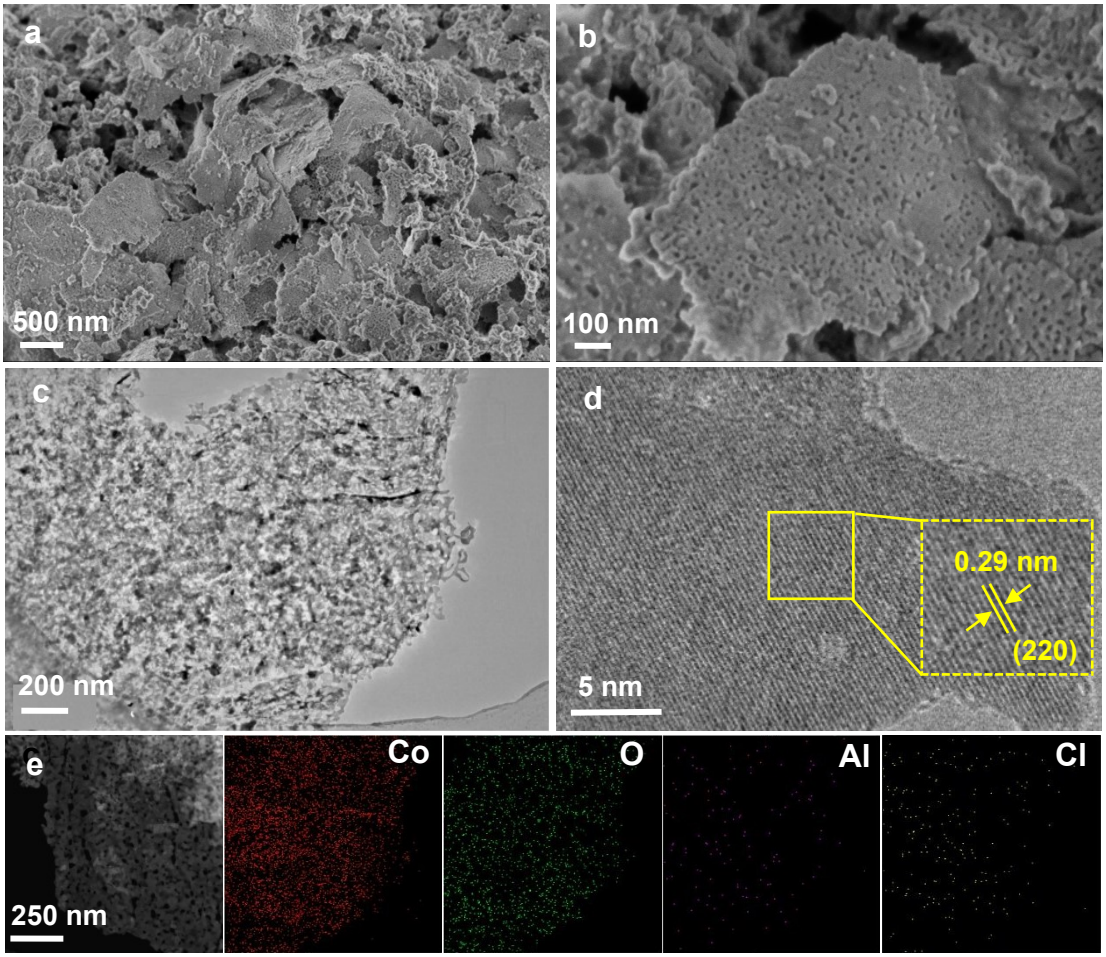

Figure S11. The microstructure of Co_3O_{4-x} cathode after 200 cycles. (a,b) SEM, (c) TEM, and (d) HRTEM images. (e) STEM-EDX elemental mapping images.

Table S1. Comparative electrochemical performance of y-s $Fe_{0.4}Co_{0.6}S$@NC with other cathode materials recently reported.

Cathode materials	Current Density (A g^{-1})	Cycle Number	Capacity (After Cycling) (mAh g^{-1})
This work	1	1800	104.2
WO_{3-x}[1]	0.1	100	~85
CuO[2]	0.2	100	112.65
Co_3O_4[3]	0.2	200	122.1
Co_3O_4@MWCNTs[4]	0.1	150	125
Nb_2O_5[5]	0.1	110	113
TiO_2[6]	0.05	50	~37
V_2O_5[7]	2	50	~60
δ-MnO_2[8]	0.05	140	~34
TeO_2[9]	0.5	700	91.1
h-MoO_3[10]	0.1	100	~100

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