Supporting Information for

In Situ Integrating CoFe Alloy Nanoparticles with Nitrogen-doped Carbon Nanotubes as Advanced Bifunctional Cathode Catalysts for Zn-air Battery

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Supplementary Figures:

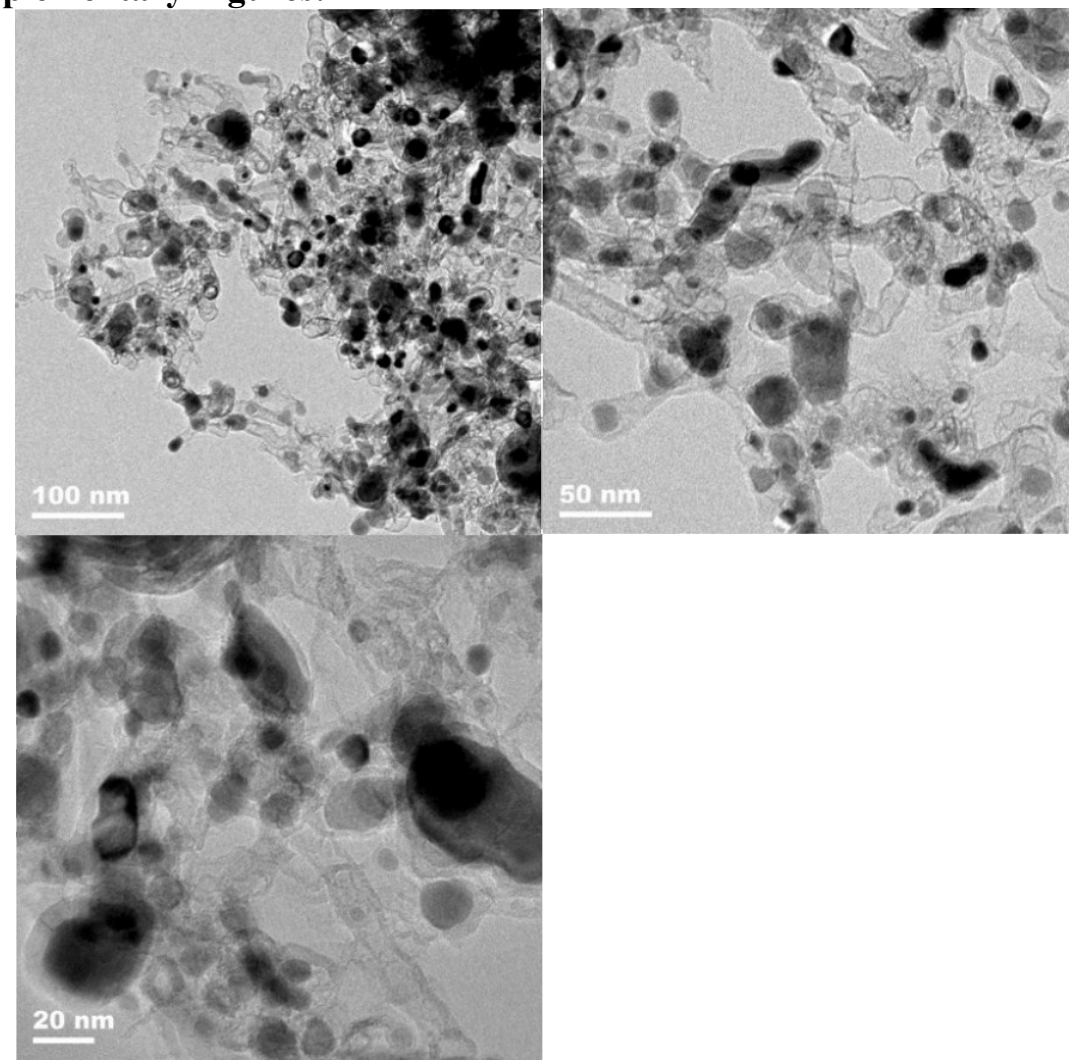

Fig. S1 TEM images of CoFe@NCNTs at different magnification.

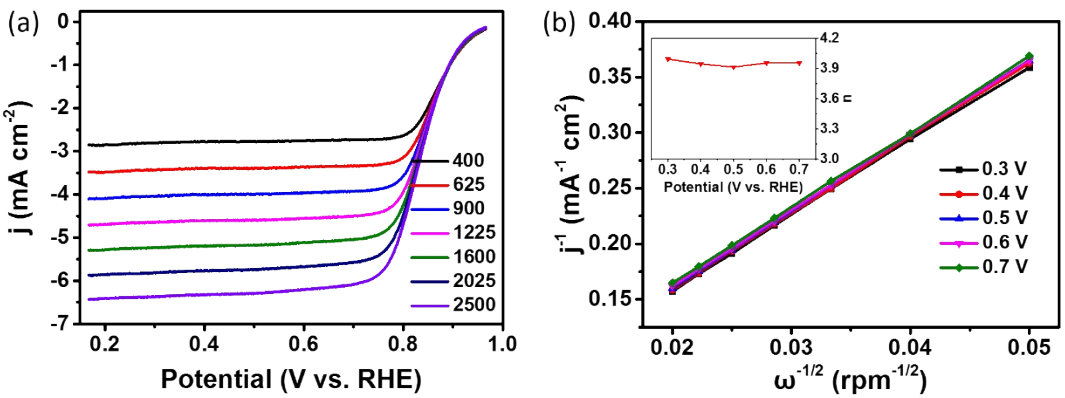

Fig. S2 a) LSV curves at different rotating speed; b) K-L plots and (inset) corresponding electro transfer number of 20% Pt/C.

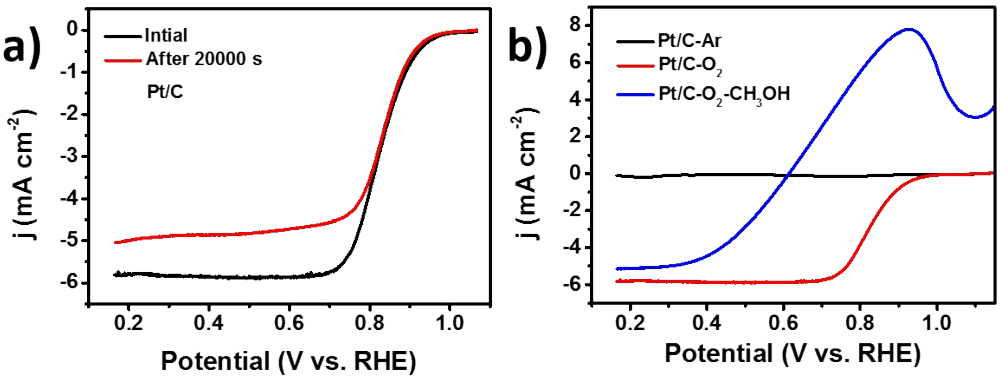

Fig. S3 a) Polarization curves collected before and after stability test for Pt/C; b) Polarization curves upon addition of 3 M methanol into O_2-saturated 0.1 M KOH for Pt/C.

Supplementary Tables:

Table S1. Element compositions of the samples.

Samples	C	N	O	Fe	Co
CoFe@NCNTs	82.11	4.62	9.41	1.73	2.13
Co@NCNTs	91.26	2.03	5.96	/	0.75
Fe@NCNTs	49.93	19.48	22.71	7.89	/

Table S2. Comparison of the ORR activity for outstanding catalysts reported up to date in 0.1 M KOH.

Catalyst	Half-wave potential	Diffusion limited current	Electron-transfer number	Reference
P-CNCo-20	0.84 V	5.1 mA cm^{-2}	3.9	S1
LDH@ZIF-67-800	0.83 V	5.5 mA cm^{-2}	3.86-3.98	S2
N-Co_9S_8/G	N/A	N/A	3.7-3.9	S3
Co@Co_3O_4@C-CM	0.81 V	N/A	3.8-3.9	S4
Co/NG	N/A	8.0 mA cm^{-2}	3.8	S5
Co-C@Co_9S_8 DSNCs	N/A	N/A	3.8	S6
Carbon-L	0.70 V	4.6 mA cm^{-2}	3.68	S7
Z8-Te-1000	0.80 V	N/A	~4.0	S8
GNPCSs-800	N/A	6 mA cm^{-2}	3.78-3.98	S9
Co, N-CNF	0.81 V	5.7 mA cm^{-2}	3.8	S10
CoFe@NCNTs	0.84 V	5.5 mA cm^{-2}	3.85~3.97	This work

Table S3. The performance of rechargeable Zn-air batteries with various electrocatalysts.

Catalysts	Loading (mg cm^{-2})	Voltage @ 10 mA cm^{-2} (V)	Peak power density (mW cm^{-2})	Specific capacitance (mAh g^{-1})	Reference
N/P co-doped carbon foam	0.5	1.17	55	735	S11
Ag-Cu on nickel foam	0.8	1.2	85.8	572	S12
MoO_x electrodeposited on stainless steel	0.3	0.81	27	/	S13
Co3O4 nanowires grown on stainless steel mesh	/	~1.1	40	/	S14
B/N co-doped porous carbon	3	~0.9	14.6	/	S15
CoO/NCNT+NiFe LDH/Ni	1+5	1.3	265	570	S16
NCNT/CoO-NiO-NiCo	0.53	~1.2	/	594	S17
NCNF	2	1.2	185	660	S18
CoFe@NCNTs	1	1.25	150	808	This work

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