SUPPORTING INFORMATION

Nanostructure engineering of metal organic derived frameworks: Cobalt phosphide embedded carbon nanotubes as an efficient ORR catalyst

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1. Figures and Tables

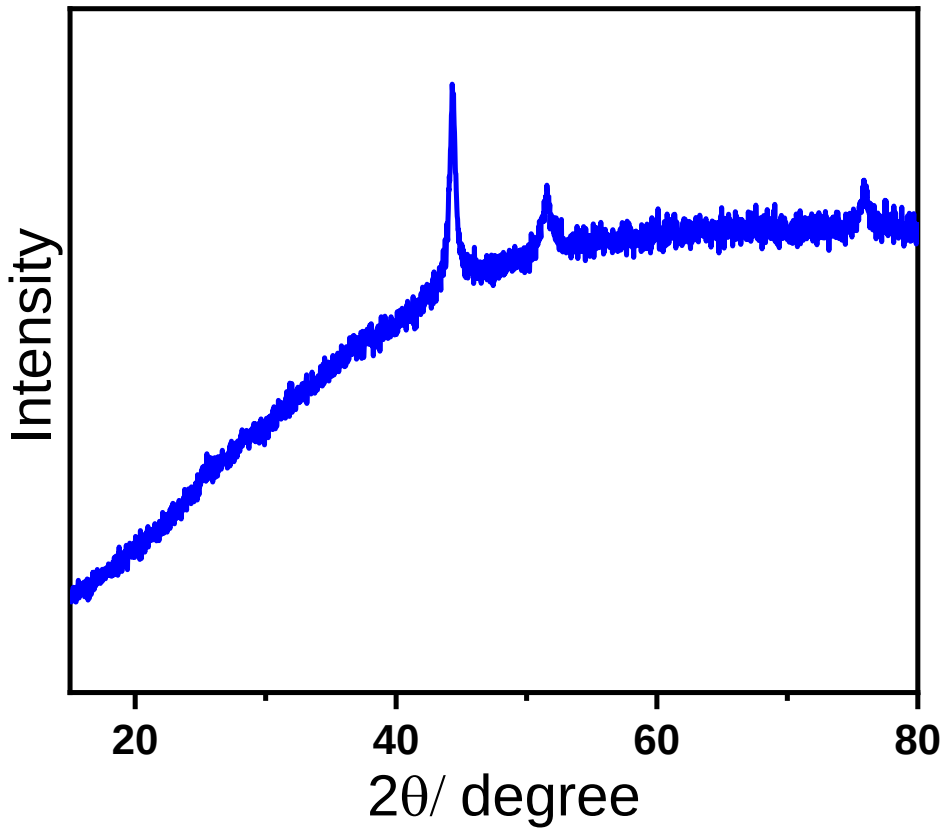

Figure S1: XRD pattern of Co-NC.

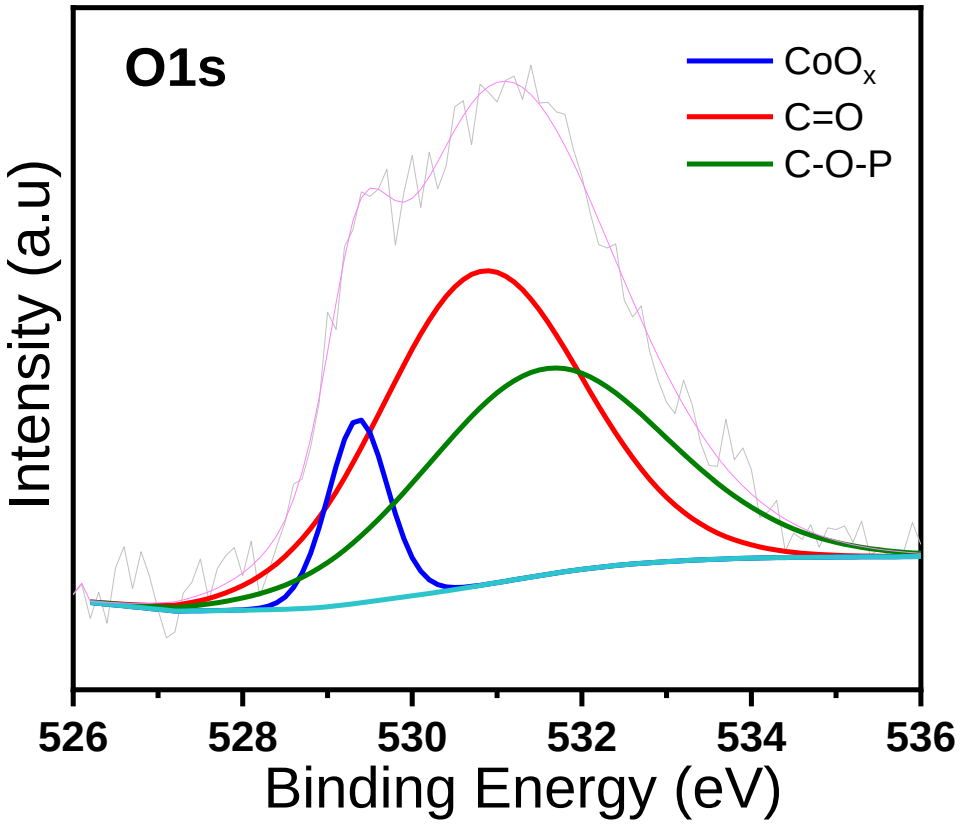

Figure S2: High resolution O1s XPS analysis of P-Co-CNTs.

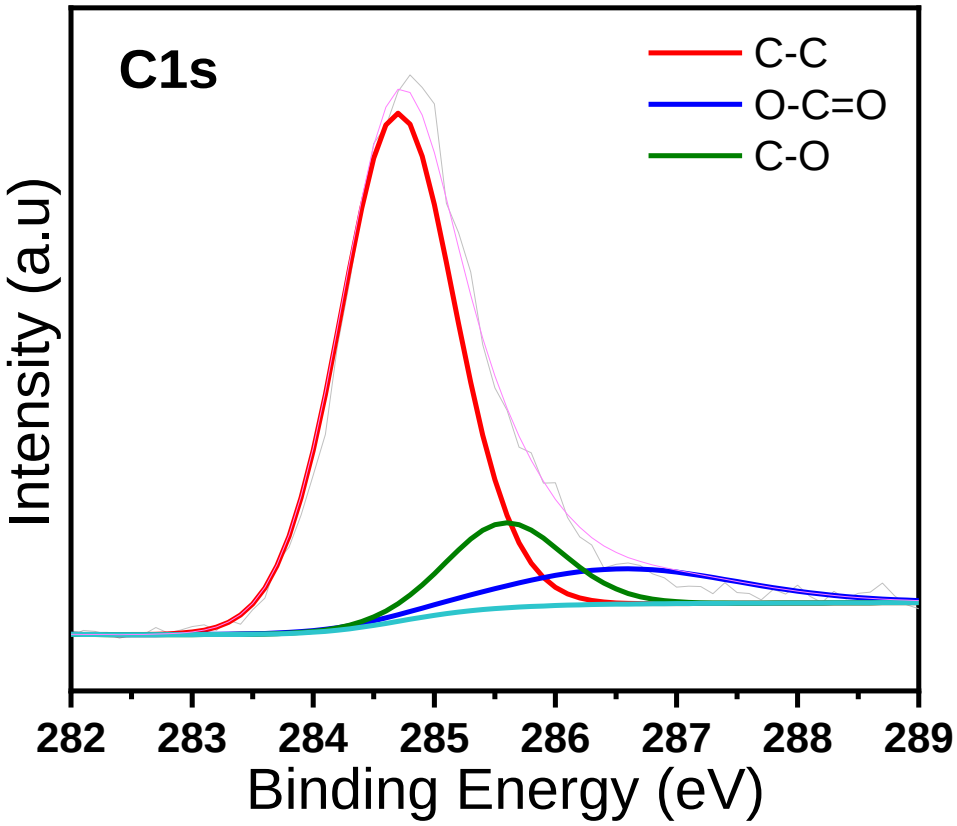

Figure S3: High resolution C1s XPS analysis of P-Co-CNTs.

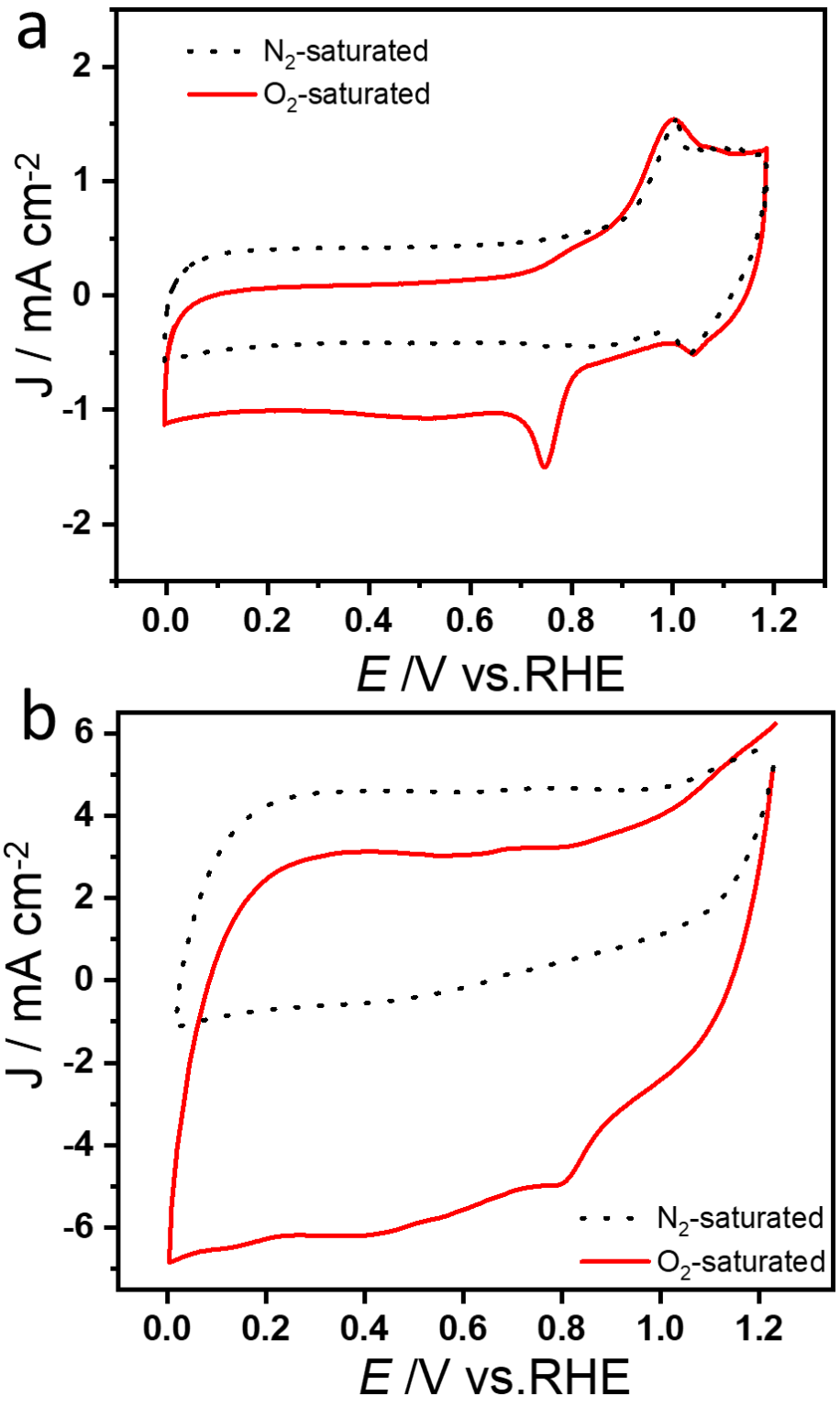

Figure S4: CV curves conducted under N_2 and O_2 saturated 0.1 M KOH solution; a) Co-CNTs, b) P-Co-CNTs.

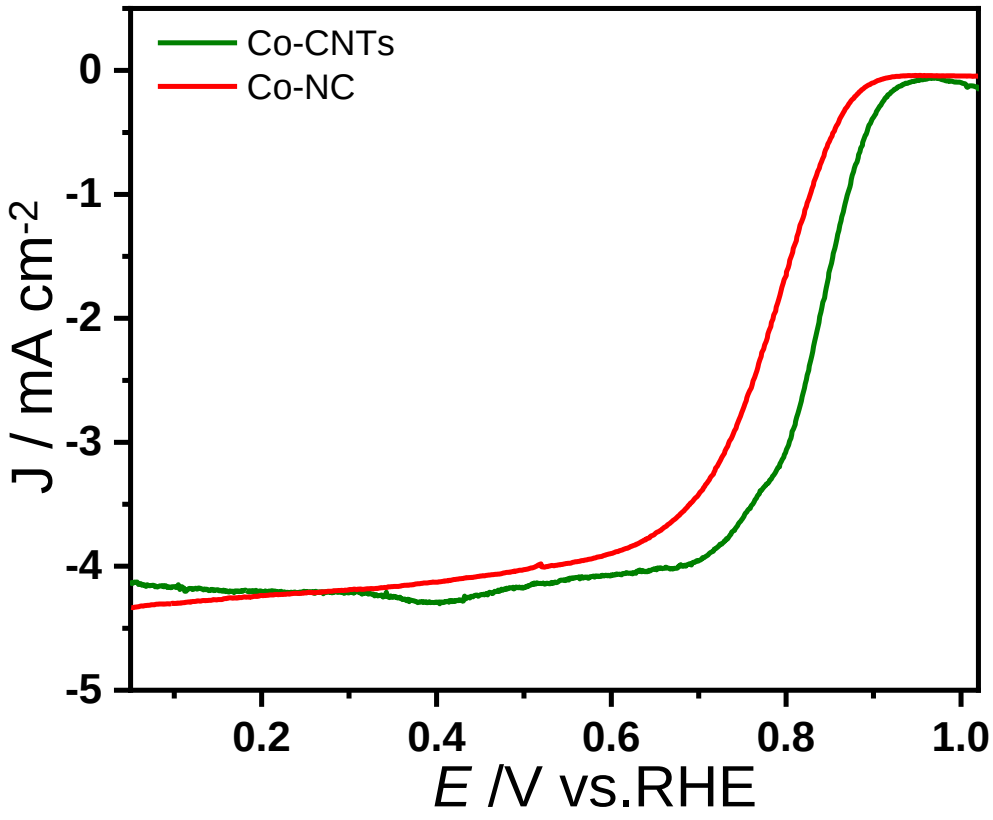

Figure S5: ORR-LSV curves conducted under O_2 saturated 0.1 M KOH solution.

Table S1. Elemental contents of P-Co-CNTs determined by XPS spectra.

C (*atm%*)	**N** (*atm%*)	**O** (*atm%*)	**P** (*atm%*)	**Co** (*atm%*)
91. 07	2. 16	3. 64	1. 61	1. 52

Table S2: Comparative study of ORR performance of the as-synthesized catalyst with reported catalysts under 0.1 M KOH solution vs. RHE.

Catalyst	**$E_{1/2}$ (V)**	**References**
P-Co-CNTs	*0.887*	*This work*
Co-N-C	0.87	[1]
Fe-N-C	0.88	[2]
$Co_{0.85}Se$@NC	0.817	[3]
Fe-N-C	0.86	[4]
NS/rGO-Co_4	0.84	[5]
Fe, Co–NC	0.85	[6]
Co_3O_4 /NCMTs	0.778	[7]
Co/N–PC	0.871	[8]
Co-N-C /PC	0.88	[9]
Co_9S_8/NC	0.82	[10]
CF-NG-Co	0.85	[11]
Co/N-PC	0.82	[12]
Co/N-C-800	0.74	[13]
CNT/N-PC	0.88	[14]
$CoS_{1.097}$–PC	0.81	[15]
CoS_2(400)/N,S-GO	0.79	[16]
Co/Co_3O_4-C	0.8	[17]

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