

MOF derived Co-NC@CNTs composite with 3D interconnected conductive carbon network as highly efficient cathode catalysts for Li-O₂ batteries

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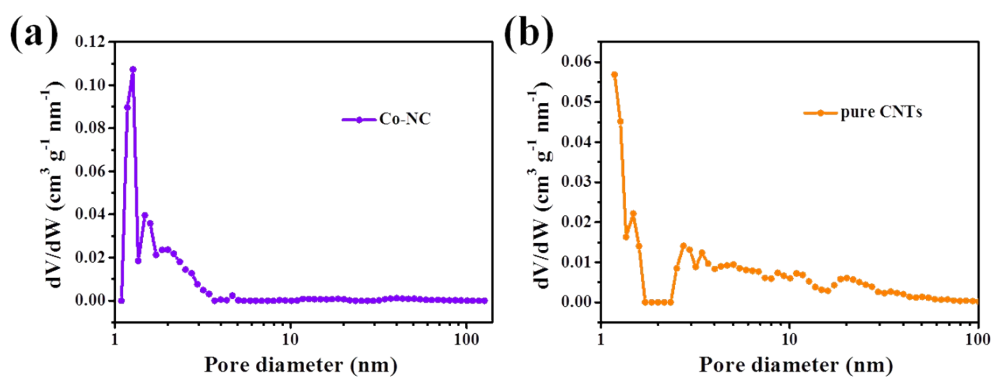


Fig. S1. Pore size distribution of the (a) Co-NCs and (b) CNTs.

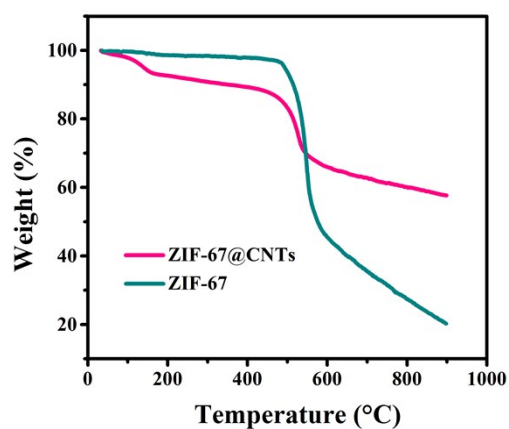


Fig. S2. TGA curves of ZIF-67@CNT and pristine ZIF-67 materials measured during heating at a ramp rate of $10\text{ }^{\circ}\text{C min}^{-1}$ in N_2 . The decomposition temperature of ZIF-67 is $\sim 485\text{ }^{\circ}\text{C}$.

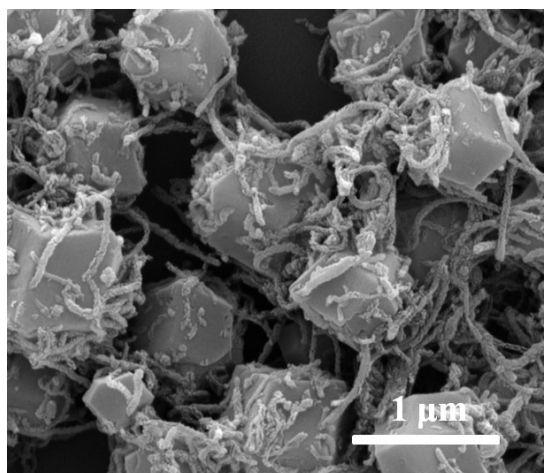


Fig. S3. SEM images of ZIF-67@CNTs.

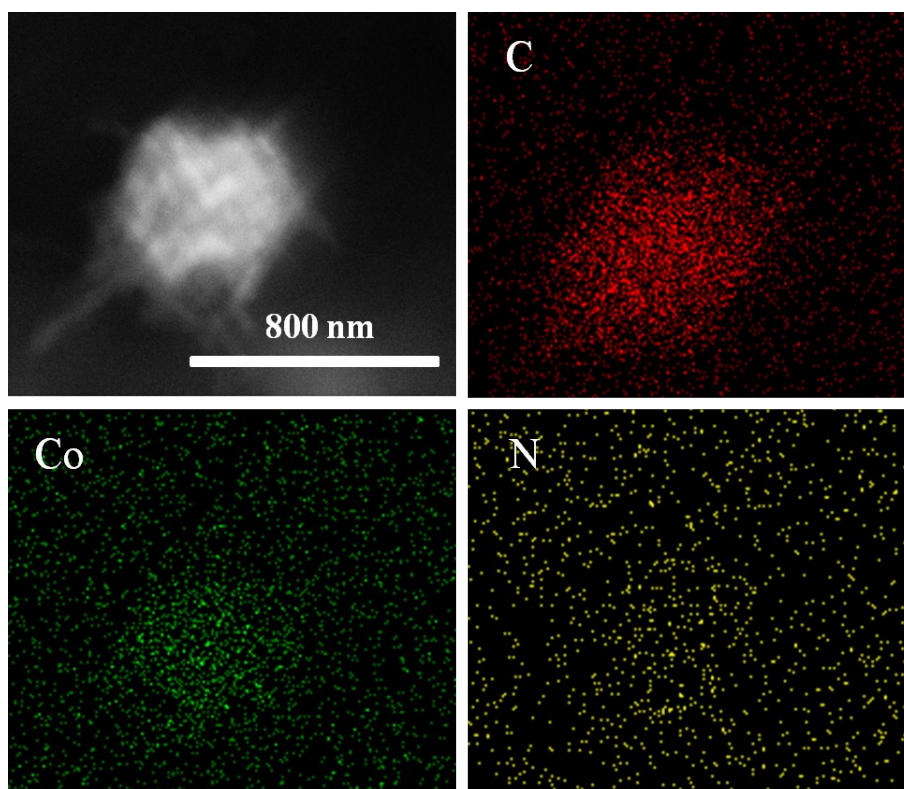


Fig. S4. EDX mapping images of Co-NC@CNTs.

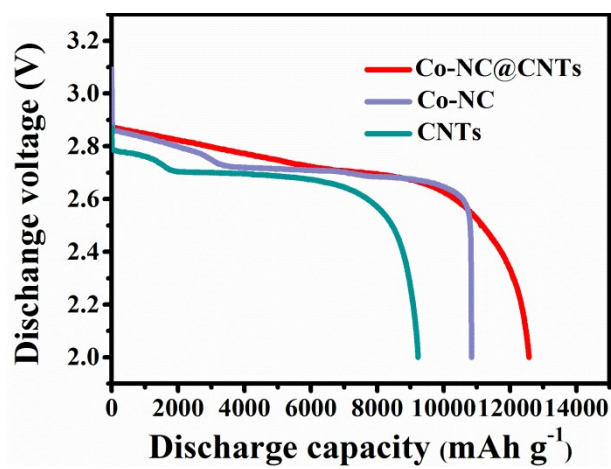


Fig. S5. First discharge curves of Li-O₂ batteries with Co-NC@CNTs, Co-NC and pure CNTs cathodes at a current density of 200 mA g⁻¹.

Table S1. Comparison of the performance of CNT-based electrodes between this work and some reported catalytic cathodes for Li-O₂ batteries

Catalysts	Current density (mA g ⁻¹)	Discharge capacity (mAh g ⁻¹)	Cycle number (current density cut-off capacity)		Ref.
Co-NC@CNTs	200	12572.2	146	250 mA g ⁻¹ 500 mAh g ⁻¹	This work
50% α -MnO ₂ /MWCNTs	200	5792	90	200 mA g ⁻¹ 1000 mAh g ⁻¹	[1]
MoO _x /CNT	100	8100	210	1000 mAh g ⁻¹	[2]
CNT@Ni@NiCo silicate	200	10046	54	150 mA g ⁻¹ 1000 mAh g ⁻¹	[3]
Co ₂ P/Ru/CNT	100	18048	185	100 mA g ⁻¹ 1000 mAh g ⁻¹	[4]
0.5 M Co ₄ N/CNT	250	3312	80	250 mA g ⁻¹ 500 mAh g ⁻¹	[5]
IrO ₂ -N/CNTs	100	6839	160	200 mA g ⁻¹ 600 mAh g ⁻¹	[6]
oxidized CNTs	/	/	57	100 mA g ⁻¹ 500 mAh g ⁻¹	[7]
Ru/RuO _x @CNTs	0.1 mA cm ⁻²	3795	113	0.1 mA cm ⁻¹ 500 mAh g ⁻¹	[8]
CoS ₂ /CNTs	0.05 mA cm ⁻²	2718.7	52	0.05 mA cm ⁻² 500 mAh g ⁻¹	[9]
RuO ₂ /buckypaper (CNTs)	0.4 mA cm ⁻²	4.72 mAh cm ⁻²	50 at least	0.4 mA cm ⁻² 1.0 mAh cm ⁻²	[10]
Fe/Fe ₃ C@NG-NCNTs	0.1 mA cm ⁻²	6966	37	0.1 mA cm ⁻² 500 mAh g ⁻¹	[11]

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