

Supporting Information

Constructing Conductive Channels between Platinum Nanoparticles and Graphite Carbon Nitride by Gamma Irradiation for Enhanced Oxygen Reduction Reaction

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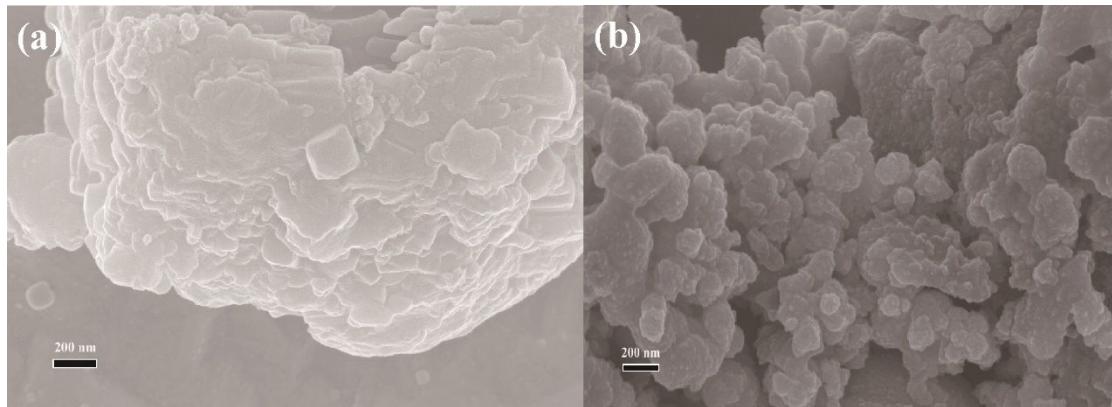


Figure S1. SEM image of (a) g-C₃N₄ and (b) CN/Pt-140.

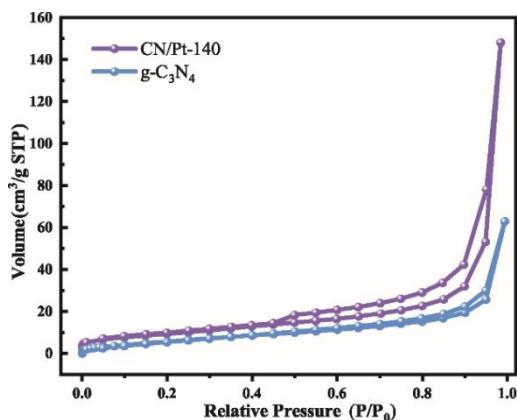


Figure S2. (a) N₂ adsorption and desorption curves of g-C₃N₄ and CN/Pt-140;

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Table S1. Elemental composition (wt%) obtained from EDS analysis of g-C₃N₄, CN/Pt-20, CN/Pt-60, CN/Pt-100,

CN/Pt-140 and CN/Pt-180.

Composite(%)	g-C ₃ N ₄	CN/Pt-20	CN/Pt-60	CN/Pt-100	CN/Pt-140	CN/Pt-180
N K	57.3	45.62	41.55	33.76	38.34	40.49
Pt L	---	1.43	9.93	11.58	12.78	15.28
C K	42.7	52.95	48.52	54.56	48.88	44.23

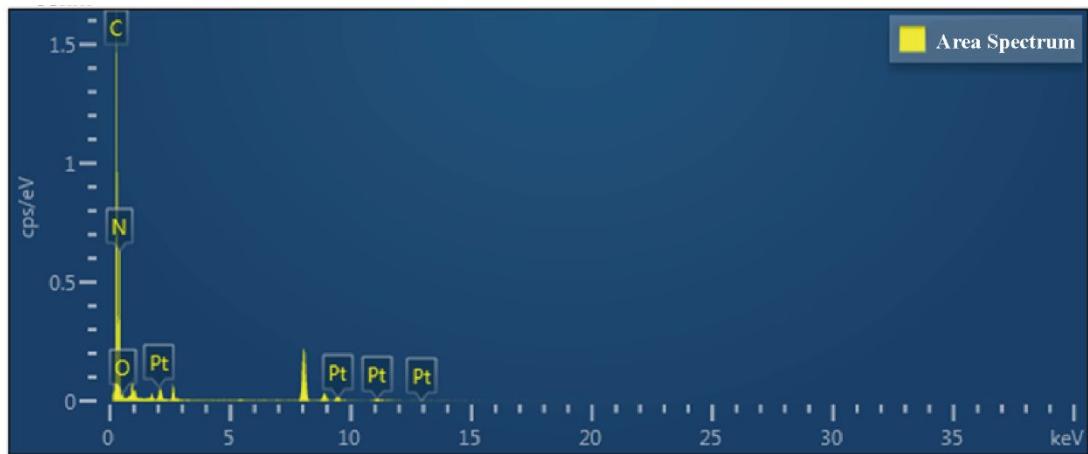


Figure S3. EDS area spectrum of CN/Pt-140.

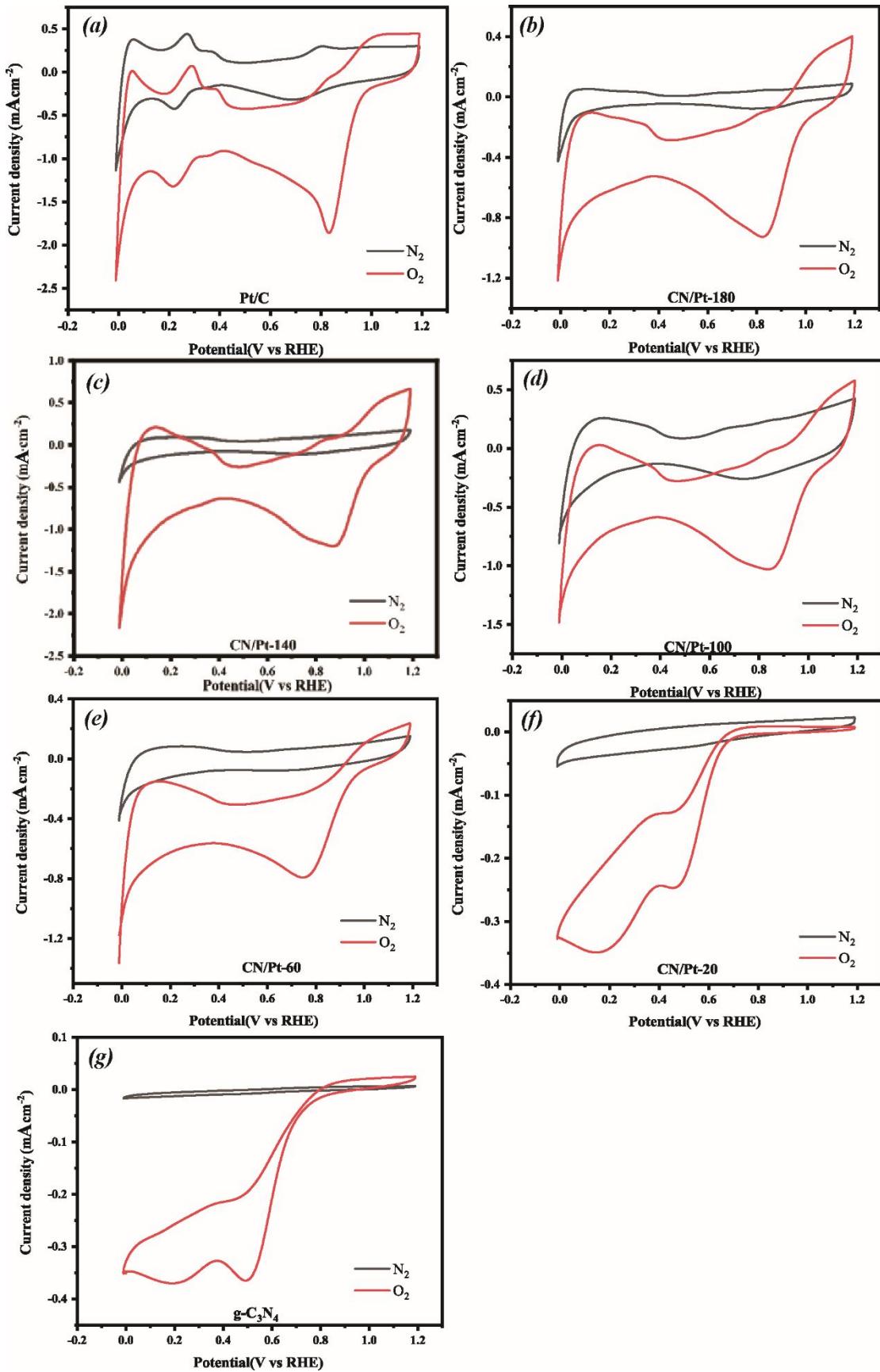


Figure S4. CV profiles of the commercial Pt/C (a), CN/Pt-180(b), CN/Pt-140(c), CN/Pt-100(d), CN/Pt-60(e), CN/Pt-20 (f) and g-C₃N₄ (g) in O₂ (red curve) and N₂ (black curve) saturated 0.1 M KOH solution.

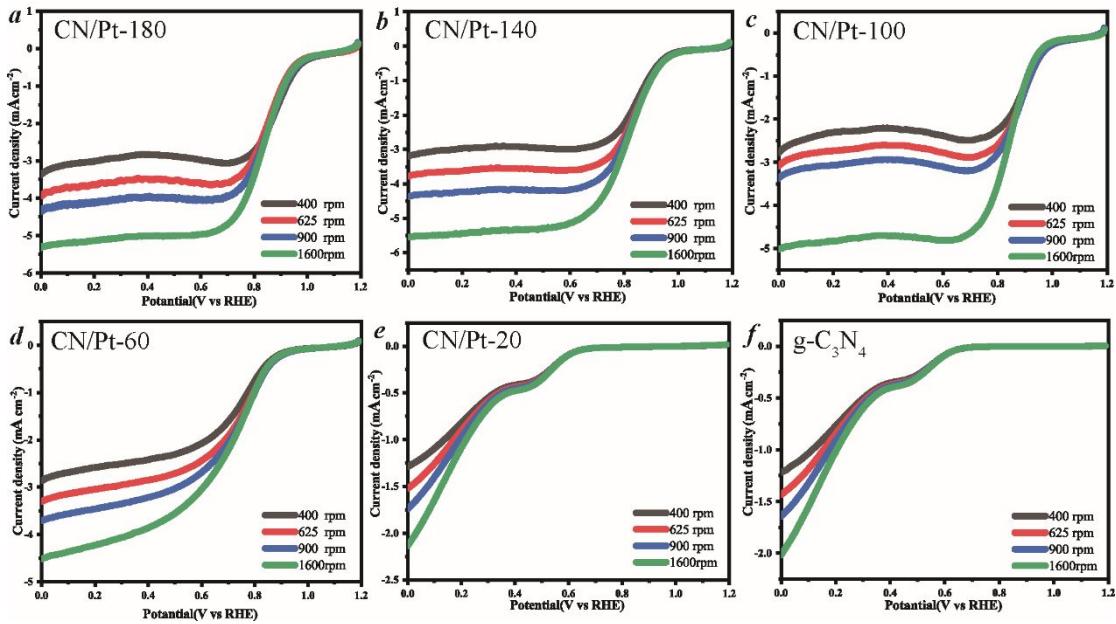


Figure S5. LSV curves at different rpm of CN/Pt-180 (a), CN/Pt-140 (b), CN/Pt-100 (c), CN/Pt-60 (d), CN/Pt-20 (e), and (f) g-C₃N₄.

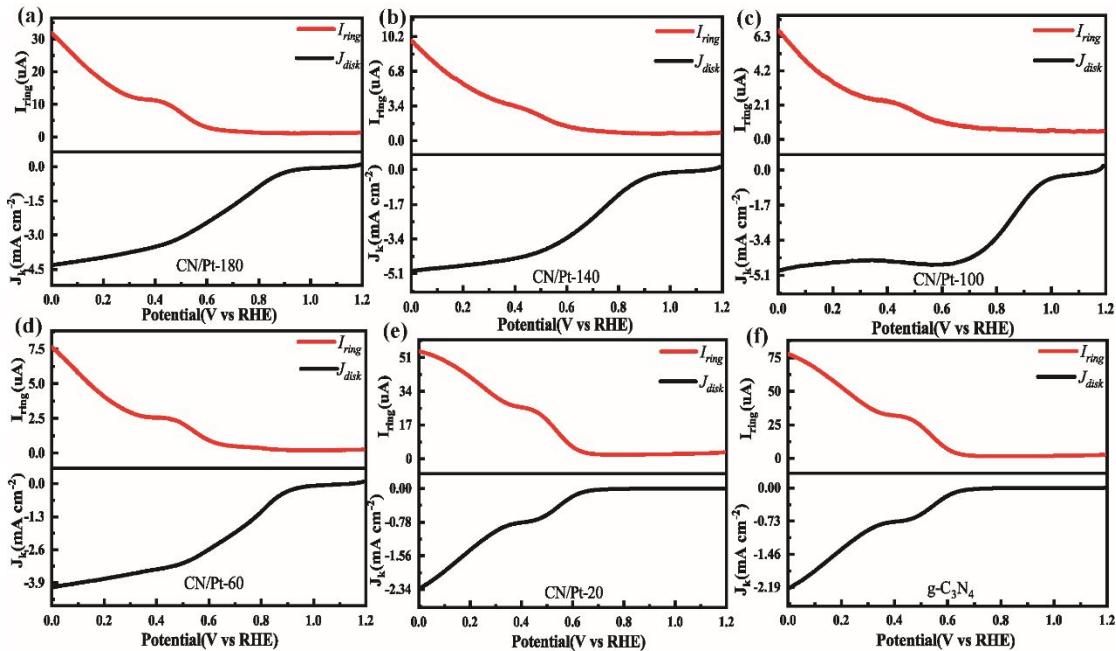


Figure S6. RRDE voltammograms of CN/Pt-180 (a), CN/Pt-140 (b), CN/Pt-100 (c), CN/Pt-60 (d), CN/Pt-20 (e)

and (f) g-C₃N₄.

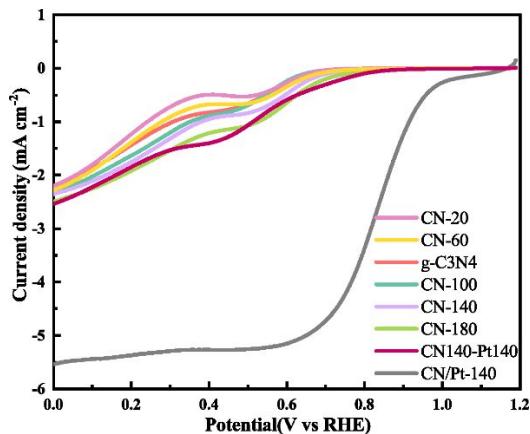


Figure S7. LSV curves of $\text{g-C}_3\text{N}_4$, CN-20, CN-60, CN-100, CN-140, CN-180, CN140-Pt140 and CN/Pt-140 in O_2

saturated 0.1 M KOH solution at a scanning speed of 1600 rpm.

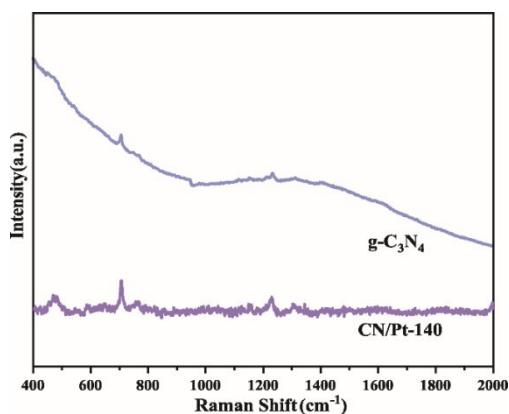


Figure S8. Raman pattern of $\text{g-C}_3\text{N}_4$ and CN/Pt-140.

Table S2. Comparison of electrocatalytic activities of CN/Pt with state-of-the-art catalysts.

Catalyst	$E_{\text{onset potential}}$ (V vs RHE)	$E_{\text{half-wave}} \text{ potential}$ (V vs RHE)	Catalyst loading (mg·cm⁻²)	Electrolyte	Ref.
CN/Pt-140	0.950	0.827	0.102	0.1M KOH	This work
CN/Pt-180	0.943	0.796	0.102	0.1M KOH	This work
CN/Pt-100	0.940	0.805	0.102	0.1M KOH	This work
Co-C ₃ N ₄ /C	0.950	---	0.610	0.1M KOH	¹
Co-C ₃ N ₄ /CNT	0.900	0.850	0.800	0.1M KOH	²
g-C ₃ N ₄ and Ti ₃ C ₂	0.800	0.820	0.210	0.1M KOH	³
Au ₁ N _x -CN	0.830	0.760	0.357	0.1M KOH	⁴
NGS4-900	0.980	0.850	0.407	0.1M KOH	⁵
g-C ₃ N ₄ /rGO	0.810	0.689	0.300	0.1M KOH	⁶

3D-P, S-CNS	0.970	0.870	0.150	0.1M KOH	7
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References

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