Fe/N-doped Carbon Nanofibers with Fe₃O₄/Fe₂C Nanocrystals

Enchased as Electrocatalyst for Efficient Oxygen Reduction reaction

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**Fig. S1** Assembly process of UPC-CMP-2 structure and photographs of UPC-CMP-2 and Fe₃O₄/Fe₂C@Fe/N/C-800 powders.
Fig. S2 Low magnification and high resolution TEM images of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-600.
Fig. S3 Low magnification and high resolution TEM images of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-700.
Fig. S4 Low magnification and high resolution TEM images of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-900.
Fig. S5 Survey XPS spectra of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-600, 700, 800 and 900.
Fig. S6 CV curves of Fe₃O₄/Fe₃C@Fe/N/C-600, 700, 800 and 900 in N₂ and O₂-saturated 0.1 M KOH–H₂O electrolyte.
Fig. S7 LSV curves of (a) N/C-800, Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 before (b) and after (c) HCl treatment.
Fig. S8 XRD patterns of Fe₃O₄/Fe₂C@Fe/N/C-800 before and after HCl treatment.
Fig. S9 TEM images of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 after HCl treatment.
**Fig. S10** LSV curves of Fe₃O₄/Fe₂C@Fe/N/C-600 at different rotation rates.
Fig. S11 LSV curves of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-700 at different rotation rates.
Fig. S12 LSV curves of $\text{Fe}_3\text{O}_4/\text{Fe}_2\text{C}@\text{Fe}/\text{N}/\text{C}$-900 at different rotation rates.
Fig. S13 Nyquist plots of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 and 20 % Pt/C recorded at 1.79 V vs. RHE.
Fig. S14 (a) RRDE test of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 and (b) corresponding H$_2$O$_2$ production yields and the number of electrons transferred.
Fig. S15 TEM images of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 after 10 h chronoamperometric test.
Fig. S16 XPS spectra of (a) Fe 2p$_{3/2}$, (b) N 1s, and (c) C 1s of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 after 10 h chronoamperometric test.
Fig. S17 LSVs of (a) Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 before and after the addition of 0.01 M KSCN in 0.5 M H$_2$SO$_4$–H$_2$O electrolyte at 1600 rpm and (b) SCN$^-$ poisoned Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 in 0.1 M KOH–H$_2$O electrolyte.
Fig. S18 The OER activity of Fe$_3$O$_4$/Fe$_2$C@Fe/N/C-800 in 1 M KOH solution.