Supporting Information

Enhanced oxygen reduction of multi-Fe₃O₄@carbon core-shell electrocatalysts through nanoparticle/polymer co-assembly strategy

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Fig.S1 Digital graphs of (a) Fe₃O₄ NPs, (b) Fe₃O₄ NPs in water, (c) mFe₃O₄@C and (d) mFe₃O₄@C in water.
Fig. S2 (a) TEM images and (b) DLS of mFe₃O₄@PS-b-PEO@PDA.

Fig. S3 TEM images of (a) Fe₃O₄@PDA and (b) Fe₃O₄@C.
Fig. S4 (a) TEM images of PS-\textit{b}-PEO micelles and (b) TGA of PS-\textit{b}-PEO micelles under nitrogen atmosphere, (c) and (d) TEM images of PS-\textit{b}-PEO@PDA and derived hollow carbon shell.

Fig. S5 TEM images of mFe$_3$O$_4$@PS-\textit{b}-PEO@PDA carbonized at different temperatures at (a) 100 °C, (b) 300 °C and (c) 500 °C.
Fig.S6 TEM images of mFe₃O₄@PS-b-PEO from initial mass ratio of Fe₃O₄/PS-b-PEO at (a) 0.3 and 10, (c) mFe₃O₄@PS-b-PEO@PDA and (d) mFe₃O₄@C prepared from initial mass ratio at 0.3 (denoted as mFe₃O₄@C-s for convenience).

Fig.S7 (a) CV curves of mFe₃O₄@C and Pt/C after circulation and in the presence of methanol at a scan rate of 10 mV s⁻¹ in O₂-saturated. (b) LSV curves of mFe₃O₄@C and Pt/C after circulation and in the presence of methanol at a rotation rate of 1600 rpm.