Supporting Information

Galvanic replacement mediated synthesis of rGO-Mn₃O₄-Pt nanocomposites for oxygen reduction reaction

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Fig. S1. TEM image of rGO-Mn₃O₄-Pt-1.
Fig. S2 HR-TEM image of the rGO-Mn$_3$O$_4$-Pt-1 nanocomposites

Fig. S3 (a) XPS survey spectra of rGO-Mn$_3$O$_4$, rGO-Mn$_3$O$_4$-Pt-1, rGO-Mn$_3$O$_4$-Pt-2, (b) XPS survey spectra of rGO-Pt.
Fig. S4 Thermogravimetric (TG) curves of the two rGO-Mn₃O₄-Pt samples after strong acid washing, where Mn₃O₄ was completely removed before analysis. The experiment was carried out in air atmosphere.
Fig. S5 Pt 4f and Mn 2p XPS spectra of the two rGO-Mn$_3$O$_4$-Pt samples. Pt 4f$_{7/2}$ and Pt 4f$_{5/2}$ peaks at 71 eV and 74.3 eV in the Pt 4f XPS spectra of both rGO-Mn$_3$O$_4$-Pt nanocomposites are typical for zero-valent Pt. Mn 2p spectra display two peaks at 641.5 and 653.2 eV corresponding to Mn 2p$_{3/2}$ and Mn 2p$_{1/2}$, respectively, an indication that the obtained manganese oxide still exists as Mn$_3$O$_4$. 
Fig. S6 The high-resolution XPS spectrum of Mn 2p for (a) rGO-Mn$_3$O$_4$-Pt-1 and (b) rGO-Mn$_3$O$_4$-Pt-2, XPS survey spectra of Mn 3s for (c) rGO-Mn$_3$O$_4$-Pt-1 and (d) rGO-Mn$_3$O$_4$-Pt-2.
Fig. S7 (a) CV curves of rGO-Mn₃O₄-Pt-2 nanocomposites and commercial Pt/C in N₂-saturated 0.1 M KOH solution at a scanning speed of 50 mV · s⁻¹. (b) Specific ECSAs for rGO-Mn₃O₄-Pt-2, rGO-Mn₃O₄-Pt-2, and commercial Pt/C.
Fig. S8 (a) LSV curves of ORR over rGO-Mn$_3$O$_4$-Pt-2 in O$_2$-saturated 0.1 M KOH solution at different rotation rates, (b) is the corresponding Koutecky-Levich plots derived from the LSV curves; (c) LSV curves of ORR over commercial Pt/C catalysts in O$_2$-saturated 0.1 M KOH solution at different rotation rates, (b) is the corresponding Koutecky-Levich plots derived from the LSV curves.