

Insights into the role of Fe-N active site in the oxygen reduction reaction on carbon-supported supramolecule catalysts

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The characterization of PPYTZ polymer

The ¹H NMR (δ ppm) and IR spectroscopy of PPYTZ polymer are shown in Fig. 1S. Wherein, the detailed analysis of the ¹H NMR (Fig. 1Sa) is as follows δ : ¹H NMR(400 MHz, (CD₃)₂SO, δ ppm) δ =13.71(s, 7H), 12.77(s, 10H), 11.61(s, 11H), 8.42(t, 12H), 8.32(m, 23H), 5.81(s, 6H), 3.06(q, 1H), 1.34(s, 1H), 1.22(d, 3H), 1.16(t, 1H). In addition, Fig. 1Sb shows the data of the IR: the peak at 1692 cm⁻¹ is due to the CO-NH stretching vibration [1], the bands at 1538 cm⁻¹ and 1457 cm⁻¹ are attributed to stretching vibration of pyridine ring (C=C and C=N) [2], the peak at 1296 cm⁻¹ is due to N-N stretching vibration of triazole ring, the bands in the region 907-644 cm⁻¹ are assigned to C-H in-of-plane bending vibration of aromatic ring [3]. Therefore, the above data analysis shows that the PPYTZ polymer has been successfully prepared

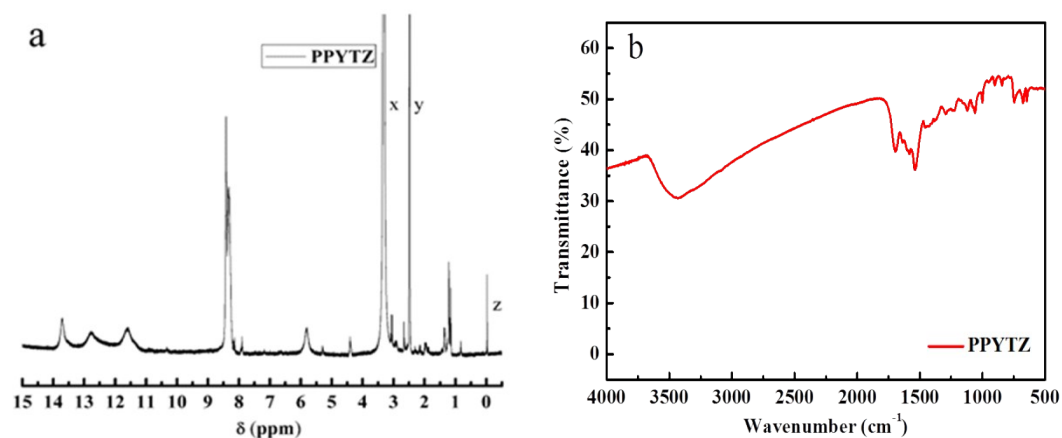


Fig. 1S ¹H NMR (a) and IR (b) of PPYTZ polymer

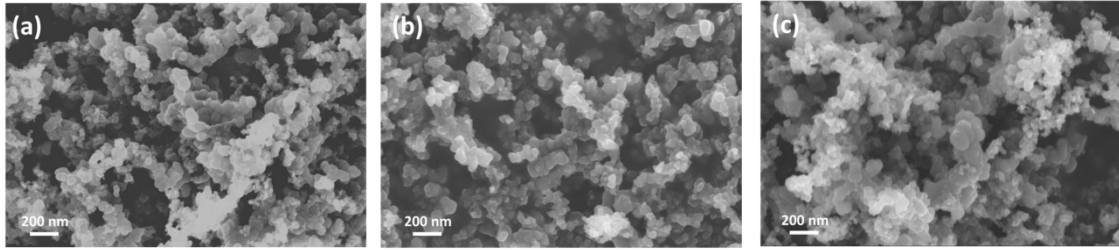


Fig. 2S SEM images of (a) Vulcan XC-72, (b) PPYTZ/C and (c) PPYTZ-Fe/C.

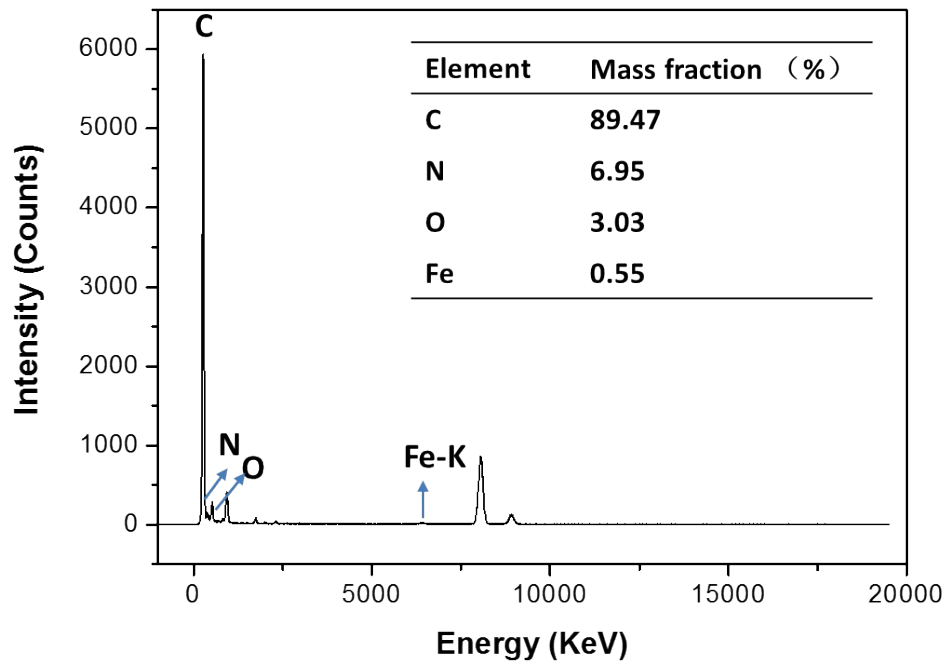


Fig. 3S TEM-EDS image of PPYTZ-Fe/C.

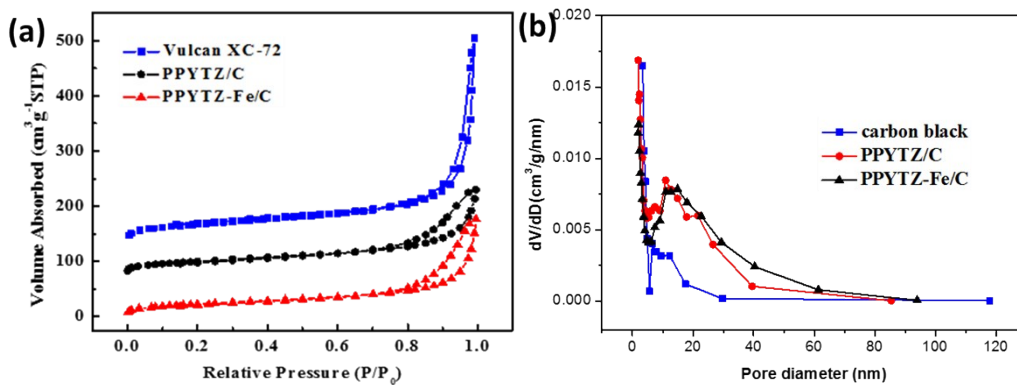


Fig. 4S N_2 adsorption/desorption isotherms and BJH pore size distribution data of Vulcan XC-72, PPYTZ/C and PPYTZ-Fe/C composite.

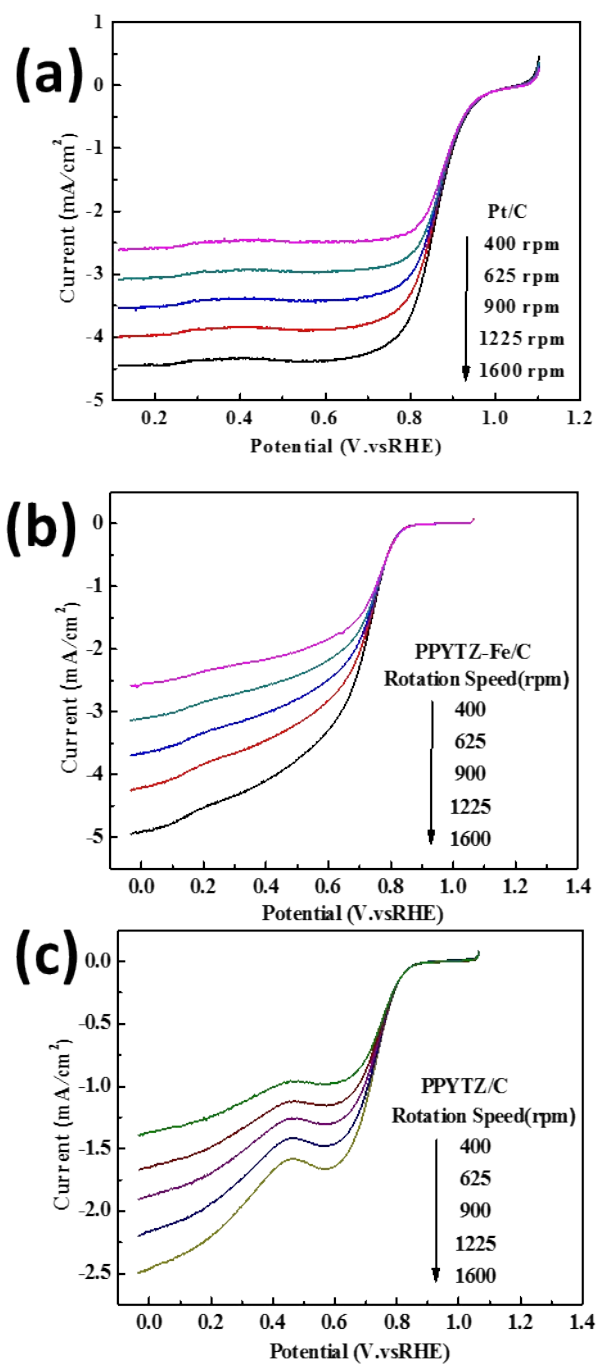


Fig. 5S (a) Pt/C, (b) PPYTZ/C and (c) PPYTZ-Fe/C polarization curves at different speeds in 0.1M KOH . Scan rate: 10 mV s⁻¹.

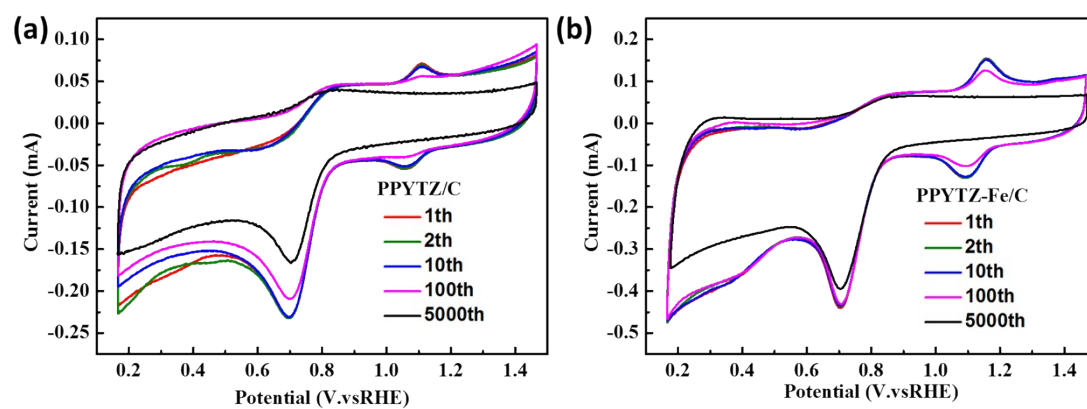


Fig. 6S 5000th CV curves of (a) PPYTZ/C and (b) PPYTZ-Fe/C in O₂ saturated KOH (0.1M) solution.