

Supporting Information

Carbon-Supported Copper-Based Nitrogen-Containing Supramolecule as an Efficient Oxygen Reduction Reaction Catalyst in Neutral Medium

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1. Molecular weight measurement

The molecular weight of Cu-SOCBP metallo-supramolecular polymer was determined by SEC-viscometry-RALLS (size exclusion chromatography-viscometry-right angle light scattering solvent) system consisting of a pump, solvent degasser, liquid chromatograph, refractive index detector, column oven, viscotek 270 dual detector. The eluent was acetonitrile at flow speed of 1 mL/min. The column temperature was 30 °C. The obtained Cu-SOCBP polymer ($c=1.0$ mg/mL) shows weight-average molecular weight ($M_w=6.5\times 10^6$ Da) and polydispersity index (PDI, $M_w/M_n=1.15$), using polyethylene oxide-PEO-22K was standard, when 20 mL of acetonitrile solution was injected into the liquid chromatograph.

2. The ORR activity of Vulcan XC-72 carbon powder.

The carbon modified electrode was prepared by the same procedure as the Pt/carbon modified electrode, except that the Pt/carbon was replaced by Vulcan XC-72 carbon.

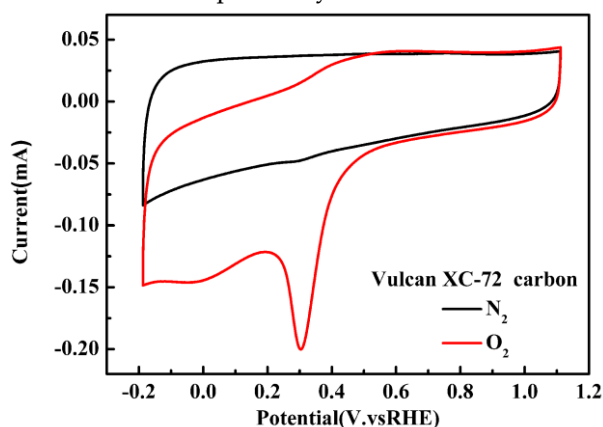


Fig.S1. CV of Vulcan XC-72 modified electrode in PBS solution saturated with N₂ or O₂. scan rate: 100 mV/s.

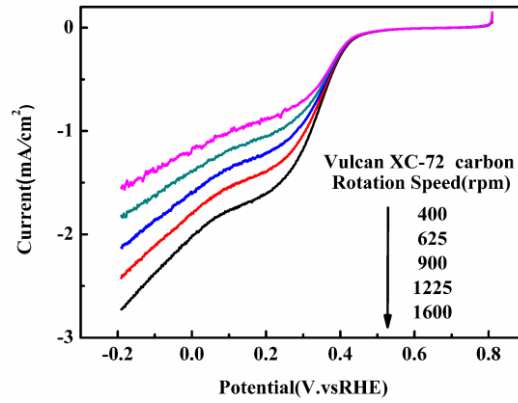


Fig.S2. Polarization curves of Vulcan XC-72 modified electrode at different rotating rates in O_2 saturated electrolyte.

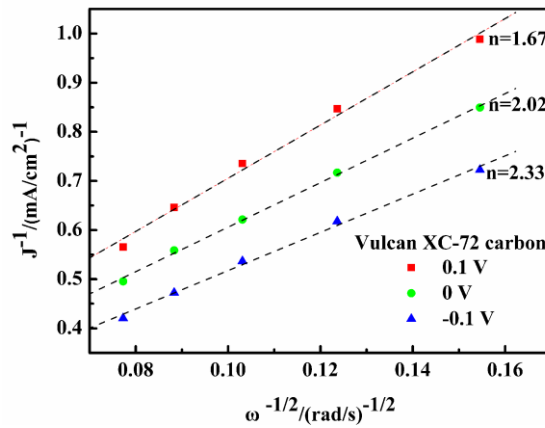
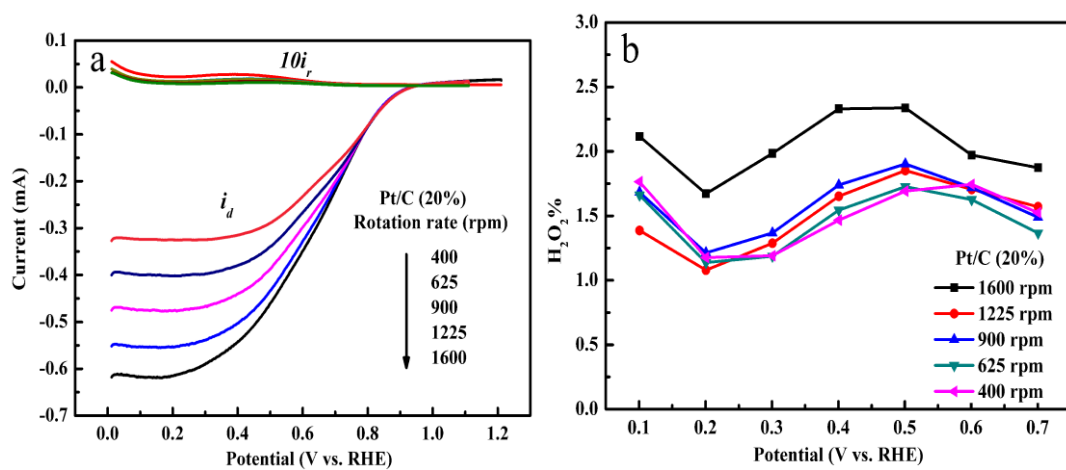


Fig.S3. The K-L plots of Vulcan XC-72 carbon modified electrode at the potentials of 0.1 V, 0.0 V, and -0.1 V, respectively.

2. RRDE measurements of the Pt/C electrolyte



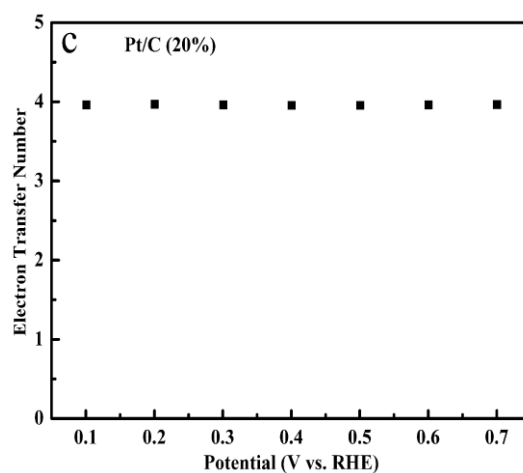


Fig. S4. RRDE curves (a), the yield of H₂O₂ (%) (b), and electron transfer number (c) of Pt/C (20%).

Table S1. The fitting equations and the values of R² in the K-L plots of the catalysts.

Catalysts and applied potential		Fitting equation	The values of R ²
Cu-SOCP/C	+ 0.41 V	$y=0.21936+2.17982x$	0.999
	+ 0.36 V	$y=0.1307+2.43089x$	0.999
	+ 0.31 V	$y=0.0929+2.49823x$	0.999
	+ 0.26 V	$y=0.06917+2.53913x$	0.9997
Pt/C	+ 0.4 V	$y=0.03483+2.27584x$	0.999
	+ 0.3 V	$y=0.03483+2.27584x$	0.999
	+ 0.2V	$y=0.01883+2.37696x$	0.9997