

Supplementary materials

Dendritic Unzipped Carbon Nanofibers Enable Uniformly Loading of Surfactant-Free Pd Nanoparticles for Electroanalysis of Small Biomolecules

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Materials and reagents

SCNF (ca. 100 nm in diameter and 20–200 μm in length) was obtained from Sigma-Aldrich (USA). K_2IrCl_6 was purchased from Alfa Aesar. UA, DA and AA were acquired from Aladdin Ltd. (Shanghai, China). The other reagents were supplied by the Sinopharm Chemical Reagent Co., Ltd., China and were of analytical grade. All other reagents were used as received without further purification. All solutions were prepared with ultrapure water with a resistivity of at least 18.25 $\text{M}\Omega\text{ cm}$.

Apparatus

The surface morphologies of the samples were obtained using scanning electron microscopy (SEM, Supra-55, Zeiss, Germany) and transmission electron microscopy (TEM, G2 F20, Tecnai). Powder X-ray diffraction (XRD) patterns were recorded using an X'Pert-PMD system with $\text{Cu K}\alpha$ radiation ($\lambda = 0.15405\text{ nm}$, 40 kV, 100 mA). X-ray photoelectron spectroscopy (XPS, ESCALAB 250, Thermo Scientific, USA) and Raman spectroscopy (inVia+Reflex, Renishaw, UK) was also carried out. All electrochemical experiments were carried out with a CHI 660E electrochemical analyzer (Shanghai Chenhua Instrument Co. Ltd., China). A three-electrode system consisting of platinum auxiliary electrode, saturated calomel electrode (SCE) reference electrode, and GCE ($d = 3\text{ mm}$) working electrode was used for measurements.

Fig. S1 (a) bare GCE, (b) GNF/GCE and (c) Pd/GNF/GCE: CVs in 0.1 M KCl. Scan rate: 50 mV/s.

Fig. S2 CV of Pd/GNF/GCE in 5.0 mM $[\text{Fe}(\text{CN})_6]^{4-}$ in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV/s)

Fig. S3 CV of GNF/GCE in 5.0 mM $[\text{Fe}(\text{CN})_6]^{4-}$ in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV/s)

Fig. S4 CV of Pd/GNF/GCE in 5.0 mM IrCl_6 in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV/s)

Fig. S5 CV of GNF/GCE in 5.0 mM IrCl_6 in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV/s)

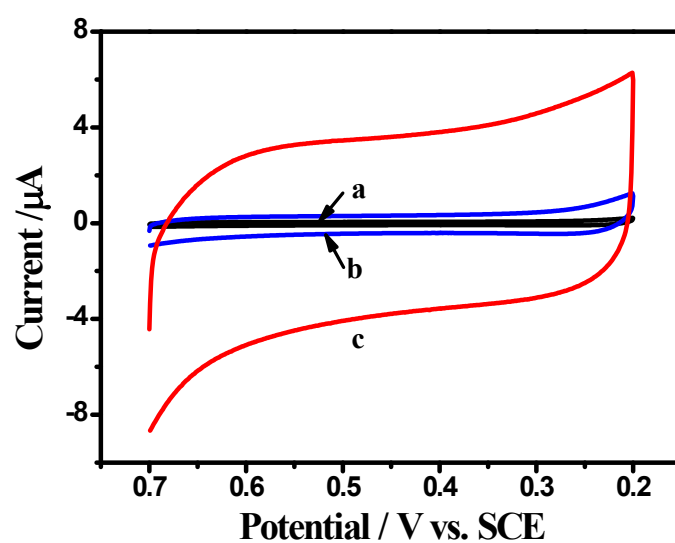


Fig. S1 (a) bare GCE, (b) GNF/GCE and (c) Pd/GNF/GCE: CVs in 0.1 M KCl. Scan rate: 50 mV/s.

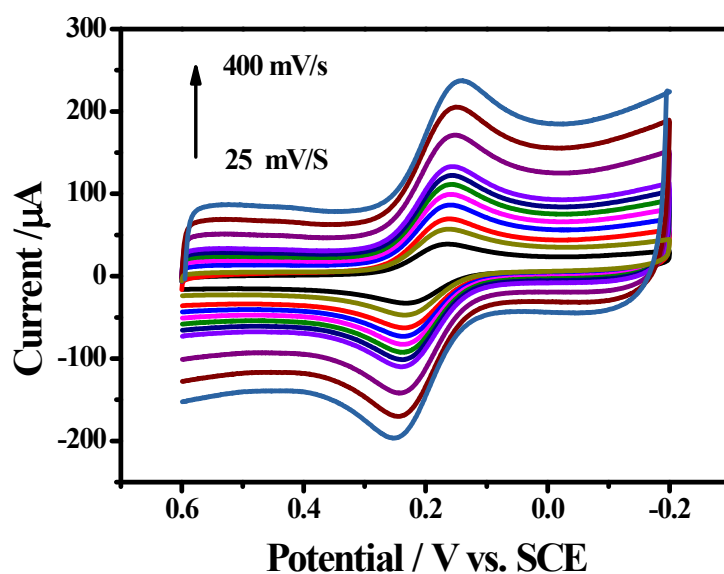


Fig. S2 CV of Pd/GNF/GCE in 5.0 mM $[\text{Fe}(\text{CN})_6]^{4-}$ in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV s^{-1})

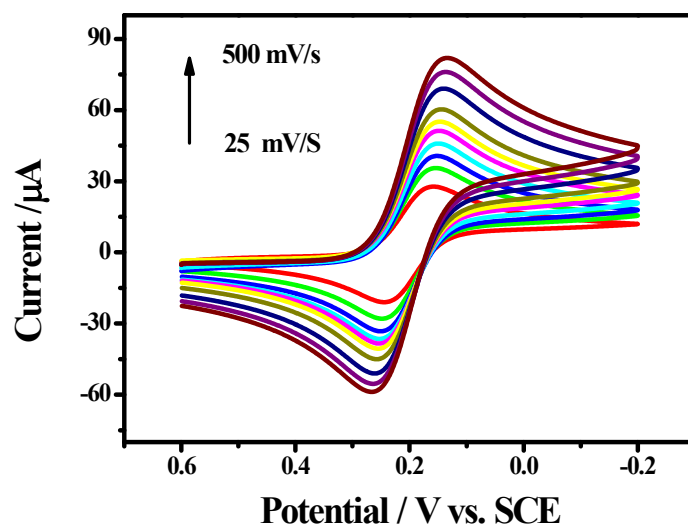


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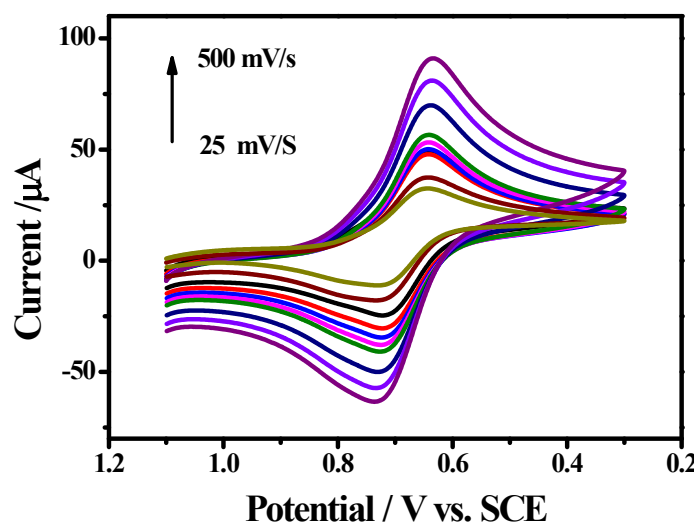


Fig. S4 CV of Pd/GNF/GCE in 5.0 mM IrCl_6 in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV s^{-1})

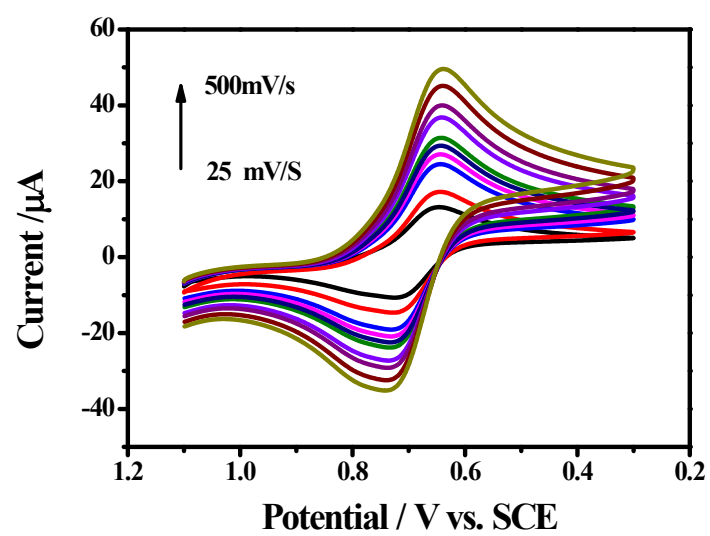


Fig. S5 CV of GNF/GCE in 5.0 mM IrCl_6 in 0.1 M KCl at different scan rates (25, 50, 75, 100, 125, 150, 200, 300, 400, 500 mV s^{-1})