

Supporting Information

Self-assembly of hemin on carbon nanotube as highly active peroxidase mimetic and its application for biosensing

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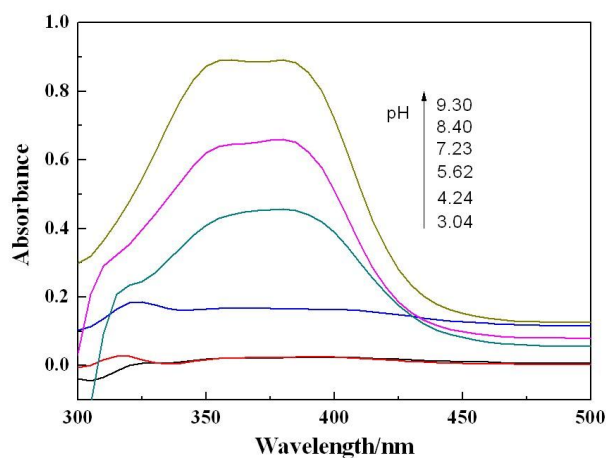


Figure S1 UV-vis spectra of the supernatant solution of hemin-SWCNT mixture under different pH conditions. Experimental conditions: hemin 45.4 μM , SWCNT 45 $\mu\text{g/mL}$.

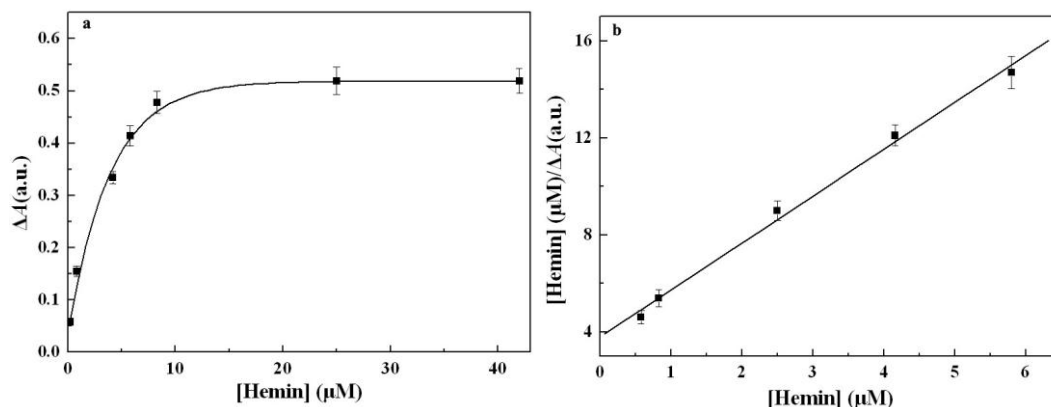
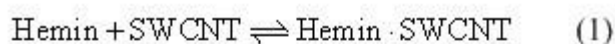


Figure S2 Langmuir isotherms obtained from the SWCNT interactions with various concentrations of hemin at room temperature. (a) Non-linear regression between ΔA and $[\text{Hemin}]$; (b) linear regression between $[\text{Hemin}]/\Delta A$ and $[\text{Hemin}]$. Experimental conditions: SWCNT 400 $\mu\text{g}/\text{mL}$, 100 μL of 5 mM TMB, 100 μL of H_2O_2 , 200 μL of 50 mM NaAc–HAc (pH 4.3), 10 min.



$$K_b = \frac{[\text{Hemin} \cdot \text{SWCNT}]}{[\text{Hemin}][\text{SWCNT}]} \quad (2)$$

$$\Delta A = \Delta A^{\text{max}} \frac{[\text{Hemin}]K_b}{1 + [\text{Hemin}]K_b} \quad (3)$$

$$\frac{[\text{Hemin}]}{\Delta A} = \frac{1}{\Delta A^{\text{max}} K_b} + \frac{[\text{Hemin}]}{\Delta A^{\text{max}}} \quad (4)$$

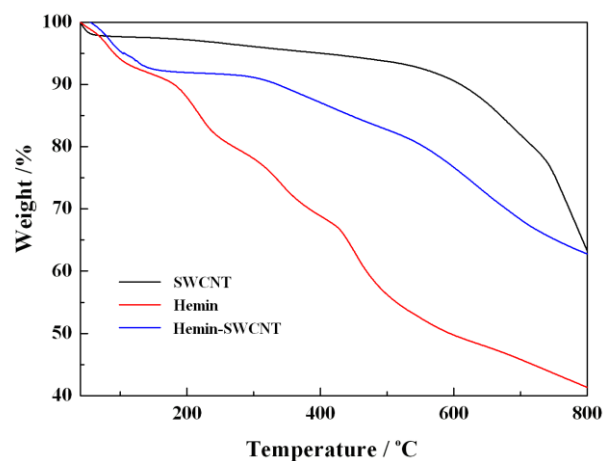


Figure S3 Thermogravimetric analysis (TGA) for SWCNT (black), hemin (red) and hemin-SWCNT nanohybrid (blue) in N₂ atmosphere.

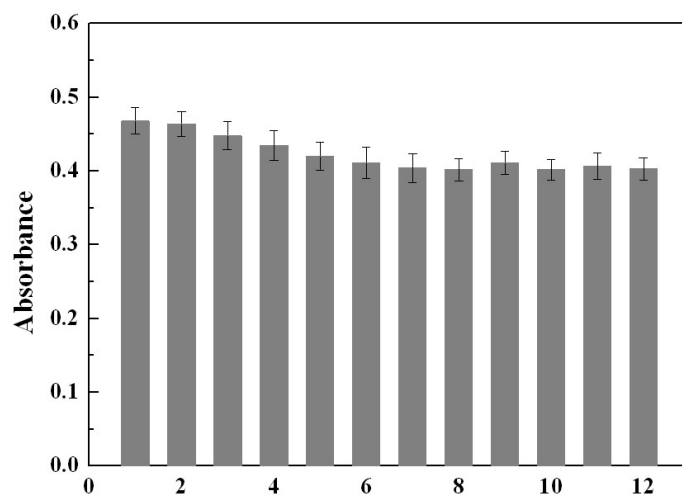


Figure S4 Effect of recycle number on the catalytic activity of hemin-SWCNT. Experimental conditions: 100 μL of 5 mM TMB, 100 μL of 9.8 mM H_2O_2 , 100 μL of 50 mM NaAc–HAc (pH 4.3) 10 min, 37 $^\circ\text{C}$. The error bars represent the standard deviation of three measurements.



Figure S5 Photographs of TMB–nanohybrid–GOx in the presence of different sugars: (1) blank, (2) 10 mM lactose, (3) 10 mM maltose, (4) 10 mM fructose, (5) 10 mM sucrose, (6) 50 μM glucose. Experimental conditions: 100 μL of 5 mM TMB, 20 μL of 5 mg mL^{-1} GOx, 50 μL of SWCNT–hemin nanohybrid, 200 μL of 50 mM NaAc–HAc (pH 4.3).

Table S1. Determination of glucose in serum

Sample	Content ($\mu\text{mol L}^{-1}$)	Added ($\mu\text{mol L}^{-1}$)	Measured ^a ($\mu\text{mol L}^{-1}$)	Recovery (%)
1	24.75	10.00	34.30	95.5
		20.00	45.10	101.8
2	15.20	10.00	25.02	98.2
		20.00	36.11	104.6
3	19.95	10.00	30.14	101.9
		20.00	39.85	99.5

^a Average of three replicates.