Supporting information

"Green" Prussian Blue Analogues as Peroxidase Mimetics for Amperometric Sensing and Biosensing

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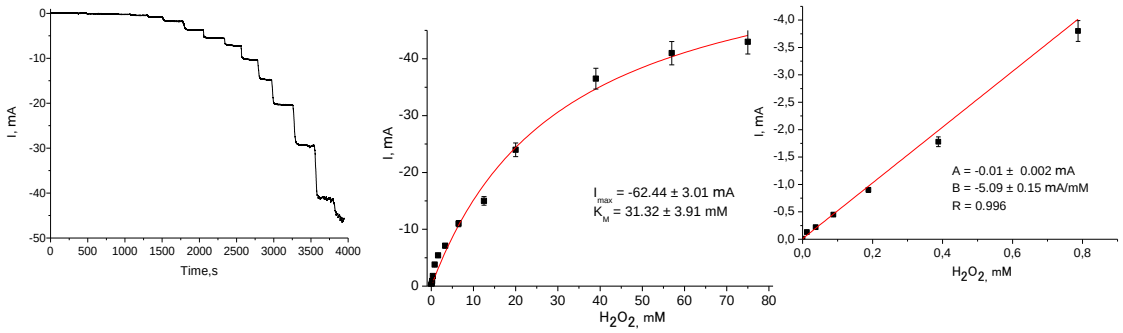
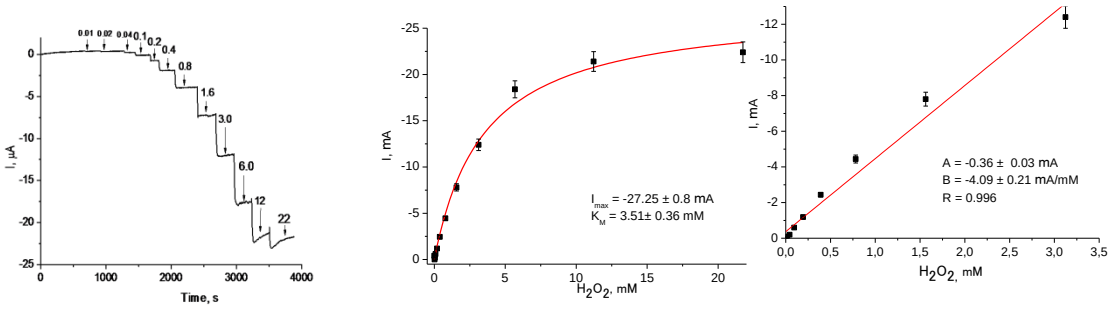
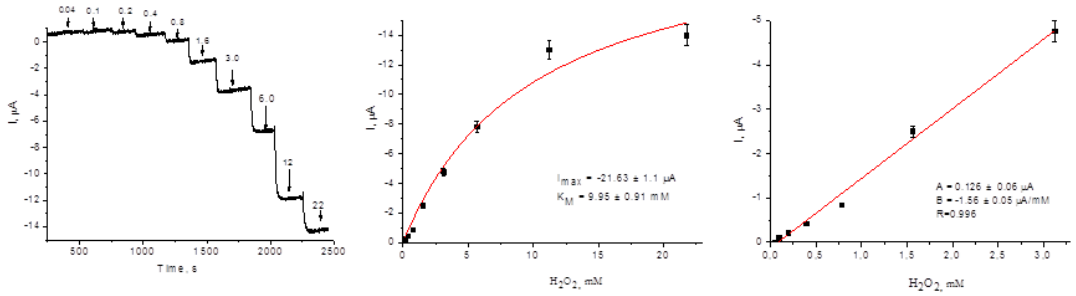

I, mA
Time,s
I, mA
I_{max} = -62.44 ± 3.01 mA
K_M = 31.32 ± 3.91 mM
H_2O_2, mM
I, mA
A = -0.01 ± 0.002 mA
B = -5.09 ± 0.15 mA/mM
R = 0.996
H_2O_2, mM

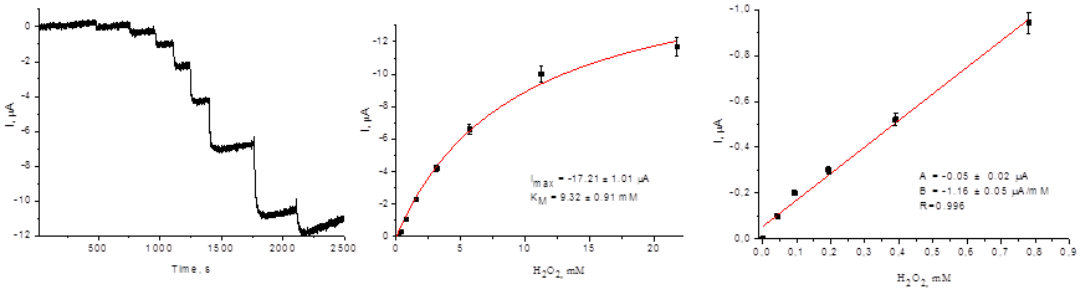
(a)


0.01 0.02 0.04 0.1 0.2 0.4 0.8 1.6 3.0 6.0 12 22
I, µA
Time, s
I, mA
I_{max} = -27.25 ± 0.8 mA
K_M = 3.51± 0.36 mM
H_2O_2, mM
I, mA
A = -0.36 ± 0.03 mA
B = -4.09 ± 0.21 mA/mM
R = 0.996
H_2O_2, mM

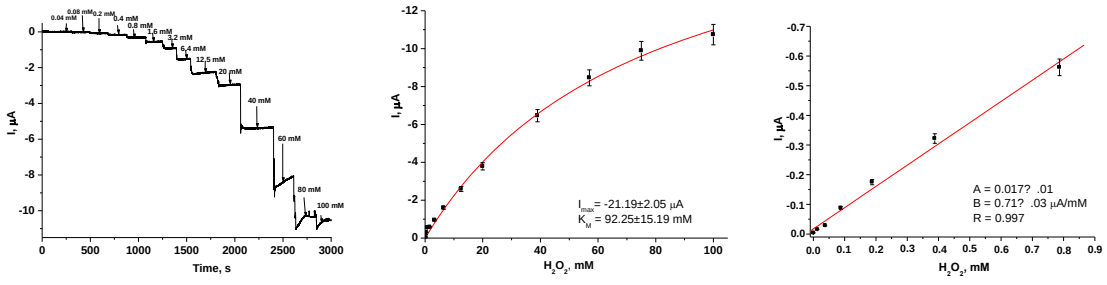
(b)


0.04 0.1 0.2 0.4 0.8 1.6 3.0 6.0 12 22
I, µA
Time, s
I, µA
I_{max} = -21.63 ± 1.1 µA
K_M = 9.95 ± 0.91 mM
H_2O_2, mM
I, µA
A = 0.126 ± 0.06 µA
B = -1.56 ± 0.05 µA/mM
R=0.996
H_2O_2, mM

(c)


I, µA
Time, s
I, µA
I_{max} = -17.21 ± 1.01 µA
K_M = 9.32 ± 0.91 mM
H_2O_2, mM
I, µA
A = -0.05 ± 0.02 µA
B = -1.16 ± 0.05 µA/mM
R=0.996
H_2O_2, mM

(d)


0.04 mM 0.08 mM 0.2 mM 0.4 mM 0.8 mM 1.6 mM 3.2 mM 6.4 mM 12.5 mM 20 mM 40 mM 60 mM 80 mM 100 mM
I, µA
Time, s
I, µA
I_{max}= -21.19±2.05 µA
K_M = 92.25±15.19 mM
H_2O_2, mM
I, µA
A = 0.017? .01
B = 0.71? .03 µA/mM
R = 0.997
H_2O_2, mM

(e)

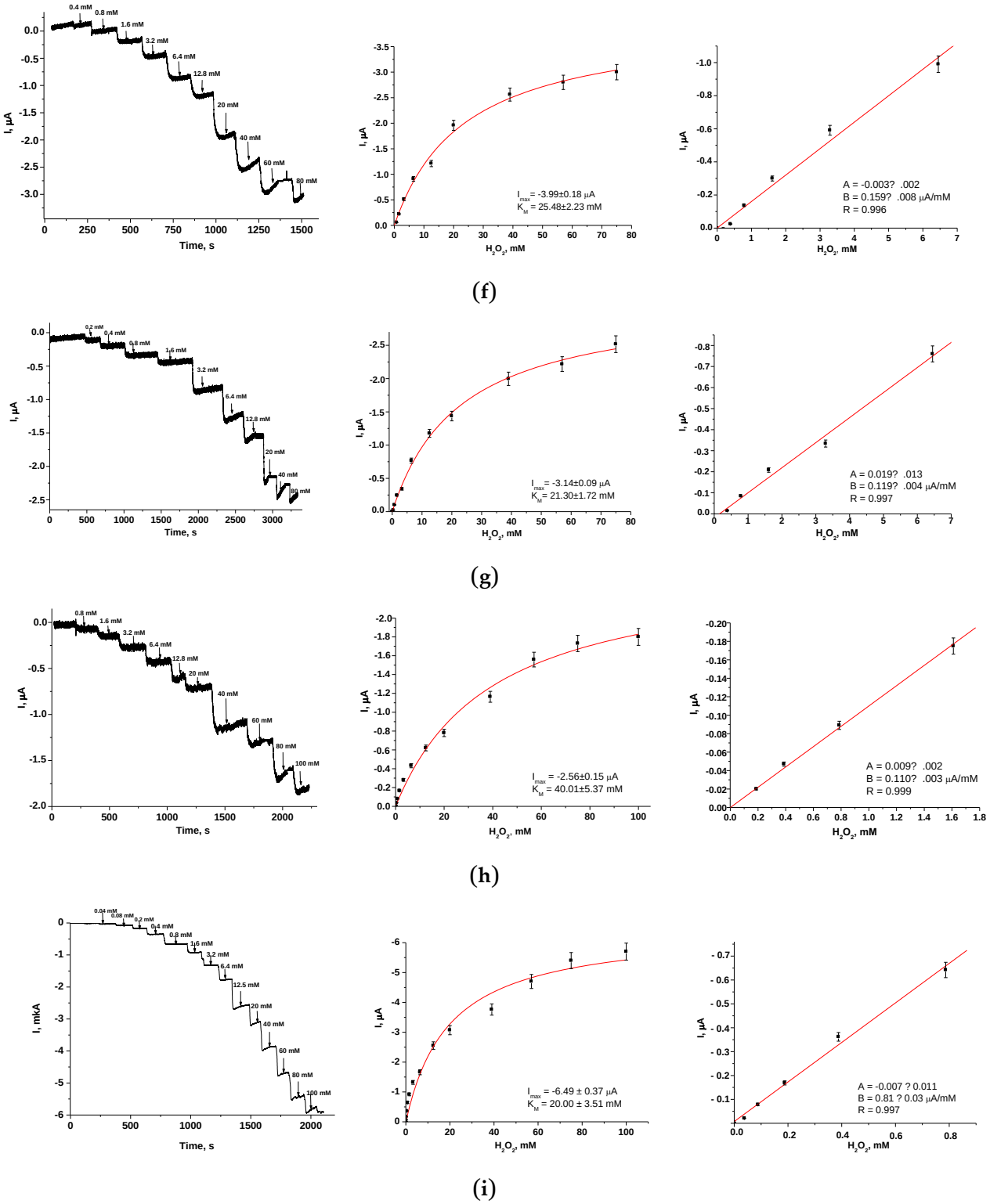


Figure S1. Amperometric characteristics of the several modified electrodes: chronoamperograms (left), dependence of the current response on increasing concentrations of H_2O_2 (middle) and calibration graphs (right). H_2O_2-sensing films are the following :gPdHCF (**a**); gCeHCF (**b**); gYHCF (**c**); gCoHCF (**d**); gMnHCF (**e**); gZnHCF (**f**); gNdHCF (**g**); gCdHCF (**h**) and chCuHCF (**i**). Conditions: working potential -50 mV vs. Ag/AgCl (reference electrode), 50 mM NaOAc buffer, pH 4.5 at 23°C.

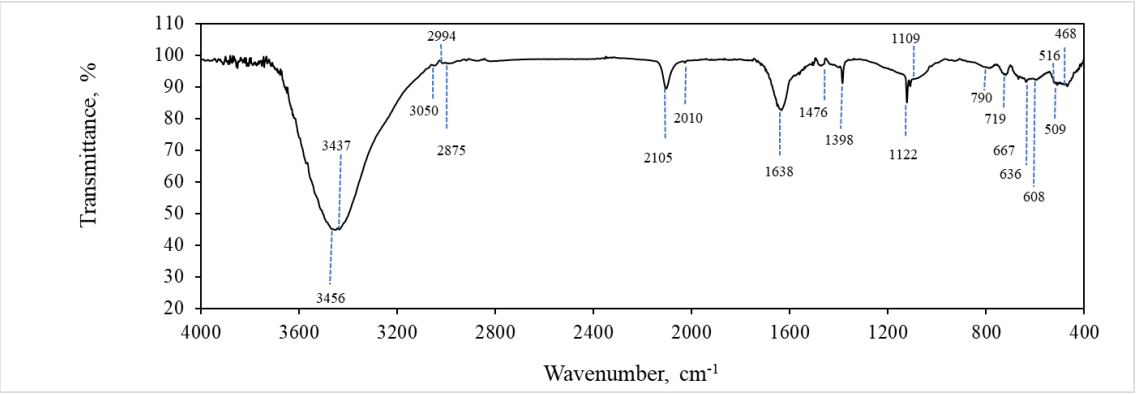


Figure S2. FTIR spectrum of the gCuHCF.

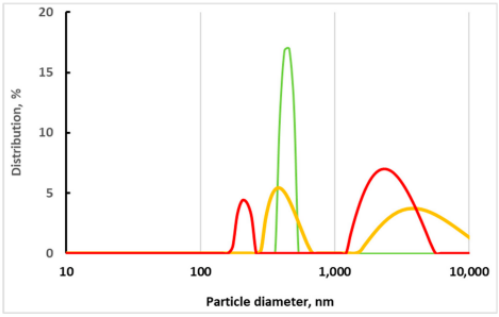


Figure S3. DLS plots of particle hydrodynamic diameter of the sample at various concentrations: the green line represents a 1.3×10^8 mL^{-1} , the yellow line 6.6×10^7 mL^{-1} , and the red line 3.3×10^7 mL^{-1} particle concentration.

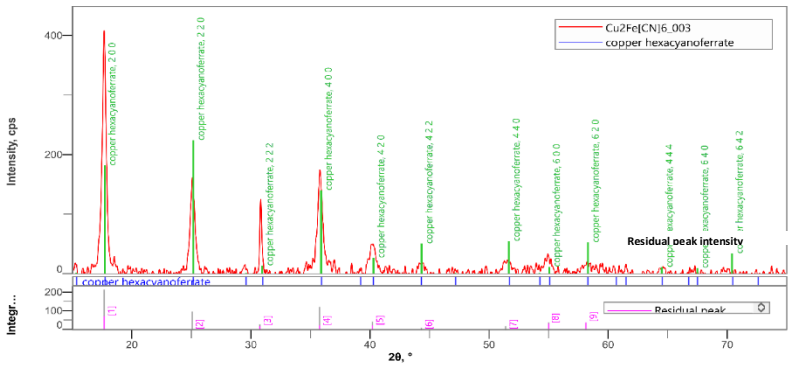


Figure S4. X-ray diffraction analysis of the gCuHCF synthesized particles.

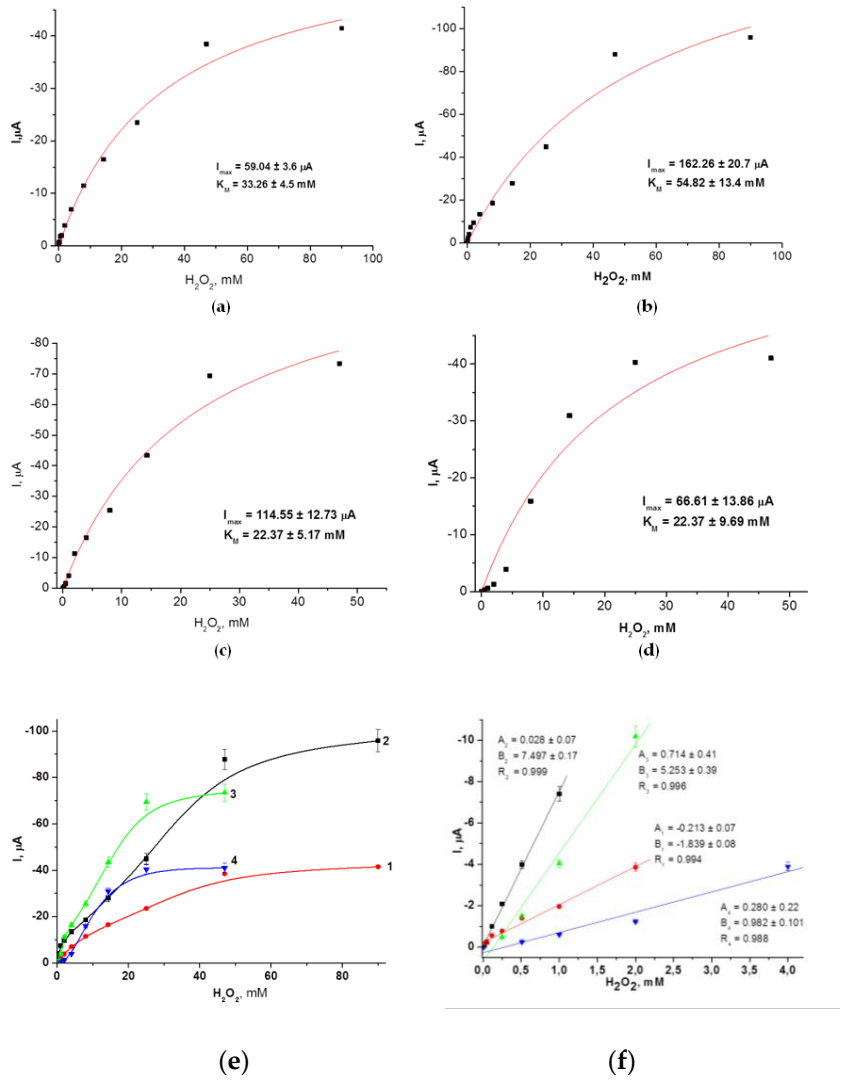


Figure S5. Effect of the PO mimetic' activity on the efficiency of H_2O_2 sensing. Current response on increasing concentrations of H_2O_2 (**a**-**e**) and calibration graphs (**f**) for the GEs modified with different quantities of gCuHCF: (**a**) 1 mU, (**b**) 2 mU, (**c**) 5 mU, (**d**) 10 mU, (**e**, **f**) – combined graphs, lines (1-4) correspond to graphs (**a**–**d**), respectively. Conditions: working potential –50 mV, Ag/AgCl (reference electrode) in 50 mM NaOAc, pH 4.5.

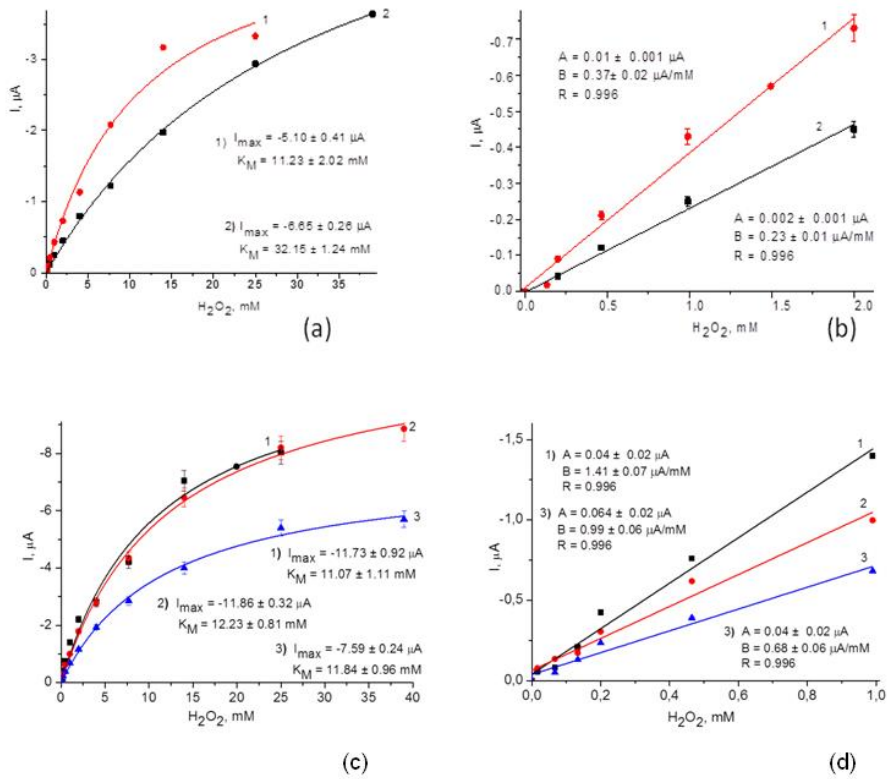


Figure S6. Effect of PO mimetic activity and working potential on analytical characteristics of the gCuHCF/GE. Current responses on increasing concentrations of H_2O_2 (**a**, **c**) and the correspondent calibration graphs (**b**, **d**) for GE, modified with different quantities of gCuHCF: (1) 0.07 mU, (2) 0.15 mU, (3) 0.40 mU. Conditions: working potential –50 mV (**a**, **b**) and –200 mV (**c**, **d**), Ag/AgCl (reference electrode) in 50 mM phosphate buffer, pH 6.0.