

ELECTRONIC SUPPLEMENTARY INFORMATION

for

MIL-88B(Fe)-NH₂: An Amine Functionalized Metal-Organic Framework for Applied in a Sensitive Electrochemical Sensor for Cd²⁺, Pb²⁺, and Cu²⁺ Ions Detection

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Table SI.1. Average particle sizes of MIL-88B(Fe)-NH₂(1.5) and MIL-88B(Fe)-NH₂(2.0).

Average values	MIL-88B(Fe)-NH ₂ (1.5)	MIL-88B(Fe)-NH ₂ (2.0)
Width (nm)	414.3	377.5
The length/width ratio	3.97	3.81

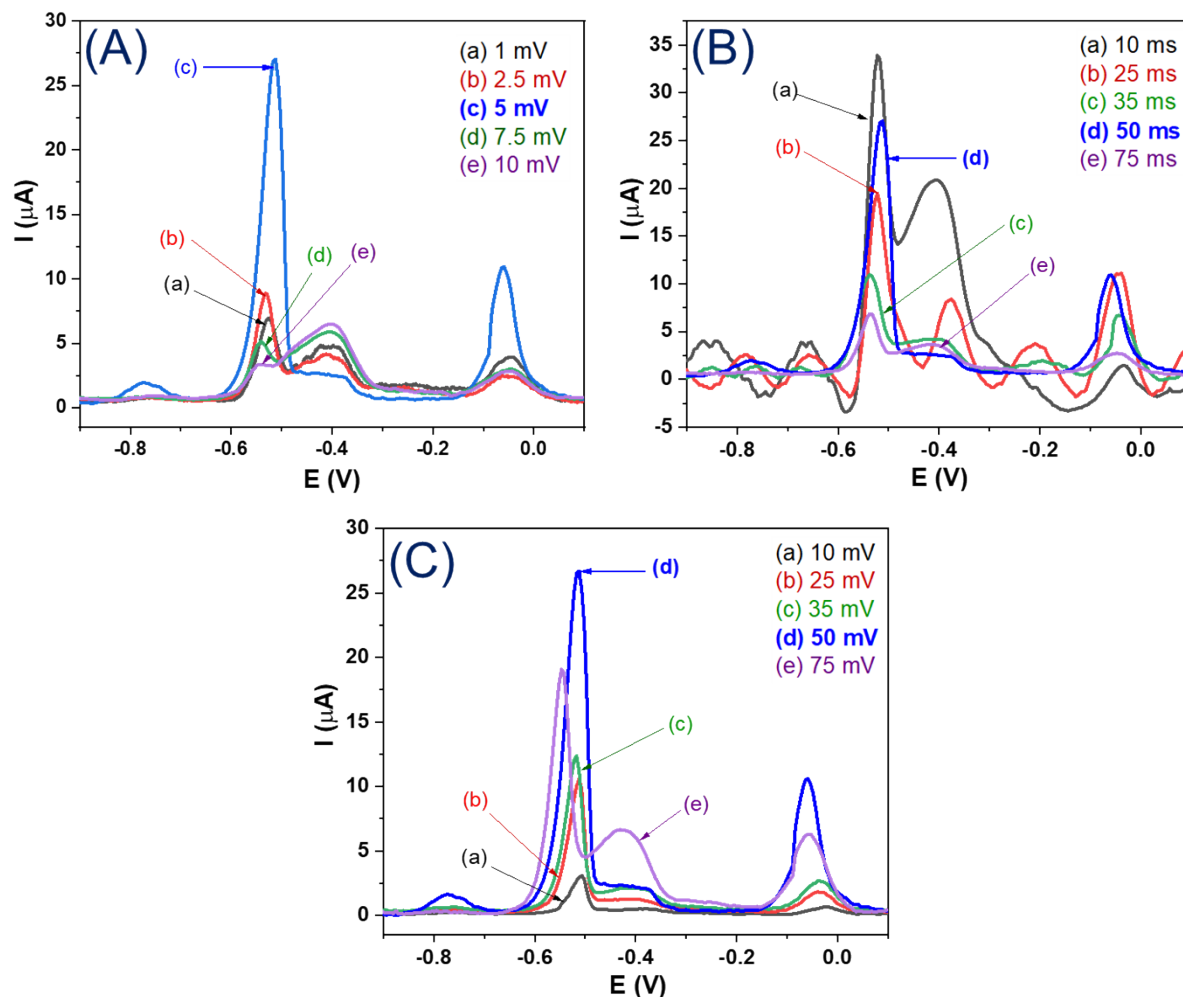


Figure 1S. DPV results of GCE/MIL-88B(Fe)-NH₂ electrodes in 0.1 M ABS (pH = 6.0) solutions containing 10 μM Cd²⁺, 10 μM Pb²⁺, and 10 μM Cu²⁺ with differential measuring conditions: (A) the change in potential step ((a):1, (b): 2.5, (c): 5, (d): 7.5, and (e): 10 mV) keeping pulse amplitude of 50 mV and pulse width of 50 ms; (B) the change in pulse width ((a):10, (b): 25, (c): 35, (d): 50, and (e): 75 ms) keeping potential step of 5 mV and pulse amplitude of 50 mV; and (C) the change in pulse amplitude ((a):10, (b): 25, (c): 35, (d): 50, and (e): 75 mV) keeping potential step of 5 mV and pulse width of 50 ms.

DPV measurements of the GCE/MIL-88B(Fe)-NH₂ electrodes were performed in 0.1 M ABS (pH = 6.0) solutions containing 10 μM Cd²⁺, 10 μM Pb²⁺, and 10 μM Cu²⁺ with differential

measuring conditions including potential step, pulse width, and pulse amplitude, in order to investigate optimization studies for DPV, and the obtained results are described in **Fig. 1S (A, B, and C, respectively)**. As can be seen in **Fig. 1S (A, B, and C)**, when the potential step is 5 mV, the pulse width is 50 ms, and the pulse amplitude is 50 mV, the obtained DPV signal is best for both Cd^{2+} , Pb^{2+} , and Cu^{2+} . Therefore, in this work, the above measuring conditions were selected for DPV measurements.

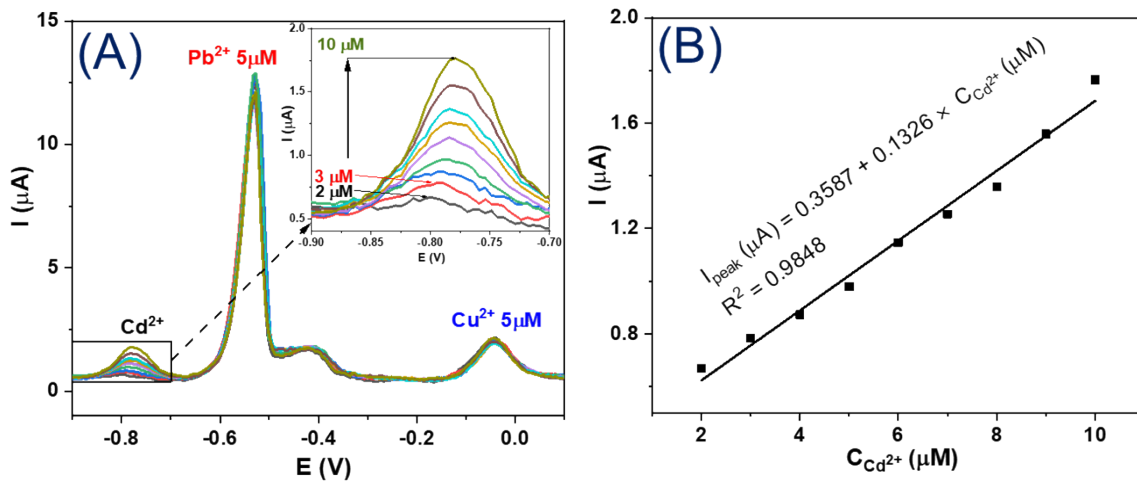


Figure 2S. (A) DPV results of GCE/MIL-88B(Fe)- NH_2 electrodes in 0.1 M ABS (pH = 6.0) solutions containing 5 μM Pb^{2+} , 5 μM Cu^{2+} , and Cd^{2+} with concentrations increasing from 2 μM to 10 μM ; and (B) the linear relationship between the output signal of the sensor and the concentration of Cd^{2+} .

The DPV results of GCE/MIL-88B(Fe)- NH_2 electrodes in different solutions containing 5 μM Pb^{2+} + 5 μM Cu^{2+} , and Cd^{2+} with concentrations increasing from 2 μM to 10 μM , and the corresponding calibration plot of Cd^{2+} , which are exhibited in **Fig. 2SA** and **Fig. 2SB**, respectively, clearly demonstrate the ability of the obtained sensor to detect the ions in the desired ranges of detection.