An Electrochemical Sensor Based on Copper-Based Metal-Organic Frameworks- reduced Graphene Oxide composites for Determination of 2,4 – Dichlorophenol in Water

(Supplementary)

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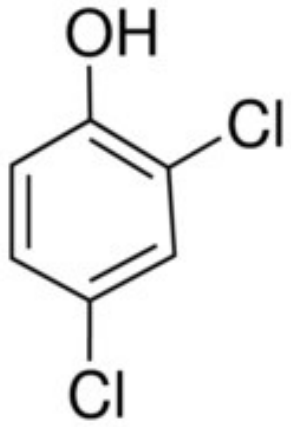


Fig. 1S: Structures of studied 2,4- dichlorophenol

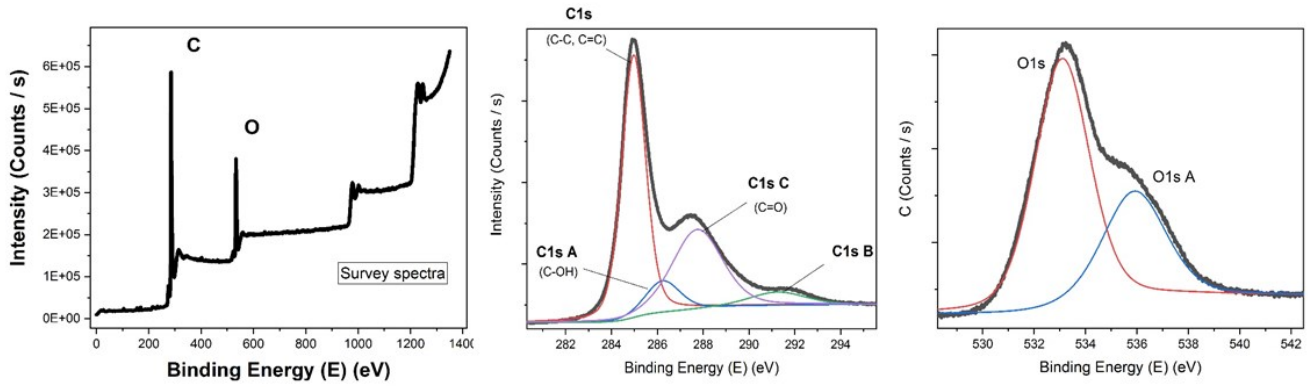


Figure 2S: XPS spectra recorded for pure GO

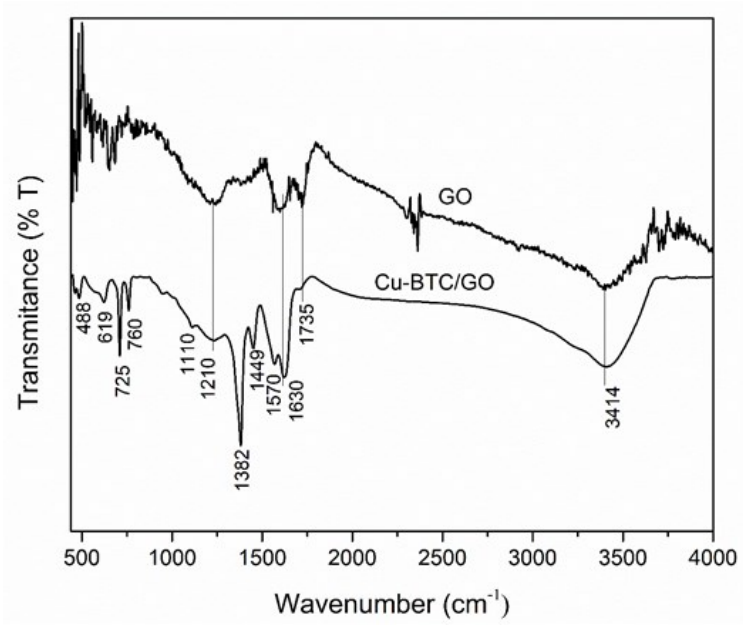


Figure 3S: FTIR spectrum of GO and Cu-BTC/GO

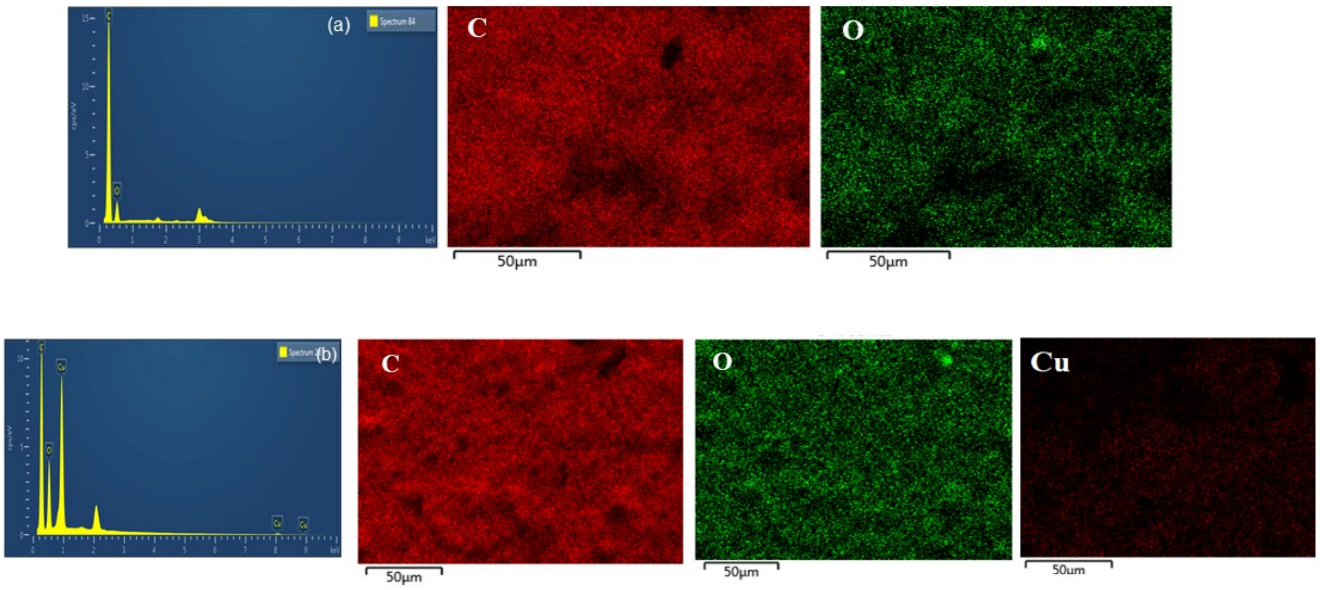


Figure 4S: EDX spectrum and EDX mapping image of GO (a) and of Cu-BTC/GO (b) samples

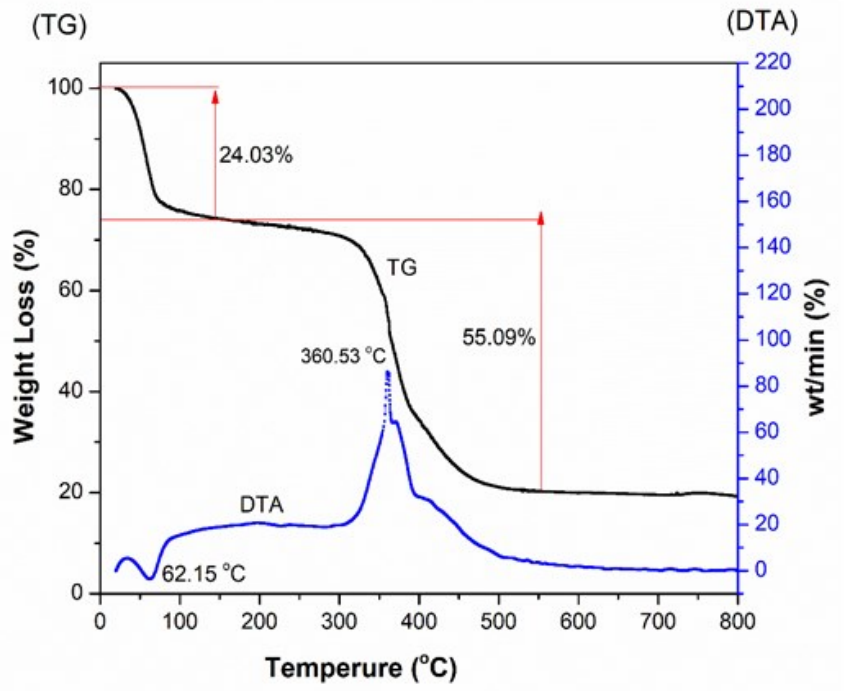


Figure 5S: TGA and DTA diagrams of Cu-BTC/GO sample

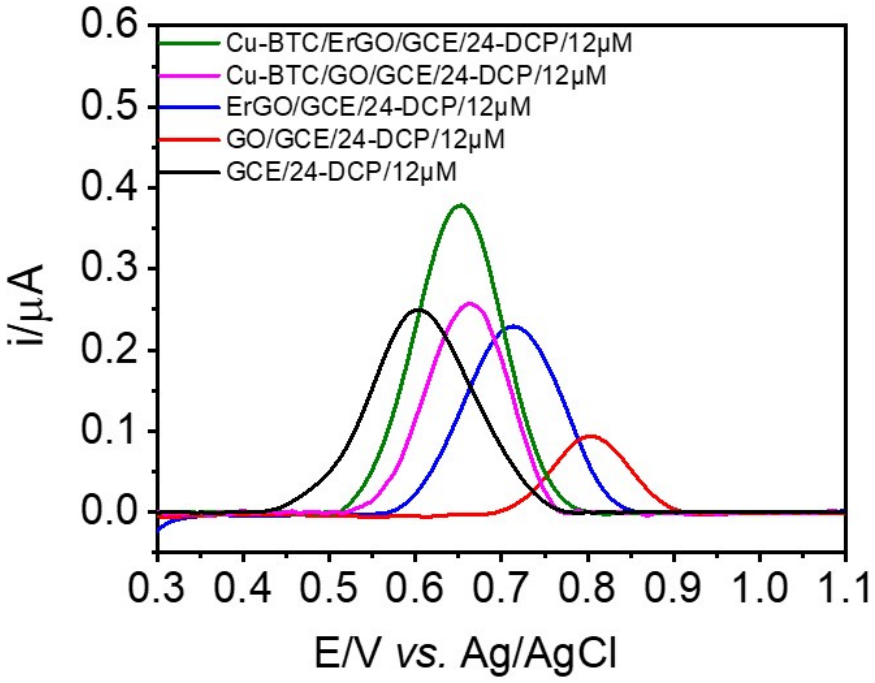


Figure 6S: DPVs of 12µM of 2,4-DCP using different electrodes: bare GCE, GO/GCE, ErGO/GCE, Cu-BTC/GO/GCE and Cu-BTC/ErGO/GCE recorded in PBS, pH = 7 after baseline substraction

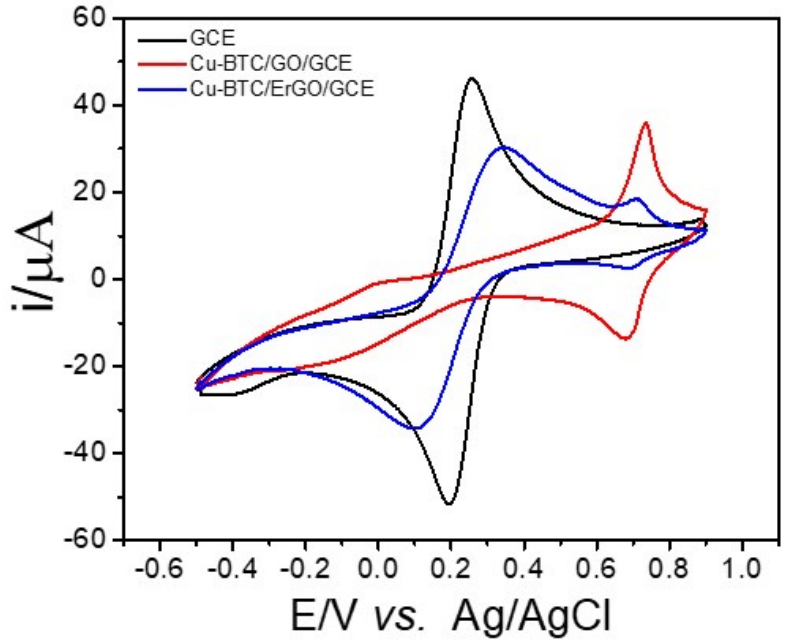
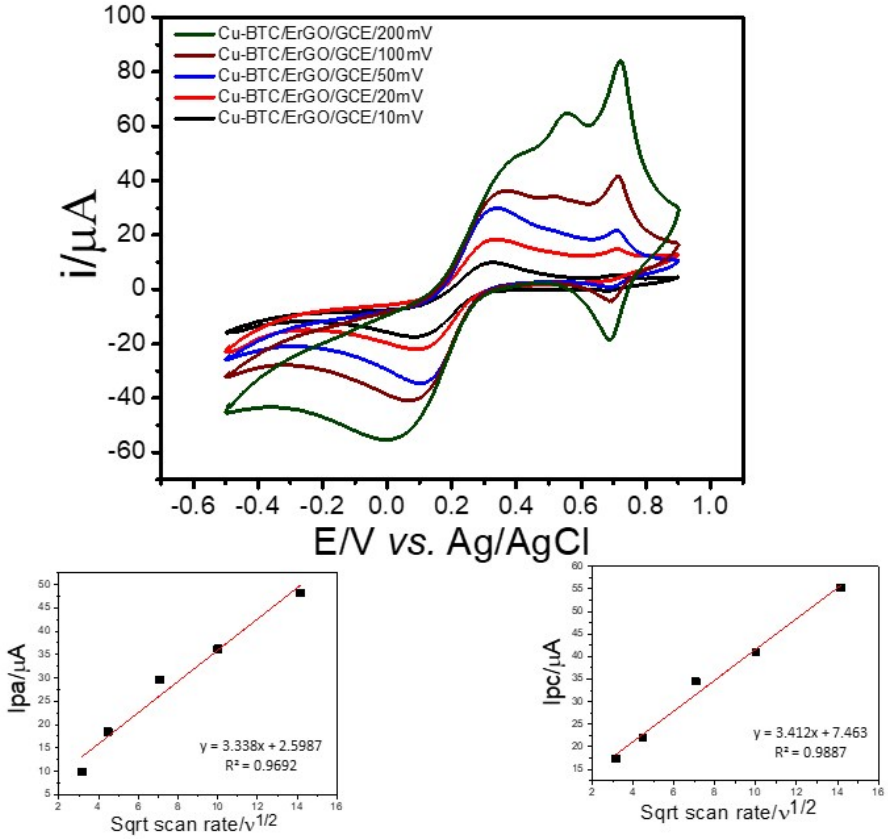


Figure 7S: CVs of bare GCE, Cu-BTC/GO/GCE and Cu-BTC/ErGO/GCE from - 0.5V - 0.9V in $K_3Fe(CN)_6$ 5mM/ PBS 0.1M, pH 7



Randle – Sevick equation:

$$I_p = (2.69 \times 10^5) n^{3/2} A C D^{1/2} v^{1/2}$$

$$A \text{ is the active surface area } (ECSA)(cm^2)$$

$$D \text{ is the diffusion coefficient of } [K_3Fe(CN)_6] \ (6.605 \times 10^{-6}\ cm^2 s^{-1})$$

$$n = 1 \text{ is the number of transferred electrons for } [Fe(CN)_6]^{3-/4-} \text{ redox couple}$$

$$C \text{ is the bulk concentration of } [K_3Fe(CN)_6] \ (5\ mM)$$

Figure 8S: CVs of Cu-BTC/ErGO/GCE in 5mM $K_3Fe(CN)_6/K_4Fe(CN)_6$ + 0.1M KCl at different scan rates and calculation of electroactive surface area (ECSA)

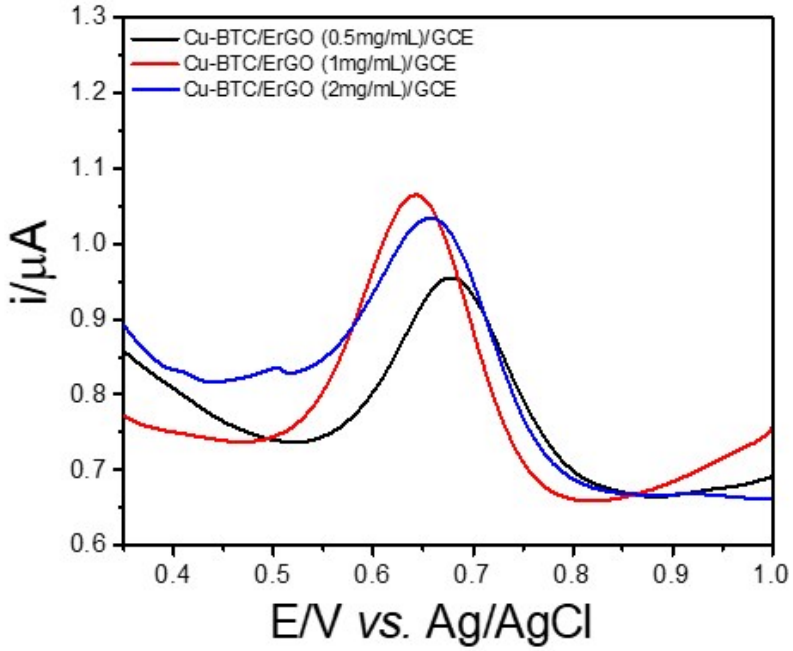


Figure 9S: Influence of content of Cu-BTC/ErGO/GCE used for modification on electrochemical signals of 2,4-DCP

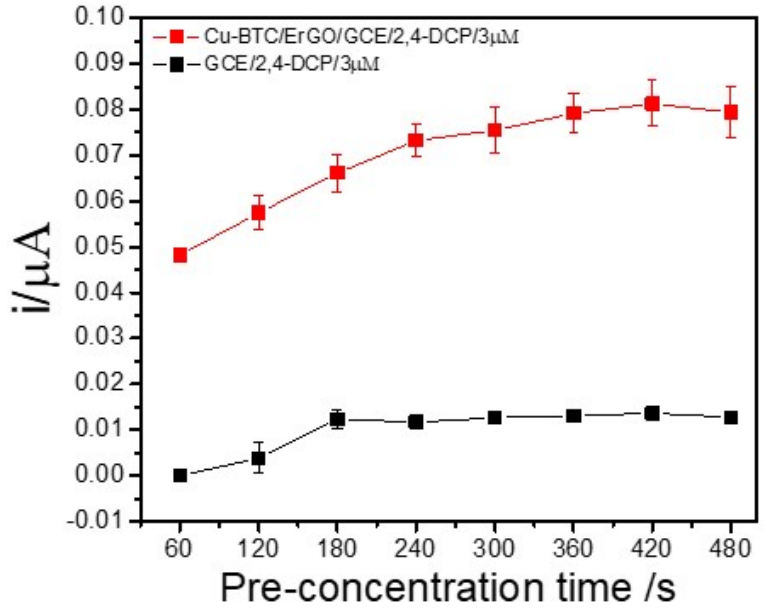


Figure 10S: Influence of accumulation time (60- 480 s) on DPV signals recorded in PBS solution (pH 7.0) containing of 2,4-DCP at concentration of 3 μM on Cu-BTC/ErGO/GCE and bare GCE

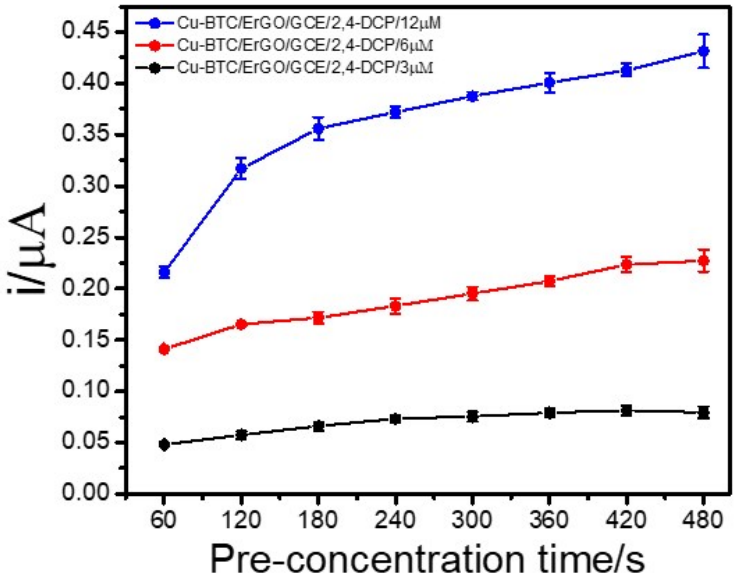


Figure 11S: Influence of accumulation time (60- 480 s) on DPV signals recorded in PBS solution (pH 7.0) containing of 2,4-DCP at concentration of 3 µM, 6 µM, 12µM on Cu-BTC/ErGO/GCE

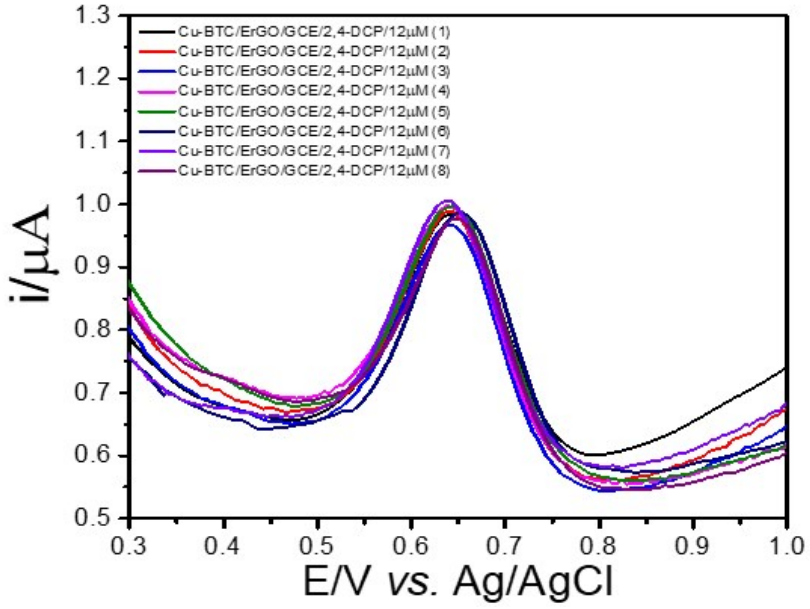


Figure 12S: Reproducibility of eight Cu-BTC/ErGO/GCE sensors at 12 µM 2,4-DCP in PBS pH 7

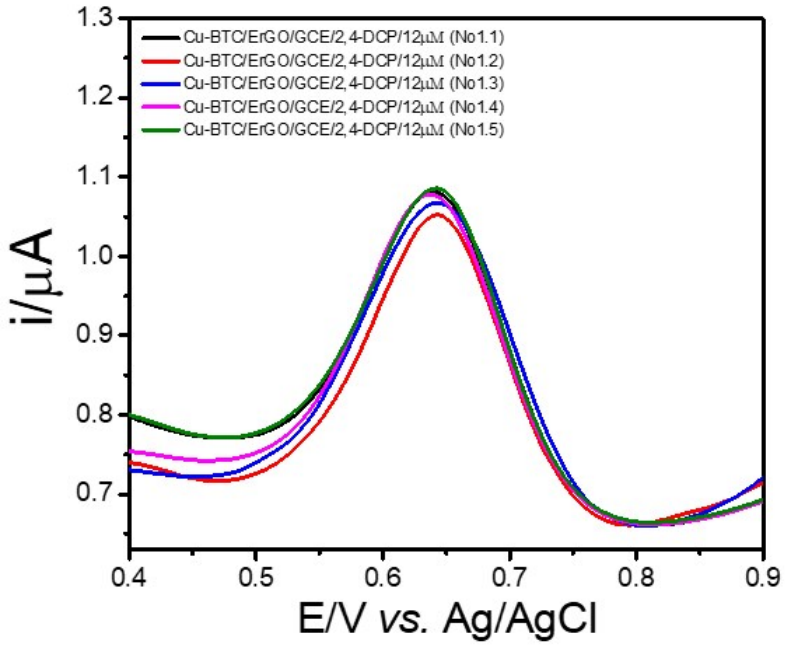


Figure 13S: Repeatability of 5 measurements using one Cu-BTC/ErGO/GCE sensor with 12 µM 2,4-DCP in PBS pH 7

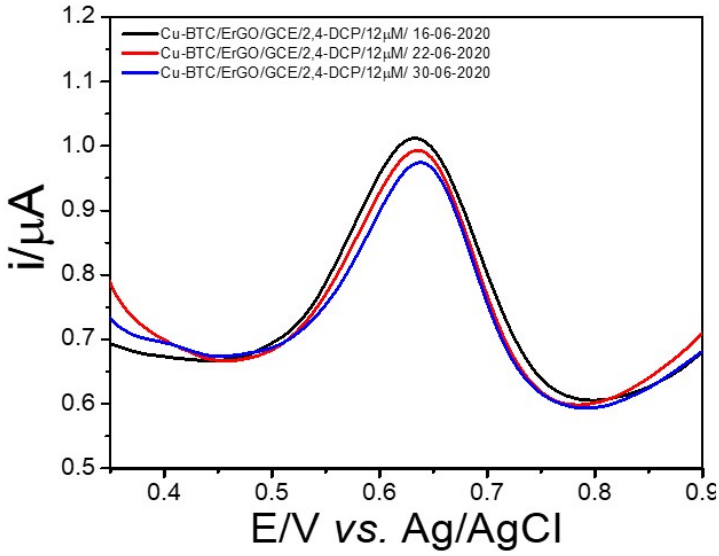


Figure 14S: DPASV response of Cu-BTC/ErGO/GCE for the detection of 2,4-DCP 12 µM after 2 weeks.

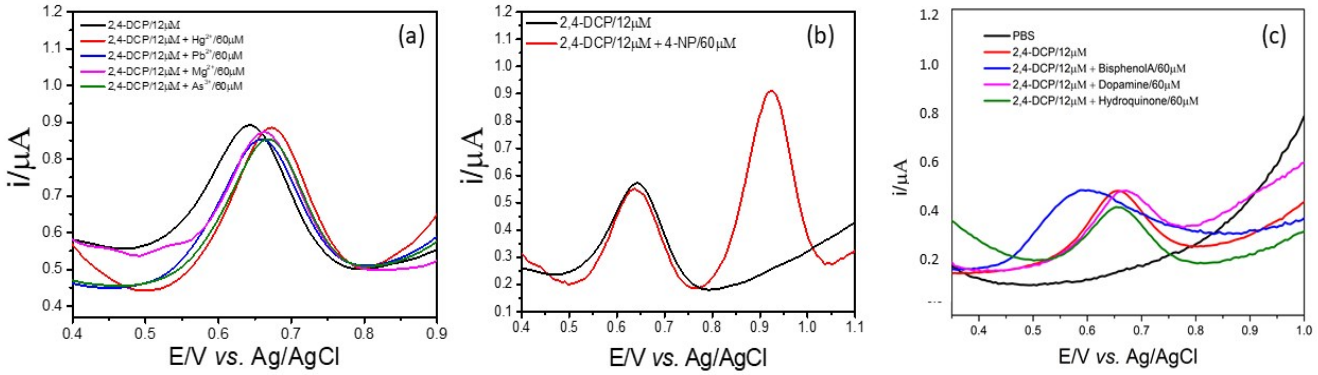


Figure 15S: Voltammograms of 2,4-DCP on Cu-BTC/ErGO/GCE before and after adding interferents at concentrations 5 time higher than that of analyte, 2,4-DCP with Hg^{2+}, Pb^{2+}, Mn^{2+} and As^{3+} (a) with 4-nitrophenol (b) and bisphenol A, hydroquinone, dopamine (c)

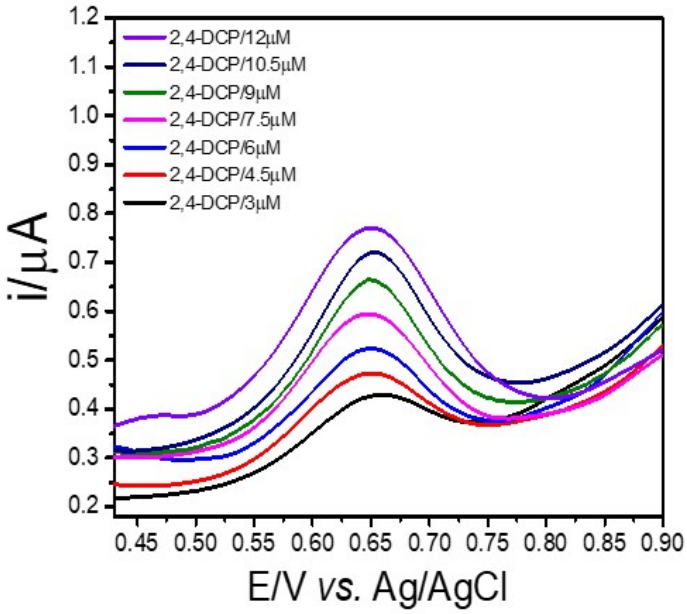


Figure 16S: Voltammograms of lake water spiked 2,4-DCP at different concentrations recorded on Cu-BTC/ErGO/GCE sensor