Supporting Information for:

A Bromine-Catalysis-Synthesized Poly(3,4-ethelenedioxythiophene) /Graphitic Carbon Nitride Electrochemical Sensor for Heavy Metal Ion Determination

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**Fig. S1.** TEM images of (a) g-C$_3$N$_4$ (b) PEDOT (BCP), (c) PEDOT/10wt%g-C$_3$N$_4$ (BCP), (d) PEDOT/10wt%g-C$_3$N$_4$ (SSP), (e) PEDOT/10wt%g-C$_3$N$_4$ (MOP).

**Fig. S2.** DPV of PEDOT (BCP), g-C$_3$N$_4$, PEDOT/10wt%g-C$_3$N$_4$ (BCP, SSP, MOP) composite-modified GCE in 0.1M ABS (pH = 4.5) containing 2µM of Cd$^{2+}$ and Pb$^{2+}$. Deposition potential: -1.2V, deposition time: 180s, pulse width: 50ms; pulse period: 100ms; increment potential: 2mV.
Fig.S3. DPV response of the PEDOT/10wt%g-C\(_3\)N\(_4\) (SSP) composite-modified GCE for the individual analysis of (a) Cd\(^{2+}\) (b) Pb\(^{2+}\). The inset shows their linear equations as well as correlation coefficient.

Fig.S4. DPV response of the PEDOT/10wt%g-C\(_3\)N\(_4\) (MOP) composite-modified GCE for the individual analysis of (a) Cd\(^{2+}\) (b) Pb\(^{2+}\). The inset shows their linear equations as well as correlation coefficient.

Fig.S5. DPV response of the PEDOT/10wt%g-C\(_3\)N\(_4\) (SSP) composite-modified GCE for the simultaneous analysis of Cd\(^{2+}\) and Pb\(^{2+}\) (b) the respective calibration curves of Cd\(^{2+}\) and Pb\(^{2+}\).
Fig.S6. (a) DPV response of the PEDOT/10wt%g-C$_3$N$_4$ (MOP) composite-modified GCE for the simultaneous analysis of Cd$^{2+}$ and Pb$^{2+}$ (b) the respective calibration curves of Cd$^{2+}$ and Pb$^{2+}$.