

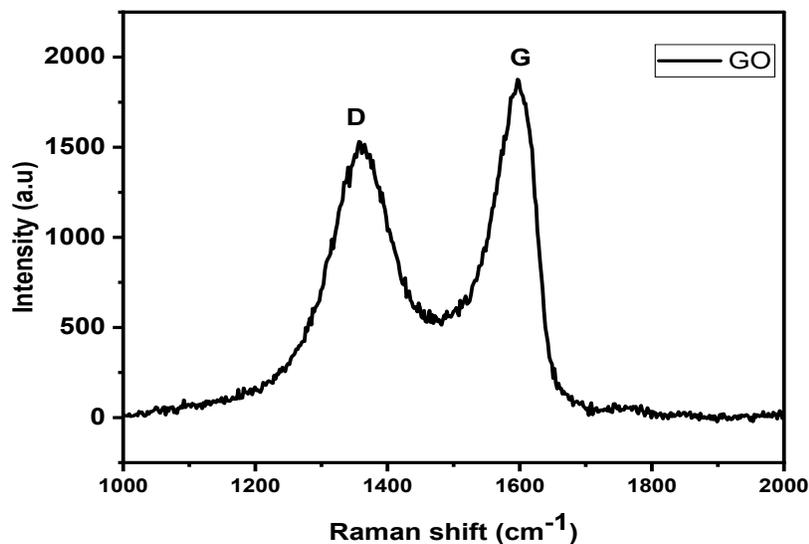
## Supporting Information

### *High-Performance Electrochemical Sensors for Cd<sup>2+</sup> and Cu<sup>2+</sup> Utilizing Ti<sub>3</sub>AlC<sub>2</sub>@Graphene Oxide Modified Glassy Carbon Electrodes*

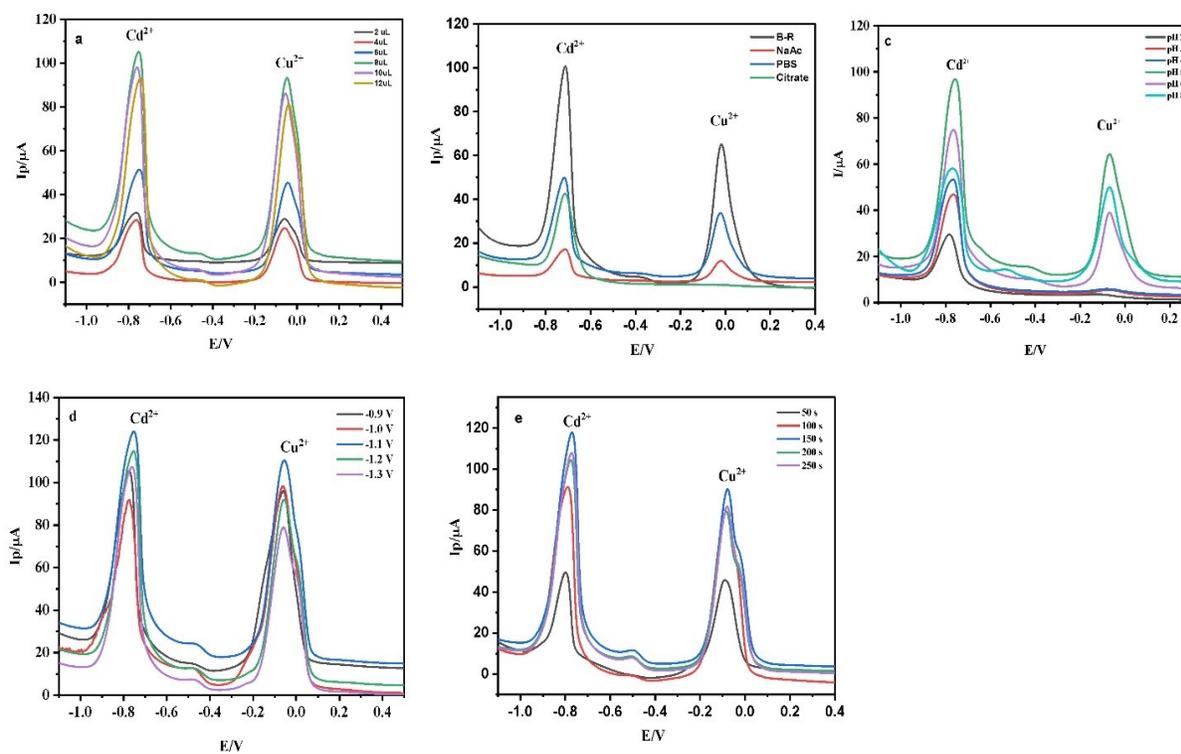
*Mansoor Ahmad<sup>a</sup>, Neha<sup>b</sup>, Yijing Ai<sup>c</sup>, Naseer Ahmad<sup>a</sup>, Behisht Ara<sup>d</sup>, Wei Sun<sup>a\*</sup>*

#### Raman spectra of Graphene oxide

The structure of graphene oxide (GO) was characterized by Raman spectroscopy (Figure S1). The spectrum shows two prominent bands at 1360 cm<sup>-1</sup> and 1600 cm<sup>-1</sup>, corresponding to the D and G bands of graphitic carbon, respectively. The D band at 1360 cm<sup>-1</sup> is associated with the breathing mode of sp<sup>2</sup> carbon rings and becomes active in the presence of structural defects and oxygen-containing functional groups, while the G band at 1600 cm<sup>-1</sup> arises from the in-plane stretching vibration of sp<sup>2</sup>-bonded C=C pairs in graphitic domains. The relatively strong and broadened D band compared to the G band indicates a high degree of disorder and the disruption of the graphitic lattice into small sp<sup>2</sup> domains separated by oxidized regions, which is characteristic of graphene oxide.



**Figure S1.** Raman spectrum of graphene oxide (GO). The spectrum displays two characteristic bands at 1360 cm<sup>-1</sup> (D band) and 1600 cm<sup>-1</sup> (G band). The intense and broadened D band, together with the G band, indicates a high degree of structural disorder and the presence of numerous defect and oxygen-containing functional groups, confirming the successful oxidation of graphite to GO.



**Figure S2.** Differential pulse anodic stripping voltammograms of Cd<sup>2+</sup> and Cu<sup>2+</sup> corresponding to the optimization experiments summarized in Figure 5 of the main text. (a) Effect of modifier volume (2–12 μL). (b) Effect of supporting electrolyte (B–R, NaAc, citrate, and BPS). (c) Effect of solution pH (2–8). (d) Effect of deposition potential (–0.9 to –1.5 V). (e) Effect of deposition time (50–250 s). Experimental conditions are the same as those described in Section 3.3 and Figure 5 of the main manuscript, unless otherwise stated.