

Supplementary Materials

Sensitive and Selective Electrochemical Detection of Lead(II) Based on Waste-Biomass-Derived Carbon Quantum Dots@Zeolitic Imidazolate Framework-8

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Table S1. Heating process of preparing the biochar.

| Heating rate | Final temperature | Retention time |
|---------------------|--------------------------|-----------------------|
| 283 K/min | 773 K | 3 h |

Table S2. S_{BET} , pore volume and average pore diameter of ZIF-8 and CQDs@ZIF-8.

| Sample | $S_{\text{BET}}(\text{m}^2/\text{g})$ | Pore volume (cm^3/g) | Average pore diameter (nm) |
|---------------|---|--|-----------------------------------|
| ZIF-8 | 2,186.9 | 0.900 | 1.645 |
| CQDs@ZIF-8 | 2,162.1 | 0.883 | 1.633 |

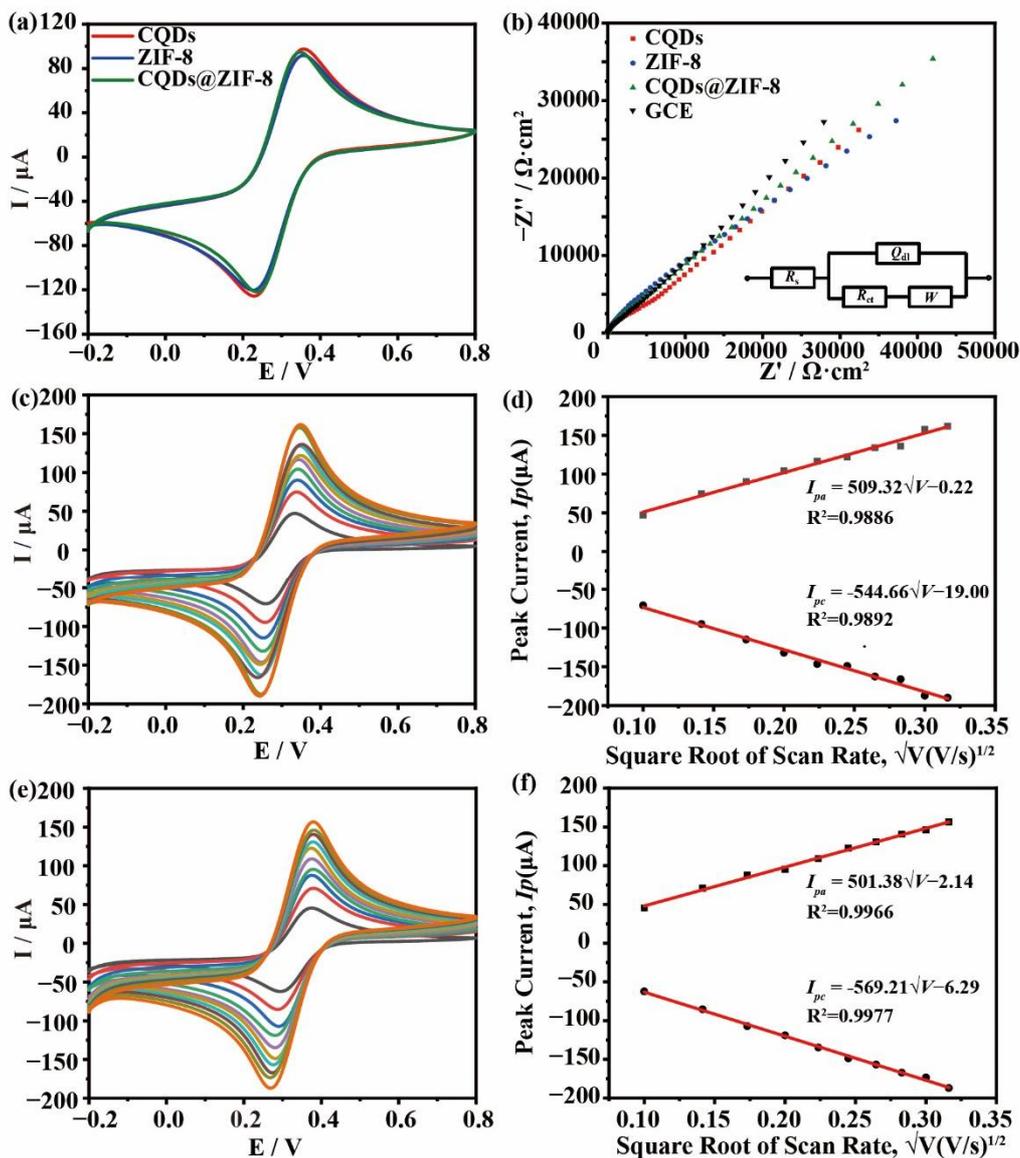


Figure S1. (a) CV (scan rate of 50 mV/s) for CQDs, ZIF-8 and CQDs@ZIF-8 and (b) EIS for CQDs, ZIF-8, CQDs@ZIF-8 and GCE; CV curves of (c) GCE and (e) CQDs@ZIF-8 at different scan rate (10, 20, 30, 40, 50, 60, 70, 80, 90, 100 mV/s) with the same solution; Relationship between peak current vs square root of scan rate derived from the CV curves of (d) GCE and (f) CQDs@ ZIF-8.

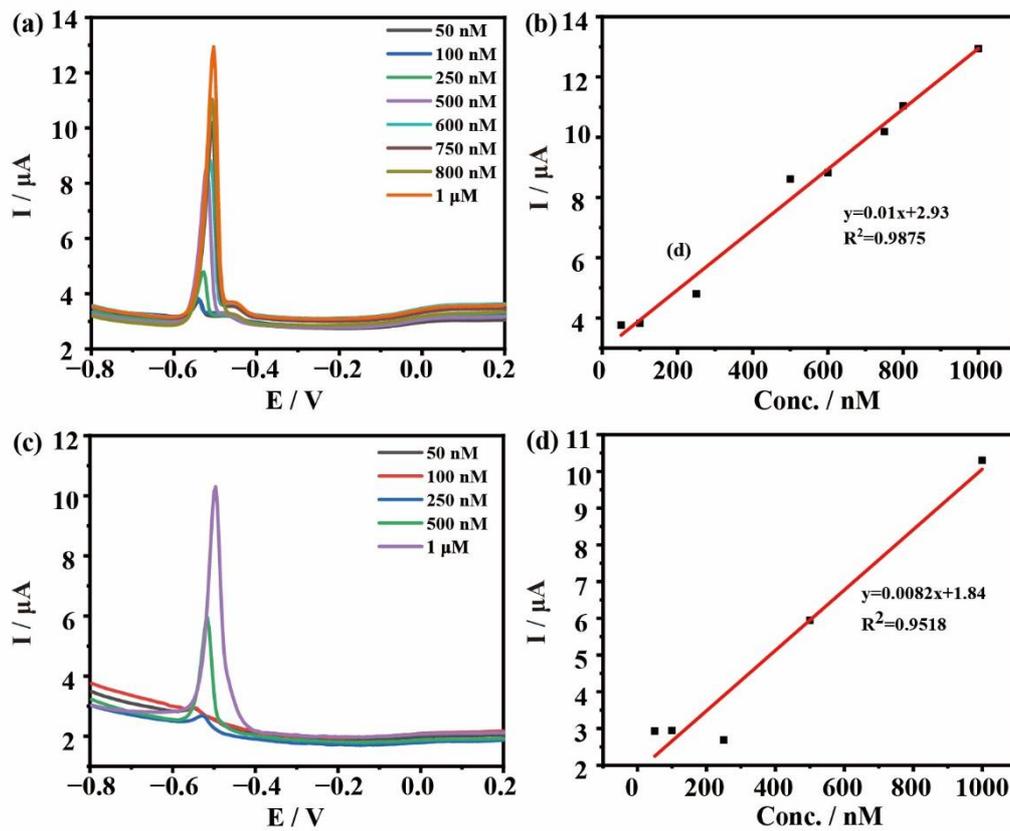


Figure S2. DPASV responses of (a) GCE and (c) CQDs at various concentrations of Pb²⁺; (b, d) linear correlation curves for Pb²⁺. Deposition potential: -0.8 V, Deposition time: 480 s.

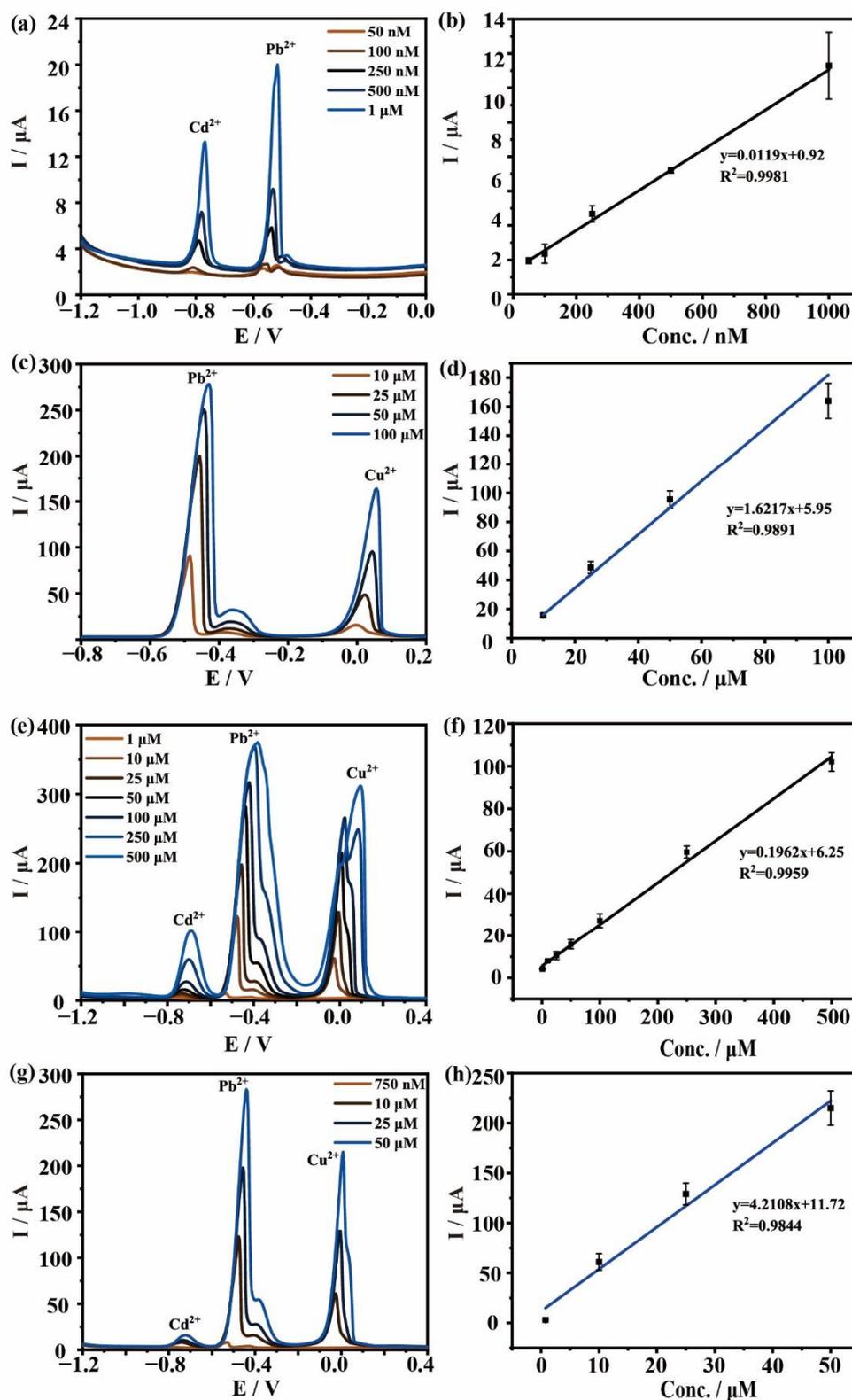


Figure S3. (a, c, e, g) DPASV responses and (b, d, f, h) linear correlation curves for (a, b, e, f) Cd^{2+} and (c, d, g, h) Cu^{2+} at various concentration coexisting ions (a, b) Pb^{2+} and Cd^{2+} , (c, d) Pb^{2+} and Cu^{2+} and (e, f, g, h) Pb^{2+} , Cd^{2+} and Cu^{2+} .

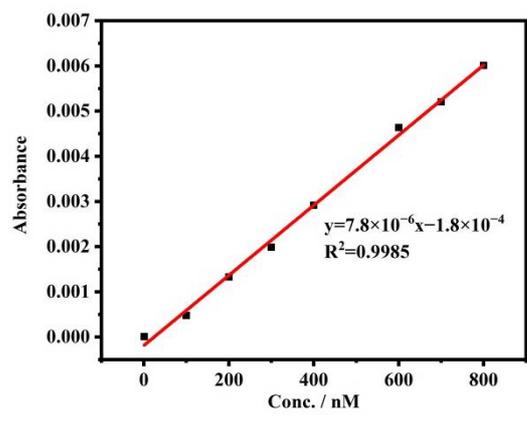


Figure S4. Standard curve of AAS for Pb²⁺.