Highly-Sensitive and Supreme-Selective N-GQD for the EC Sensing of Cadmium

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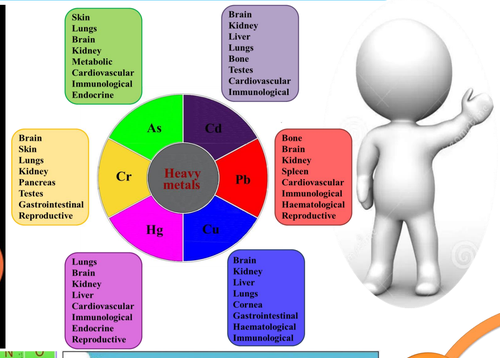
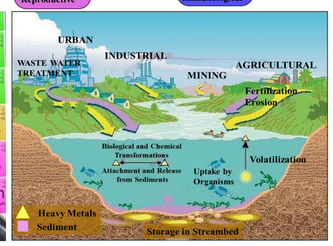
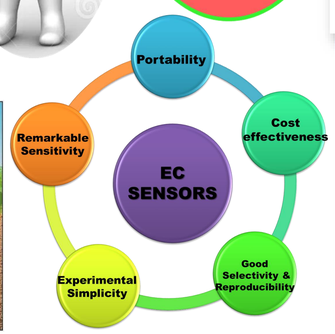
Introduction

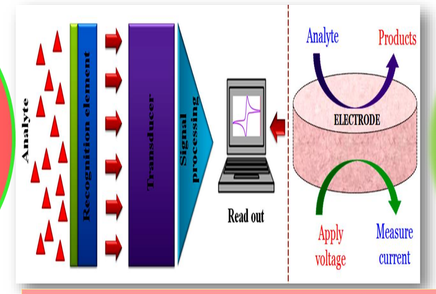


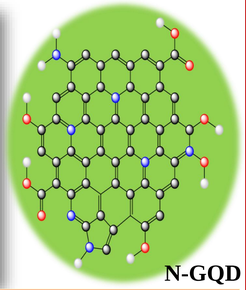


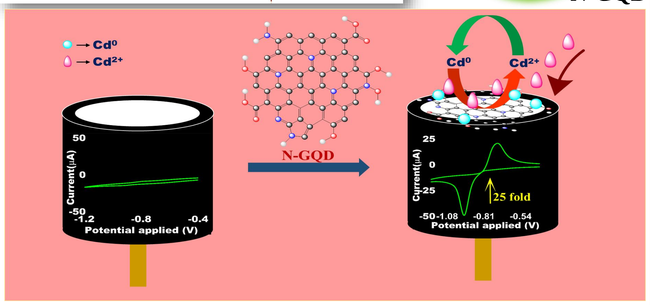
Analytical Techniques

- AAS
- AES/AFS
- ICP-MS
- ICP-OES
- NAA
- XRF
- EC Technique

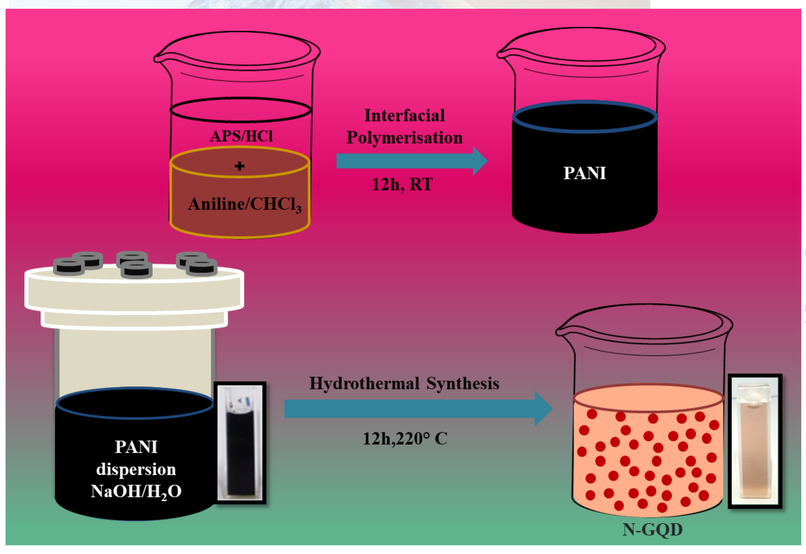






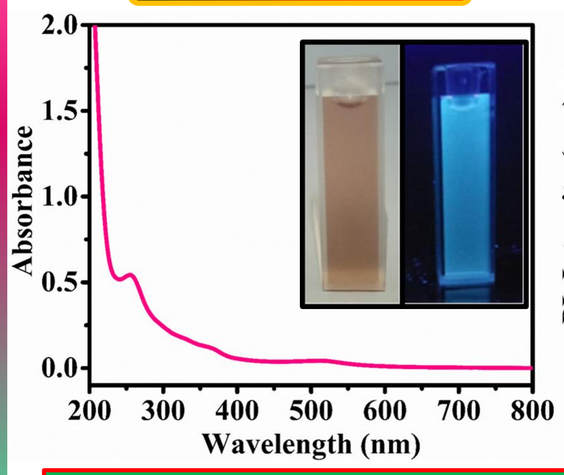


Synthesis of N-GQD

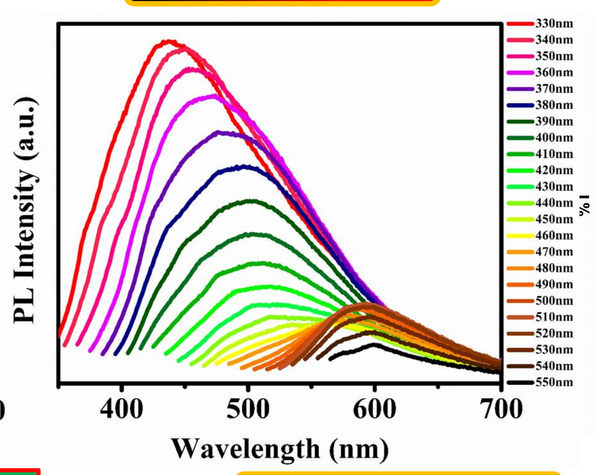


Characterisations

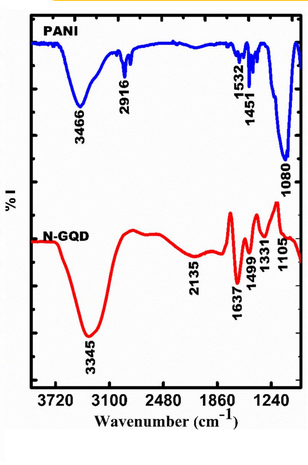
Absorption Spectra

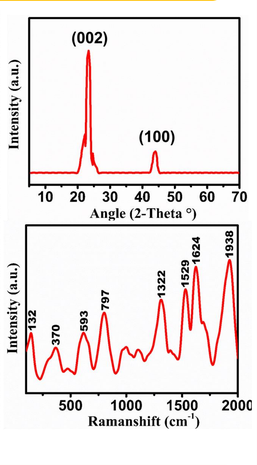


Emission Spectra



FT-IR ,Raman, XRD Spectra

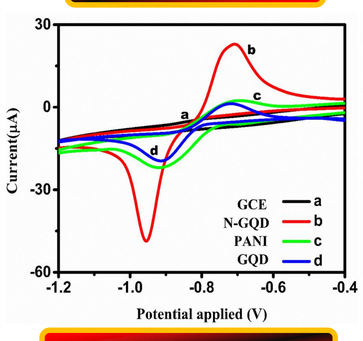




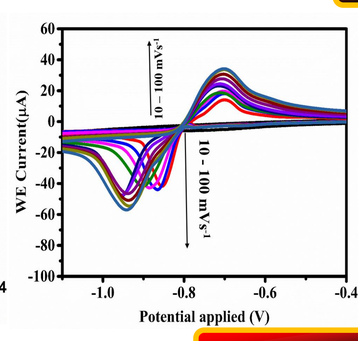
Peak at 260 nm corresponds $\pi \longrightarrow \pi^*$ transition
Peak at 516 nm corresponds $n \longrightarrow \pi^*$ transition

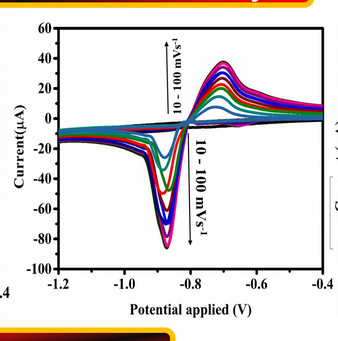
EC Sensing Studies

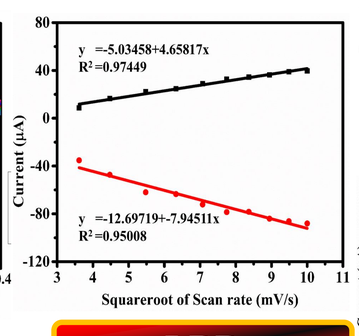
Control



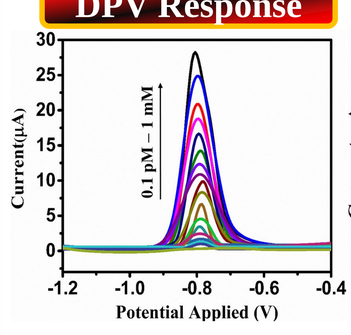
Scan rate study



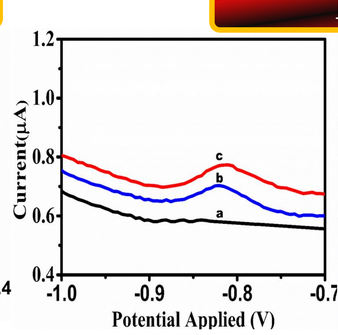


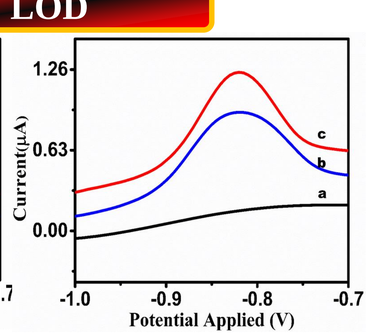


DPV Response

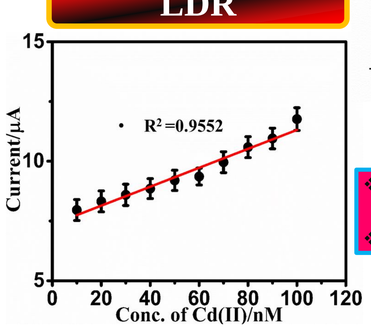


LOD

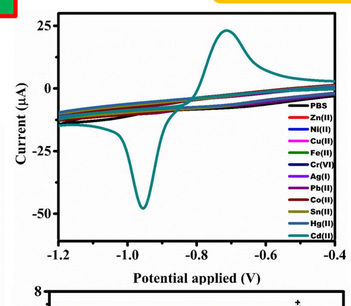


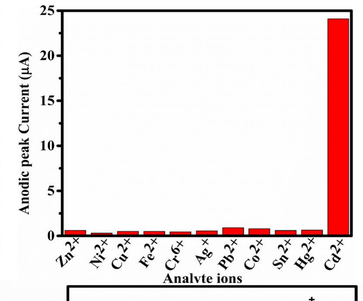


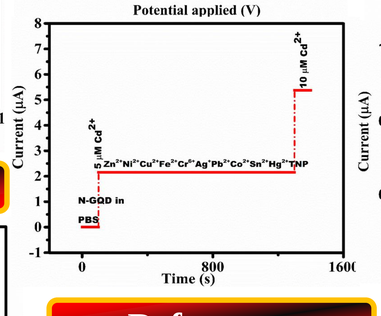
LDR

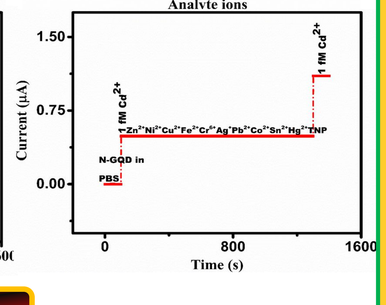


Interference









Conclusions

- N-GQD was prepared by a simple hydrothermal route using PANI as the source material
- The effective doping is confirmed through the absorption and FT-IR spectra
- N-GQD can detect Cd(II) up to 0.000011 ppb levels
- The electrode shows excellent selectivity towards Cd(II)

References

- Aswathi Ramachandran, Arya Nair J S, and Sandhya Karunakaran Yesodha, *ACS Sustainable Chem. Eng.*, 2019.
- Libo Li, Dong Liu, Aiping Shi and Tianyan You, *Sensors and Actuators B*, 2017.

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