



Graphene Quantum Dots Doped with Sulfur and Nitrogen as Versatile Electrochemical Sensors for Heavy Metal Ions Cd(II), Pb(II), and Hg(II)

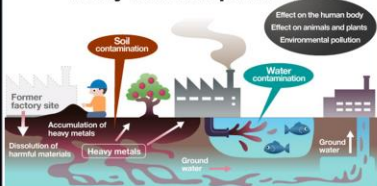


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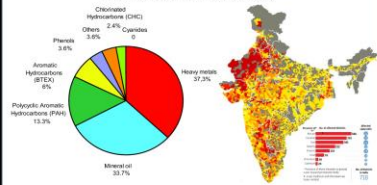
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INTRODUCTION

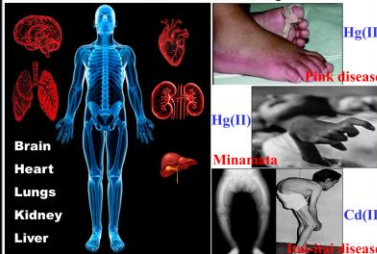
Heavy metal ion pollution



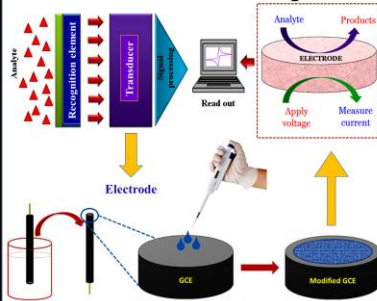
Pollution Statistics



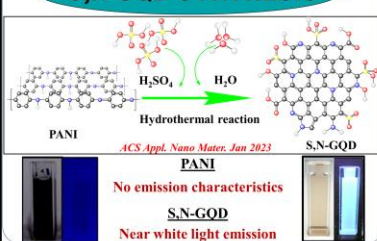
Effect on Human body



Electrochemical Sensing

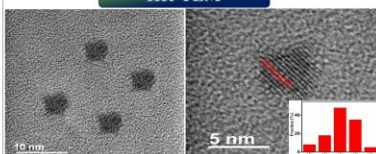


S,N-GQD SYNTHESIS

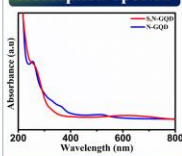


CHARACTERISATIONS

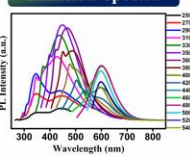
HR-TEM



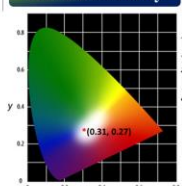
Absorption Spectra



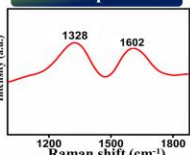
Emission Spectra



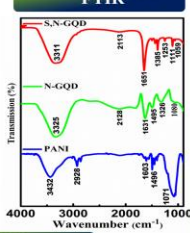
CIE Chromaticity



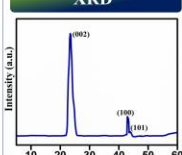
Raman Spectrum



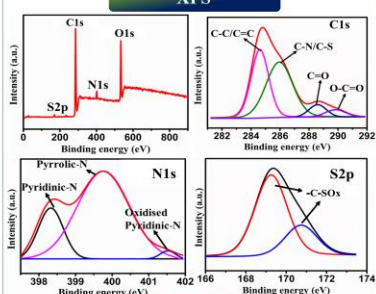
FTIR



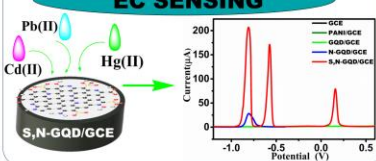
XRD



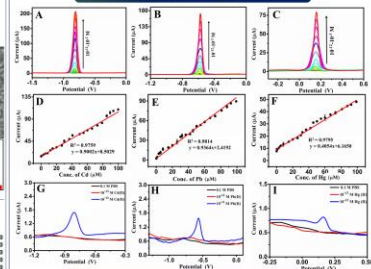
XPS



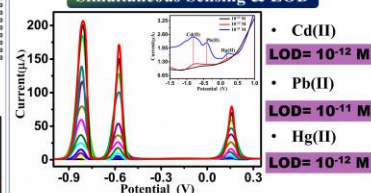
EC SENSING



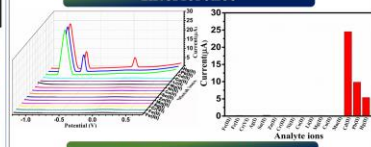
Selective Sensing & LOD



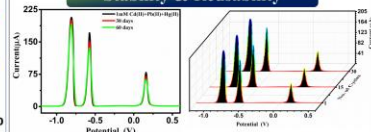
Simultaneous Sensing & LOD



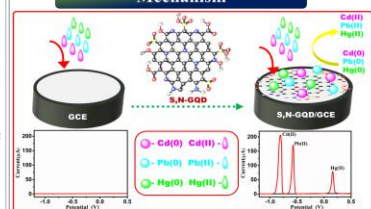
Interference



Stability & Reusability



Mechanism



Conclusions

S,N-GQD was prepared by a simple hydrothermal route using PANI as the source material

The effective formation confirmed from HR-TEM, Absorption, Raman, XPS and XRD

S,N-GQD simultaneously detect Cd(II), Pb(II) and Hg(II) in pM levels

References

Aswathi Ramchandran, Arya Nair J S, and Sandhya Karunakaran Yesodha, ACS Sustainable Chem. Eng. 2019.

Saisree S, Arya Nair J S, and Sandhya Karunakaran Yesodha, ACS Applied Nano Materials, 2023

Acknowledgement

Director IIST
HOD, Chemistry IIST
Dr. K. Y. Sandhya, Research Supervisor