Electronic Supplementary Material

Environmentally benign synthesis of fluorescent carbon nanodots using waste PET bottle: Highly selective and sensitive detection of Pb^{2+} ions in aqueous medium

Arnab Ghosh[a] and Gopal Das[a,b]

[a] *Centre for the Environment, Indian Institute of Technology Guwahati, Assam, 781039, India*

[b] *Department of Chemistry, Indian Institute of Technology Guwahati, Assam, 781039, India*

E-mail: gdas@iitg.ac.in, Tel.: +91-361-258-2313; fax: +91-361-258-2349

Calculation of quantum yield

The quantum yield (QY) of CDs was determined using quinine sulfate as the standard and calculated with following equation:

$QY_x = QY_{std} (I_x / I_{std}) (A_{std} / A_x) (\eta_x^2 / \eta_{std}^2)$

where the subscript "x" denotes CDs, the subscript "std" designates quinine sulfate, "*QY*" represents the quantum yield, "*I*" is the integrated PL intensity, "*A*" is the absorbance, and "η" stands for the refractive index of the solvent. Quinine sulfate (QY: 54 %) was dissolved in 0.1 M H_2SO_4 (refractive index: 1.33) and CDs were dissolved in water (refractive index: 1.33). The absorbance values of the respective solutions were kept below 0.10 at excitation wavelength so as to minimize the reabsorption effects.

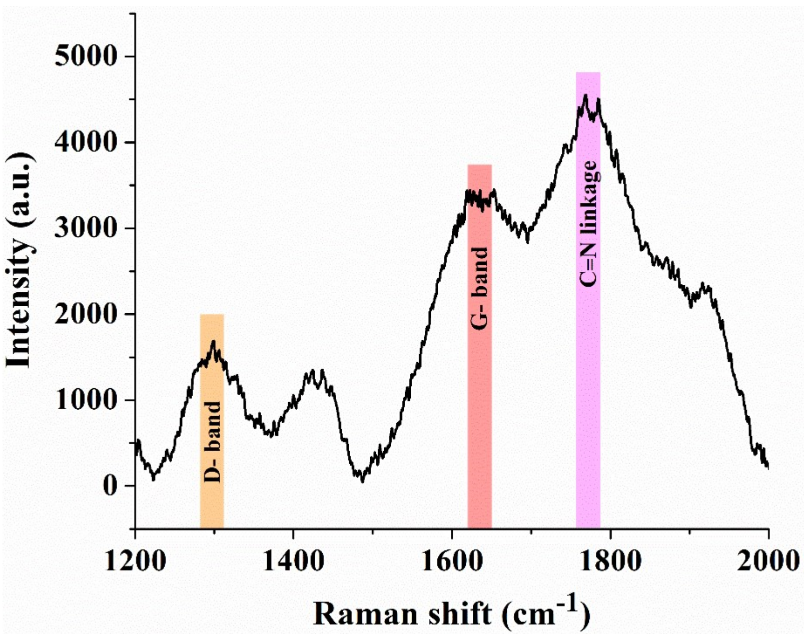

Fig. S1. Raman spectrum of the as prepared CDs.

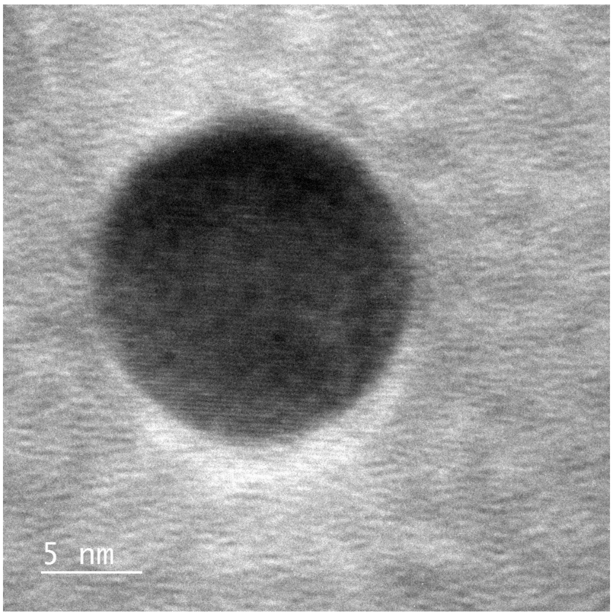

Fig. S2. HRTEM image of the synthesized carbon nanodot.

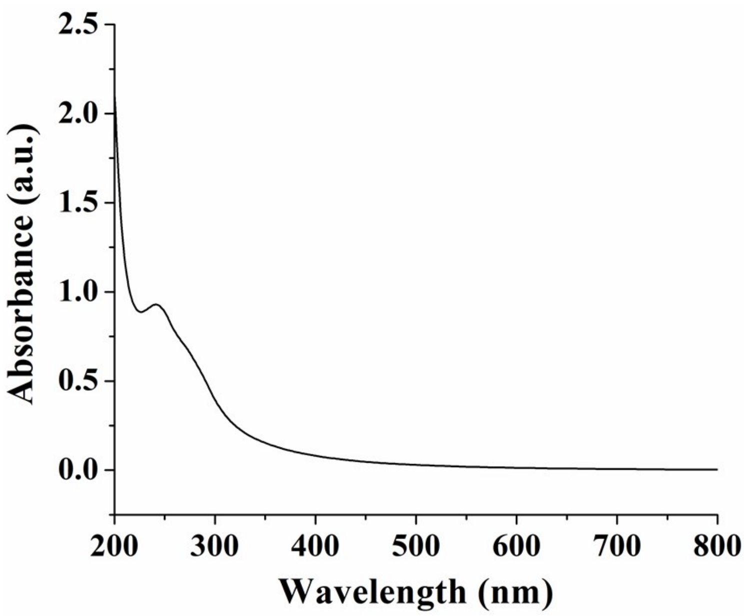

Fig. S3. UV-vis spectrum of the CD solution

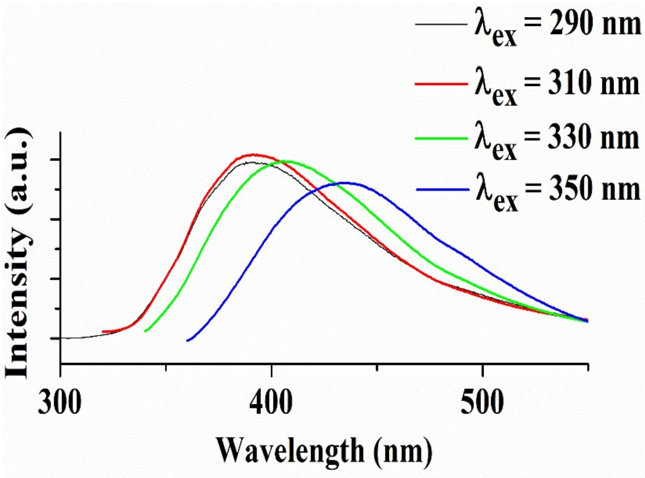

Fig. S4. Emission spectrum of the CDs at different excitation wavelength (λ_{ex})

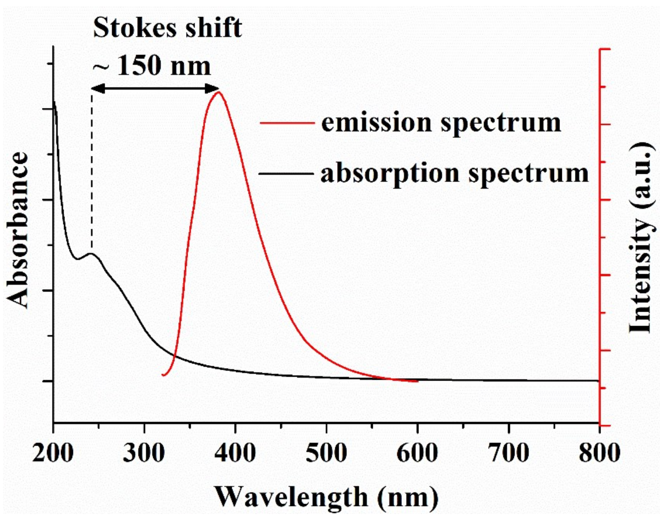

Fig. S5. Determination of Stokes shift from the maximum absorption and emission spectrum of the synthesized CDs

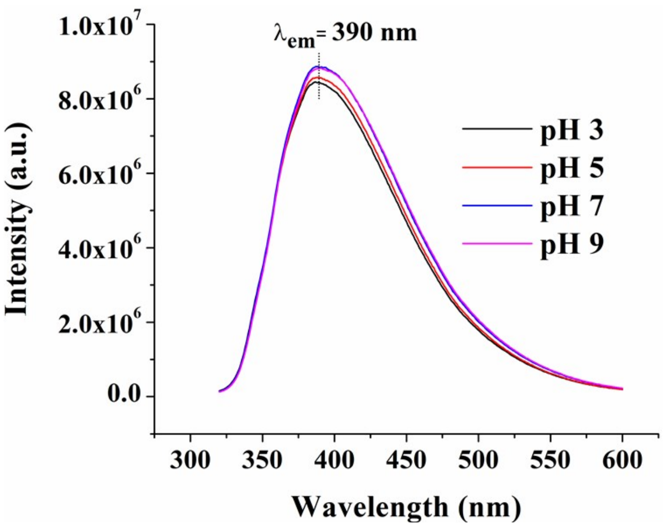

Fig. S6. Emission spectrum of the synthesized CDs at different solution Ph

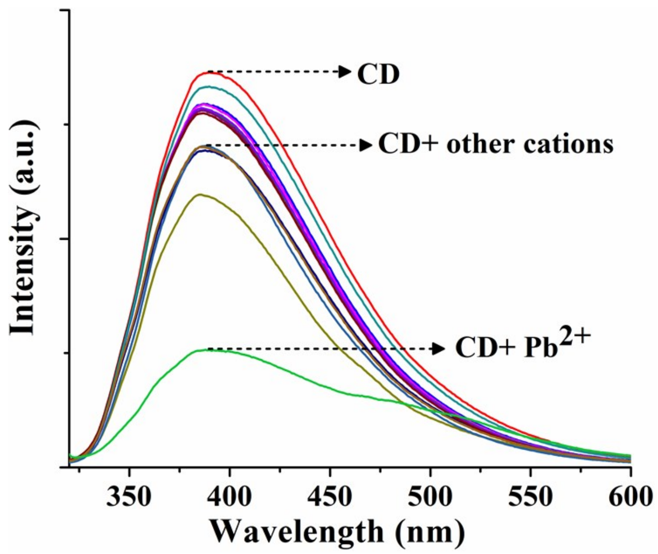

Fig. S7. Selectivity of Pb^{2+} over other cations in quenching of fluorescence intensity of an aqueous solution of CDs.

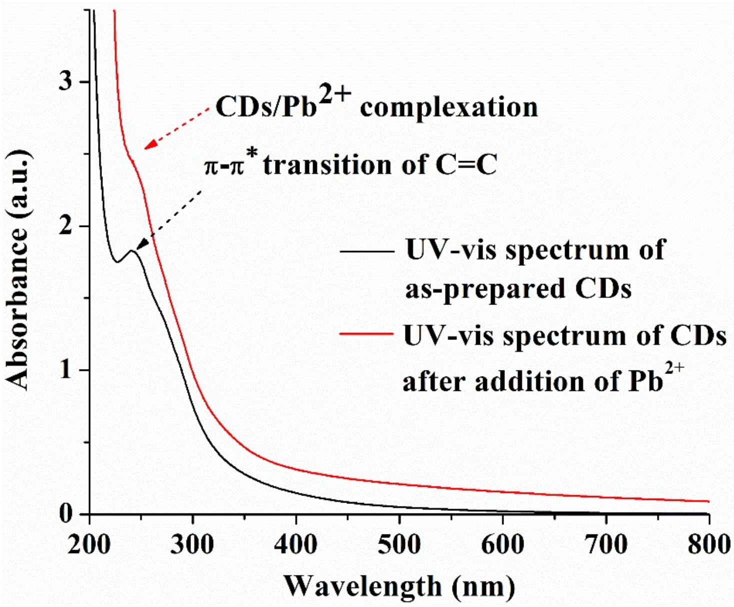

Fig. S8. UV-vis spectrum of the as-prepared CDs Vs UV-vis spectrum of CDs after addition 10 μM of Pb^{2+} ions

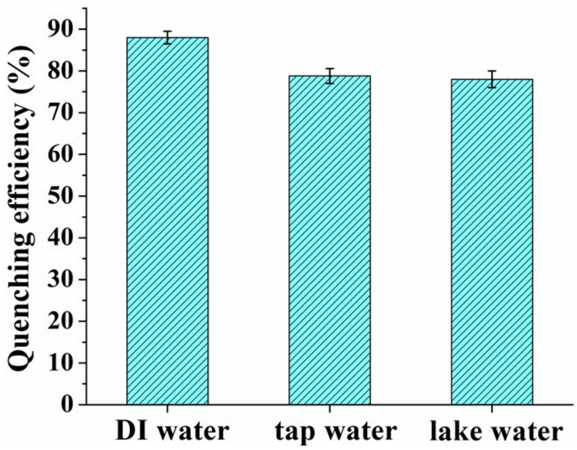

Fig. S9. Fluorescence quenching efficiency of different water samples spiked with Pb^{2+} ions