Electronic Supplementary Material (ESI) for New Journal of Chemistry.
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N-doped carbon dots synthesized by rapid microwave irradiation as highly fluorescent probe for Pb^{2+} detection

Yuliang Jiang[a,b], Yuxiang Wang[a], Fandian Meng[a], Bingxiang Wang[b],

Yixiang Cheng[a,*], Chengjian Zhu[a,*]

a Key Lab of Mesoscopic Chemistry of MOE, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing 210093, China

b School of Chemistry and Materials Science, Nanjing Normal University, Nanjing 210097, China

Contents:

ESI 1. Determination of quantum yields

The quantum yields of NCDs were calculated by using quinine sulfate (0.1M H_2SO_4,QY=0.54) solution as reference together with the following formula:

$$QY = Q_{Yref} \times [I \times A_{ref} \times \eta^2]/[I_{ref} \times A \times \eta_{ref}^2]$$

Where QY is the quantum yield of unknown; Q_{Yref} is the quantum yield of the reference compound; η is the refractive index of the solvent, I is the integrated fluorescence intensity and A is the absorbance at the excitation wavelength. The absorbances at the wavelength of excitation is optimally kept in between A = 0.02-0.05 in order to avoid inner filter effects and ensure linear response on the intensity.

ESI 2. The reactant colour changed over time

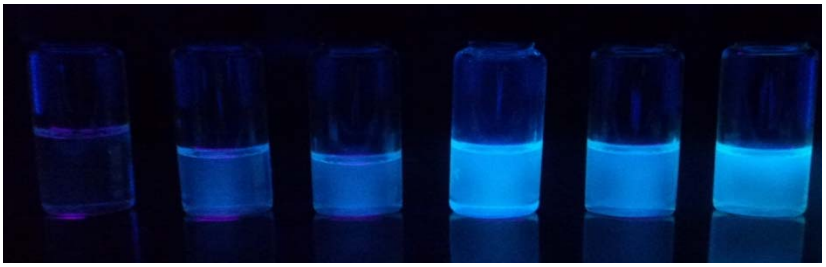

Fig. S1 The reactant colour changed over time under ultraviolet (UV) irradiation at 365 nm (from left to right 0, 2, 5, 10, 15, 20min).

ESI 3. FT-IR spectrum of NCDs

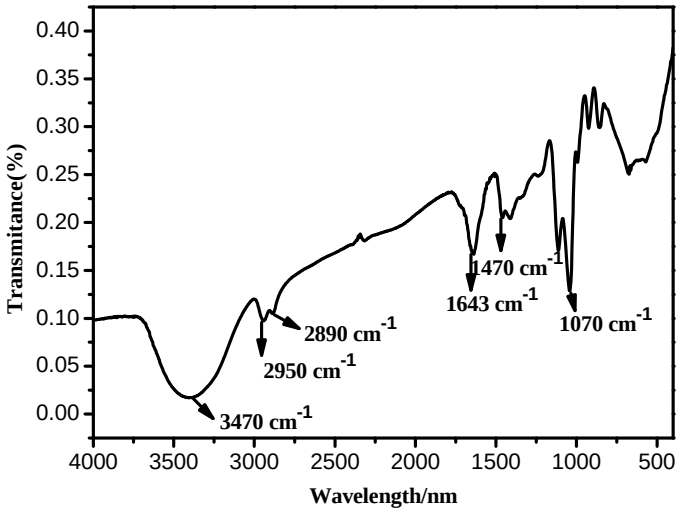

Fig. S2 The FTIR spectrum of NCDs

ESI 4. XPS spectra of NCDs

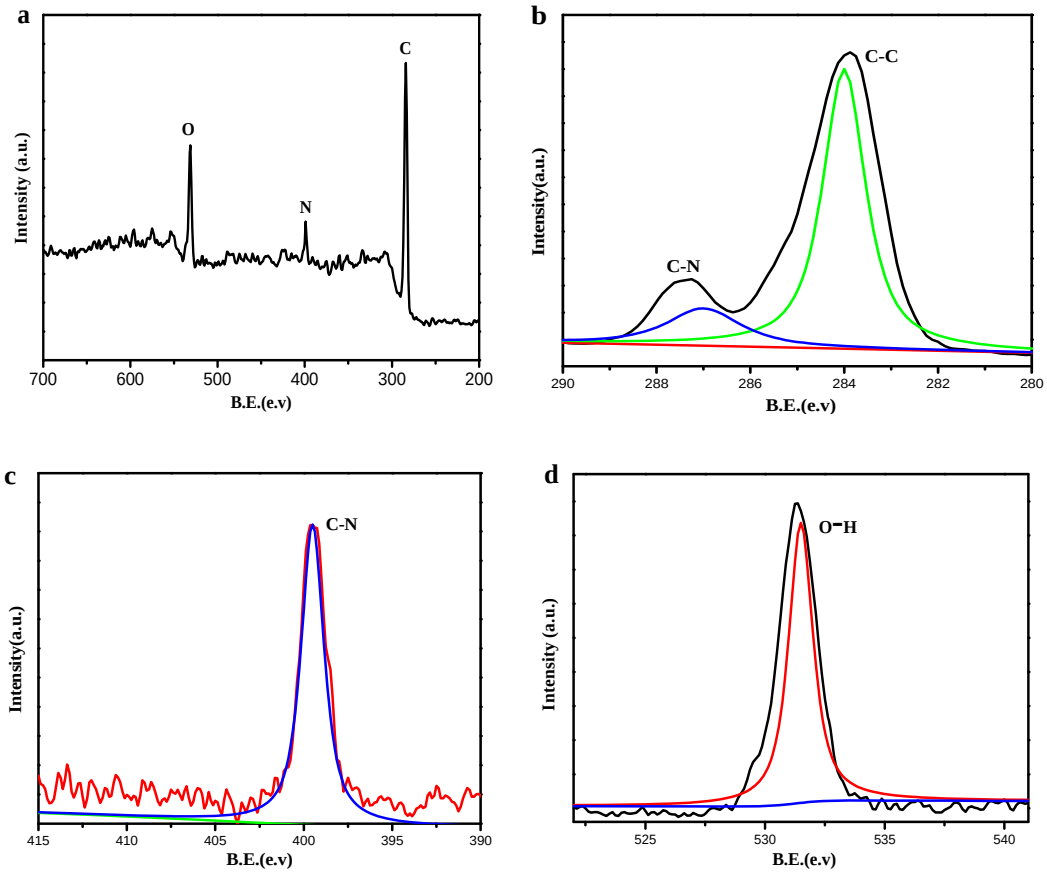

Fig. S3 a) XPS, b) C1s, c) N1s and d) O1s, spectra of the NCDs

ESI 5. Fluorescence spectrum of NCDs under different pH

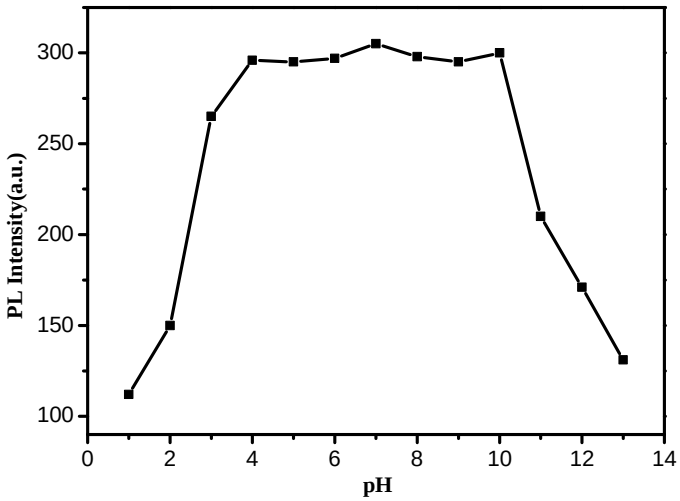

Fig. S4 The emission spectrum of NCDs under different pH form 1 to 13

ESI 6. The stability of NCDs

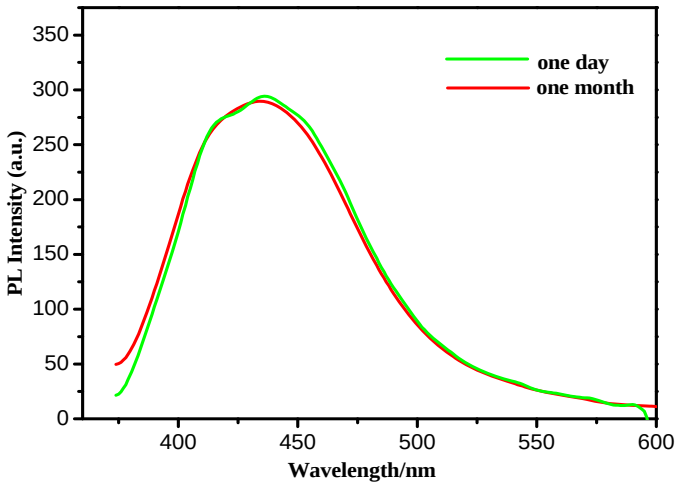

Fig. S5 The stability of NCDs

ESI 7. The analysis result of Pb^{2+} in water samples

Table S1. The analysis result of Pb^{2+} in water samples

Sample	Add / nM	Found / nM	Recovery / %	RSD / %
Drinking water	1.00	0.88	88.00	3.12
	5.00	5.12	102.00	2.52
	10.00	10.20	102.00	3.14
	50.00	49.80	99.60	1.73
	100.00	99.00	99.00	2.54