Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Facile one-step synthesis of highly luminescent N-doped carbon dots as efficient fluorescence probe for chromium (VI) detection based on inner filter effect

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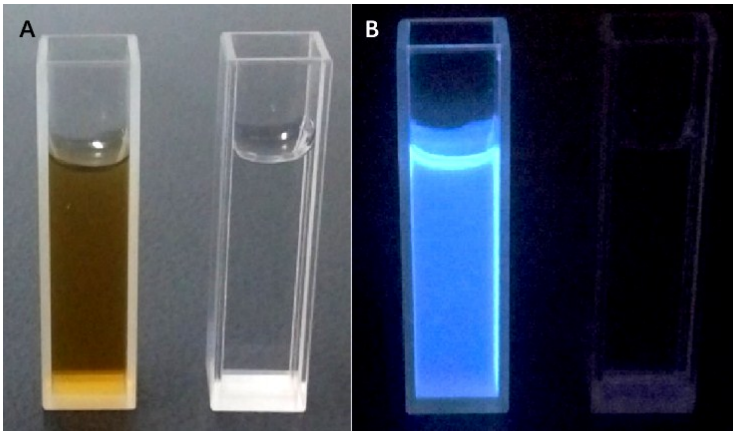

Figure S1 As-prepared reaction mixtures (left) and the starting materials (right) under irradiation with visible (A) and UV light (B).

Figure S2. Photographs of the CG-CDs power under irradiation with visible (left) and UV light (right).

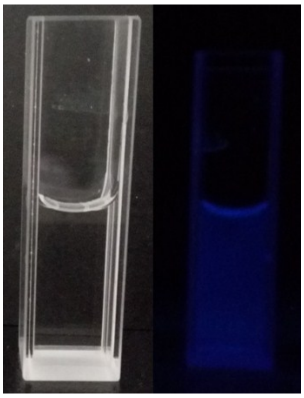

Figure S3. Photograph of the CG-CDs aqueous solution under irradiation with visible (left) and UV light (right)

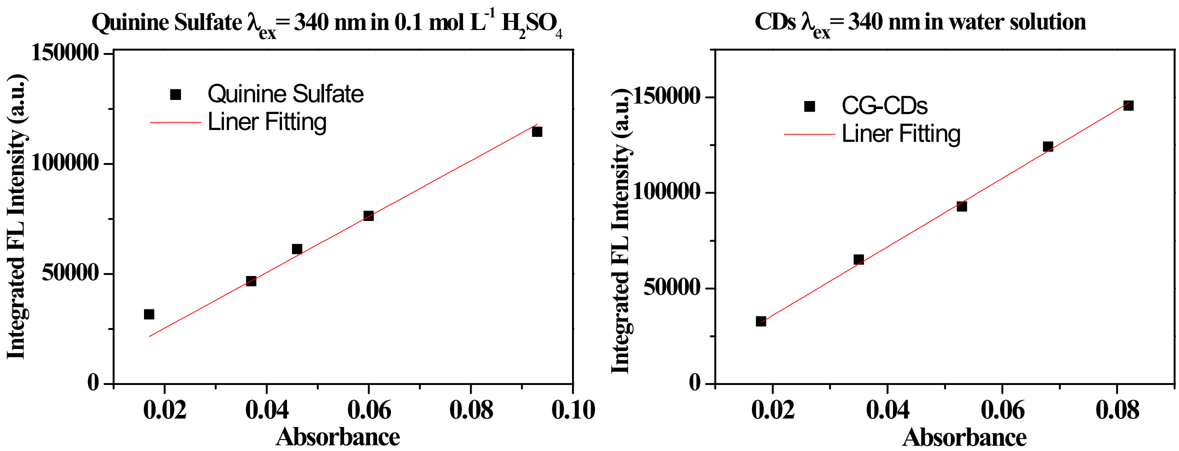

Figure S4. Plots of integrated fluorescence (FL) intensity of quinine sulfate (referenced dye) and CG-CDs synthesized from citric acid and glycine as a function of optical absorbance at 340 nm.

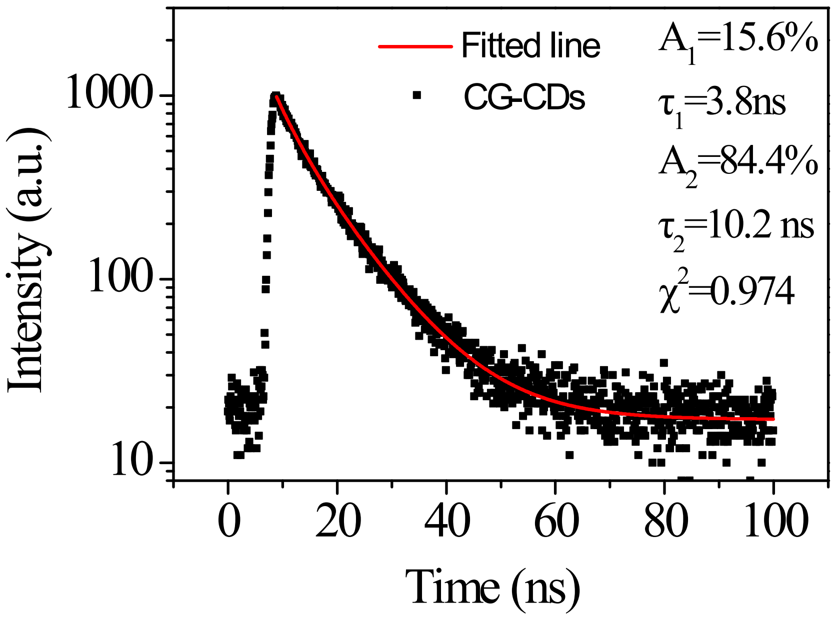

Figure S5 Fluorescence decay spectra and fitting curves of CG-CDs.

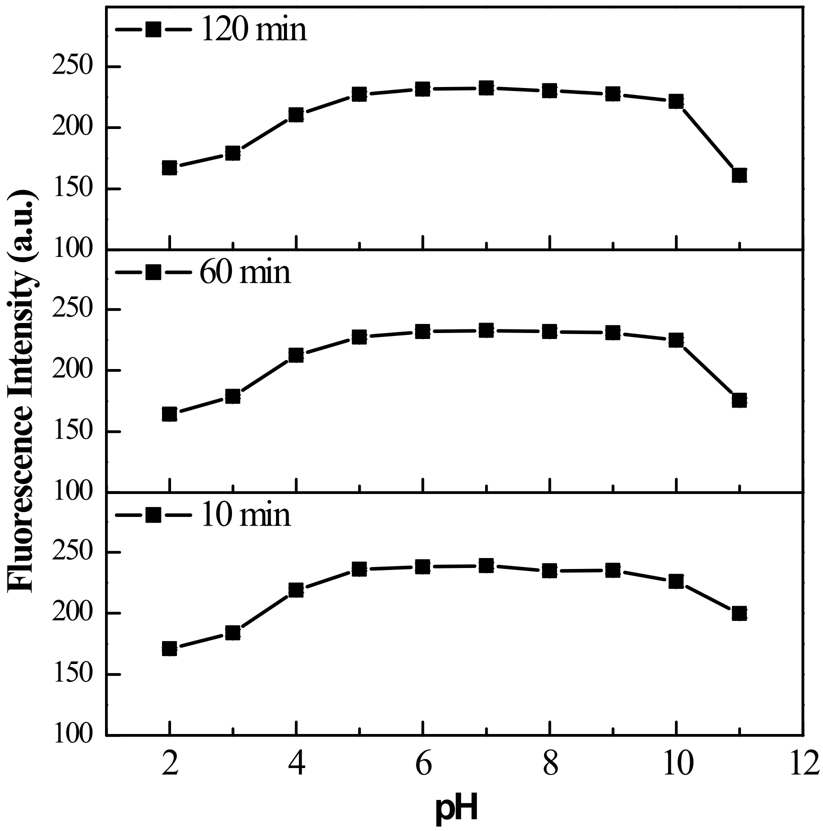

Figure S6. Effects of pH value on the fluorescence intensity of CG-CDs within 120 min.

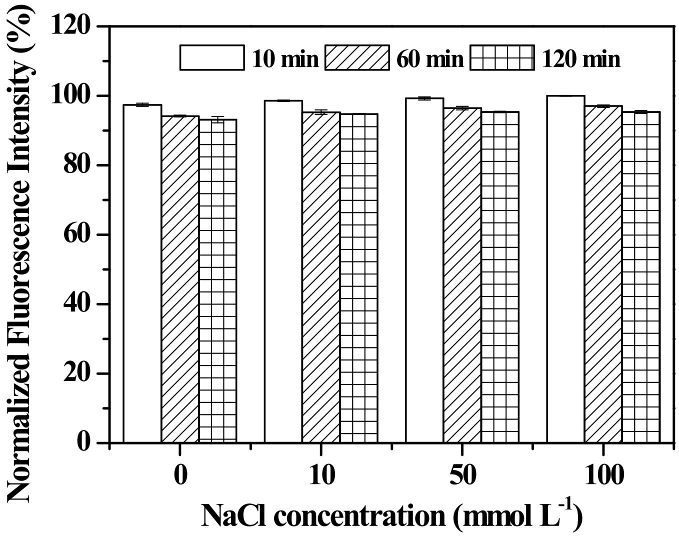

Figure S7. Effects of ionic strength of NaCl on the fluorescence intensity of CG-CDs within 120 min.

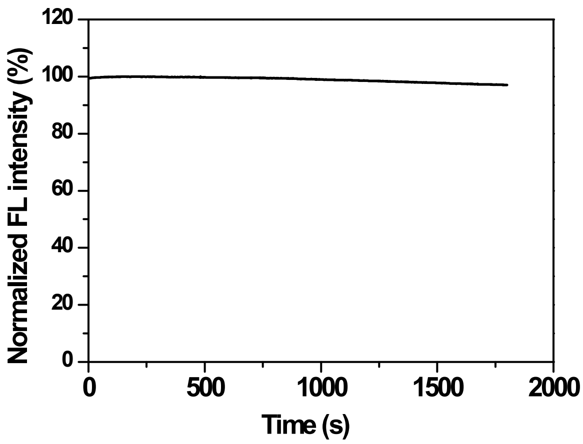

Figure S8. Photostability of fluorescence intensity for CG-CDs under continuous excitation at 340 nm for 30 min.

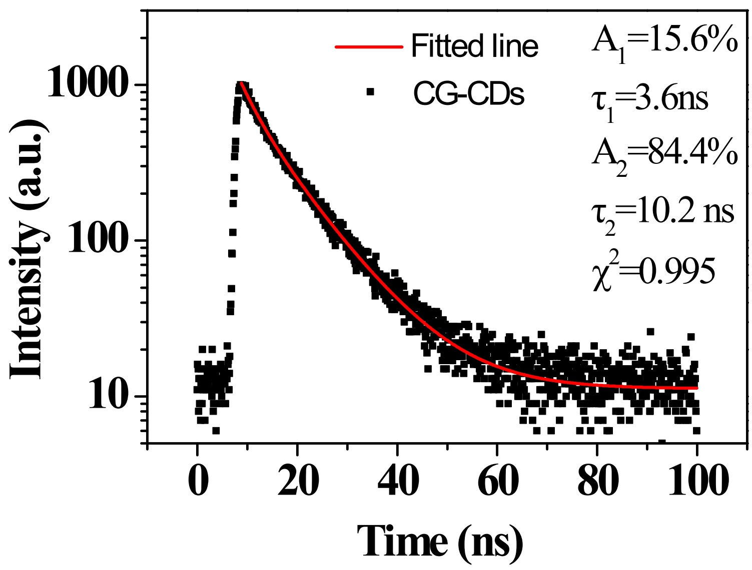

Figure S9. Fluorescence decay and fitting curves of CG-CDs in the presence of Cr (VI) (200 μM).

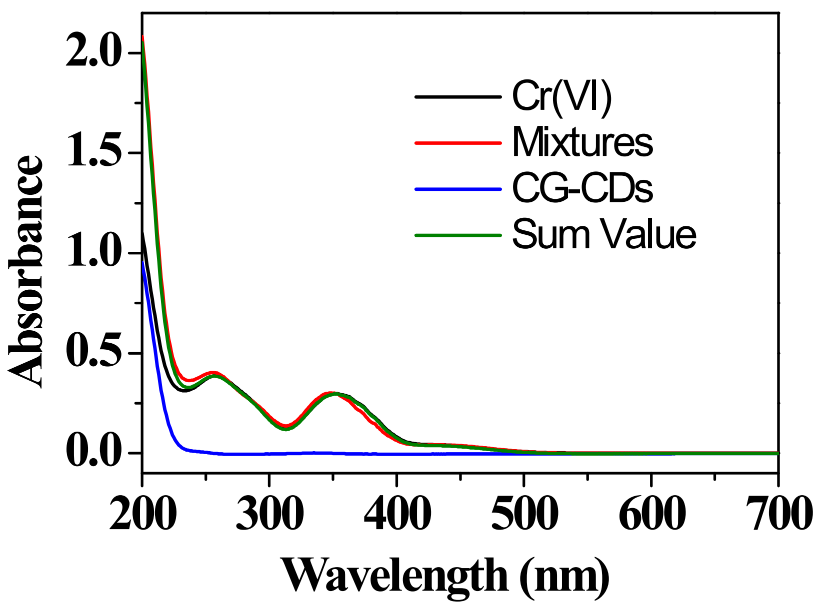

Figure S10. The UV-vis absorption spectra of CG-CDs, Cr(VI), CG-CDs- Cr(VI) mixtures and the sum value of absorbance of CG-CDs and Cr(VI).

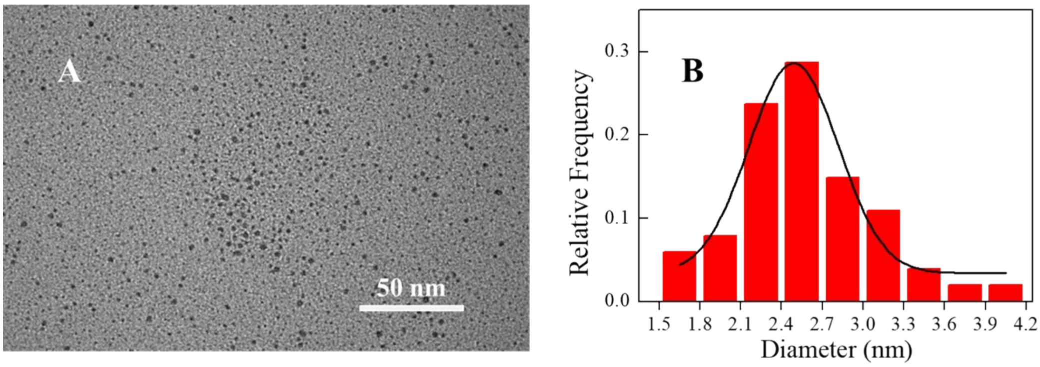

Figure S11. TEM image (A) and size distribution histogram (B) of CG-CDs in present of chromium (VI) (100 μmol L^{-1}), the average size was 2.6 nm, which is similar to the pure CG-CDs.

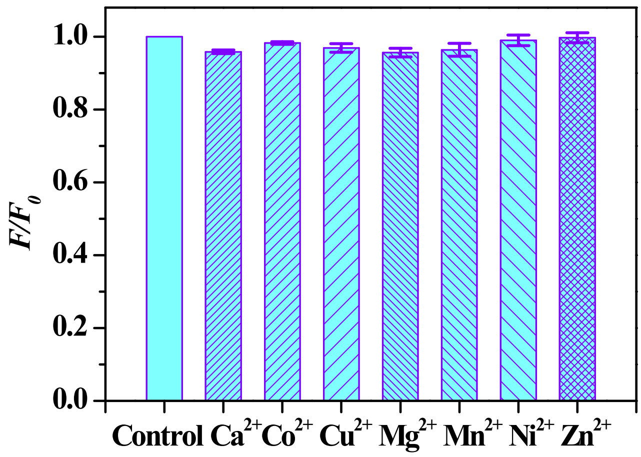

Figure S12. Fluorescence intensity response of CG-CDs in the presence of 200 μM solution of various metal ions. The blank represents the fluorescence response of the solution of CG-CDs without adding any metal ion. The concentration of each kind of ion was 100 μM.

Table S1. Parameters for QY calculation

	Quinine Sulfate					CDs				
Abs	0.017	0.037	0.046	0.06	0.093	0.018	0.035	0.053	0.068	0.082
Integrated FL	31662	46722	61250	76330	114662	32756	65095	92882	124230	145645
lope	1.27×10^6					1.79×10^6				
QY	55%					78%				

FL: fluorescence; QY: quantum yield.

Table S2. The comparison of the determination of Cr(VI)

Methods	Time consumption	Linear detection range	Detection limit	Reference
Fluorescence method with carbon dot	1 min	0.01-50 μM	/	[1]
Electrochemical detection based on gold nanoparticles	/	0.1-105 μM	0.03 μM	[2]
Colorimetric method with gold nanoparticle	30 min	0.1-20 μM	0.088 μM	[3]
Fluorescence method with AlQx modified SBA-15	/	0.32-5.8 μM	7.7 nM	[4]
Colorimetric method with Ce(VI) and 1,5-DPC modified Paper microfluidic devices	10 min	0.23-3.75 μg (4.42-7.2 μmol)	0.12 μg (2.31μmol)	[5]
Colorimetric method with silver nanoparticle	/	1 nM-1 mM	1 nM	[6]
Fluorescence method with graphitic carbon nitride nanosheets	10 min	0.6-300 μM	0.15 μM	[7]
boron and nitrogen co-doped carbon dots	1 min	1.39-260 μM	0.28 μM	[8]
nitrogen and sulfur co-doped carbon dots	10 min	2-160 μM	1.72 μM	[9]

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