Supplementary information

One-step high-yield preparation of nitrogen- and sulfur-codoped carbon dots with applications in chromium (VI) and ascorbic acid detection

Fanrong Meng,[a] Haoran Xu,[a] Shuolin Wang,[a] Jingxian Wei,[a] Wengong Zhou,[a] Qiang Wang,[a] Peng Li,[a] Fangong Kong,[a] Yucang Zhang*[b]

[a]*State Key Laboratory of Biobased Material and Green Papermaking, Qilu University of Technology (Shandong Academy of Sciences), Jinan, 250353, P.R. China*

[b]*College of food and biological engineering，Jimei University，Xiamen, 361021，P.R. China*

**Yucang Zhang, Ph. D., College of food and biological engineering，Jimei University，Xiamen, China*

Email: yczhang@jmu.edu.cn

Table S1. Optimal excitation-emission wavenumber and SY of the different CDs synthesized

	CDs-IP	CDs-PM	CDs-IPM	CDs-IM	CDs-A
λ_{ex} (nm)	451	442	455	448	425
λ_{em} (nm)	392	358	397	356	252
SY (%)	9.2%	25.7%	65.69%	37.6%	18.3%

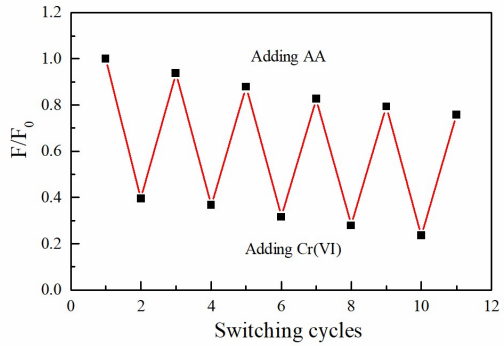


Fig. S1. Switching cycles of the CD-IPMs/Cr (VI) samples upon alternate addition of Cr (VI) (20 μM) and AA (20 μM) in pH 7.4 HEPES buffered water (λex = 397 nm, λem = 455 nm)

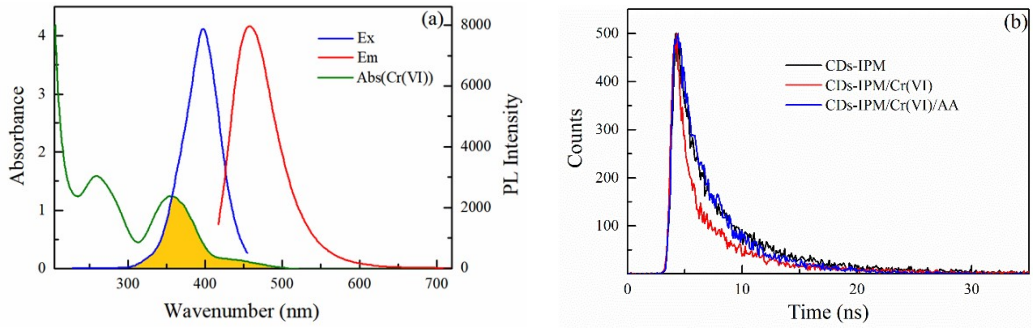


Fig. S2 (a) The overlap between the ultraviolet absorption spectrum of Cr (VI) and fluorescence excitation and emission spectra of CD-IPMs. (b) Fluorescence decay curves of CD-IPMs with and without the existence of Cr (VI) (20μM), after addition of AA (20 μM) as a function of time at $\lambda_{ex}/\lambda_{em}$ of 397/455 nm.

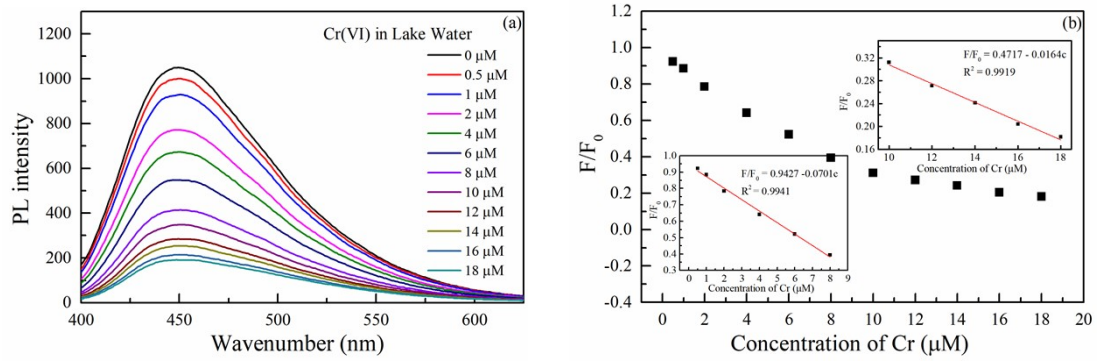
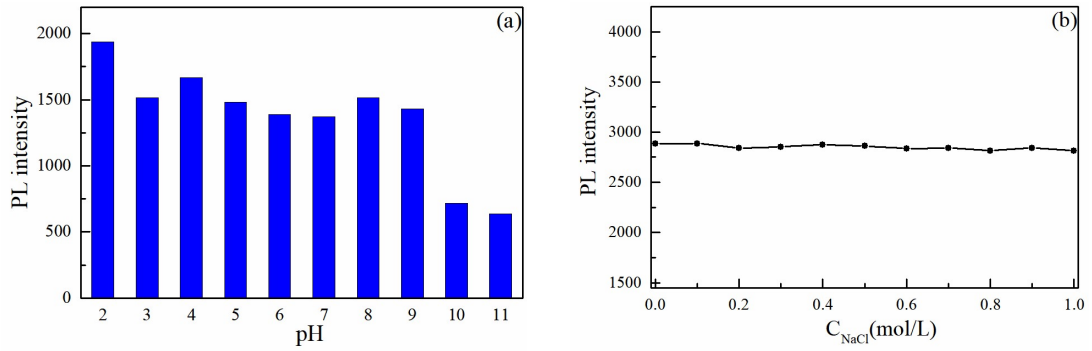


Fig. S3 (a) Fluorescence emission spectra of CDs-IPM with different amount of Cr(VI) in lake water under 397 nm excitation. (b) The linear relationship between fluorescence intensity ratio (F/F_0) and concentration of Cr(VI) in lake water.



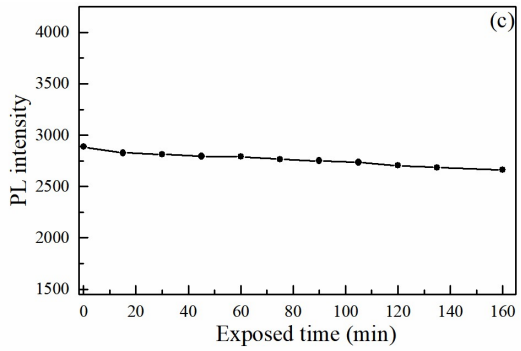


Fig. S4 The PL intensity of CD-IPMs at different (a) pH values, (b) ionic strengths, and (c) storage time periods under ultraviolet light-based experimental conditions.

Table S2. The sensor performance for Cr(VI) detection in comparison with previous works

Sensor	Size (nm)	Linear range (μM)	LOD (μM)	QY (%)	Reference
PNCQDs	4.24-6.33	1.5-30	0.023	9.6	[1]
C-dots	2-4	1000–6000	--	10.2	[2]
N, Cl-CDs	3.7–5.8	3-40	0.28	--	[3]
CDs-220	6-9	0.2-40	0.25	21.85	[4]
N-C-dots	2-8	2-9	1.9	17.6	[5]
CQD	1-5	5-100	14	15.34	[6]
NCND	7	10-100	9000	--	[7]
S, N-CDs	1-9	0.03–50	0.021	17	[8]
CDs-IPM	1-4.6	3-30	0.017	29.27	This work

Refference

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