

Electronic Supporting Information

Highly selective and sensitive sensing for Al³⁺ and F⁻ based on green photoluminescent carbon dots

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Table S1 Overview of detection for Al³⁺ and F⁻

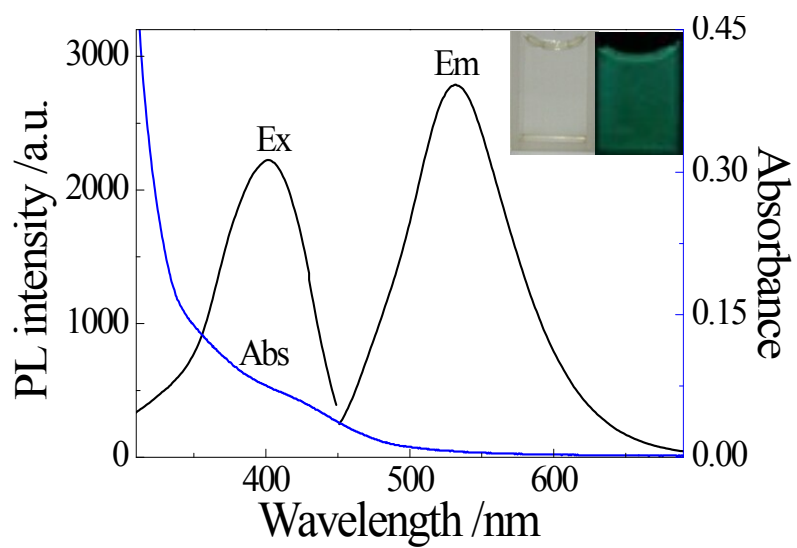


Fig. S1 UV-vis absorption, PL excitation and emission spectra of the CDs. The inset shows the PL photo of the CDs solution under the illumination of room light (left) and of 365 nm light (right), respectively.

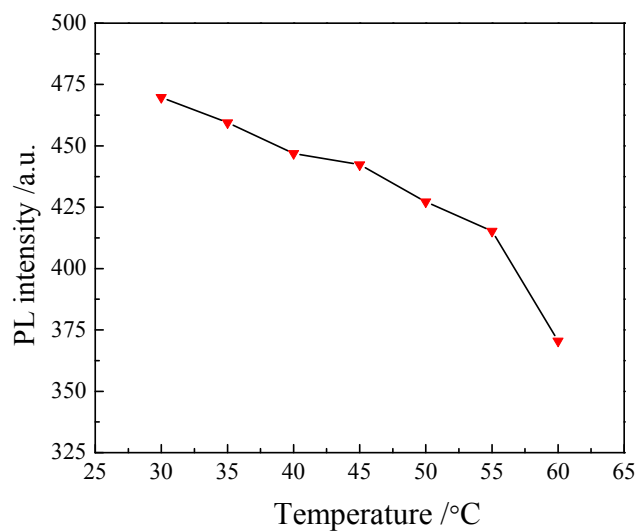


Fig. S2 The curve of fluorescence intensity of probe varied with the temperature

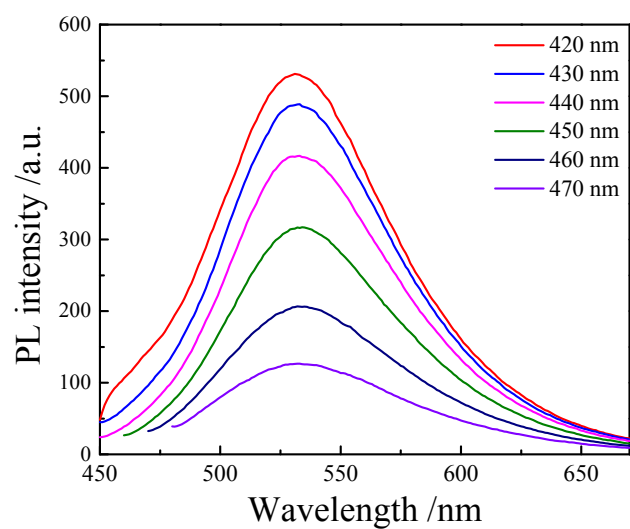


Fig. S3 Fluorescence spectra of CDs at different excitation wavelength

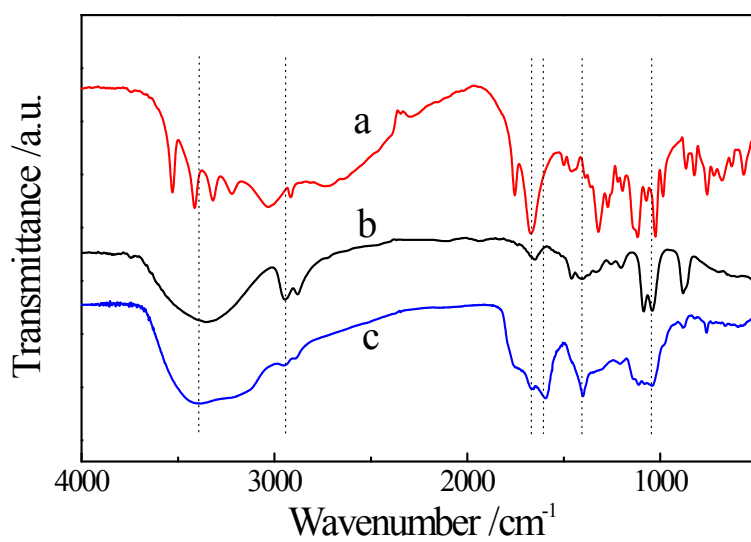


Fig.S4 FT-IR spectra of ascorbic acid (a), glycol (b) and CDs (c).

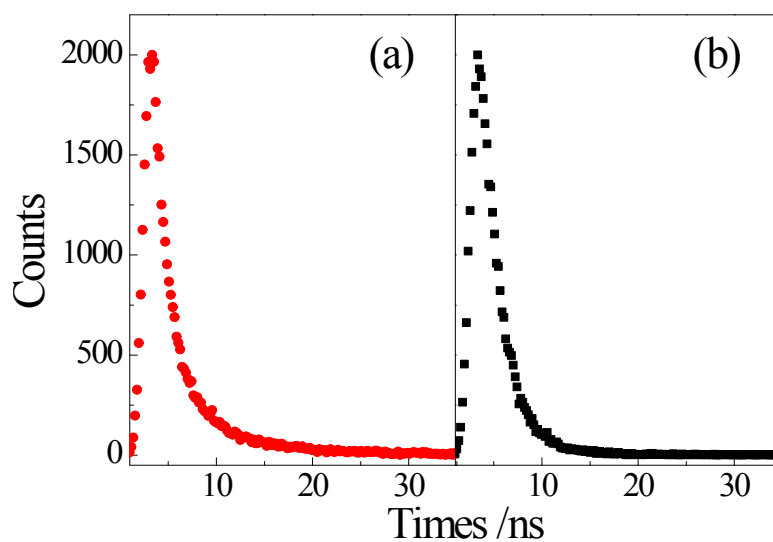


Fig.S5 The lifetime curves of CDs in the absence (a) and presence (b) of Al^{3+} ions ($10 \mu\text{M}$)

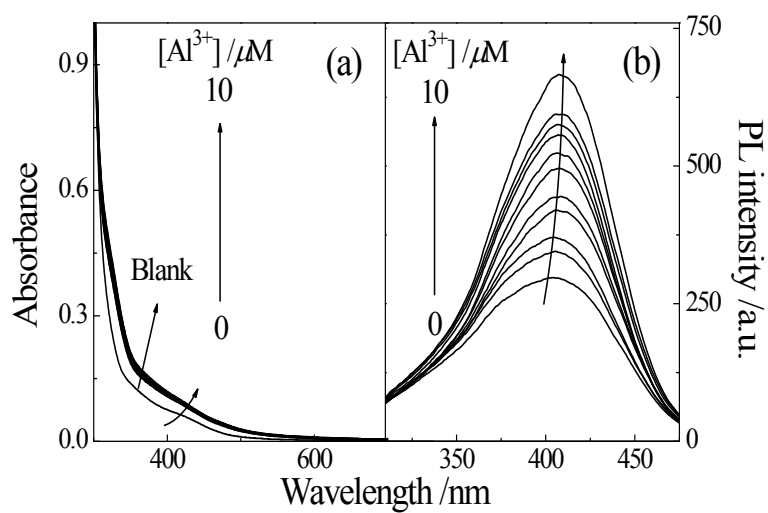


Fig.S6 UV-vis absorption (a) and PL excitation spectral change (b) of the CDs in 50 mM Tris-HCl buffer solution of pH 7.4 containing different concentration of Al^{3+} ions (0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, $10.0 \mu\text{M}$, respectively).

Table S1 Overview of detection for Al³⁺ and F⁻

Methods	Materials	Detection	Linear range(μM)	LOD (μM)	References
Fluorescence	RCS	Al ³⁺	3.2 ~130	3.2	<u>1</u>
Fluorescence	MCIH	Al ³⁺	0.05 ~0.25	0.05	<u>2</u>
Fluorescence	3HFF	Al ³⁺	5 ~100	0.52	<u>3</u>
Colorimetry	GSH-AgNPs	Al ³⁺	0.4 ~4.0	1.2	<u>4</u>
Fluorescence	Alizarin	Al ³⁺	3 ~45	0.52	<u>5</u>
Colorimetry	L-AuNPs	Al ³⁺	66 ~322	19.6	<u>6</u>
Fluorescence	carbon dots	Al ³⁺	0.50 ~10	0.39	This work
Colorimetry	HNHCB	F ⁻	-	1.3	<u>7</u>
Fluorescence	MPBA, PBA	F ⁻	0 ~2.6*10 ⁴	1.1*10 ²	<u>8</u>
Colorimetry	E1	F ⁻	0 ~100	7.3	<u>9</u>
Electrochemistry	Spiropyran	F ⁻	0.5 ~10	8.3*10 ⁻²	<u>10</u>
Fluorescence	TAPB	F ⁻	0.17 ~3.0	0.17	<u>11</u>
Fluorescence	carbon dots	F ⁻	0.50 ~10	0.14	This work

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