Supporting Information

Fish scales derived carbon dots as efficient fluorescent nanoprobe for detection of ferric ions

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Table S1 The concentrations of Fe^{3+} standard solutions, injected volumes and the final concentrations of Fe^{3+} in the CDs-Fe^{3+} assay system. C_{CDs}=250 μg mL^{-1}

Concentration of Fe^{3+} standard solution (M)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Volume added (μL)	0	4	8	12	16	20	24	28	32	36	40
Ultimate concentration of Fe^{3+} in CDs-Fe^{3+} system (μmol L^{-1})	0	1	2	3	4	5	6	7	8	9	10
Concentration of Fe^{3+} standard solution (M)	0.001	0.001	0.001	0.001	0.001	0.01	0.01	0.01	0.01	0.01	0.01
Volume added (μL)	44	48	64	80	96	11.2	13.2	15.2	17.2	19.2	21.2
Ultimate concentration of Fe^{3+} in CDs-Fe^{3+} system (μmol L^{-1})	11	12	16	20	24	28	33	38	43	48	53
Concentration of Fe^{3+} standard solution (M)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Volume added (μL)	23.2	252	27.2	31.2	35.2	39.2	43.2	51.2	59.2	67.2	83.2
Ultimate concentration of Fe^{3+} in CDs-Fe^{3+} system (μmol L^{-1})	58	63	68	78	88	98	108	128	148	168	188
Concentration of Fe^{3+} standard solution (M)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Volume added (μL)	83.2	91.2	99.2	107.2	115.2	123.2	131.2	139.2	147.2	155.2	163.2
Ultimate concentration of Fe^{3+} in CDs-Fe^{3+} system (μmol L^{-1})	208	228	248	268	288	308	328	348	368	388	408
Concentration of Fe^{3+} standard solution (M)	0.01	0.01	0.01	0.01							
Volume added (μL)	171.2	179.2	187.2	196.2							
Ultimate concentration of Fe^{3+} in CDs-Fe^{3+} system (μmol L^{-1})	428	448	468	488							

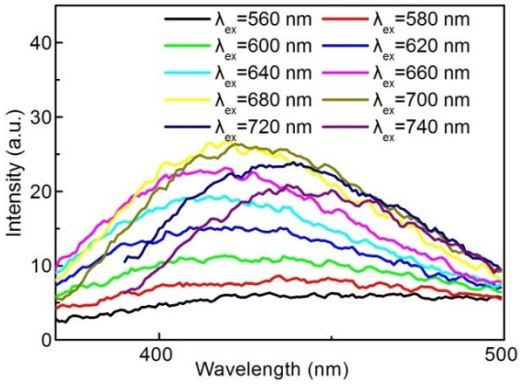

Fig. S1 Fluorescence emission intensity of CDs within λ_{ex} range of 560~740 nm, C_{CDs}: 125 μg mL^{-1}.

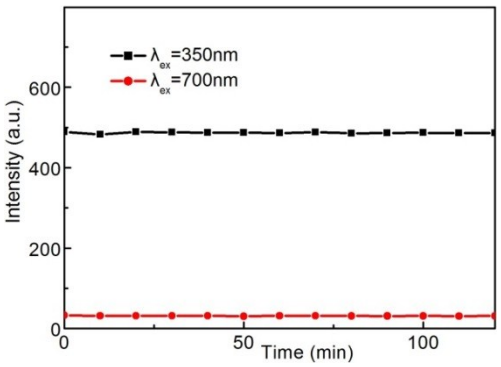

Fig. S2 Fluorescence emission intensity of CDs at λ_{ex}=350 and 700 nm upon irradiation for different time intervals. C_{CDs}: 125 μg mL^{-1}

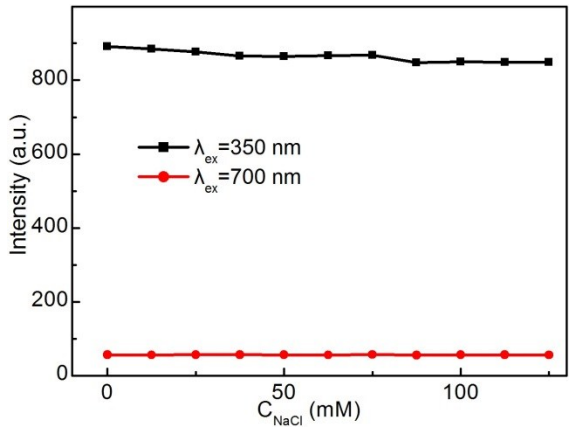

Fig. S3 Fluorescence emission intensity of aqueous CDs solution with different NaCl concentrations at λ_{ex}=350 and 700 nm. C_{CDs}: 250 μg mL^{-1}, C_{NaCl}: 0~125 mM.

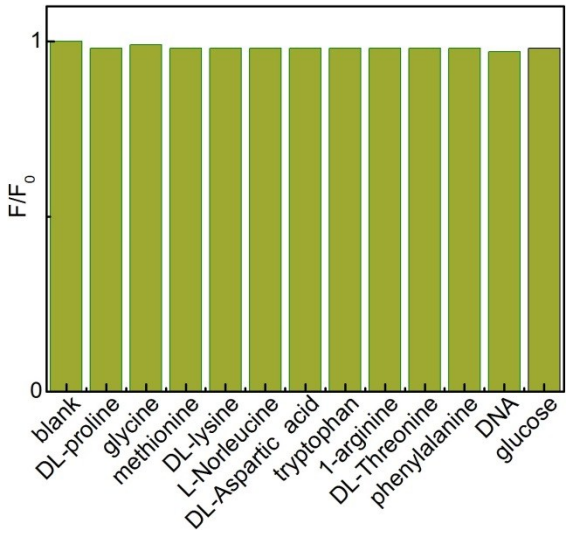

Fig. S4 Fluorescence respones of CDs to different biomolecules, C_{CDs}: 125 μg mL^{-1}, concentration of biomolecules: 2.5 μg L^{-1}.

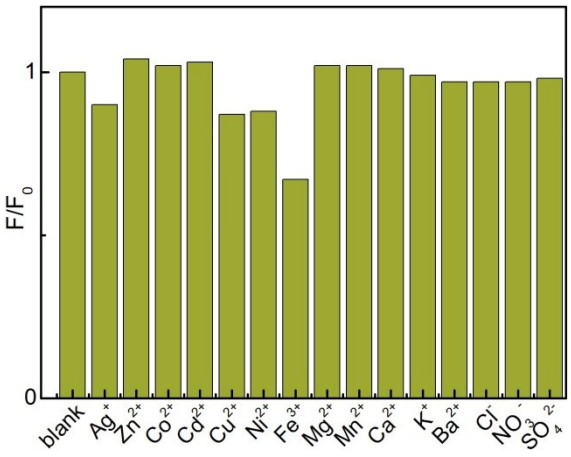

Fig. S5 Fluorescence responds of CDs towards different metal ions and common anions, C_{CDs}: 125 μg mL^{-1}, concentration of metal ions and anions: 100 μmol L^{-1}.

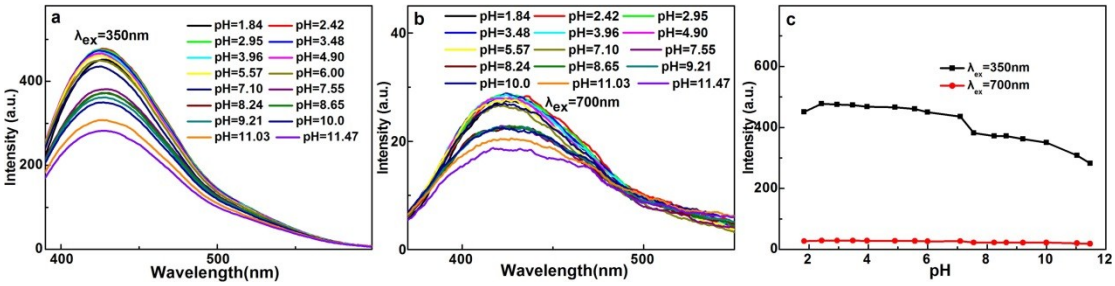

Fig. S6 PL spectra within pH range of 2-11 at (a) λ_{ex}=350 nm, (b) λ_{ex}=700 nm, (c) Emission intensity vs pH plots, C_{CDs}: 125 μg mL^{-1}.

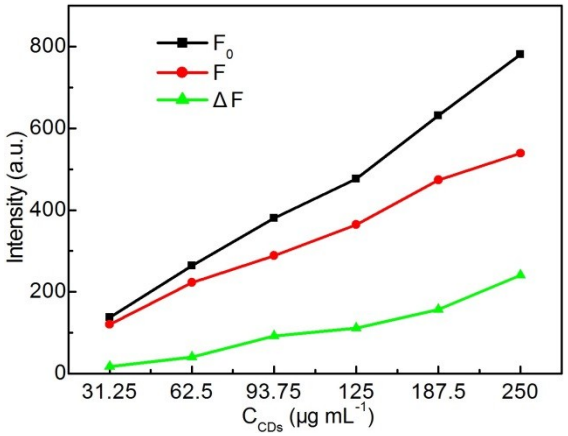

Fig.S7 Effect of the CDs concentration on fluorescence intensity of CDs-Fe^{3+} system, C_{Fe3+}=2.5 μmol L^{-1}.

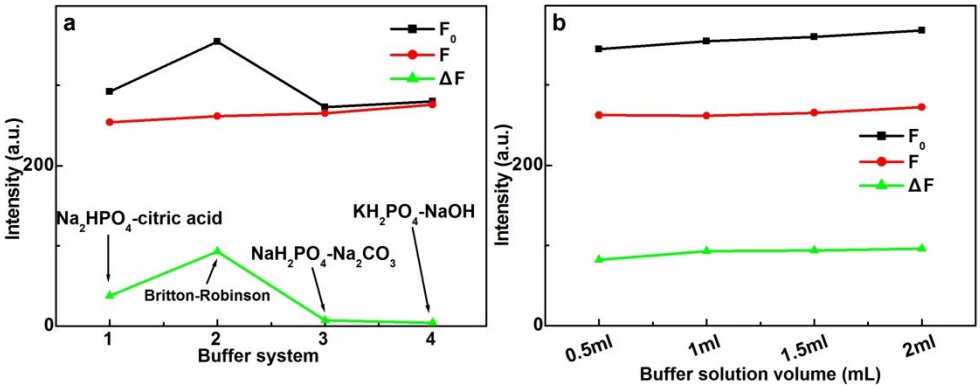

Fig.S8 Effect of (a) buffer solution type and (b) dosage of BR buffer solution on the fluorescence intensity of CDs-Fe^{3+} system. C_{CDs}= 125 μg mL^{-1}, C_{Fe3+}= 2.5μmol L^{-1}.

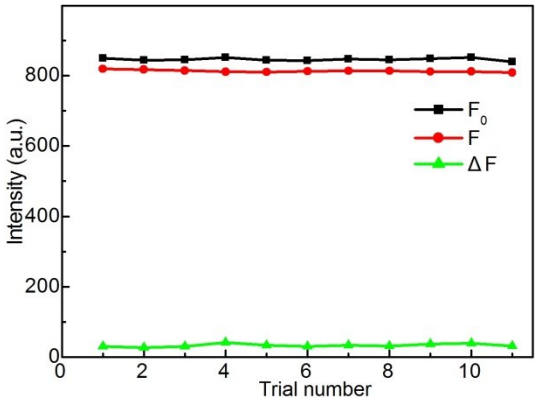

Fig.S9 Fluorescence intensities of CDs-Fe^{3+} system at 11 parallel trials. C_{CDs}=250 μg mL^{-1}, C_{Fe3+}= 2.5 μmol L^{-1}.

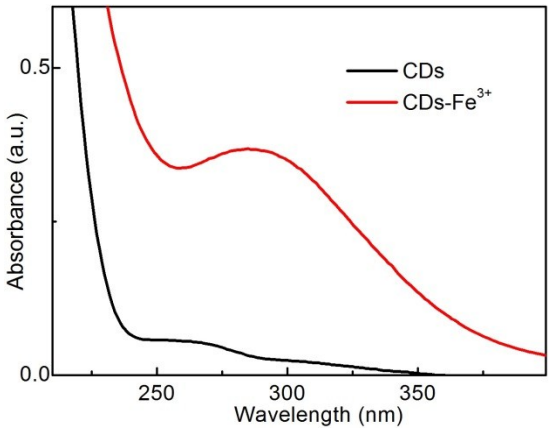

Fig.S10 UV-Vis absorption spectra of CDs and CDs-Fe^{3+} system, C_{CDs}=25 μg mL^{-1}, C_{Fe3+}= 50 μmol L^{-1}.