

Supporting Information

A Dual-Emission Ratiometric Fluorescence Probe for Highly Selective and Simultaneous Detection of Tetracycline and Ferric ions in Environmental Water Samples Based on the Boron-Doped Carbon Quantum Dots/CdTe-Eu³⁺ Composite

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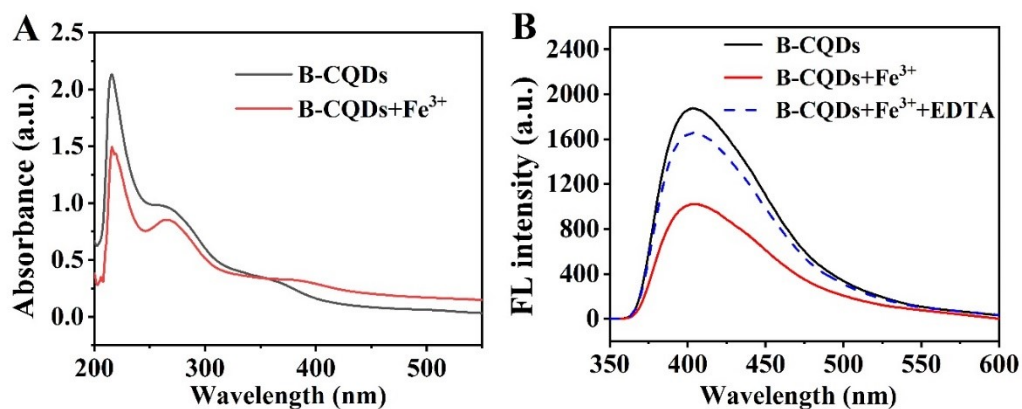


Figure S1. (A) UV-vis absorption spectra of B-CQDs and B-CQDs +Fe³⁺, conditions: B-CQDs: 50.0 mg/L, Fe³⁺: 15.0 μ M, Tirs-HCl buffer: 25 mM, pH=8.0. (B) Fluorescence spectra of B-CQDs in the presence of Fe³⁺ and EDTA, conditions: B-CQDs: 6.0 mg/L, Fe³⁺: 15.0 μ M, EDTA: 20.0 μ M, Tirs-HCl buffer: 25 mM, pH=8.0, λ_{ex} =270 nm.

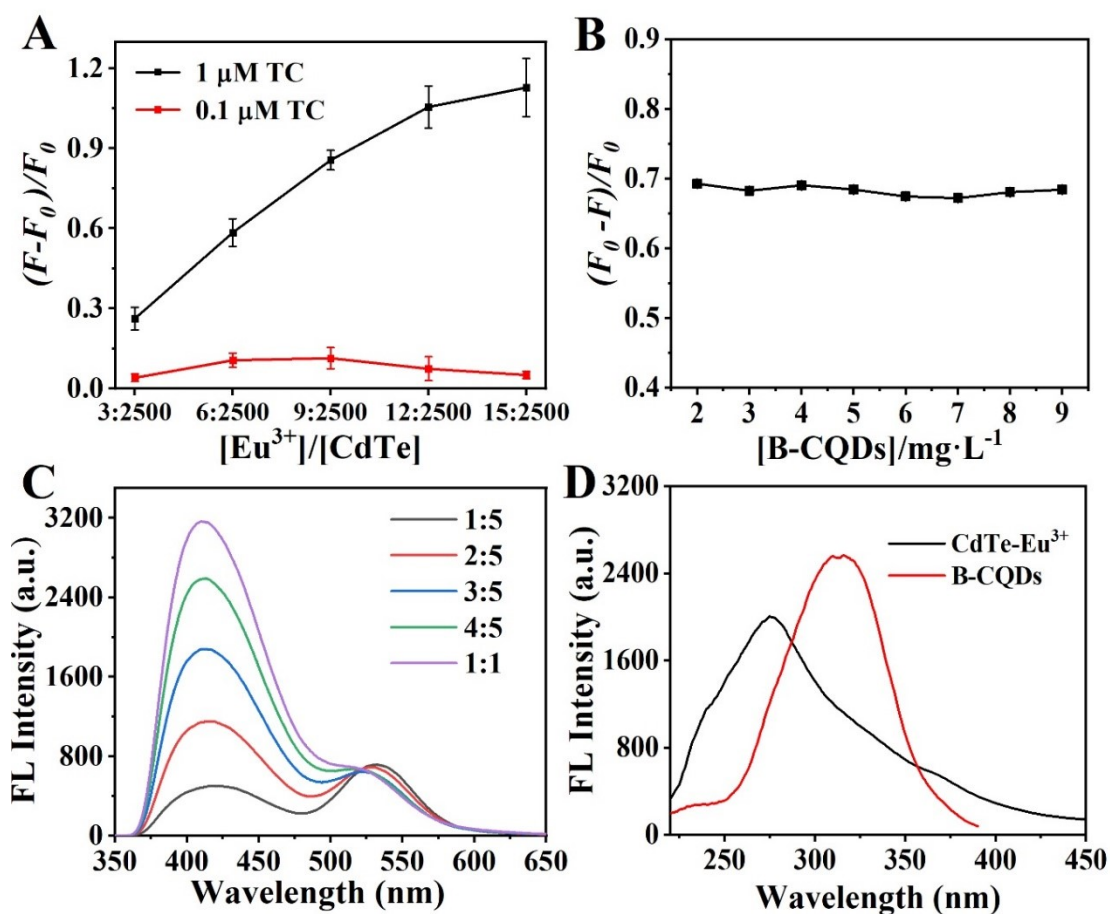


Figure S2. (A) Effect of the composition ratios of $\text{Eu}^{3+}/\text{CdTe}$ on fluorescence recover efficiency of the CdTe-Eu^{3+} system in the presence of TC; (B) Effect of the concentrations of B-CQDs on the fluorescence quenching efficiency of B-CQDs caused by Fe^{3+} ; (C) Effect of the composition ratios of B-CQDs/ CdTe-Eu^{3+} on the fluorescence intensity of the B-CQDs/ CdTe-Eu^{3+} probe; (D) Excitation spectra of B-CQDs and CdTe-Eu^{3+} .

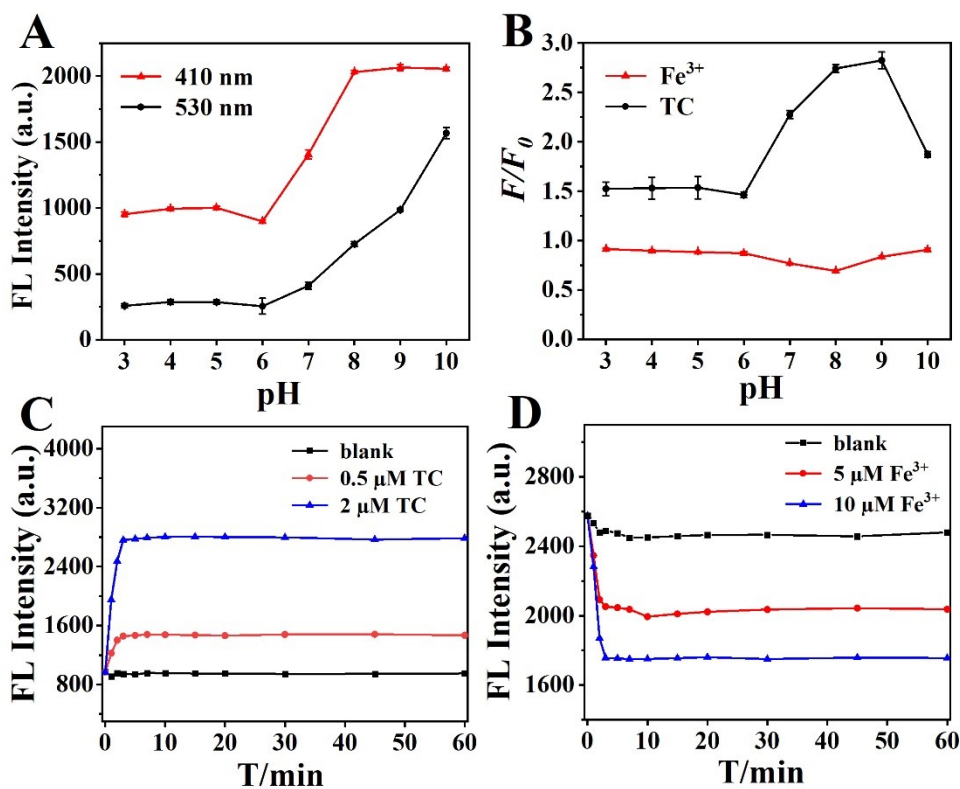


Figure S3. (A) Effect of pH on the fluorescence intensities of the B-CQDs/CdTe-Eu³⁺ probe; (B) Effect of pH on the fluorescence intensity ratio of F/F_0 caused by TC and Fe³⁺; (C) Effect of equilibrium time on the fluorescence intensities of CdTe-Eu³⁺ in the presence of TC; (D) Effect of equilibrium time on the fluorescence intensities of B-CQDs in the presence of Fe³⁺. Conditions: B-CQDs: 6.0 mg/L, CdTe-Eu³⁺: 10.0 mg/L, TC: 2.0 μ M, Fe³⁺: 15.0 μ M, Tris-HCl buffer: 25 mM, λ_{ex} =270 nm.

Table S1. Comparison of the proposed method with reported analytical methods for TC detection

Methods	Materials	Linear range (μM)	LOD (μM)	References
Fluorometric	F,N-GQDs	2-30	0.077	[S1]
Fluorometric	P-CDs	0.02-0.8	0.012	[S2]
Fluorometric	N,S-CDs	0.369-73.7	0.148	[S3]
Fluorometric	Luminol-Eu-Cit	0.5-80	0.039	[S4]
Fluorometric	QDs-MIP	0.5-15	0.14	[S5]
Colorimetric	CNNPs	0.8-400	0.12	[S6]
Colorimetric	MIP-PC	0.01-0.15	0.002	[S7]
Electrochemical	CB-PS/GCE	5-120	1.15	[S8]
Electrochemical	aptasensor	22.4-6750	22.4	[S9]
Fluorometric	B-CQDs/CdTe-Eu ³⁺	0.01-2.0	0.0042	This work

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