

**Novel coumarin-chitosan fluorescent hydrogel for selective
identification of Fe²⁺ in aqueous system**

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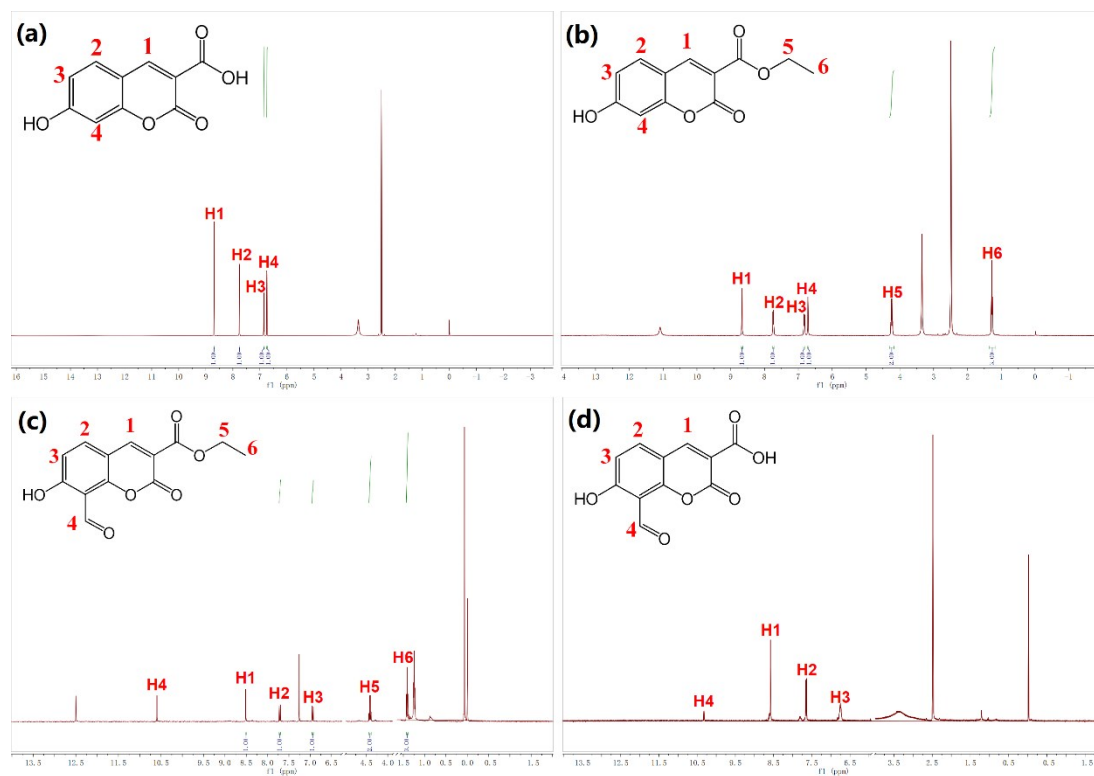


Figure S1 ^1H NMR spectra of (a) CA, (b) CB, (c) CO and (d) CAO.

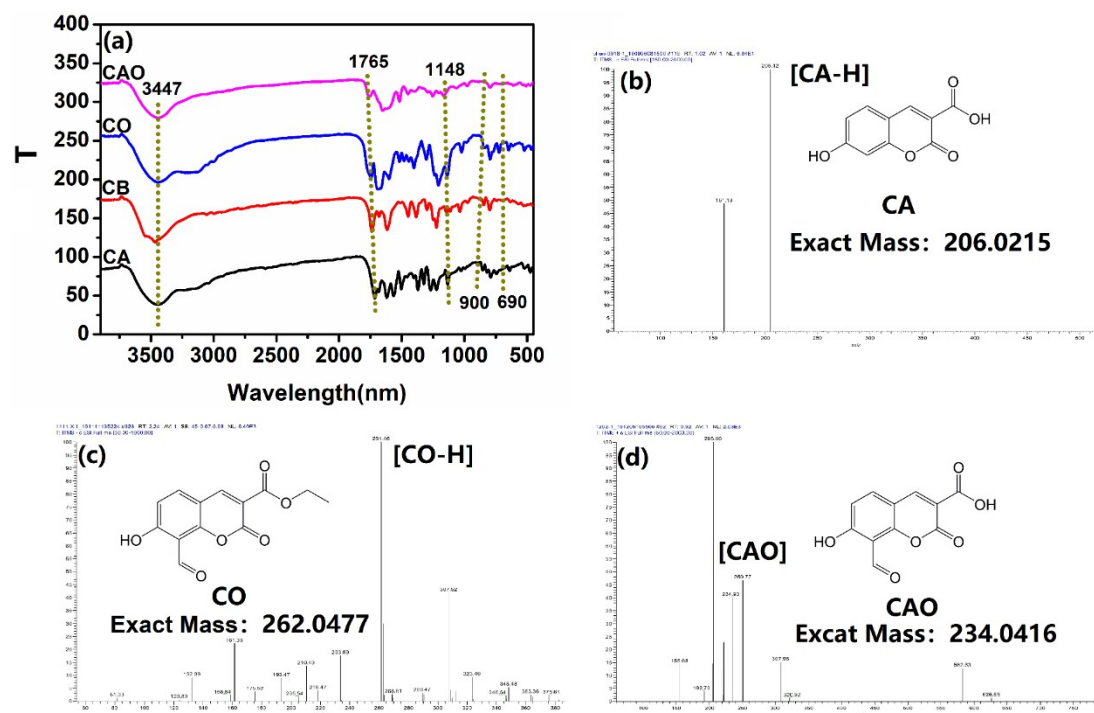
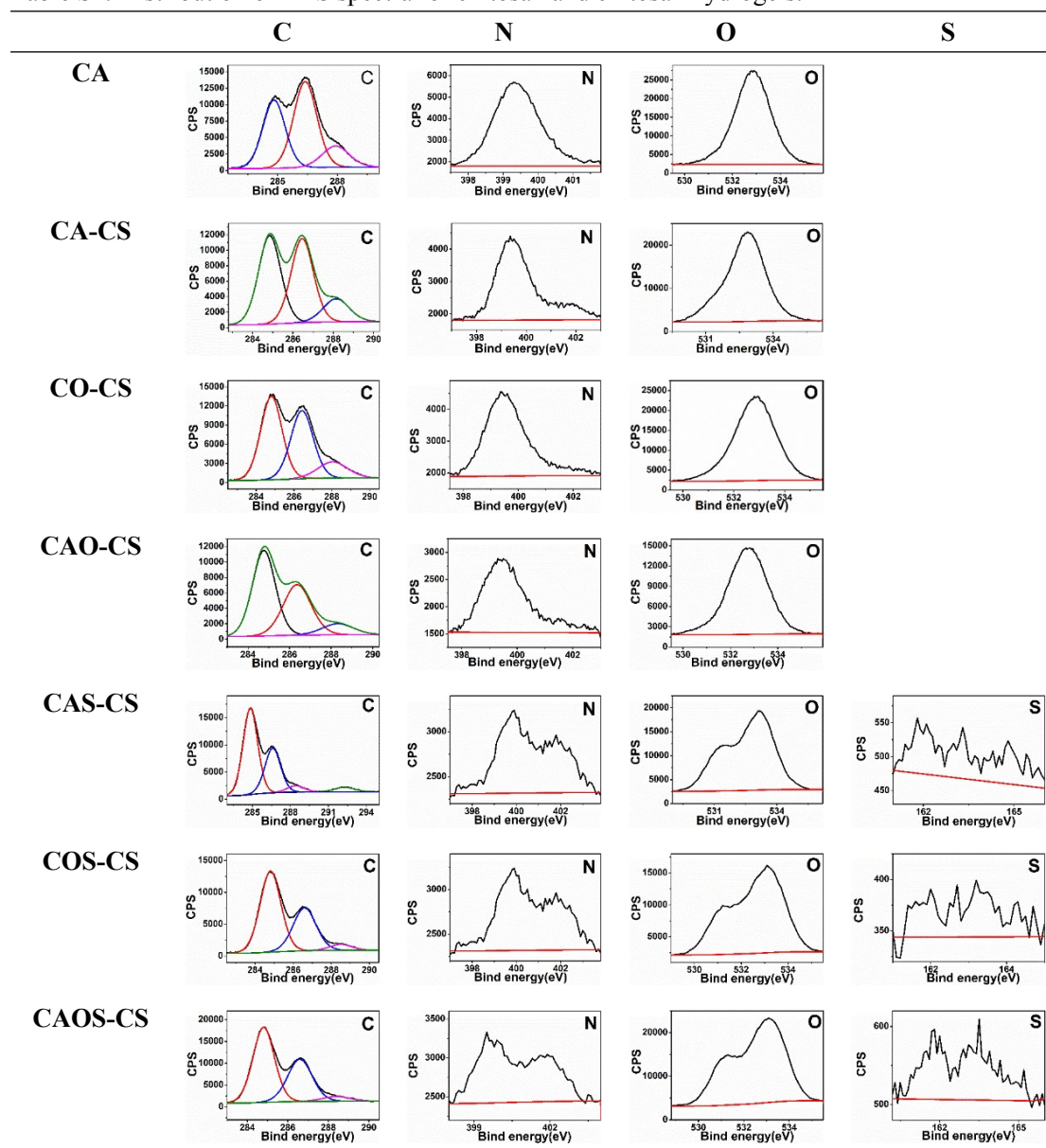


Figure S2 (a) FTIR spectra of CA, CB, CO and CAO. HR-MS spectra of (b) CA, (c) CO and (d) CAO.

Table S1. The content of elemental components in fluorescent hydrogels by XPS.

Elements	Atomic %						
	CA	CA-CS	CO-CS	CAO-CS	CAS-CS	COS-CS	CAOS-CS
C	64.69	64.82	67.7	71.48	68.15	66.09	64.64
N	6.52	5.39	5.09	3.97	2.76	2.63	2.44
O	28.79	27.21	27.21	24.55	28.88	31.16	32.74
S	-	-	-	-	0.22	0.11	0.18

Table S2. Distribution of XPS spectra for chitosan and chitosan hydrogels.



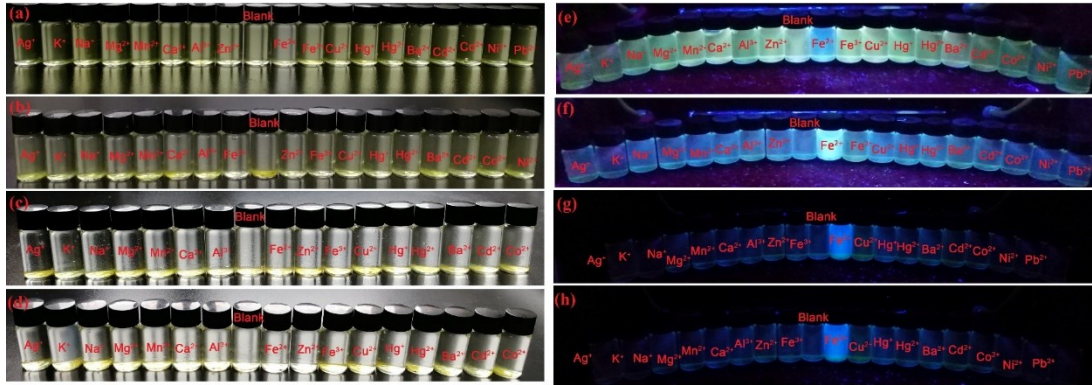


Figure S3 Photos of all sensors identifying metal ions from left to right (a) CO-CS under natural light, (a) CAO-CS under natural light, (a) COS-CS under natural light, (a) CAOS-CS under natural light, (a) CO-CS under fluorescence, (a) CAO-CS under fluorescence, (a) COS-CS under fluorescence and (a) CAOS-CS under fluorescence.

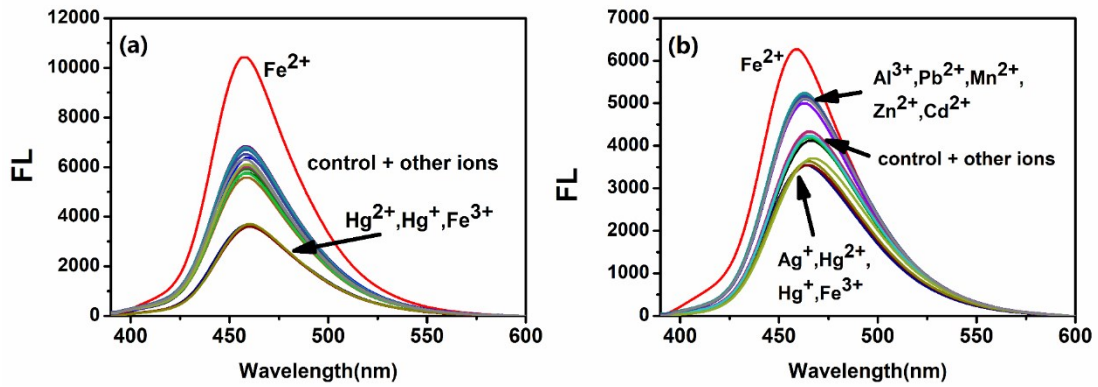


Figure S4 Fluorescence intensity change of (a) CA-CS and (b) CAS-CS (10^{-4} mol/L) in H_2O after addition of mental ions (2 equivalent of control). $\lambda_{ex} = 360$ nm.

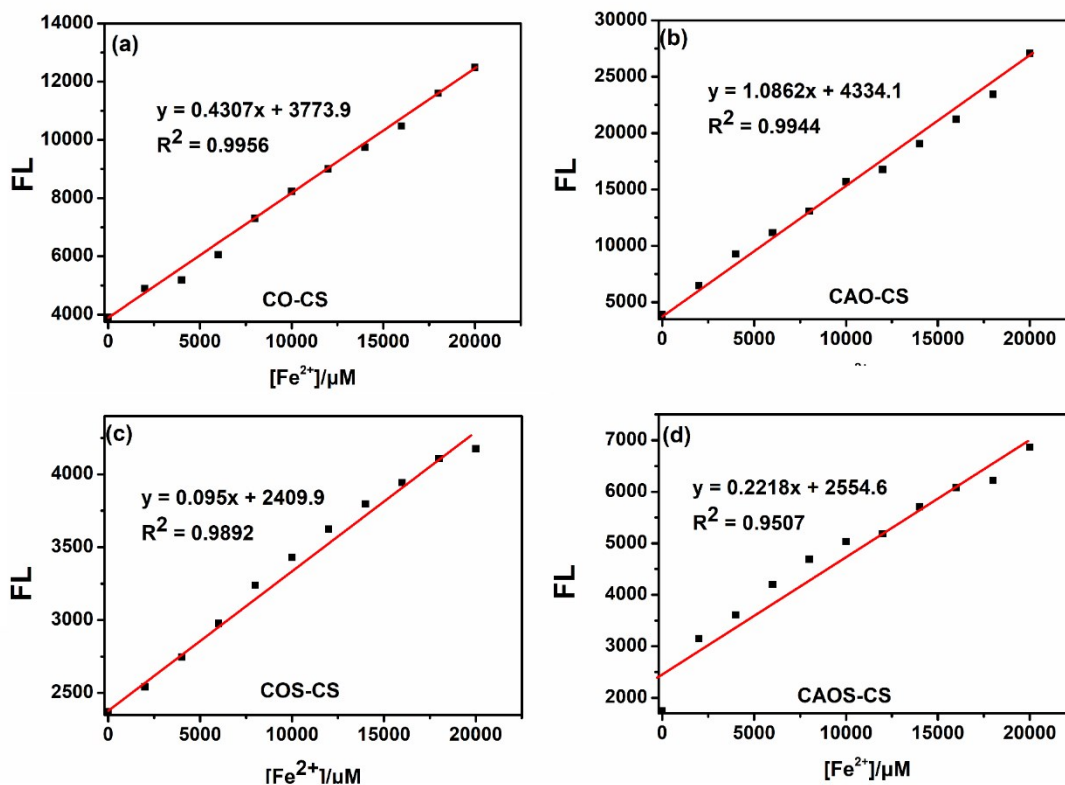


Figure S5 Standard curve of fluorescence titration of all sensors with Fe^{2+} . (a) CO-CS, (b) CAO-CS, (c) COS-CS and (d) CAOS-CS.

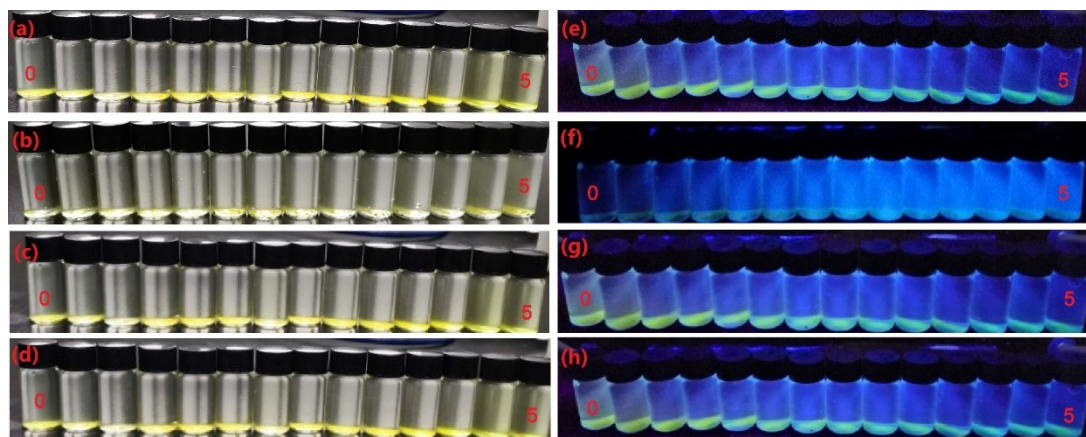


Figure S6 Photographs of macromolecular sensor for fluorescence titration of nitrophenol. (a) CO-CS with Fe^{2+} under natural light, (a) CAO-CS with Fe^{2+} under natural light, (a) COS-CS with Fe^{2+} under natural light, (a) CAOS-CS with Fe^{2+} under natural light, (a) CO-CS with Fe^{2+} under fluorescence, (a) CAO-CS with Fe^{2+} under fluorescence, (a) COS-CS with Fe^{2+} under fluorescence and (a) CAOS-CS with Fe^{2+} under fluorescence.

Table S3. Fluorescence quantum yield before and after the probe was combined with Fe²⁺.

Probes	Φ^a	Φ^b
CO-CS	0.06	0.11
CAO-CS	0.09	0.59
COS-CS	0.04	0.05
CAOS-CS	0.12	0.18

^a before combining with Fe²⁺.

^b after combining with Fe²⁺.