Stimuli-Sensitive Pyrenylated Hydrogels as Optical Sensing Platform for Multiple Metal Ions

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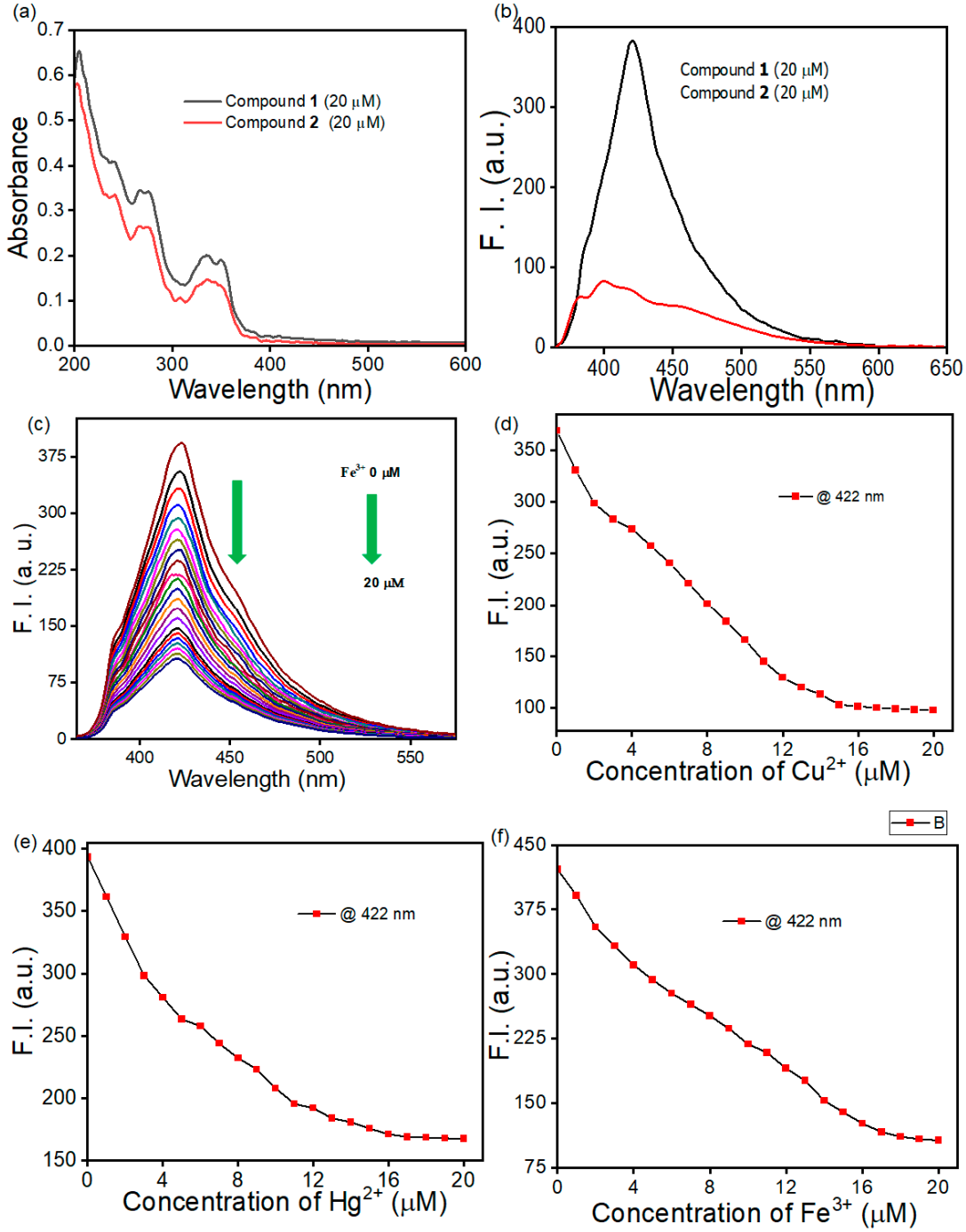

Figure S1. (a) Absorbance spectra of the compound **1** (20 μM) and **2** (20 μM) in water. (b) Emission spectra of compound **1** (20 μM, λ_{ex} = 345 nm) and **2** (20 μM, λ_{ex} = 345 nm) in water. (c) Fluorescence titration of compound **1** (20 μM, λ_{ex} = 345 nm) with increasing concentration of Fe^{3+}. Change in the emission intensity of compound **1** in the presence of increasing concentrations of (d) Cu^{2+}, (e) Hg^{2+}, and (f) Fe^{3+}.

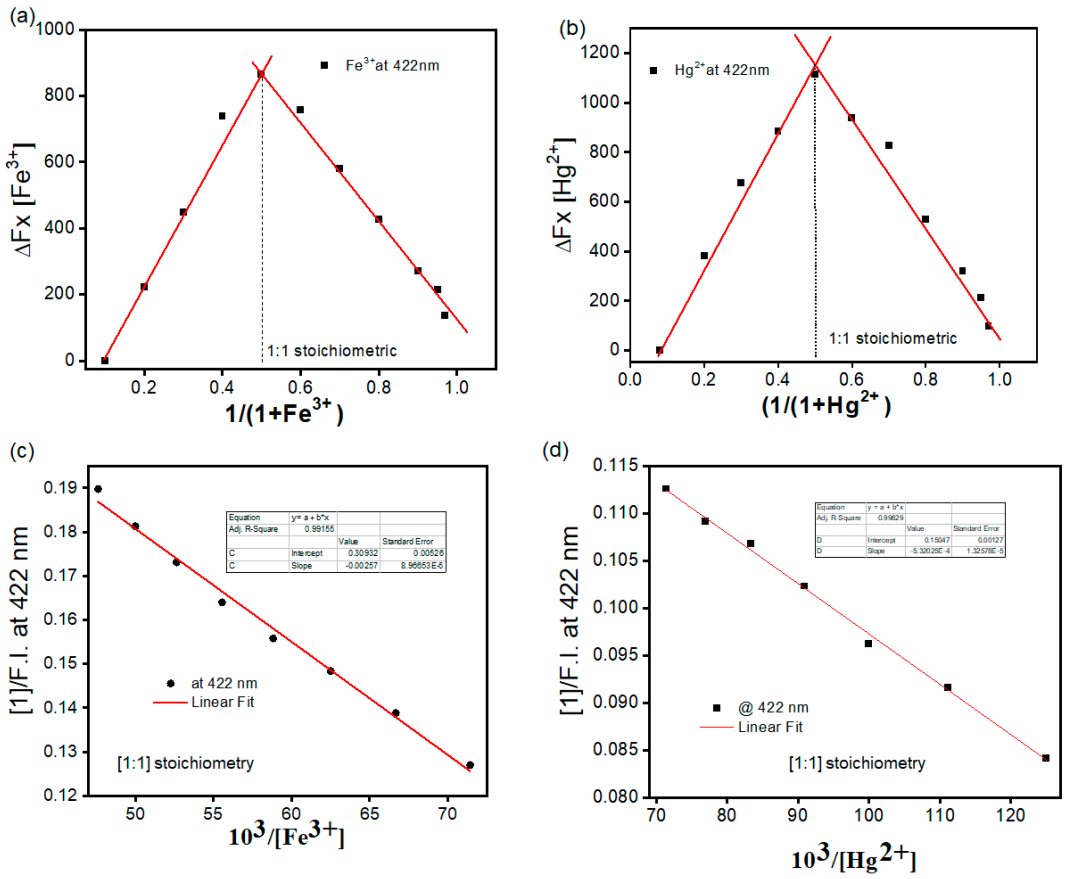

Figure S2: Jobs plot for the interaction of compound **1** with (a) Fe^{3+}, (b) Hg^{2+}. Calculation of binding constant for compound **1** with (c) Fe^{3+}, (d) Hg^{2+}.

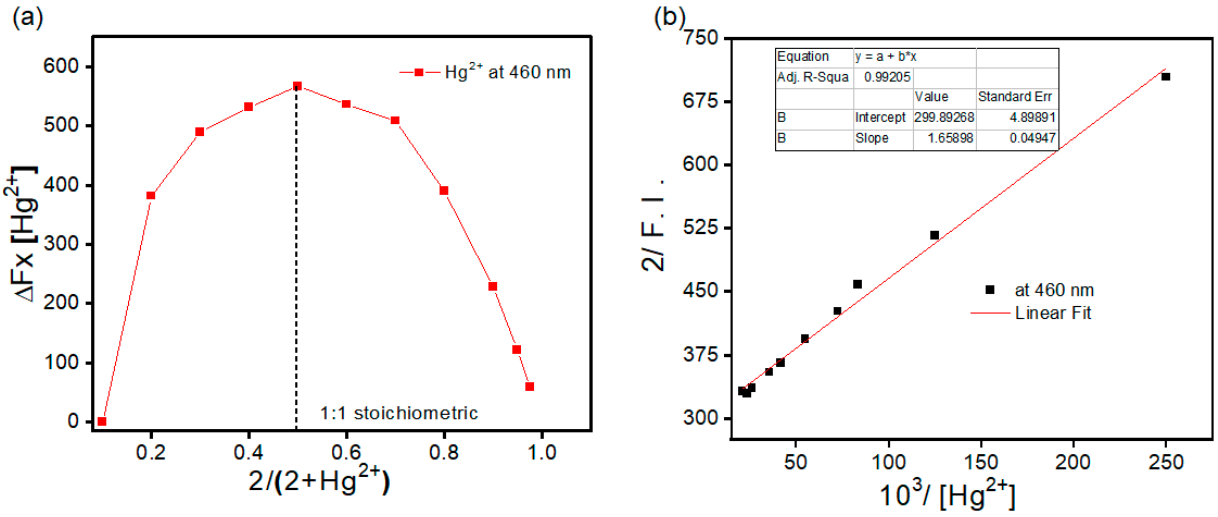

Figure S3: (a) Jobs plot for the interaction of compound **2** with Hg^{2+}. (b) Calculation of binding constant for the interaction of compound **2** with Hg^{2+}.

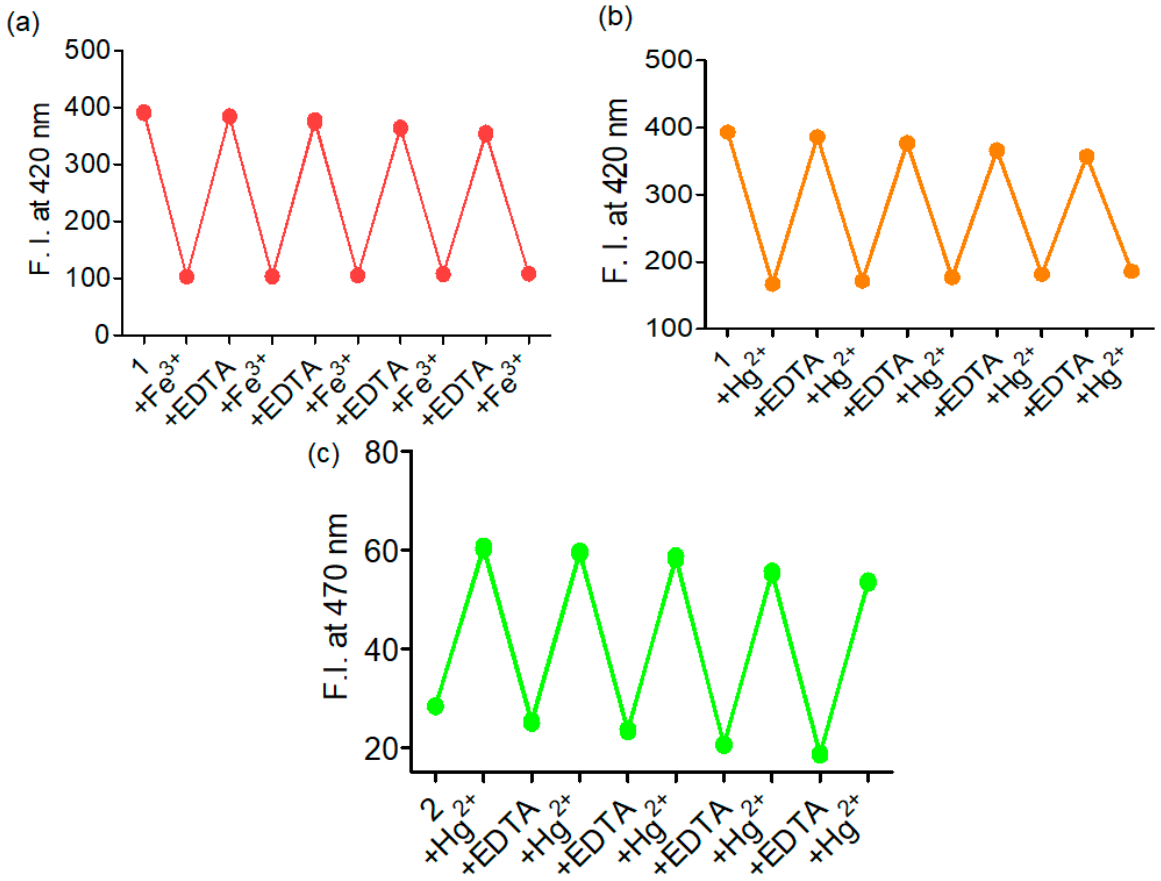

Figure S4: EDTA-mediated recovery plot for the interaction of compound **1** with (a) Fe^{3+} and (b) Hg^{2+}. (c) EDTA-mediated recovery plot for the interaction of compound **2** with Hg^{2+}.

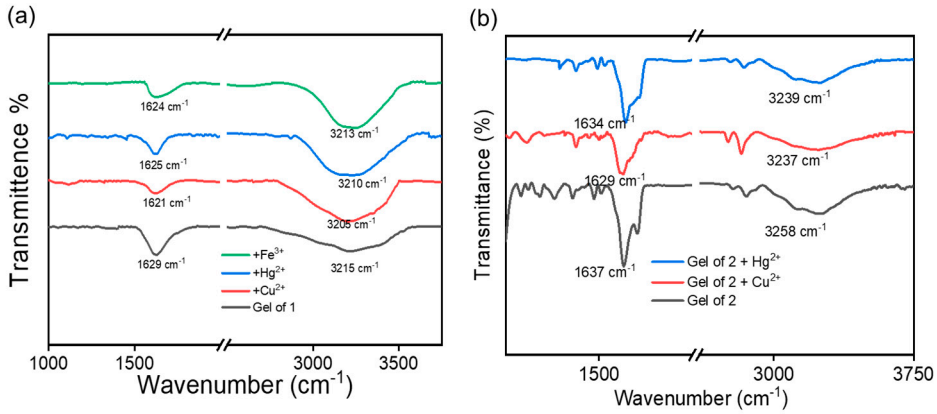

Figure S5: FT-IR spectra for the interaction of (a) compound **1** with Cu^{2+}, Fe^{3+}, and Hg^{2+}, and (b) compound **2** with Cu^{2+} and Hg^{2+}.

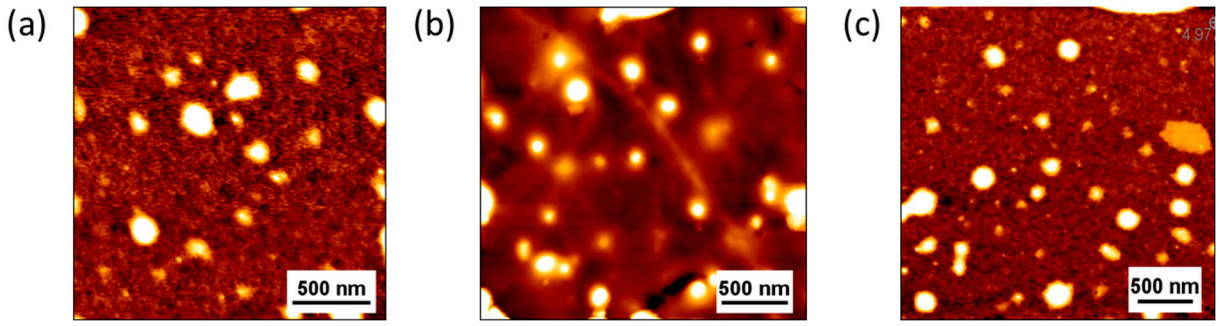

Figure S6: AFM images for the interaction of compound **1** with Cu^{2+}, Fe^{3+}, and Hg^{2+}.

Table S1: Recovery experiment of (a) Cu^{2+}, (b) Fe^{3+}, and (c) Hg^{2+} using compound **1** (20 µM) and in a tap water sample.

(a)

Cu^{2+} added (µM)	Cu^{2+} calculated Std plot: Y= 341.71-17.41x			Cu^{2+} found	Recovery	RSD (%)
0	0	0	0	0	0	0
2	2.12	2.25	2.05	2.14	107.00	4.74
4	4.06	4.22	4.11	4.13	103.25	1.98
6	6.11	6.02	6.09	6.07	101.1	0.78
8	8.23	8.09	8.15	8.16	102.00	0.86
10	10.14	10.04	10.31	10.16	101.6	1.34

(b)

Hg^{2+} added (µM)	Hg^{2+} calculated Std plot: Y= 322.02-12.72x			Hg^{2+} found	Recovery	RSD (%)
0	0	0	0	0	0	0
2	2.20	2.15	2.11	2.15	103.00	2.09
4	4.34	4.12	4.48	4.31	107.83	4.21
6	6.09	6.19	6.37	6.22	103.61	2.28
8	8.09	8.36	8.21	8.22	102.75	1.65
10	10.09	10.39	10.15	10.21	102.10	1.55

(c)

Fe^{3+} added (µM)	Fe^{3+} calculated Std plot: Y= 351.27-14.40x			Fe^{3+} found	Recovery	RSD (%)
0	0	0	0	0	0	0
2	2.18	2.05	2.12	2.12	102.56	3.07
4	4.46	4.15	4.28	4.30	107.50	3.62
6	6.19	6.03	6.43	6.22	103.67	3.24
8	8.15	8.35	8.07	8.19	102.37	1.76
10	10.11	10.35	10.06	10.17	101.70	1.52

Table S2: Recovery experiment of (a) Cu^{2+} and (b) Hg^{2+} using compound **2** (20 μM) in a tap water sample.

(a)

Cu^{2+} added (μM)	Cu^{2+} calculated Std plot: Y= 48.56-1.14x			Cu^{2+} found	Recovery	RSD (%)
0	0	0	0	0	0	0
2	2.22	2.16	2.30	2.23	103.67	3.15
4	4. 16	4.32	4.01	4.16	104.08	3.72
6	6.18	6.09	6.29	6.19	103.11	1.62
8	8.12	8.02	8.25	8.13	101.63	1.42
10	10.04	10.19	10.28	10.17	101.70	1.19

(b)

Hg^{2+}added (μM)	Hg^{2+} calculated Std plot: Y= 0.935x + 31.64			Hg^{2+} found	Recovery	RSD (%)
0	0	0	0	0	0	0
2	2.30	2.15	2.22	2.21	102.50	3.38
4	4.16	4.02	4.35	4.18	104.41	3.97
6	6.23	6.05	6.33	6.20	103.39	2.29
8	8.01	8.22	8.39	8.21	102.58	2.32
10	10.25	10.11	10.35	10.24	102.36	1.18