Supporting information

Pyrene-based simple but highly selective fluorescence sensor for Cu^{2+} ion via *static* excimer mechanism

Soma Sarkar, Swapnadip Roy, Anindita Sikdar, R. N. Saha, Sujit S. Panja*

Table of content

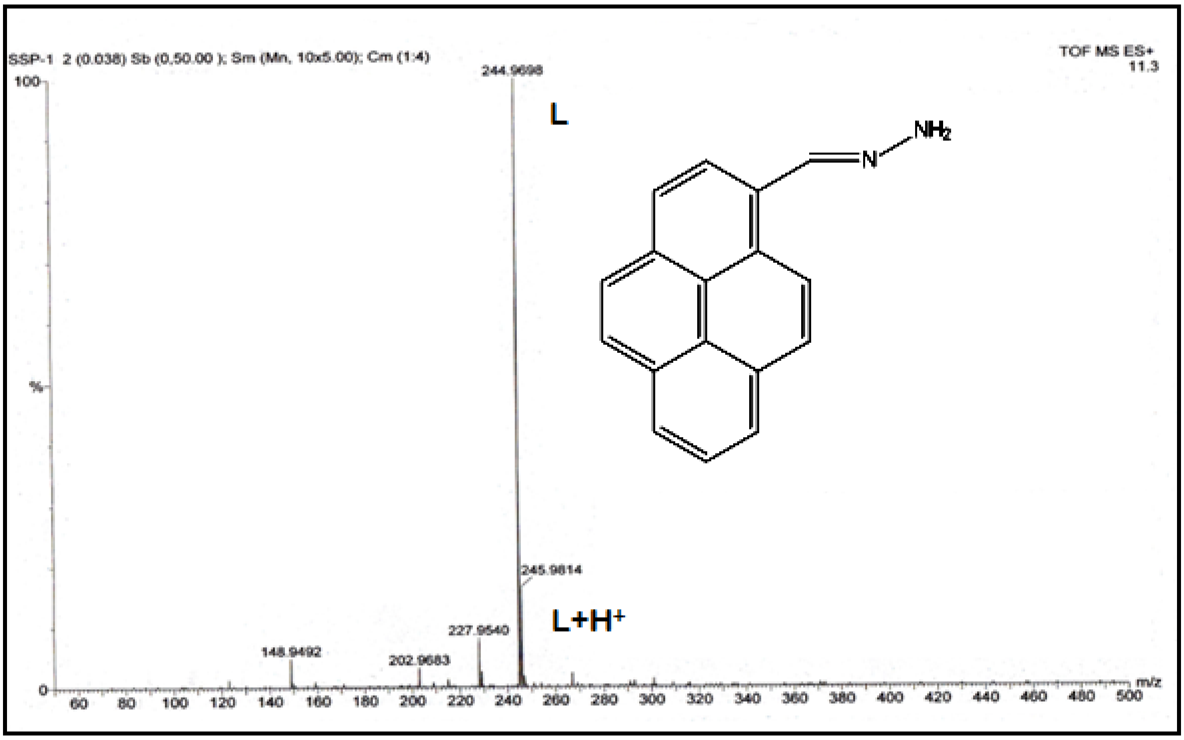

Fig. S1 ESI-MS spectrum of **L**

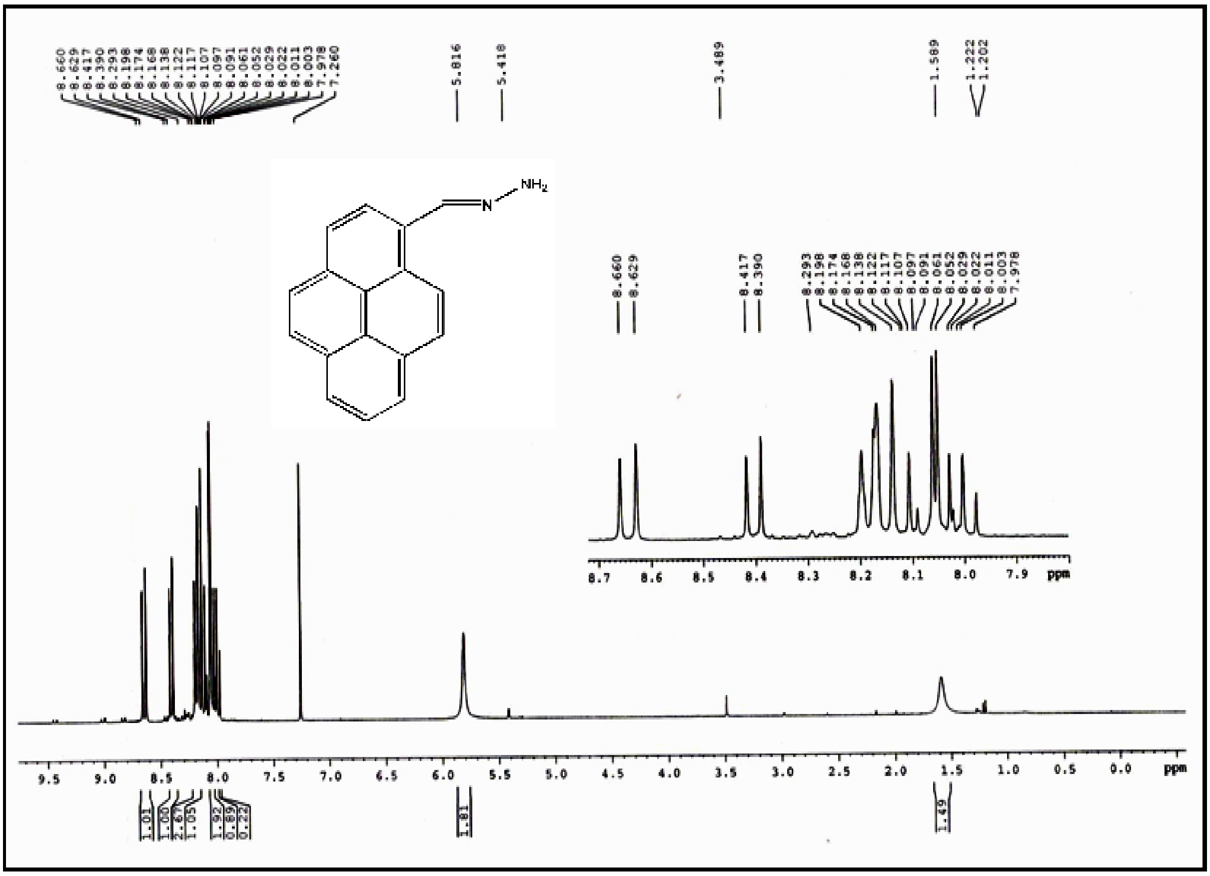

Fig. S2 ^{1}H NMR (CDCl$_3$) spectrum of **L**

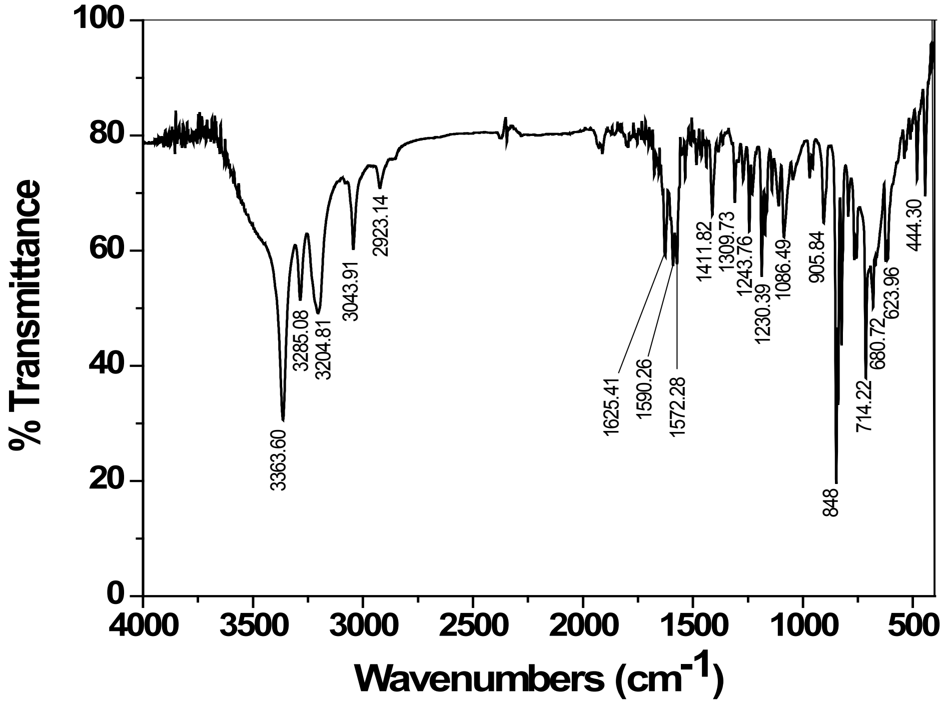

Fig. S3 FTIR spectrum of **L**

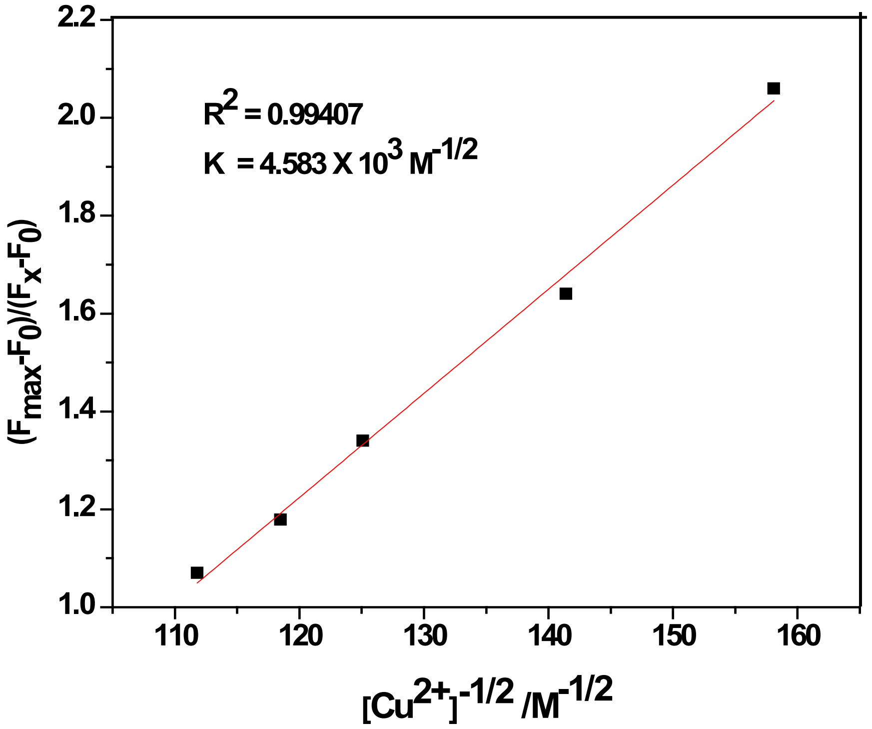

Fig. S4 Determination of the binding constant of **L** for Cu^{2+} (4.583 X 10^3 $M^{-1/2}$).

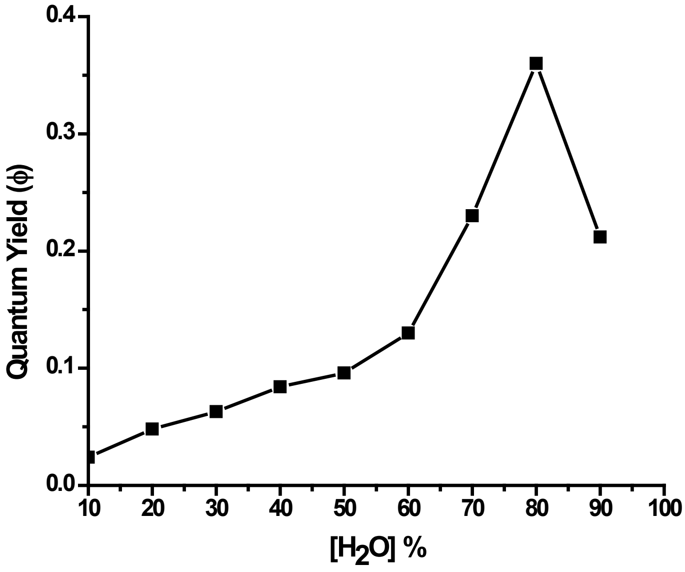

Fig. S5 Changes in quantum yield of **L** (5 µM) in CH_3CN upon varying the concentration of H_2O.

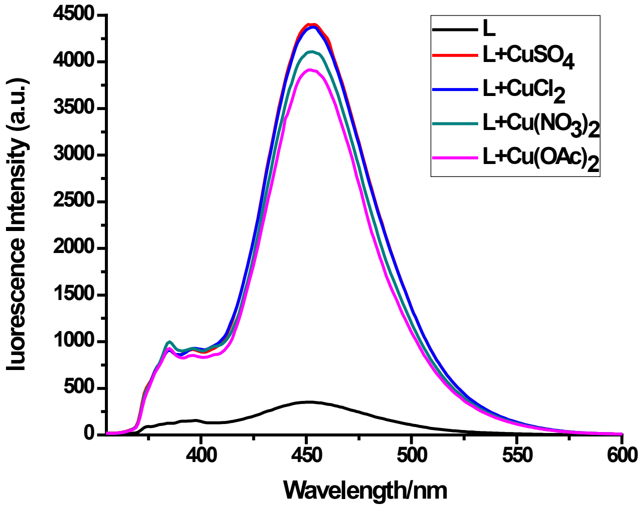

Fig. S6 Fluorescence spectra of **L** (5 µM) with different salts of Cu^{2+} (SO_4^{2-}, Cl^-, NO_3^-, OAc^- taken as counter ions) (100 µM) in Tris-HCl (10 mM, pH =7) buffer containing CH_3CN/H_2O (v/v = 1:1). (λ_{ex}=350 nm, λ_{em}=452 nm, Slit: 2.5 nm).

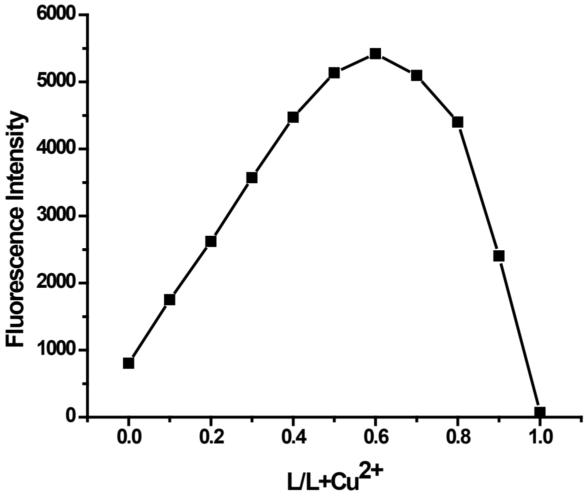

Fig. S7 Job's plot of **L**+Cu^{2+} complex in Tris-HCl (10 mM, pH =7) buffer containing CH_3CN/H_2O (v/v = 1:1) solution gives rise to a 2:1 stoichiometry.

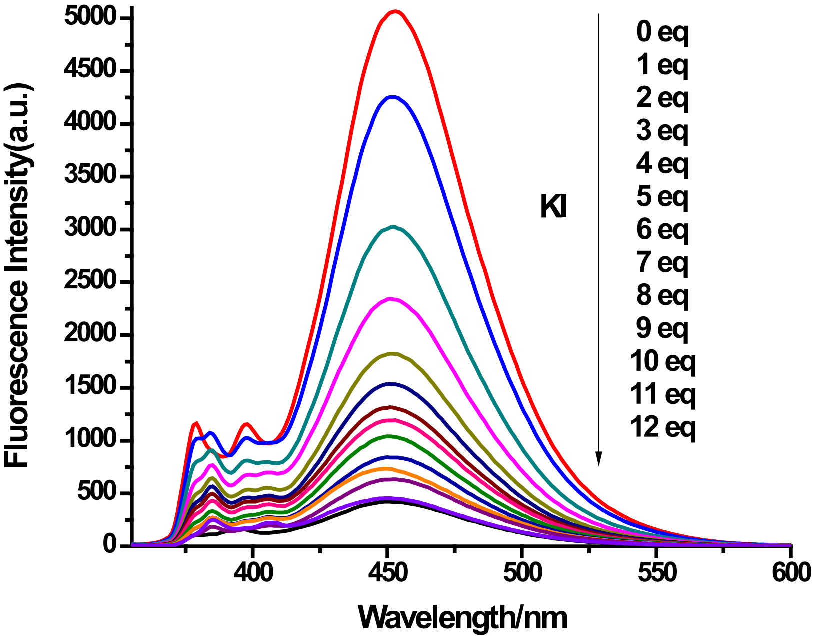

Fig. S8 Fluorescence spectra of reversible binding of **L**(5 μM) with Cu^{2+} (100 μM) by adding KI (0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60 μM) in Tris-HCl (10 mM, pH =7) buffer containing CH_3CN-H_2O (v/v = 1:1) solution. (λ_{ex}=350 nm, λ_{em}=452 nm, Slit: 2.5 nm).

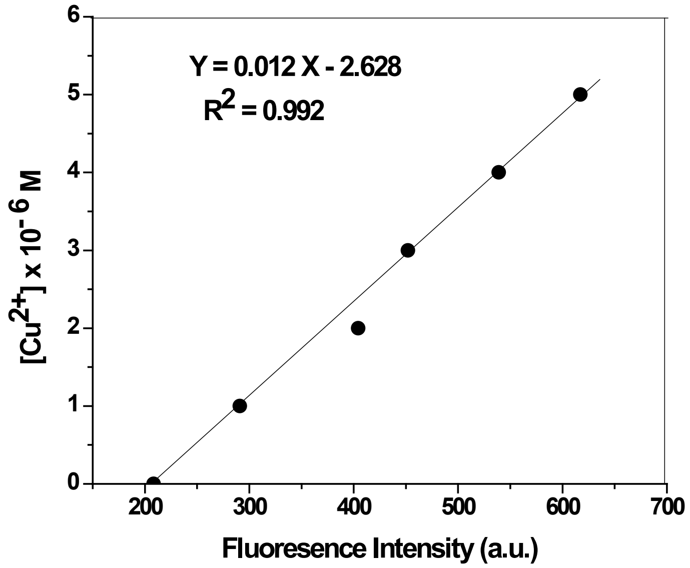

Fig. S9 Calibration Curve of Fluorescence intensity vs. concentration of Cu^{2+} ion in TrisHCl (20 mM, pH = 7) buffer(λ_{ex}=350 nm, λ_{em}=460 nm, Slit: 2.5 nm).

Table S1: Determination of Cu^{2+} in drinking water samples collected from different places

With 1μM externally added Cu^{2+}

Source of tap water sample*	Cu found without externally added Cu^{2+} (μM)	Cu found by externally added 1 μM Cu^{2+} (μM)	% of Deviation
Site – A	0.128	1.13	0.17
Site – B	0.105	1.106	0.09
Site – C	0.26	1.272	0.12
Site – D	0.163	1.164	0.08
Site – E	0.228	1.231	0.16
Site – F	0.241	1.243	0.12

With 2 μM externally added Cu^{2+}

Source of tap water sample*	Cu found without externally added Cu^{2+} (μM)	Cu found by externally added 2 μM Cu^{2+} (μM)	% of Deviation
Site – A	0.128	2.136	0.4
Site – B	0.105	2.109	0.2
Site – C	0.26	2.276	0.7
Site – D	0.163	2.157	0.3
Site – E	0.228	2.238	0.5
Site – F	0.241	2.251	0.4

With 4 μM externally added Cu^{2+}

Source of tap water sample*	Cu found without externally added Cu^{2+} (μM)	Cu found by externally added 4 μM Cu^{2+} (μM)	% of Deviation
Site – A	0.128	4.134	0.15
Site – B	0.105	4.19	0.12
Site – C	0.26	4.27	0.23
Site – D	0.163	4.159	0.1
Site – E	0.228	4.237	0.2
Site – F	0.241	4.247	0.14