

Supporting Information for

**Morphology directing synthesis of Rhodamine-based fluorophore microstructures and application towards extra and intracellular detection of Hg<sup>2+</sup>.**

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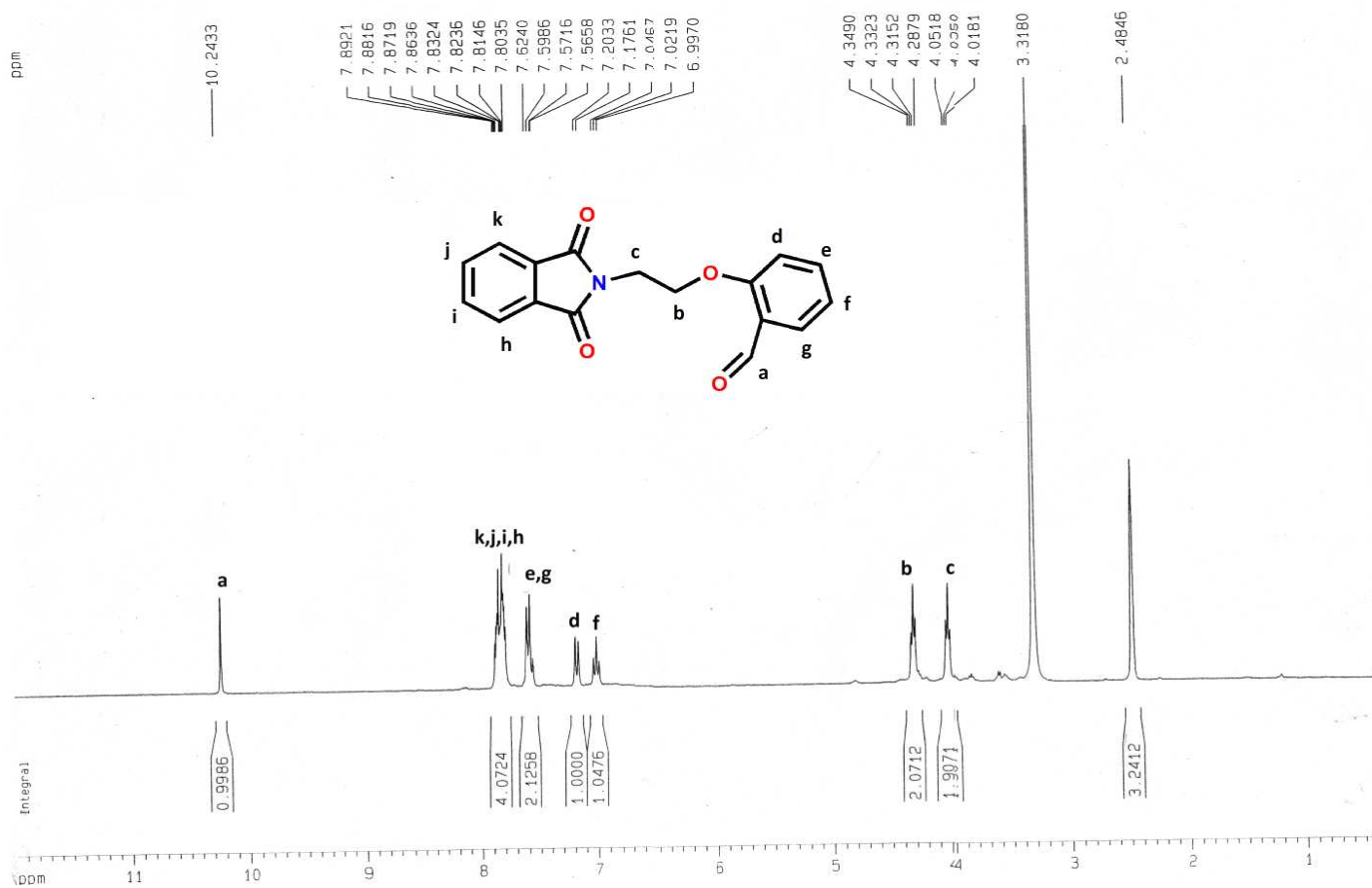
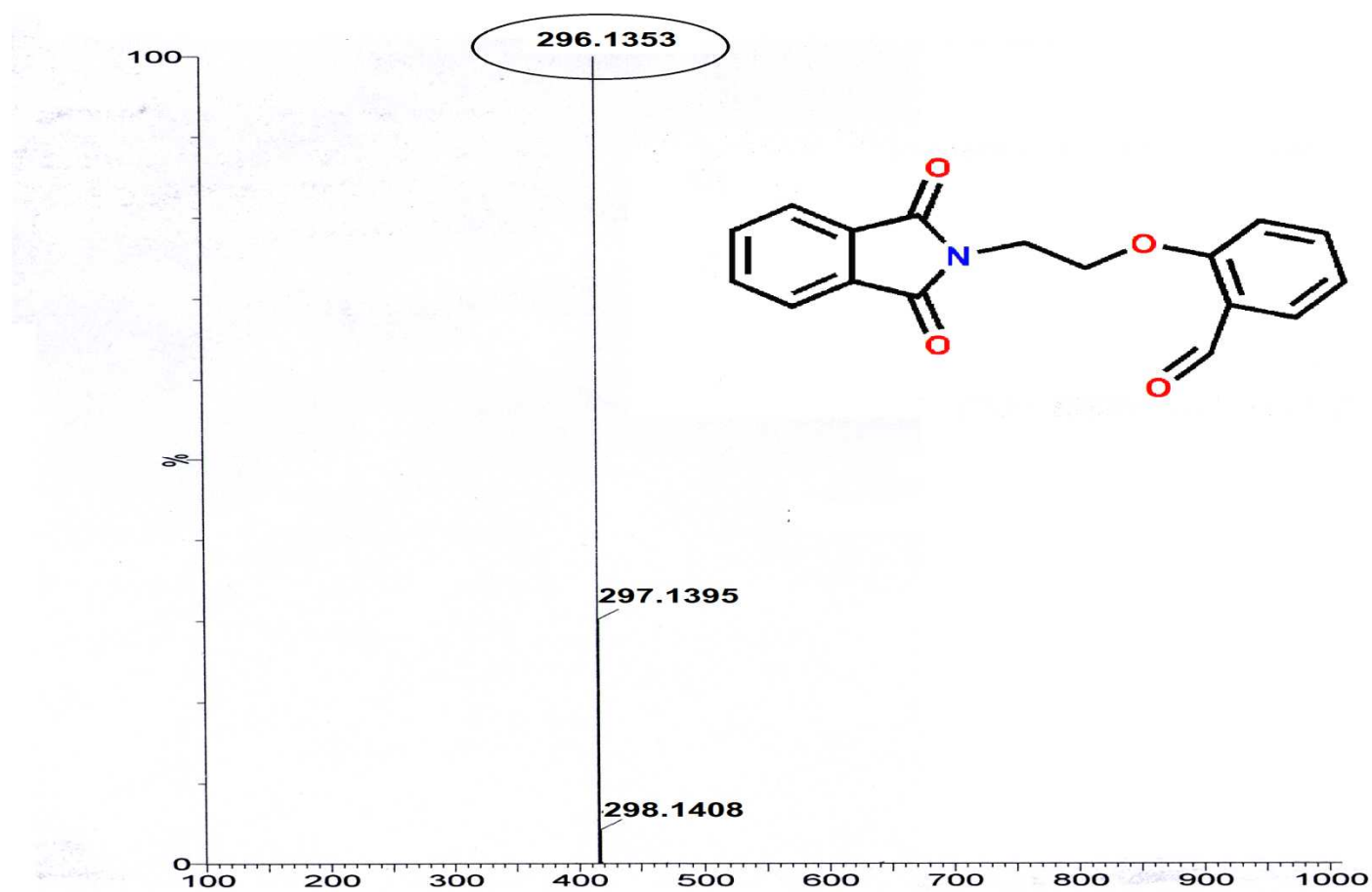
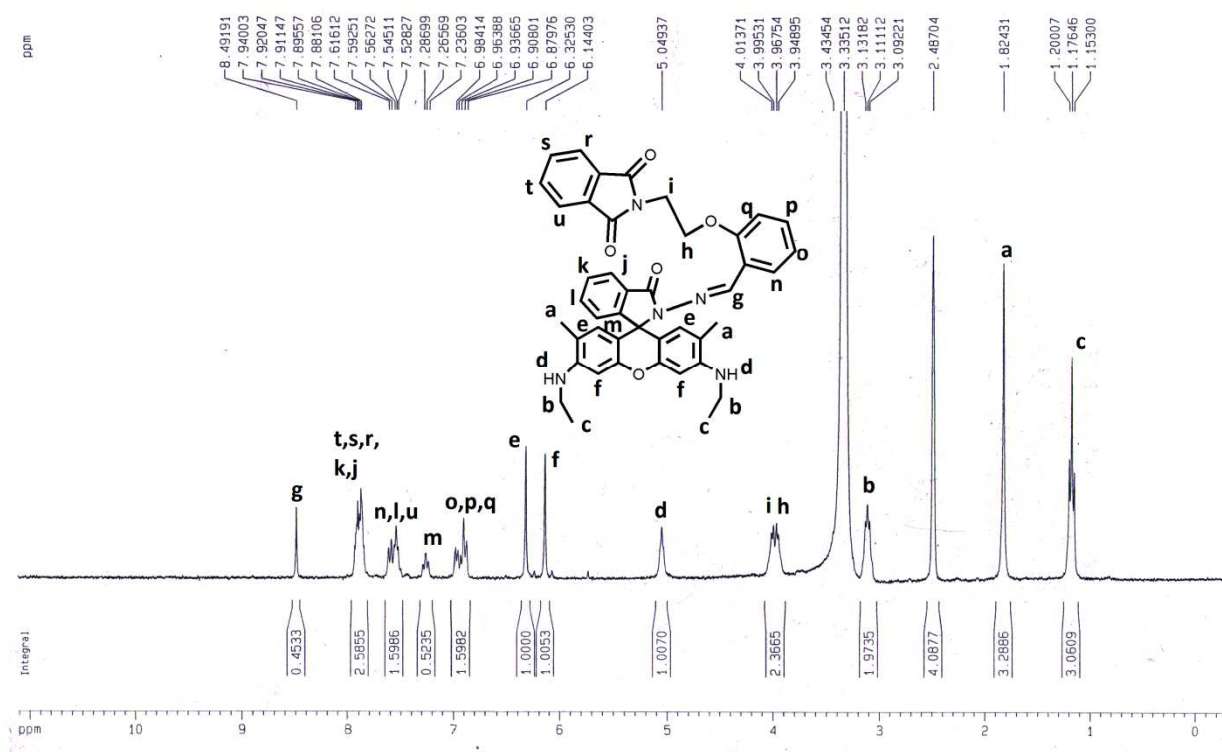


Figure S1  $^1\text{H}$  NMR spectrum of  $\text{L}^2$



**Figure S2** Mass spectrum of  $L^2$  in  $CH_3CN$ ,



**Figure S3**  $^1\text{H}$  NMR spectrum of  $\text{L}^3$ ,

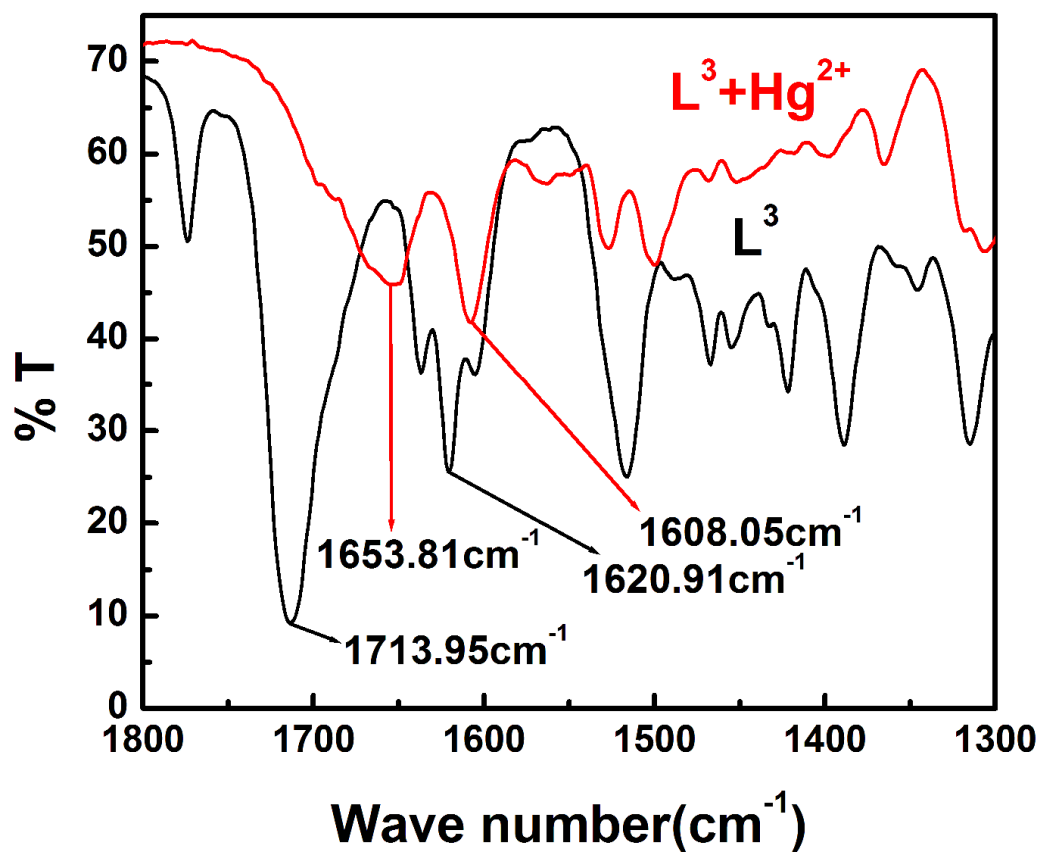
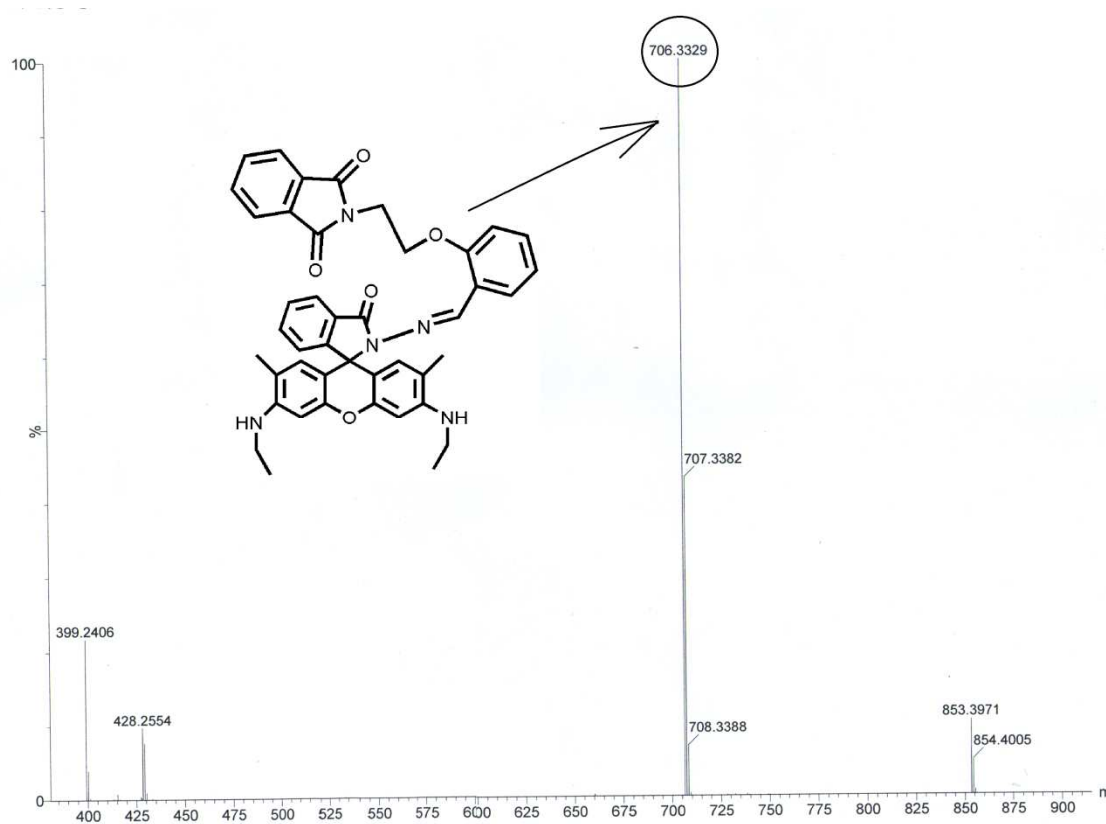


Figure S4 IR Spectrum of L<sup>3</sup> and L<sup>3</sup>+Hg<sup>2+</sup> complex



**Figure S5** Mass spectrum of  $L^3$  in  $CH_3CN$ ,

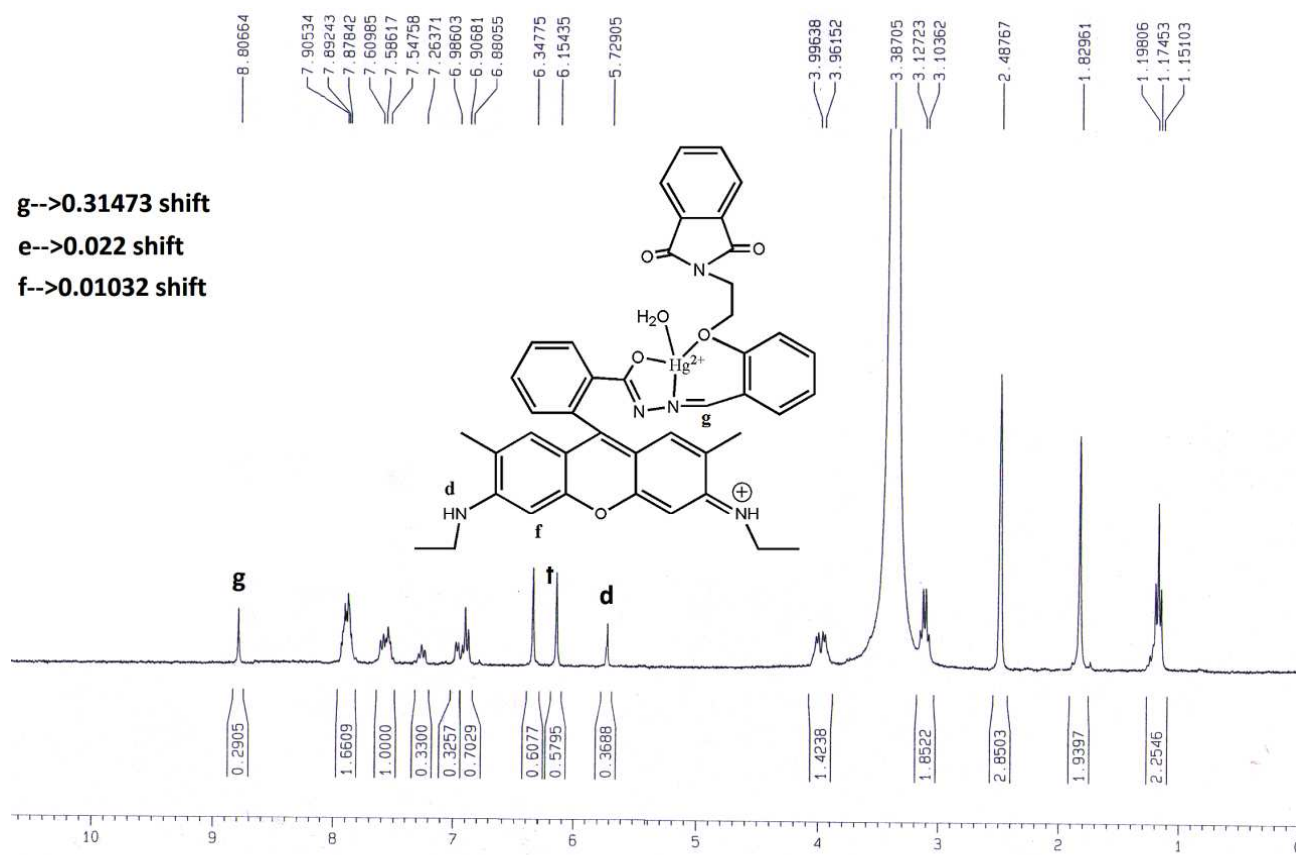
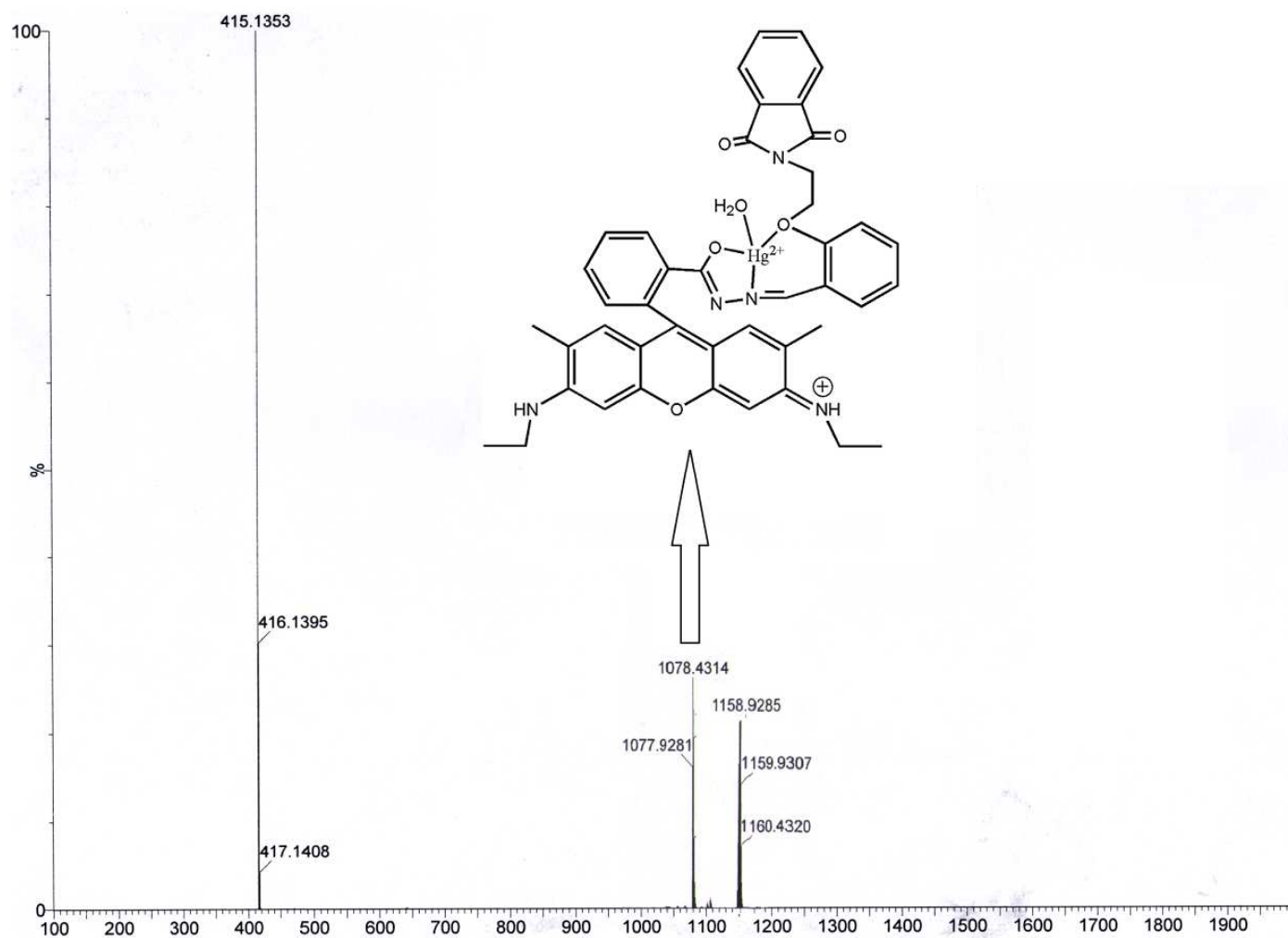


Figure S6  $^1H$  NMR spectrum of  $L^3 + Hg^{2+}$  complex,



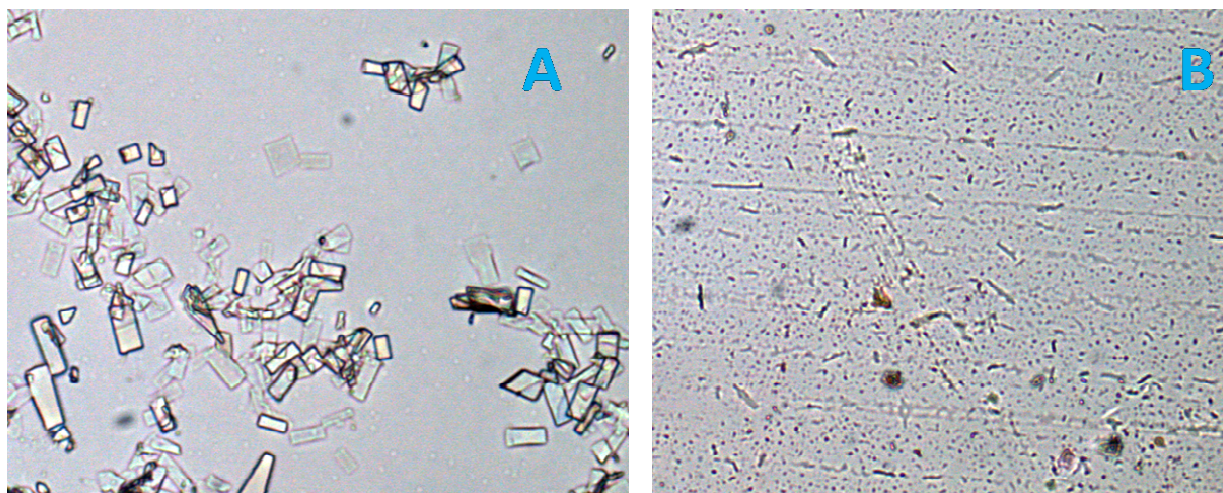
**Figure S7** Mass spectrum of  $L^3 + Hg^{2+}$  in  $CH_3CN$ ,



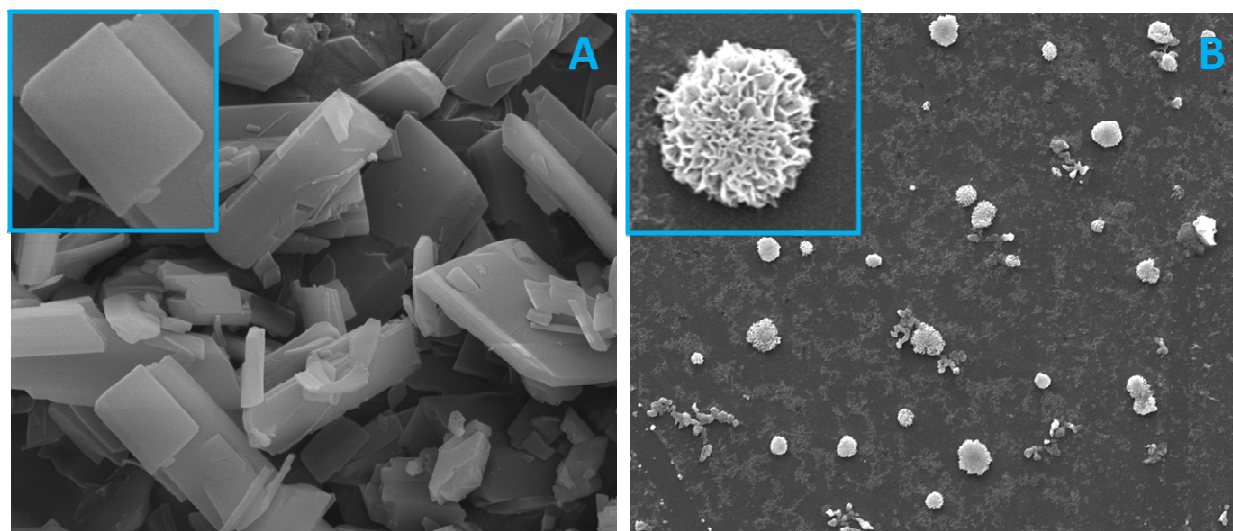
**Table T1** Crystal refinement parameter

Parameters	<b>1</b>
Elemental formula	C <sub>43</sub> H <sub>39</sub> N <sub>5</sub> O <sub>5</sub>
Formula weight	705.79
Crystal system	Monoclinic
Space group	P21/n (No. 14)
a/Å	9.815(2)
b/Å	16.106(3)
c/Å	22.883(5)
V/Å <sup>3</sup>	3616.2(13)
Z	4
Density(D/gcm <sup>-3</sup> )	1.296
μ/mm <sup>-1</sup>	0.086
F(000)	1488
Θ range for data collection/ <sup>0</sup>	2.2, 27.4
Dataset	-12: 12 ; -20: 20 ; -29: 29
Tot., Uniq. Data, R(int)	59211, 8241, 0.179
Observed data [I > 2.0 σ(I)]	2335

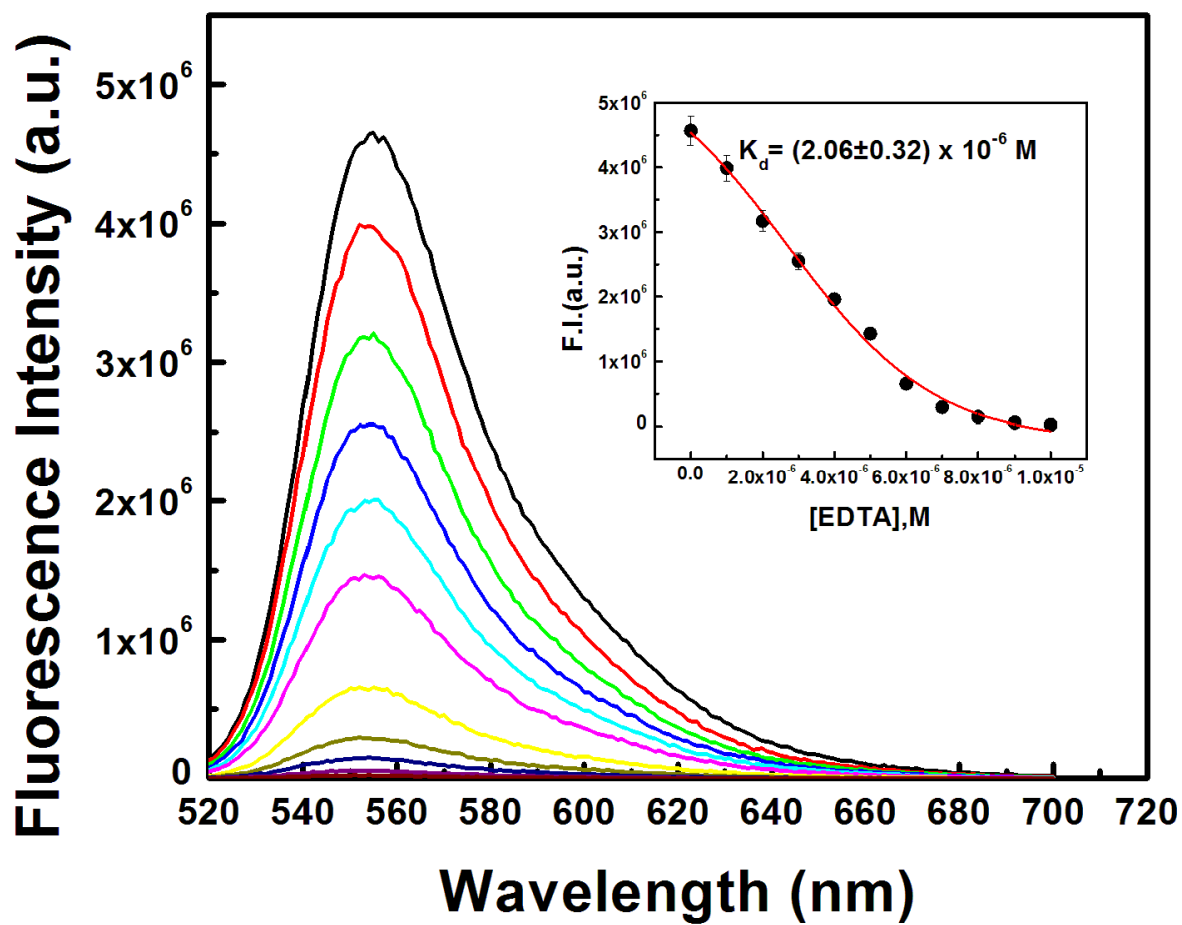
Nref, Npar	8241, 491
R, wR2, S	0.0731, 0.2481, 0.99



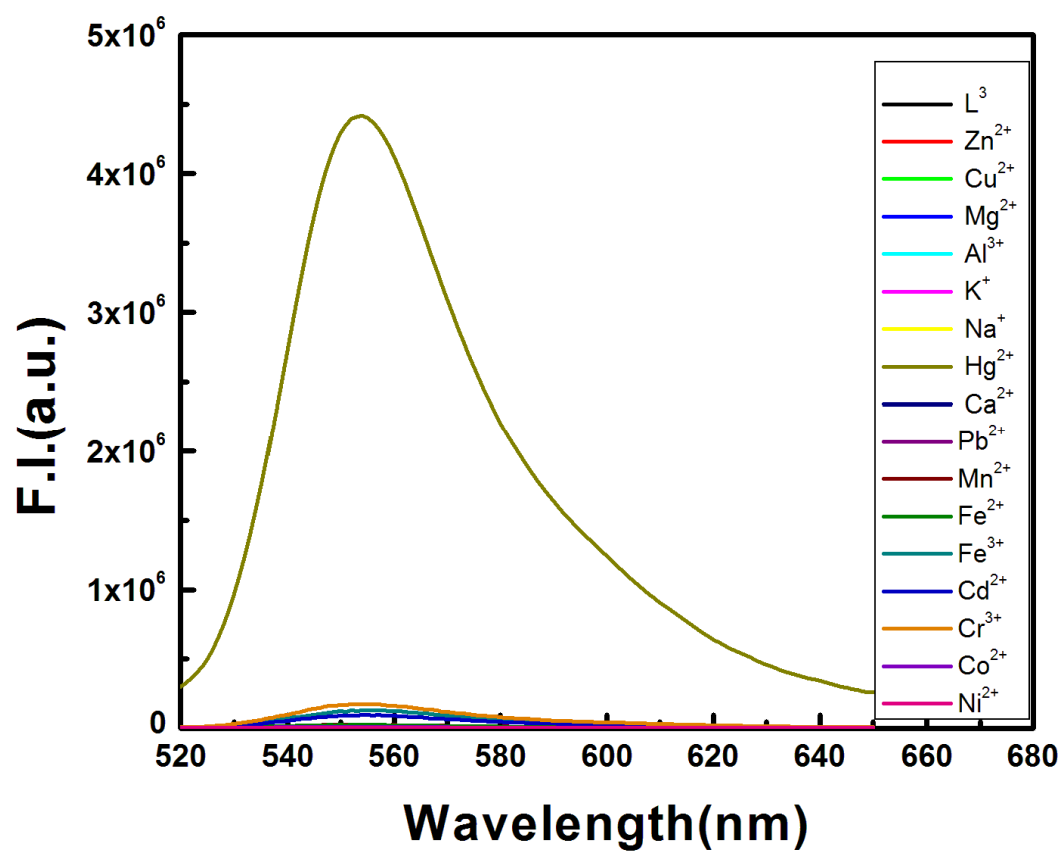
**Figure S9** Polarized optical microscopy images (A) of  $L^3$  microcrystals (block shape) (B)  $L^3\text{-Hg}^{2+}$  (No shape).



**Figure S10** SEM images of (A)  $L^3$  and (B)  $L^3\text{-Hg}^{2+}$ .



**Figure S11** Fluorescence titration and  $K_d$  value from competition method.



**Figure S12** Fluorescence emission spectra of different metals.

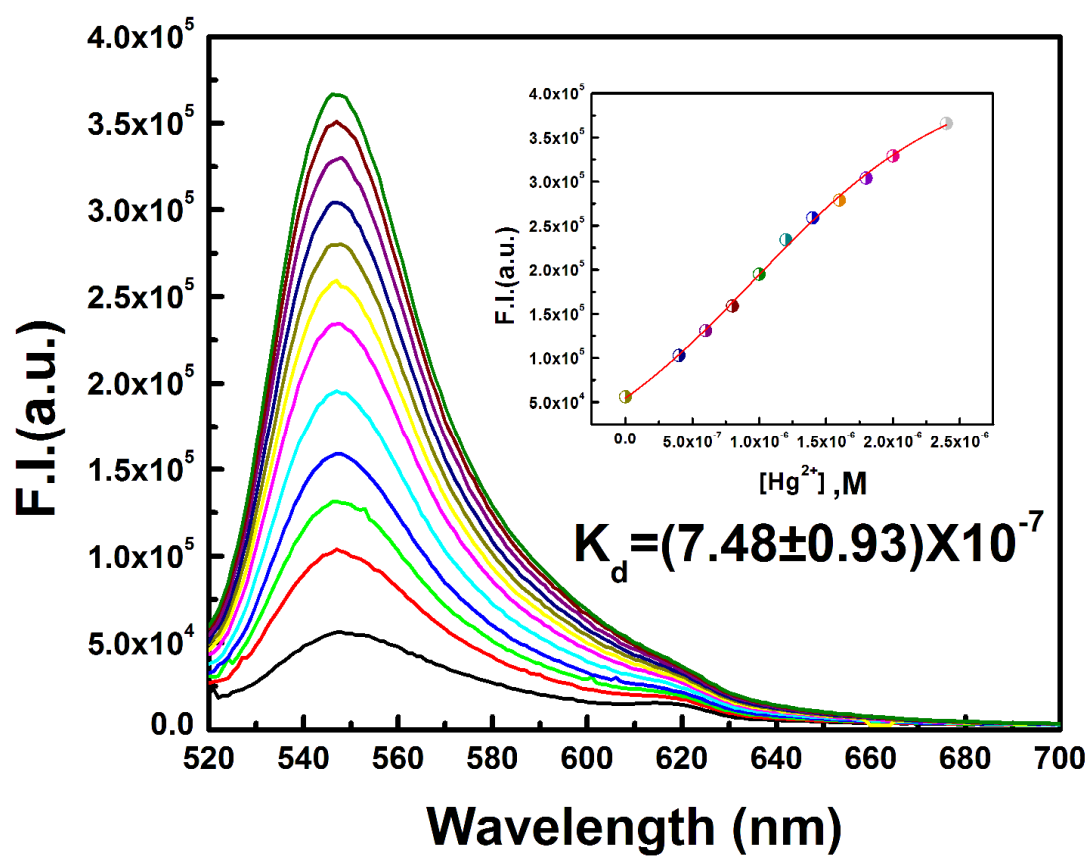
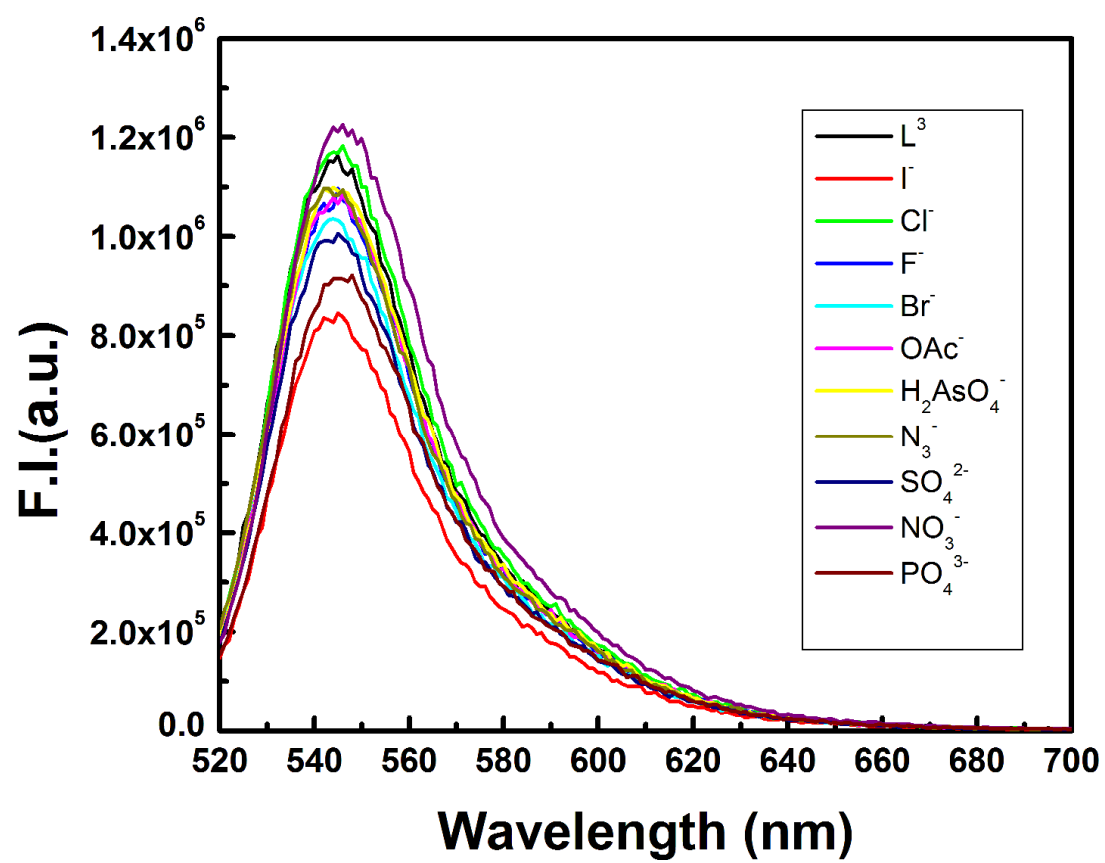


Figure S13 Fluorescence emission spectra of varying  $Hg^{2+}$  concentration in  $L^3$ +SDS solution



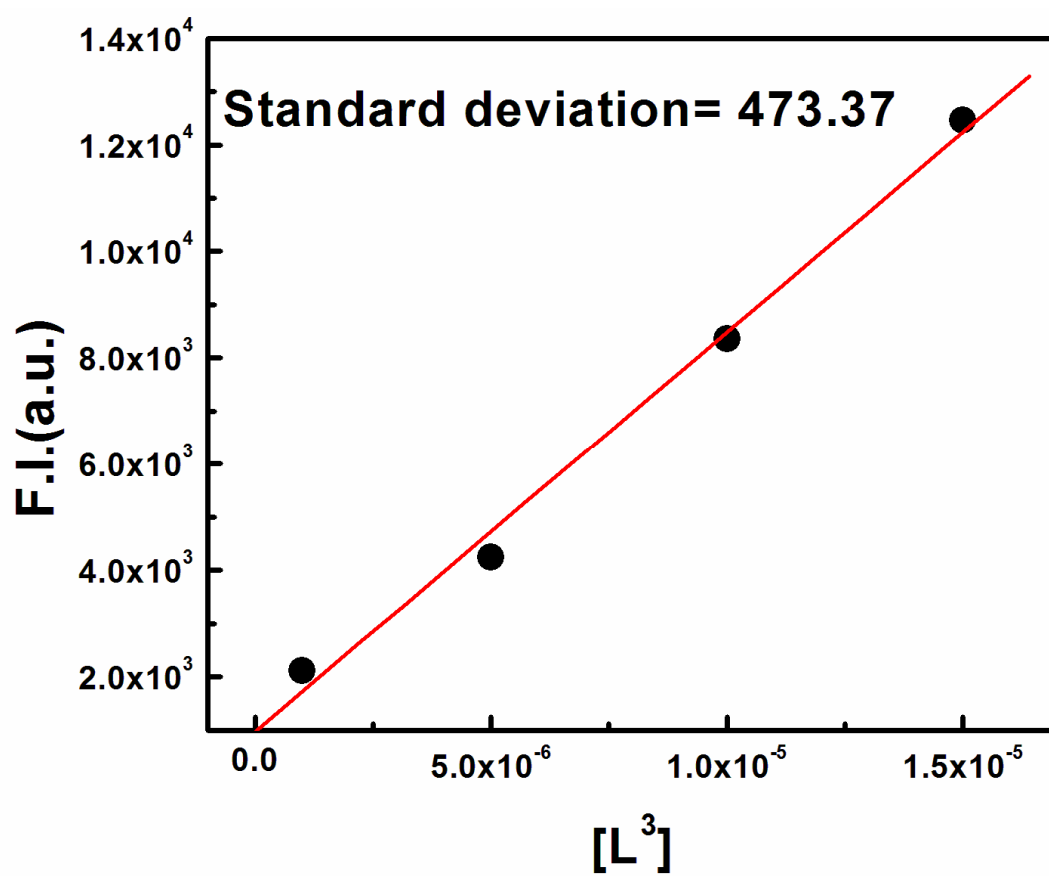
**Figure S14** Fluorescence emission spectra of different anions,

## Quantum Yield Determination:

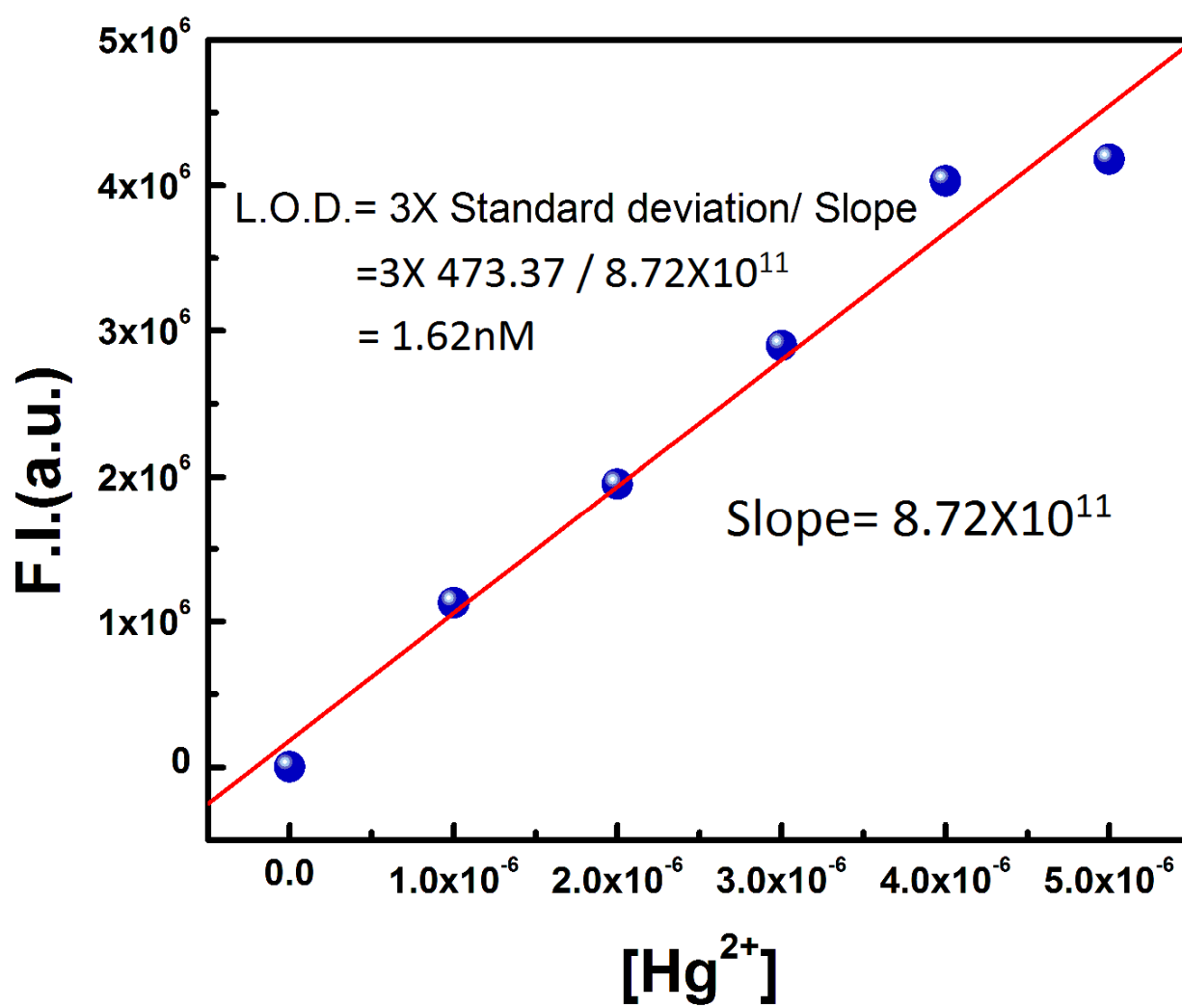
Fluorescence quantum yields ( $\Phi$ ) were estimated by integrating the area under the fluorescence

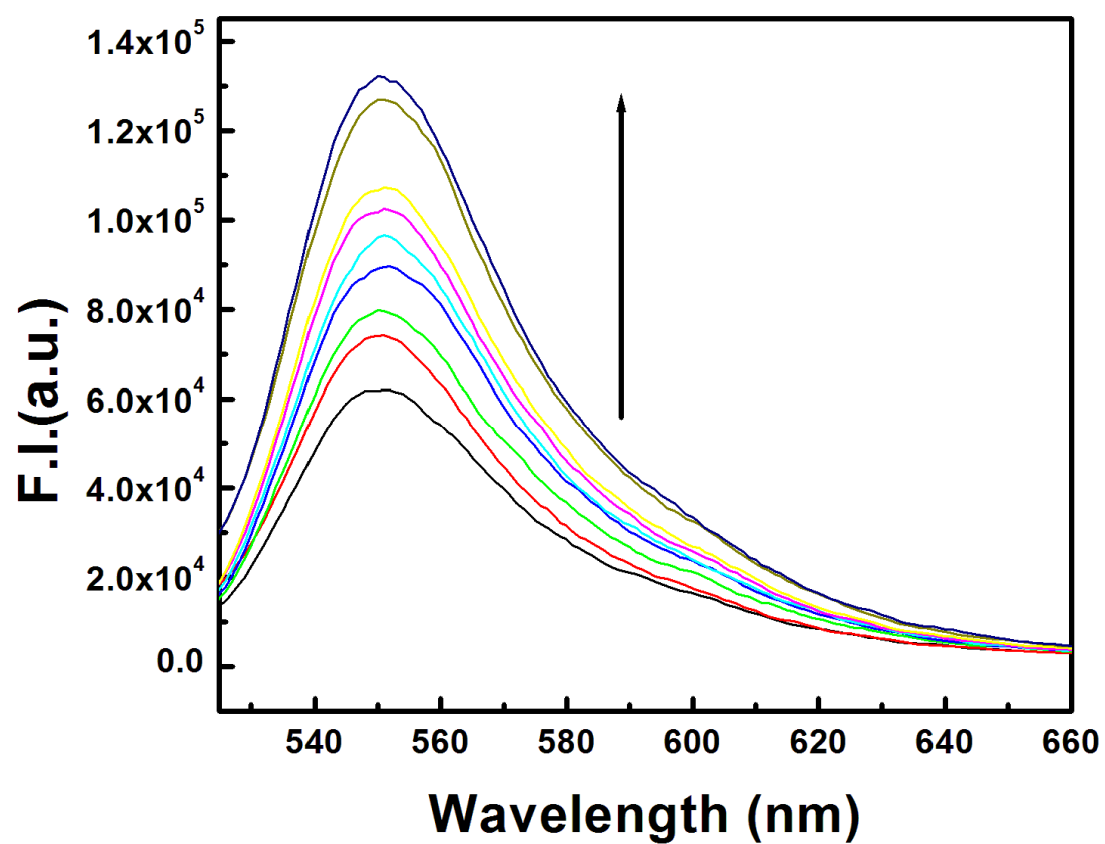
curves with the equation:  $\Phi_{sample} = \frac{OD_{std}}{OD_{sample}} \times \frac{A_{sample}}{A_{std}} \times \Phi_{std}$

where, A is the area under the fluorescence spectral curve and OD is optical density of the compound at the excitation wavelength. The standard used for the measurement of fluorescence quantum yield was rhodamine 6G ( $\Phi_{std}=0.94$  in  $\text{CH}_3\text{OH}$ ).



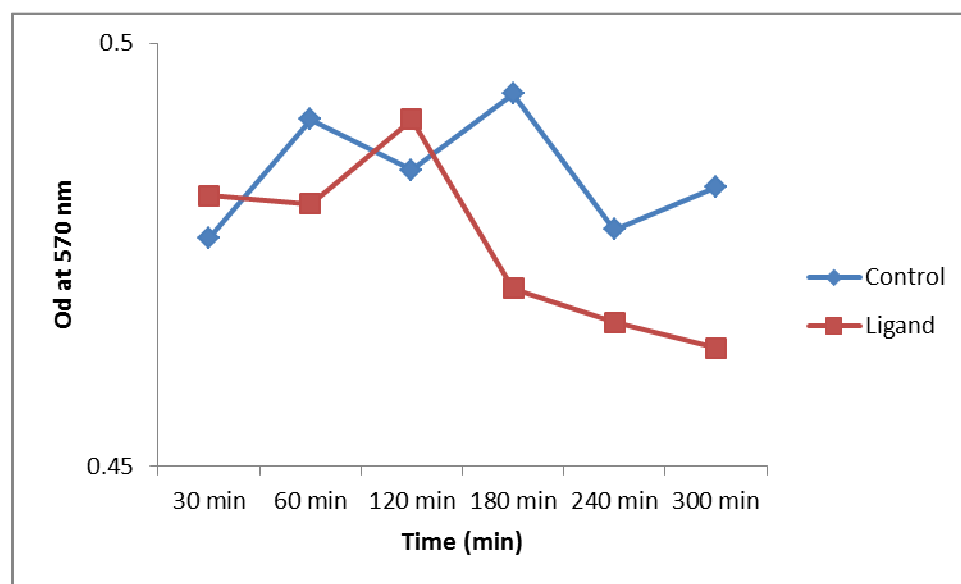




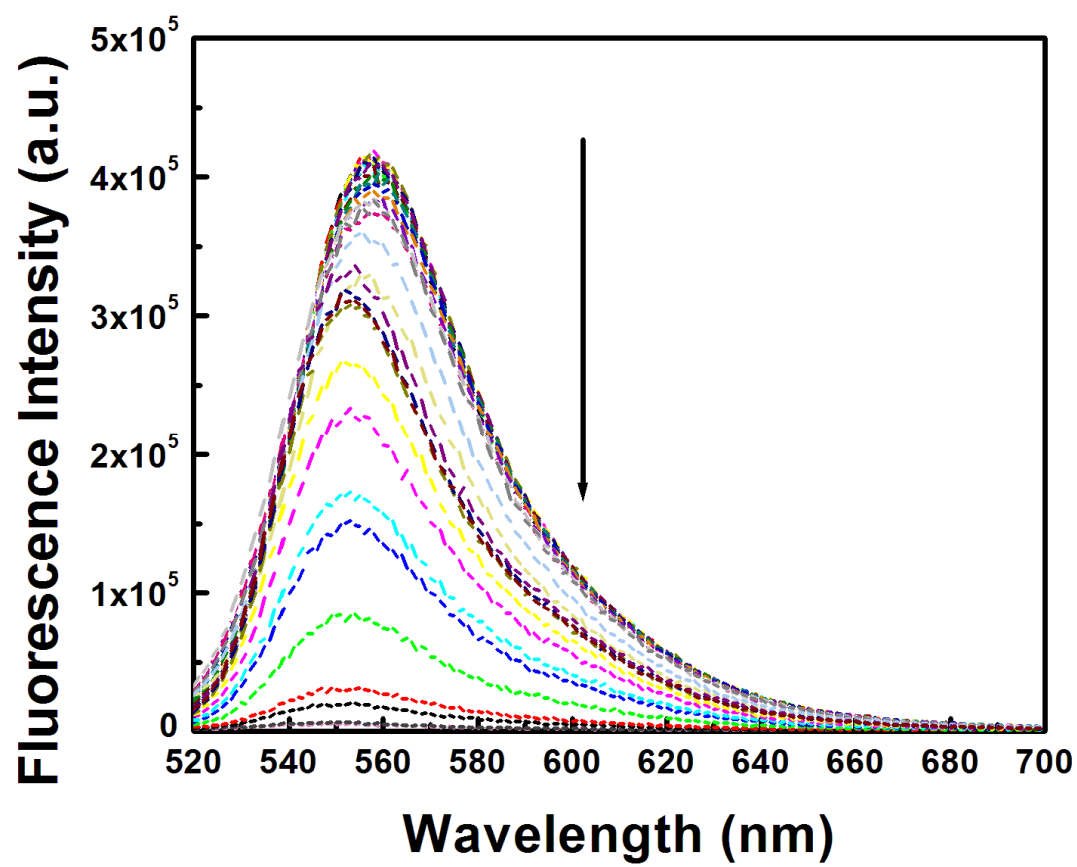


Fluorescence spectra in nano molar concentration of  $\text{Hg}^{2+}$ , gradually adding 1Nm  $\text{Hg}^{2+}$  solution in  $10\mu\text{m L}^3$ .

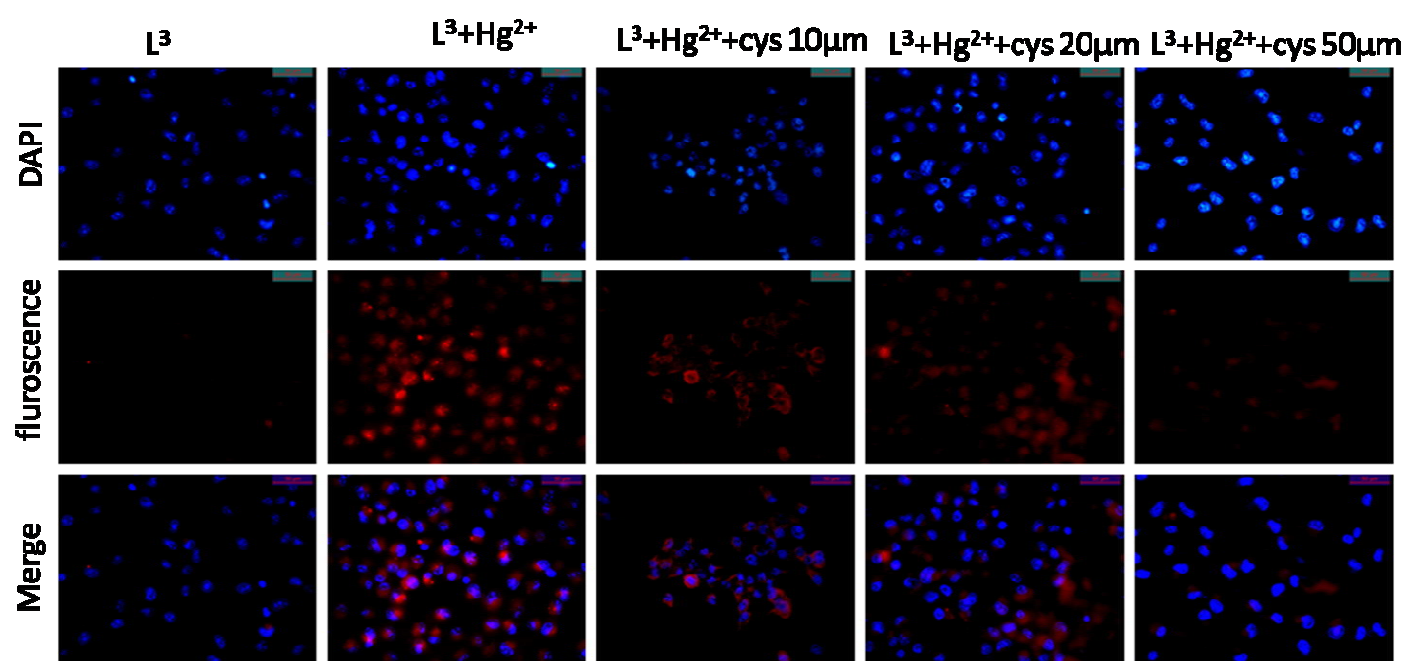
**Figure S16** Limit of detection calculation and fluorescence spectra,



**Figure S17** Cytotoxicity test of the ligand L<sup>3</sup> ( MTT assay of ligand in time dependent manner in HeLa cells.



**Figure S18** Fluorescence titration with cysteine in  $L^3+Hg^{2+}$ .



**Figure S19** The fluorescence images of HeLa cells were capture (40X) after incubated with 10 $\mu M$  of  $L^3$  for 30 min at 37 ° C, preincubated 10 $\mu M$  of  $Hg^{2+}$  for 30 min at 37°C followed by washing twice with 1X PBS and, subsequent incubation with 10 $\mu M$   $L^3$  for 30 min at 37°C and preincubated 10 $\mu M$  of  $Hg^{2+}$  for 30 min at 37°C followed by 10 $\mu M$   $L^3$  and 10, 20 and 50 $\mu M$  cysteine for 30 min at 37°C with alternative washing with 1X PBS two times.

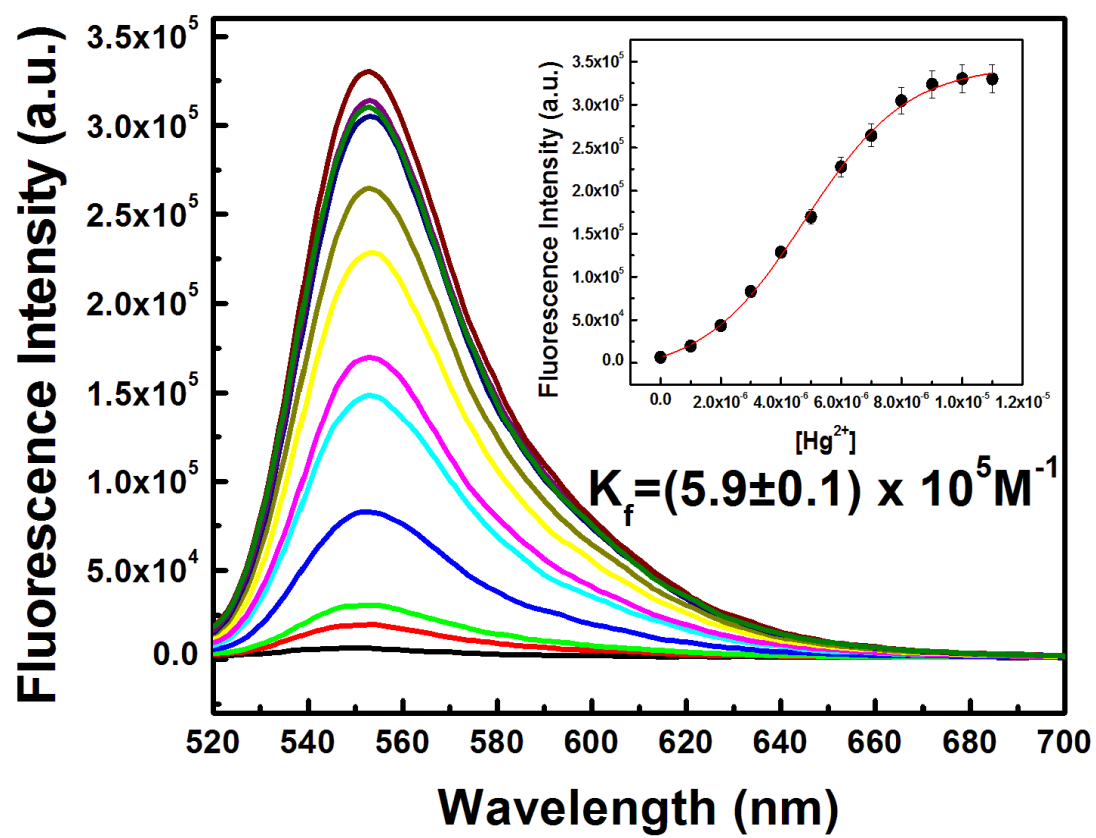


Figure S20a Fluorescence titration with formation constant value of  $L^4$  with  $Hg^{2+}$  ion.

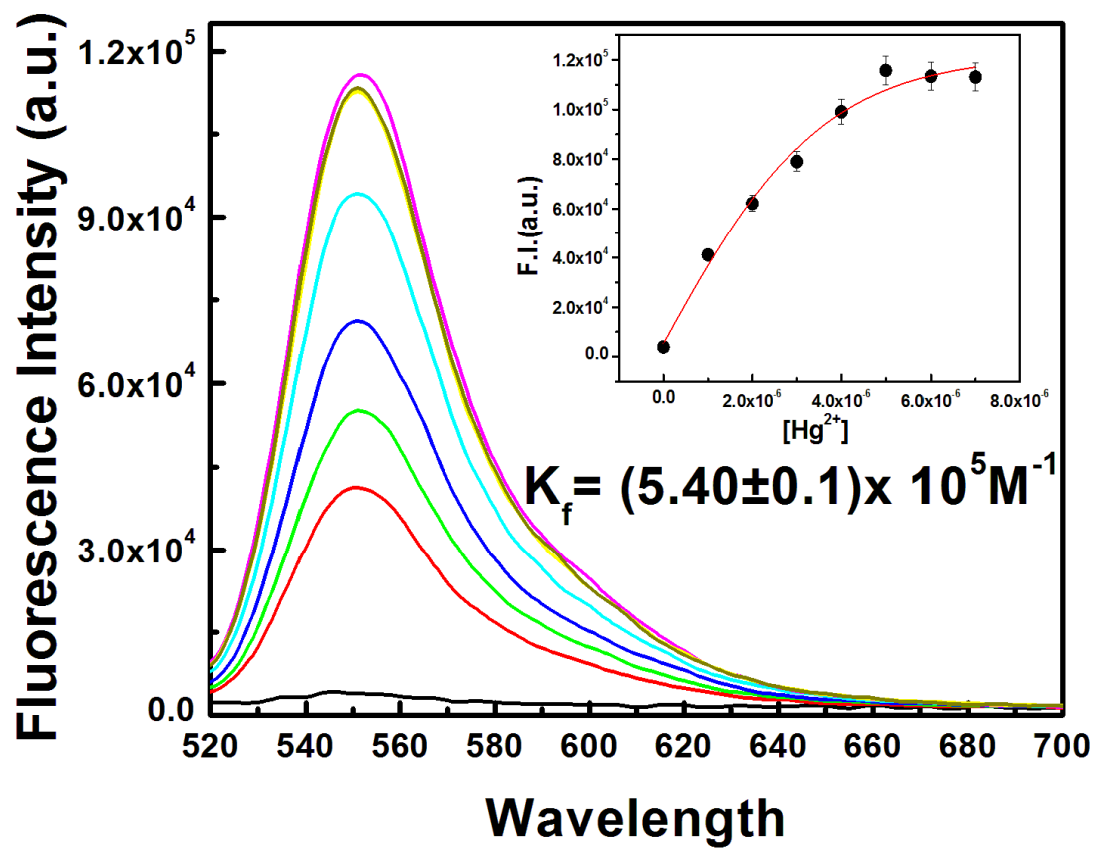


Figure S20b Fluorescence titration with formation constant value of  $L^5$  with  $Hg^{2+}$  ion.

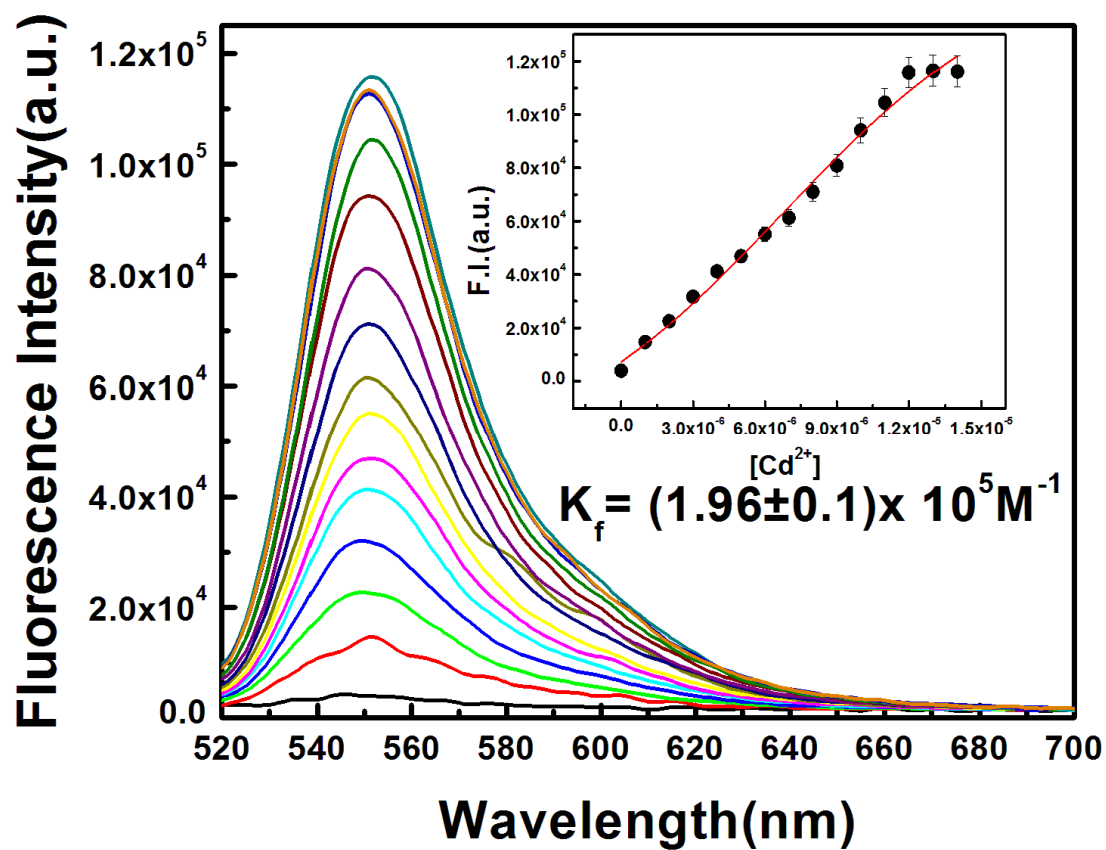


Figure S20c Fluorescence titration with formation constant value of  $L^5$  with  $Cd^{2+}$  ion.