

Supplementary Data

A novel terephthalaldehyde based turn-on fluorescent chemosensor for Cu²⁺ and its application in living cells imaging

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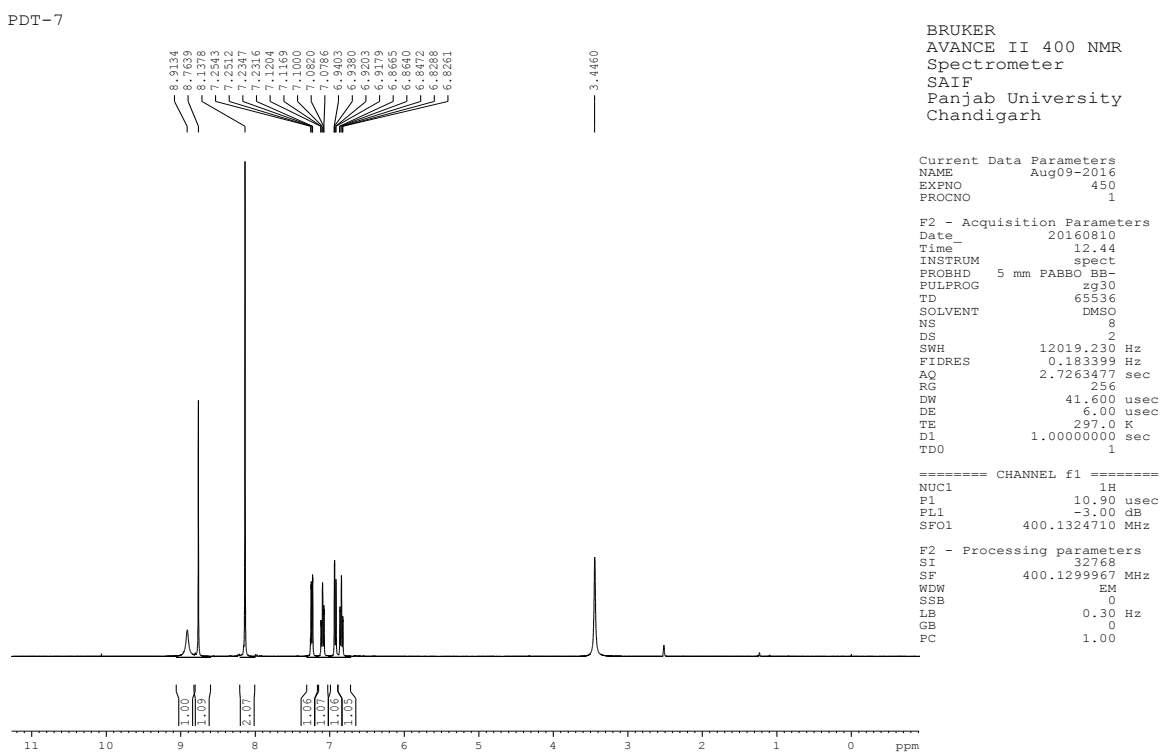


Figure S1: ¹H-NMR spectra of receptor **1** recorded in DMSO-d₆ at room temperature.

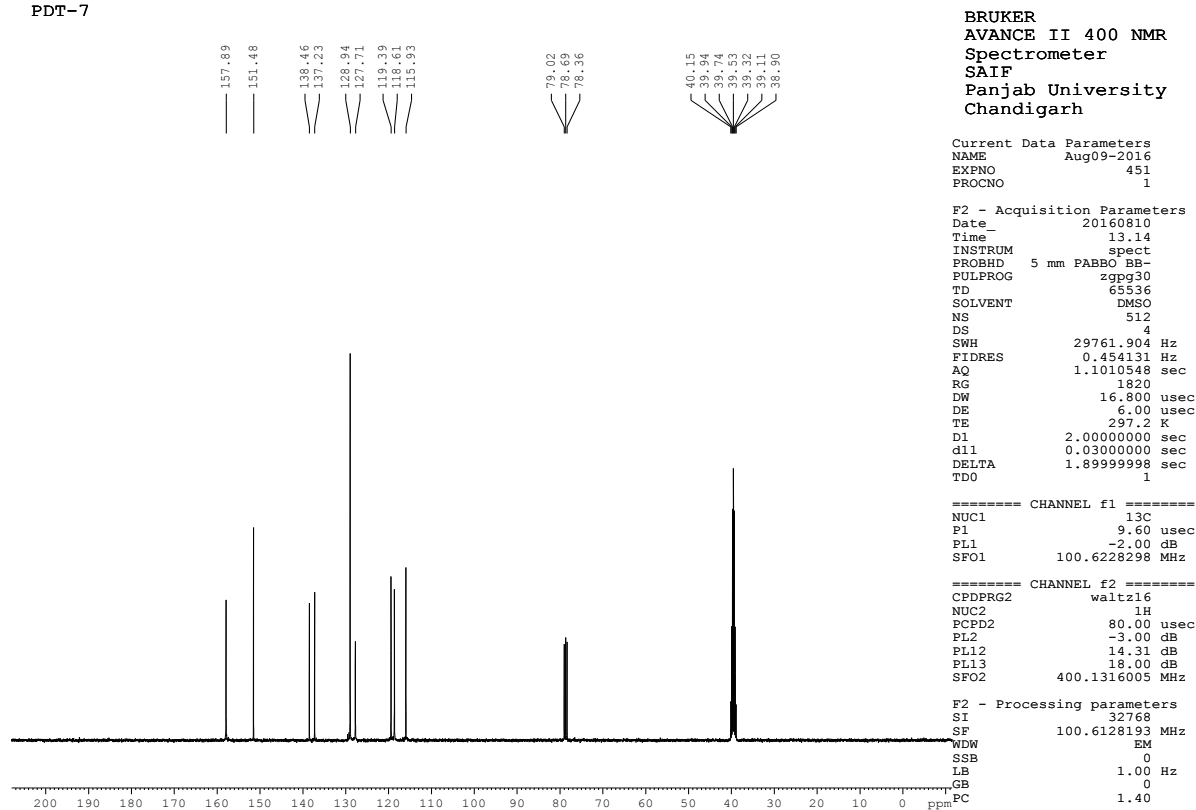


Figure S2: ¹³C-NMR spectra of receptor 1 recorded in DMSO-d₆ at room temperature.

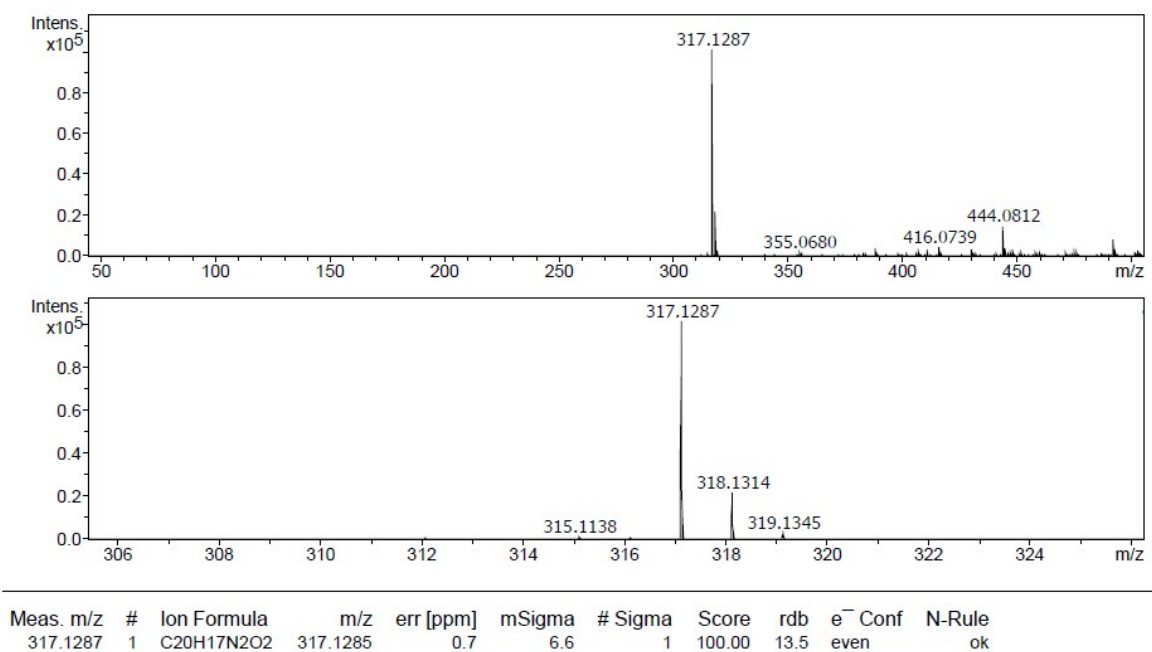


Figure S3: HRMS spectra of receptor 1.

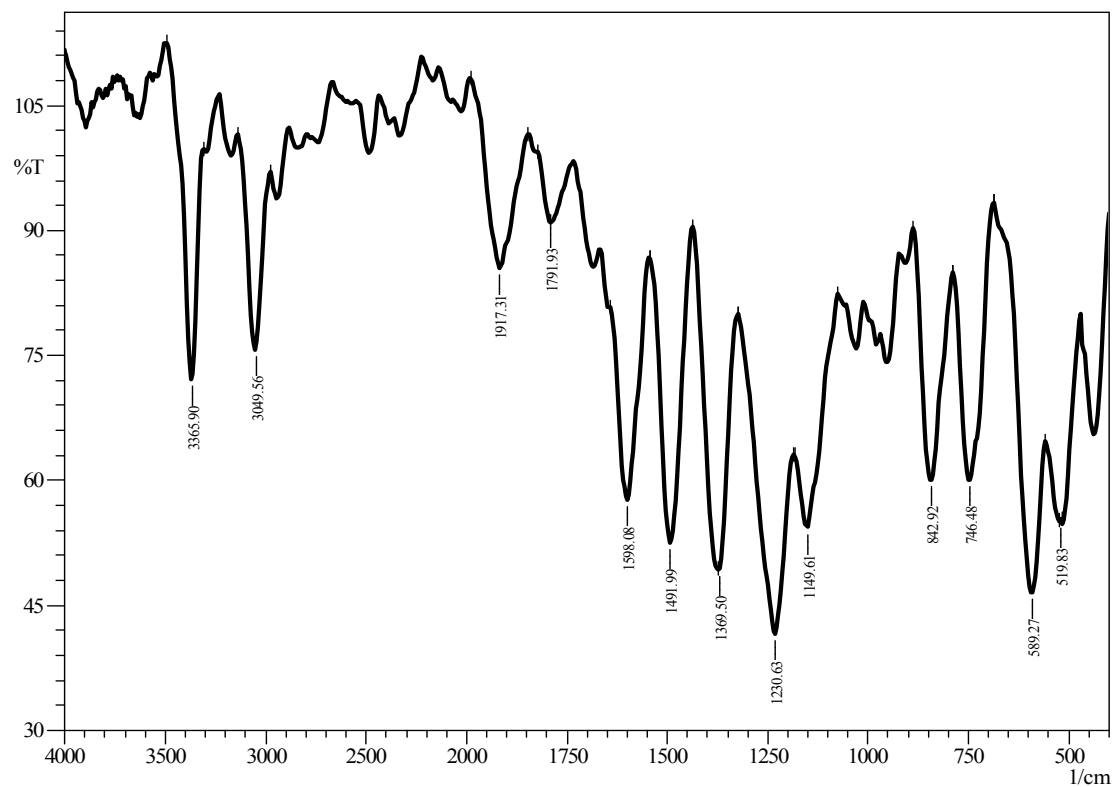


Figure S4. Infrared spectrum of receptor 1.

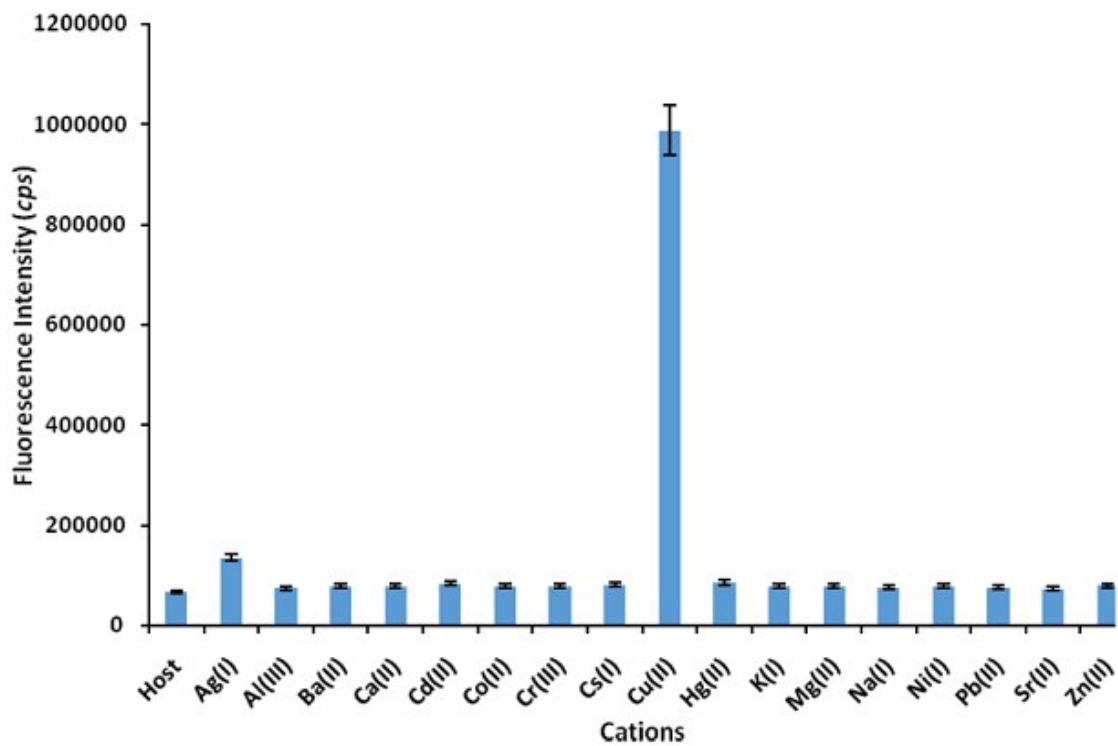


Figure S5. Relative responses of fluorescence at 386 nm of receptor **1** (CH₃CN) in the absence and presence of different cations.

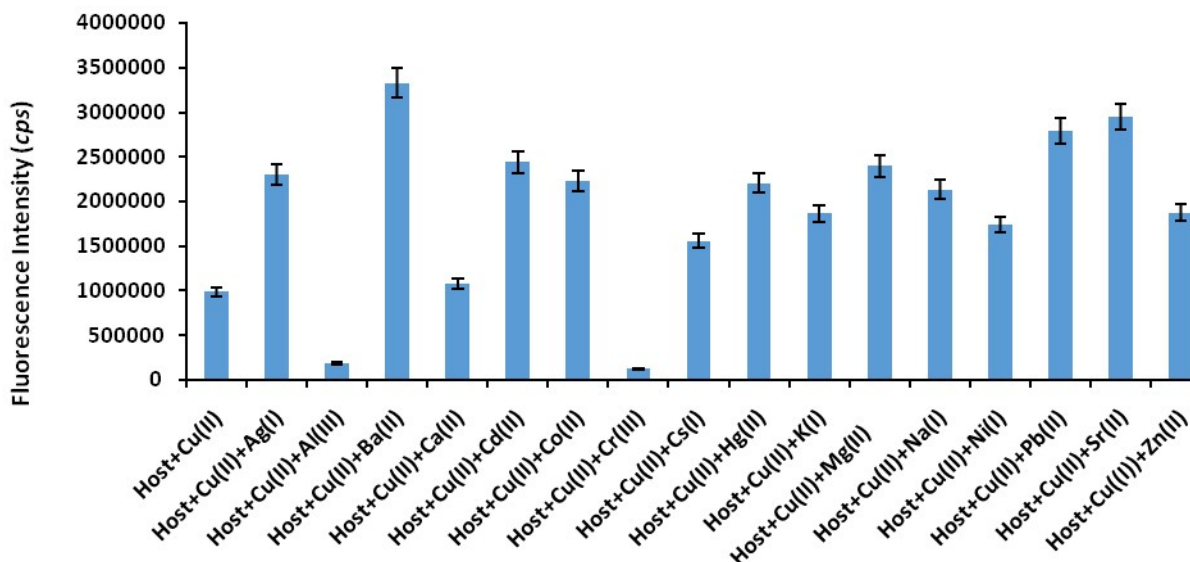


Figure S6. Fluorescence intensity changes of **1** (1×10^{-5} M, CH₃CN) upon addition of two equivalents of Cu²⁺ in the presence of two equivalent of different metal ions Na⁺, K⁺, Ca²⁺, Mg²⁺, Al³⁺, Co²⁺, Ni²⁺, Zn²⁺, Cr³⁺, Ba²⁺, Cs⁺, Cd²⁺, Pb²⁺, Ag⁺ and Sr³⁺.

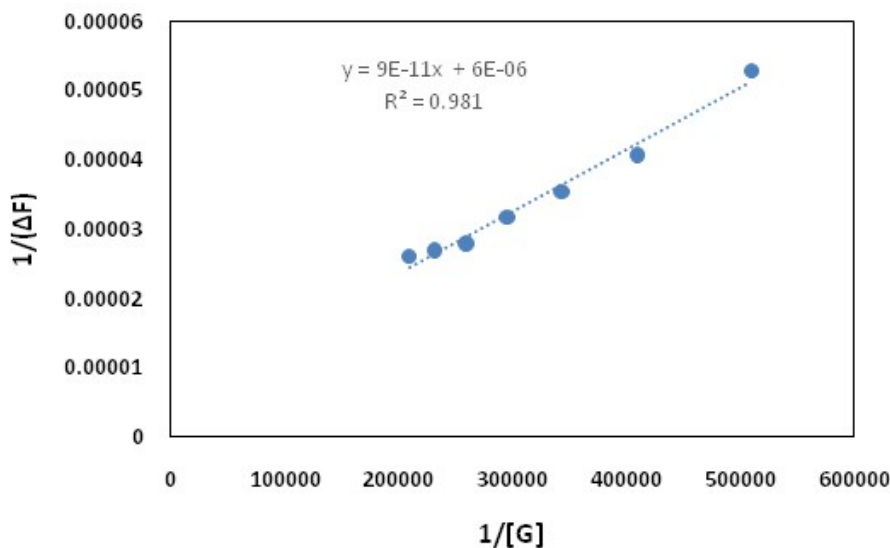


Figure S7. Benesi-Hildebrand plot for determining the affinity constant (K_a) of receptor **1**. Cu²⁺ ion complexation, $K_a = 6.67 \times 10^4$ M⁻¹, where $\Delta F = (F - F_0)$.

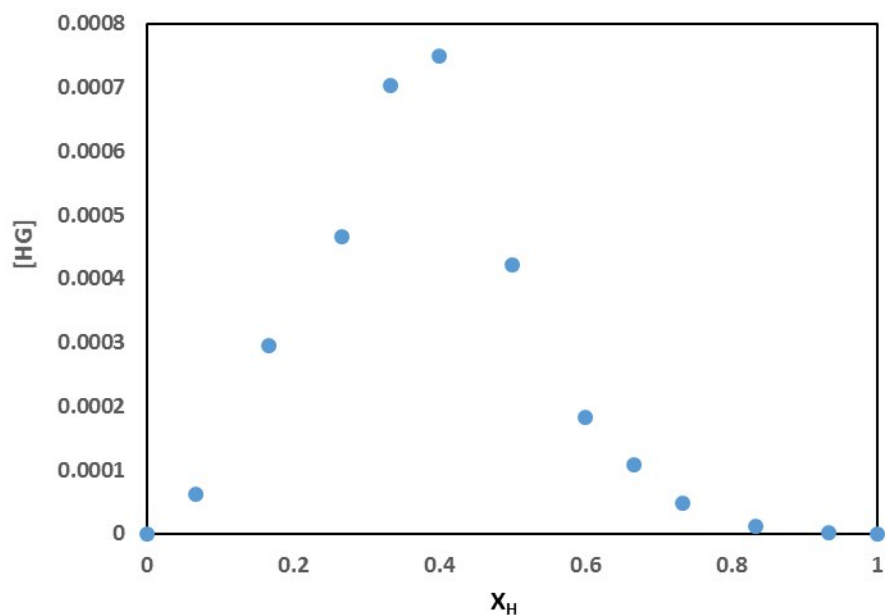


Figure S8. 2:1 Stoichiometry of the host guest relationship realized from the Job's plot for receptor **1** (CH_3CN).

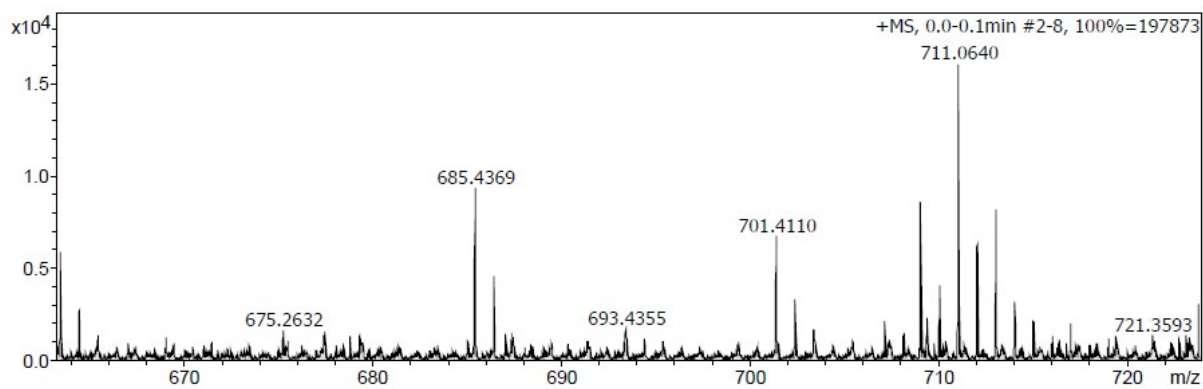


Figure S9. LC MS spectra of receptor **1.Cu²⁺**

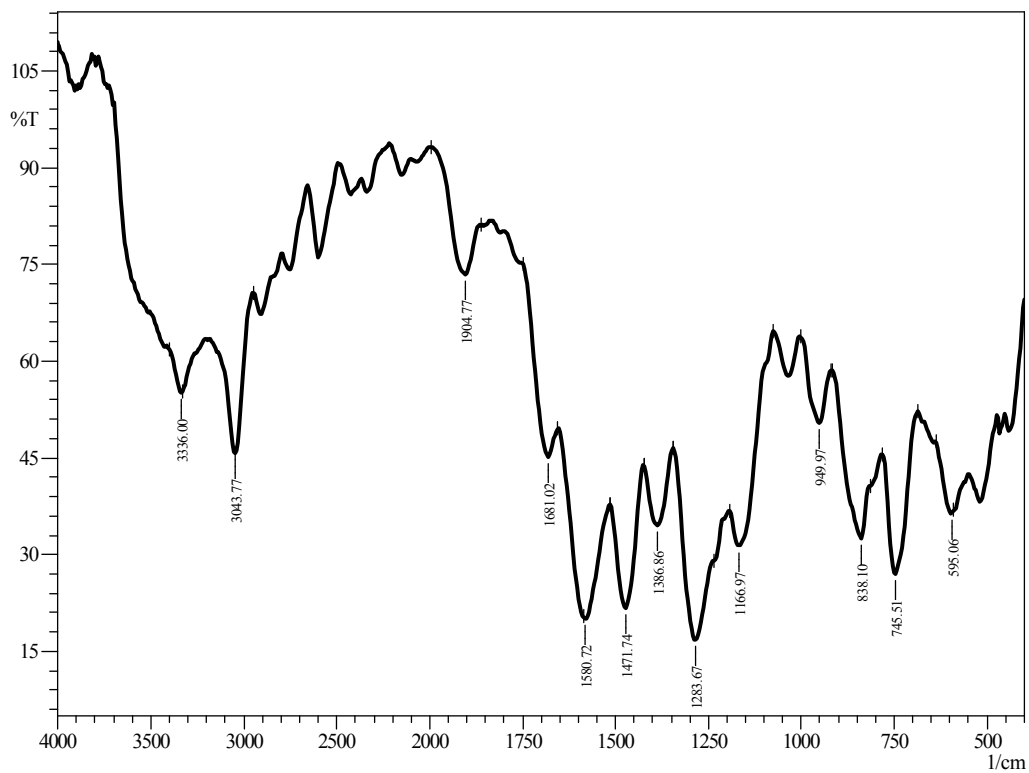


Figure S10. IR spectra of complex **1**.Cu²⁺

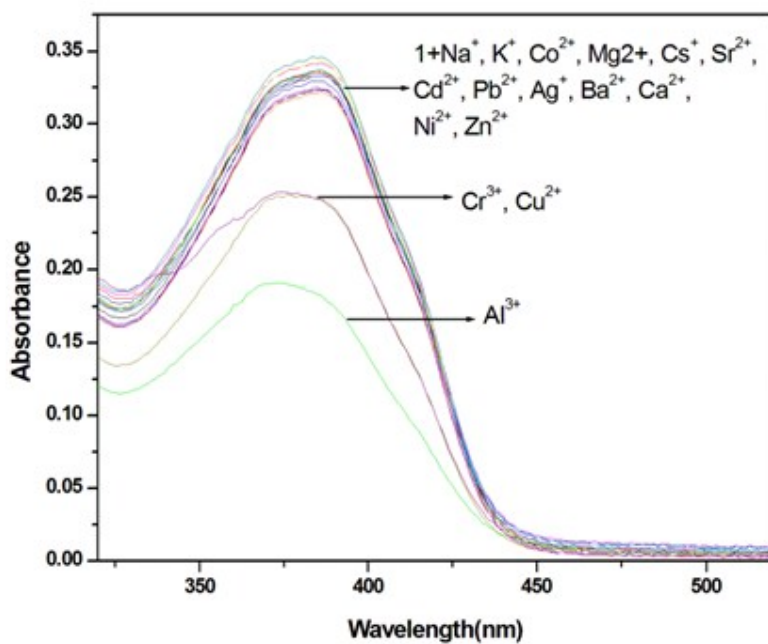


Figure S11. UV-Vis spectral changes of receptor **1** (1×10^{-5} M, CH₃CN) in Acetonitrile upon addition of Na⁺, K⁺, Ca²⁺, Mg²⁺, Al³⁺, Co²⁺, Ni²⁺, Zn²⁺, Cr³⁺, Ba²⁺, Cs⁺, Cd²⁺, Pb²⁺, Ag⁺ and Sr³⁺ ion (1×10^{-4} M, H₂O).

Table S1: Crystal data and data collection parameters of receptor **1**.

Parameters	1
Formula	C ₁₂ H ₁₈ N ₄ O ₂
MW	316.35
crystalsyst	Monoclinic
Space group	<i>P</i> 2 ₁ / <i>c</i>
<i>a</i> (Å)	8.4729(3)
<i>b</i> (Å)	5.9222(2)
<i>c</i> (Å)	15.3241(7)
α (deg)	90.00
β (deg)	91.525(4)
γ (deg)	90
<i>V</i> (Å ³)	768.66(5)
<i>Z</i>	2
<i>T</i> /K	293(2)
λ (Å)	1.54814
ρ_{calcd} (g/cm ³)	1.367
μ (mm ⁻¹)	0.719
Goodness of fit	1.256
Total reflections	1502
Unique reflections	1260
R _{int}	0.062
R ₁ , wR ₂ [(<i>I</i> > 2 σ (<i>I</i>)]	0.0619, 0.1570
R ₁ , wR ₂ (all data)	0.0861, 0.2223

Table S2: Comparison of reported detection limit with present work.

Author	Response	Detection limit	Reference
Singh et al	Fluorescence	30 μ M	1
Chang et al	Fluorescence	1.5 μ M	2
Wu et al	Fluorescence	0.87 μ M	3
Chawla et al	Fluorescence	6 μ M	4
Liu et al	Fluorescence	1.5 μ M	5
Maity et al	UV, Fluorescence	20 μ M	6
Singh et al	Fluorescence	35 μ M-10 nM	7
Kuwar et al	fluorescence	0.62 μM	Present Work

References

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