***Supporting Information***

# Ratiometric detection of hypochlorite applying the restriction to 2-way-ESIPT : A Simple design for "naked-eye" tap water analysis

## Shorter

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**1. Determination of fluorescence quantum yield:**

Here, the quantum yield φ was measured by using the following equation,

$\varphi_x = \varphi_s ( F_x / F_s)( A_s / A_x)(n_x^2/ n_s^2)$

Where,

X & S indicate the unknown and standard solution respectively, φ = quantum yield,

F = area under the emission curve, A = absorbance at the excitation wave length,

n = index of refraction of the solvent. Here φ measurements were performed using anthracene in ethanol as standard [φ = 0.27] (error ~ 10%).

The quantum yield of **BTHT** itself is 0.01 which changes into 0.65.

**2. Calculation of detection limit:**

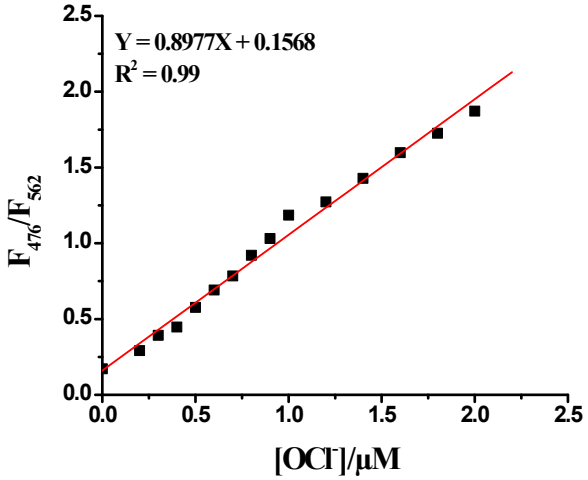



Fig. S1: Plot of intensity ratio (i.e. $F_{476}/F_{562}$ ) vs. [$OCl^-$] in micromolar.

The detection limit DL of BTHT for $OCl^-$ was determined from the following equation [S2]:

DL = K* Sb1/S. Where K = 2 or 3 (we take 2 in this case);

From the graph we get slope = 0.8977, and Sb1 value is 0.066269.

Thus using the formula we get the Detection Limit = 0.14 μM i.e. BTHT can detect $OCl^-$ in this ppm level.

**3. Fluorescence ratiometric responses of BTHT to $OCl^-$ + metal ions anions and reactive species**:

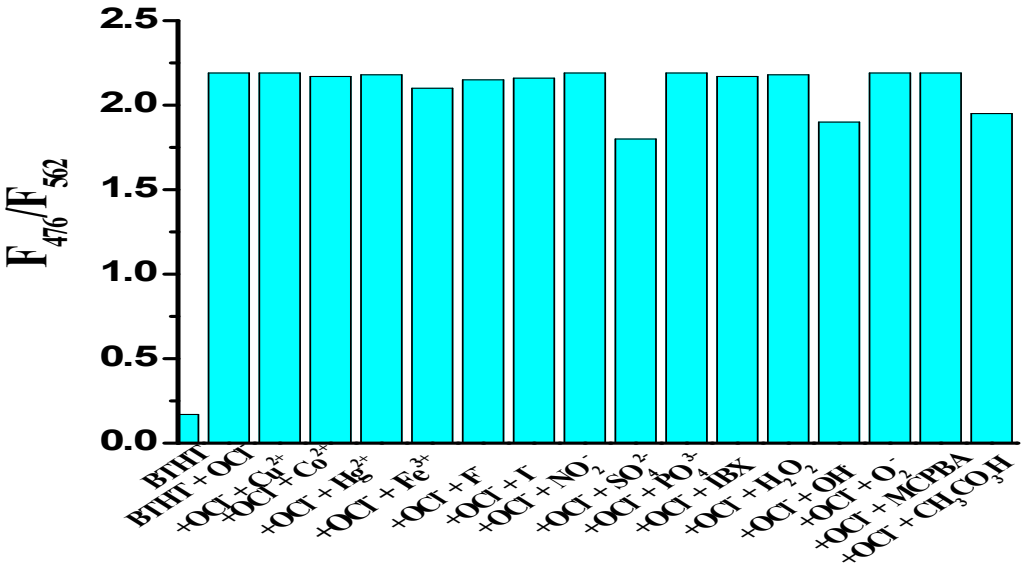
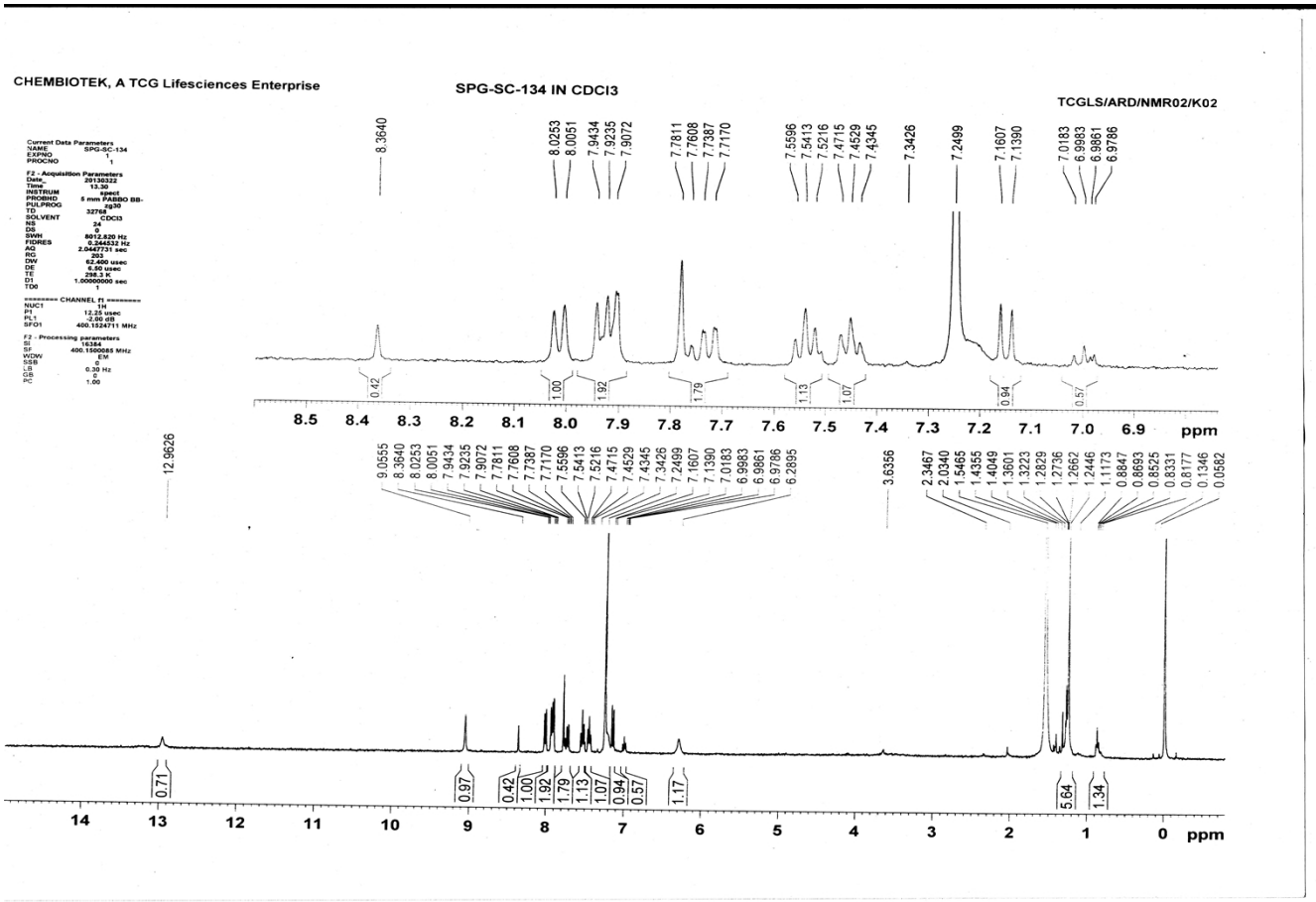
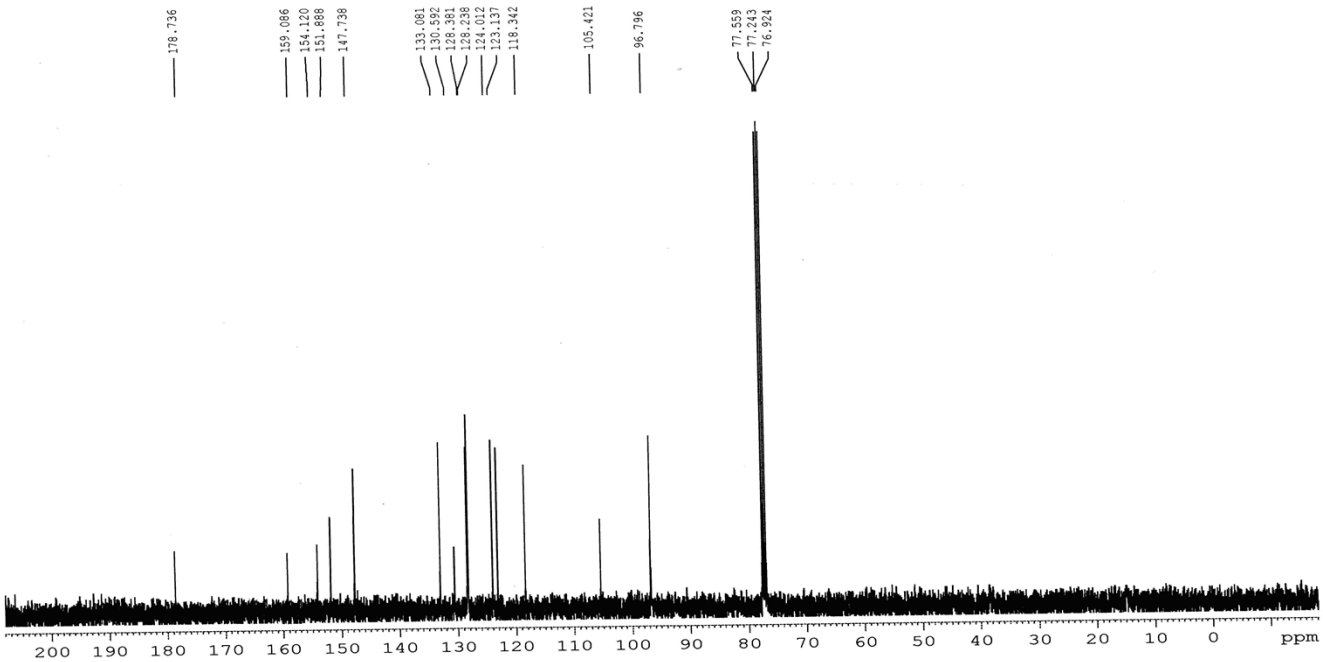



Fig S3: Fluorescence responses of BTHT (c = 2.0 x $10^{-5}$ M) to $OCl^-$ (1 equiv) containing 10 equiv of various metal ions and anions (λex = 365 nm).

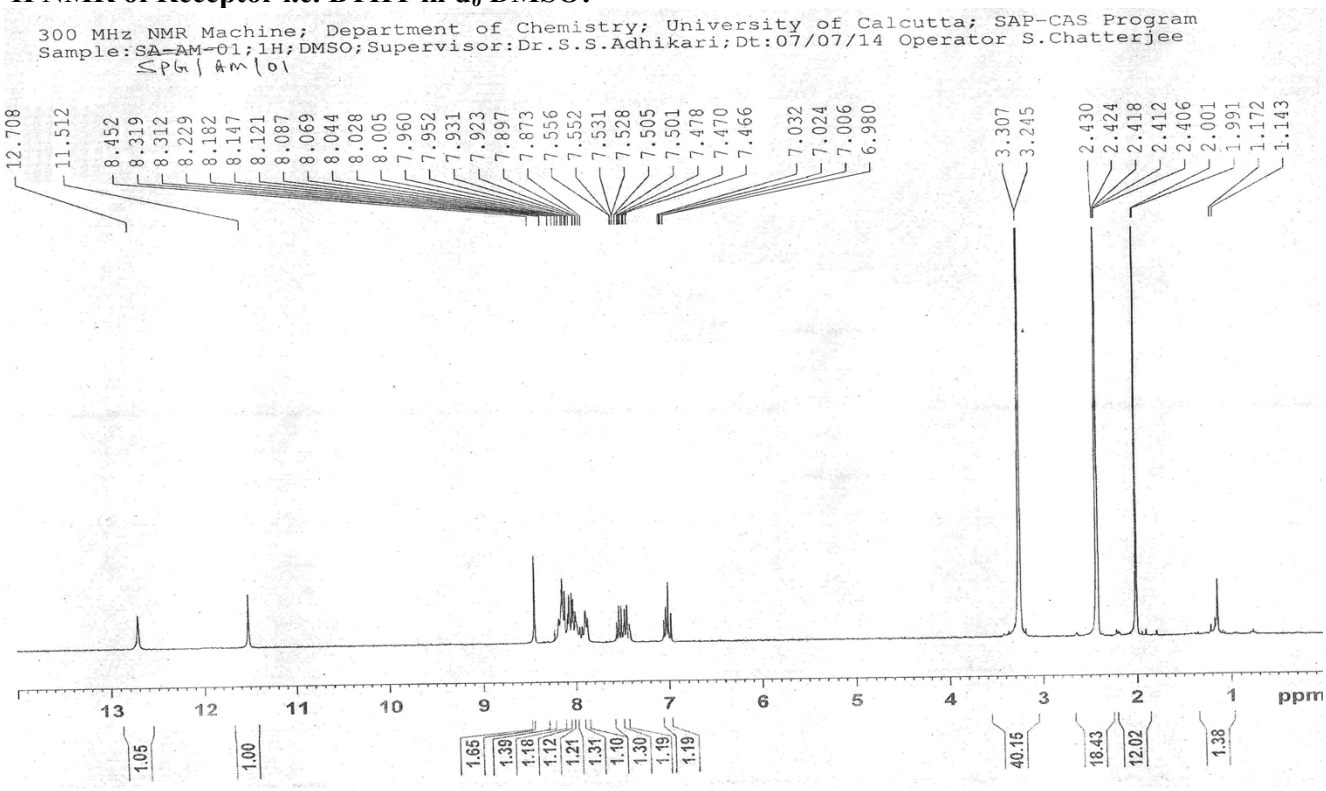
## 4. $^{1}$H NMR, $^{13}$C NMR and ESI MS spectra of BTHT:

## $^{1}$H NMR and $^{13}$C NMR spectrum of Receptor i.e. BTHT in $CDCl_3$:

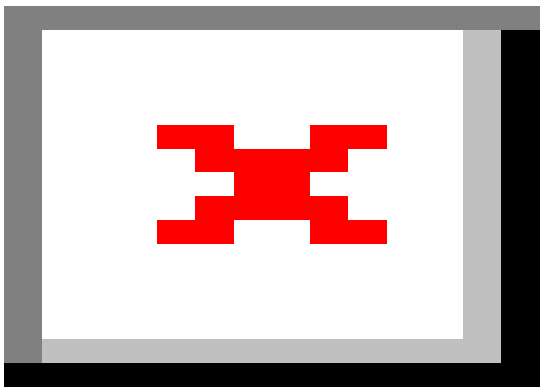


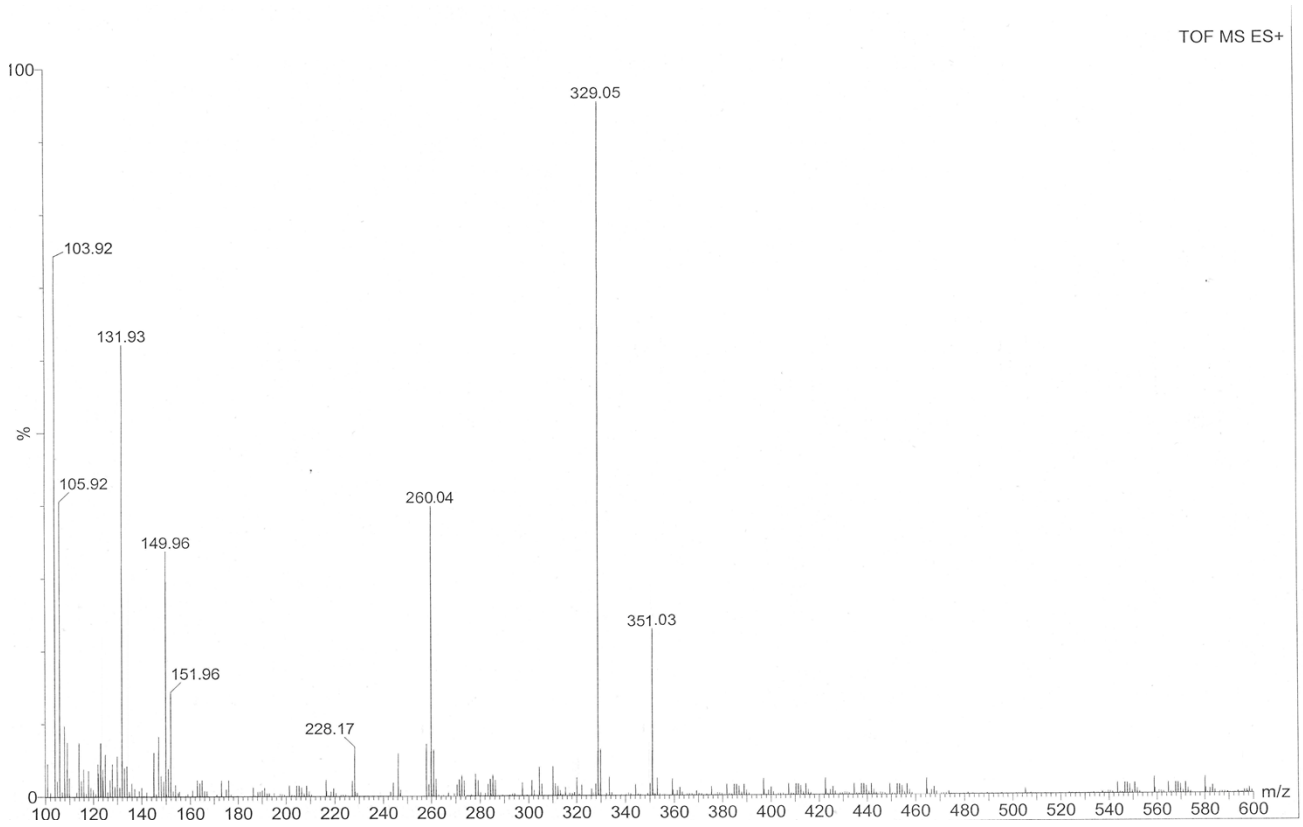
**$^1$H NMR of Receptor i.e. BTHT in $d_6$ DMSO:**



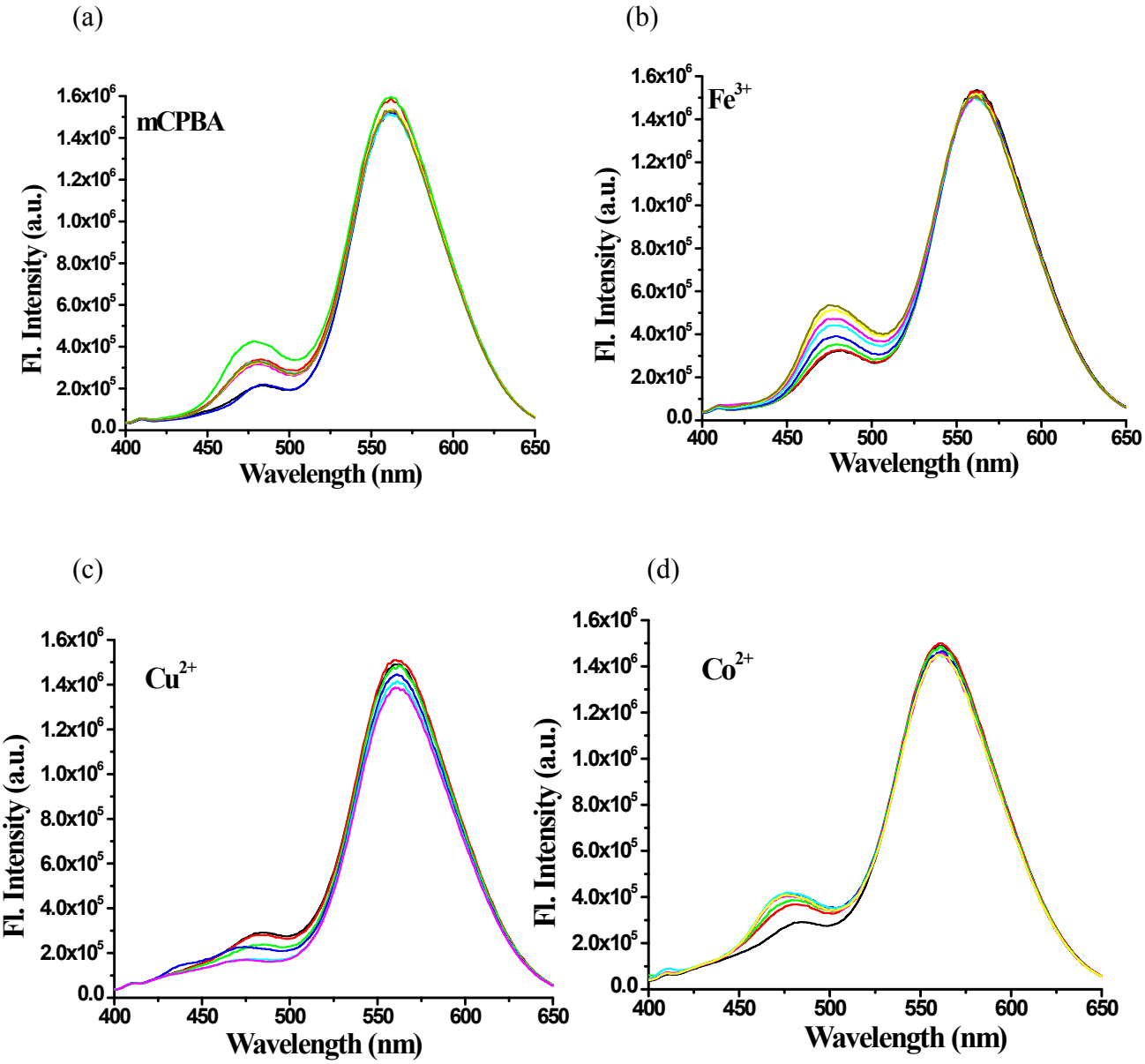

**$^1$H NMR of BTHT + $OCl^-$ in $d_6$ DMSO:**



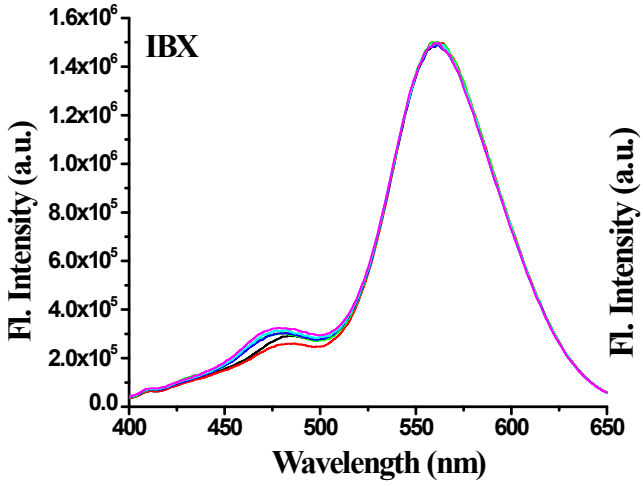
**ESI-MS of Receptor i.e. BTHT:**



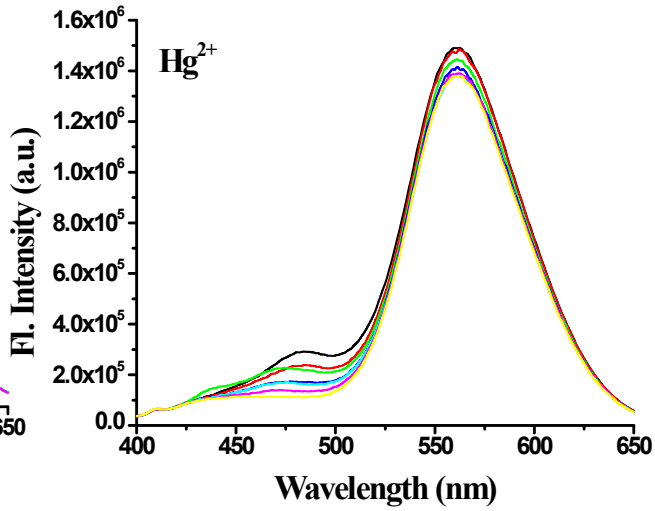
**5. Fluorescence emission spectra of DPNO with different anions and oxidants as mCPBA, $Fe^{3+}$, $Cu^{2+}$, $Co^{2+}$, IBX, $Hg^{2+}$, $I^-$, $CH_3COOOH$, $NO_3^-$, Super oxide, $SO_4^{2-}$, $PO_4^{3-}$, $H_2O_2$, Hydroxyl radical and $F^-$ in $CH_3CN$ : $H_2O$ (1:1, v/v) (The solutions of anions and oxidants were prepared from mCPBA, $FeCl_3$, $Cu(ClO_4)_2 \cdot 6H_2O$, $Co(ClO_4)_2 \cdot 6H_2O$, IBX, $HgCl_2$, KI, $CH_3COOOH$, $NaNO_3$, $K_2O$ , $Na_2SO_4$, $Na_3PO_4$, $H_2O_2$, Femton's reagent and respectively in $CH_3CN$-$H_2O$).**



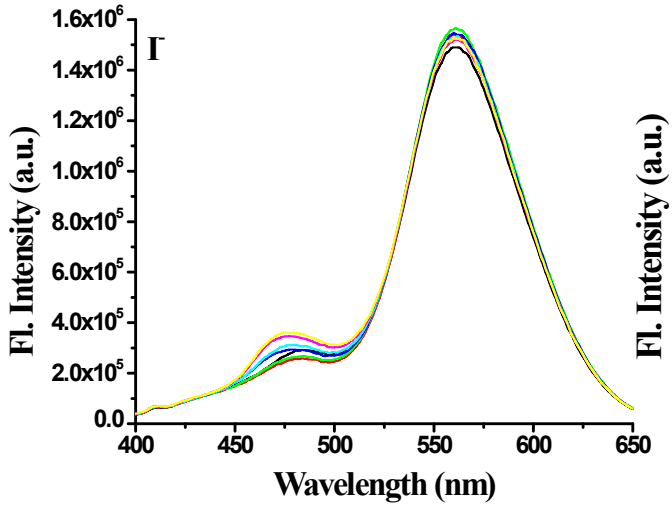
(e)


IBX
Fl. Intensity (a.u.)
Wavelength (nm)

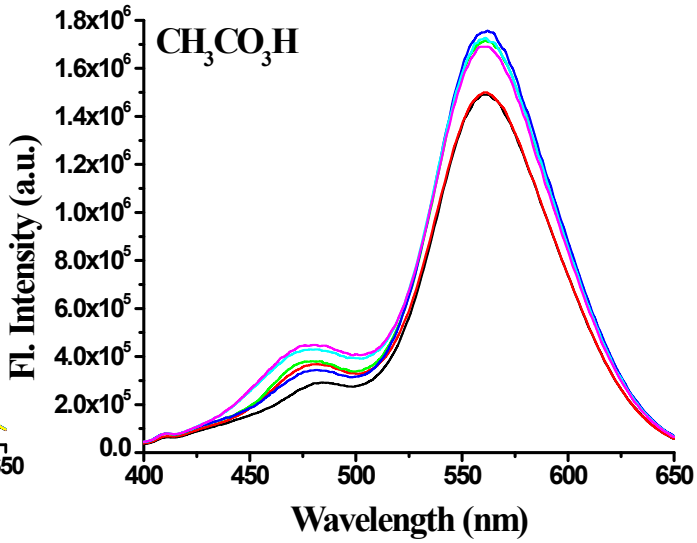
(f)


Hg2+
Fl. Intensity (a.u.)
Wavelength (nm)

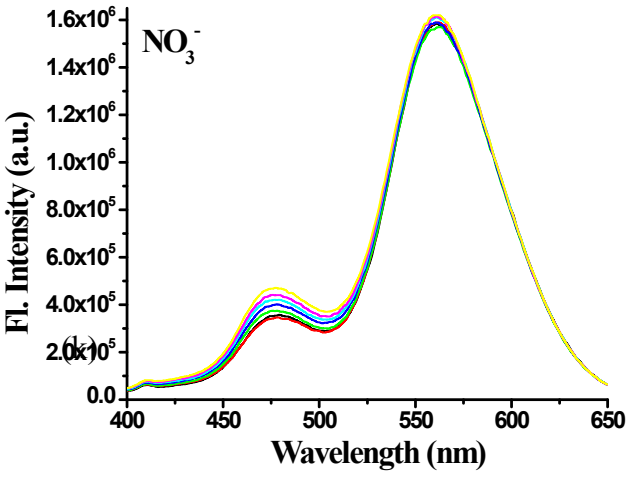
(g)


I-
Fl. Intensity (a.u.)
Wavelength (nm)

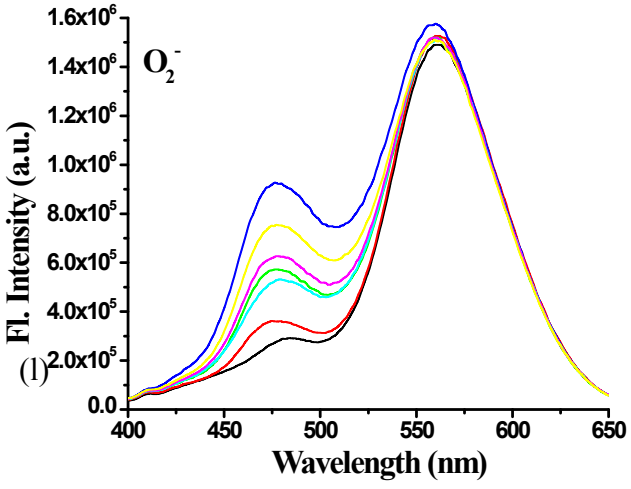
(h)


CH3CO3H
Fl. Intensity (a.u.)
Wavelength (nm)

(i)

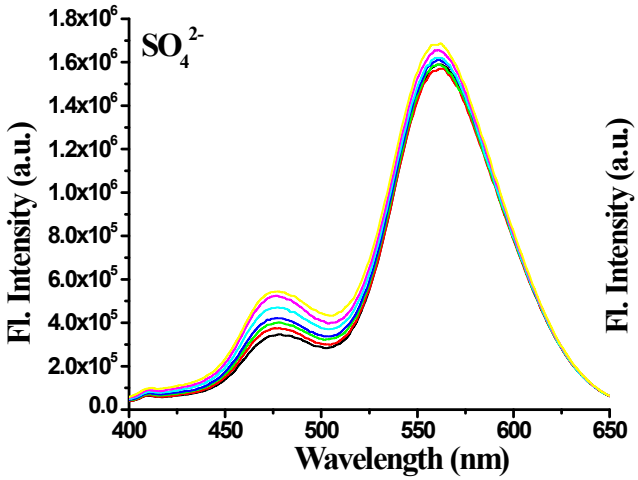

NO3-
Fl. Intensity (a.u.)
Wavelength (nm)

(j)

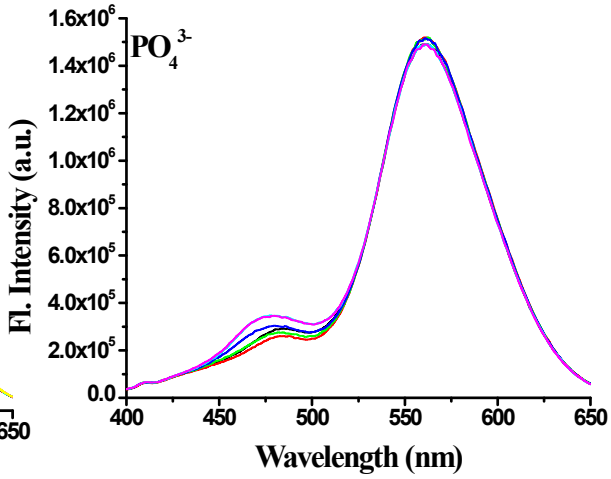

O2-
Fl. Intensity (a.u.)
Wavelength (nm)

(k)

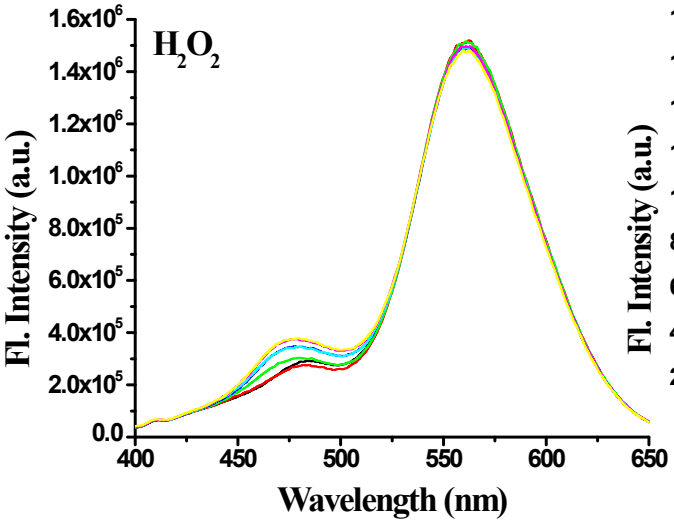
(l)


SO4 2-
Fl. Intensity (a.u.)
Wavelength (nm)

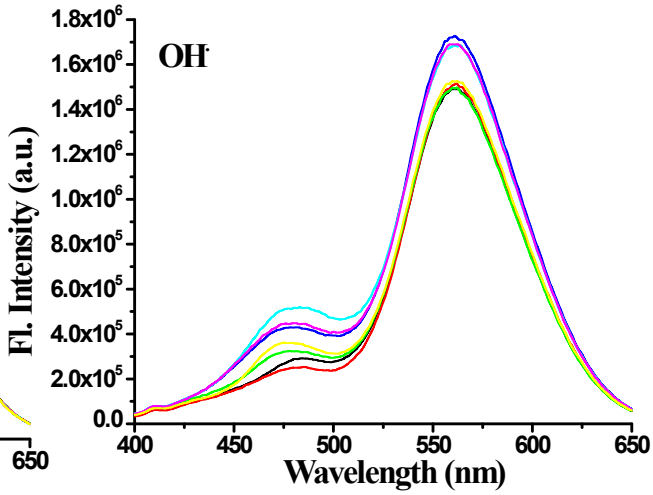
(m)

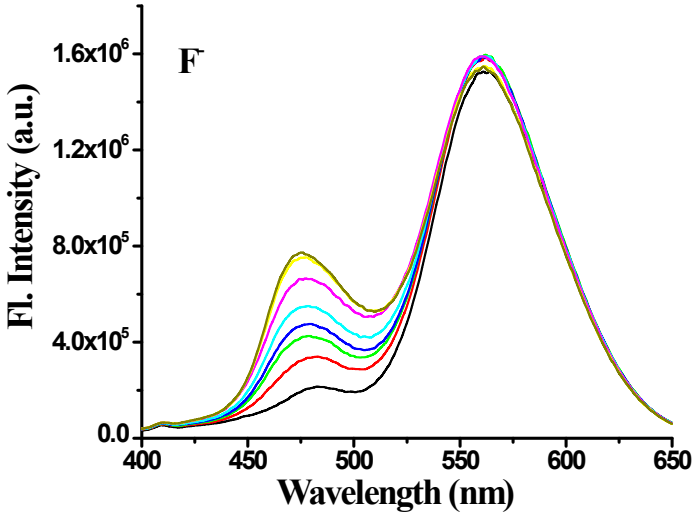

PO4 3-
Fl. Intensity (a.u.)
Wavelength (nm)

(n)


H2O2
Fl. Intensity (a.u.)
Wavelength (nm)

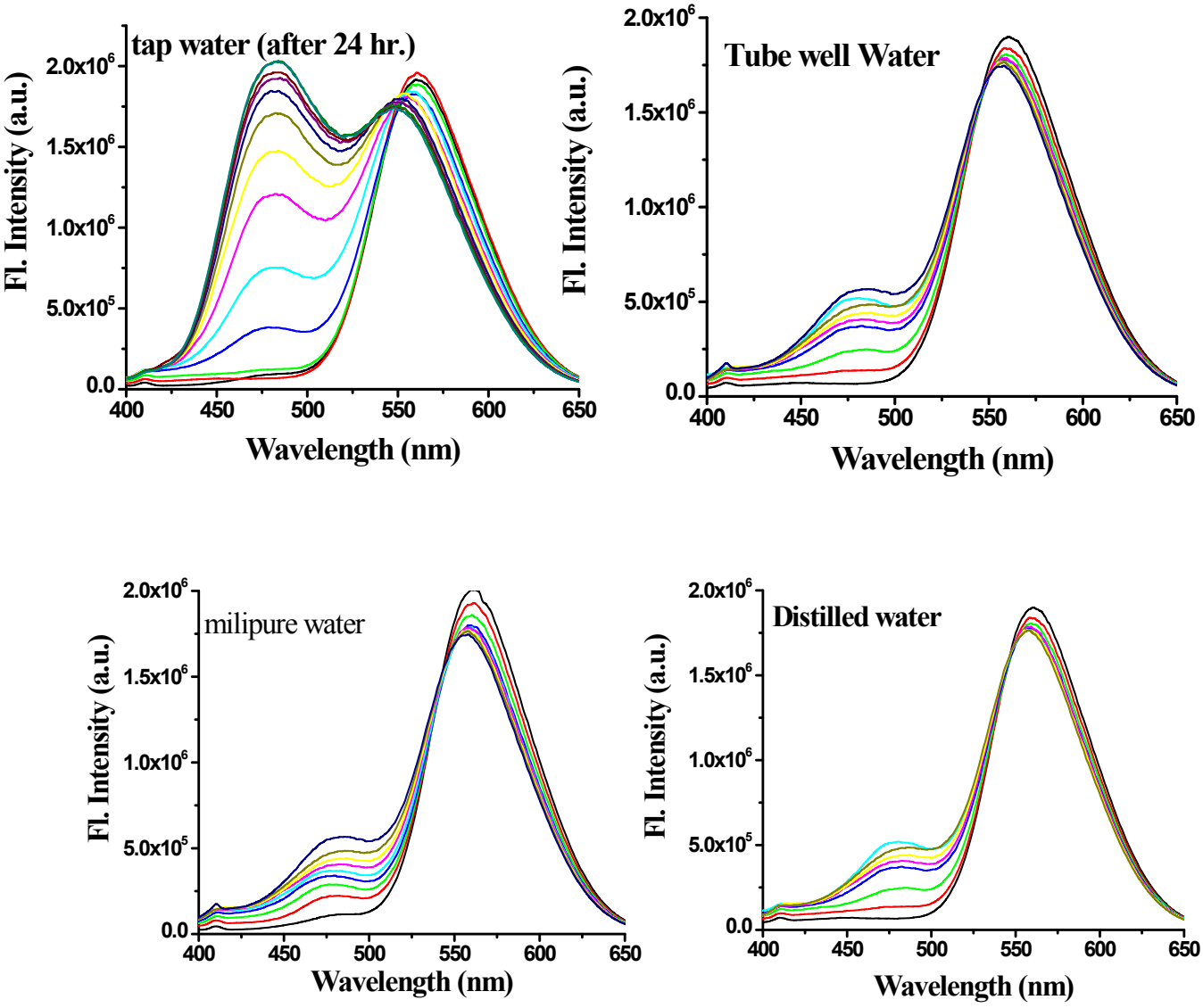
(o)

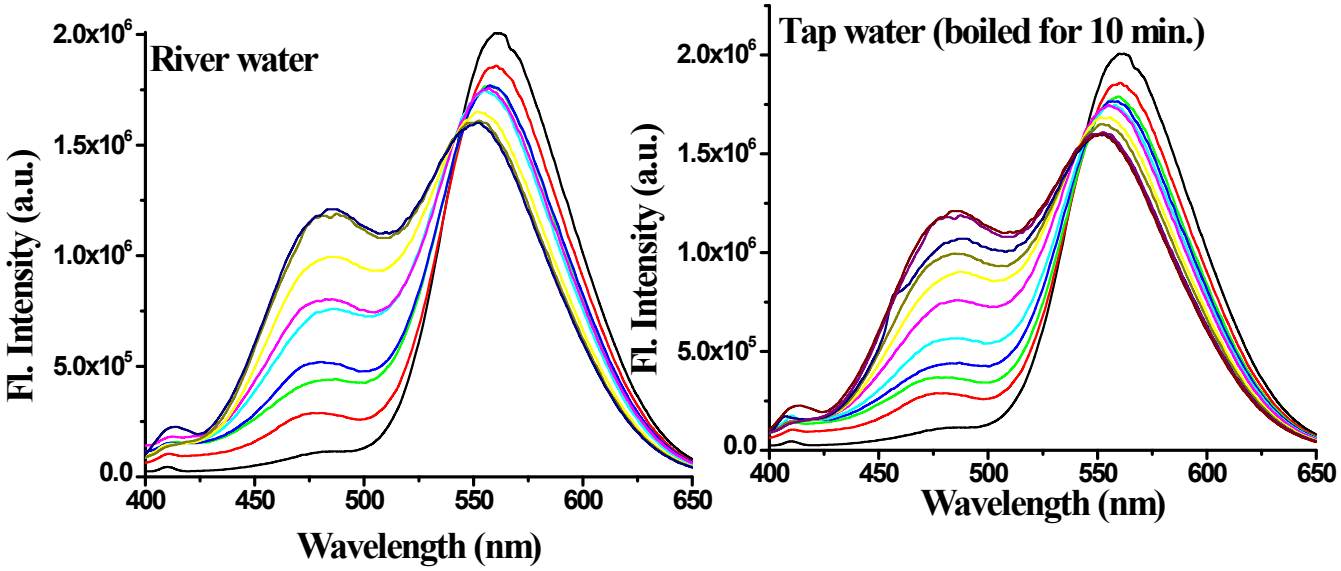

OH-
Fl. Intensity (a.u.)
Wavelength (nm)


F-
Fl. Intensity (a.u.)
Wavelength (nm)

**6. Fluorescence spectra of BTHT with different types of water samples:**

Fluorescence emission spectra of BTHT ($c=2x10^{-5}$ M) with different water samples (total volume 500 micro-litre for each) in $CH_3CN$ : $H_2O$ (1:1, v/v).




River water
Fl. Intensity (a.u.)
2.0x10^6
1.5x10^6
1.0x10^6
5.0x10^5
0.0
400
450
500
550
600
650
Wavelength (nm)
Tap water (boiled for 10 min.)
Fl. Intensity (a.u.)
2.0x10^6
1.5x10^6
1.0x10^6
5.0x10^5
0.0
400
450
500
550
600
650
Wavelength (nm)