Supporting Information

Fast and ratiometric “Naked eye” detection of hydrazine both solid and vapour phase sensing

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1. Bar Diagram of PBF towards different amine containing compound in UV-vis and fluorescence titration methods:

(a) Relative absorbance of the PBF in presence of other amine containing compounds

(b) Bar chart illustrating fluorescence response of free ligand and two equivalent of other amine containing compounds in CH$_3$CN-H$_2$O (6:4, v/v, 25 °C).

Figure S1: (a) Relative absorbance of the PBF in presence of other amine containing compounds (b) Bar chart illustrating fluorescence response of free ligand and two equivalent of other amine containing compounds in CH$_3$CN-H$_2$O (6:4, v/v, 25 °C).

2. Fluorescence intensity vs conc. of hydrazine plot:

Figure S2: Fluorescence intensity ratio changes ($F_{530}/F_{418}$) of PBF upon gradual addition of hydrazine.
3. Calculation of the detection limit:

The detection limit DL of PBF for hydrazine was determined from the following equation\(^1\):

\[
DL = K \times \frac{Sb_1}{S}
\]

Where \( K = 2 \) or 3 (we take 2 in this case); \( Sb_1 \) is the standard deviation of the blank solution; \( S \) is the slope of the calibration curve.

From the graph we get slope = 0.552, and \( Sb_1 \) value is 0.113009.

Thus using the formula we get the Detection Limit = 0.41 \( \mu \)M i.e. PBF can detect hydrazine in this minimum concentration.

4. Calculation of rate constant:

From the time vs. Fl. Intensity vs. time (sec.) plot at fixed wavelength (530nm) using first order rate equation (Figure 5), we get rate constant \( K = \) slope \( \times 2.303 = 0.067 \times 2.303 = 15.43 \times 10^{-2} \ \text{sec}^{-1} \)
5. \(^1\)H NMR, \(^{13}\)C NMR and HR MS spectra of PBF and corresponding hydrazone product:

\(^1\)H NMR spectrum of Receptor i.e. PBF:

\(^{13}\)C NMR spectrum of PBF:
HR MS Mass Spectra of PBF:

\[ ^1H \text{ NMR spectrum of Hydrazone product i.e. PBF + Hyd:} \]
6. UV-vis absorption spectra of PBF with different cations as Ag⁺, Cd²⁺, Co²⁺, Cu²⁺, Fe³⁺, Mn²⁺, Pd²⁺. (The solutions of metal ions were prepared from AgNO₃, Cd(ClO₄)₂·H₂O, Co(ClO₄)₂·6H₂O, Cu(ClO₄)₂·6H₂O, FeCl₃, MnCl₂, Pb(ClO₄)₂, Zn(ClO₄)₂·6H₂O, and NaClO₄, respectively in CH₃CN-H₂O), different anions Cl⁻, Br⁻, I⁻ as their tetra butyl salt and SO₄²⁻, SO₃²⁻, ClO₄⁻, HPO₄⁻ as their sodium salt in CH₃CN : H₂O (6:4, v/v).

(a) 

(b)
7. Fluorescence emission spectra of PBF with different cations as Ag⁺, Cd²⁺, Co²⁺, Cu²⁺, Fe³⁺, Mn²⁺, Pb²⁺, Zn²⁺, Na⁺ (the solutions of metal ions were prepared from AgNO₃, Cd(ClO₄)₂·2H₂O, Co(ClO₄)₂·6H₂O, Cu(ClO₄)₂·6H₂O, FeCl₃, MnCl₂, Pb(ClO₄)₂, Zn(ClO₄)₂·6H₂O, and NaClO₄, respectively in CH₃CN·H₂O), different anions Cl⁻, Br⁻, I⁻ as their tetra butyl salt and ClO₄⁻, HPO₄²⁻, SO₃²⁻, SO₄²⁻ as their sodium salt in CH₃CN·H₂O (8:2, v/v).
8. Fluorescence emission spectra of PBF with different amines

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

(i)

(j)

(k)

(l)

(m)

(n)

(o)

(p)

(q)

(r)
9. References: