Supporting Information for

Two Uranyl Heterocyclic Carboxyl Compounds with Fluorescent Properties as High Sensitivity and Selectivity Optical Detectors for Nitroaromatics

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1. Infrared Spectra

Figure S1. IR spectrum of the ligand HL₂

Figure S3. IR spectra of compounds: (a) for 1, (b) for 2.
2. The figure of structure

![Figure S2](image)

**Figure S2.** 2D of the compound 2 with the hydrogen bonds of C4-H4···N3.

3. TG analyses

![Figure S4](image)

**Figure S4.** TG curves of compounds: (a) for 1, (b) for 2.
4. PXRD

![Simulated](image1.png)

(a) Simulated 1

![Simulated](image2.png)

(b) Simulated 2

Figure S5. Powder X-ray diffraction patterns for compounds: (a) for 1, (b) for 2.

5. UV-vis Spectra

![Absorption](image3.png)

(a) Absorbance vs Wavenumber (nm)

![Absorption](image4.png)

(b) Absorbance vs Wavenumber (nm)

Figure S6. Solid-state UV-vis absorption spectra: (a) for compound 1, (b) for compound 2.

6. Band gap

![Graph](image5.png)

(a) $(\alpha h\nu)^2$ vs $h\nu (eV)$

![Graph](image6.png)

(b) $(\alpha h\nu)^2$ vs $h\nu (eV)$

Figure S6. Band gap energy for compound 1.
Figure S7. The band gap of the ligands and the two compounds: (a) for H₂L₁, (b) for 1, (c) for HL₂, (d) for 2.

7. Fluorescence Spectroscopy

Figure S8. (a) Luminescence quenching of 2 dispersed in H₂O by gradually increasing TNP concentration; (b) the detection limit of TNP for 2.
Figure S9. Luminescence quenching of compound I dispersed in H$_2$O by gradually increasing different quenchers’ concentration: (a) DNT, (b) p-Nitroaniline, (c) m-Dinitrobenzene, (d) sodium nitrobenzene sulfonate, (e) NB, (f) Benzene.
Figure S10  Luminescence quenching of compound 2 dispersed in H2O by gradually increasing different quenchers’ concentration: (a) DNT, (b) p-Nitroaniline, (c) m-Dinitrobenzene, (d) sodium nitrobenzene sulfonate, (e) NB, (f) Benzene.

Figure S11.  Plot of fraction of luminescence intensity of 2 vs. concentration of analytes. $I_0$ and $I$ are the luminescence intensities in the absence and presence of nitroaromatics, respectively.
Figure S12. For 2, (a) linear relationships of the quenching are fluorescence intensity ratio and quencher concentration; (b) at different concentrations, the value of the fluorescence intensities and the quencher ratios.
Figure S13. UV absorption of different quenchers with compound 2: TNP, DNT, p-Nitroaniline, m-Dinitrobenzene, Sodium nitrobenzene sulfonate and NB, respectively.

8. Table for bond angles

Table S1. The main bond lengths (Å) and angles (deg) for compounds 1 and 2#

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<th>compound 1</th>
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<th>compound 2</th>
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<td>U(1)-O(3)#2</td>
<td>U(1)-O(4)#2</td>
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Symmetry transformations used to generate equivalent atoms: for 1: \#1= -x, -y+1, -z+1; \#2= -x+1, -y+1, -z+1; \#3= x-1, y, z; for 2: \#1= -x+3, -y, -z; \#2= -x+2, y-1/2, -z+1/2; \#3= x+1, -y+1/2, z-1/2.