Electronic Supplementary Material (ESI) for RSC Advances.

Tetraphenylethene -functionalized diketopyrrolopyrrole solid state emissive molecules: enhanced emission in the solid state and as a fluorescent probe for cyanide detection

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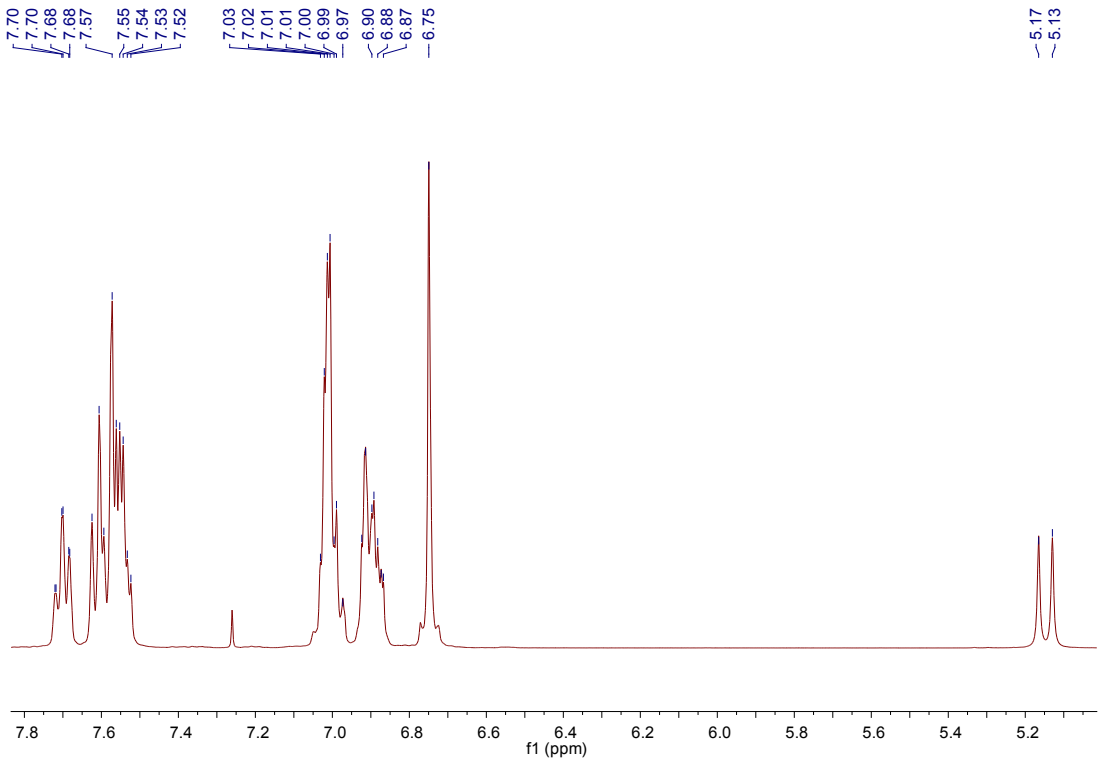


Fig.S1 ^{1}H NMR spectrum of compound **7** in $CDCl_3$.

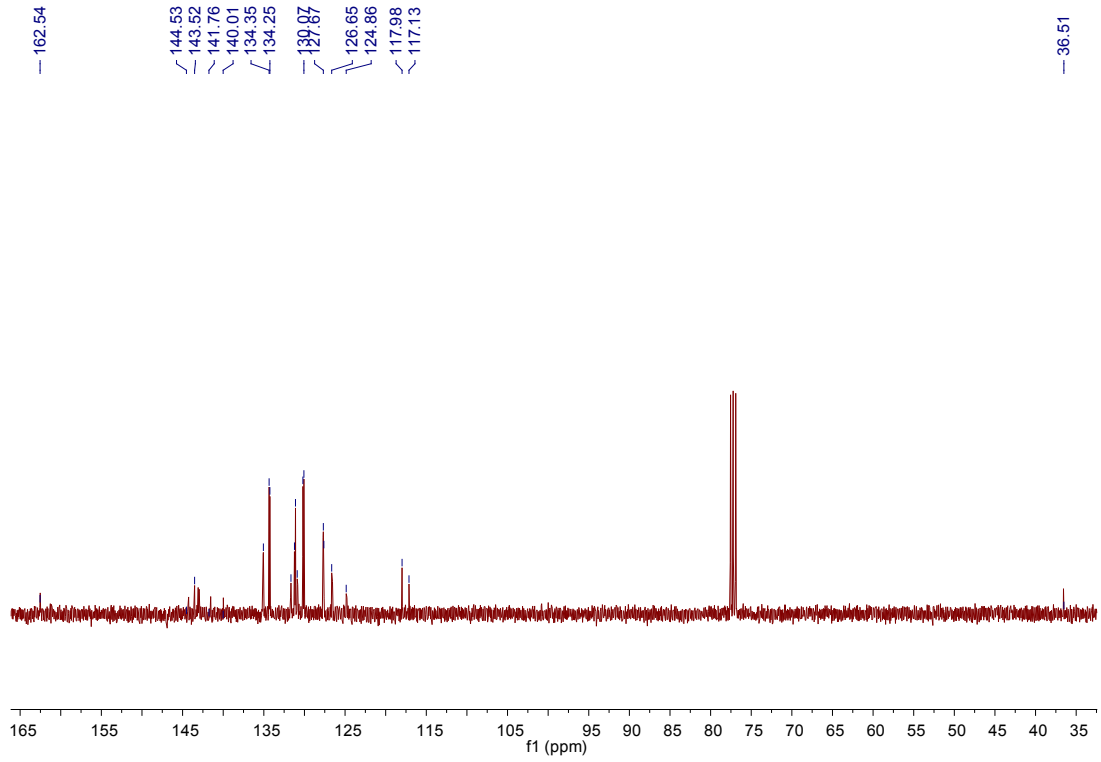


Fig.S2 ^{13}C NMR spectrum of compound **7** in $CDCl_3$.

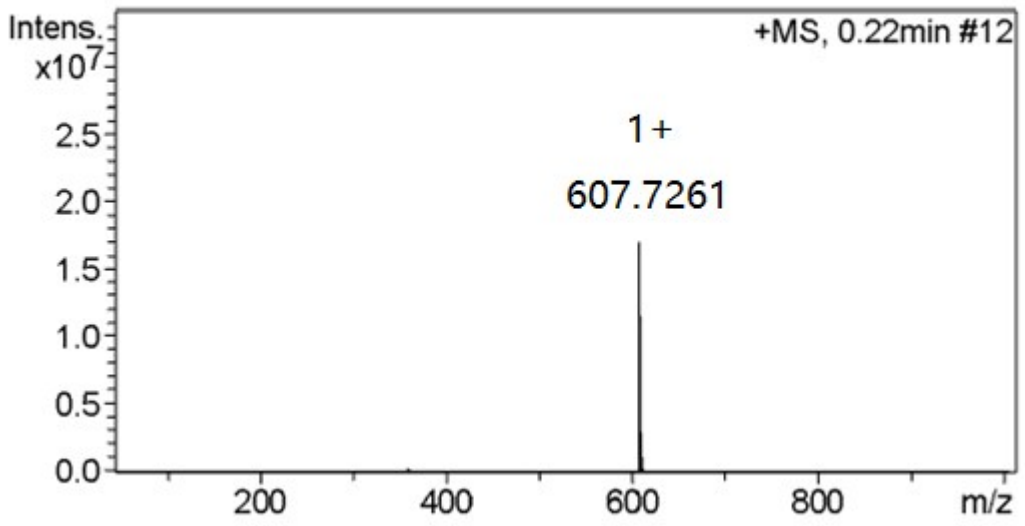


Fig.S3 HRMS spectrum of compound **7**.

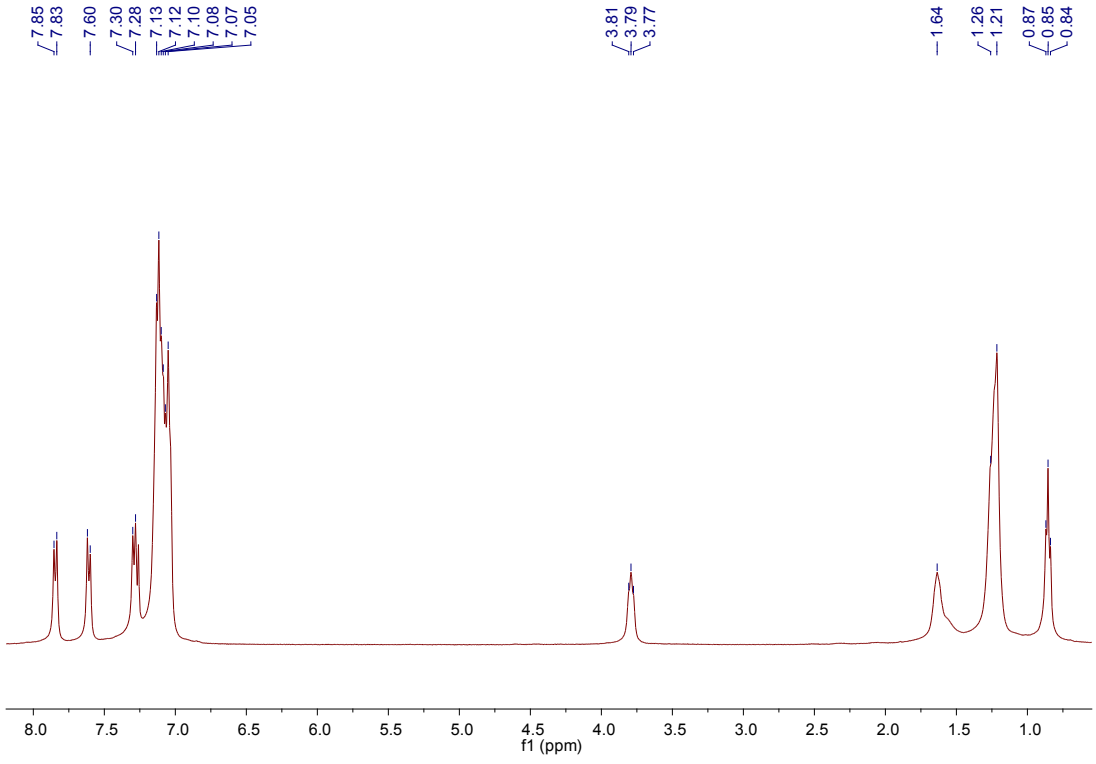


Fig.S4 ^{1}H NMR spectrum of **DPP1** in $CDCl_3$.

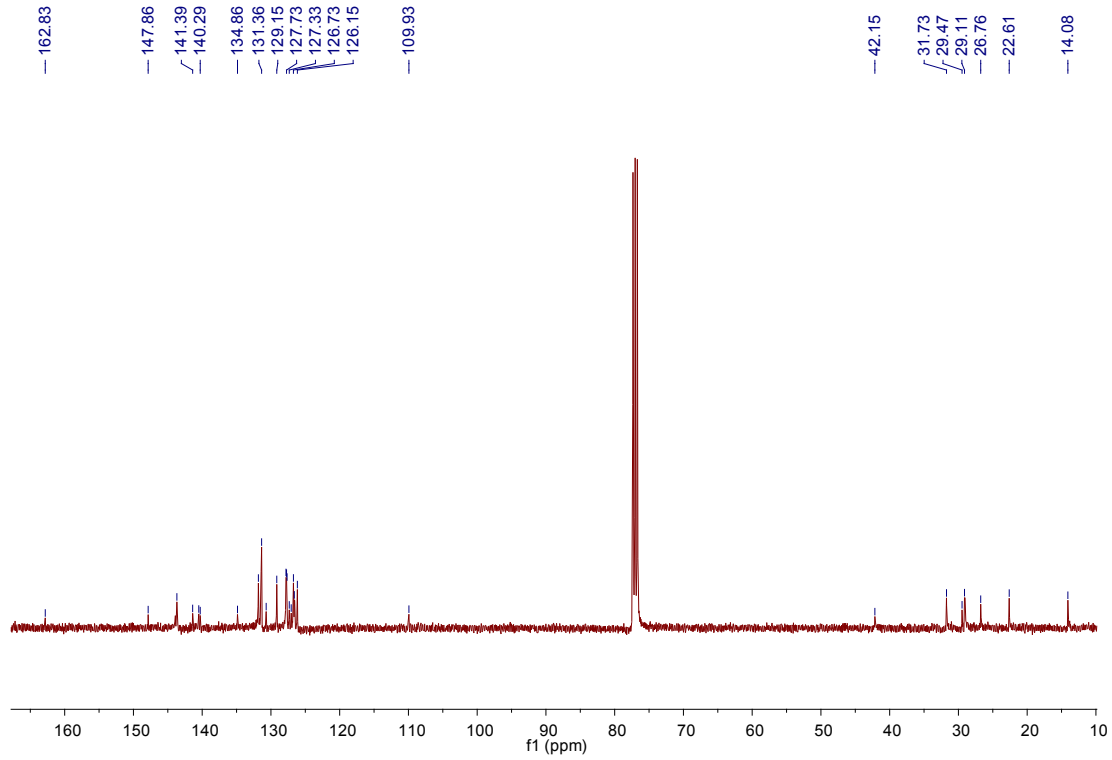


Fig.S5 ^{13}C NMR spectrum of **DPP1** in $CDCl_3$.

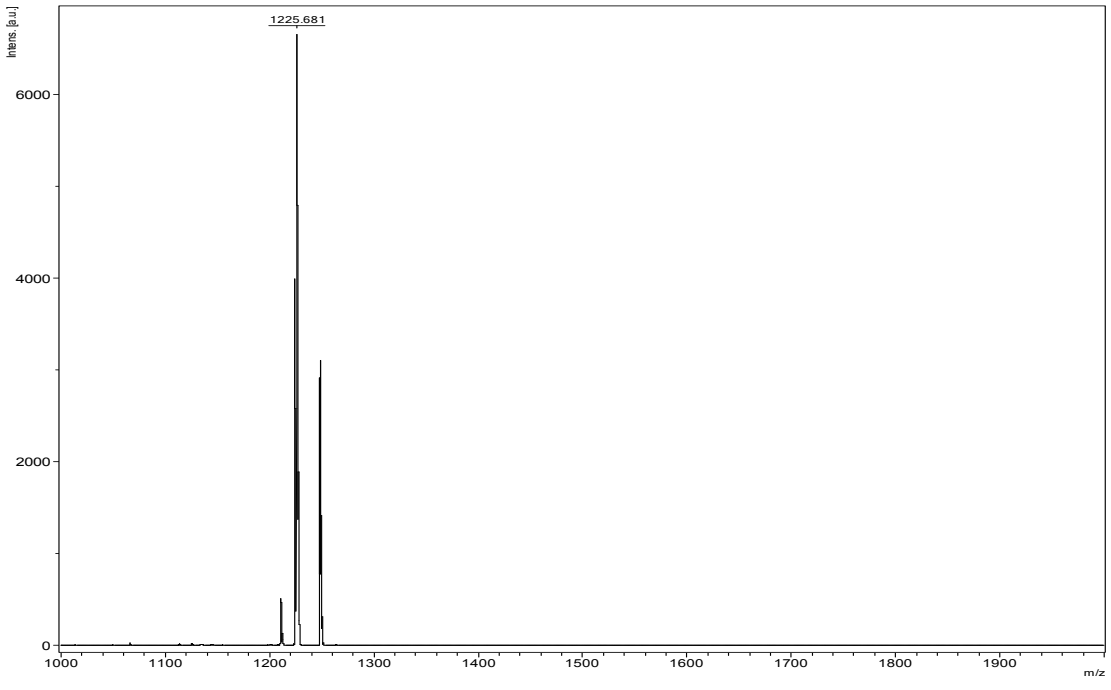


Fig.S6 HRMS spectrum of **DPP1**.

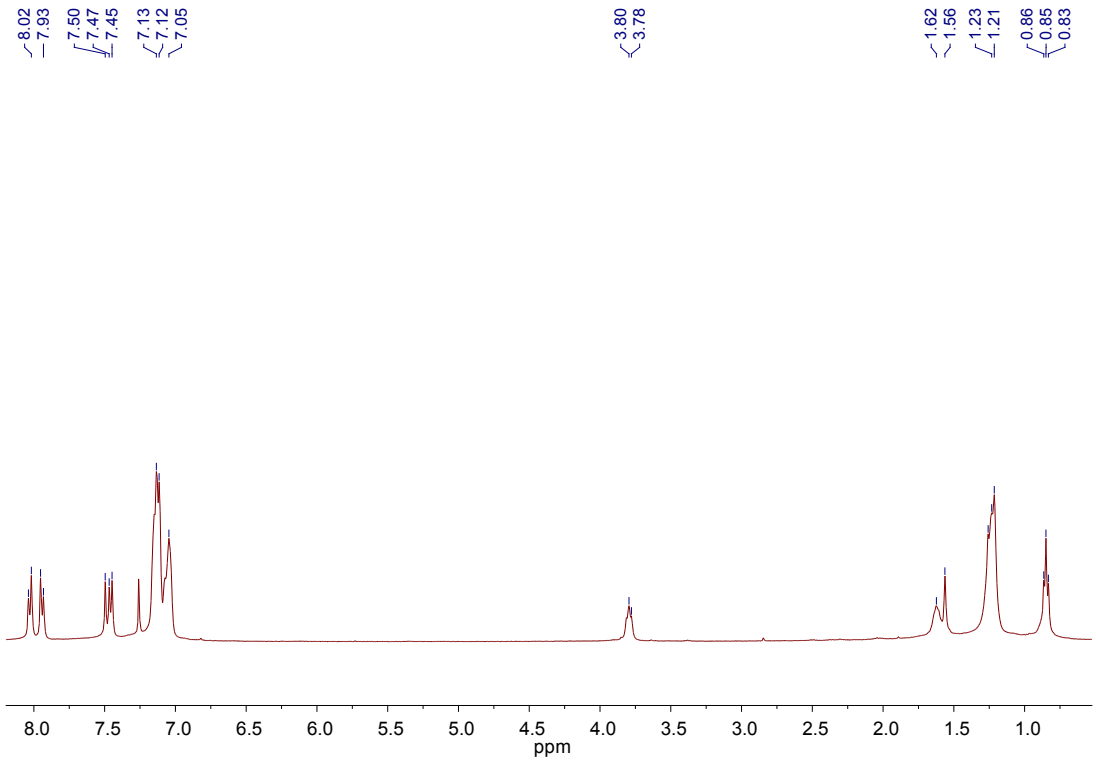


Fig.S7 ^{1}H NMR spectrum of **DPP2** in $CDCl_3$.

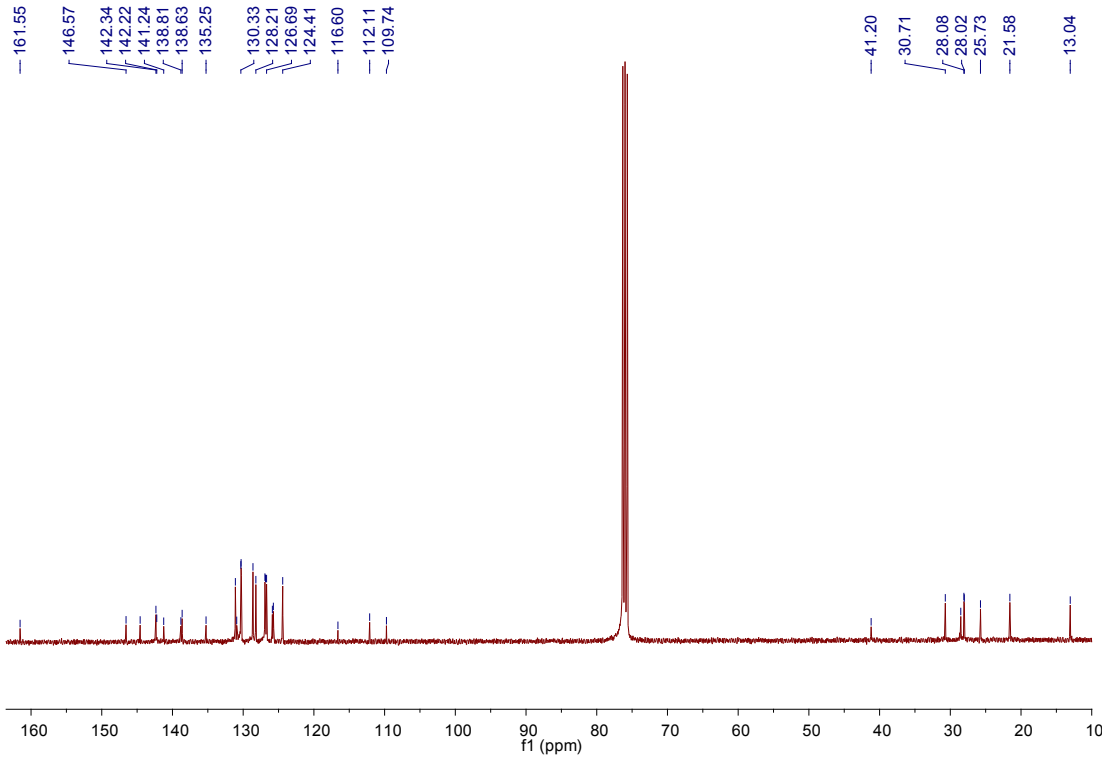


Fig.S8 ^{13}C NMR spectrum of **DPP2** in $CDCl_3$.

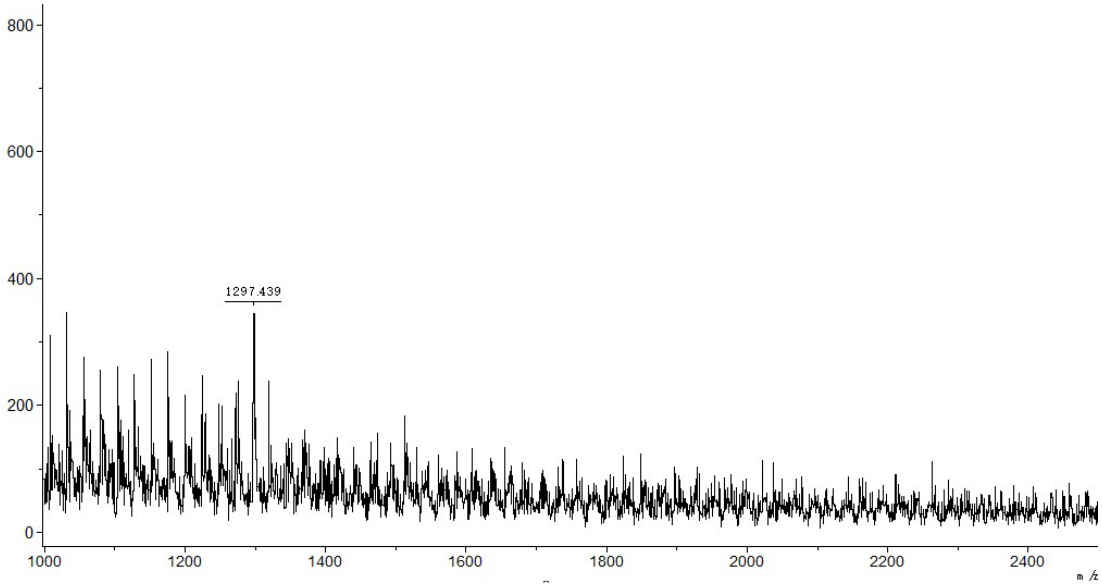


Fig.S9 HRMS spectrum of **DPP2**.

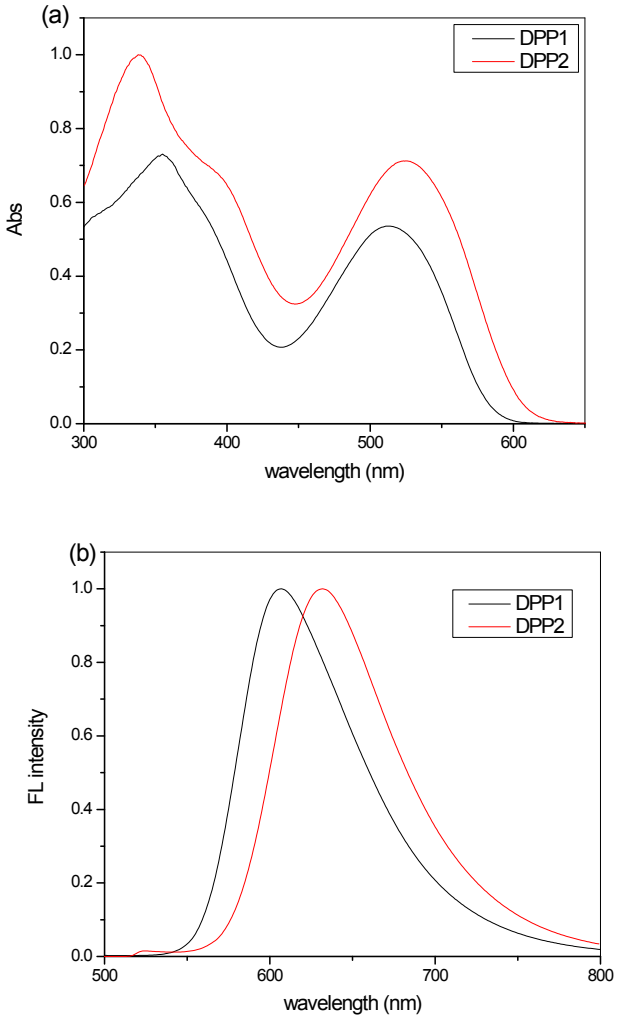


Fig.S10 (a) Normalized UV-vis and (b) photoluminescence (PL) spectra of **DPP1** and

DPP2 in THF.

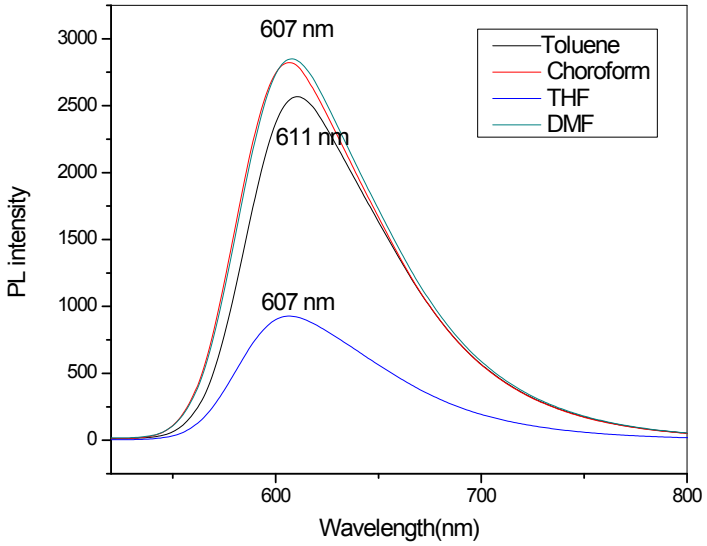


Fig.S11 The photoluminescence (PL) spectra of **DPP1** (10 μM) in different solvents.

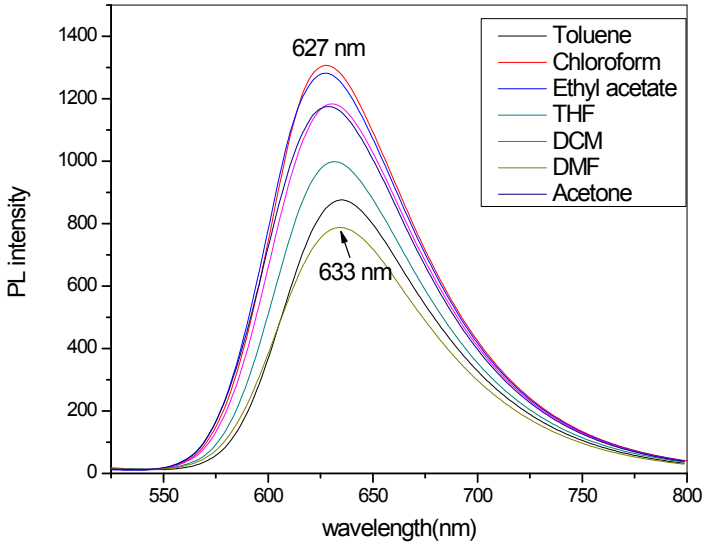


Fig.S12 The photoluminescence (PL) spectra of **DPP2** (10 μM) in different solvents.

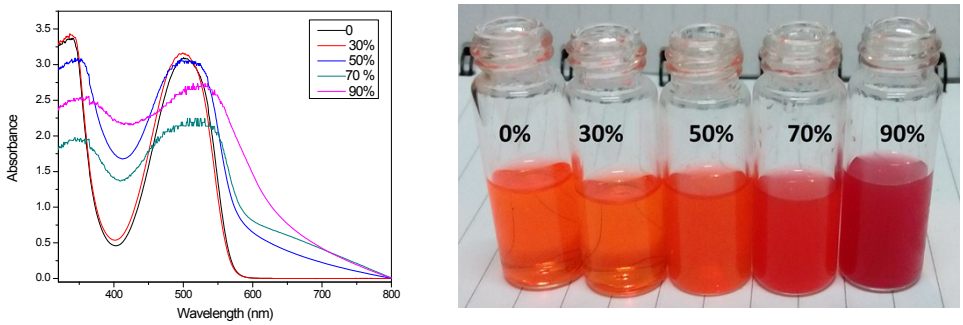


Fig.S13 The UV-vis spectra of **DPP1** (10 μM) in THF/water.

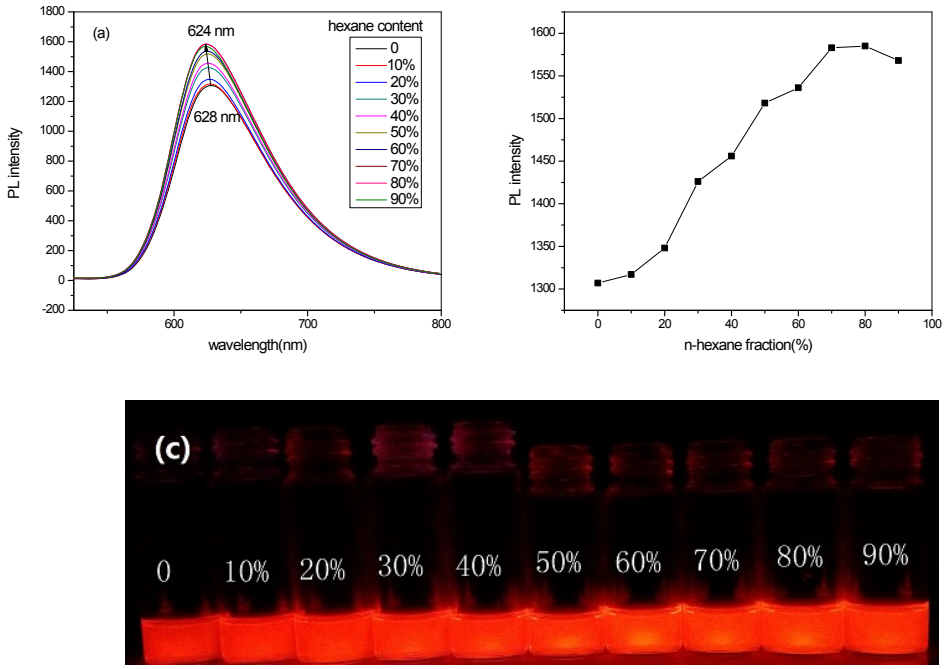


Fig. S14 (a) The photoluminescence (PL) spectra, (b) PL intensity *vs* f_h and (c) emission photographs of **DPP2** in $CHCl_3$/hexane mixtures with different f_h values.

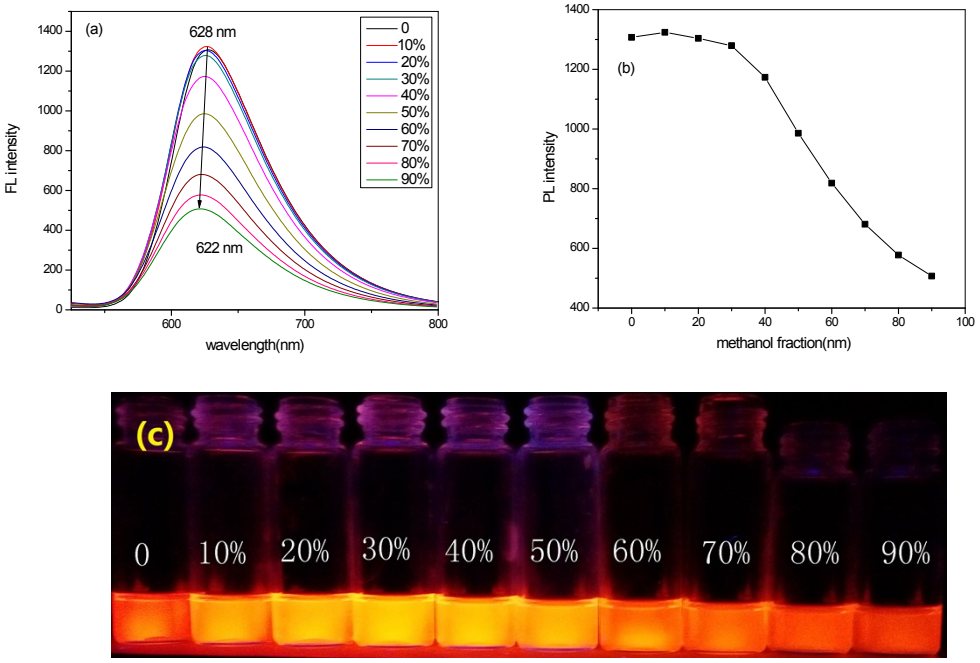
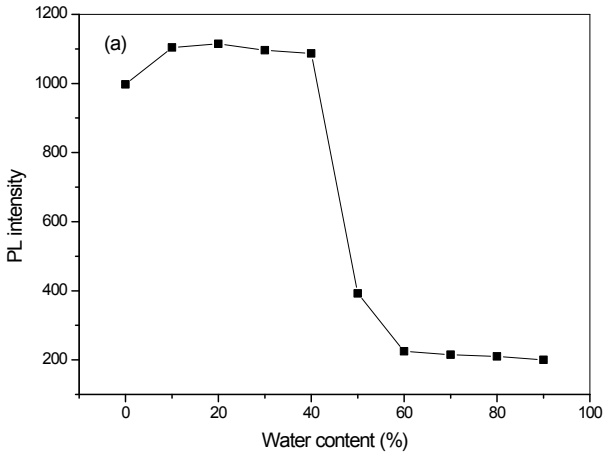


Fig.S15 (a) The photoluminescence (PL) spectra spectra, (b) PL intensity *vs* f_m and (c) emission photographs of **DPP2** in $CHCl_3$/methanol mixtures with different f_m values.



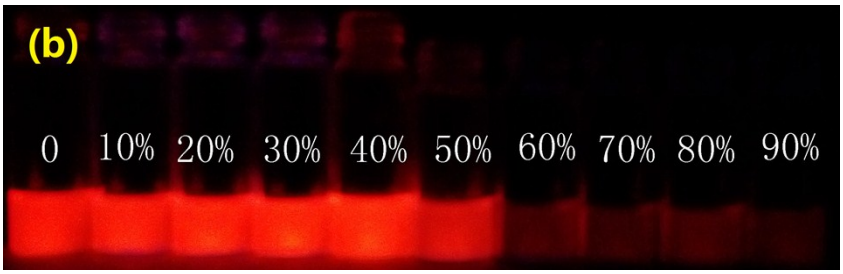


Fig.S16 (a) PL intensity *vs* f_w and (b) emission photographs of **DPP2** in THF/water mixtures with different f_w values.

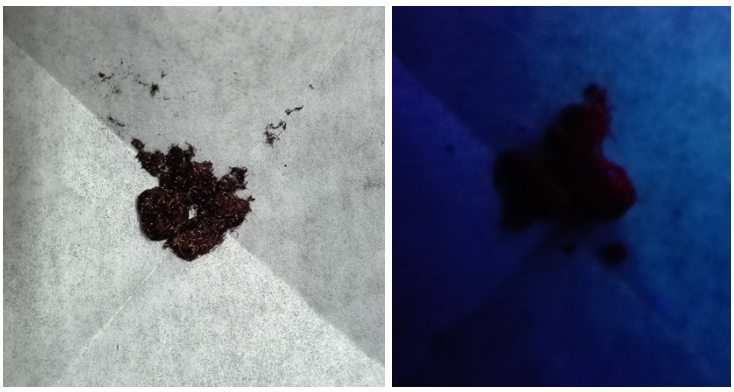


Fig. S17 The photographs of compound **4** in daylight (left) and under 365 nm exciation (right).

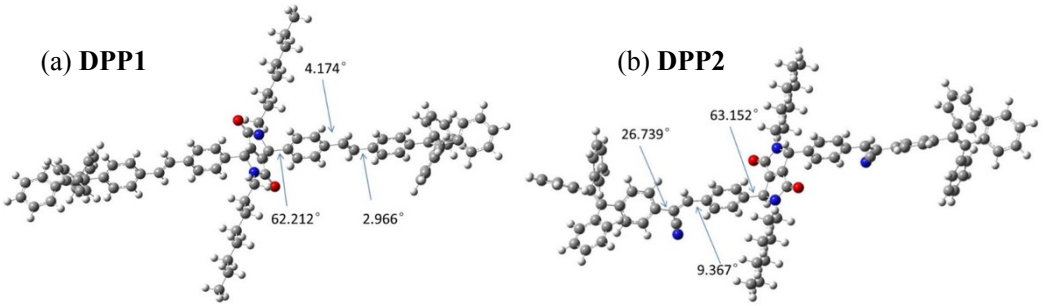


Fig.S18 The optimizations of the molecular geometry by theoretical calculation.

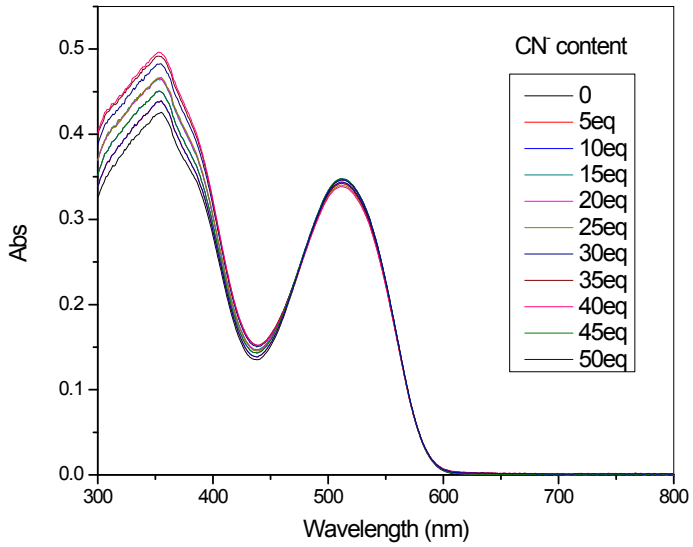


Fig. S19 UV-Vis spectral changes of **DPP1** in THF (10 μM) with the increasing concentrations of cyanide anion.

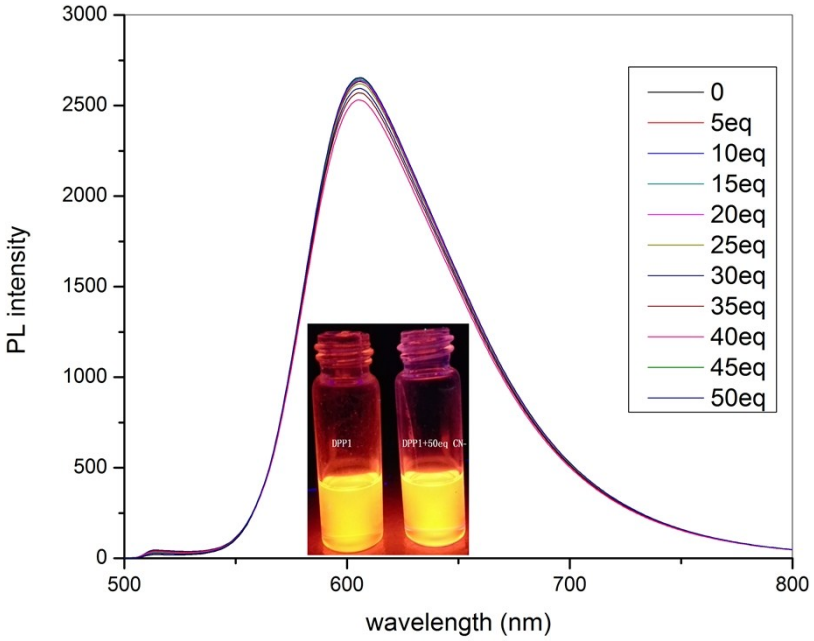


Fig. S20 The photoluminescence (PL) spectral changes of **DPP1** (10 μM) in THF with the increasing concentrations of CN^- in THF under excitation at 510 nm.

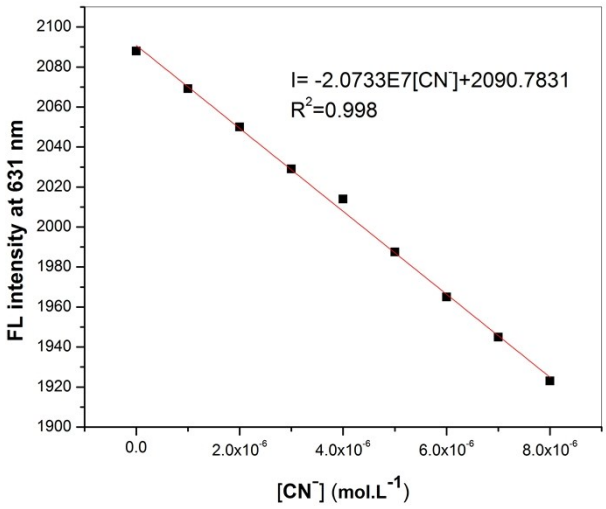


Fig.S21 The linear relation for concentration of CN^- in the range of 1–8 μM.

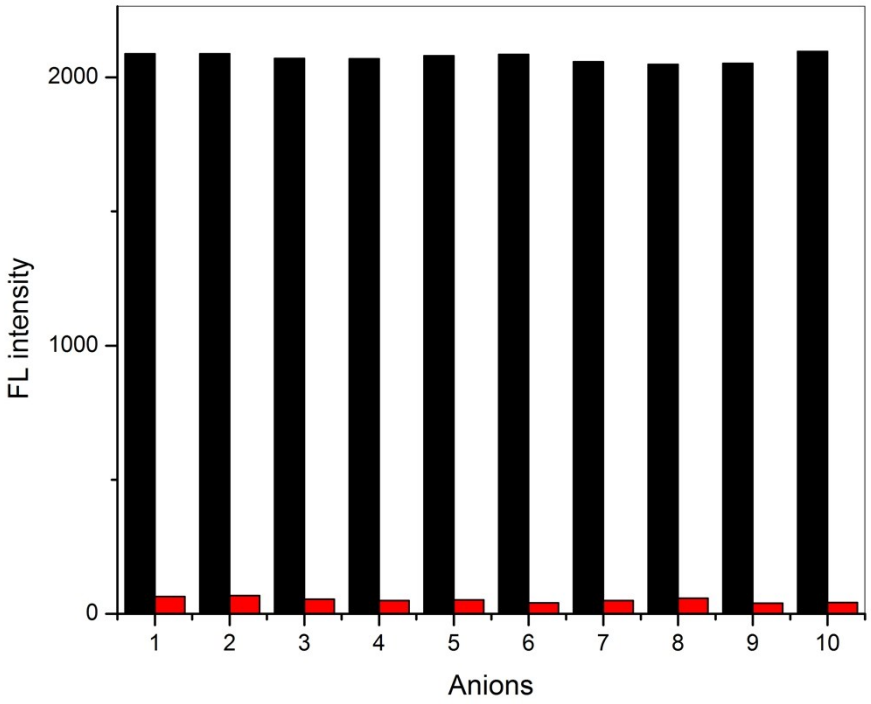


Fig. S22 Selectivity of **DPP2**. The black bars represent fluorescence intensity at 631nm of **DPP2** in THF in the presence of other anions (52 equiv). The red bars represent the fluorescence intensity that occurs upon the subsequent addition of 52 equiv of CN^- to the above solution. From 1 to 10, control, F^-, Cl^-, Br^-, I^-, HSO_4^-, $H_2PO_4^-$, OAc^-, NO_3^- and ClO_4^-.

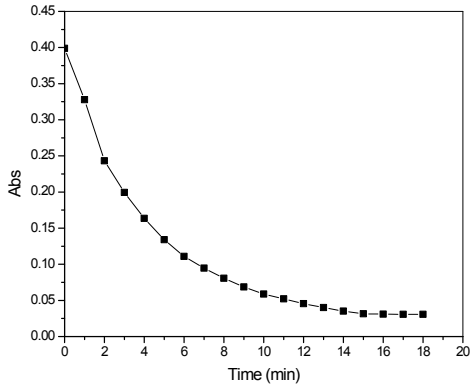


Fig. S23 Time-dependent absorption intensity of probe **DPP2** (10 μM) in THF at 525 nm in the presence of CN^- (24 equiv) at room temperature.