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Supplementary Information

Aromatic Azaheterocycle-Cored Luminogens with Tunable Physical Properties via Nitrogen Atoms for Sensing Strong Acids

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1. Optical Spectra

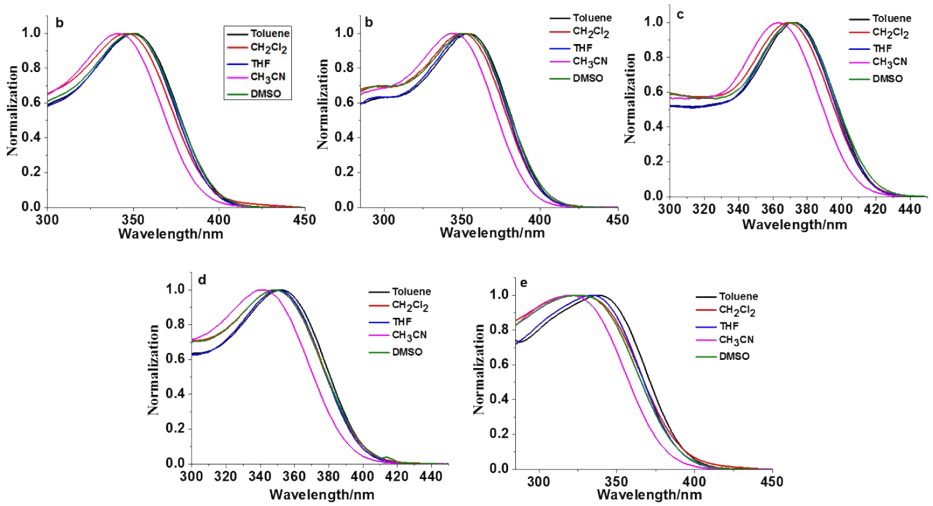

Fig. S1 Normalized absorption spectra of PY-TPE (a), PYM-TPE (b), PYA-TPE (c), PYD-TPE (d) and PTZ-TPE (e) in in different solvents.

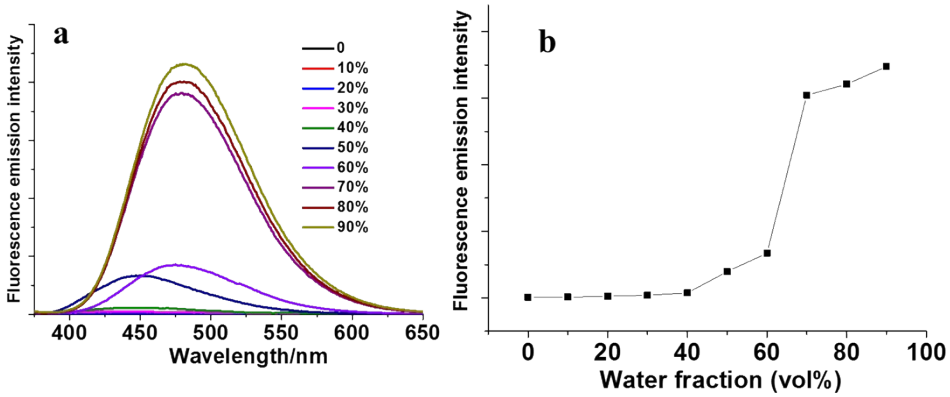

Fig. S2 Fluorescence spectra of BZ-TPE (**a**) in CH_3CN–water mixtures (1.0×10^{-5}M, excited at 332 nm) with varied volumetric fractions of water; (**b**) the fluorescence intensity change spectra of BZ-TPE at different content of water.

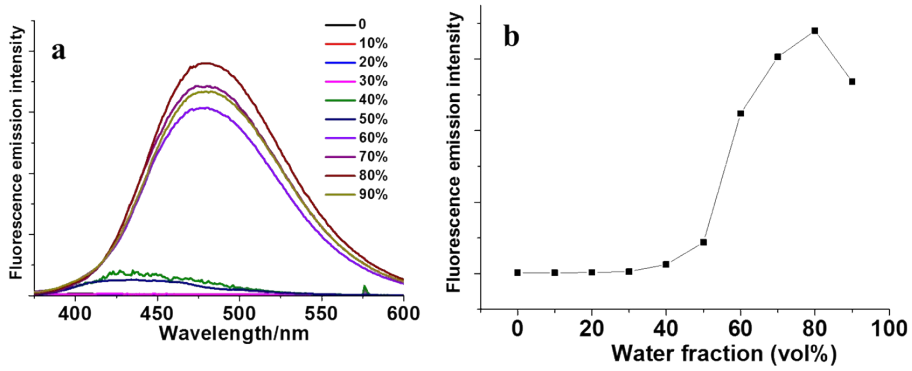

Fig. S3 Fluorescence spectra of PY-TPE (**a**) in CH_3CN–water mixtures (1.0×10^{-5}M, excited at 340 nm) with varied volumetric fractions of water; (**b**) the fluorescence intensity change spectra of PY-TPE at different content of water.

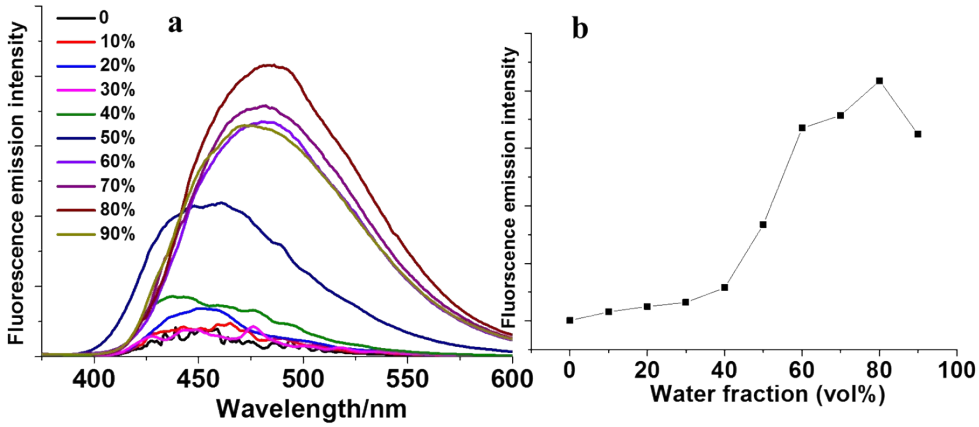

Fig. S4 Fluorescence spectra of PYM-TPE (**a**) in CH_3CN–water mixtures (1.0×10^{-5}M, excited at 346 nm) with varied volumetric fractions of water; (**b**) the fluorescence intensity change spectra of PYM-TPE at different content of water.

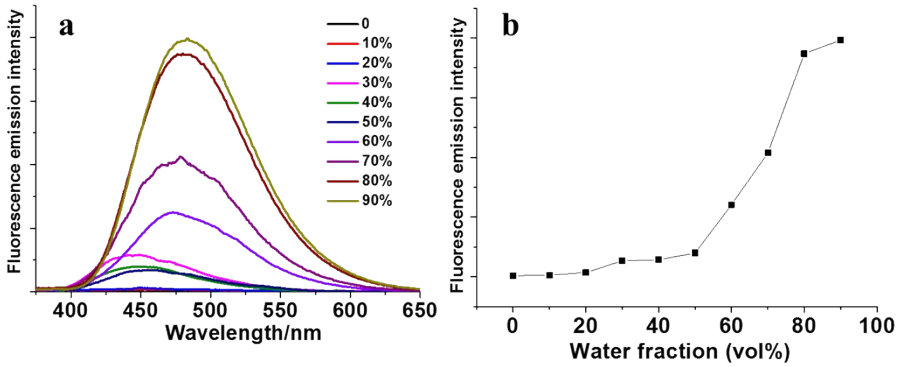

Fig. S5 Fluorescence spectra of PYA-TPE in CH_3CN–water mixtures (1.0×10^{-5}M, excited at 363 nm) with varied volumetric fractions of water; (**b**) the fluorescence intensity change spectra of PYA-TPE at different content of water.

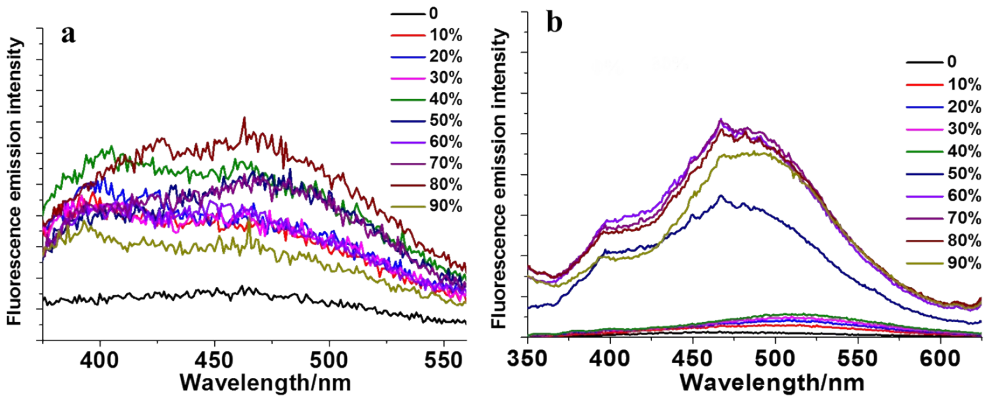

Fig. S6 Fluorescence spectra of PYD-TPE (**a**) and PTZ-TPE (**b**) in CH_3CN–water mixtures (1.0×10^{-5} M) with varied volumetric fractions of water.

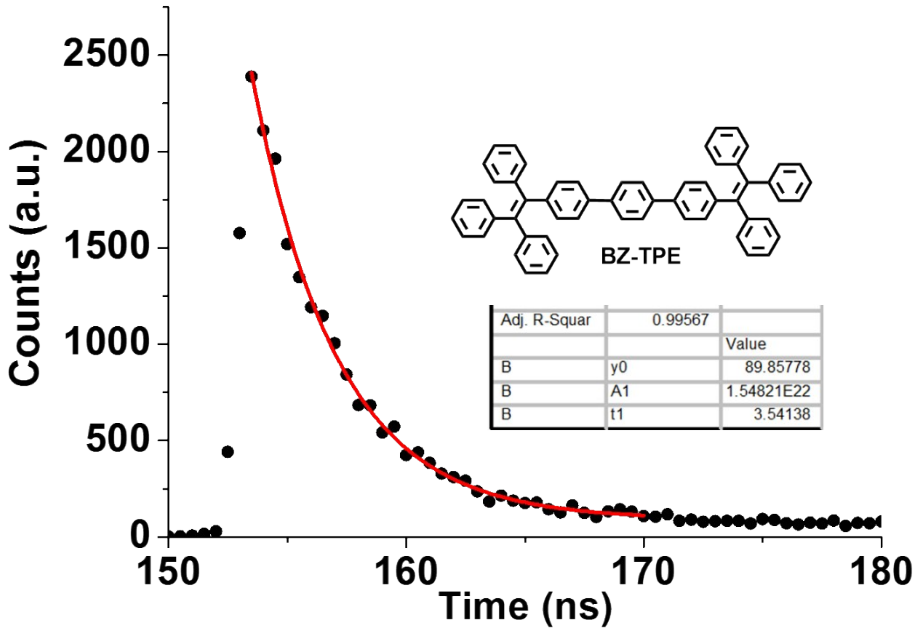

Fig. S7 Fluorescence decay curve for BZ-TPE in CH_3CN–water (90%) mixtures (1×10^{-5} M).

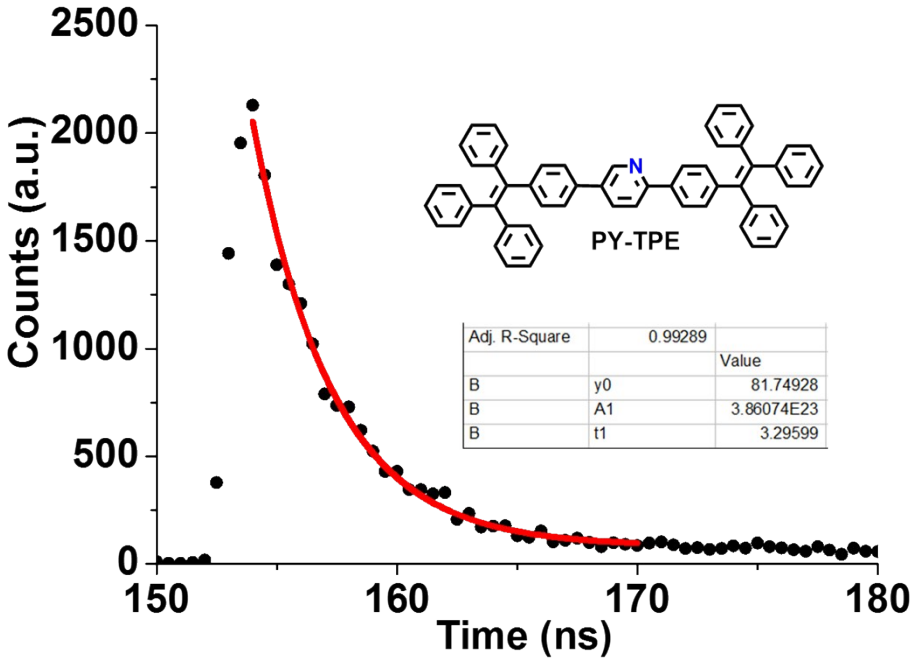

Fig. S8 Fluorescence decay curve for PY-TPE in CH_3CN–water (90%) mixtures (1×10^{-5} M).

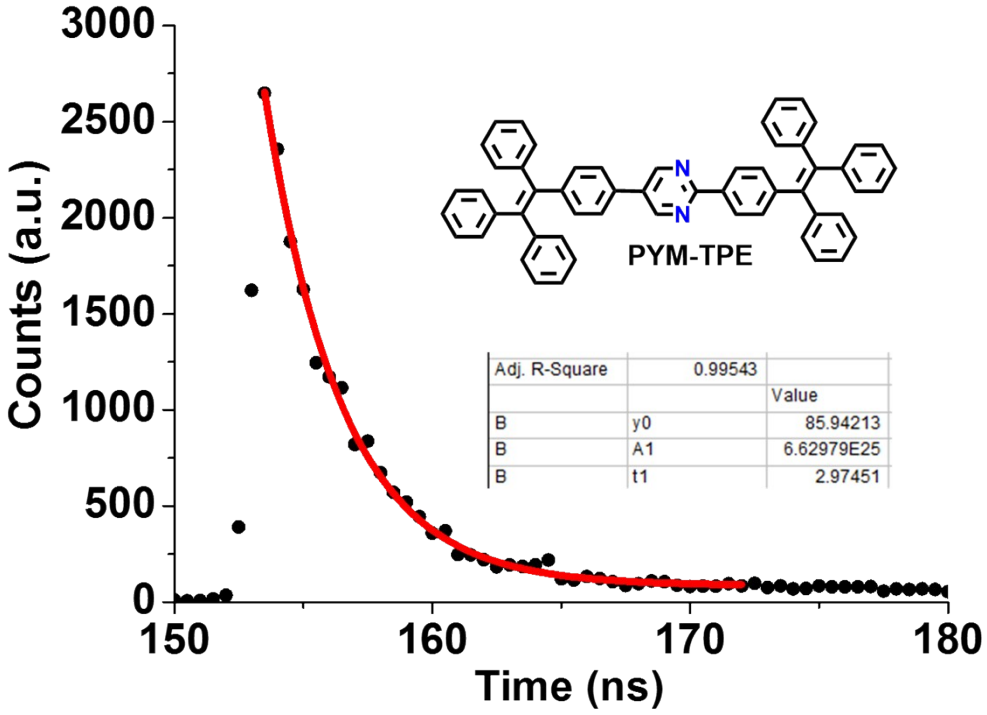

Fig. S9 Fluorescence decay curve for PYM-TPE in CH_3CN–water (90%) mixtures (1×10^{-5} M).

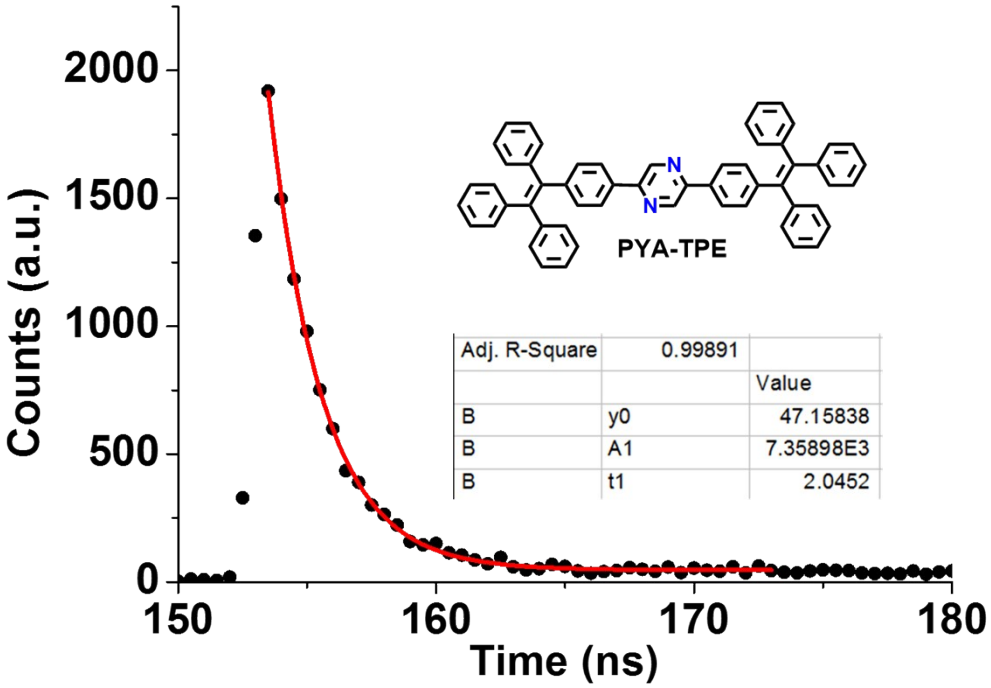

Fig. S10 Fluorescence decay curve for PYA-TPE in CH_3CN–water (90%) mixtures (1×10^{-5} M).

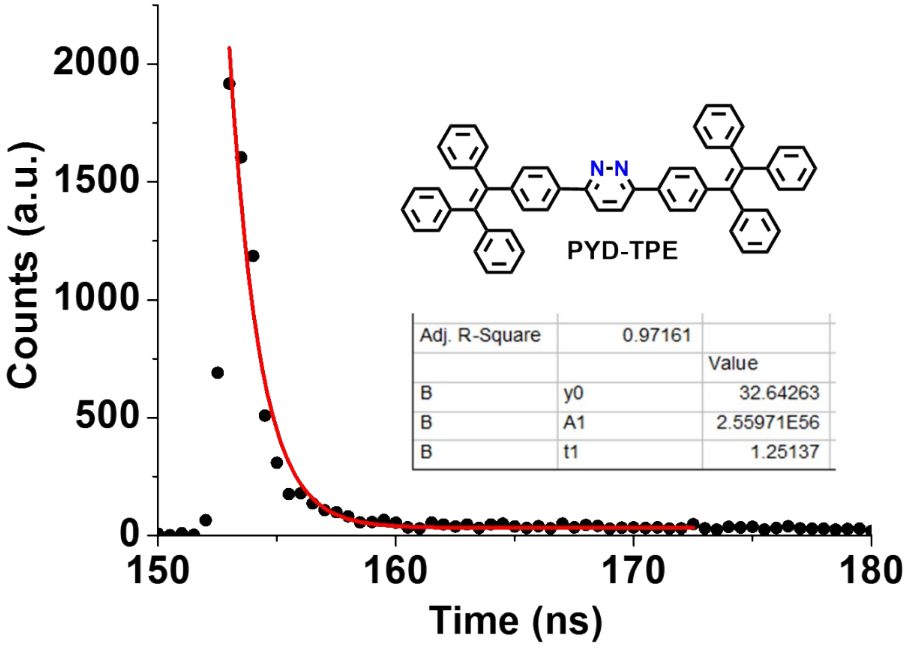

Fig. S11 Fluorescence decay curve for PYD-TPE in CH_3CN–water (90%) mixtures (1×10^{-5} M).

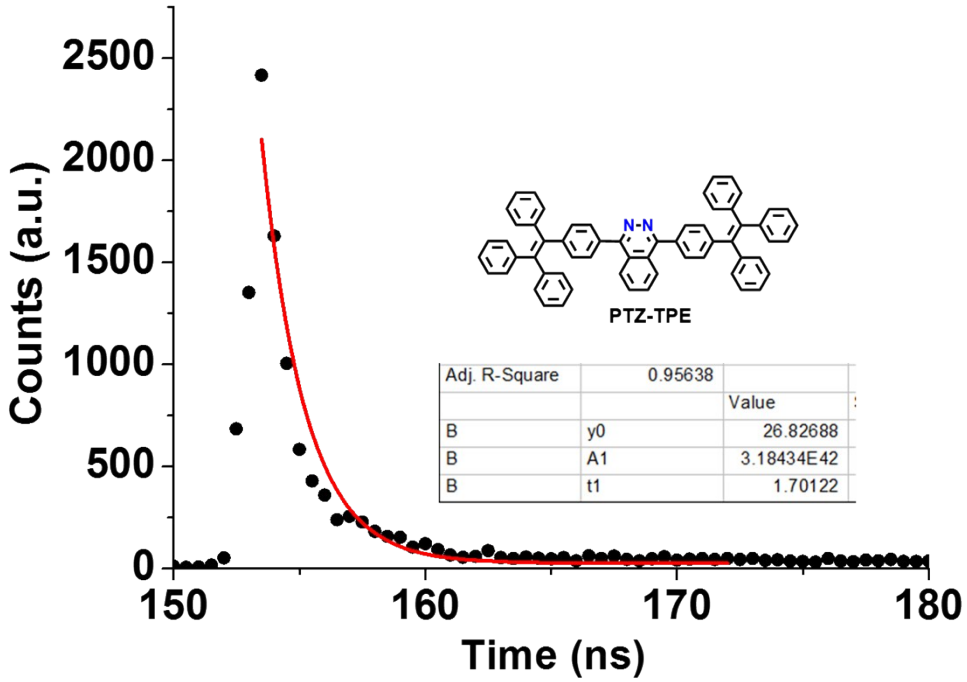

Fig. S12 Fluorescence decay curve for PTZ-TPE in CH_3CN–water (90%) mixtures (1×10^{-5} M).

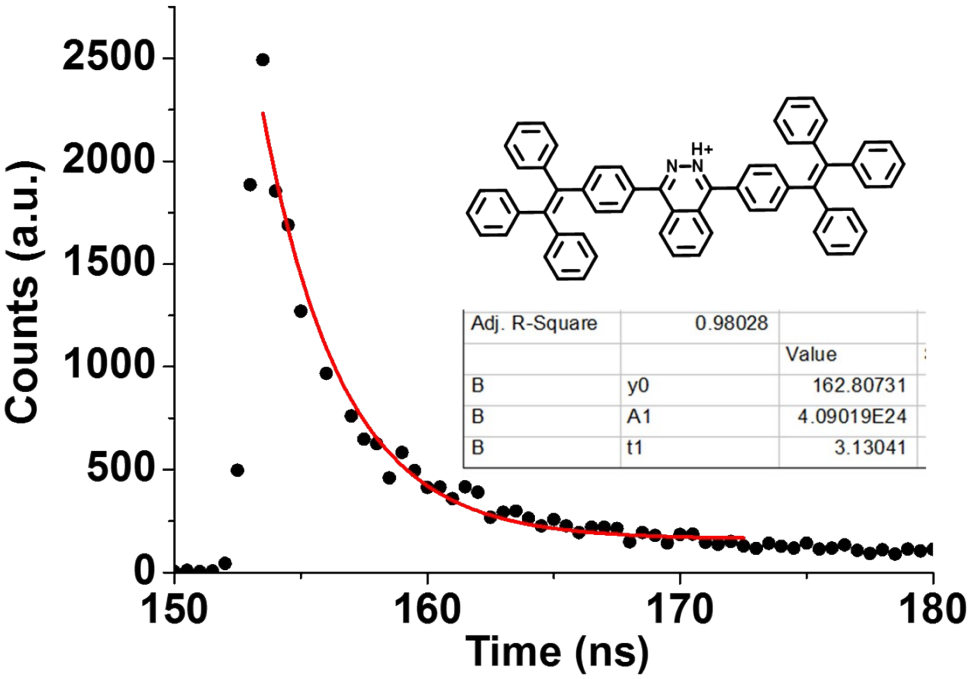

Fig. S13 Fluorescence decay curve for H^+@PTZ-TPE in in CH_3CN–water (90%) mixtures (1×10^{-5} M).

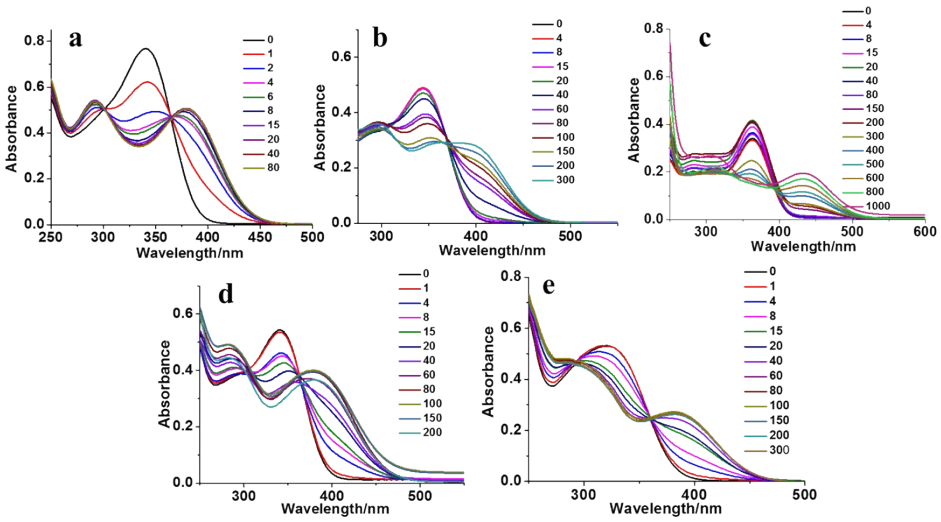

Fig. S14 Absorption emission spectral change in PY-TPE (a), PYM-TPE (b), PYA-TPE (c), PYD-TPE (d) and PTZ-TPE(e) in CH_3CN (2×10^{-5}M) with the addition of TFA in different molar ratios.

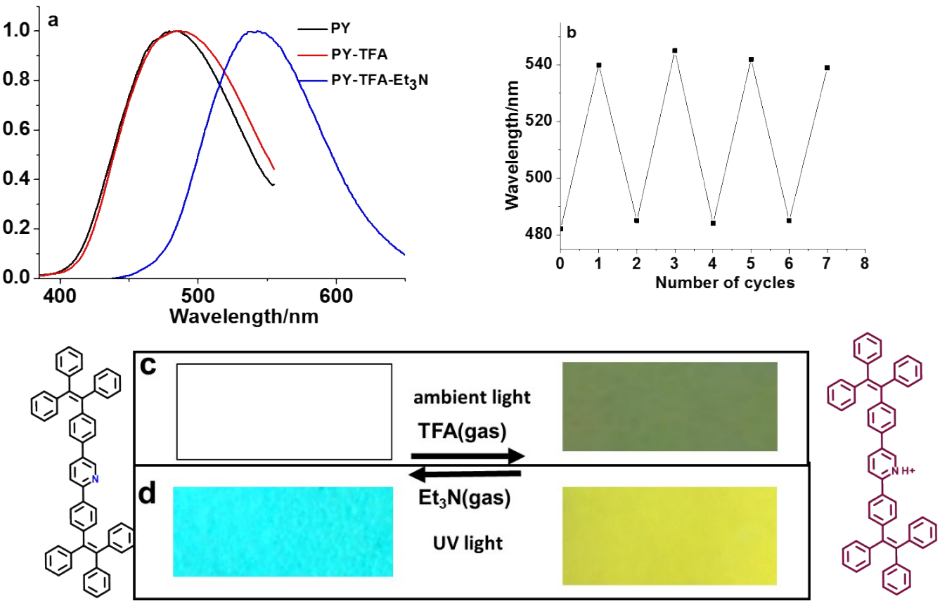

Fig. S15 Normalized emission spectra of initial, TFA fumed and TEA fumed (a) and the fluorescent recovery cycles (b) of the test silica support of PY-TPE. The pictures of (c) PY-TPE on a silica support under ambient light and (d) H^+@ PY-TPE under UV light (bottom.

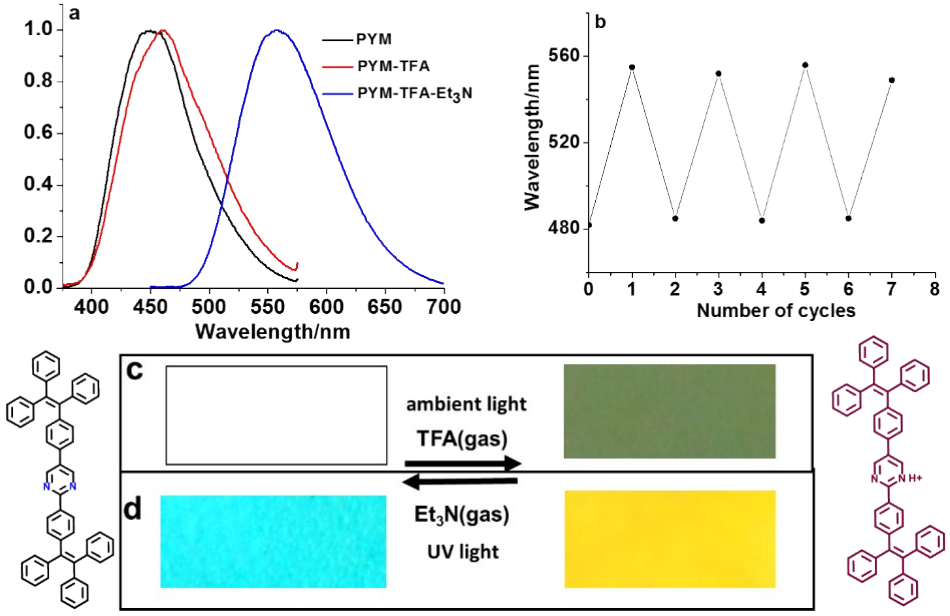

Fig. S16 Normalized emission spectra of initial, TFA fumed and TEA fumed (a) and the fluorescent recovery cycles (b) of the test silica support of PYM-TPE. The pictures of (c) PYM-TPE on a silica support under ambient light and (d) H^+@ PYM-TPE under UV light.

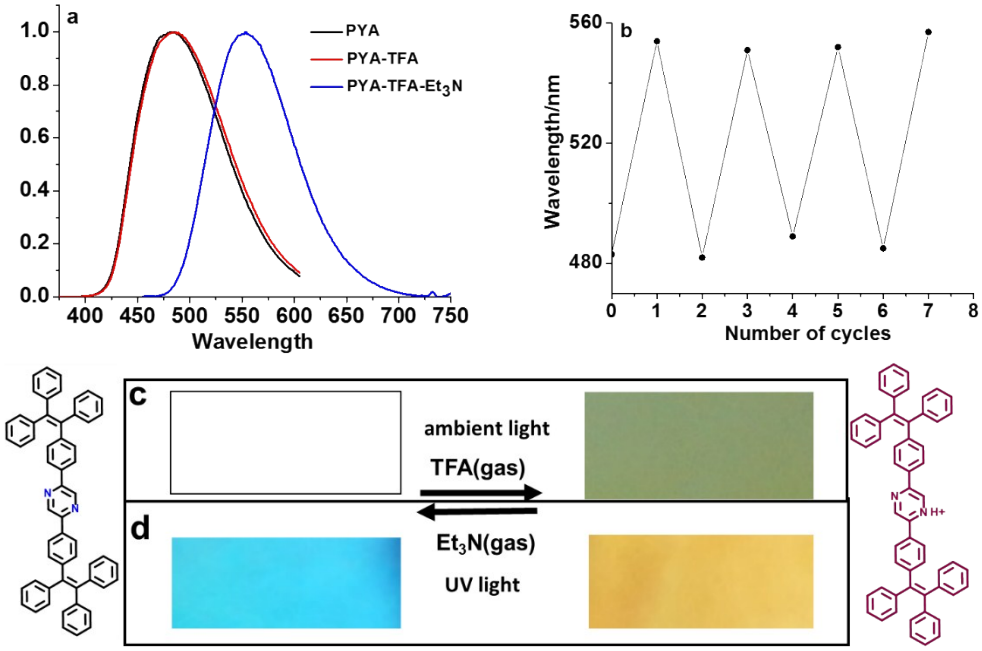

Fig. S17 Normalized emission spectra of initial, TFA fumed and TEA fumed (a) and the fluorescent recovery cycles (b) of the test silica support of PYA-TPE. The pictures of (c) PYA-TPE on a silica support under ambient light and (d) H^+@ PYA-TPE under UV light.

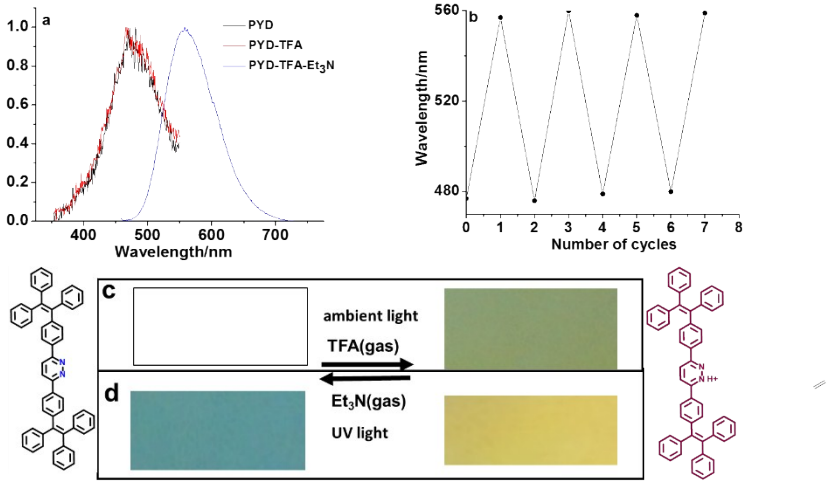

Fig. S18 Normalized emission spectra of initial, TFA fumed and TEA fumed (a) and the fluorescent recovery cycles (b) of the test silica support of PYD-TPE. The pictures of (c) PYD-TPE on a silica support under ambient light and (d) H^+@ PYD-TPE under UV light.

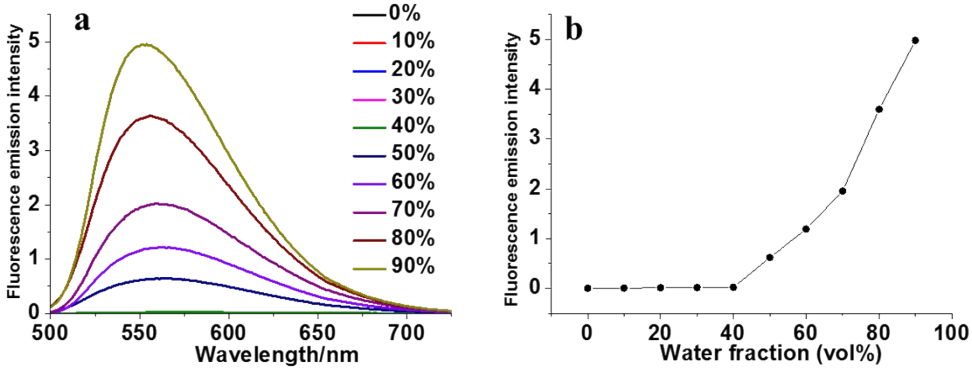

Fig. S19 Fluorescence spectra of PYD-TPE (a) in CH_3CN–water mixtures (1.0×10^{-3} M, 150 equiv TFA excited at 380 nm) with varied volumetric fractions of water; (b) the fluorescence intensity change spectra of PYD-TPE at different content of water.

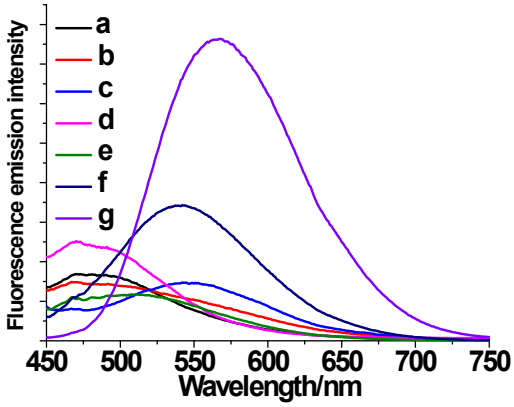

Fig. S20 Emission spectra of PTZ-TPE at 1×10^{-3} M in in CH_3CN–water (90%) mixtures with the addition of (150 equiv different organic acids). (a) acetic acid. (b) lactic acid. (c) ortho-hydroxybenzoic acid. (d) tartaric acid. (e) phosphoric acid. (f) oxalic acid. (g) trifluoroacetic acid.

2. ^{1}H and ^{13}C NMR Spectra for New Compounds

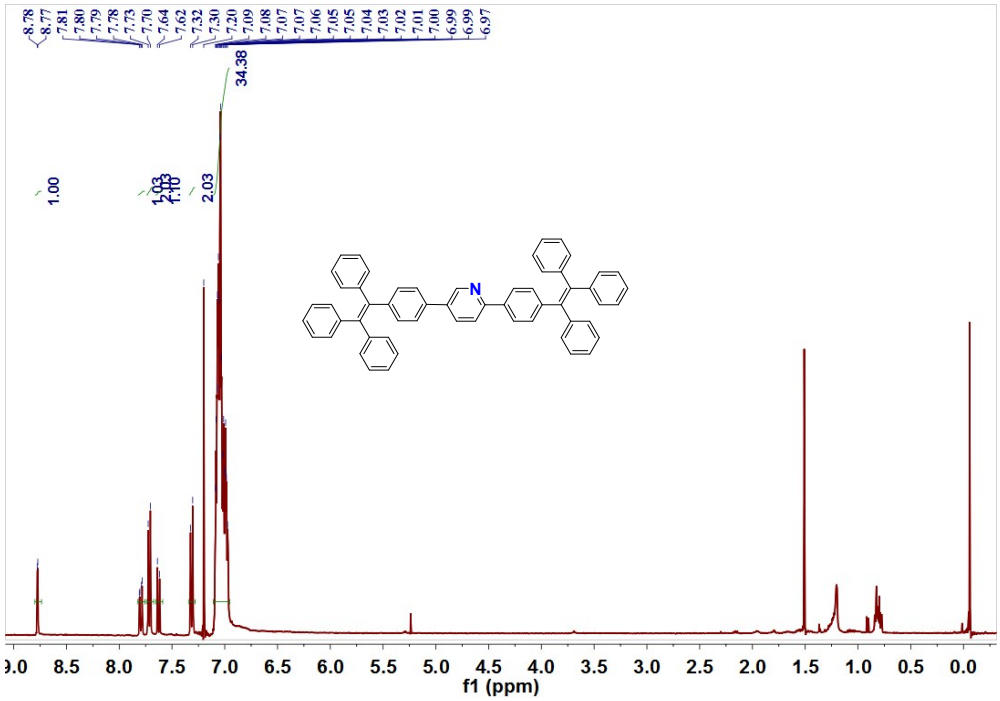

Fig. S21 ^{1}H NMR spectra of PY-TPE (400MHz, $CDCl_3$, ppm)

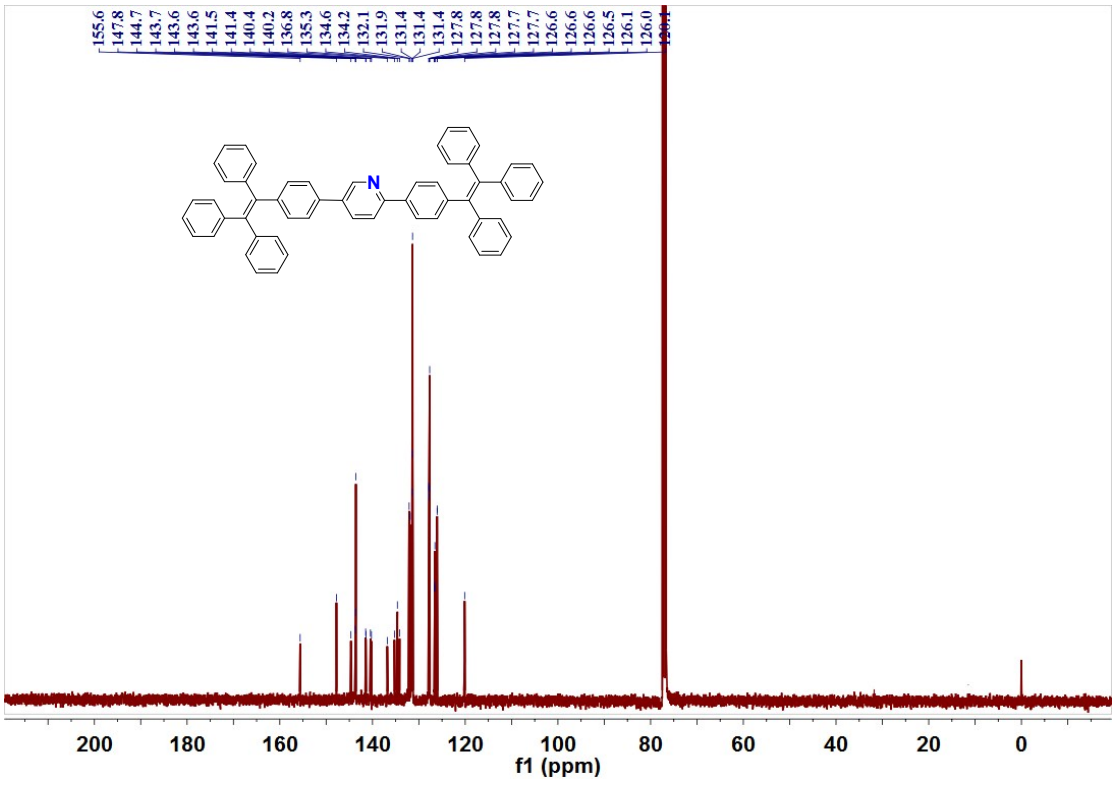

Fig. S22 ^{13}C NMR spectra of PY-TPE (100MHz, $CDCl_3$, ppm)

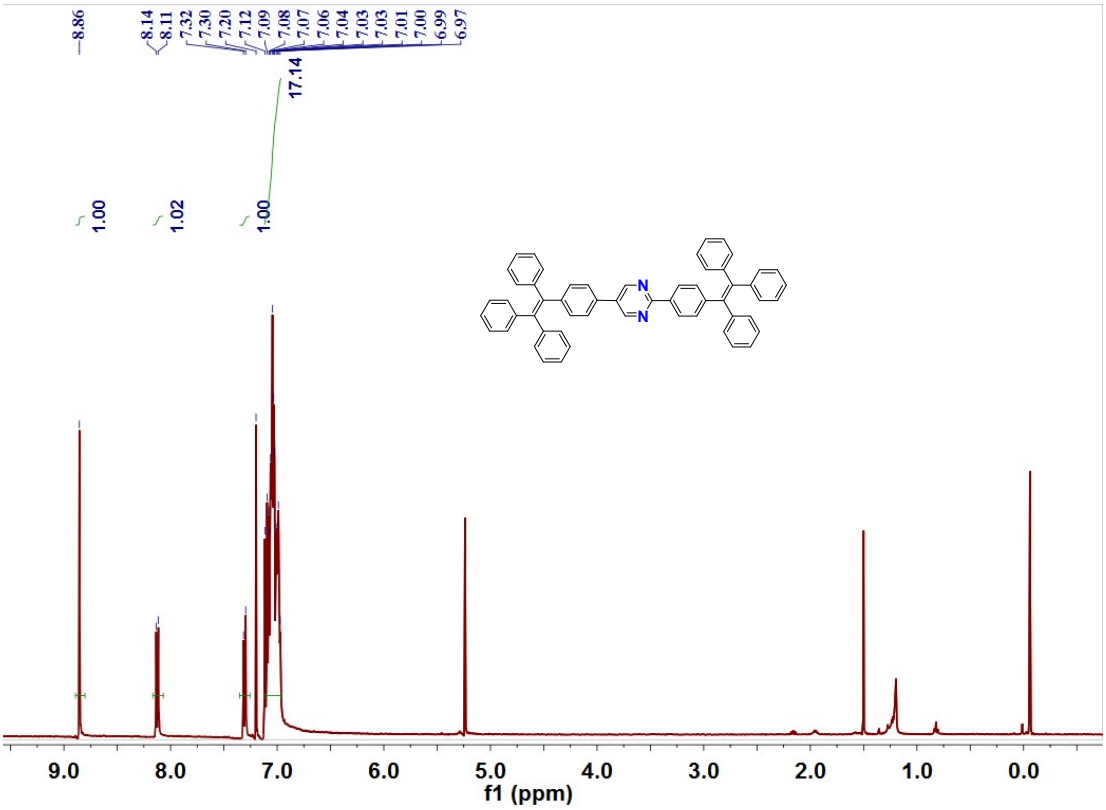

Fig. S23 ^{1}H NMR spectra of PYM-TPE (400MHz, $CDCl_3$, ppm)

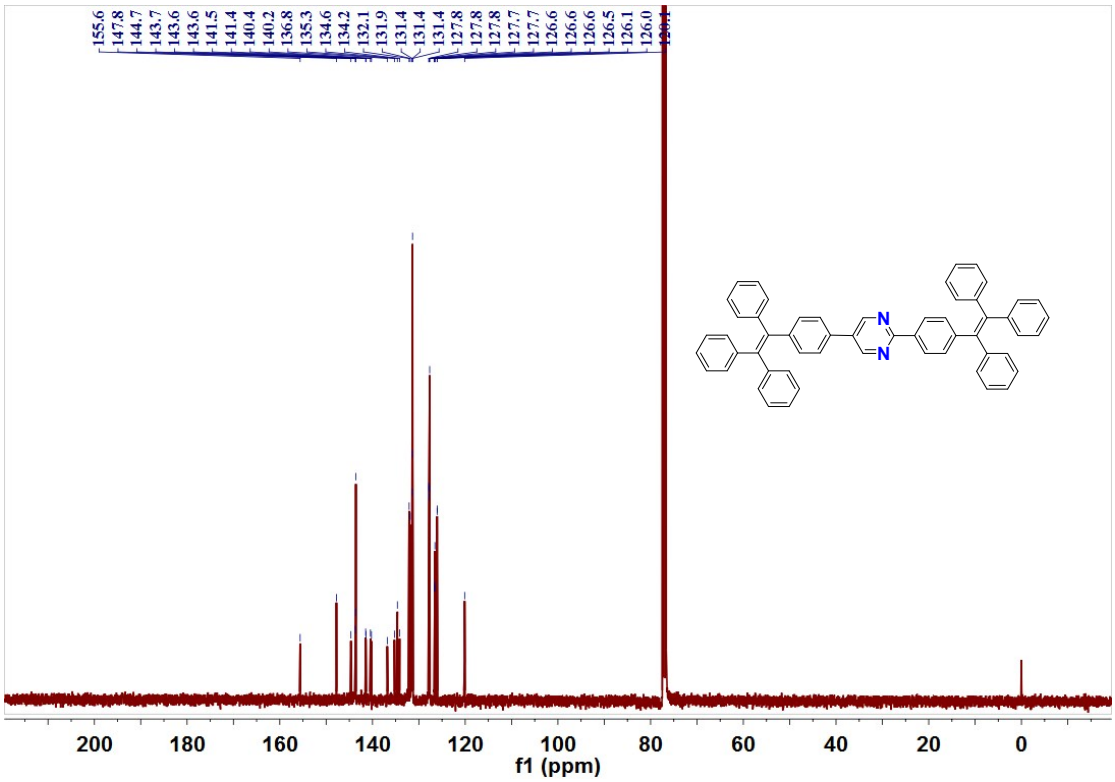

Fig. S24 ^{13}C NMR spectra of PYM-TPE (100MHz, $CDCl_3$, ppm)

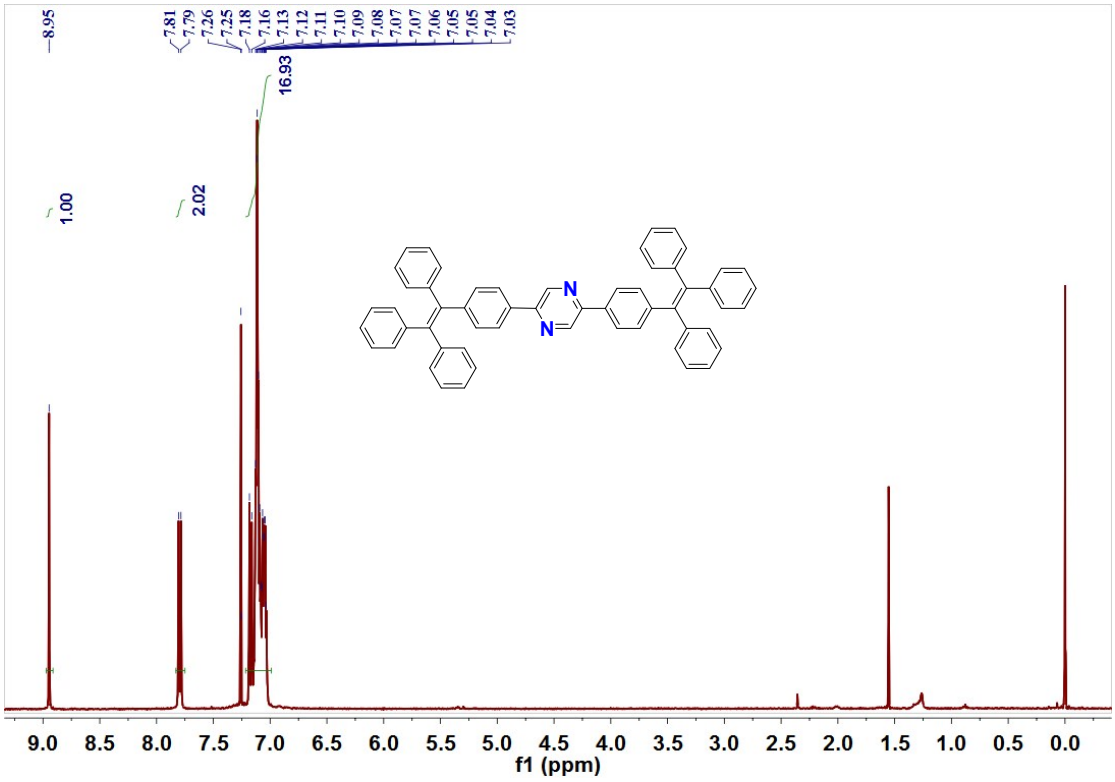

Fig. S25 ^{1}H NMR spectra of PYA-TPE (400MHz, $CDCl_3$, ppm)

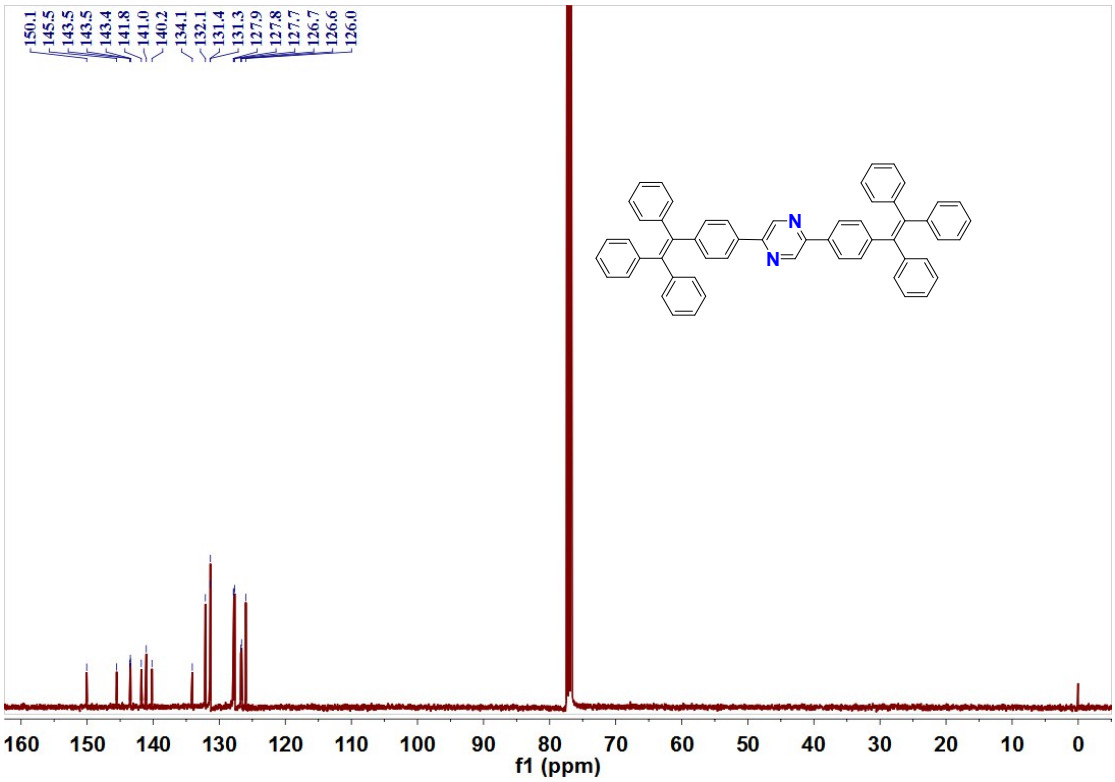

Fig. S26 ^{13}C NMR spectra of PYA-TPE (100MHz, $CDCl_3$, ppm)

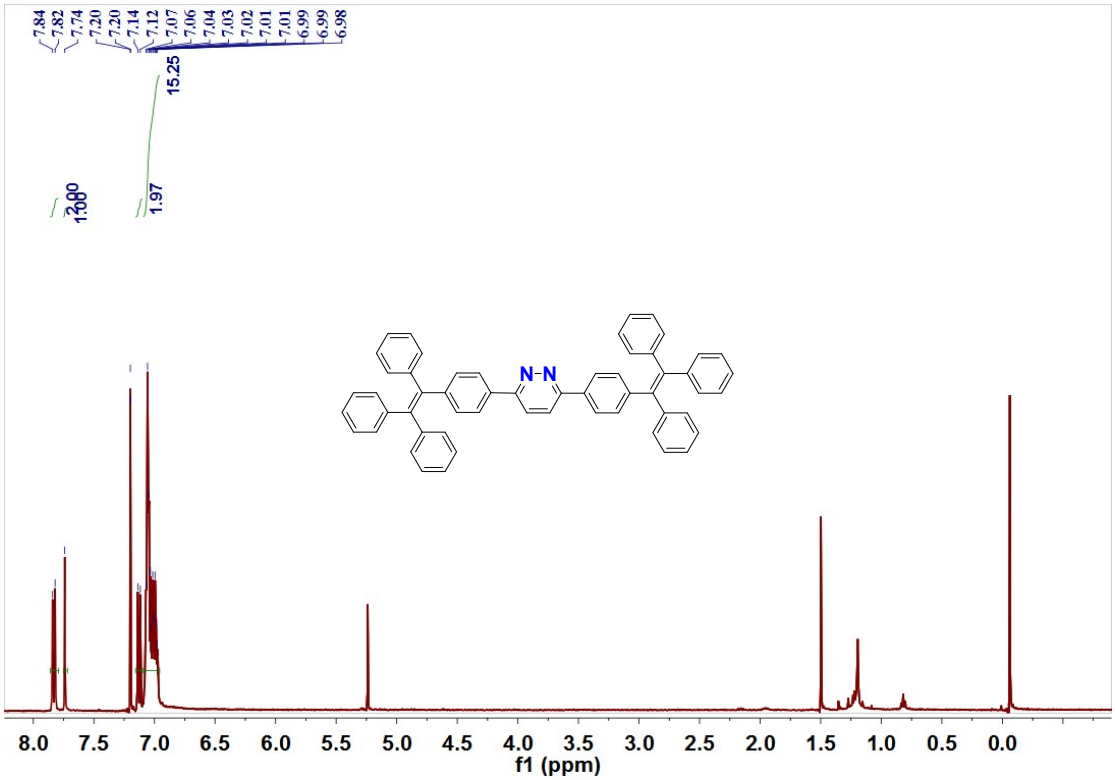

Fig. S27 ^{1}H NMR spectra of PYD-TPE (400MHz, $CDCl_3$, ppm)

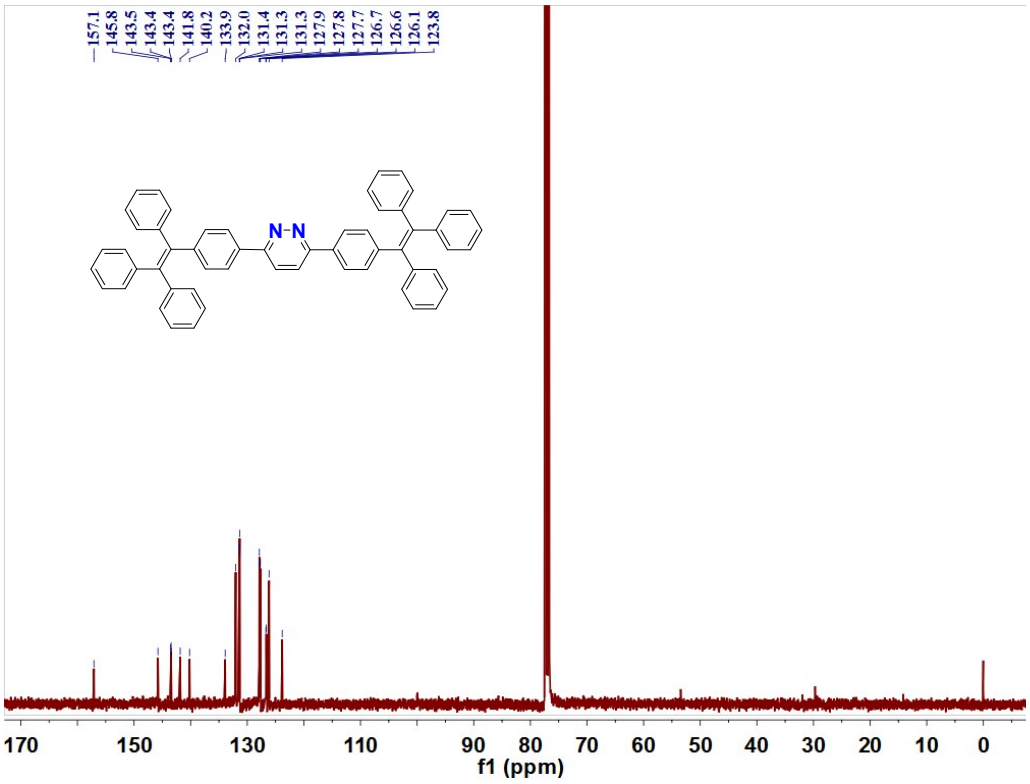

Fig. S28 ^{13}C NMR spectra of PYD-TPE (100MHz, $CDCl_3$, ppm)

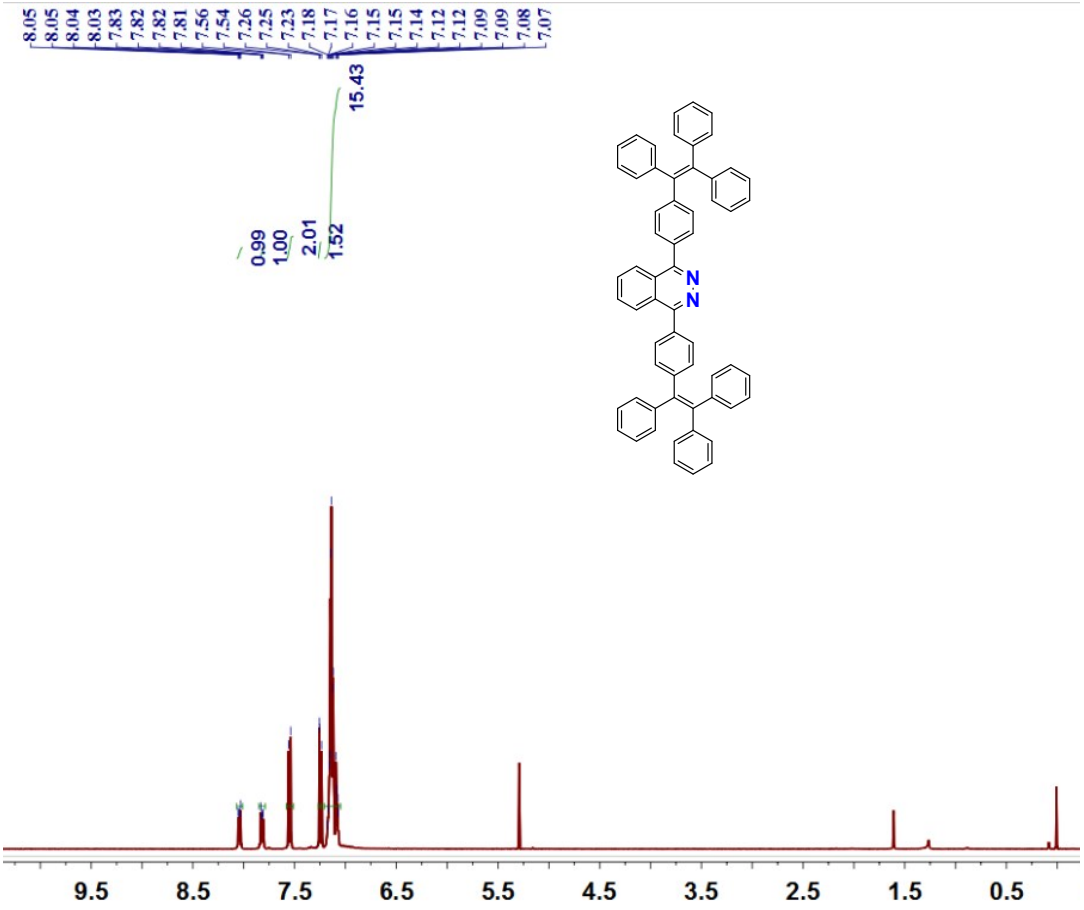

Fig. S29 ^{1}H NMR spectra of PTZ-TPE (400MHz, $CDCl_3$, ppm)

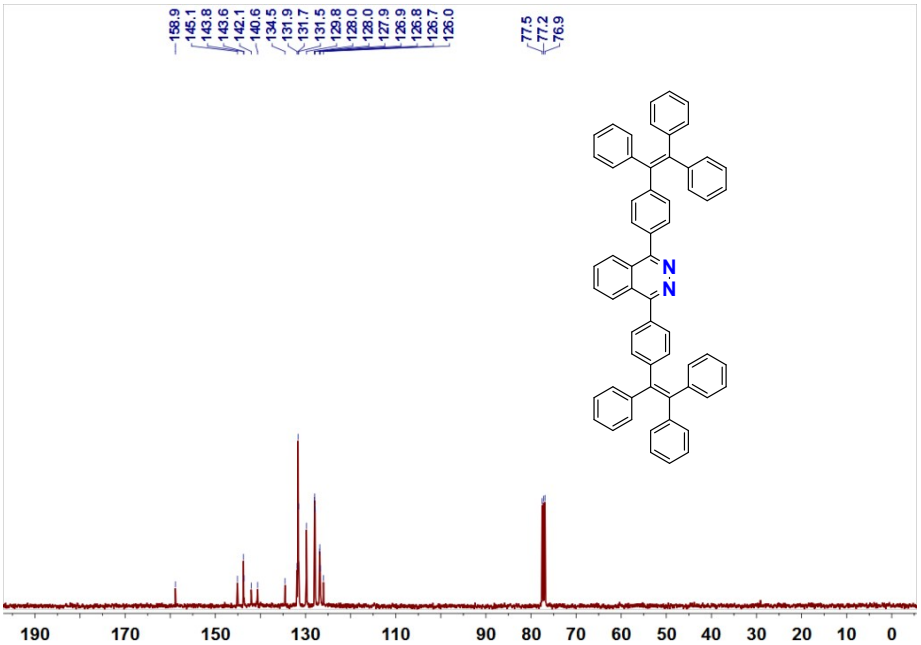

Fig. S30 ^{13}C NMR spectra of PTZ-TPE (100MHz, $CDCl_3$, ppm)