

## Supporting Information

# Facile Incorporation of Aggregation Induced Emission Active Conjugated Polymer into Mesoporous Silica Hollow Nanospheres: Synthesis, Characterization, Photophysical Studies and Application in Bioimaging

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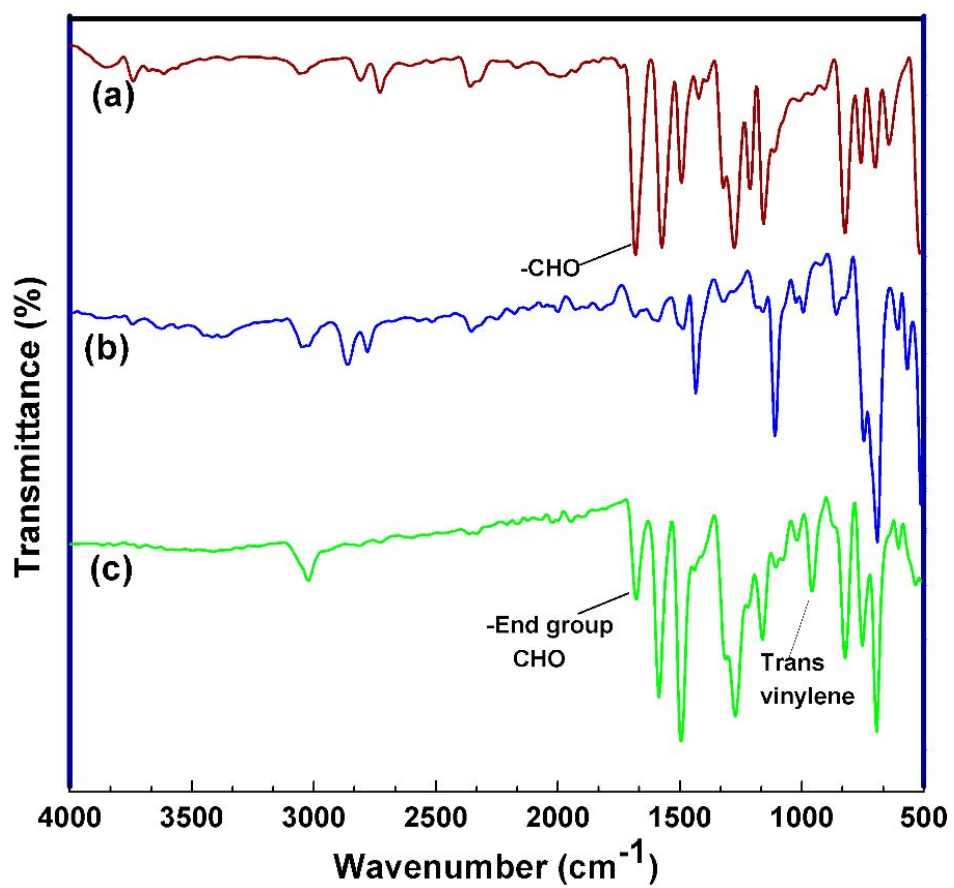
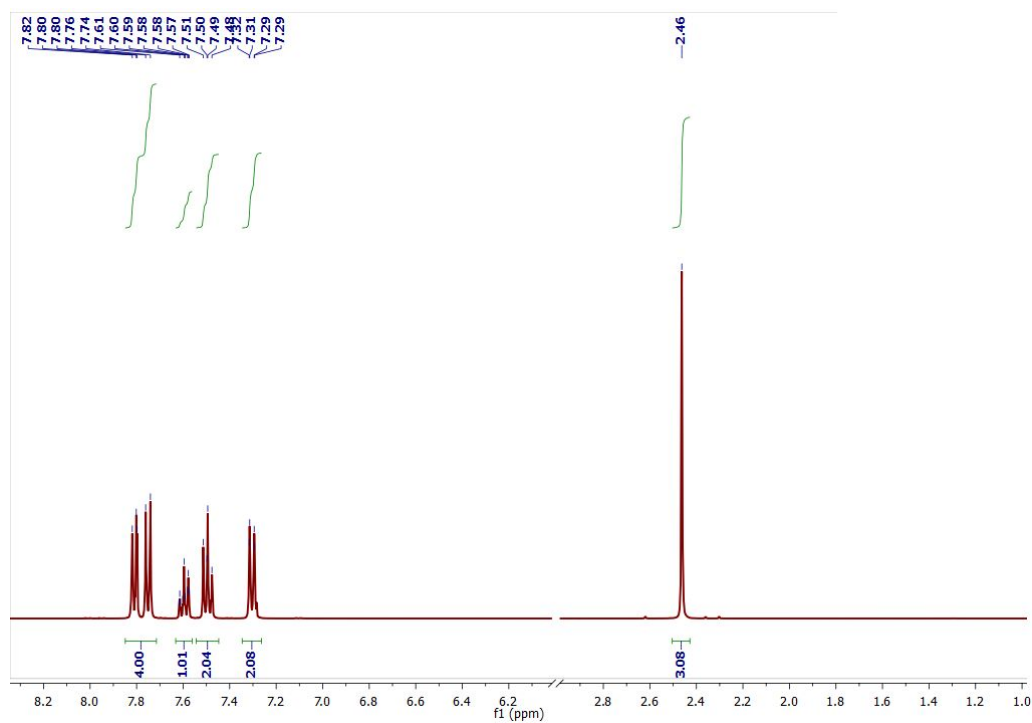
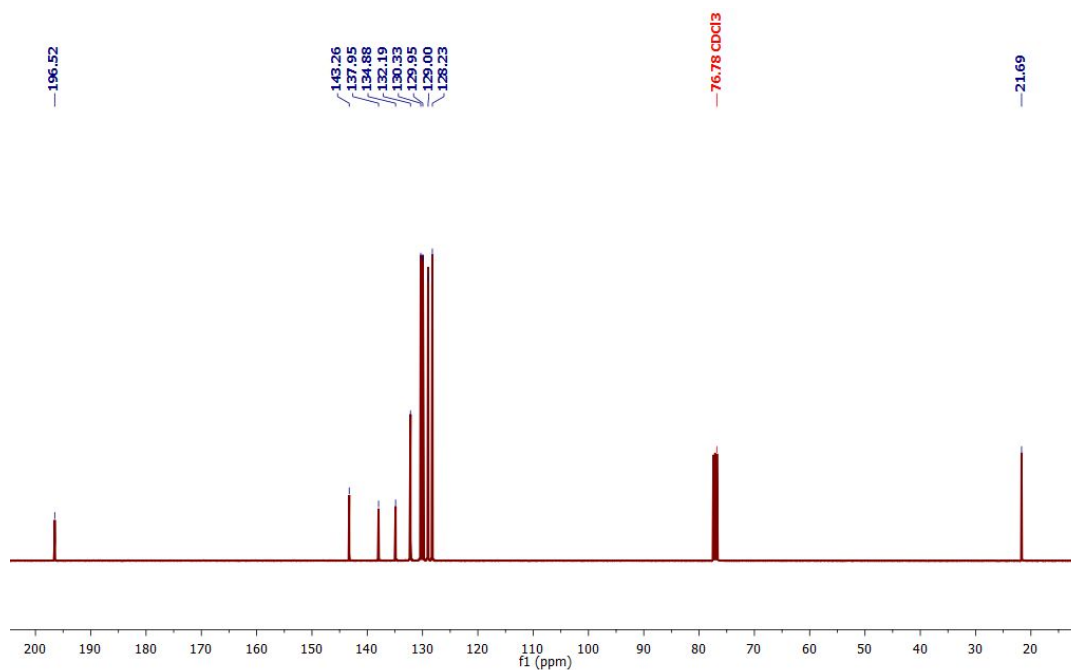


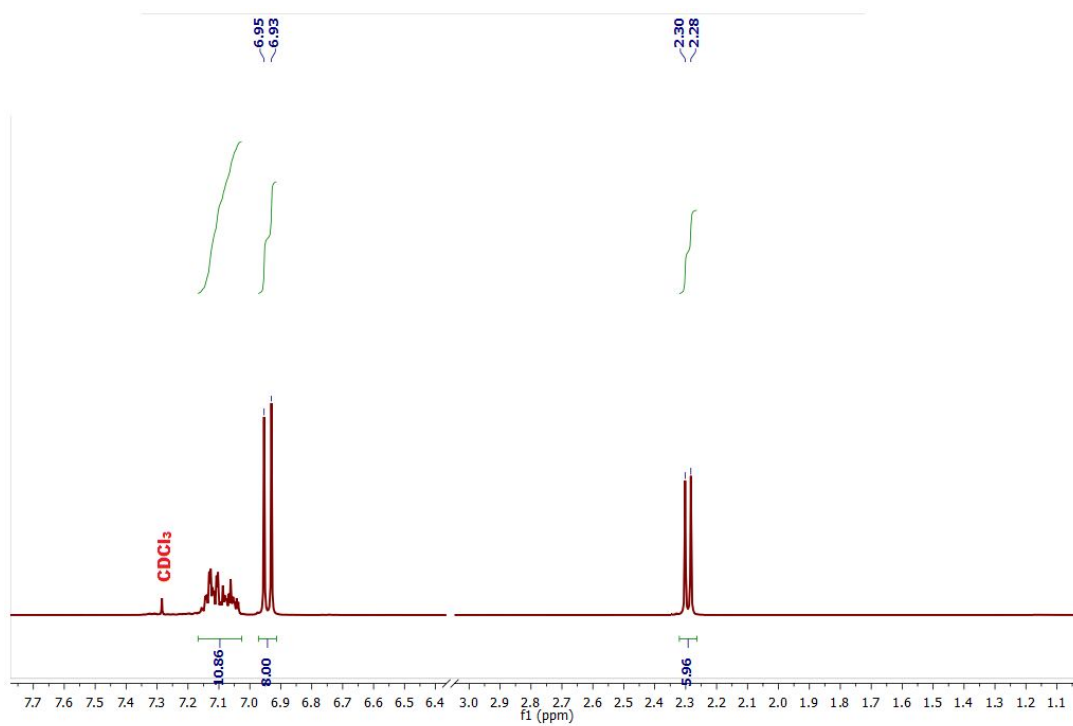
Figure S1. FT-IR spectrum of (a) compound 5, (b) compound 4 and (c) PTPA polymer



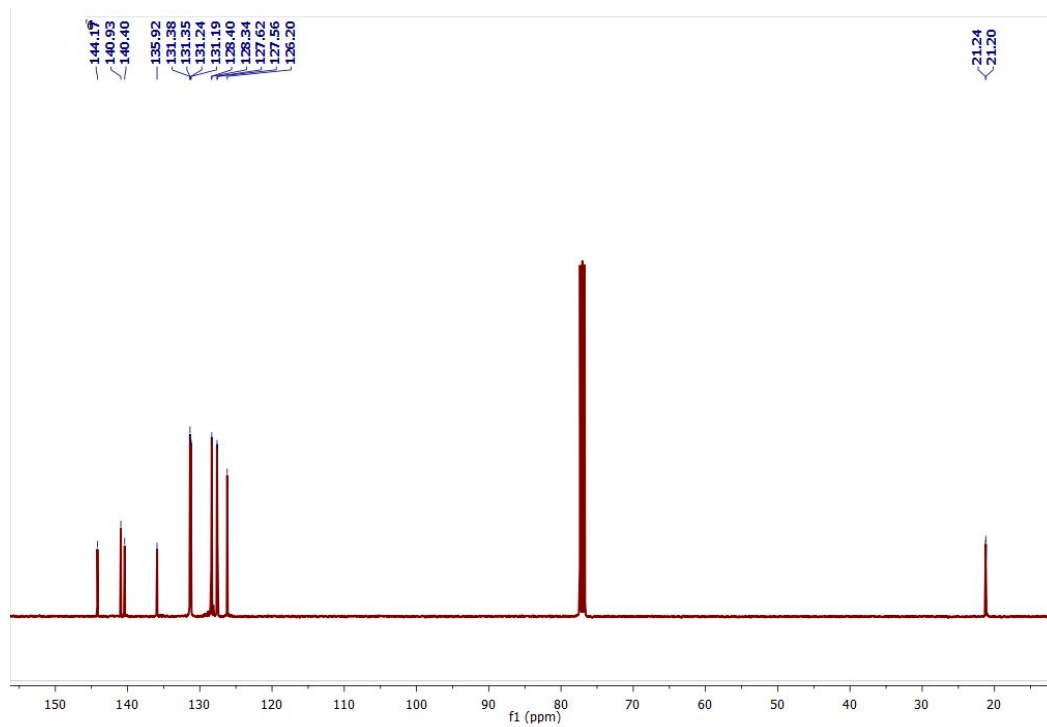
**Figure S2.** <sup>1</sup>H NMR spectrum of **1**



**Figure S3.** <sup>13</sup>C NMR spectrum of **1**



**Figure S4.** <sup>1</sup>H NMR spectrum of **2**



**Figure S5.** <sup>13</sup>C NMR spectrum of **2**



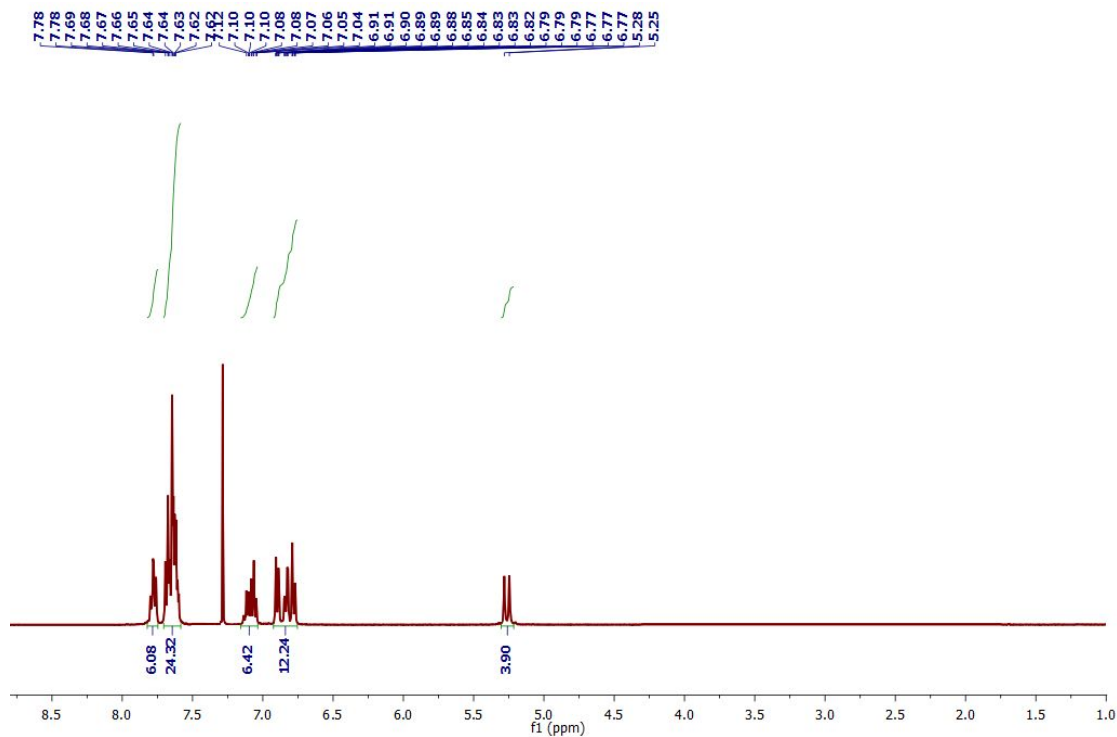


Figure S8.  $^1\text{H}$  NMR spectrum of **4**

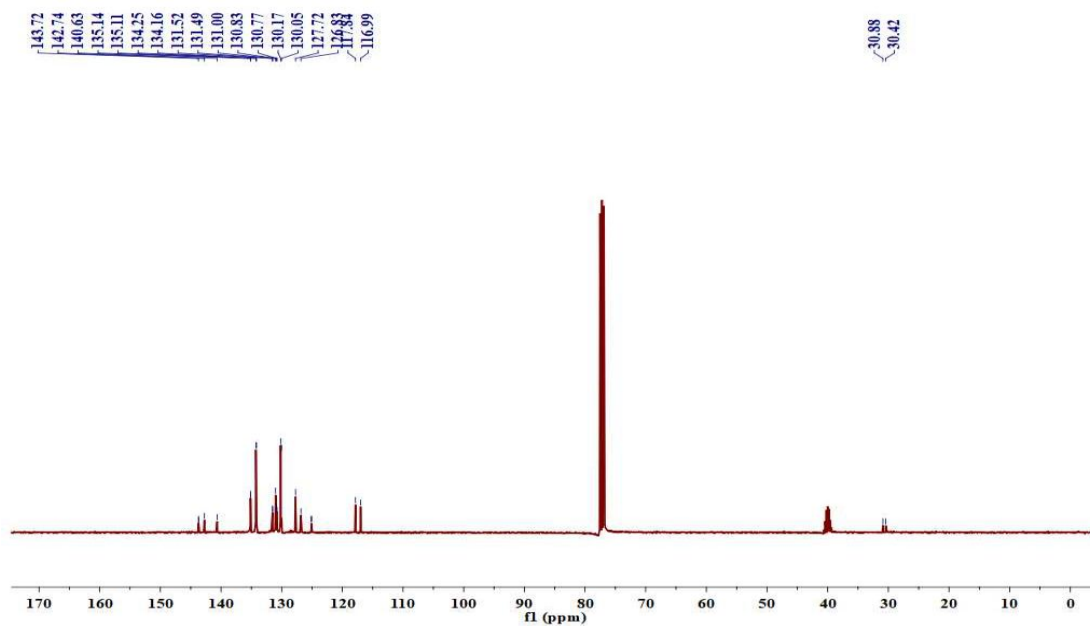
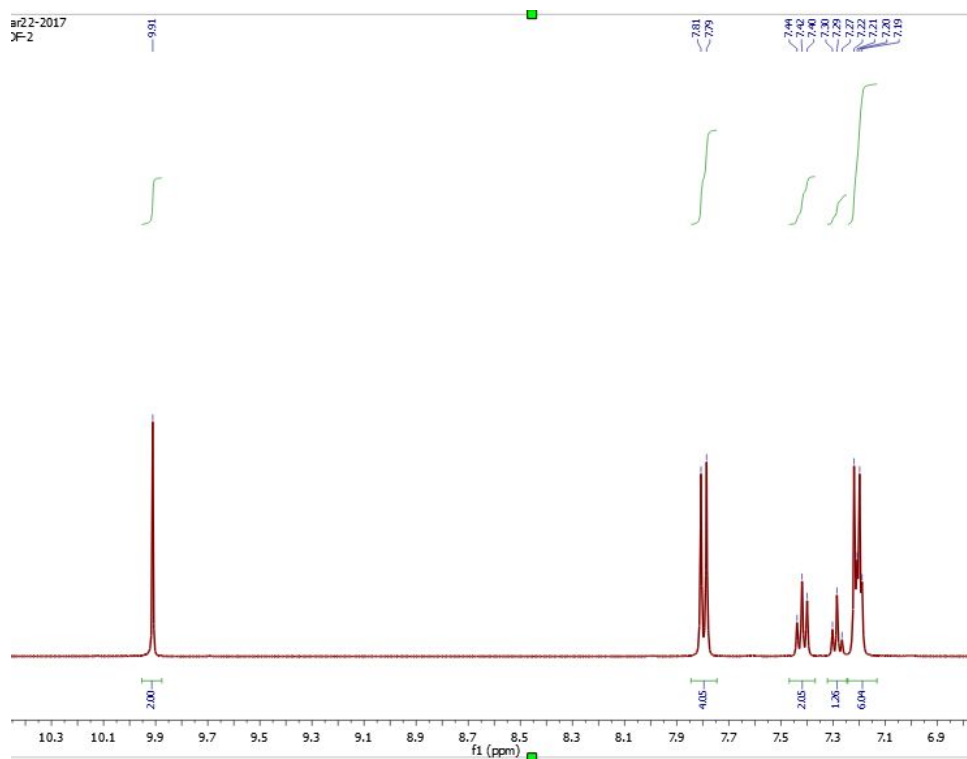
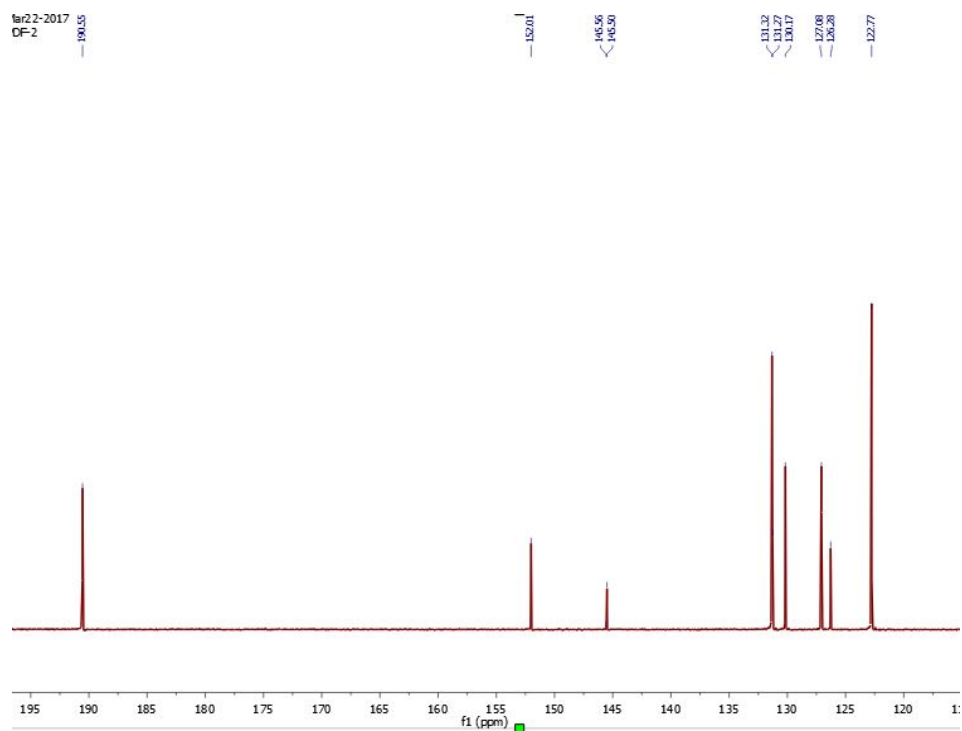


Figure S9.  $^{13}\text{C}$  NMR spectrum of **4**

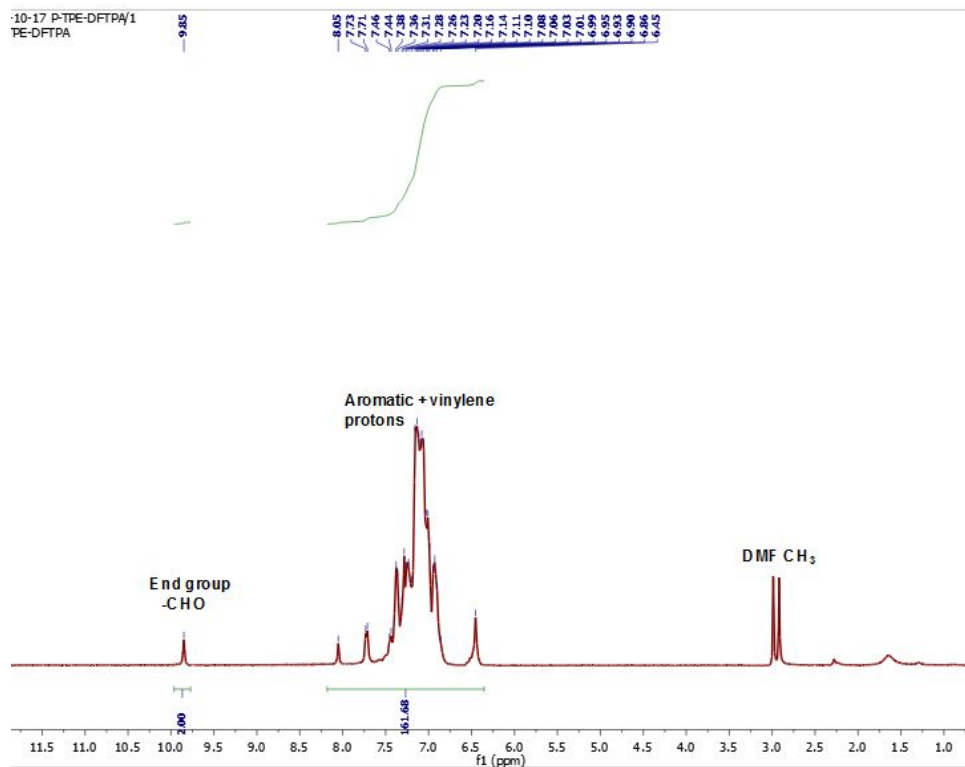


**Figure S10.**  $^1\text{H}$  NMR spectrum of compound **5**



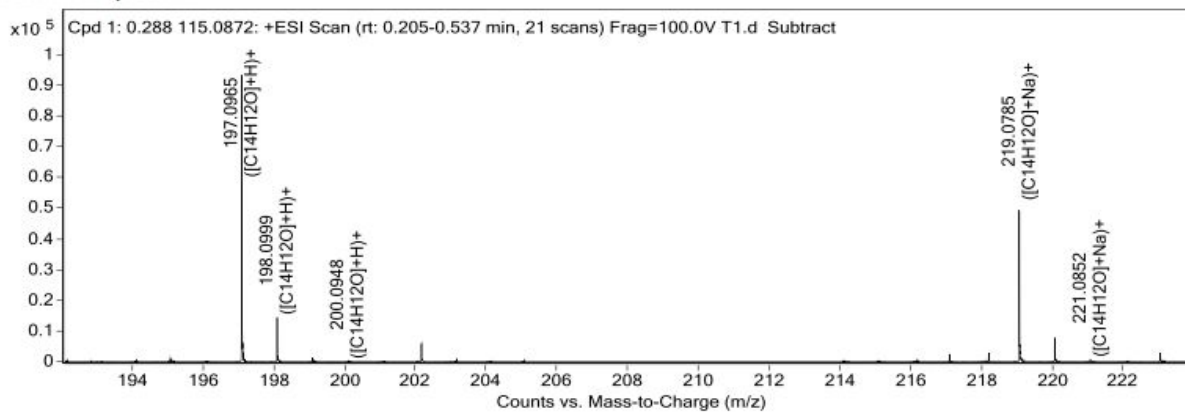
**Figure S11.**  $^{13}\text{C}$ -NMR spectrum of compound **5**





**Figure S12.** <sup>1</sup>H NMR spectrum of PTPA polymer

#### MS Zoomed Spectrum



**Figure S13.** Mass spectrum of compound 1

Cpd 1: 0.277 371.1020; +ESI Scan (rt: 0.194-0.492 min, 19 scans) Frag=100.0V T2.d Subtract

Mass spectrum showing relative intensity (y-axis, scaled by  $\times 10^4$ ) versus mass-to-charge ratio (x-axis, Counts vs. Mass-to-Charge (m/z)). The spectrum displays several peaks, with the base peak at m/z 360.1879 [C<sub>28</sub>H<sub>24</sub>]<sup>+</sup>. Other labeled peaks include m/z 361.1915 [C<sub>28</sub>H<sub>24</sub>]<sup>+</sup>, m/z 383.1739 [(C<sub>28</sub>H<sub>24</sub>)+Na]<sup>+</sup>, and m/z 385.1739.

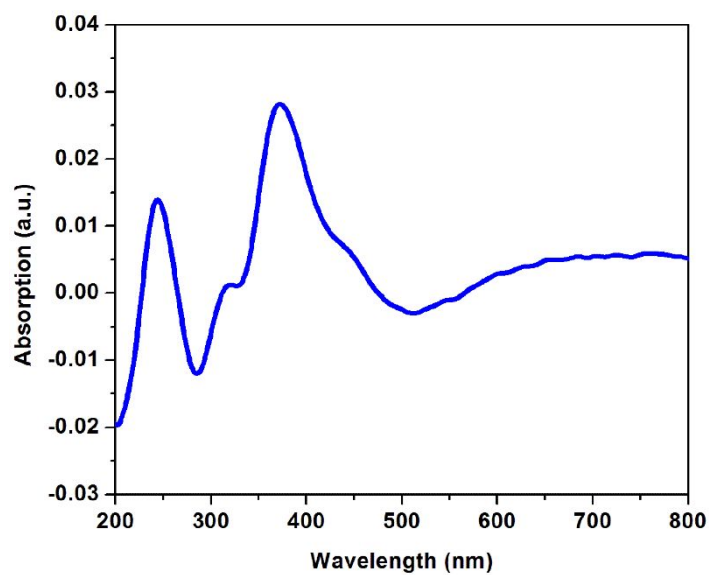
**Figure S14.** Mass spectrum of compound **2**

Cpd 1: 0.252 441.1878: +ESI Scan (rt: 0.202-0.467 min, 17 scans) Frag=100.0V T4.d Subtract

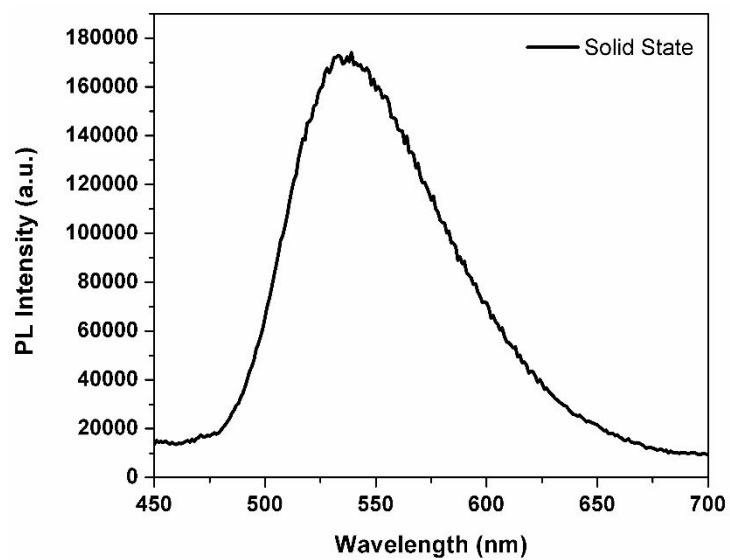
Mass spectrum showing relative intensity (Y-axis, 0 to 3.0) versus mass-to-charge ratio (X-axis, 1040 to 1066). The spectrum displays several peaks, with the most prominent ones labeled as follows:

Mass-to-Charge Ratio (m/z)	Chemical Formula
1043.2001	$[\text{C}_{64}\text{H}_{52}\text{Br}_2\text{P}_2+\text{H}]^+$
1045.2003	$[\text{C}_{64}\text{H}_{52}\text{Br}_2\text{P}_2+\text{H}]^+$
1063.1804	$[\text{C}_{64}\text{H}_{52}\text{Br}_2\text{P}_2+\text{Na}]^+$
1065.1792	$[\text{C}_{64}\text{H}_{52}\text{Br}_2\text{P}_2+\text{Na}]^+$
1067.1795	$[\text{C}_{64}\text{H}_{52}\text{Br}_2\text{P}_2+\text{Na}]^+$

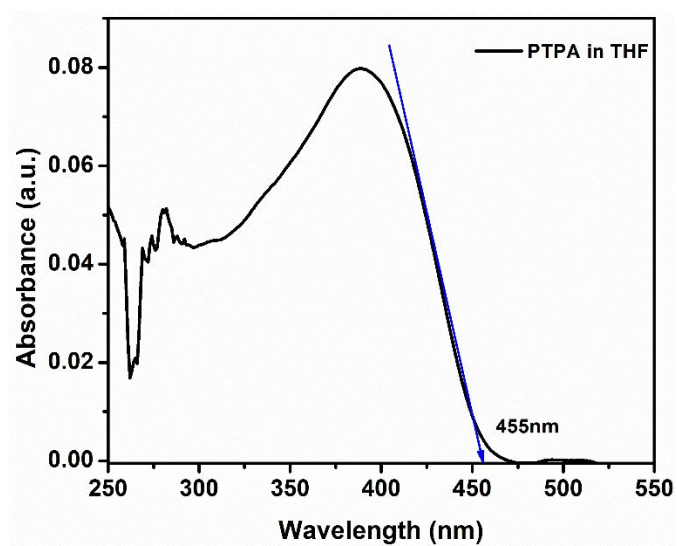
**Figure S15.** Mass spectrum of compound **4**



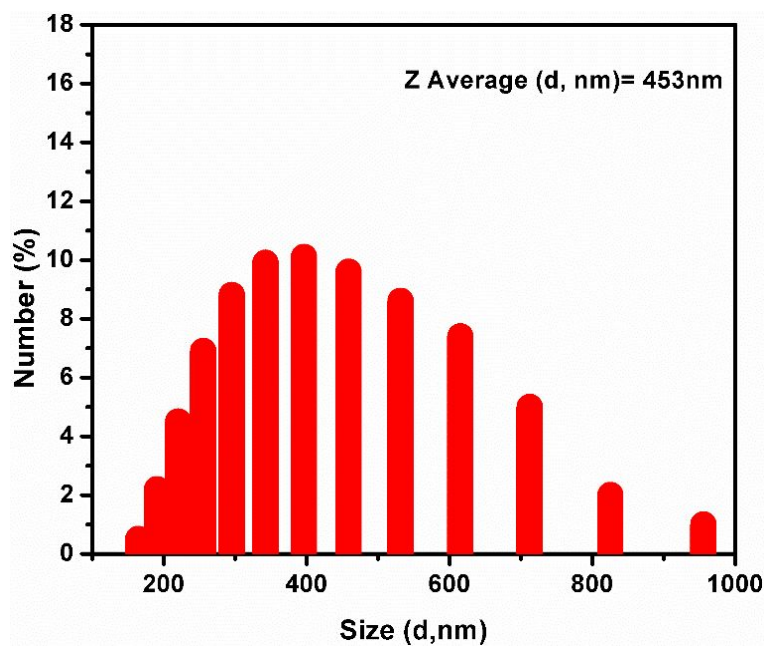
**Figure S16.** Solid state UV-visible spectrum of PTPA polymer



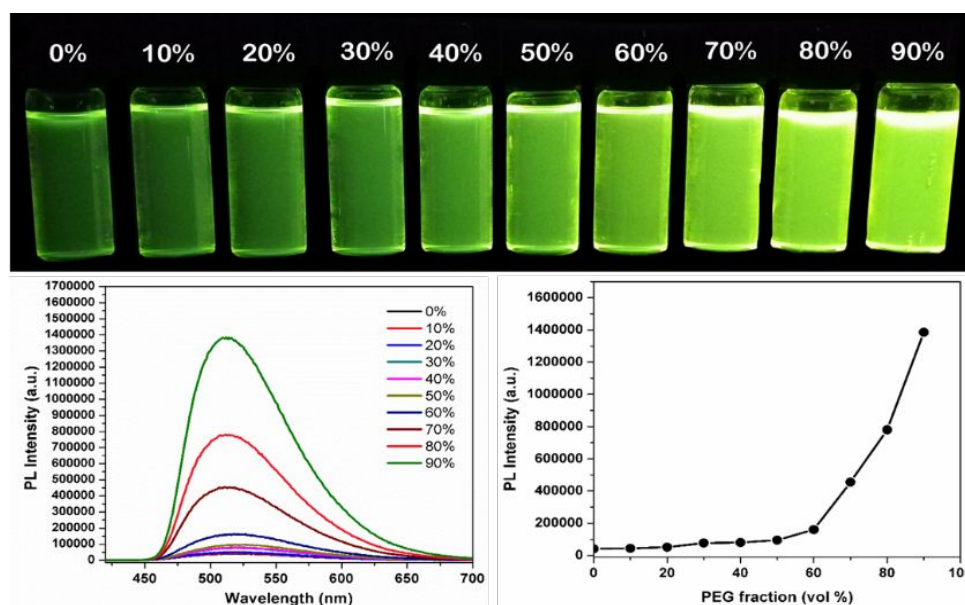
**Figure S17.** Solid state PL spectrum of PTPA polymer



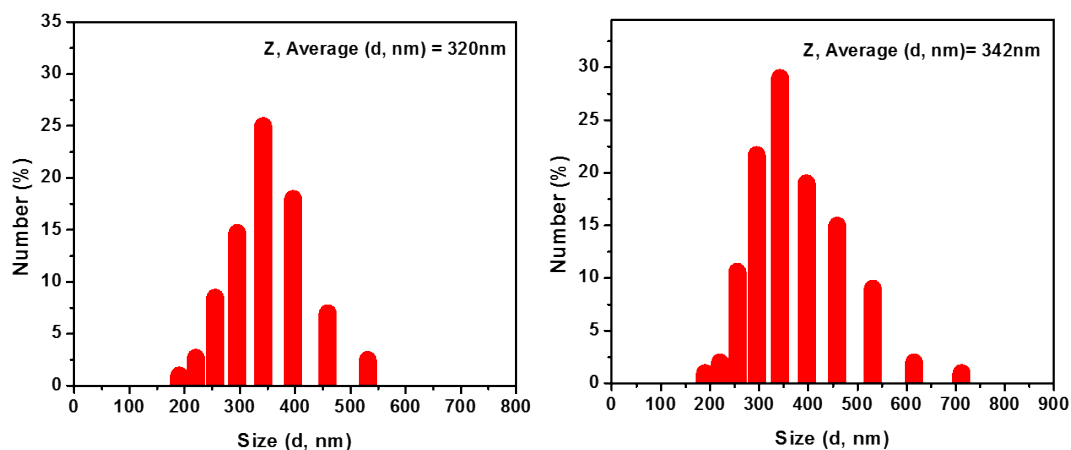
**Figure S18.** UV absorbance spectrum of PTPA polymer in THF solution



**Figure S19.** Average particle size distribution of 90% THF-water mixture of *PTPA*



**Figure S20** (a) PL spectra of **PTPA** in THF/PEG mixed solvents with different water fractions ( $f_{\text{PEG}}$ ) with excitation at 390 nm; and (b) the changes of the PL intensity with different  $f_{\text{PEG}}$  excitation at 390 nm. (c) Photographs of **PTPA** in THF/PEG mixtures with different fractions of PEG taken under UV illumination.



**Figure S21.** Average particle size distribution of *MSHNs*-GTMS and Apt-*MSHNs* in aqueous medium