Supporting Information

Highly efficient luminescent side-chain polymers with short-spacer attached tetraphenylethylene AIEgens via RAFT polymerization capable of naked eye explosive detection

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Supplementary Figures

1. Typical ESI-MS profile for monomers

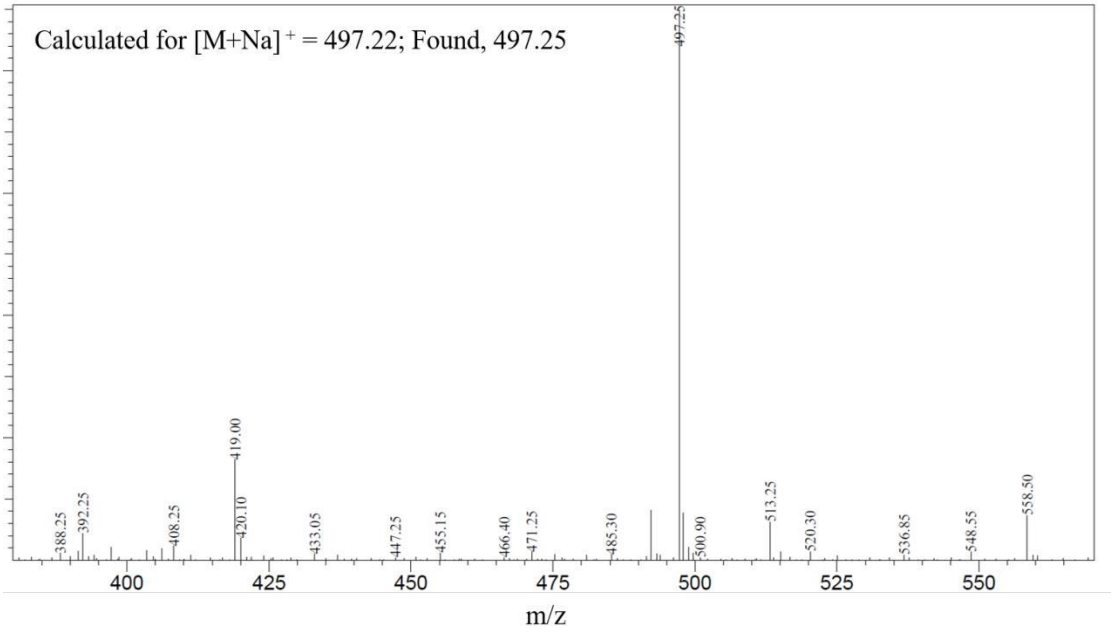

Fig. S1 The electrospray ionization mass spectrum (ESI-MS) profile of monomer M(4).

2. Representative ^{1}H-NMR, ^{13}C-NMR spectra

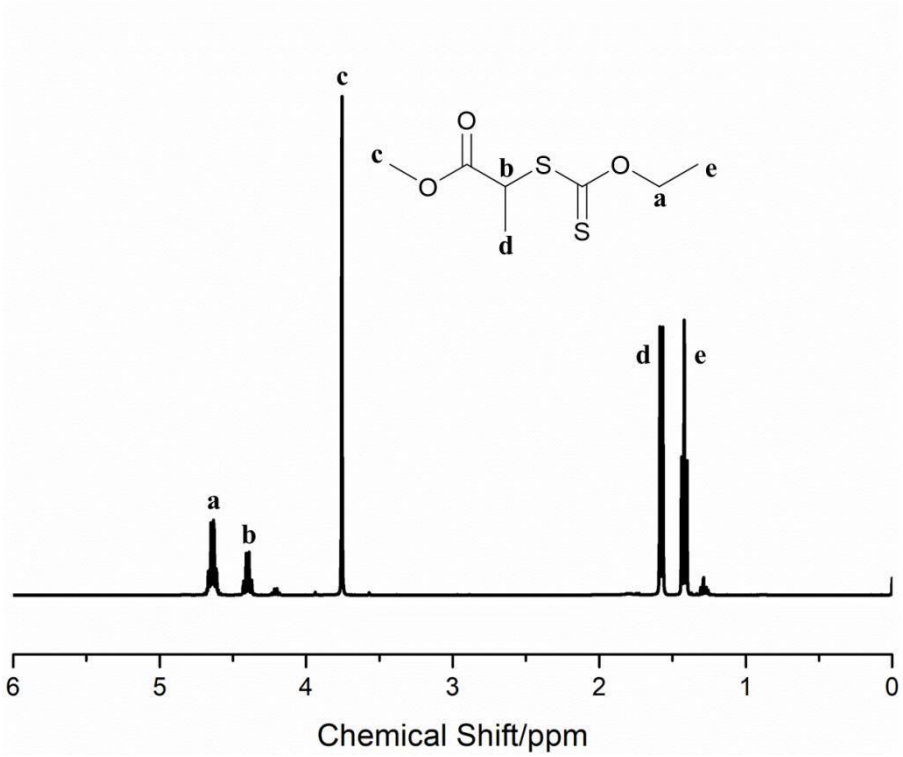

Fig. S2 ^{1}H-NMR spectrum of chain transfer agent (CTA).

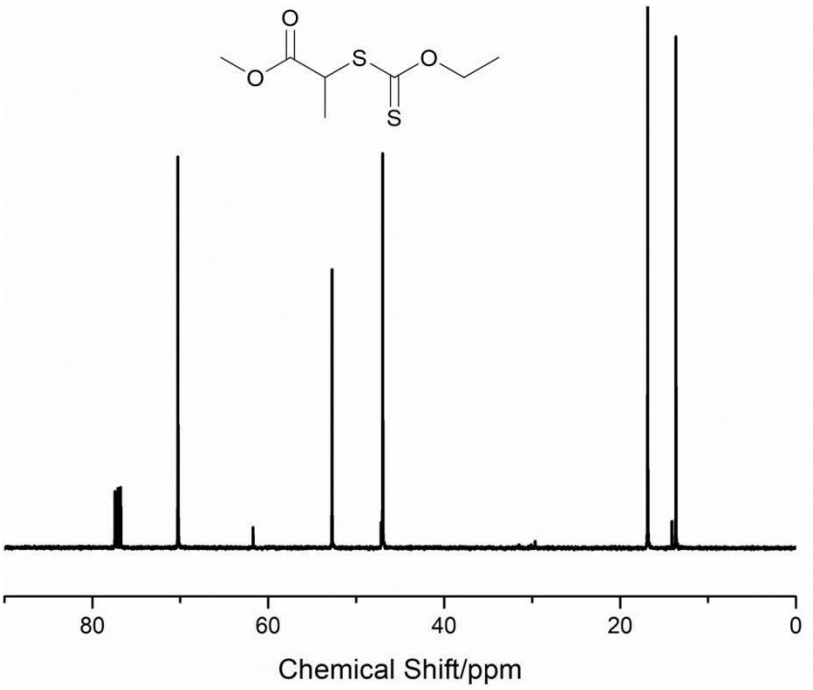

Fig. S3 ^{13}C-NMR spectrum of CTA.

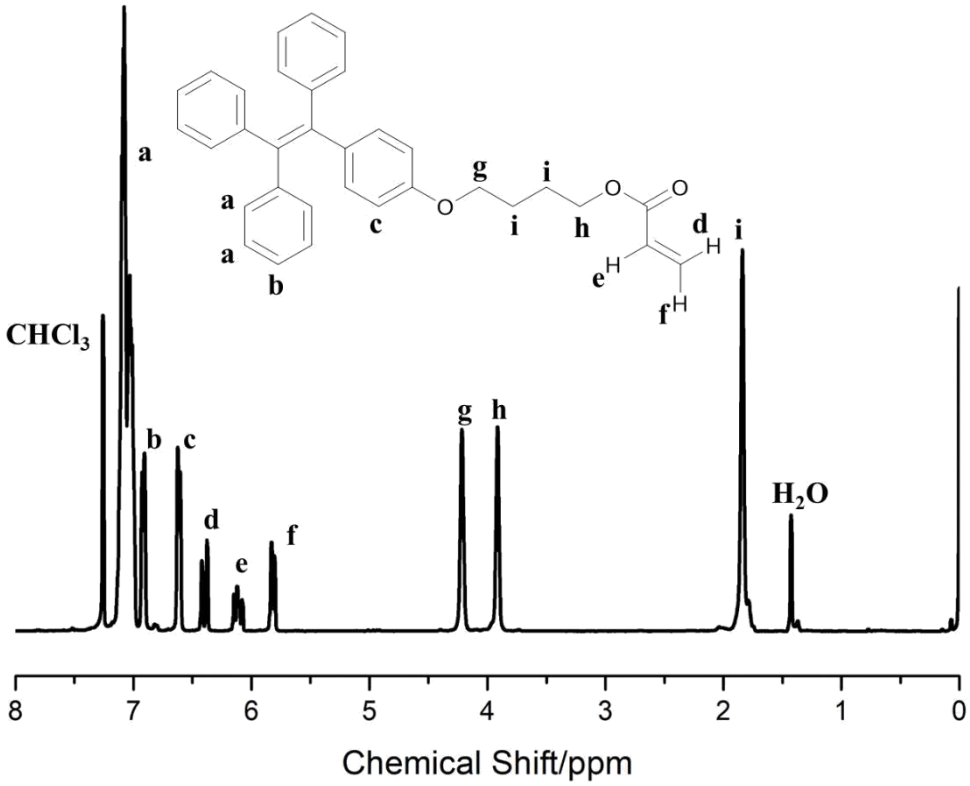

Fig. S4 ^{1}H-NMR spectrum of monomer M(4).

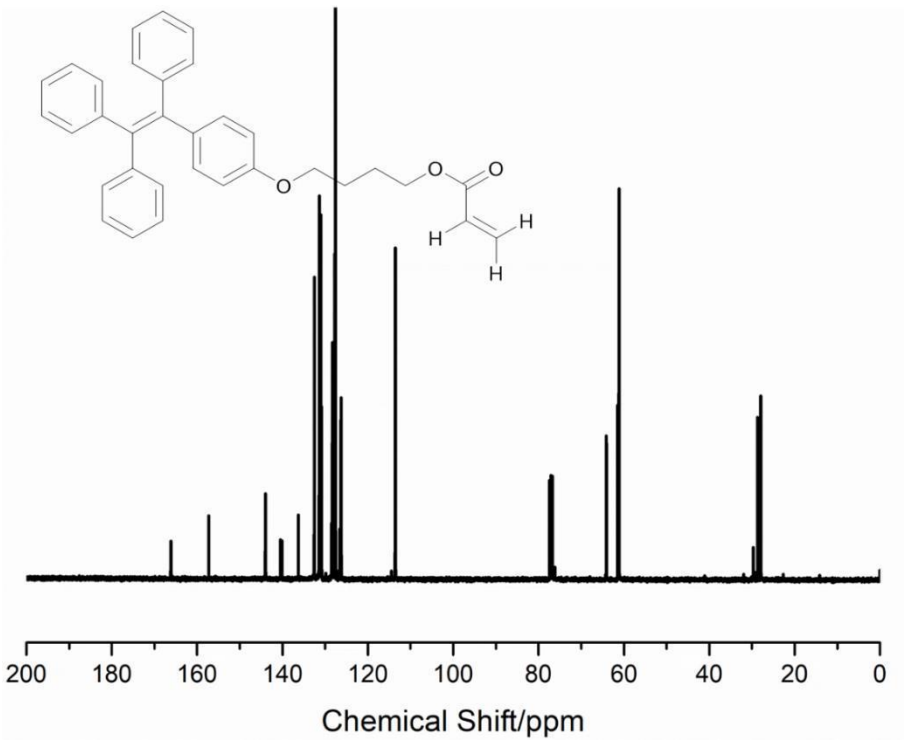

Fig. S5 ^{13}C-NMR spectrum of M(4).

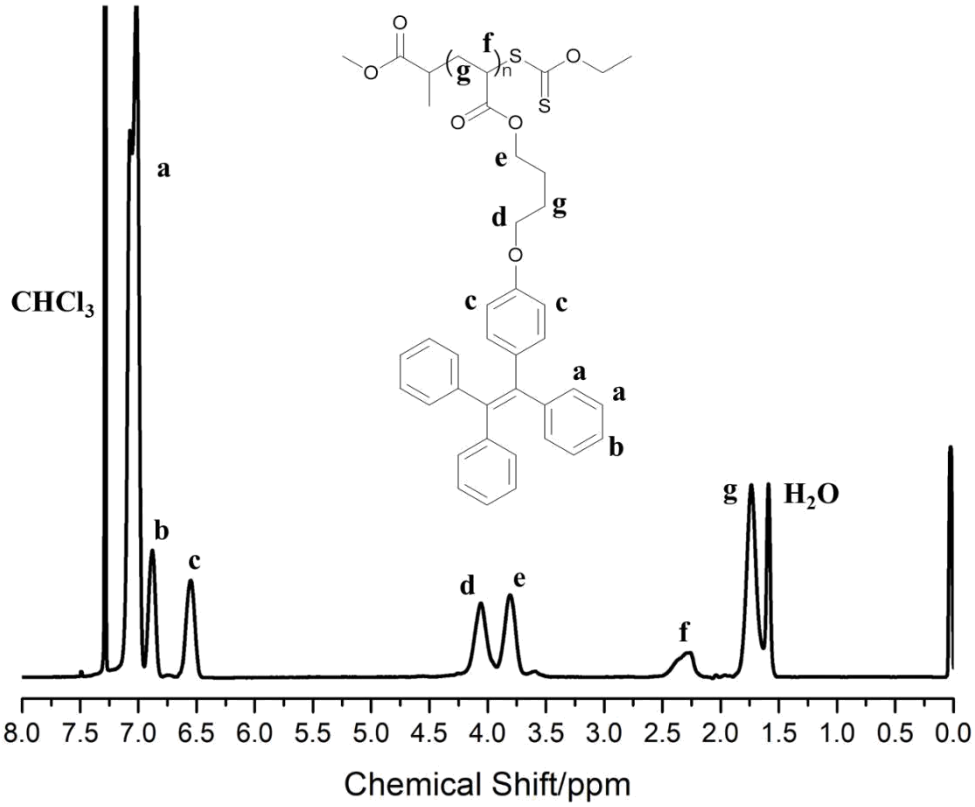

Fig. S6 ^{1}H-NMR spectrum of polymer *P4*.

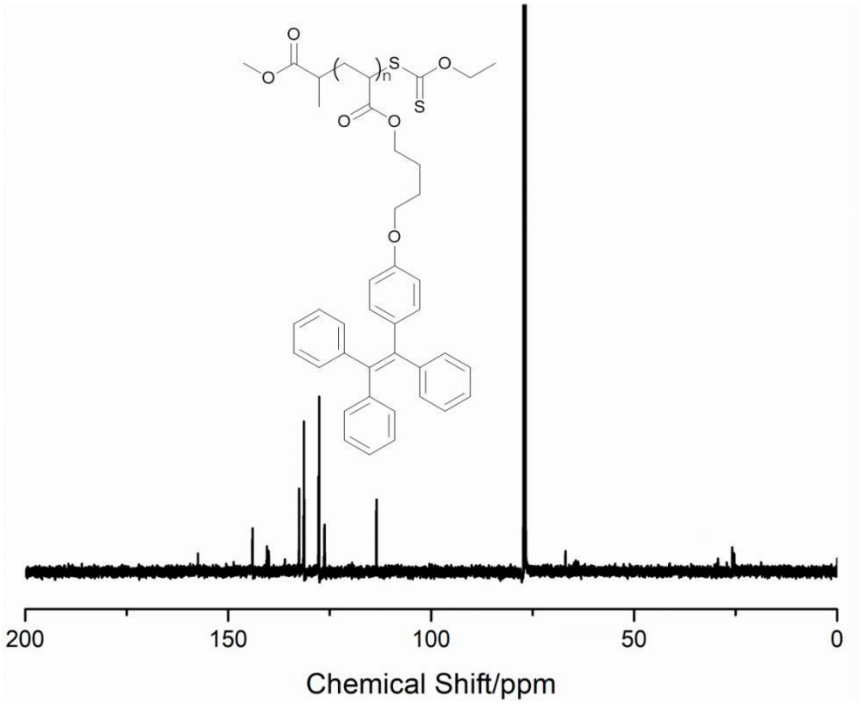

Fig. S7 ^{13}C-NMR spectrum of *P4*.

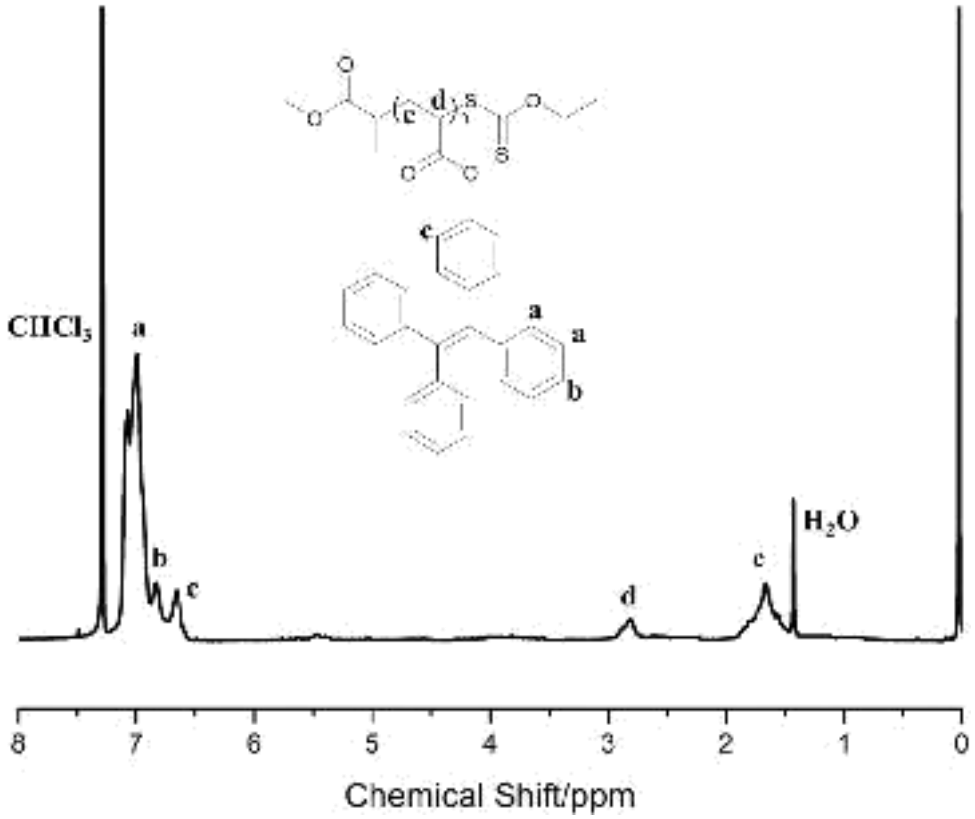

Fig. S8 ^{1}H-NMR spectrum of polymer *P0*.

3. GPC curves of *P0-P5*

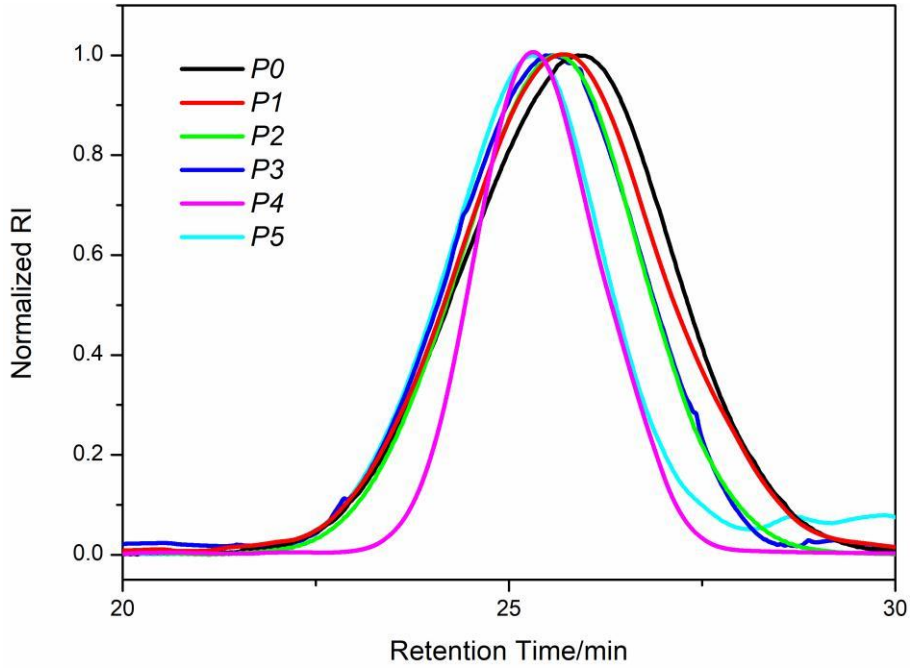

Fig. S9 GPC curves of *P0-P5*.

4. Fluorescence emission spectra of *P1, P3, P4, P5*

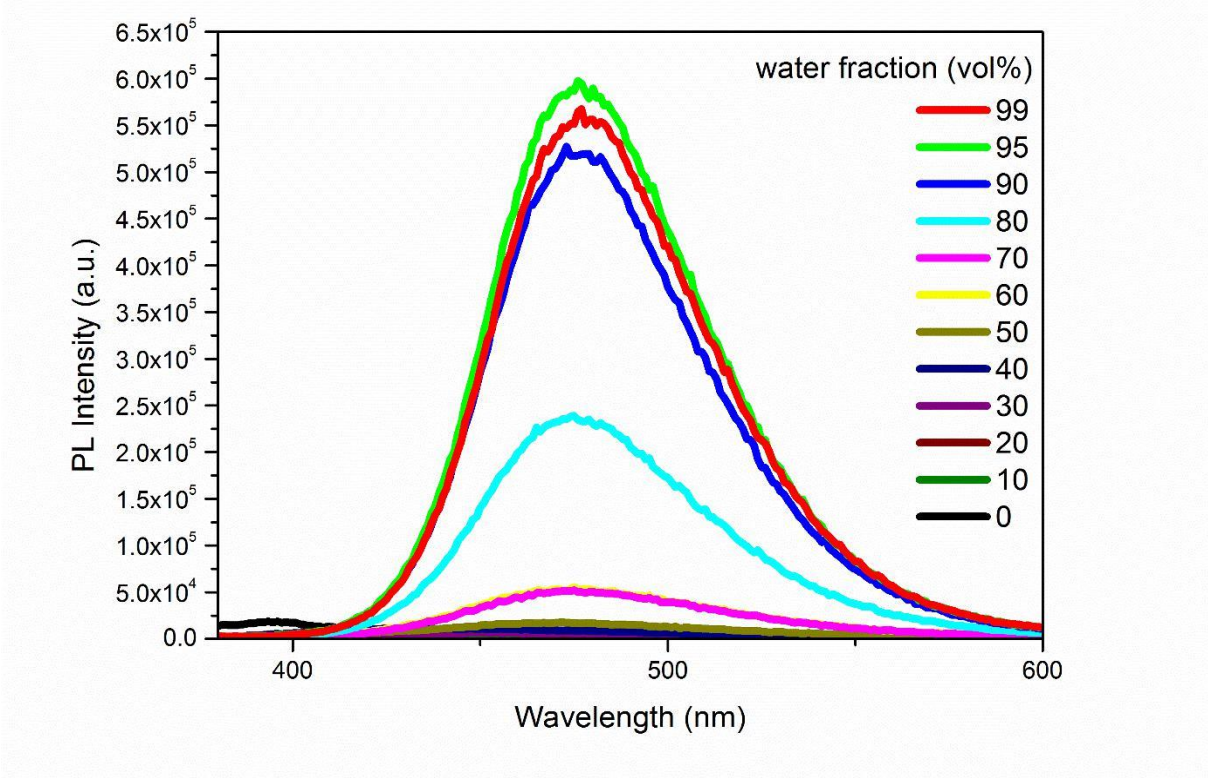

Fig. S10 Fluorescence emission spectra of *P1* in THF and THF/H_2O mixture solutions with different water fractions at a fixed concentration (1.0 mg/mL, λ_{ex} = 360 nm).

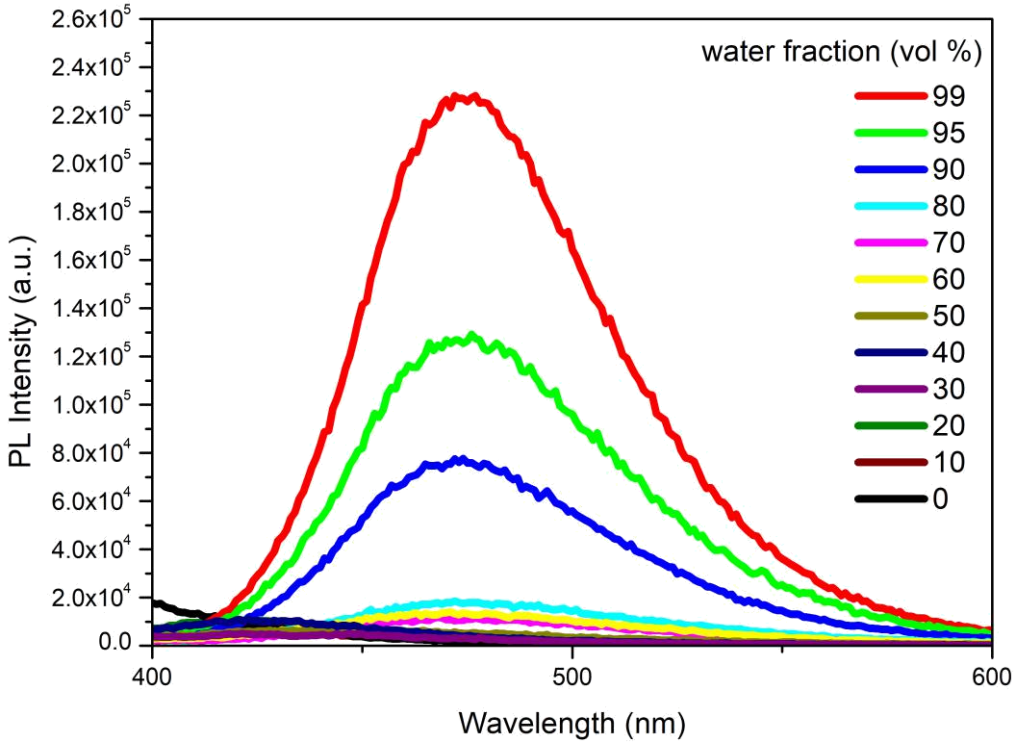

Fig. S11 Fluorescence emission spectra of *P3* in THF and THF/H_2O mixture solutions with different water fractions at a fixed concentration (1.0 mg/mL, λ_{ex} = 360 nm).

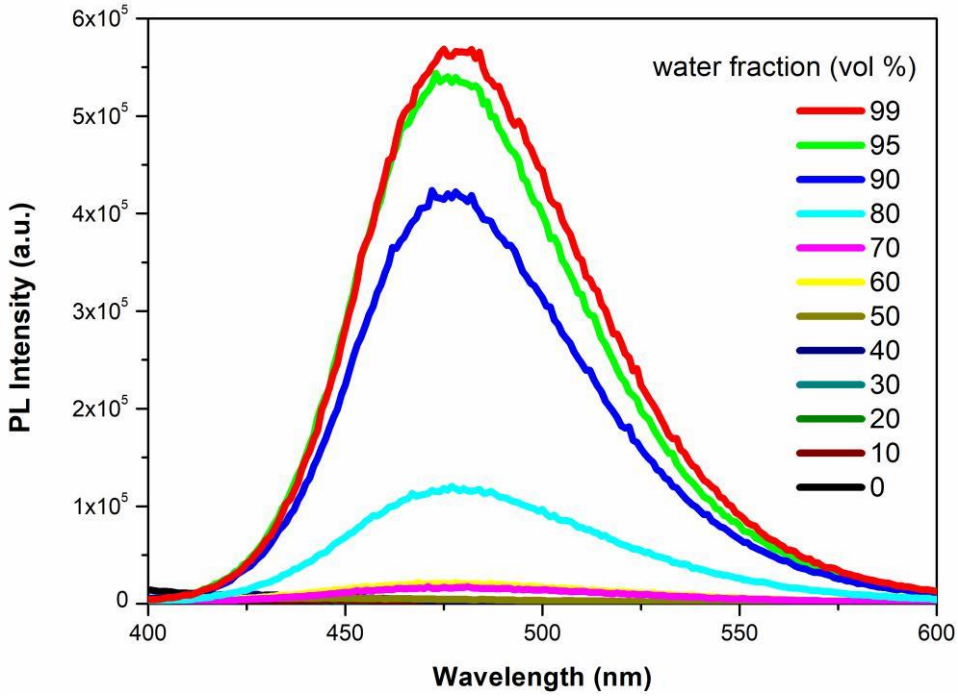

Fig. S12 Fluorescence emission spectra of *P4* in THF and THF/H_2O mixture solutions with different water fractions at a fixed concentration (1.0 mg/mL, λ_{ex} = 360 nm).

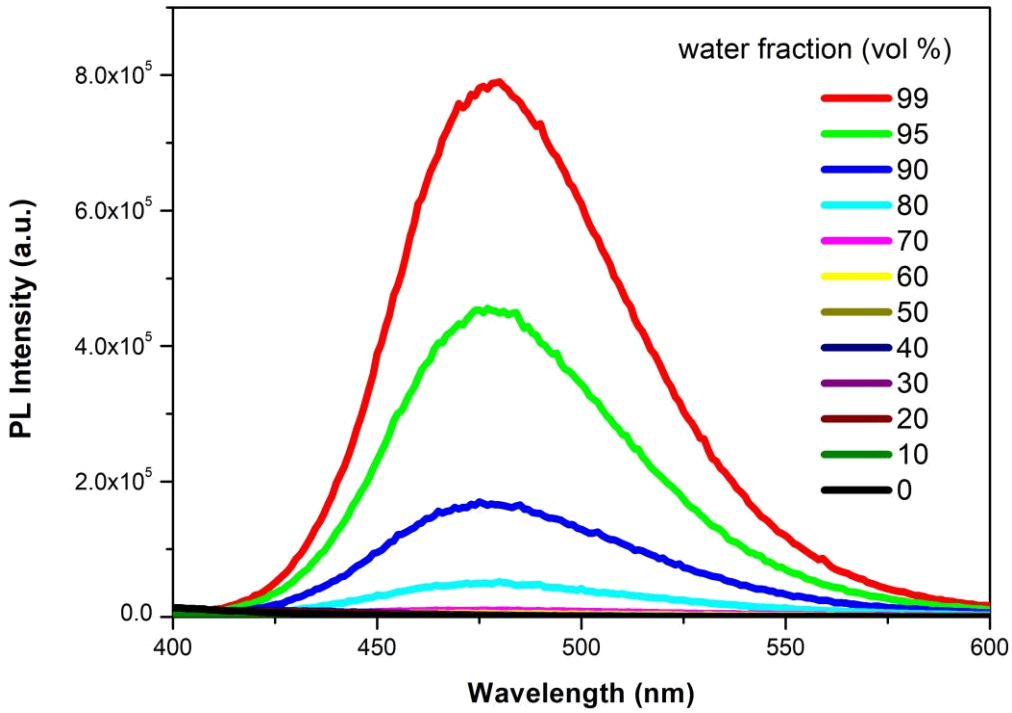

Fig. S13 Fluorescence emission spectra of *P5* in THF and THF/H_2O mixture solutions with different water fractions at a fixed concentration (1.0 mg/mL, λ_{ex} = 360 nm).

5. The aggregated polymer particle sizes in mixture solvent measured via DLS

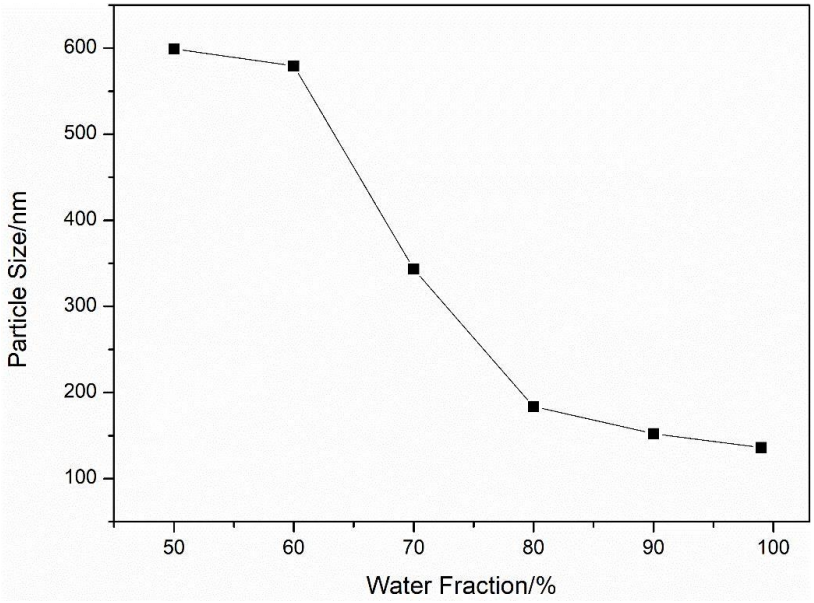

Fig. S14 The changing trend of aggregated particle sizes of polymer *P2* in THF/H_2O mixture solvent measured using dynamic light scattering (DLS).

6. UV-vis spectra of *P0* in solution and in film state

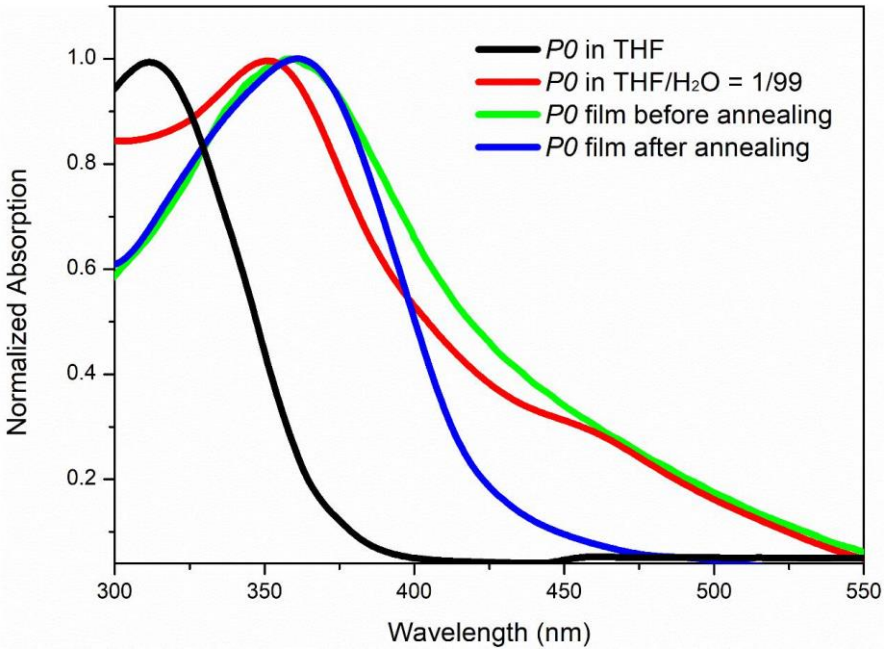

Fig. S15 UV-vis spectra of *P0* in solution and in film state (with peak value 312 nm in THF, 351 nm in THF/H_2O (1/99, v/v), 360 nm in film state before and after annealing).

7. The dimension of single chain columns of the short spacer side-chain polymers *P0, P1* and *P2*

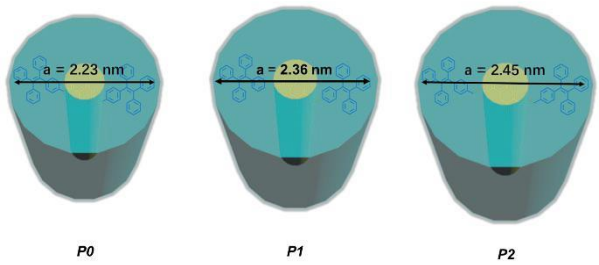

Fig. S16 Schematic representation of single chain column of the short spacer side-chain polymers *P0, P1* and *P2* in compact structure after annealing.

8. Fluorescence detection of TNT with polymer *P0* film spin-coated on quartz

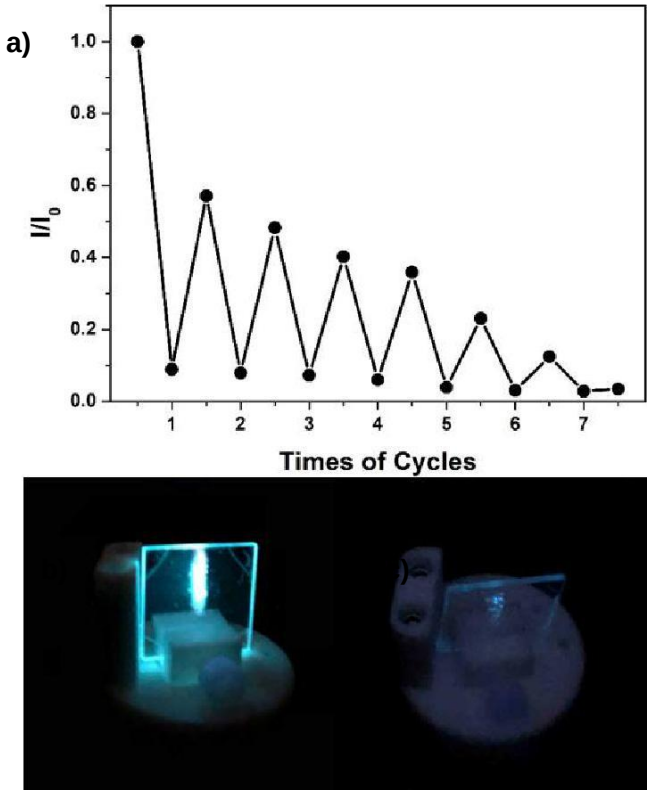

Fig. S17 a) The fluorescence intensity changes upon several cycles of quenching and restoring of *P0* film spin-coated on quartz; Photographs of the spin-coated film on quartz **b)** as prepared, **c)** after quenched with 5 ppm TNT solution.