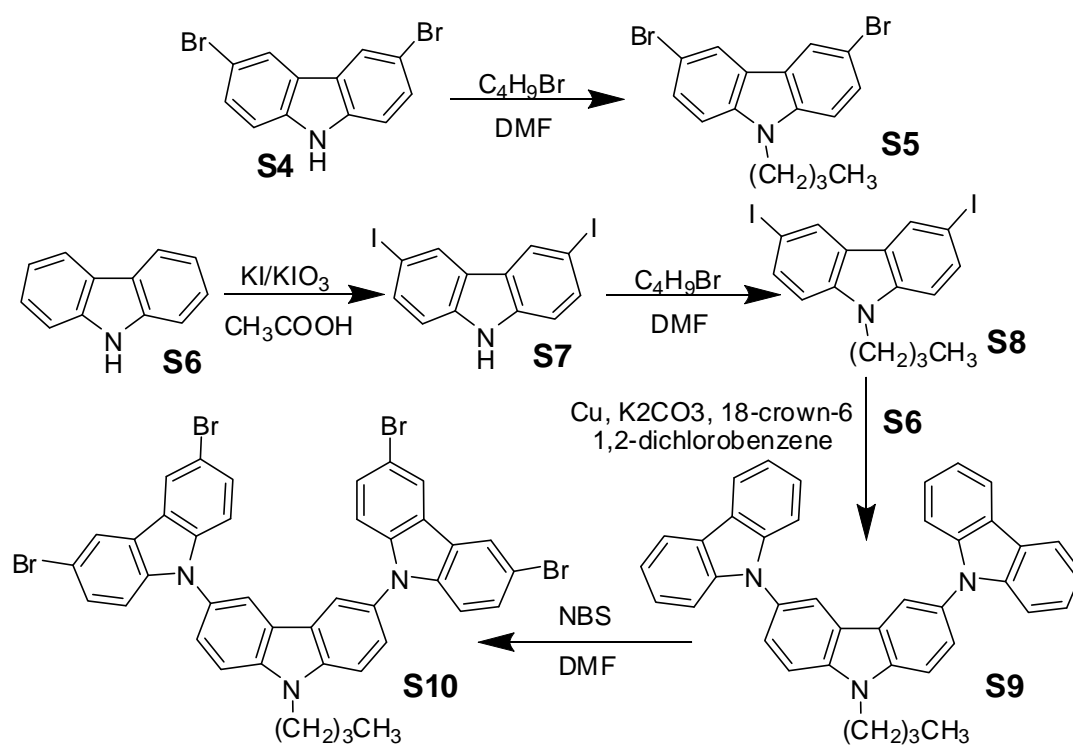


Electronic Supplementary Information:

A Conjugated Hyperbranched Polymer Constructed by Carbazole and Tetraphenylethylene Moieties: convenient Synthesis through One-Pot “A₂+B₄” Suzuki Polymerization, Aggregation-Induced Enhanced Emission, and Application as Explosive Chemosensors and PLED

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Jingui Qin, Qianqian Li and Zhen Li*



Scheme S1 Synthesis of carbazole-based monomers **S5** and **S10**.

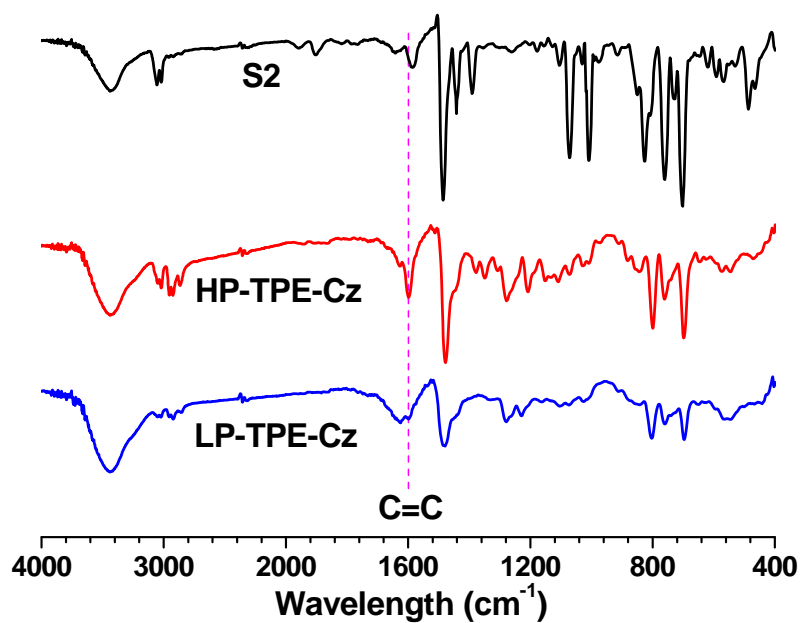


Fig. S1 The FT-IR spectra of **HP-TPE-Cz**, **LP-TPE-Cz** and compound **S2**.

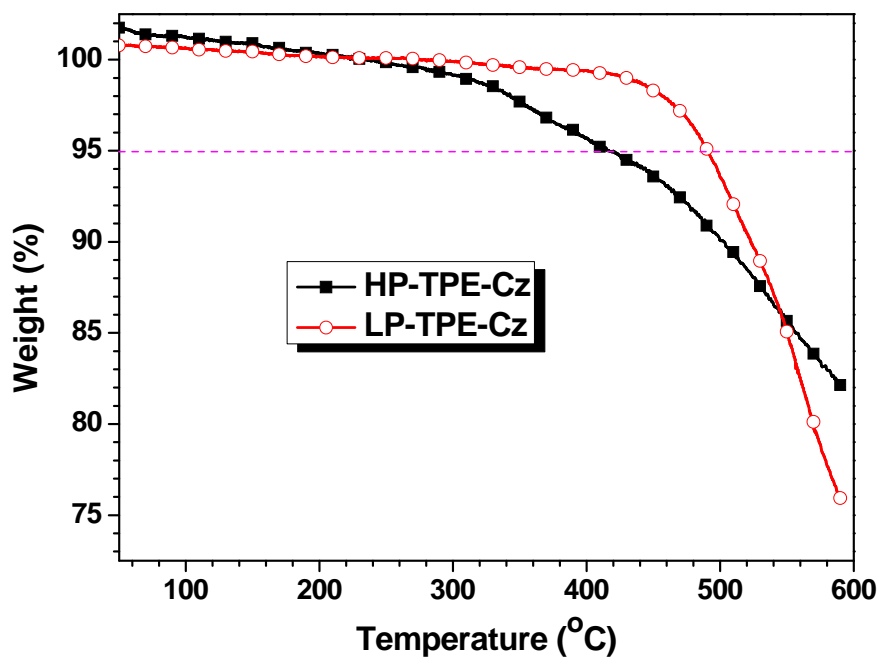


Fig. S2 TGA thermograms of these two polymers **HP-TPE-Cz** and **LP-TPE-Cz**, measured in nitrogen at a heating rate of 10 °C/min.

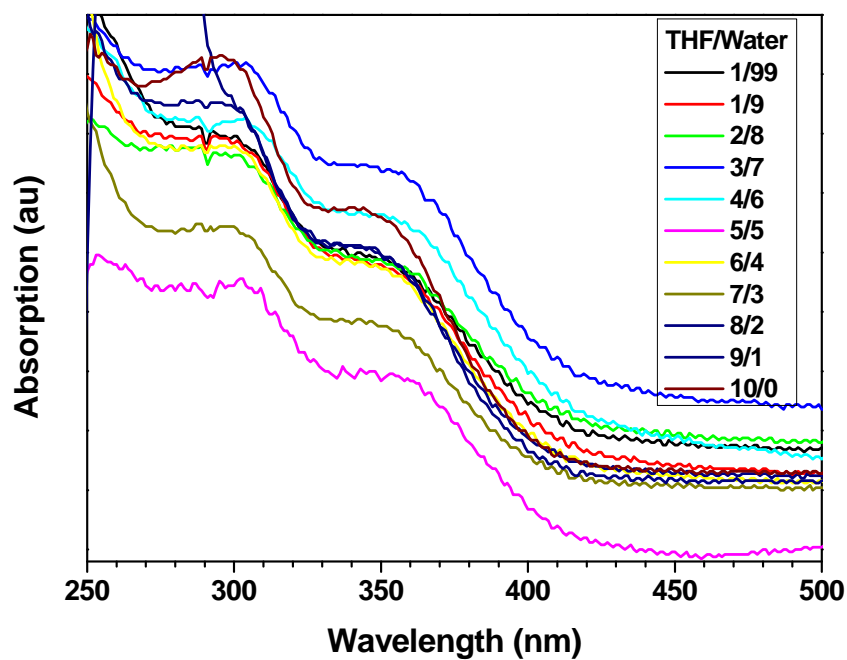


Fig. S3 UV-Vis spectra of **HP-TPE-Cz** in THF and THF/water mixtures. (2.0×10^{-3} mg/mL).

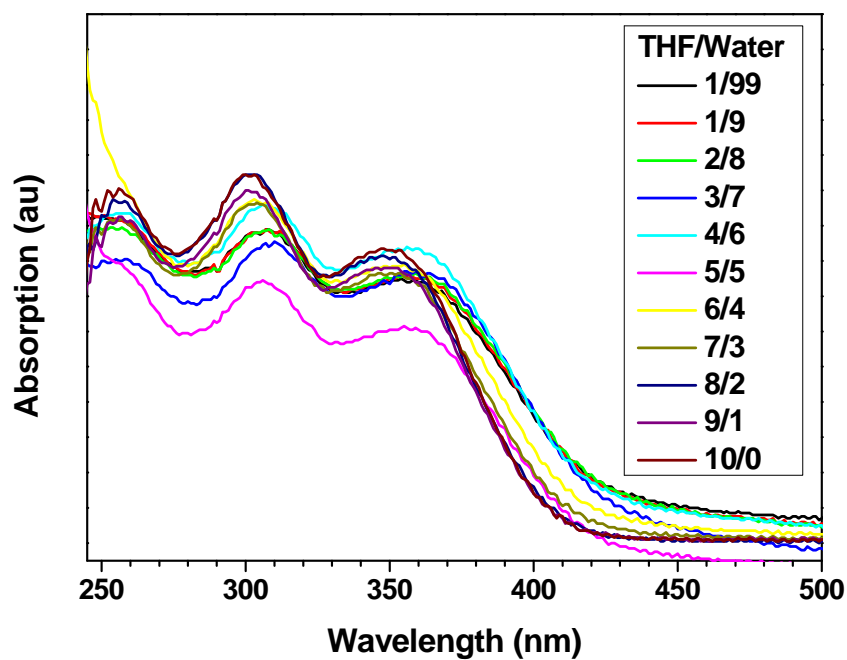


Fig. S4 UV-Vis spectra of **LP-TPE-Cz** in THF and THF/water mixtures. (2.0×10^{-3} mg/mL).

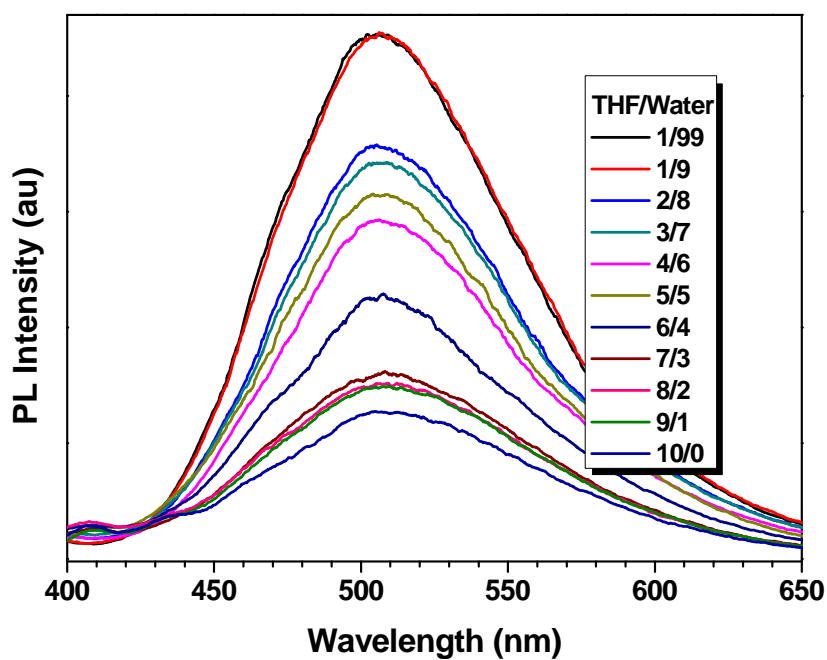


Fig. S5 Photoluminescence (PL) spectra of **LP-TPE-Cz** in THF and THF/water mixtures. (2.0×10^{-3} mg/mL $\lambda_{\text{ex}} = 350$ nm).

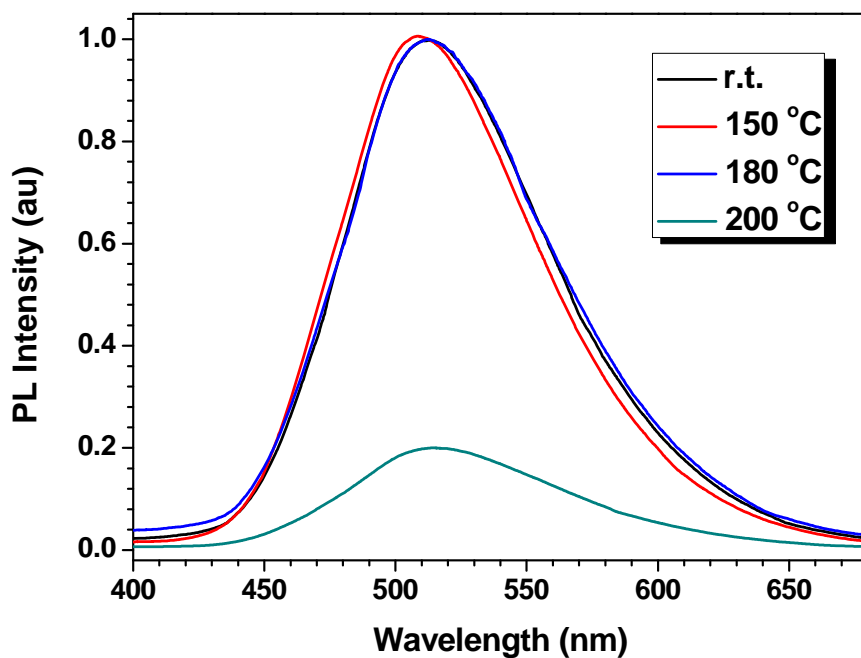


Fig. S6 Photoluminescent spectra of the films of **HP-TPE-Cz** before and after annealing at different temperatures for 30 min in air.

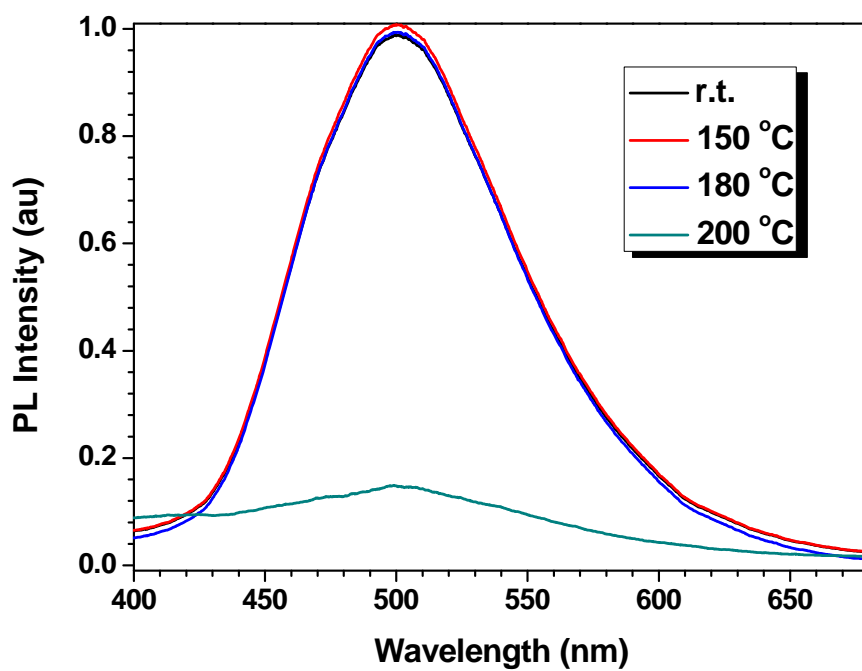


Fig. S7 Photoluminescent spectra of the films of **LP-TPE-Cz** before and after annealing at different temperatures for 30 min in air.

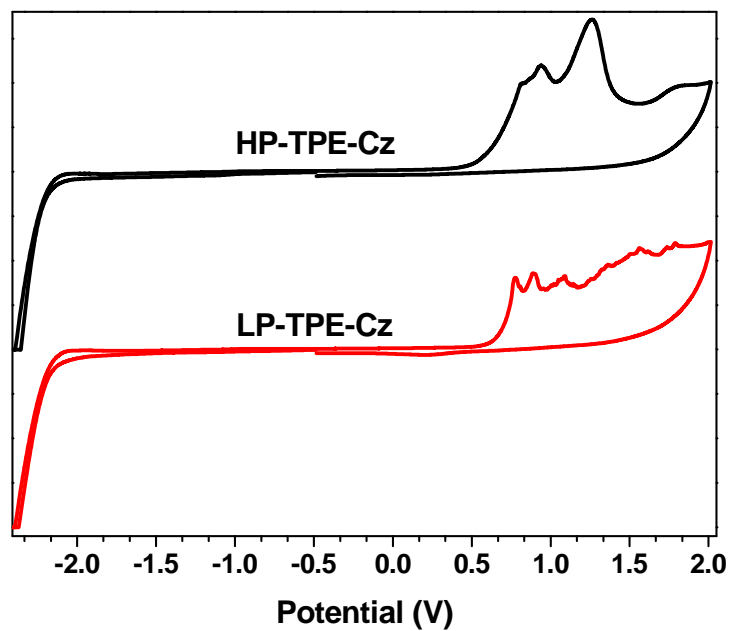


Fig. S8 Cyclic voltammograms of the polymers films on Pt working electrode.

Table S1. Electrochemical Properties of Hyperbranched Polymers

no.	E_g^{opt} (eV) ^a	$E_{\text{onset(ox)}}$ (V) vs Fc ^b	E_{HOMO} (eV) ^c	E_{LUMO} (eV) ^d
HP-TPE-Cz	2.66	0.60	-5.40	-2.74
LP-TPE-Cz	2.63	0.70	-5.50	-2.87

^a Band gaps obtained from absorption edge ($E_g = 1240/\lambda_{\text{onset}}$). ^b $E_{\text{Fc}} = 0.48$ V vs Ag/AgCl. ^c $E_{\text{HOMO}} = -(E_{\text{onset(ox),FOC}} + 4.8)$ eV. ^d $E_{\text{LUMO}} = (E_{\text{HOMO}} + E_g^{\text{opt}})$ eV.

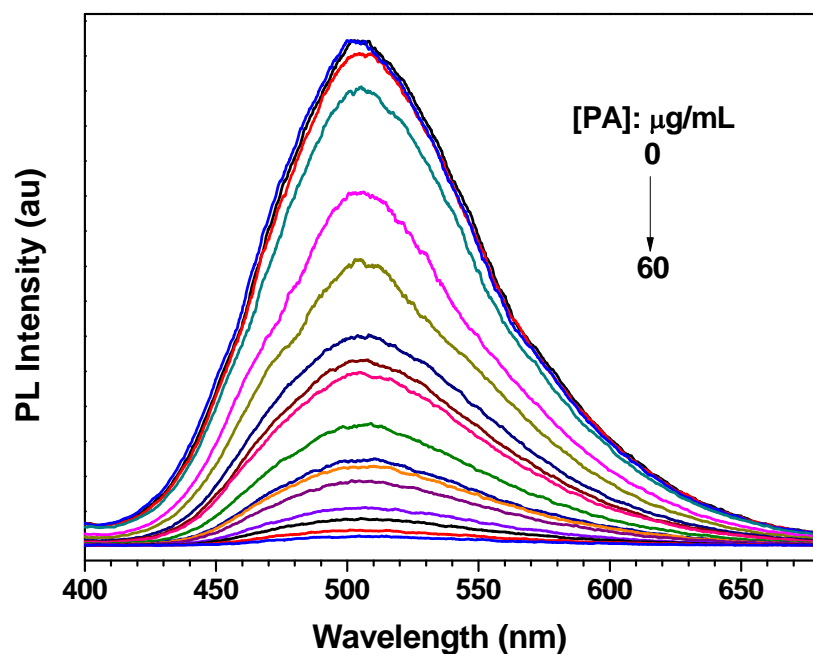


Fig. S9 PL spectra of LP-TPE-Cz in THF/water mixture (1:9 v/v 2.0×10^{-3} mg/mL) containing different amounts of picric acid (PA).

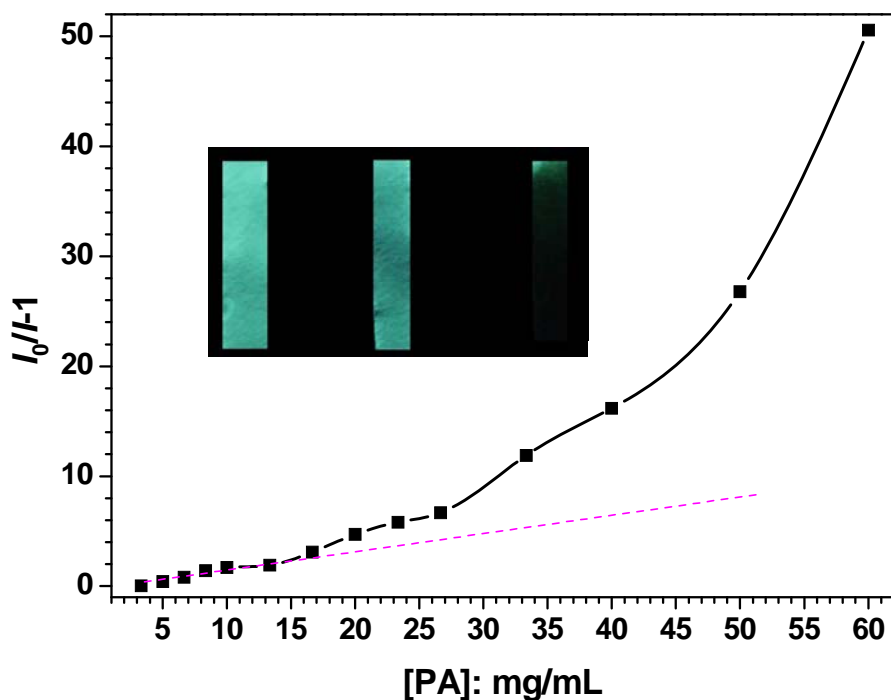


Fig. S10 PA concentration effect on the PL peak intensity of **LP-TPE-Cz** in THF/water mixture (1:9 v/v 2.0×10^{-3} mg/mL), where I = peak intensity and I_0 = peak intensity at [PA]=0 mg/mL. Inset: fluorescence images of **LP-TPE-Cz** samples adsorbed in the filter papers before (the left one), after (the middle one) being partially dipped into pure toluene and after (the right one) being partially dipped into a toluene solution of PA (80 $\mu\text{g/mL}$).