Supporting Information

A Λ-shaped cyanostilbene derivative: multi-stimuli responsive fluorescence sensors, rewritable information storage and colour converter for w-LED

Wenyan Fang[a,b], Wang Zhao[b], Pan Pei[b], Rui Liu[b], Yuyang Zhang[a], Lin Kong[a], Jiaxiang Yang[a,c]*

[a]College of Chemistry & Chemical Engineering, Key Laboratory of Functional Inorganic Materials of Anhui Province, Anhui University, Hefei 230601, PR China [b] School of Chemical and Materials Engineering of Huainan Normal University, Anhui, Huainan 232038, PR China. [c]State Key Laboratory of Crystal Materials, Shandong University, Jinan 502100, PR China

jxyang@ahu.edu.cn

Contents

1 ^{1}H, ^{13}C NMR and mass spectrum of target compound TSA and its precursor TSX

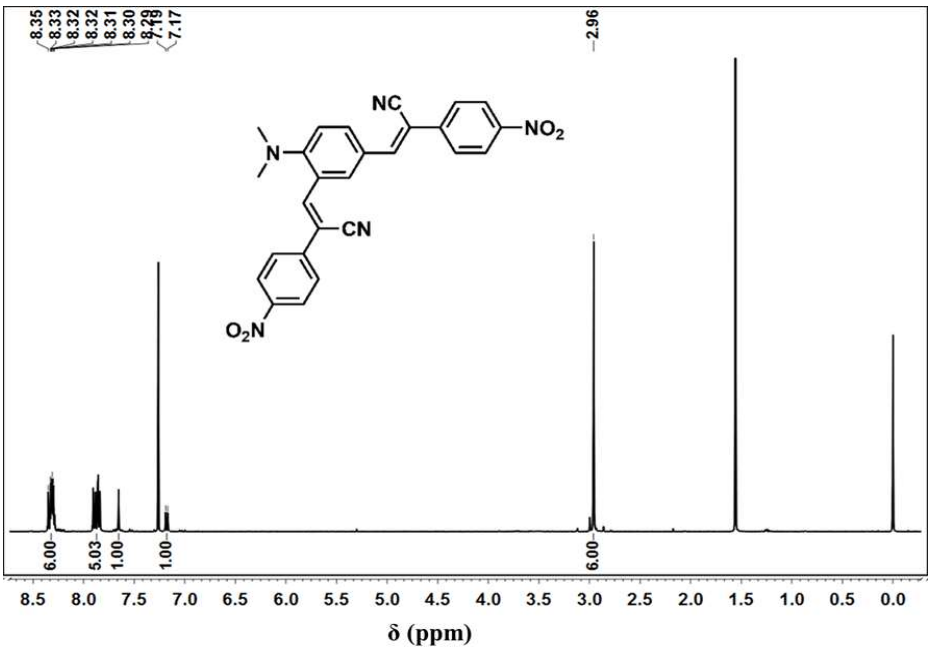

Fig. S1 The ^{1}H NMR of compound **TSX**.

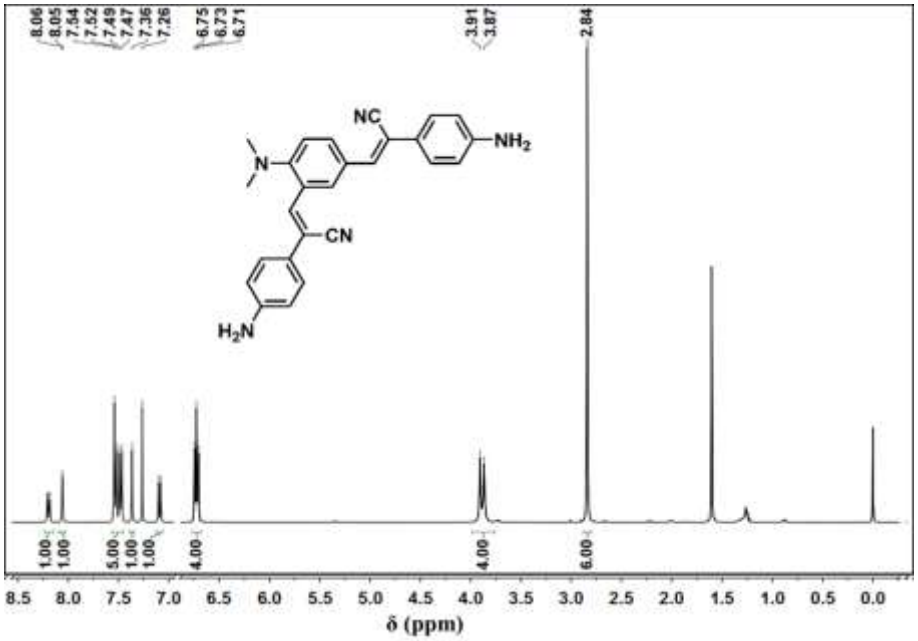

Fig. S2 The ^{1}H NMR of compound **TSA**.

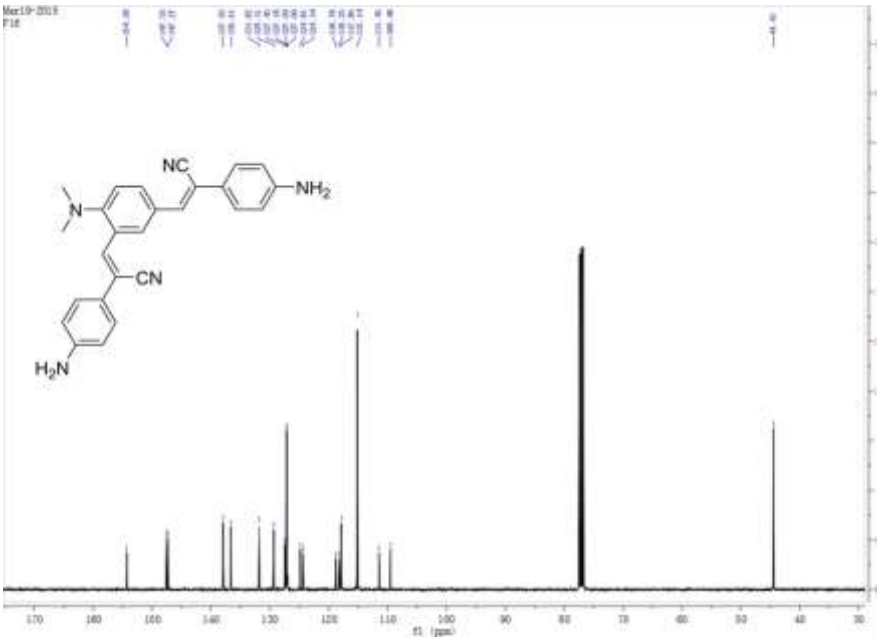

Fig. S3 The ^{13}C NMR of compound **TSA**

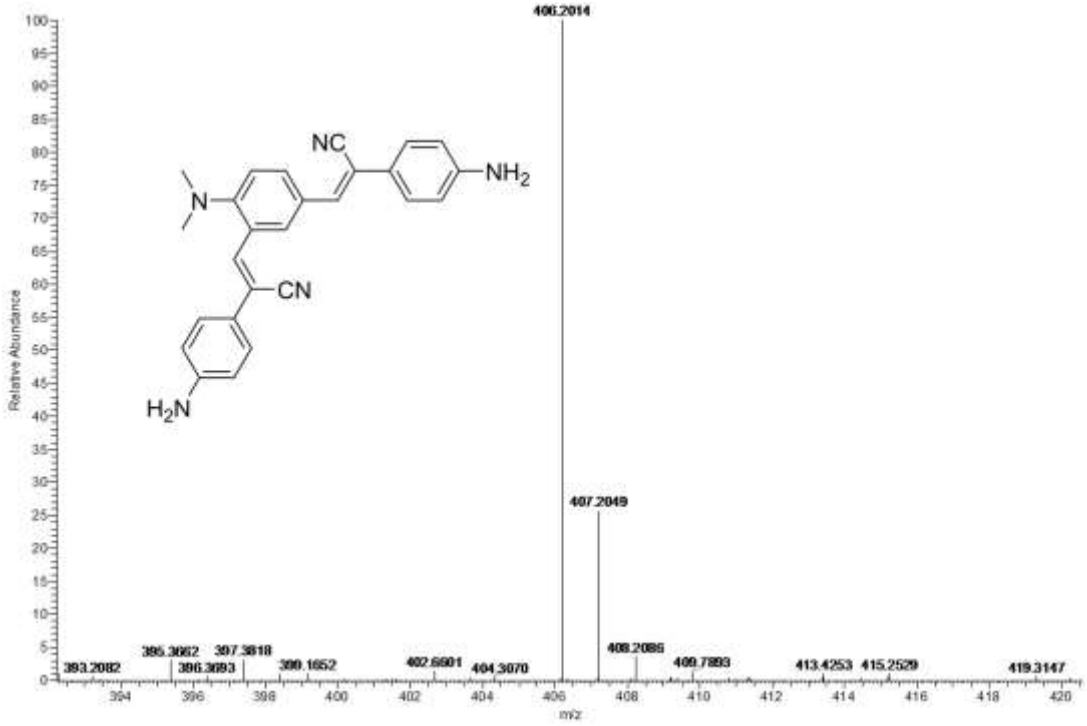

Fig. S4 The mass spectrum of compound **TSA.**

2 TGA and DTG curve of TSA

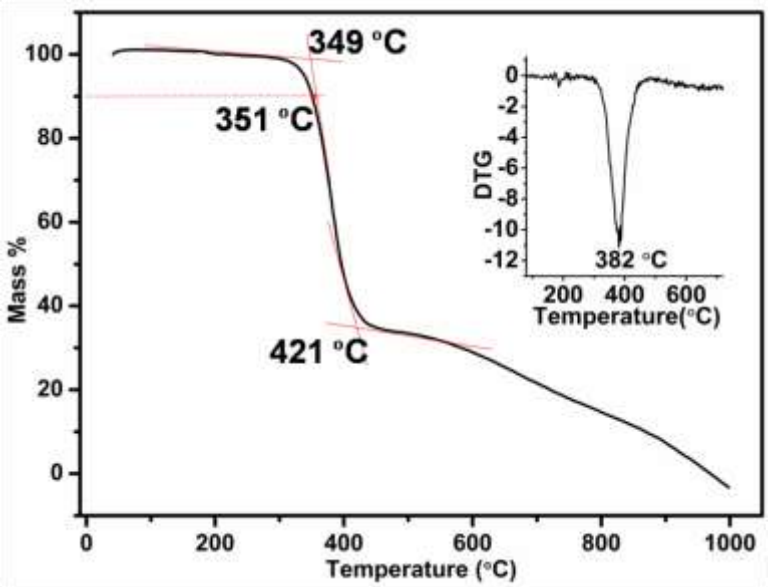

Fig. S5 The TGA curve of **TSA** recorded under nitrogen at a heating rate of 10 °C/min. The inset represents DTG curve.

3 The time-dependent DFT (TD-DFT) calculations

Table S1 The wavelength of absorption maximum of **TSA**, oscillator strength and major orbital contributions of experiment and theory calculation

Compound	Experimental λ (nm)	Theoretical λ (nm)	Osc. strength	Major contributions (% coefficients)	energy gaps （eV）
TSA	387	401	0.2913	H-1→L (56%) H→L + 1 (26%)	3.0908

4 Electron density distributions of the frontier molecular orbital

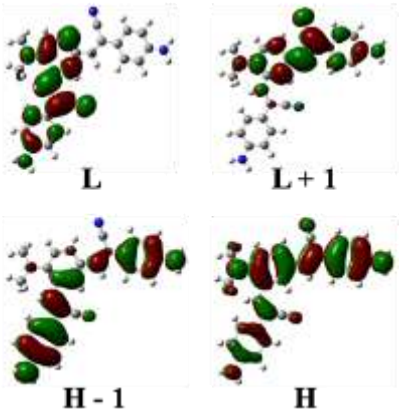

Fig. S6 Electron density distributions of the frontier molecular orbital of compounds **TSA** calculated at the B3LYP/6-31G(d) level

5 Time-resolved emission decay curves

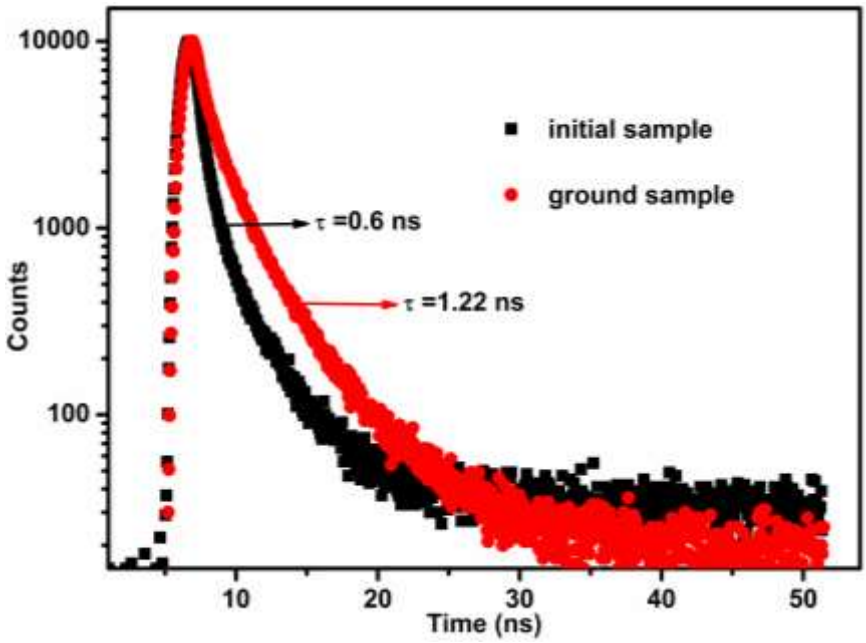

Fig. S7 Time-resolved emission decay curves of **TSA** in original and ground states.

6 Fluorescence quenching rates for aromatic nitro compounds

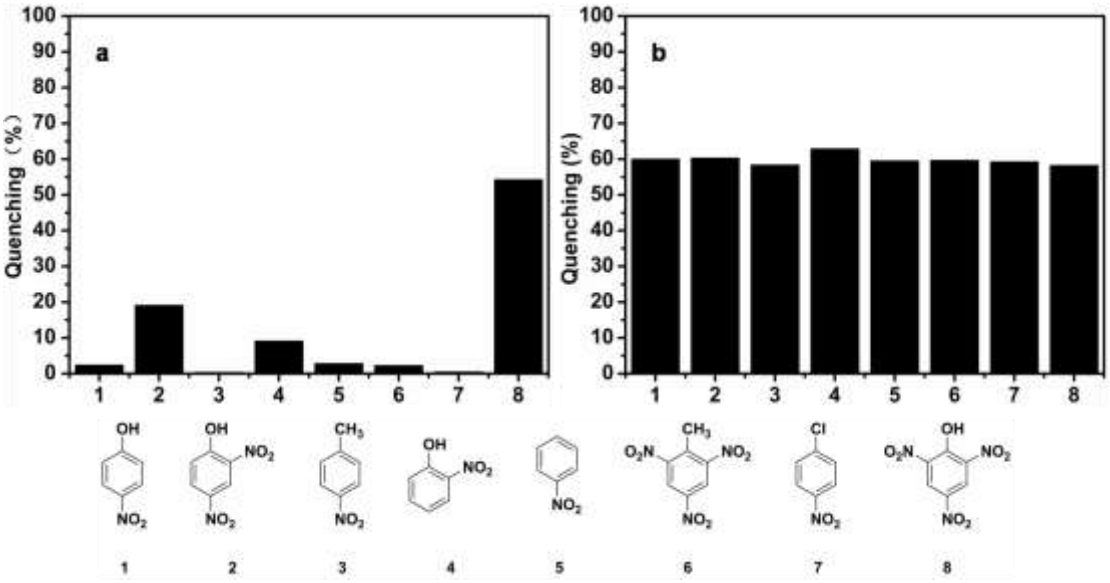

Fig. S8 (a) Fluorescence quenching rates of compound **TSA** upon addition of various aromatic nitro compounds in EtOH/H_2O (f_w = 5%) mixture. (b) Fluorescence quenching rates of compound **TSA** toward PA and PA + other aromatic nitro compounds in EtOH/H_2O (f_w = 5%) mixture.

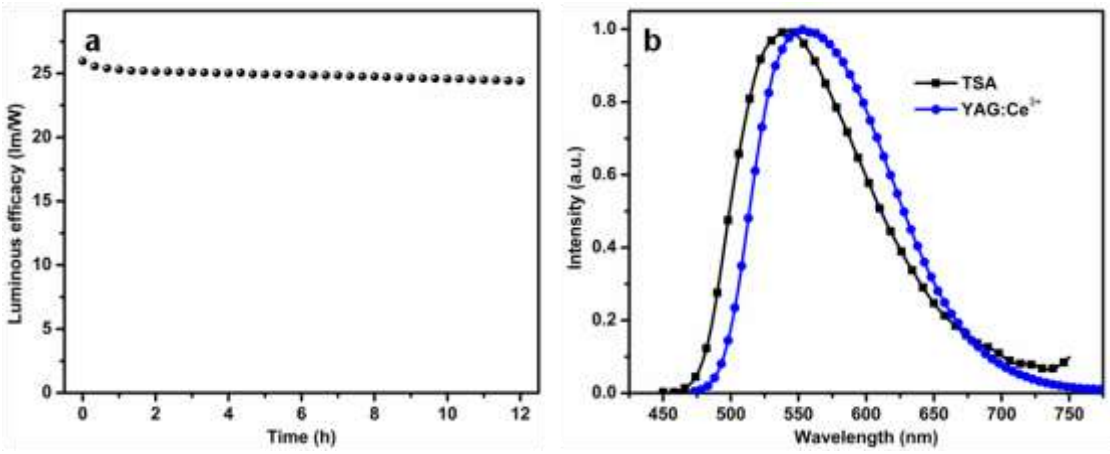

Fig.S9 (a) The temporal stability of the fabricated w-LED. **(b)** The emission spectra of **TSA** and **YAG:Ce.**