

Electronic Supplementary Material (ESI) for New Journal of Chemistry.

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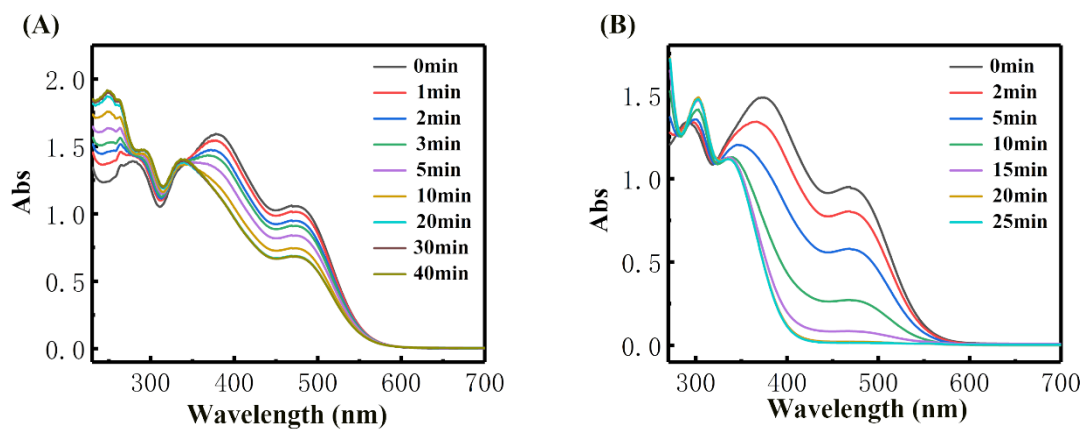
## Supplementary Information

# **AIE-active dual fluorescent switch with negative photochromism for information display and encryption**

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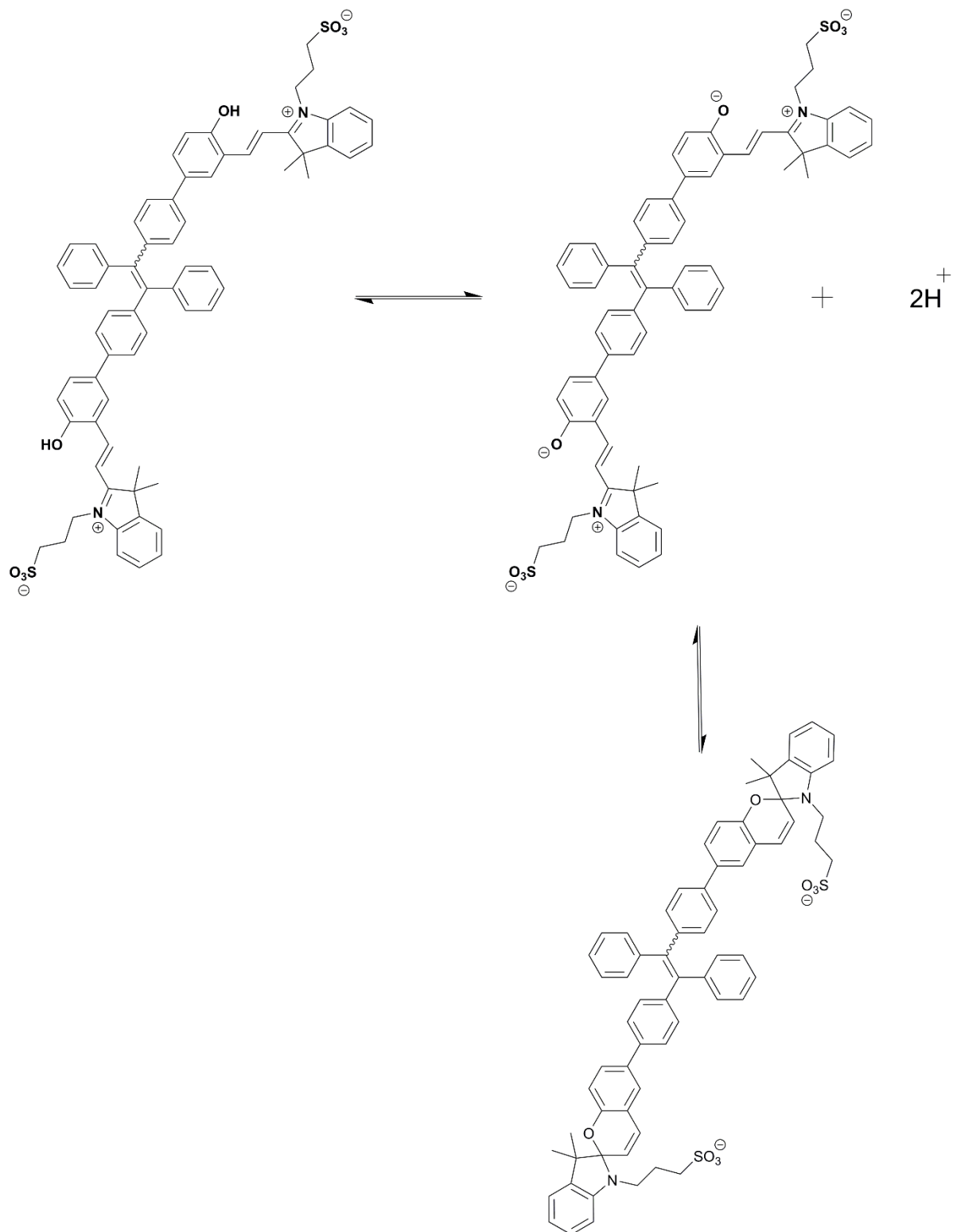
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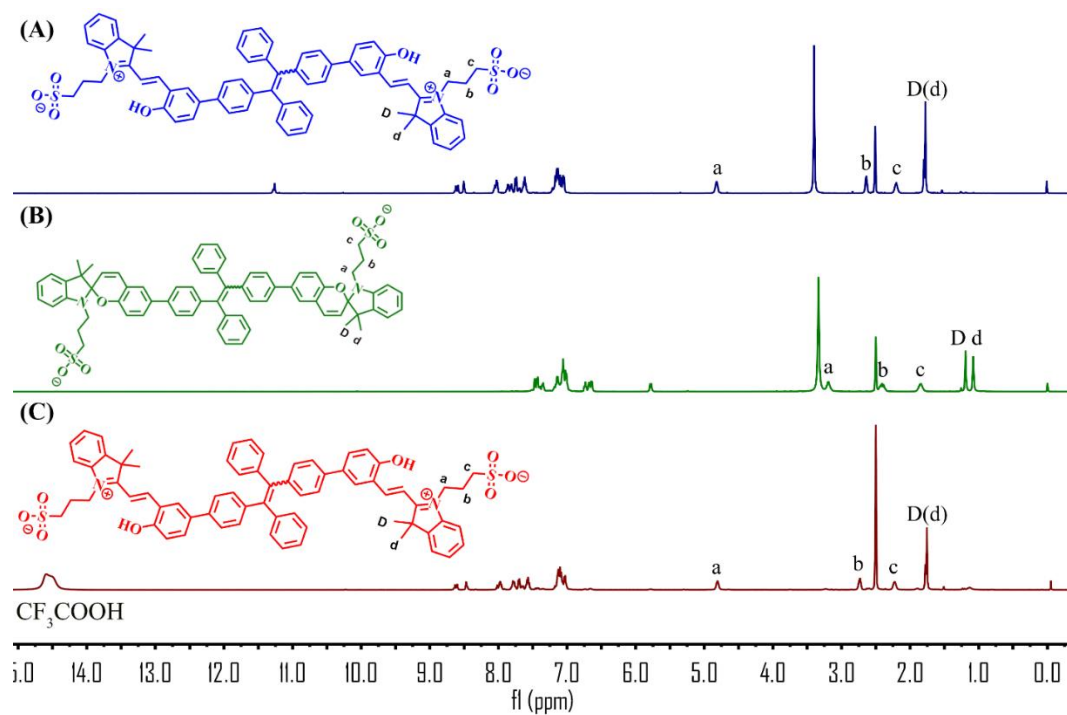


**Fig. S1** UV-vis absorption spectra of STS ( $10^{-4}$  mol/L) irradiated with blue light for different time

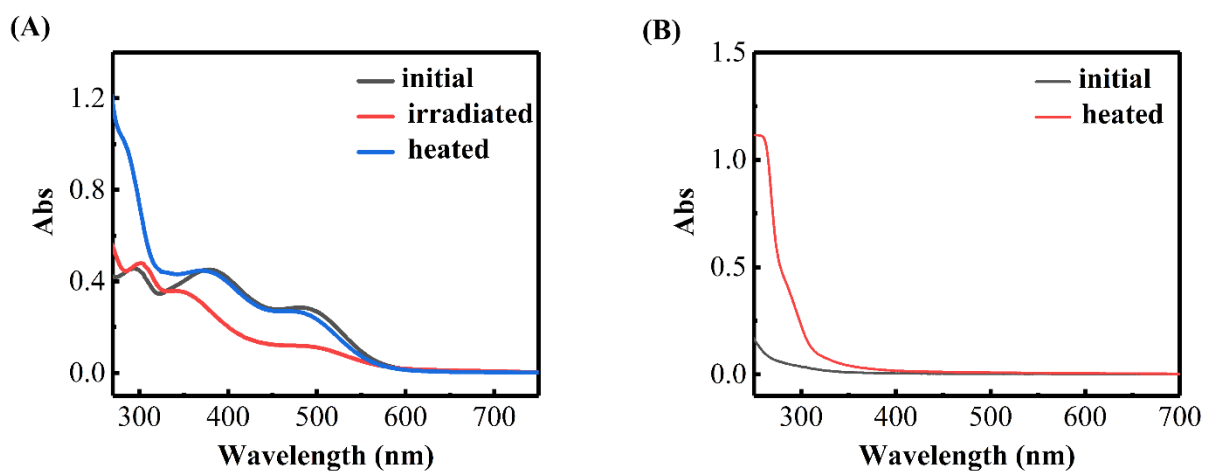
(A) in  $\text{CH}_3\text{OH}$ , (B) in DMSO.



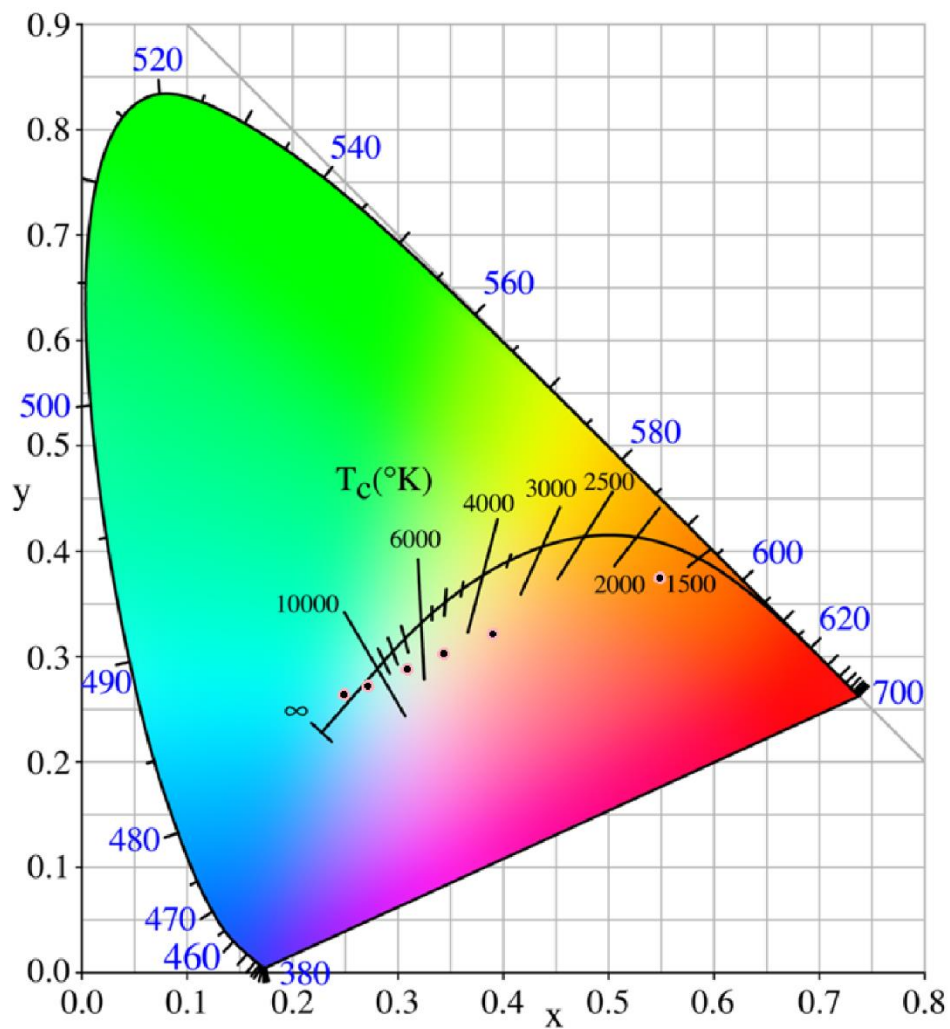
**Fig. S2** Prediction of the mechanism of ring closure caused by dilution of STS.



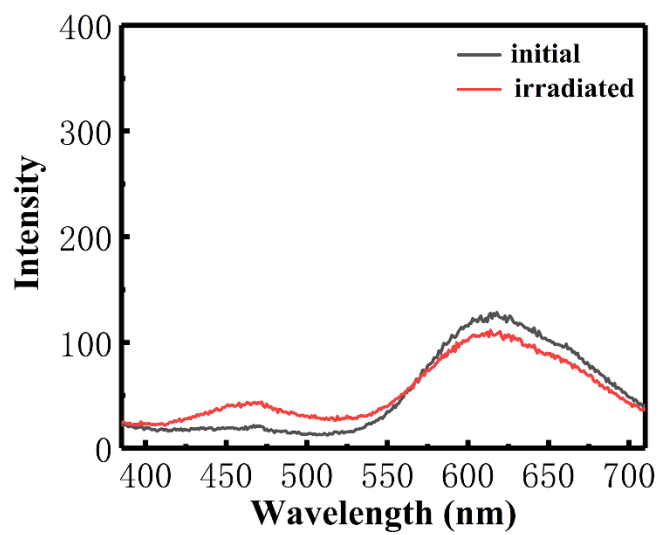
**Fig. S3**  $^1\text{H}$  NMR spectra of STS in  $\text{DMSO-d}_6$  (A) initial, (B) after addition of 2 eq NaOH, (C) adding 80 eq  $\text{CF}_3\text{COOD}$  on the basis of B.



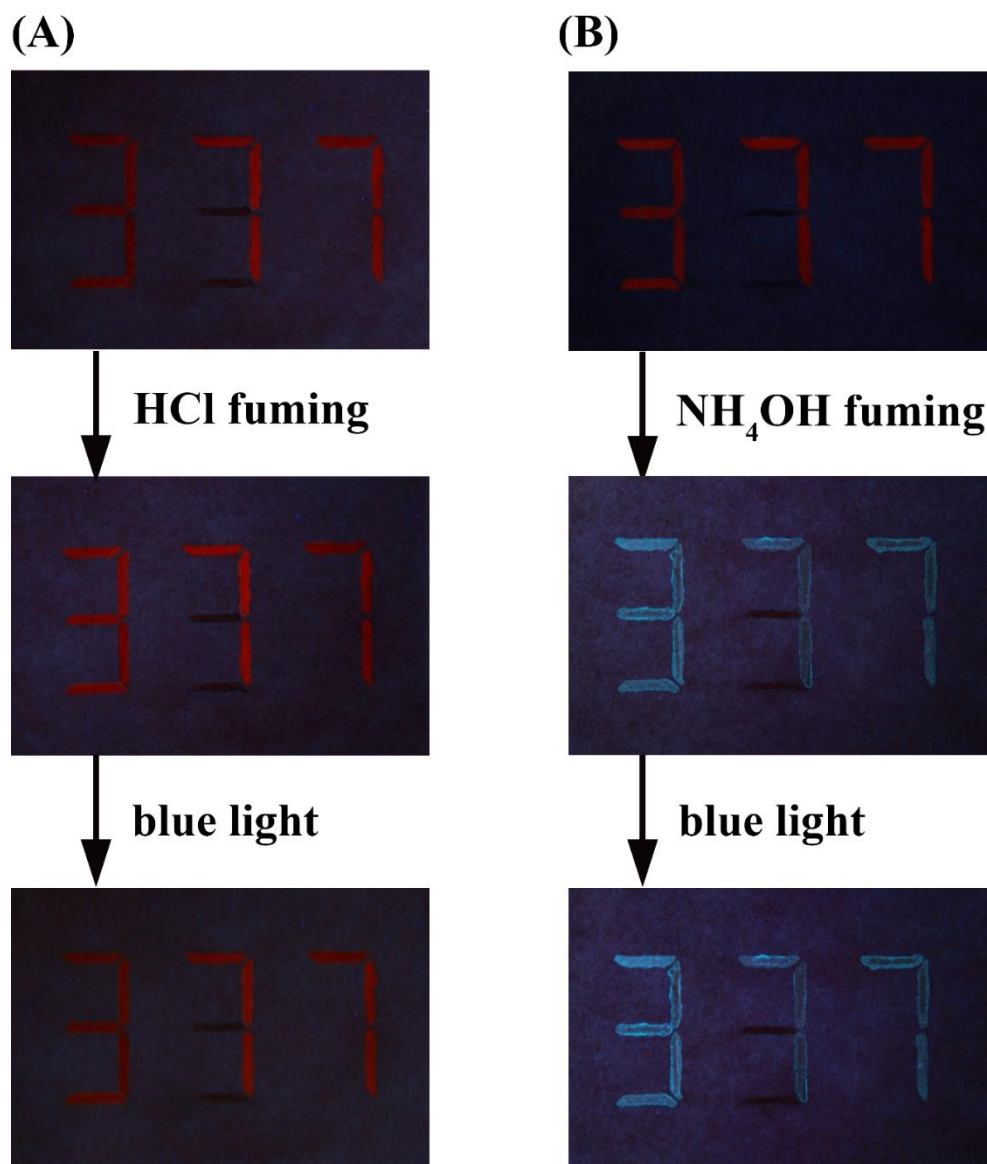
**Figure S4** (A) UV-vis absorption spectra of STS/PVP film after different treatments. (B) UV-vis absorption spectra of PVP film before and after heated at 135°C.



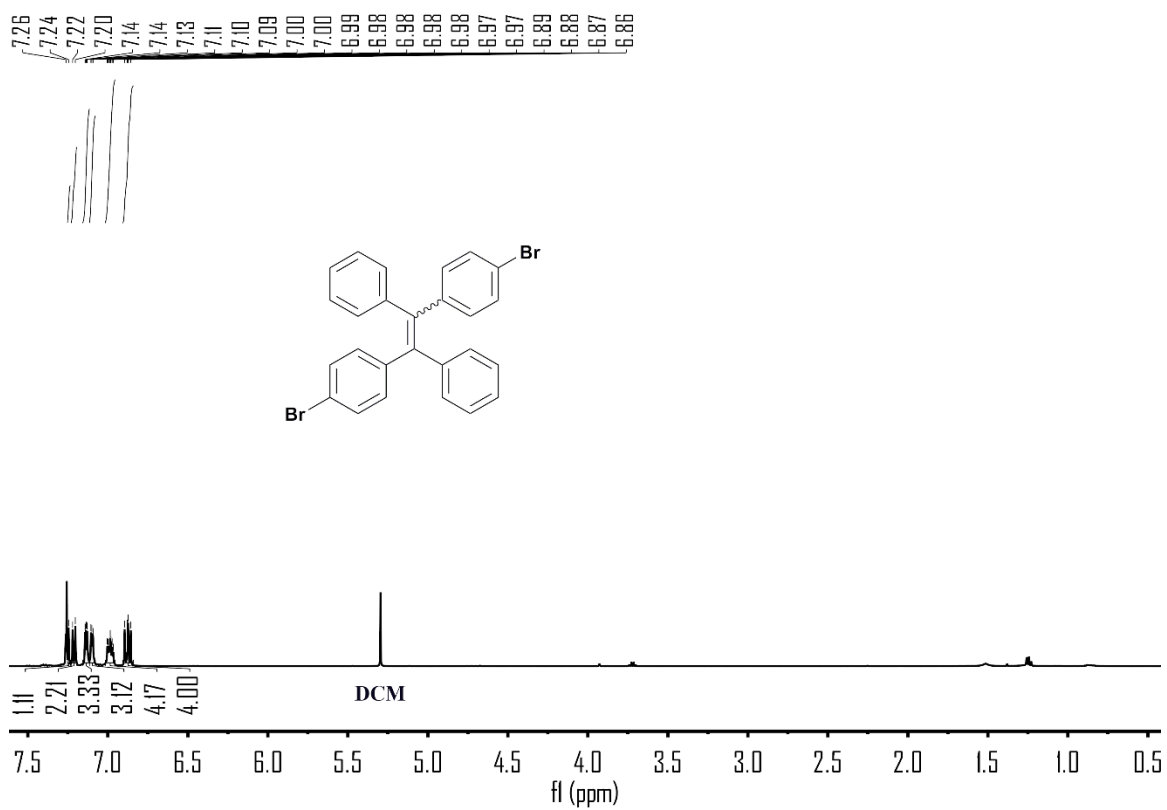
**Fig. S5** CIE graph of STS/PVP film irradiated with blue light for different time (from right to left, followed by 0 min, 3 min, 5 min, 7 min, 10 min, 15 min).



**Fig. S6** PL spectra of STS/PVP film doping with 0.5% H<sub>2</sub>SO<sub>4</sub> before and after blue light irradiation, Ex=365 nm.

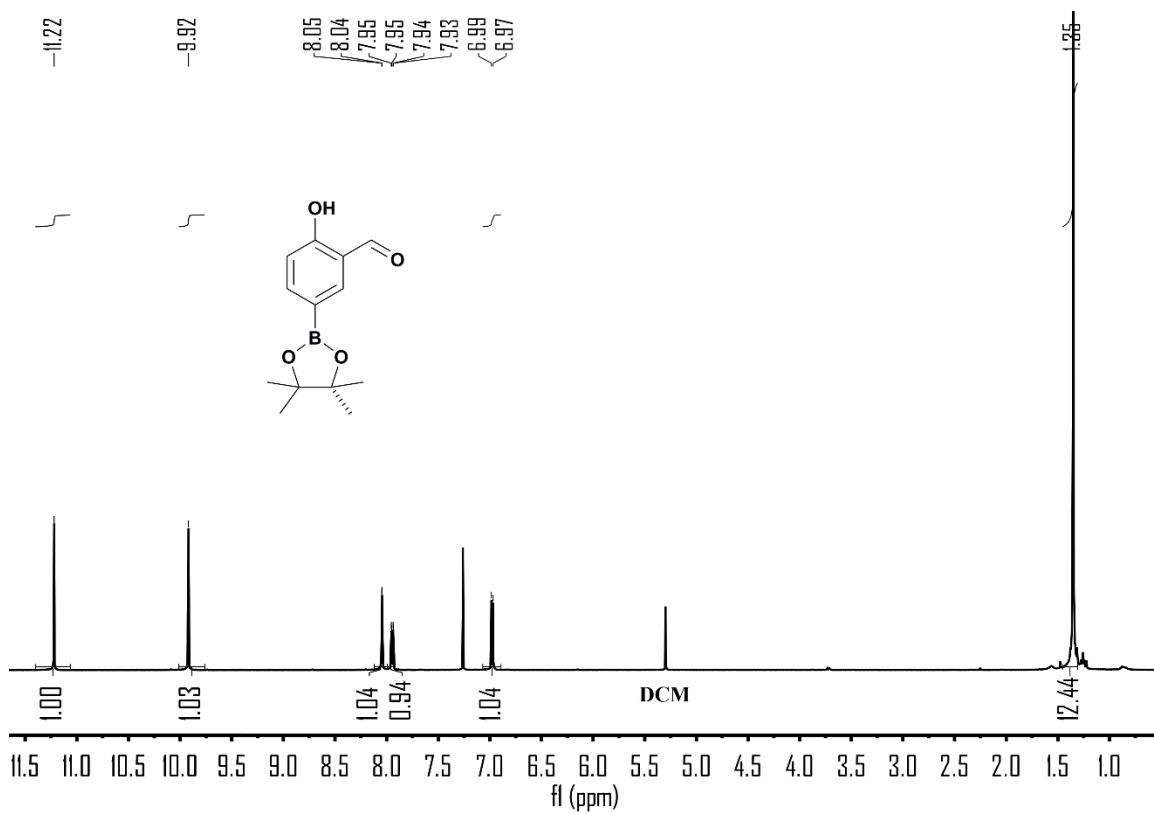


**Fig. S7** Fluorescence images of encrypted information after different processing (A) HCl fuming and blue light irradiating, (B) NH<sub>4</sub>OH fuming and blue light irradiating.

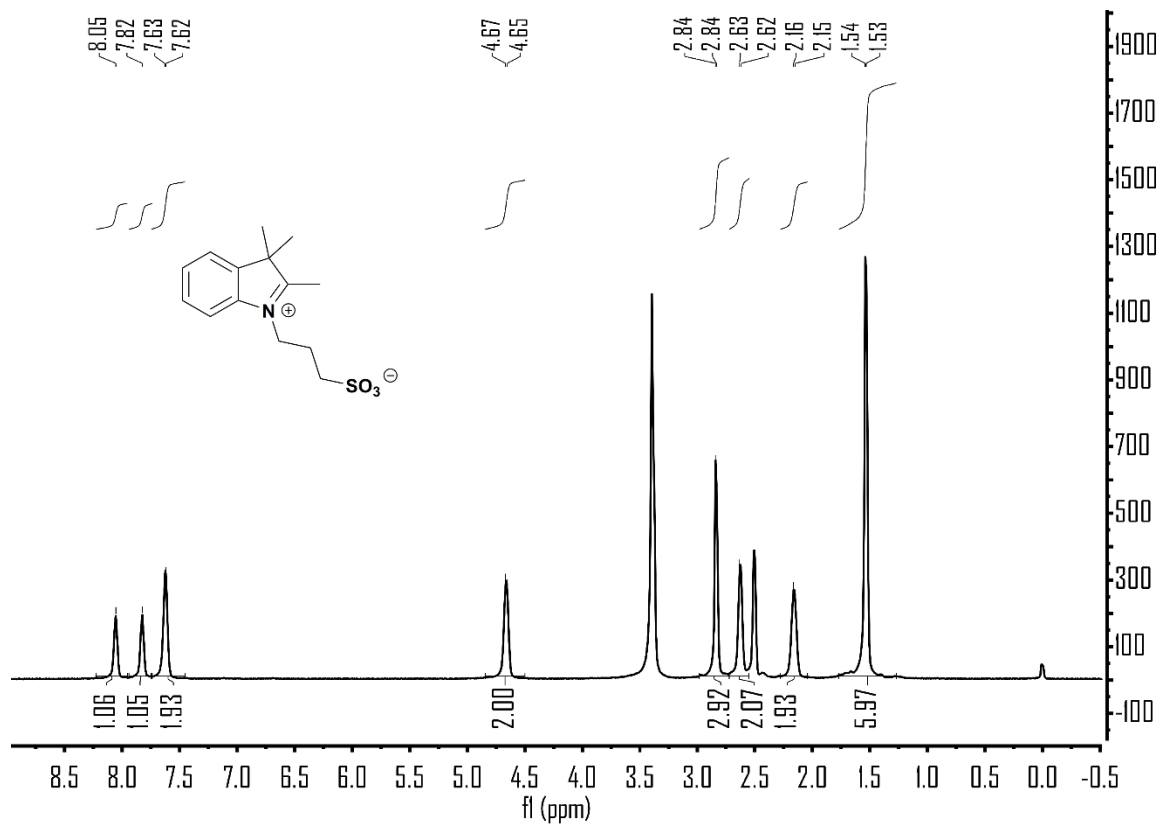


**Fig. S8.** <sup>1</sup>H NMR spectrum of compound Br-TPE-Br in CDCl<sub>3</sub>.

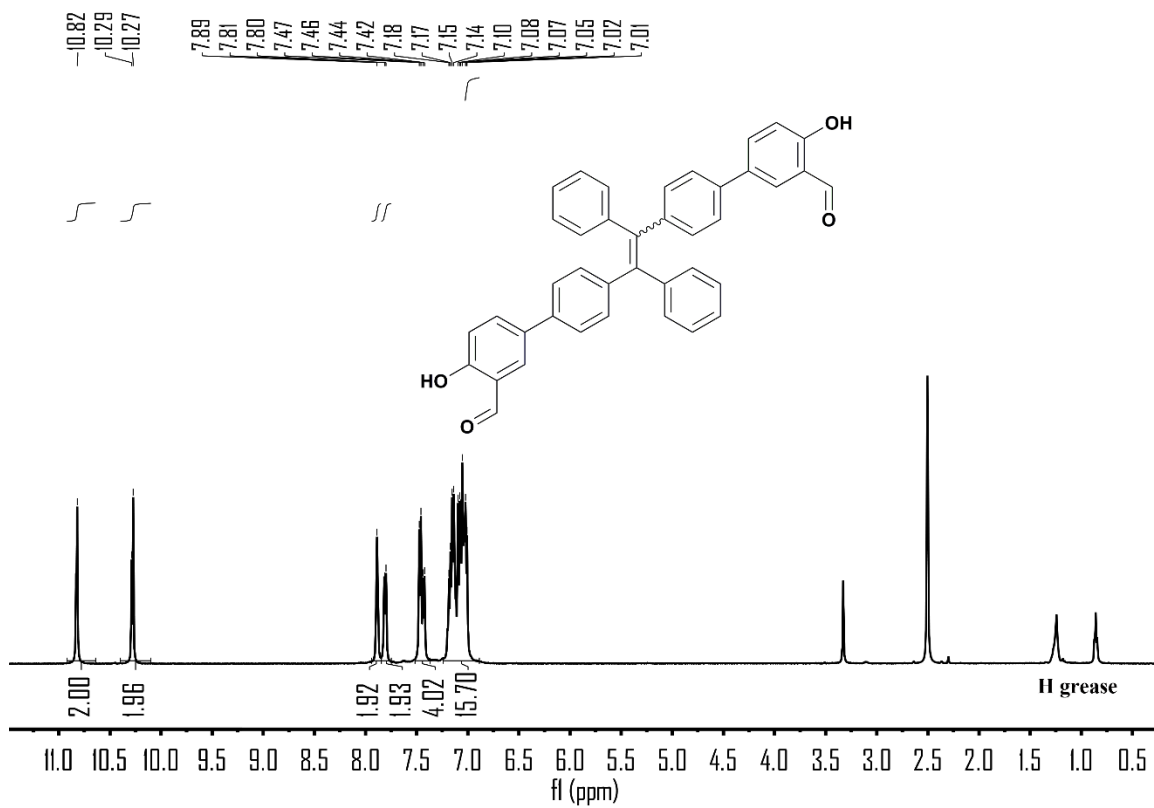




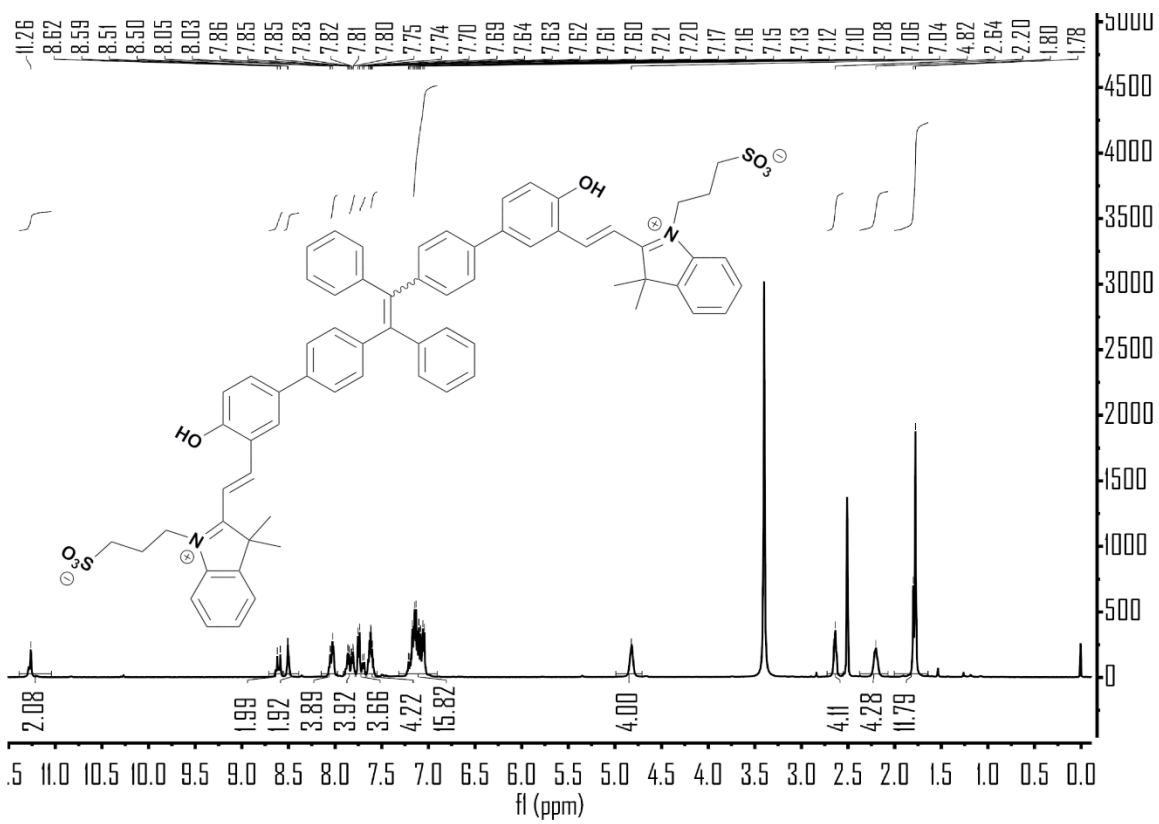
**Fig. S9.** <sup>1</sup>H NMR spectrum of compound BE-CHO in CDCl<sub>3</sub>.



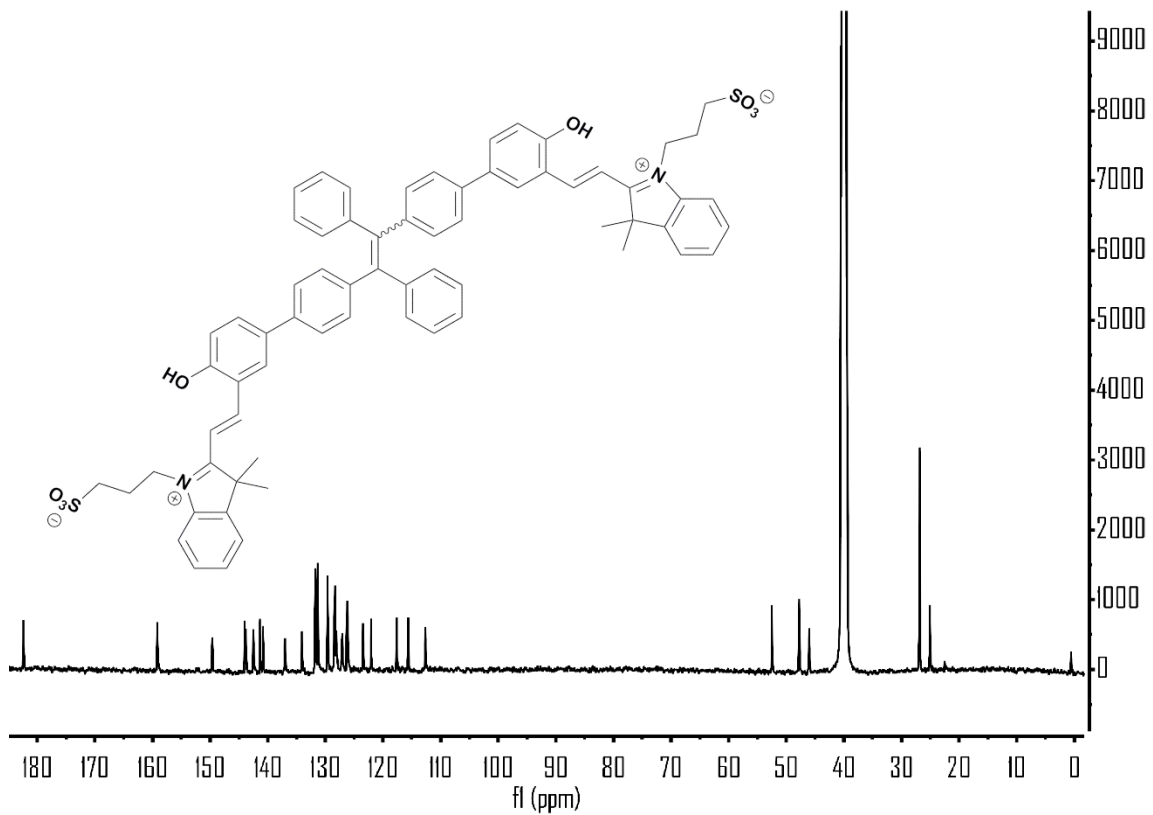
**Fig. S10.** <sup>1</sup>H NMR spectrum of compound Indole-SO<sub>3</sub> in DMSO-d<sub>6</sub>.



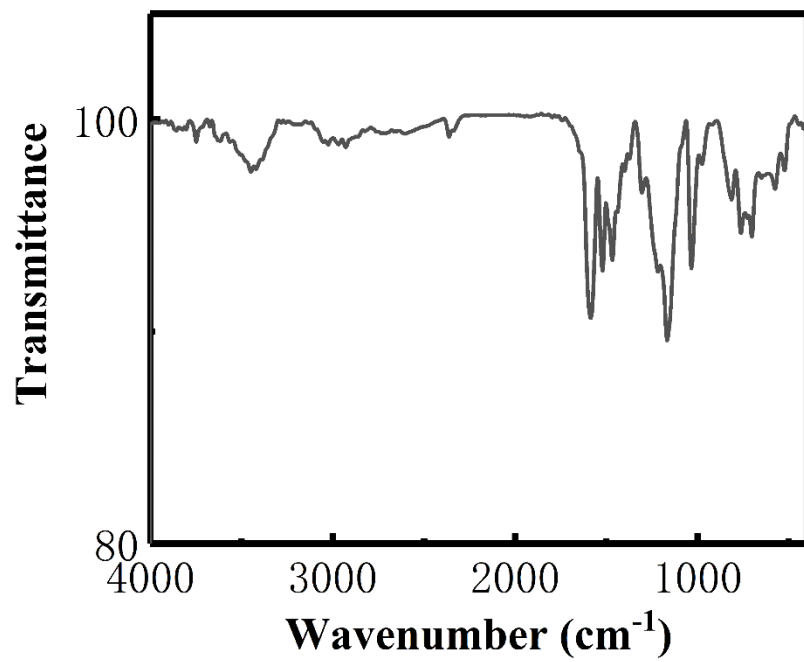
**Fig. S11.** <sup>1</sup>H NMR spectrum of compound CHO-TPE-CHO in DMSO-d<sub>6</sub>.



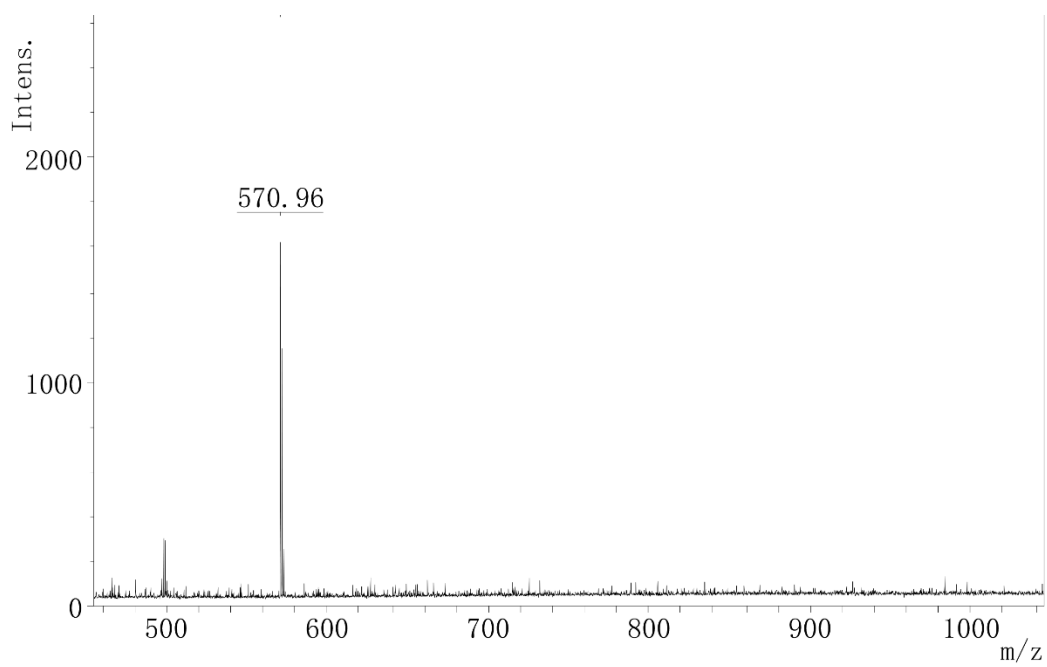
**Fig. S12.** <sup>1</sup>H NMR spectrum of compound STS in DMSO-d<sub>6</sub>.



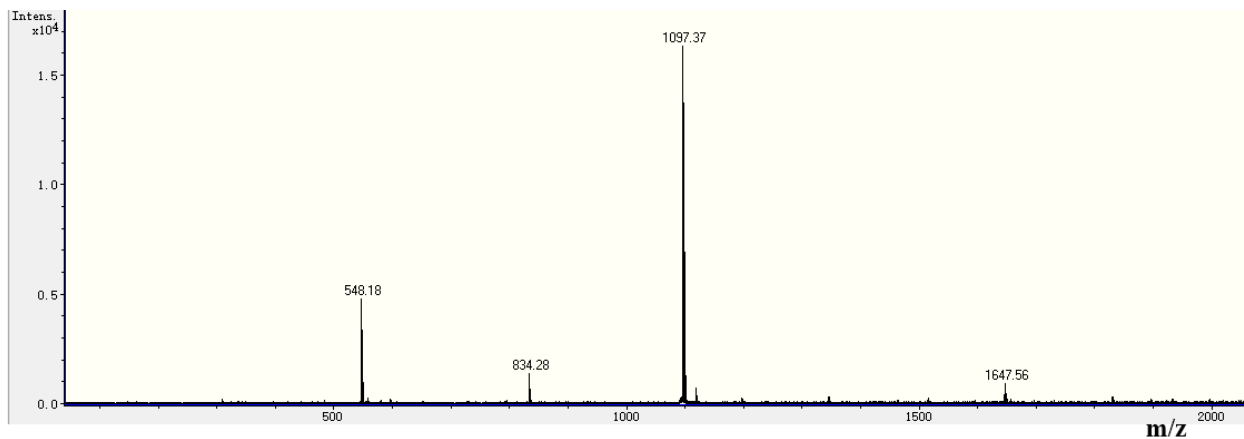
**Fig. S13.**  $^{13}\text{C}$  NMR spectrum of compound STS in  $\text{DMSO-d}_6$ .



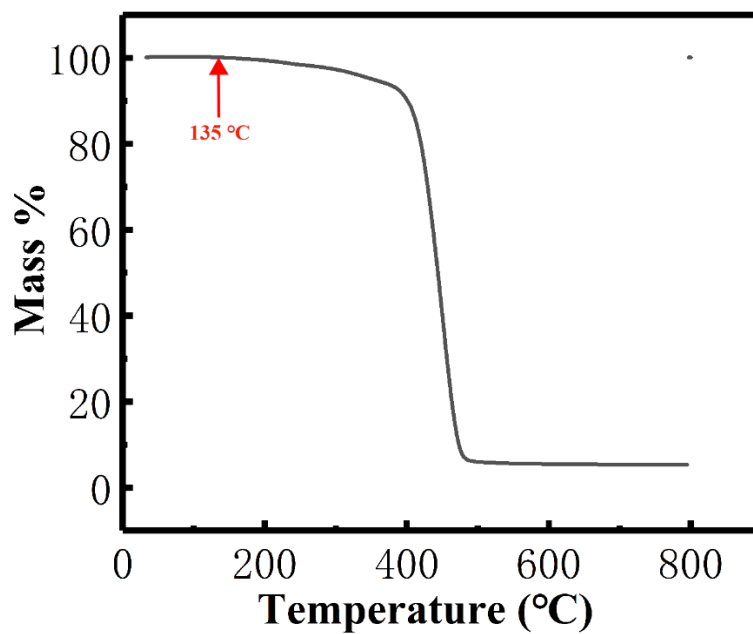
**Fig. S14.** FT-IR spectrum of STS.



**Fig. S15.** Mass spectrometry of CHO-TPE-CHO.



**Fig. S16.** Mass spectrometry of STS.



**Fig. S17** Thermal decomposition curve of STS/PVP film.