AIE-active molecule based self-assembled nano-fibrous films for sensitive detection of volatile organic amines

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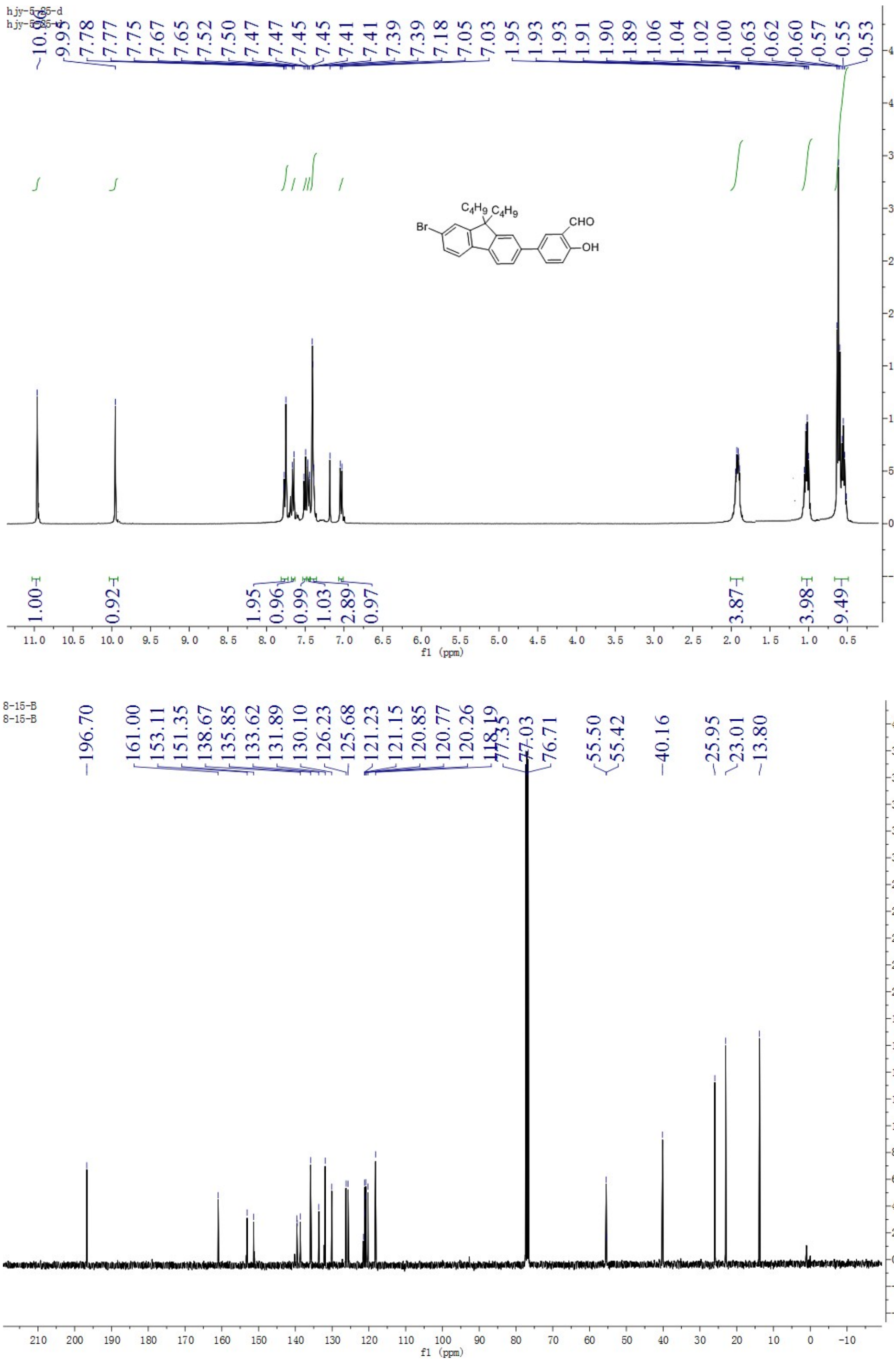
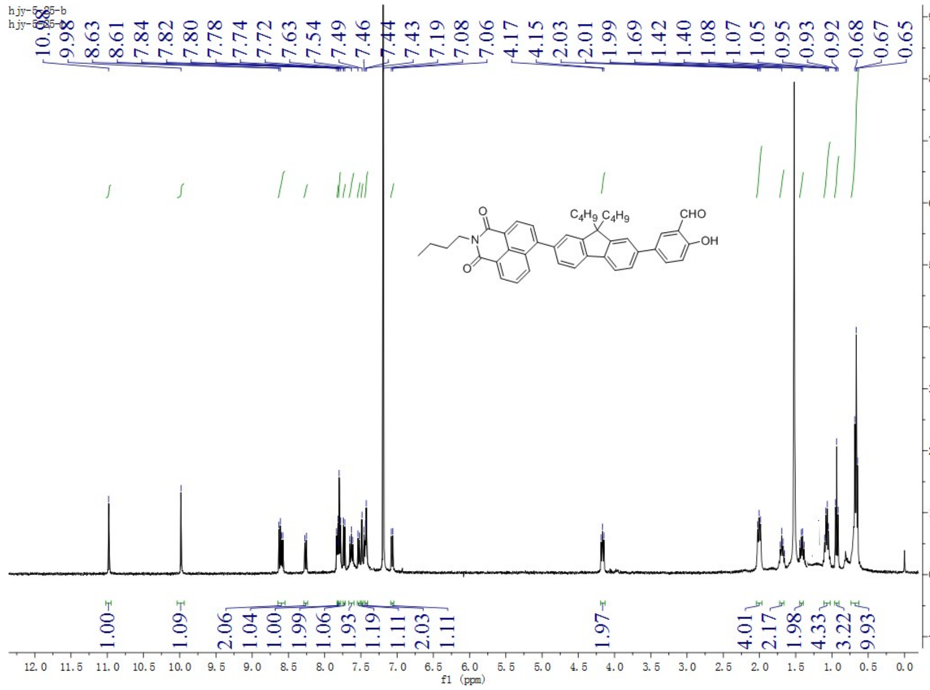
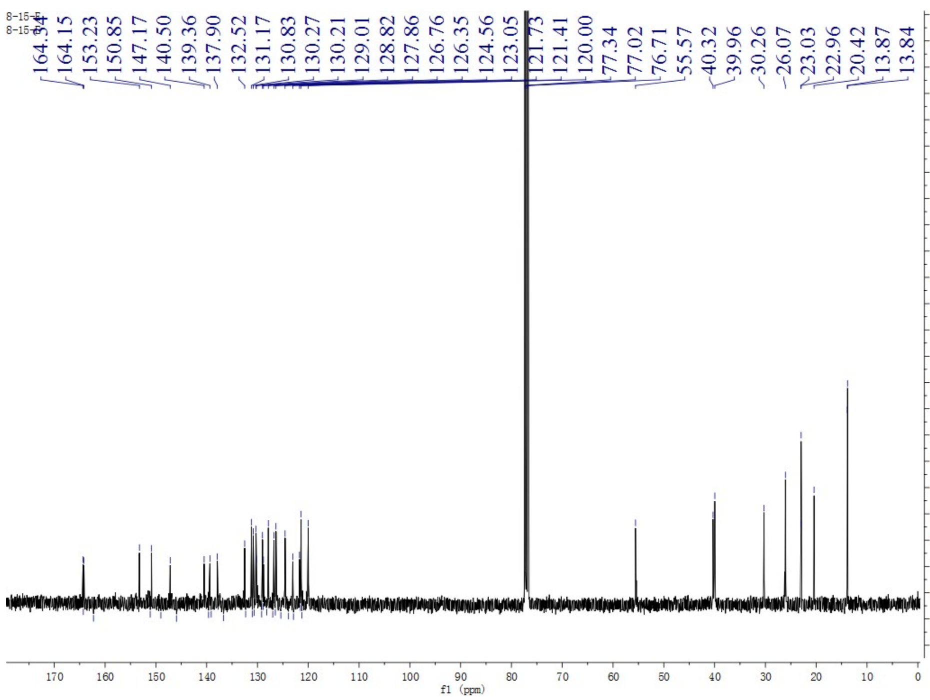


Fig.S1 ^{1}H NMR and ^{13}C NMR spectra of compounds **SFB**





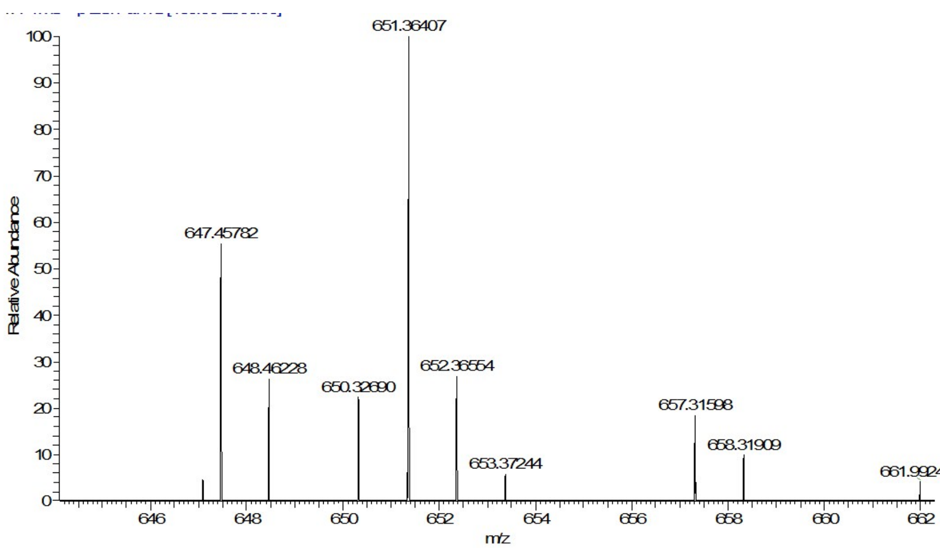
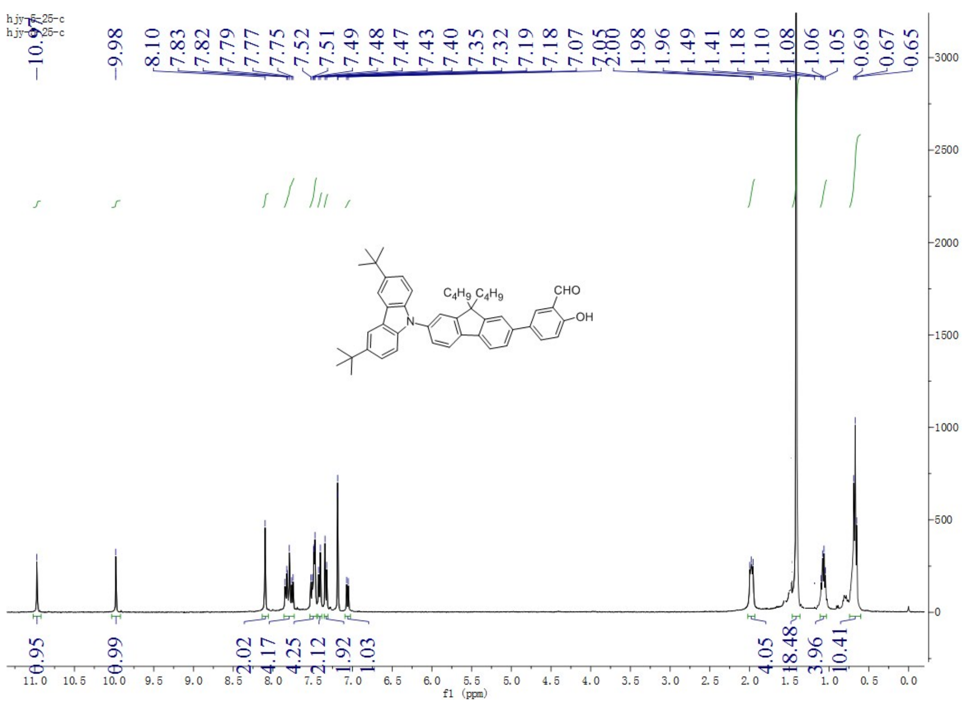
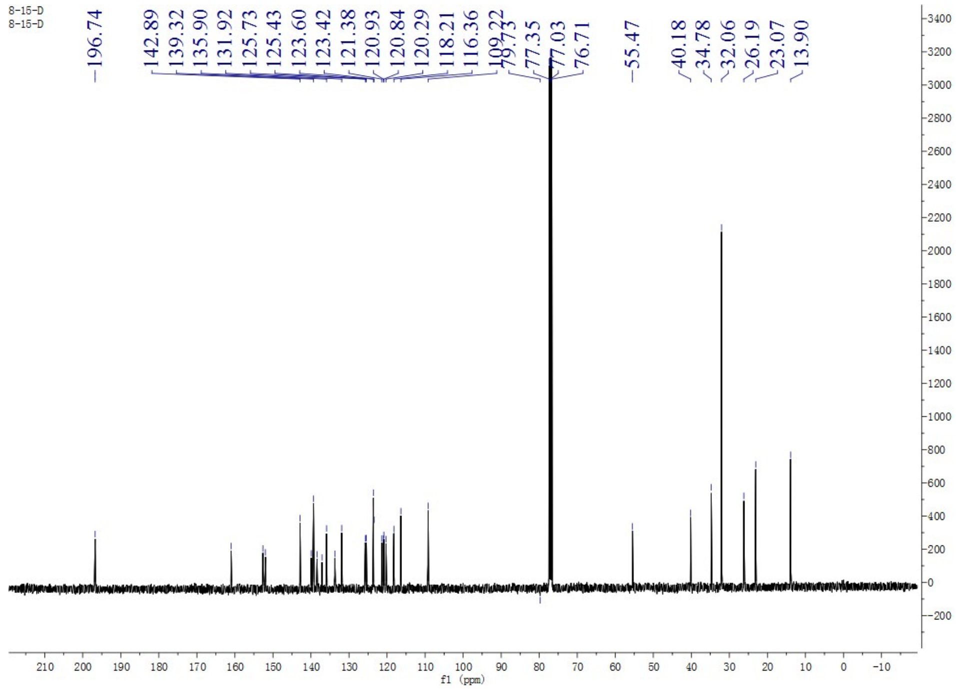


Fig.S2 ^{1}H NMR, ^{13}C NMR and high resolution mass spectrometry of compounds **SFN**





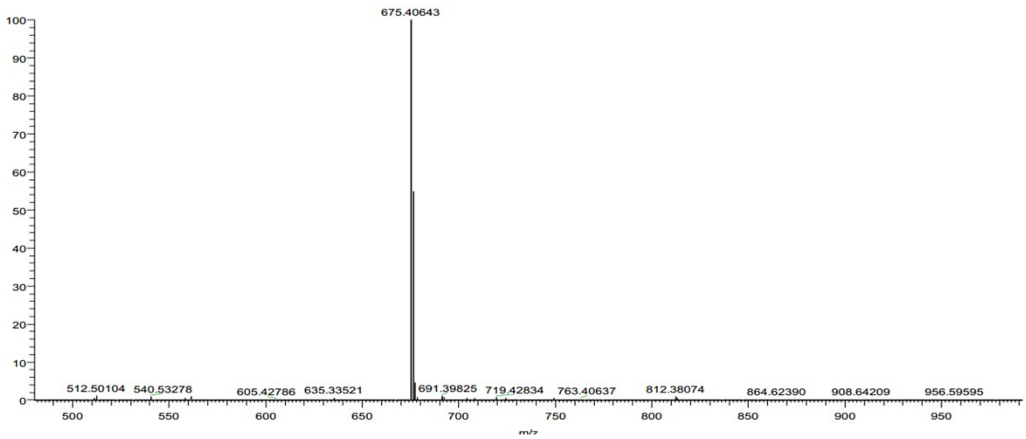


Fig.S3 ^{1}H NMR, ^{13}C NMR and high resolution mass spectrometry of compounds **SFC**

Table S1 Emission wavelength and quantum yield of SFN and SFC in different solvents at R.T. and their solid quantum yield.

	λ_{em}/nm (Φ_{em})^{a}					
	Hexane	Toluene	THF	CH_2Cl_2	CH_3CN	Solid
SFN	431(0.77)	460(0.56)	496(0.41)	507(0.39)	536(0.37)	502(0.61)
SFC	389/527(0.05)	396/538(0.04)	407/542(0.02)	413/557(0.012)	436(0.008)	553(0.08)

a Determined in different solvents using 0.1 M sulfuric acid solution of quinine sulfate (Φ_{em}=0.54, excited at 365 nm) was used as the reference.

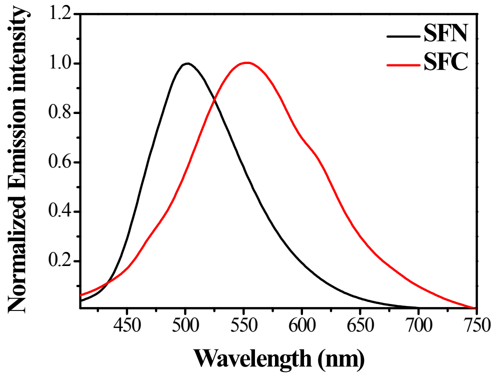


Fig. S4 Normalized emission spectra of SFN and SFC in solid state.

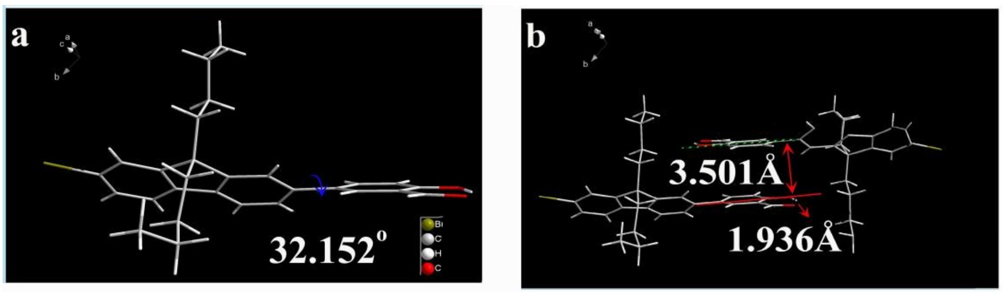


Fig. S5 (a) Molecular structure and (b) crystal packing mode of SFB. The inter/intramolecular weak interactions (O-H···O and π-π) were shown as dashed lines.

Table S2 Crystallographic data of **SFB, SFN and SFC** (1558696-1558698)

	SFB	**SFN**	**SFC**
formula	$C_{28}H_{29}BrO_2$	$C_{44}H_{43}NO_4$	$C_{48}H_{53}NO_2$
fw	477.42	649.32	675.41
crystal system	Triclinic	Triclinic	Triclinic
space group	P-1 (2)	P-1 (2)	P-1 (2)
a, Å	8.7300(7)	11.742(5)	11.417(3)

b, Å	10.4348(8)	12.270(5)	14.259(4)
c, Å	13.1284(13)	13.311(5)	14.489(4)
a, deg	99.414(3)	67.566(10	100.327(4)
β, deg	97.111(3)	84.865(11)	110.851(4)
γ, deg	97.020(2)	77.303(12)	112.865(4)
V, Å^3	1158.30(17)	1729.25(122)	1887.88(90)
Z	2	1	2
ρ_{calcd},g cm^{-3}	1.369	1.16471	1.09507
T / K	296(2)	296(2)	296(2)
μ, mm^{-1}	1.248	1.248	1.189
θ, deg	2.32 to 25	2.42 to 26.98	2.3 to 27.39
F(000)	496	692	728
index ranges	$-10 \le h \le 10$, $-11 \le k \le 12$, $-15 \le l \le 13$	$-13 \le h \le 9$, $-14 \le k \le 14$, $-15 \le l \le 15$	$-13 \le h \le 13$, $-10 \le k \le 16$, $-17 \le l \le 14$
data/restraints/parameters	4068 /0 /283	6022 /278 /445	6447 /0 /469
GOF (F^2)	1.064	1.024	1.047
R_1^a,wR_2^b (I>2σ(I))	0.0461,0.1143	0.0221,0.2258	0.0541, 0.1435
R_1^a, wR_2^b (all data)	0.0574,0.1198	0.0315,0.2114	0.0712, 0.1611

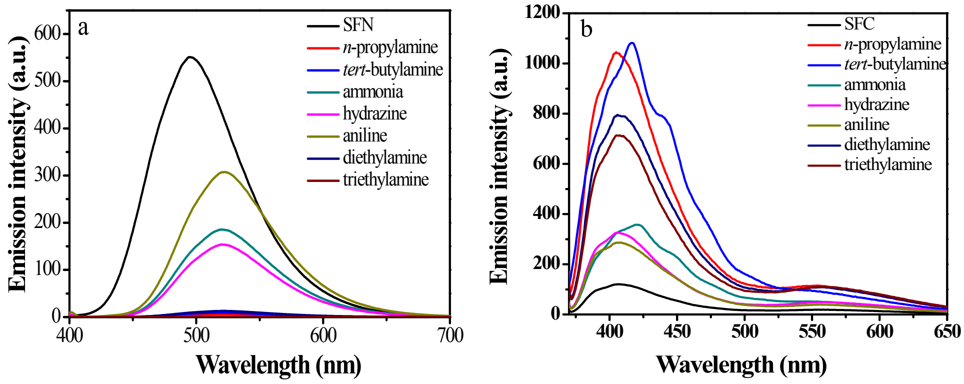


Fig. S6 Changes in fluorescence intensity of SFN (a) and SFC (b) in THF solution with addition of 100 eq. different amines.

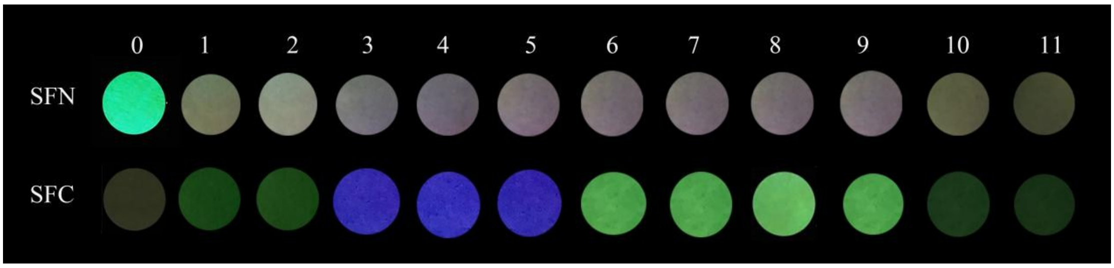


Fig.S7 Photographs of SFN and SFC on test papers upon exposure to different saturated amine vapors for 30 s under 365 nm lamp: (0) blank; (1) ammonia; (2) hydrazine; (3) *n*-propylamine; (4) *tert*-butylamine; (5) *n*-butylamine; (6) diethylamine; (7) diisopropylamine; (8) N,N-diisopropylethylamine; (9) triethylamine; (10) aniline; (11) pyridine.

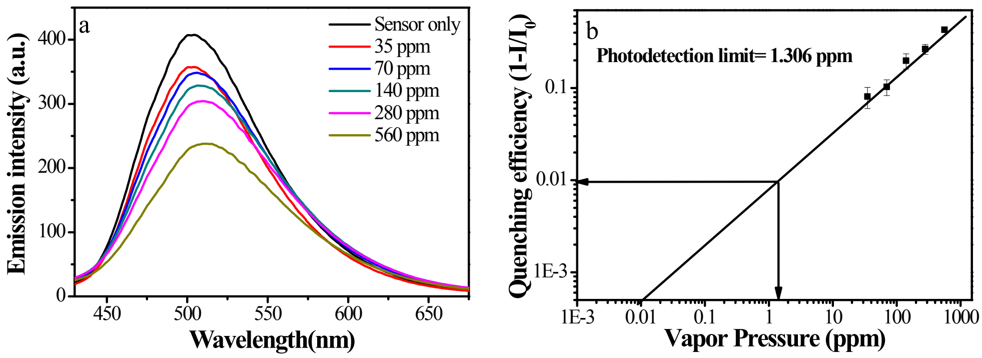


Fig. S8 (a) Changes in fluorescence intensity of SFN films exposed to aniline vapor with different concentrations; (b) The concentration-dependent fluorescence quenching efficiency ($1-I/I_0$) for SFN as a function of the vapor pressure of aniline, fitted with the Langmuir equation.

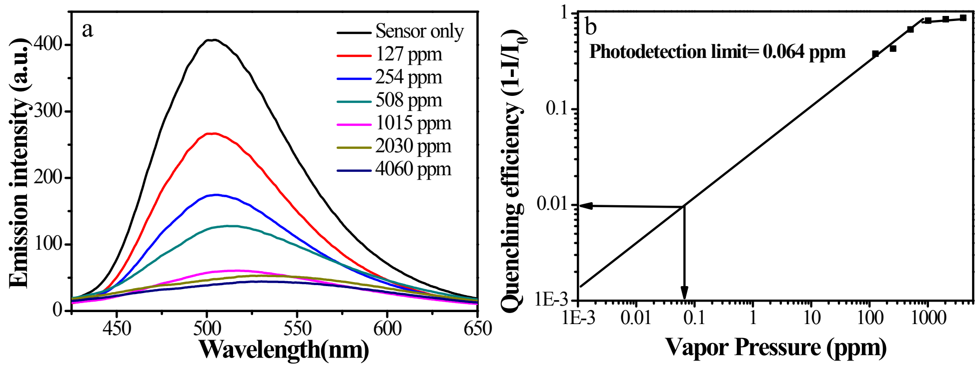


Fig. S9 (a) Changes in fluorescence intensity of SFN films exposed to *n*-propylamine vapor with different concentrations; (b) The concentration-dependent fluorescence quenching efficiency (1-I/I_0) for SFN as a function of the vapor pressure of *n*-propylamine, fitted with the Langmuir equation.

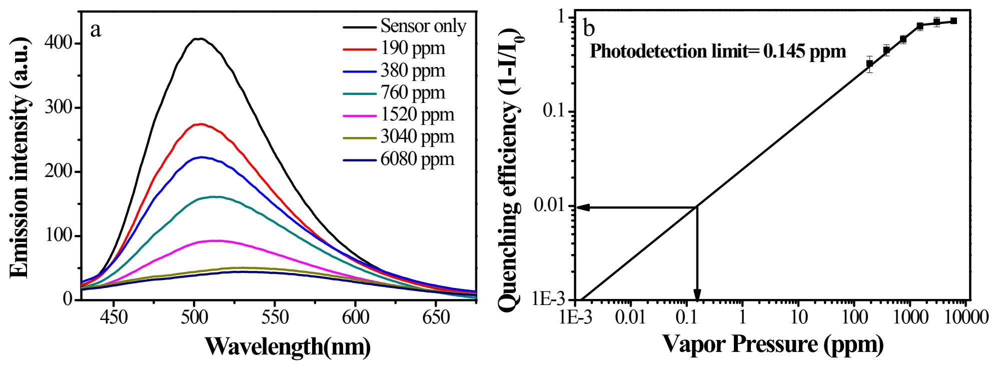


Fig. S10 (a) Changes in fluorescence intensity of SFN films exposed to triethylamine vapor with different concentrations; (b) The concentration-dependent fluorescence quenching efficiency (1-I/I_0) for SFN as a function of the vapor pressure of triethylamine, fitted with the Langmuir equation.

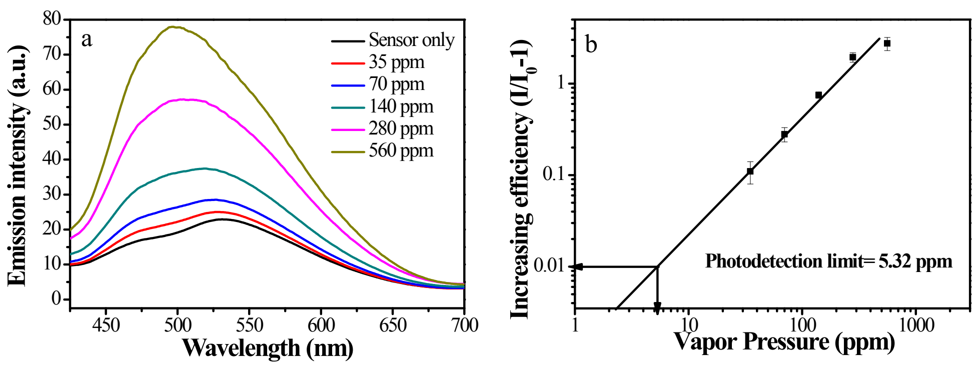


Fig. S11 (a) Changes in fluorescence intensity of SFC films exposed to aniline vapor with different concentrations; (b) The concentration-dependent fluorescence increasing efficiency (I/I_0-1) for SFC as a function of the vapor pressure of aniline, fitted with the Langmuir equation.

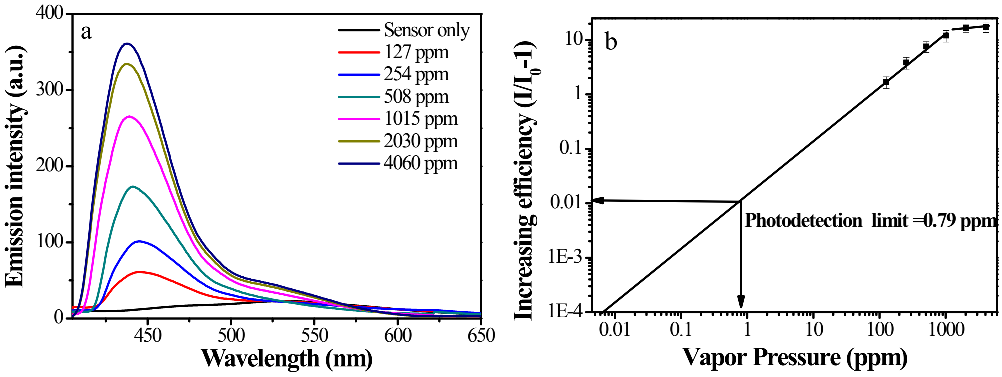


Fig. S12 (a) Changes in fluorescence intensity of SFC films exposed to *n*-propylamine vapor with different concentrations; (b) The concentration-dependent fluorescence increasing efficiency (I/I_0-1) for SFC as a function of the vapor pressure of *n*-propylamine vapor.

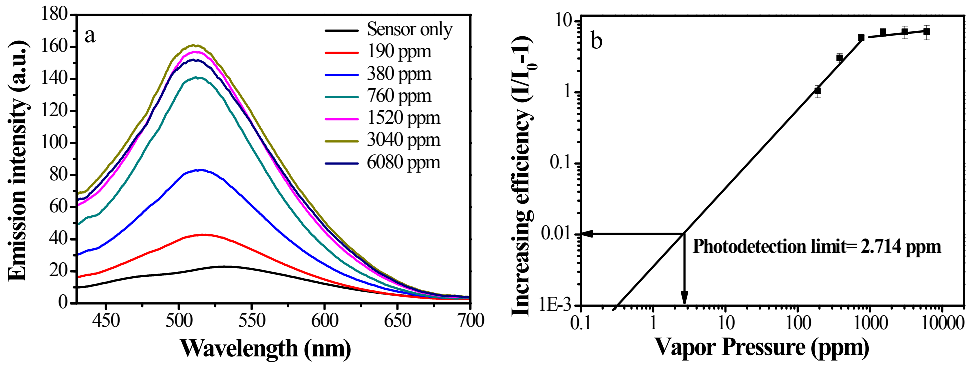
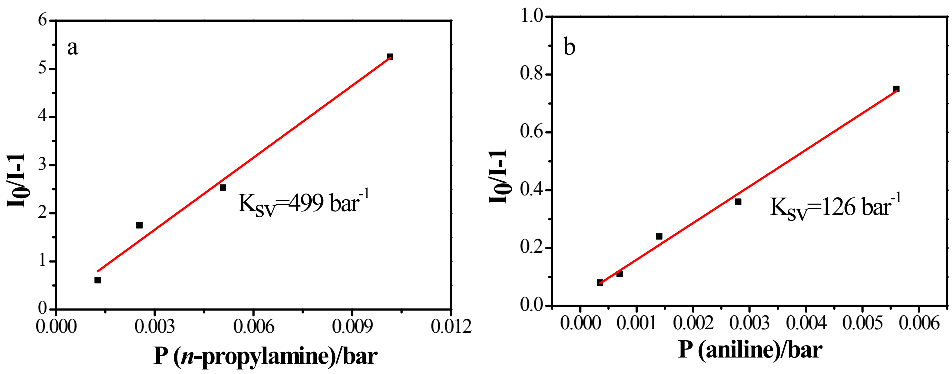


Fig. S13 (a) Changes in fluorescence intensity of SFN films exposed to triethylamine vapor with different concentrations; (b) The concentration-dependent fluorescence increasing efficiency (I/I_0-1) for SFC as a function of the vapor pressure of triethylamine, fitted with the Langmuir equation.



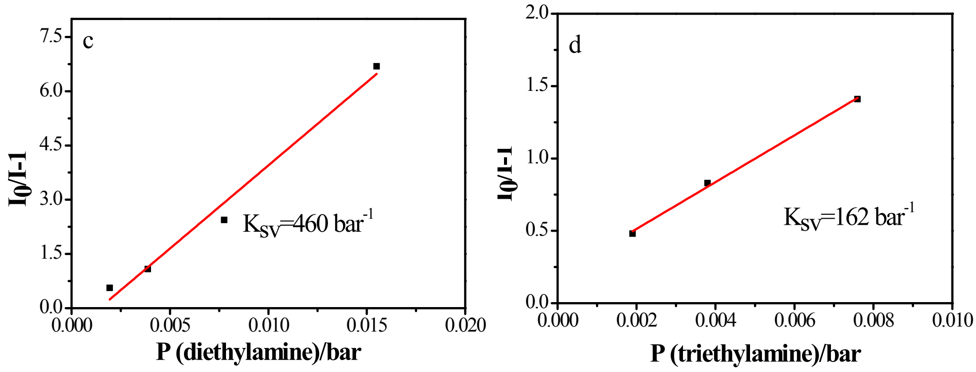


Fig. S14 Stern-Volmer plot of SFN in *n*-propylamine (a), aniline (b), diethylamine (c) and triethylamine (d) vapor.

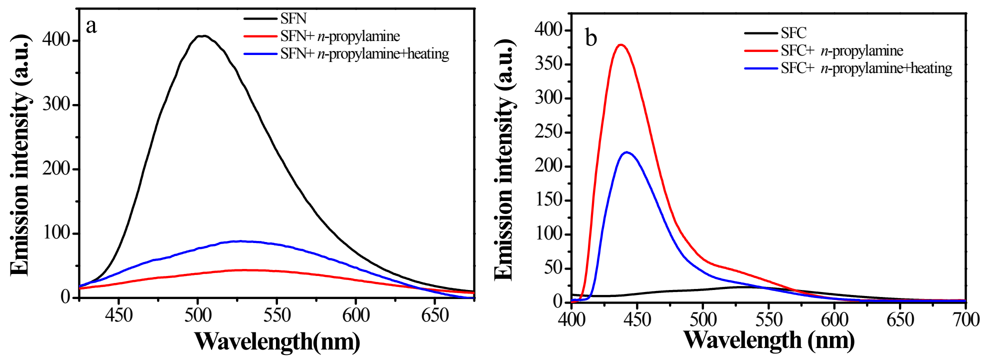


Fig. S15 Emission spectra of SFN(a) and SFC(b) films exposed to *n*-propylamine vapor and then heating.

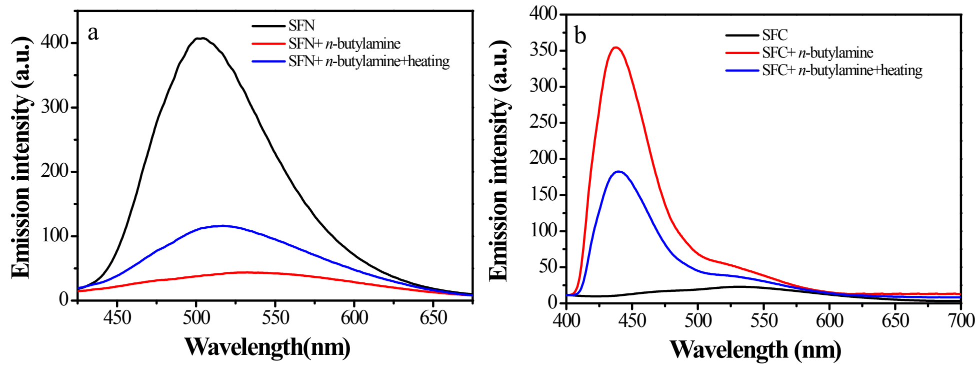


Fig. S16 Emission spectra of SFN(a) and SFC(b) films exposed to *n*-butylamine vapor and then heating.

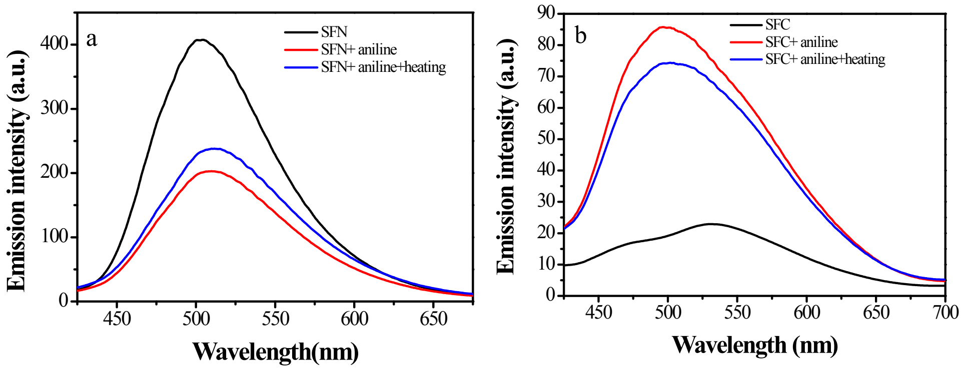


Fig. S17 Emission spectra of SFN(a) and SFC(b) films exposed to aniline vapor and then heating.

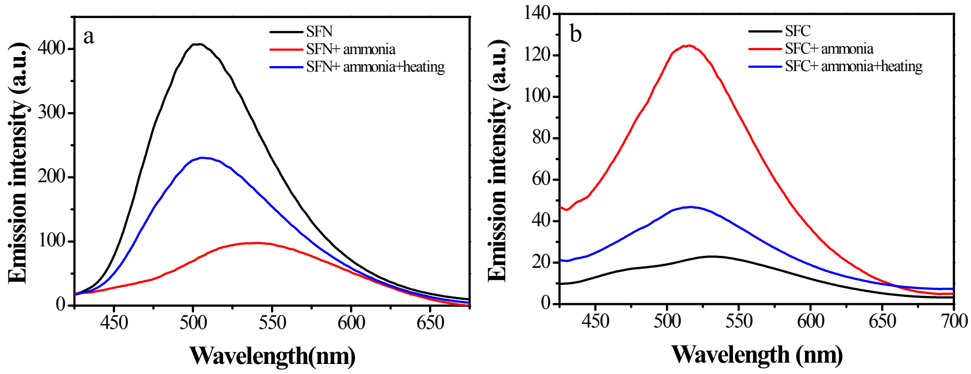


Fig. S18 Emission spectra of SFN(a) and SFC(b) films exposed to ammonia vapor and then heating.

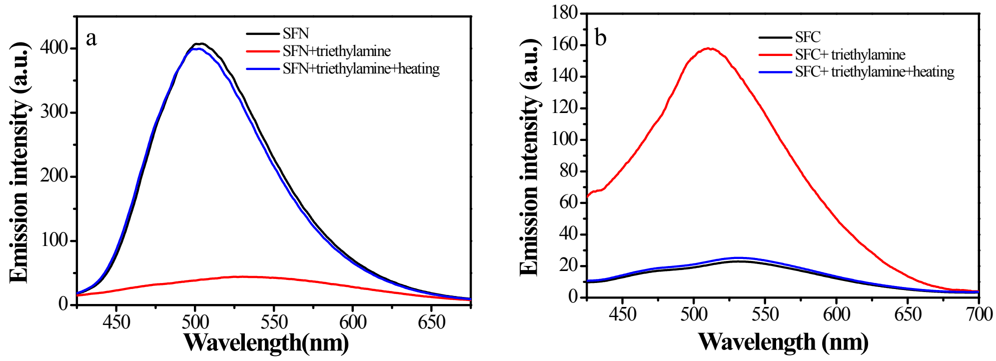


Fig. S19 Emission spectra of SFN(a) and SFC(b) films exposed to triethylamine vapor and then heating.

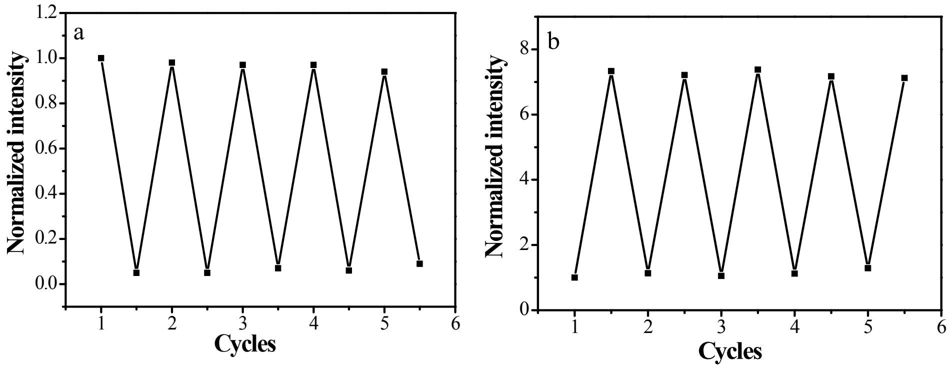
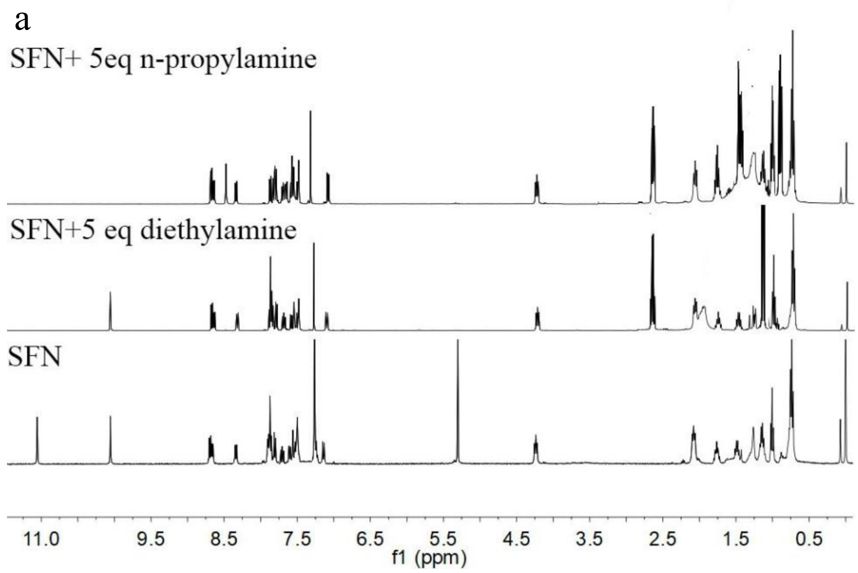


Fig. S20 Cycles of the emission (a) quenching/ (b) increasing by exposure to the saturated of triethylamine vapors and recovery by the heating, respectively.



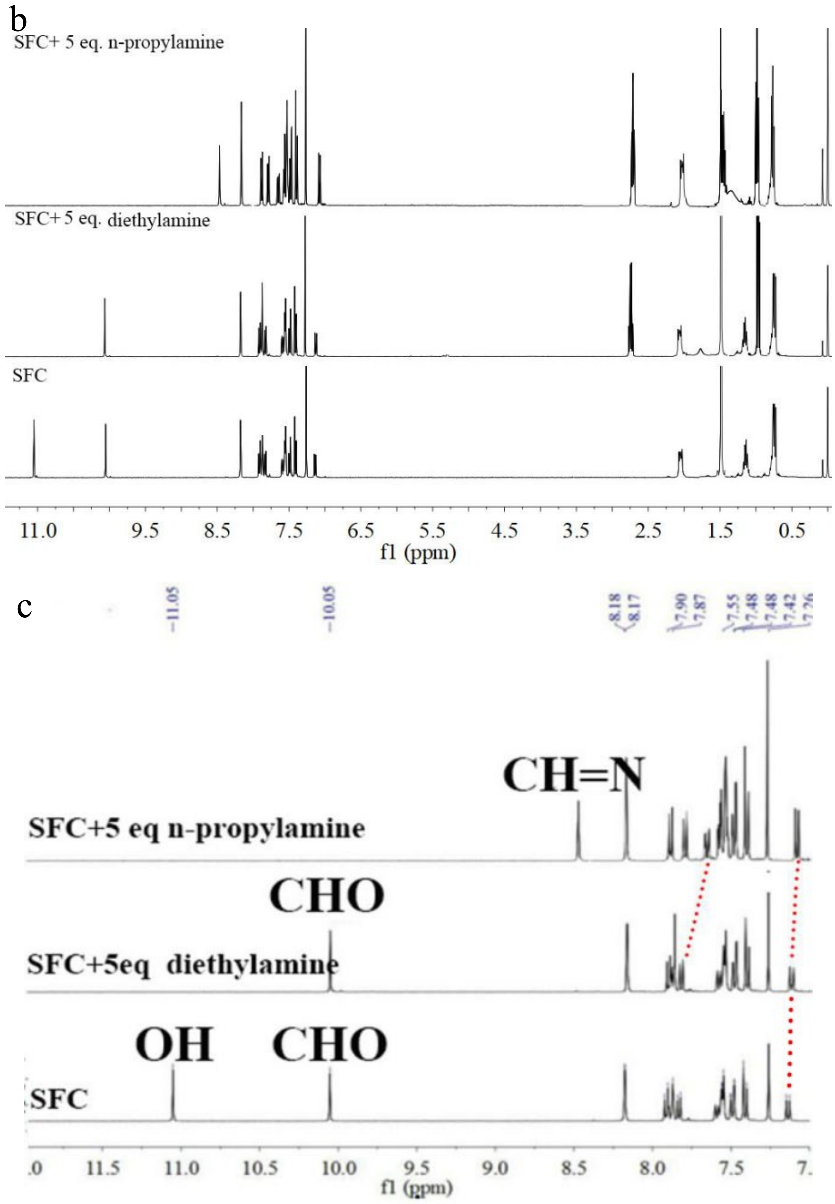


Fig. S21 Changes in ^{1}H NMR spectra of SFN(a), SFC(b) and enlarged ^{1}H NMR spectra of SFC(c) upon addition of *n*-propylamine and diethylamine in $CDCl_3$ solvent.