Supplementary Information

Bisspiropyran fluorescent probe for selective and rapid detection of cyanide anion in liqueurs

Ziqiang Zhou[#], Hongzhi Hu[#], Ling Xia, Gongke Li*, Xiaohua Xiao*

School of Chemistry, Sun Yat-sen University, Guangzhou, 510006, P.R.China

Contents

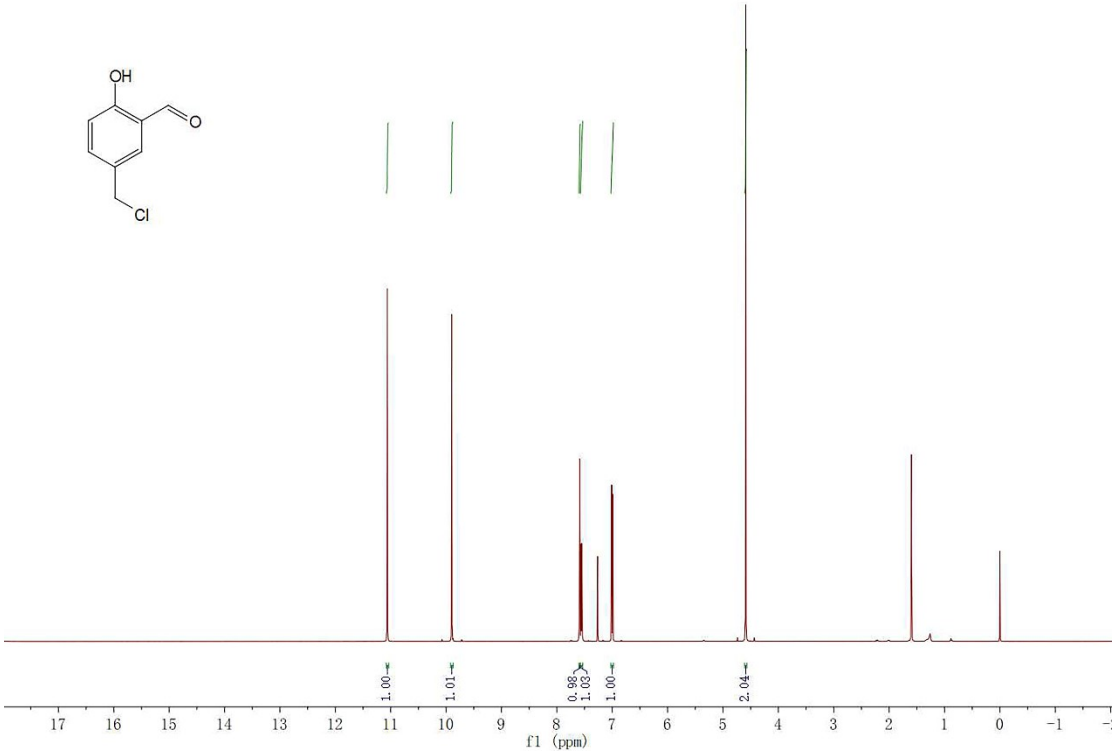

Fig. S1 ^{1}H NMR (400 MHz, $CDCl_3$) spectra of 5-chloromethylsalicyl aldehyde

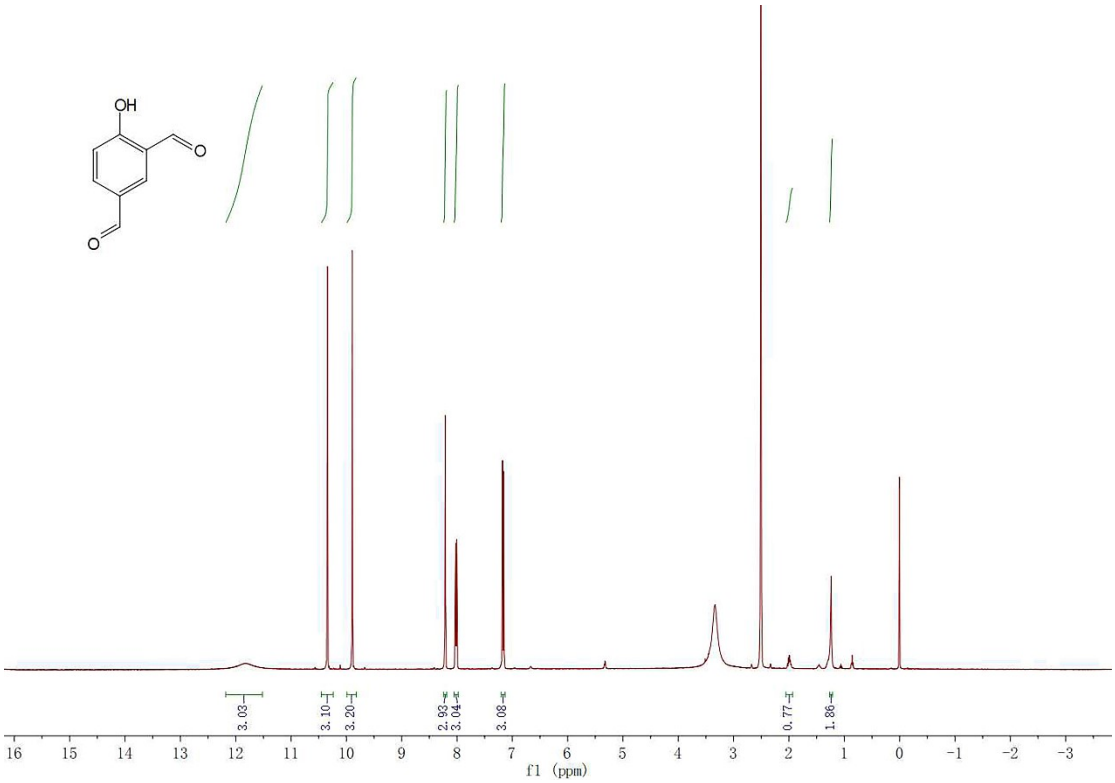

Fig. S2 ^{1}H NMR (400 MHz, $CDCl_3$) spectra of 4-Hydroxy-1,3-benzenedicarboxaldehyde

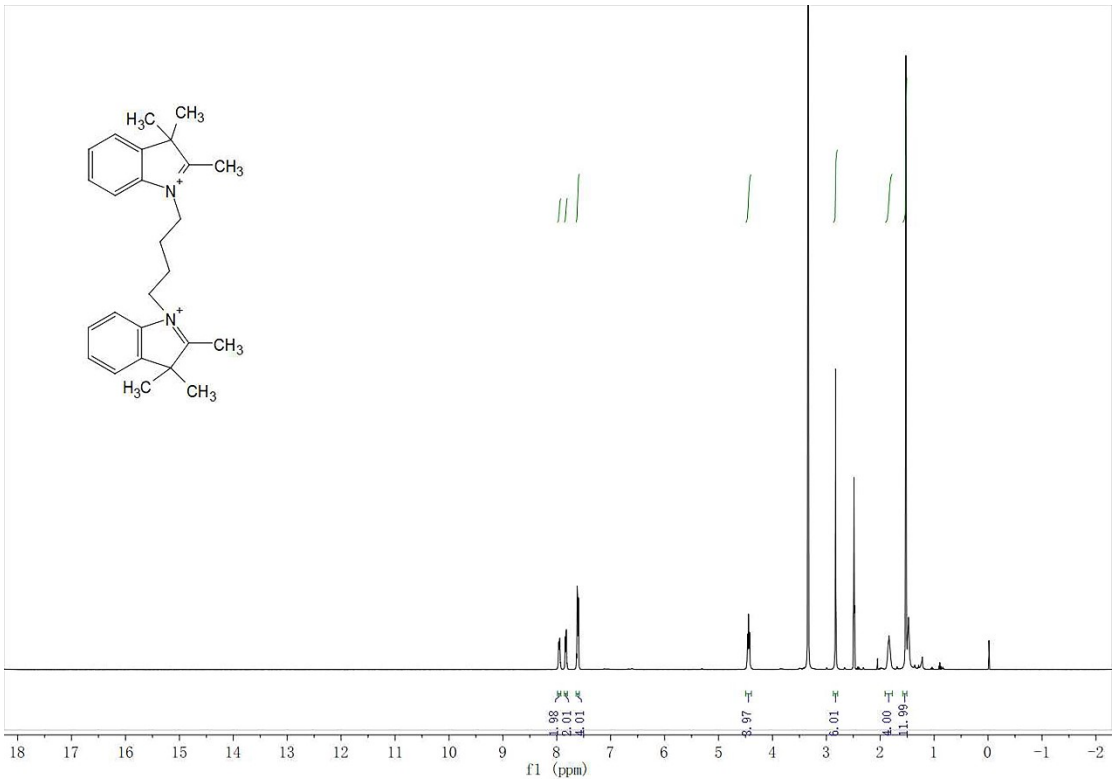

Fig. S3 ^{1}H NMR (400 MHz, $CDCl_3$) spectra of N, N'-(1,4-butanediyl)bis[2,3,3-trimethyl-3H-indolium] dibromide

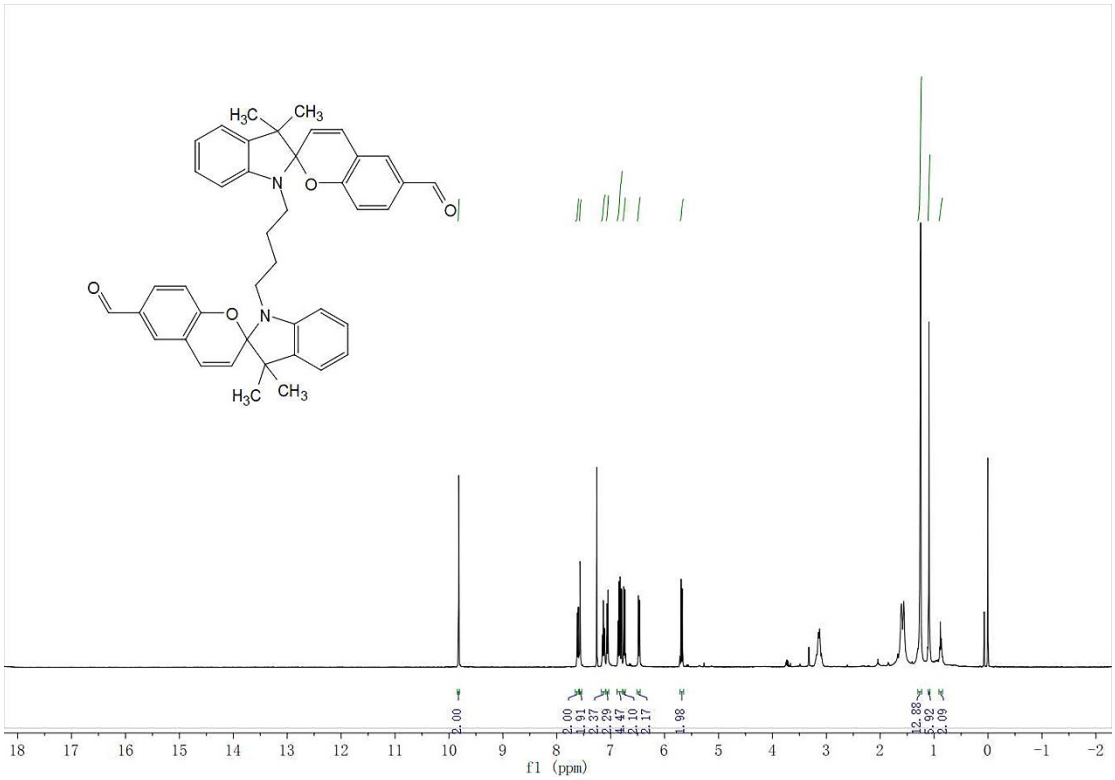

Fig. S4 ^{1}H NMR (400 MHz, $CDCl_3$) spectra of SP1

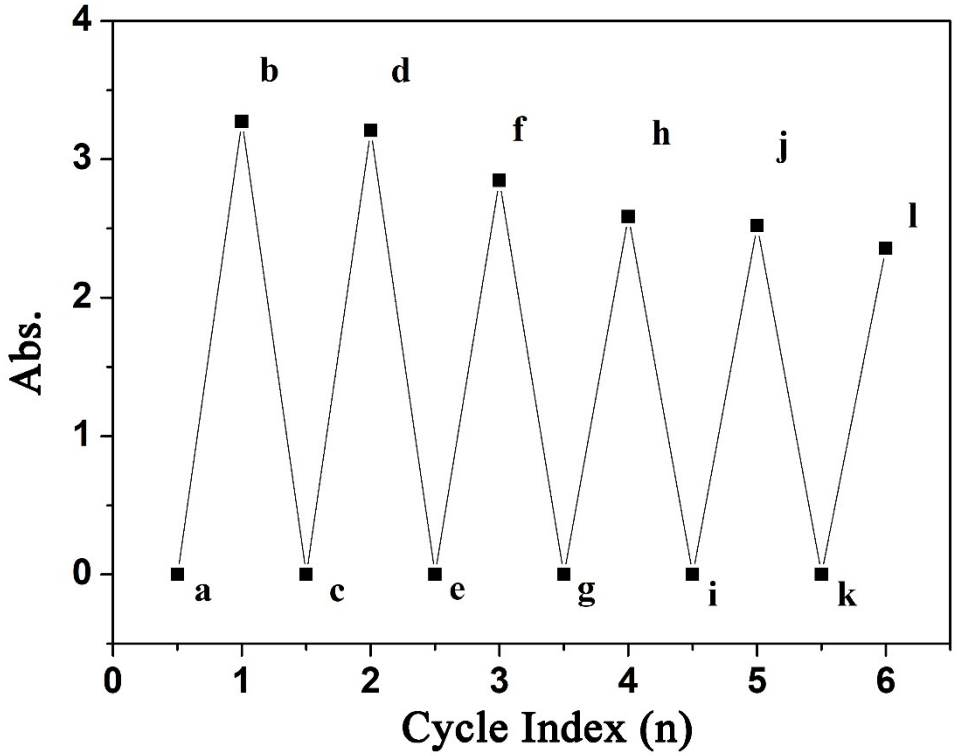

Fig. S5. Absorption intensity of SP1 (50 μmol/L) solution at 570 nm (excitation at 320 nm) before (a) and after UV (b, d, f, h, j, l) and visible light (c, e, g, i, k) irradiation.

The newly prepared 50.0 μmol/L SP1 solution was excited by 365 nm UV light for 30 min and then placed in the dark for 5 min. This cycle was repeated for 5 times. The absorption intensity of SP1 at 570 nm was measured. After five cycles, the absorption intensity of SP1 at 570 nm was 72% of that of the initial excitation.

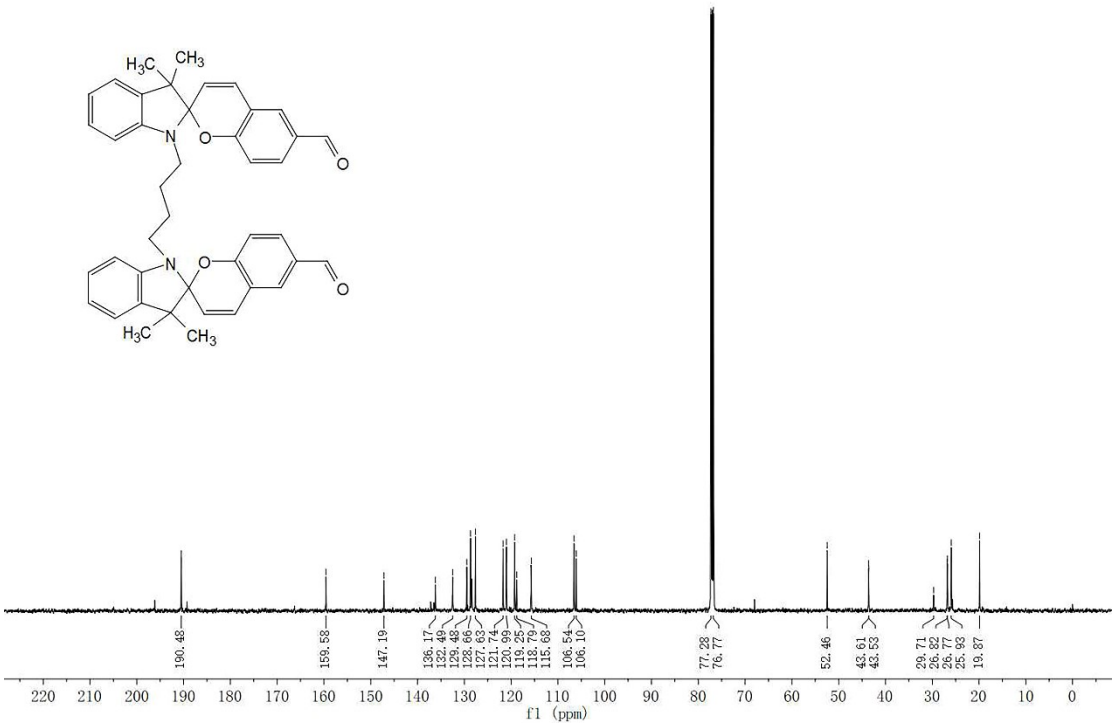

Fig. S6 ^{13}C NMR (400 MHz, $CDCl_3$) spectra of SP1

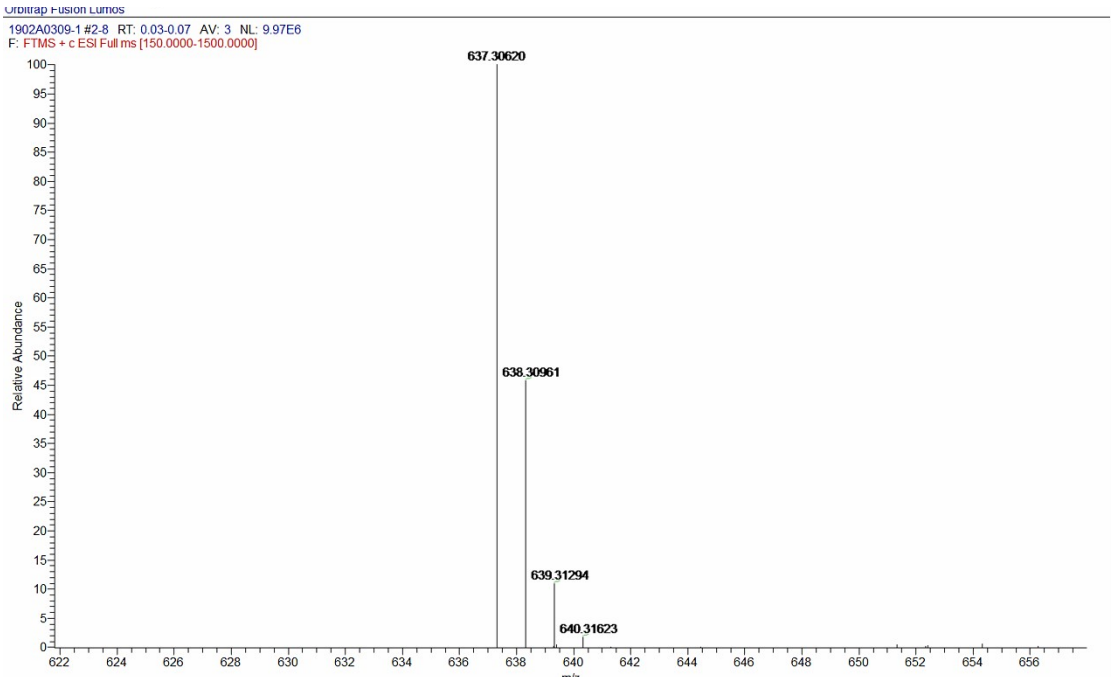

Fig. S7 HR-MS spectra of SP1

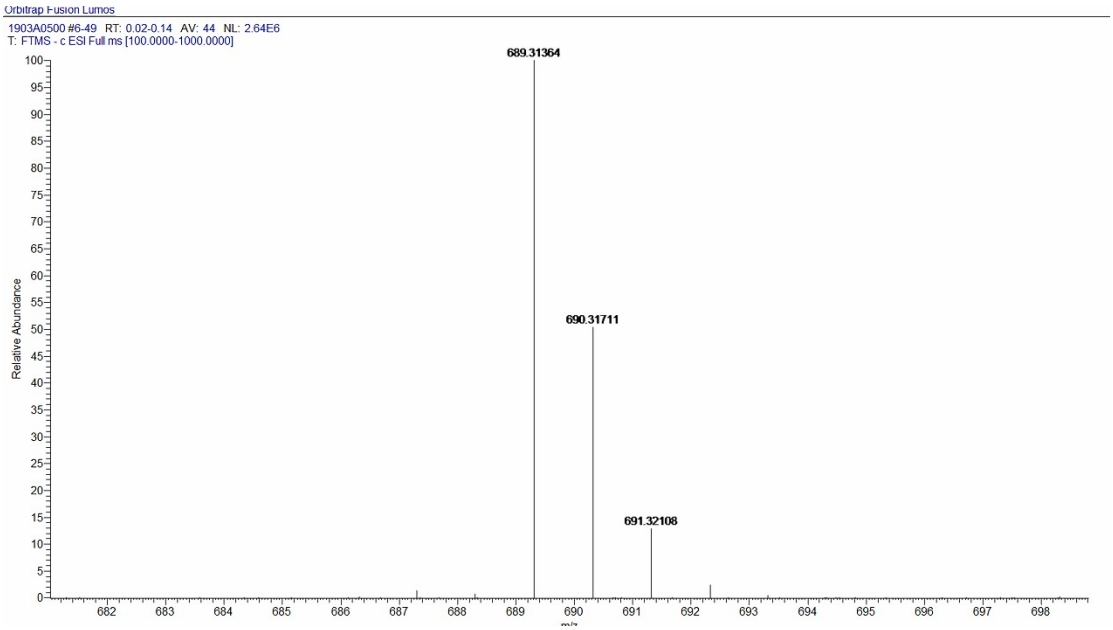

Fig. S8. HR-MS spectra of MC1-2CN

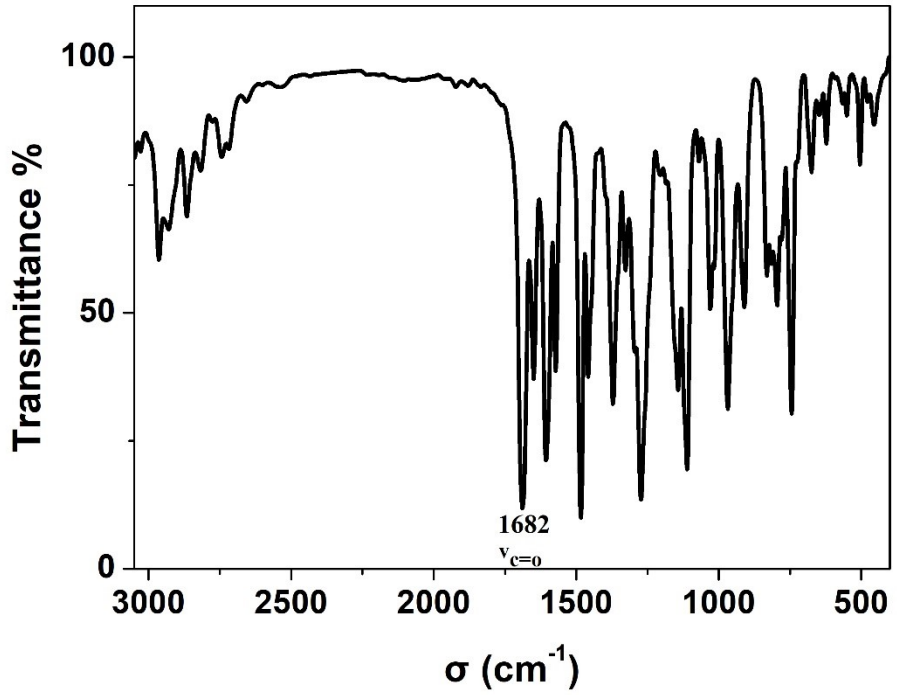

Fig. S9 The IR spectra of SP1

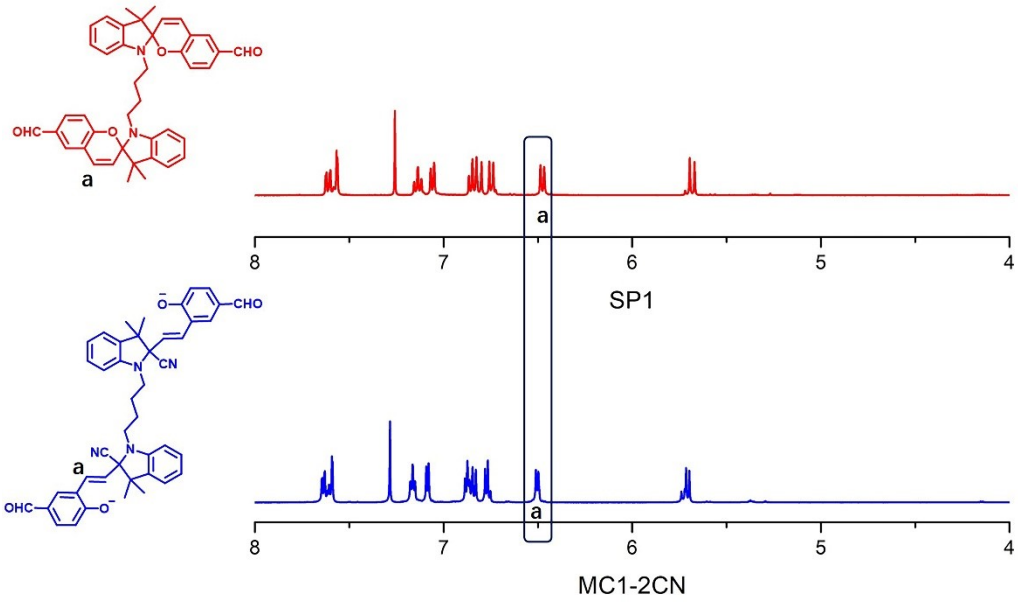

Fig. S10 ^{1}H NMR spectral changes of SP1

Table. S1 Comparison of probe for CN^-

Probe	DL (μmol/L)	Response time (min)	Solvent system(*v*/*v*)	Ref
Salicylideneaniline-based	2.4	15	THF:H_2O=8:2	[1]
Stilbene-based	66	15	THF:H_2O=6:4	[2]
Triazole-base	1.43	15	DMSO	[3]
Coumarin-based	9.37	≥3	MeCN:buffer=1:1	[4]
Naphthaldehyde-based	1.6	-	EtOH/H_2O=95:5	[5]
Benzofurazan-based	1.47	≥2	CH_3CN/H_2O=95:5	[6]
Schiff base	0.59	≥15	DMSO	[7]
Naphthalimide base	0.23	60	DMSO:H_2O=9:1	[8]
spiropyran-based	0.21	4	THF:H_2O=9:1	This work

- Not mentioned

References

1 W.C. Lin, S.K. Fang and J.W. Hu, *Anal Chem*, 2014, **86**, 4648-4652.

2 Y.D. Lin, Y.S. Peng and W. Su, *Tetrahedron*, 2012, **68**, 2523-2526.

3 Y. Chen, W. Shi, Y. Hui and X. Sun, *Talanta*, 2005, **137**, 38-42.

4 M.J. Peng, Y. Guo, X.-F. Yang, F. Suzenet and Duan, *RSC Adv.*, 2014, **4**, 19077-19085.

5 Y. Jhong and W.H. Hsieh, *J Fluoresc*, 2014, **24**, 1723-1726.

6 Z. Liu, X. Wang and Z. Yang, *J. Org. Chem.*, 2011, **76**, 10286-10290.

7 C. Liang and S. Jiang, *Analyst*, 2017, **142**, 4825-4833.

8 Y. Hao, K.H. Nguyen, Y. Zhang and G. Zhang, *Talanta*, 2018, **176**, 234-241.