Supplementary Material

A novel coumarin derivatives-modified cellulose fluorescent probe for selective and sensitive detection of CN^- in food sample

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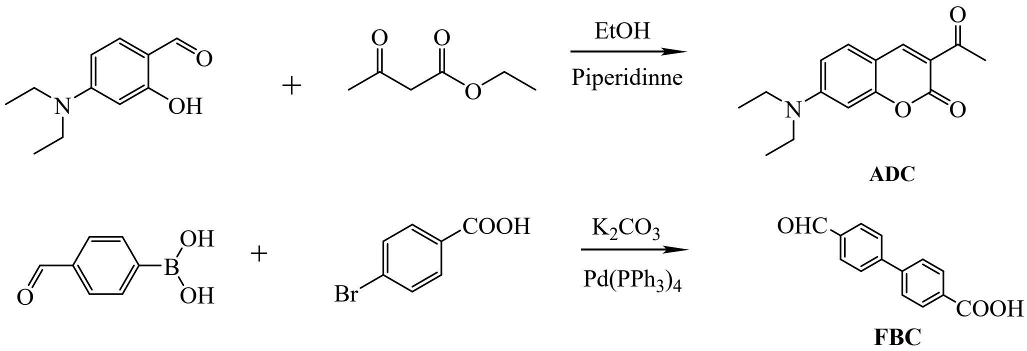
1. Experimental instruments

Fourier transform-infrared (FT-IR) spectra were recorded on Nicolet spectrometer using powder-pressed KBr. UV-*vis* absorption spectra were obtained on Shimadzu UV-2450 spectrophotometer, and fluorescence spectra were acquired on PerkinElmer LS55 spectrophotometer. ^{1}H NMR spectra were gained on Bruker AV 600 spectrometer in DMSO-d_6, and ESI-MS spectra were measured on LTQ Orbitrap XL mass spectrometer. XPS spectra data were obtained on Shimadzu AXIS UltraDLD X-ray photoelectron spectrometer with monochromatic Al Ka radiation (hv = 1486.6 eV, 600 W). The element compositions of chemicals were measured on PE2400II organic elemental analyzer (EA). The microscopic morphologies of samples were obtained using Quanta 200 scanning electron microscope (SEM). X-ray diffraction (XRD) patterns were determined with Rigaku Ultima IV horizontal X-ray diffractometer. Thermogravimetric data were collected on Netzsch TGA-209 F1 thermogravimetric analyzer at a heating rate of 20 °C/min under nitrogen atmosphere over a range of 25-800 °C.

2. Figures



Scheme S1. The synthesis route of **ADC** and **FBC**.

Fig. S1. ^{1}H NMR spectra of compound **ADC**.

Fig. S2. ^{1}H NMR spectra of compound **FBC**.

Fig. S3. Fluorescence emission intensity of **ADC** and **DCB** excited at 365 nm.

Fig. S4. photostability of **DCB-CA** (1×10^{-4} g/mL) and **DCB-CA** + CN^- (1×10^{-4} g/mL +100.0 μM CN^-) were measured in DMF solution.

Fig. S5. The HRMS spectra of **DCB**

Fig. S6. The HRMS spectra of **DCB** after reaction with CN^-.

Fig. S7. Stress-strain curve of **DCB-CA** film.

Fig. S8. The relationship between the absorption intensity at 450 nm and immersion time of **DCB-CA** film in water.

Fig. S9. Photographs of the film being placed in the water for 48 h under day light (a) and 365 nm UV lamp (b).

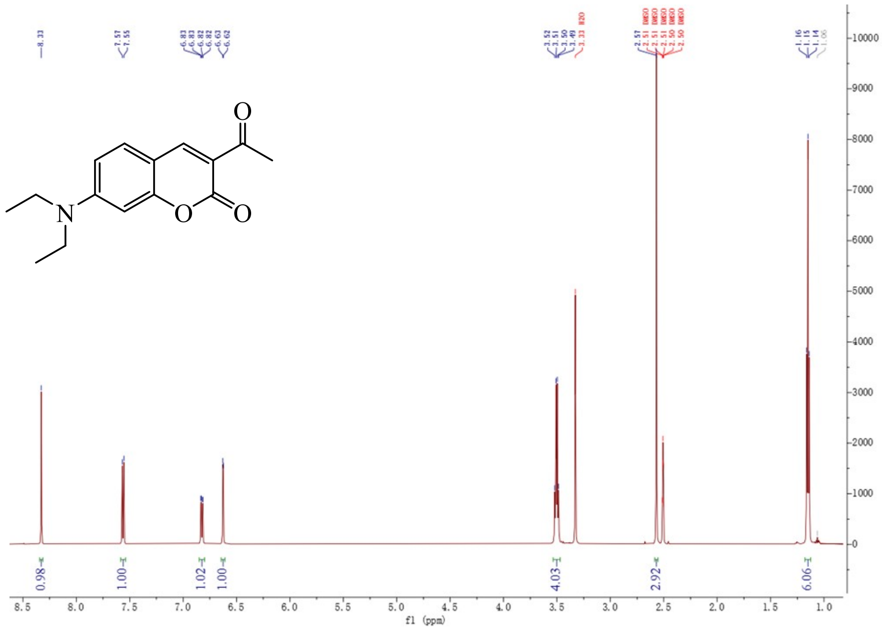


Fig. S1 [1]H NMR spectra of compound **ADC**.

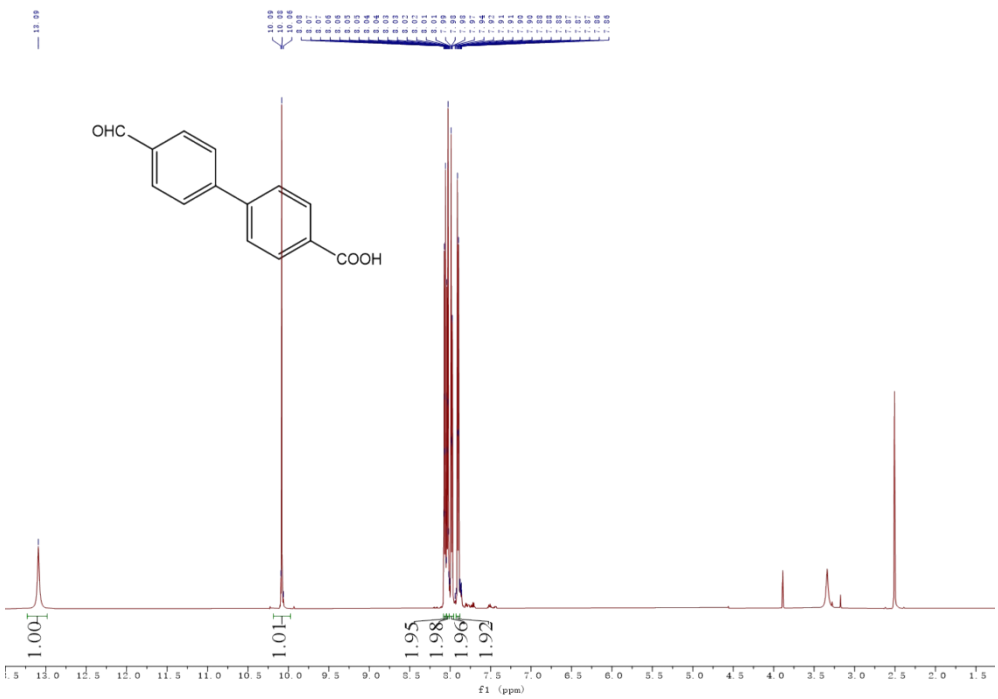


Fig. S2 [1]H NMR spectra of compound **FBC**.

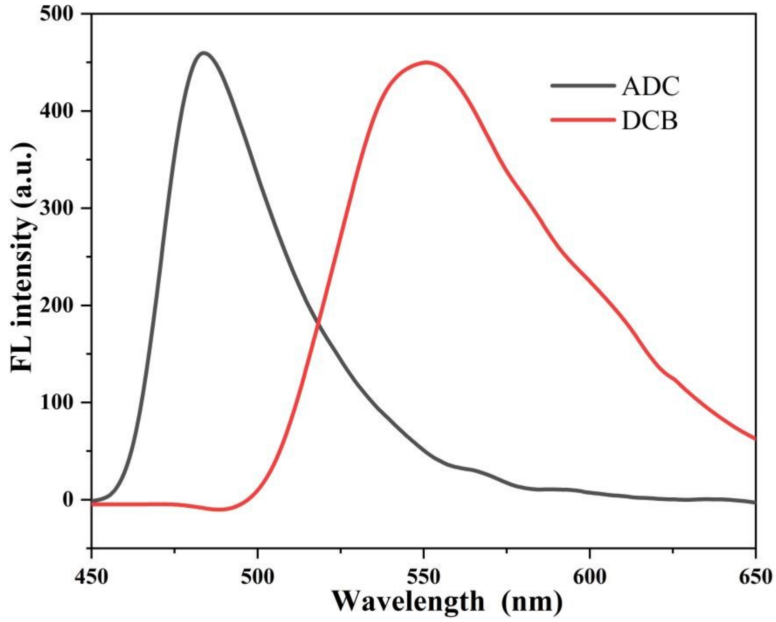


Fig. S3 Fluorescence emission intensity of **ADC** and **DCB** excited at 365 nm.

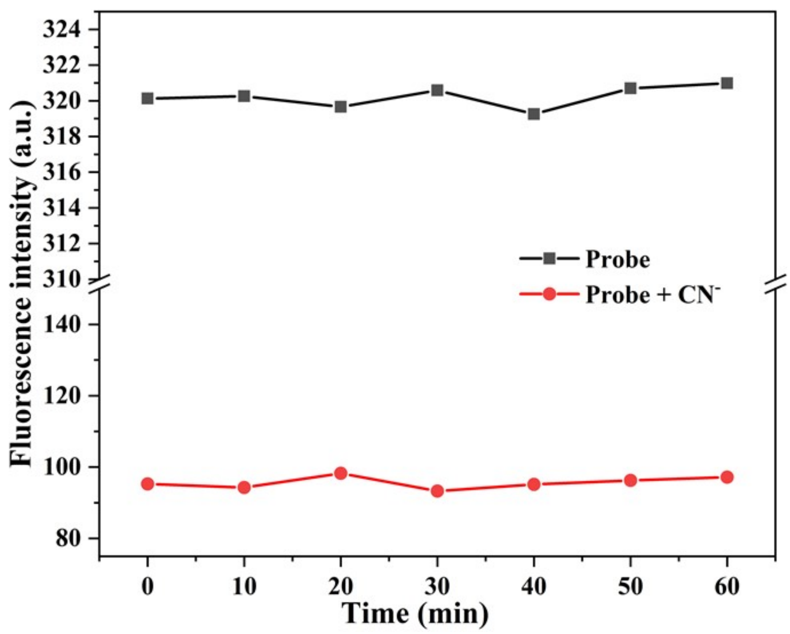


Fig. S4 photostability of **DCB-CA** (1×10^{-4} g/mL) and **DCB-CA** + CN^{-} (1×10^{-4} g/mL + 100.0 μM CN^{-}) were measured in DMF solution.

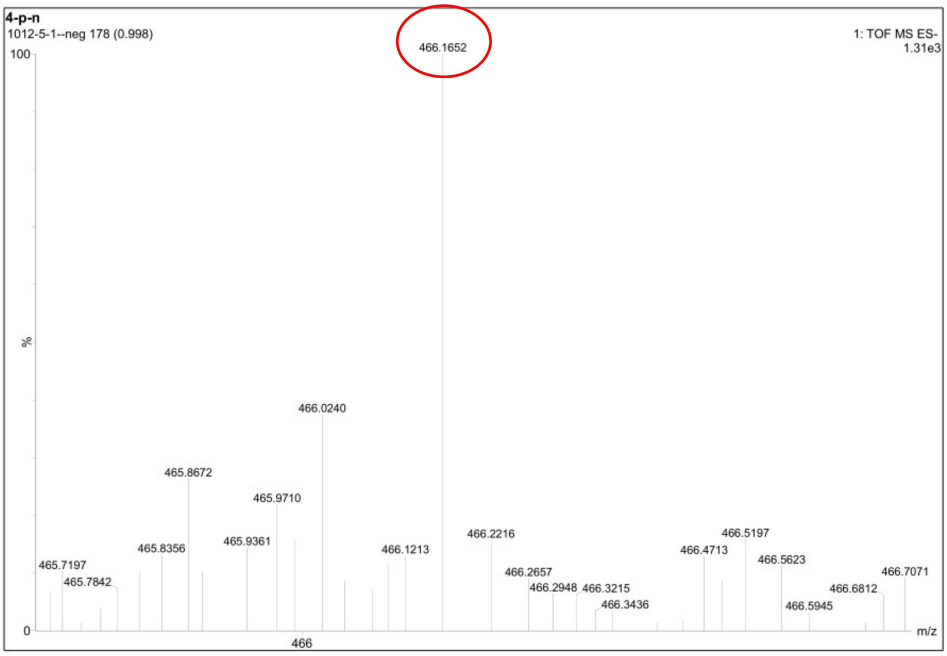


Fig. S5 The HRMS spectra of **DCB**

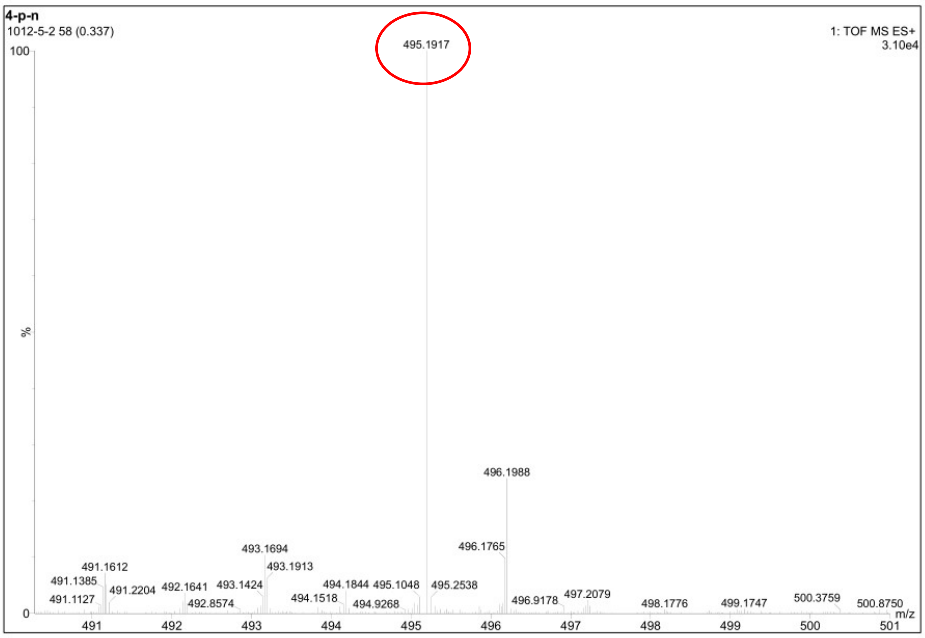


Fig. S6 The HRMS spectra of **DCB-CN**.

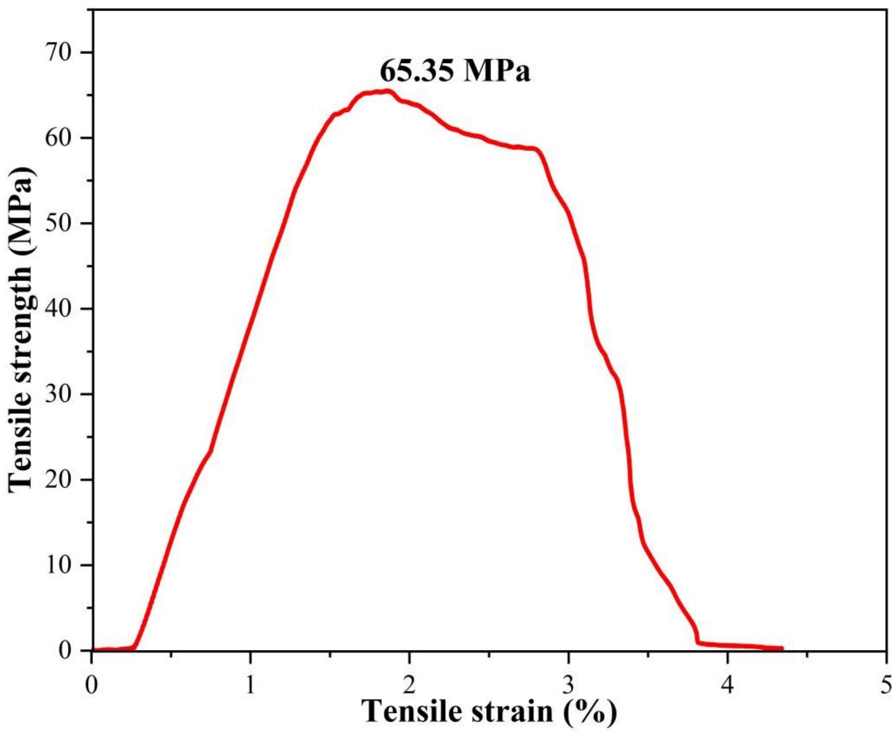


Fig. S7 Stress-strain curve of **DCB-CA** film.

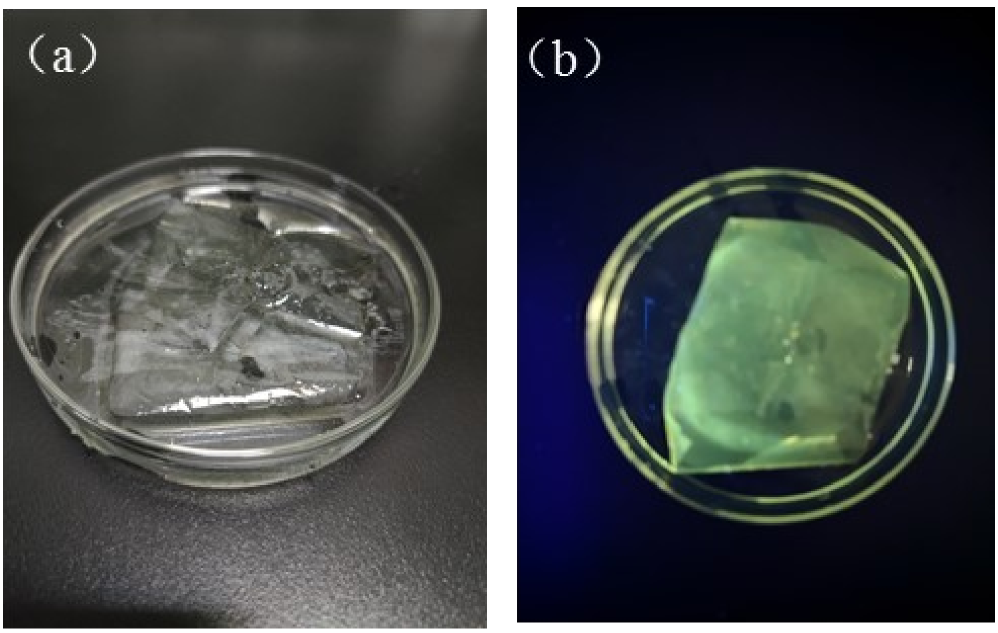


Fig. S8 Photographs of the film being placed in the water for 48 h under day light (a) and 365 nm UV lamp (b).

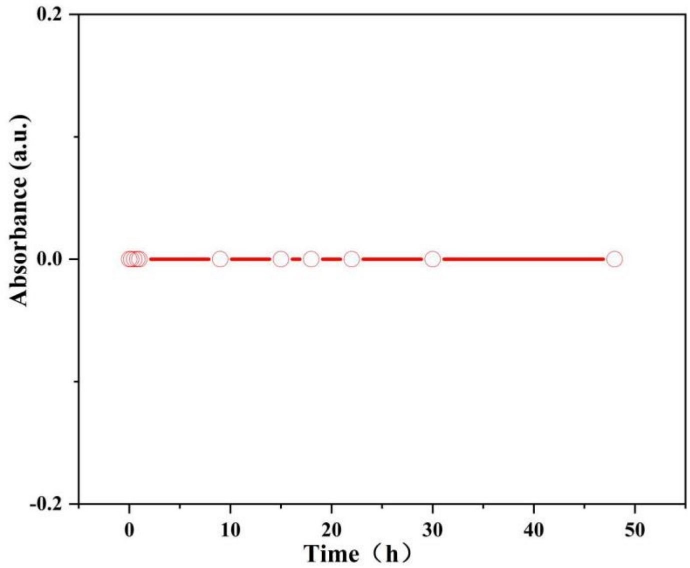
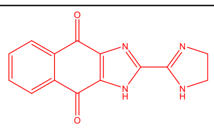
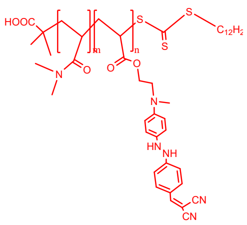
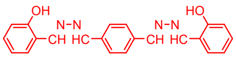
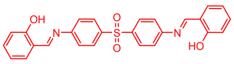
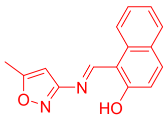
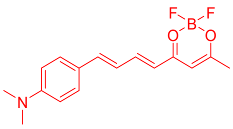
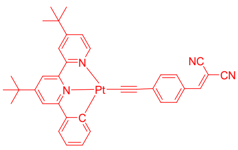
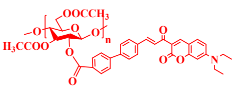


Fig. S9 The relationship between the absorption intensity at 450 nm and immersion time of **DCB-CA** film in water.

Table S1 Comparison of **DCB-CA** with other CN^{-} probes.

Sensors	**Structure of probe**	**Methods**	**LOD (μM)**	**Food samples application**	**Materials**	**References**
R		Fluorometry	1	No	Strips	1

P1		Fluorometry	8	Yes	Strips	2
L1		Fluorometry	0.95	Yes	Strips	3
DSS		Colormetric	5.81	No	No	4
AIN		Colormetric	12.3	No	No	5
NBF		Fluorometry	2.23	Yes	No	6
ML'CT+L'L'CT		Colorimetric	6.0	No	No	7
DCB-CA		Fluorometry	0.58	Yes	Film	This work

References

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