Supporting Information

Improving Sulfite Detection Performance of a Fluorescent Probe via Post-synthetic Modification with Metal-Organic Framework

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Supplementary Figures and Table

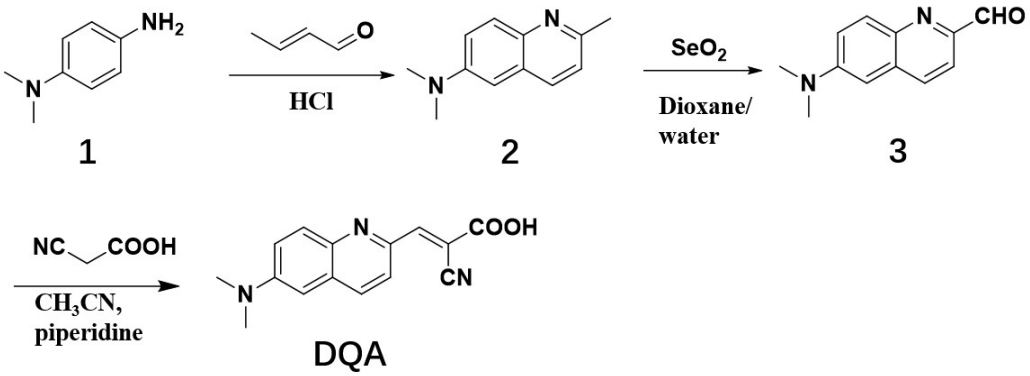


Figure S1. The general synthesis route of the small-molecule probe **DQA**.

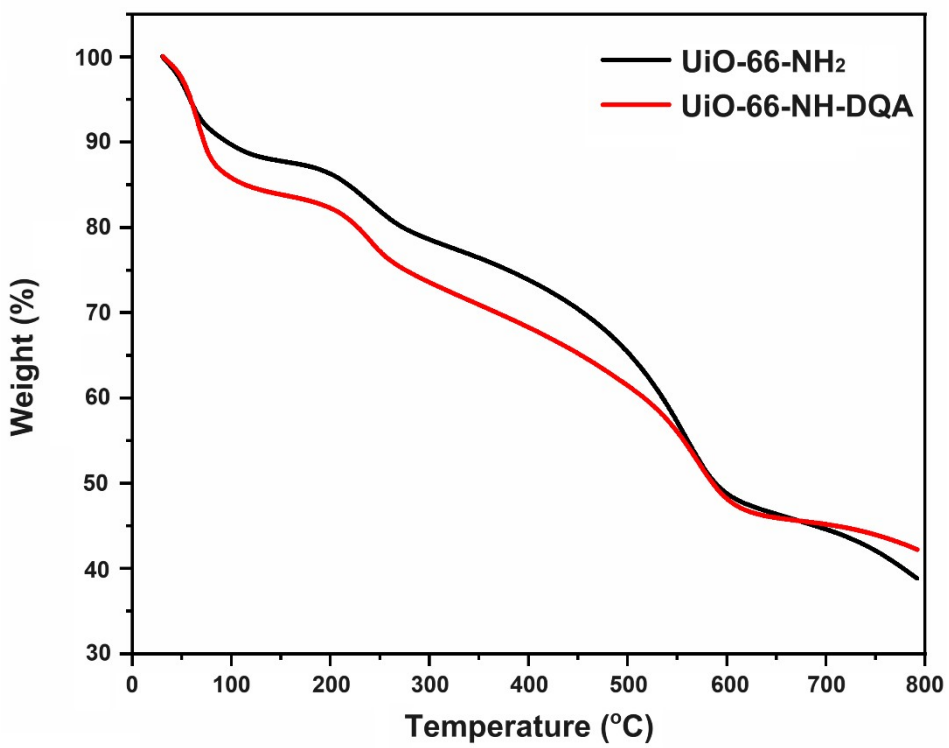


Figure S2. The TGA curves of UiO-66-NH_2 and **UiO-66-NH-DQA**.

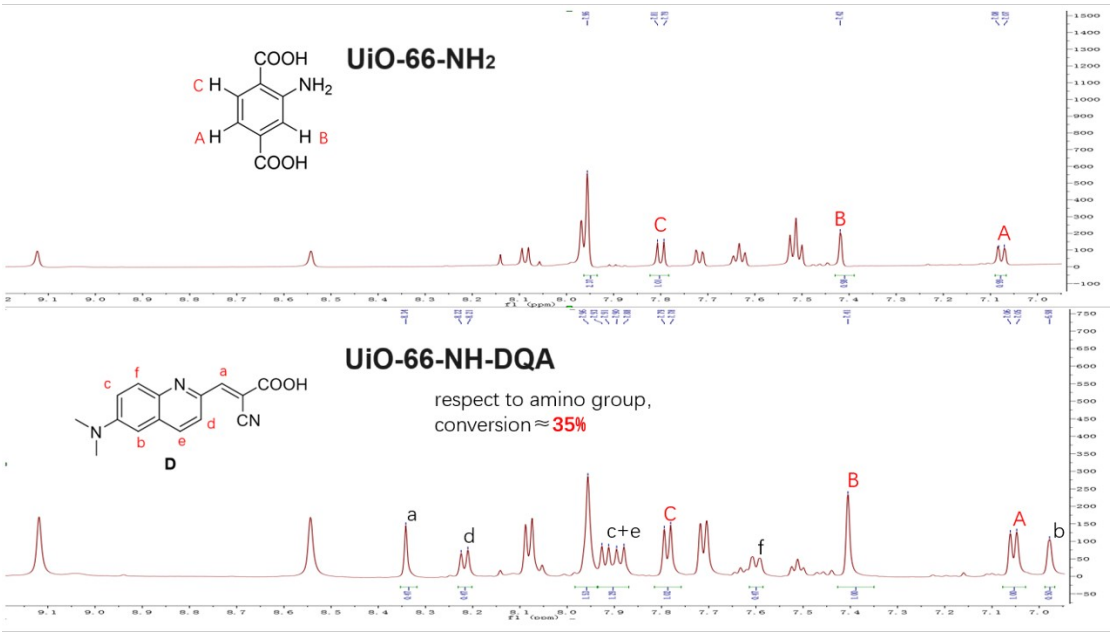


Figure S3. The comparison on the HNMR spectra of UiO-66-NH_2 and **UiO-66-NH-DQA**.

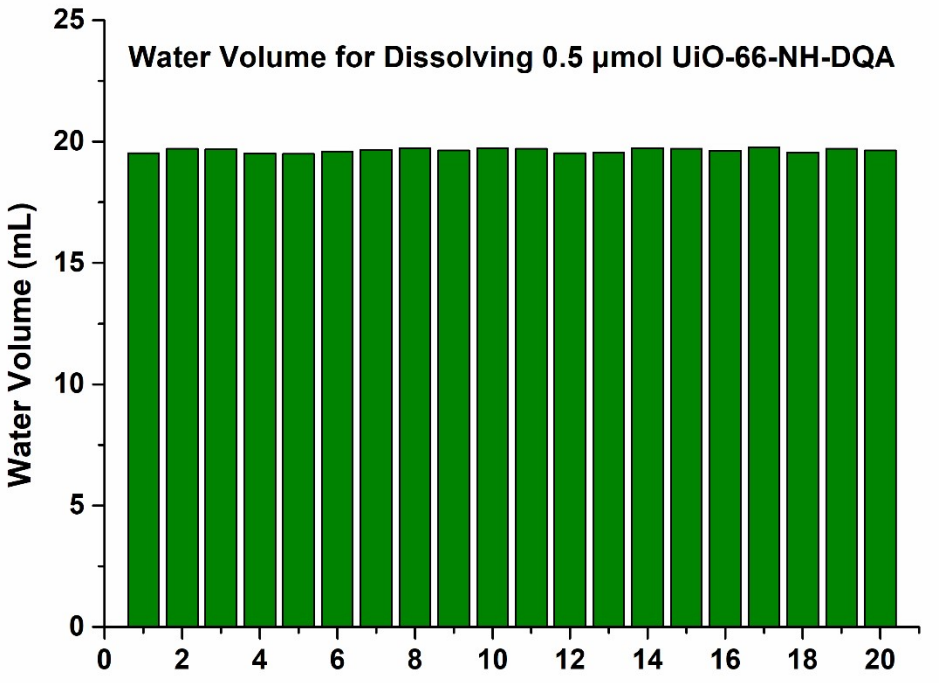


Figure S4. The water volume for dissolving 0.5 μmol **UiO-66-NH-DQA**.

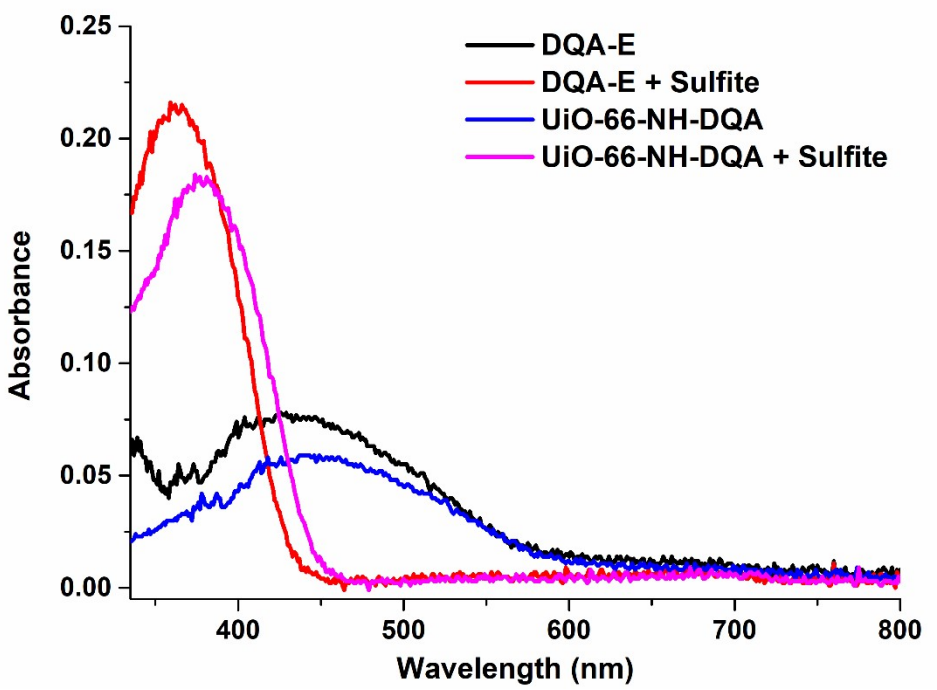


Figure S5. The absorption spectra of **DQA-E** (10 μM) and **UiO-66-NH-DQA** in the absence and presence of sulfite (500 μM) in the solution system.

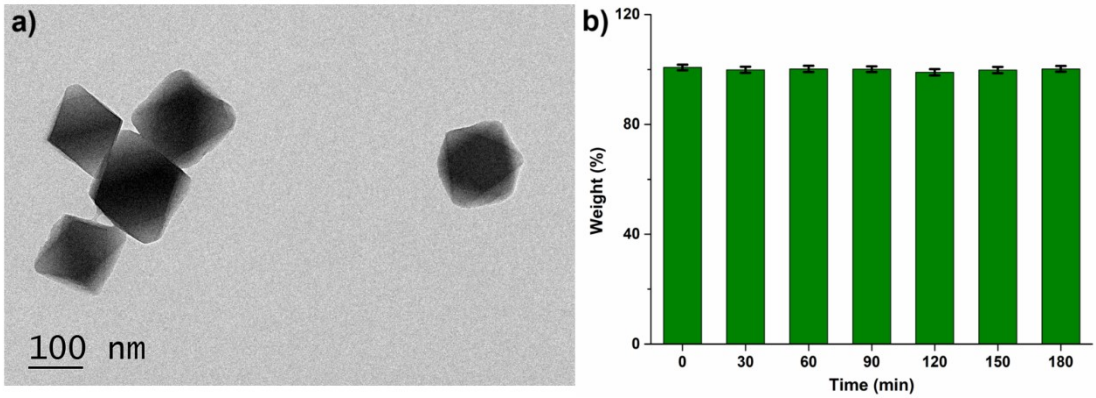


Figure S6. The (a) TEM image and (b) time-dependent weigh percentage analysis after reacting UiO-66-NH_2 (5 μM) with sulfite (500 μM) in 3 h. Conditions: pH 7.4, 37 °C.

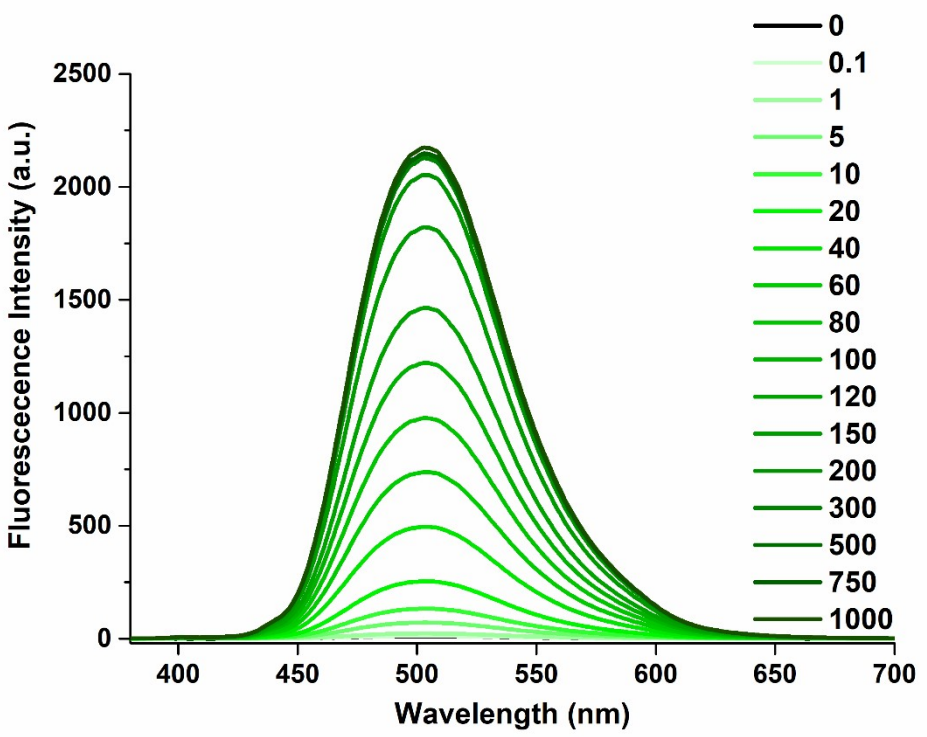


Figure S7. The fluorescence spectra of **UiO-66-NH-DQA** with various concentrations of sulfite (0-1000 μM). Conditions: pH 7.4, 37 °C, 30 min, 5 nm * 5 nm, 500 V, λ_{ex} = 364 nm.

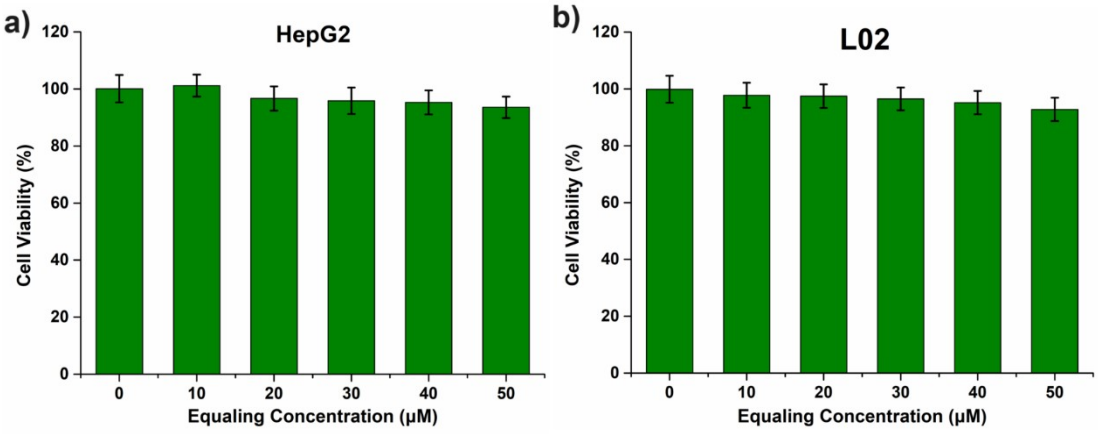


Figure S8. The Cell viability of (a) HepG2 and (b) L02 cells incubated with **UiO-66-NH-DQA** at different equaling concentrations (0-50 μM) of for 24 h at 37 °C.\

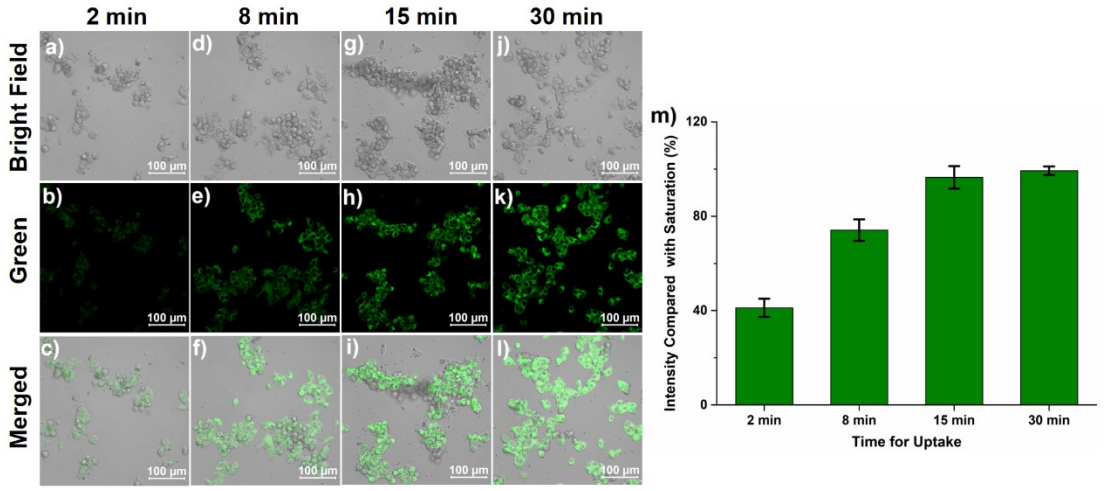


Figure S9. The confocal images of living HepG2 cells incubated with 150 μM sulfite for 30 min, and then with **UiO-66-NH-DQA** for different time conditions to suggest the uptake: (a-c) 2 min; (d-f) 8 min; (g-i) 15 min, and (j-l) 30 min. (m) The quantitative analysis. Conditions: λ_{ex} = 364 nm; Green channel: 440-600 nm, scale bar: 100 μm.

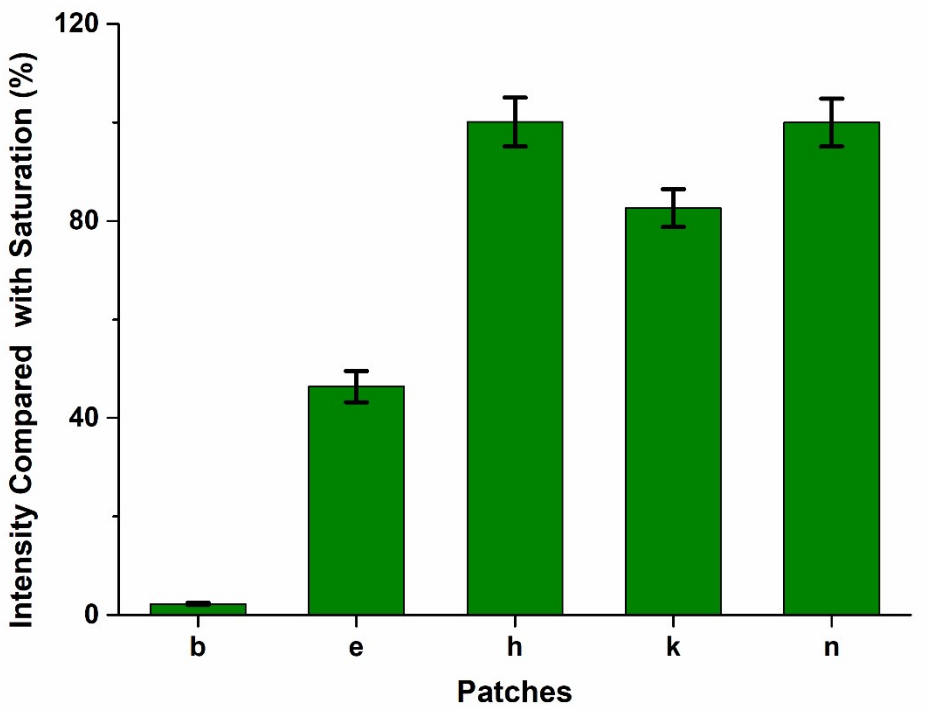
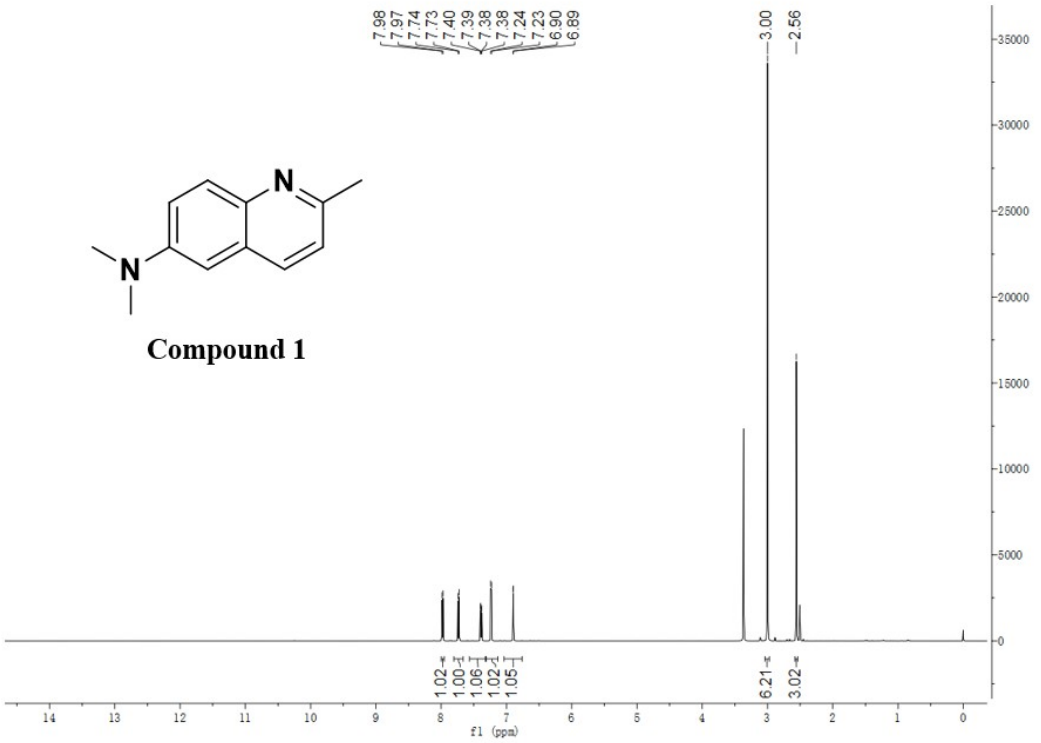


Figure S10. The quantitative analysis of the patches in Figure 6.

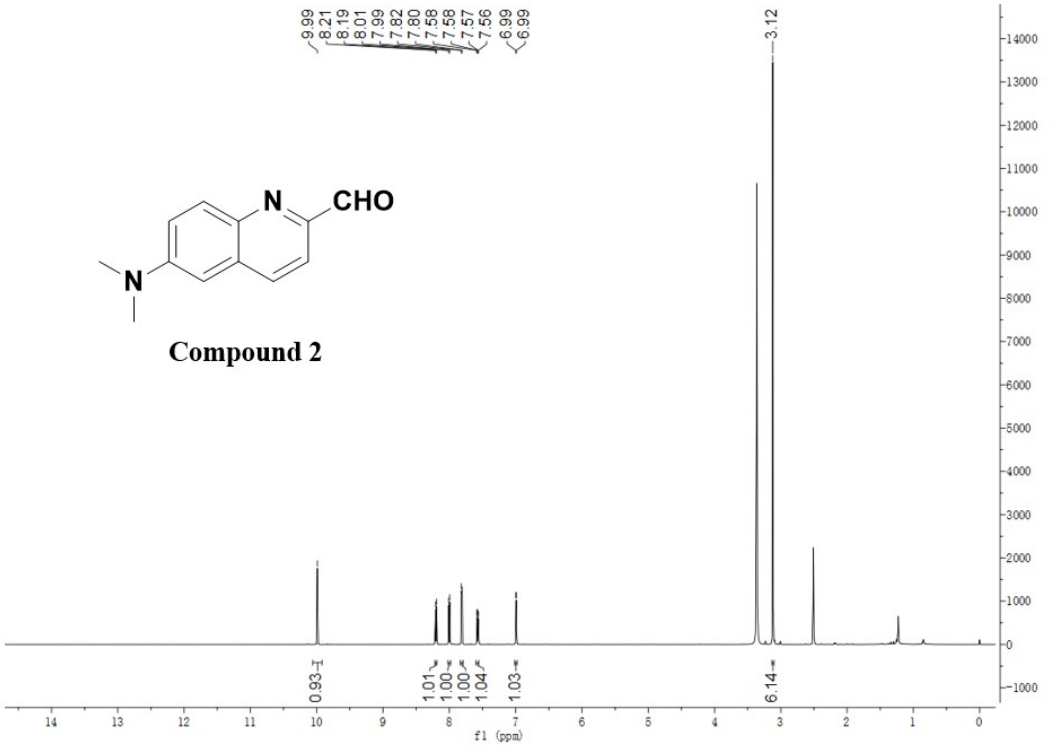
Table S1. The comparison between **UiO-66-NH-DQA** and the recently reported probes for sulfite.

Sources	$\lambda_{ex}/\lambda_{em}$ (nm)	Response time (min)	Linear interval (μM)	LOD (μM)	Response fold	Applications
Ref 23	420/508	60	200	1.87	6	HeLa cells, Food samples
Ref 24	480/550	14	100	0.16	90	HeLa cells, LPS-induced mice
Ref 25	413/528	> 14	15	0.2526	16	HeLa cells, Food samples
Ref 26	400/475	0.67	44	0.038	6.5	HeLa cells, Mice, Test strips
Ref 27	400/580	Not given	200	0.42	4	Food samples, Test strips
Ref 28	360/432	Not given	100	0.003	~ 25	HepG2 cells
Ref 29	419/559	6	18	0.823	~25	Living cells
Ref 30	405/482	0.25	500	0.086	2	Chinese herbs, HepG2 cells
Ref 31	430/555	0.13	4	3.64	5	HeLa cells, Liver injury mice
Ref 32	420/485	20	2	0.024	4	HeLa cells
Ref 33	417/487	5	12	0.044	10	HeLa, HepG2, L02 cells
Ref 34	400/494	60	80	1.1	9	HeLa, HepG2, L02 cells
Ref 35	411/489	60	80	2.8	7.5	HeLa, HepG2, L02 cells
Ref 36	425/516	1	22.5	0.25	30	Food samples, Test strips
Ref 37	500/575	Not given	20	0.06	7	HeLa cells, Tumor tissue, Zebrafish
Ref 38	290/339	1	24	0.06315	16	HeLa cells, Food samples
Ref 39	365/560	Not given	100	0.31	2	HeLa cells, Test strips
Ref 40 DQA-E	364/483	50	150	0.013	60	HeLa cells
This work	**364/503**	**15**	**150**	**0.025**	**340**	**HepG2 cells**

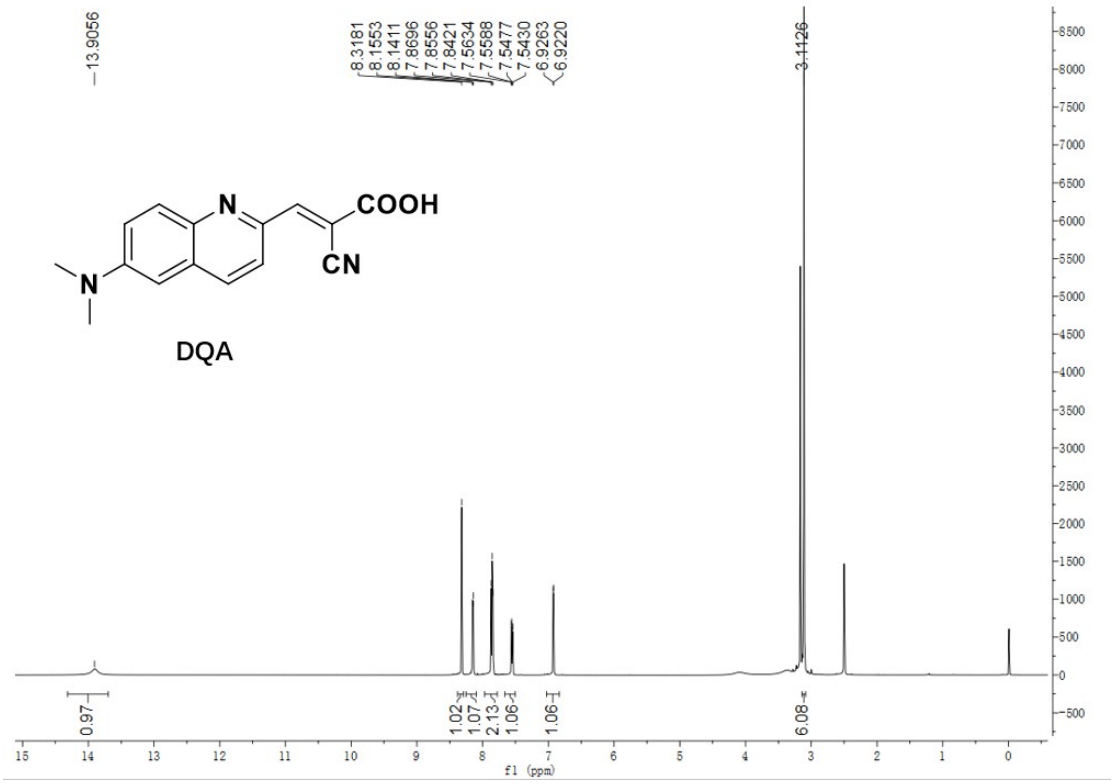
NMR and HRMS spectra



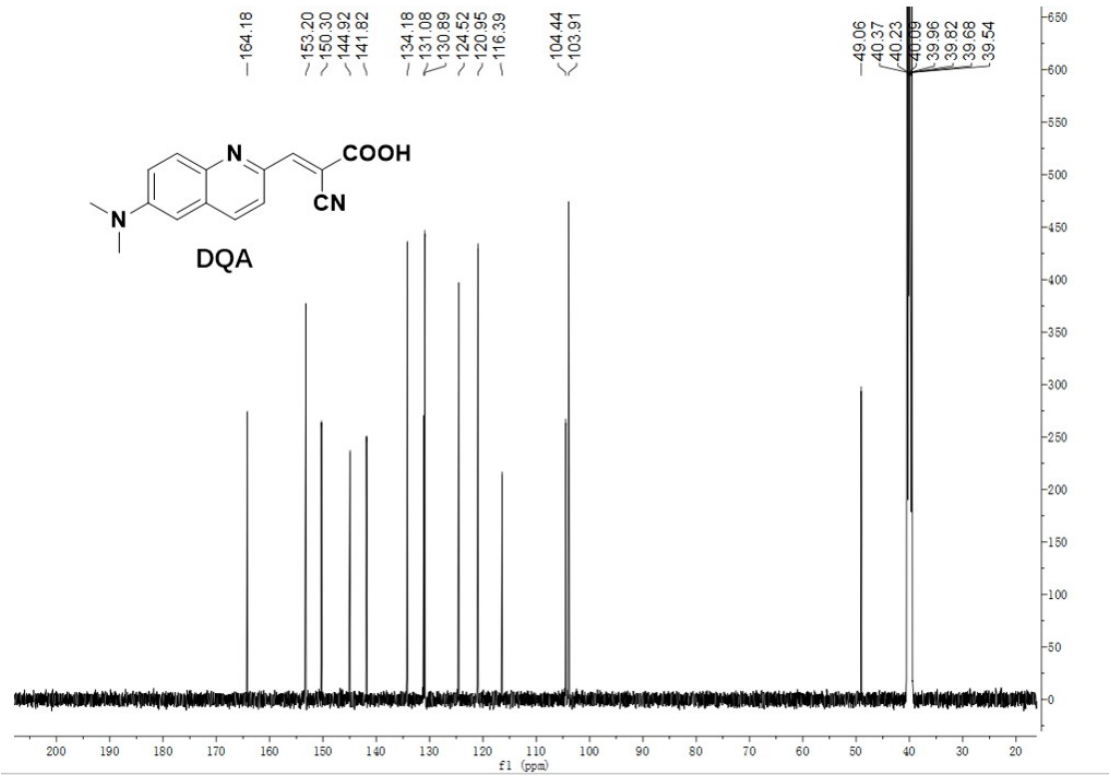
^{1}H NMR spectrum of compound **1** (600 MHz, in DMSO-d_6).



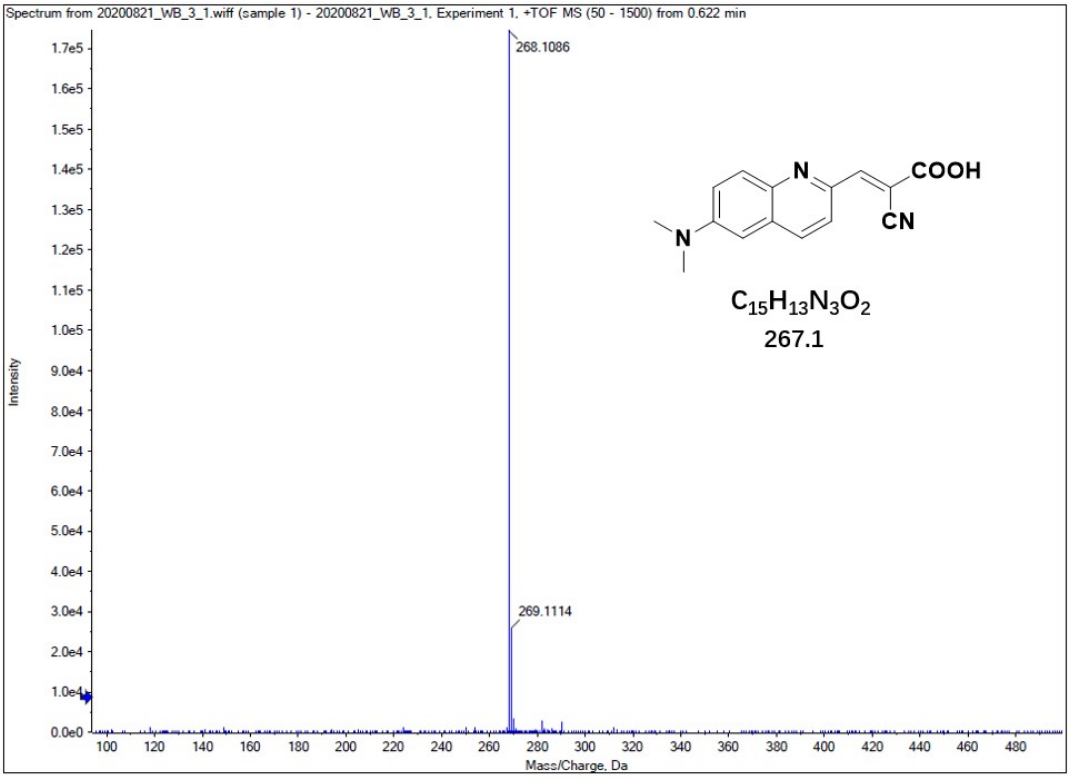
^{1}H NMR spectrum of compound **2** (600 MHz, in DMSO-d_6).



^{1}H NMR spectrum of **DQA** (600 MHz, in DMSO-d_6).



^{13}C NMR spectrum of **DQA** (151 MHz, in DMSO-d_6).



HRMS spectrum of **DQA** in acetonitrile.