Electronic Supplementary Material (ESI) for Materials Advances.

Supporting Information

Ionic liquid-based chemodosimeter probe for selective detection and removal of bisulfite in pure aqueous system, with potential uses in biosensing†

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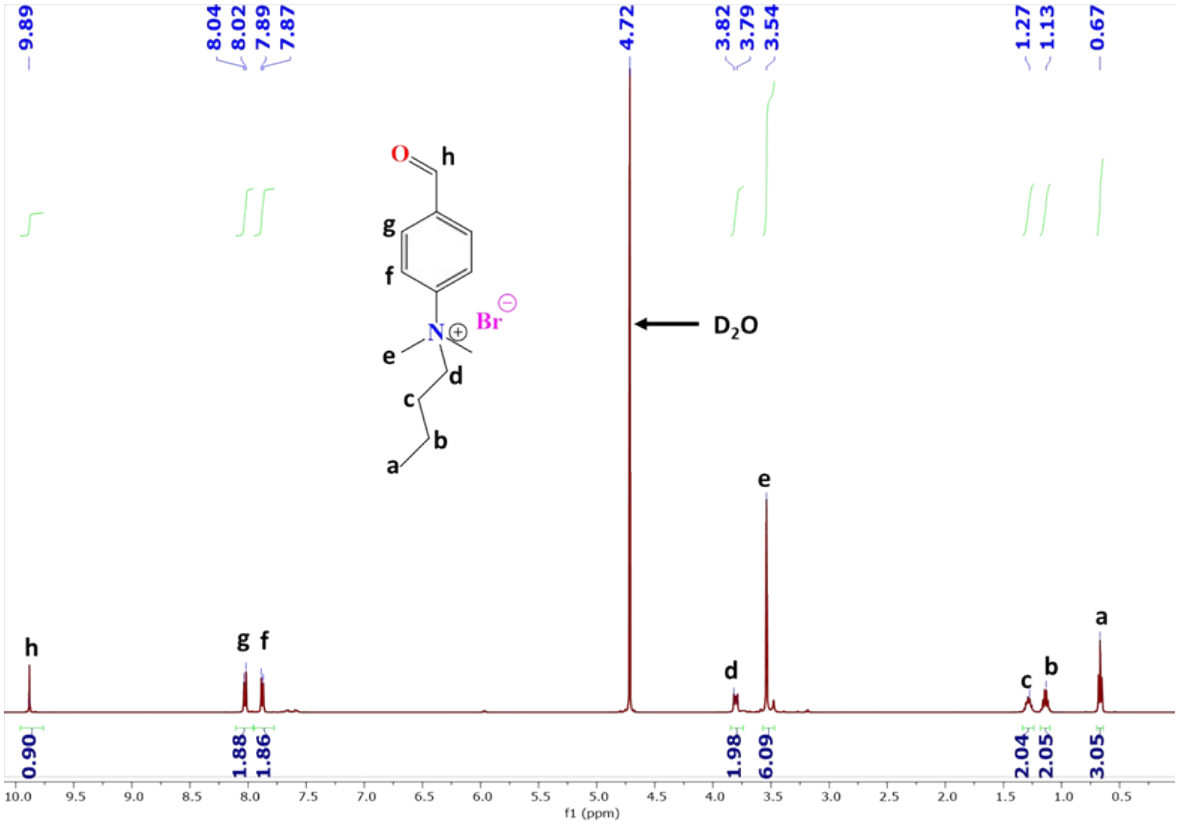

Fig. S1 ^{1}H NMR of hydrophilic **TSIL-1** at 500 MHz in D_2O solvent.

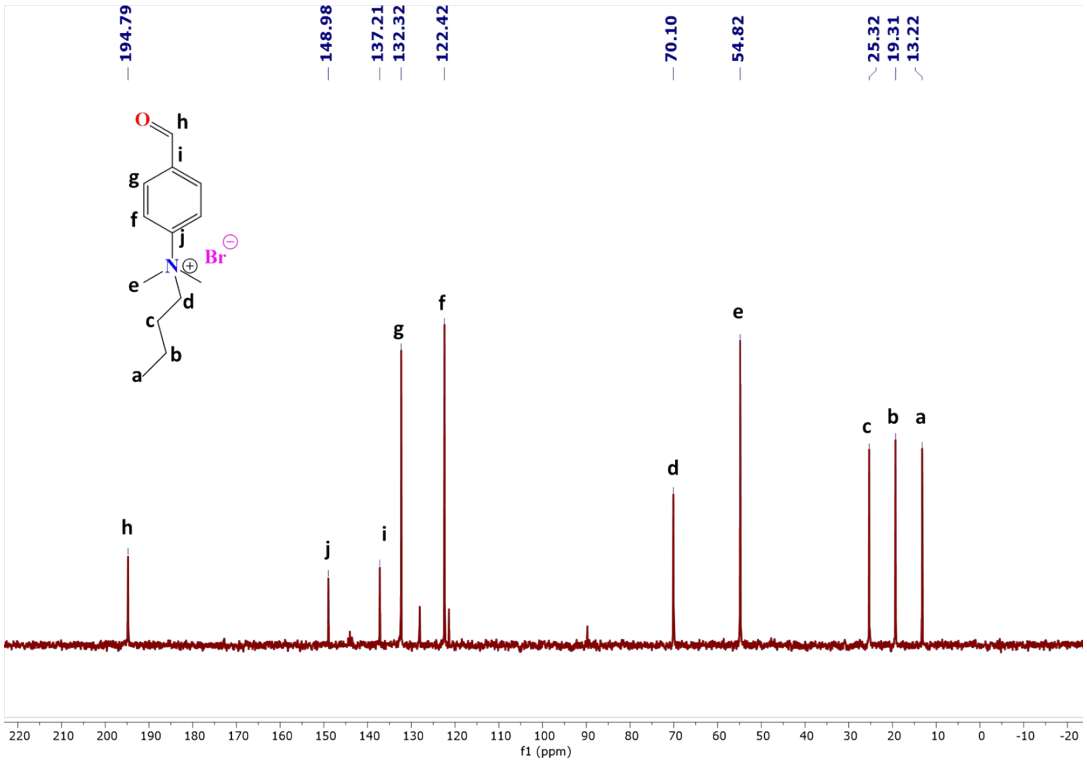

Fig. S2 ^{13}C NMR of hydrophilic **TSIL-1** at 500 MHz in D_2O solvent.

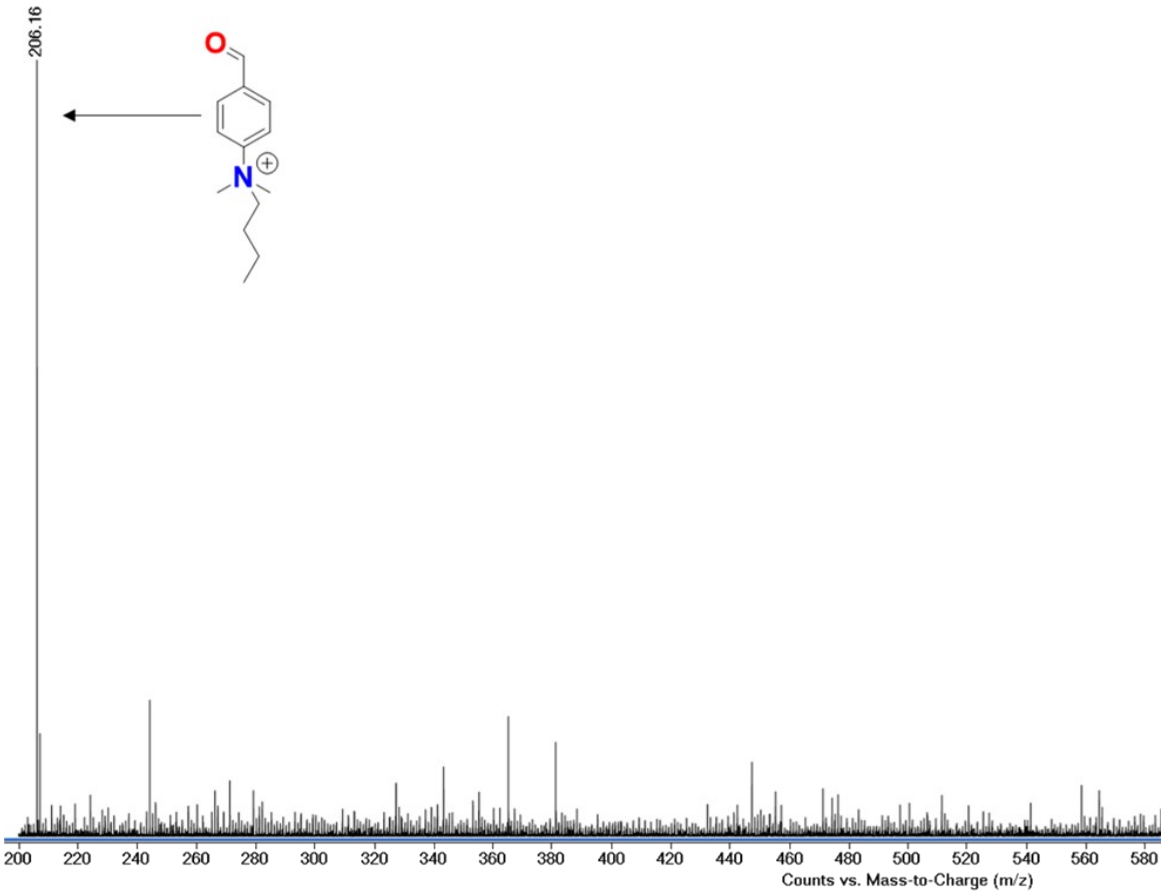

Fig. S3 ESI-MS of **TSIL-1** (+ve Scan).

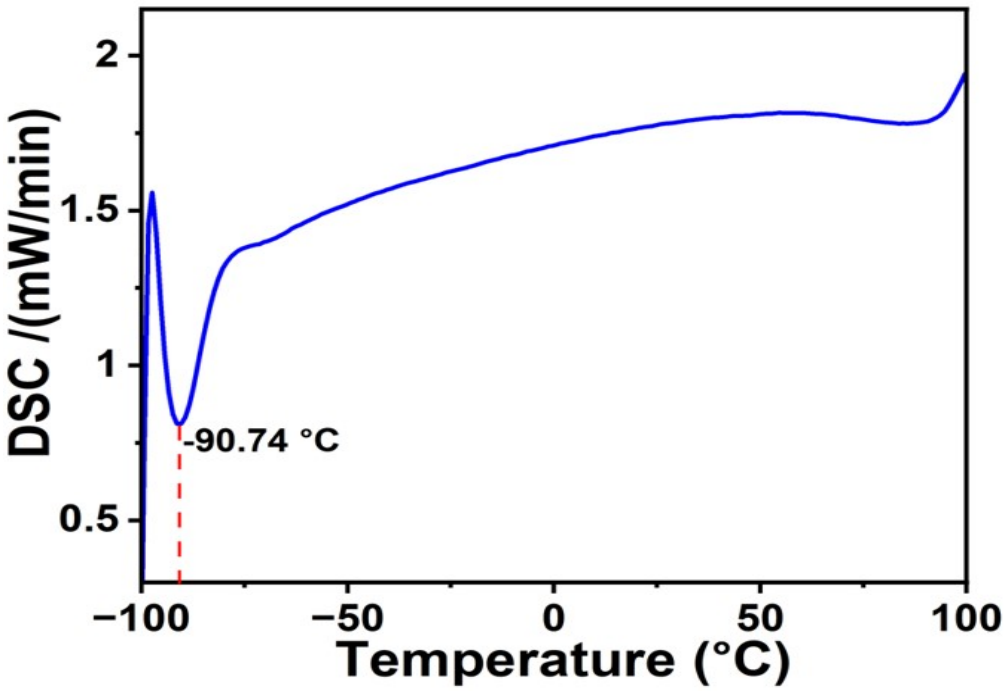

Fig. S4 DSC profile of **TSIL-1** showing room temperature ionic liquid behaviour (mp: -90 °C).

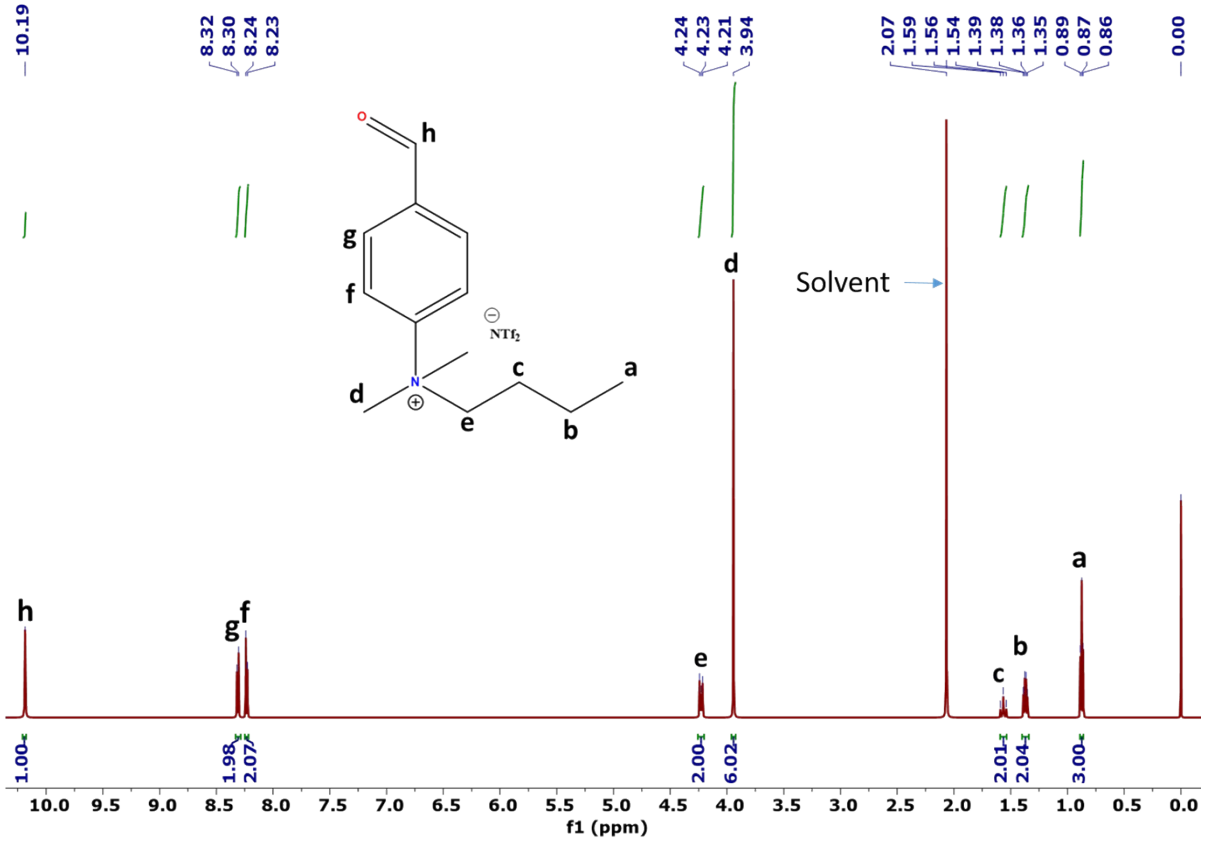

Fig. S5 [1]H NMR of hydrophobic **TSIL-2** at 600 MHz in Acetone-d6 solvent.

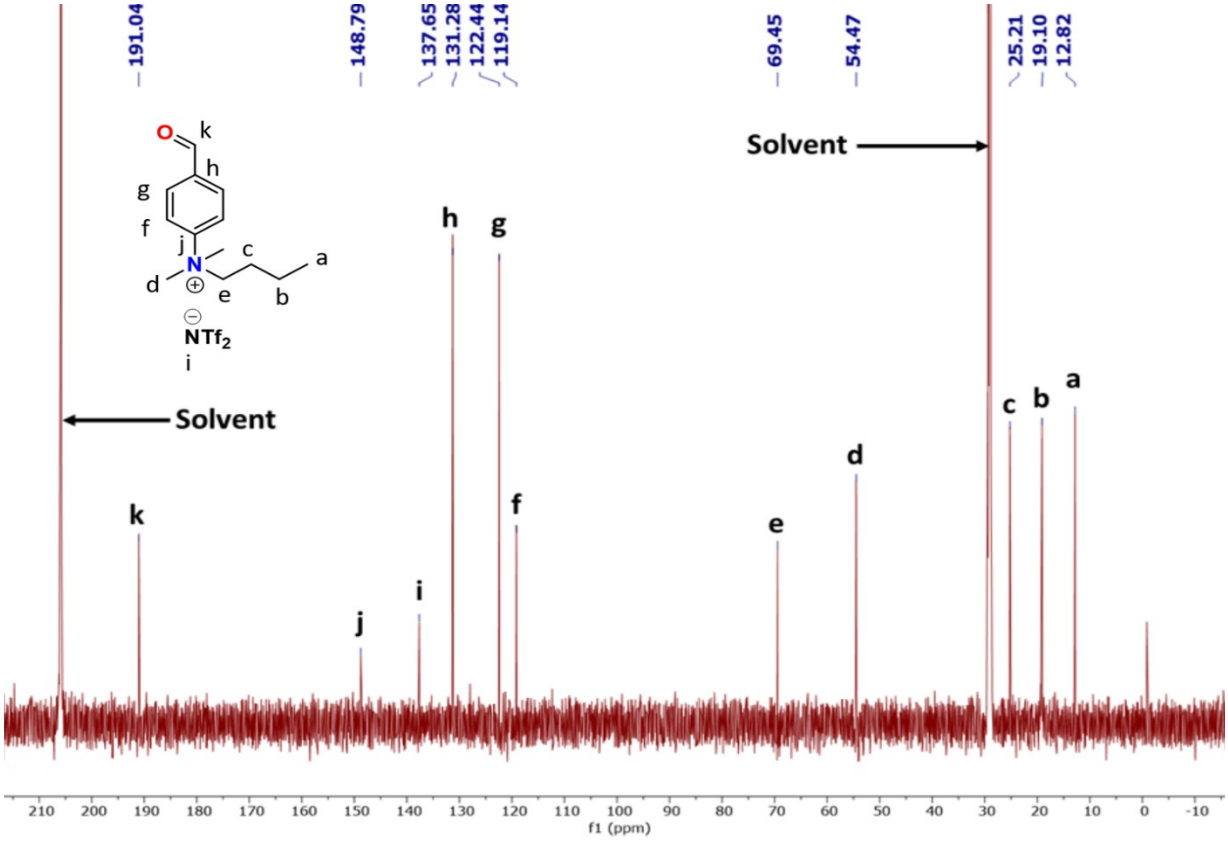

Fig. S6 [13]C NMR of hydrophobic **TSIL-2** at 600 MHz in Acetone-d6 solvent.

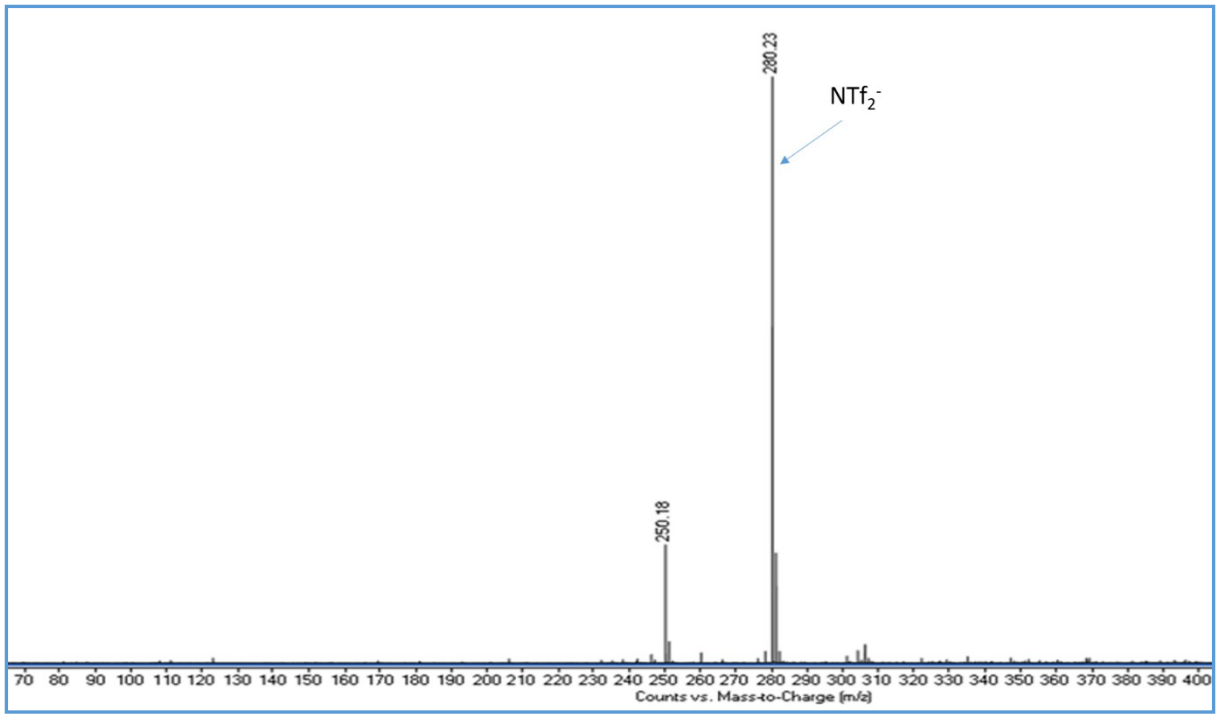

Fig. S7 ESI-MS of **TSIL-2** (-ve Scan).

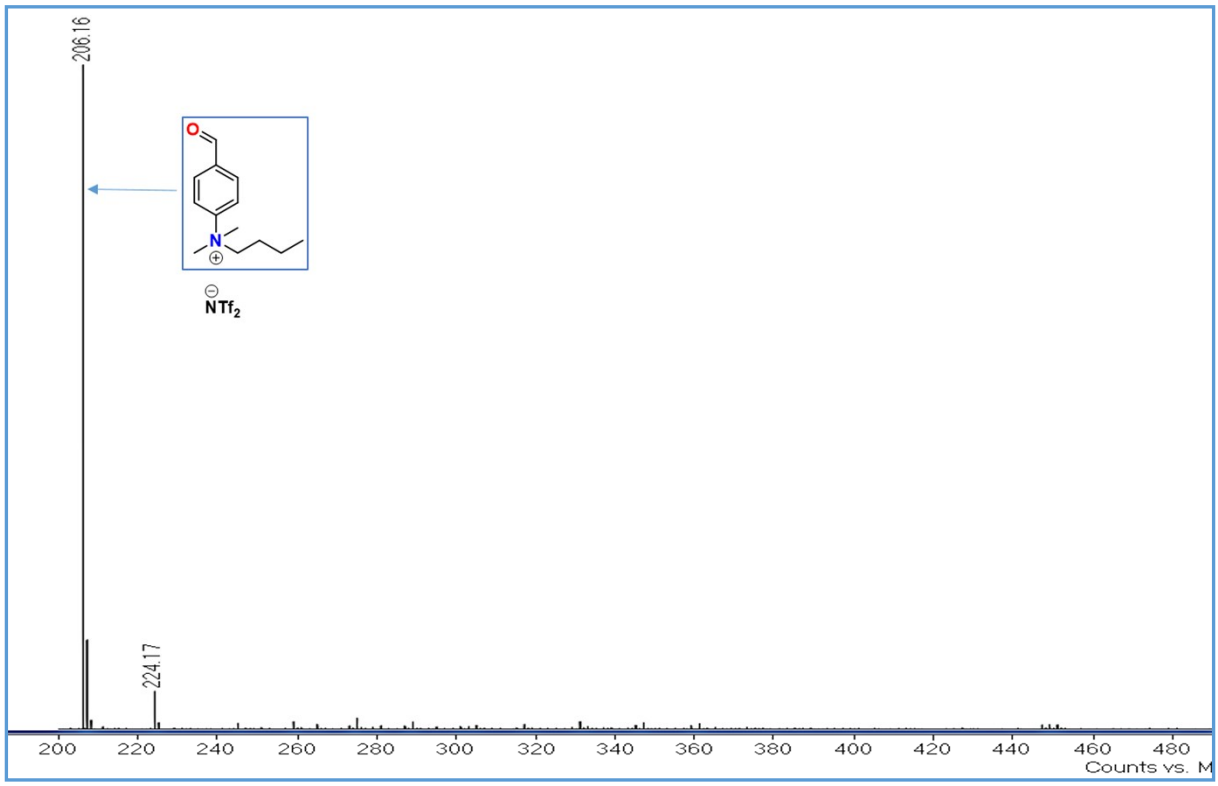

Fig. S8 ESI-MS of **TSIL-2** (+ve Scan).

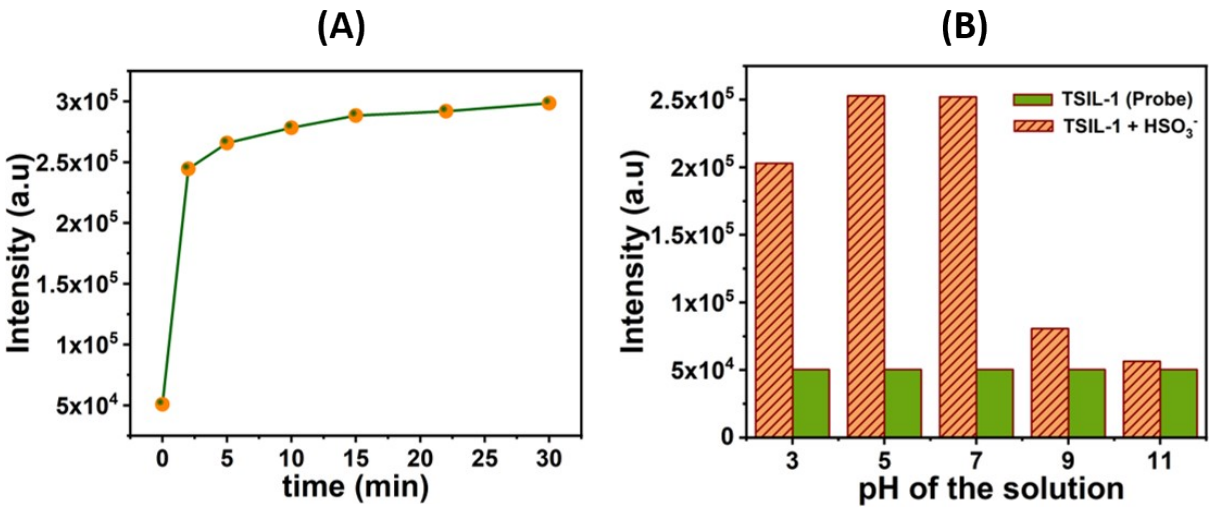

Fig. S9 (A) The fluorescence intensity of the probe (**TSIL-1**) with addition of bisulfite over time (190 μM bisulfite, pH ~ 7.2); (B) The fluorescence emission of the probe (**TSIL-1**) with and without bisulfite at different pH.

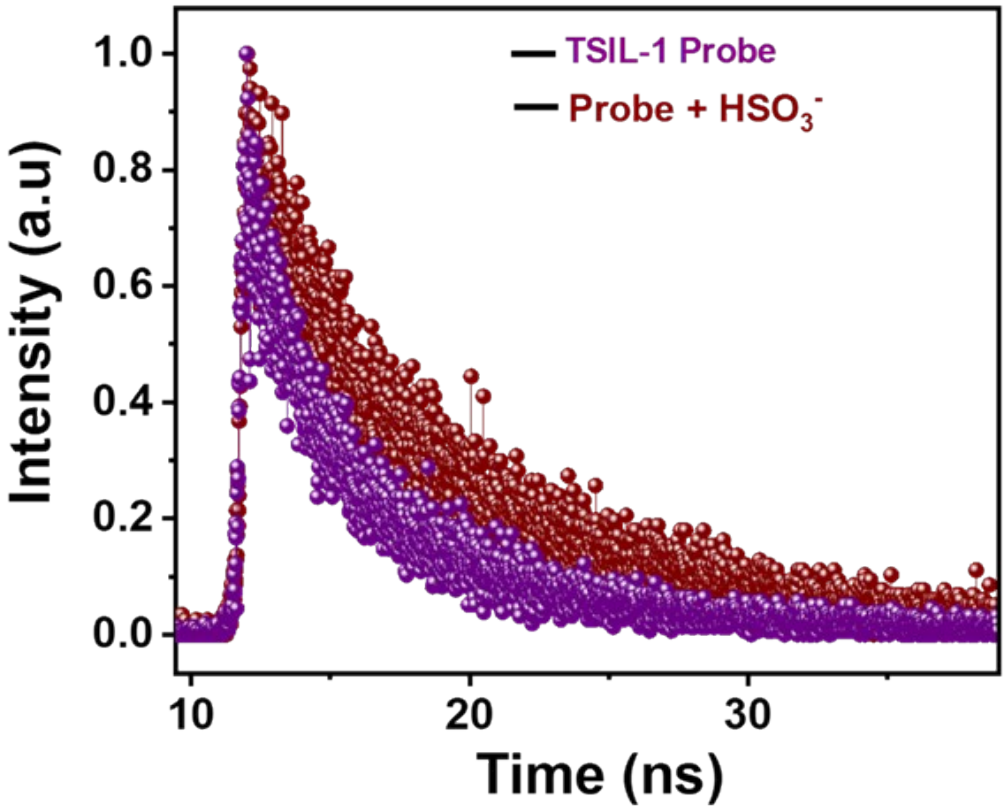

Fig. S10 The time-correlated single photon counting (TCSPC) experiment of the probe material (**TSIL-1**) before and after bisulfite addition.

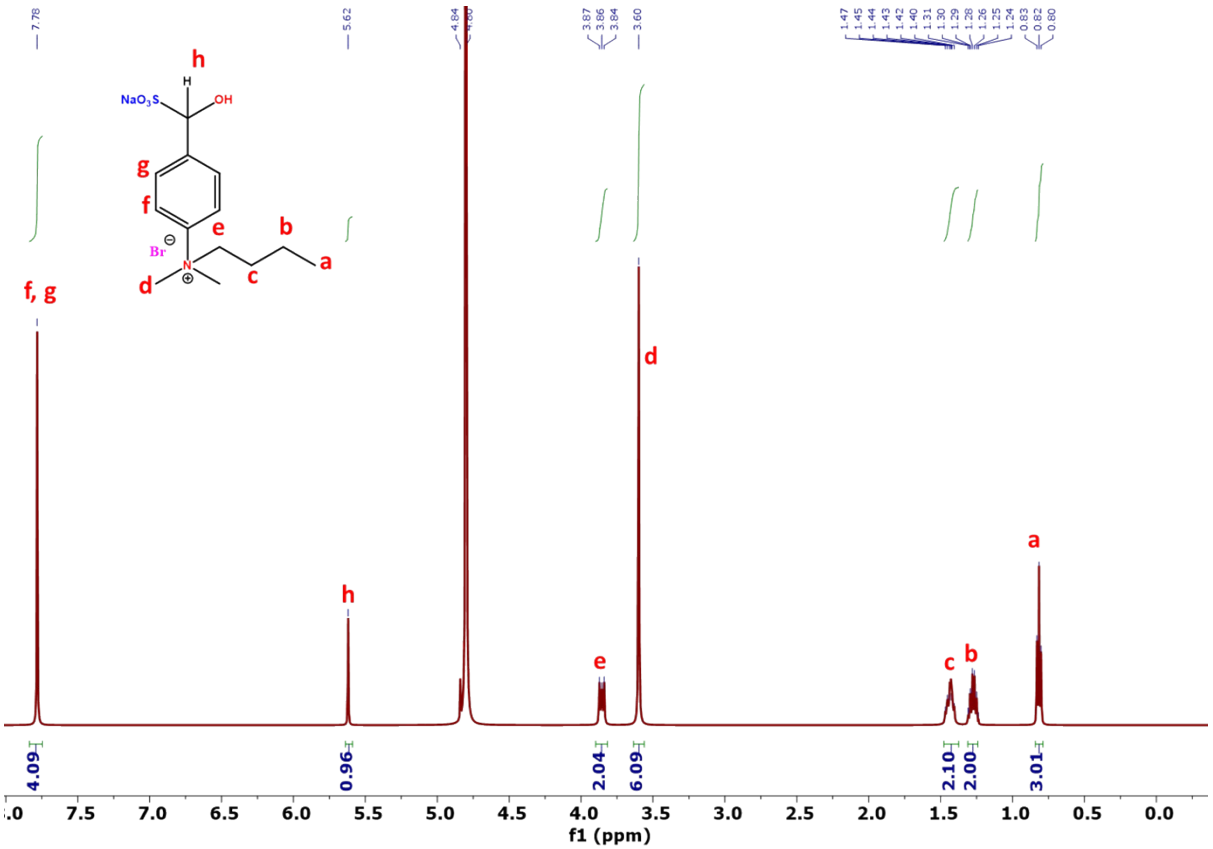

Fig. S11 ^{1}H NMR spectrum of **TSIL-1** with $NaHSO_3$ in D_2O.

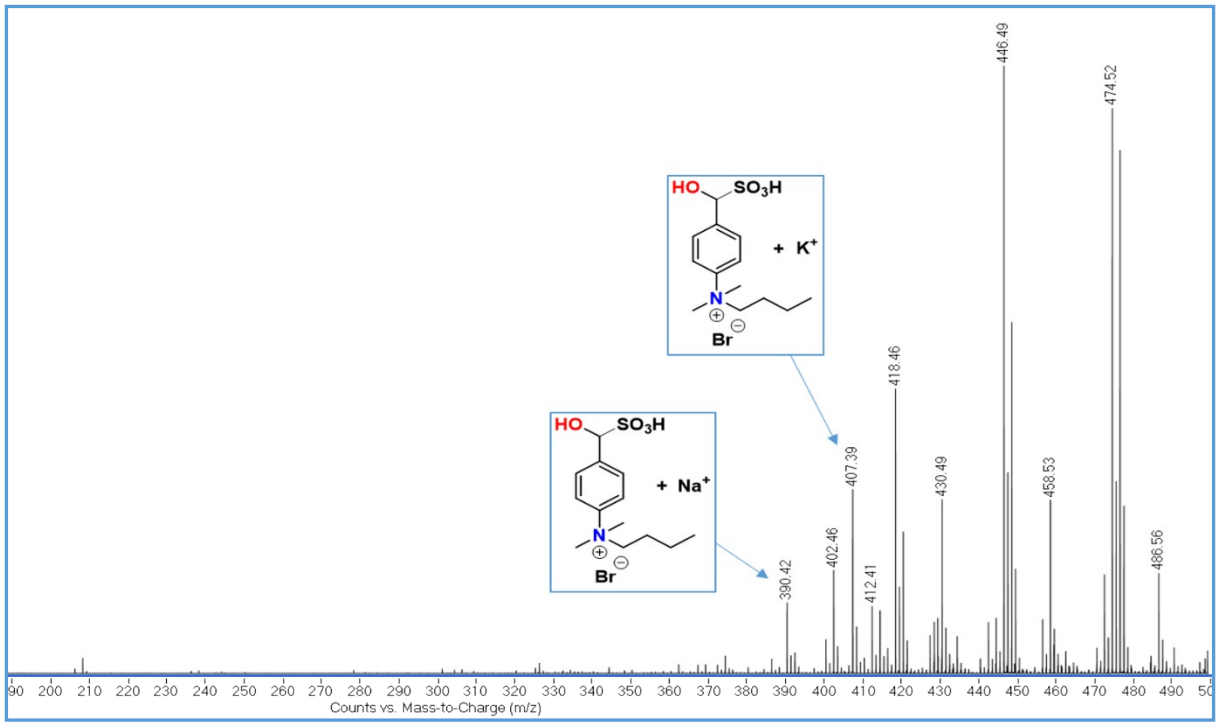

Fig. S12 ESI-MS of **TSIL-1** with $NaHSO_3$ in D_2O (+ve Scan).

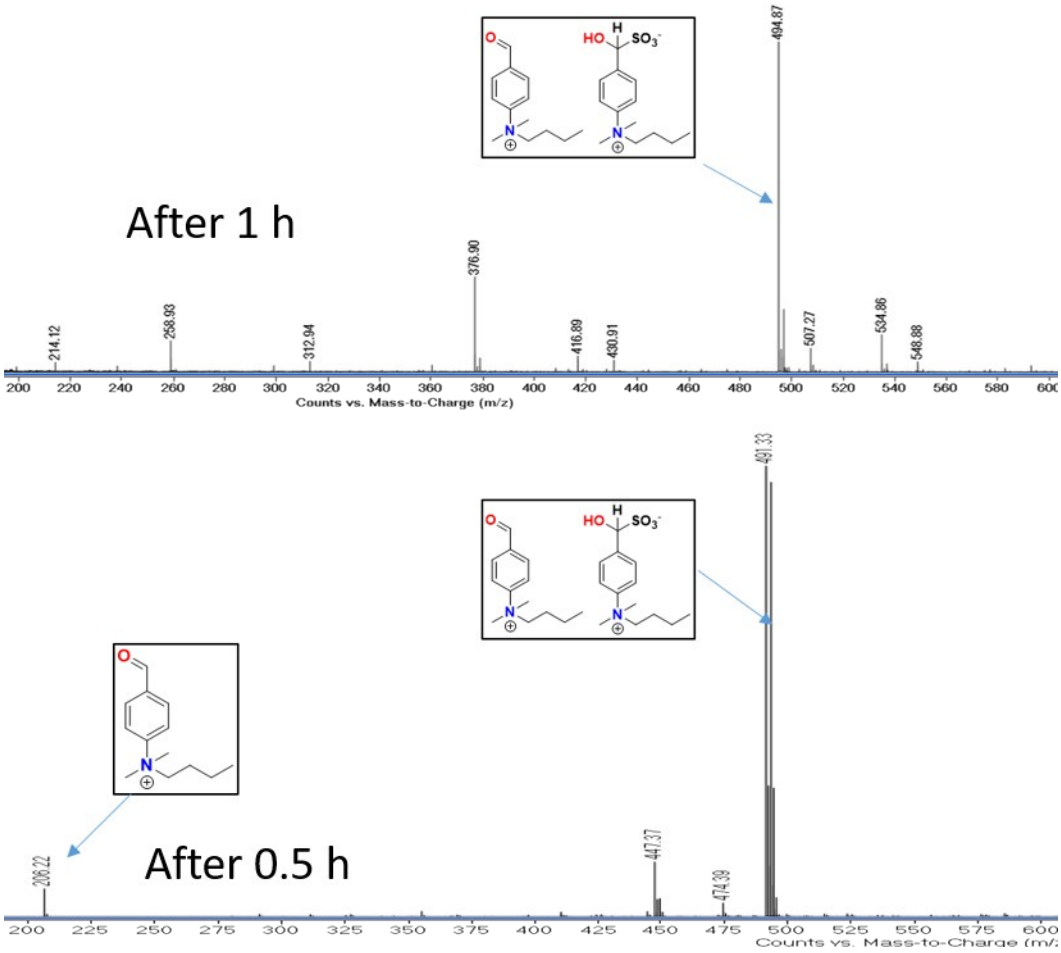

Fig. S13 The mass spectrum of organic phase (**TSIL-2** in ethylacetate) showing formation of bisulfite adduct with time.

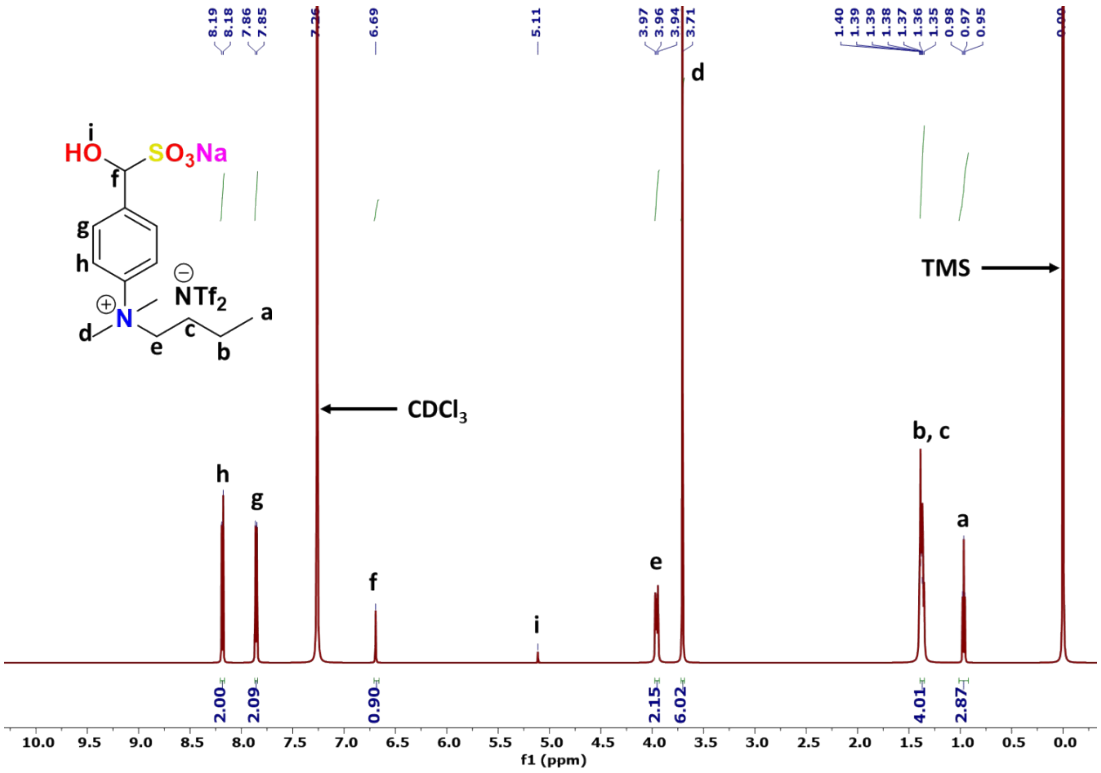

Fig. S14 The dried organic phase from liquid-liquid extraction experiment showing formation of bisulfite adduct in $CDCl_3$.

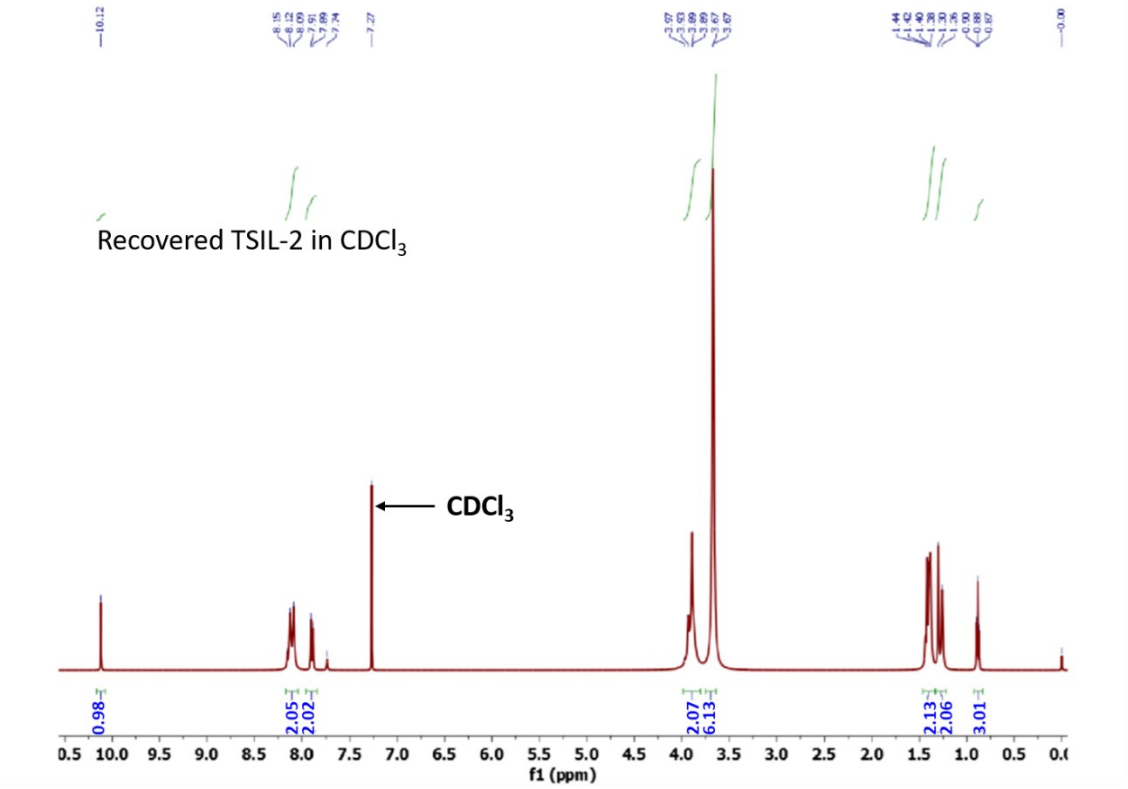

Fig. S15 The dried organic phase from the third cycle of recycling experiment from liquid-liquid extraction experiment showing formation of bisulfite adduct in $CDCl_3$.

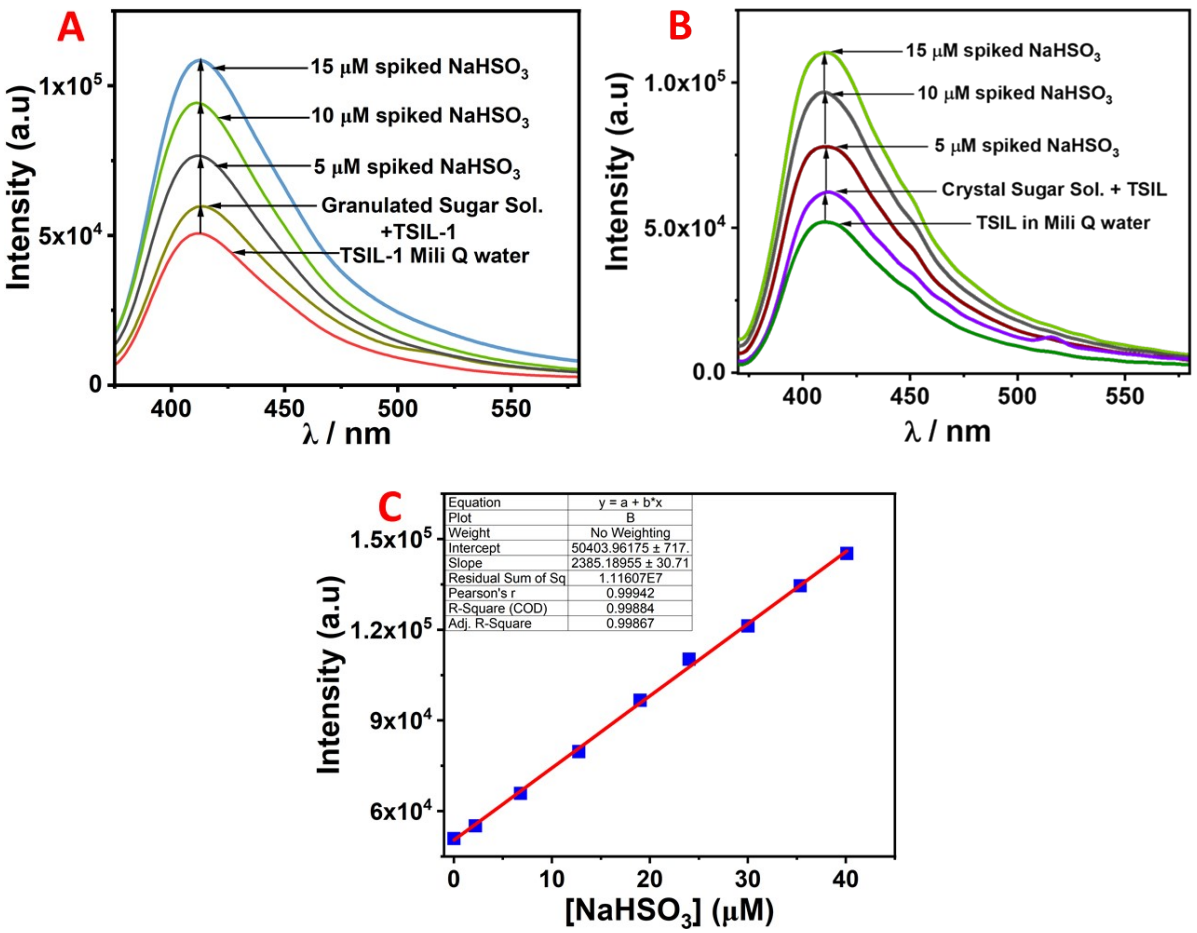

Fig. S16 Real sample quantification of (A) Granulated sugar and (B) Crystal sugar; (C) Calibration plot.

Table S1 Performance comparison of the probe with some literature reports.

S.No.	Probe	Type of response	Sensing Phase	Removal Studies	L.O.D Value	Ref
1	Functionalized silica	Turn off	Aqueous	yes	64 ppb	[8]
2	Organic Probe	NIR	Aqueous + DMSO	No	24 nM	[10]
3	Benzopyranium Salt	Ratiometric	Aqueous + EtOH	No	0.017 μM	[2]
4	Organic Probe	Ratiometric	Aqueous + DMF	No	12.6 nM	[16]
5	Dicyanoisophorone-quinolinium-based	Ratiometric	Aqueous + DMSO	No	2.5 μM	[18]

6	Organic Salt	Turn off	Aqueous + DMSO	No	2.1 µM	[19]
7	Coumarin-Benzopyran derivative	Turn on	Aqueous	No	177 nM	[20]
8	Triphenylamine-Benzopyrylium based	Turn on	Aqueous	No	12.7 nM	[21]
9	Unsymmetrical azine	Turn off	Aqueous + organic	No	25 nM	[22]
10	Organic probe	Ratiometric	Aqueous + DMSO	No	58 µM	[29]
11	Organic Probe	Turn on	Aqueous + Acetonitrile	No	10 µM	[30]
12	**Ionic liquid (This work)**	**Turn on**	**Aqueous**	**Yes**	**91 nM**	**This work**