Supporting Information

Smart Supramolecular Gels of Enolizable Amphiphilic Glycosylfuran

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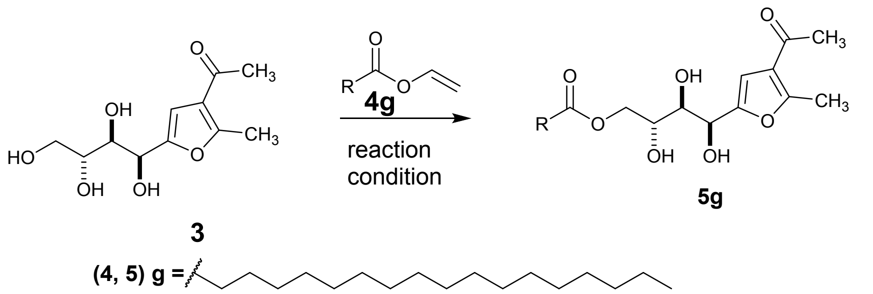
Table S1. Optimization of reaction condition



S. No	**Solvent**	**Temperature (°C)**	**Time (h)**	**Yield (%)$**
1	Dioxane	50	24	NR
2	Acetone	50	24	54
3	Acetonitrile	50	24	35
4	Isopropanol	50	24	38
5	*t*-BuOH	50	24	23
6	DMSO	50	24	Trace#
7	H_2O	50	24	Trace#
8	DCM	50	24	Trace#
9	DMF	50	24	Trace#
10	Toluene	50	24	10
11	Acetone	60	24	47
12	Acetone	70	24	Trace#
13	Acetone	50	48	78
14	Acetone	50	60	83
15	Acetone	50	72	79

Note: Reactions performed at <50 ^{o}C did not furnish the corresponding product in good yield, hence not shown in the optimization table. # observed trace product in TLC. $ isolated yield after column chromatography.

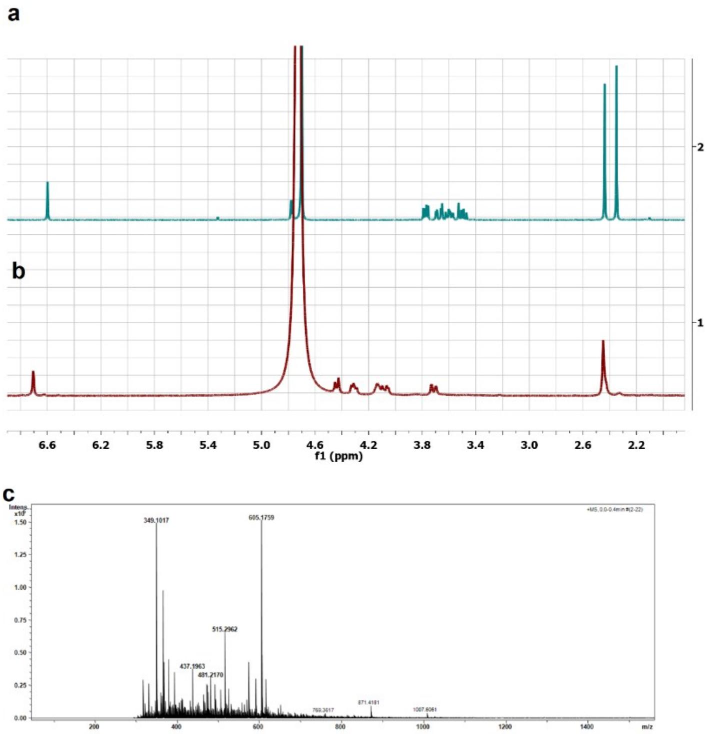
Table S2. Solvents/Oils used for gelation studies

S. No.	**Solvent/vegetable oils**	**Observation Critical Gel Concentration (CGC wt/v%)**						
		5a	**5b**	**5c**	**5d**	**5e**	**5f**	**5g**
1	Ethanol	S	S	S	S	S	S	S
2	*n*-Butanol	S	S	S	S	S	S	S

3	Octanol	S	S	S	S	S	S	S
4	Decanol	S	S	S	S	S	S	S
5	Dodecanol	S	S	S	S	S	S	S
6	Toluene	S	S	S	S	S	S	PG
7	Benzene	S	S	S	S	S	S	S
8	Diesel	S	S	S	S	S	S	S
9	1,2-Dichlorobenzene	S	S	S	S	S	PG	G
10	Chloroform	S	S	S	S	S	S	S
11	Hazelnut oil	S	S	S	PG	G (1)	G (1)	G(0.7)
12	Olive oil	S	PG	S	PG	G (1)	G (1)	G(0.8)
13	Heavy paraffin oil	S	PG	S	G(1)	G (1)	G (1)	G(0.6)
14	Light paraffin oil	S	S	S	PG	PG	PG	G (1)
15	Sesame oil	S	S	S	PG	PG	PG	PG
16	Linseed oil	S	S	S	PG	PG	G (1)	G (0.6)
17	H_2O	I	P	P	P	Crys	Crys	Crys
18	DMSO+ H_2O (1:9)*	S	P	S	P	P	PG	G (1)
19	DMF+ H_2O (1:1)	S	P	S	P	P	PG	PG
20	Ethylacetate	S	S	S	S	S	S	S
21	Cyclohexane	S	S	S	S	S	S	S
22	EPALO	S	S	S	S	S	PG	G (1)
23	Castor oil	S	S	S	S	S	S	PG

** Self-sorting gel under basic pH was observed even without using heating cooling cycle*

NMR and mass spectral analysis



*The addition of freshly prepared 1 wt/v% Na_2S solution into the solution of **5g** (1 wt/v%) dramatically accelerate the gelation process by encapsulating Na2S and H2S via the intermolecular interactions. Xerogel obtained from SGH is subjected to the mass spectral analysis. Mass spectral data reveals the enolization of 5g along with the strongly interacted H_2O and Na_2S in xerogel state. Exact mass calculated for C29H51Na2O8S m/z = 605.3100; found m/z = 605.1759*

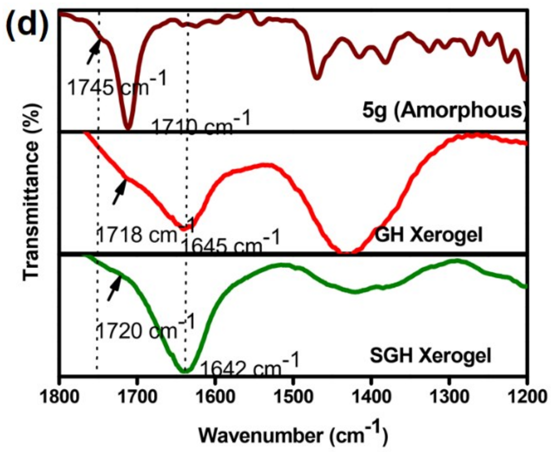


Figure S1. (a) ^{1}H NMR spectra of compound 3 in D_2O; (b) ^{1}H NMR spectra of compound 3 in D2O + NaOH 1wt/v%; (c) Mass spectra of xerogel of SGH in MeOH and (d) FTIR spectral comparison of **5g** in amorphous state, GH xerogel and SGH xerogel.

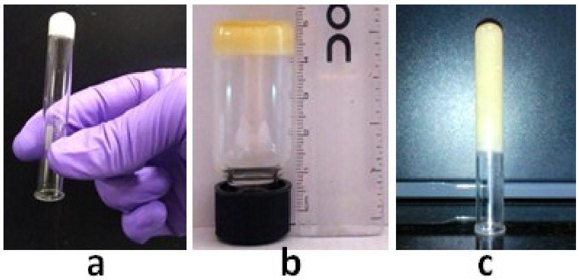


Figure S2. Images of gel formed by compound **5g** in a) 1 wt/v% of Na_2S under self-sorting condition (SGH); b) 1 wt/v% of NaOH under self-sorting condition (GH); c) 1 wt/v% of Na_2S under the influence of heating cooling cycle.

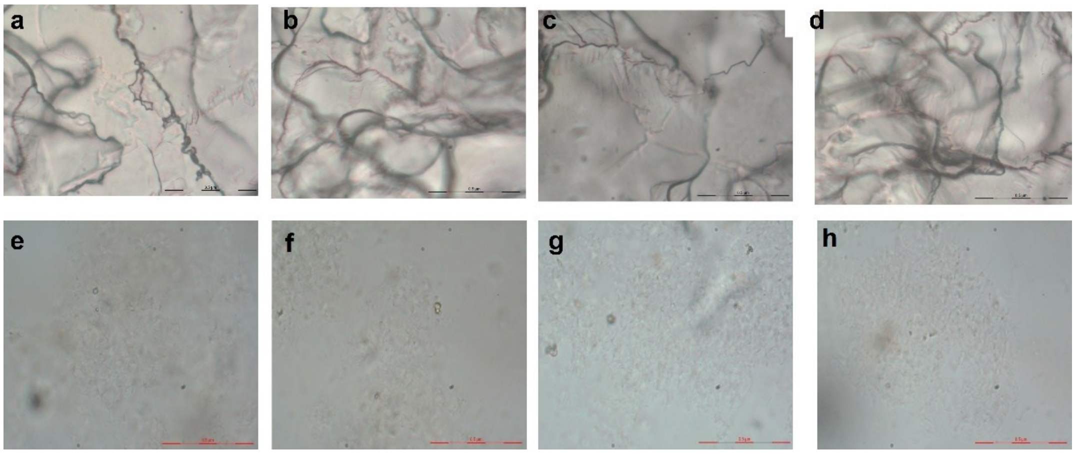


Figure S3. Optical microscopy image of (a-d) GH and (e-h) SGH respectively

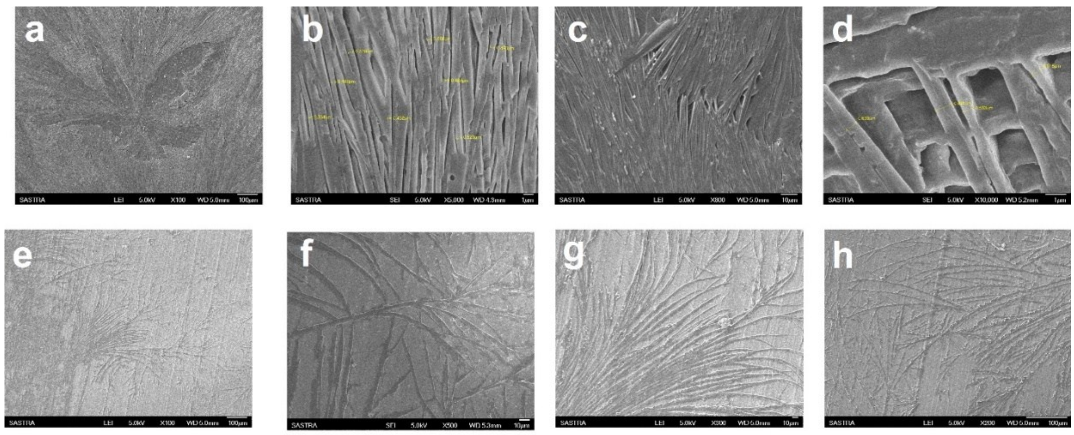


Figure S4 FESEM image of (a-d) GH and (e-h) SGH respectively.

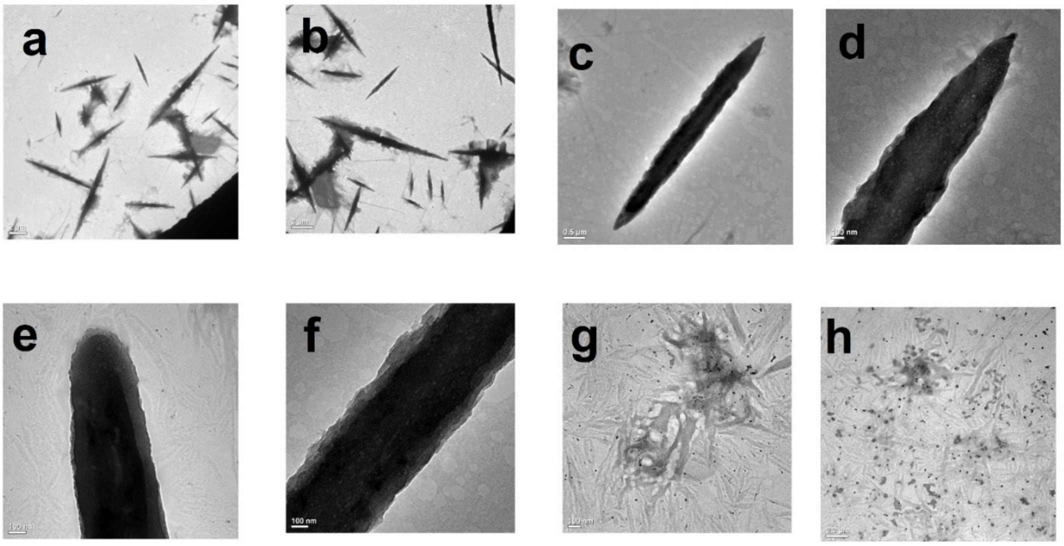


Figure S5 FETEM image of (a-f) Crystalline structure in water under neutral pH by glycosylfuran, 5g and (g,h) SGH respectively.

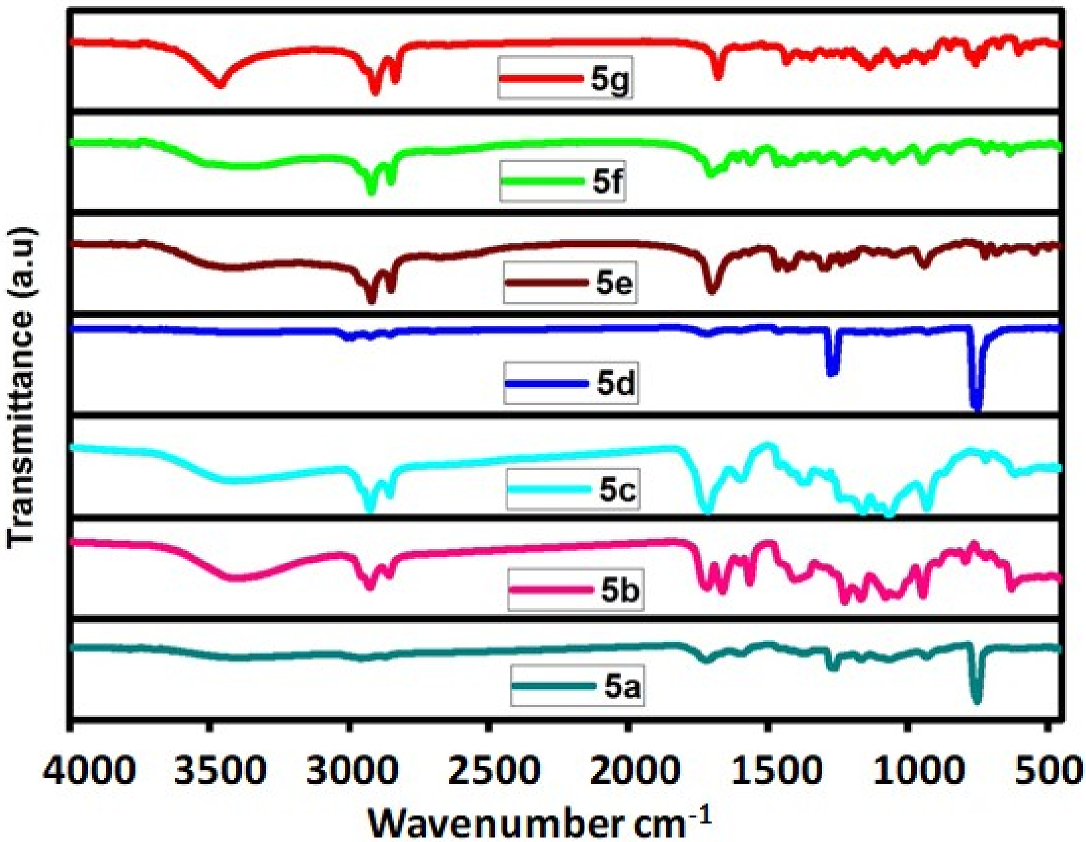


Figure S6 FTIR spectra of compound 5a-g

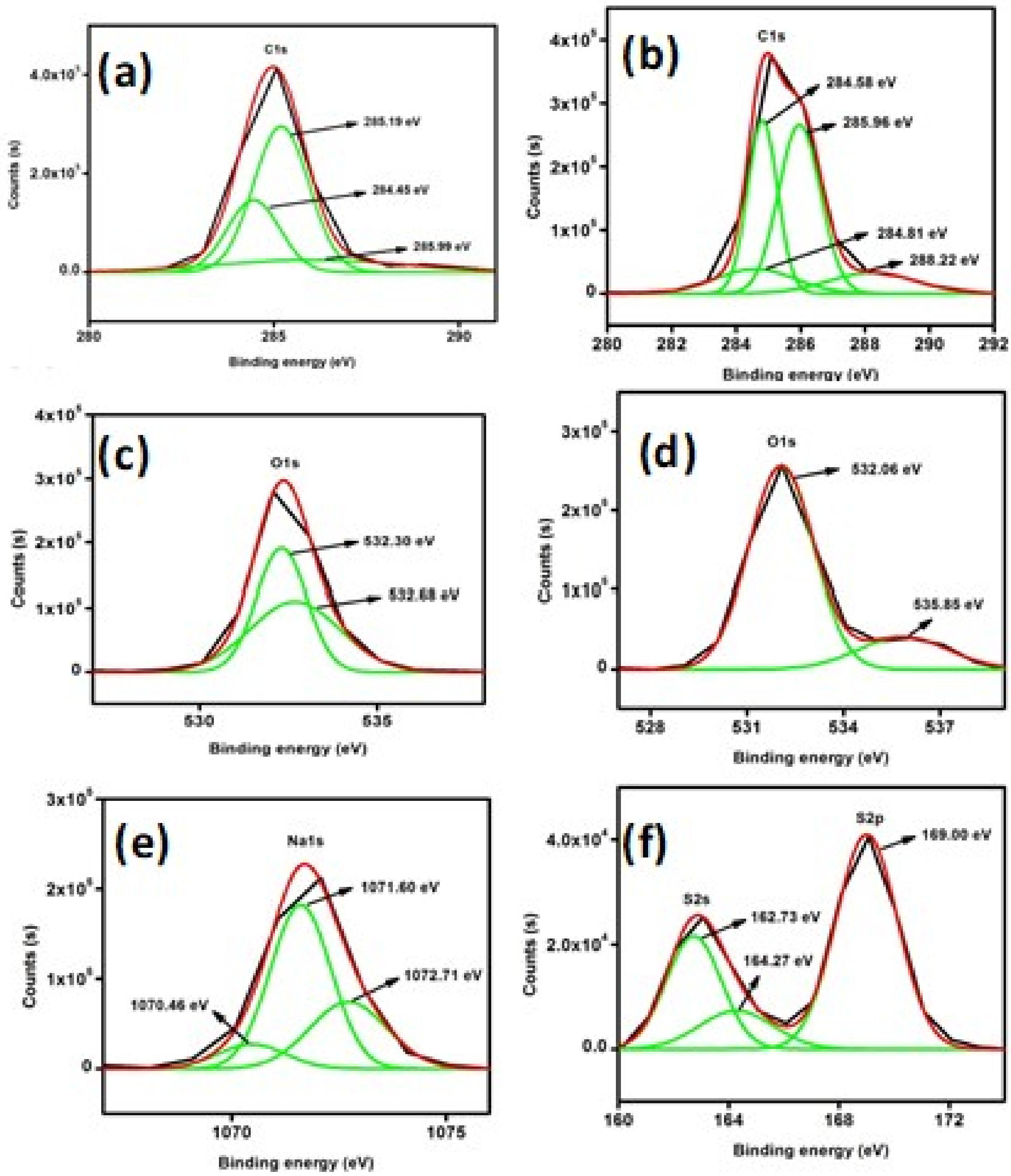


Figure S7. (a-f) XPS spectra of xerogel formed by **GH** and **SGH**

NMR spectra

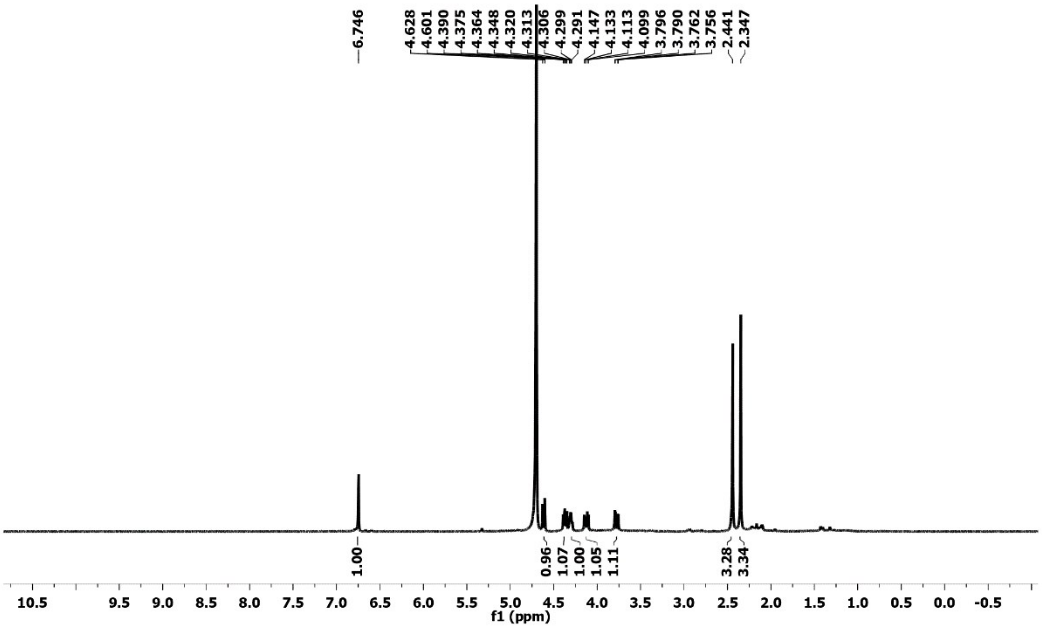


Figure S8. ^{1}H NMR of compound, **3** in D_2O

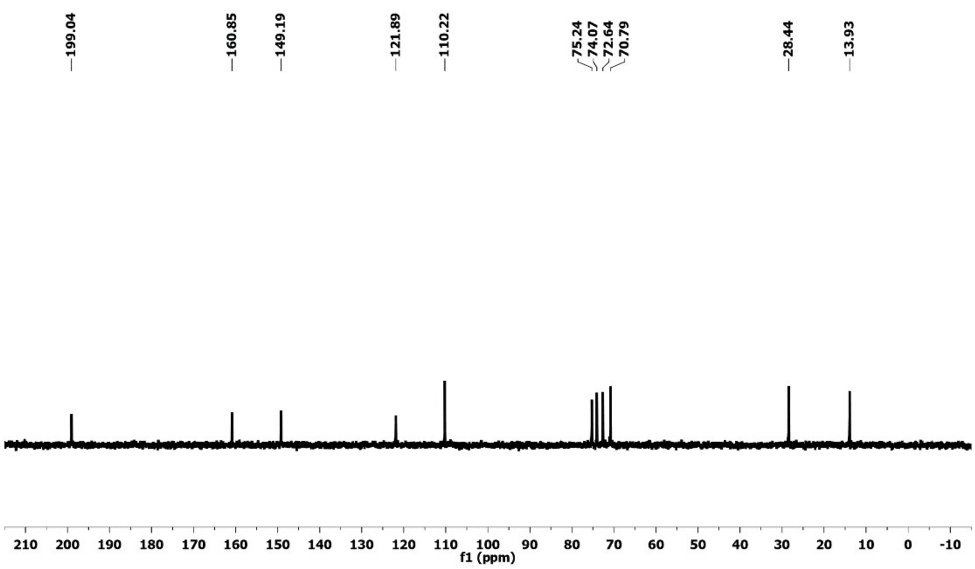


Figure S9. ^{13}C NMR of compound, **3** in D_2O

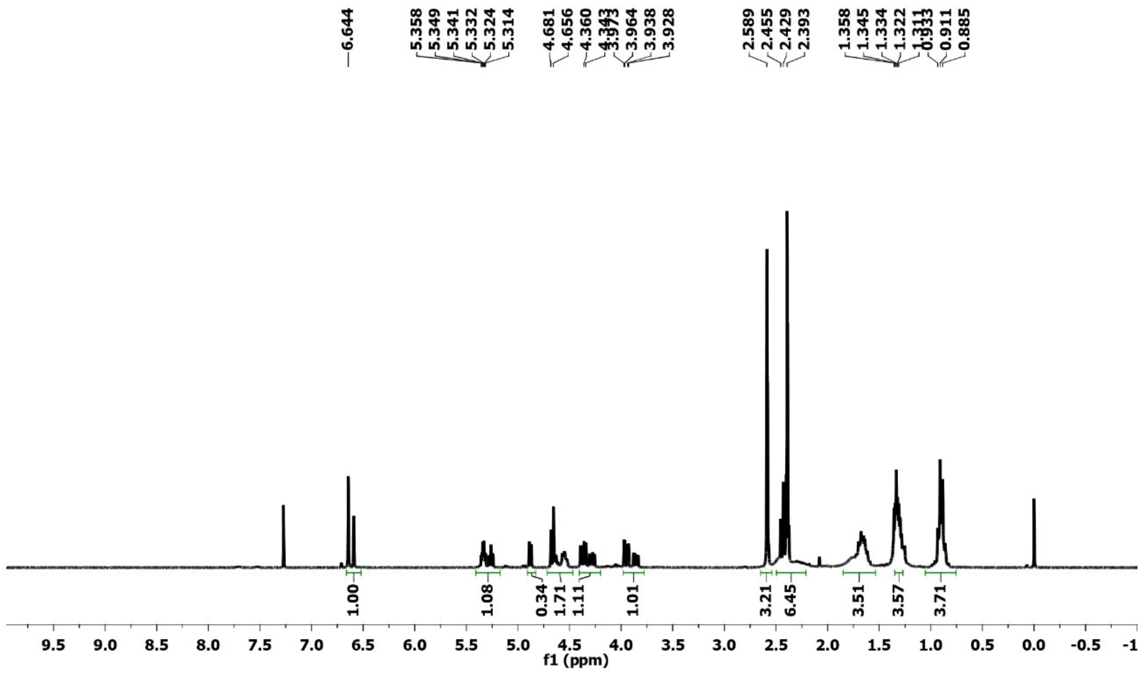


Figure S10. ^{1}H NMR of compound, **5a** in $CDCl_3$

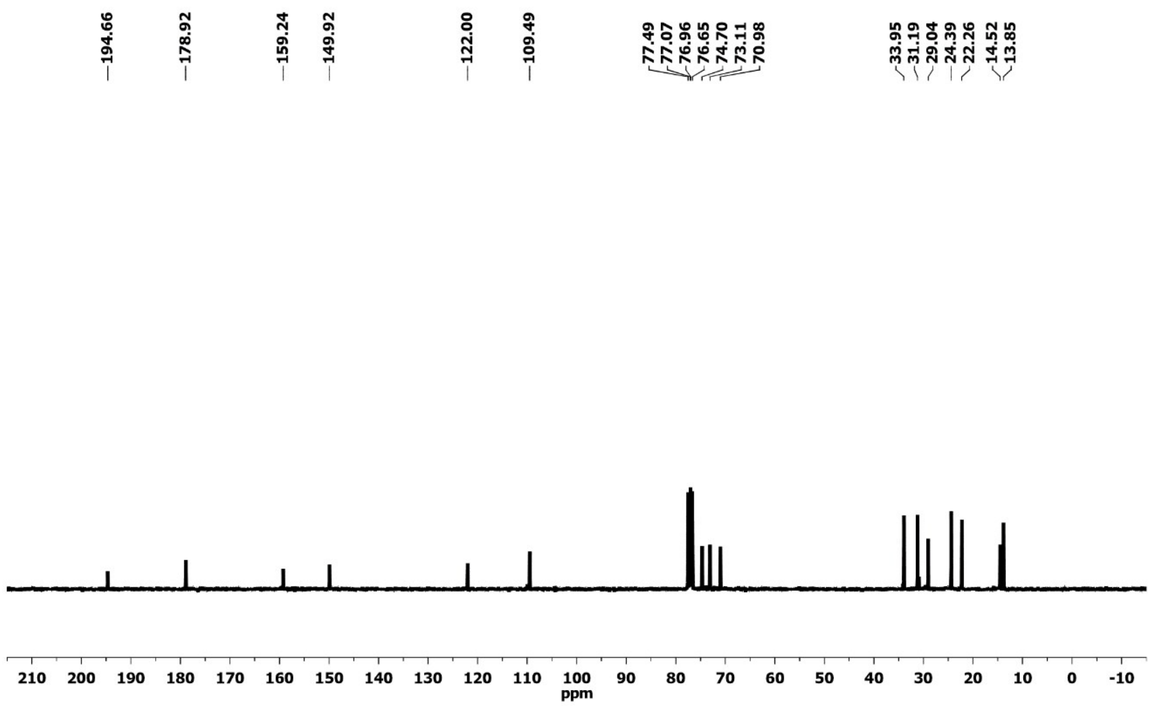


Figure S11. ^{13}C NMR of compound, **5a** in $CDCl_3$

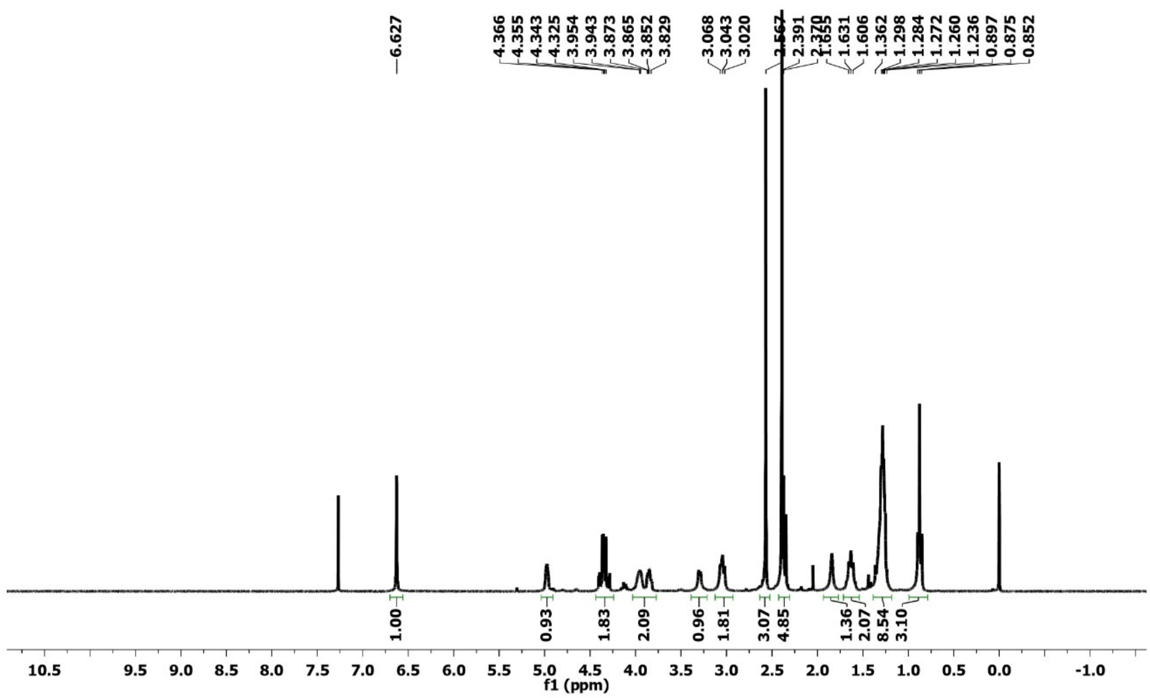


Figure S12. ^{1}H NMR of compound, **5b** in $CDCl_3$

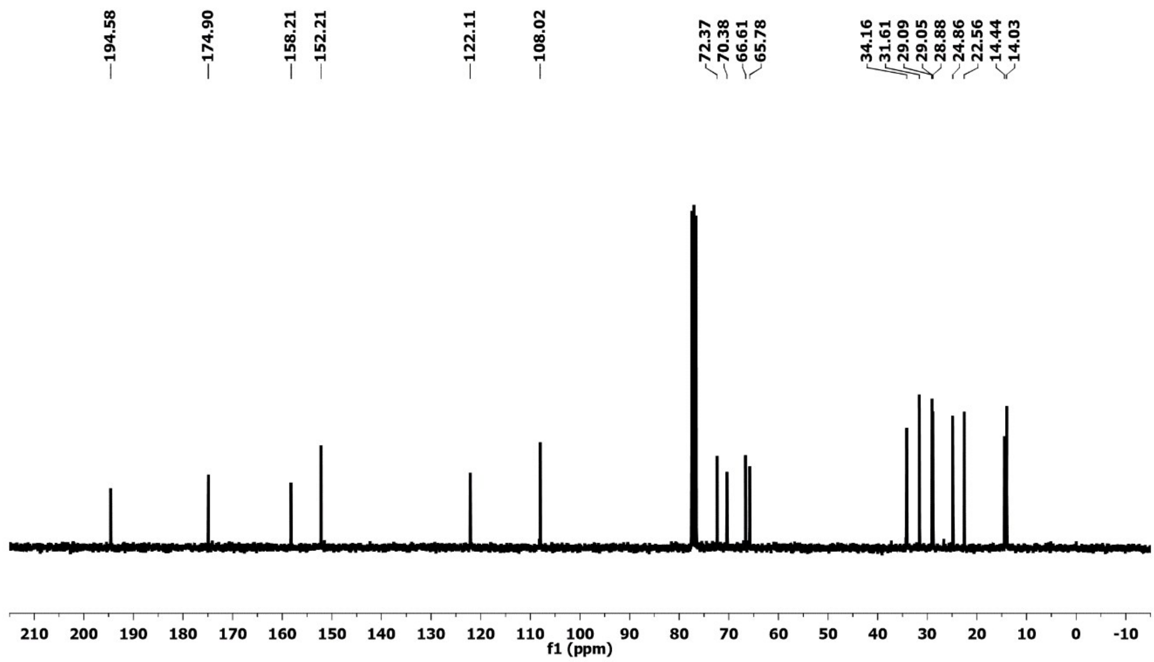


Figure S13. ^{13}C NMR of compound, **5b** in $CDCl_3$

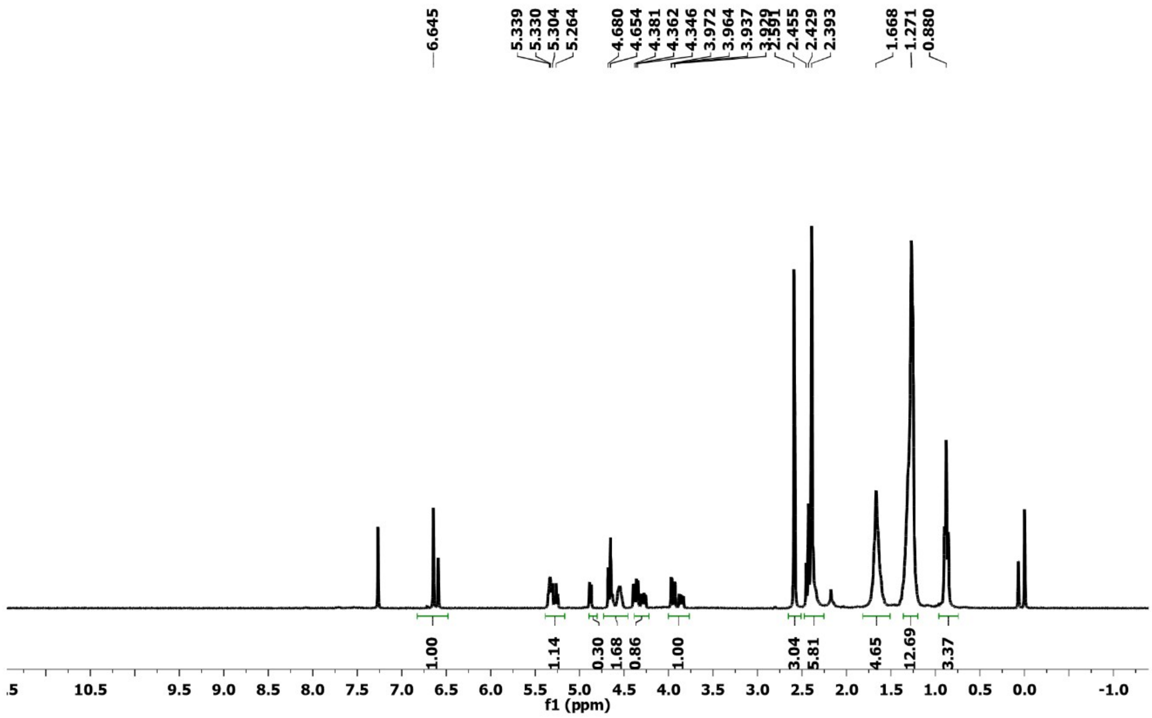


Figure S14. ^{1}H NMR of compound, **5c** in $CDCl_3$

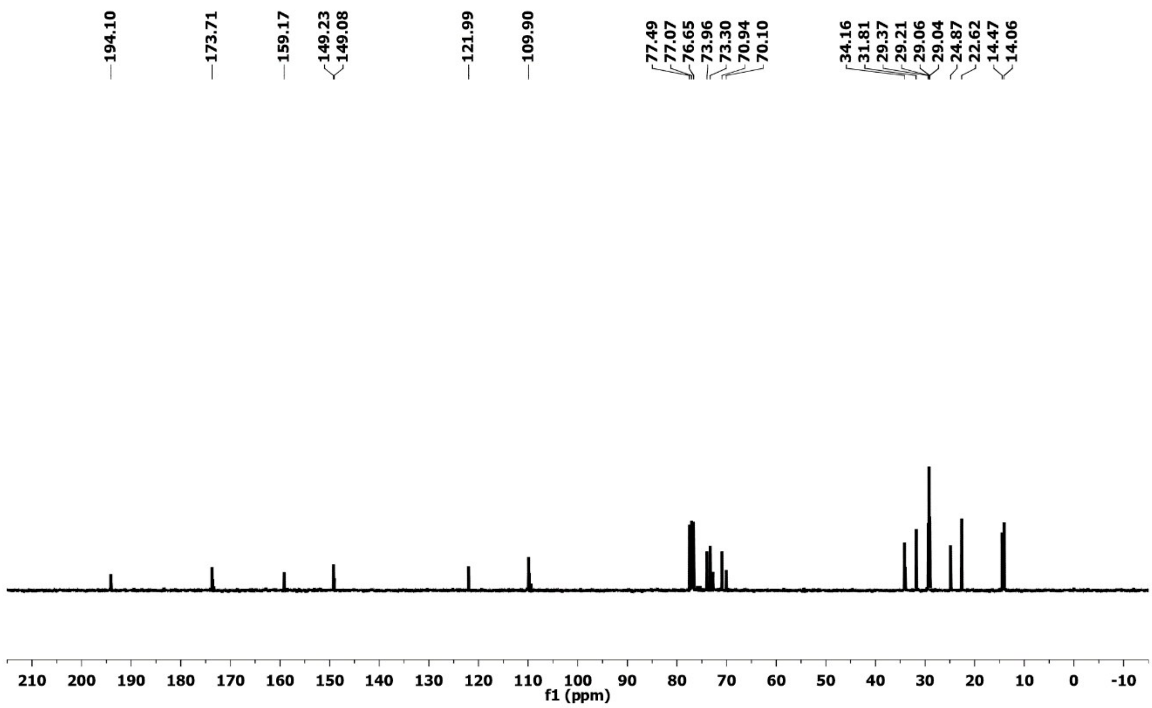


Figure S15. ^{13}C NMR of compound, **5c** in $CDCl_3$

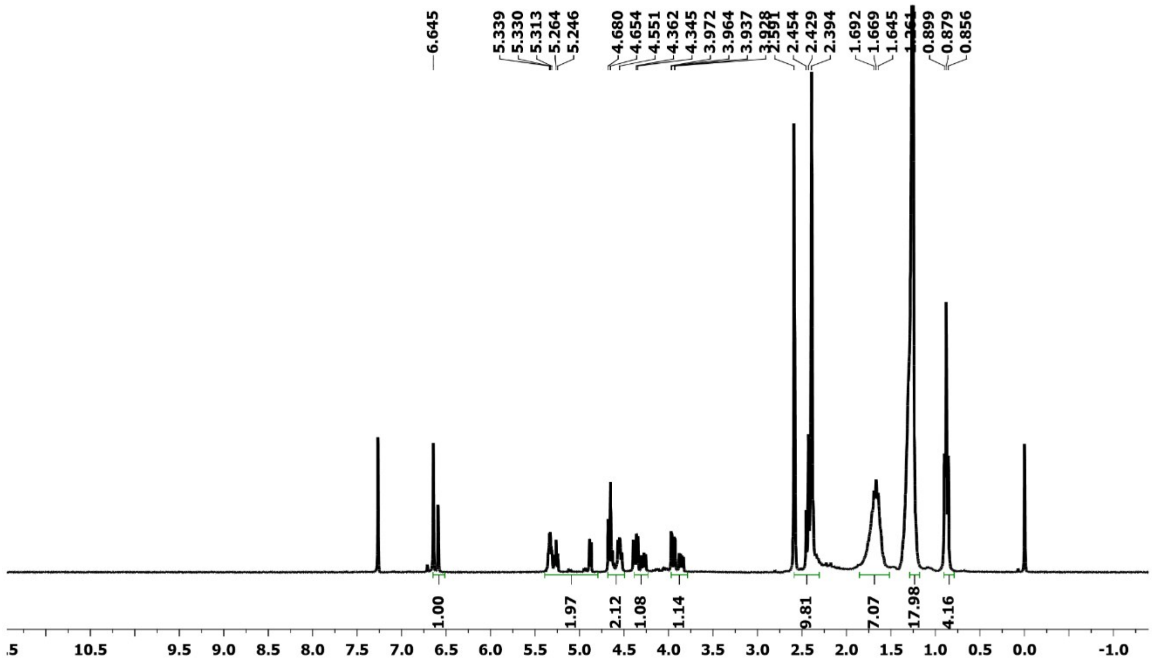


Figure S16. ^{1}H NMR of compound, **5d** in $CDCl_3$

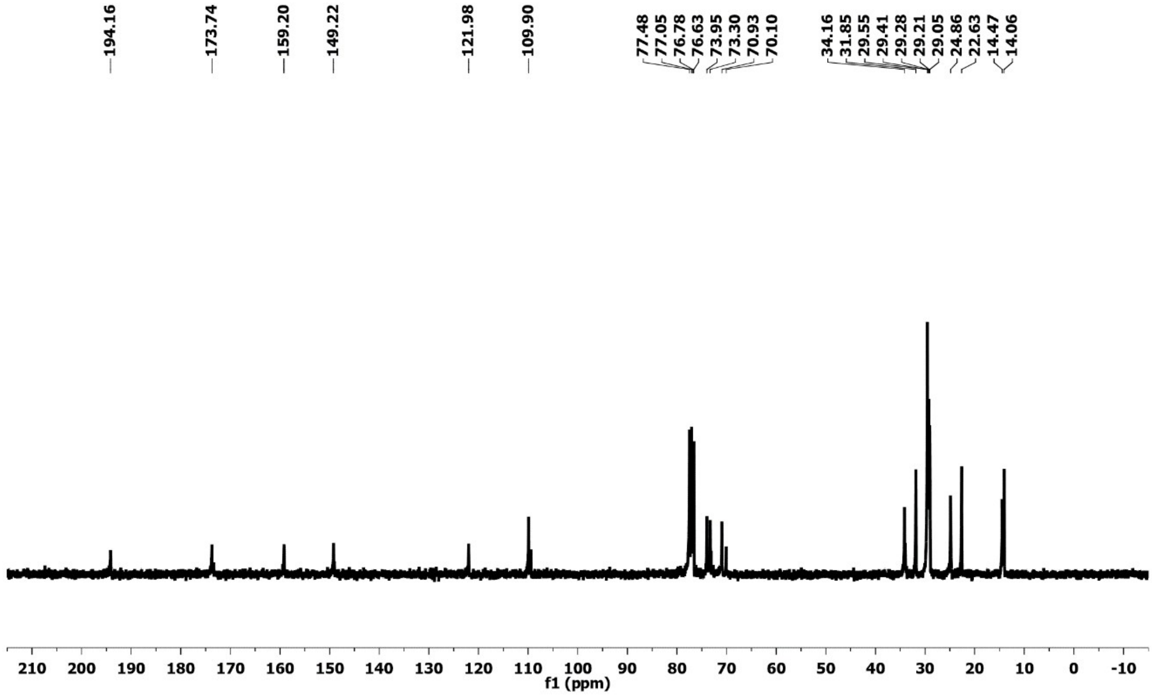


Figure S17. ^{13}C NMR of compound, **5d** in $CDCl_3$

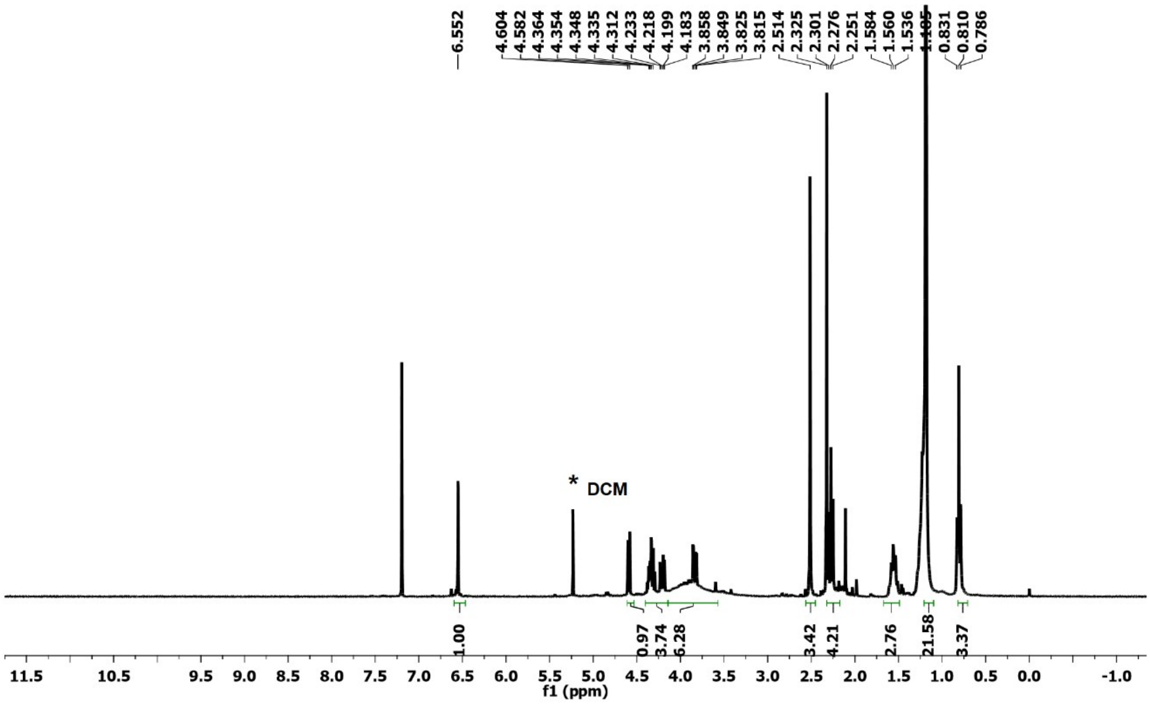


Figure S18. ^{1}H NMR of compound, **5e** in $CDCl_3$

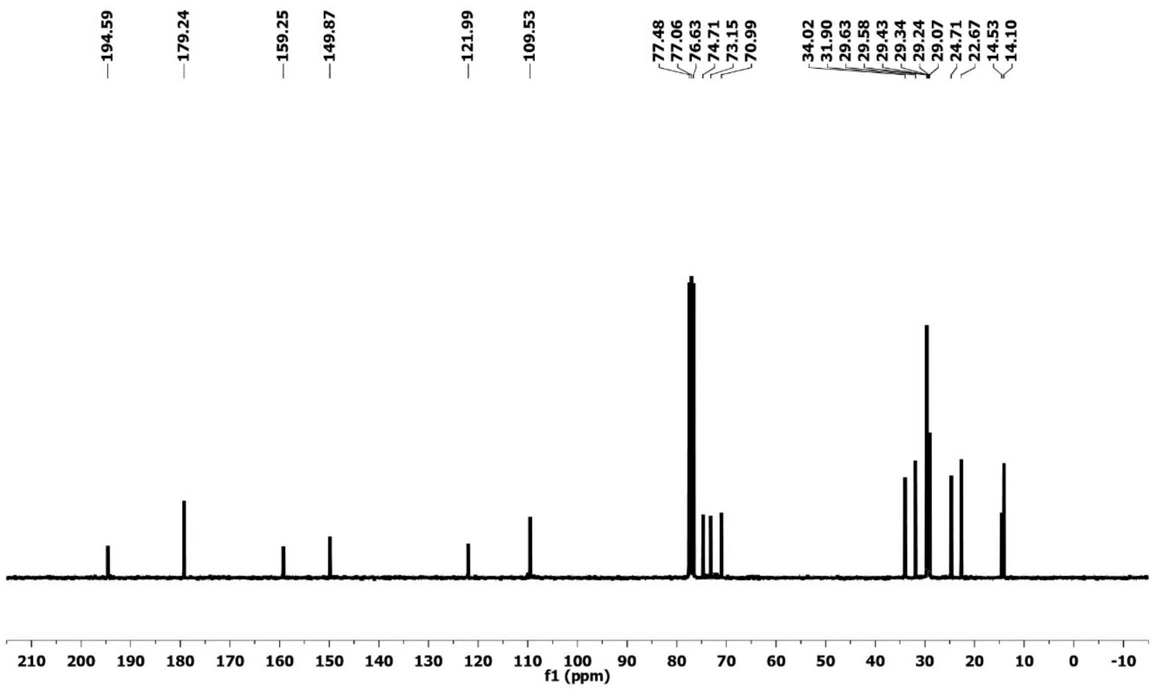


Figure S19. ^{13}C NMR of compound, **5e** in $CDCl_3$

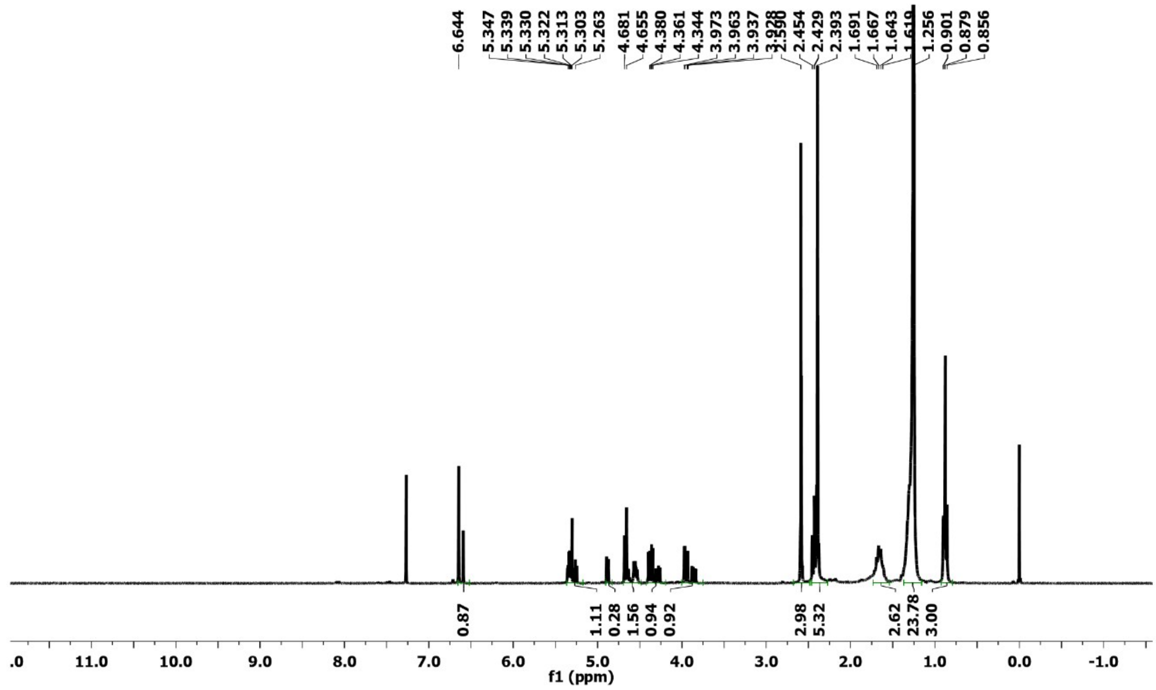


Figure S20. ^{1}H NMR of compound, **5f** in $CDCl_3$ at 300 K

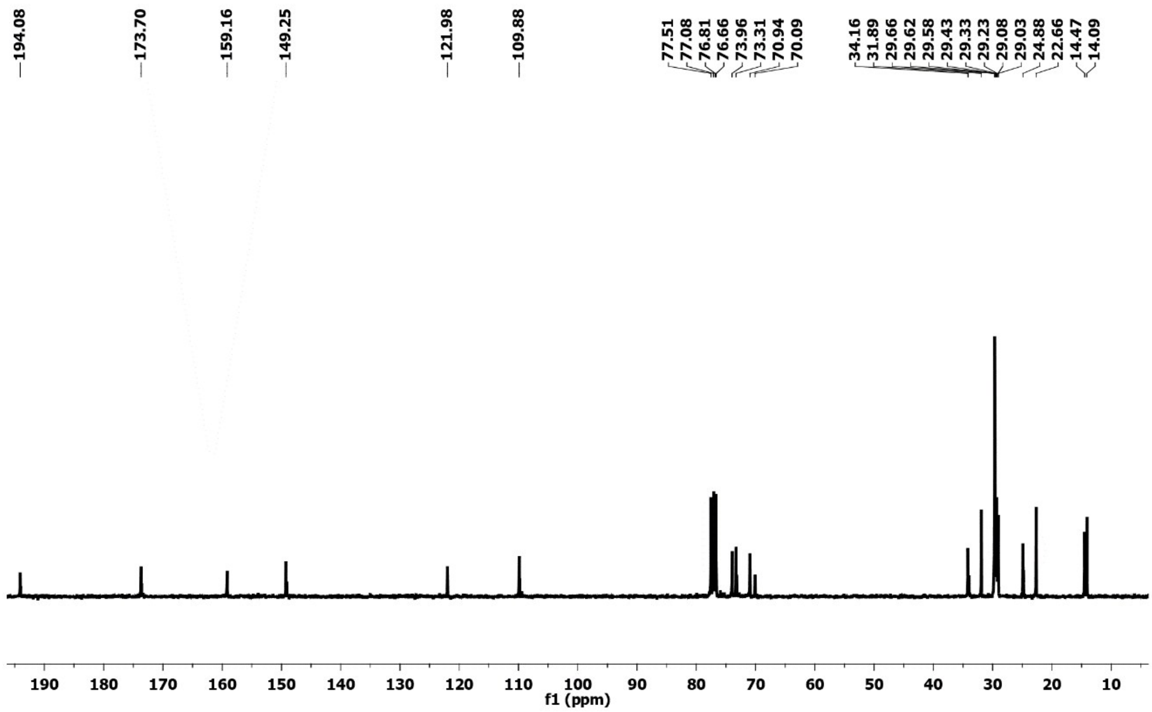


Figure S21. ^{13}C NMR of compound, **5f** in $CDCl_3$ at 300 K

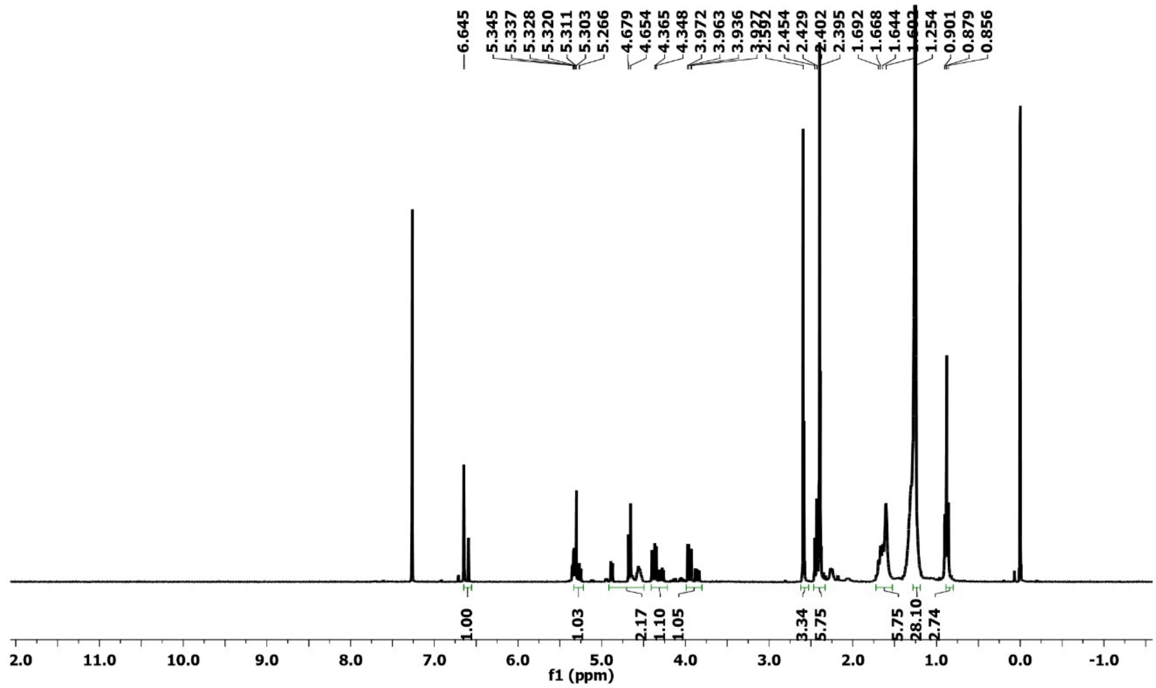


Figure S22. ^{1}H NMR of compound, **5g** in $CDCl_3$

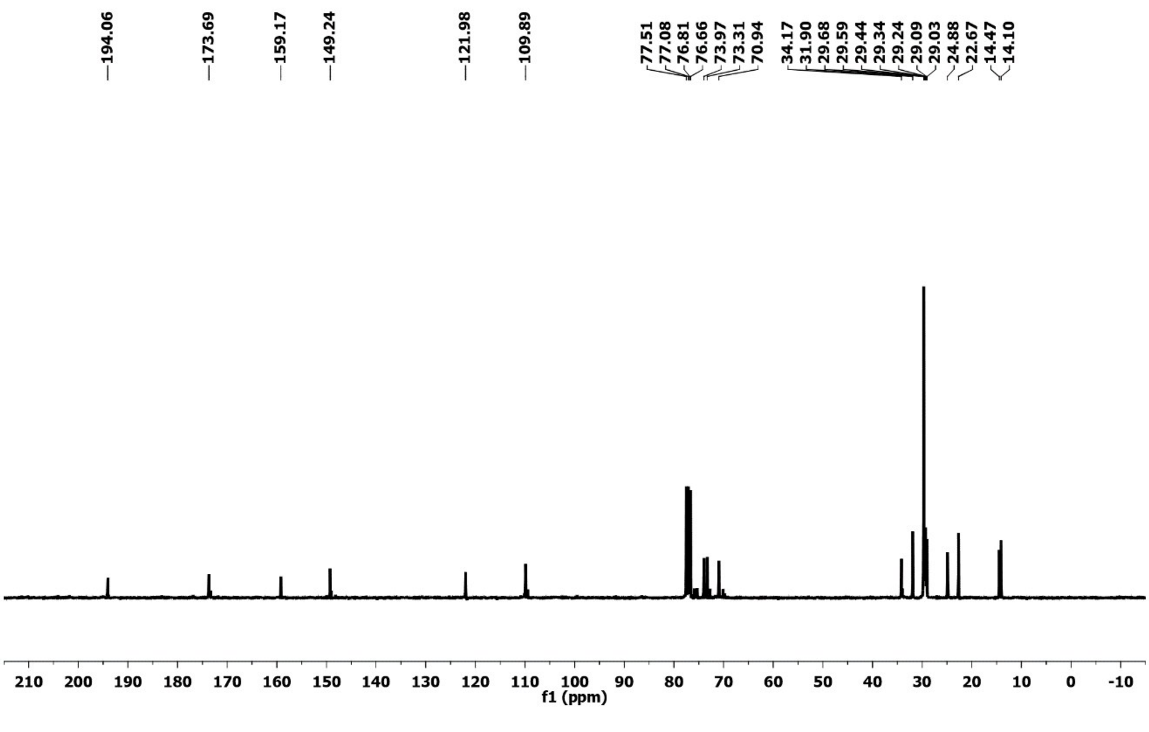


Figure S23. ^{13}C NMR of compound, **5g** in $CDCl_3$

H2S interaction/sensing studies

The sensing response H_2S generated from Na_2S has been calculated using the equation, $S = R_a/R_8$, where R_a represents the resistance at the ambient atmosphere and R_g is the resistance of the sensing element in the presence of the target gas.

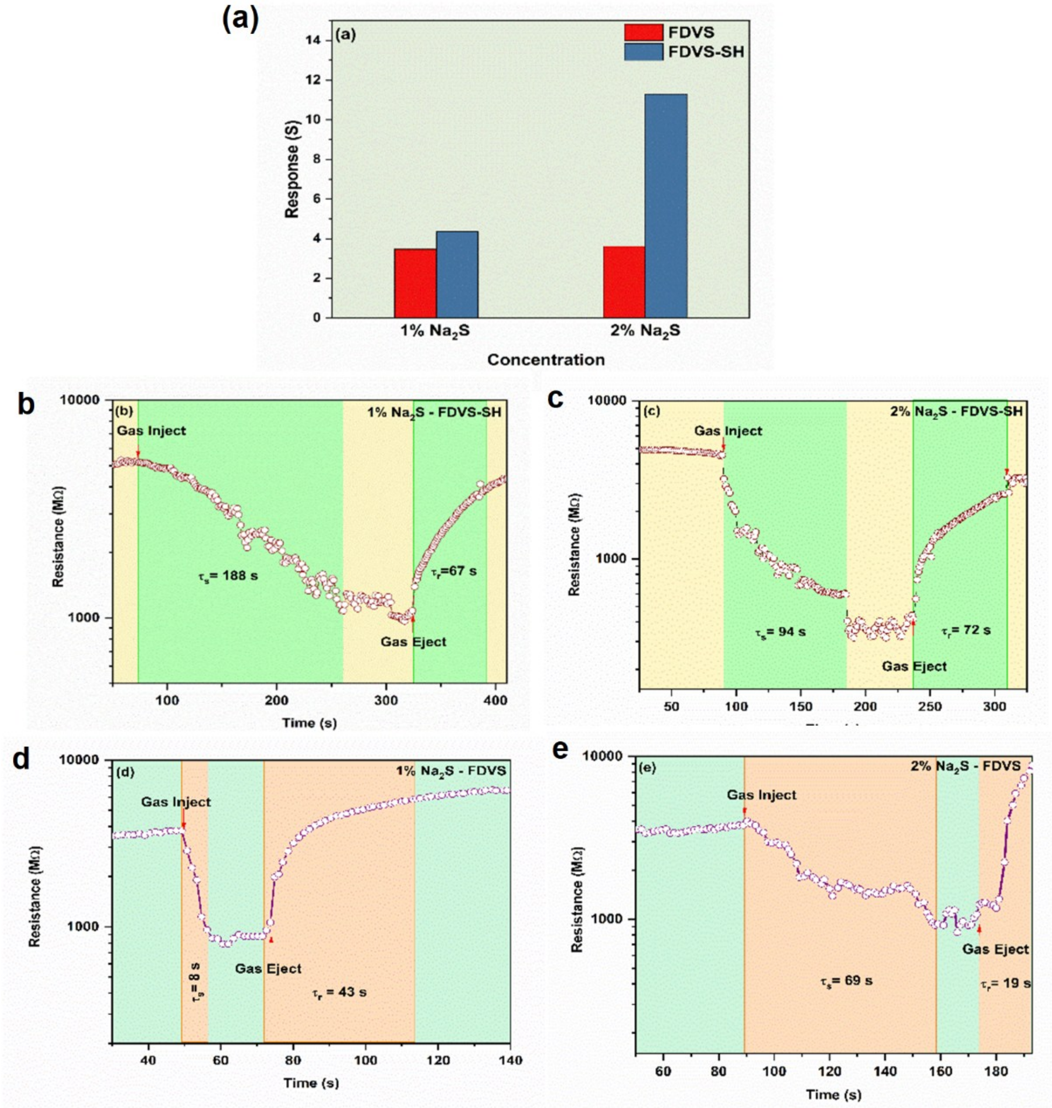


Figure S24. (a) representation of H_2S Sensing characteristics of **5g** in amorphous state (red) and xerogel of GH in assembled state (blue) towards 1% and 2% of Na_2S concentration. (b-e) shows the transient responses GH & amorphous 5g sensing elements towards 1% and 2% of Na_2S concentration dissolved in water.