Supporting Information

Lipase catalyzed synthesis of fluorescent glycolipids: Gelation studies and graphene incorporated self-assembled sheet formation for semiconductor applications.

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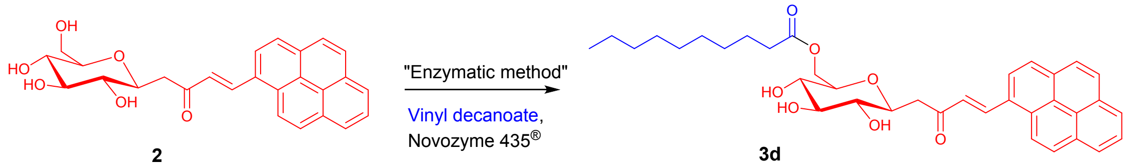
Contents

Table 1. Optimization of Novozyme 435® catalyzed transesterification reaction of sugar derivative with vinylester of fatty acid.



S. #	Solvent/s	Temperature (ºC)	Time (h)	*Yield obtained (%)*
1	Acetone	40	24	*24*
2	Isopropyl alcohol	40	24	*trace*
3	2-Butanol	40	24	*trace*
4	DMSO	40	24	*trace*
5	DMF	40	24	*trace*
6	Acetonitrile	40	24	*trace*
7	DMSO-acetone (1:1)	40	24	*47*
8	DMSO-isopropylalcohol	40	24	*34*
9	DMSO-2-butanol	40	24	*33*
10	DMSO-acetonitrile	40	24	*22*
11	Aqueous DMSO	40	24	*trace*
12	DMF-acetone (1:3)	40	24	*23*
13	DMSO-acetone (1:2)	40	24	*55*
14	DMSO-acetone (1:3)	40	24	*58*
15	DMSO-acetone (1:3)	45	24	*62*
16	DMSO-acetone (1:3):	50	24	*65*
17	DMSO-acetone (1:3)	60	24	*37*
18	DMSO-acetone (1:3)	50	36	*75*
19	DMSO-acetone (1:3)	50	48	*87*
20	DMSO-acetone (1:3)	50	60	*65*
[a] Anhydrous DMSO and DMF was used for optimization studies				

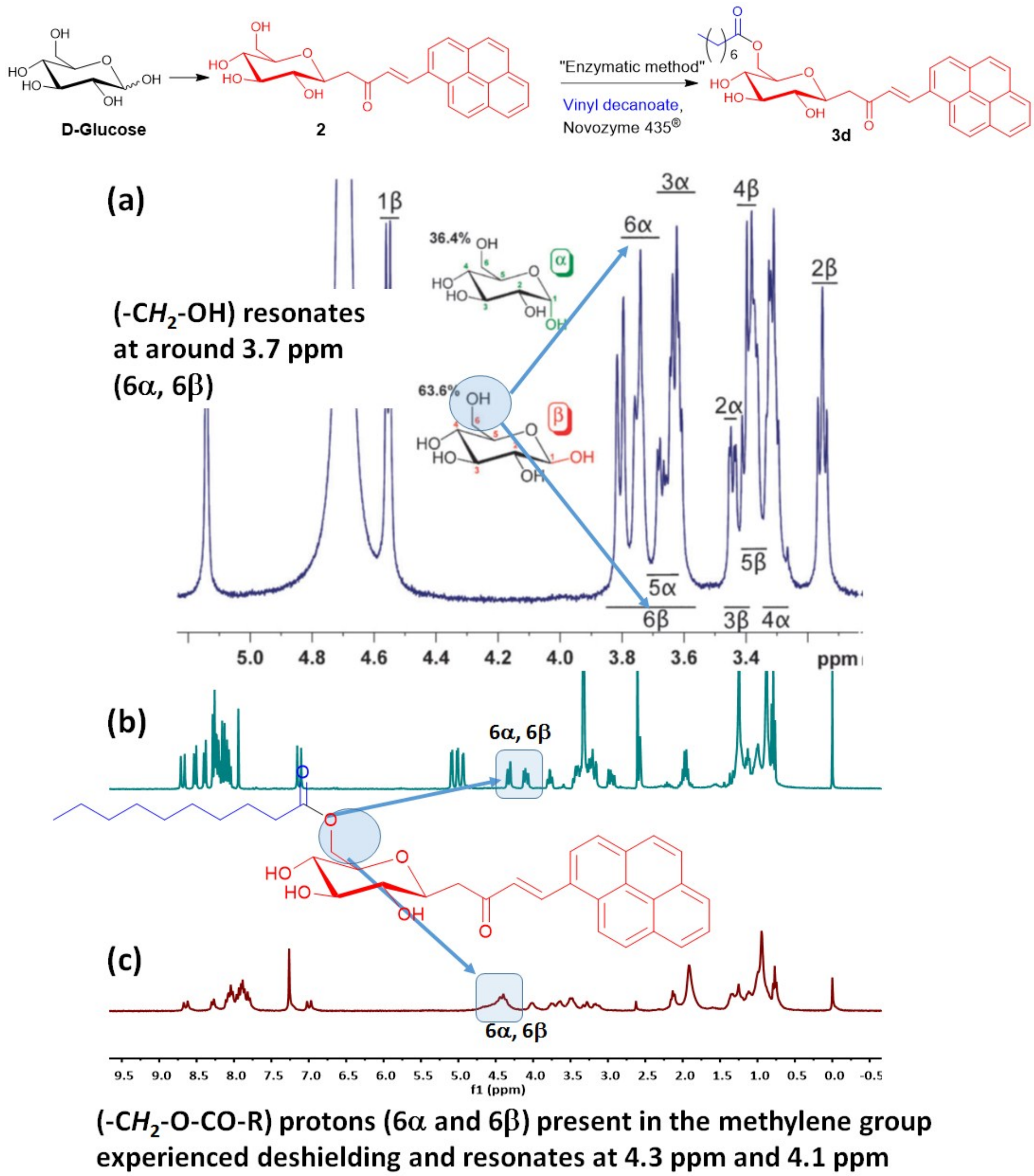


Figure S1 - Transesterification of compound 2 and vinyl deaconate under optimized condition. (a) ^{1}H NMR spectra of D-glucopyranose dissolved in D_2O[1]; (b) ^{1}H NMR Spectra of pure compound **3d** dissolved in $CDCl_3$-DMSO-d_6 mixture and (c) ^{1}H NMR spectra of crude compound **3d** dissolved in $CDCl_3$.

Reference 1. R. G. Griffin and T. F. Prisner, *Phys. Chem. Chem. Phys.*, 2010, **12**, 5737.

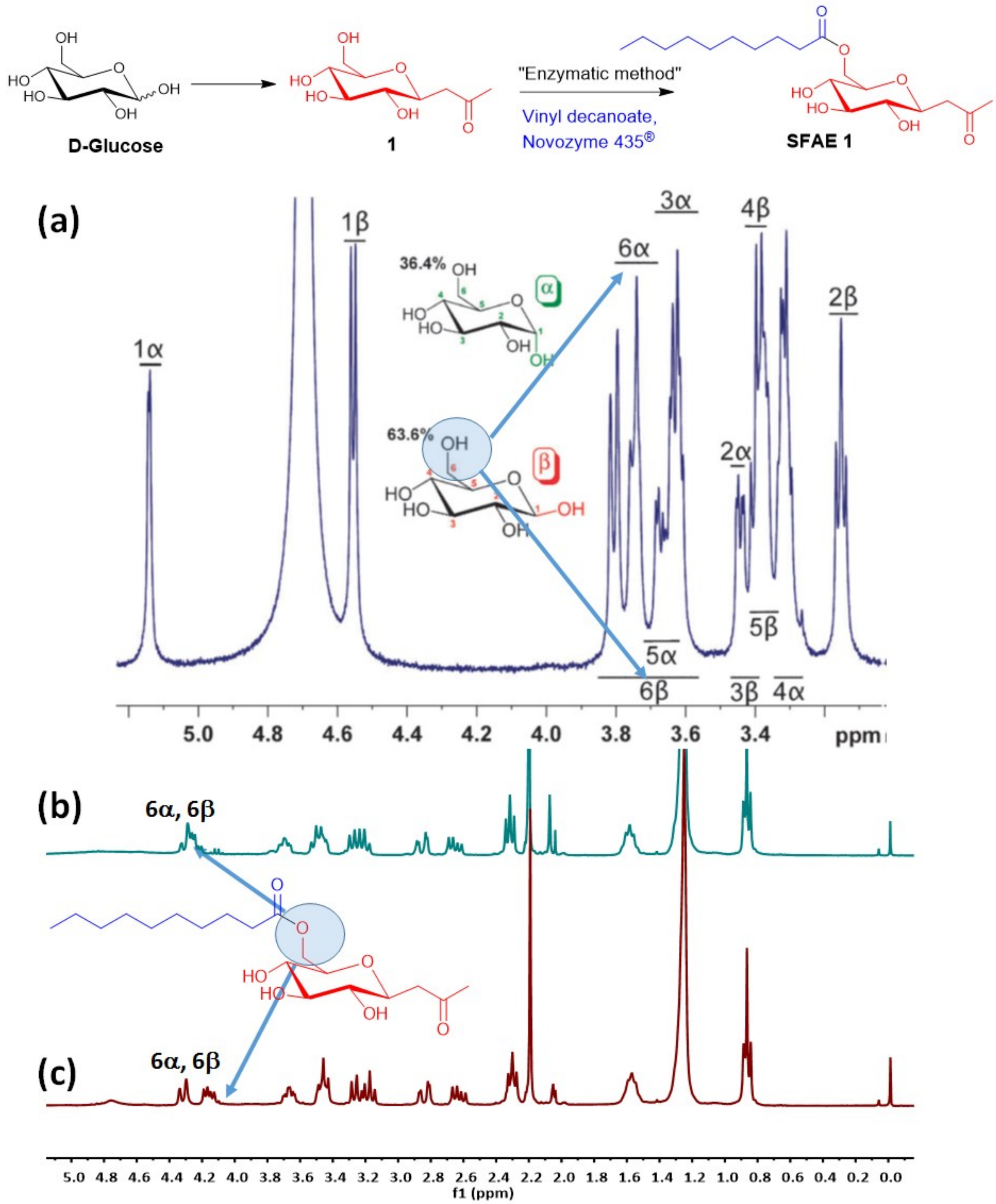


Figure S2 - Transesterification of compound 1 and vinyl deaconate under optimized condition. (a) ^{1}H NMR Spectra of D-glucopyranose dissolved in D_2O[1]; (b) ^{1}H NMR Spectra of crude SFAE 1 dissolved in $CDCl_3$ and (c) ^{1}H NMR Spectra of pure SFAE 1 dissolved in $CDCl_3$

References
1. R. G. Griffin and T. F. Prisner, *Phys. Chem. Chem. Phys.*, 2010, **12**, 5737.

Table S2. Solvents/vegetable oils used for gelation studies

S. No	Solvent/vegetable oils	Observation (CGC % wt/v)[#]						
		3a	3b	3c	3d	3e	3f	3g
1	Ethanol	S	S	S	S	P	P	P
2	n-Butanol	S	S	S	P	P	P	P
3	Octanol	P	S	S	P	P	P	P
4	Decanol	P	P	P	P	P	P	P
6	Dodecanol	P	P	P	P	P	P	P
7	Toluene	S	PG	G (3.0)	PG	S	S	S
8	Benzene	PG	PG	G (3.0)	PG	S	S	S
9	1,2-Dichlorobenzene	PG	PG	G (2.5)	PG	PG	S	S
10	Chloroform	S	S	S	P	P	P	P
11	Hazelnut oil	PG	G (2.0)	G (1.7)	G(2.0)	P	P	P
12	Olive oil	PG	G (2.0)	G (1.5)	G (2.0)	P	P	P
13	Heavy paraffin oil	PG	G (1.0)	G (0.7)	G (1.0)	G (2.0)	P	P
14	Light paraffin oil	PG	G (1.0)	G (0.7)	G (1.3)	G (2.0)	P	P
15	Sesame oil	PG	G (1.5)	G (1.5)	G (3.0)	P	P	P
16	Linseed oil	PG	G (1.0)	G (0.3)	G (0.7)	G (1.5)	G (2.0)	P
17	Water	P	P	I	I	I	I	I
18	DMSO+H_2O	P	P	P	P	P	P	P

19	DMF+H_2O	P	P	P	P	P	P	P
20	Ethylacetate	P	P	P	S	S	S	P
21	Cyclohexane	P	P	P	PG	G (0.5)	G (1.5)	G (2.5)

S = solution; P = precipitate; I = insoluble; G = gel; PG = partial gel. Critical Gelation Concentration (CGC) is presented in parenthesis [% (w/v)]

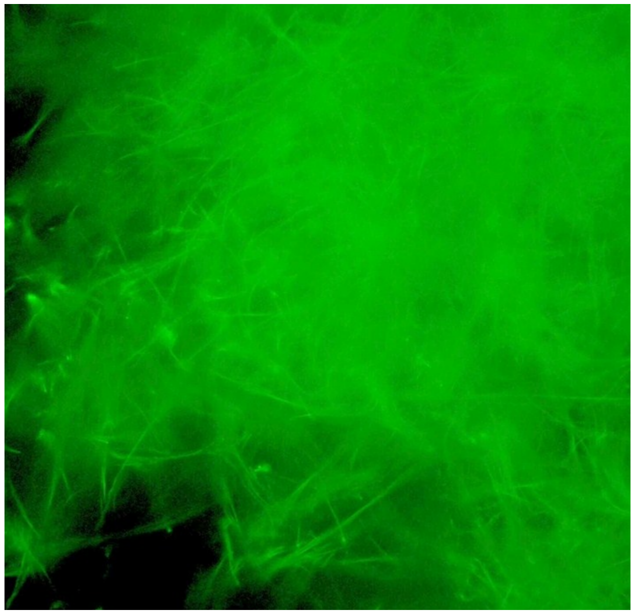


Figure S3. Optical microscopy image of SSG

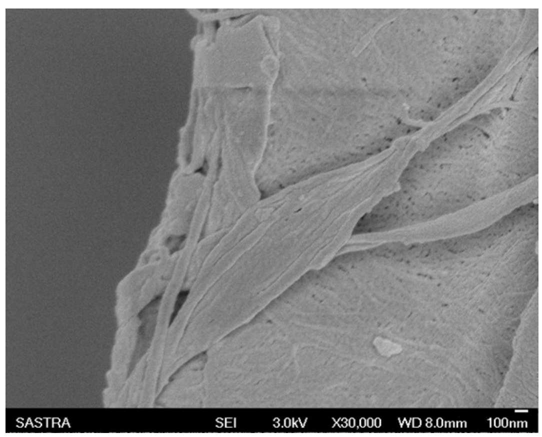


Figure S4. FESEM images of polymer film obtained from SSG.

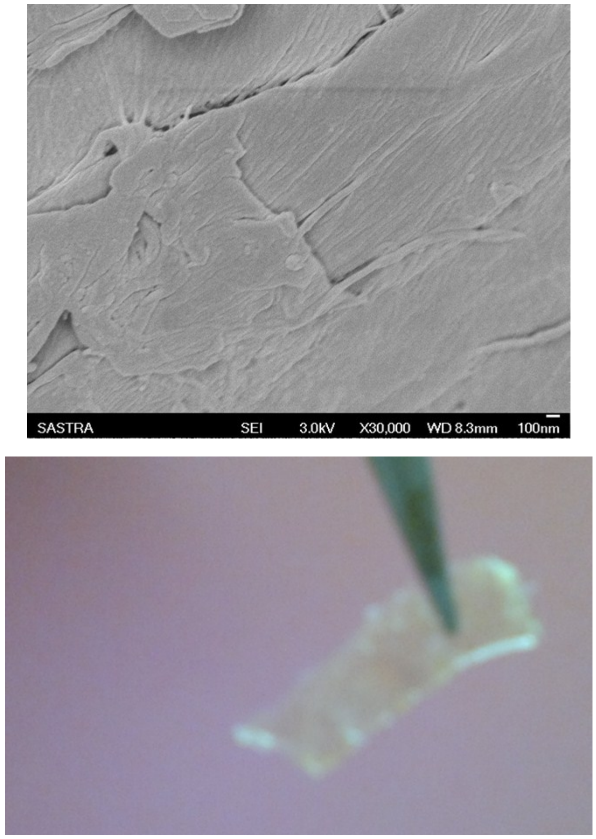


Figure S5. FESEM images of film obtained from GSSG

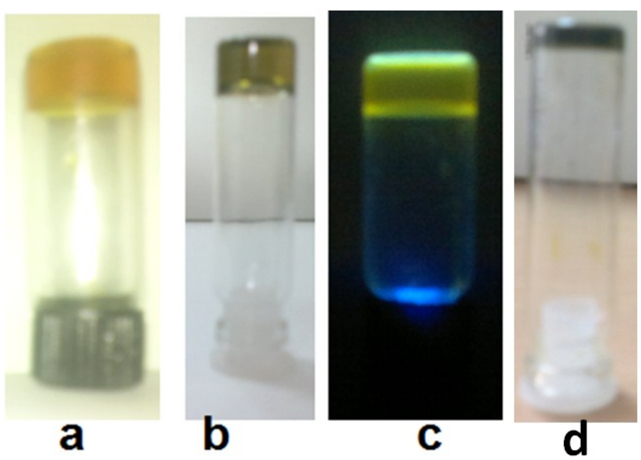


Figure S6. Gel images of (a) SSG, (b) GSSG prepared by mixing **3d** (0.3 % w/v) and graphene in the ratio of 1:0.5, (c) SSG under UV light and (d) GSSG prepared by mixing **3d** (1.5 % w/v) and graphene in the ratio of 1:1.

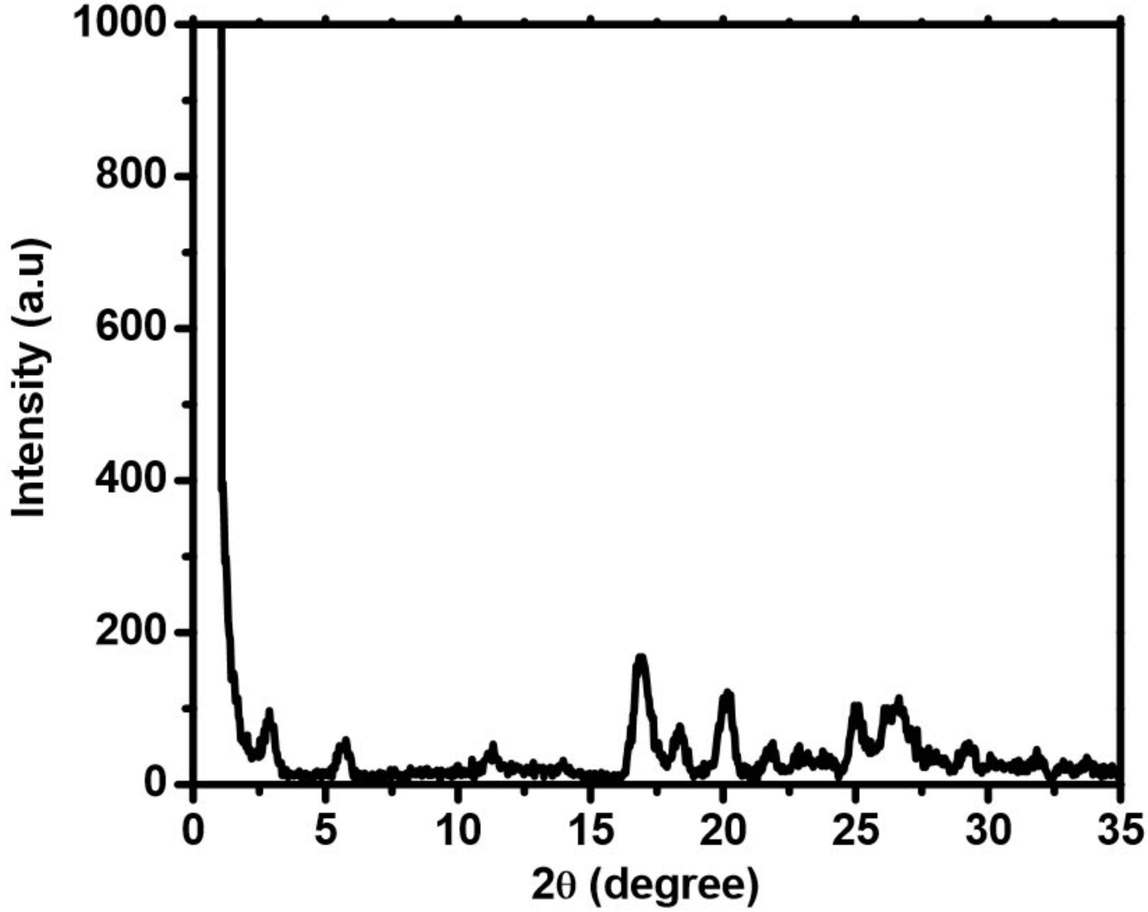


Figure S7. SAXD pattern of Xerogel of SSG obtained from cyclohexane.

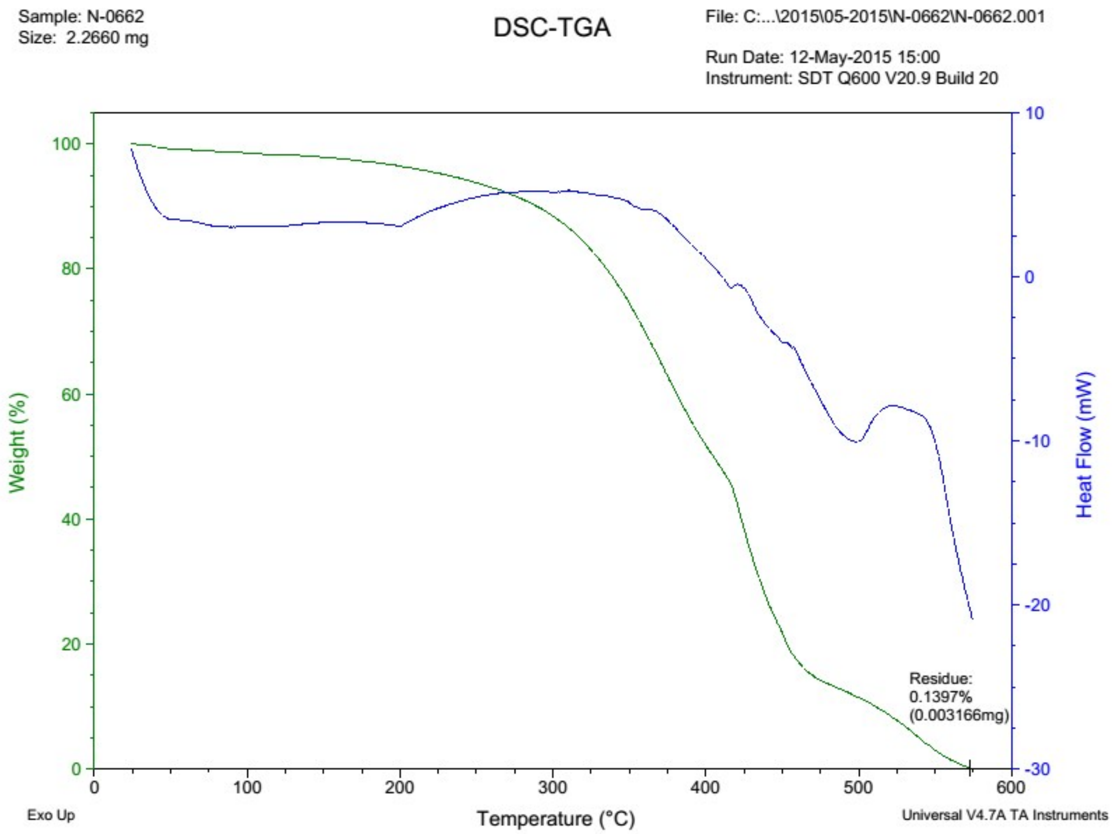


Figure S8. DSC-TGA analysis of GSSG

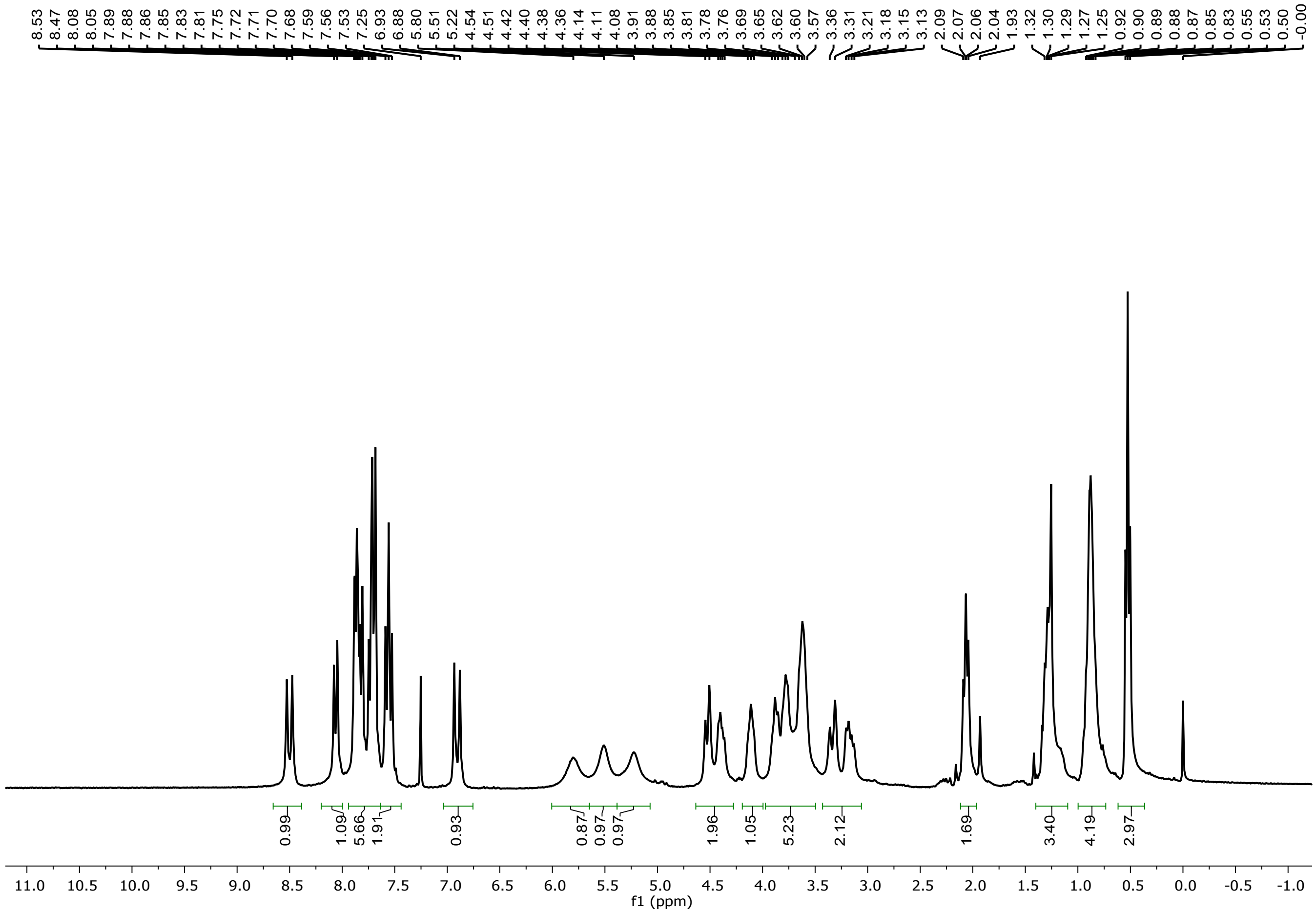


Figure S9. ^{1}H NMR spectrum of compound 3a

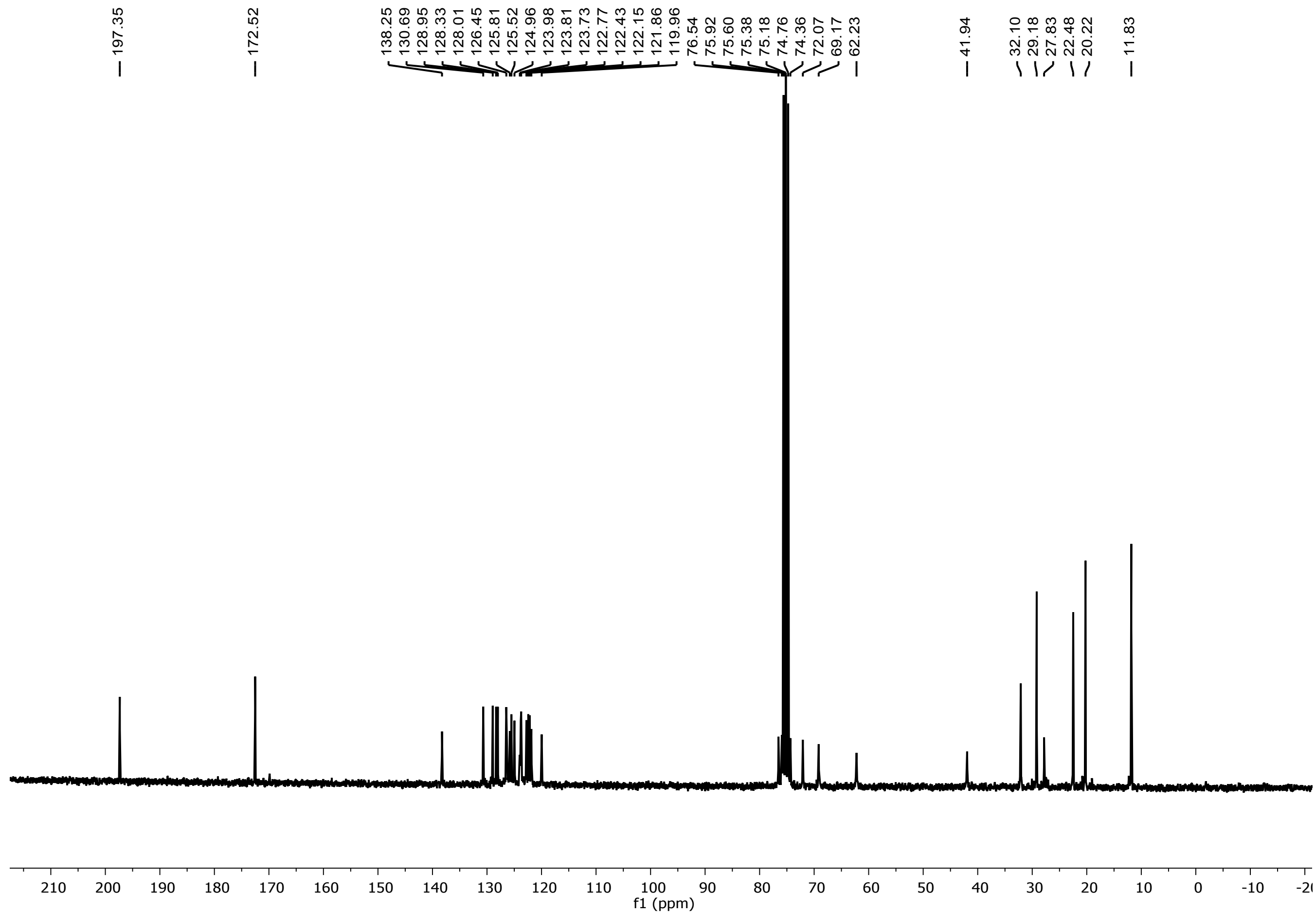


Figure S10. ^{13}C NMR spectrum of compound 3a

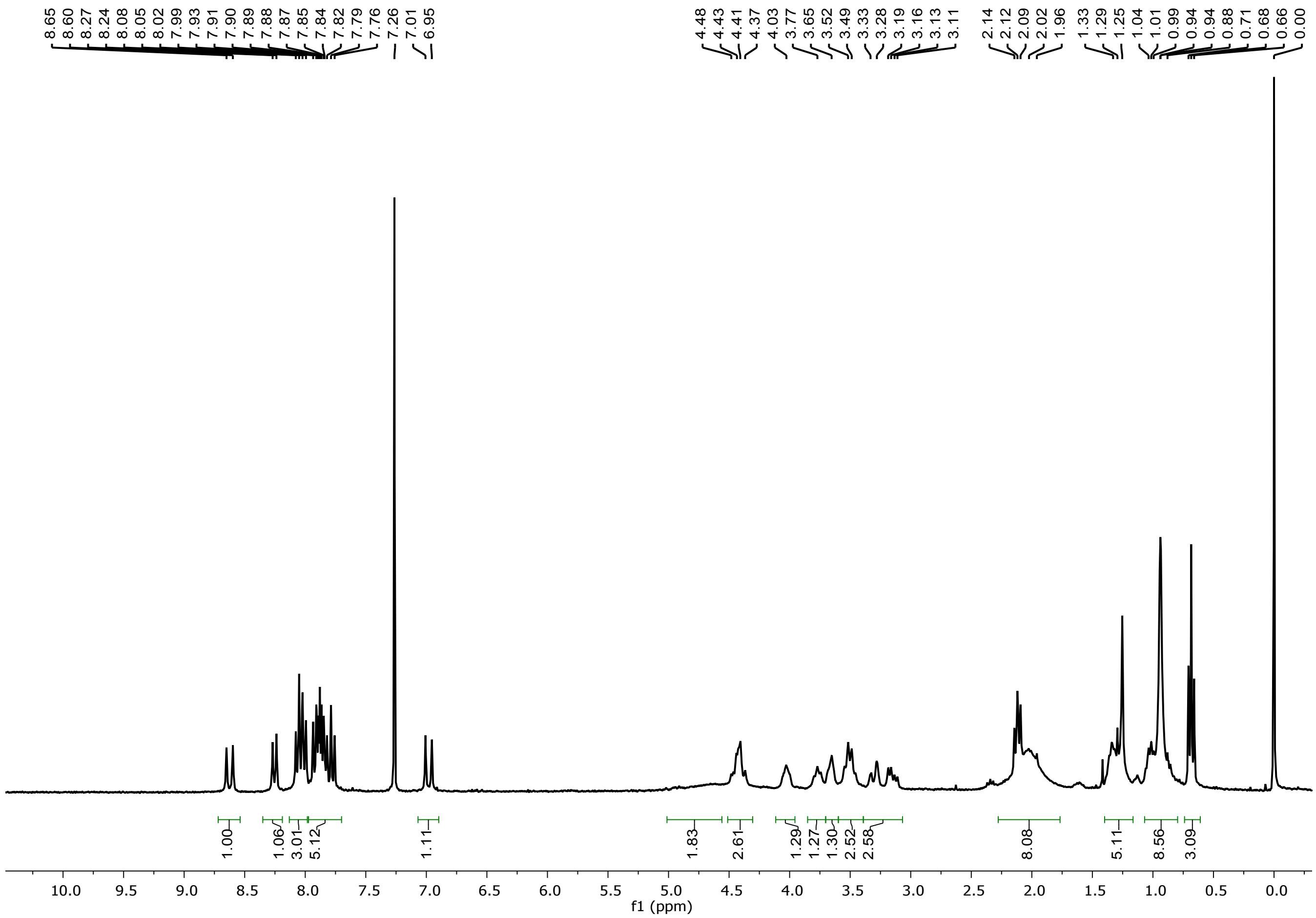


Figure S11. ^{1}H NMR spectrum of compound 3b

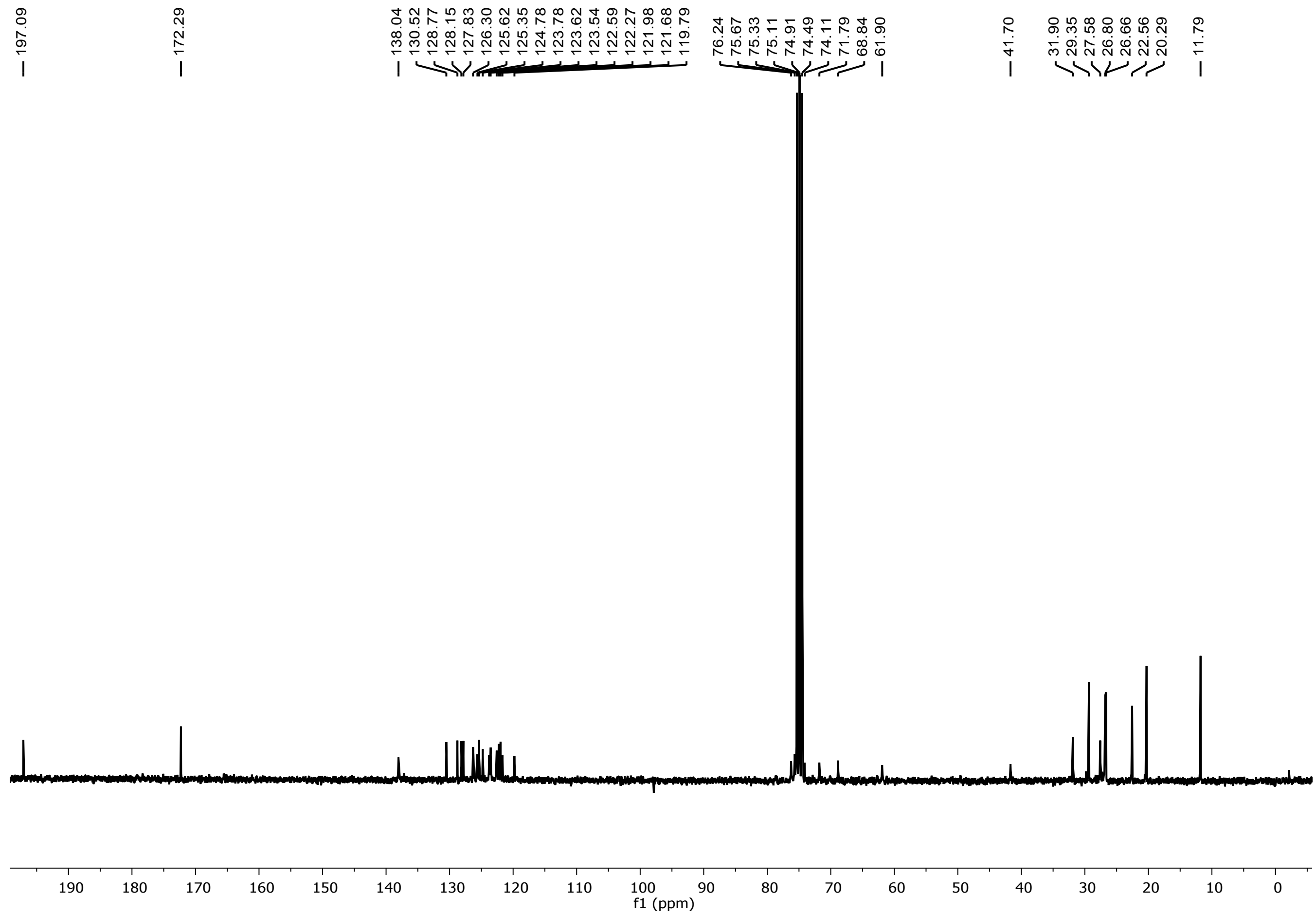


Figure S12. ^{13}C NMR spectrum of compound 3b

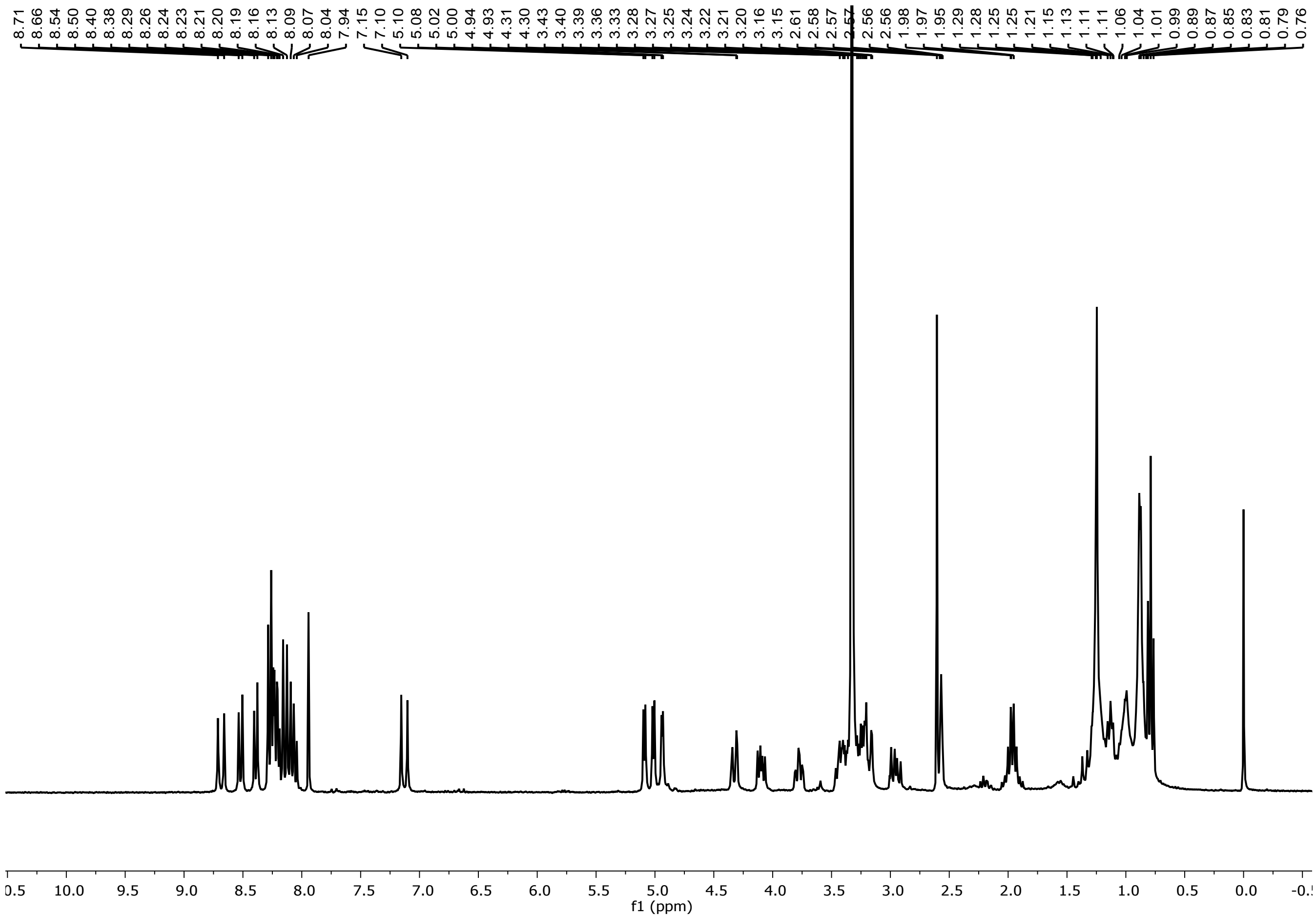


Figure S13. ^{1}H NMR spectrum of compound 3c

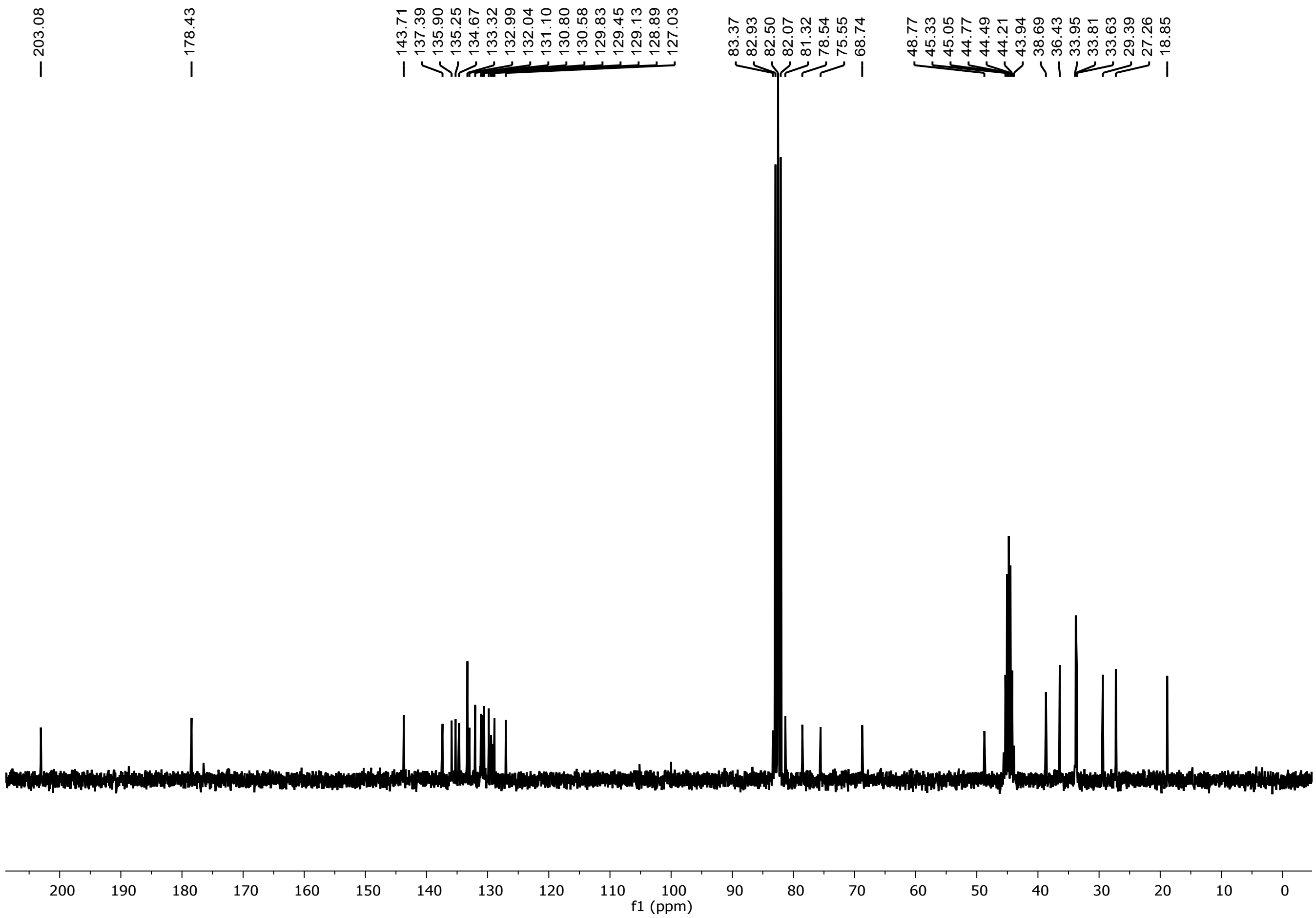


Figure S14. ^{13}C NMR spectrum of compound 3c

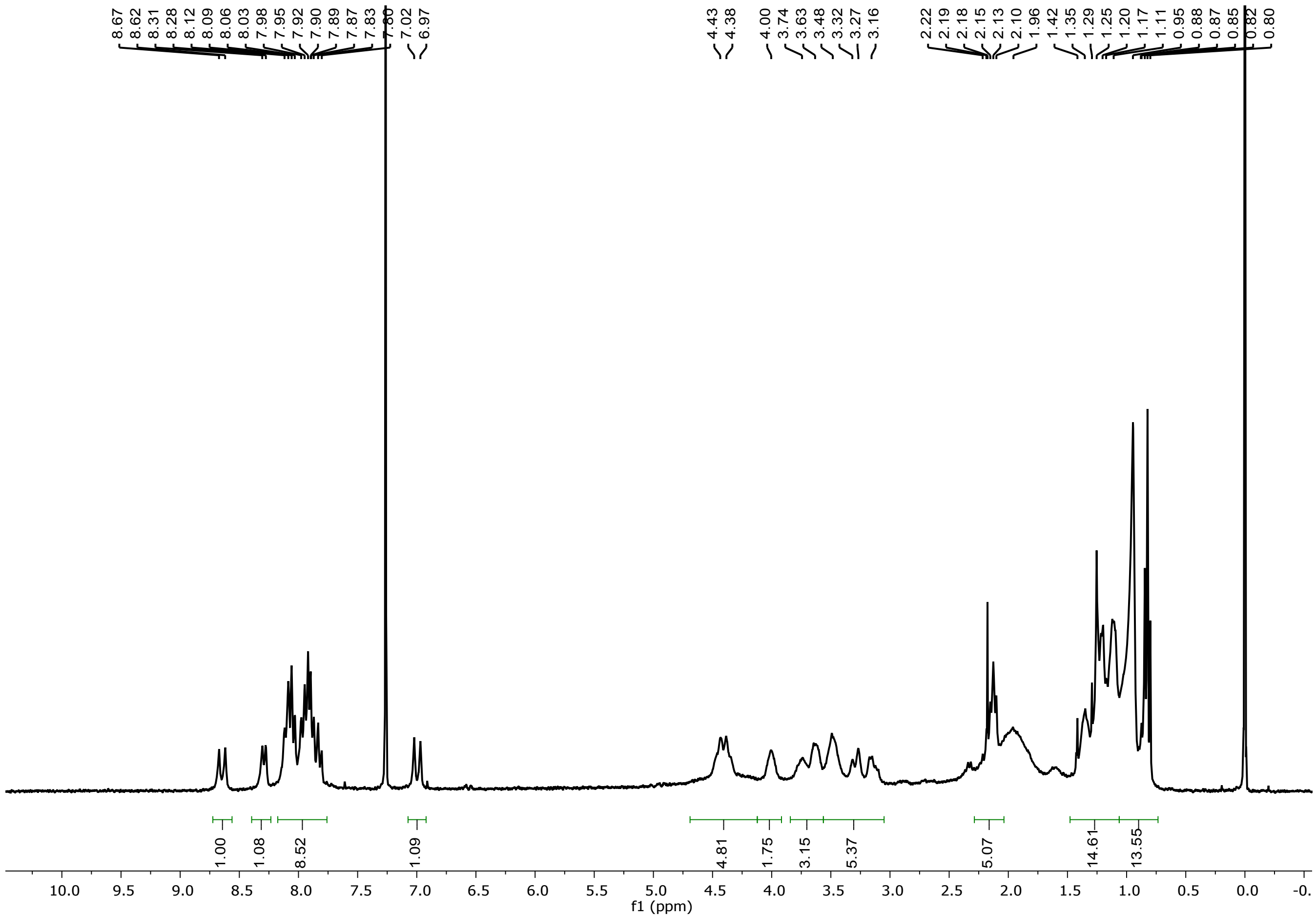


Figure S15. ^{1}H NMR spectrum of compound 3d

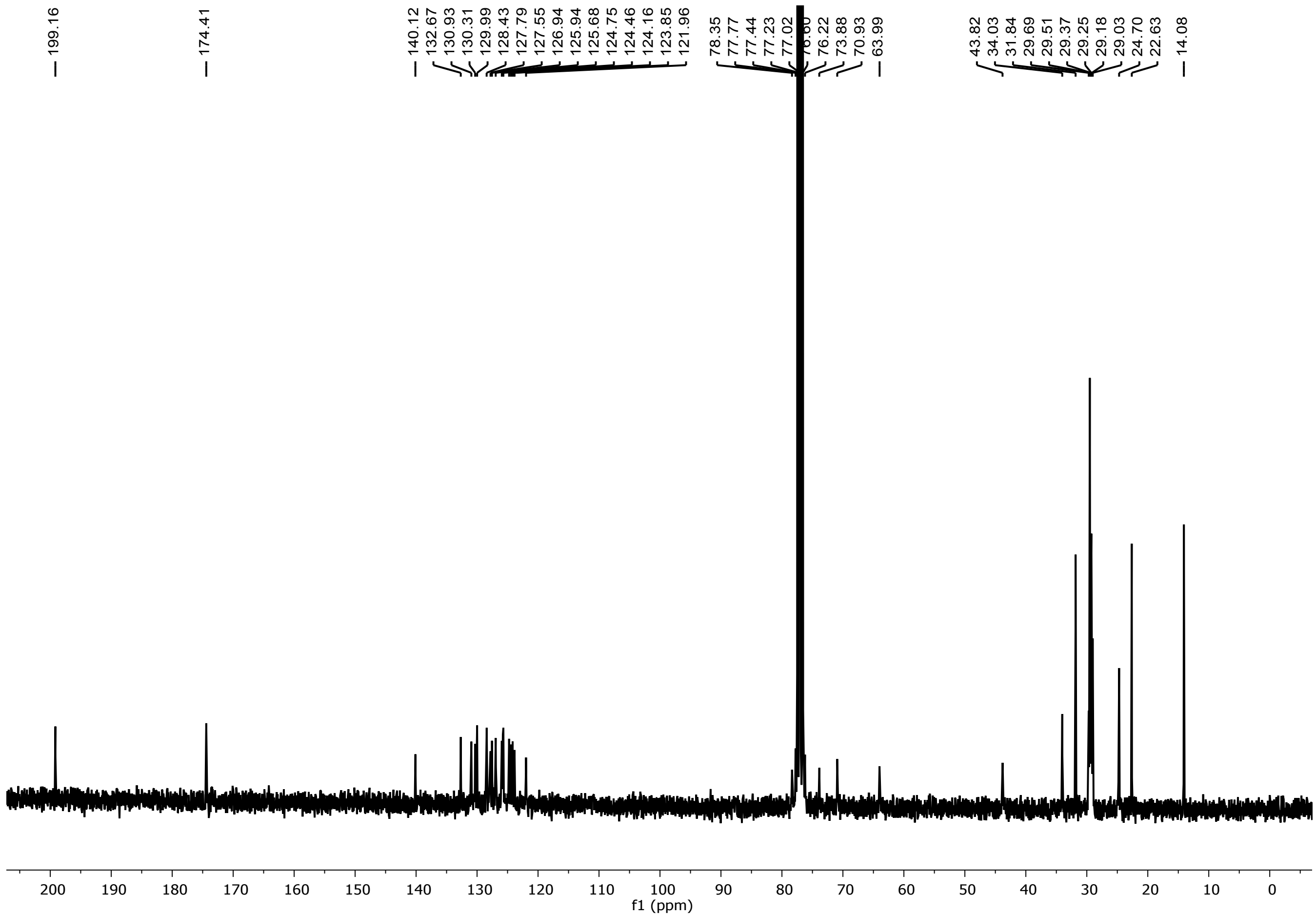


Figure S16. ^{13}C NMR spectrum of compound 3d

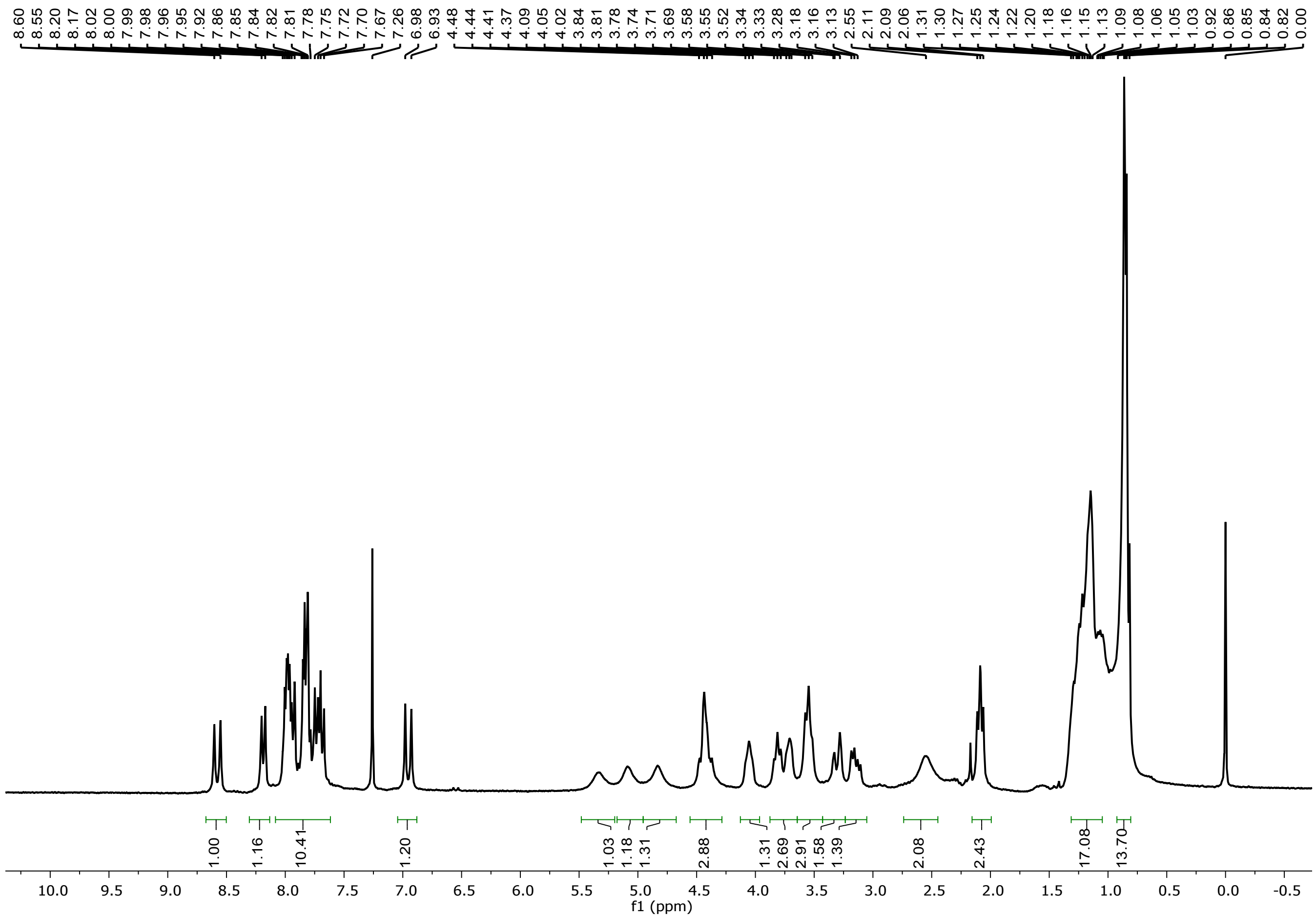


Figure S17. ^{1}H NMR spectrum of compound 3e

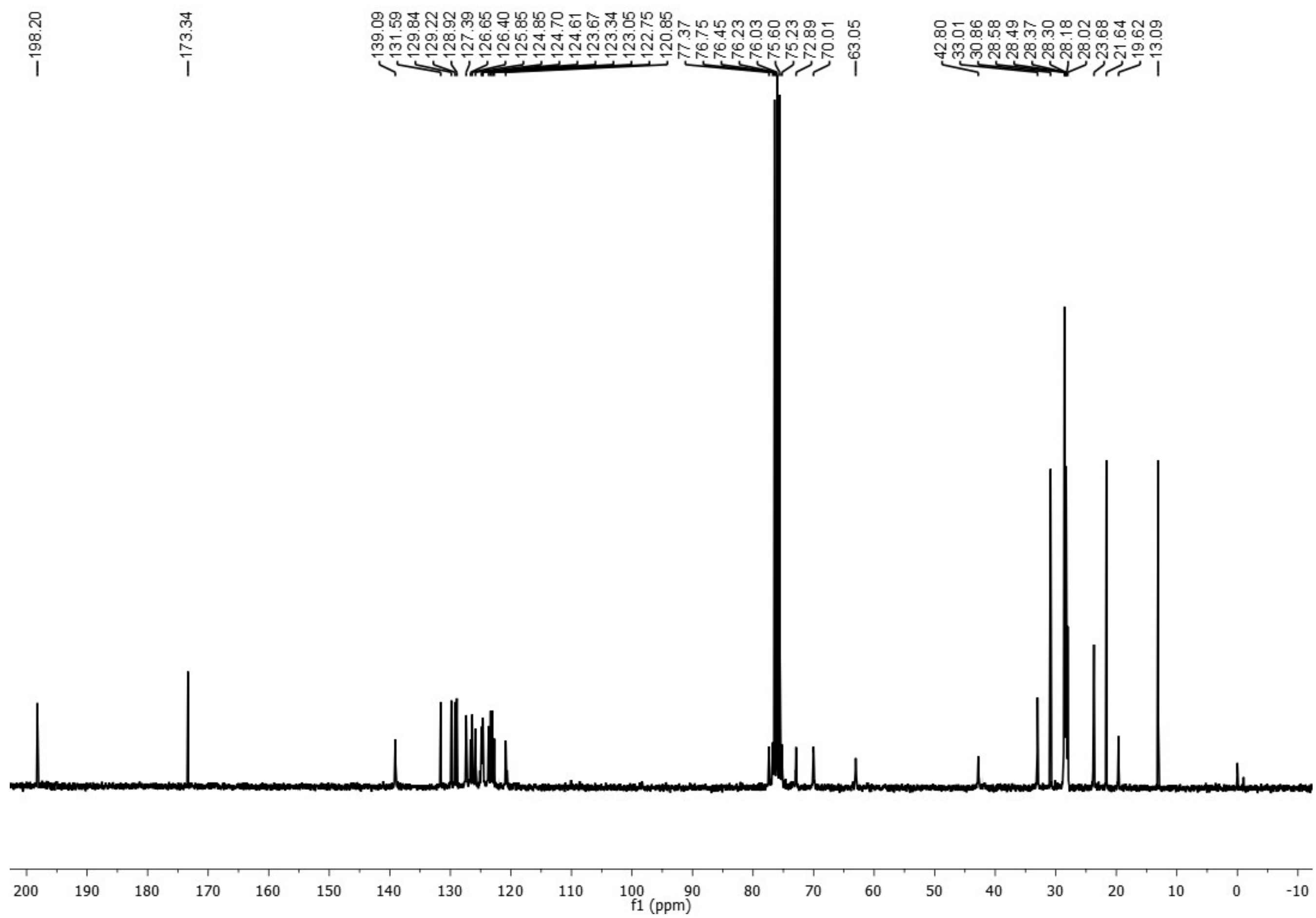


Figure S18. ^{13}C NMR spectrum of compound 3e

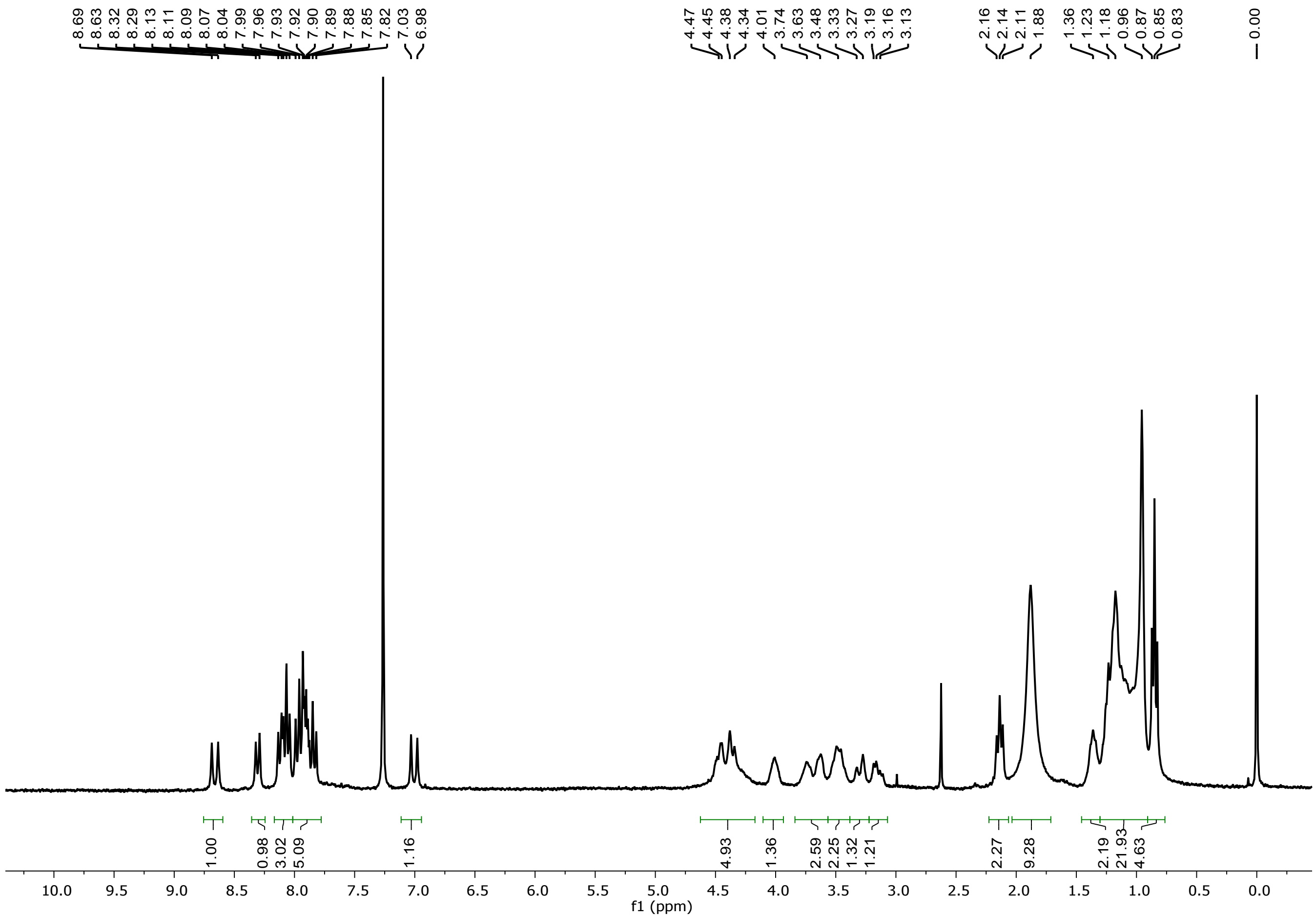


Figure S19. ^{1}H NMR spectrum of compound 3f

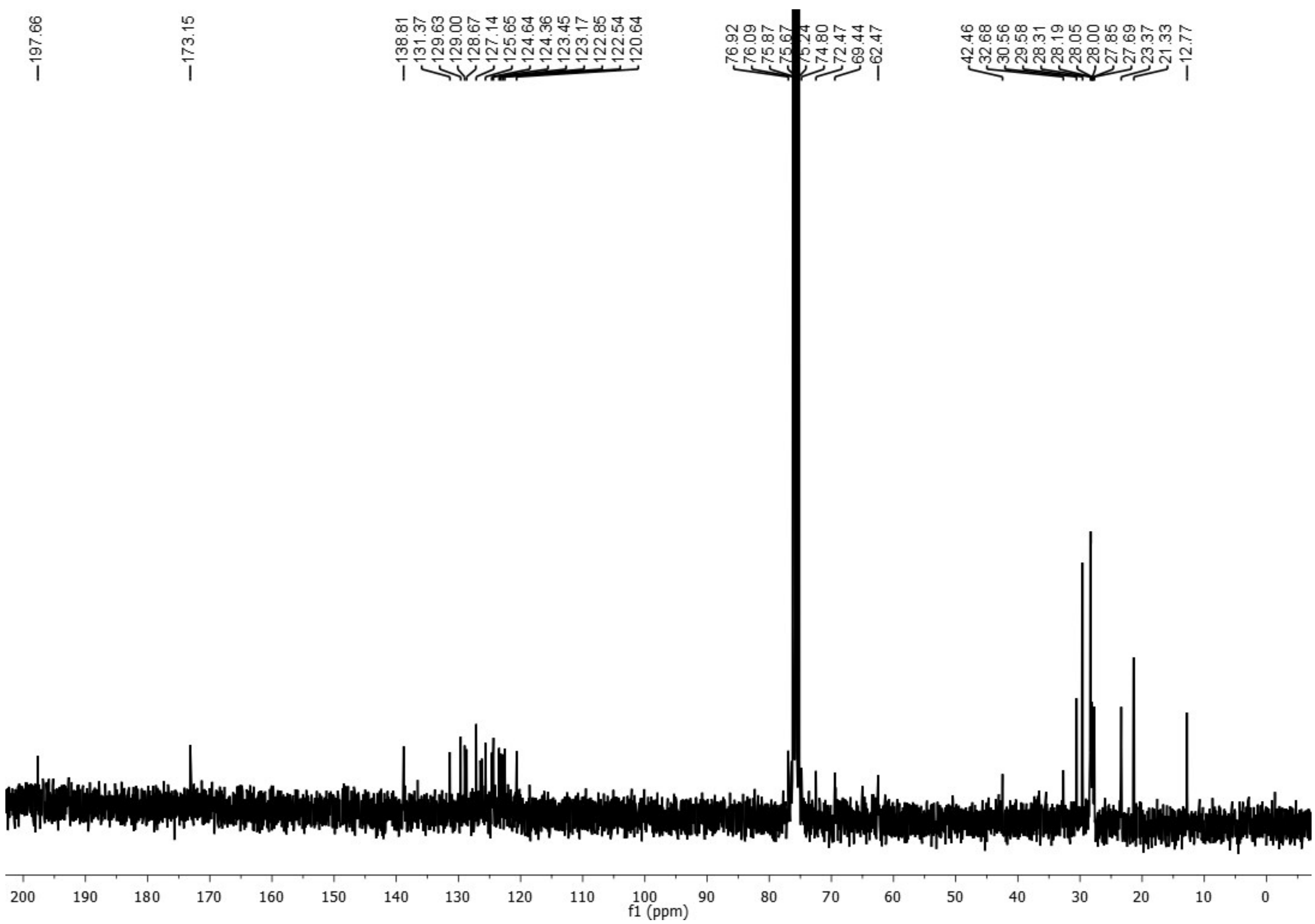


Figure S20. ^{13}C NMR spectrum of compound 3f

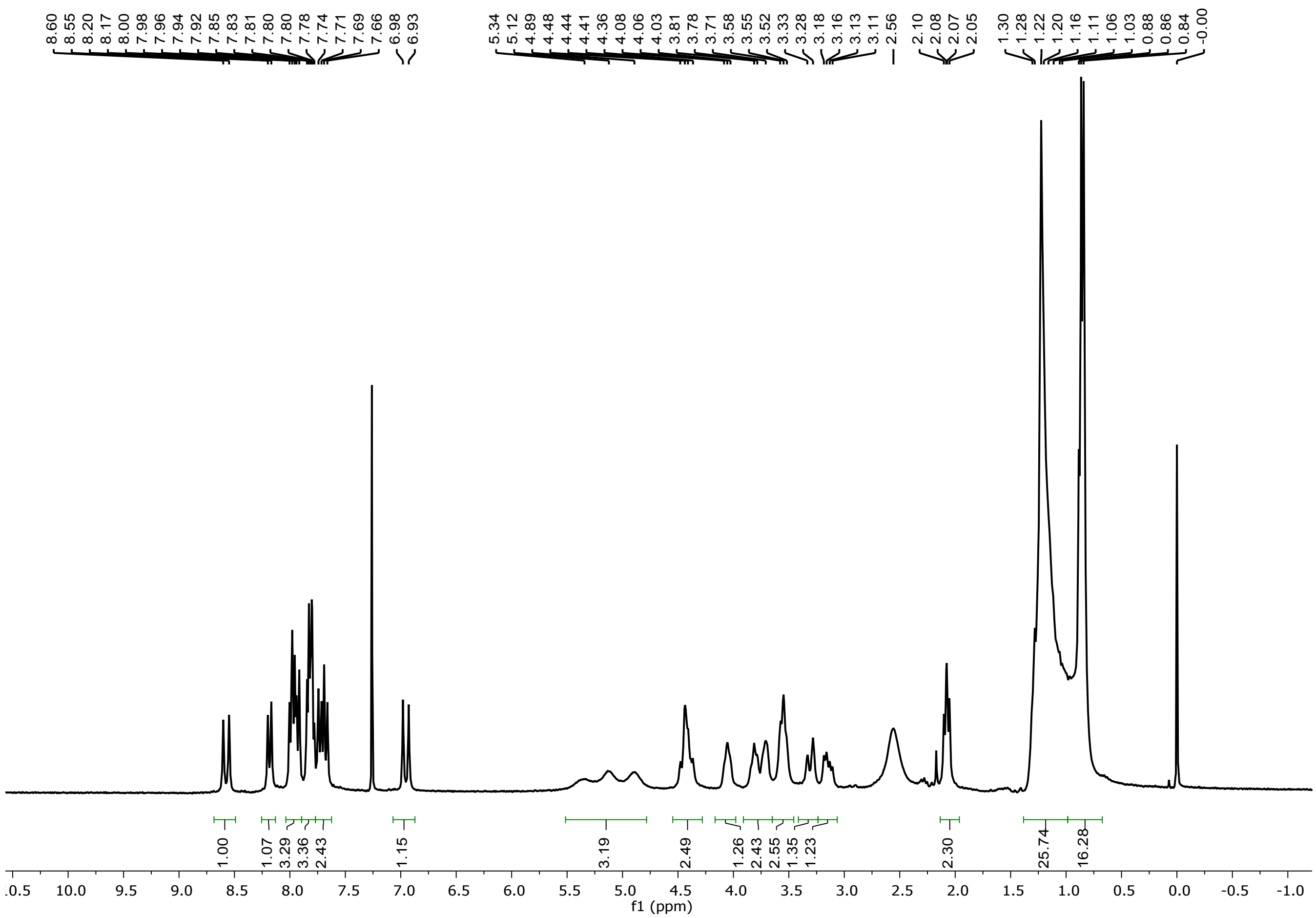


Figure S21. ^{13}C NMR spectrum of compound 3g

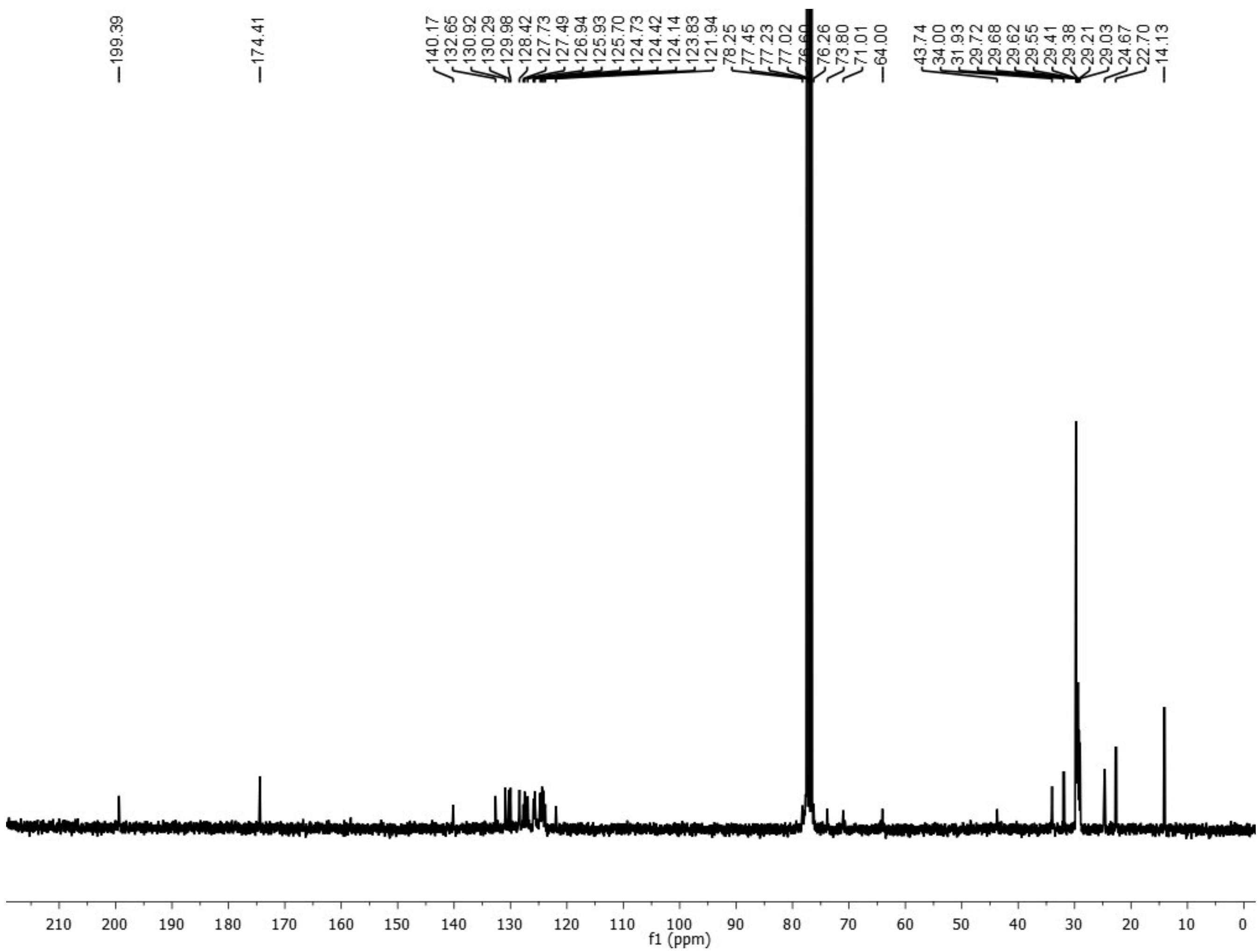
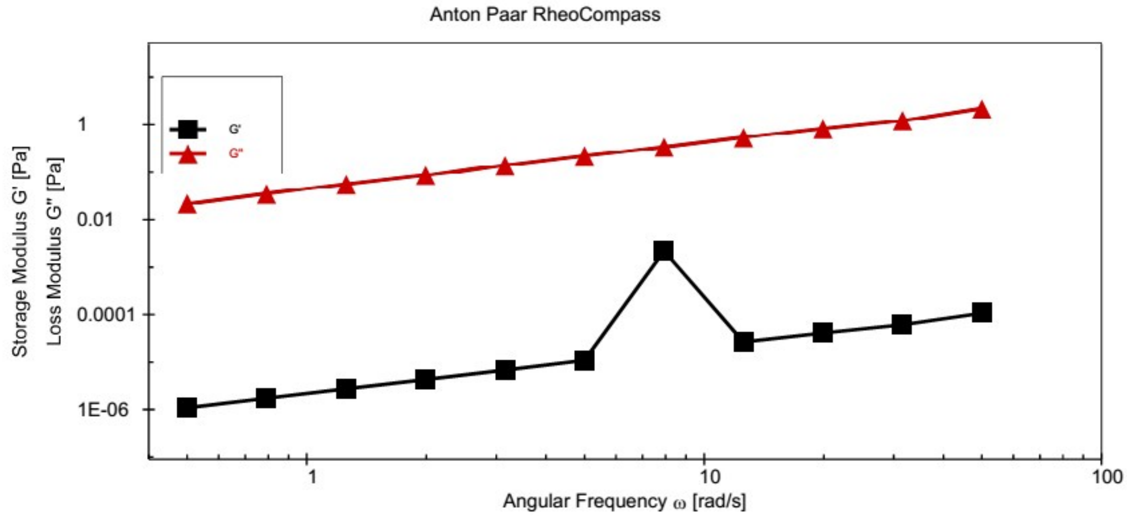


Figure S22. ^{13}C NMR spectrum of compound 3g



km-linseed-lowvis-fs-4sep15 1, Frequency sweep 1, Interval 1

Point No. Nº	Angular Frequency ω [rad/s]	Storage Modulus G' [Pa]	Loss Modulus G'' [Pa]	Loss Factor tan(δ) [1]	Strain γ [%]	Shear Stress τ [Pa]	Torque M [mN·m]	Status Stat
1	50	0.00010731	2.1463	20000.000	50.1	1.0748	0.0049464	ME-,taD,TruStrain™
2	31.5	6.1014E-05	1.2203	20000.000	50	0.60991	0.0028068	ME-,taD,TruStrain™
3	19.9	4.0939E-05	0.81877	20000.000	50	0.40931	0.0018836	ME-,taD,TruStrain™
4	12.6	2.6478E-05	0.52955	20000.000	50	0.26477	0.0012185	ME-,taD,TruStrain™
5	7.92	0.0021976	0.33782	153.725	50	0.16892	0.00077737	TruStrain™
6	5	1.0916E-05	0.21831	20000.000	50	0.10916	0.00050234	ME-,taD,TruStrain™
7	3.15	6.795E-06	0.1359	20000.000	50	0.067951	0.00031271	ME-,taD,TruStrain™
8	1.99	4.2925E-06	0.085849	20000.000	50	0.042925	0.00019754	ME-,taD,TruStrain™
9	1.26	2.7375E-06	0.05475	20000.000	50	0.027375	0.00012598	ME-,taD,TruStrain™
10	0.792	1.736E-06	0.03472	20000.000	50	0.01736	7.9889E-05	ME-,taD,TruStrain™
11	0.5	1.0872E-06	0.021744	20000.000	50	0.010872	5.0032E-05	ME-,taD,TruStrain™

Figure S23. Angular frequency dependence of G′ and G′′ of linseed oil.