Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Evaluation of sodium acetate trihydrate-urea DES as a benign reaction media for the Biginelli reaction. Unexpected synthesis of methylenebis(3-hydroxy-5,5-dimethylcyclohex-2-enones), hexahydroxanthene-1,8-diones and hexahydroacridine-1,8-diones

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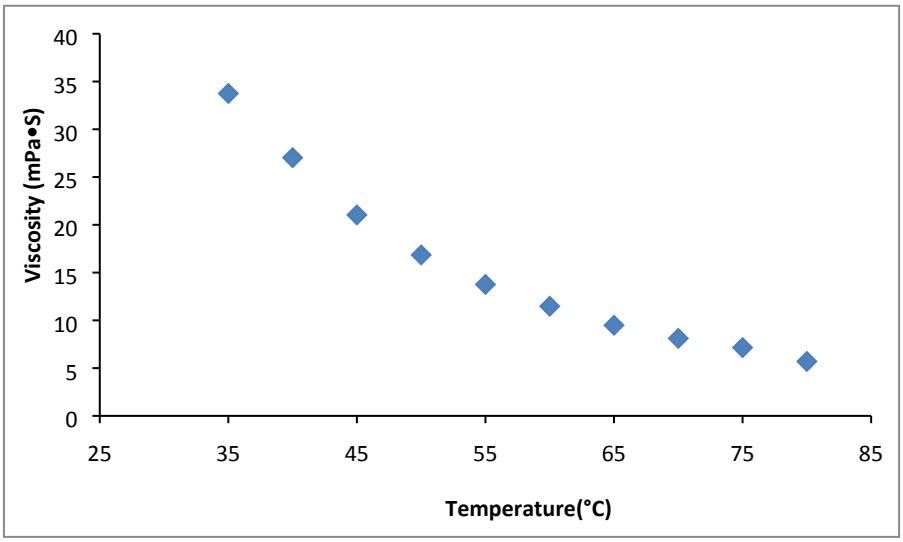
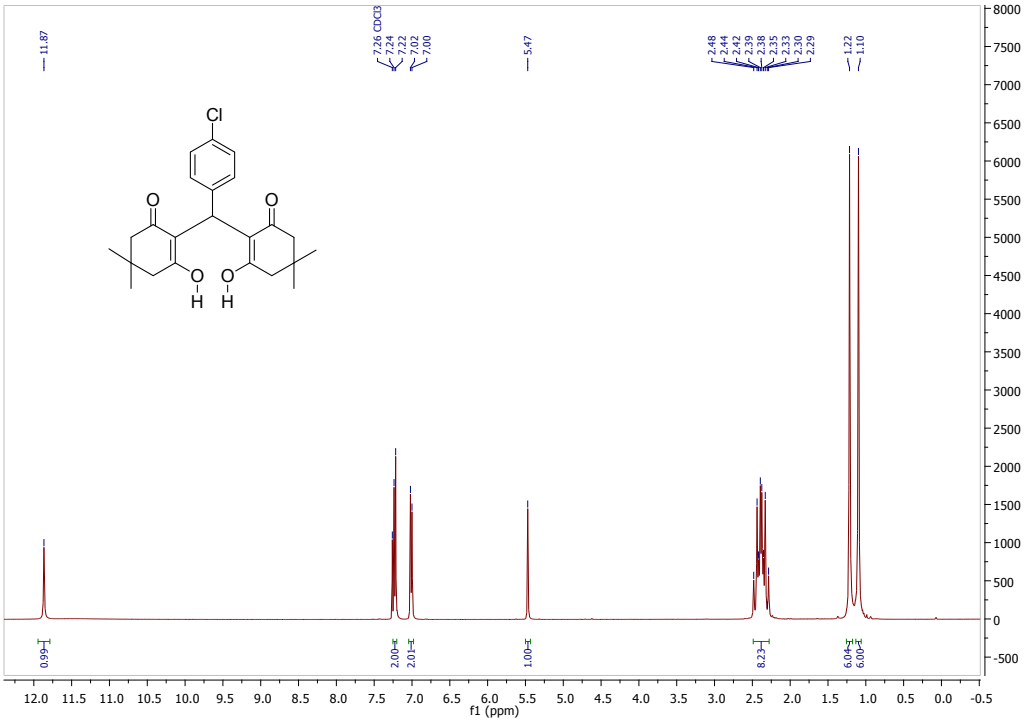
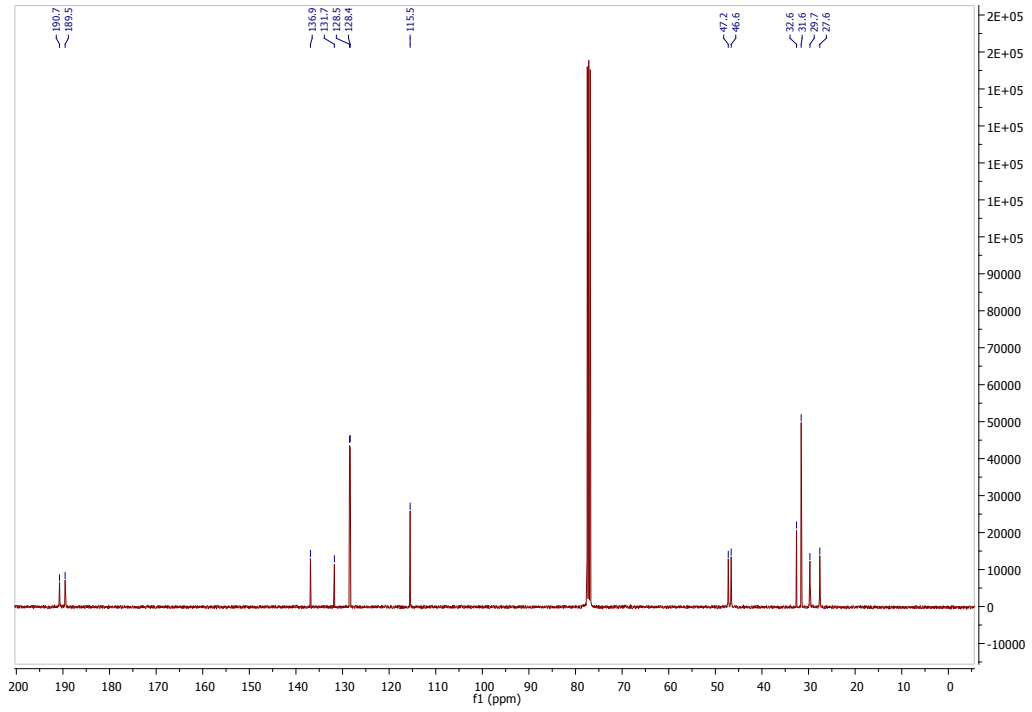
Viscosity of the DES as a function of temperature



1H and 13C spectra for 2,2'-((4-chlorophenyl)methylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6a**).[1]





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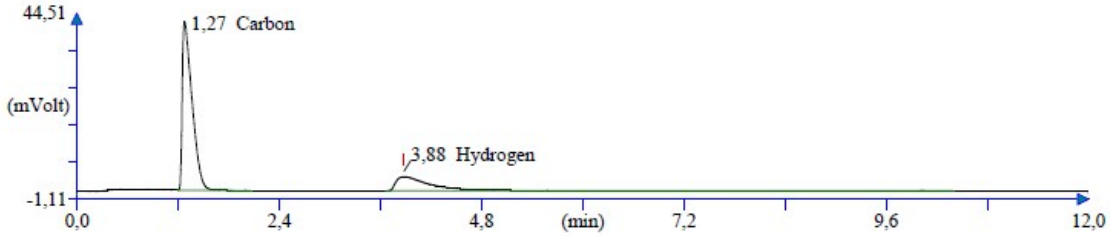
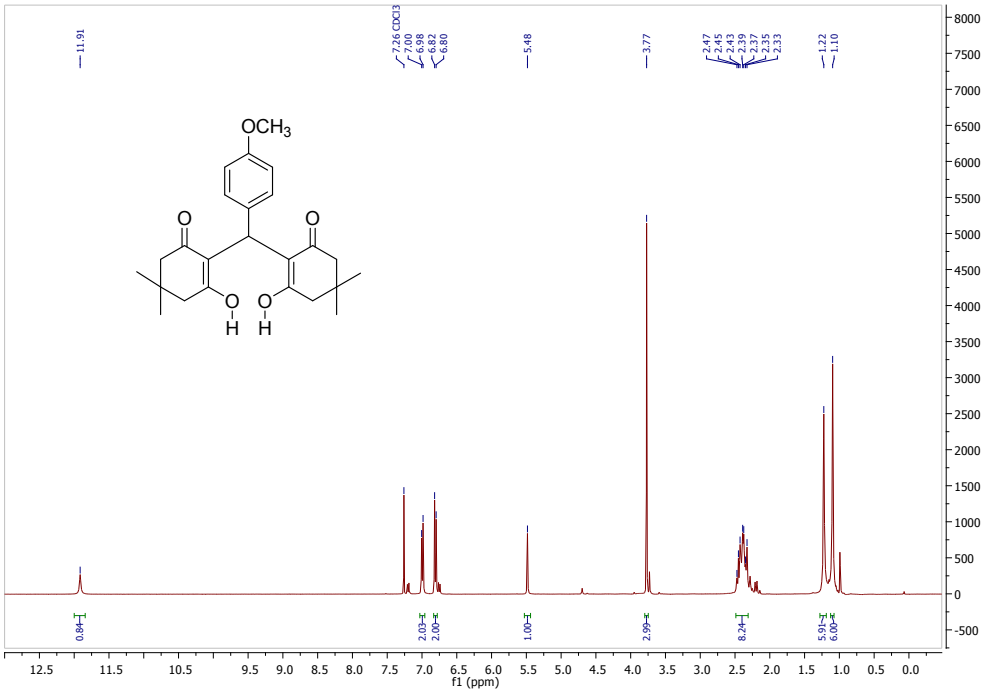
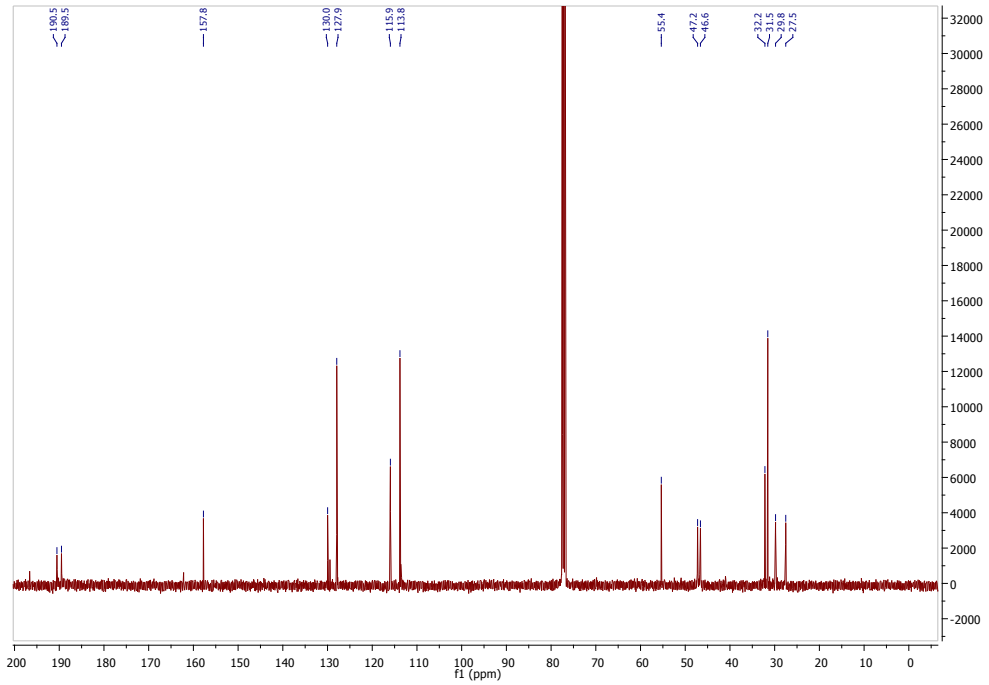
Element Name		Ret.Time	Area	BC	Area ratio	K factor
Carbon	68.8383	77	3235806	mi	1.000000	.464422E+07
Hydrogen	6.7621	233	1014477	mi	3.189630	.147901E+08
Totals	75.6004		4250283			

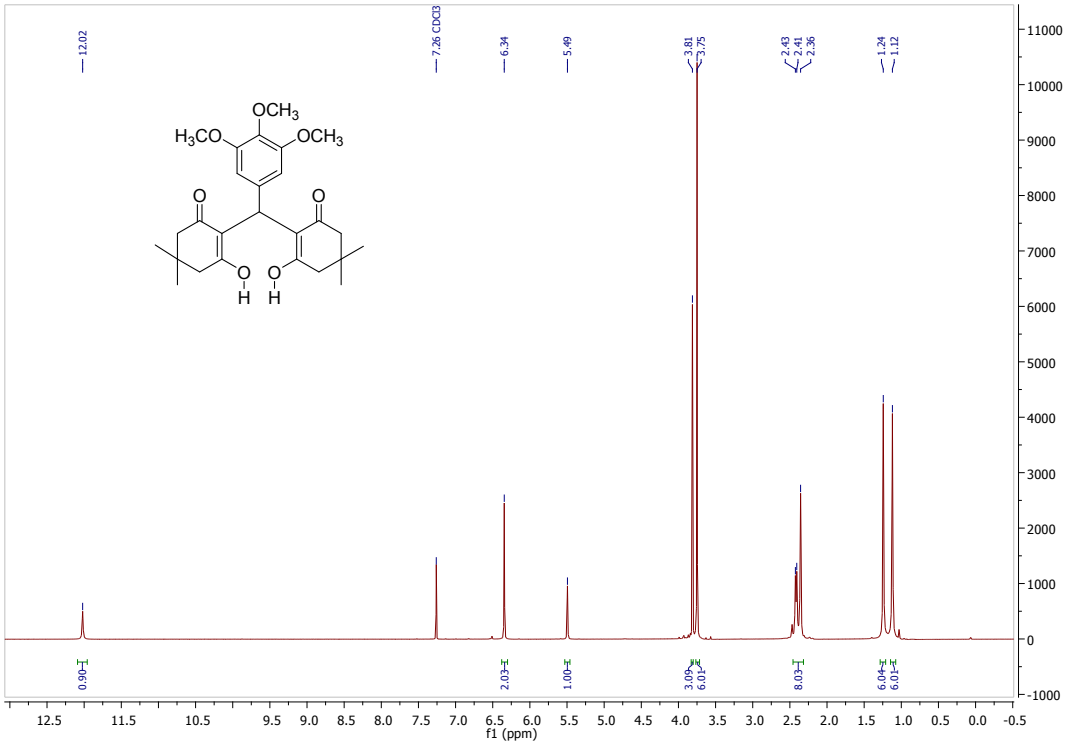


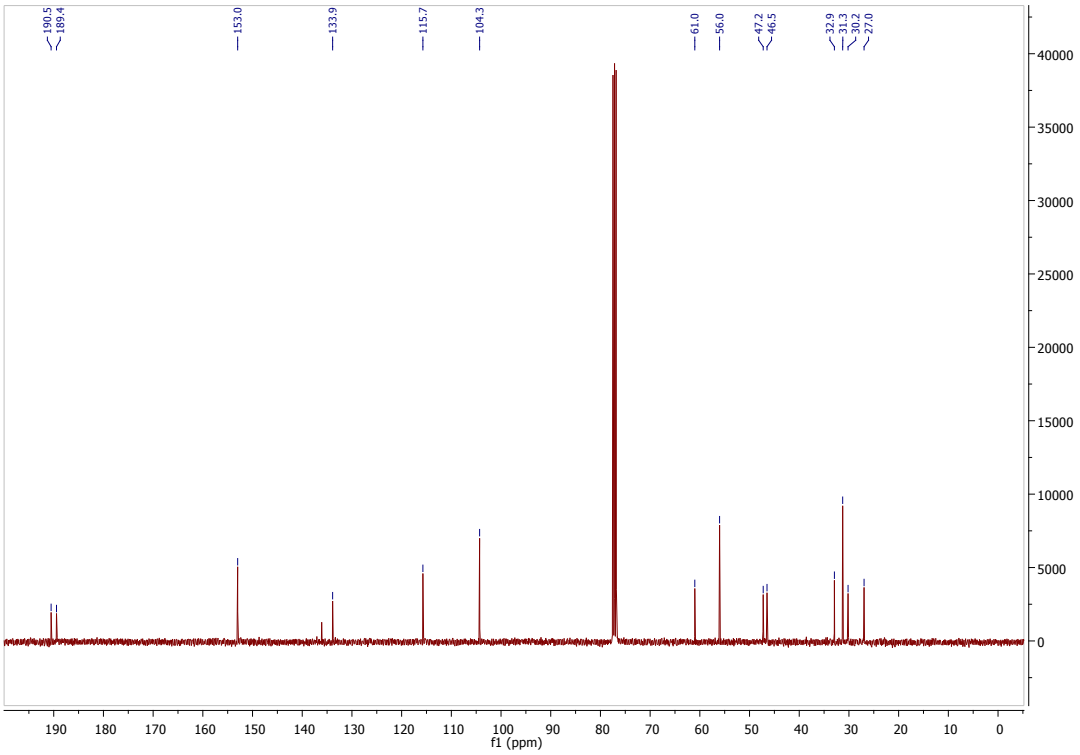
1H and 13C spectra for 2,2'-((4-methoxyphenyl)methylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6b**).[2]



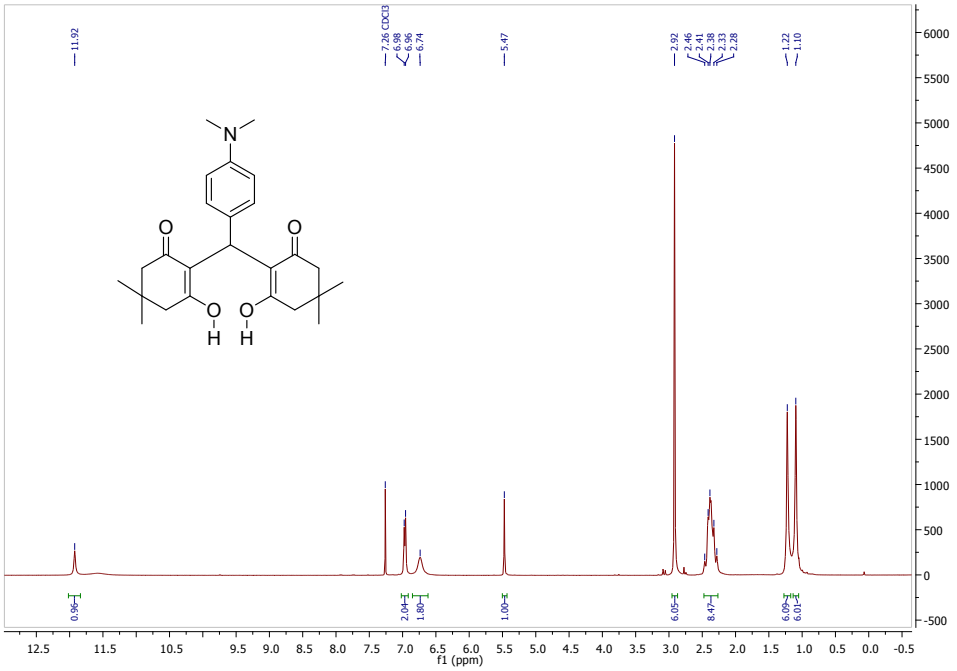


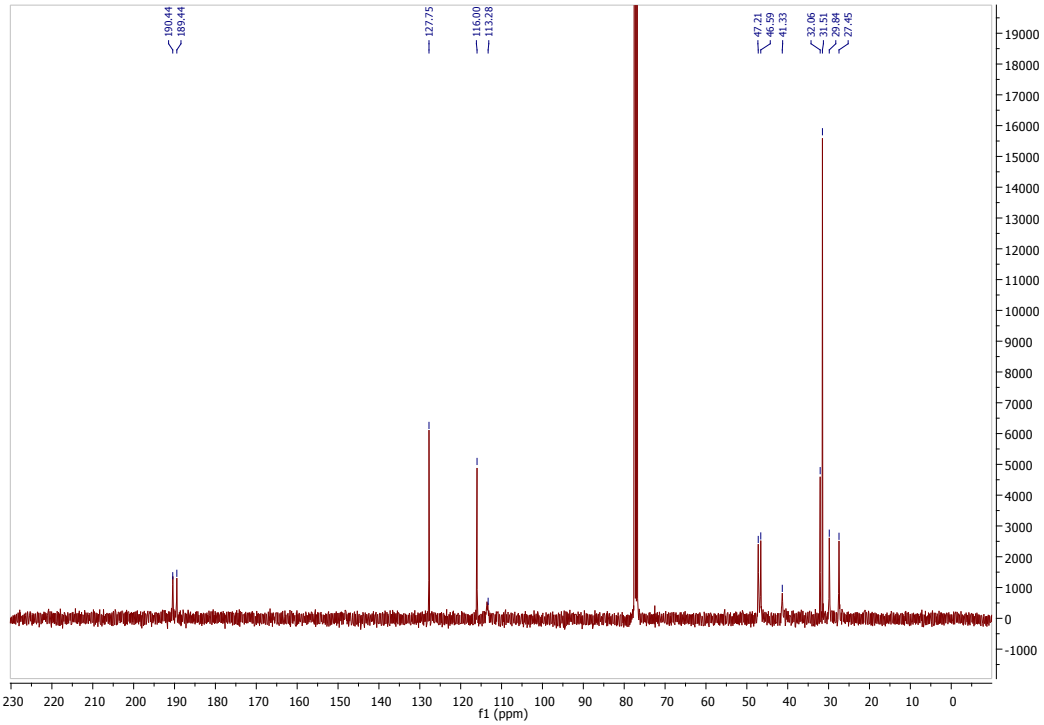
1H and 13C spectra for 2,2'-((3,4,5-trimethoxyphenyl)methylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6c**).[3]



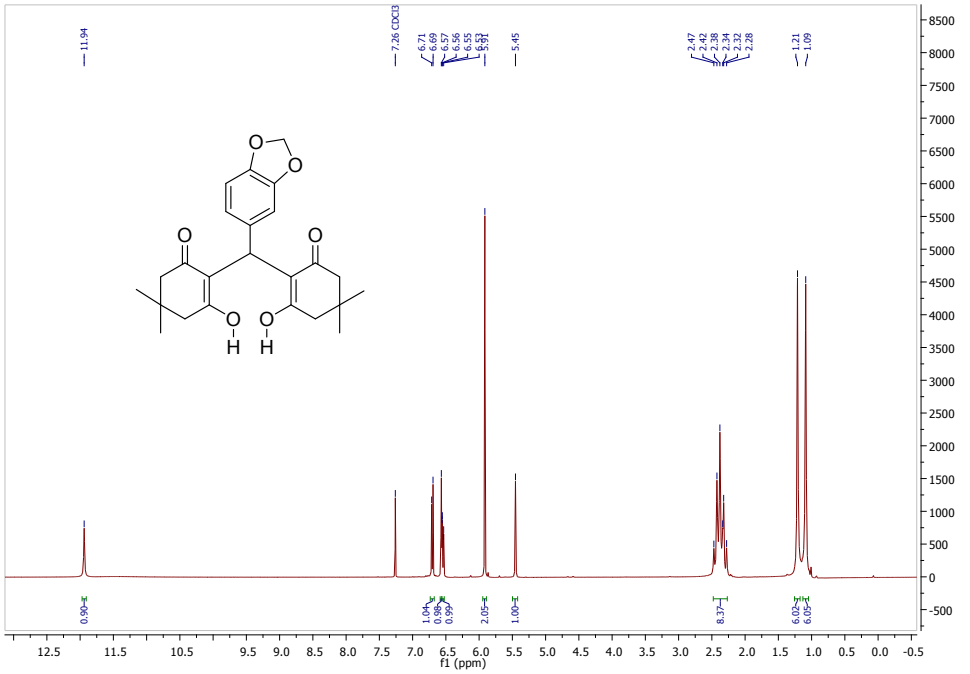


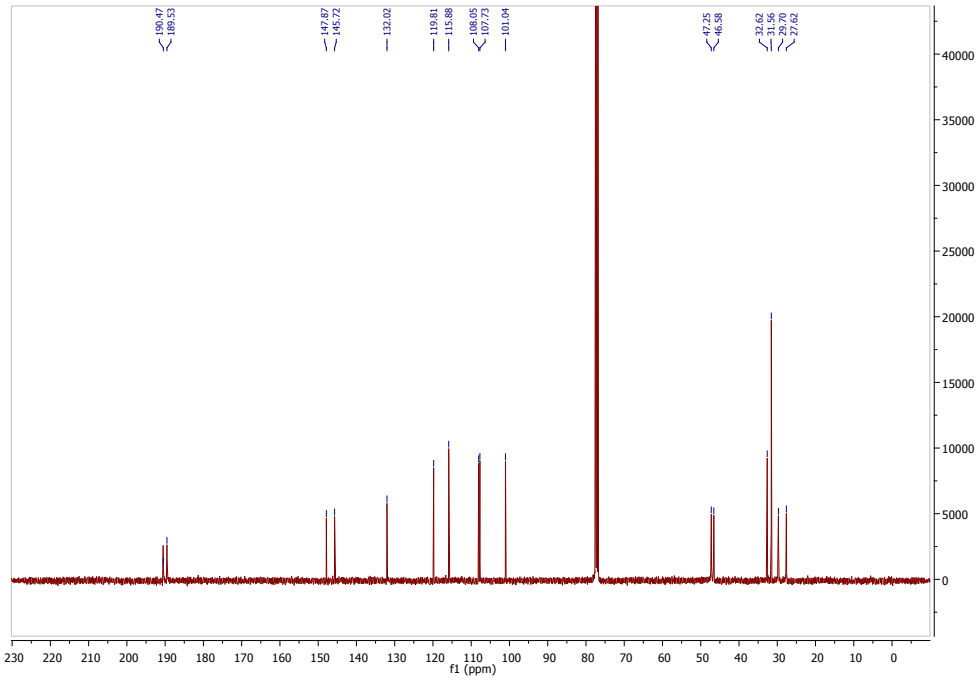
1H and 13C spectra for 2,2'-((4-(dimethylamino)phenyl)methylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6d**).[3]



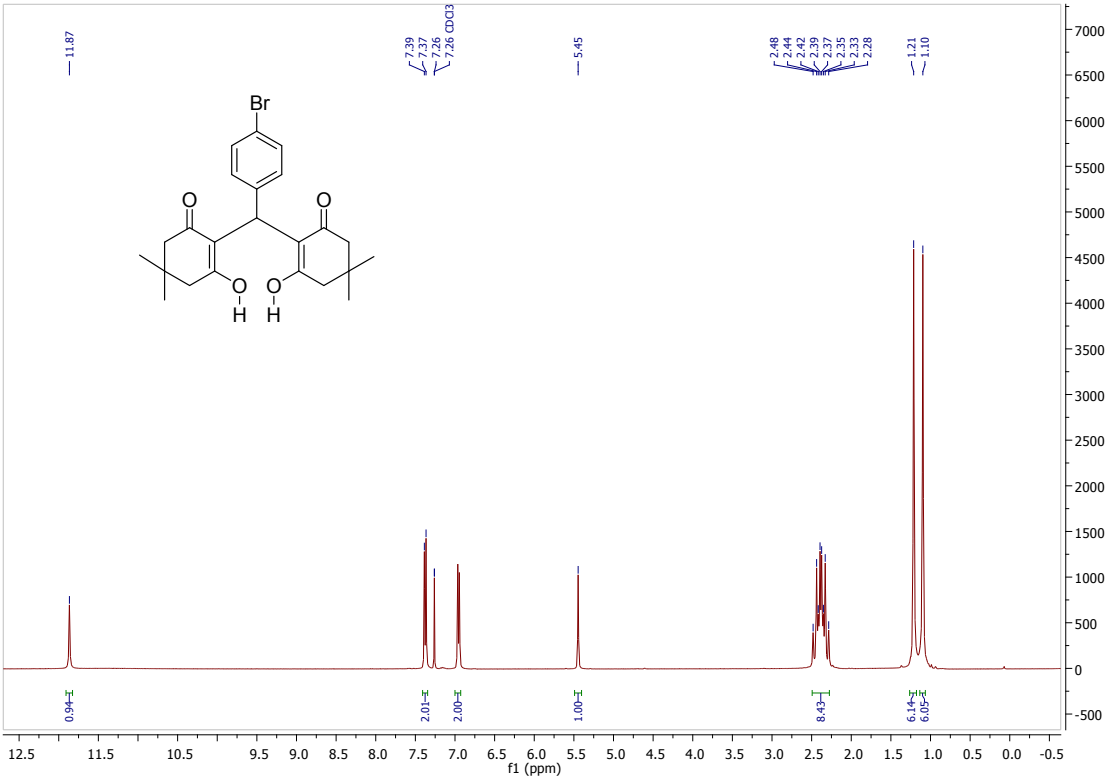


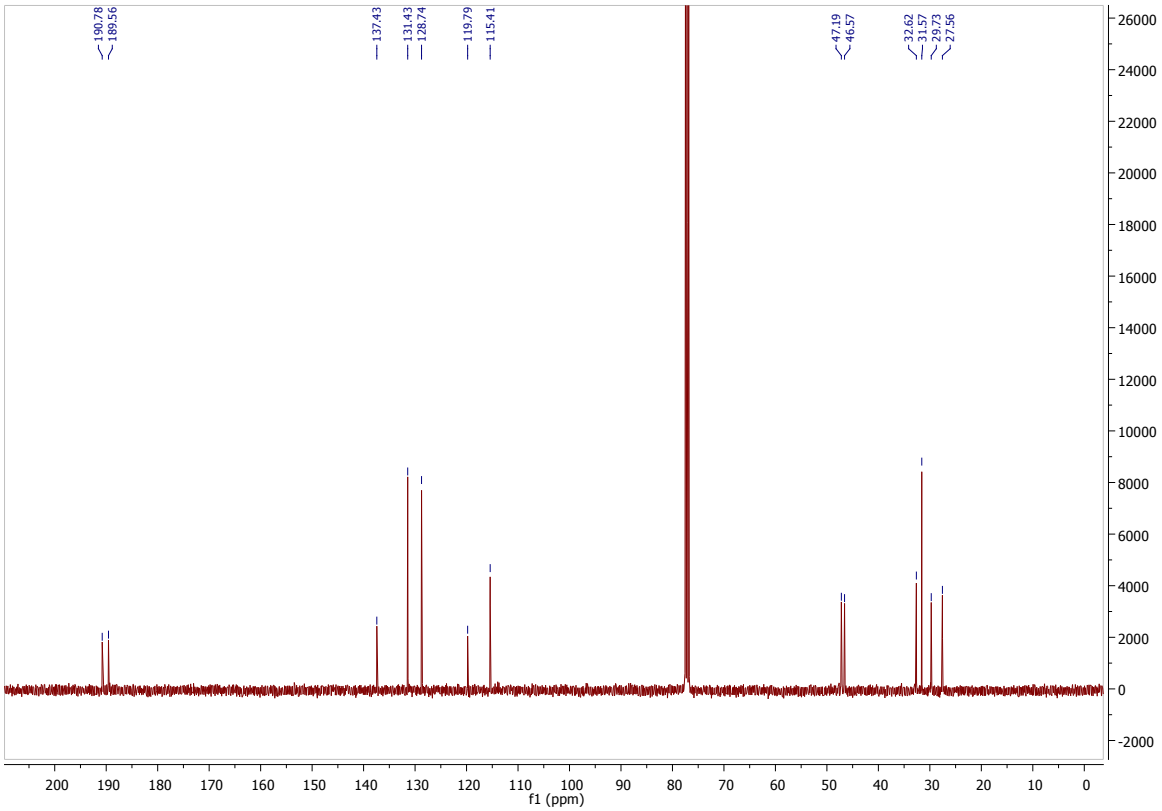
1H and 13C spectra for 2,2'-(benzo[*d*][1,3]dioxol-5-ylmethylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6e**).[4]



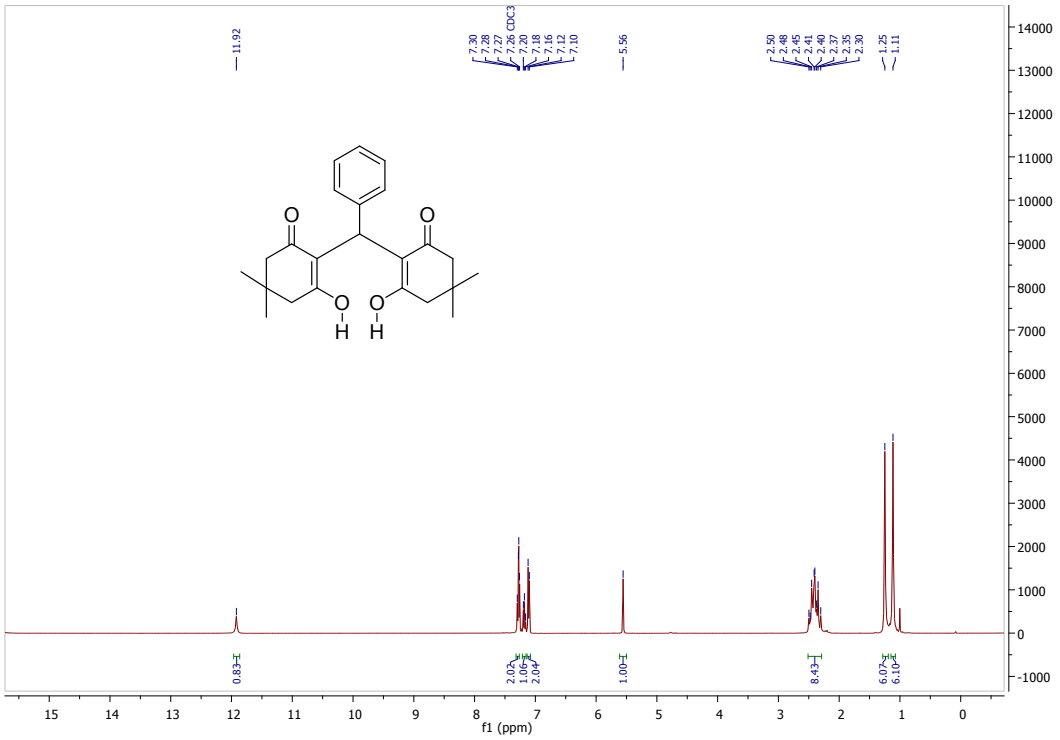


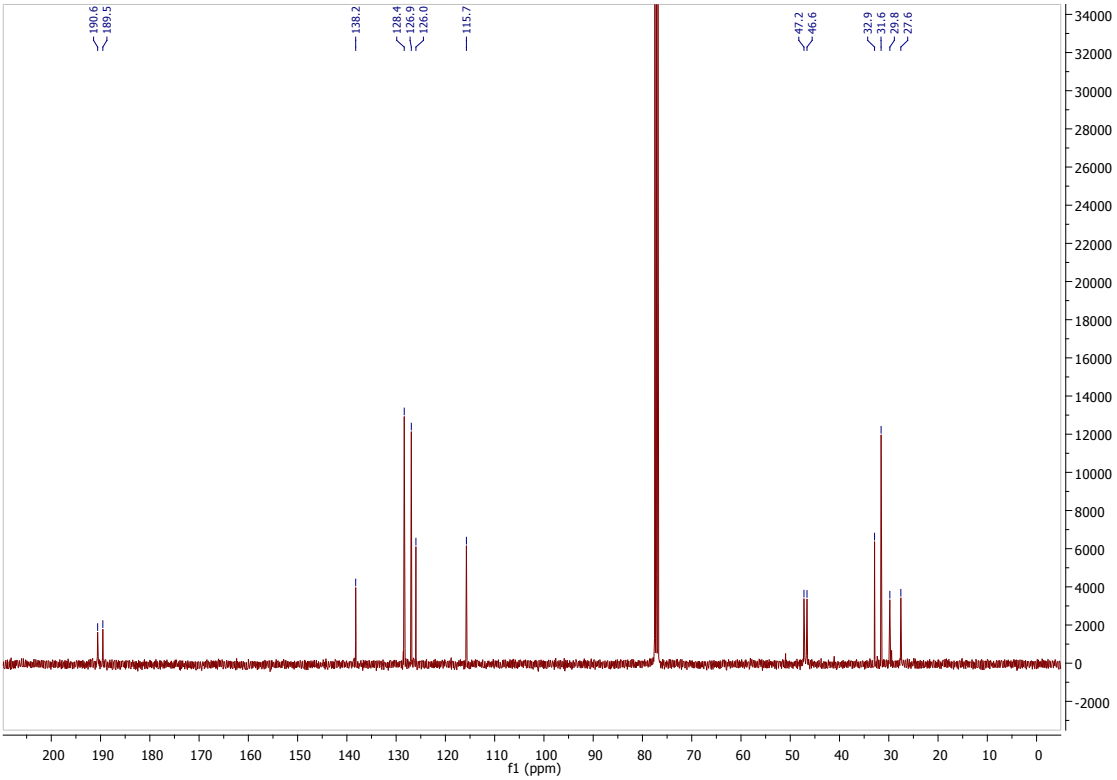
1H and 13C spectra for 2,2'-((4-bromophenyl)methylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6f**).[3]



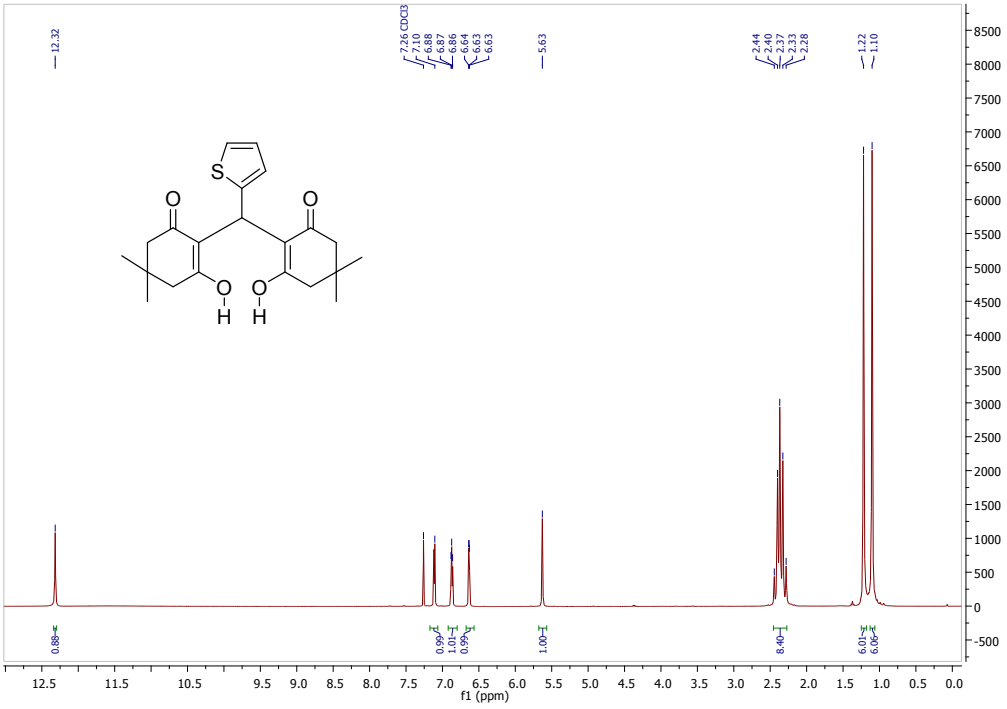


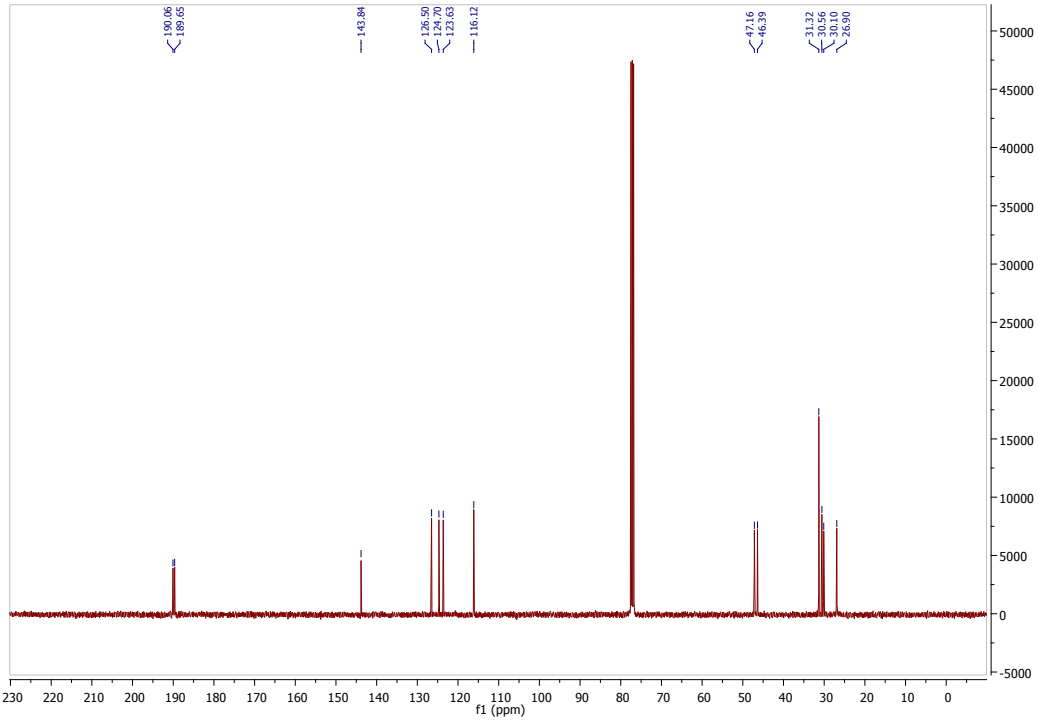
1H and 13C spectra for 2,2'-(phenylmethylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6g**).[2]



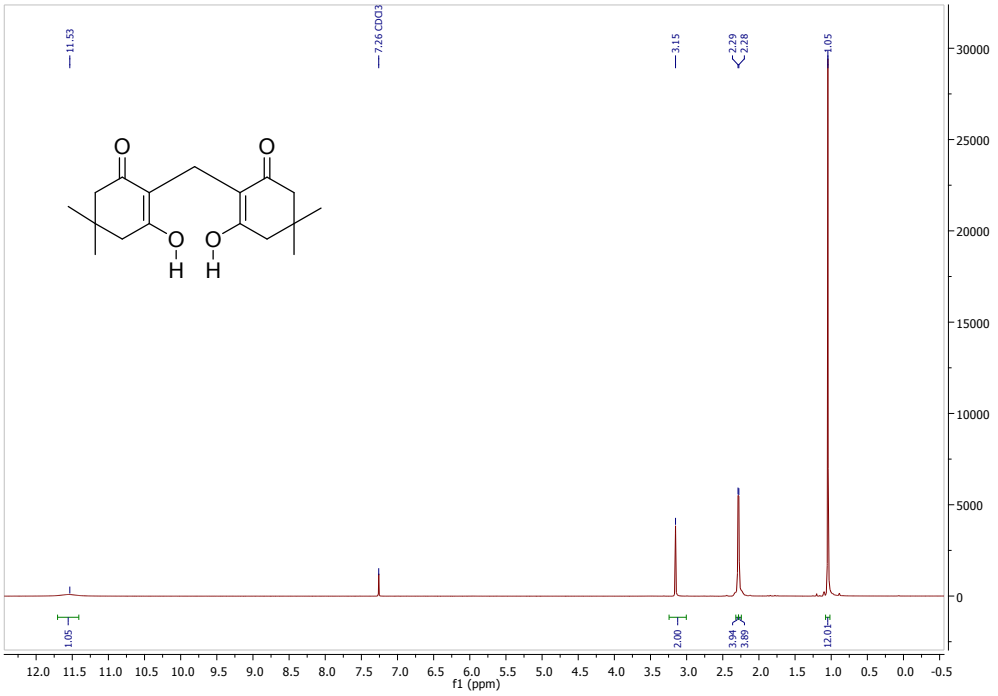


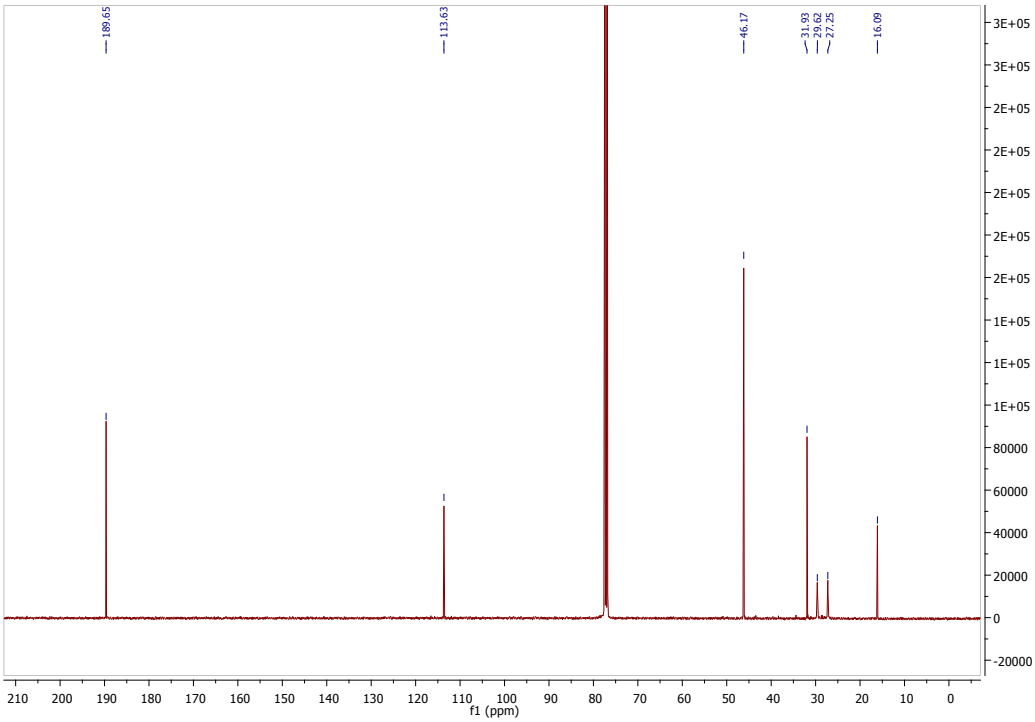
1H and 13C spectra for 2,2'-(thiophen-2-ylmethylene)bis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6h**).[5]



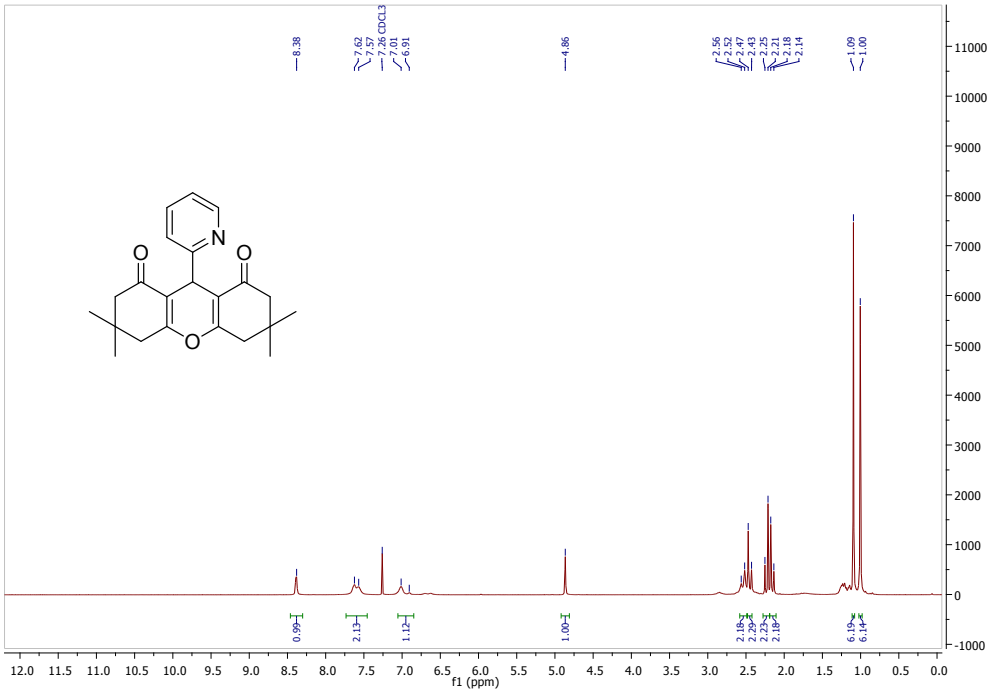


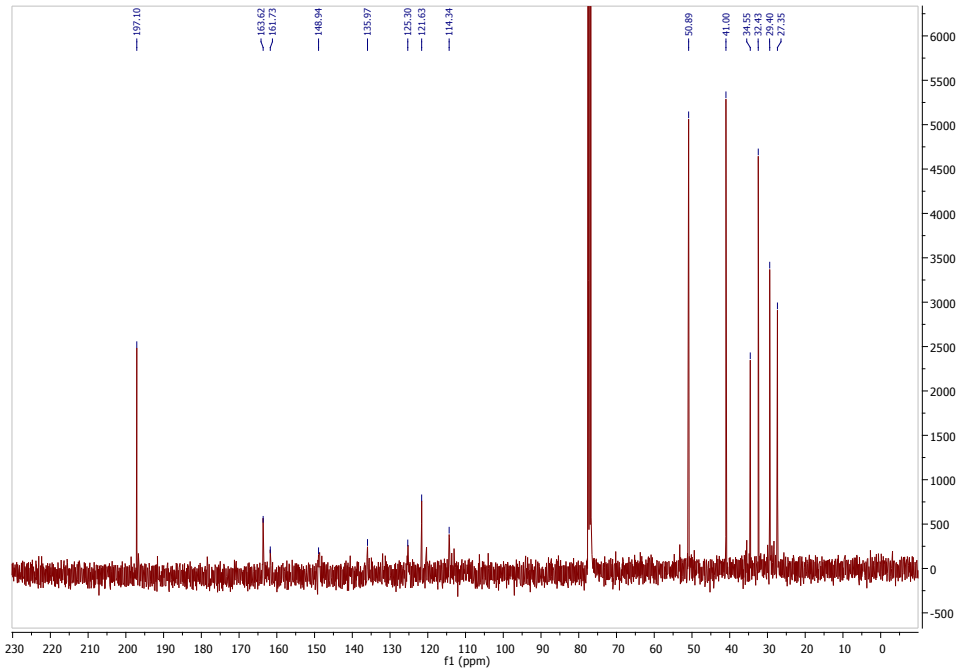
1H and 13C spectra for 2,2'-methylenebis(3-hydroxy-5,5-dimethylcyclohex-2-enone) (**6i**).[5]



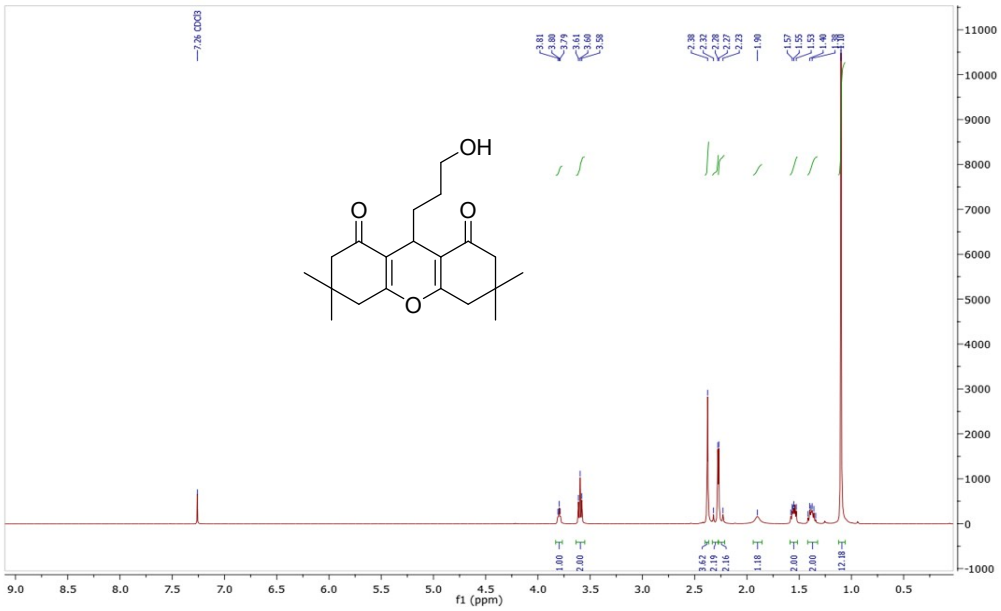


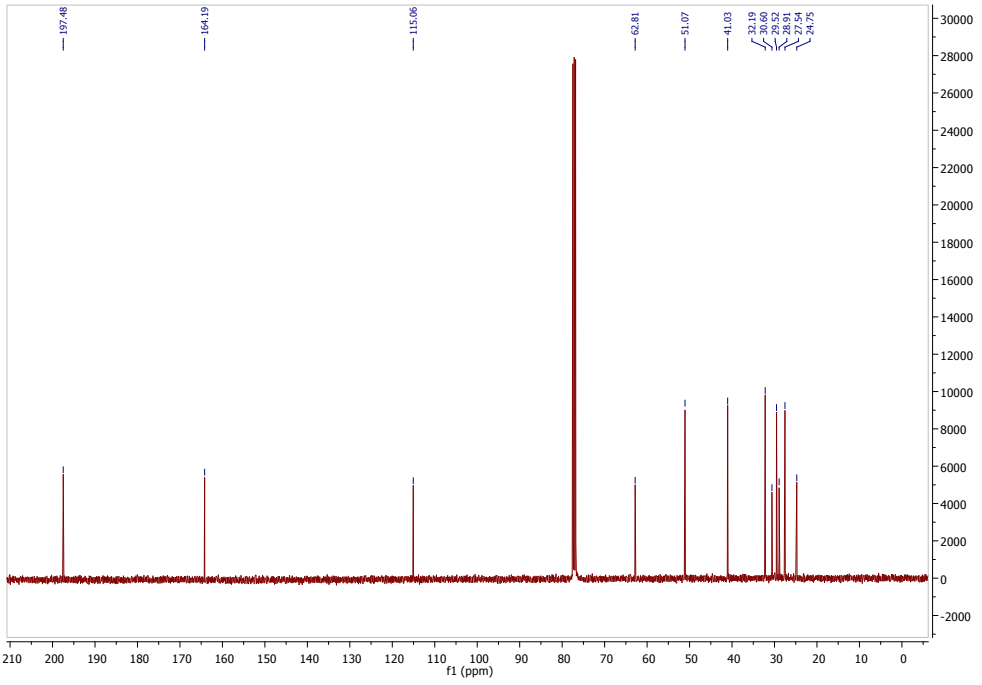
1H and 13C spectra for 3,3,6,6-tetramethyl-9-(pyridin-2-yl)-3,4,5,6,7,9-hexahydro-1*H*-xanthene-1,8(2*H*)-dione (**6j**).[6]





1H and 13C spectra and organic elemental analysis for 9-(3-hydroxypropyl)-3,3,6,6-tetramethyl-3,4,5,6,7,9-hexahydro-1*H*-xanthene-1,8(2*H*)-dione (**6k**).





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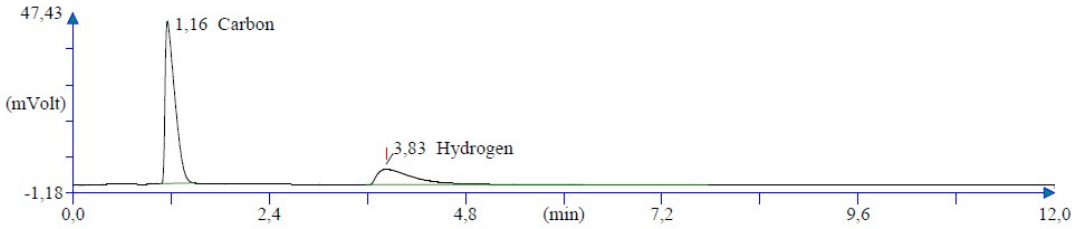
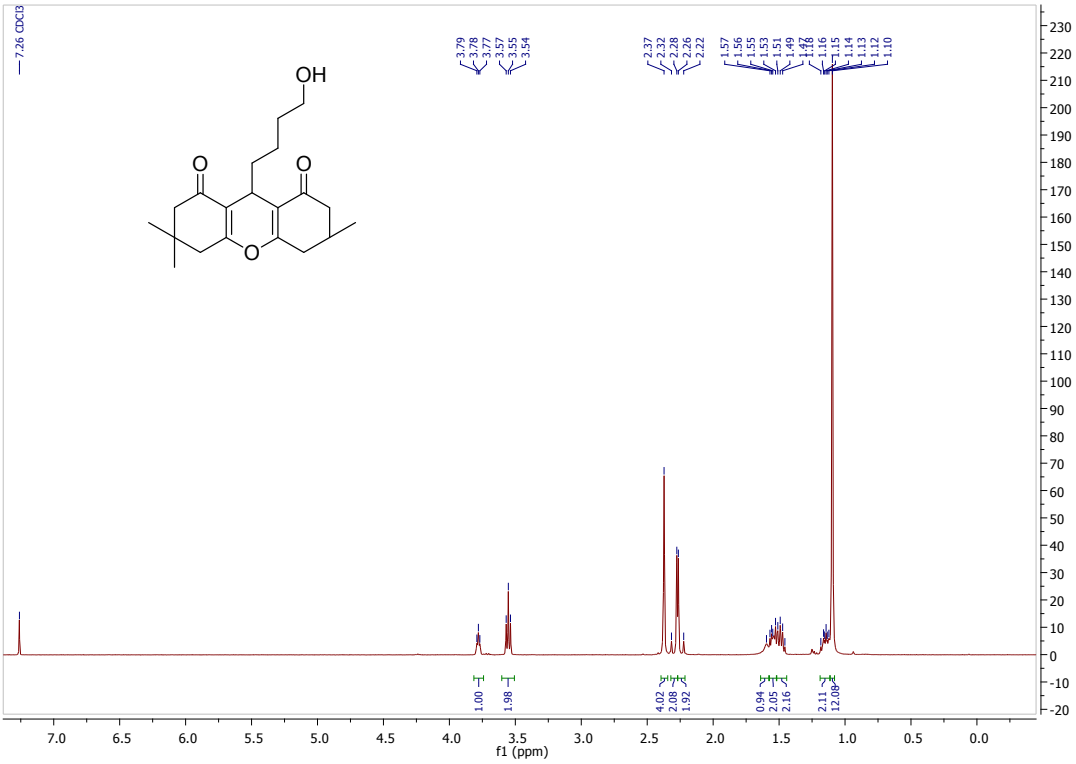
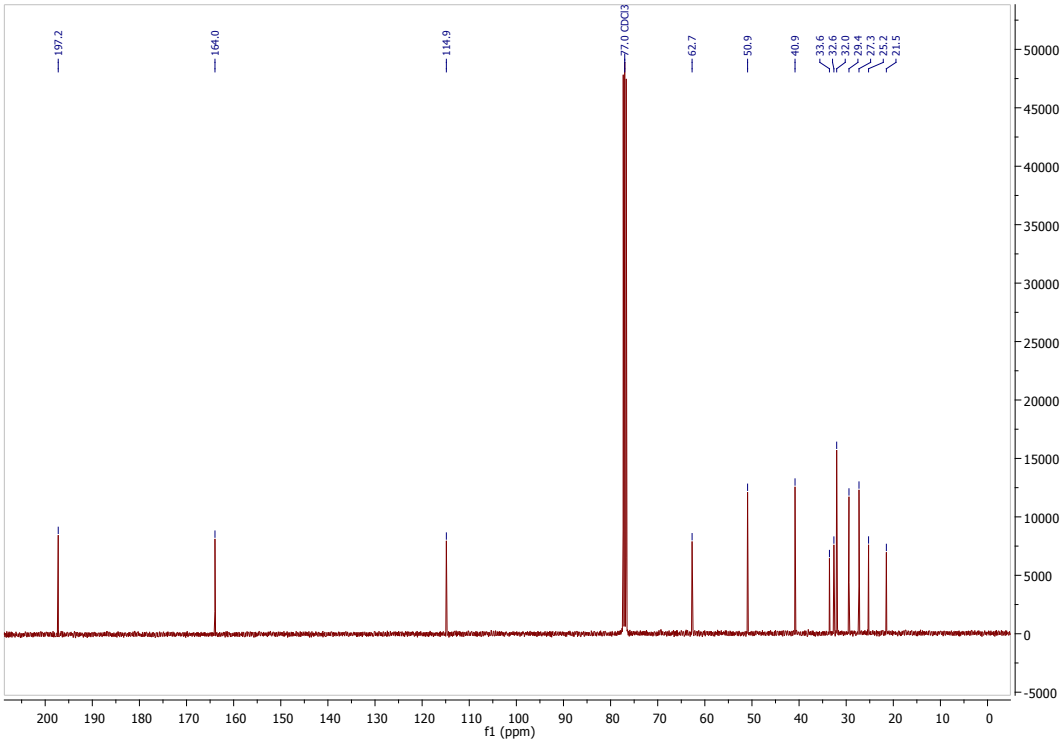
Element Name		Ret.Time	Area	BC	Area ratio	K factor
Carbon	72.6140	70	3584727	mi	1.000000	.464422E+07
Hydrogen	8.4968	230	1337443	mi	2.680284	.147901E+08
Totals	81.1108		4922170			



1H and 13C spectra and organic elemental analysis for 9-(4-hydroxybutyl)-3,3,6,6-tetramethyl-3,4,5,6,7,9-hexahydro-1*H*-xanthene-1,8(2*H*)-dione (**6l**).





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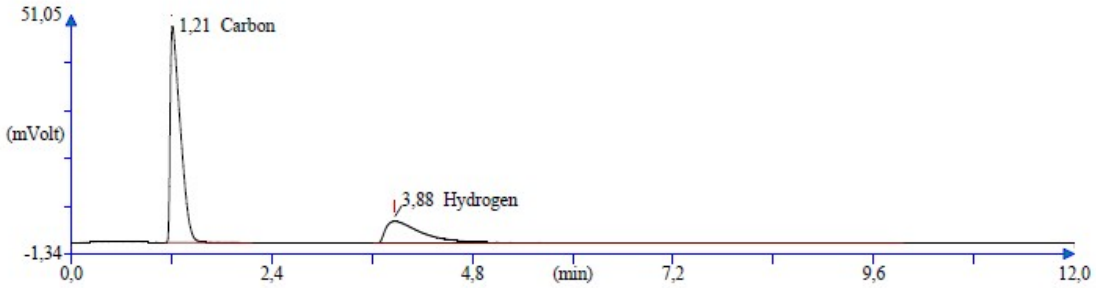
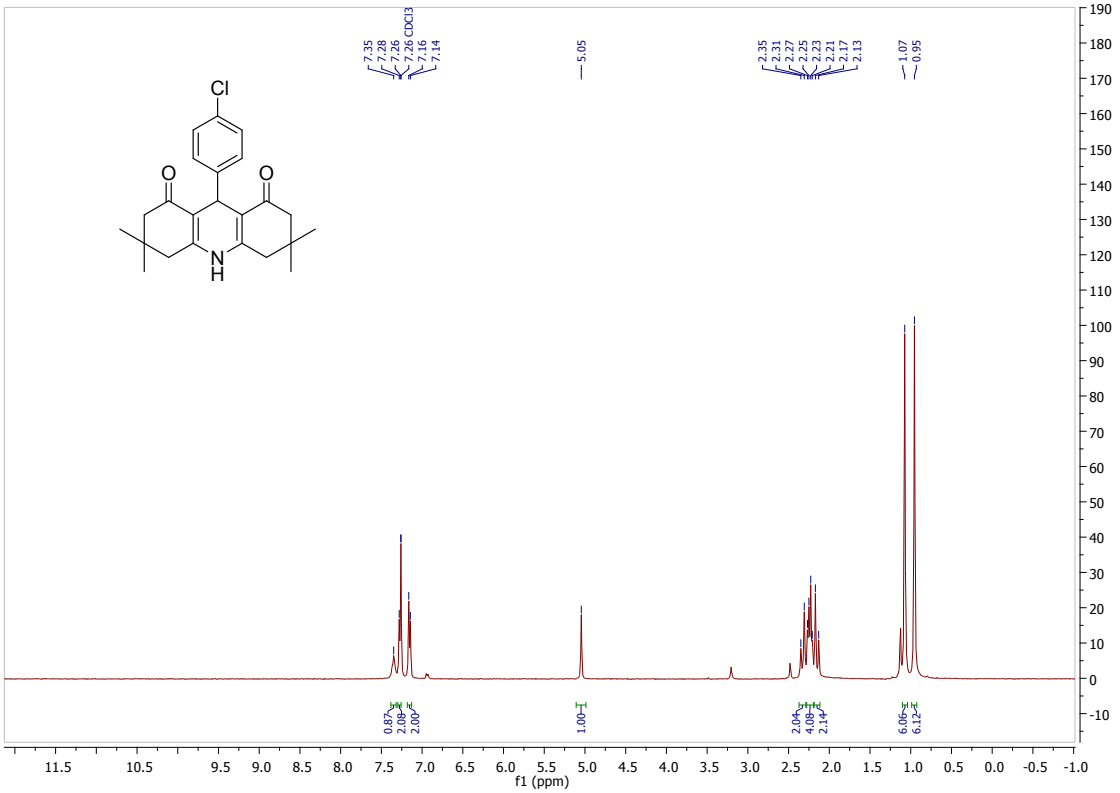
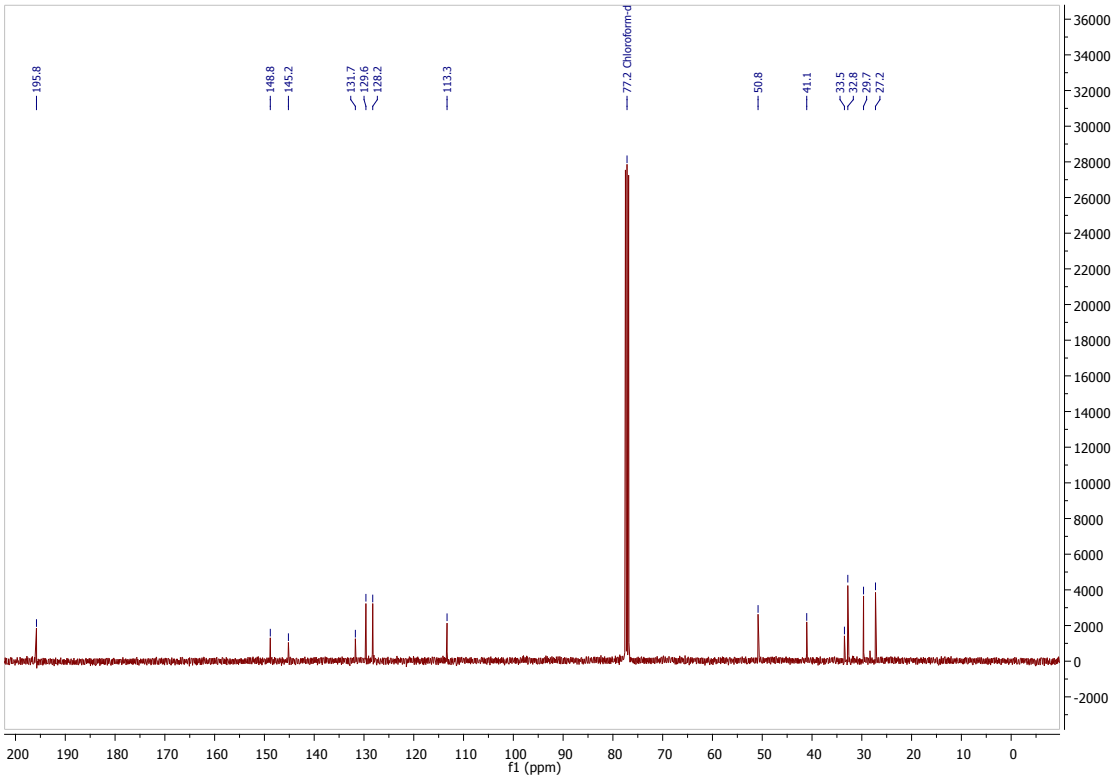
Element Name	% peso	Ret.Time	Area	BC	Area ratio	K factor
Carbon	72.5373	73	3982816	RS	1.000000	
Hydrogen	8.6833	233	1492913	RS	2.667815	
Totals	81.2206		5475729			



1H and 13C spectra for 9-(4-chlorophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5a**).[1, 7]





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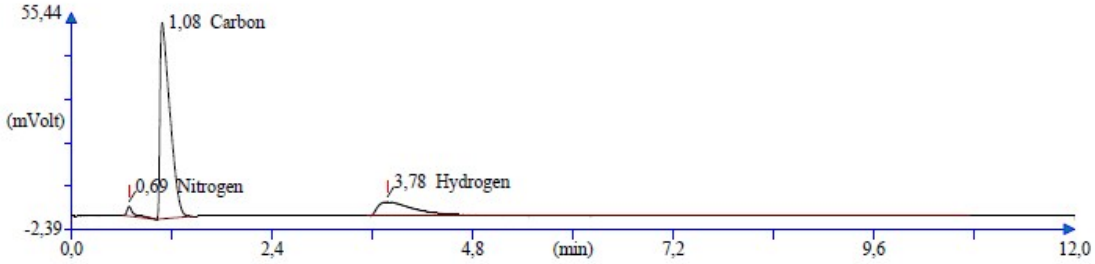
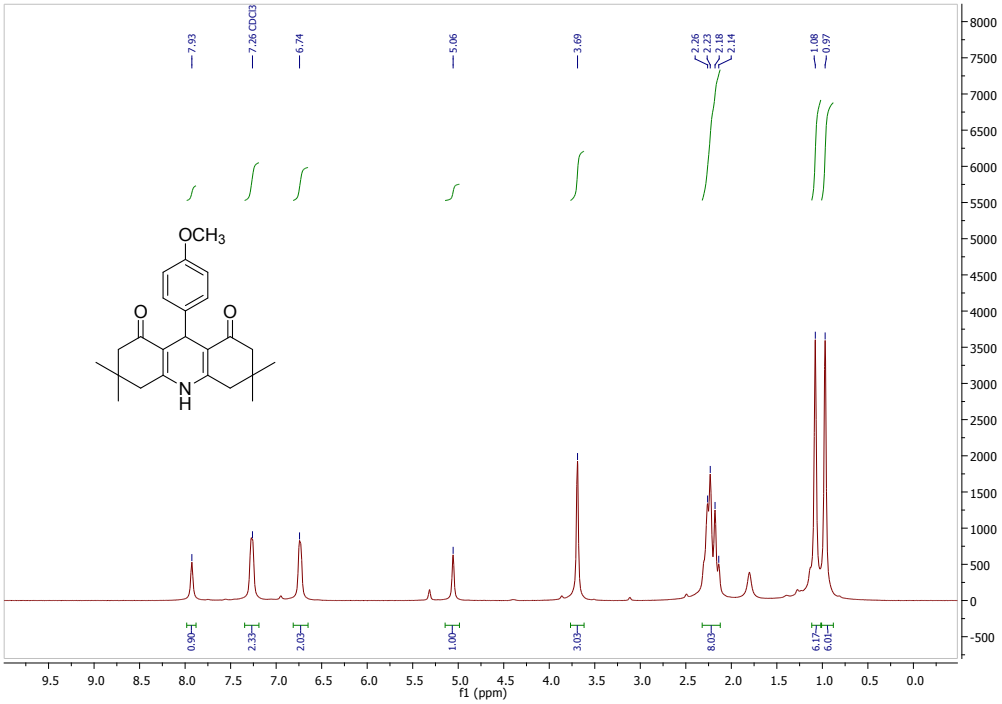
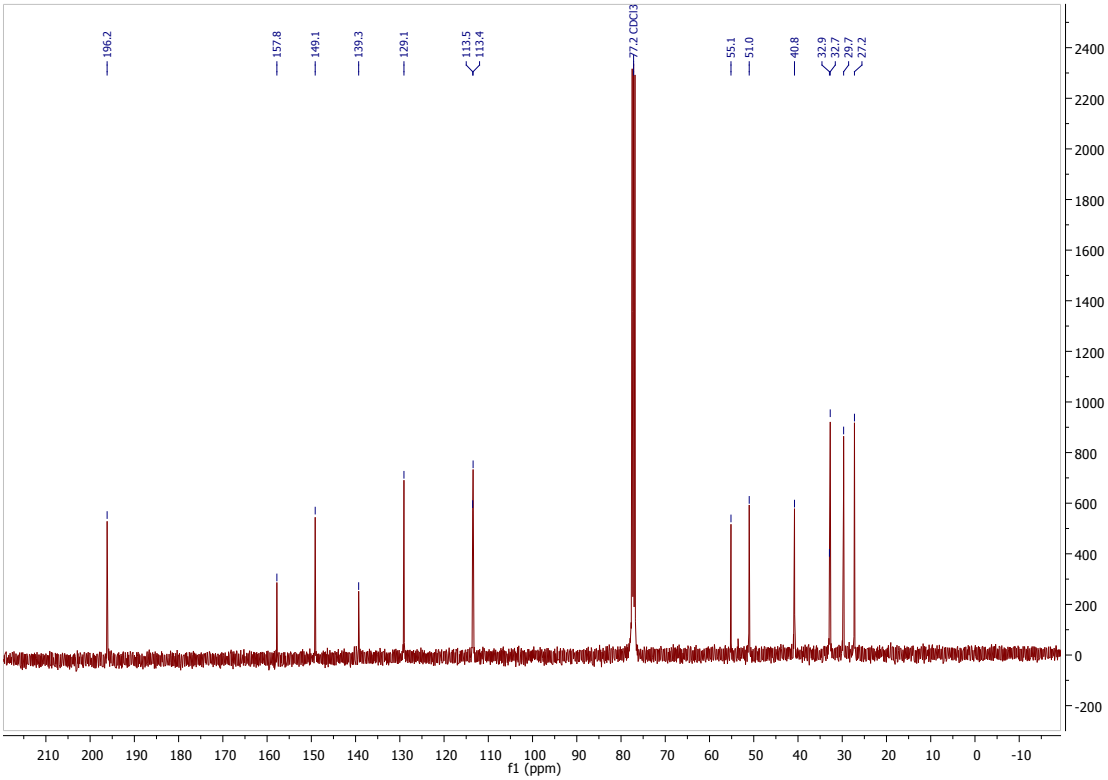
Element Name		Ret.Time	Area	BC	Area ratio	K factor
Nitrogen	3.6352	42	153917	RS	27.979890	.187129E+07
Carbon	71.9872	65	4306580	RS	1.000000	.449478E+07
Hydrogen	6.8093	227	1332464	RS	3.232042	.147351E+08
Totals	82.4318		5792961			

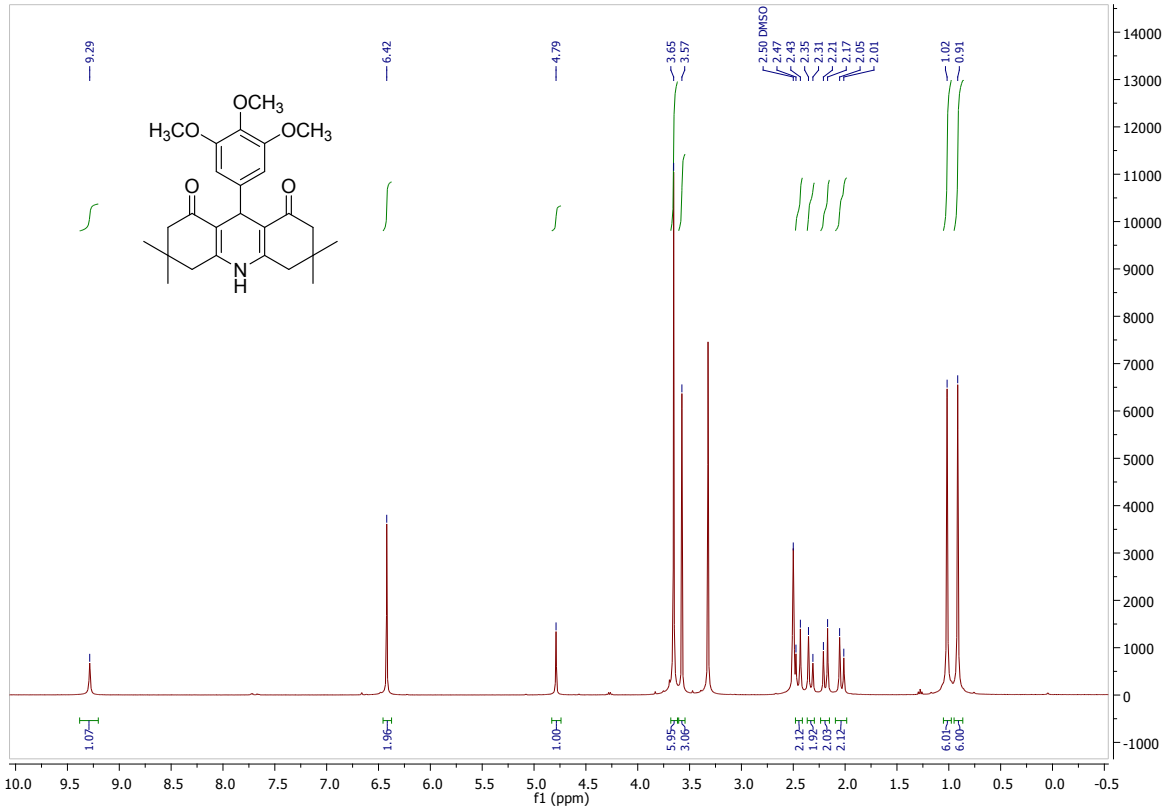


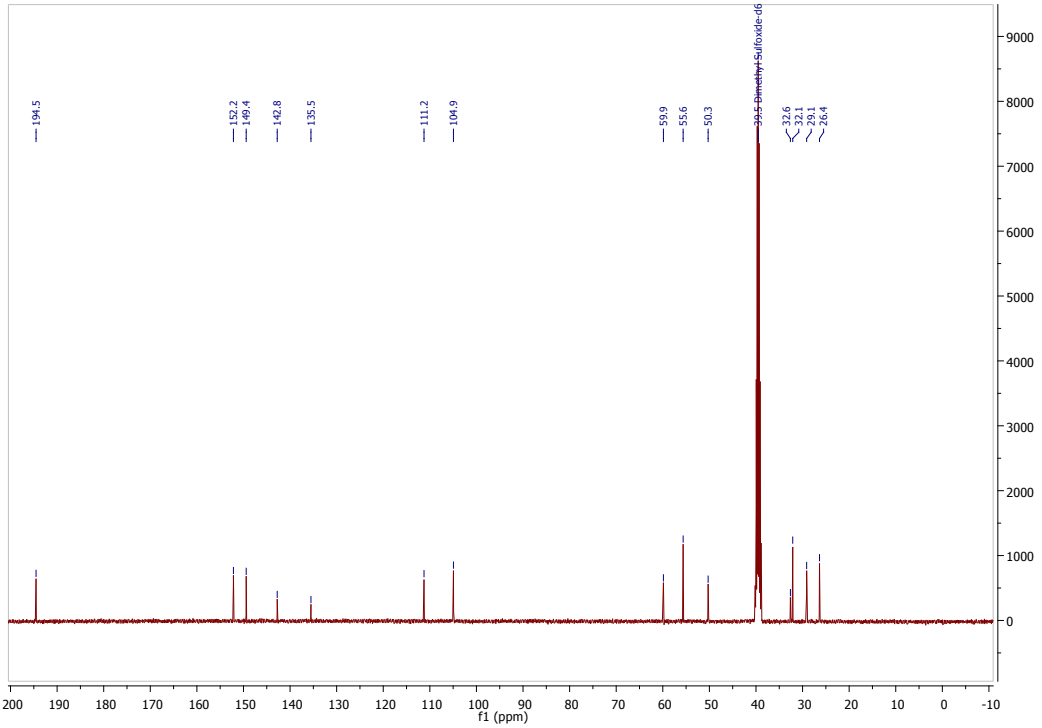
1H and 13C spectra for 9-(4-methoxyphenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5b**).[7]



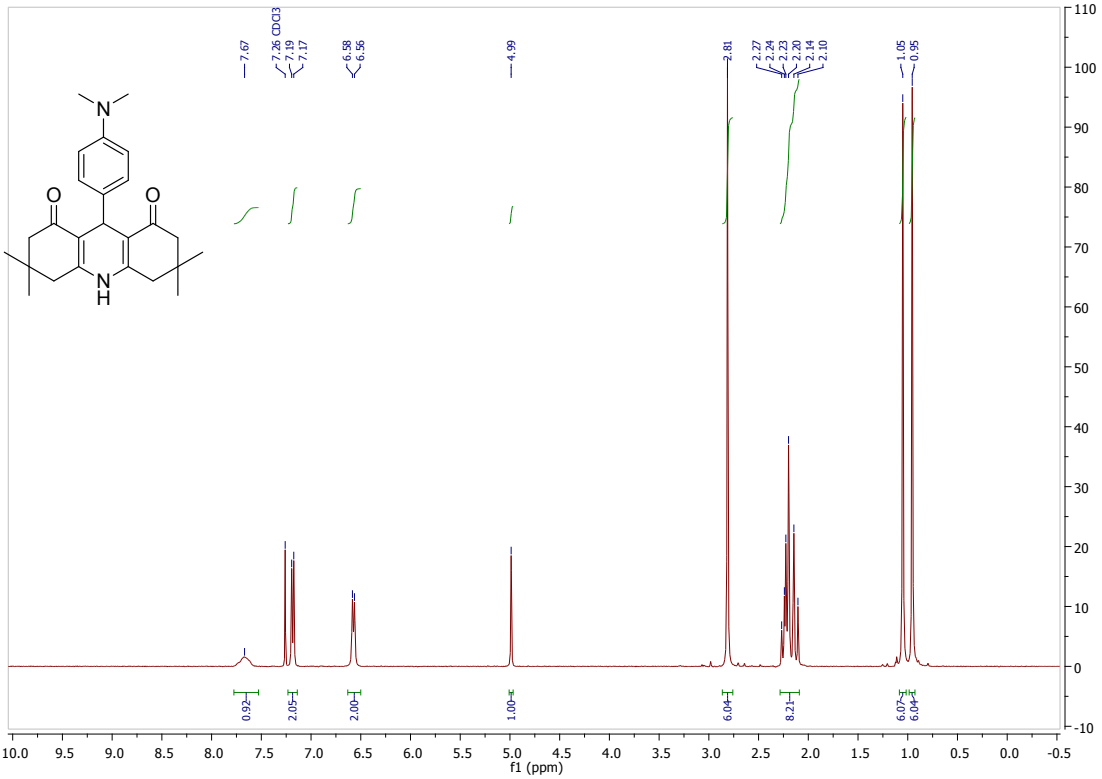


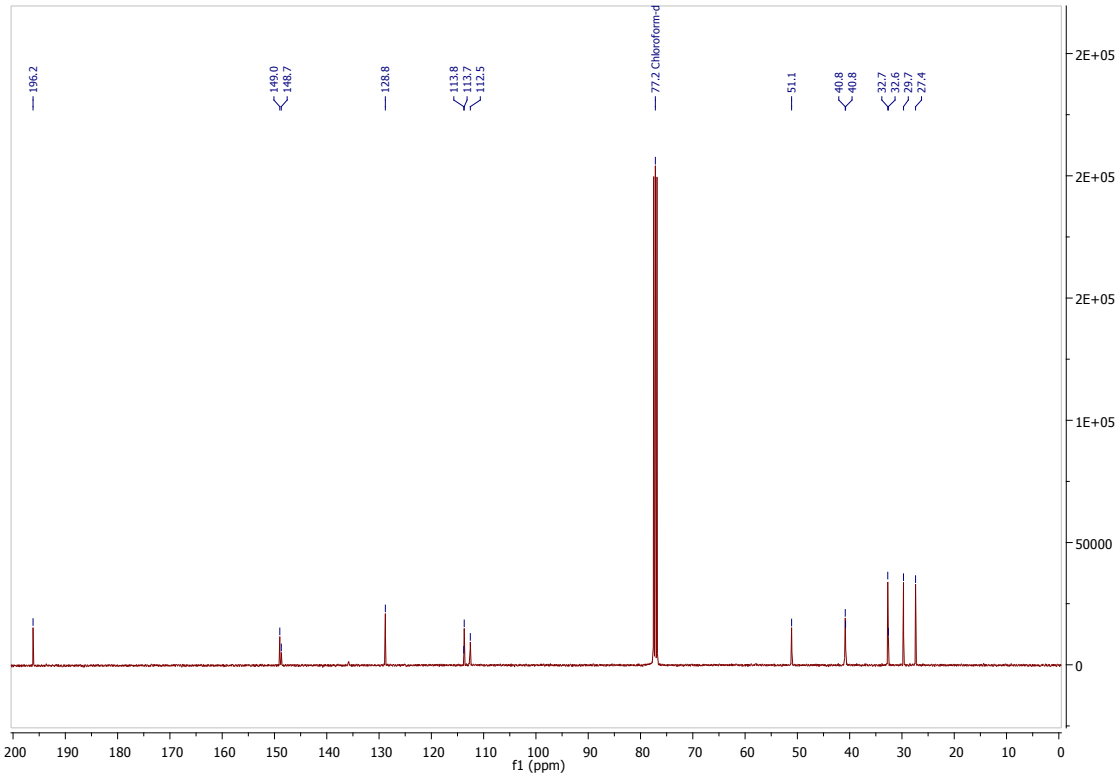
1H and 13C spectra for 3,3,6,6-tetramethyl-9-(3,4,5-trimethoxyphenyl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5c**).[8, 9]



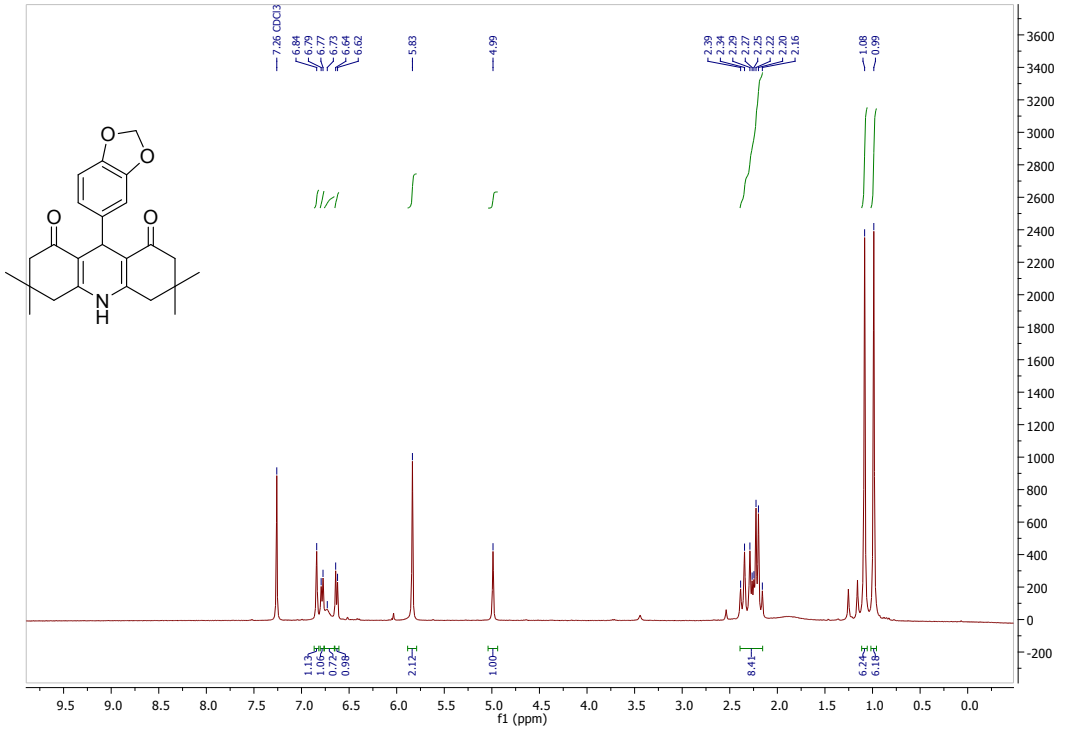


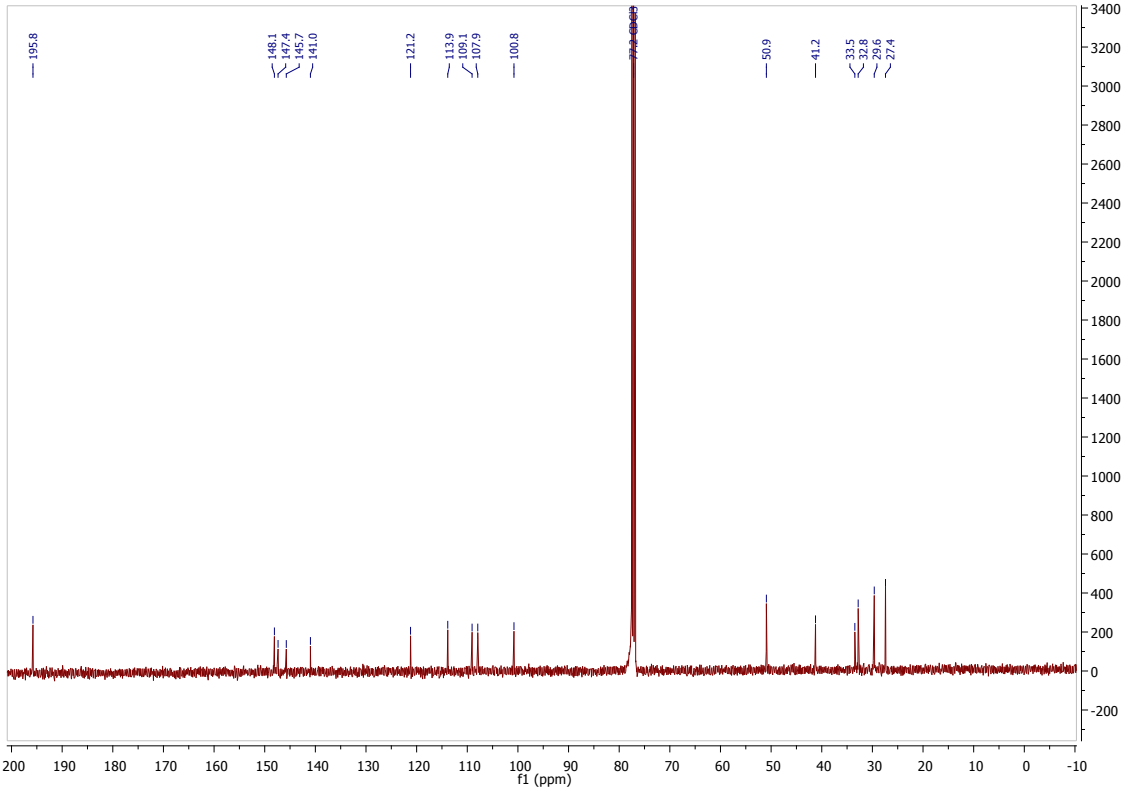
1H and 13C spectra for 9-(4-(dimethylamino)phenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5d**).[7]



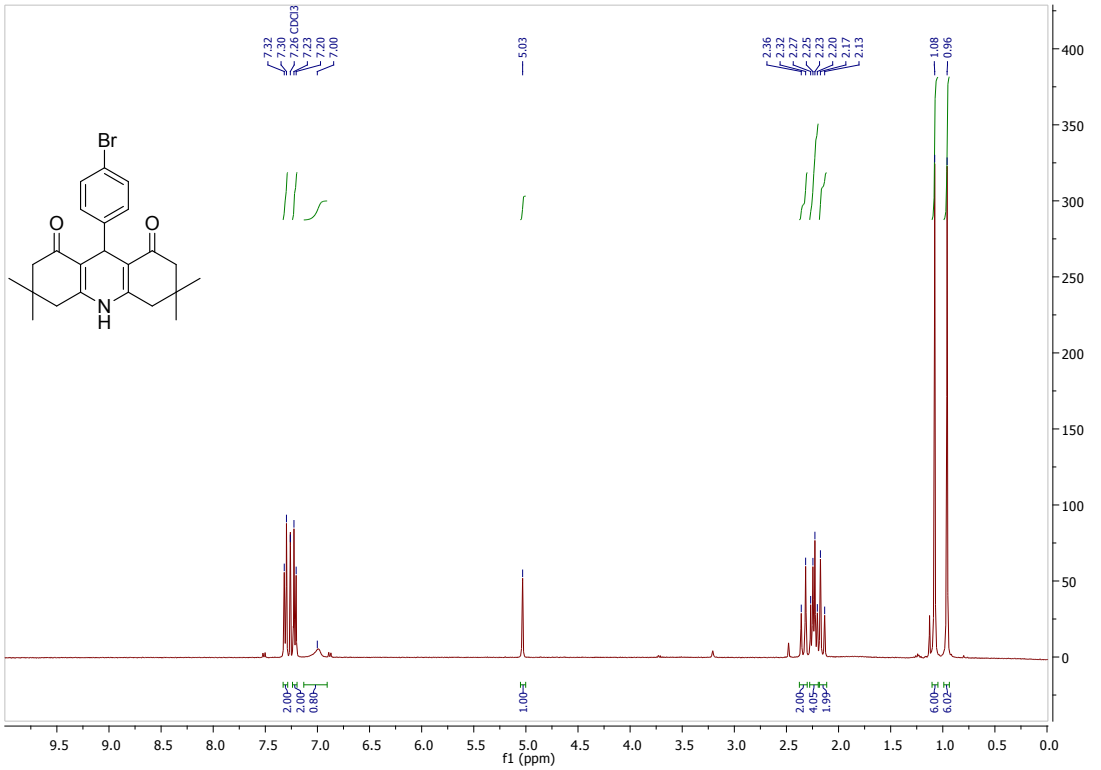


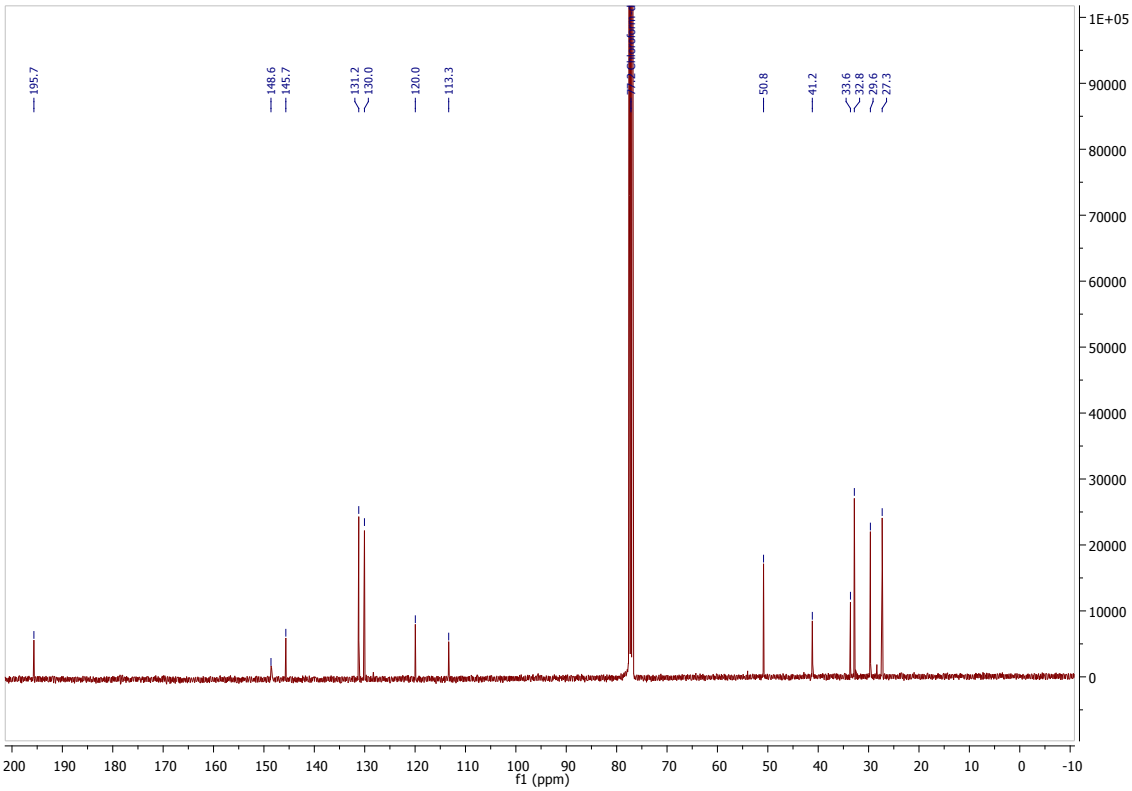
1H and 13C spectra for 9-(benzo[*d*][1,3]dioxol-5-yl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5e**).[7]



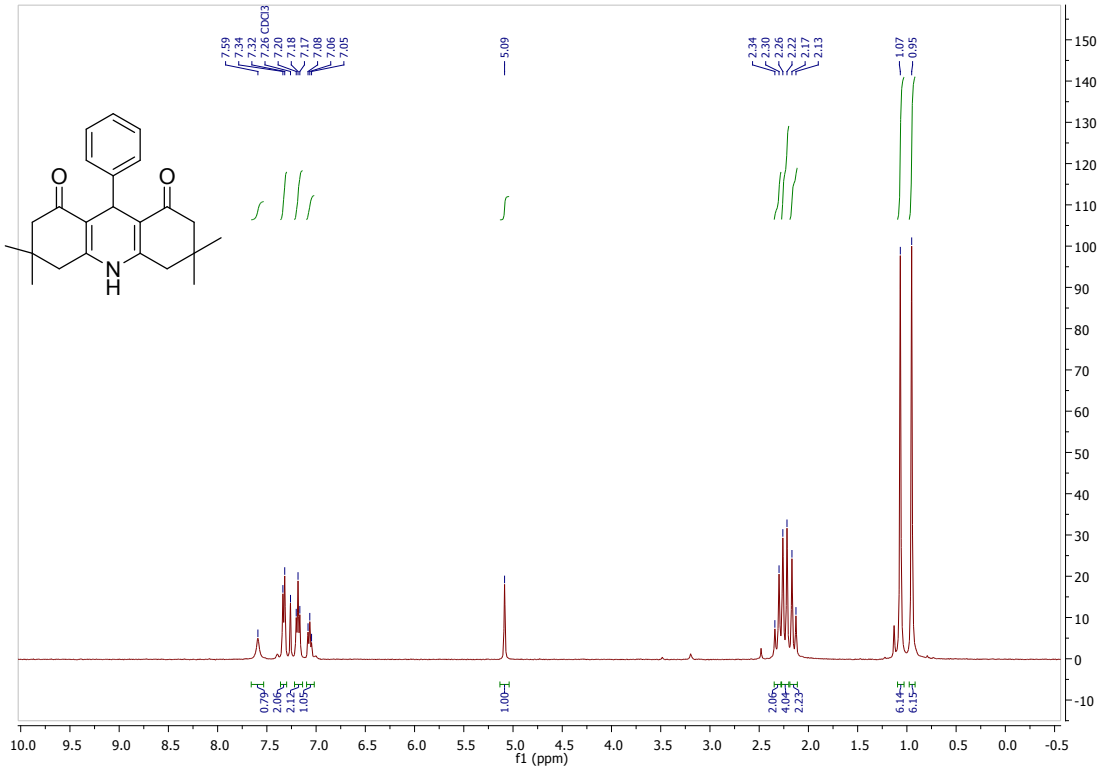


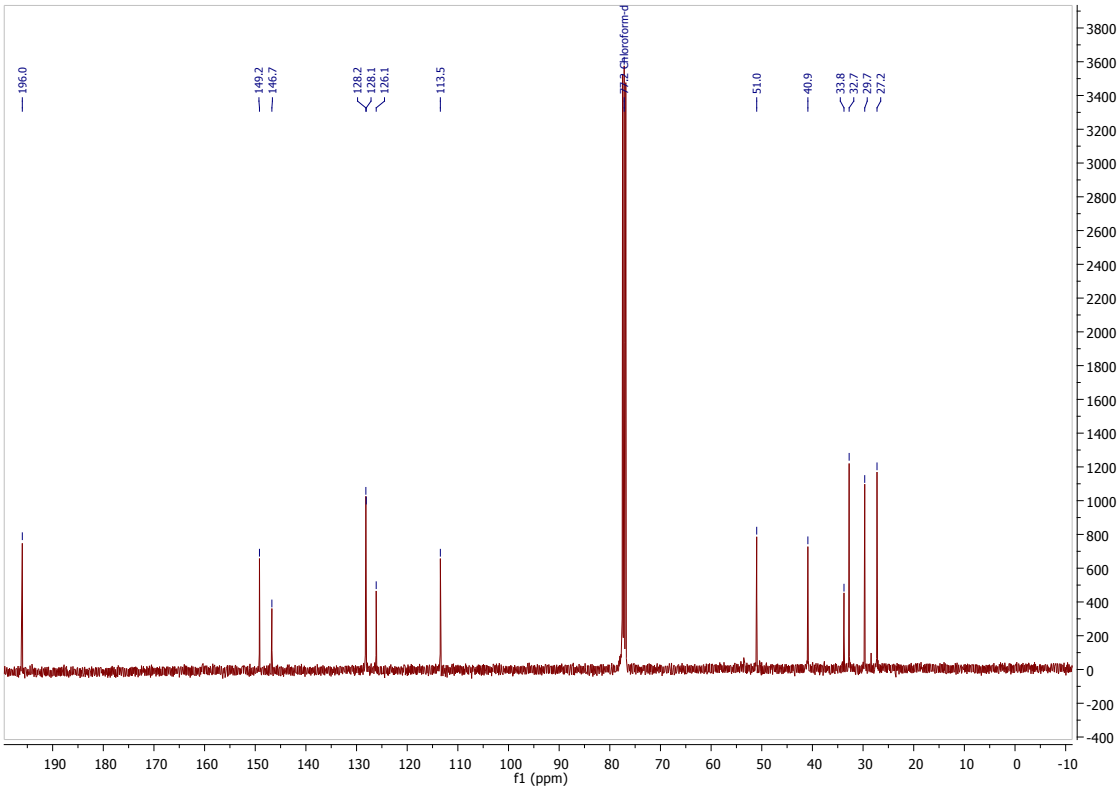
1H and 13C spectra for 9-(4-bromophenyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5f**).[7]



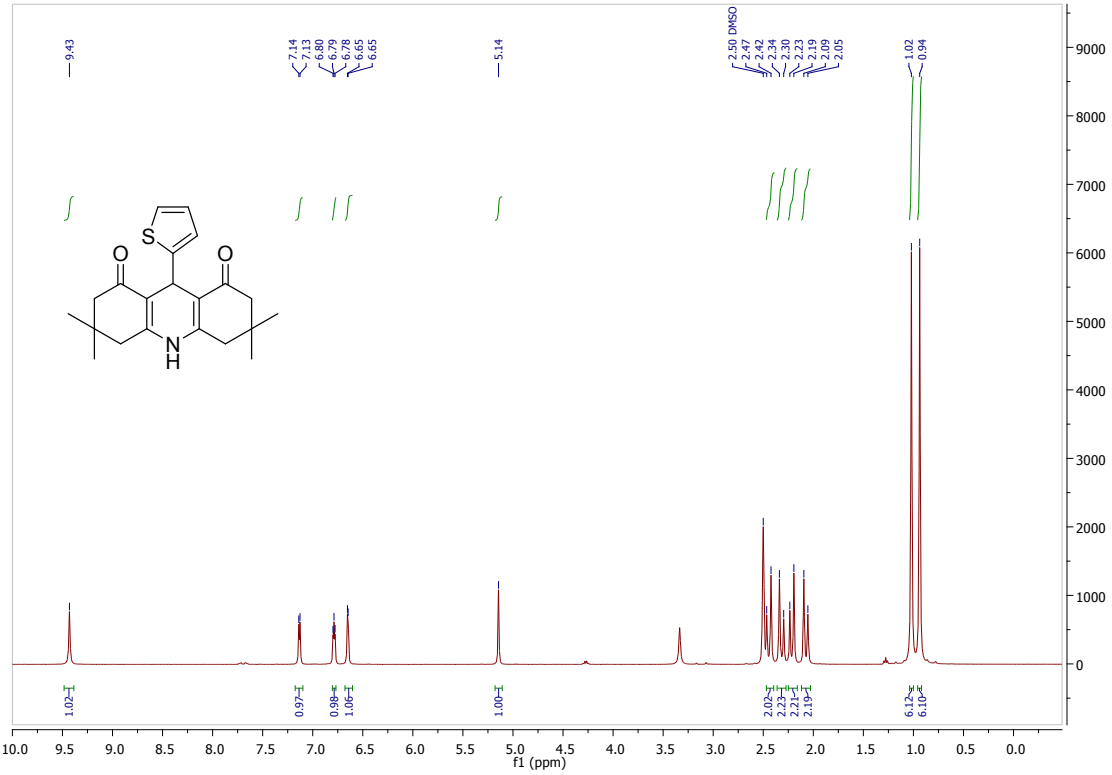


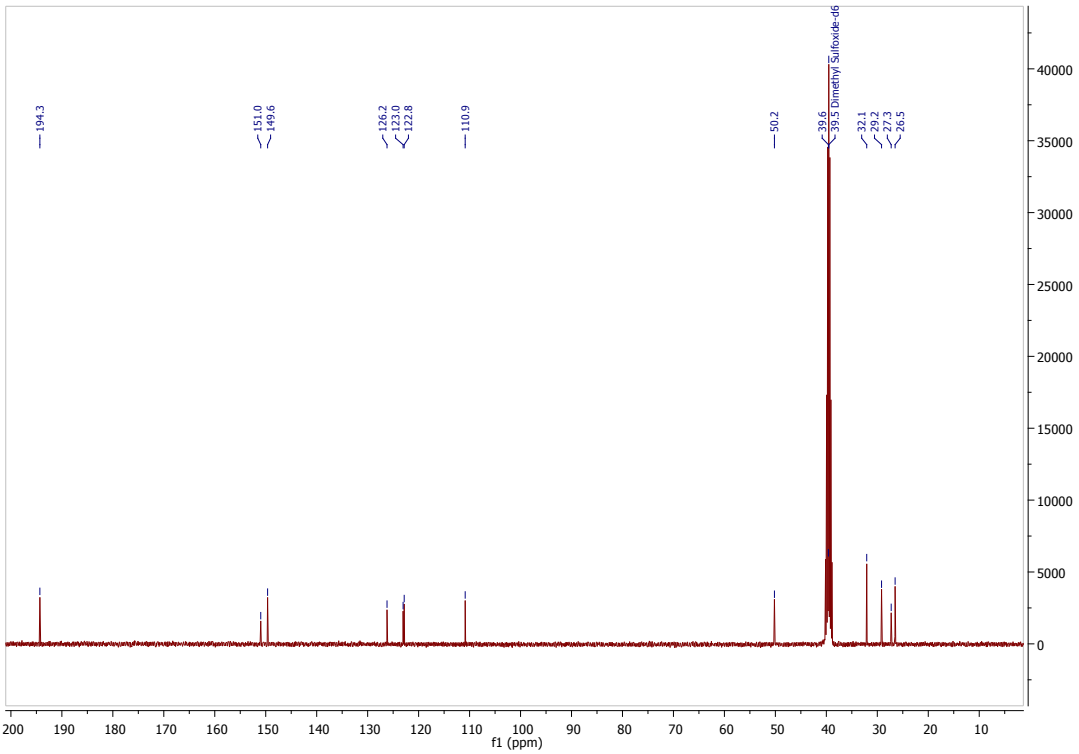
1H and 13C spectra for 3,3,6,6-tetramethyl-9-phenyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5g**).[7]



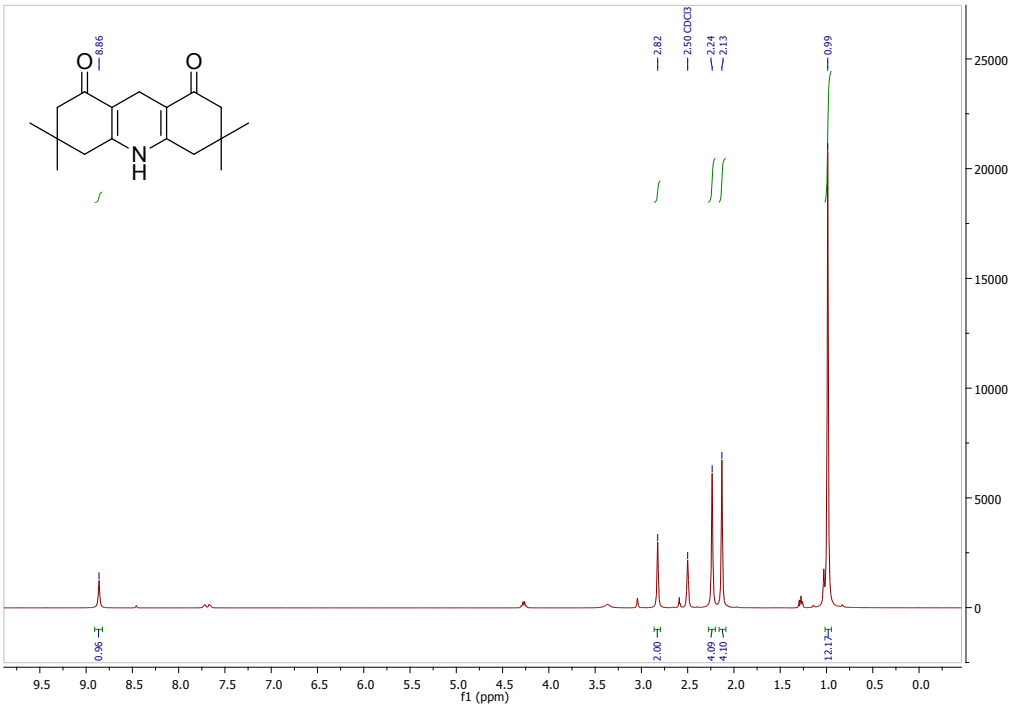


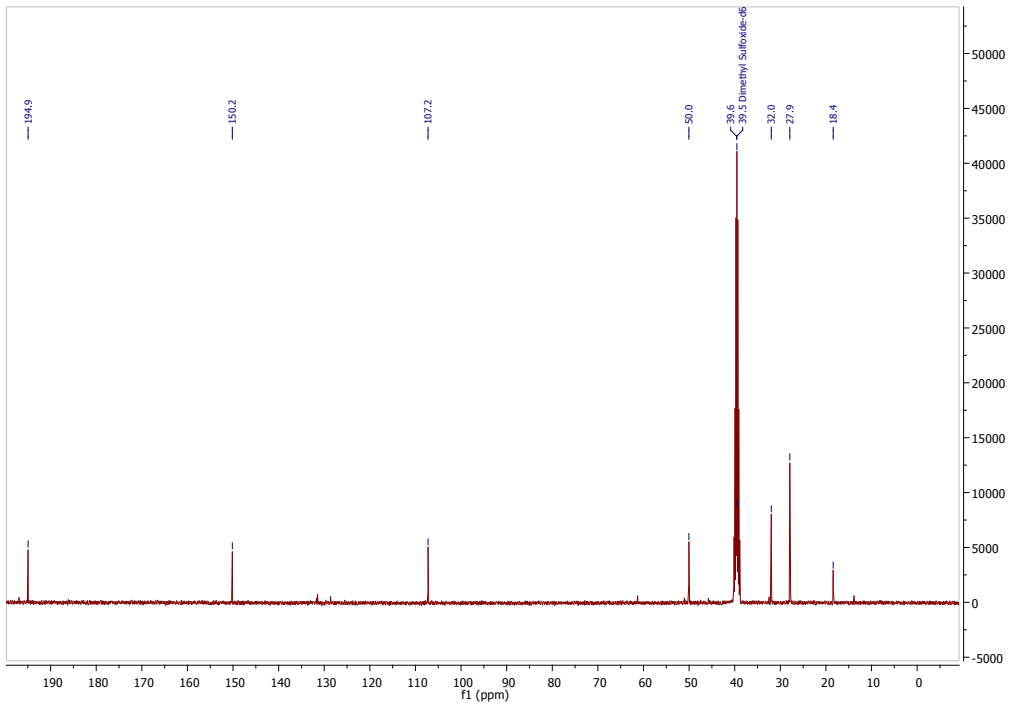
1H and 13C spectra for 3,3,6,6-tetramethyl-9-(thiophen-2-yl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5h**).[9]



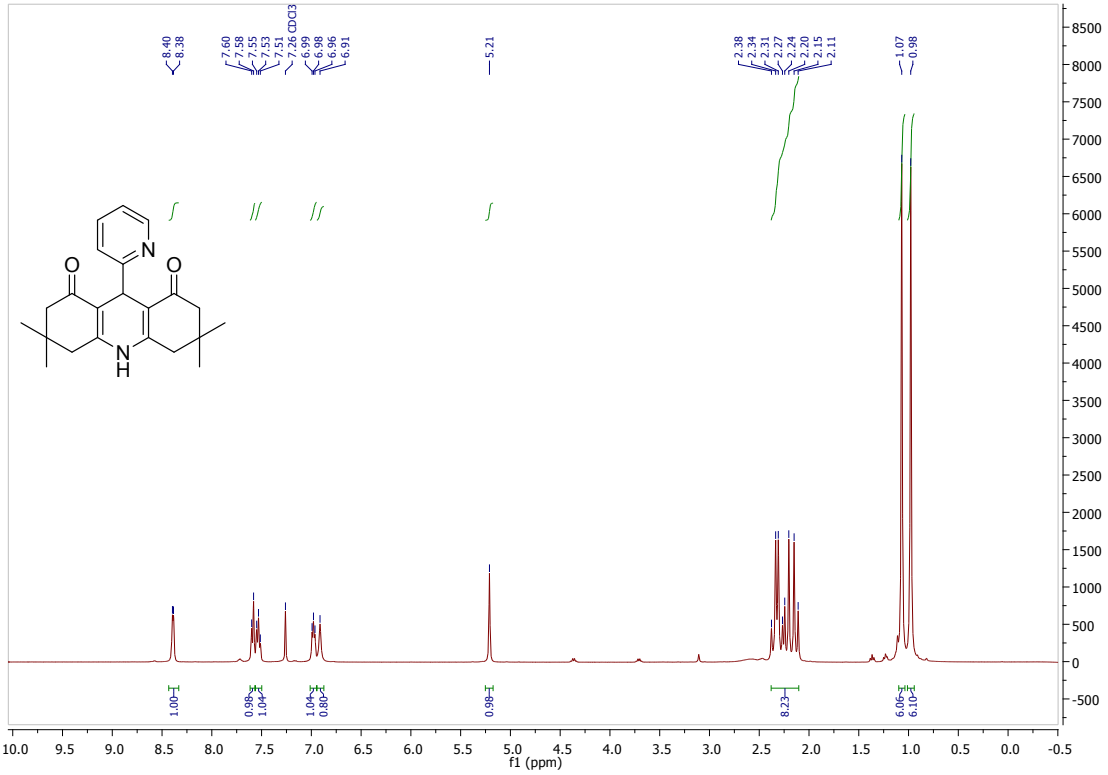


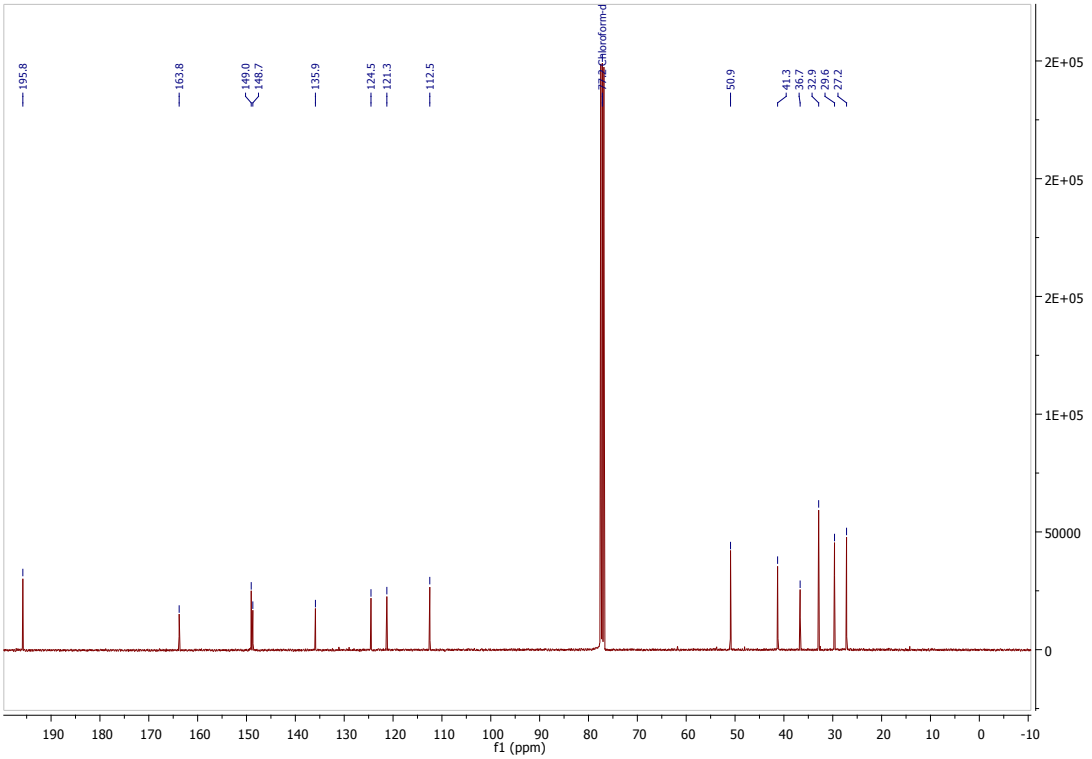
1H and 13C spectra for 3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5i**).[10]



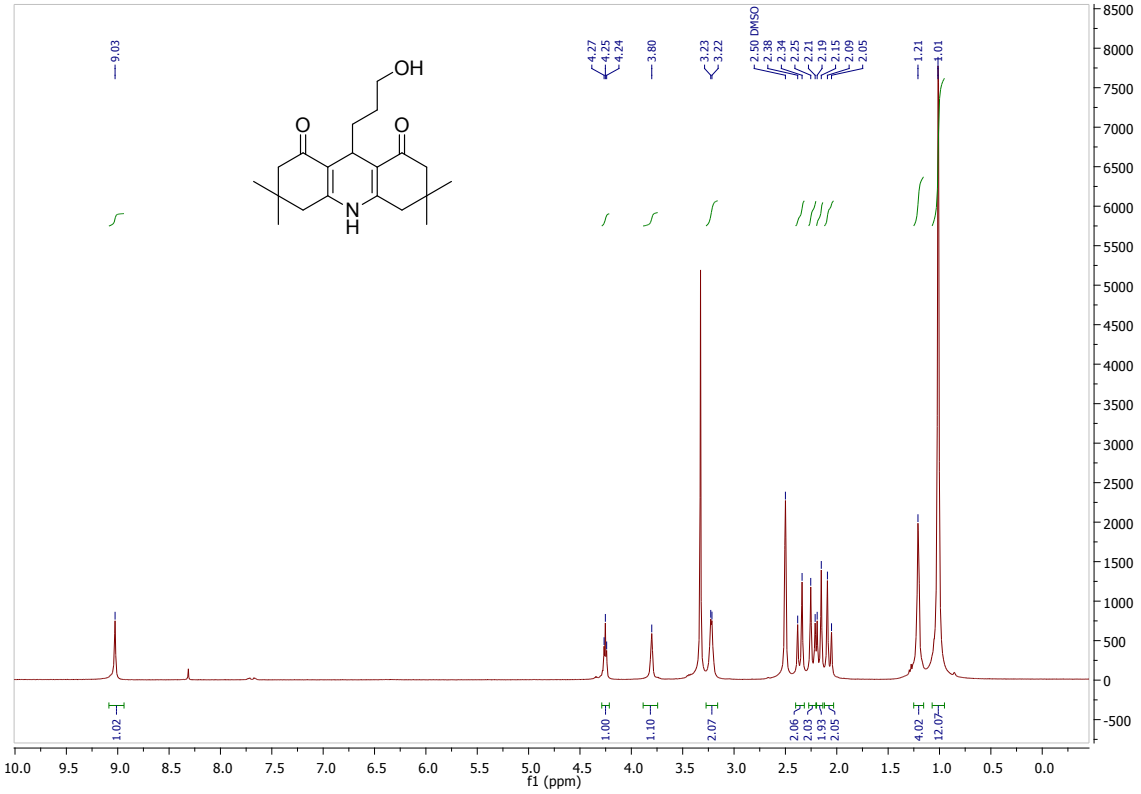


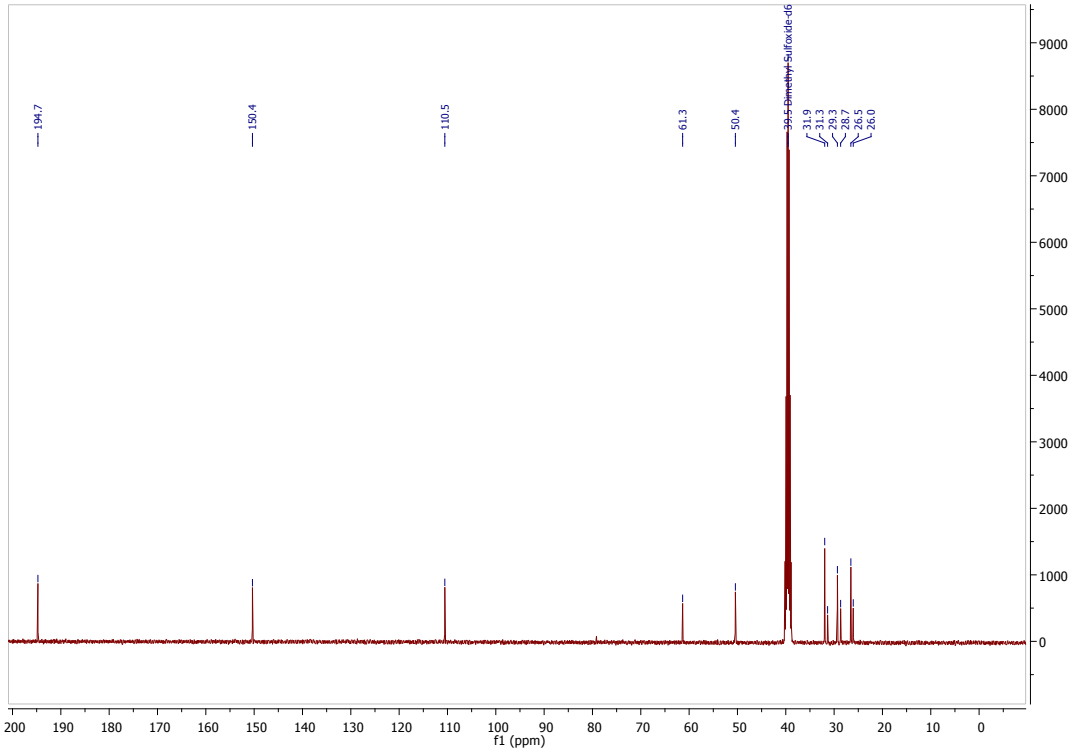
1H and 13C spectra for 3,3,6,6-tetramethyl-9-(pyridin-2-yl)-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5j**).[1]





1H and 13C spectra and organic elemental analysis for 9-(3-hydroxypropyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5k**).





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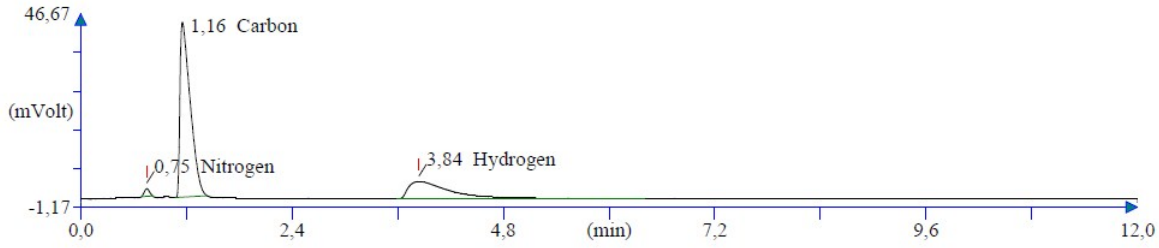
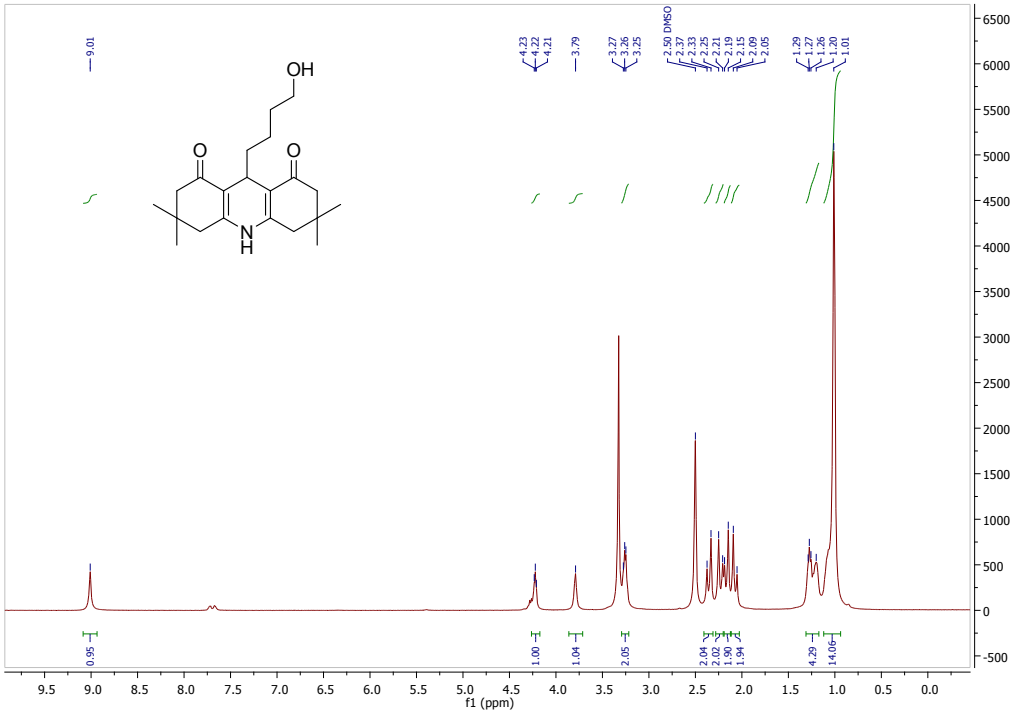
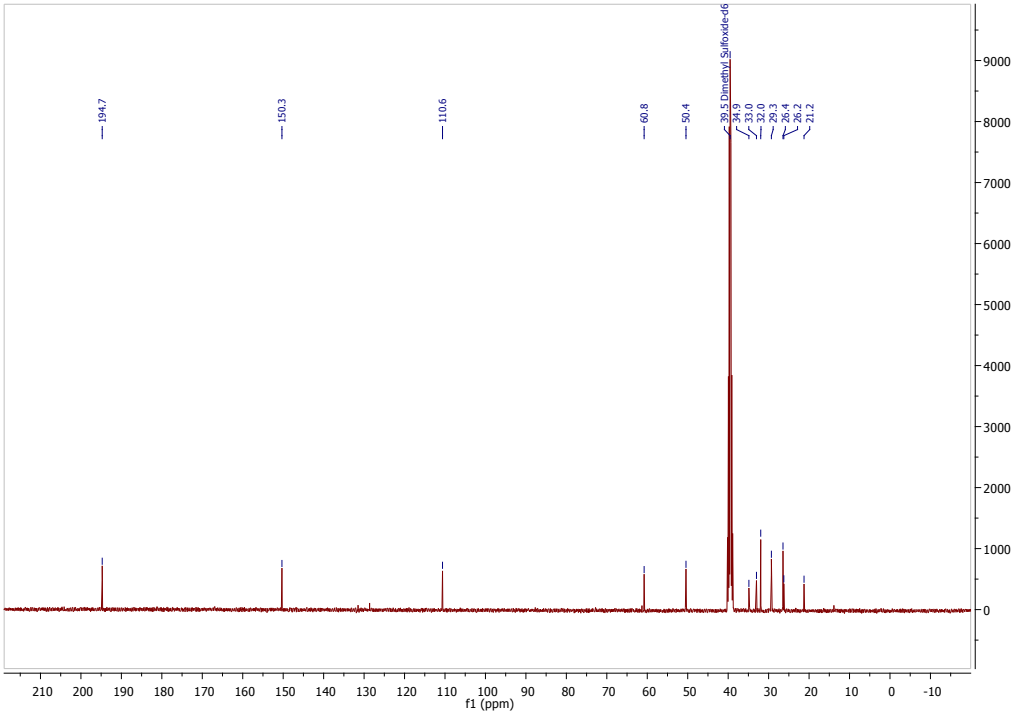
Element Name	Ret.Time	Area	BC	Area ratio	K factor
Nitrogen	4.1417	45 75921	mi	46.053710	.177283E+07
Carbon	72.6015	70 3496444	mi	1.000000	.464422E+07
Hydrogen	8.8400	231 1357251	mi	2.576122	.147901E+08
Totals	85.5832	4929616			



1H and 13C spectra and organic elemental analysis for 9-(4-hydroxybutyl)-3,3,6,6-tetramethyl-3,4,6,7,9,10-hexahydroacridine-1,8(2*H*,5*H*)-dione (**5l**).





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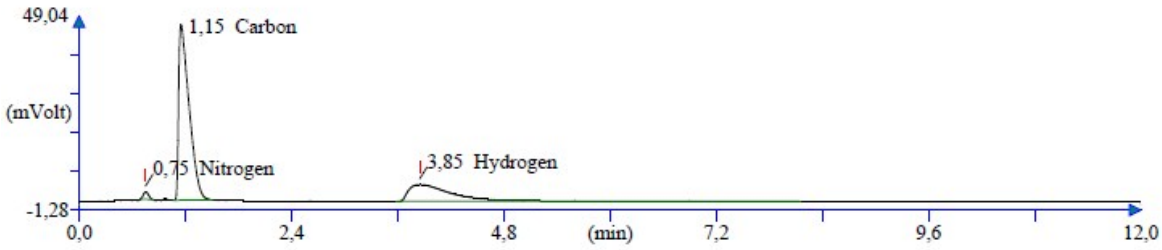
Element Name	Ret.Time		Area	BC	Area ratio	K factor
Nitrogen	3.9768	45	77269	mi	48.425910	.177283E+07
Carbon	73.3152	69	3741822	mi	1.000000	.464422E+07
Hydrogen	9.1084	231	1481815	mi	2.525161	.147901E+08
Totals	86.4003		5300906			



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