

A Combined Synthetic and Computational Study of Novel Binaphthyl and Biphenyl α - and β -Amino Acids and Esters: Organocatalysis of Asymmetric Diels Alder Reactions

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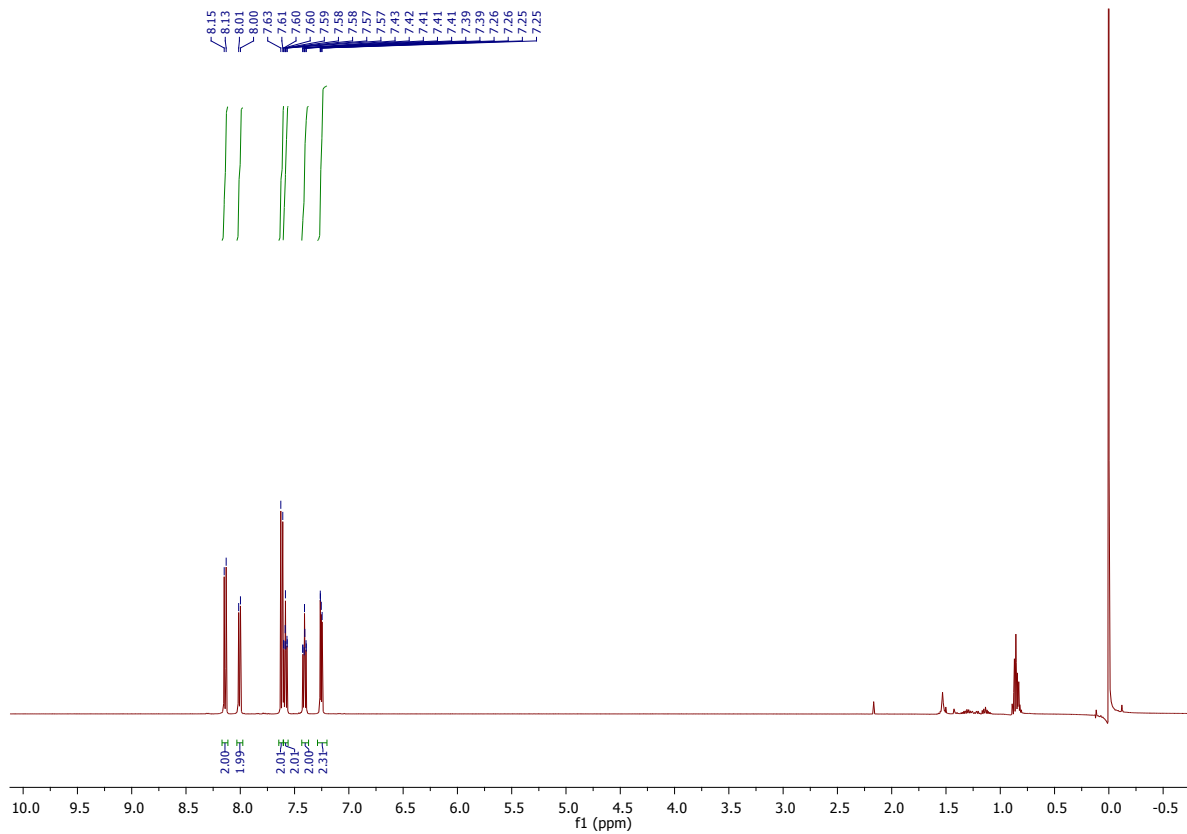
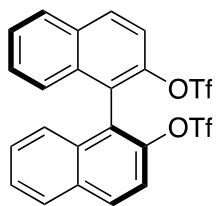
Supporting information

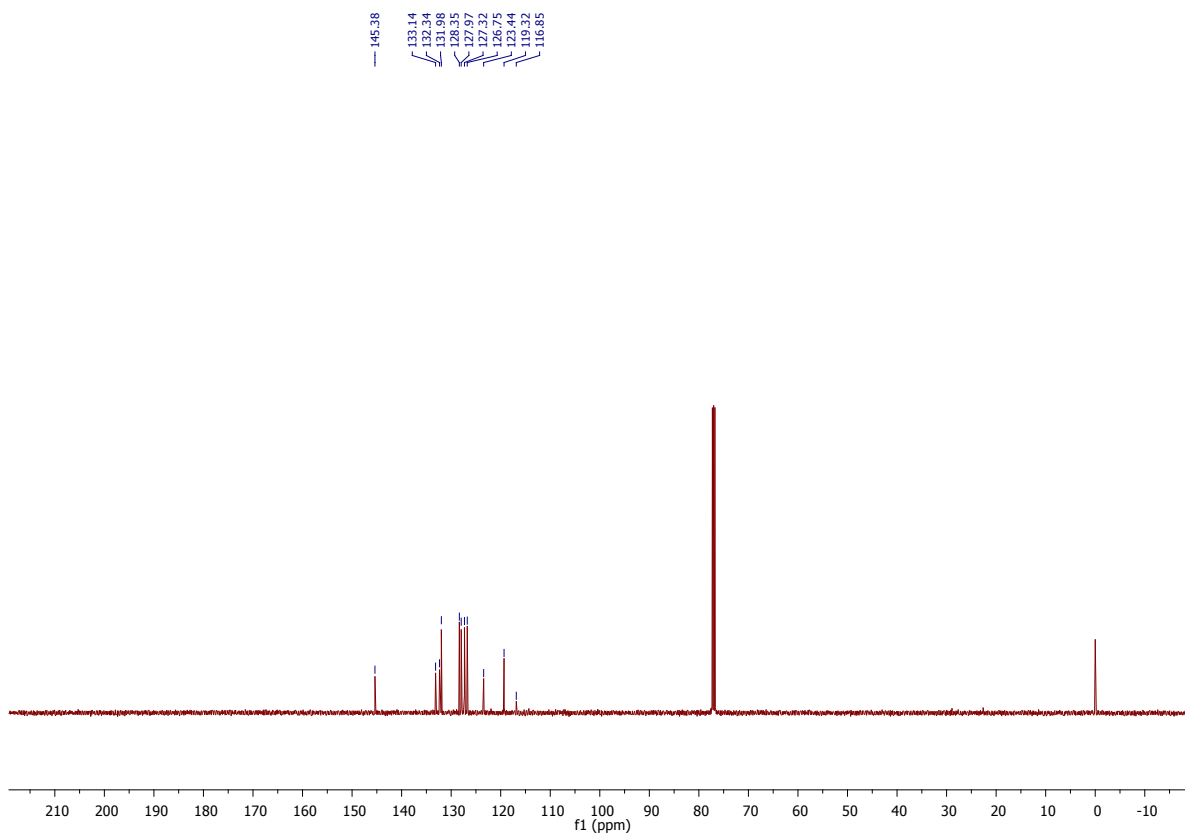
S2	General Experimental Detail
S3-60	NMR Spectra
S61-97	HPLC Traces
S98-122	Computational Supplementary Information

General Experimental Detail

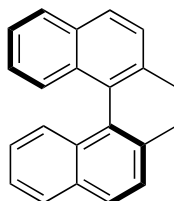
Melting points were recorded using a Büchi B-545 Melting Point apparatus. Optical rotations were obtained using a Bellingham and Stanley Ltd ADP440 polarimeter and the solvents used for these measurements were of HPLC-grade quality. IR spectra were recorded on a Perkin-Elmer 100 FT-IR spectrophotometer and samples were used as thin film DCM solutions on KBr plates. NMR spectra were recorded on a Bruker 500 MHz Spectrometer. Chemical shifts were recorded in parts per million (ppm), *J* values are given in Hertz (Hz) and are referenced against tetramethylsilane or the residual deuterated solvents peak. High-resolution mass spectra were obtained from the EPSRC Mass Spectrometry Unit at the University of Swansea. Enantiomeric excesses were determined by chiral high performance liquid chromatography using a Hitachi Elite LaChrom HPLC system using an L-2200 autosampler, L-2130 pump and L-2400 UV detector. All HPLC samples were run against racemate as a standard and using a hexane-isopropanol mixture. Conditions varied and are provided in detail below. Unless otherwise stated, all starting materials were sourced from commercial suppliers and were used without any purification. Reactions which required the use of anhydrous solvents were, in the case of THF and Et₂O, dried and distilled over sodium and benzophenone. Toluene, DCM and CH₃CN were distilled over CaH₂ and DMF was distilled over MgSO₄. Needles and glassware were oven-dried and allowed to cool under a positive pressure of nitrogen gas prior to use. Light petroleum ether was distilled at 40-60 °C to remove impurities. Dicyclopentadiene was cracked on the day of use to distil cyclopentadiene.

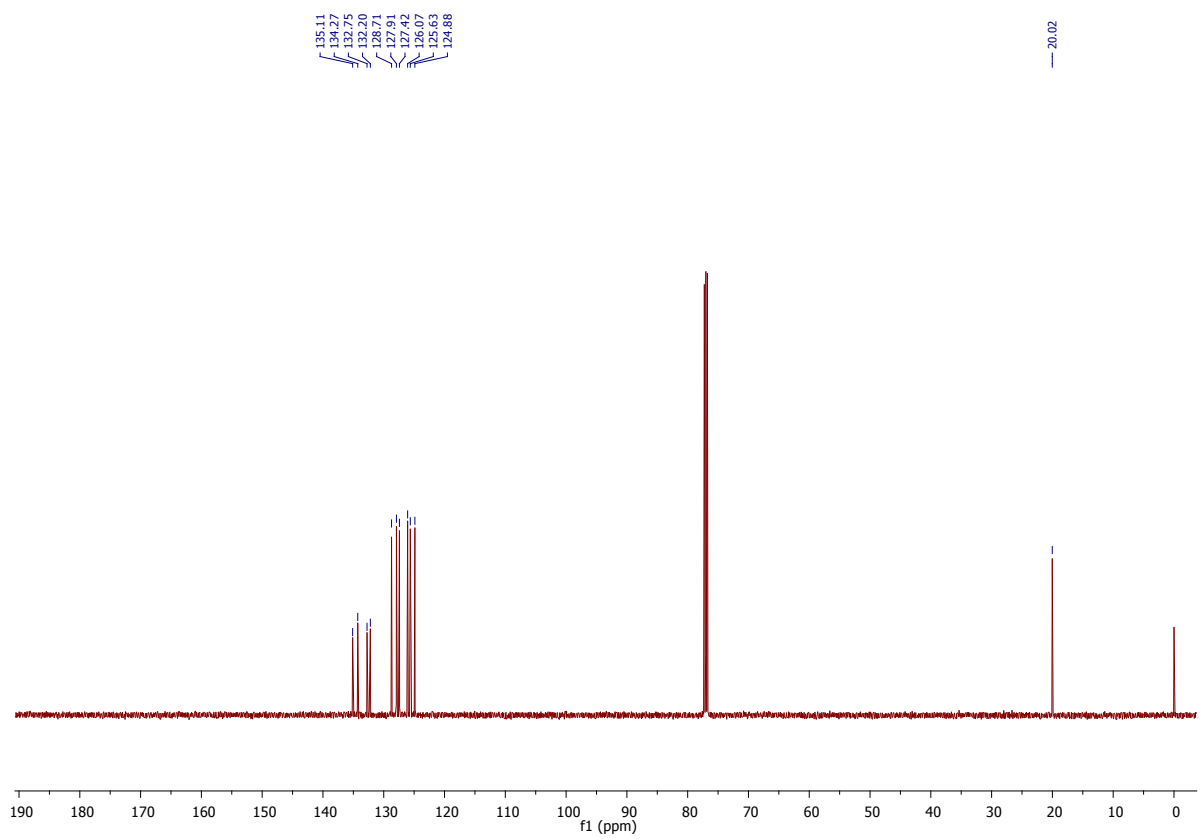
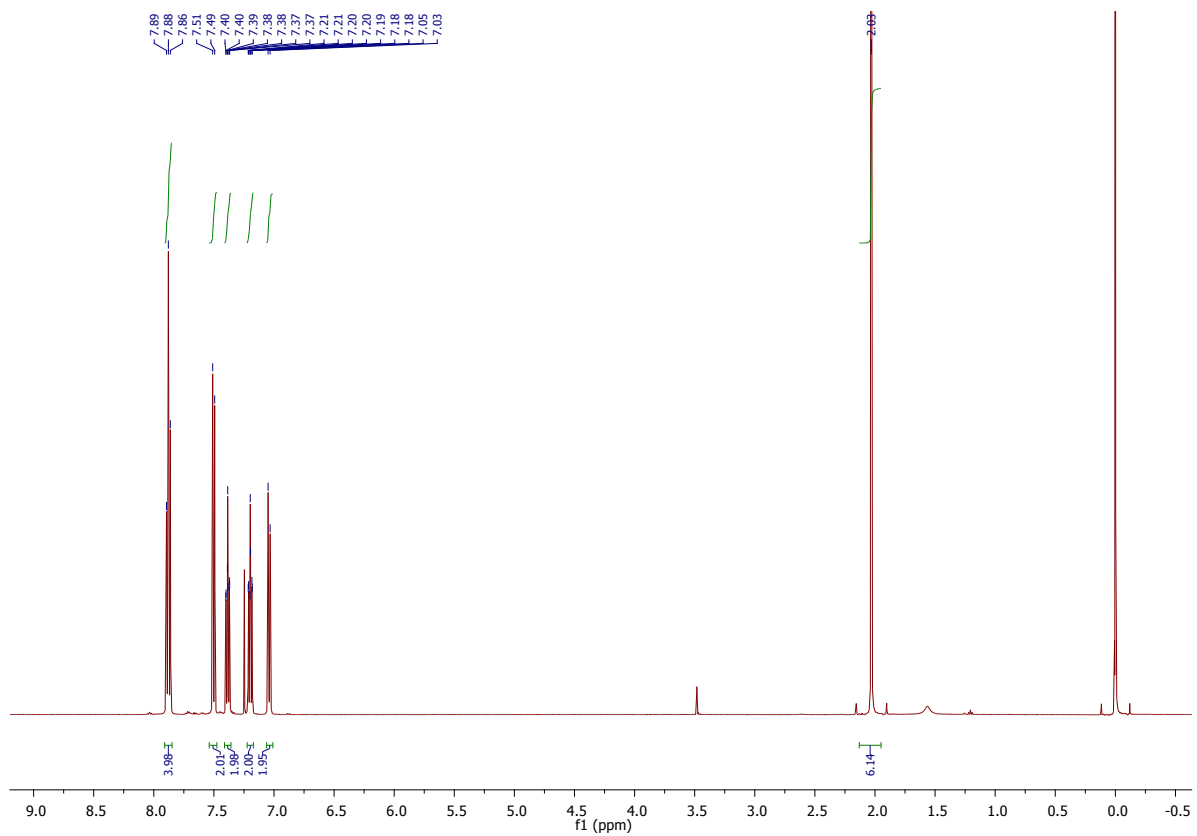
(S)-(+)-[1,1']-Binaphthalene-2,2'-diol bis-trifluoromethanesulfonate



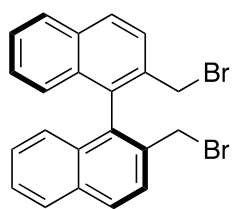


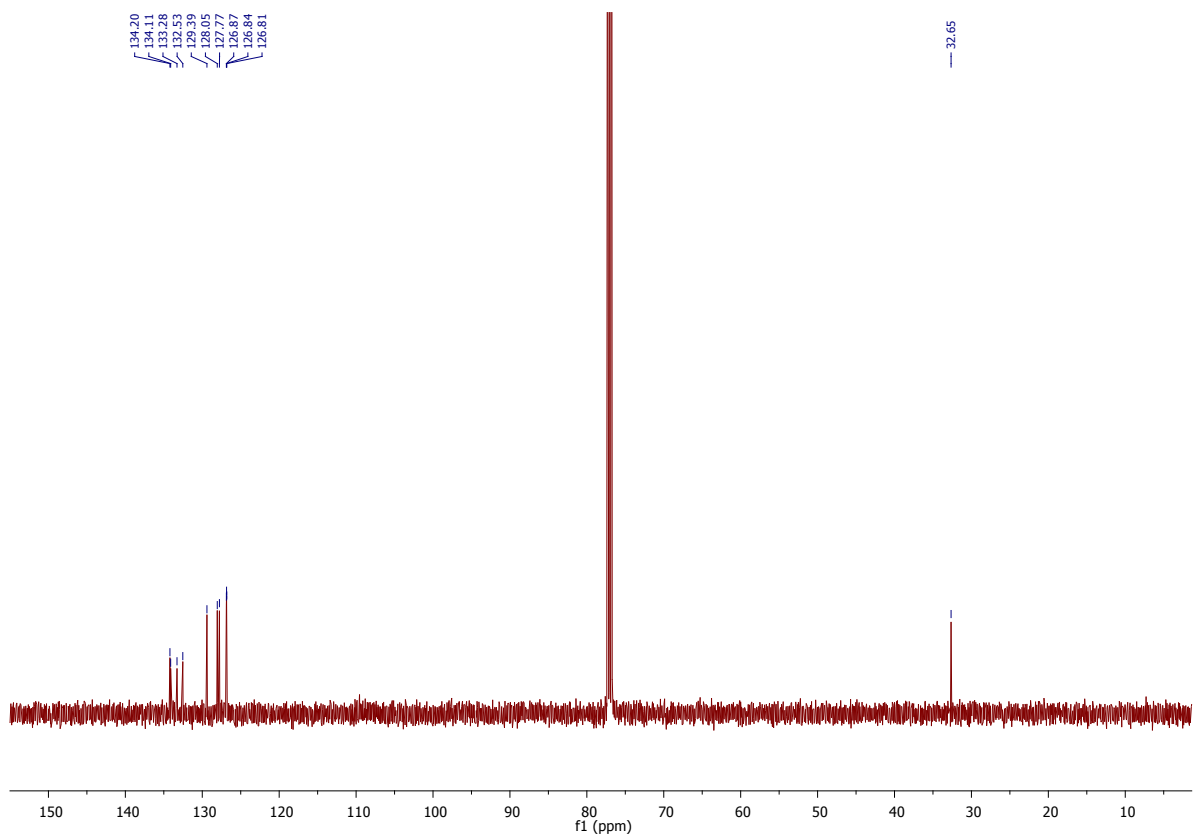
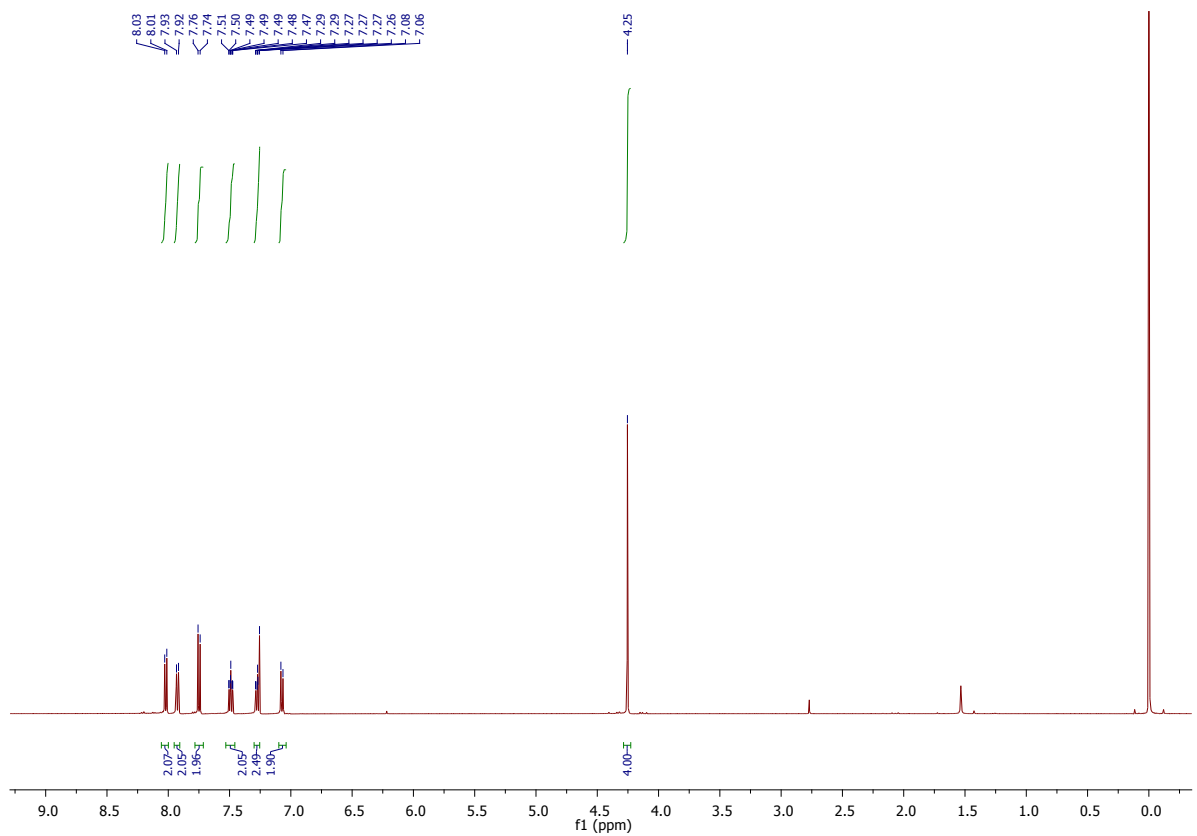
(S)-(+)-2,2'-Dimethyl-[1,1']binaphthalene



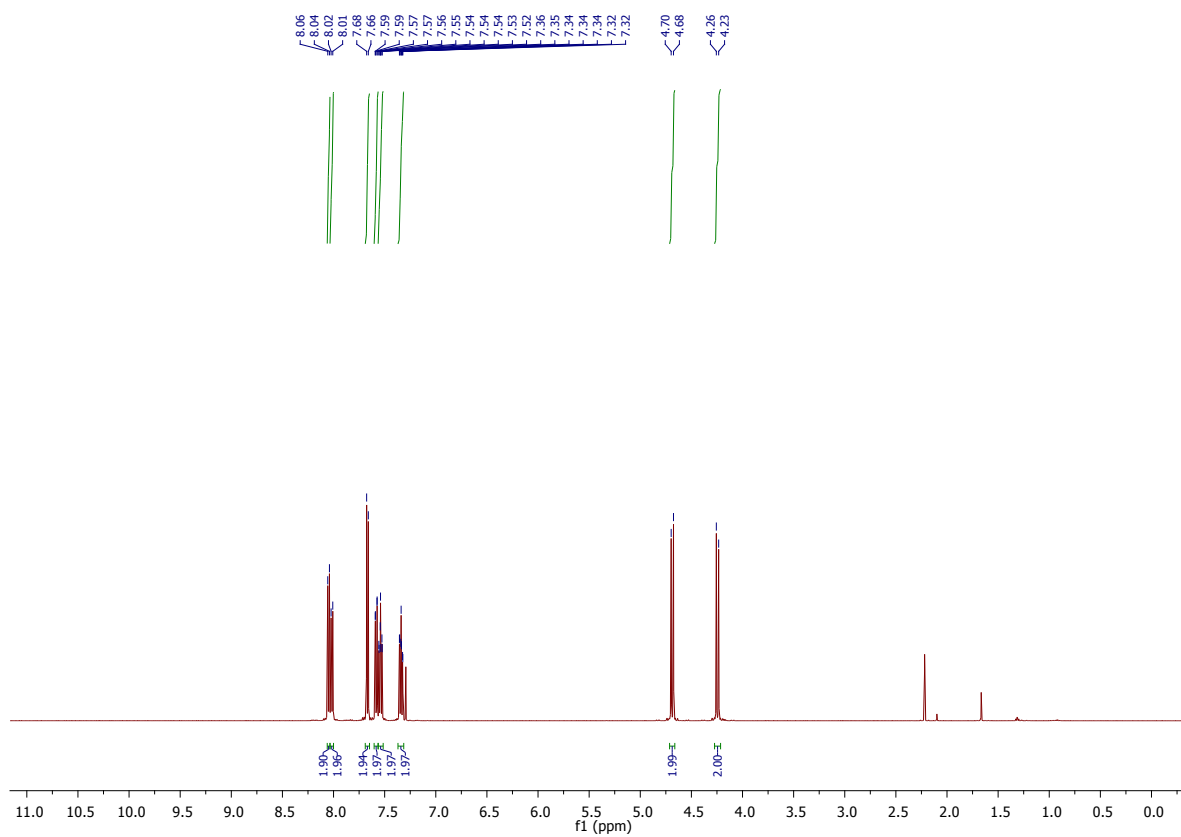
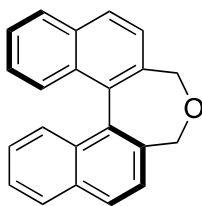


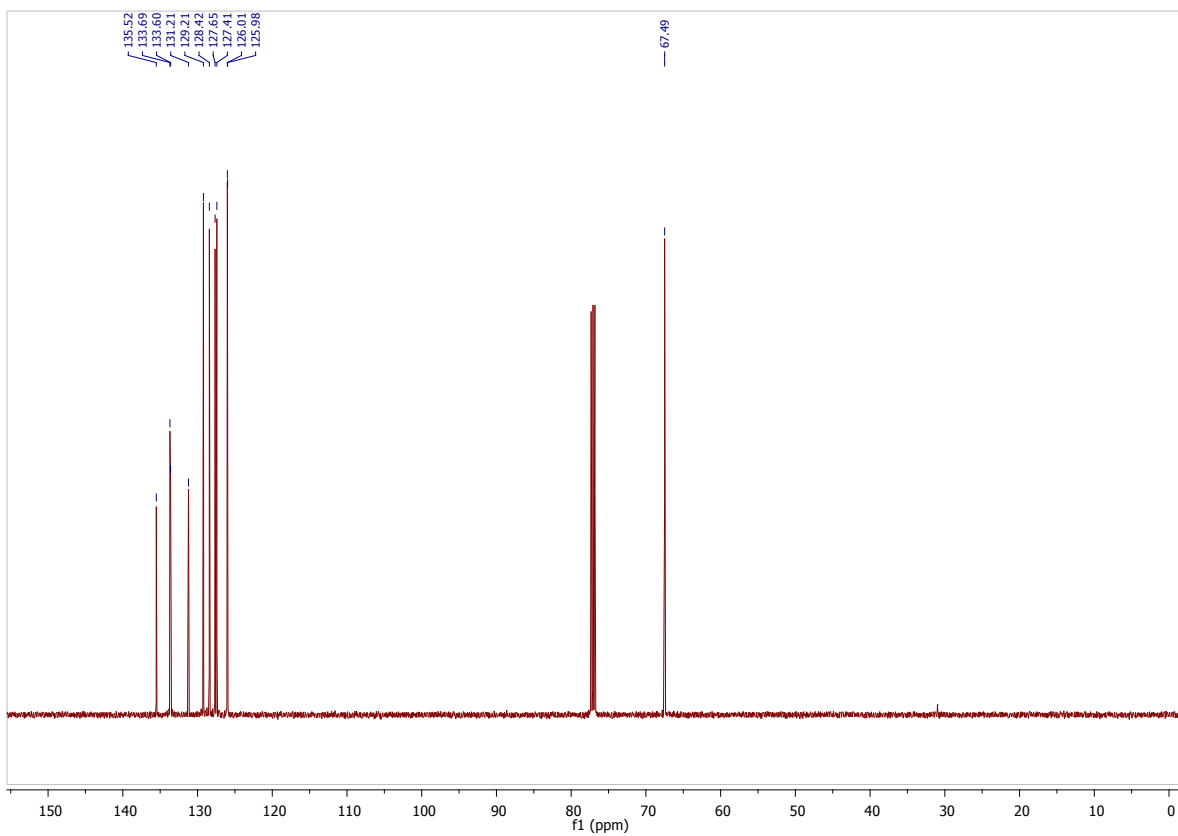
(S)-2,2'-Bis-bromomethyl-[1,1']binaphthalene (-)-7



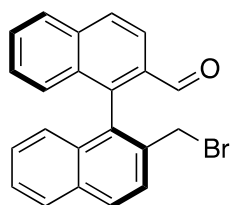


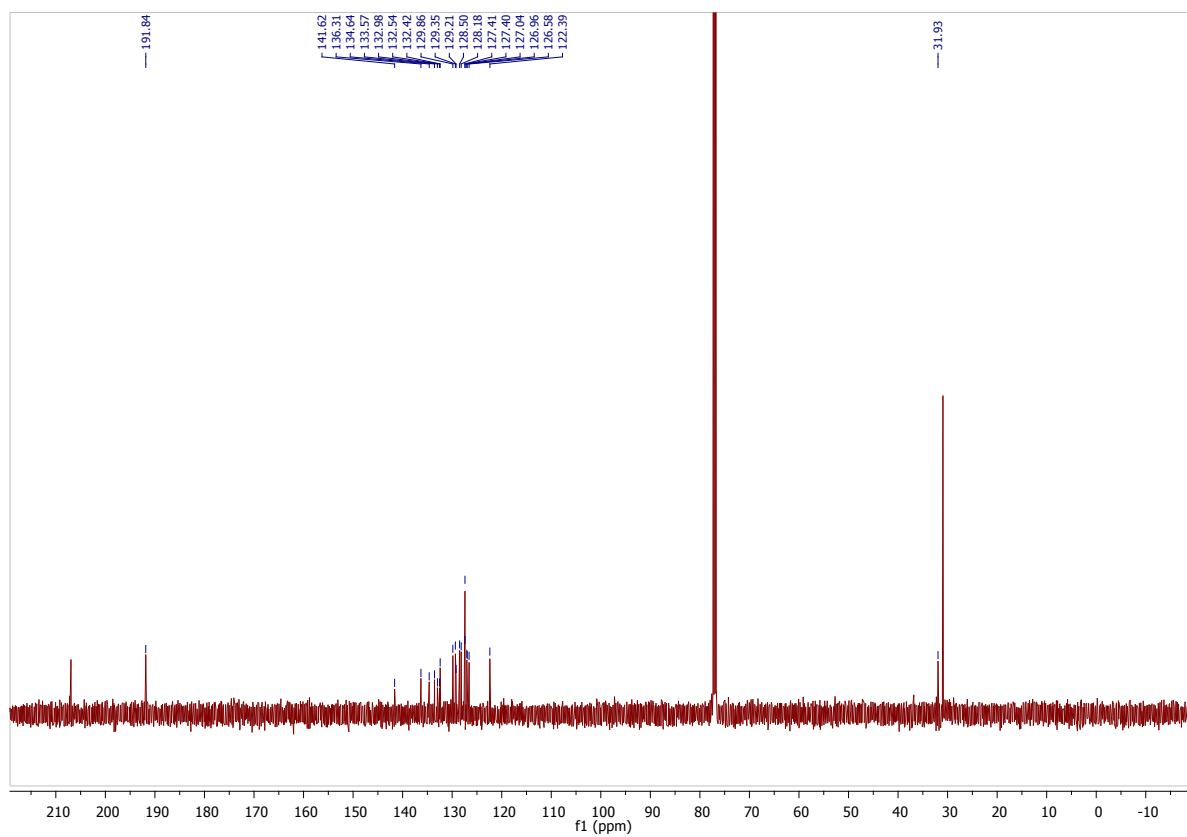
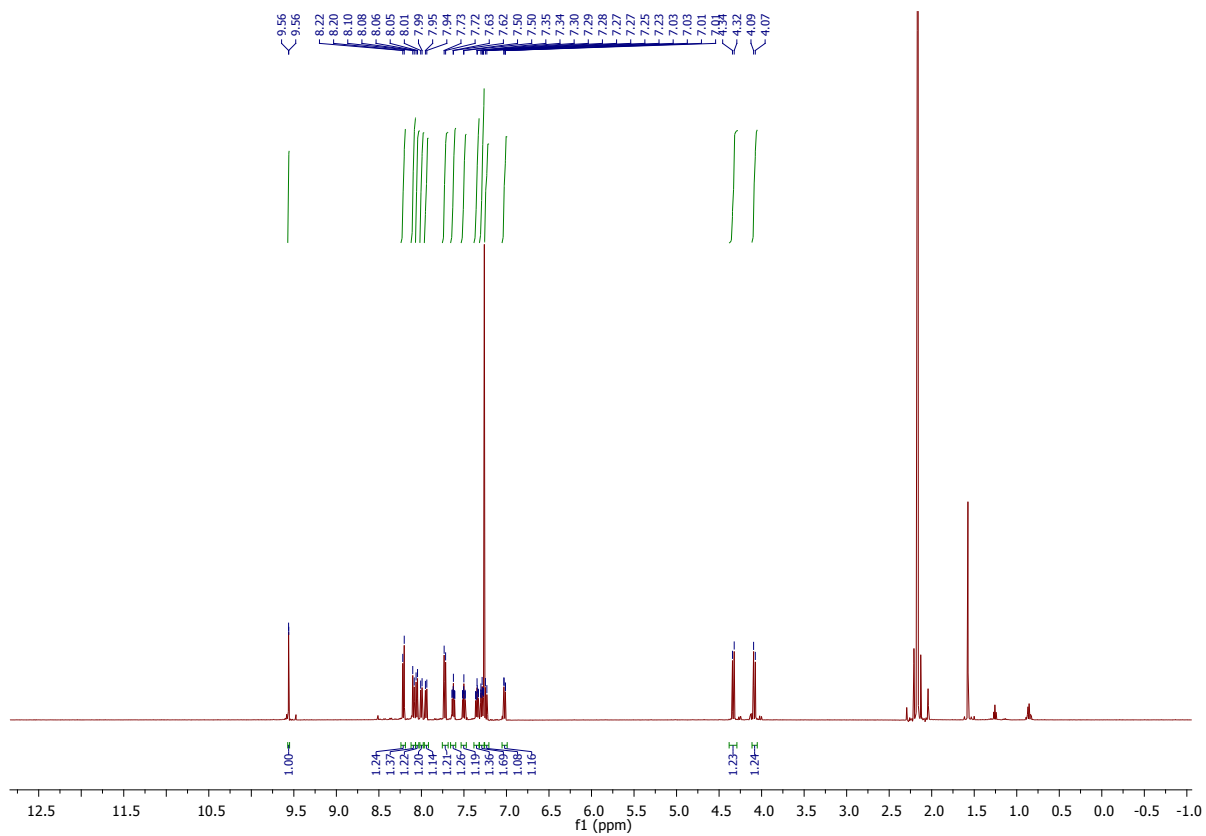
(S)-3,5-Dihydrodinaphtho[2,1-c:1',2'-e]oxepine (+)-9



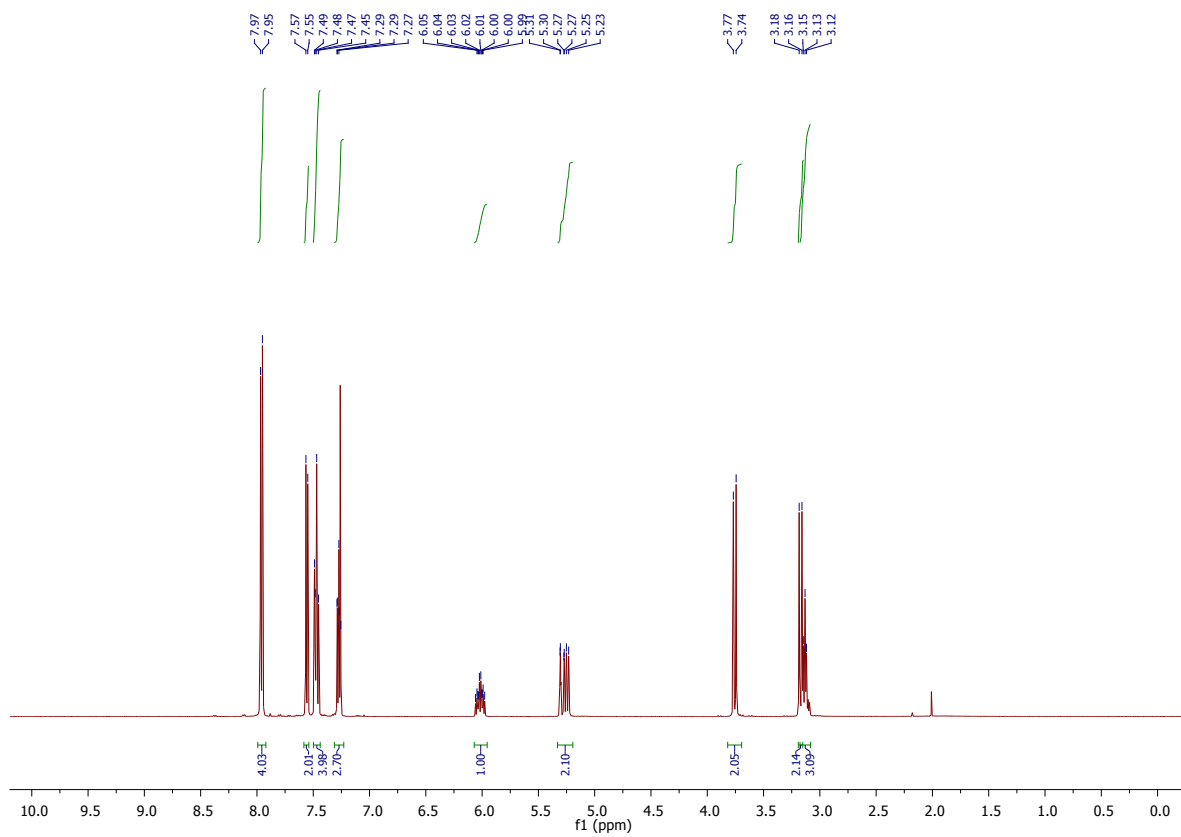
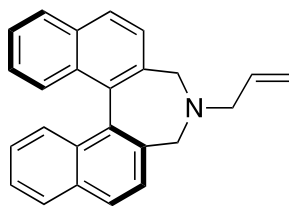


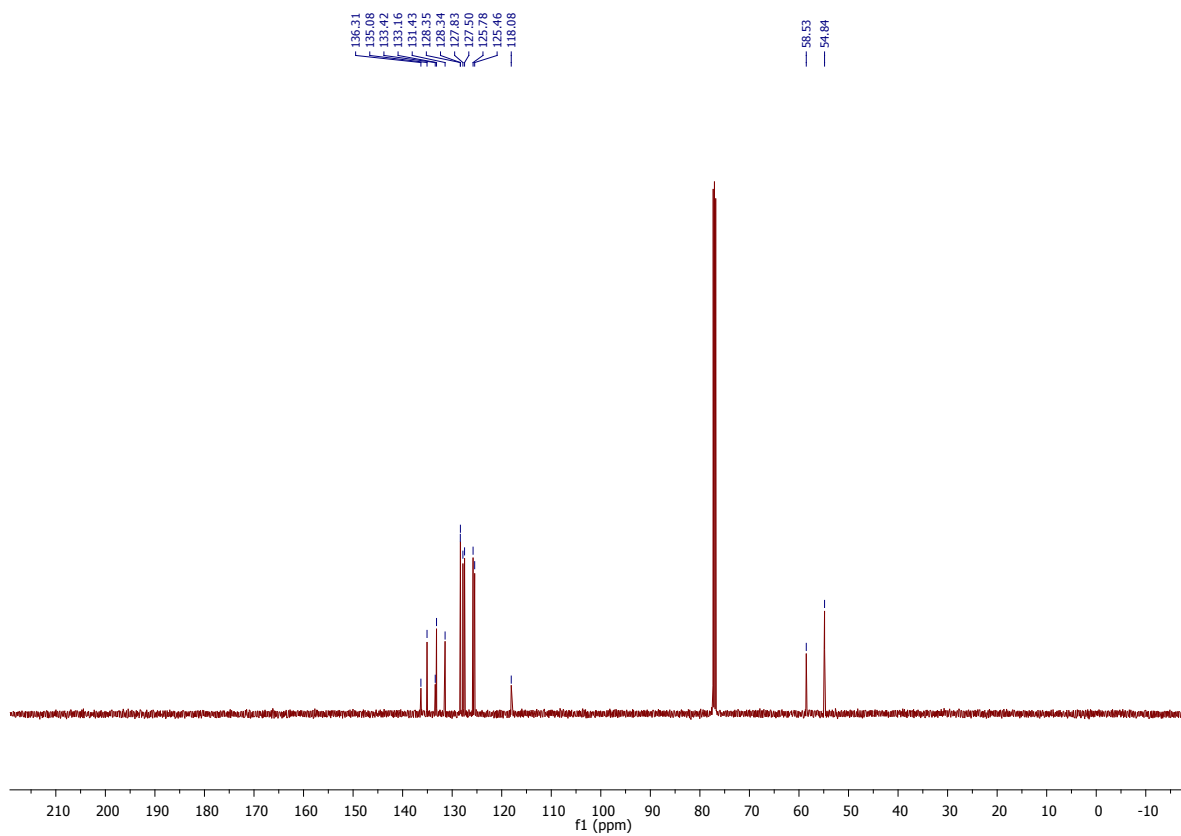
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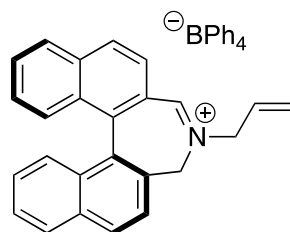


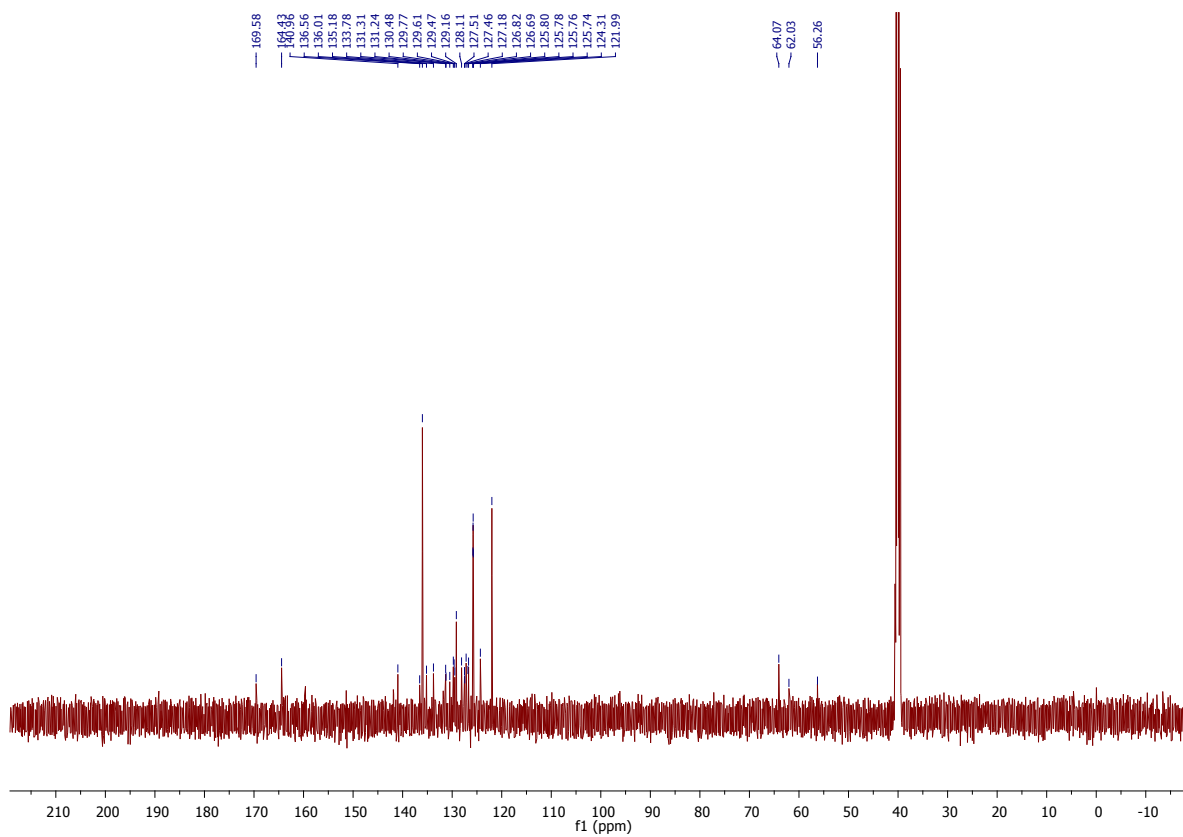
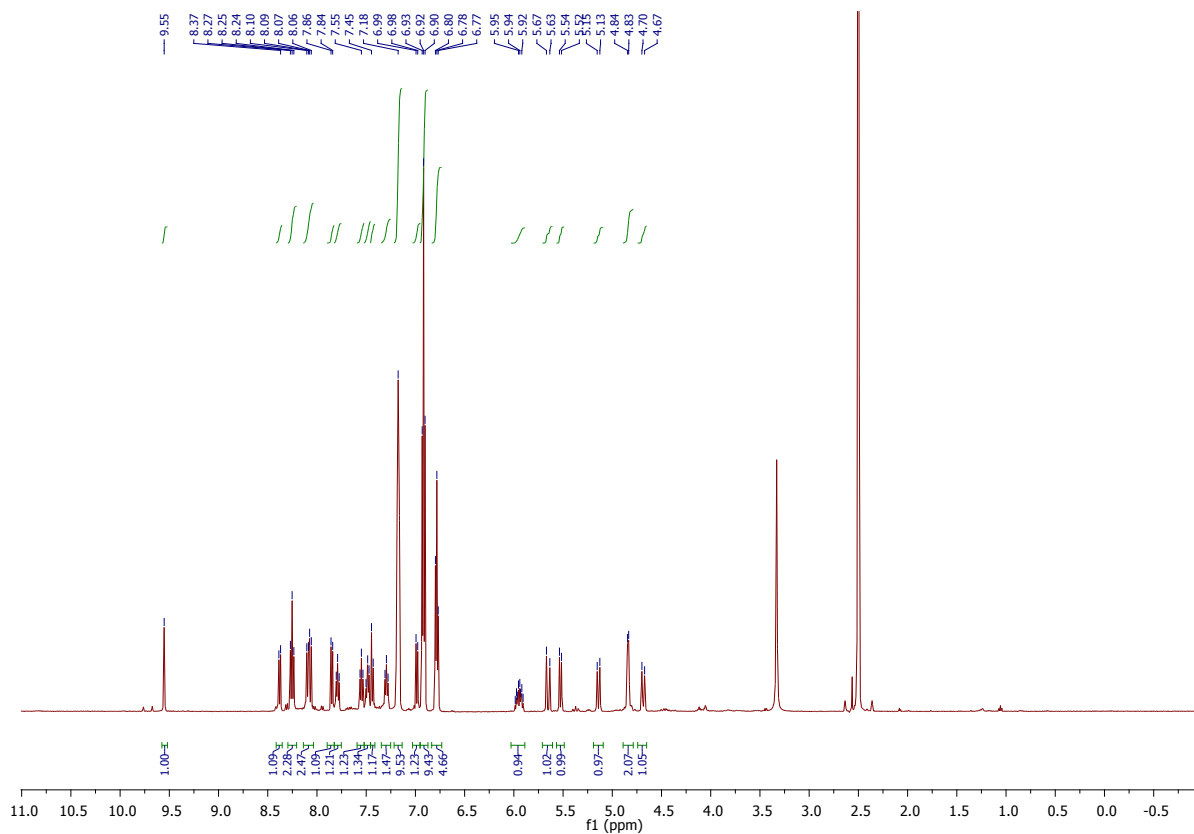
(S)-Allyl-4,5-dihydro-3H-4-aza-cyclohepta[2,1-a;3,4-a']dinaphthalene (+)-6



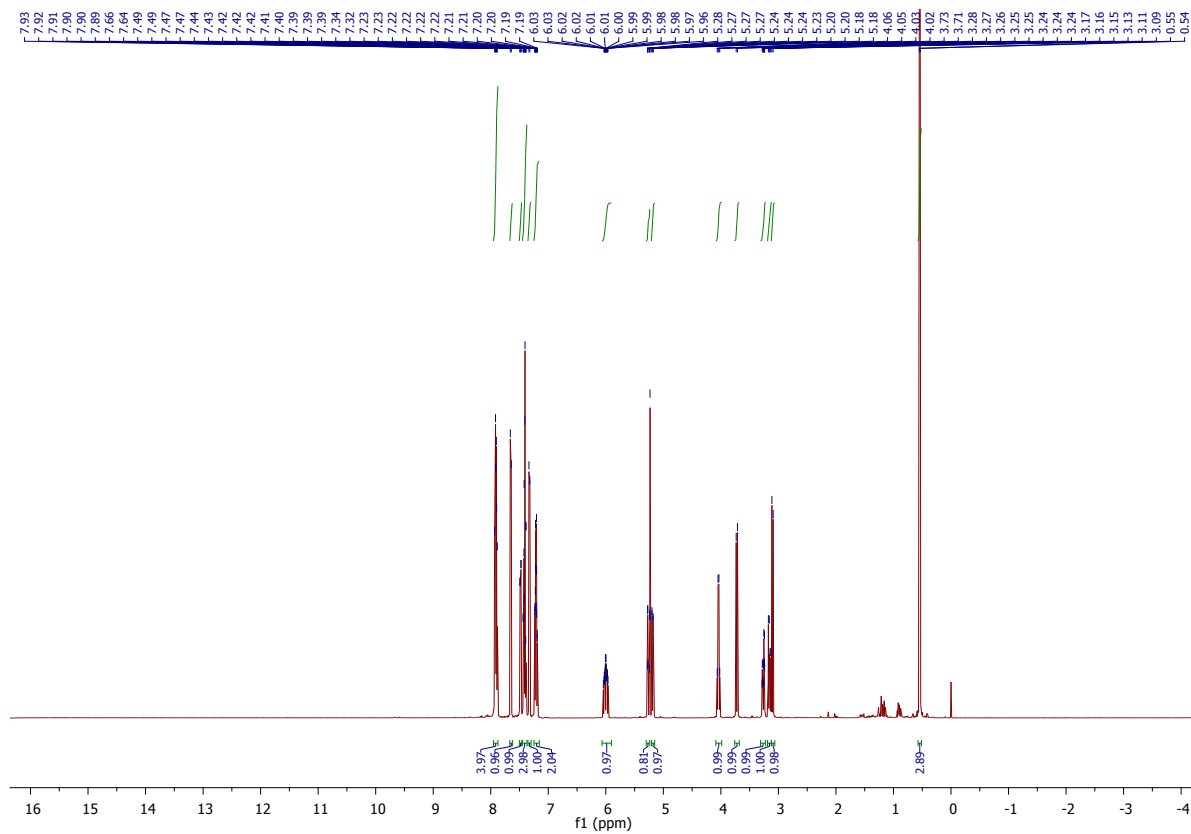
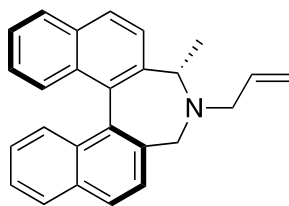


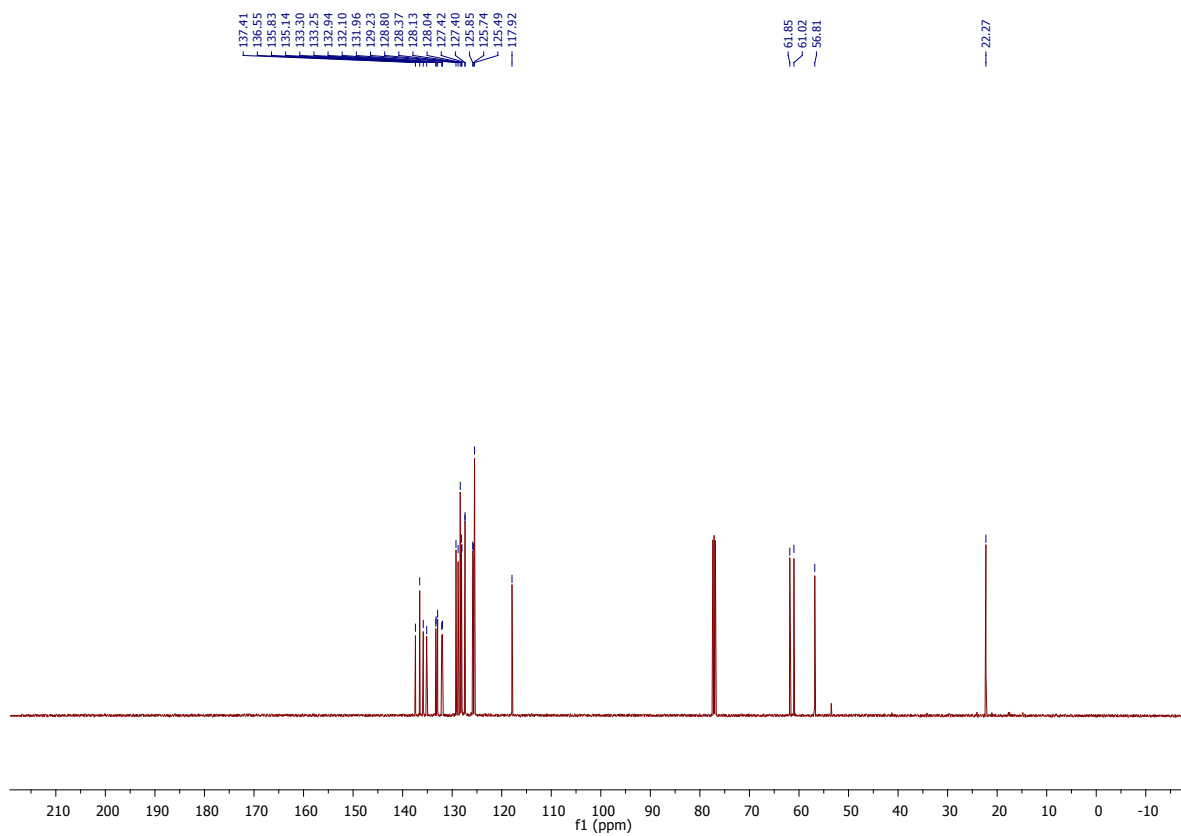
(S)-4-Allyl-3H-dinaphtho[2,1-c:1',2'-e]azepin-4-ium tetraphenylborate (+)-8



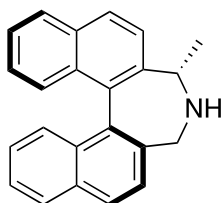


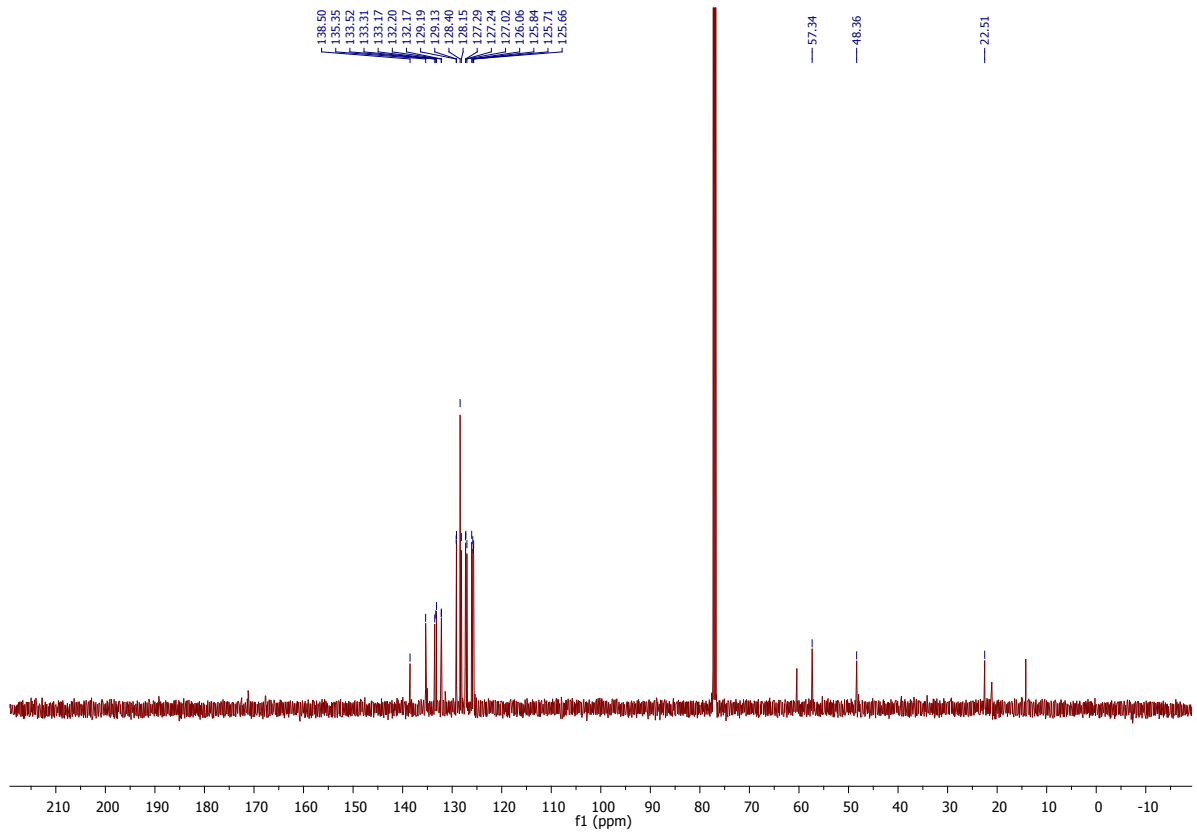
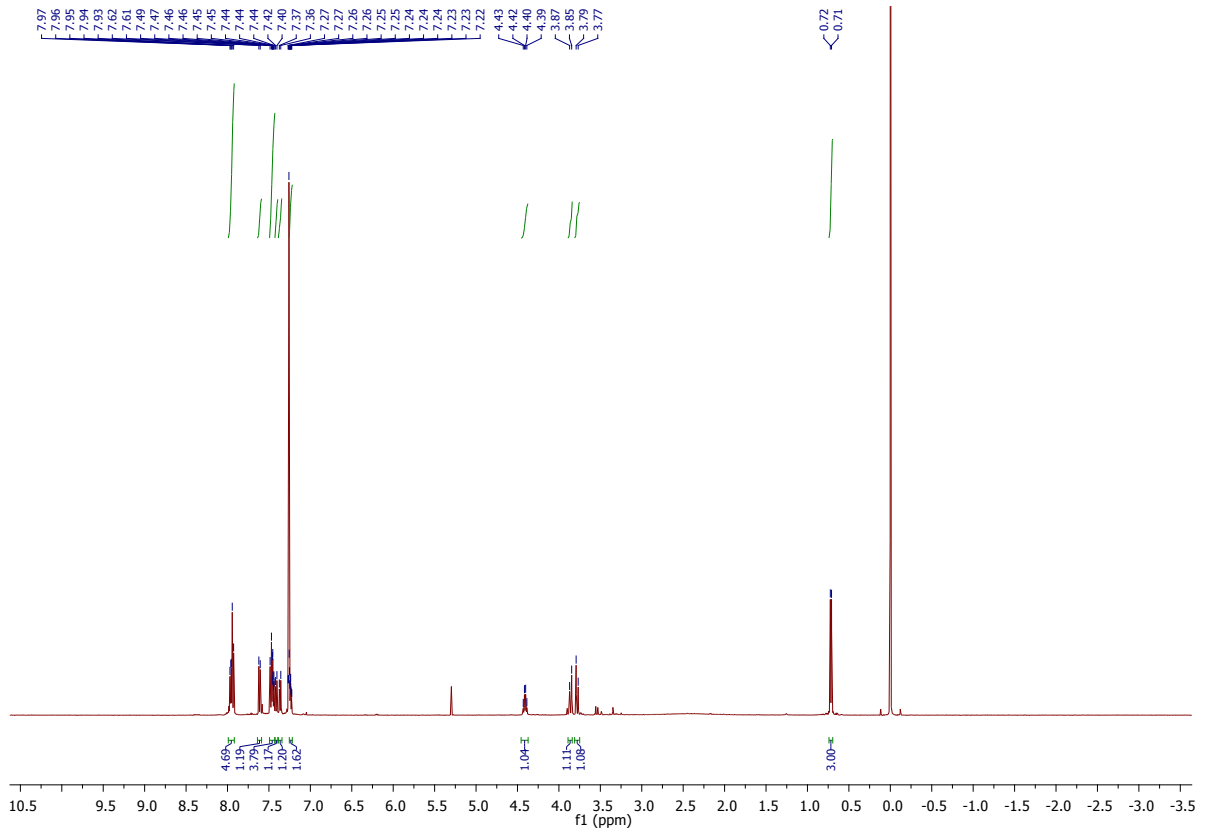
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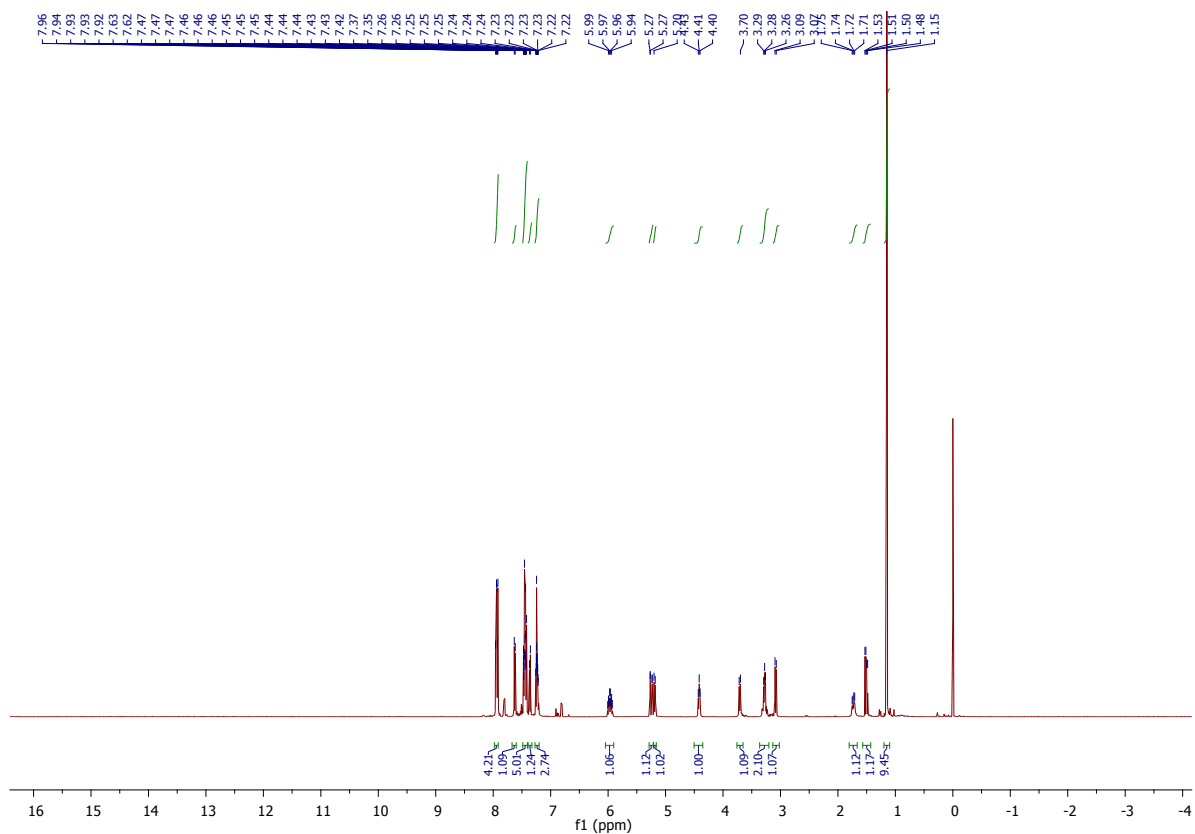
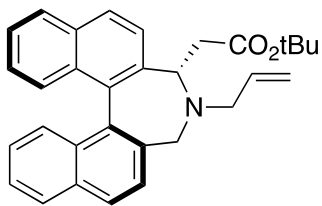


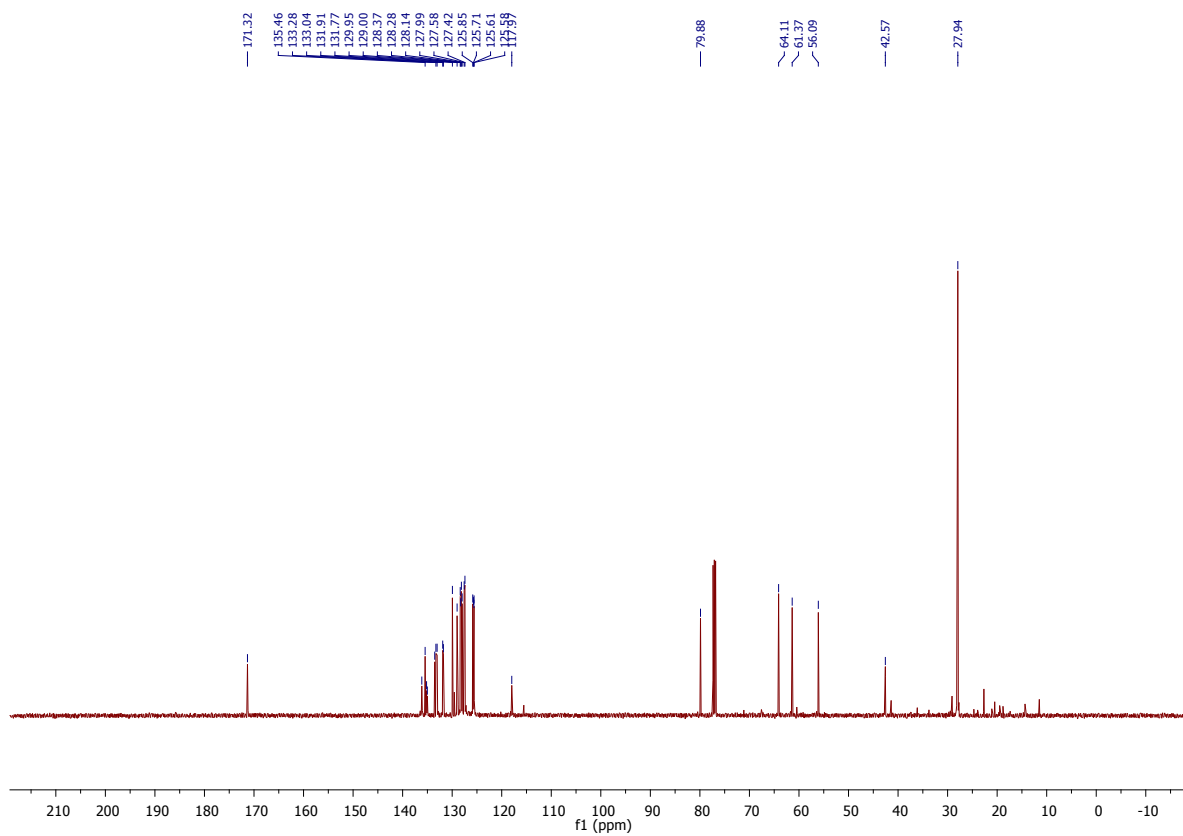
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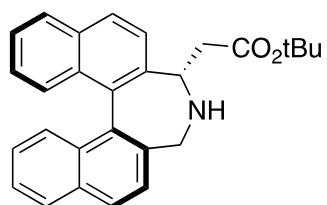


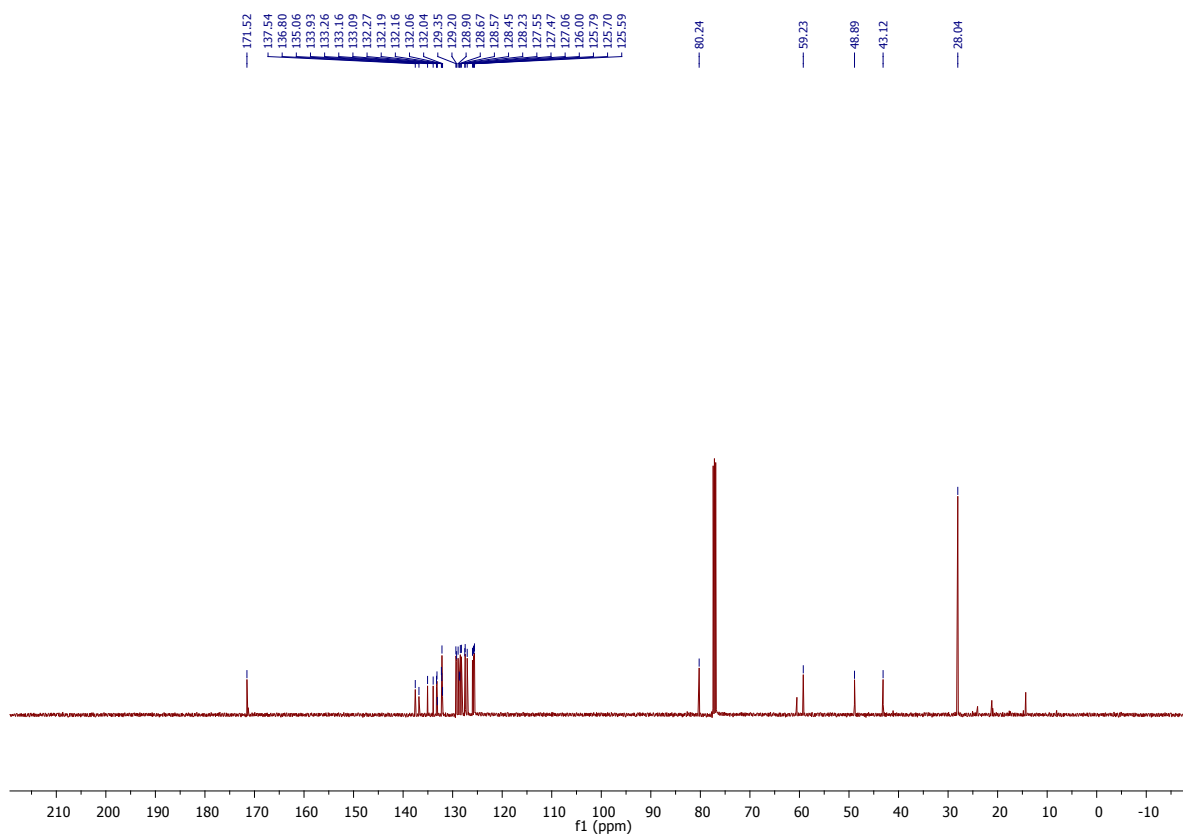
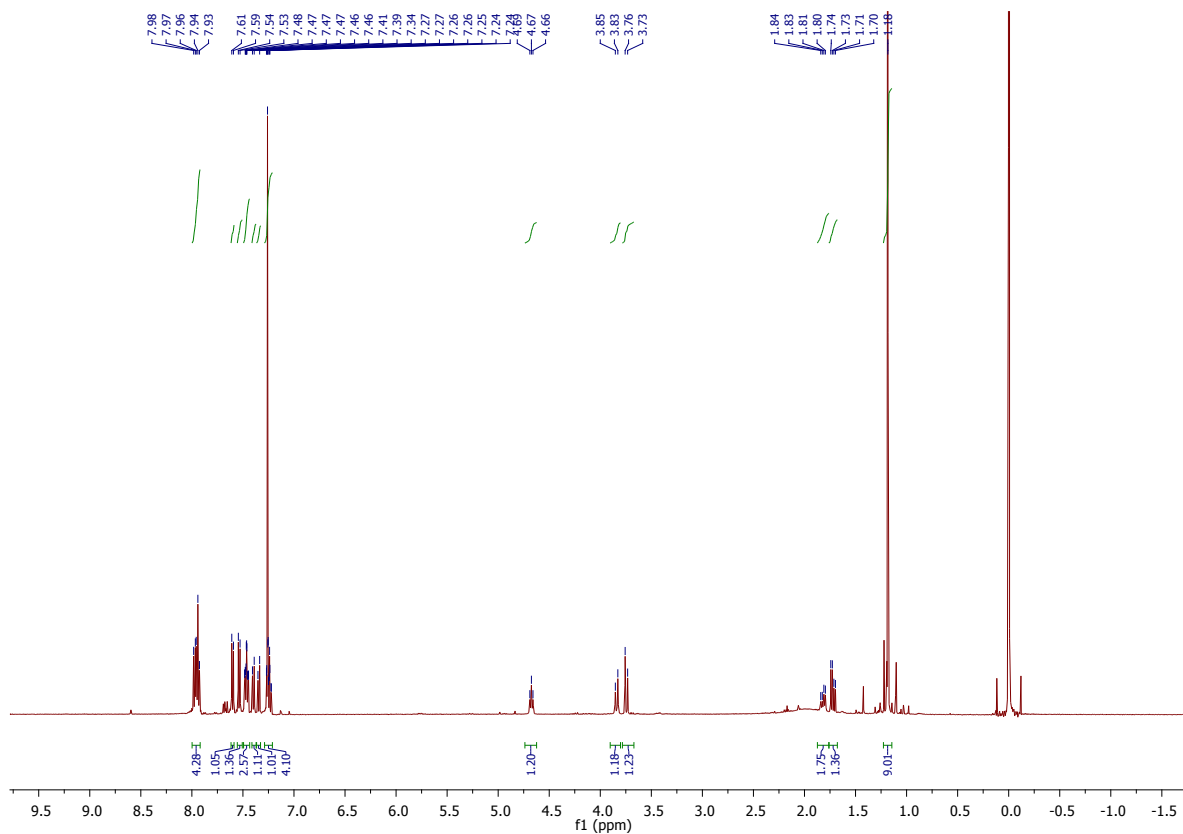
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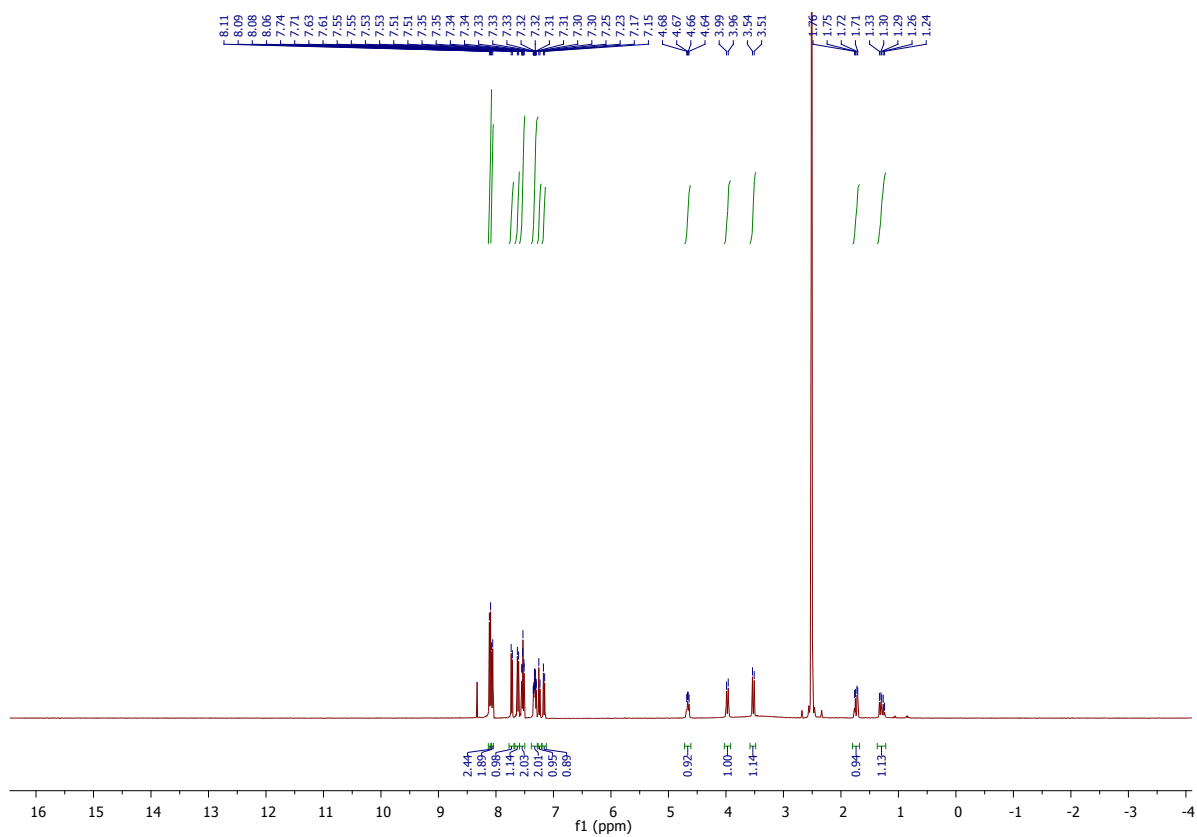
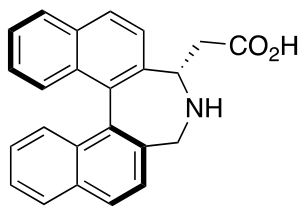


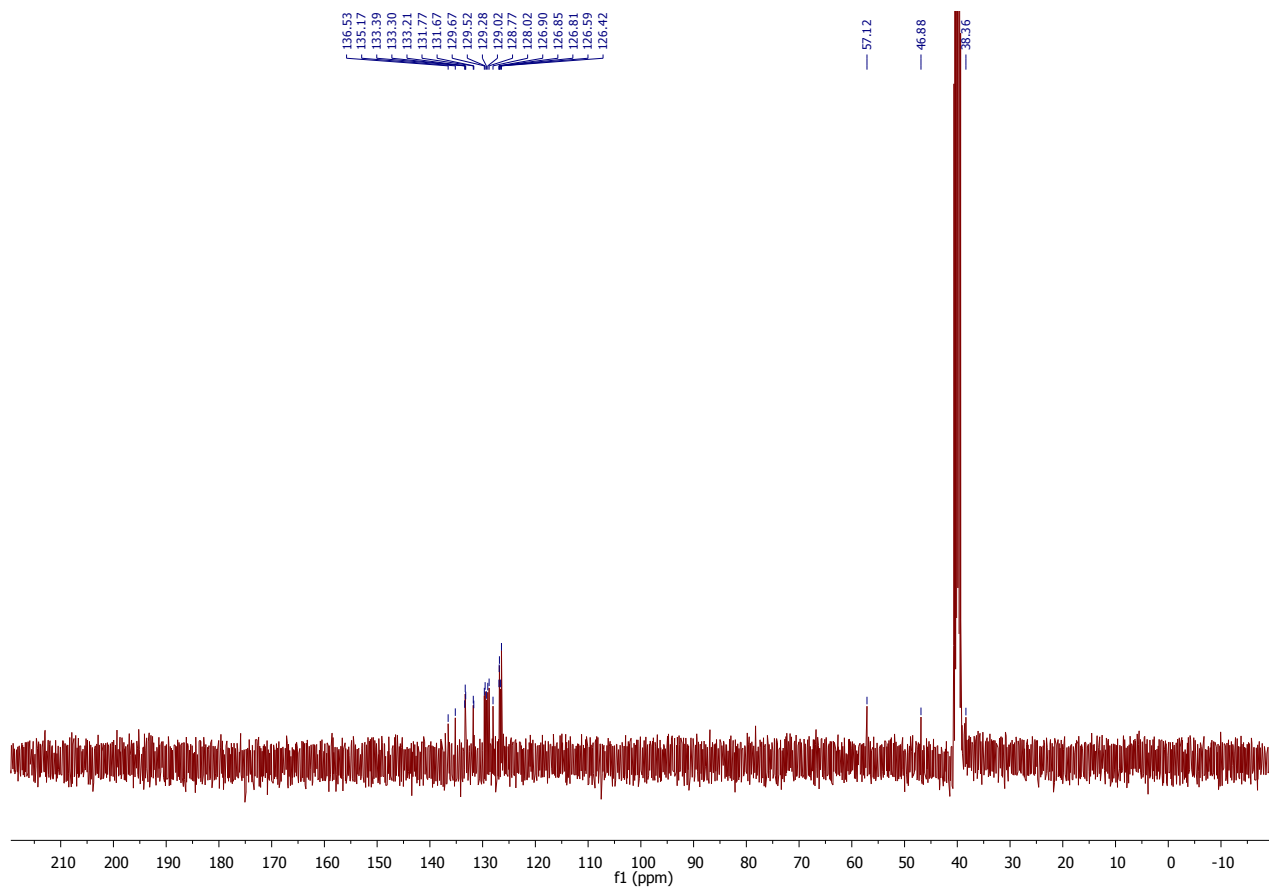
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30**



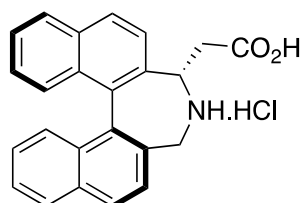


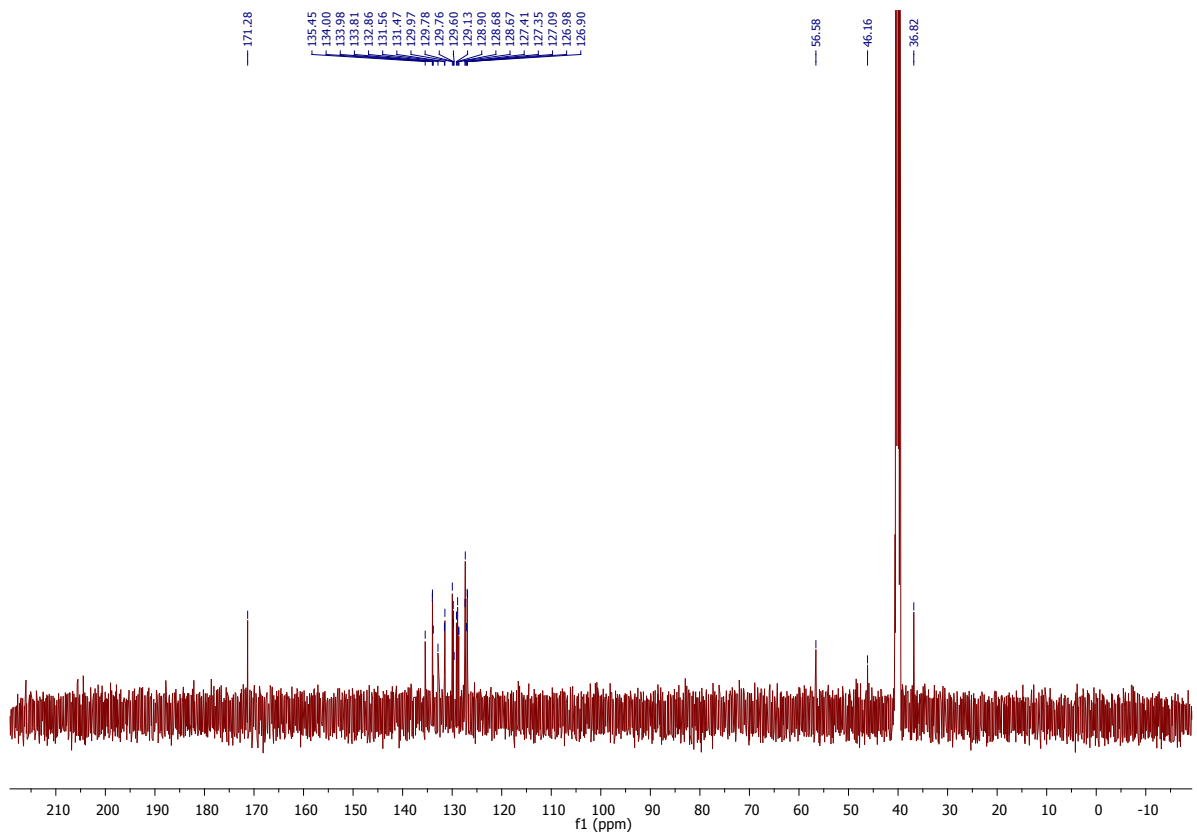
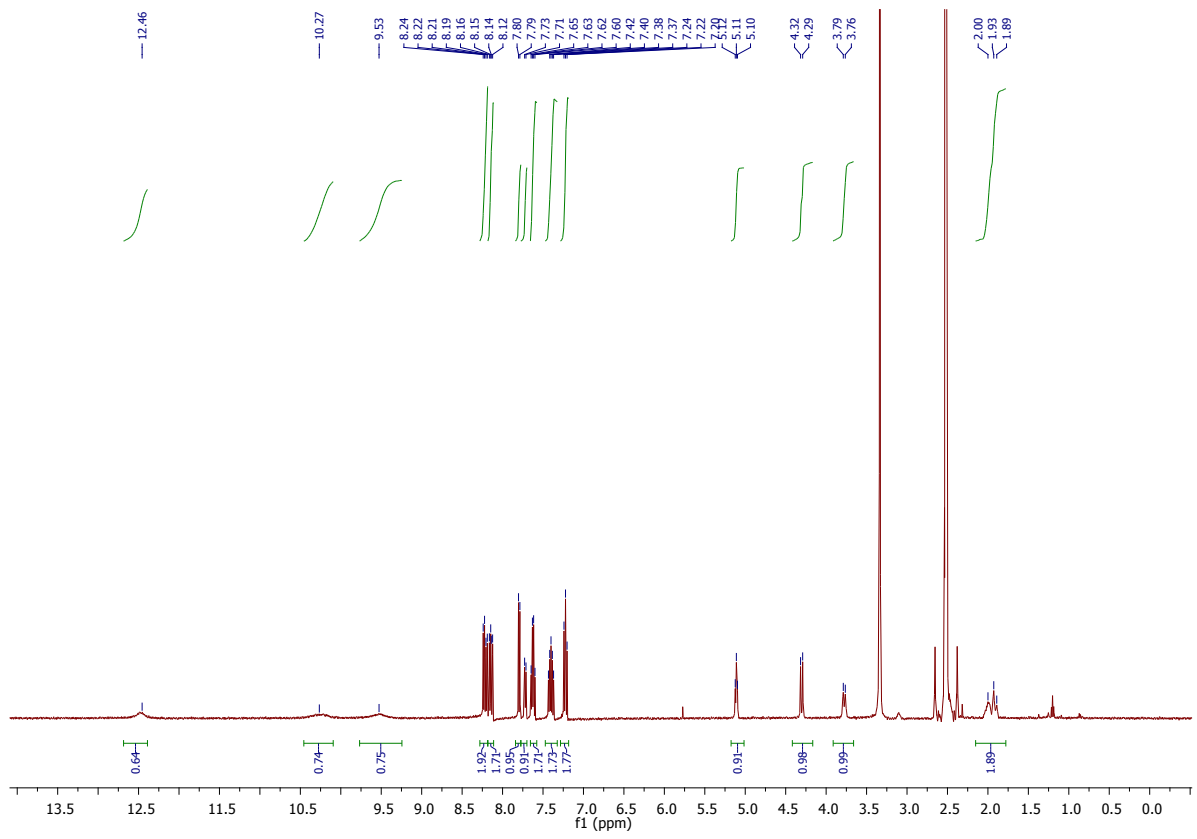
2-((3S,11cS)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepin-3-yl)acetic acid (+)-32



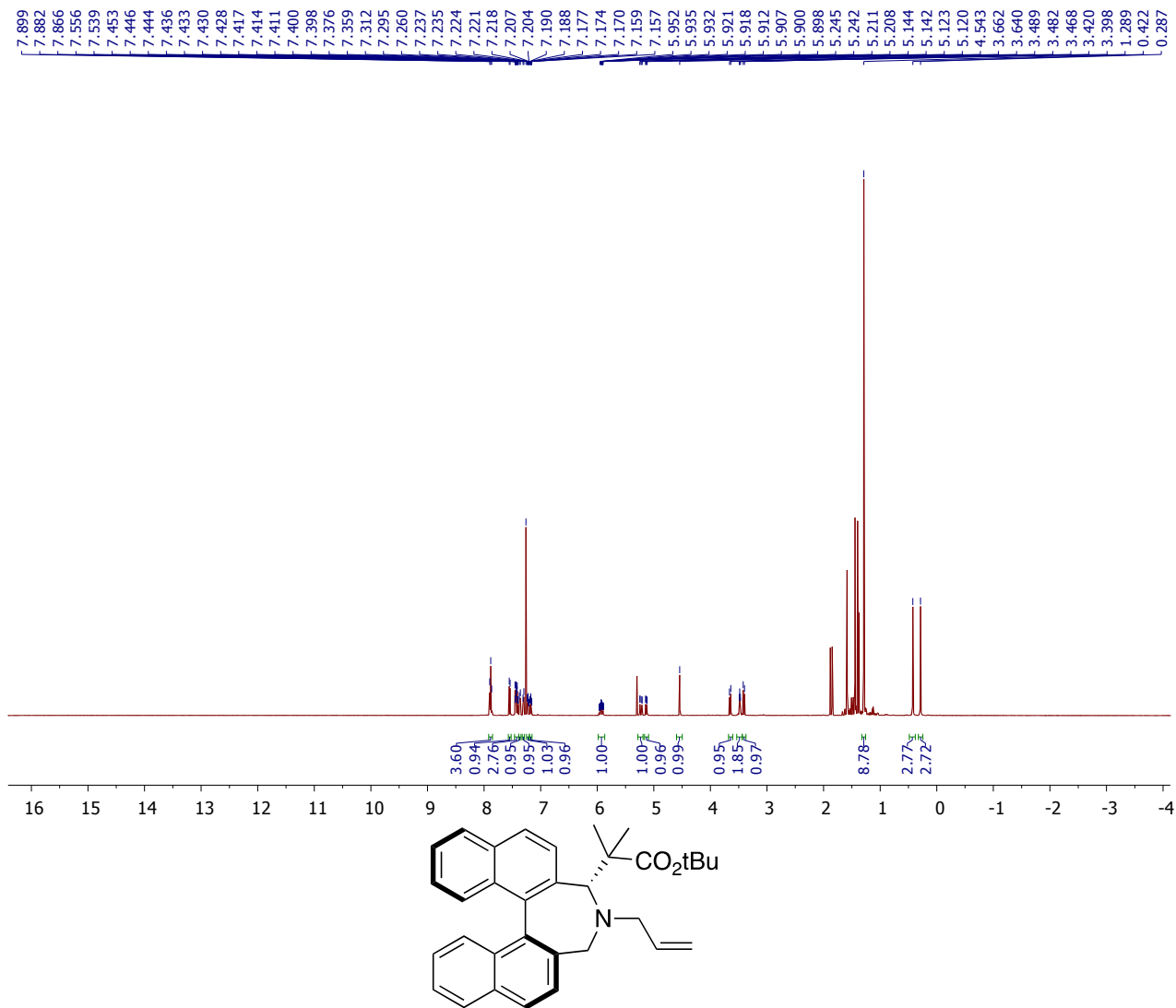


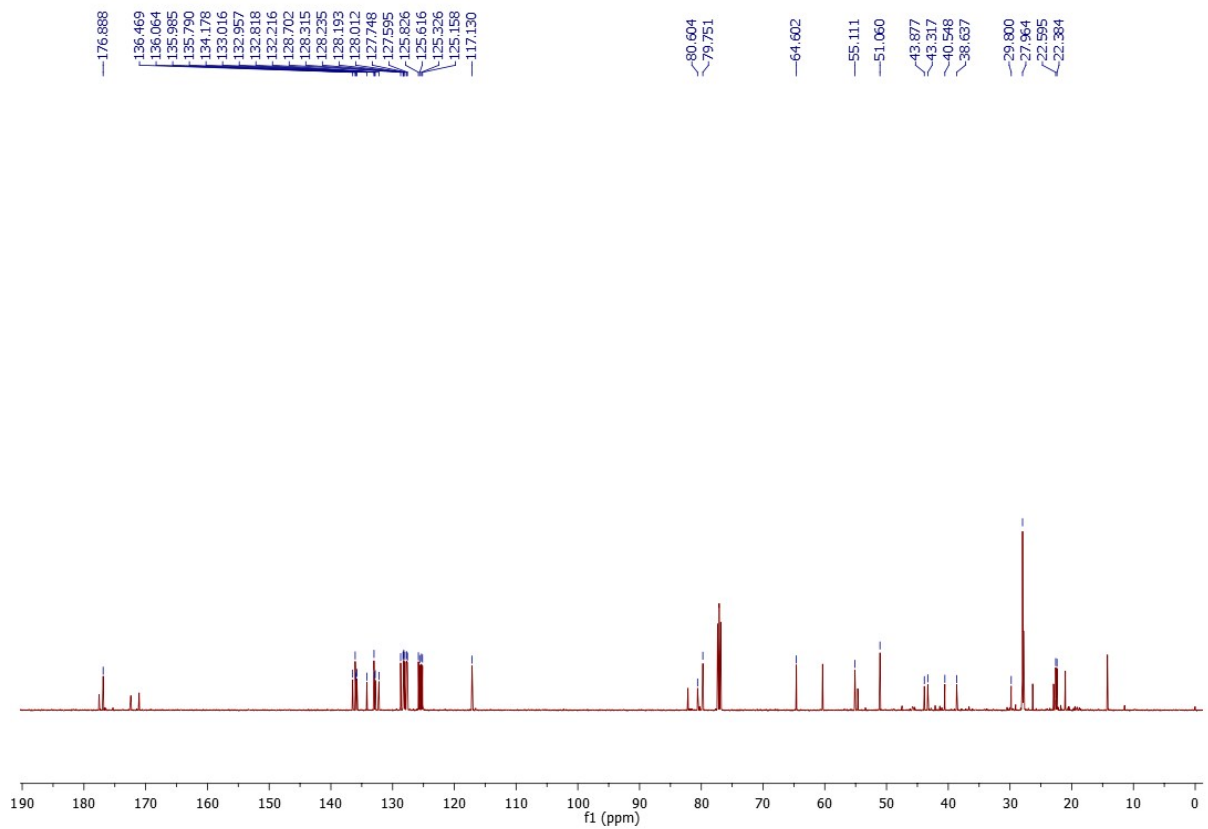
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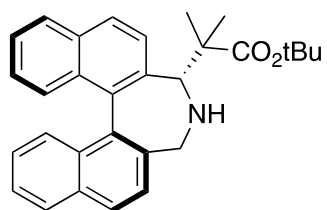


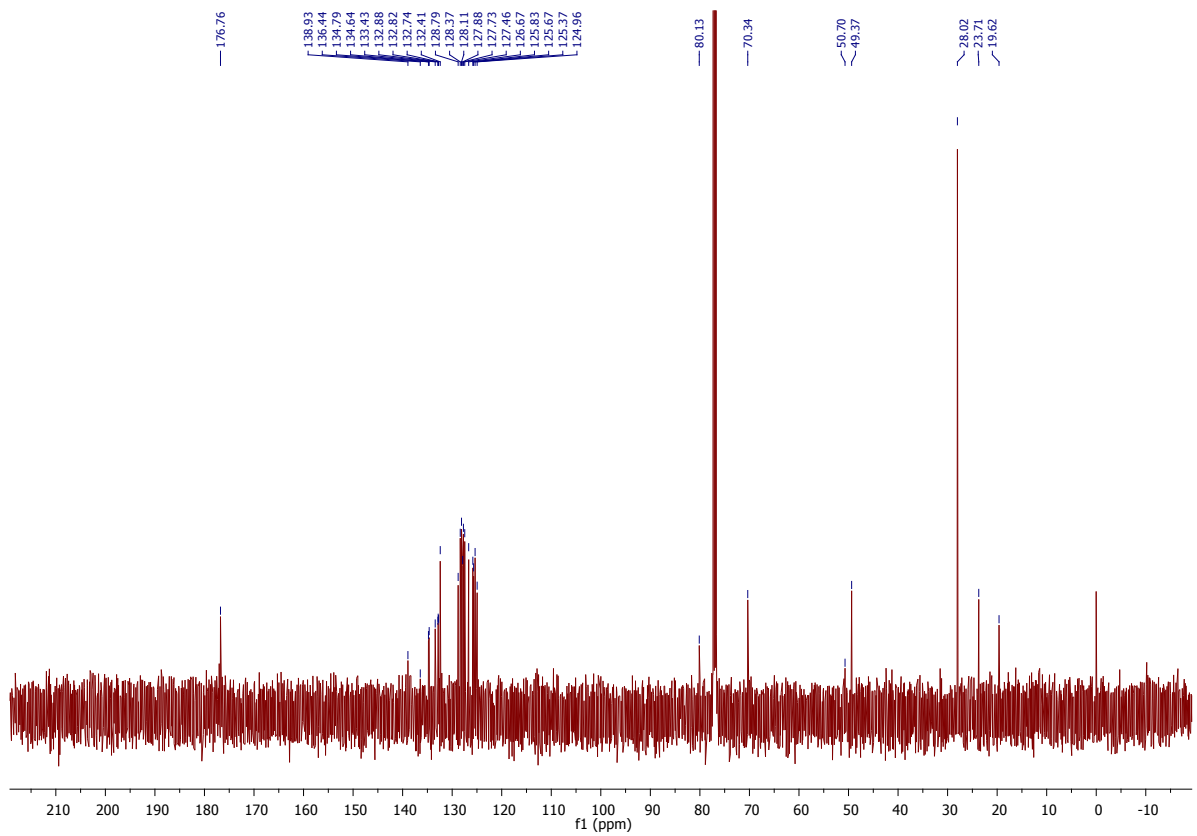
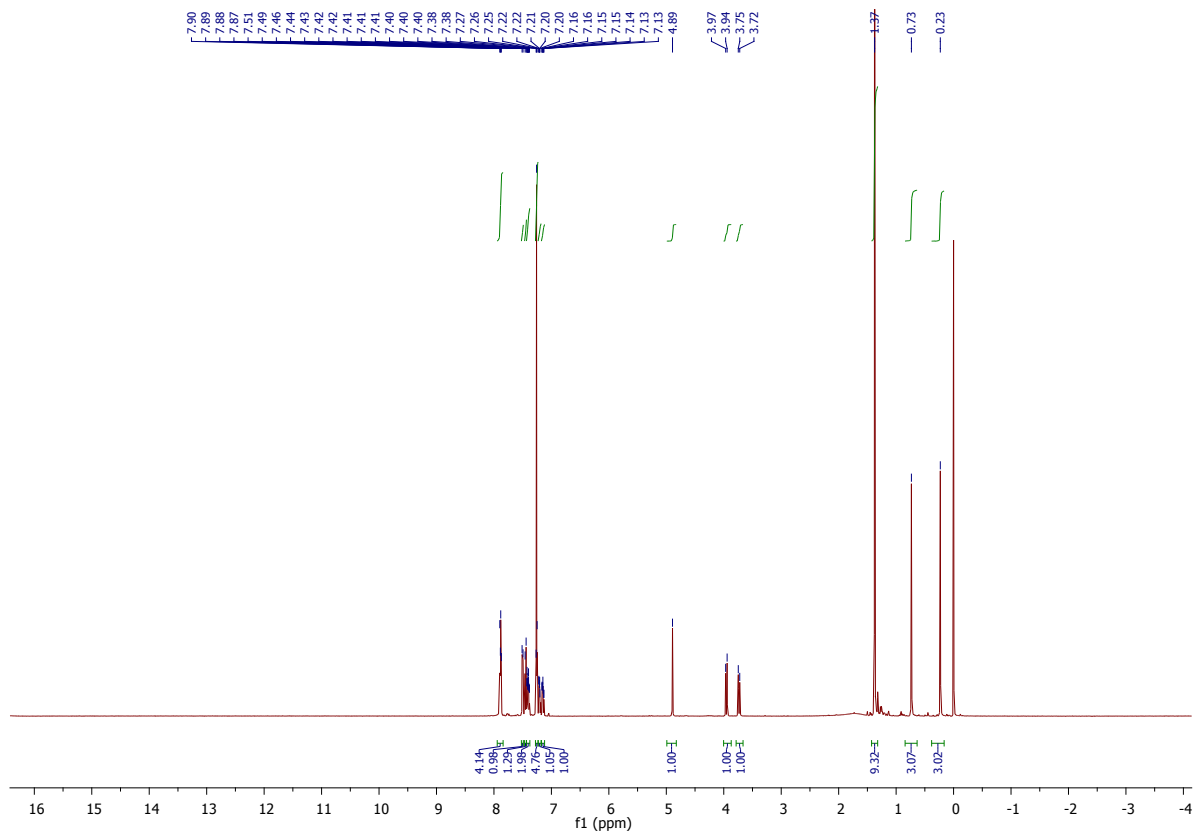
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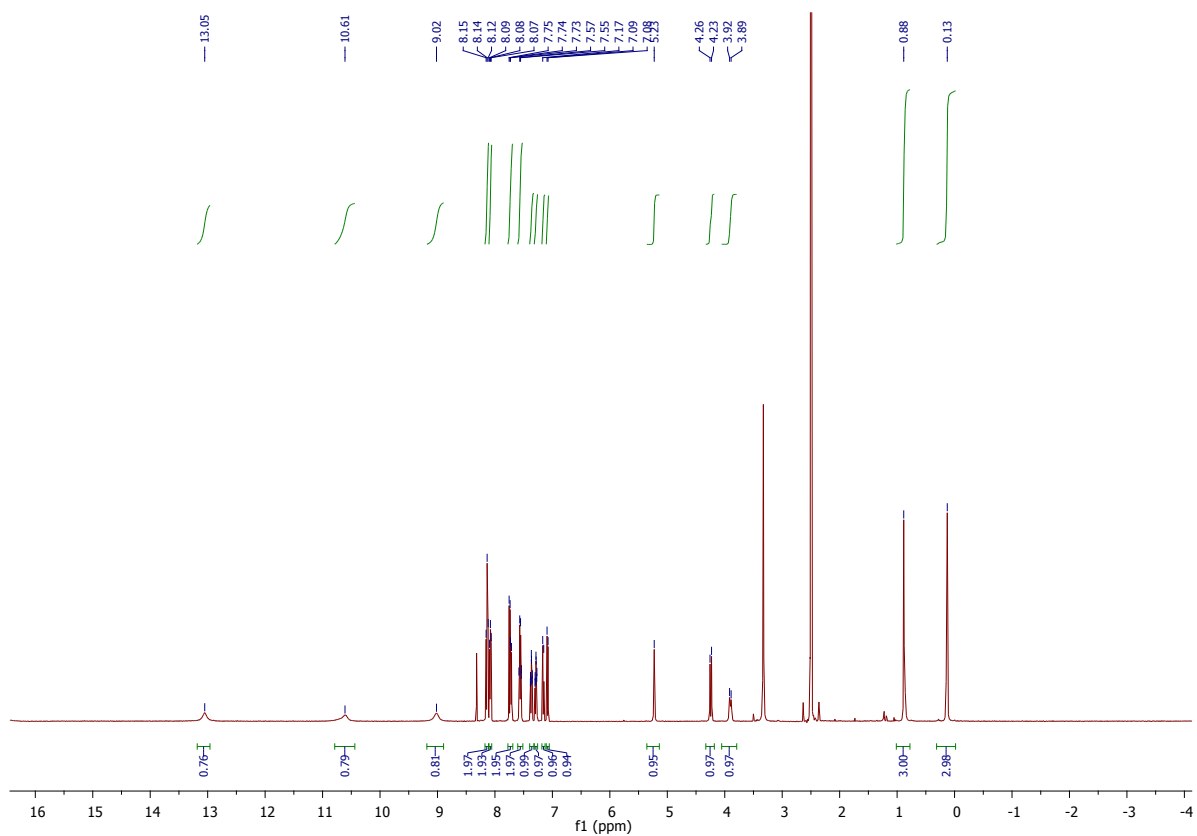
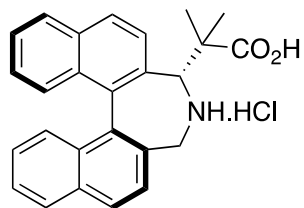


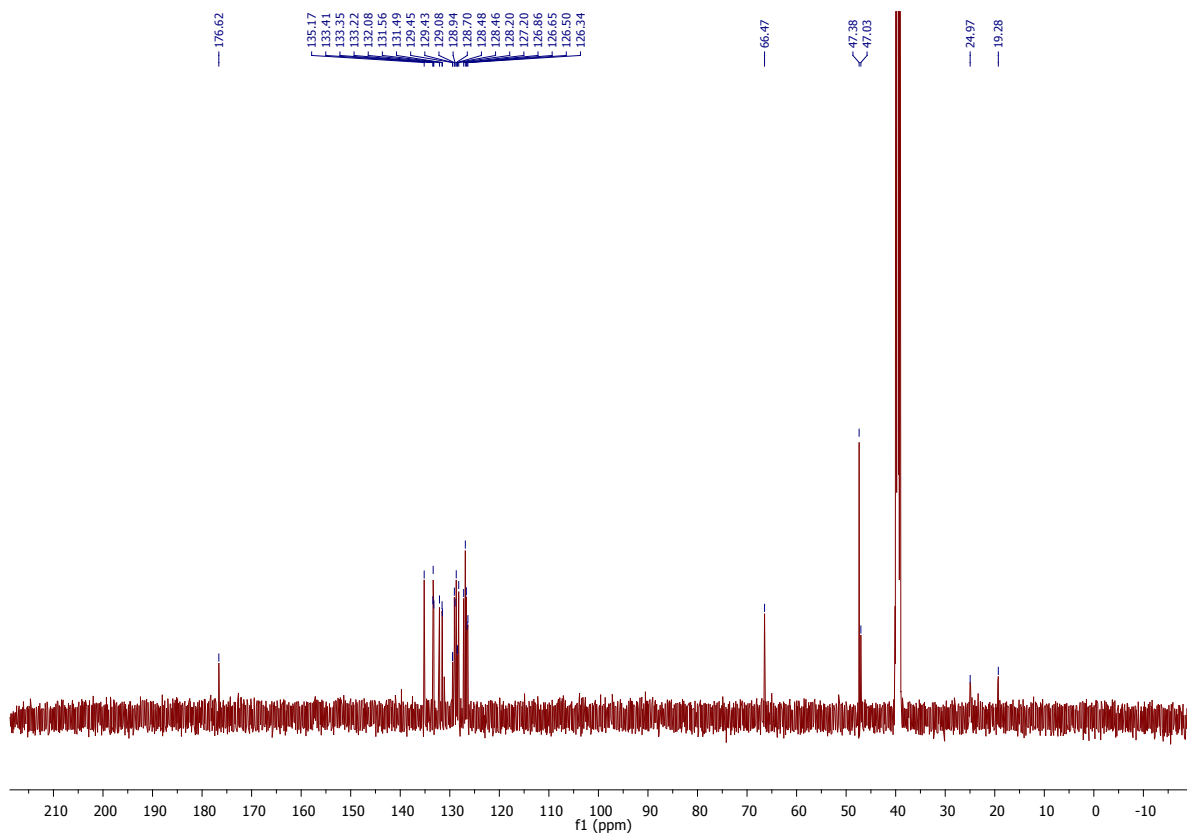
tert-Butyl 2-((3R,11S)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepin-3-yl)-2-methylpropanoate (+)-31



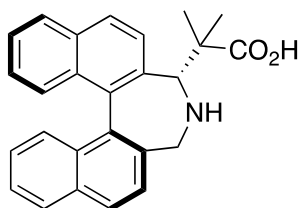


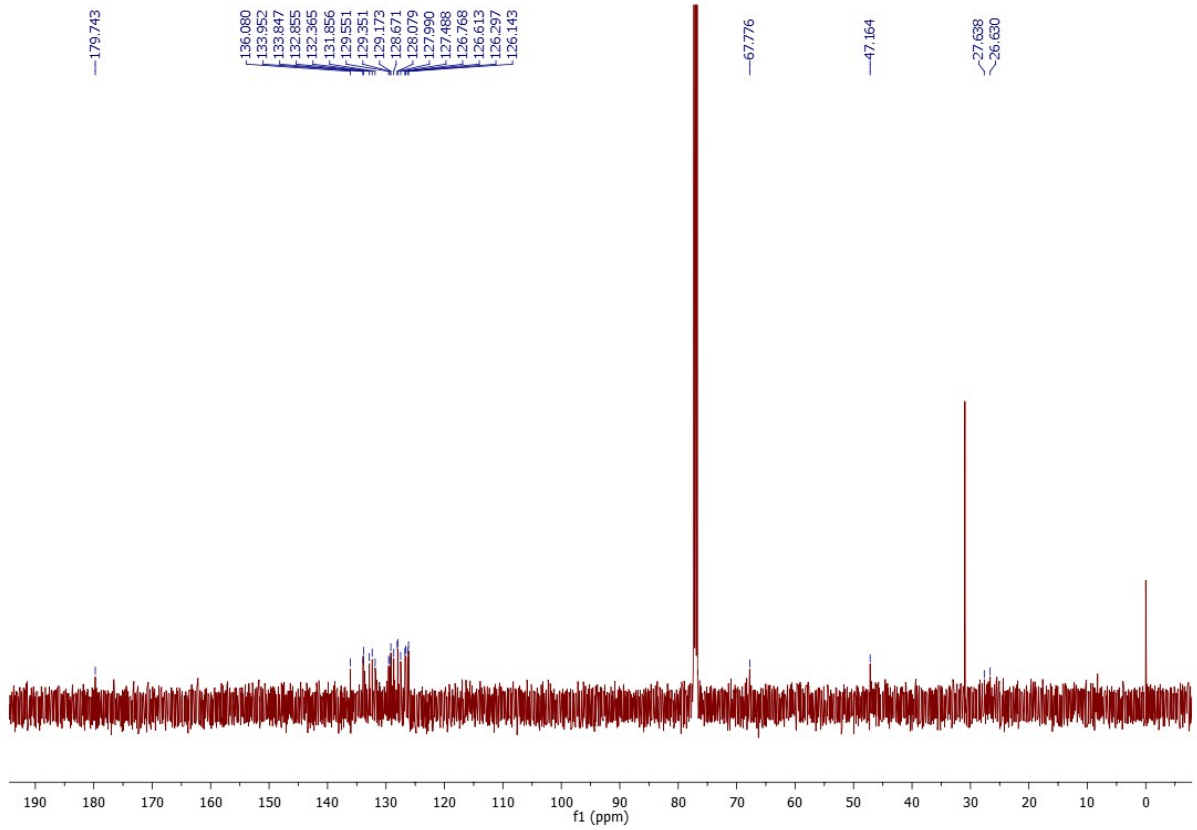
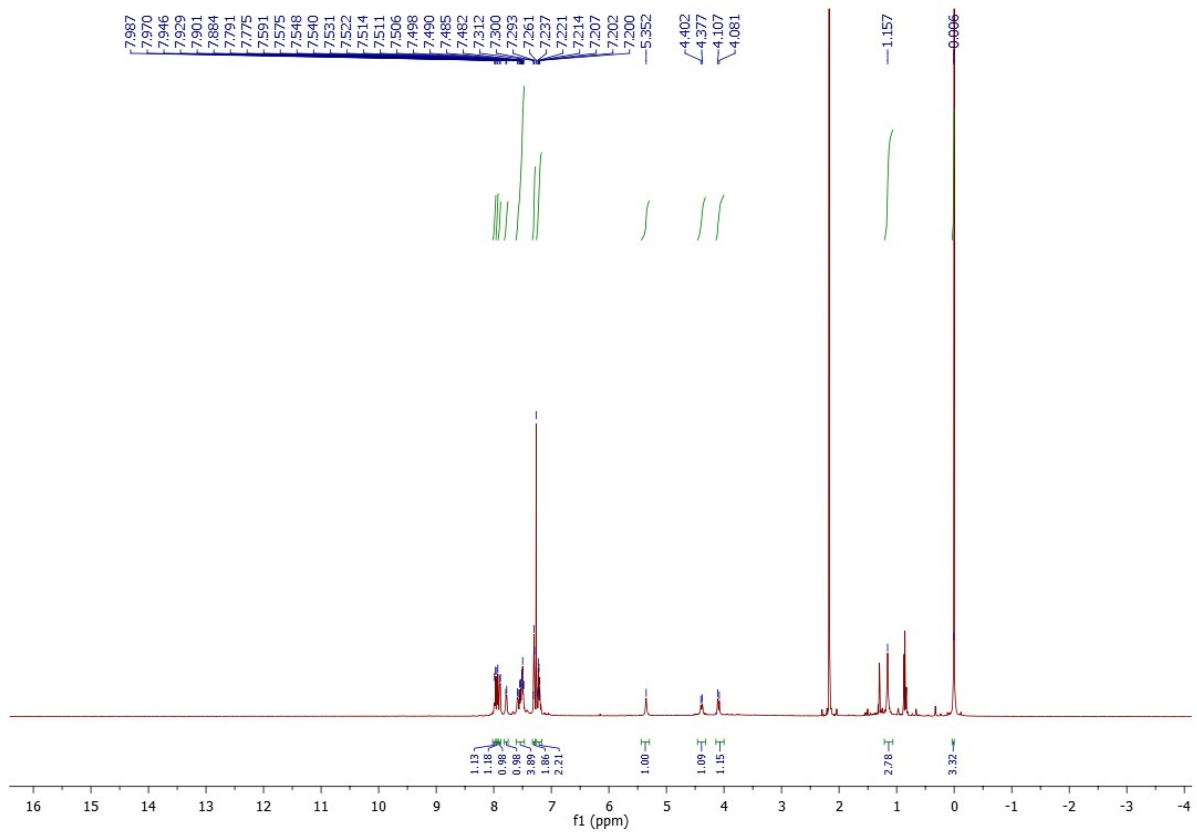
2-((3R,11cS)-4,5-Dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepin-3-yl)-2-methylpropanoic acid hydrochloride (+)-33.HCl



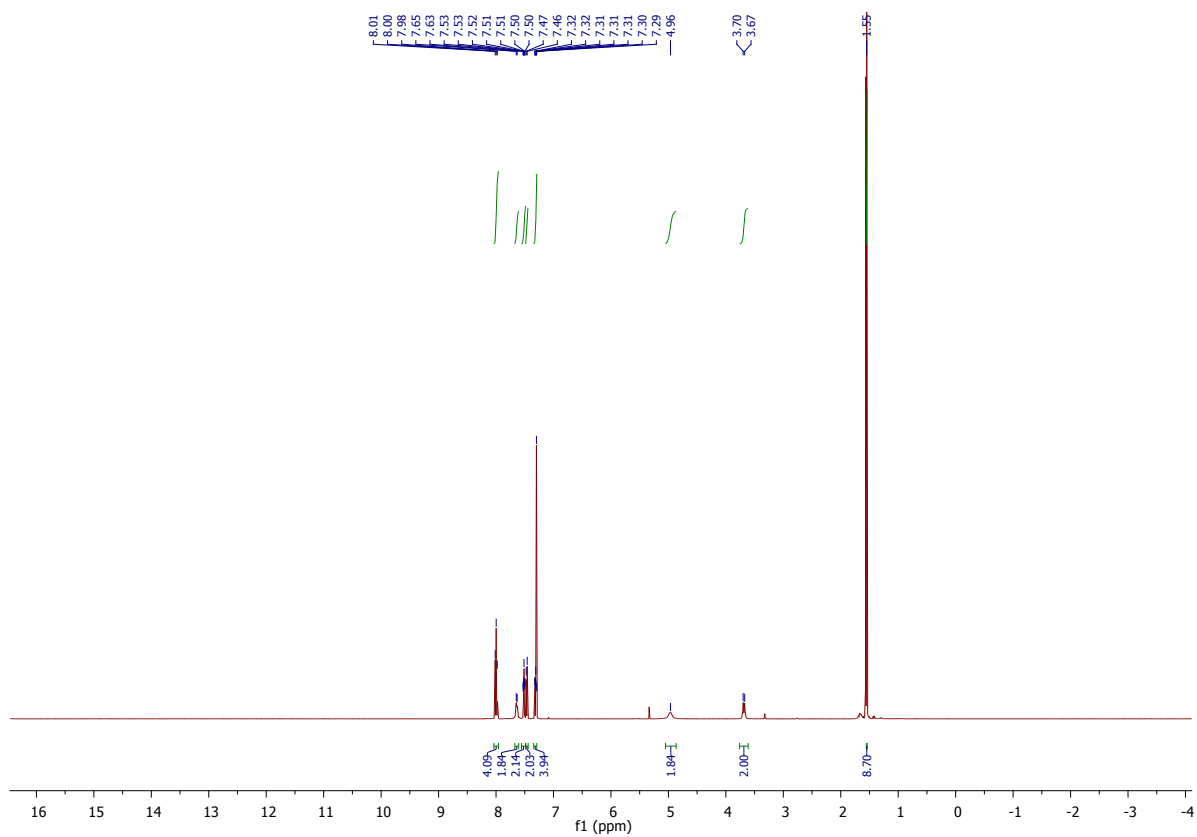
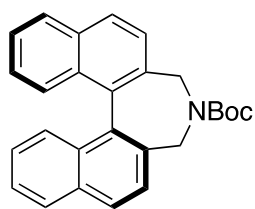


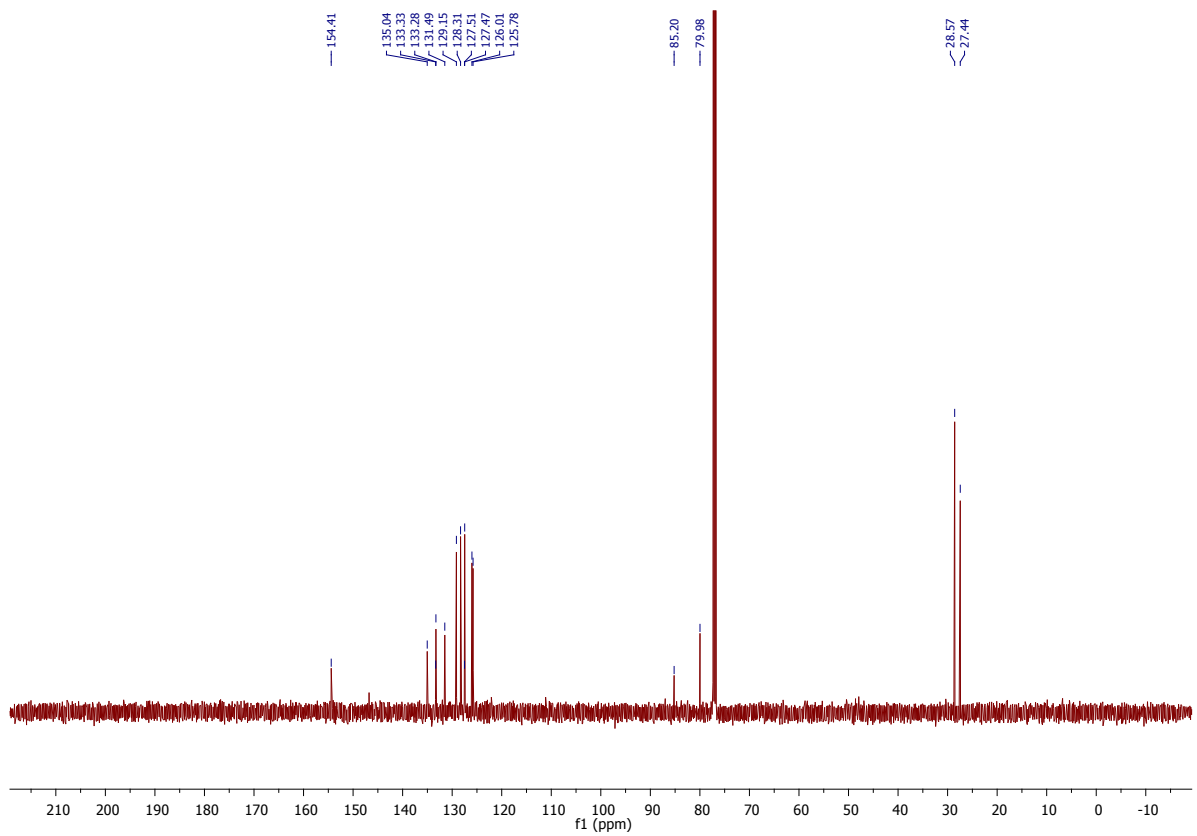
2-((3S,11cS)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepin-3-yl)-2-methylpropanoic acid (+)-33





(S)-Tert-butyl 3H-dinaphtho[2,1-c:1',2'-e]azepine-4(5H)-carboxylate (-)-13

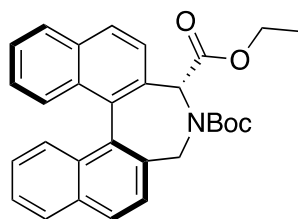


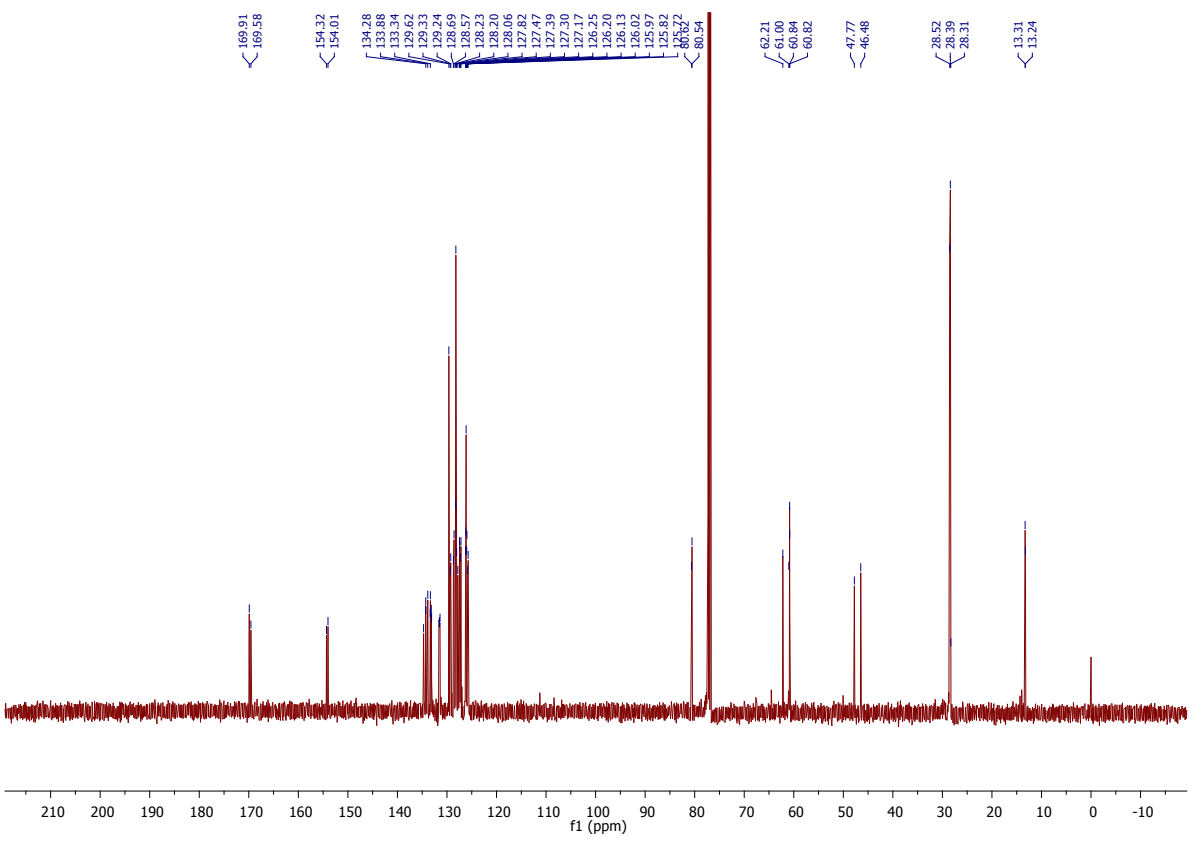
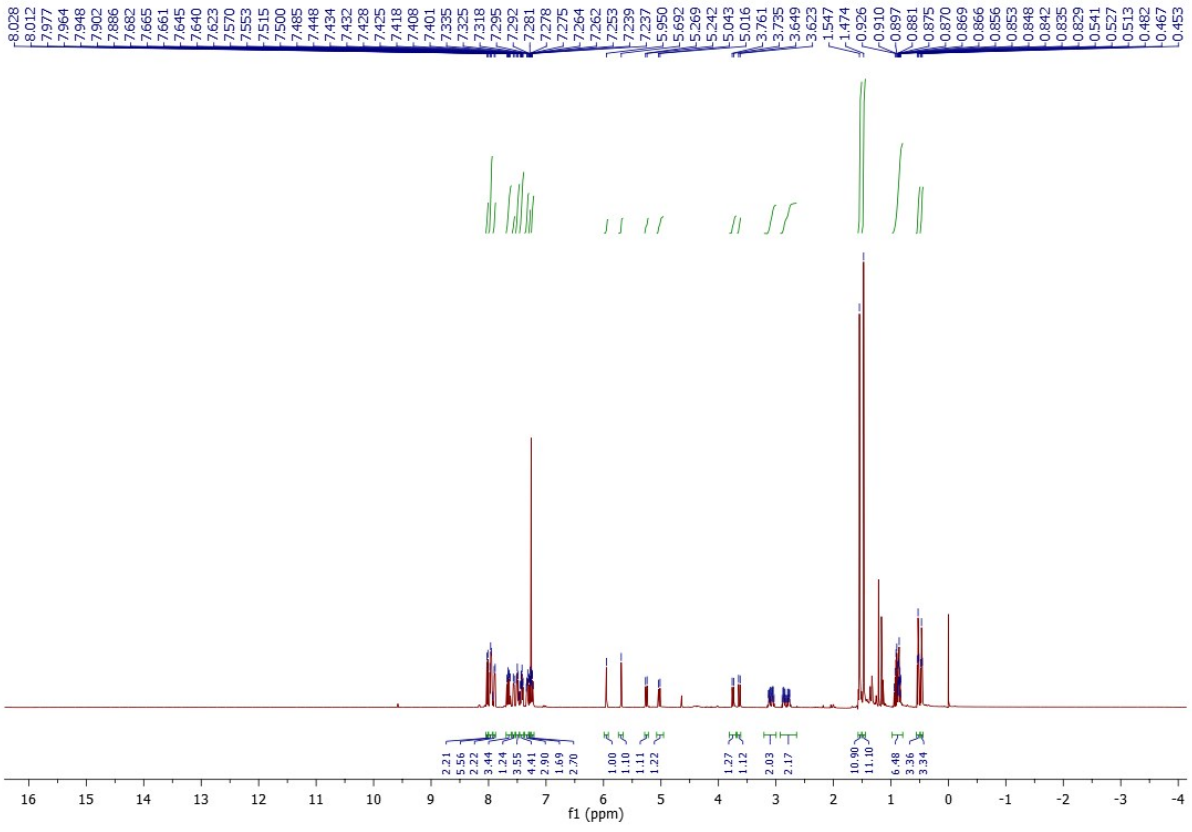


(3R,11S)-4-Tert-butyl
dicarboxylate (-)-15

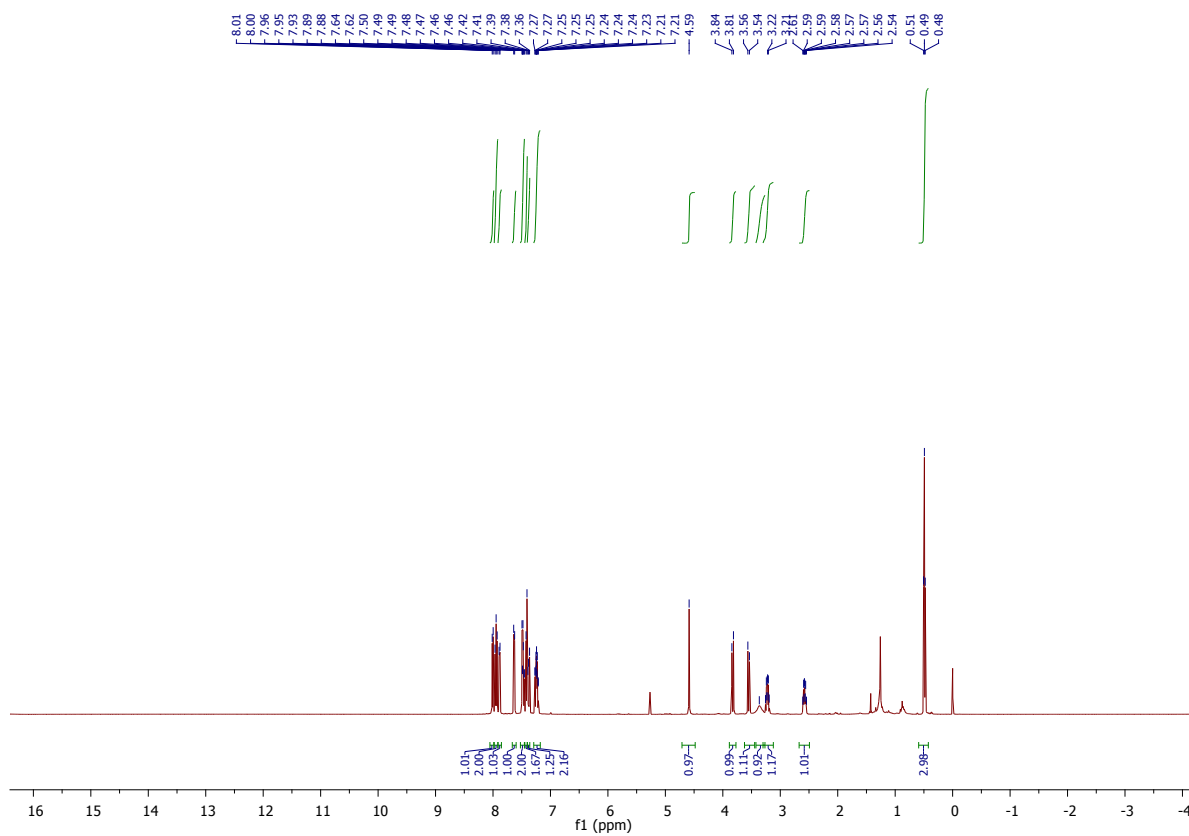
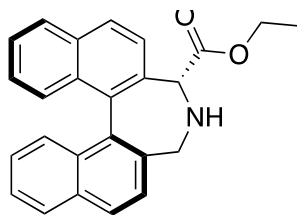
3-ethyl

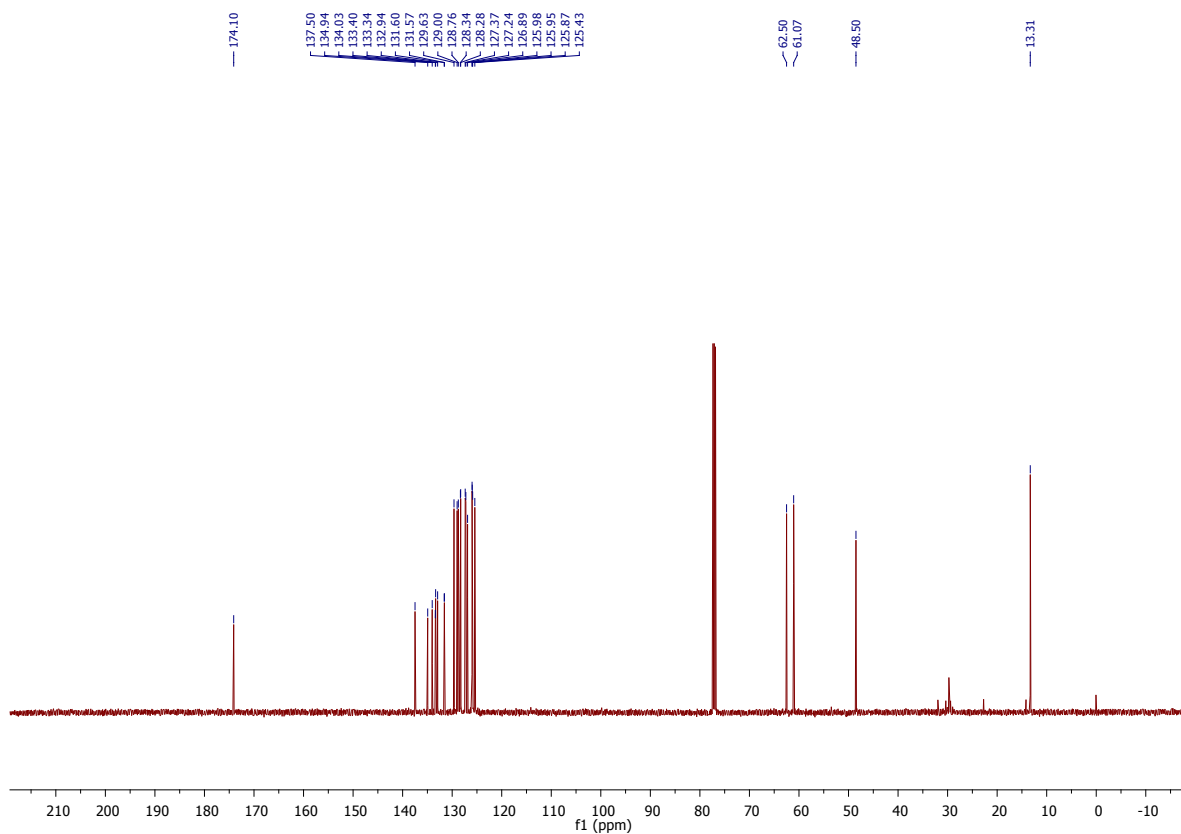
3H-dinaphtho[2,1-c:1',2'-e]azepine-3,4(5H)-



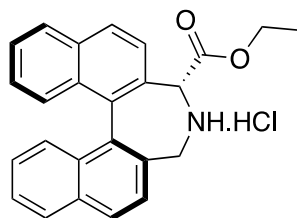


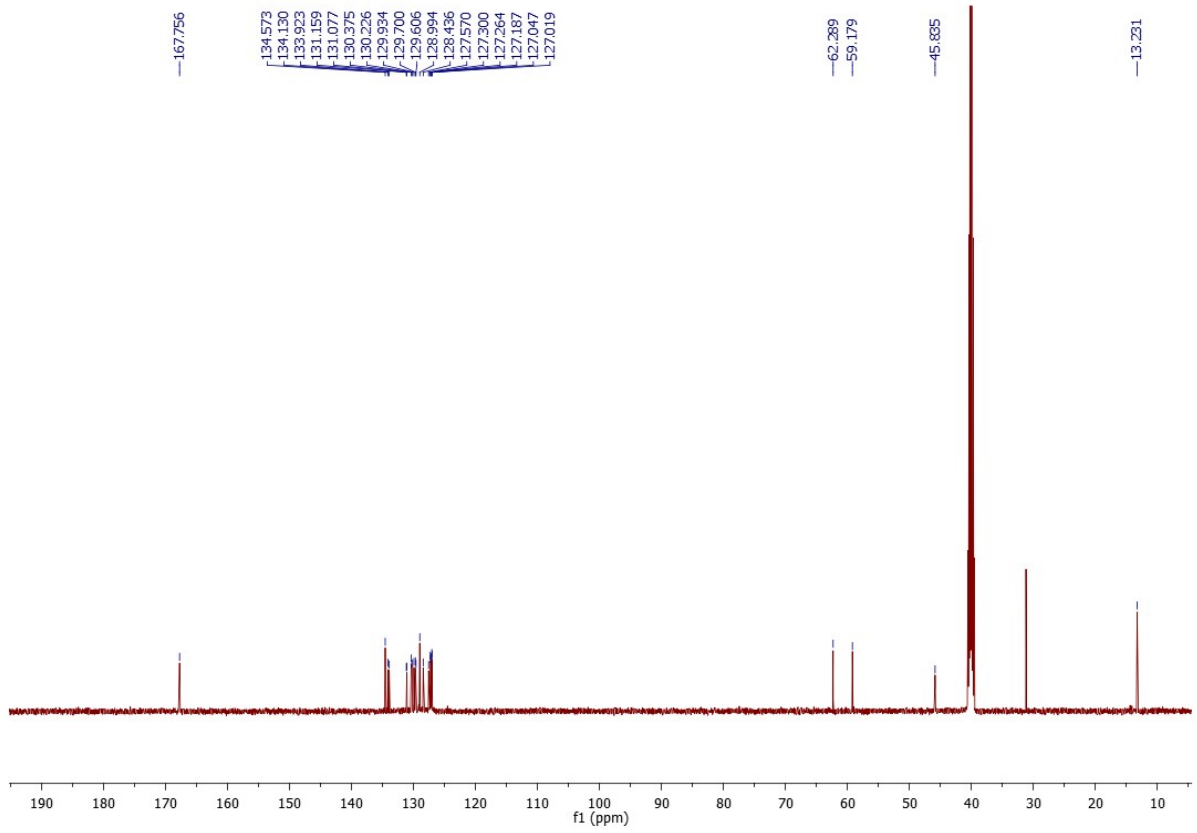
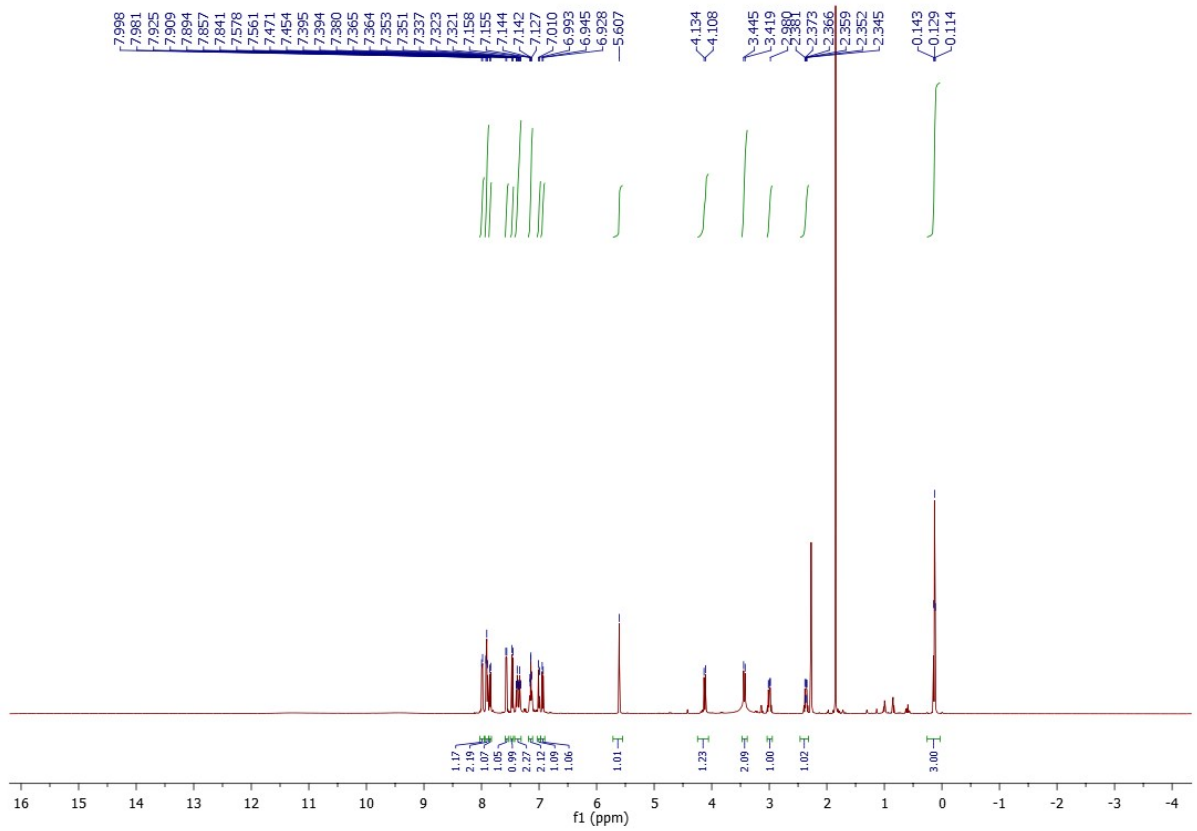
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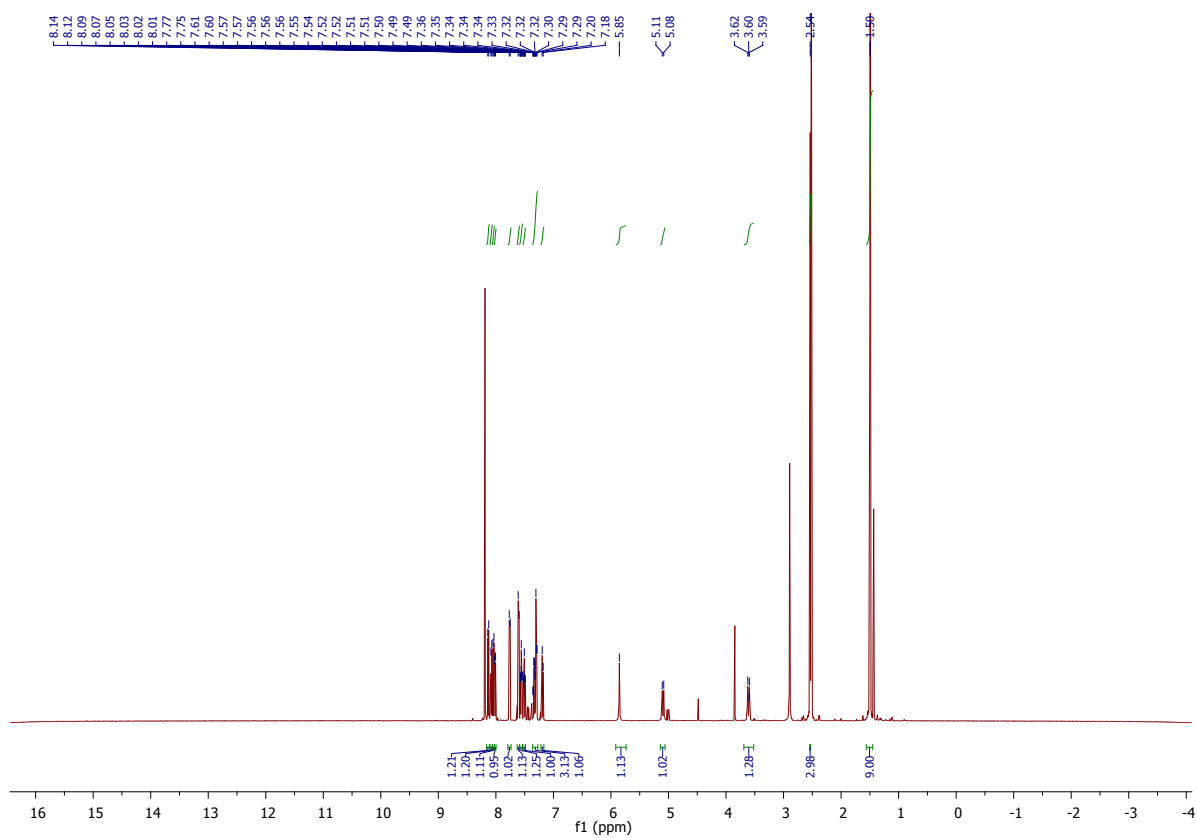
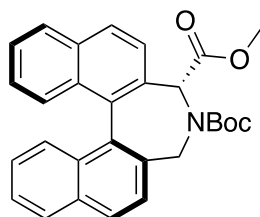


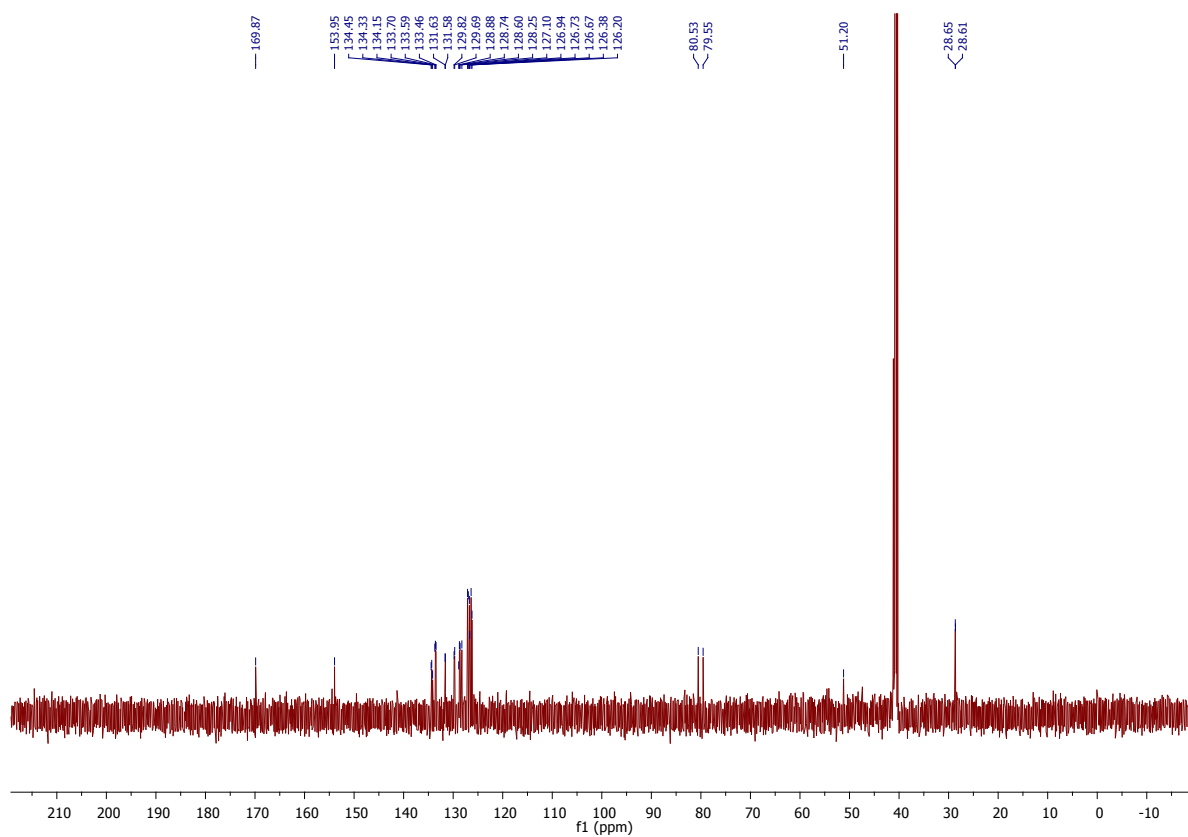
(3R,11S)-Ethyl 4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylate hydrochloride (+)-17.HCl



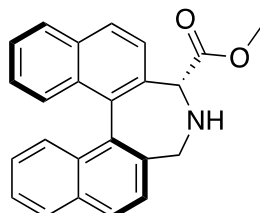


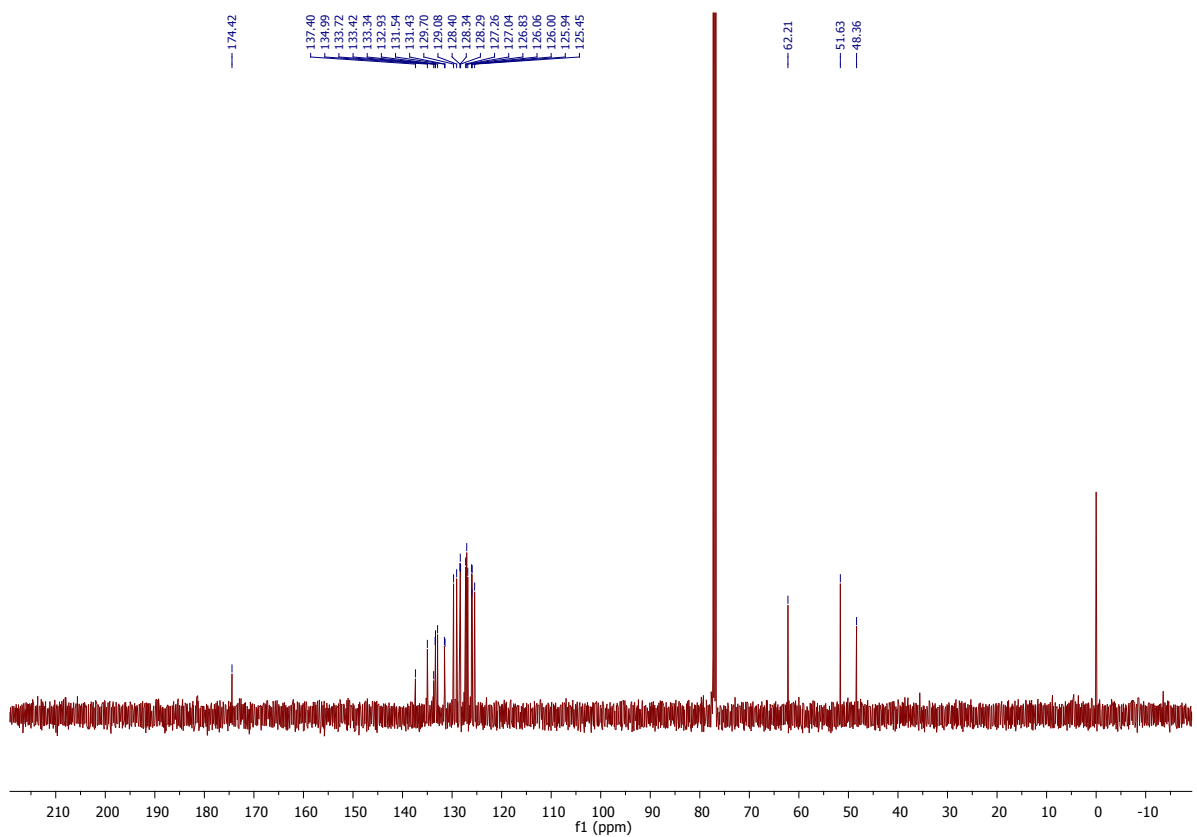
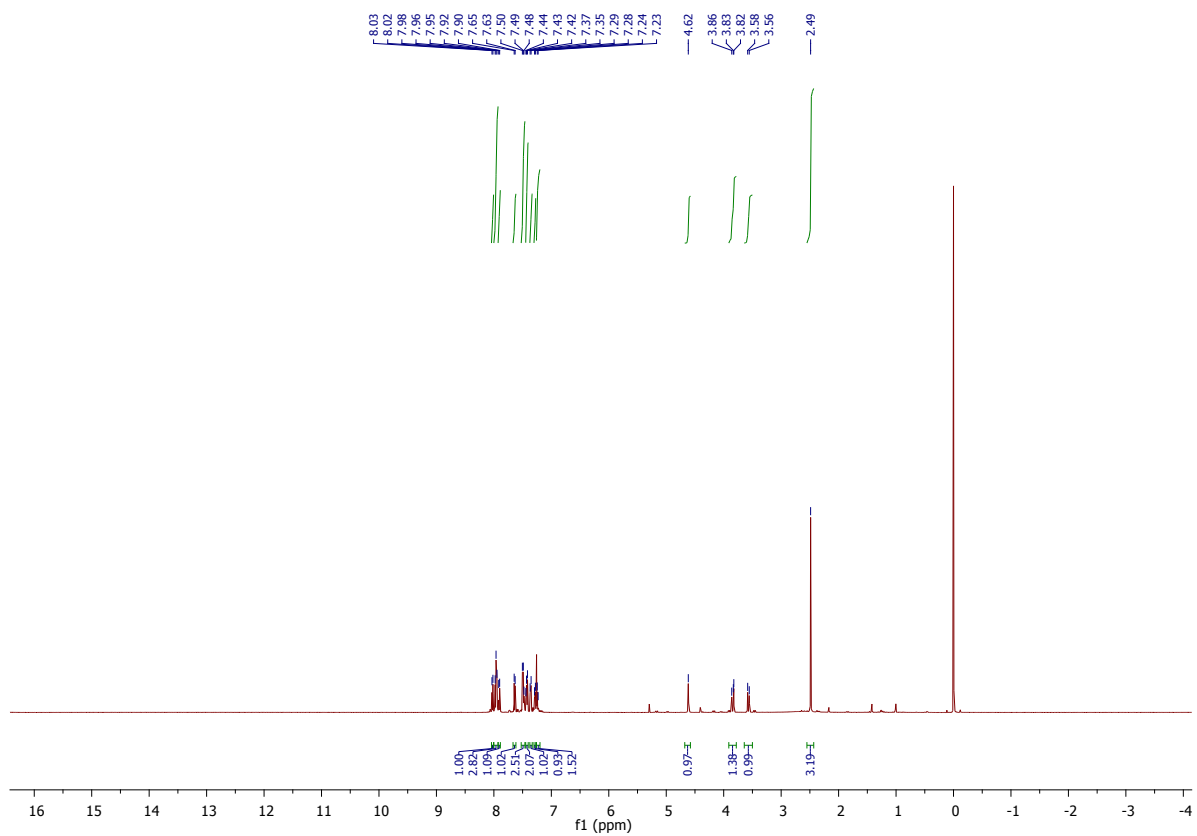
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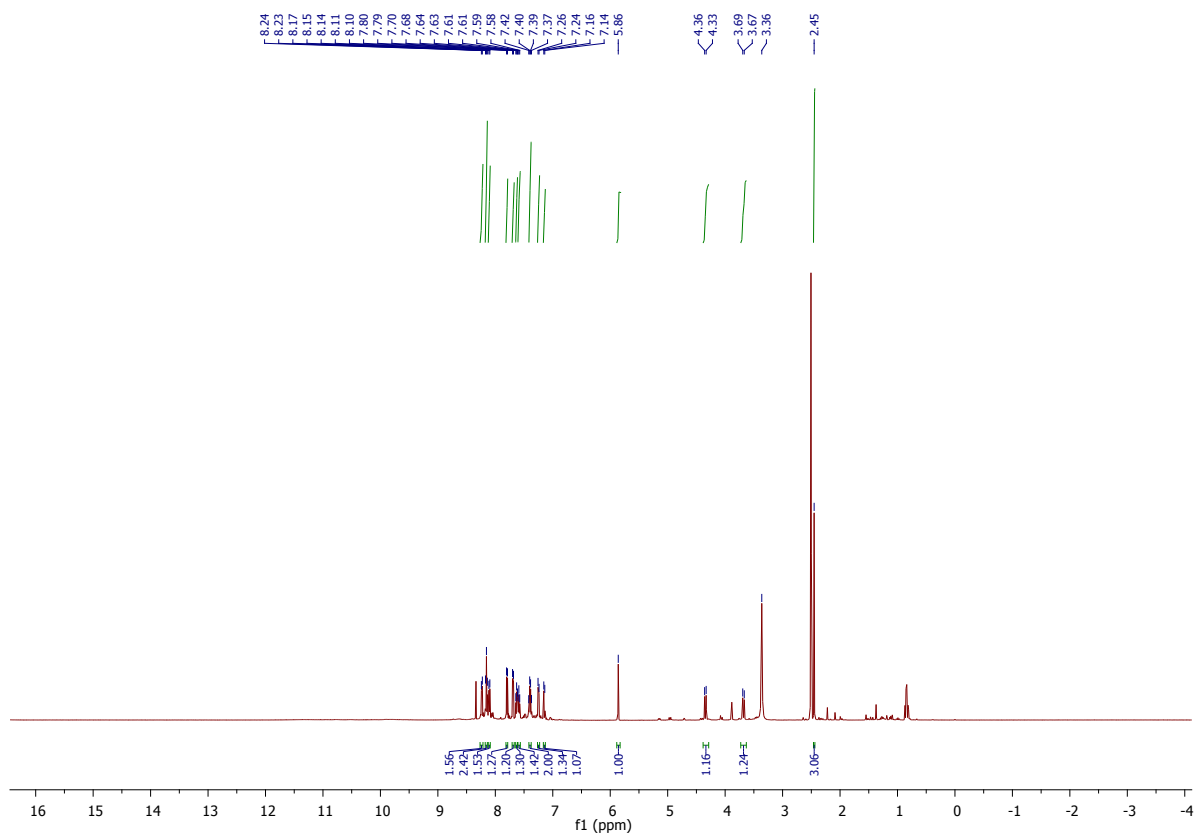
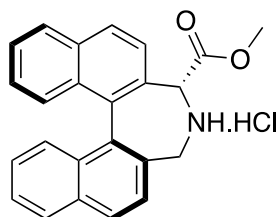


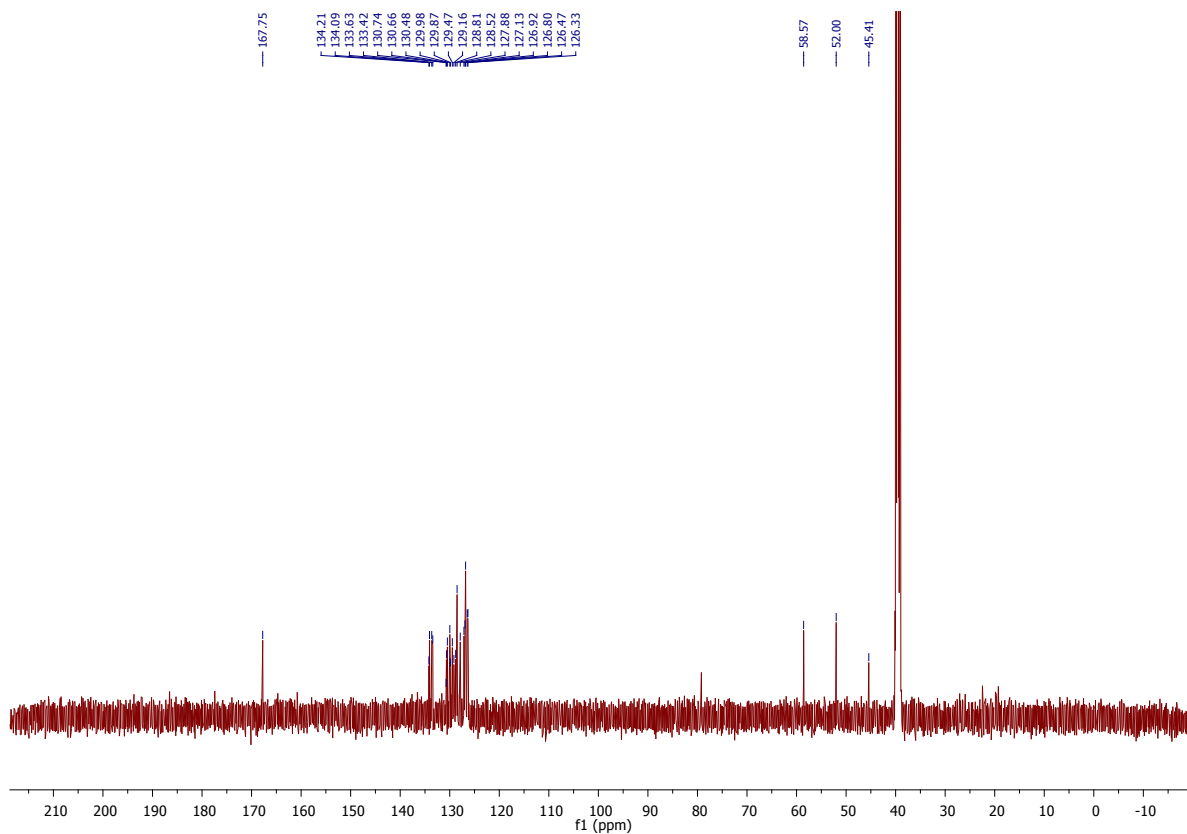
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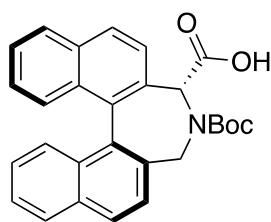


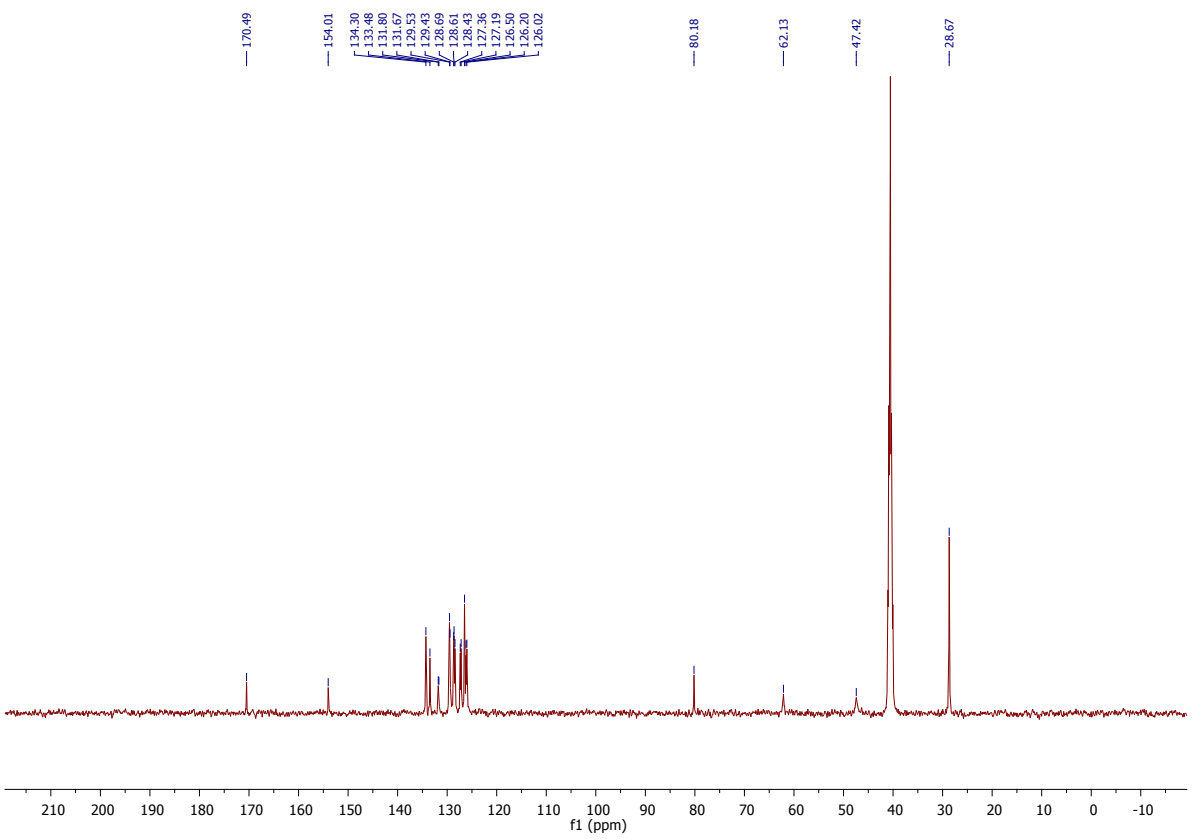
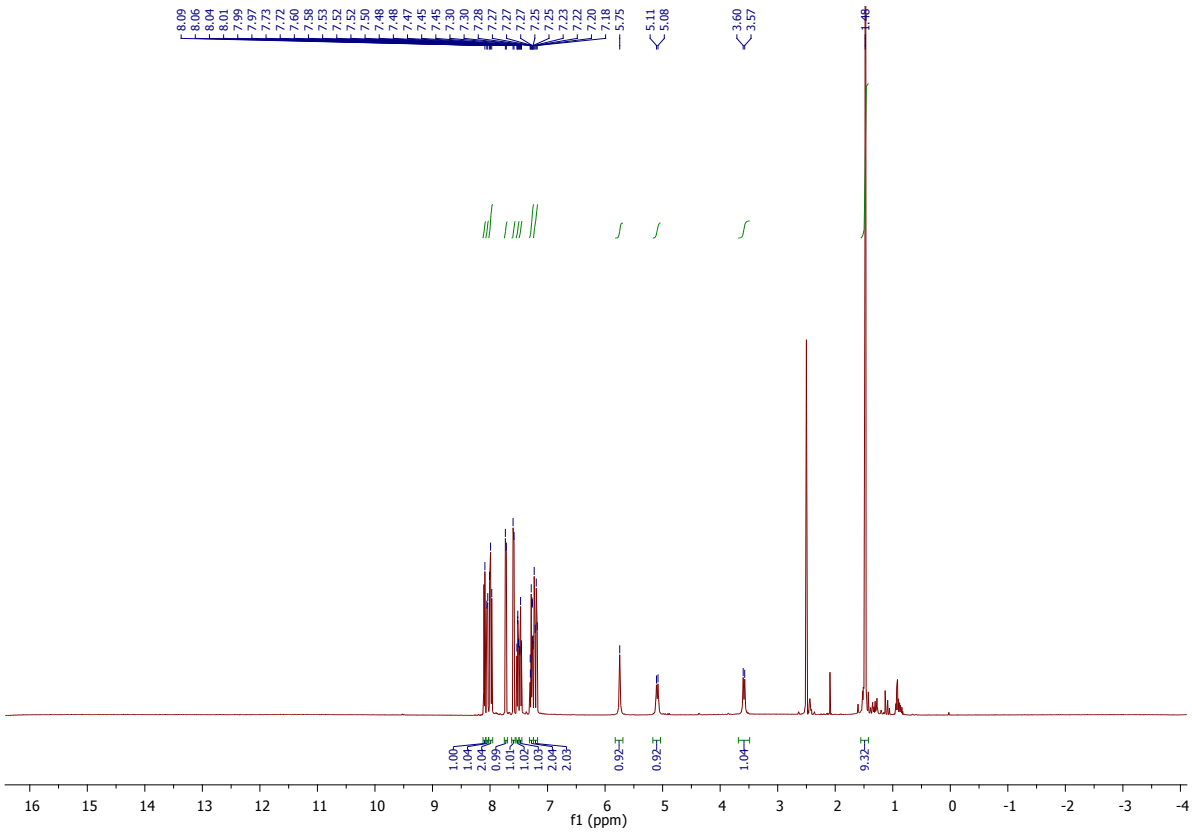
3R,11cS)-Methyl 4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylate hydrochloride (+)-16.HCl



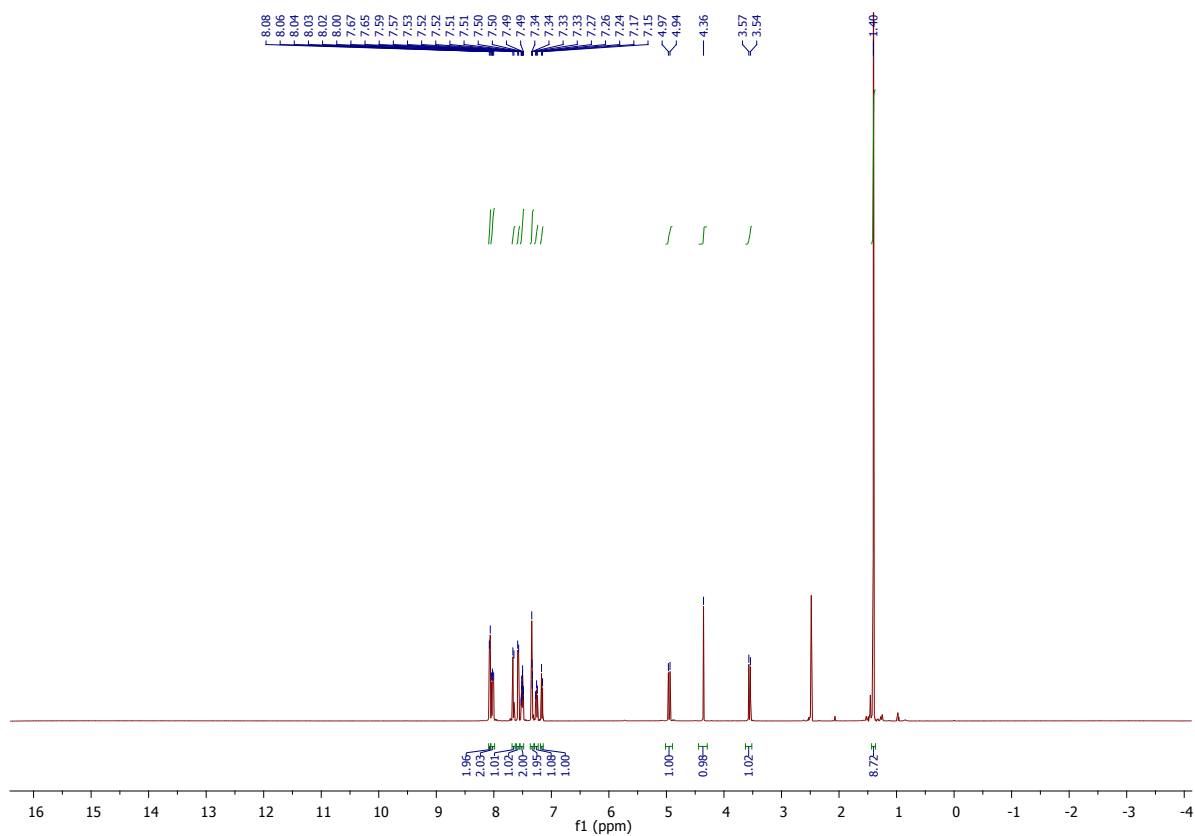
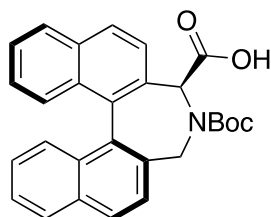


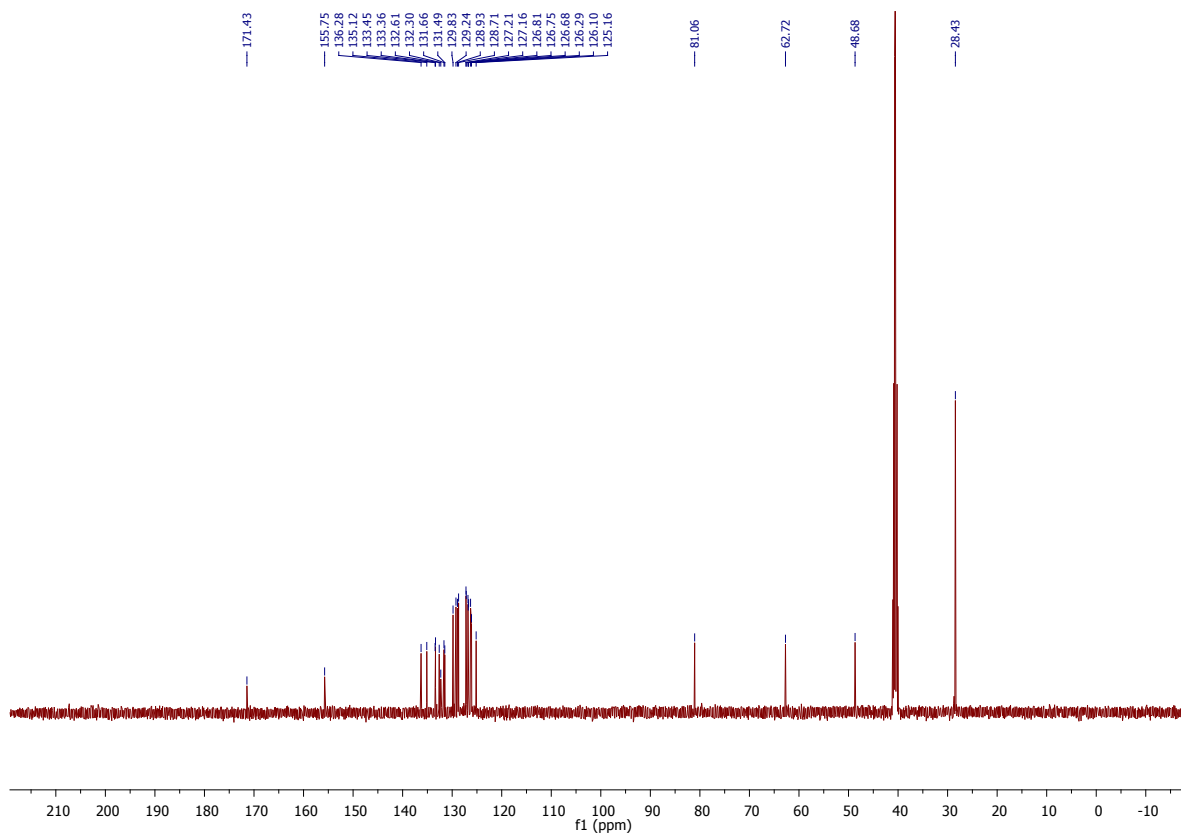
1st eluting diastereoisomer (3R,11S)-4-(Tert-butoxycarbonyl)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylic acid (-)-18a



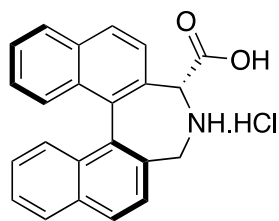


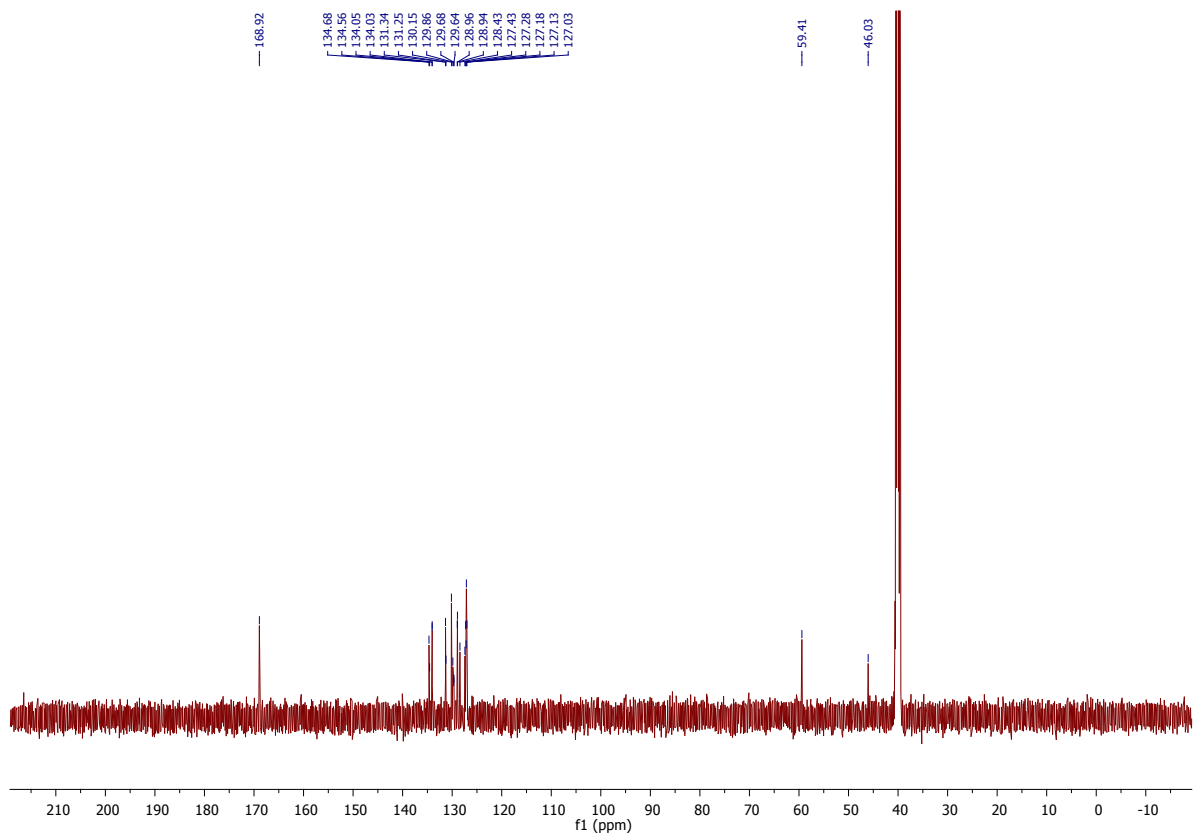
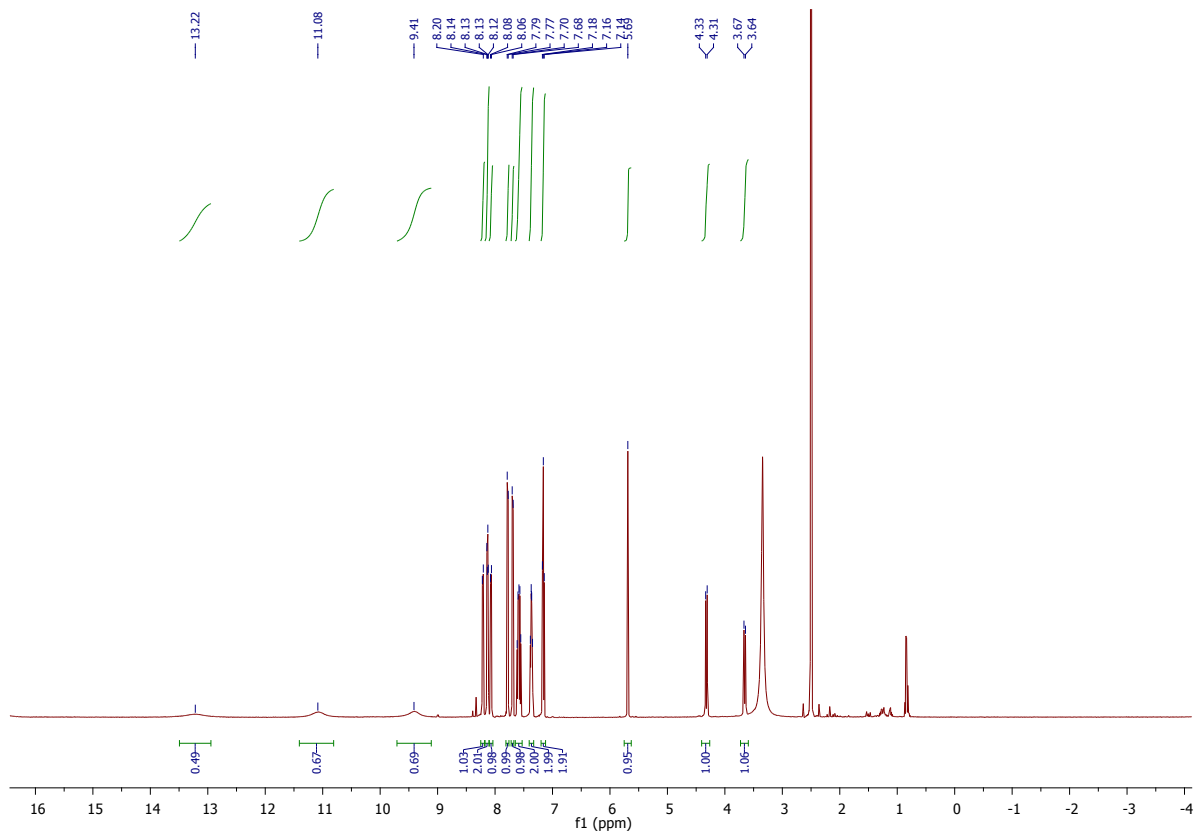
2nd eluting diastereoisomer (3S,11cS)-4-(Tert-butoxycarbonyl)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylic acid (+)-18b



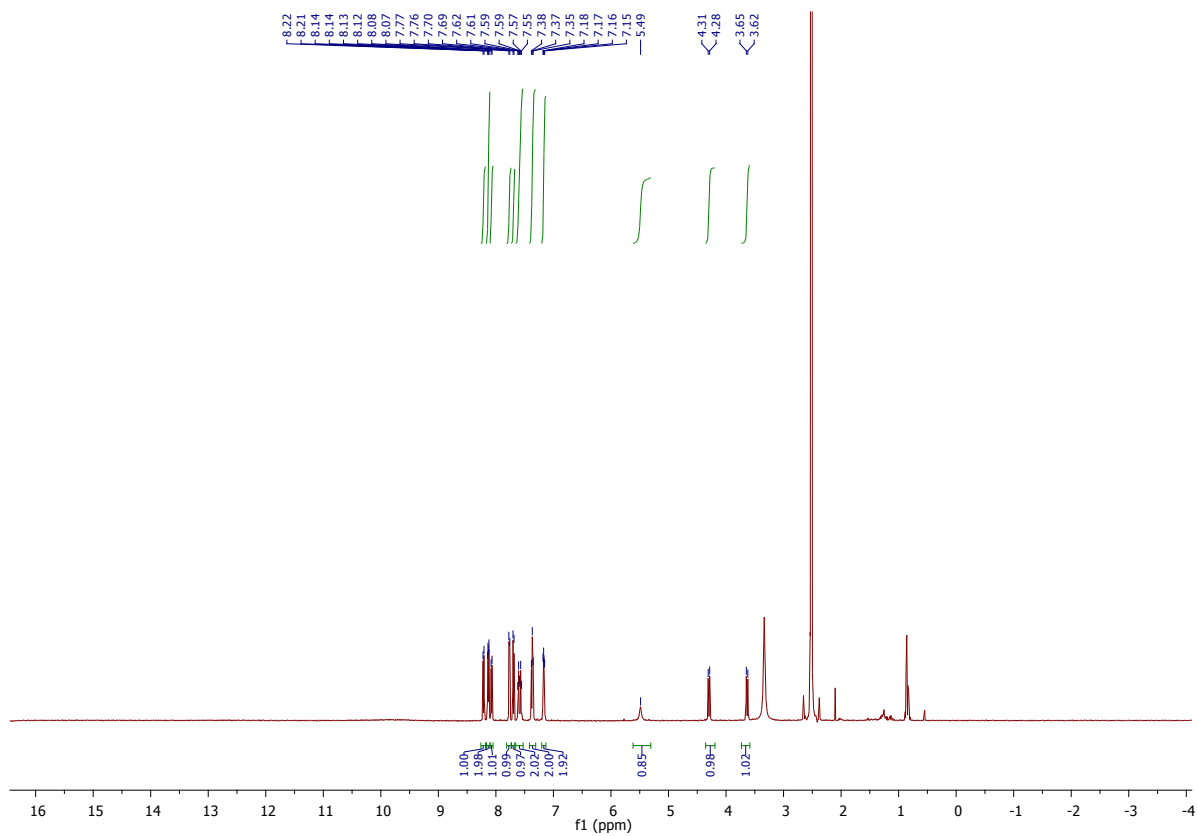
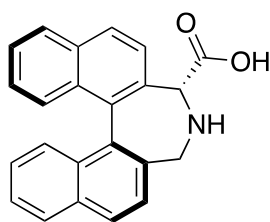


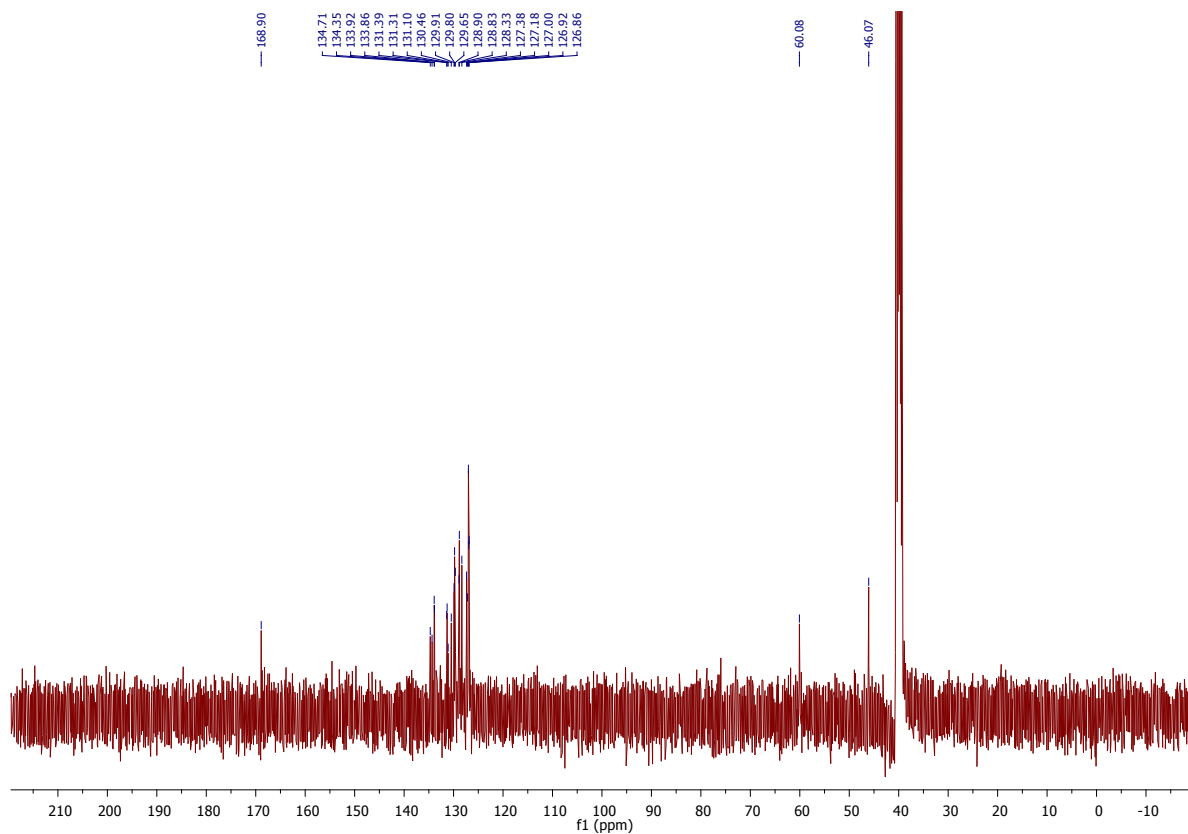
(3R,11cS)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylic acid hydrochloride (+)-19a.HCl



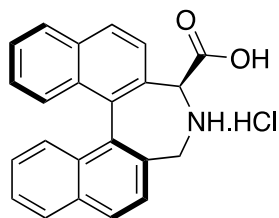


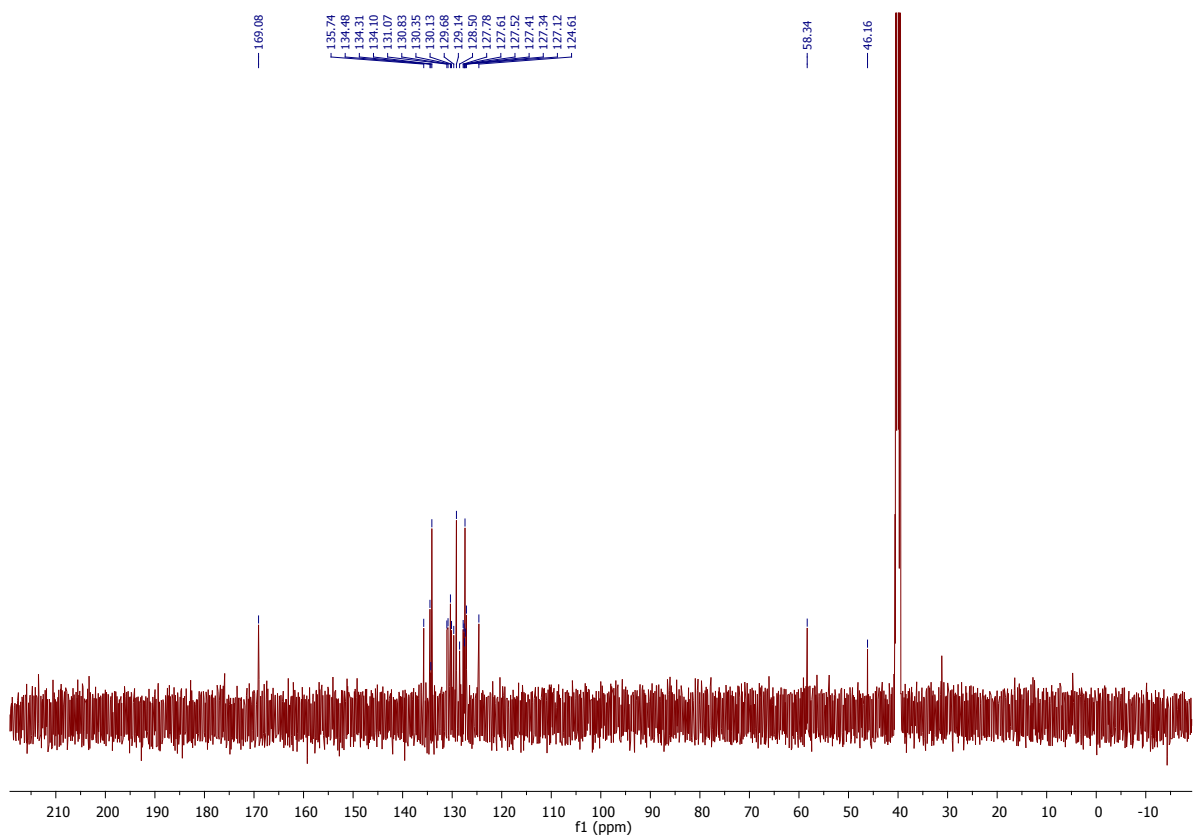
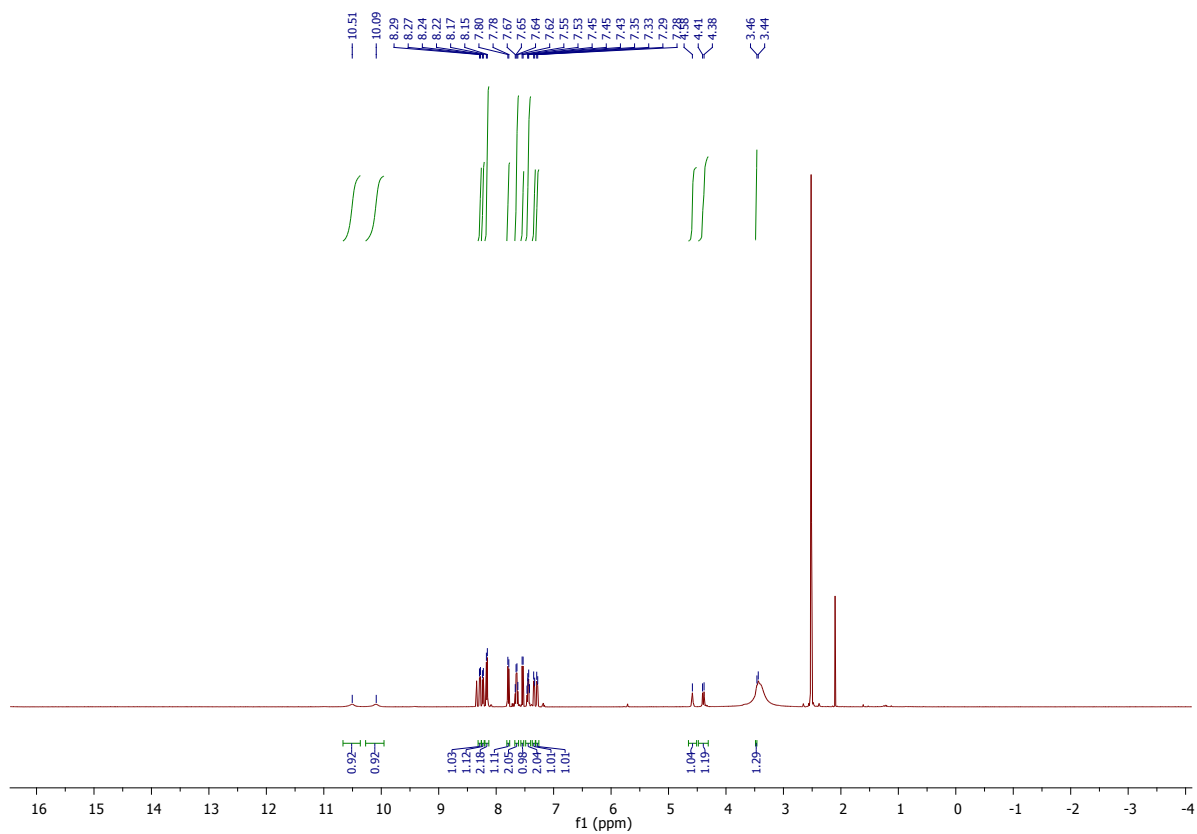
(3R,11cS)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylic acid (+)-19a



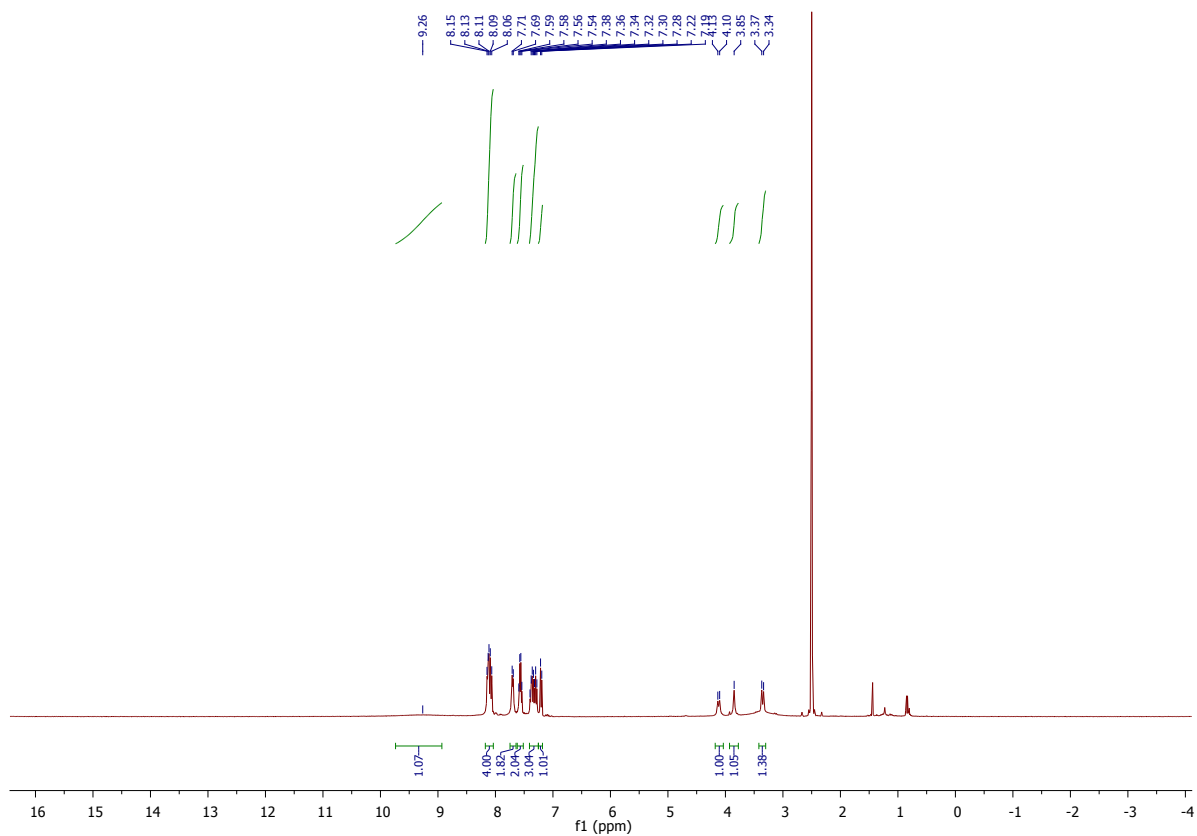
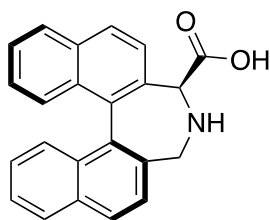


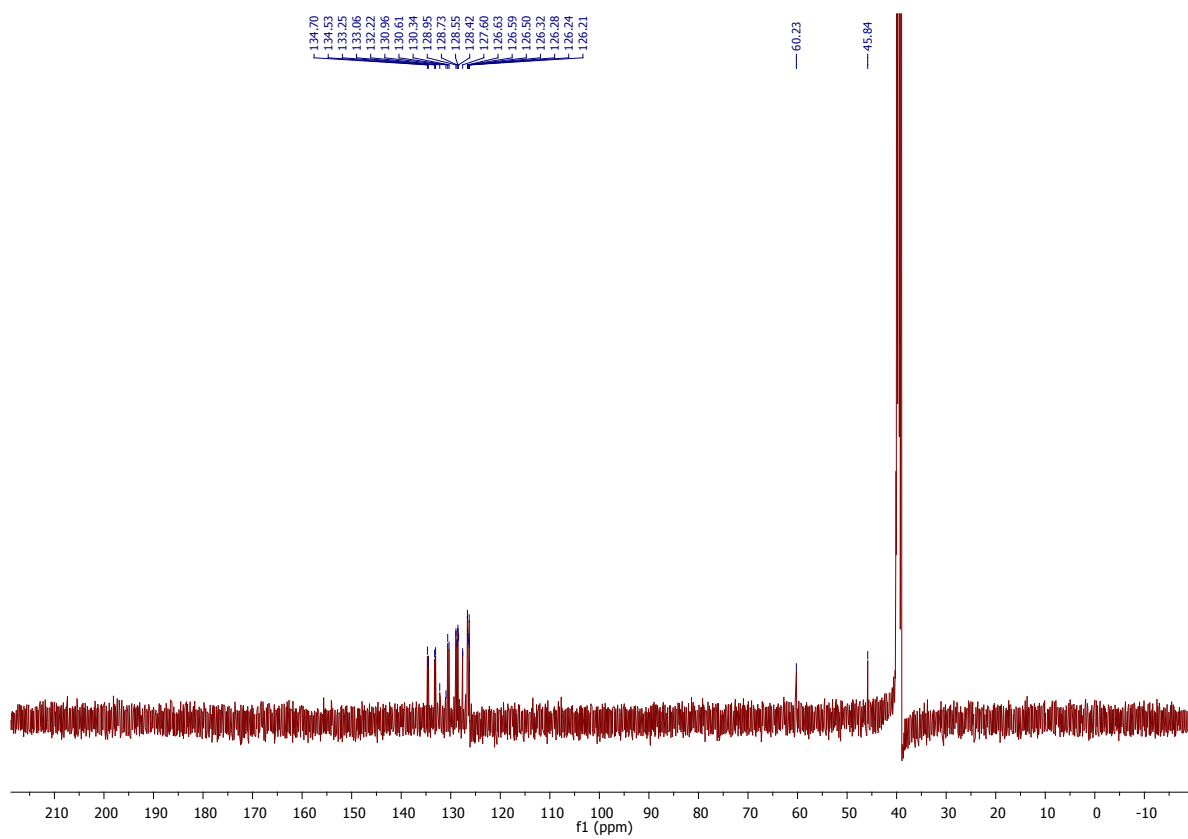
(3S,11cS)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylic acid hydrochloride (+)-19b.HCl



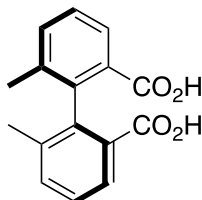


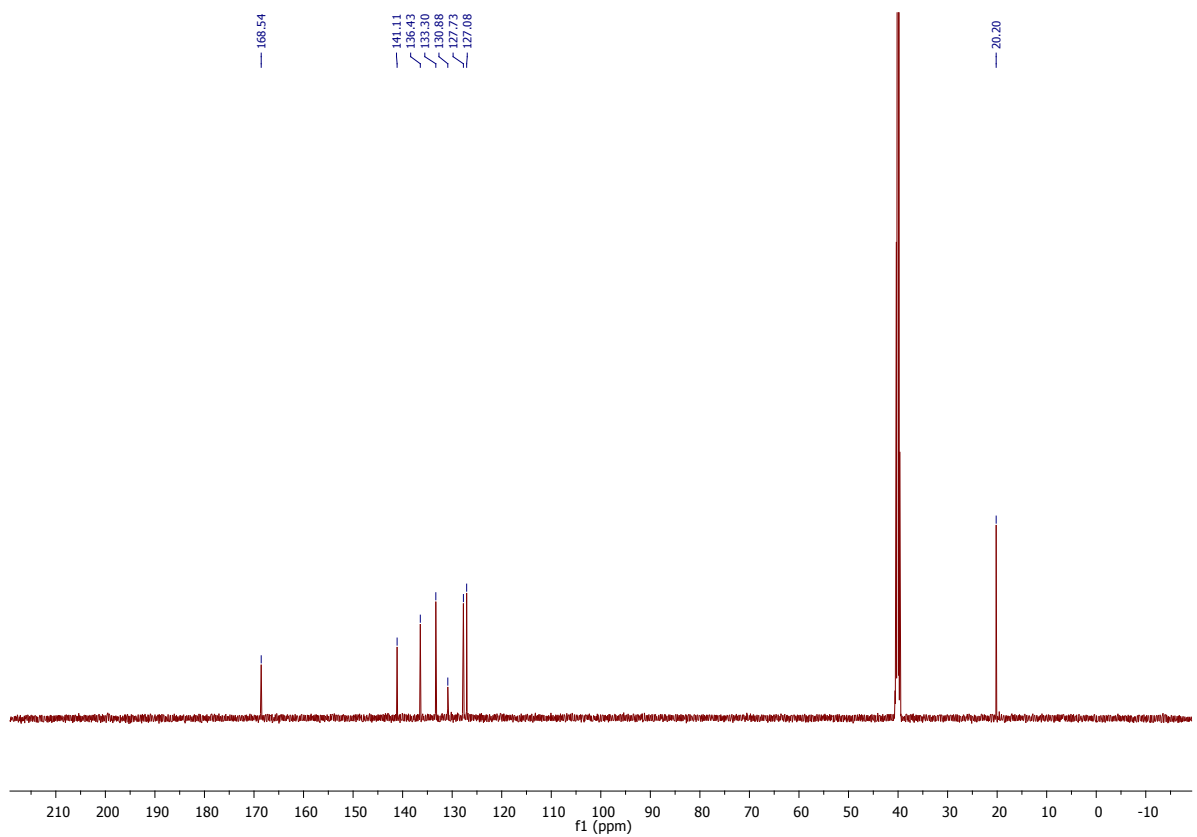
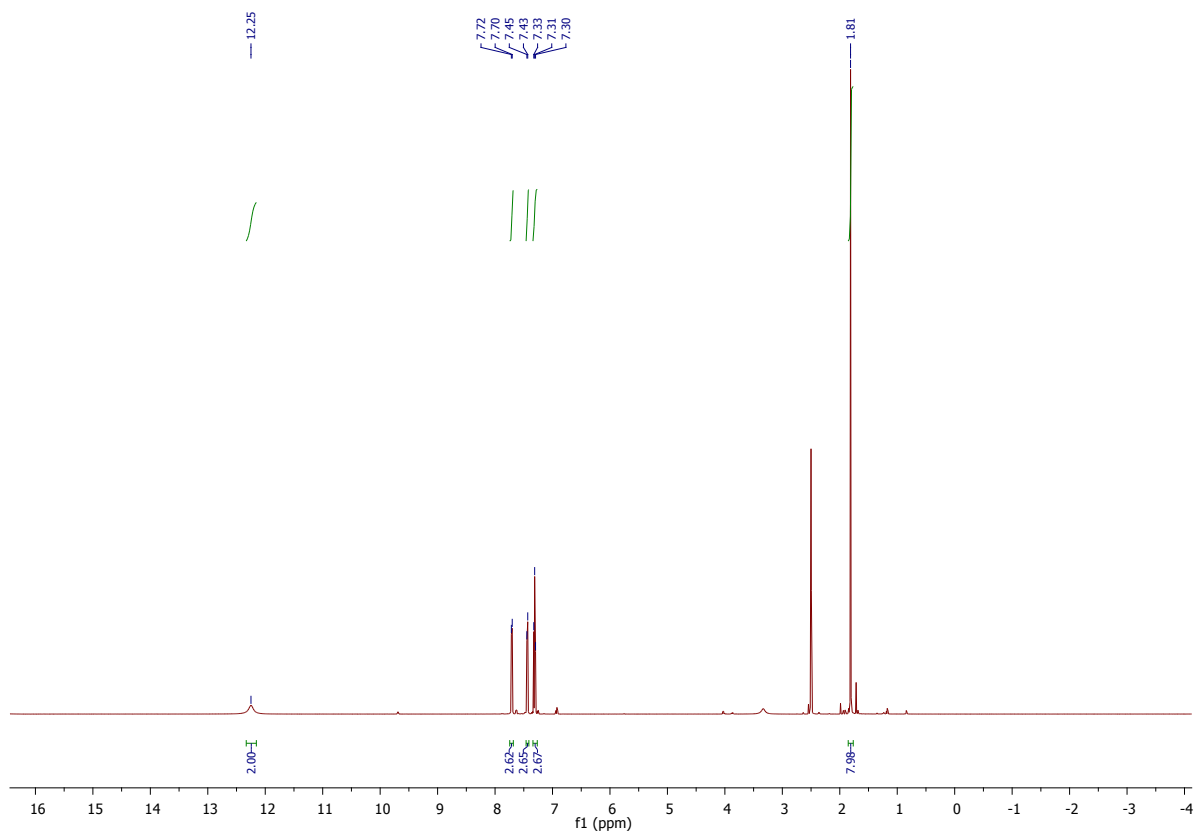
(3S,11cS)-4,5-dihydro-3H-dinaphtho[2,1-c:1',2'-e]azepine-3-carboxylic acid (+)-19b



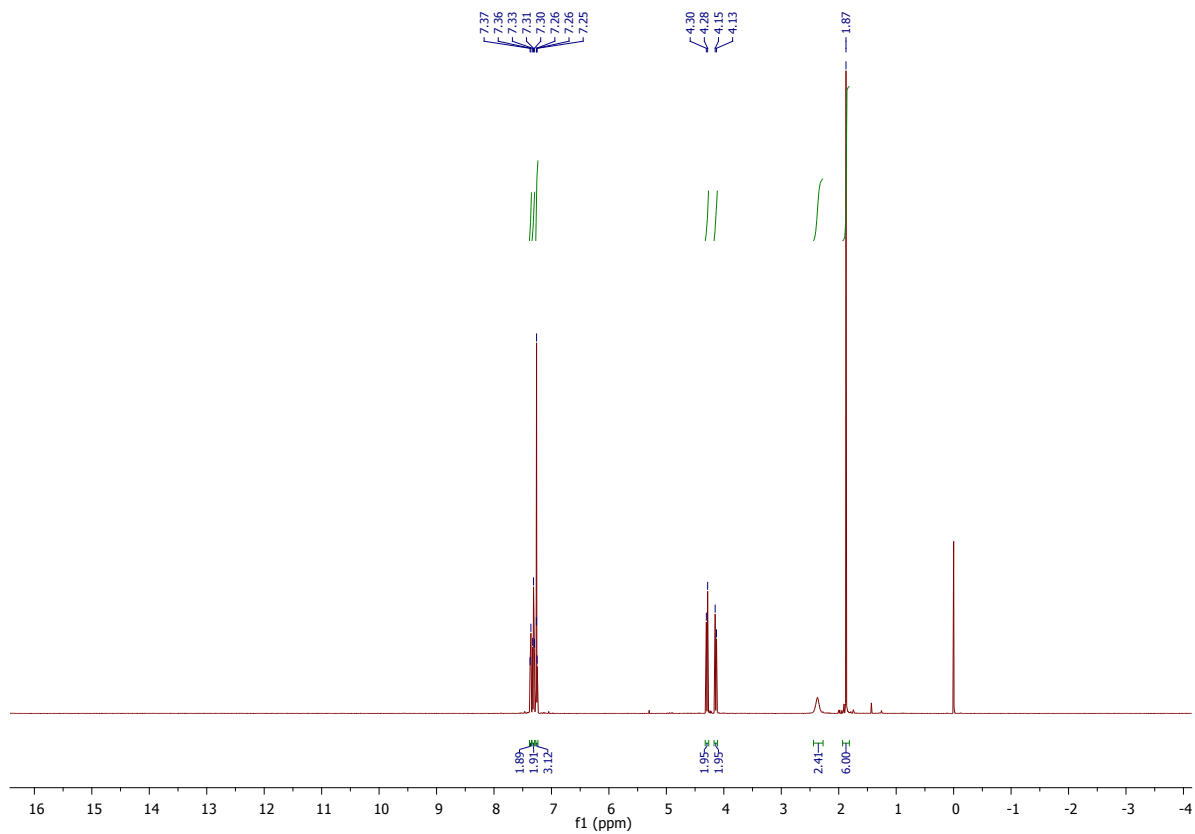
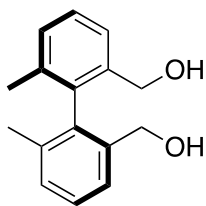


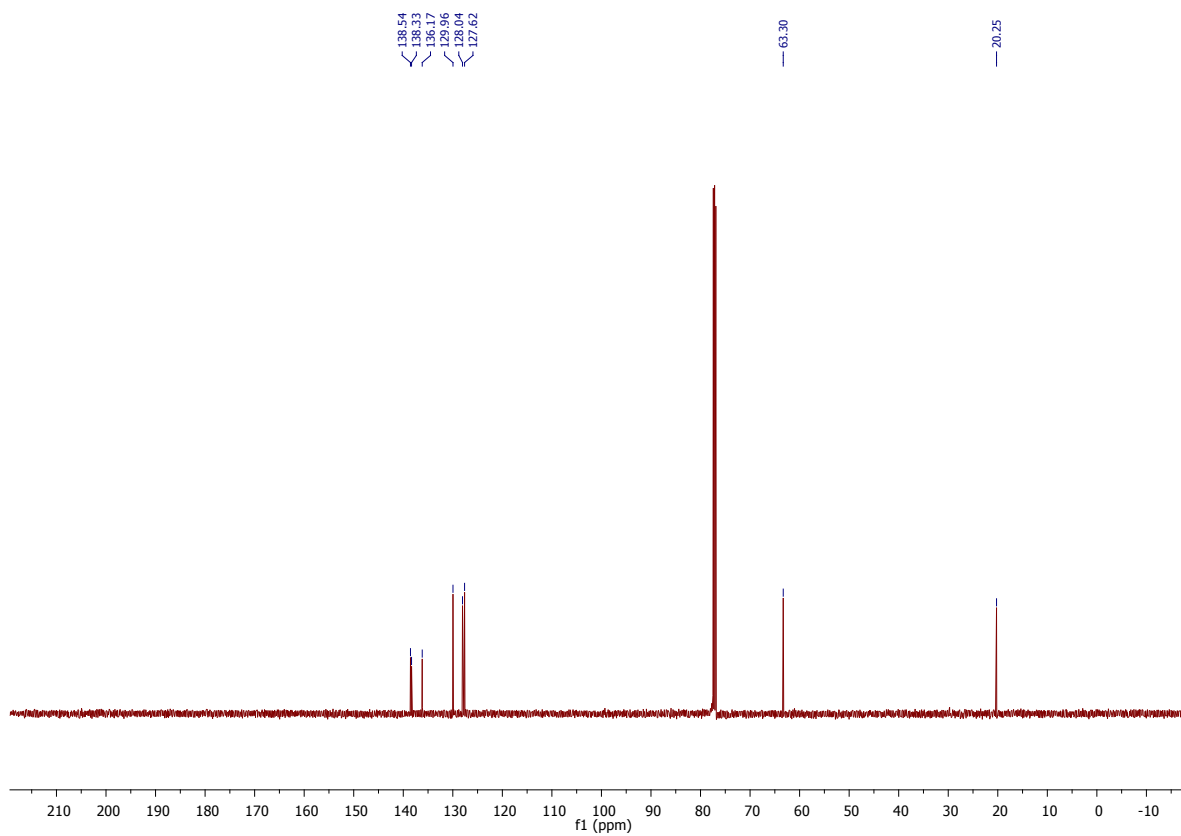
(S)-6,6'-dimethyl-[1,1'-biphenyl]-2,2'-dicarboxylic acid 31 (+)-21



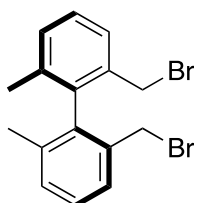


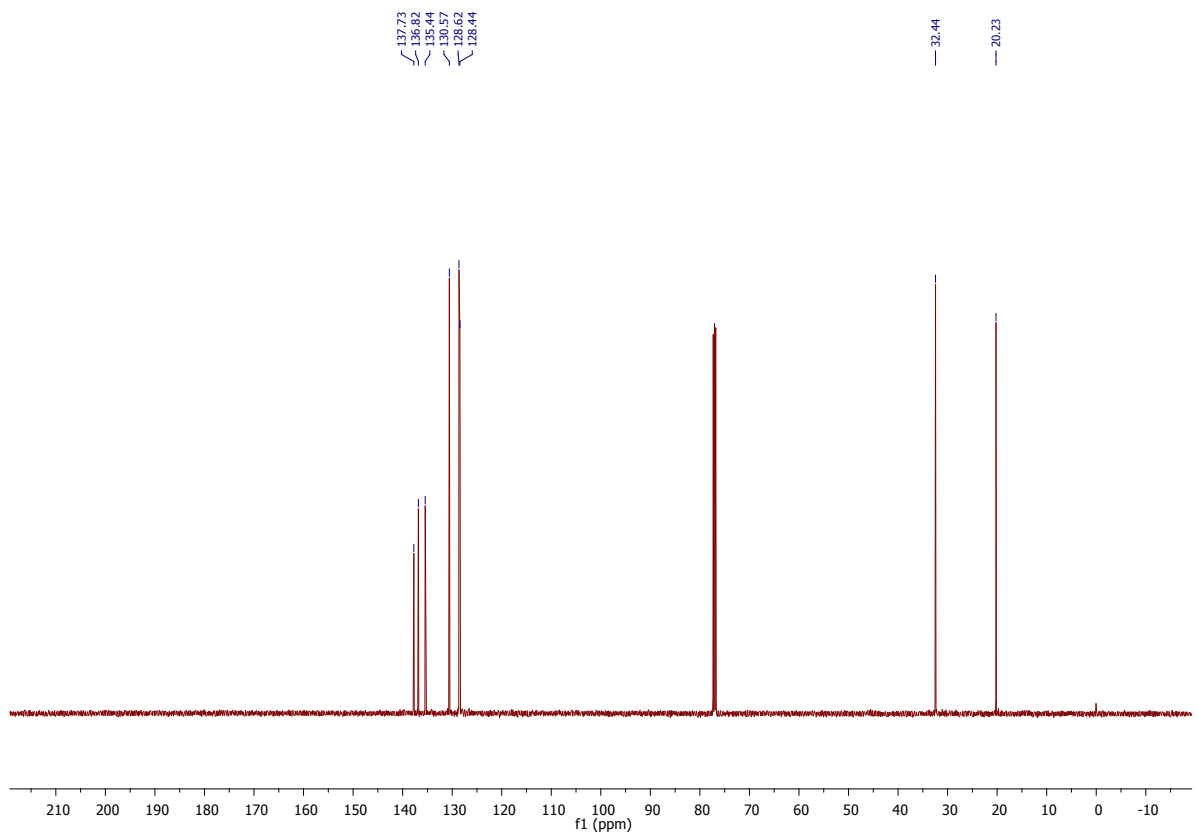
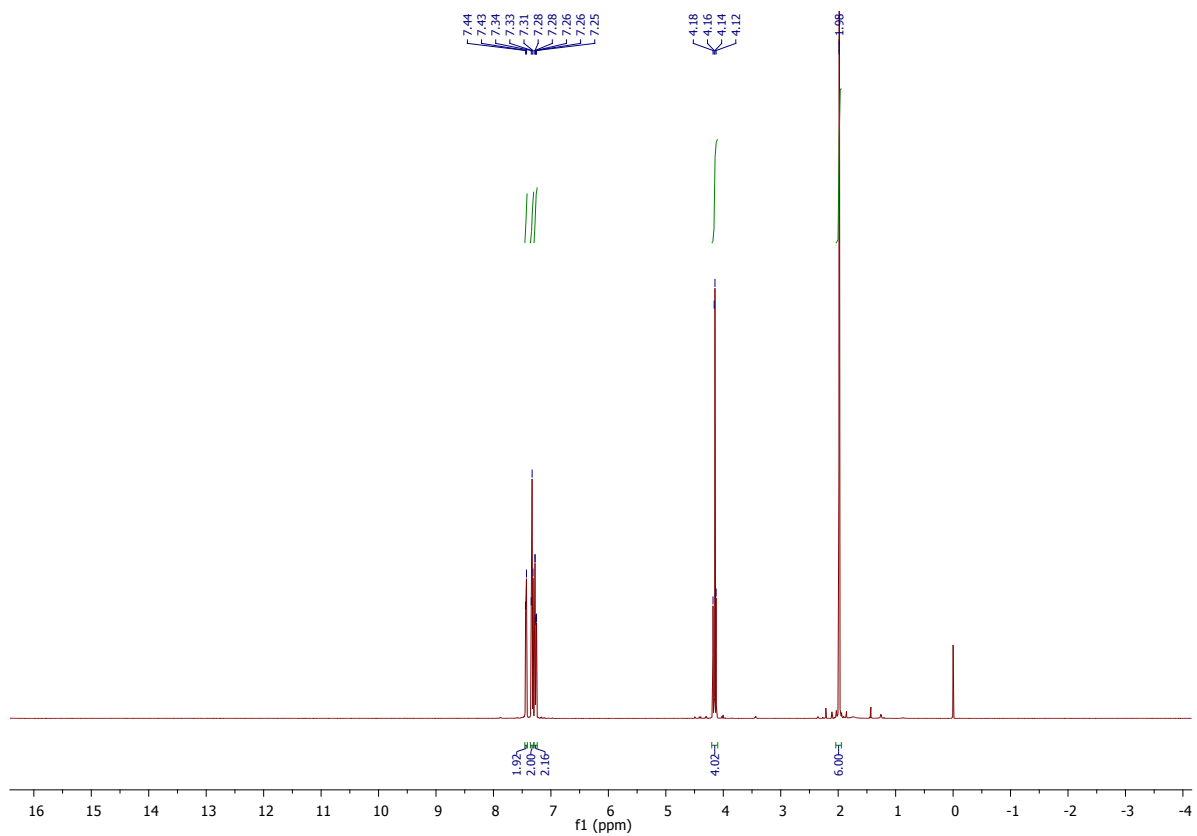
(-)-(S)-(6,6'-dimethyl-[1,1'-biphenyl]-2,2'-diyl)dimethanol (-)-22



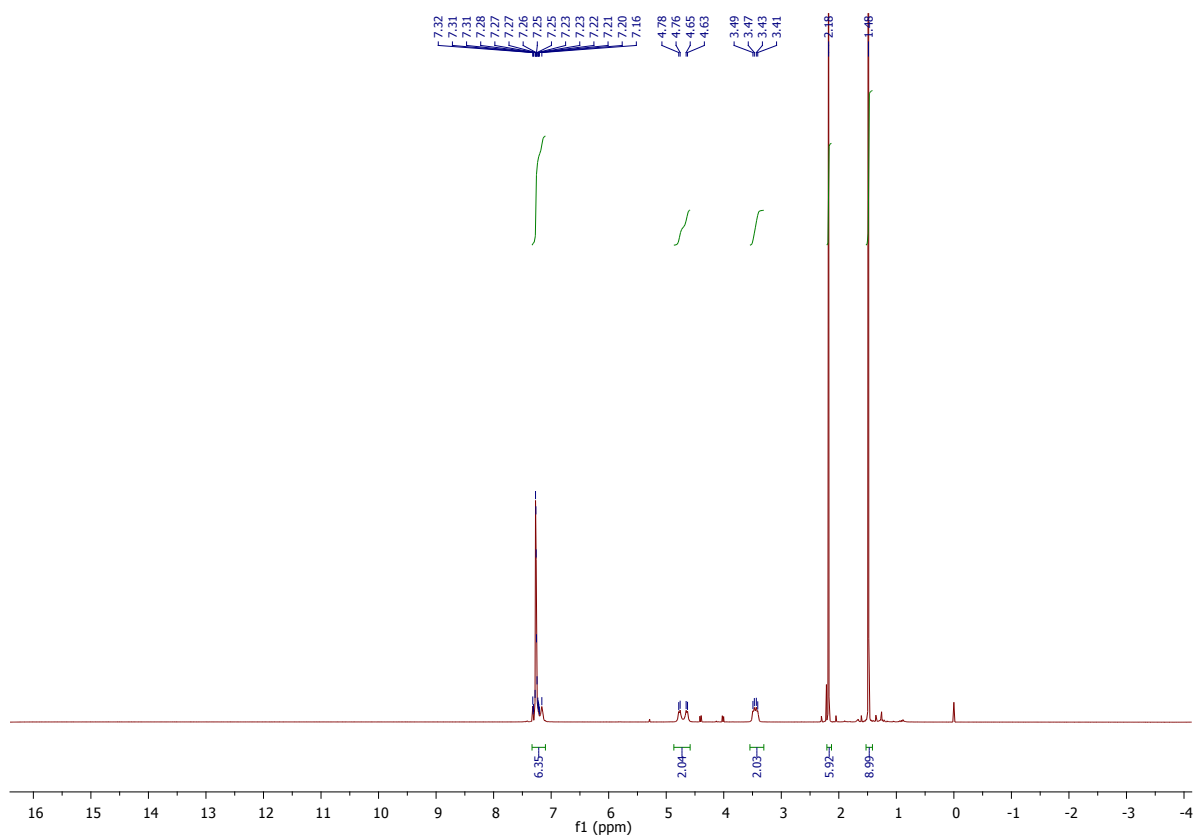
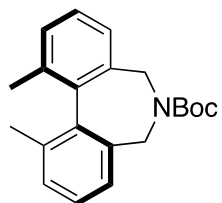


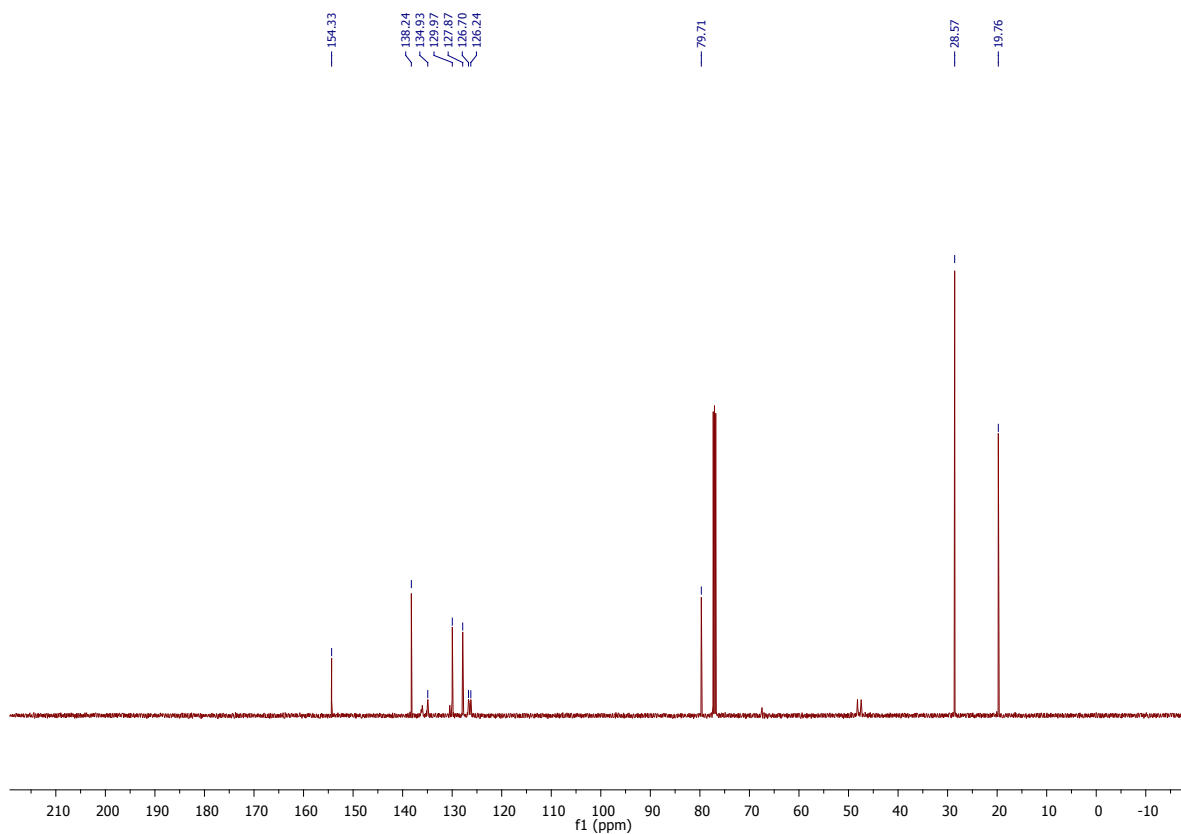
(+)-2,2'-bis(bromomethyl)-6,6'-dimethyl-1,1'-biphenyl (+)-20



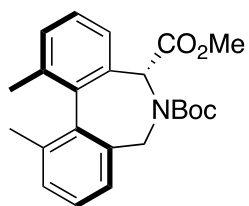


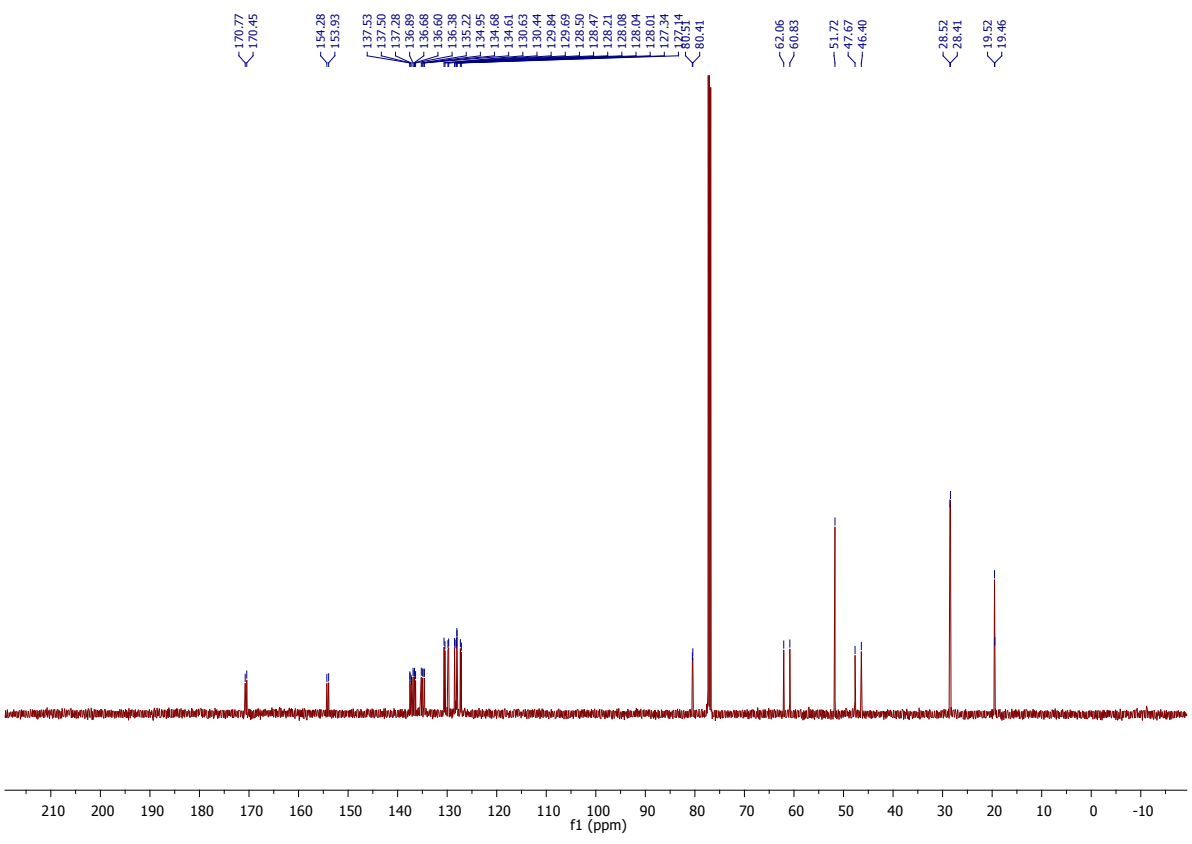
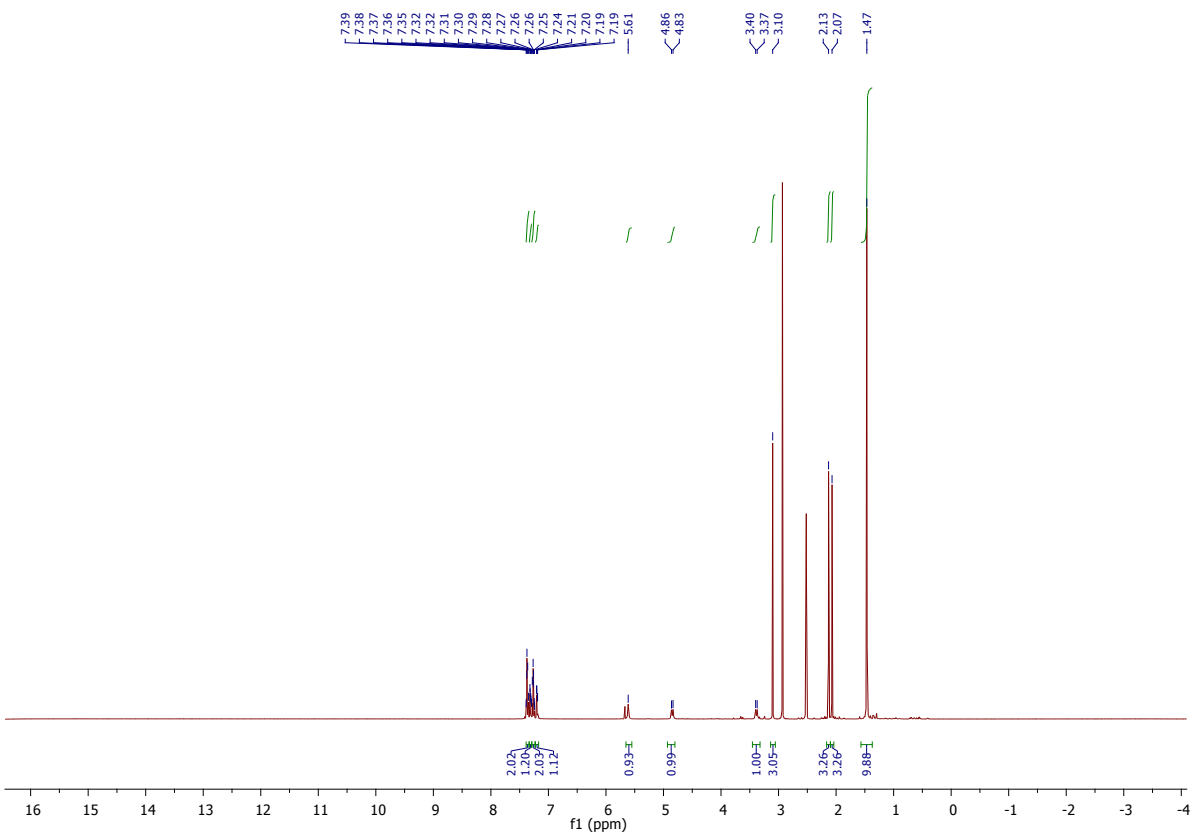
(+)-(S)-tert-butyl 1,11-dimethyl-5H-dibenzo[c,e]azepine-6(7H)-carboxylate (-)-23



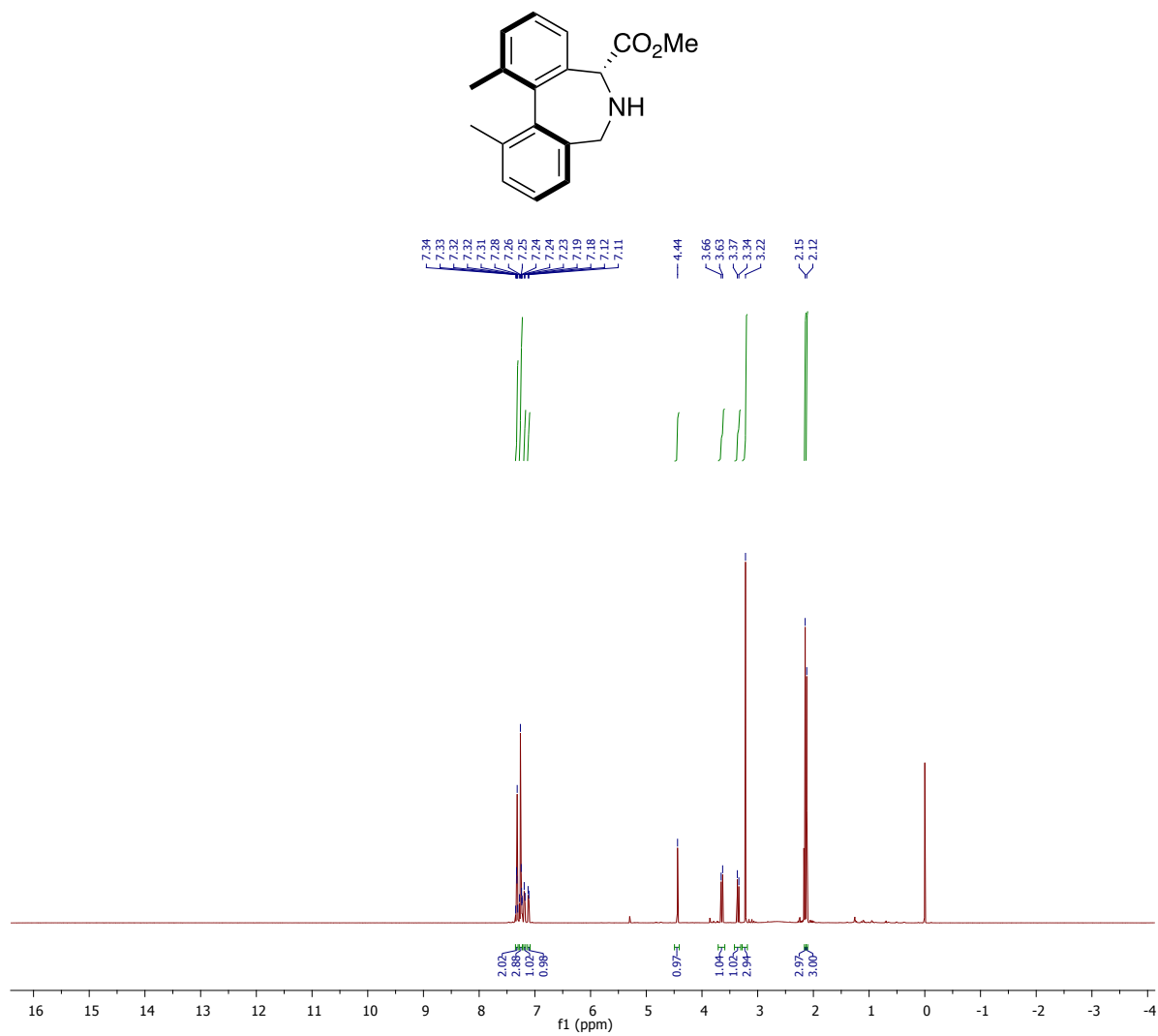


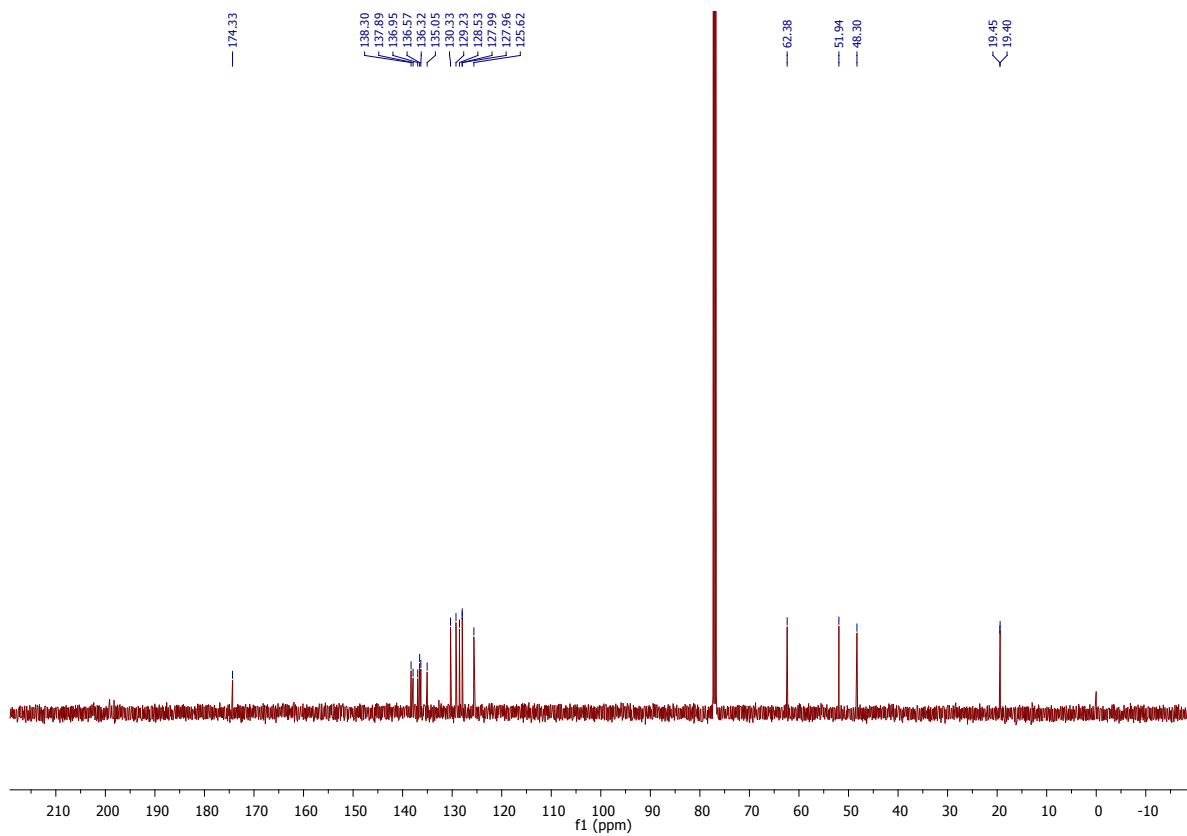
(5R,11bS)-6-tert-butyl 5-methyl 1,11-dimethyl-5H-dibenzo[c,e]azepine-5,6(7H)-dicarboxylate (–)-24



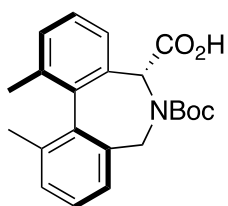


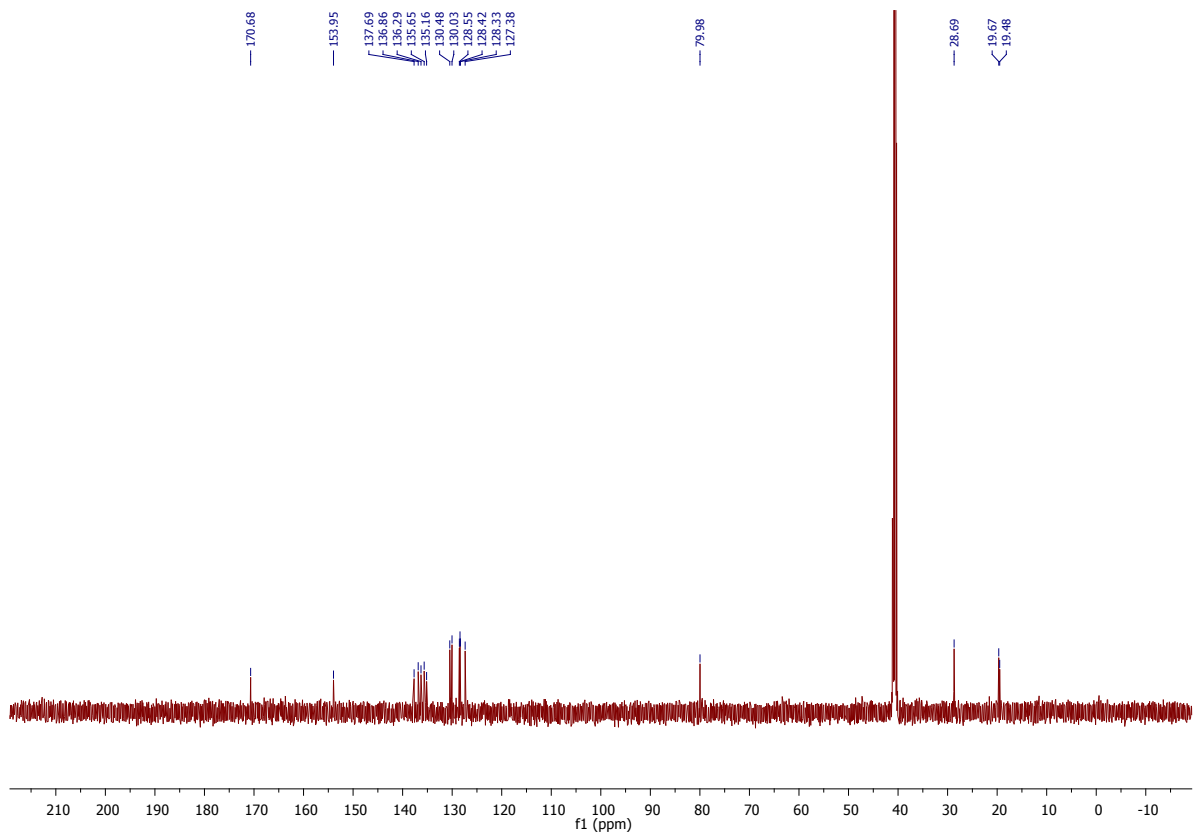
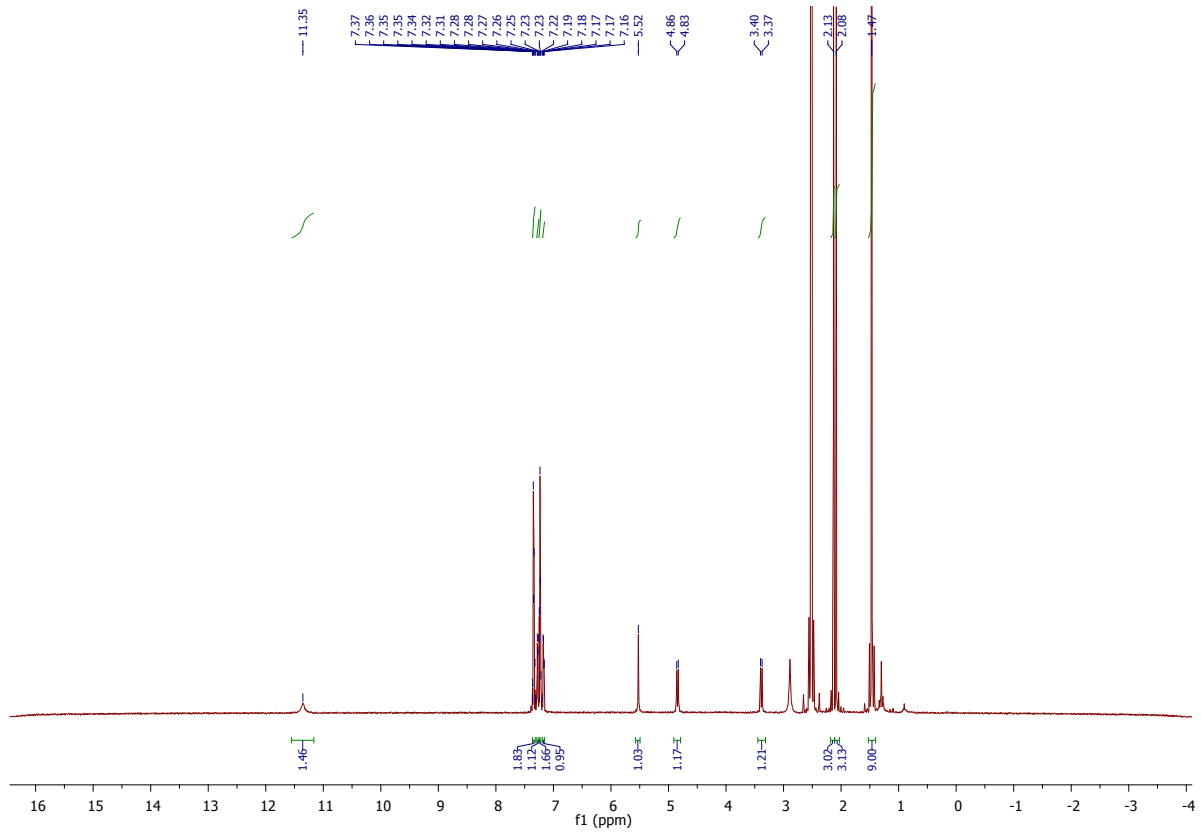
(5R,11bS)-Methyl 1,11-dimethyl-6,7-dihydro-5H-dibenzo[c,e]azepine-5-carboxylate (+)-
25



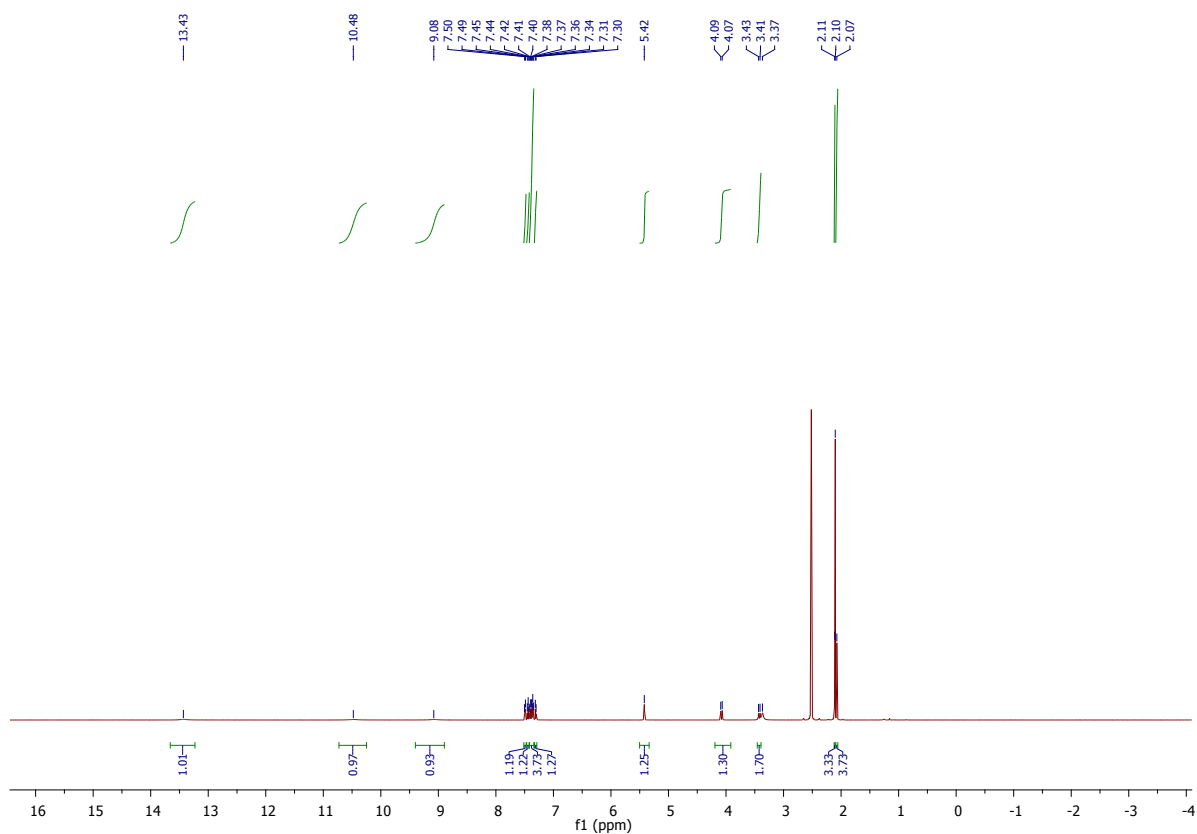
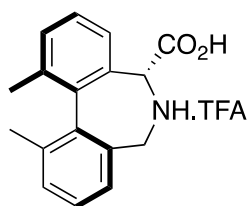


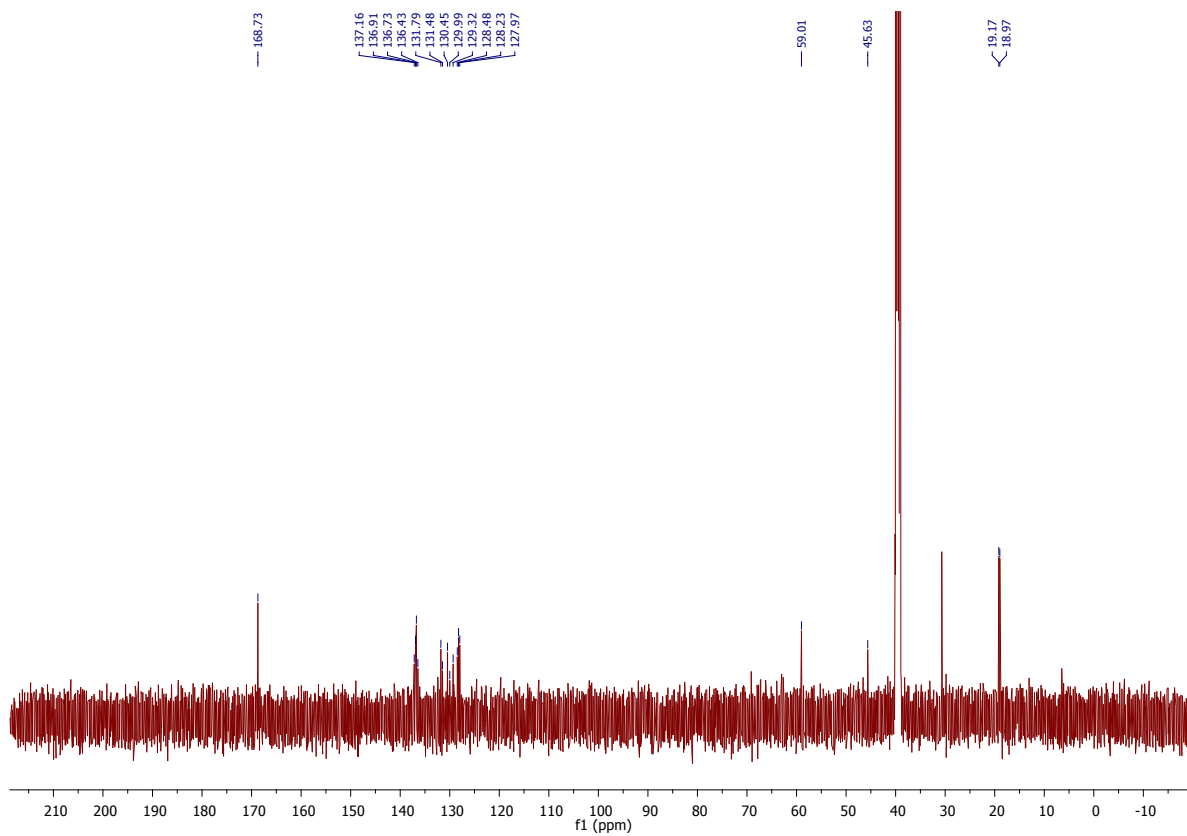
(5R,11bS)-6-(tert-butoxycarbonyl)-1,11-dimethyl-6,7-dihydro-5Hdibenzo[c,e] azepine-5-carboxylic acid (-)-26





(5R,11bS)-1,11-dimethyl-6,7-dihydro-5H-dibenzo[*c,e*]azepine-5-carboxylic acid trifluoroacetic acid (-)-27.TFA

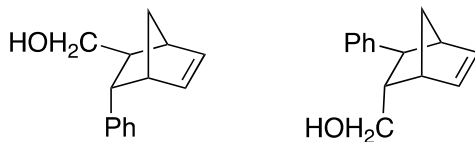




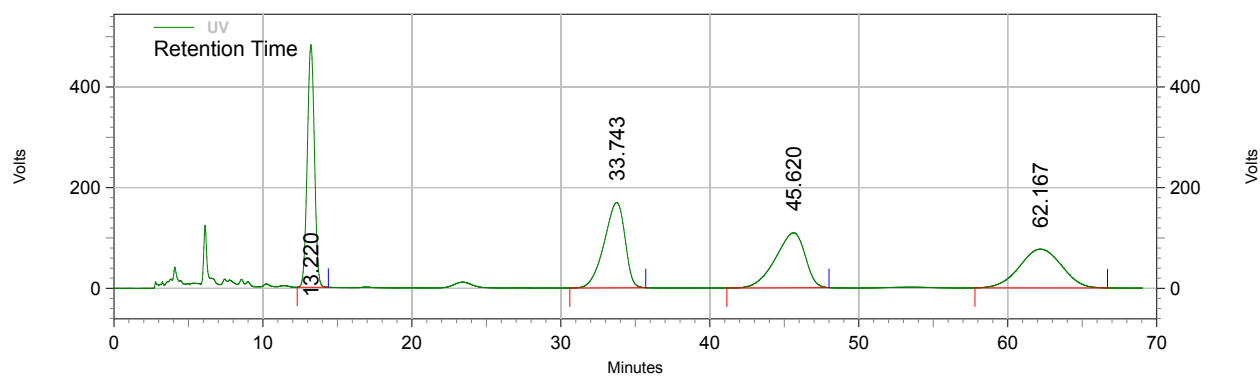
Racemic trace

Table 1: Entry 1

3-Phenylbicyclo[2.2.1]hept-5-en-2-yl)methanol



Enantiomeric excesses were determined using HPLC with Chiralcel® OJ column (hexane/iPrOH=90:10, $\lambda=222$ nm), 1.0 mL; *endo* isomer (t_R 15 min, 35 min) *exo* isomer (t_R 47 min, 65 min))

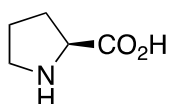


UV Results

Retention Time	Area	Area %	Height	Height %
13.220	64536756	25.71	1928102	57.55
33.743	65498431	26.09	677564	20.22
45.620	60424958	24.07	436586	13.03
62.167	60578598	24.13	308081	9.20

Totals	251038743	100.00	3350333	100.00
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Table 1: Entry 2

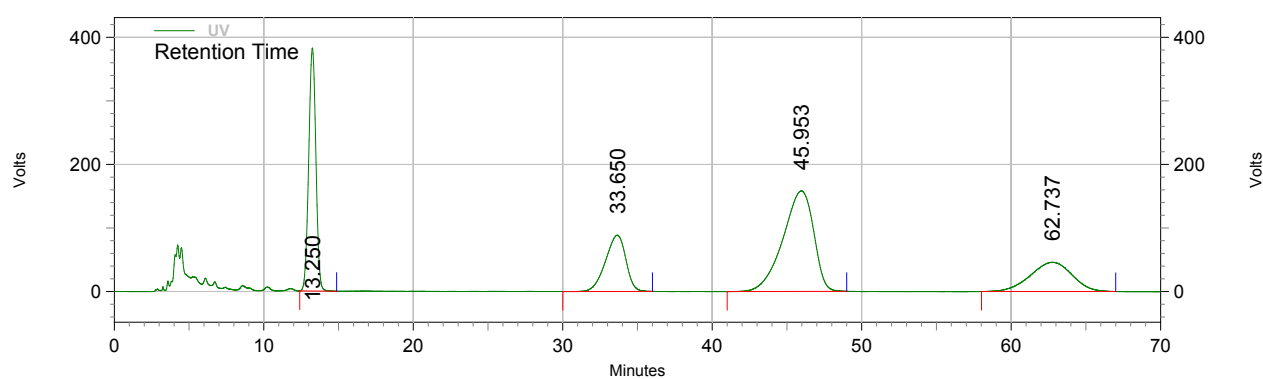


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk81a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 12:06:25

Printed: 12/08/2015 16:07:04

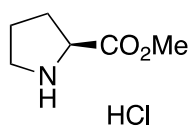


UV Results

Retention Time	Area	Area %	Height	Height %
13.250	51007629	24.22	1529611	56.64
33.650	33510346	15.91	354250	13.12
45.953	90381098	42.92	632596	23.43
62.737	35702246	16.95	183908	6.81

Totals	210601319	100.00	2700365	100.00
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Table 1: Entry 3

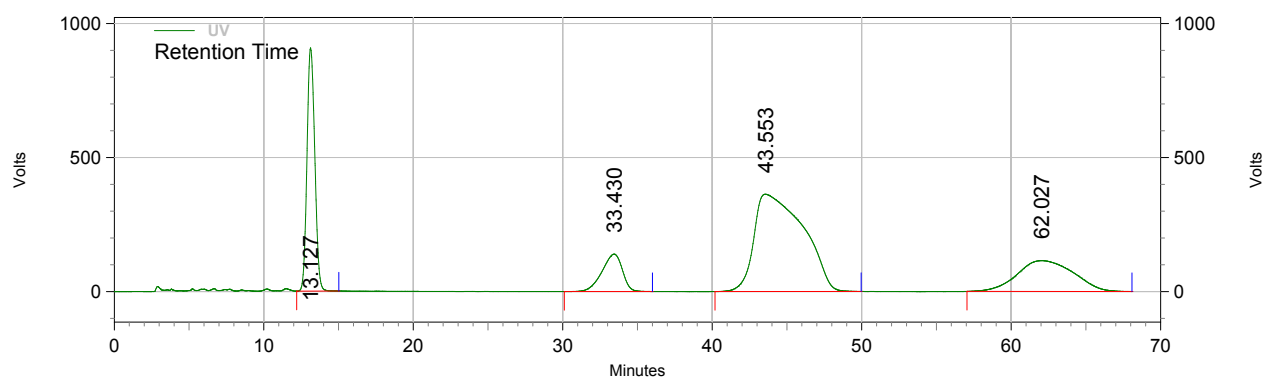


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk146A 80.20 70 min OJ 222nm 1 ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 27/08/2015 12:31:30

Printed: 27/08/2015 13:42:30

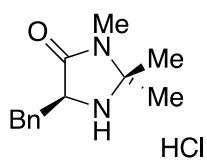


UV Results

Retention Time	Area	Area %	Height	Height %
13.127	131888924	20.65	3629379	59.51
33.430	52971200	8.29	558125	9.15
43.553	333423380	52.21	1451480	23.80
62.027	120378914	18.85	460042	7.54

Totals	638662418	100.00	6099026	100.00
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Table 1: Entry 4

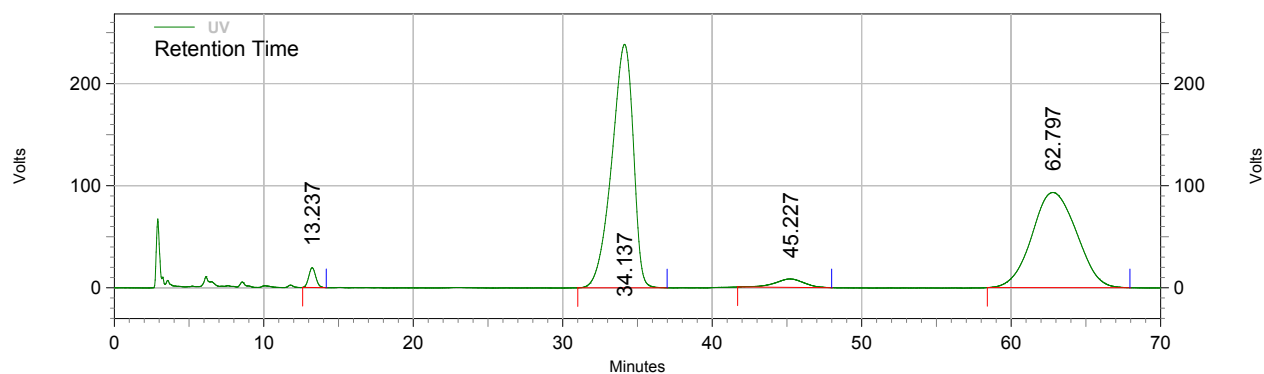


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk111a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 06:10:02

Printed: 12/08/2015 10:04:20

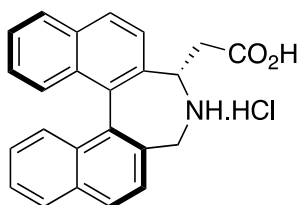


UV Results

Retention Time	Area	Area %	Height	Height %
13.237	2535884	1.41	77678	5.40
34.137	95500448	53.13	953999	66.36
45.227	4462090	2.48	33011	2.30
62.797	77264272	42.98	372904	25.94

Totals	179762694	100.00	1437592	100.00
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Table 1: Entry 9

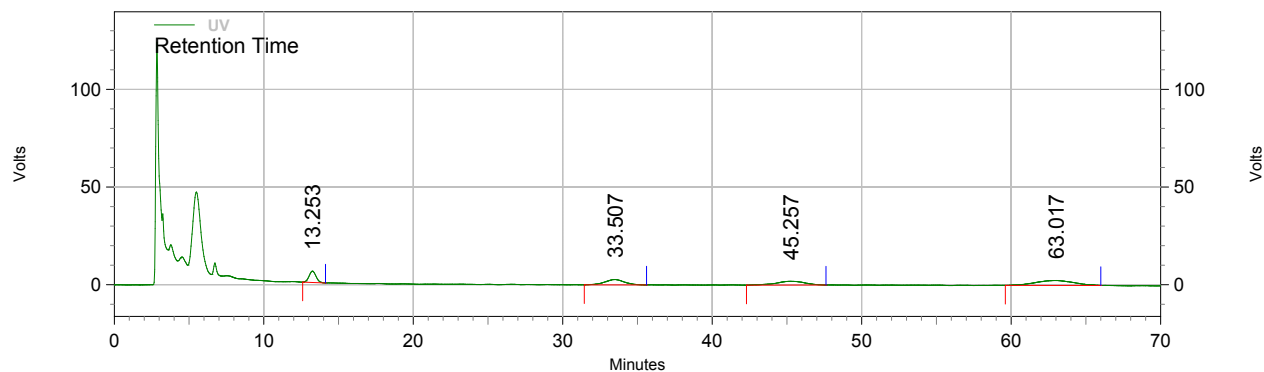


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk105a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 10:55:10

Printed: 12/08/2015 16:12:07

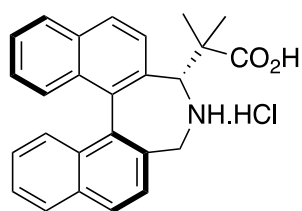


UV Results

Retention Time	Area	Area %	Height	Height %
13.253	751905	16.38	23162	44.59
33.507	1001477	21.82	10940	21.06
45.257	1047410	22.82	7748	14.92
63.017	1789119	38.98	10092	19.43

Totals	4589911	100.00	51942	100.00
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Table 1: Entry 10

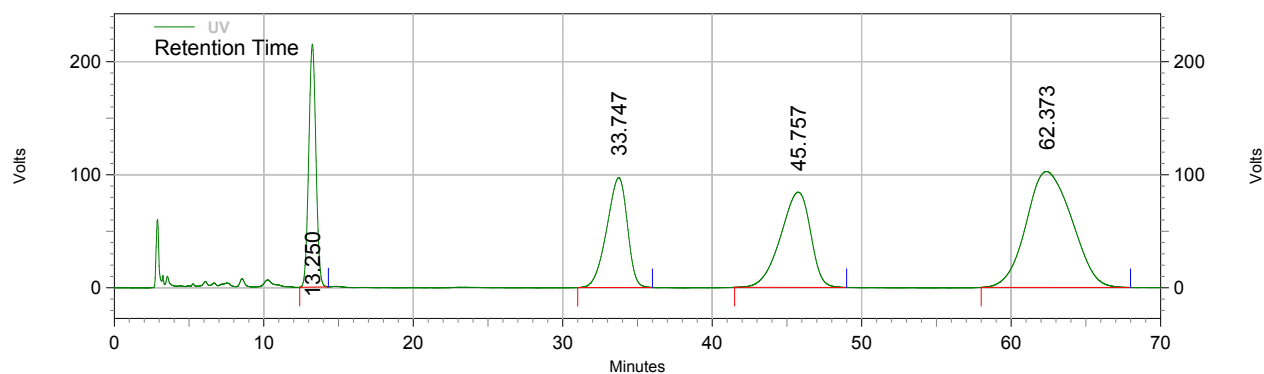


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk106a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 08:32:35

Printed: 12/08/2015 10:01:41

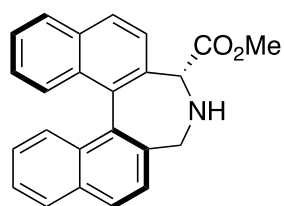


UV Results

Retention Time	Area	Area %	Height	Height %
13.250	28787746	14.39	859465	43.07
33.747	37159913	18.57	388520	19.47
45.757	47032218	23.51	337013	16.89
62.373	87102801	43.53	410333	20.56

Totals	200082678	100.00	1995331	100.00
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Table 1: Entry 11

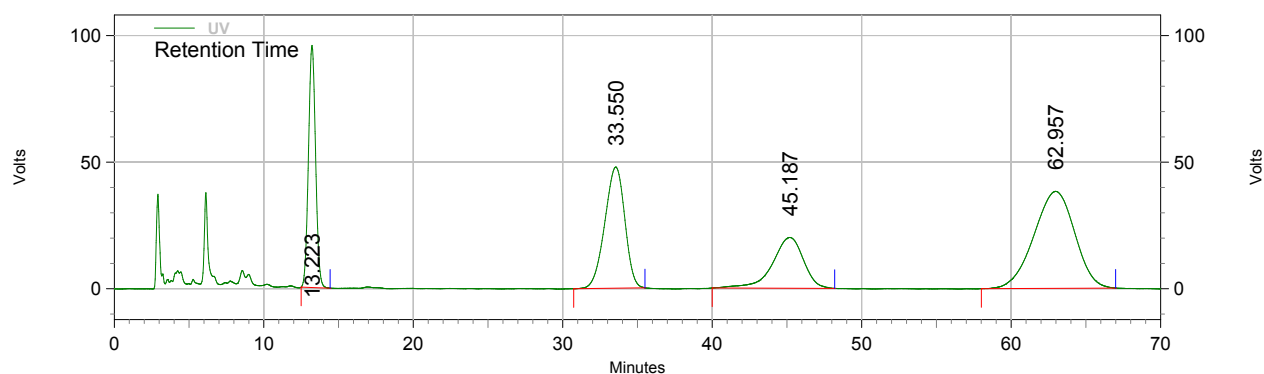


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk115a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 11/08/2015 21:51:29

Printed: 12/08/2015 10:25:56

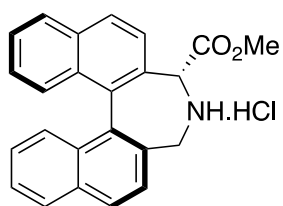


UV Results

Retention Time	Area	Area %	Height	Height %
13.223	12692405	17.83	382644	47.37
33.550	17808685	25.01	191505	23.71
45.187	11576366	16.26	80270	9.94
62.957	29122669	40.90	153312	18.98

Totals				
	71200125	100.00	807731	100.00

Table 1: Entry 12

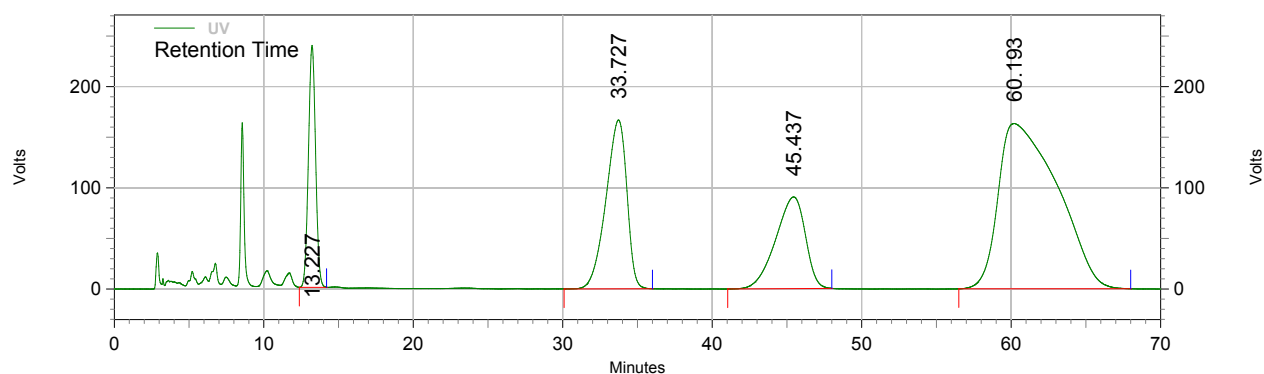


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk122a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 02:36:15

Printed: 12/08/2015 10:36:00



UV Results

Retention Time	Area	Area %	Height	Height %
13.227	31895315	9.75	956531	36.24
33.727	64867738	19.83	667327	25.28
45.437	50082498	15.31	362259	13.72
60.193	180191602	55.10	653465	24.76

Totals	327037153	100.00	2639582	100.00
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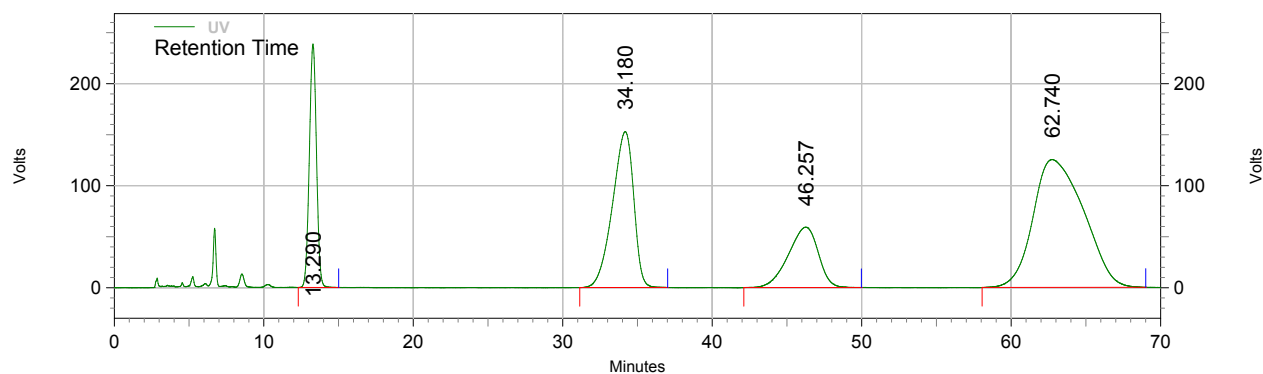
Table 1: Entry 13

Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\fk155a OJ col 70min 80.20 1ml 222nm.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 18/09/2015 21:49:54

Printed: 19/09/2015 10:11:22



UV Results

Retention Time	Area	Area %	Height	Height %
13.290	31628773	13.03	954437	41.43
34.180	60283005	24.83	611146	26.53
46.257	33002472	13.59	236572	10.27
62.740	117891887	48.55	501415	21.77

Totals	242806137	100.00	2303570	100.00
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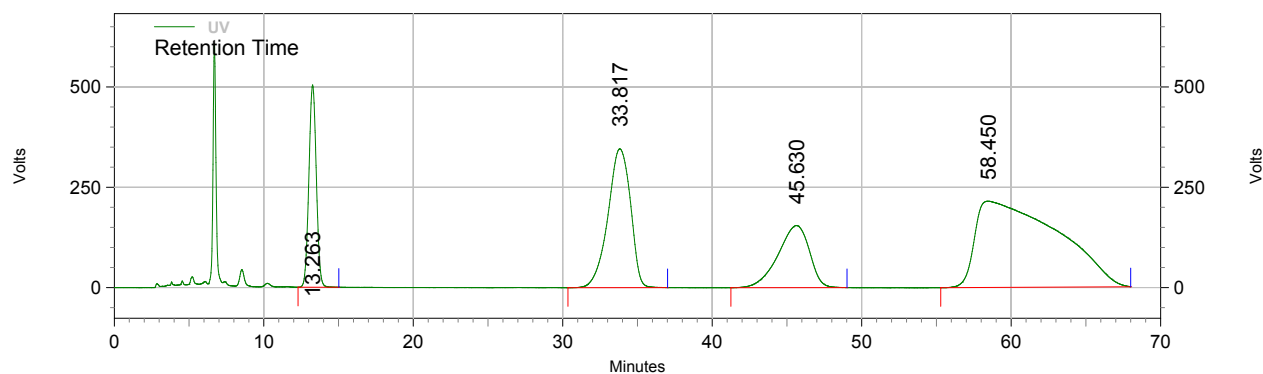
Table 1: Entry 14

Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk150a 80.20 70 min OJ new col 222nm 1 ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 25/08/2015 19:15:15

Printed: 26/08/2015 10:32:28



UV Results

Retention Time	Area	Area %	Height	Height %
13.263	69612656	10.93	2016253	41.33
33.817	145199395	22.80	1383630	28.36
45.630	90385111	14.20	618673	12.68
58.450	331523585	52.07	859872	17.63

Totals	636720747	100.00	4878428	100.00
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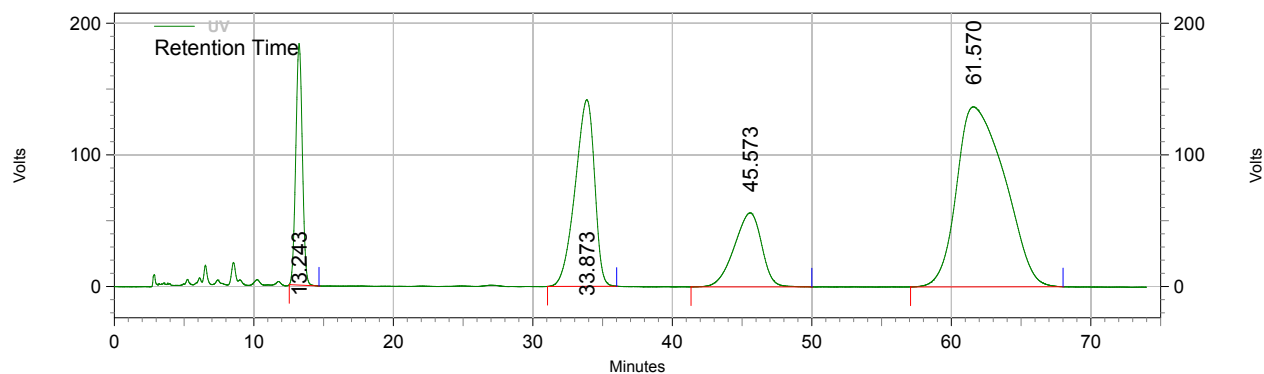
Table 1: Entry 15

Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk141A 80.20 70 min OJ 222nm 1 ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 27/08/2015 13:40:54

Printed: 27/08/2015 15:01:49



UV Results

Retention Time	Area	Area %	Height	Height %
13.243	24066176	10.00	733768	35.40
33.873	54790835	22.76	567050	27.36
45.573	30757918	12.78	224860	10.85
61.570	131091183	54.46	546904	26.39

Totals	240706112	100.00	2072582	100.00
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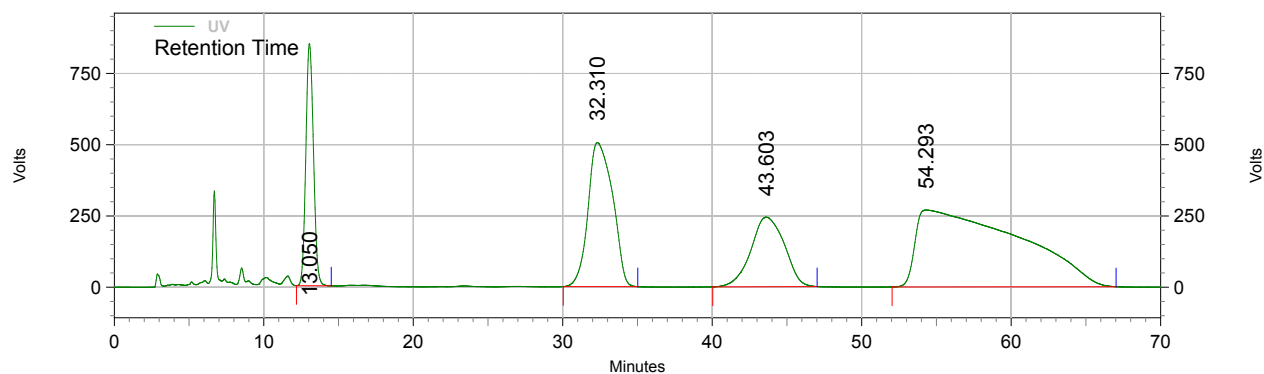
Table 1: Entry 16

Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk149A 80.20 70 min OJ 222nm 1 ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 27/08/2015 14:56:04

Printed: 27/08/2015 16:49:34

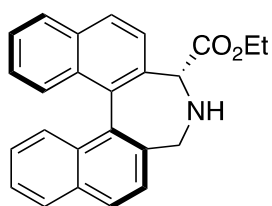


UV Results

Retention Time	Area	Area %	Height	Height %
13.050	120621900	11.76	3397867	45.46
32.310	230889588	22.51	2021312	27.04
43.603	151872631	14.81	976340	13.06
54.293	522194865	50.92	1078936	14.43

Totals	1025578984	100.00	7474455	100.00
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Table 1: Entry 17

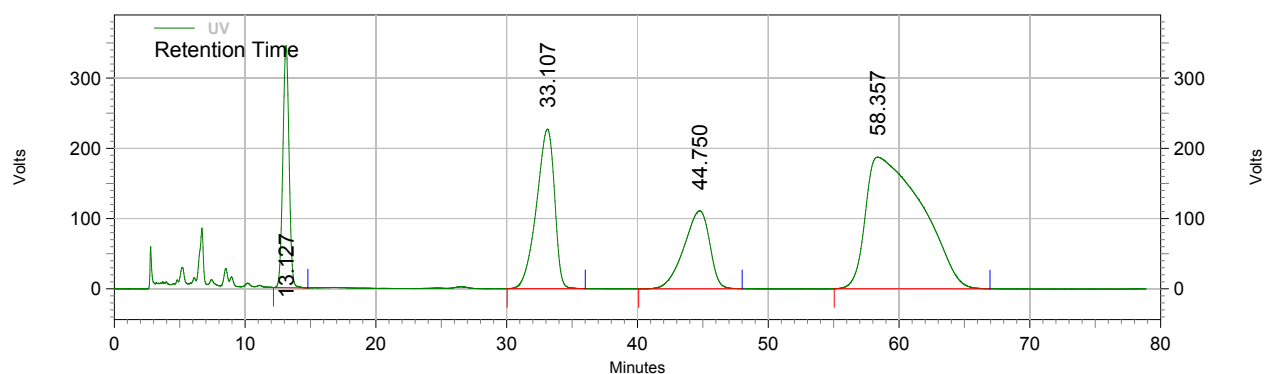


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk143A 80.20 70 min OJ 222nm 1 ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 11/09/2015 11:51:35

Printed: 11/09/2015 13:13:14

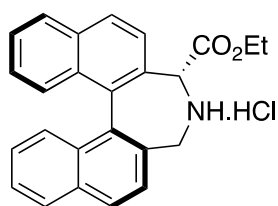


UV Results

Retention Time	Area	Area %	Height	Height %
13.127	45428356	10.87	1379101	39.64
33.107	86833598	20.78	907986	26.10
44.750	60782790	14.55	443364	12.74
58.357	224756662	53.80	749036	21.53

Totals	417801406	100.00	3479487	100.00
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Table 1: Entry 18

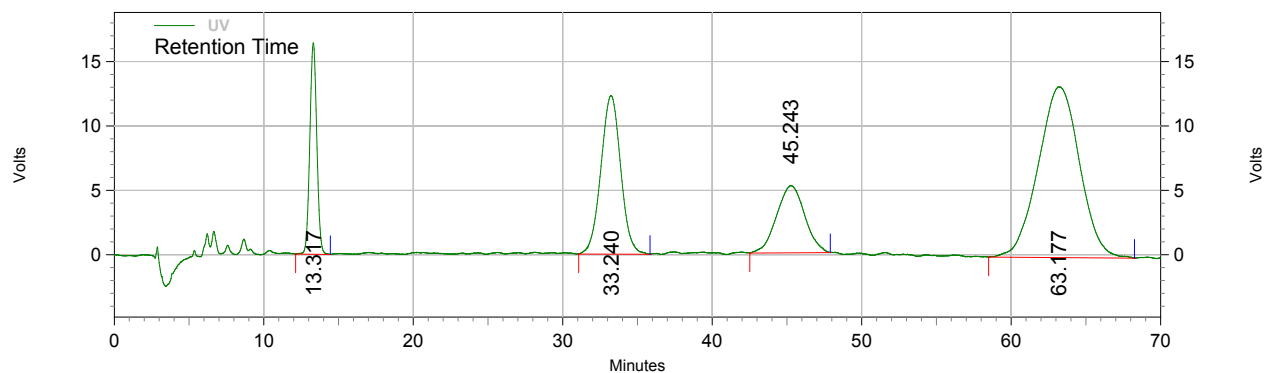


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\fk156a OJ col 70min 80.20 1ml 222nm.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 18/09/2015 19:27:44

Printed: 19/09/2015 10:13:59

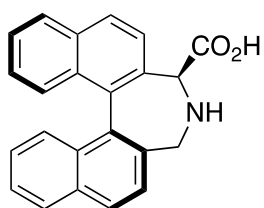


UV Results

Retention Time	Area	Area %	Height	Height %
13.317	2133020	10.89	65686	34.77
33.240	4530531	23.13	49242	26.07
45.243	2725000	13.91	20940	11.09
63.177	10200716	52.07	53026	28.07

Totals	19589267	100.00	188894	100.00
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Table 1: Entry 21

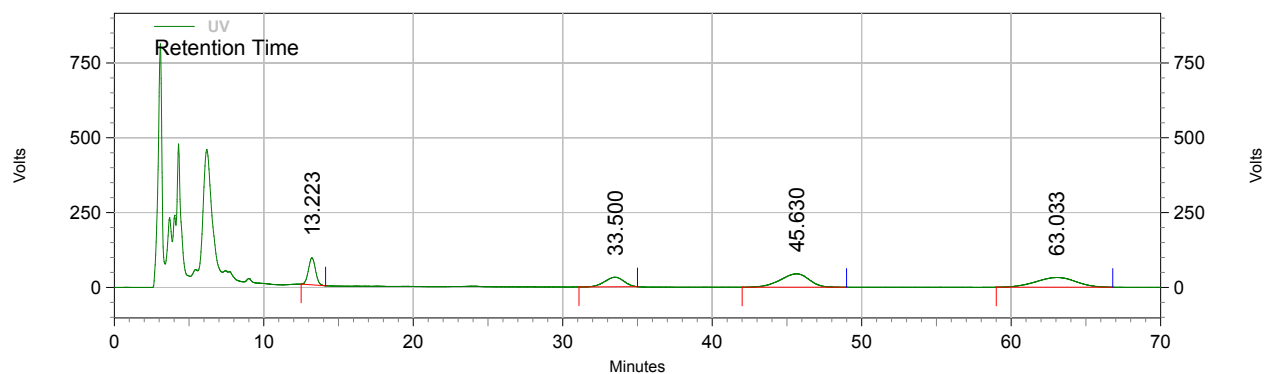


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk89a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 01:25:06

Printed: 12/08/2015 09:47:20

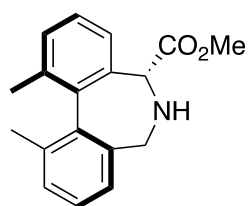


UV Results

Retention Time	Area	Area %	Height	Height %
13.223	11911109	16.55	361581	45.33
33.500	11440553	15.90	127837	16.03
45.630	24172440	33.59	178657	22.40
63.033	24440004	33.96	129629	16.25

Totals	71964106	100.00	797704	100.00
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Table 1: Entry 23

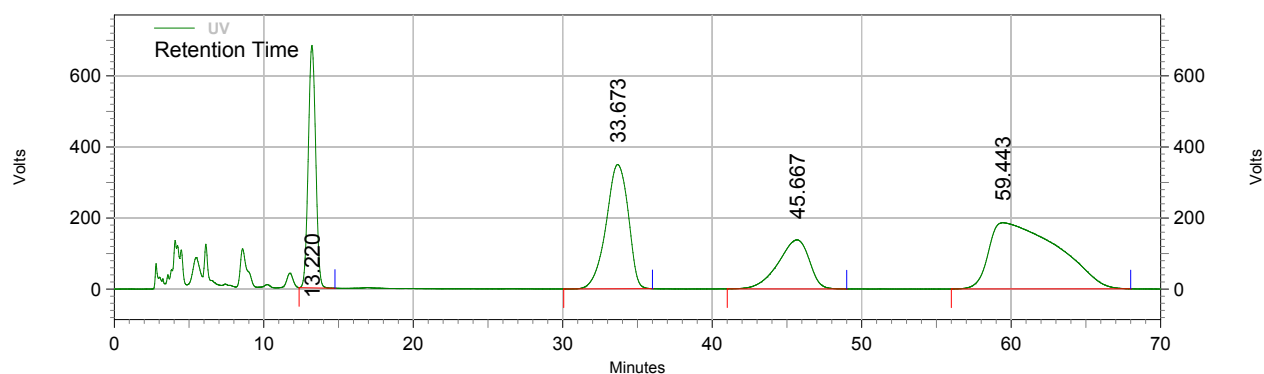


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk88a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 09:43:55

Printed: 12/08/2015 16:09:15

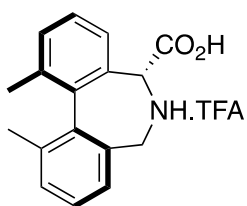


UV Results

Retention Time	Area	Area %	Height	Height %
13.220	94254496	16.94	2729897	50.31
33.673	143949344	25.88	1398691	25.78
45.667	80006616	14.38	551984	10.17
59.443	238099322	42.80	745216	13.73

Totals	556309778	100.00	5425788	100.00
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Table 1: Entry 24

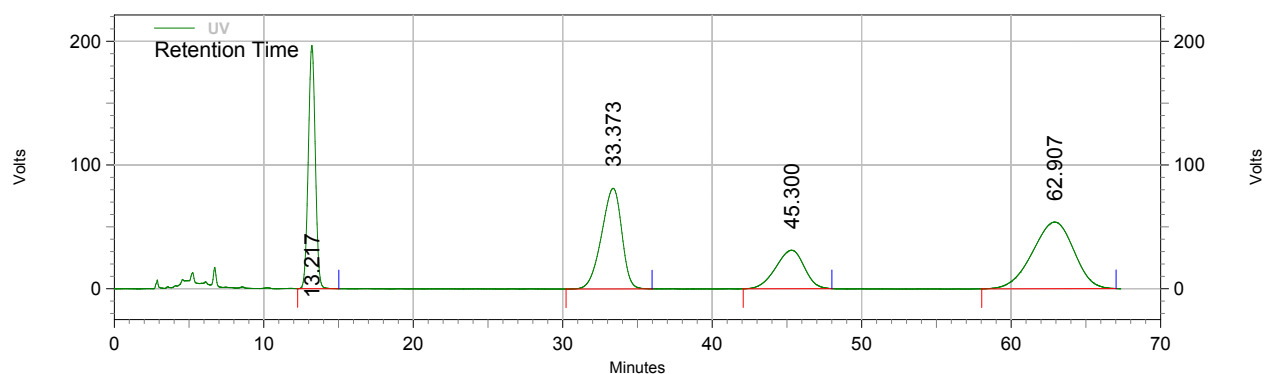


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\fk144a OJ col 70min 80.20 1ml 222nm.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 18/09/2015 18:18:48

Printed: 18/09/2015 19:28:04



UV Results

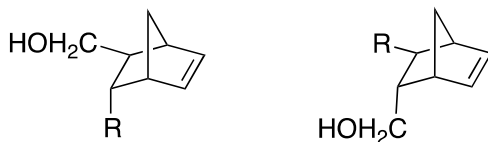
Retention Time	Area	Area %	Height	Height %
13.217	25698863	22.49	786582	54.18
33.373	30578984	26.76	325339	22.41
45.300	16499502	14.44	124453	8.57
62.907	41500099	36.32	215390	14.84

Totals	114277448	100.00	1451764	100.00
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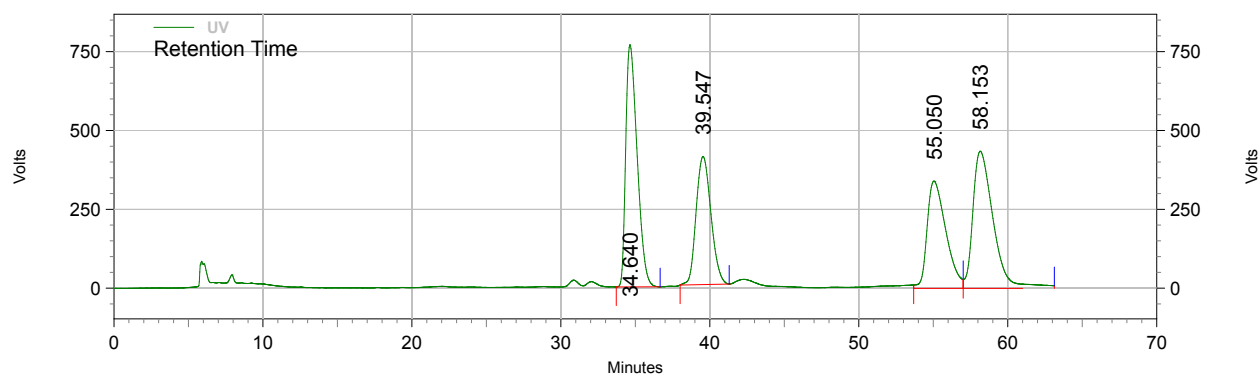
Table 2:

Racemic trace

3-(4-Methoxyphenyl)bicyclo[2.2.1]hept-5-en-2-yl)methanol



Enantiomeric excesses were determined using Chiralcel® AS-3 column (hexane/iPrOH=95:5, $\lambda=222$ nm), 0.5 mL; *endo* isomer (t_R 35 min, 59 min) *exo* isomer (t_R 39 min, 56 min)).



UV Results

Retention Time	Area	Area %	Height	Height %
34.640	163558053	29.20	3072756	39.40
39.547	112346323	20.06	1624898	20.84
55.050	118755971	21.20	1360526	17.45
58.153	165465336	29.54	1739711	22.31
Totals	560125683	100.00	7797891	100.00

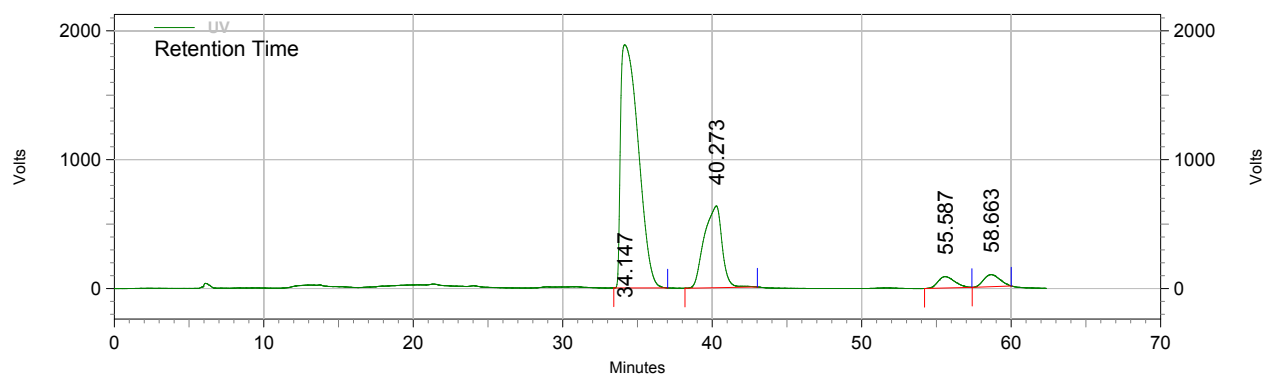
Table 2: Entry 1

Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk127a 95.5 60 min AS-3
222nm 0.5ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\95.5 0.5ml 254nm 70 min.met

Acquired: 25/08/2015 11:53:47

Printed: 25/08/2015 15:08:53

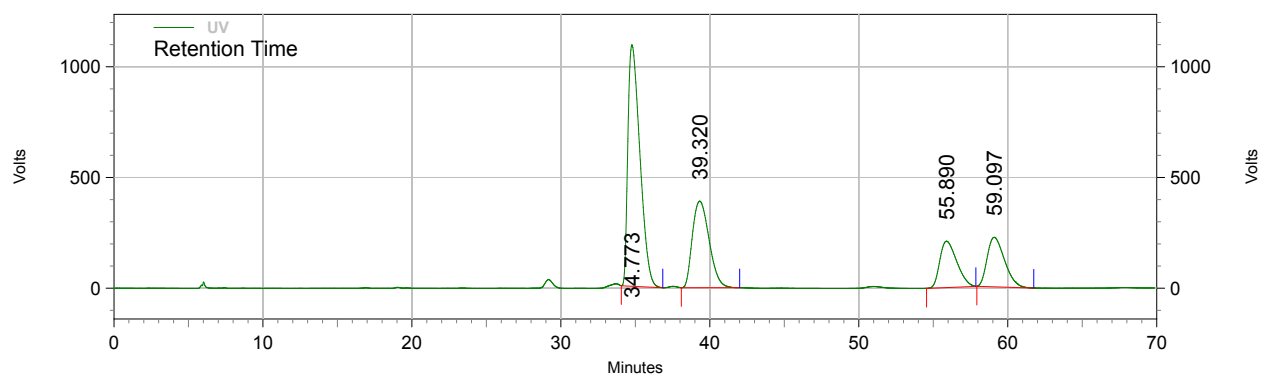
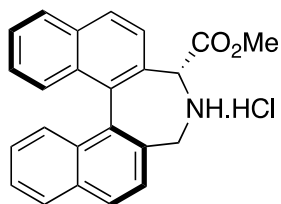
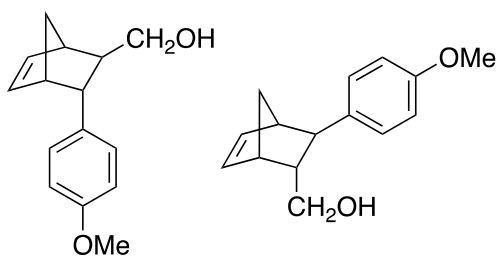


UV Results

Retention Time	Area	Area %	Height	Height %
34.147	621306304	70.07	7545500	69.80
40.273	209866962	23.67	2536428	23.46
55.587	27427539	3.09	354425	3.28
58.663	28036378	3.16	374410	3.46

Totals	886637183	100.00	10810763	100.00
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Table 2: Entry 2



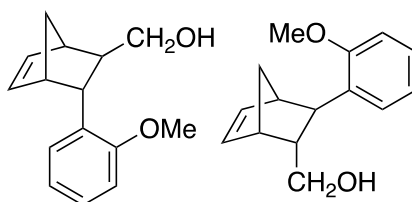
UV Results

Retention Time	Area	Area %	Height	Height %
34.773	244782841	48.39	4362457	56.96
39.320	122076450	24.13	1563928	20.42
55.890	66366689	13.12	838484	10.95
59.097	72598464	14.35	894406	11.68

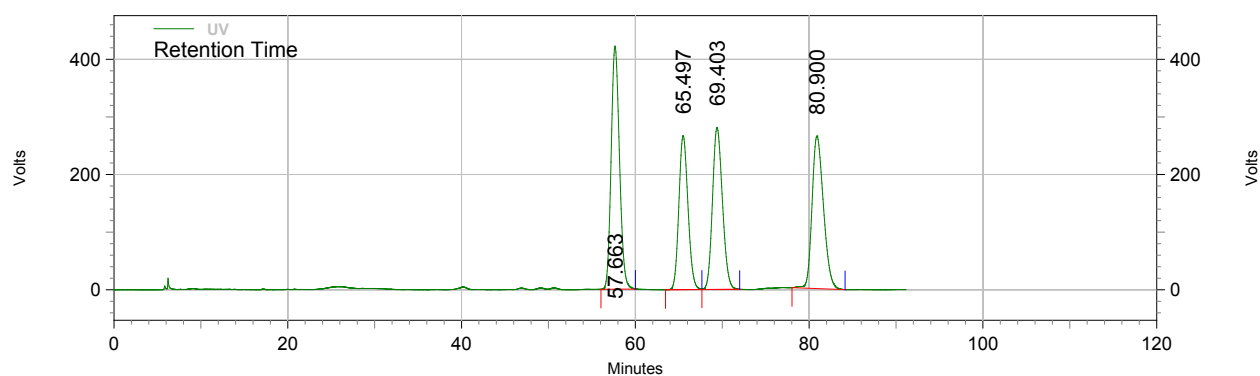
Totals	505824444	100.00	7659275	100.00
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Racemic trace

3-(2-Methoxyphenyl)bicyclo[2.2.1]hept-5-en-2-yl)methanol



Enantiomeric excesses were determined using Chiralcel® AD-H column (hexane/iPrOH=98:2, $\lambda=222$ nm), 0.5 mL; *endo* isomer (t_R 65 min, 80 min) *exo* isomer (t_R 57 min, 69 min)).



UV Results

Retention Time	Area	Area %	Height	Height %
57.663	112116054	29.82	1687969	34.15
65.497	77688234	20.67	1069444	21.64
69.403	89562179	23.82	1125462	22.77
80.900	96566392	25.69	1059634	21.44

Totals	375932859	100.00	4942509	100.00
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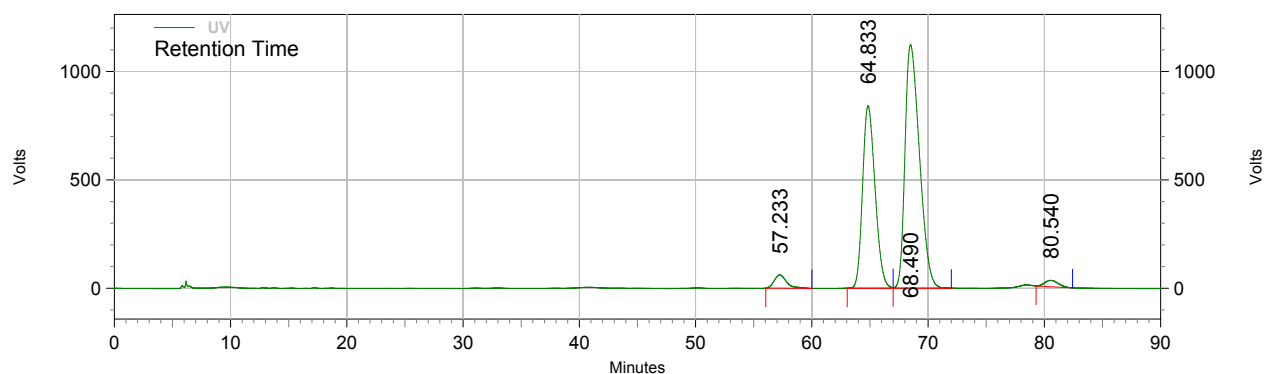
Table 2: Entry 3

Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk126A 98.2 90 min AD-H 222nm 0.5 ml.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\98.2 0.5ml 222nm 90 min.met

Acquired: 26/08/2015 17:04:04

Printed: 26/08/2015 18:38:23

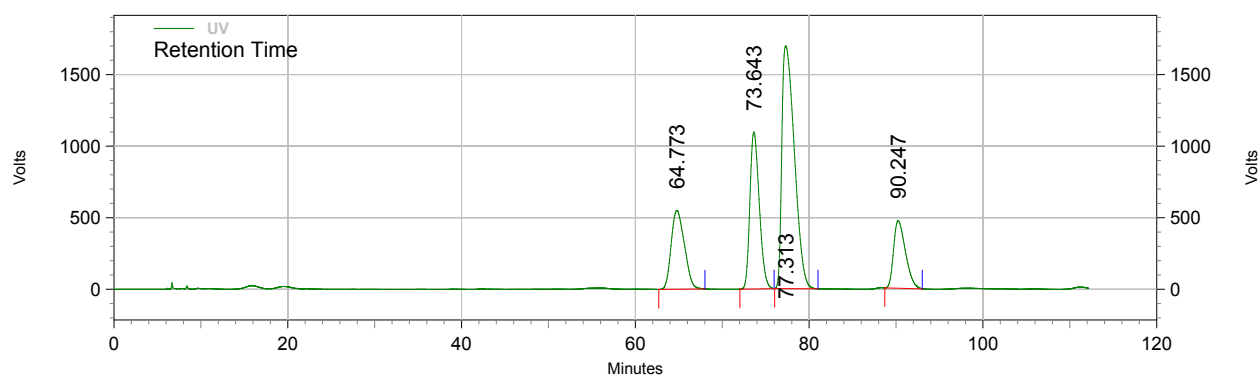
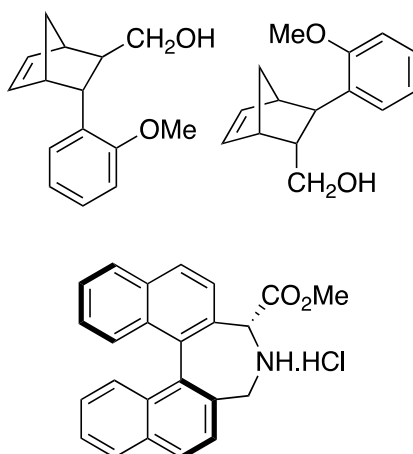


UV Results

Retention Time	Area	Area %	Height	Height %
57.233	18253405	2.74	245313	2.98
64.833	251635736	37.71	3368507	40.97
68.490	387917941	58.13	4490546	54.62
80.540	9517660	1.43	117705	1.43

Totals	667324742	100.00	8222071	100.00
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Table 2: Entry 4



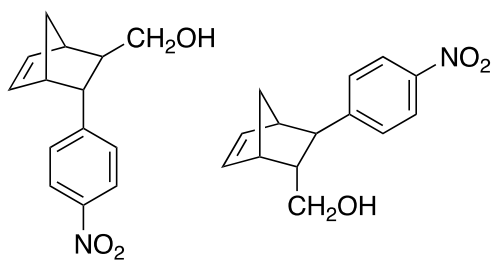
UV Results

Retention Time	Area	Area %	Height	Height %
64.773	232326523	16.35	2201612	14.42
73.643	329047246	23.16	4387511	28.74
77.313	679753155	47.85	6788242	44.47
90.247	179479029	12.63	1887803	12.37

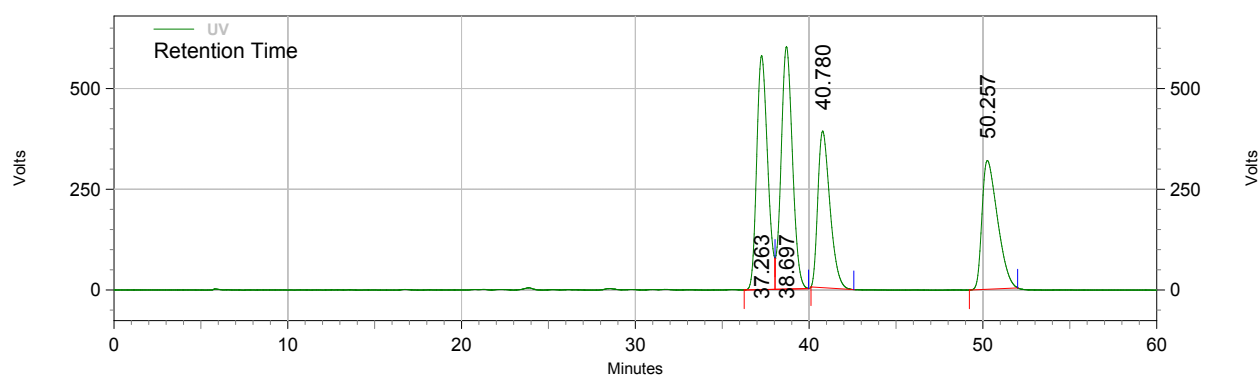
Totals	1420605953	100.00	15265168	100.00
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Racemic trace

3-(4-Nitrophenyl)bicyclo[2.2.1]hept-5-en-2-yl)methanol



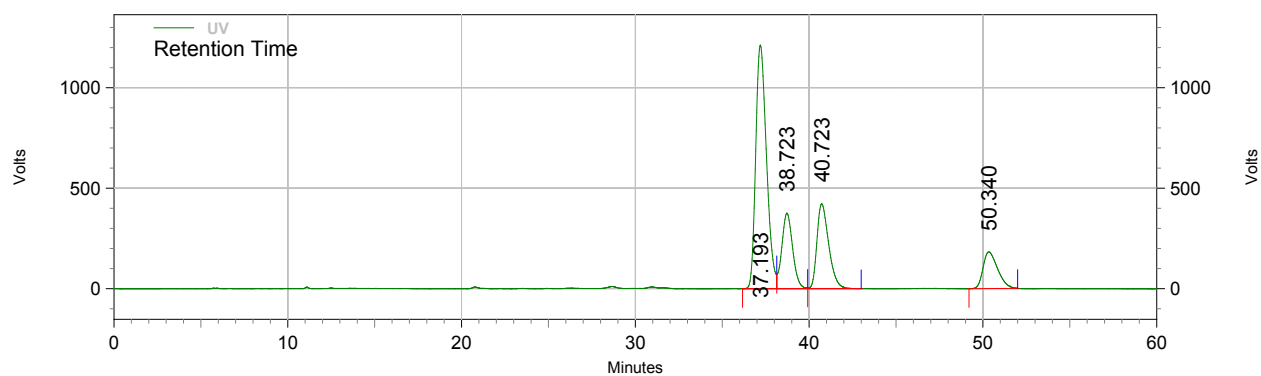
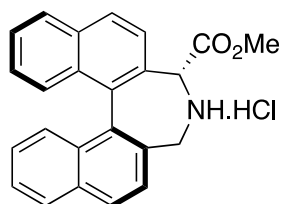
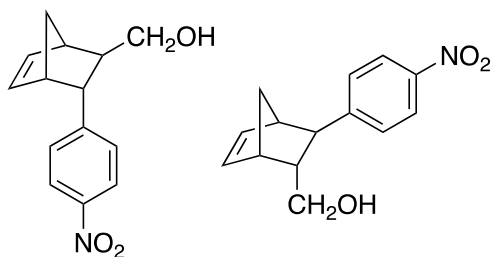
Enantiomeric excesses were determined using Chiralcel® AD-H column (hexane/iPrOH=90:10, $\lambda=254$ nm), 0.5 mL; *endo* isomer (t_R 49 min, 57 min) *exo* isomer (t_R 43 min, 53 min)).



UV Results

Retention Time	Area	Area %	Height	Height %
37.263	101429900	27.78	2325141	30.72
38.697	109077192	29.88	2409635	31.84
40.780	75191423	20.60	1555653	20.55
50.257	79372910	21.74	1278614	16.89
Totals	365071425	100.00	7569043	100.00

Table 2: Entry 5

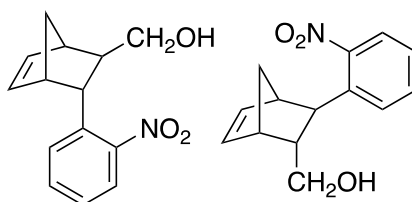


UV Results

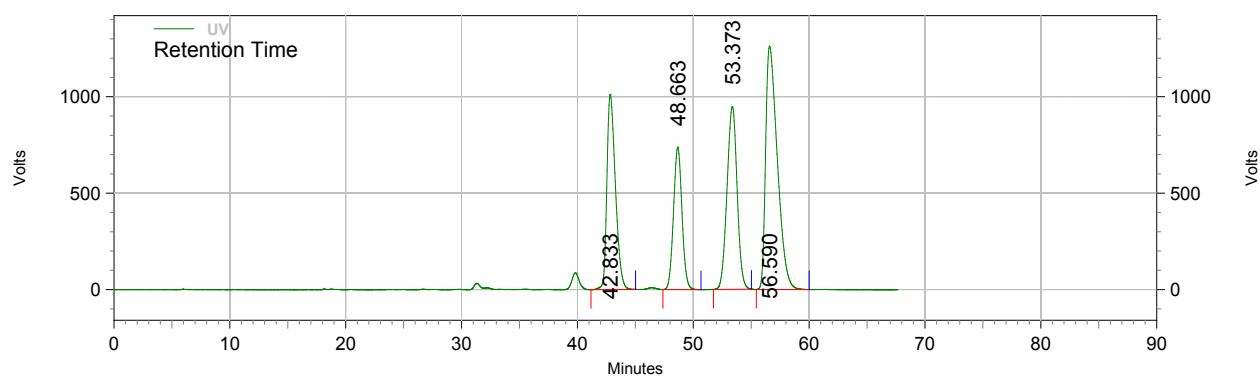
Retention Time	Area	Area %	Height	Height %
37.193	208648627	52.80	4848600	55.28
38.723	64947736	16.43	1503547	17.14
40.723	79165321	20.03	1688706	19.25
50.340	42443003	10.74	729707	8.32
Totals	395204687	100.00	8770560	100.00

Racemic trace

3-(2-Nitrophenyl)bicyclo[2.2.1]hept-5-en-2-yl)methanol



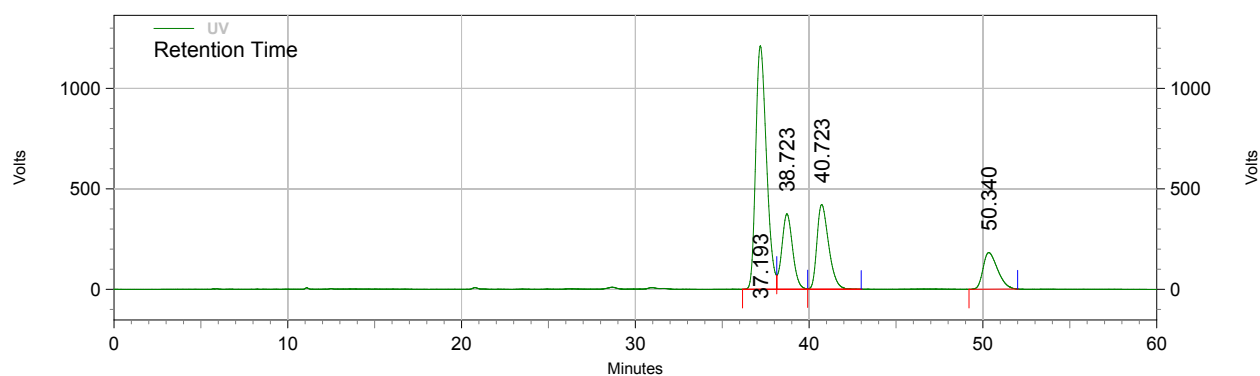
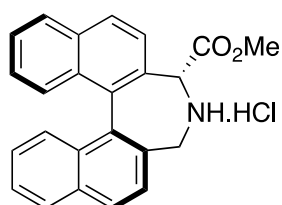
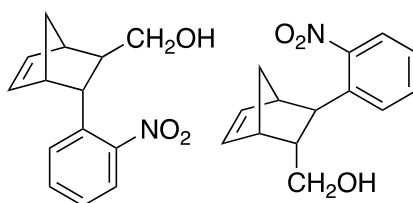
Enantiomeric excesses were determined using Chiralcel® AD-H column (hexane/iPrOH=95:5, $\lambda=254$ nm), 0.5 mL; *endo* isomer (t_R 37 min, 39 min) *exo* isomer (t_R 41 min, 50 min)).



UV Results

Retention Time	Area	Area %	Height	Height %
42.833	206808907	21.99	4048777	25.56
48.663	150125042	15.96	2952648	18.64
53.373	229614645	24.41	3792924	23.94
56.590	354062576	37.64	5049003	31.87
Totals	940611170	100.00	15843352	100.00

Table 2: Entry 6



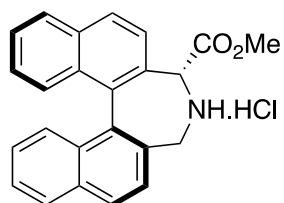
UV Results

Retention Time	Area	Area %	Height	Height %
37.193	208648627	52.80	4848600	55.28
38.723	64947736	16.43	1503547	17.14
40.723	79165321	20.03	1688706	19.25
50.340	42443003	10.74	729707	8.32

Totals	395204687	100.00	8770560	100.00
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Extras

DMSO

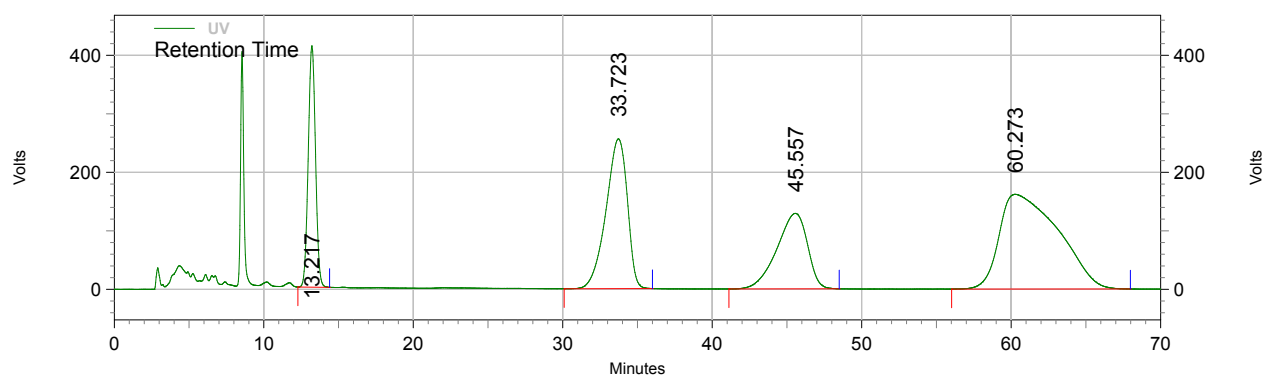


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk119a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 00:13:56

Printed: 12/08/2015 10:28:22



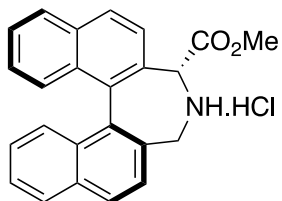
UV Results

Retention Time	Area	Area %	Height	Height %
13.217	55890096	13.68	1651198	43.01
33.723	101626015	24.87	1024026	26.67
45.557	73475052	17.98	516098	13.44
60.273	177699782	43.48	647663	16.87

Totals	Area	Area %	Height	Height %
	408690945	100.00	3838985	100.00

Area % Report

MeOH

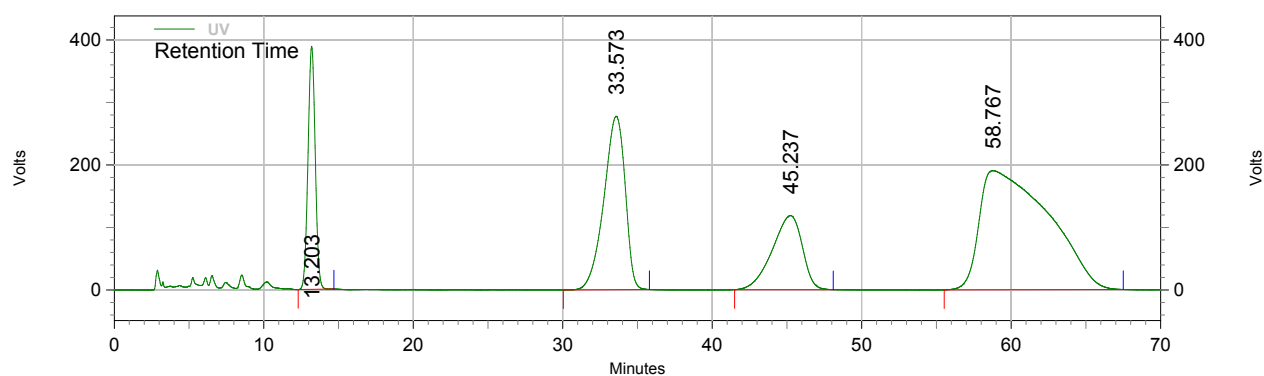


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk120a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 11/08/2015 23:02:42

Printed: 12/08/2015 10:30:47



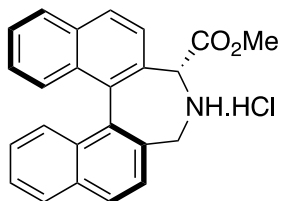
UV Results

Retention Time	Area	Area %	Height	Height %
13.203	52399515	11.06	1555104	39.86
33.573	109823275	23.18	1109560	28.44
45.237	66181909	13.97	474323	12.16
58.767	245313138	51.78	762016	19.53

Totals	473717837	100.00	3901003	100.00
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Area % Report

DCM

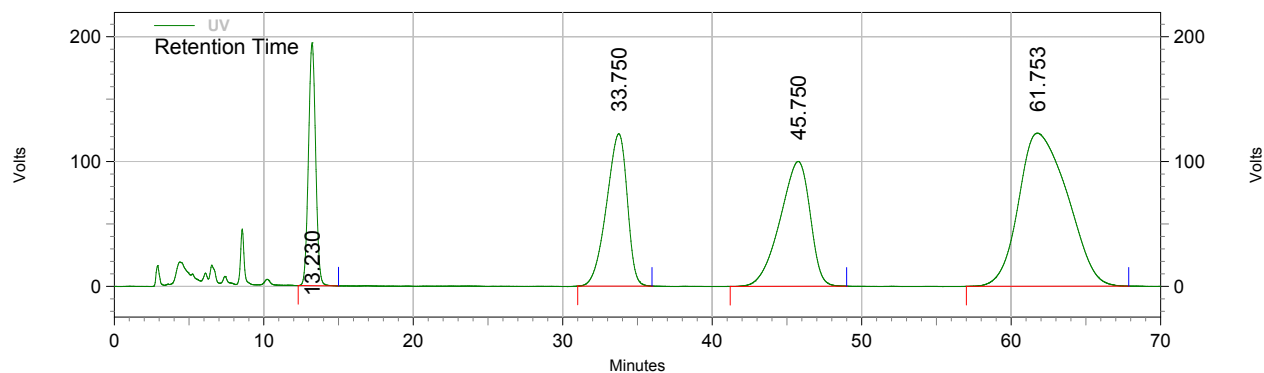


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk121a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 03:47:31

Printed: 12/08/2015 10:33:05



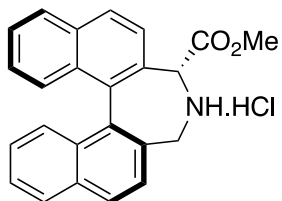
UV Results

Retention Time	Area	Area %	Height	Height %
13.230	26024299	10.83	778147	36.07
33.750	46967516	19.55	488398	22.64
45.750	55930542	23.28	400235	18.55
61.753	111333006	46.34	490645	22.74

Totals	240255363	100.00	2157425	100.00
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Area % Report

MeOH:H₂O

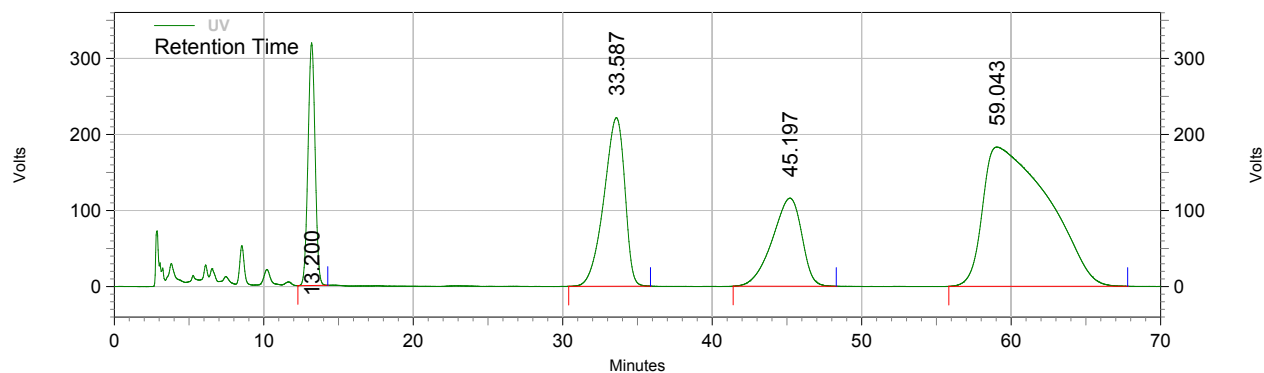


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk90a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 11/08/2015 20:40:19

Printed: 12/08/2015 09:50:32



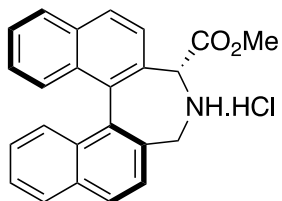
UV Results

Retention Time	Area	Area %	Height	Height %
13.200	42115716	10.15	1276100	38.00
33.587	86078004	20.75	886733	26.40
45.197	63615376	15.34	463155	13.79
59.043	223016583	53.76	732413	21.81

Totals	Area	Area %	Height	Height %
	414825679	100.00	3358401	100.00

Area % Report

EtOH:H₂O

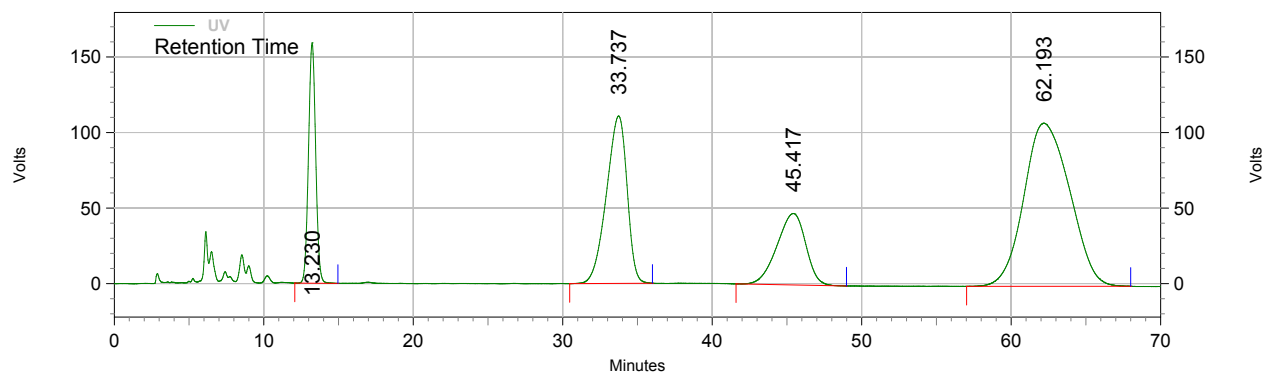


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk130a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 70 min.met

Acquired: 13/08/2015 12:31:21

Printed: 13/08/2015 13:50:39



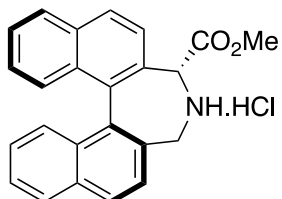
UV Results

Retention Time	Area	Area %	Height	Height %
13.230	21307907	11.75	636421	37.42
33.737	42518471	23.44	443333	26.06
45.417	25355990	13.98	189325	11.13
62.193	92178605	50.83	431894	25.39

Totals	181360973	100.00	1700973	100.00
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Area % Report

THF:H₂O

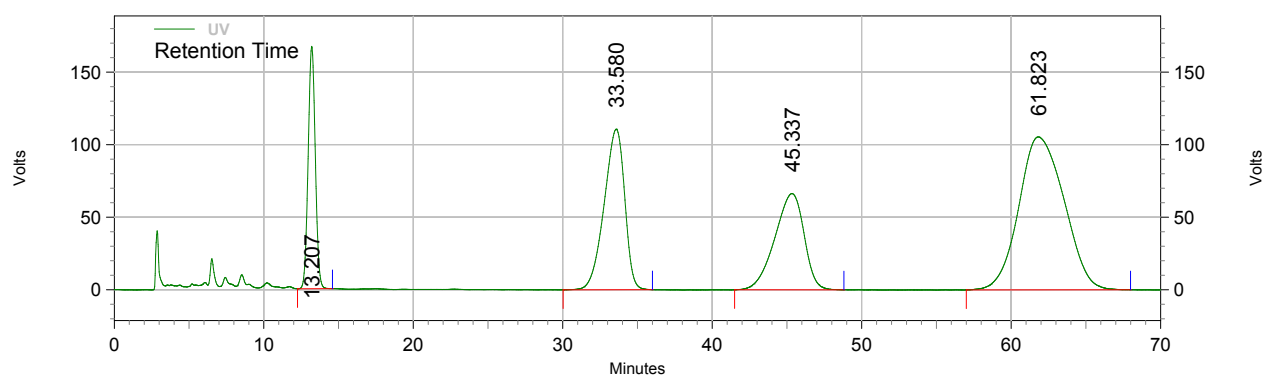


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk132a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 13:17:43

Printed: 12/08/2015 15:51:40



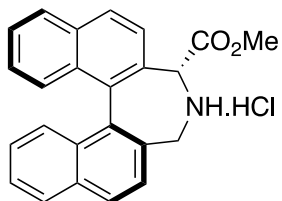
UV Results

Retention Time	Area	Area %	Height	Height %
13.207	22225410	11.73	668225	37.17
33.580	42284116	22.32	442747	24.63
45.337	36111913	19.07	265336	14.76
61.823	88787139	46.88	421628	23.45

Totals	Area	Area %	Height	Height %
	189408578	100.00	1797936	100.00

Area % Report

DMF:H₂O

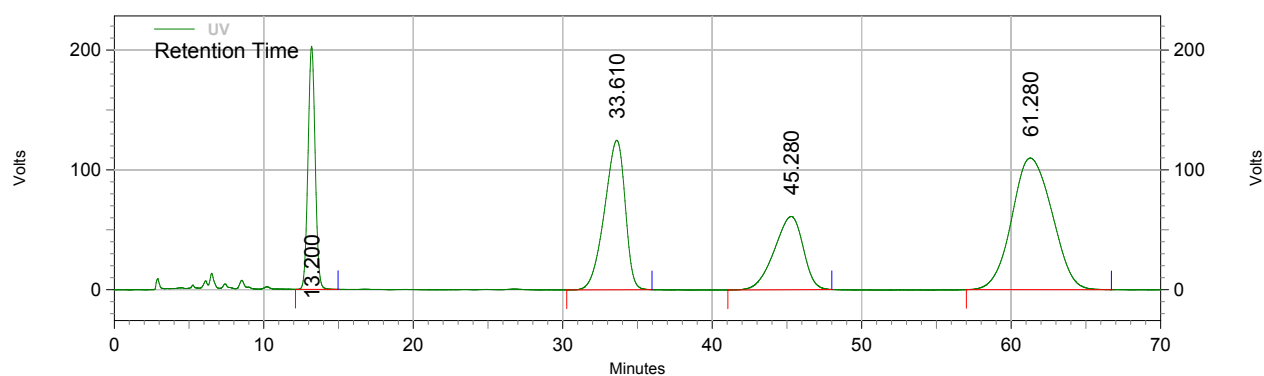


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk133a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 14:28:56

Printed: 12/08/2015 15:53:59



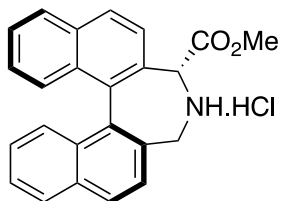
UV Results

Retention Time	Area	Area %	Height	Height %
13.200	27068837	14.26	811312	40.69
33.610	47814006	25.18	499001	25.02
45.280	32831882	17.29	244522	12.26
61.280	82159769	43.27	439294	22.03

Totals	189874494	100.00	1994129	100.00
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Area % Report

CH₂NO₂:H₂O

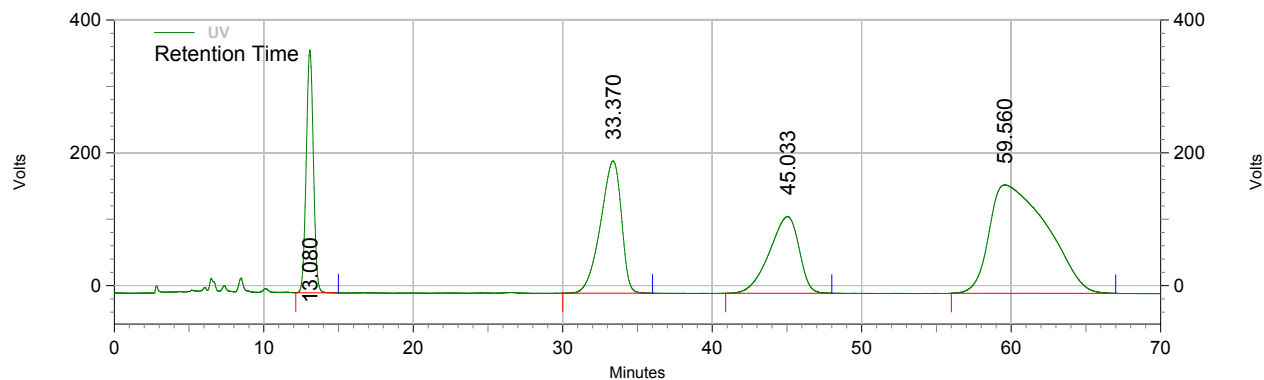


Data File: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\fk128a 80.20 70 min ojnew col 222nm new OJ.dat

Method: C:\EZChrom Elite\Enterprise\Projects\Fran\diels alder\80.20 1ml 222nm 60 min.met

Acquired: 12/08/2015 16:05:19

Printed: 12/08/2015 17:35:11



UV Results

Retention Time	Area	Area %	Height	Height %
13.080	48745952	13.35	1463413	43.36
33.370	77109017	21.12	796852	23.61
45.033	63875285	17.50	461735	13.68
59.560	175361503	48.03	652775	19.34

Totals	Area	Area %	Height	Height %
	365091757	100.00	3374775	100.00

Computational Supplementary Information

Cartesian coordinates for all 16 transition structures calculated at B3LYP/6-31G*

z-endo-si-a

1	6	0	-2.489319	-0.519059	0.621655
2	6	0	-1.559452	-0.681484	1.645625
3	6	0	-0.017063	0.413801	-0.578955
4	6	0	-0.536043	0.399879	1.897124
5	1	0	0.738119	0.919854	-1.188198
6	1	0	-1.006209	1.387405	1.951693
7	1	0	-0.005911	0.220752	2.834818
8	7	0	0.484814	0.436553	0.813862
9	6	0	-1.307332	1.205111	-0.723901
10	6	0	-2.491191	0.770410	-0.132765
11	6	0	-1.266683	2.413552	-1.461716
12	1	0	-0.339244	2.711566	-1.945212
13	6	0	-3.657090	1.609255	-0.199621
14	6	0	-3.601173	2.826054	-0.959805
15	6	0	-2.389394	3.191860	-1.598253
16	6	0	-4.752411	3.655462	-1.038700
17	6	0	-1.534118	-1.863552	2.425248
18	6	0	-3.370610	-1.605882	0.292338
19	6	0	-2.426377	-2.878416	2.181348
20	6	0	-3.347275	-2.789390	1.104543
21	1	0	-0.810472	-1.955172	3.231341
22	6	0	-4.225887	-3.863110	0.797401
23	6	0	1.782277	0.470467	1.108052
24	1	0	1.990377	0.479119	2.176129
25	6	0	-0.117773	-1.010774	-1.178554
26	8	0	-0.739149	-1.238715	-2.187536
27	8	0	0.625126	-1.900573	-0.506499
28	6	0	0.601110	-3.247068	-1.034495
29	1	0	-0.414769	-3.644670	-0.988331
30	1	0	0.948444	-3.254099	-2.069794
31	1	0	1.271461	-3.819329	-0.394346
32	6	0	2.875233	0.470936	0.243327
33	6	0	3.128030	3.164011	0.344850
34	6	0	4.227517	0.290250	0.734581
35	1	0	2.706214	0.399502	-0.823473
36	6	0	4.387087	2.719729	-0.325967
37	6	0	3.346615	3.220598	1.718997
38	1	0	2.261859	3.562909	-0.171800
39	6	0	5.060453	1.954868	0.811153
40	1	0	4.258489	-0.008863	1.781506
41	1	0	4.996610	3.615512	-0.532057
42	1	0	4.268515	2.187371	-1.269423
43	6	0	4.550662	2.568867	2.001017
44	1	0	6.117643	1.712524	0.748208
45	1	0	4.975755	2.439942	2.991509
46	1	0	2.672091	3.653419	2.449211

47	6	0	5.182676	-0.551559	-0.069572
48	6	0	6.129613	-1.326691	0.617615
49	6	0	5.181029	-0.585460	-1.472419
50	6	0	7.042925	-2.121290	-0.074024
51	1	0	6.146440	-1.314067	1.705292
52	6	0	6.095865	-1.377503	-2.165109
53	1	0	4.460388	-0.004285	-2.041317
54	6	0	7.029805	-2.148003	-1.469213
55	1	0	7.761837	-2.719840	0.477699
56	1	0	6.076045	-1.395068	-3.250910
57	1	0	7.740269	-2.765041	-2.011049
58	6	0	-5.070418	-3.794531	-0.286017
59	6	0	-4.235832	-1.583346	-0.836430
60	6	0	-5.061736	-2.648878	-1.116629
61	1	0	-4.208843	-4.746760	1.430225
62	1	0	-5.734429	-4.622782	-0.515412
63	1	0	-5.708823	-2.612825	-1.988172
64	1	0	-4.230318	-0.720627	-1.492101
65	6	0	-4.863131	1.311533	0.495795
66	6	0	-5.907729	3.322860	-0.371855
67	6	0	-5.955423	2.145128	0.411691
68	1	0	-4.918056	0.418106	1.106311
69	1	0	-2.421161	-3.774766	2.796014
70	1	0	-6.863031	1.898400	0.954913
71	1	0	-6.780844	3.965611	-0.434856
72	1	0	-4.697653	4.565793	-1.630080
73	1	0	-2.356938	4.107059	-2.183261

z-endo-si-b

1	6	0	2.442254	-0.553497	-0.714201
2	6	0	1.513092	-0.728257	-1.736758
3	6	0	0.001651	0.541539	0.420952
4	6	0	0.533706	0.380700	-2.043716
5	1	0	-0.736899	1.115778	0.991404
6	1	0	1.039892	1.347156	-2.133100
7	1	0	0.004155	0.184112	-2.978021
8	7	0	-0.490241	0.494417	-0.970899
9	6	0	1.324905	1.281425	0.535049
10	6	0	2.493921	0.771180	-0.025206
11	6	0	1.331198	2.525338	1.213731
12	1	0	0.412329	2.888390	1.668057
13	6	0	3.693568	1.563153	0.011943
14	6	0	3.684802	2.815191	0.714294
15	6	0	2.484821	3.261514	1.323386
16	6	0	4.869954	3.597770	0.763919
17	6	0	1.433839	-1.949739	-2.447585
18	6	0	3.269484	-1.660709	-0.318164
19	6	0	2.268697	-2.993657	-2.134625
20	6	0	3.186500	-2.888361	-1.057330
21	1	0	0.708528	-2.053622	-3.250371

22	6	0	4.004544	-3.987071	-0.678793
23	6	0	-1.790176	0.443617	-1.260673
24	1	0	-1.998493	0.394678	-2.327897
25	6	0	-0.030229	-0.884099	1.031829
26	8	0	-0.678203	-1.796831	0.575547
27	8	0	0.673515	-0.919478	2.165961
28	6	0	0.682245	-2.189566	2.858250
29	1	0	1.150756	-2.950736	2.231256
30	1	0	1.266651	-2.019160	3.761336
31	1	0	-0.337754	-2.493388	3.103803
32	6	0	-2.876133	0.429978	-0.389944
33	6	0	-4.218657	0.249722	-0.879780
34	6	0	-3.184477	3.220293	-0.458441
35	1	0	-2.702372	0.370123	0.676553
36	6	0	-5.072211	1.947796	-0.975154
37	1	0	-4.250519	0.057533	-1.953923
38	6	0	-3.999893	2.803406	-1.639920
39	6	0	-3.962250	3.122634	0.682849
40	1	0	-2.202949	3.677077	-0.522604
41	6	0	-5.143247	2.429707	0.362623
42	1	0	-5.986133	1.695763	-1.507264
43	1	0	-4.497759	3.699753	-2.045736
44	1	0	-3.446086	2.344813	-2.460409
45	1	0	-5.940315	2.198133	1.059914
46	1	0	-3.690543	3.481149	1.669316
47	6	0	-5.173655	-0.645274	-0.147750
48	6	0	-6.077711	-1.415512	-0.893385
49	6	0	-5.202043	-0.743532	1.251695
50	6	0	-6.982130	-2.269258	-0.260682
51	1	0	-6.068363	-1.354546	-1.979576
52	6	0	-6.105377	-1.594341	1.884732
53	1	0	-4.517020	-0.156562	1.858226
54	6	0	-6.998716	-2.360823	1.130627
55	1	0	-7.670271	-2.861784	-0.856291
56	1	0	-6.110956	-1.662582	2.968774
57	1	0	-7.701227	-3.023852	1.626617
58	6	0	4.137595	-1.614132	0.808791
59	6	0	4.849913	-3.898416	0.402438
60	6	0	4.905221	-2.703013	1.158101
61	1	0	2.217020	-3.924953	-2.692205
62	1	0	3.939830	-4.905942	-1.255750
63	1	0	5.467570	-4.745677	0.685536
64	1	0	5.558716	-2.645050	2.023929
65	1	0	4.187107	-0.708988	1.402914
66	6	0	4.890082	1.182049	-0.658904
67	6	0	6.014421	3.185224	0.123369
68	6	0	6.016842	1.971180	-0.604129
69	1	0	2.486184	4.205975	1.860967
70	1	0	4.850470	4.537189	1.310374
71	1	0	6.913614	3.792925	0.163192
72	1	0	6.916316	1.661165	-1.128093

73	1	0	4.909605	0.259741	-1.227333
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z-endo-re-a

1	6	0	2.566595	-0.365218	-0.487147
2	6	0	1.699855	-1.011039	-1.365491
3	6	0	-0.056062	0.395607	0.487453
4	6	0	0.488920	-0.277302	-1.890183
5	1	0	-0.901309	0.904413	0.959321
6	1	0	0.760658	0.711079	-2.275807
7	1	0	0.016673	-0.841171	-2.697255
8	7	0	-0.538042	-0.086936	-0.825947
9	6	0	1.049511	1.429324	0.323258
10	6	0	2.304021	1.069700	-0.163358
11	6	0	0.754880	2.774958	0.650874
12	1	0	-0.224982	3.025096	1.049389
13	6	0	3.279741	2.095866	-0.411643
14	6	0	2.971138	3.453122	-0.059477
15	6	0	1.699402	3.757948	0.487919
16	6	0	3.934220	4.472152	-0.291296
17	6	0	1.919380	-2.358067	-1.744560
18	6	0	3.640000	-1.108218	0.115628
19	6	0	2.988886	-3.059045	-1.244594
20	6	0	3.859139	-2.467633	-0.291302
21	1	0	1.241665	-2.828846	-2.452576
22	6	0	4.926976	-3.205086	0.287669
23	6	0	-1.830443	-0.242143	-1.110158
24	1	0	-2.025556	-0.468100	-2.156986
25	6	0	0.334599	-0.724799	1.476973
26	8	0	0.941411	-0.494711	2.493421
27	8	0	-0.134360	-1.938025	1.126037
28	6	0	0.250256	-3.007443	2.023557
29	1	0	-0.165409	-2.836634	3.019059
30	1	0	-0.154156	-3.918747	1.582574
31	1	0	1.338082	-3.064624	2.089398
32	6	0	-2.932147	-0.116492	-0.266661
33	6	0	-4.276480	0.023999	-0.786994
34	6	0	-3.197406	-2.821350	-0.124322
35	1	0	-2.772306	0.039106	0.793381
36	6	0	-5.126813	-1.654821	-0.704883
37	1	0	-4.301444	0.210818	-1.859183
38	6	0	-4.452783	-2.305377	0.499210
39	6	0	-3.412467	-2.999830	-1.486636
40	1	0	-2.323943	-3.145917	0.426534
41	6	0	-4.613758	-2.369786	-1.831726
42	1	0	-6.181169	-1.396487	-0.667396
43	1	0	-5.067396	-3.171873	0.796036
44	1	0	-4.328102	-1.682462	1.384477
45	6	0	-5.236944	0.937879	-0.076729
46	6	0	-6.173770	1.648284	-0.843540

47	6	0	-5.251323	1.100727	1.317372
48	6	0	-7.093221	2.504046	-0.238566
49	1	0	-6.177463	1.536291	-1.925584
50	6	0	-6.172426	1.953861	1.923269
51	1	0	-4.539738	0.571931	1.945780
52	6	0	-7.096406	2.658406	1.148372
53	1	0	-7.803843	3.050747	-0.851375
54	1	0	-6.165629	2.070995	3.003028
55	1	0	-7.811395	3.323734	1.622895
56	1	0	-5.034953	-2.328608	-2.831458
57	1	0	-2.736777	-3.496279	-2.174016
58	1	0	1.474433	4.786021	0.758470
59	1	0	3.170007	-4.084333	-1.556714
60	6	0	5.143951	4.179483	-0.875118
61	6	0	4.532431	1.836599	-1.036723
62	1	0	4.773527	0.826628	-1.346676
63	6	0	5.436979	2.849735	-1.261300
64	1	0	3.689833	5.492305	-0.006827
65	1	0	5.871400	4.966214	-1.051990
66	1	0	6.384513	2.627301	-1.743446
67	6	0	4.471612	-0.570982	1.136947
68	1	0	4.290738	0.436668	1.491735
69	6	0	5.728943	-2.643204	1.253646
70	6	0	5.487130	-1.318857	1.689756
71	1	0	6.105435	-0.890228	2.473018
72	1	0	5.091891	-4.227844	-0.041668
73	1	0	6.539894	-3.216792	1.692846

z-endo-re-b

1	6	0	2.489945	-0.433869	-0.553341
2	6	0	1.589913	-1.015711	-1.443101
3	6	0	-0.077811	0.565693	0.355465
4	6	0	0.454552	-0.185690	-1.995737
5	1	0	-0.890927	1.157514	0.789798
6	1	0	0.812536	0.778082	-2.371750
7	1	0	-0.043978	-0.706852	-2.815531
8	7	0	-0.569403	0.074188	-0.949096
9	6	0	1.115213	1.495835	0.196192
10	6	0	2.345243	1.023600	-0.256442
11	6	0	0.930700	2.867879	0.496394
12	1	0	-0.033796	3.208326	0.864564
13	6	0	3.409583	1.959145	-0.499203
14	6	0	3.210836	3.343686	-0.175243
15	6	0	1.958453	3.764534	0.339062
16	6	0	4.261764	4.272971	-0.402490
17	6	0	1.694694	-2.383730	-1.792267
18	6	0	3.480409	-1.257969	0.085239
19	6	0	2.681750	-3.169541	-1.251054
20	6	0	3.581169	-2.640055	-0.289253
21	1	0	0.993093	-2.805614	-2.507690

22	6	0	4.564359	-3.460008	0.327635
23	6	0	-1.863473	-0.140827	-1.197931
24	1	0	-2.072635	-0.398564	-2.234477
25	6	0	0.124567	-0.615468	1.333080
26	8	0	-0.387987	-1.706302	1.195873
27	8	0	0.849378	-0.237618	2.385159
28	6	0	1.072673	-1.244336	3.399011
29	1	0	1.649989	-2.070387	2.978993
30	1	0	1.635131	-0.740094	4.183341
31	1	0	0.119093	-1.615937	3.780518
32	6	0	-2.944963	-0.032197	-0.332411
33	6	0	-4.309966	0.001222	-0.814557
34	6	0	-3.035034	-2.787045	-0.117387
35	1	0	-2.763690	0.148133	0.719979
36	6	0	-5.044076	-1.728251	-0.657921
37	1	0	-4.378651	0.152892	-1.890433
38	6	0	-4.290488	-2.310767	0.535154
39	6	0	-3.284586	-2.999268	-1.468501
40	1	0	-2.121550	-3.029598	0.411337
41	6	0	-4.528548	-2.440040	-1.785483
42	1	0	-6.110908	-1.535430	-0.589435
43	1	0	-4.850464	-3.196137	0.880565
44	1	0	-4.158851	-1.659483	1.398700
45	6	0	-5.309750	0.869300	-0.101825
46	6	0	-6.309017	1.499478	-0.859584
47	6	0	-5.300176	1.064924	1.288077
48	6	0	-7.266009	2.310119	-0.250561
49	1	0	-6.332596	1.360126	-1.938172
50	6	0	-6.258585	1.872719	1.898273
51	1	0	-4.541494	0.595469	1.908410
52	6	0	-7.244617	2.498196	1.132012
53	1	0	-8.025349	2.795238	-0.856793
54	1	0	-6.233247	2.015957	2.974664
55	1	0	-7.988960	3.128094	1.609809
56	1	0	-4.984213	-2.444127	-2.771043
57	1	0	-2.606412	-3.474271	-2.168450
58	1	0	1.815209	4.813027	0.585947
59	1	0	2.772509	-4.214321	-1.536235
60	6	0	5.453755	3.868121	-0.955136
61	6	0	4.647876	1.583237	-1.092720
62	1	0	4.806964	0.551198	-1.382081
63	6	0	5.640111	2.511611	-1.313542
64	1	0	4.099293	5.315284	-0.140655
65	1	0	6.248823	4.587063	-1.129519
66	1	0	6.574537	2.201113	-1.772012
67	6	0	4.343179	-0.776592	1.109809
68	1	0	4.258701	0.254821	1.431753
69	6	0	5.398102	-2.954247	1.297587
70	6	0	5.275121	-1.602503	1.698491
71	1	0	5.922490	-1.212972	2.478983
72	1	0	4.638564	-4.500879	0.023304

73	1	0	6.144279	-3.590566	1.764287
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1	6	0	-2.338404	-0.182443	0.589404
2	6	0	-1.128760	-0.527194	1.186877
3	6	0	-0.413018	0.054698	-1.553932
4	6	0	0.116572	0.283683	0.909924
5	1	0	0.114521	0.290395	-2.484762
6	1	0	-0.059213	1.354813	1.060923
7	1	0	0.910658	-0.026658	1.588227
8	7	0	0.608754	0.100955	-0.480798
9	6	0	-1.476343	1.117987	-1.343873
10	6	0	-2.378889	1.026124	-0.286971
11	6	0	-1.492034	2.230981	-2.218962
12	1	0	-0.792466	2.266085	-3.050407
13	6	0	-3.276379	2.120466	-0.035123
14	6	0	-3.289691	3.235187	-0.939768
15	6	0	-2.393202	3.250827	-2.038161
16	6	0	-4.181144	4.316566	-0.703945
17	6	0	-1.041784	-1.643189	2.056692
18	6	0	-3.484742	-1.029971	0.781226
19	6	0	-2.146656	-2.414166	2.320350
20	6	0	-3.384459	-2.144877	1.679650
21	1	0	-0.092283	-1.871585	2.535340
22	6	0	-4.516848	-2.976885	1.889720
23	6	0	1.902424	0.029090	-0.789015
24	1	0	2.096141	-0.049511	-1.856727
25	6	0	-0.997459	-1.355852	-1.793201
26	8	0	-2.035623	-1.539774	-2.377264
27	8	0	-0.167733	-2.335994	-1.379128
28	6	0	-0.661866	-3.675690	-1.618929
29	1	0	-1.606357	-3.825009	-1.092504
30	1	0	-0.813777	-3.838495	-2.688100
31	1	0	0.105760	-4.344278	-1.229026
32	6	0	3.008631	0.066265	0.057010
33	6	0	3.140772	-2.617140	-0.057294
34	6	0	4.358840	0.200568	-0.452044
35	1	0	2.857314	0.158478	1.125009
36	6	0	4.417324	-2.236892	0.621291
37	6	0	3.365974	-2.685958	-1.429616
38	1	0	2.243948	-2.955327	0.449167
39	6	0	5.132850	-1.505197	-0.512012
40	1	0	4.390699	0.479704	-1.504050
41	1	0	4.982504	-3.160802	0.829307
42	1	0	4.320078	-1.699655	1.564428
43	6	0	4.602241	-2.094264	-1.704274
44	1	0	6.197928	-1.303264	-0.441517
45	1	0	5.037716	-1.982879	-2.692435
46	1	0	2.667269	-3.070090	-2.163352
47	6	0	5.350031	1.017713	0.331259

48	6	0	6.304762	1.765818	-0.374737
49	6	0	5.374696	1.053856	1.734012
50	6	0	7.250762	2.537571	0.298606
51	1	0	6.301452	1.750896	-1.462465
52	6	0	6.321949	1.823076	2.408186
53	1	0	4.650367	0.491278	2.316934
54	6	0	7.262998	2.567607	1.693665
55	1	0	7.974912	3.116183	-0.267282
56	1	0	6.322256	1.843558	3.494103
57	1	0	7.998471	3.167389	2.221282
58	6	0	-5.007717	4.322346	0.394649
59	6	0	-4.129030	2.174376	1.103698
60	6	0	-4.969038	3.244976	1.311646
61	1	0	-4.187906	5.146667	-1.405539
62	1	0	-2.414069	4.093348	-2.724047
63	1	0	-5.681837	5.155873	0.568435
64	1	0	-5.607029	3.265025	2.190477
65	1	0	-4.110513	1.362572	1.821293
66	6	0	-4.708263	-0.842224	0.080805
67	6	0	-5.694013	-2.746933	1.216499
68	6	0	-5.781669	-1.678297	0.293377
69	1	0	-4.788500	-0.038314	-0.640917
70	1	0	-2.081856	-3.253598	3.007831
71	1	0	-4.430699	-3.807648	2.585475
72	1	0	-6.552749	-3.391469	1.379764
73	1	0	-6.703684	-1.519860	-0.258277

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1	6	0	2.197624	-0.173203	-0.686678
2	6	0	0.938014	-0.339882	-1.256686
3	6	0	0.393109	0.360900	1.511983
4	6	0	-0.166848	0.640327	-0.931173
5	1	0	-0.073359	0.702310	2.443615
6	1	0	0.171641	1.676003	-1.036849
7	1	0	-1.011169	0.496582	-1.602880
8	7	0	-0.646188	0.464651	0.461964
9	6	0	1.577485	1.270082	1.237243
10	6	0	2.434126	1.031416	0.165141
11	6	0	1.768712	2.390039	2.083132
12	1	0	1.098508	2.543746	2.925141
13	6	0	3.469232	1.983871	-0.131941
14	6	0	3.657799	3.105985	0.743542
15	6	0	2.796885	3.271391	1.857931
16	6	0	4.684837	4.047173	0.462701
17	6	0	0.665281	-1.441450	-2.104692
18	6	0	3.199332	-1.186454	-0.884193
19	6	0	1.632813	-2.379632	-2.366936
20	6	0	2.908648	-2.292945	-1.751191
21	1	0	-0.316308	-1.528064	-2.564580
22	6	0	3.894805	-3.294966	-1.958497

23	6	0	-1.925702	0.262996	0.788449
24	1	0	-2.090489	0.162556	1.858996
25	6	0	0.728187	-1.129665	1.770317
26	8	0	-0.017486	-2.044477	1.486814
27	8	0	1.874954	-1.252790	2.434565
28	6	0	2.263158	-2.599647	2.791449
29	1	0	1.493550	-3.062240	3.413265
30	1	0	2.414580	-3.192772	1.887500
31	1	0	3.195537	-2.491398	3.343299
32	6	0	-3.045622	0.211494	-0.033101
33	6	0	-2.940985	-2.532830	0.154164
34	6	0	-4.390770	0.225280	0.499368
35	1	0	-2.925123	0.291940	-1.106150
36	6	0	-4.235671	-2.249720	-0.535697
37	6	0	-3.158084	-2.573604	1.525782
38	1	0	-2.012990	-2.805187	-0.334574
39	6	0	-5.015709	-1.560935	0.581525
40	1	0	-4.431292	0.501494	1.551588
41	1	0	-4.733586	-3.212561	-0.739438
42	1	0	-4.167284	-1.718590	-1.485047
43	6	0	-4.439304	-2.071754	1.785062
44	1	0	-6.093113	-1.446414	0.505595
45	1	0	-4.884381	-1.969967	2.770225
46	1	0	-2.424020	-2.880362	2.260047
47	6	0	-5.470215	0.934878	-0.268553
48	6	0	-6.468191	1.611826	0.449404
49	6	0	-5.535629	0.937437	-1.670674
50	6	0	-7.496056	2.282895	-0.211802
51	1	0	-6.434622	1.620659	1.536667
52	6	0	-6.564330	1.605767	-2.332519
53	1	0	-4.781723	0.424152	-2.261514
54	6	0	-7.547995	2.280879	-1.606233
55	1	0	-8.253253	2.808056	0.362945
56	1	0	-6.596171	1.601260	-3.418189
57	1	0	-8.347516	2.801727	-2.124490
58	6	0	5.479407	3.912492	-0.651115
59	6	0	4.295229	1.892167	-1.287801
60	6	0	5.271396	2.829972	-1.538887
61	1	0	4.821756	4.884798	1.141648
62	1	0	2.948008	4.120207	2.519360
63	1	0	6.258046	4.640207	-0.859777
64	1	0	5.885685	2.741215	-2.430257
65	1	0	4.145675	1.075284	-1.983975
66	6	0	4.457135	-1.169076	-0.218632
67	6	0	5.109668	-3.232934	-1.316534
68	6	0	5.384920	-2.165152	-0.429411
69	1	0	4.681435	-0.361917	0.468885
70	1	0	1.426740	-3.212604	-3.033925
71	1	0	3.665824	-4.119470	-2.628798
72	1	0	5.855122	-4.005686	-1.479767
73	1	0	6.337736	-2.131884	0.091158

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1	6	0	2.323051	-0.637917	-0.442580
2	6	0	1.094584	-1.113482	-0.893322
3	6	0	0.429847	0.291329	1.535256
4	6	0	-0.125853	-0.221276	-0.884573
5	1	0	-0.075495	0.805683	2.359762
6	1	0	0.072036	0.729908	-1.395353
7	1	0	-0.942337	-0.723481	-1.404474
8	7	0	-0.600596	0.092331	0.487421
9	6	0	1.534007	1.200933	1.028209
10	6	0	2.409989	0.774990	0.032443
11	6	0	1.604912	2.519256	1.541803
12	1	0	0.932343	2.814791	2.343867
13	6	0	3.331836	1.718245	-0.539710
14	6	0	3.397982	3.047367	-0.001079
15	6	0	2.530604	3.411616	1.060130
16	6	0	4.313804	3.981849	-0.555600
17	6	0	0.961907	-2.441036	-1.372361
18	6	0	3.444908	-1.535538	-0.376782
19	6	0	2.042588	-3.287059	-1.396454
20	6	0	3.299815	-2.868853	-0.887485
21	1	0	-0.004867	-2.781991	-1.733747
22	6	0	4.407293	-3.757789	-0.844537
23	6	0	-1.884813	0.308335	0.760218
24	1	0	-2.087053	0.511775	1.809995
25	6	0	0.930444	-1.027661	2.165350
26	8	0	1.973963	-1.108215	2.765149
27	8	0	0.014531	-2.002341	2.061646
28	6	0	0.373926	-3.253106	2.692931
29	1	0	0.546701	-3.101351	3.760638
30	1	0	-0.475401	-3.914774	2.526217
31	1	0	1.277587	-3.657088	2.232181
32	6	0	-2.974229	0.285826	-0.108607
33	6	0	-4.335421	0.286553	0.390674
34	6	0	-2.989612	2.983200	-0.374965
35	1	0	-2.810437	0.099854	-1.162569
36	6	0	-5.013874	2.018597	0.249647
37	1	0	-4.389260	0.127148	1.466802
38	6	0	-4.289067	2.561808	-0.979512
39	6	0	-3.185172	3.238096	0.979602
40	1	0	-2.099276	3.232828	-0.941667
41	6	0	-4.437045	2.735662	1.347542
42	1	0	-6.089051	1.865391	0.220420
43	1	0	-4.822012	3.470203	-1.306799
44	1	0	-4.226152	1.898024	-1.841421
45	1	0	-2.466944	3.704190	1.644731
46	1	0	-4.859635	2.776891	2.346602

47	6	0	-5.367718	-0.557898	-0.308026
48	6	0	-6.388643	-1.134752	0.463267
49	6	0	-5.367464	-0.781987	-1.693305
50	6	0	-7.376867	-1.920193	-0.128341
51	1	0	-6.405003	-0.973280	1.538954
52	6	0	-6.357086	-1.565111	-2.286314
53	1	0	-4.590907	-0.358438	-2.324480
54	6	0	-7.365094	-2.136532	-1.506964
55	1	0	-8.152873	-2.364025	0.488318
56	1	0	-6.337793	-1.732087	-3.359355
57	1	0	-8.133534	-2.747289	-1.971213
58	6	0	5.603113	-3.366691	-0.289114
59	6	0	4.686362	-1.177974	0.218134
60	6	0	5.735038	-2.069375	0.259822
61	1	0	6.671247	-1.776392	0.725925
62	1	0	1.941451	-4.297393	-1.784045
63	1	0	4.286264	-4.759747	-1.248288
64	1	0	6.442288	-4.055314	-0.255741
65	1	0	4.800572	-0.194866	0.658671
66	6	0	4.159696	1.407553	-1.655523
67	6	0	5.114350	3.638256	-1.619365
68	6	0	5.024578	2.341634	-2.179684
69	1	0	2.597147	4.413932	1.474888
70	1	0	4.362319	4.979515	-0.126858
71	1	0	5.808340	4.360903	-2.038440
72	1	0	5.643509	2.081960	-3.033656
73	1	0	4.102387	0.421411	-2.101133

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1	6	0	-2.151472	0.661228	-0.484571
2	6	0	-0.872417	0.876799	-0.990722
3	6	0	-0.455839	-0.902720	1.272343
4	6	0	0.090504	-0.283885	-1.114362
5	1	0	-0.047886	-1.640521	1.972765
6	1	0	-0.378974	-1.147188	-1.596704
7	1	0	0.955076	0.007821	-1.707795
8	7	0	0.573785	-0.716348	0.220315
9	6	0	-1.747616	-1.473262	0.718436
10	6	0	-2.551834	-0.737610	-0.149291
11	6	0	-2.100410	-2.795606	1.085907
12	1	0	-1.470684	-3.340094	1.785398
13	6	0	-3.698352	-1.366668	-0.746789
14	6	0	-4.048062	-2.702319	-0.353589
15	6	0	-3.234318	-3.385670	0.585291
16	6	0	-5.185737	-3.326908	-0.932517
17	6	0	-0.441784	2.176882	-1.351533
18	6	0	-3.012850	1.787639	-0.244949
19	6	0	-1.277905	3.255044	-1.201577
20	6	0	-2.567610	3.096534	-0.630741
21	1	0	0.557530	2.314679	-1.755913

22	6	0	-3.415128	4.215427	-0.408600
23	6	0	1.859445	-0.752084	0.565756
24	1	0	2.024703	-0.965128	1.619004
25	6	0	-0.566028	0.399024	2.110682
26	8	0	0.342131	1.192719	2.213448
27	8	0	-1.721405	0.449197	2.771692
28	6	0	-1.894291	1.584764	3.651956
29	1	0	-1.890941	2.508729	3.070403
30	1	0	-2.861149	1.431845	4.128991
31	1	0	-1.092153	1.612744	4.392516
32	6	0	2.989649	-0.547147	-0.224969
33	6	0	4.294554	-0.346364	0.371817
34	6	0	3.441250	-3.192503	-0.514165
35	1	0	2.872008	-0.340729	-1.281477
36	6	0	5.253799	-1.949666	0.248440
37	1	0	4.248639	-0.210613	1.451125
38	6	0	4.696520	-2.567841	-1.030499
39	6	0	3.594441	-3.448615	0.845551
40	1	0	2.635891	-3.561384	-1.139795
41	6	0	4.730300	-2.769590	1.298158
42	1	0	6.289969	-1.625888	0.288768
43	1	0	5.379859	-3.378223	-1.335054
44	1	0	4.586475	-1.901695	-1.885740
45	1	0	2.918196	-4.033273	1.459166
46	1	0	5.092048	-2.766498	2.321592
47	6	0	5.223816	0.668595	-0.237974
48	6	0	6.063709	1.400071	0.615937
49	6	0	5.302487	0.906712	-1.618797
50	6	0	6.951104	2.348263	0.108708
51	1	0	6.014908	1.232136	1.689516
52	6	0	6.191963	1.852280	-2.127268
53	1	0	4.665306	0.365473	-2.313045
54	6	0	7.019625	2.576122	-1.266303
55	1	0	7.585449	2.909478	0.788477
56	1	0	6.235630	2.026136	-3.198553
57	1	0	7.710168	3.313196	-1.665017
58	6	0	-4.640473	4.063545	0.197257
59	6	0	-4.274992	1.673004	0.402539
60	6	0	-5.065511	2.780399	0.616538
61	1	0	-6.024446	2.668714	1.114532
62	1	0	-0.951101	4.249136	-1.494652
63	1	0	-3.069685	5.198425	-0.718168
64	1	0	-5.278781	4.925981	0.365385
65	1	0	-4.612193	0.699192	0.737774
66	6	0	-4.485089	-0.739459	-1.754102
67	6	0	-5.936048	-2.680226	-1.886023
68	6	0	-5.571384	-1.379170	-2.307325
69	1	0	-3.508510	-4.393315	0.885933
70	1	0	-5.444344	-4.333537	-0.614269
71	1	0	-6.800615	-3.168185	-2.326319
72	1	0	-6.152938	-0.882060	-3.078324

73 1 0 -4.217849 0.253626 -2.095742

e-exo-si-a

1	6	0	2.352698	-0.233326	-0.537144
2	6	0	1.136058	-0.621415	-1.092229
3	6	0	0.445105	0.246060	1.580099
4	6	0	-0.098133	0.229768	-0.892764
5	1	0	-0.077355	0.589336	2.479710
6	1	0	0.089329	1.278962	-1.147197
7	1	0	-0.901780	-0.136390	-1.531334
8	7	0	-0.580743	0.180239	0.510825
9	6	0	1.515211	1.271464	1.251871
10	6	0	2.411385	1.060027	0.207244
11	6	0	1.545033	2.471594	2.002897
12	1	0	0.850167	2.602482	2.828644
13	6	0	3.317952	2.112083	-0.163254
14	6	0	3.344412	3.317520	0.616091
15	6	0	2.453145	3.458644	1.709771
16	6	0	4.244008	4.359102	0.262060
17	6	0	1.029333	-1.824666	-1.834638
18	6	0	3.485538	-1.113508	-0.637247
19	6	0	2.121083	-2.638059	-2.011803
20	6	0	3.364598	-2.320201	-1.405342
21	1	0	0.074944	-2.088387	-2.284468
22	6	0	4.482167	-3.189830	-1.520810
23	6	0	1.014849	-1.135104	1.975296
24	8	0	2.063677	-1.268449	2.553937
25	8	0	0.154725	-2.139579	1.706880
26	6	0	0.617730	-3.447780	2.119338
27	1	0	-0.187350	-4.136952	1.864162
28	1	0	1.532215	-3.705330	1.581453
29	1	0	0.812612	-3.460139	3.193610
30	6	0	-2.983895	0.099910	-0.003877
31	6	0	-4.318422	0.143564	0.534511
32	6	0	-3.024252	-2.684400	-0.060060
33	1	0	-2.851718	0.212332	-1.072447
34	6	0	-5.013548	-1.640954	0.575071
35	1	0	-4.332280	0.275487	1.618039
36	6	0	-3.837823	-2.413019	1.163618
37	6	0	-3.846488	-2.613025	-1.171969
38	1	0	-1.991645	-3.014188	-0.044983
39	6	0	-5.080526	-2.061604	-0.782589
40	1	0	-5.928269	-1.501340	1.145581
41	1	0	-4.230316	-3.374110	1.535653
42	1	0	-3.302724	-1.943594	1.989847
43	6	0	-1.871414	0.104360	0.832388
44	1	0	-2.051591	0.067220	1.905045
45	1	0	-3.572215	-2.888941	-2.183983
46	1	0	-5.919596	-1.878407	-1.444345

47	6	0	-5.374369	0.979468	-0.122069
48	6	0	-6.329700	1.610703	0.688091
49	6	0	-5.448866	1.158383	-1.512201
50	6	0	-7.329541	2.406778	0.128264
51	1	0	-6.286344	1.485135	1.767912
52	6	0	-6.447255	1.952401	-2.072501
53	1	0	-4.727083	0.678854	-2.168511
54	6	0	-7.391191	2.579700	-1.254171
55	1	0	-8.056623	2.891305	0.773191
56	1	0	-6.487892	2.084722	-3.149812
57	1	0	-8.167800	3.198431	-1.693646
58	6	0	4.167033	2.034509	-1.303350
59	6	0	5.066527	4.238674	-0.832950
60	6	0	5.015738	3.068638	-1.627818
61	1	0	2.484215	4.369747	2.301097
62	1	0	4.137961	1.149683	-1.928337
63	1	0	5.651093	2.987723	-2.505070
64	1	0	5.747171	5.042430	-1.097714
65	1	0	4.260881	5.259953	0.869913
66	6	0	5.664240	-2.906125	-0.877376
67	6	0	4.713962	-0.868470	0.036252
68	6	0	5.772418	-1.741415	-0.081246
69	1	0	2.041217	-3.547121	-2.602326
70	1	0	4.380589	-4.091508	-2.119404
71	1	0	6.511428	-3.579757	-0.966869
72	1	0	6.698421	-1.537575	0.448384
73	1	0	4.809515	0.009812	0.663163

e-exo-si-b

1	6	0	2.177444	-0.244709	-0.629210
2	6	0	0.908830	-0.403694	-1.181160
3	6	0	0.428033	0.688975	1.482739
4	6	0	-0.132591	0.674522	-0.977565
5	1	0	-0.017455	1.191348	2.349856
6	1	0	0.268880	1.668236	-1.198385
7	1	0	-0.989371	0.510367	-1.628644
8	7	0	-0.610191	0.682929	0.425483
9	6	0	1.659673	1.479864	1.083613
10	6	0	2.494019	1.044265	0.056258
11	6	0	1.926683	2.689224	1.771069
12	1	0	1.271233	2.997458	2.581715
13	6	0	3.585936	1.879696	-0.363403
14	6	0	3.851226	3.094828	0.353678
15	6	0	3.008423	3.463910	1.432412
16	6	0	4.935188	3.921603	-0.047869
17	6	0	0.567112	-1.584774	-1.885239
18	6	0	3.113202	-1.335313	-0.689278
19	6	0	1.474241	-2.607087	-2.020071
20	6	0	2.753166	-2.523175	-1.410086

21	1	0	-0.418326	-1.665697	-2.337455
22	6	0	3.674320	-3.603075	-1.480721
23	6	0	0.682159	-0.761793	1.968897
24	8	0	-0.131422	-1.656585	1.856958
25	8	0	1.840004	-0.857623	2.615679
26	6	0	2.147274	-2.150984	3.187075
27	1	0	3.101287	-2.018891	3.694933
28	1	0	1.367184	-2.446168	3.892093
29	1	0	2.230985	-2.896173	2.393630
30	6	0	-3.007934	0.312163	-0.014770
31	6	0	-4.324031	0.255185	0.567038
32	6	0	-2.772268	-2.533608	0.202783
33	1	0	-2.918733	0.332654	-1.093764
34	6	0	-4.829752	-1.583612	0.784457
35	1	0	-4.322052	0.474966	1.636038
36	6	0	-3.578680	-2.190522	1.409970
37	6	0	-3.612626	-2.618896	-0.893338
38	1	0	-1.716182	-2.773557	0.236317
39	6	0	-4.880259	-2.128034	-0.528258
40	1	0	-5.745045	-1.476354	1.361180
41	1	0	-3.880023	-3.133480	1.896544
42	1	0	-3.054053	-1.601093	2.161782
43	6	0	-1.882518	0.474653	0.780370
44	1	0	-2.032329	0.474809	1.857495
45	1	0	-3.335238	-2.967484	-1.881820
46	1	0	-5.741703	-2.073064	-1.184580
47	6	0	-5.481941	0.916771	-0.115616
48	6	0	-6.465699	1.530602	0.673649
49	6	0	-5.622561	0.953338	-1.511758
50	6	0	-7.556431	2.173349	0.087000
51	1	0	-6.372875	1.513639	1.757491
52	6	0	-6.711822	1.593372	-2.098876
53	1	0	-4.881631	0.480292	-2.151380
54	6	0	-7.682594	2.206540	-1.301412
55	1	0	-8.304120	2.647827	0.715688
56	1	0	-6.803183	1.616173	-3.180989
57	1	0	-8.530312	2.705220	-1.761672
58	6	0	4.397778	1.580976	-1.494280
59	6	0	5.713094	3.587765	-1.131189
60	6	0	5.430634	2.411687	-1.866192
61	1	0	3.216462	4.382865	1.973651
62	1	0	4.193661	0.689924	-2.076361
63	1	0	6.032682	2.164769	-2.735893
64	1	0	6.535592	4.229280	-1.433435
65	1	0	5.129374	4.832346	0.512627
66	6	0	4.890938	-3.535402	-0.842669
67	6	0	4.370274	-1.311114	-0.022552
68	6	0	5.233442	-2.381917	-0.097601
69	1	0	1.217220	-3.502578	-2.579949
70	1	0	3.393807	-4.490481	-2.042351
71	1	0	5.586279	-4.367687	-0.900004

72	1	0	6.186962	-2.341806	0.421216
73	1	0	4.645394	-0.437966	0.557574

e-exo-re-a

1	6	0	2.333624	-0.599136	-0.463990
2	6	0	1.097078	-1.022730	-0.943904
3	6	0	0.463525	0.200213	1.591712
4	6	0	-0.112402	-0.119469	-0.856083
5	1	0	-0.030926	0.660863	2.453748
6	1	0	0.093543	0.868227	-1.287820
7	1	0	-0.936766	-0.567909	-1.411075
8	7	0	-0.575456	0.083633	0.540150
9	6	0	1.572435	1.134660	1.142538
10	6	0	2.440242	0.773038	0.115051
11	6	0	1.656570	2.412604	1.748140
12	1	0	0.989209	2.656613	2.571469
13	6	0	3.370526	1.745718	-0.390850
14	6	0	3.450595	3.032430	0.240926
15	6	0	2.588685	3.328710	1.327314
16	6	0	4.375088	3.994951	-0.247385
17	6	0	0.945340	-2.307315	-1.523652
18	6	0	3.443608	-1.513532	-0.472705
19	6	0	2.014646	-3.162799	-1.618178
20	6	0	3.278900	-2.801743	-1.083607
21	1	0	-0.027116	-2.606606	-1.906140
22	6	0	4.374269	-3.706109	-1.113372
23	6	0	0.958290	-1.163462	2.123840
24	8	0	2.002880	-1.293264	2.713126
25	8	0	0.037885	-2.123870	1.950108
26	6	0	0.395455	-3.420796	2.481217
27	1	0	0.575368	-3.352701	3.556311
28	1	0	-0.457598	-4.064489	2.269215
29	1	0	1.294673	-3.791047	1.984724
30	6	0	-2.958742	0.294486	-0.008578
31	6	0	-2.958011	3.120520	-0.148940
32	6	0	-4.302659	0.302394	0.507705
33	1	0	-2.811369	0.174694	-1.074563
34	6	0	-3.795152	2.877007	1.064718
35	6	0	-3.753490	3.012192	-1.275815
36	1	0	-1.932824	3.473560	-0.125307
37	6	0	-4.964030	2.097269	0.474073
38	1	0	-4.336546	0.205185	1.594505
39	1	0	-4.187866	3.847567	1.411029
40	1	0	-3.280468	2.421556	1.912092
41	6	0	-4.997576	2.474399	-0.897119
42	1	0	-5.892352	1.986181	1.028583
43	6	0	-1.859629	0.265513	0.844855
44	1	0	-2.046676	0.379478	1.911129
45	1	0	-3.456356	3.260515	-2.288384

46	1	0	-5.822715	2.274650	-1.571440
47	6	0	-5.367688	-0.531574	-0.138334
48	6	0	-6.347046	-1.117211	0.677254
49	6	0	-5.426848	-0.752140	-1.523145
50	6	0	-7.355923	-1.909267	0.127852
51	1	0	-6.315866	-0.958817	1.753151
52	6	0	-6.434713	-1.541392	-2.073125
53	1	0	-4.685940	-0.308146	-2.183155
54	6	0	-7.402853	-2.123191	-1.249395
55	1	0	-8.102018	-2.358042	0.776929
56	1	0	-6.464164	-1.705297	-3.146465
57	1	0	-8.186999	-2.738153	-1.680707
58	6	0	5.171213	3.720075	-1.334126
59	6	0	4.193838	1.507418	-1.527604
60	6	0	5.067816	2.467672	-1.985209
61	1	0	2.665416	4.298432	1.811901
62	1	0	4.434279	4.958846	0.251580
63	1	0	5.872243	4.463749	-1.701522
64	1	0	5.683447	2.263182	-2.856381
65	1	0	4.125979	0.556374	-2.042538
66	6	0	5.576753	-3.375115	-0.533877
67	6	0	4.691635	-1.219447	0.143029
68	6	0	5.728030	-2.125511	0.112288
69	1	0	1.898854	-4.138536	-2.082701
70	1	0	4.238451	-4.672219	-1.592736
71	1	0	6.406492	-4.075504	-0.556658
72	1	0	6.669451	-1.881793	0.595927
73	1	0	4.820828	-0.274745	0.657253

e-exo-re-b

1	6	0	-2.166137	0.600447	-0.529424
2	6	0	-0.882378	0.760118	-1.044816
3	6	0	-0.488295	-0.763839	1.401558
4	6	0	0.079554	-0.407605	-1.032995
5	1	0	-0.087309	-1.419994	2.182817
6	1	0	-0.388467	-1.317514	-1.422254
7	1	0	0.949572	-0.185010	-1.647905
8	7	0	0.550150	-0.694336	0.344380
9	6	0	-1.775028	-1.392064	0.900554
10	6	0	-2.571020	-0.754395	-0.048533
11	6	0	-2.130891	-2.668006	1.404003
12	1	0	-1.507745	-3.133848	2.163612
13	6	0	-3.713092	-1.444293	-0.584203
14	6	0	-4.065693	-2.731104	-0.054260
15	6	0	-3.259577	-3.309956	0.958511
16	6	0	-5.199298	-3.414128	-0.571949
17	6	0	-0.447200	2.014270	-1.538326
18	6	0	-3.027087	1.746720	-0.416976
19	6	0	-1.282330	3.103316	-1.508954
20	6	0	-2.576209	3.007461	-0.933915

21	1	0	0.555532	2.107655	-1.946991
22	6	0	-3.422556	4.144903	-0.835657
23	6	0	-0.606588	0.622083	2.089939
24	8	0	0.299183	1.424715	2.109652
25	8	0	-1.766919	0.742559	2.733260
26	6	0	-1.948541	1.970004	3.477823
27	1	0	-1.927688	2.823135	2.796951
28	1	0	-2.925117	1.875749	3.950211
29	1	0	-1.160264	2.076676	4.226181
30	6	0	2.971405	-0.549215	-0.086201
31	6	0	3.380199	-3.311592	-0.296975
32	6	0	4.270015	-0.378188	0.511559
33	1	0	2.870567	-0.397659	-1.153581
34	6	0	4.105880	-3.008258	0.973892
35	6	0	4.222101	-3.064658	-1.367160
36	1	0	2.412332	-3.797712	-0.349705
37	6	0	5.189342	-2.057271	0.478885
38	1	0	4.226380	-0.309519	1.599890
39	1	0	4.606188	-3.930773	1.312505
40	1	0	3.488582	-2.657112	1.802203
41	6	0	5.357455	-2.380438	-0.895804
42	1	0	6.056566	-1.834938	1.095385
43	6	0	1.834183	-0.693909	0.704309
44	1	0	1.984206	-0.809484	1.775129
45	1	0	4.021794	-3.314696	-2.402839
46	1	0	6.186870	-2.048873	-1.510115
47	6	0	5.233474	0.623290	-0.050539
48	6	0	6.049370	1.339012	0.837658
49	6	0	5.353140	0.877703	-1.425604
50	6	0	6.956151	2.290304	0.368634
51	1	0	5.967569	1.158206	1.907229
52	6	0	6.259700	1.825653	-1.895398
53	1	0	4.739483	0.335793	-2.140932
54	6	0	7.064410	2.535956	-0.999738
55	1	0	7.574498	2.838144	1.073529
56	1	0	6.337393	2.012958	-2.962538
57	1	0	7.769455	3.274799	-1.368741
58	6	0	-5.943997	-2.871647	-1.592426
59	6	0	-4.493638	-0.927051	-1.656607
60	6	0	-5.577026	-1.621600	-2.145619
61	1	0	-3.535938	-4.280271	1.362353
62	1	0	-5.459972	-4.381675	-0.150786
63	1	0	-6.806008	-3.403636	-1.984031
64	1	0	-6.154394	-1.208114	-2.967457
65	1	0	-4.224086	0.025177	-2.098073
66	6	0	-4.652407	4.058914	-0.226016
67	6	0	-4.294235	1.702072	0.229462
68	6	0	-5.083576	2.827025	0.321213
69	1	0	-0.951446	4.060670	-1.902533
70	1	0	-3.072649	5.089825	-1.243237
71	1	0	-5.289782	4.935225	-0.152845

72	1	0	-6.046304	2.769450	0.821095
73	1	0	-4.636459	0.769315	0.662111

z-exo-si-a

1	6	0	-2.511552	-0.579222	0.608365
2	6	0	-1.593021	-0.833658	1.623639
3	6	0	-0.028843	0.458840	-0.477775
4	6	0	-0.573150	0.221125	1.982342
5	1	0	0.734788	1.021112	-1.025050
6	1	0	-1.045145	1.199412	2.121008
7	1	0	-0.051882	-0.041768	2.905069
8	7	0	0.456888	0.353725	0.915670
9	6	0	-1.318301	1.260771	-0.561912
10	6	0	-2.507756	0.774347	-0.024779
11	6	0	-1.270292	2.533016	-1.182661
12	1	0	-0.337567	2.874156	-1.625598
13	6	0	-3.673532	1.615961	-0.026290
14	6	0	-3.610394	2.897863	-0.669855
15	6	0	-2.391813	3.321468	-1.257567
16	6	0	-4.761651	3.730883	-0.684181
17	6	0	-1.571815	-2.083530	2.289318
18	6	0	-3.385430	-1.632582	0.168690
19	6	0	-2.455317	-3.074638	1.939130
20	6	0	-3.363962	-2.888165	0.864469
21	1	0	-0.857372	-2.248245	3.091952
22	6	0	-4.232532	-3.931911	0.445651
23	6	0	1.753298	0.368808	1.222527
24	1	0	1.950861	0.319728	2.291976
25	6	0	-0.120993	-0.900979	-1.212306
26	8	0	-0.719101	-1.027515	-2.252791
27	8	0	0.602889	-1.855840	-0.612284
28	6	0	0.590841	-3.143765	-1.270620
29	1	0	0.971133	-3.050908	-2.290193
30	1	0	1.238627	-3.780415	-0.669241
31	1	0	-0.426986	-3.537999	-1.296783
32	6	0	2.849044	0.406400	0.364210
33	6	0	4.193464	0.300121	0.869745
34	6	0	3.018838	3.218264	0.399540
35	1	0	2.690673	0.342925	-0.704719
36	6	0	4.956279	2.041560	0.961483
37	1	0	4.223202	0.118562	1.945933
38	6	0	3.831558	2.850196	1.598728
39	6	0	3.818231	3.143821	-0.728144
40	1	0	2.014830	3.626443	0.441778
41	6	0	5.025672	2.511698	-0.380668
42	1	0	5.872942	1.842079	1.510943
43	1	0	4.278346	3.772415	2.006138
44	1	0	3.284686	2.372289	2.412869

45	1	0	5.844691	2.312110	-1.062338
46	1	0	3.546246	3.478025	-1.723020
47	6	0	5.202686	-0.549323	0.156022
48	6	0	6.145249	-1.254828	0.918071
49	6	0	5.245162	-0.667307	-1.241803
50	6	0	7.102090	-2.063666	0.303524
51	1	0	6.126499	-1.177199	2.003131
52	6	0	6.200762	-1.473614	-1.856736
53	1	0	4.531836	-0.130024	-1.861645
54	6	0	7.132761	-2.175031	-1.086203
55	1	0	7.820506	-2.605125	0.911869
56	1	0	6.217582	-1.556858	-2.939620
57	1	0	7.876431	-2.802448	-1.568294
58	6	0	-4.240528	-1.505315	-0.960871
59	6	0	-5.066328	-3.763728	-0.635178
60	6	0	-5.057429	-2.542871	-1.350795
61	1	0	-2.452565	-4.025180	2.466138
62	1	0	-4.216811	-4.872181	0.990854
63	1	0	-5.722633	-4.569579	-0.950459
64	1	0	-5.696844	-2.425947	-2.220899
65	1	0	-4.234276	-0.582776	-1.529134
66	6	0	-4.887010	1.254734	0.624833
67	6	0	-5.924262	3.337367	-0.064878
68	6	0	-5.979599	2.092002	0.605389
69	1	0	-2.353599	4.287780	-1.753286
70	1	0	-4.701416	4.692643	-1.187025
71	1	0	-6.797353	3.983101	-0.077896
72	1	0	-6.893118	1.795622	1.112680
73	1	0	-4.947373	0.308361	1.149035

z-exo-si-b

1	6	0	2.442309	-0.553488	-0.714094
2	6	0	1.513136	-0.728330	-1.736628
3	6	0	0.001565	0.541373	0.421019
4	6	0	0.533678	0.380552	-2.043629
5	1	0	-0.737047	1.115509	0.991493
6	1	0	1.039831	1.347022	-2.133056
7	1	0	0.004155	0.183904	-2.977936
8	7	0	-0.490296	0.494323	-0.970844
9	6	0	1.324764	1.281339	0.535153
10	6	0	2.493844	0.771179	-0.025061
11	6	0	1.330912	2.525316	1.213719
12	1	0	0.411989	2.888317	1.667978
13	6	0	3.693414	1.563275	0.012081
14	6	0	3.684502	2.815360	0.714348
15	6	0	2.484454	3.261619	1.323351
16	6	0	4.869577	3.598055	0.763976
17	6	0	1.433987	-1.949814	-2.447470

18	6	0	3.269681	-1.660620	-0.318118
19	6	0	2.268969	-2.993646	-2.134564
20	6	0	3.186808	-2.888265	-1.057308
21	1	0	0.708673	-2.053752	-3.250247
22	6	0	4.004992	-3.986893	-0.678830
23	6	0	-1.790220	0.443559	-1.260667
24	1	0	-1.998498	0.394618	-2.327899
25	6	0	-0.030393	-0.884302	1.031780
26	8	0	-0.678893	-1.796759	0.575681
27	8	0	0.673832	-0.920059	2.165593
28	6	0	0.682112	-2.190137	2.857912
29	1	0	1.150708	-2.951394	2.231082
30	1	0	1.266257	-2.019821	3.761183
31	1	0	-0.338019	-2.493787	3.103115
32	6	0	-2.876218	0.429991	-0.389983
33	6	0	-4.218727	0.249720	-0.879846
34	6	0	-3.184421	3.220211	-0.458738
35	1	0	-2.702513	0.370093	0.676521
36	6	0	-5.072275	1.947841	-0.975322
37	1	0	-4.250592	0.057480	-1.953979
38	6	0	-3.999896	2.803312	-1.640173
39	6	0	-3.962199	3.122731	0.682564
40	1	0	-2.202861	3.676920	-0.522952
41	6	0	-5.143263	2.429883	0.362407
42	1	0	-5.986211	1.695795	-1.507401
43	1	0	-4.497696	3.699677	-2.046031
44	1	0	-3.446154	2.344621	-2.460651
45	1	0	-5.940375	2.198491	1.059707
46	1	0	-3.690457	3.481317	1.668996
47	6	0	-5.173677	-0.645263	-0.147739
48	6	0	-6.077036	-1.416359	-0.893327
49	6	0	-5.202608	-0.742746	1.251750
50	6	0	-6.981302	-2.270192	-0.260517
51	1	0	-6.067266	-1.355990	-1.979546
52	6	0	-6.105789	-1.593636	1.884889
53	1	0	-4.518128	-0.155078	1.858228
54	6	0	-6.998433	-2.360981	1.130834
55	1	0	-7.668907	-2.863385	-0.856081
56	1	0	-6.111808	-1.661255	2.968967
57	1	0	-7.700838	-3.024064	1.626899
58	6	0	4.137833	-1.613974	0.808802
59	6	0	4.850400	-3.898166	0.402363
60	6	0	4.905603	-2.702774	1.158051
61	1	0	2.217378	-3.924934	-2.692166
62	1	0	3.940357	-4.905757	-1.255806
63	1	0	5.468167	-4.745362	0.685414
64	1	0	5.559124	-2.644756	2.023856
65	1	0	4.187252	-0.708847	1.402957
66	6	0	4.889998	1.182249	-0.658690
67	6	0	6.014115	3.185577	0.123511
68	6	0	6.016682	1.971487	-0.603909

69	1	0	2.485702	4.206131	1.860844
70	1	0	4.849976	4.537509	1.310368
71	1	0	6.913249	3.793364	0.163338
72	1	0	6.916210	1.661518	-1.127807
73	1	0	4.909640	0.259910	-1.227062

z-exo-re-a

1	6	0	2.592000	-0.320101	-0.543194
2	6	0	1.733370	-0.899838	-1.473961
3	6	0	-0.041030	0.331864	0.484287
4	6	0	0.516562	-0.136882	-1.938874
5	1	0	-0.890472	0.792248	0.995920
6	1	0	0.779654	0.882161	-2.241865
7	1	0	0.050882	-0.636936	-2.790781
8	7	0	-0.514746	-0.043838	-0.865874
9	6	0	1.055600	1.386053	0.409836
10	6	0	2.314153	1.080436	-0.102540
11	6	0	0.747187	2.696933	0.847325
12	1	0	-0.235403	2.903442	1.263693
13	6	0	3.279212	2.133718	-0.264769
14	6	0	1.681804	3.699419	0.767904
15	6	0	1.967843	-2.208040	-1.963698
16	6	0	3.673177	-1.098748	-0.002786
17	6	0	3.045216	-2.936108	-1.522548
18	6	0	3.908405	-2.416466	-0.522228
19	1	0	1.295807	-2.625807	-2.709339
20	6	0	4.985124	-3.187084	-0.006396
21	6	0	-1.805850	-0.182435	-1.169176
22	1	0	-1.986348	-0.341836	-2.230881
23	6	0	0.357558	-0.862636	1.379839
24	8	0	0.941235	-0.705593	2.423711
25	8	0	-0.074386	-2.051411	0.918253
26	6	0	0.323832	-3.184101	1.727009
27	1	0	-0.095864	-3.101123	2.732025
28	1	0	-0.065610	-4.062597	1.212375
29	1	0	1.412366	-3.230130	1.792054
30	6	0	-2.917306	-0.103047	-0.334982
31	6	0	-3.148807	-2.900530	-0.166209
32	6	0	-4.246210	-0.002060	-0.876205
33	1	0	-2.778209	0.030909	0.730901
34	6	0	-3.952336	-2.622178	-1.394428
35	6	0	-3.947855	-2.714833	0.947186
36	1	0	-2.142988	-3.301204	-0.169458
37	6	0	-5.071234	-1.754823	-0.832591
38	1	0	-4.257825	0.071009	-1.964929
39	1	0	-4.406914	-3.569111	-1.730325
40	1	0	-3.397726	-2.219098	-2.243294
41	6	0	-5.147301	-2.098231	0.542398

42	1	0	-5.976924	-1.569773	-1.403884
43	1	0	-5.962491	-1.824222	1.202625
44	1	0	-3.678932	-2.956949	1.968996
45	6	0	-5.249179	0.923859	-0.261667
46	6	0	-6.168186	1.569682	-1.102256
47	6	0	-5.310927	1.173411	1.118485
48	6	0	-7.120082	2.447240	-0.582213
49	1	0	-6.133851	1.390367	-2.174766
50	6	0	-6.262158	2.048056	1.638954
51	1	0	-4.617732	0.684047	1.797893
52	6	0	-7.170113	2.688554	0.790437
53	1	0	-7.819256	2.941192	-1.250409
54	1	0	-6.294440	2.232678	2.708836
55	1	0	-7.909964	3.370226	1.199129
56	6	0	2.956635	3.453929	0.198289
57	6	0	4.533930	1.940280	-0.909314
58	6	0	3.909112	4.498448	0.052370
59	6	0	5.121494	4.267777	-0.553359
60	6	0	5.427822	2.977873	-1.048812
61	1	0	1.446299	4.699298	1.122207
62	1	0	3.654218	5.488964	0.420139
63	1	0	5.840598	5.074001	-0.664252
64	1	0	6.376997	2.806144	-1.548156
65	1	0	4.784554	0.962326	-1.302976
66	6	0	4.498133	-0.639447	1.061235
67	6	0	5.780607	-2.698768	1.003932
68	6	0	5.522783	-1.418872	1.549870
69	1	0	3.238025	-3.929662	-1.918943
70	1	0	5.162256	-4.176483	-0.420399
71	1	0	6.598663	-3.297307	1.393899
72	1	0	6.136108	-1.050208	2.366857
73	1	0	4.305032	0.332487	1.499598

z-exo-re-b

1	6	0	2.523454	-0.366152	-0.632343
2	6	0	1.630354	-0.871353	-1.574193
3	6	0	-0.058251	0.475565	0.385210
4	6	0	0.474995	-0.013287	-2.033572
5	1	0	-0.876821	0.997320	0.891321
6	1	0	0.810816	0.990744	-2.312238
7	1	0	-0.018374	-0.459986	-2.899181
8	7	0	-0.549144	0.121797	-0.962215
9	6	0	1.114479	1.443195	0.323235
10	6	0	2.350434	1.048378	-0.183609
11	6	0	0.903884	2.771100	0.769369
12	1	0	-0.064666	3.049775	1.176809
13	6	0	3.393480	2.026645	-0.330569
14	6	0	1.912039	3.700782	0.703993
15	6	0	1.760630	-2.193399	-2.063551

16	6	0	3.532906	-1.231277	-0.084840
17	6	0	2.765978	-3.010465	-1.609028
18	6	0	3.658730	-2.565213	-0.599667
19	1	0	1.062860	-2.554171	-2.815127
20	6	0	4.658980	-3.425500	-0.071604
21	6	0	-1.841427	-0.075874	-1.233047
22	1	0	-2.037476	-0.257717	-2.288225
23	6	0	0.182942	-0.805243	1.219337
24	8	0	-0.258312	-1.898590	0.938399
25	8	0	0.858753	-0.513062	2.331200
26	6	0	1.116610	-1.617520	3.227447
27	1	0	1.736447	-2.364737	2.727970
28	1	0	1.644515	-1.181452	4.074266
29	1	0	0.176651	-2.072677	3.547832
30	6	0	-2.935663	-0.024383	-0.378590
31	6	0	-3.006351	-2.871736	-0.151185
32	6	0	-4.277262	-0.016786	-0.894417
33	1	0	-2.781538	0.132429	0.682120
34	6	0	-3.845931	-2.645768	-1.365705
35	6	0	-3.786067	-2.689964	0.975347
36	1	0	-1.977556	-3.208497	-0.157987
37	6	0	-4.998002	-1.827268	-0.797493
38	1	0	-4.315398	0.025277	-1.984018
39	1	0	-4.259724	-3.617369	-1.683660
40	1	0	-3.324540	-2.229393	-2.229251
41	6	0	-5.022874	-2.139370	0.585446
42	1	0	-5.924666	-1.702121	-1.351057
43	1	0	-5.835451	-1.888915	1.258474
44	1	0	-3.477419	-2.892886	1.994148
45	6	0	-5.326453	0.855740	-0.281794
46	6	0	-6.299448	1.423484	-1.118202
47	6	0	-5.378469	1.134011	1.093392
48	6	0	-7.293735	2.253386	-0.599469
49	1	0	-6.273869	1.220618	-2.186732
50	6	0	-6.371913	1.960914	1.612734
51	1	0	-4.643972	0.703344	1.769110
52	6	0	-7.333045	2.524268	0.768027
53	1	0	-8.034409	2.687411	-1.264603
54	1	0	-6.396262	2.168490	2.678645
55	1	0	-8.105973	3.168959	1.175571
56	6	0	3.169132	3.363861	0.141267
57	6	0	4.634137	1.742855	-0.968811
58	6	0	4.199140	4.334051	0.009483
59	6	0	5.394571	4.016176	-0.590644
60	6	0	5.605337	2.710444	-1.094485
61	1	0	1.749222	4.713729	1.062121
62	1	0	4.017498	5.338654	0.382519
63	1	0	6.173397	4.766319	-0.691360
64	1	0	6.541889	2.470948	-1.589738
65	1	0	4.811894	0.751551	-1.368995
66	6	0	4.389672	-0.841327	0.982931

67	6	0	5.485417	-3.006727	0.944958
68	6	0	5.338318	-1.705881	1.482826
69	1	0	2.875639	-4.018412	-2.000346
70	1	0	4.751599	-4.428024	-0.481318
71	1	0	6.244360	-3.673538	1.343573
72	1	0	5.980326	-1.386785	2.298950
73	1	0	4.287117	0.149565	1.410007
