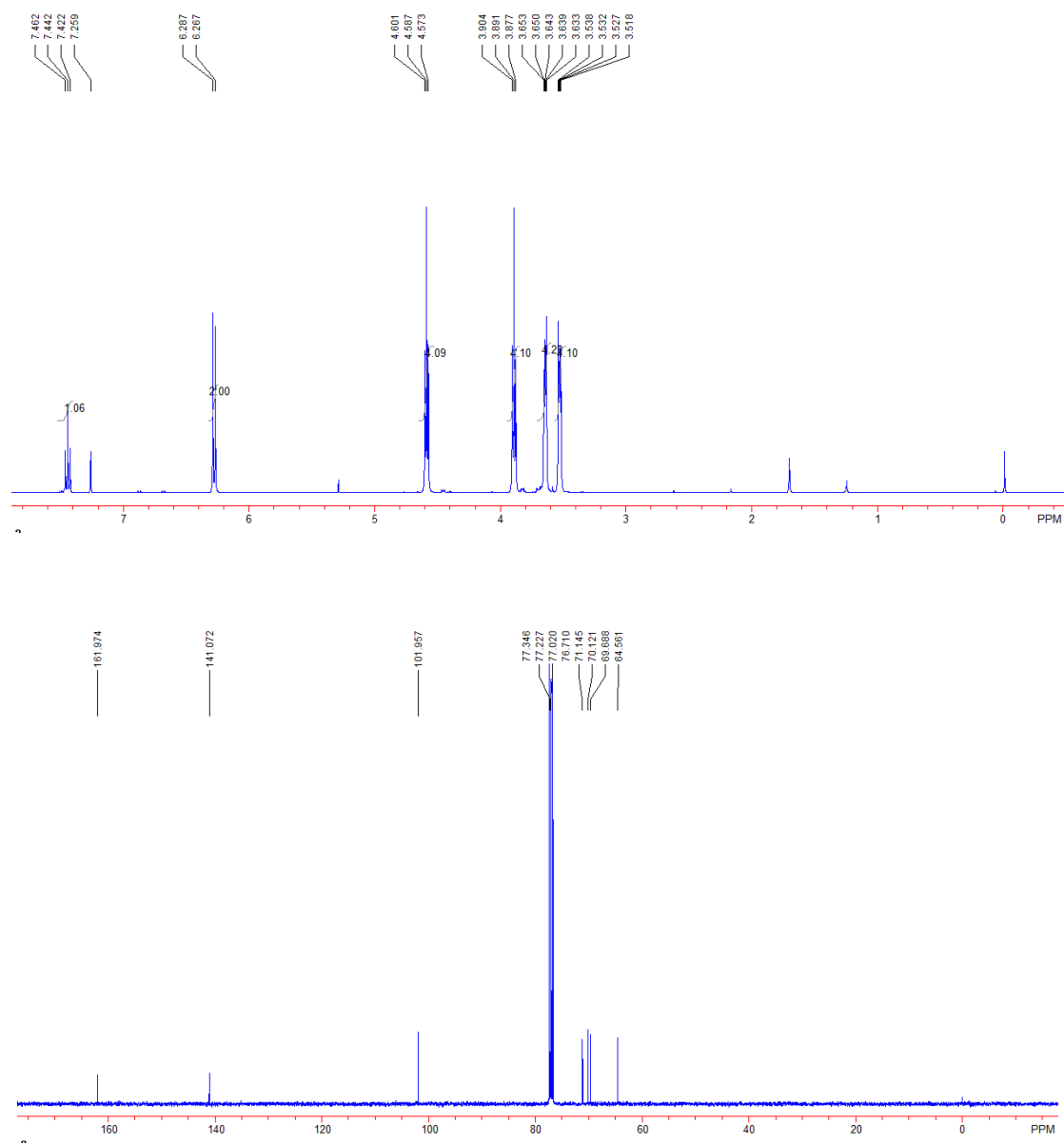
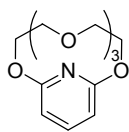
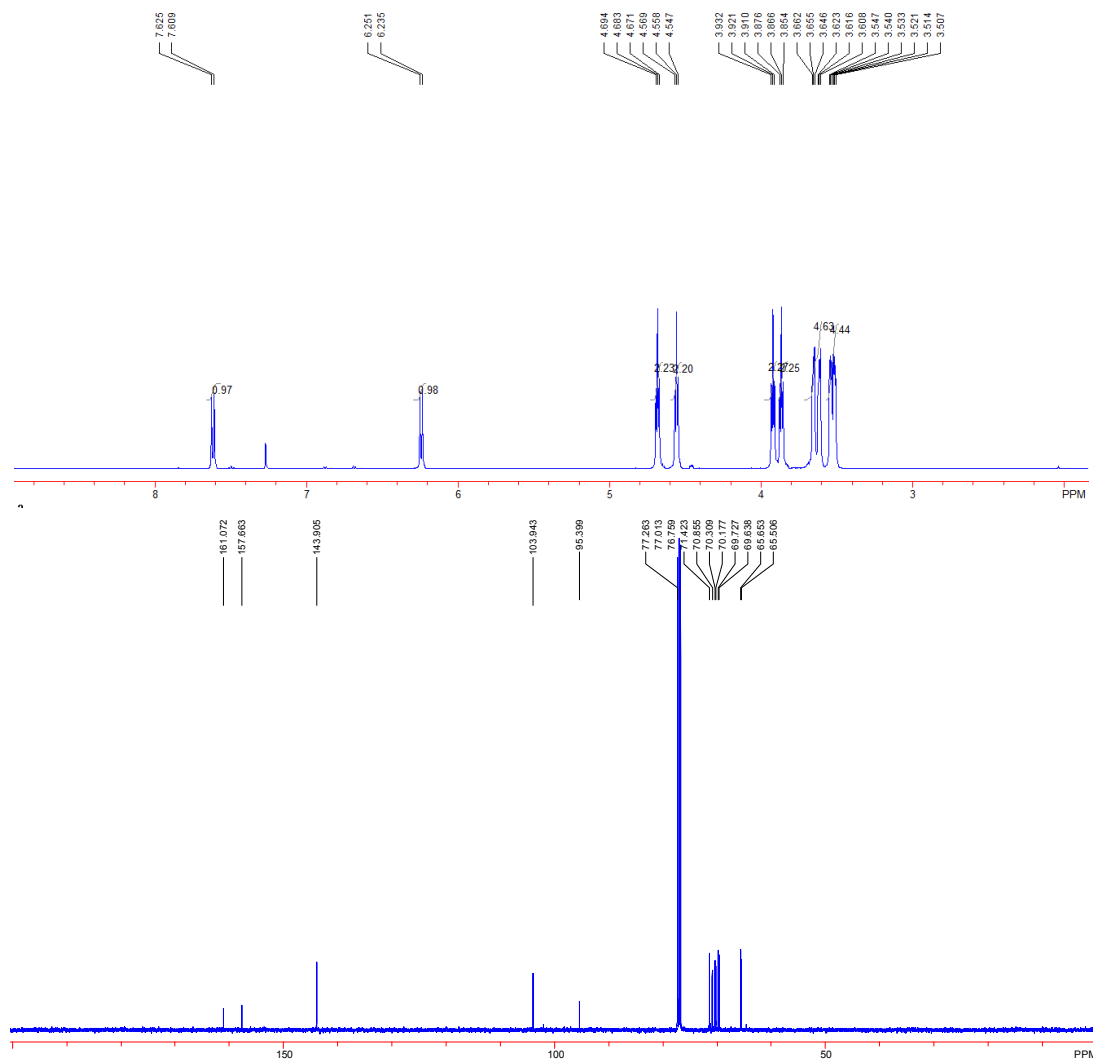
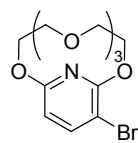


XI. ^1H , ^{13}C and ^{31}P NMR Spectra for Ligands and Catalysts

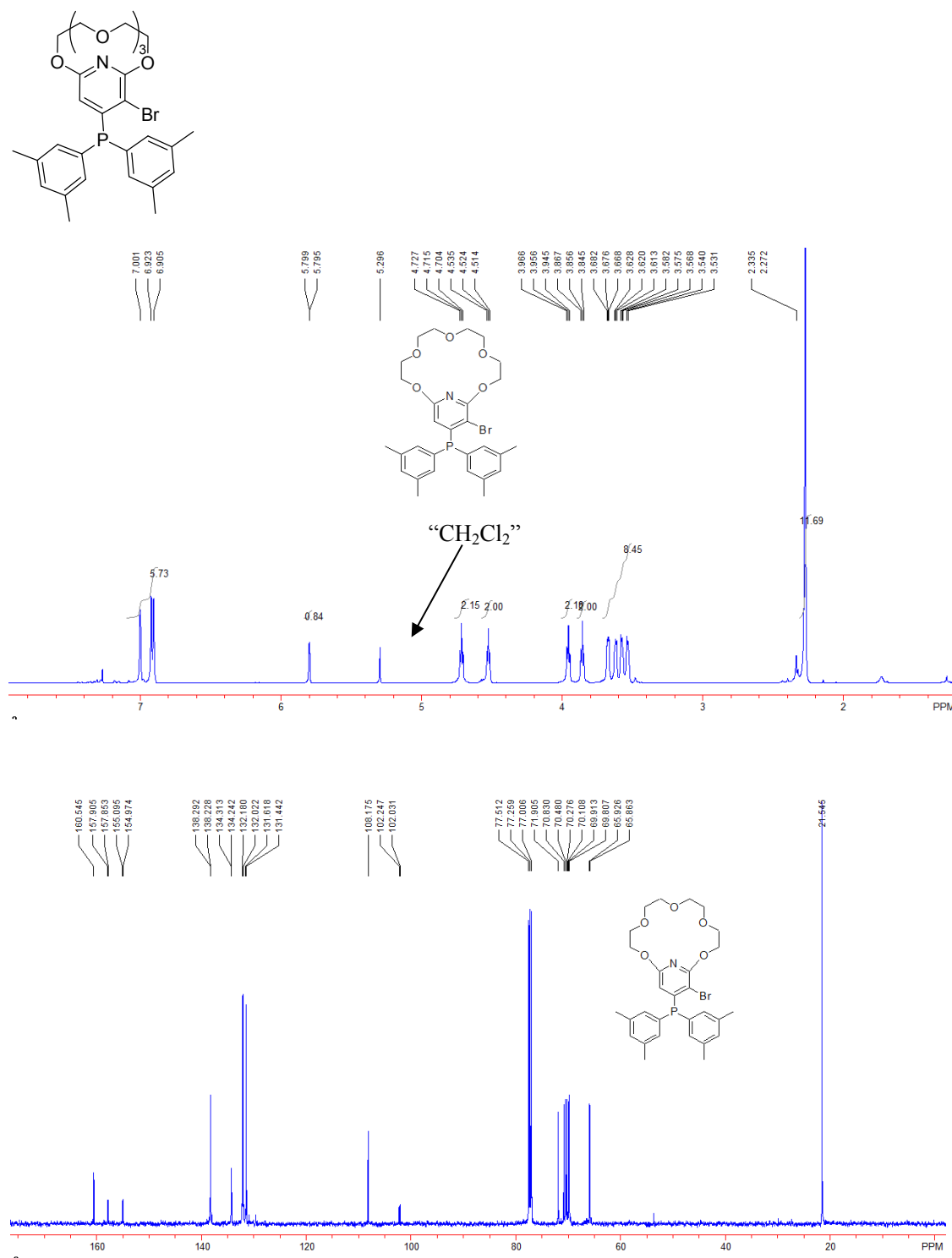
2,6-Pyridyl-16-crown-6 (2)

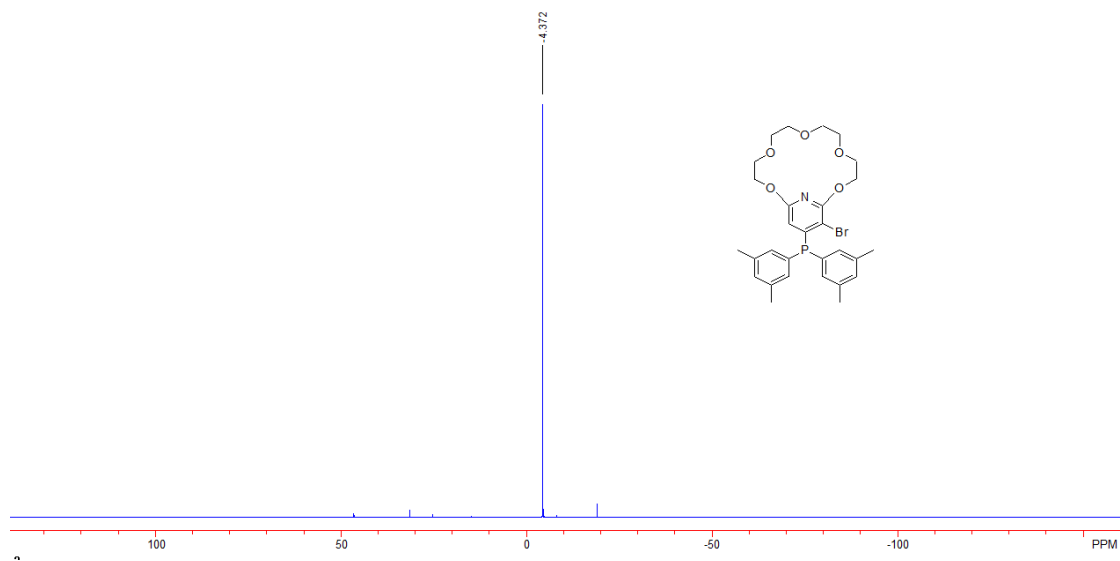


3-Bromo-2,6-pyrido-16-crown-6 (3)

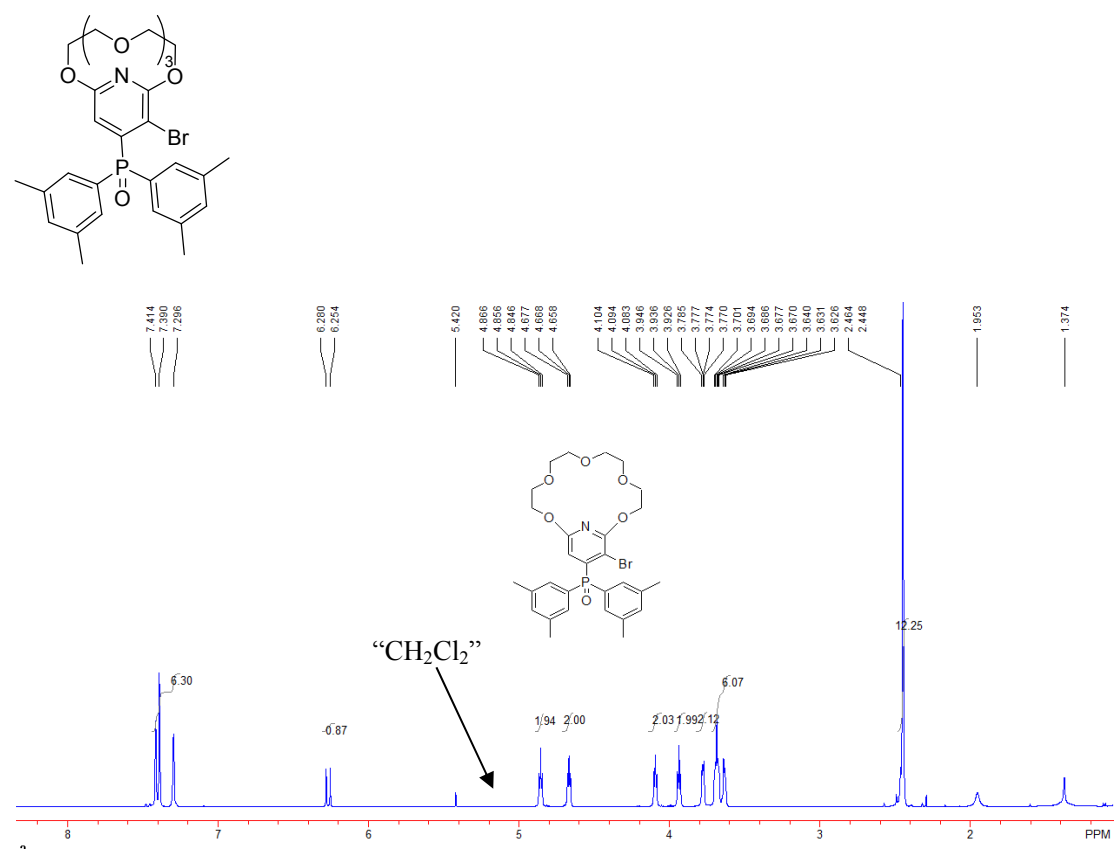


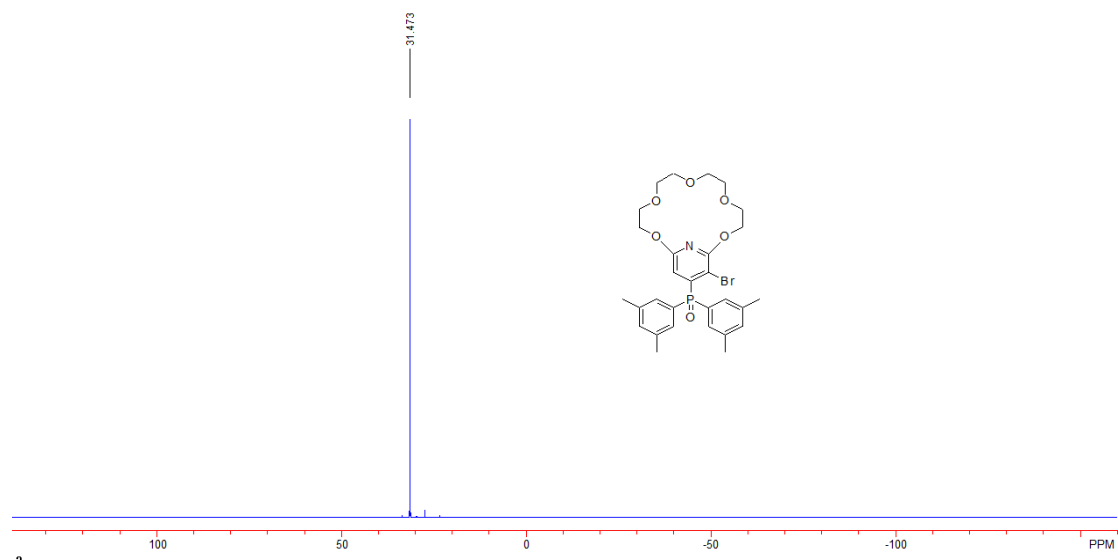
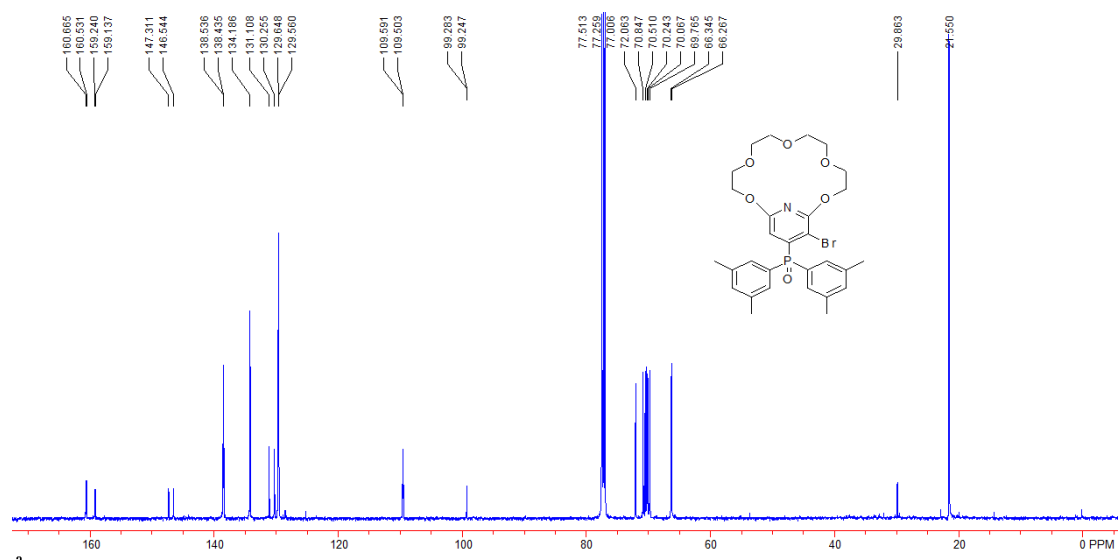
3-Bromo-4-di(3,5-dimethylphenyl)phosphino-2,6-pyridyl-crown-6 (4)

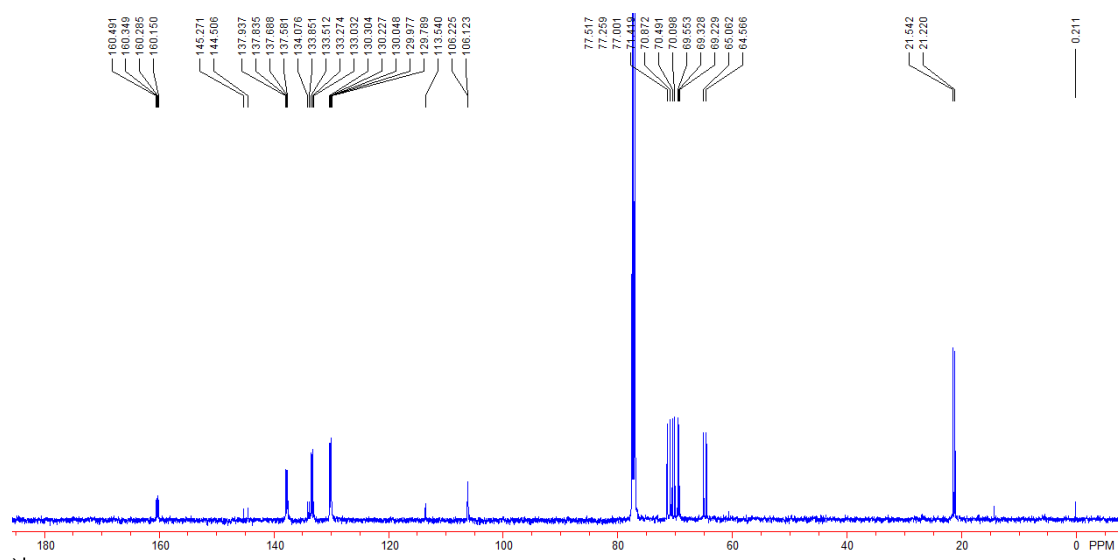
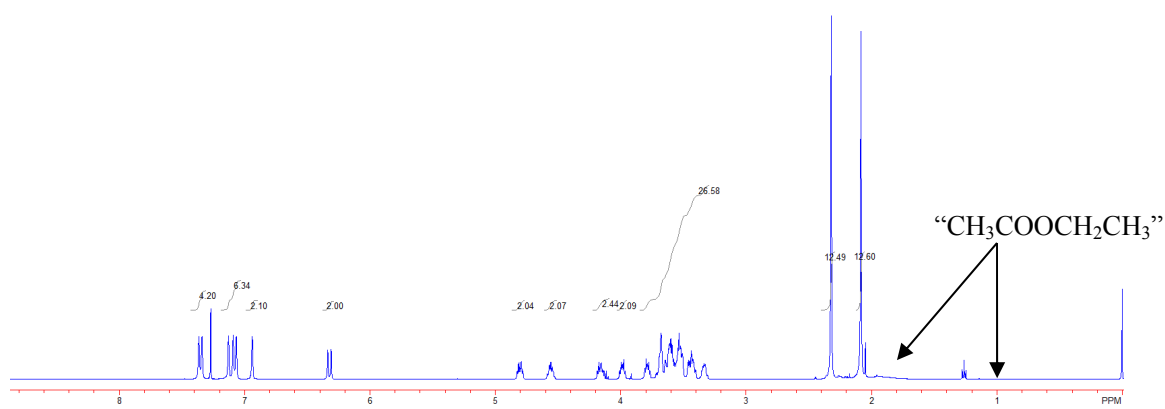


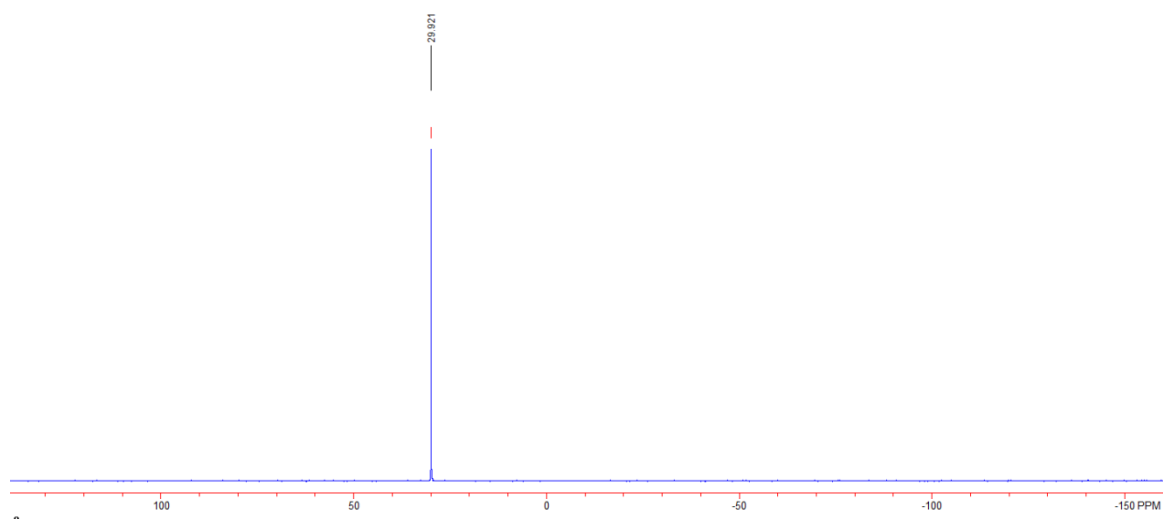


3-Bromo-4-di(3,5-dimethylphenyl)phosphino-2,6-pyridoyl-16-crown-6 (5)

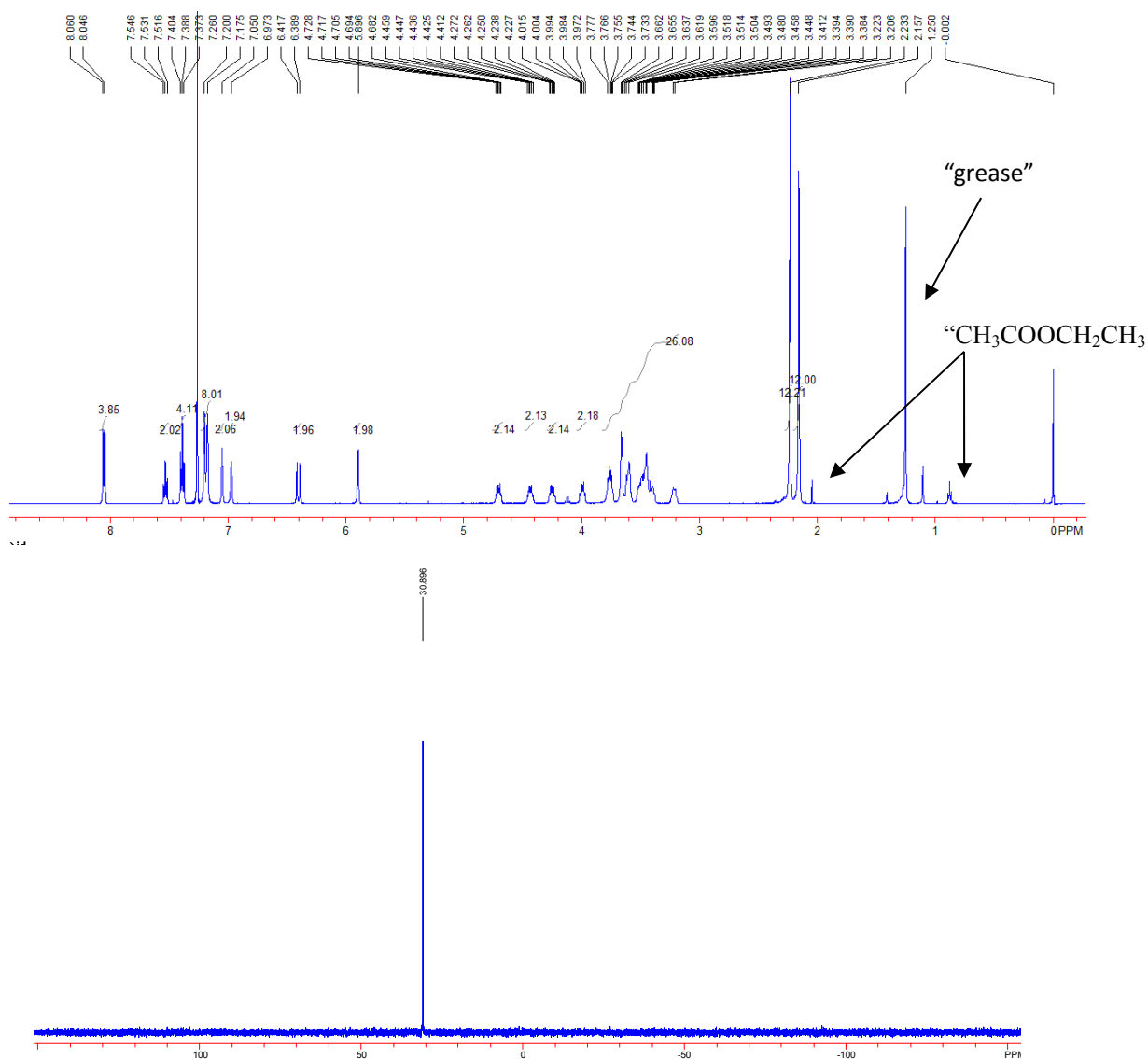
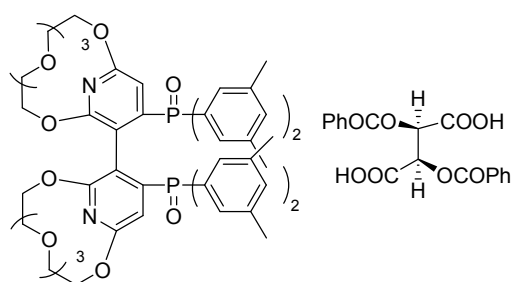




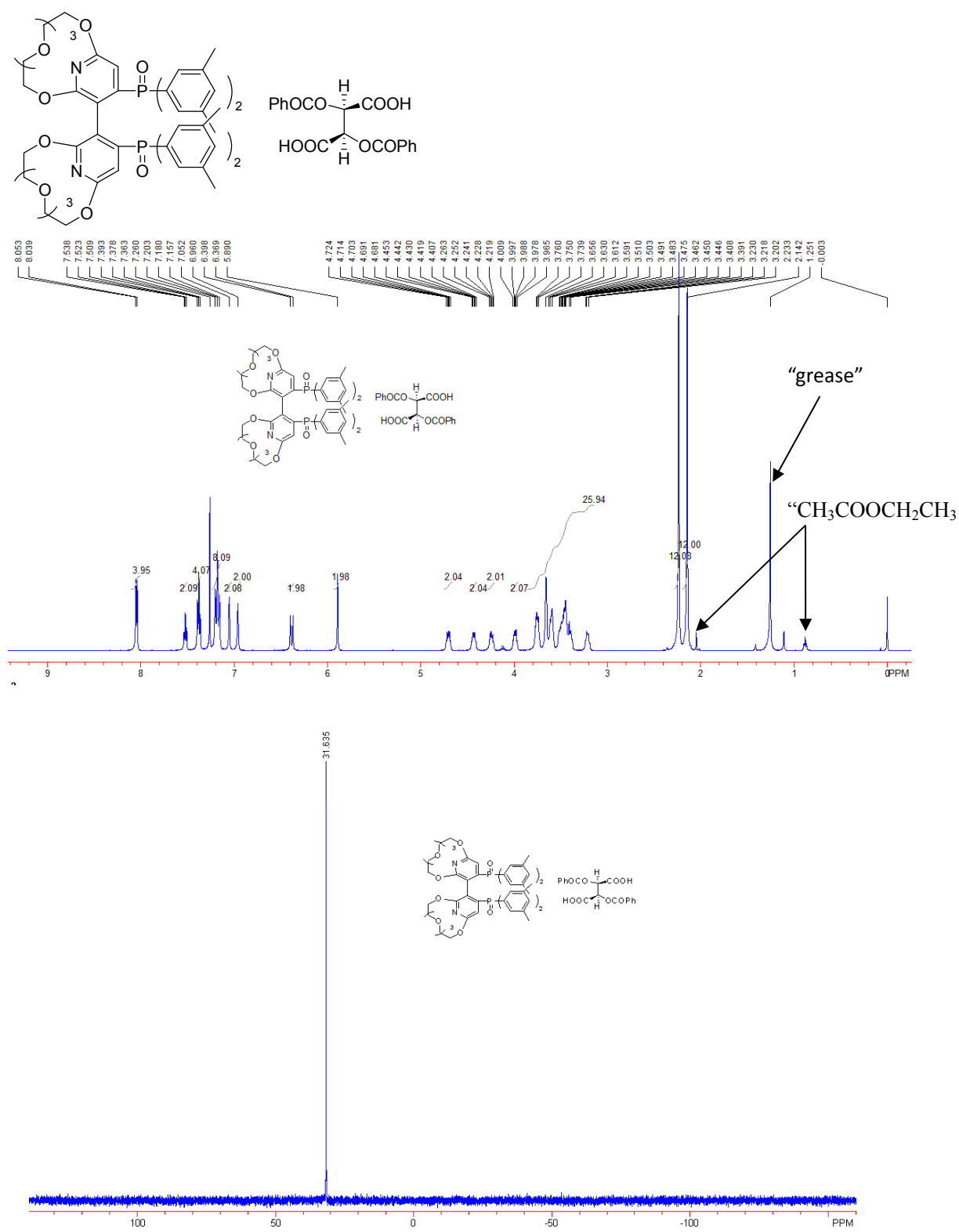




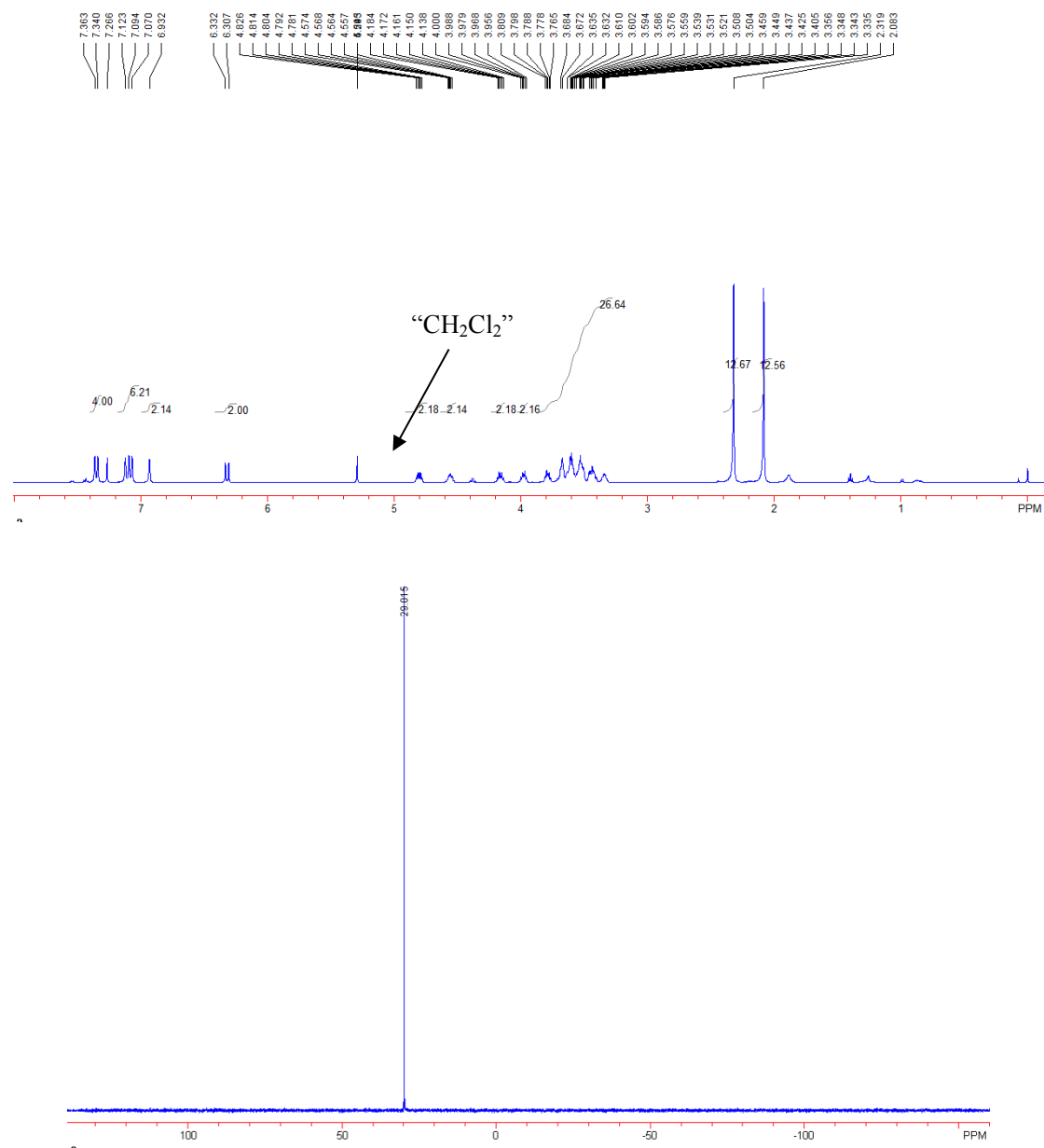
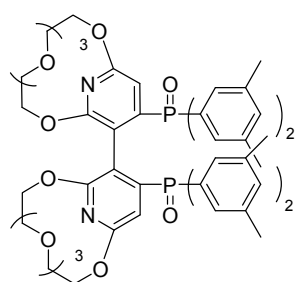
The 1:1 complex of (+)-6 and (L)-DBTA



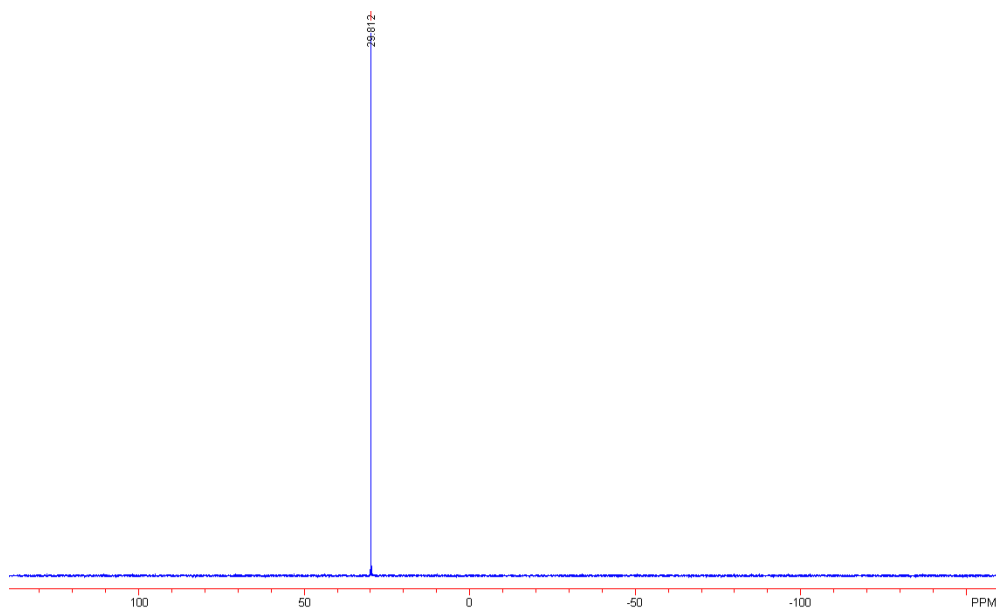
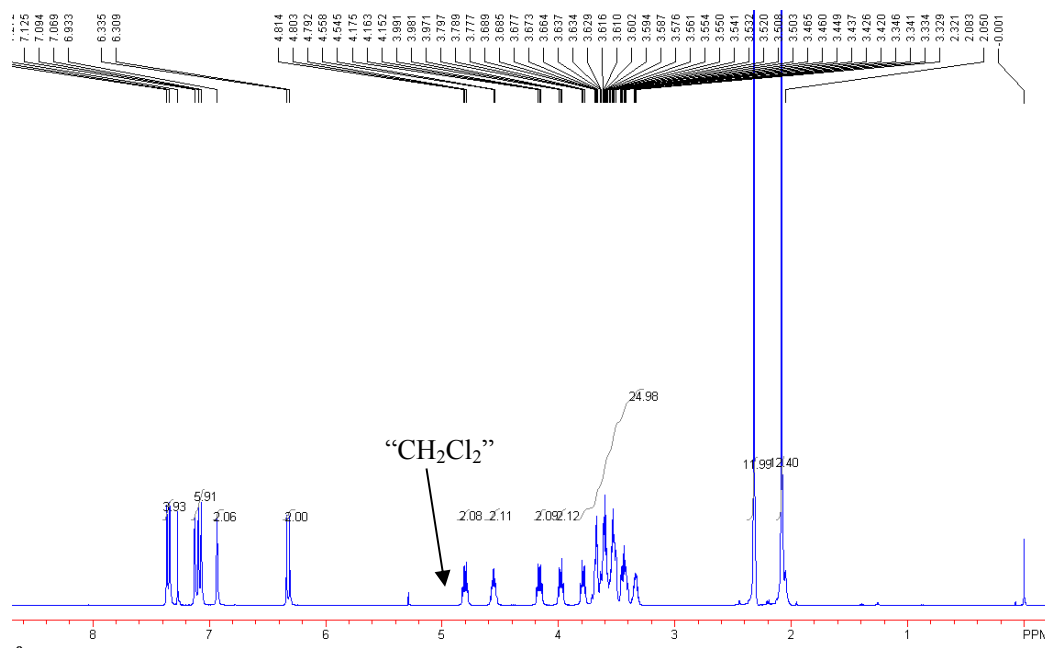
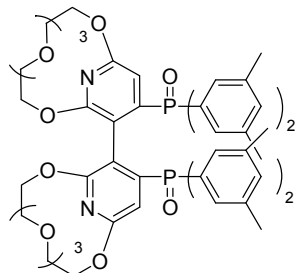
The 1:1 complex of (–)-6 and (D)-DBTA



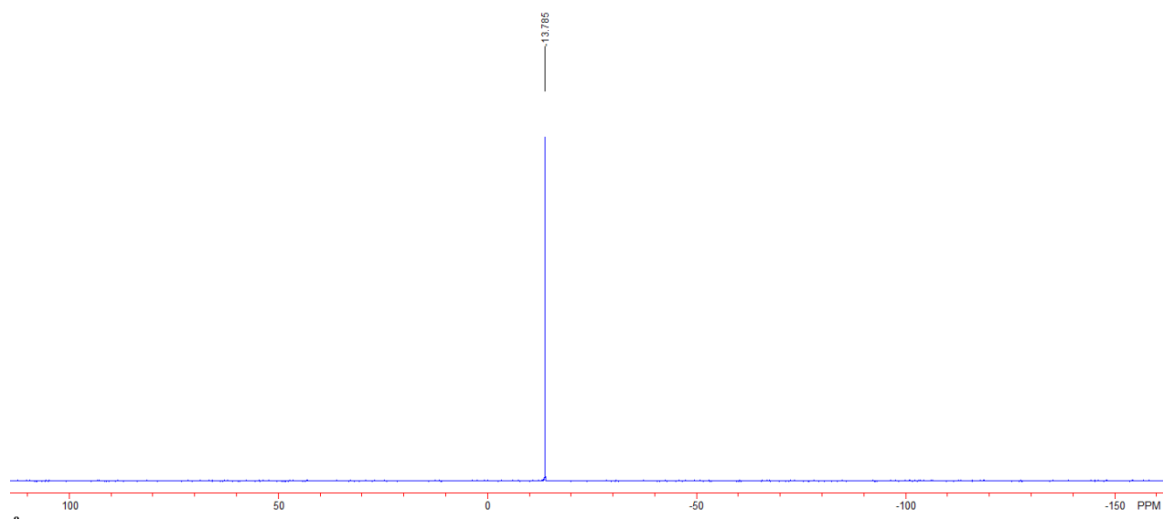
Compound (+)-6



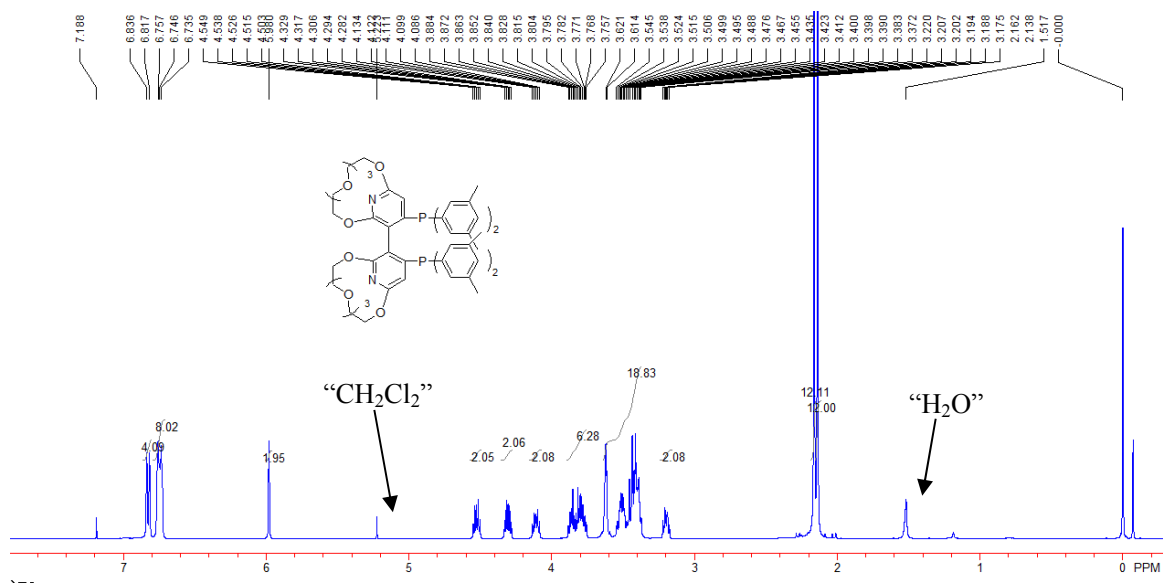
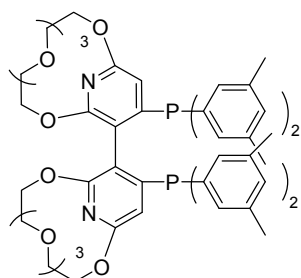
Compound (-)-6

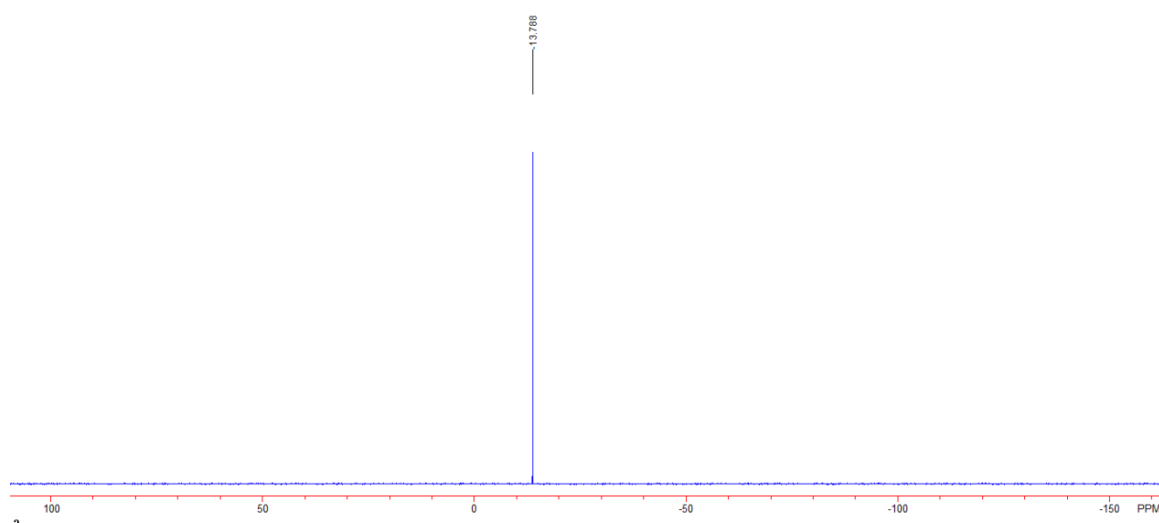
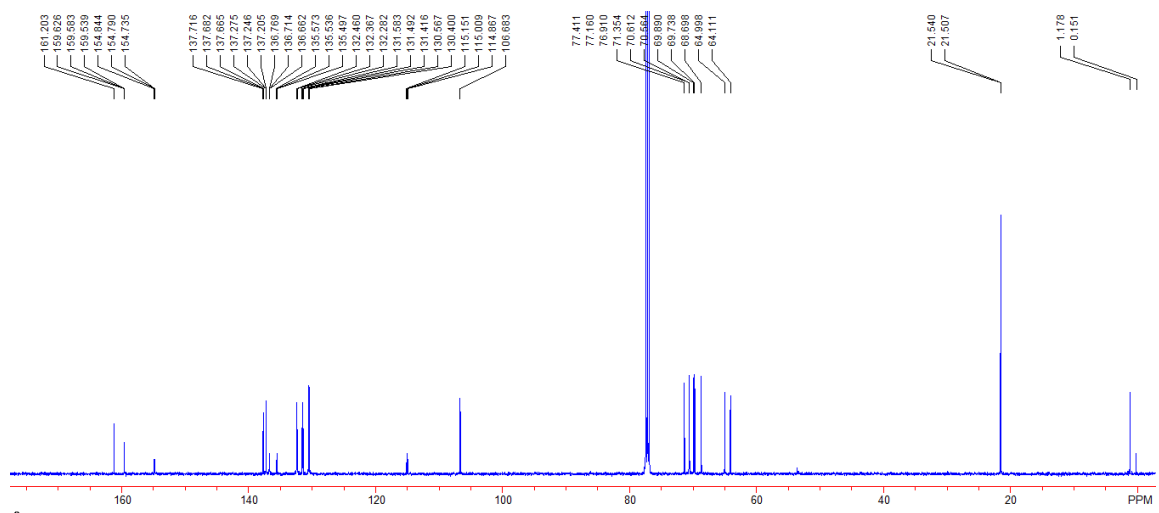




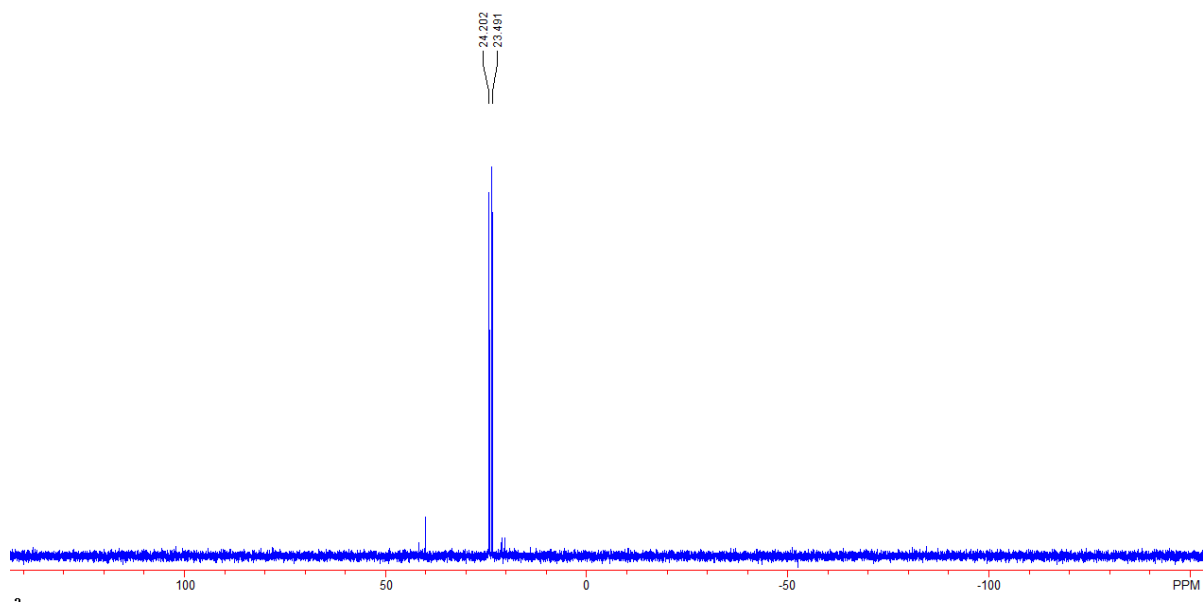


(+)-Xyl-P16C6-Phos ((+)-7)

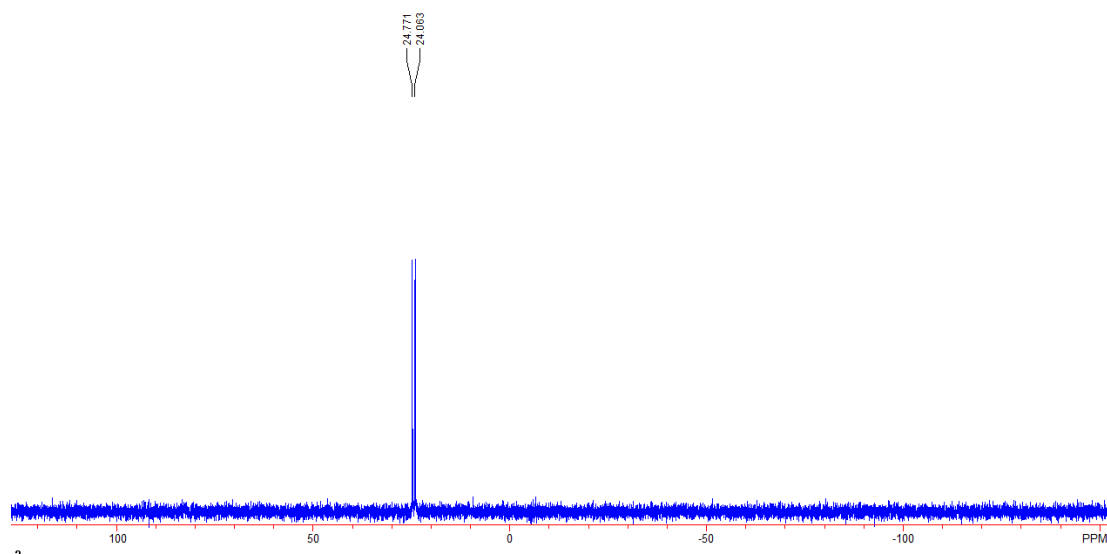




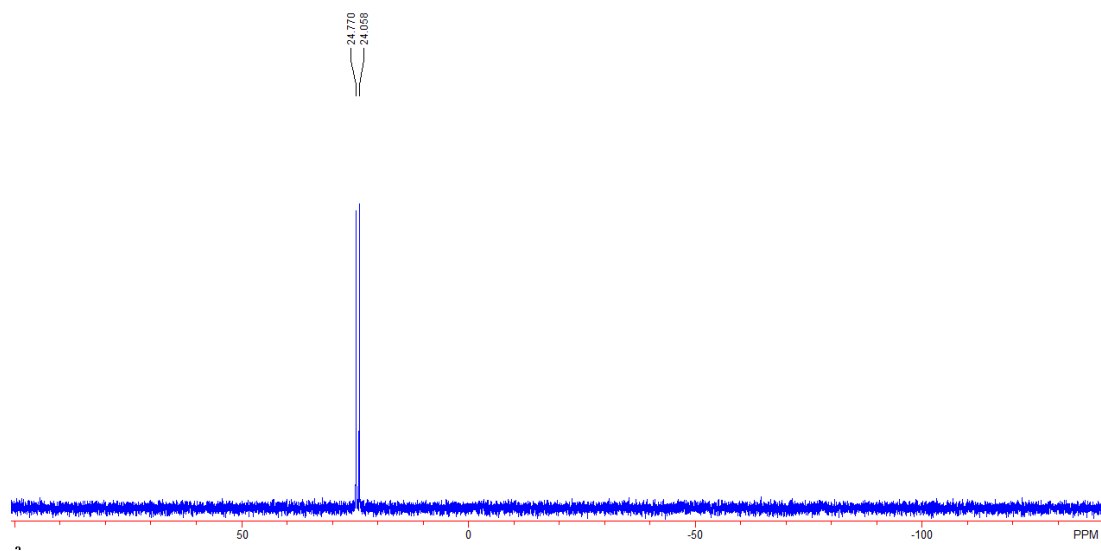
The complex of (-)-Xyl-P16C6-Phos and [Rh(COD)₂]BF₄ (1:1 mole ratio)



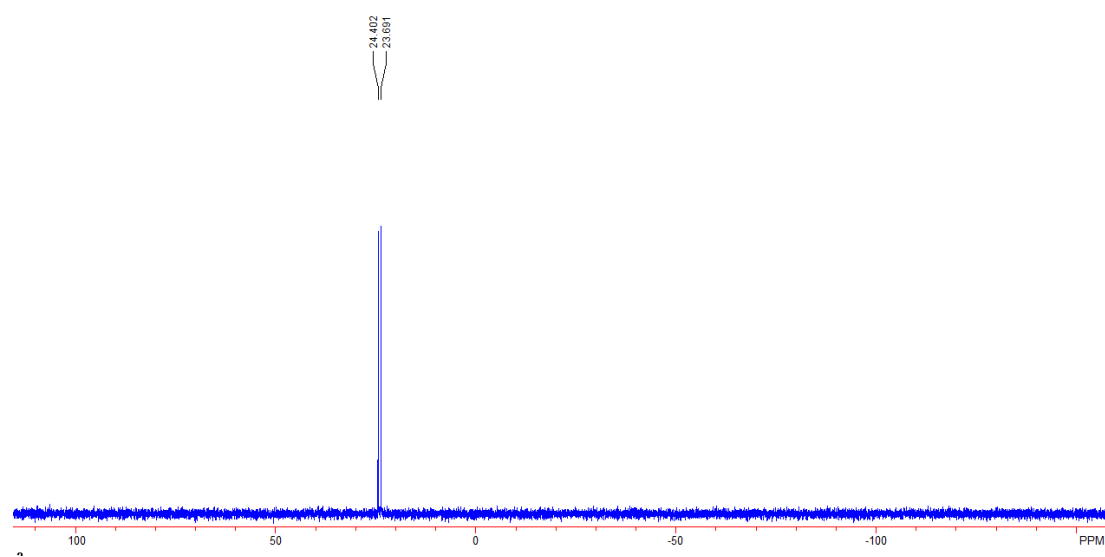
The complex of (-)-Xyl-P16C6-Phos, [Rh(COD)₂]BF₄ and NaBAR_F (1:1:10 mole ratio)



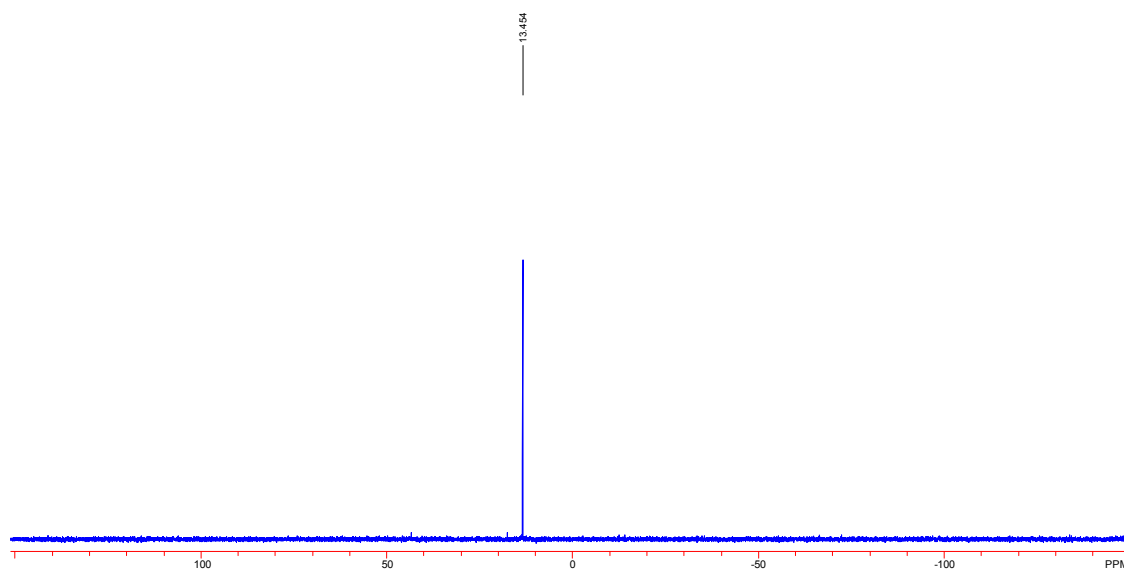
The complex of (-)-Xyl-P16C6-Phos, [Rh(COD)₂]BF₄ and LiBAR_F (1:1:10 mole ratio)



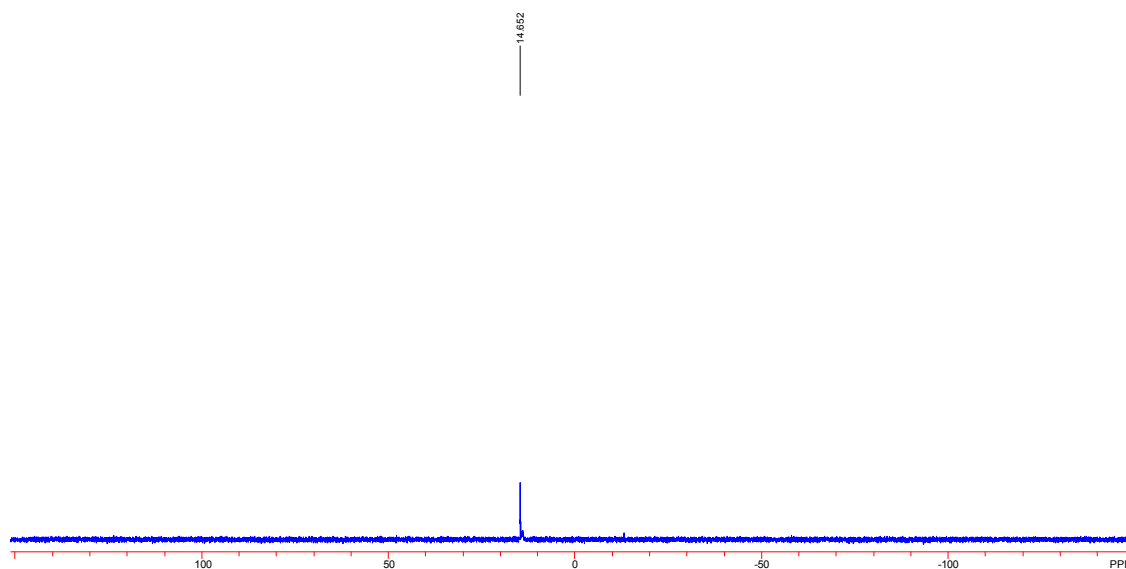
The complex of (-)-Xyl-P16C6-Phos, $[\text{Rh}(\text{COD})_2]\text{BF}_4$ and KBAR_F (1:1:10 mole ratio)



The complex of (+)-Xyl-P16C6-Phos, $[\text{Ir}(\text{COD})_2]\text{BF}_4$ (1:1 mole ratio)

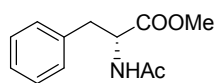


The complex of (+)-Xyl-P16C6-Phos, [Ir(COD)₂]BF₄ and NaBAR_F (1:1:10 mole ratio)

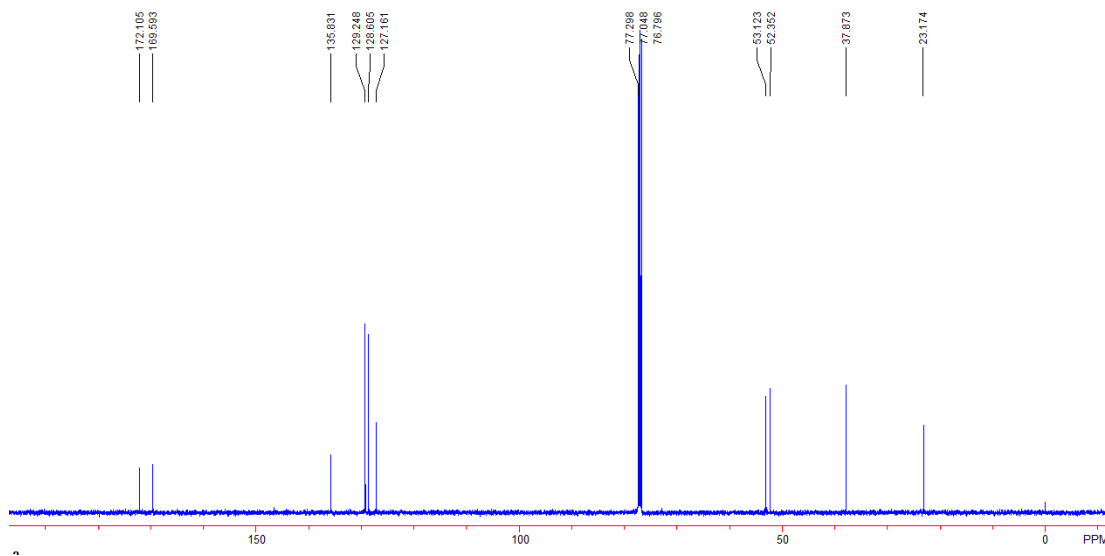
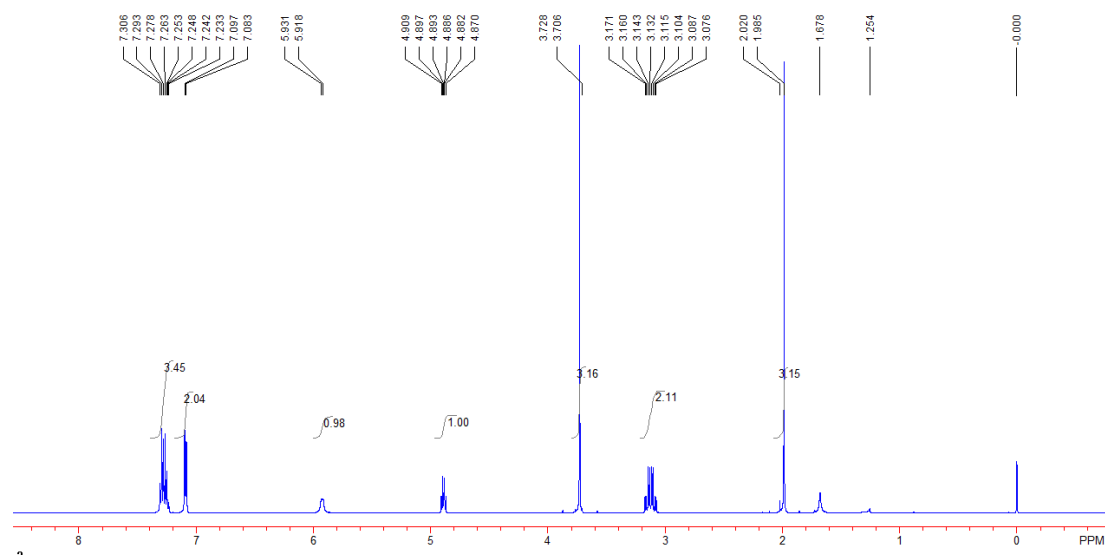


XII. ^1H , ^{13}C NMR Spectra and Chiral GC, HPLC Chromatograms for 9a–t and

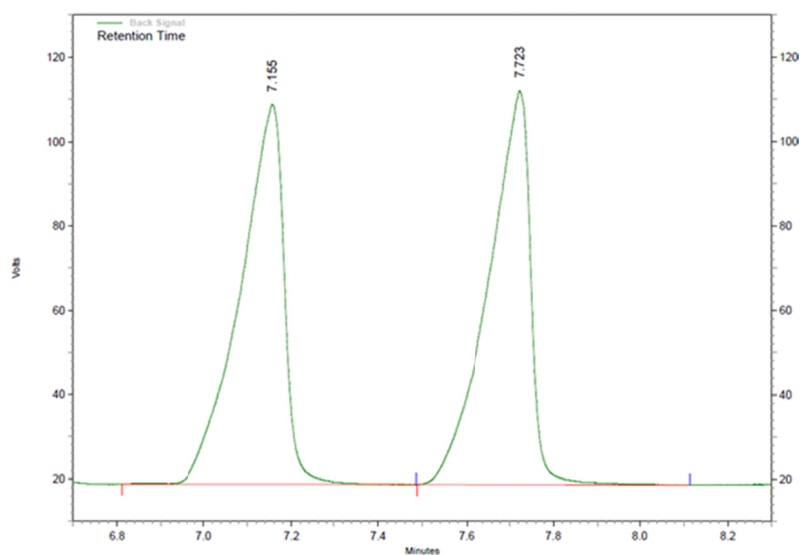
11a–e.



(*R*)-*N*-acetyl-phenylalanine methyl ester (9a)



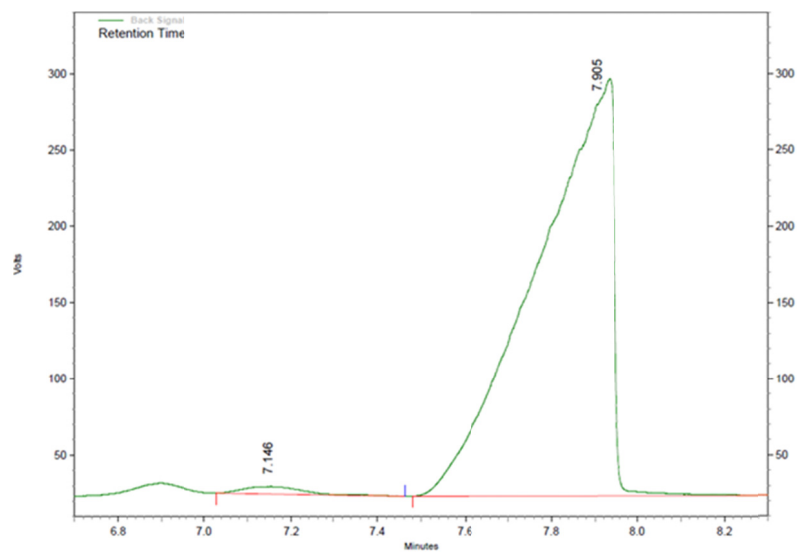
Chromatograms are illustrated below for a 97% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
7.155	4809022	49.91	691621	49.10
7.723	4826753	50.09	716851	50.90

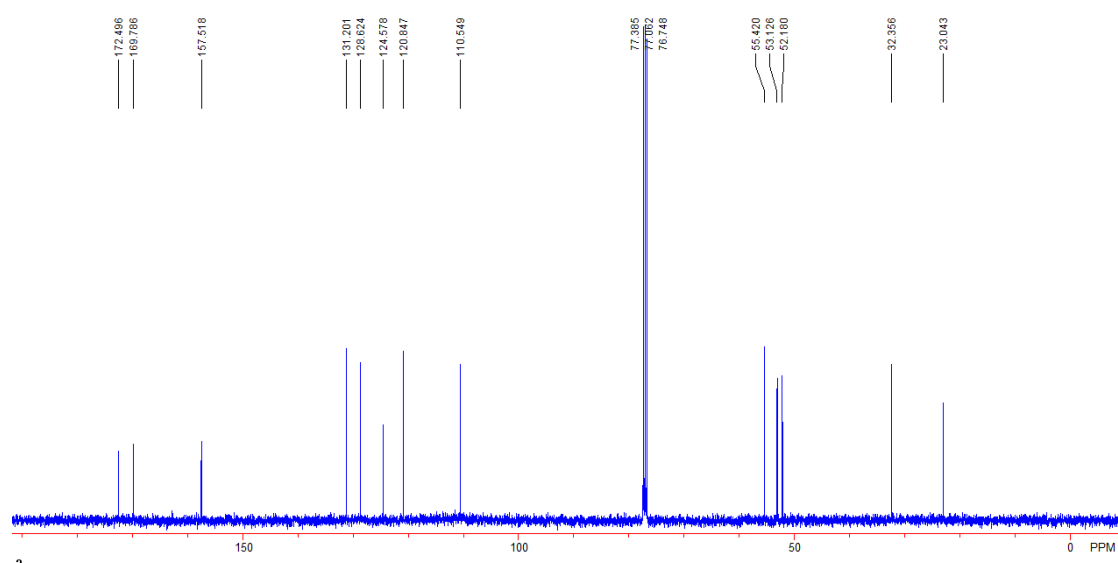
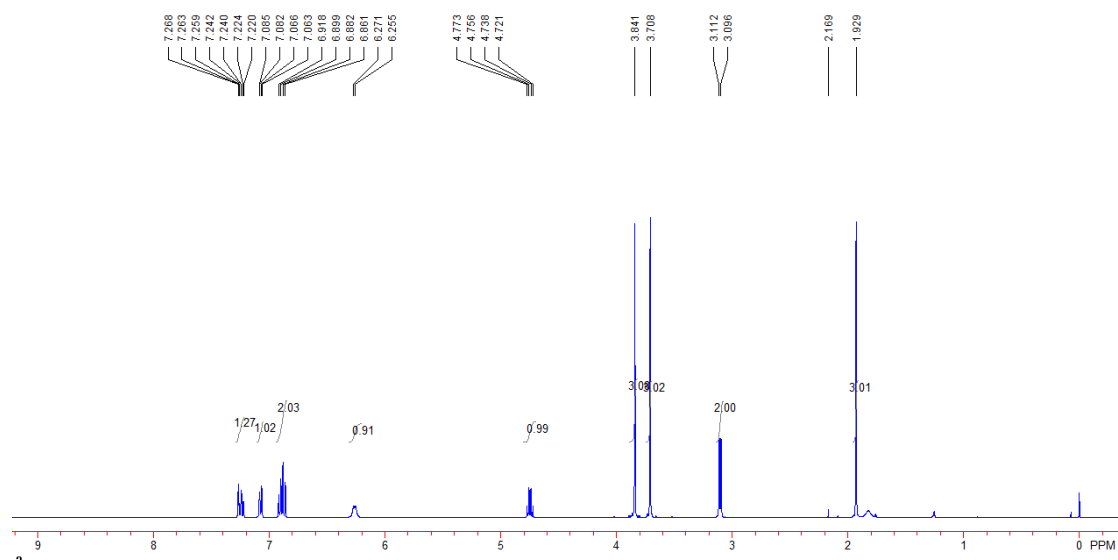
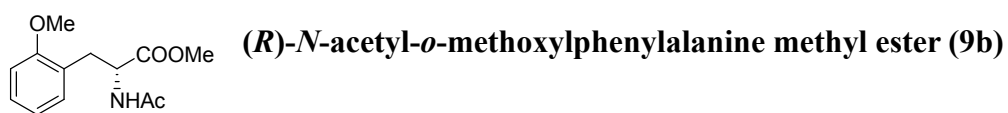
Totals	9635775	100.00	1408472	100.00
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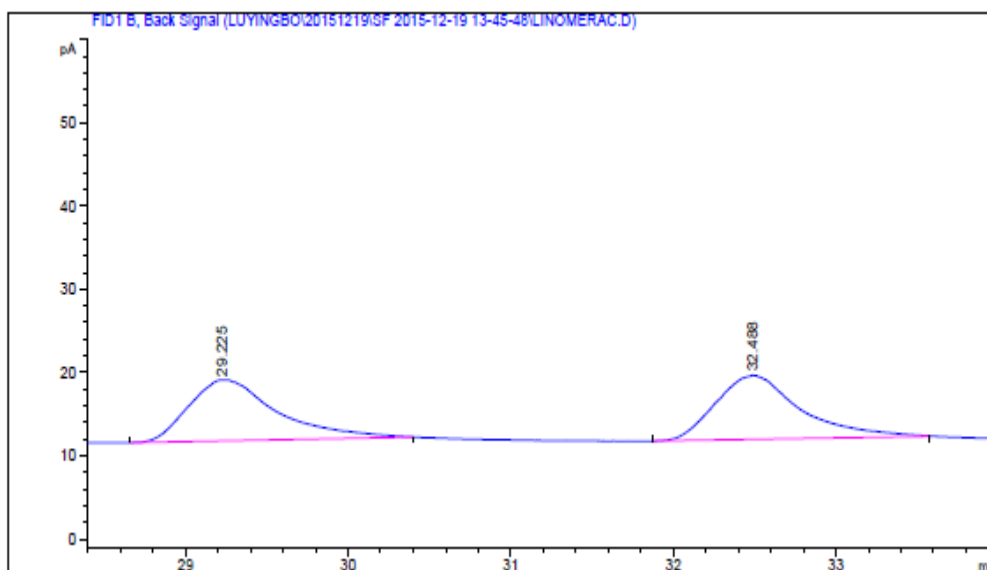
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
7.146	352217	1.33	37289	1.86
7.905	26098488	98.67	1971496	98.14

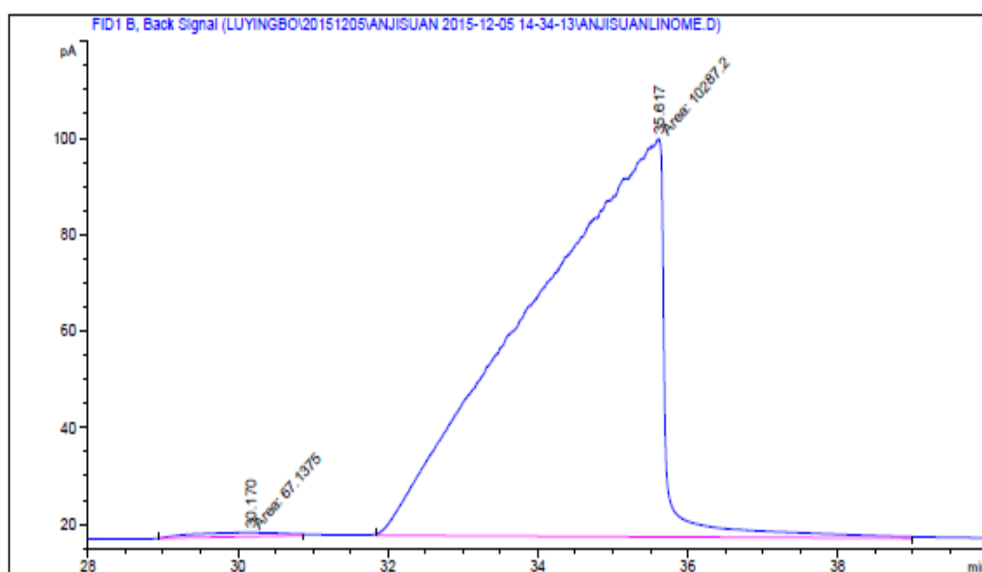
Totals	26450705	100.00	2008785	100.00
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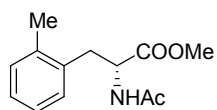
Chromatograms are illustrated below for a 99% ee sample:



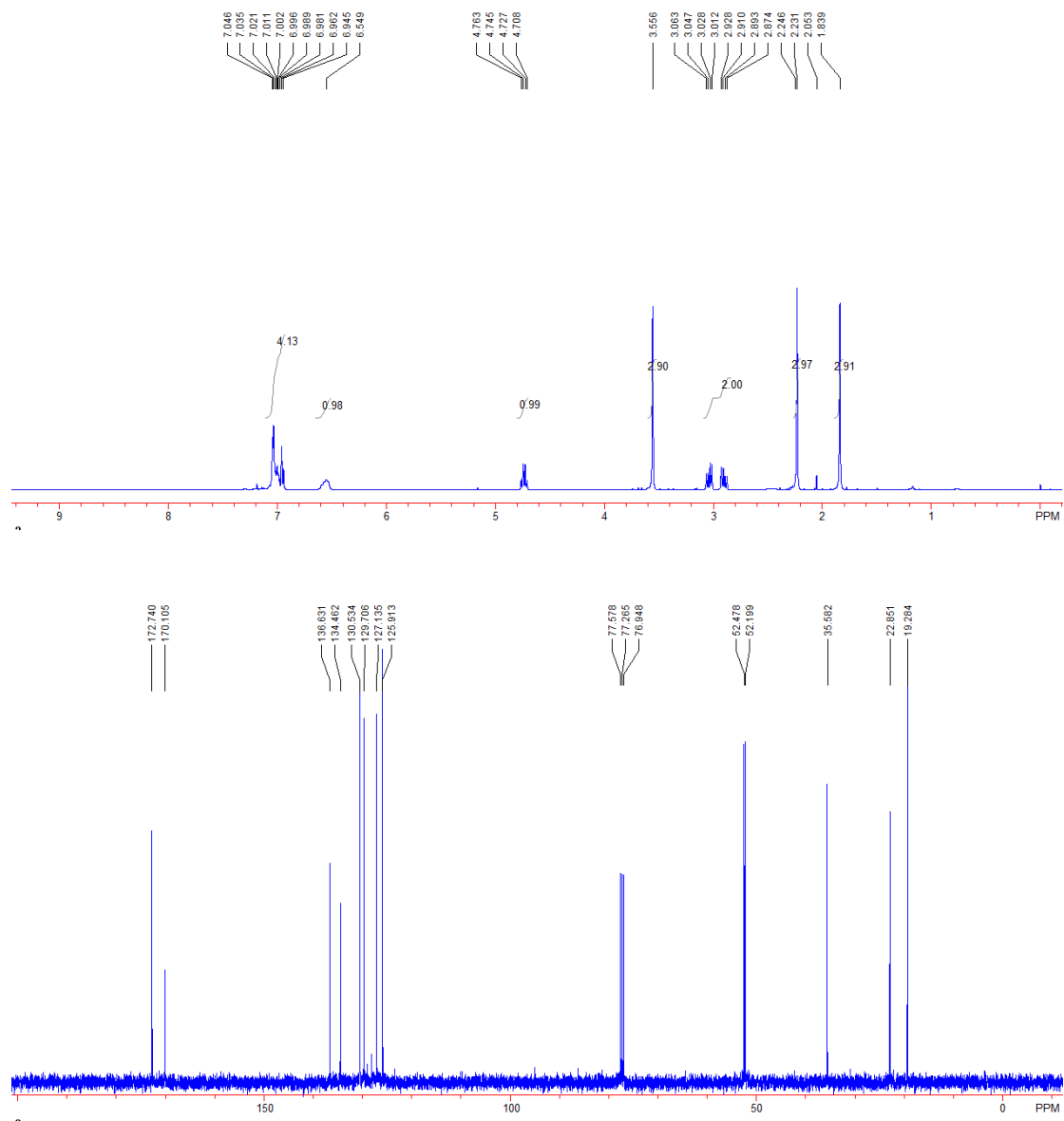
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	29.225	BB	0.4440	274.87610	7.32085	49.86910
2	32.488	BB	0.4237	276.31909	7.69972	50.13090



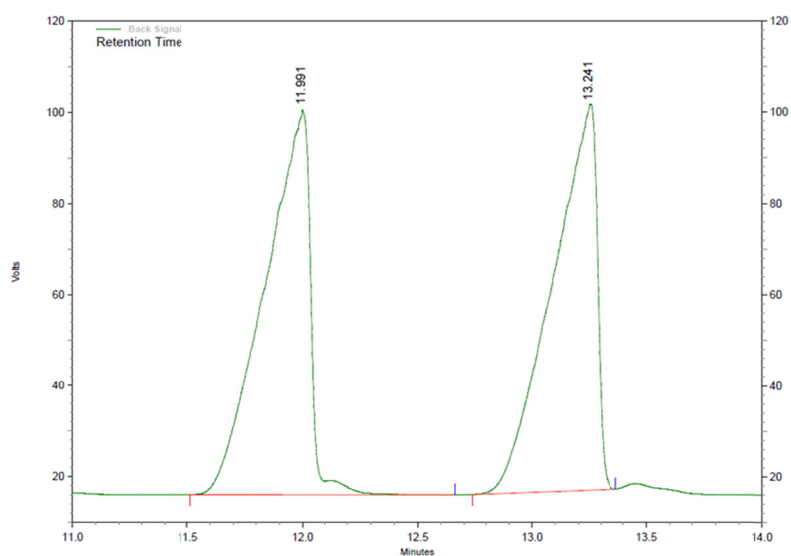
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	30.170	MM	1.4684	67.13747	7.62009e-1	0.64840
2	35.617	MM	2.0797	1.02872e4	82.44273	99.35160



(R)-N-acetyl-o-methylphenylalanine methyl ester (9c)



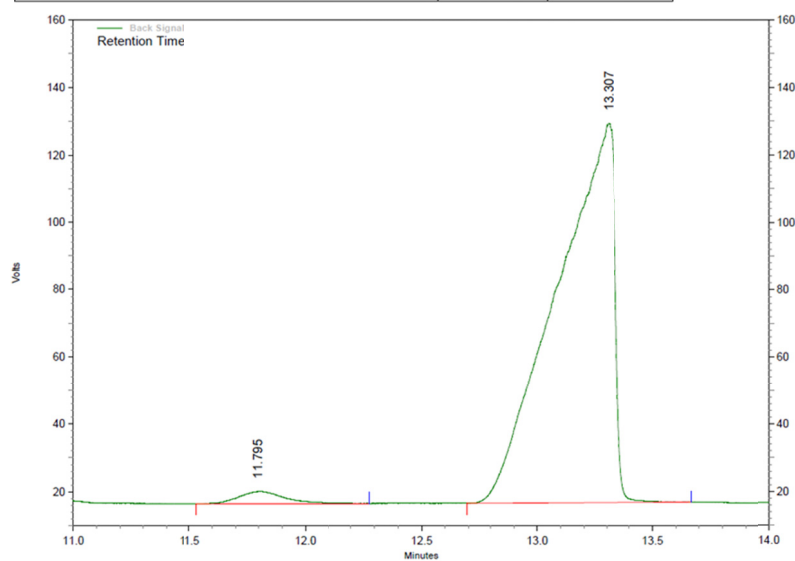
Chromatograms are illustrated below for a 95% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
11.991	8899875	50.48	636799	49.97
13.241	8731478	49.52	637595	50.03

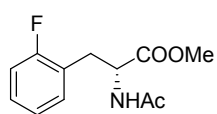
Totals	17631354	100.00	1274394	100.00
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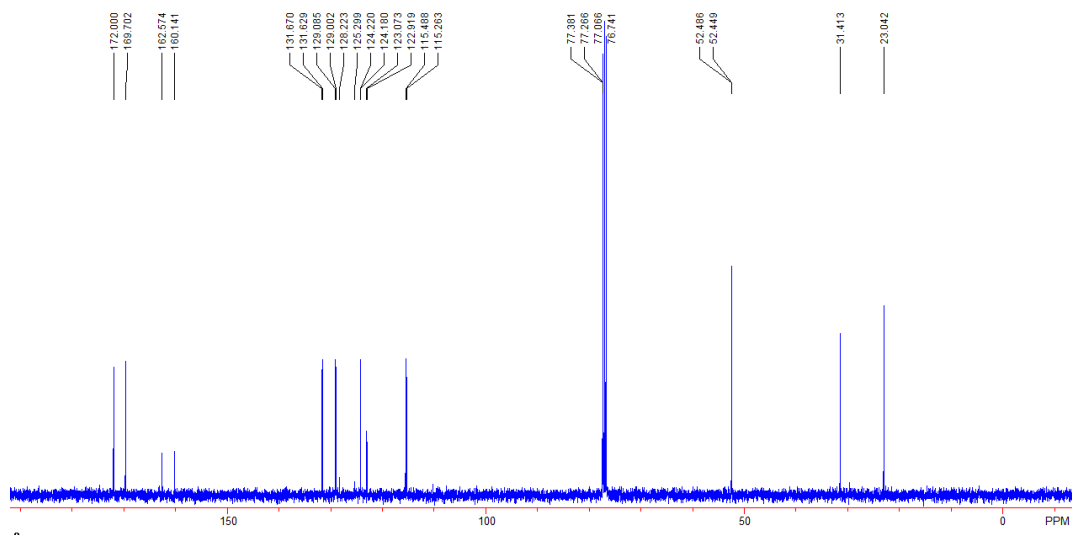
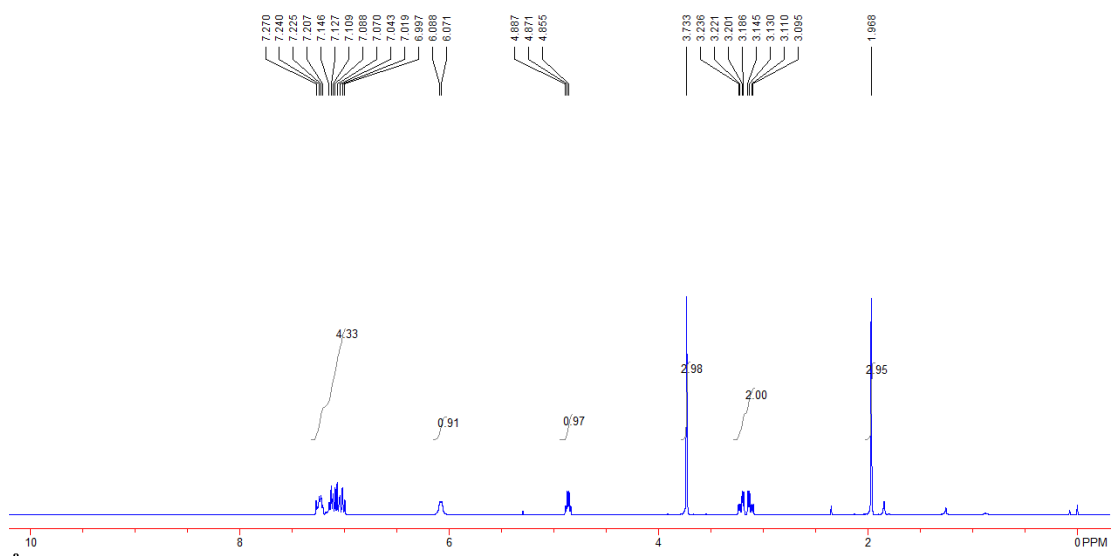
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
11.795	390965	2.53	28052	3.14
13.307	15087813	97.47	865154	96.86

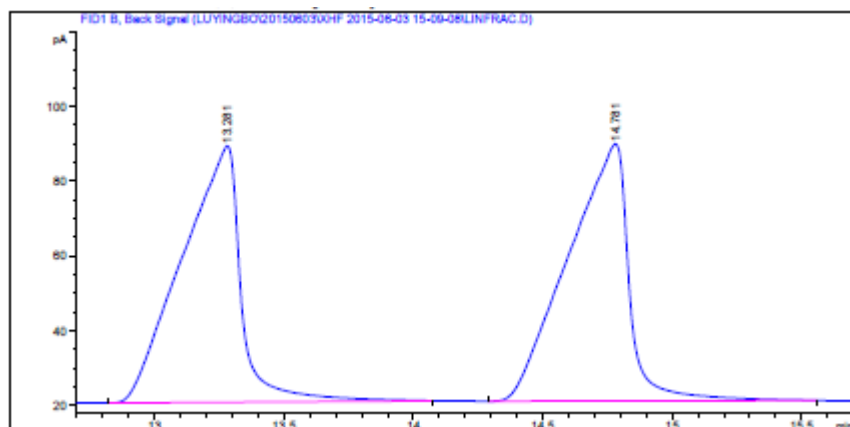
Totals	15478784	100.00	893206	100.00
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(R)-N-acetyl-o-fluorophenylalanine methyl ester (9d)

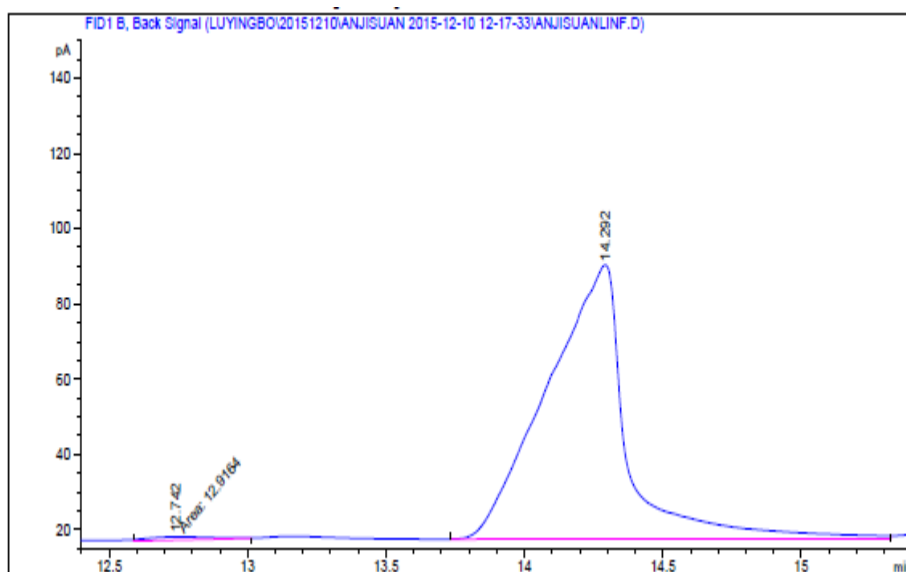


Chromatograms are illustrated below for a 98% ee sample:



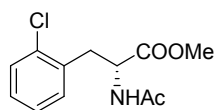
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	13.281	BB	0.2073	1096.11340	68.64207	49.20854
2	14.781	BB	0.2118	1131.37280	68.82481	50.79146

Totals : 2227.48621 137.46688

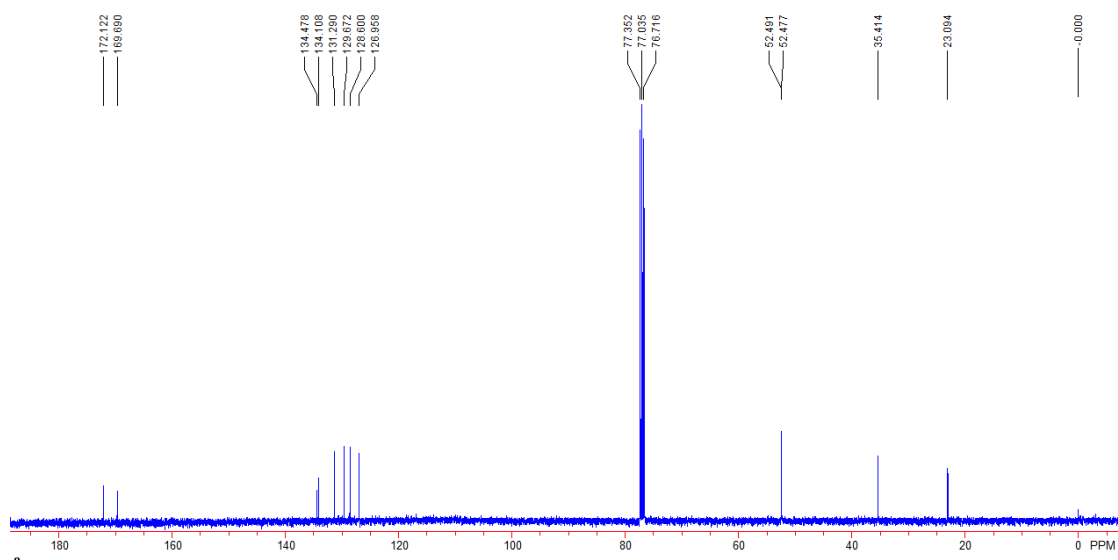
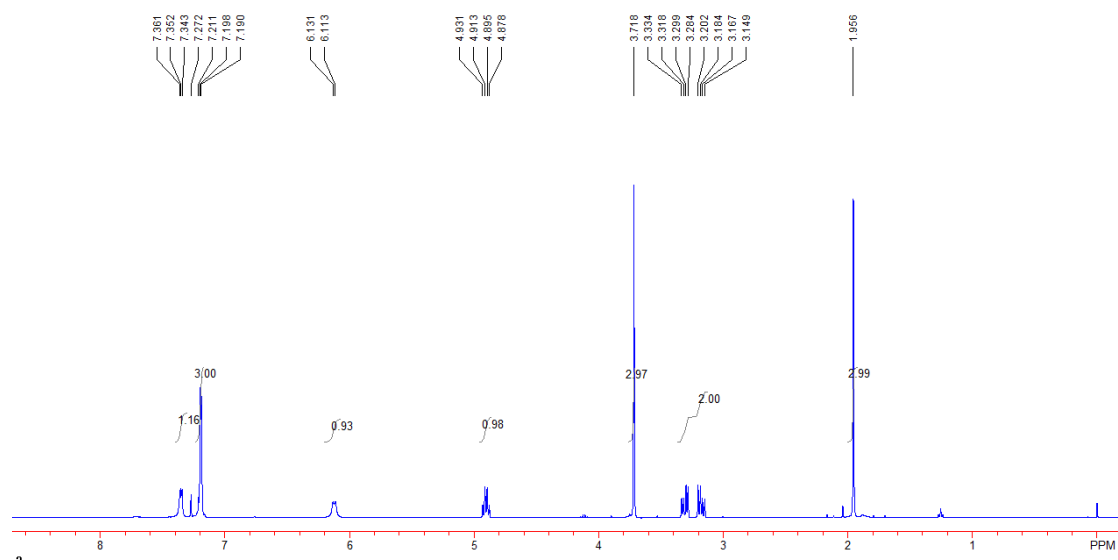


Signal 1: FID1 B, Back Signal

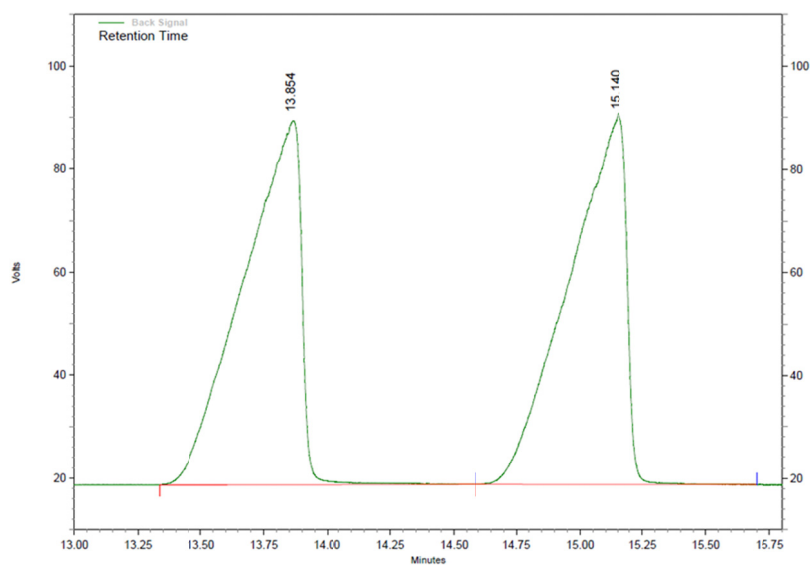
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	12.742	MM	0.2592	12.91642	8.30424e-1	0.86756
2	14.292	BB	0.2576	1475.89832	72.78063	99.13244



(R)-N-acetyl-o-chlorophenylalanine methyl ester (9e)

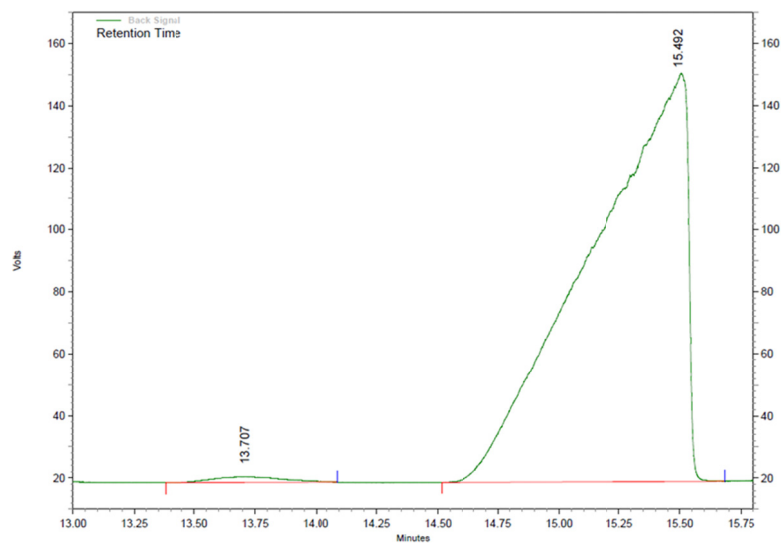


Chromatograms are illustrated below for a 98% ee sample:



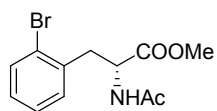
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
13.854	8619235	49.36	536509	49.81
15.140	8841422	50.64	540679	50.19
Totals	17460657	100.00	1077188	100.00

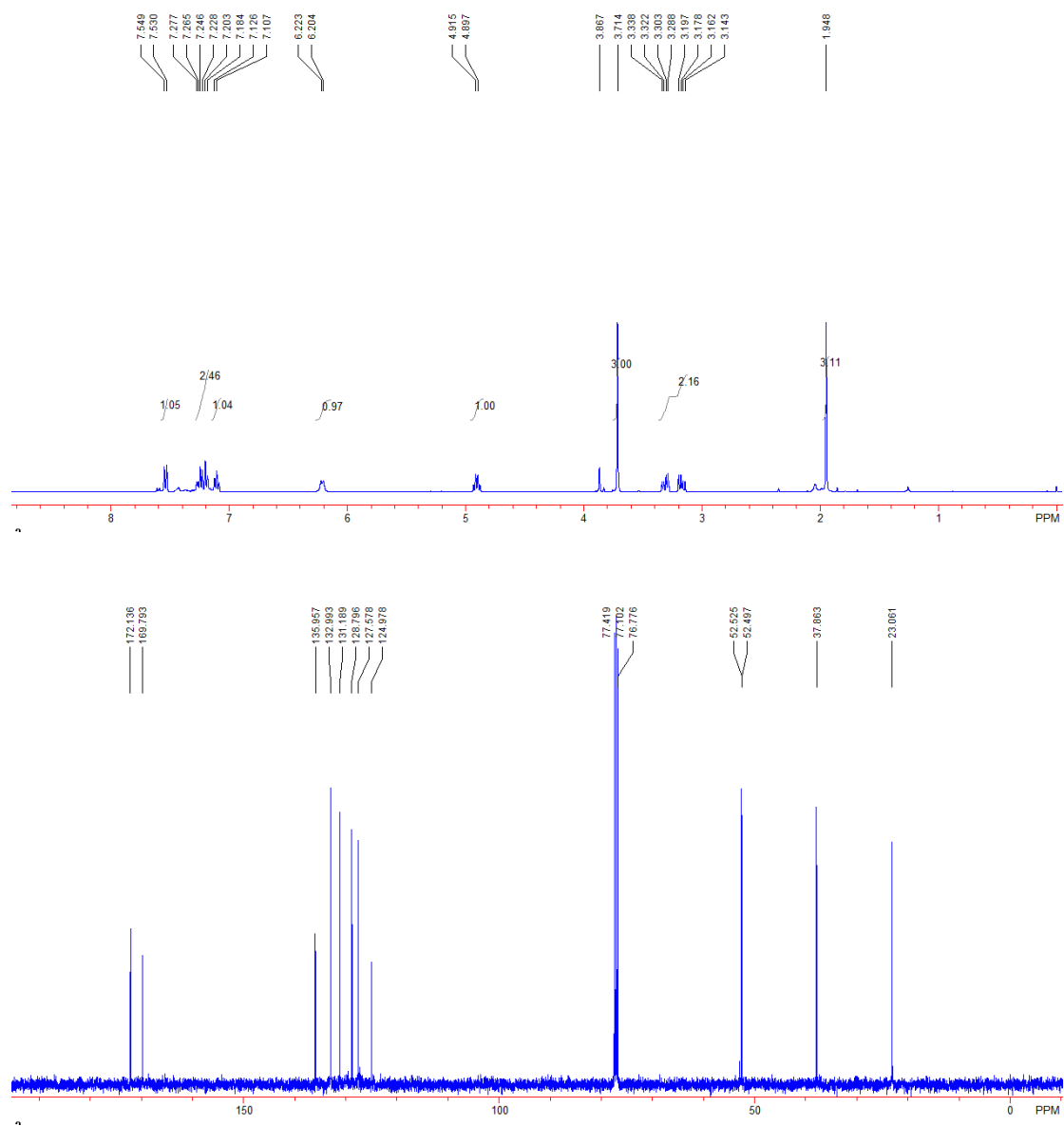


**Back Signal
Results**

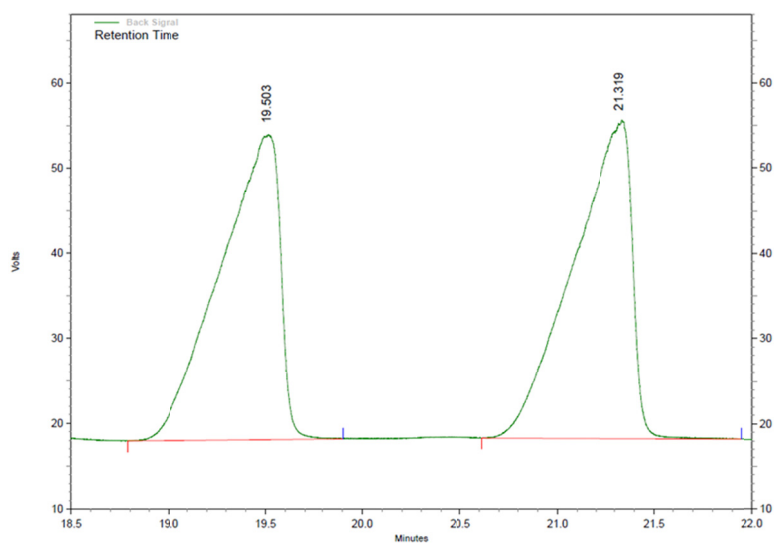
Retention Time	Area	Area %	Height	Height %
13.707	282930	1.00	14228	1.41
15.492	28139391	99.00	994653	98.59
Totals	28422321	100.00	1008881	100.00



(R)-N-acetyl-o-bromophenylalanine methyl ester (9f)

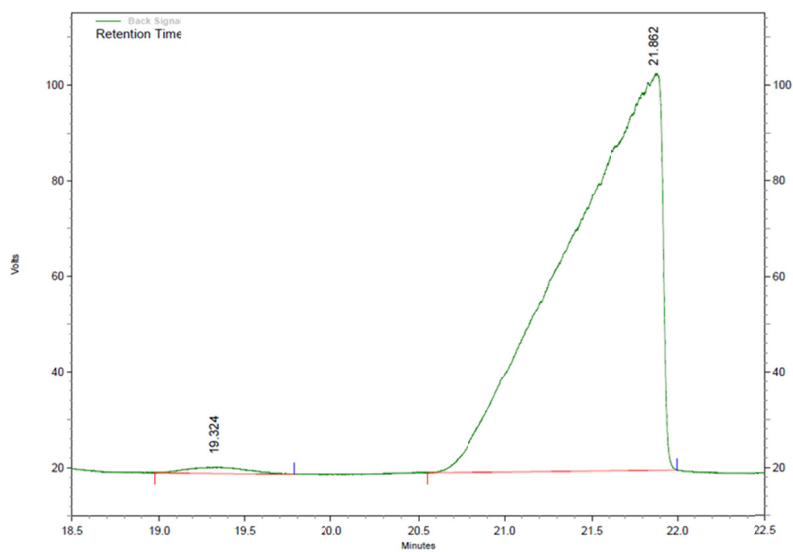


Chromatograms are illustrated below for a 98% ee sample:



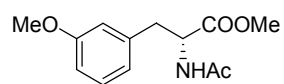
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
19.503	5906036	49.12	274688	49.06
21.319	6118028	50.88	285183	50.94
Totals	12024064	100.00	559871	100.00

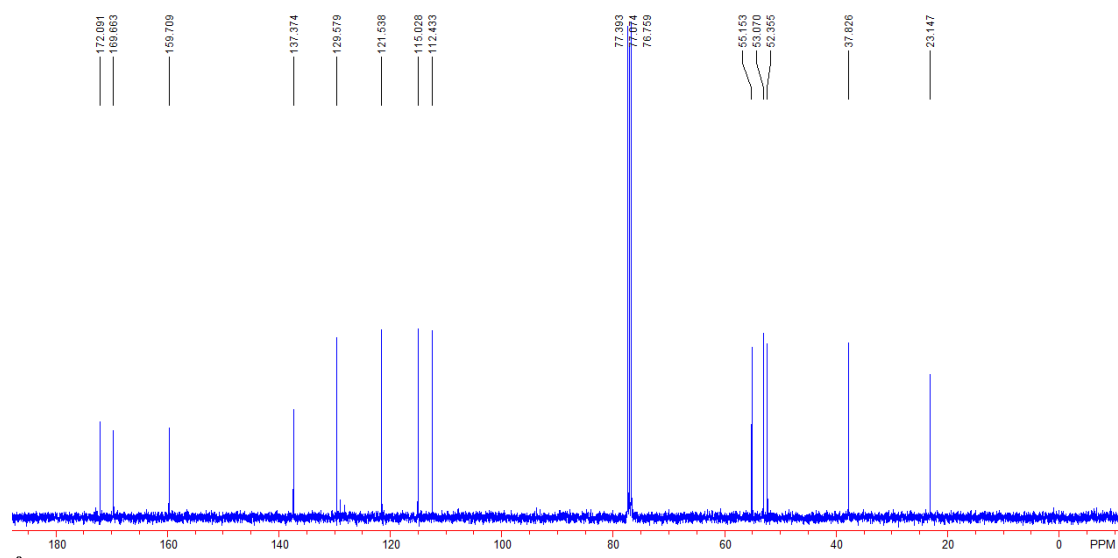
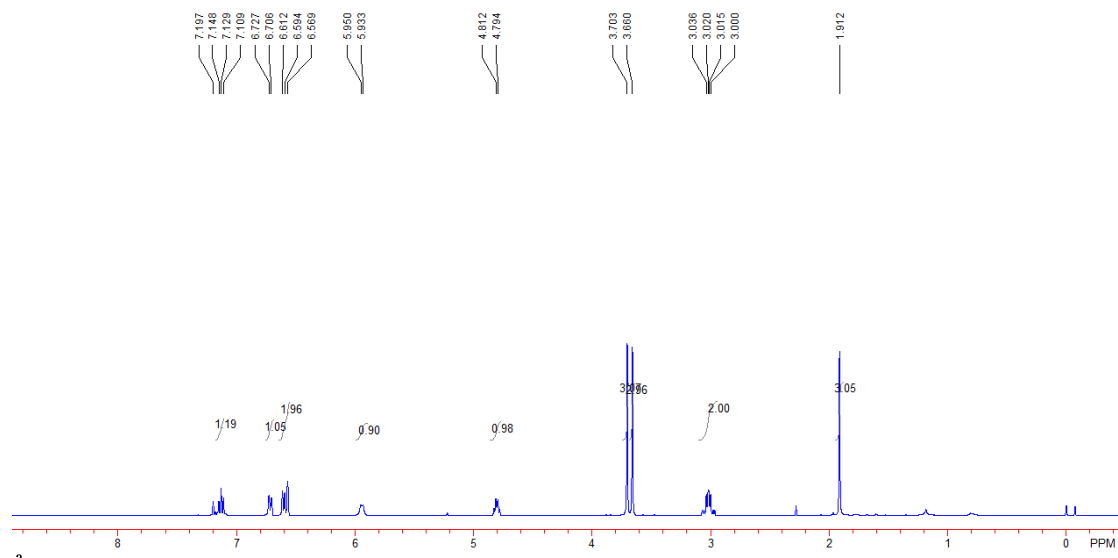


**Back Signal
Results**

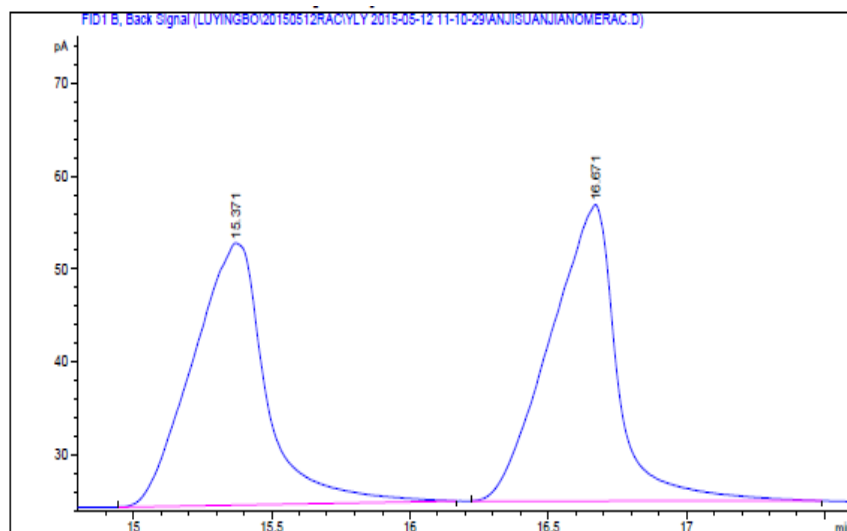
Retention Time	Area	Area %	Height	Height %
19.324	241664	0.98	9745	1.52
21.862	24339990	99.02	630092	98.48
Totals	24581654	100.00	639837	100.00



(R)-N-acetyl-m-methoxyphenylalanine methyl ester (9g)

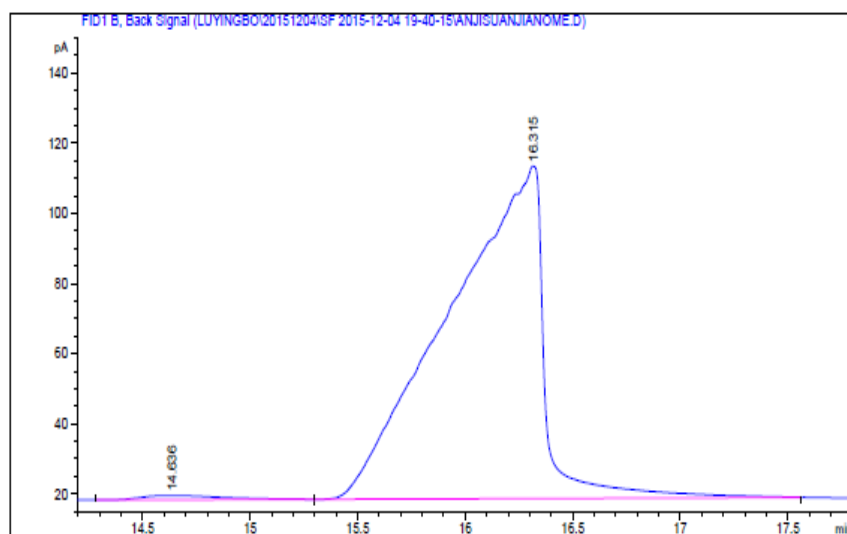


Chromatograms are illustrated below for a 98% ee sample:



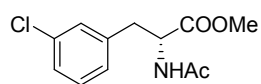
Signal 1: FID1 B, Back Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	15.371	BB	0.2428	522.35468	28.24508	49.04215
2	16.671	BB	0.2194	542.75897	31.91832	50.95785

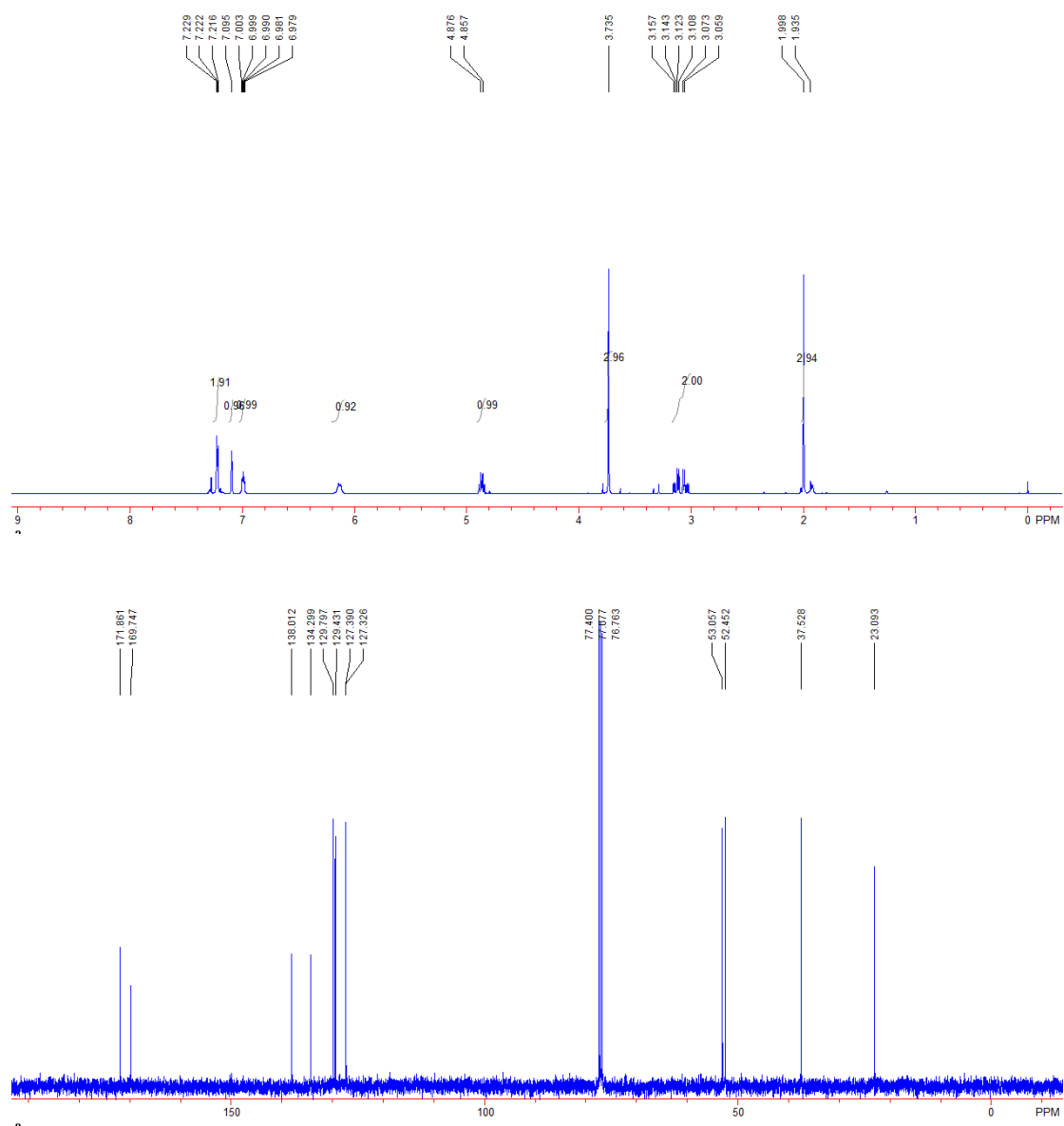


Signal 1: FID1 B, Back Signal

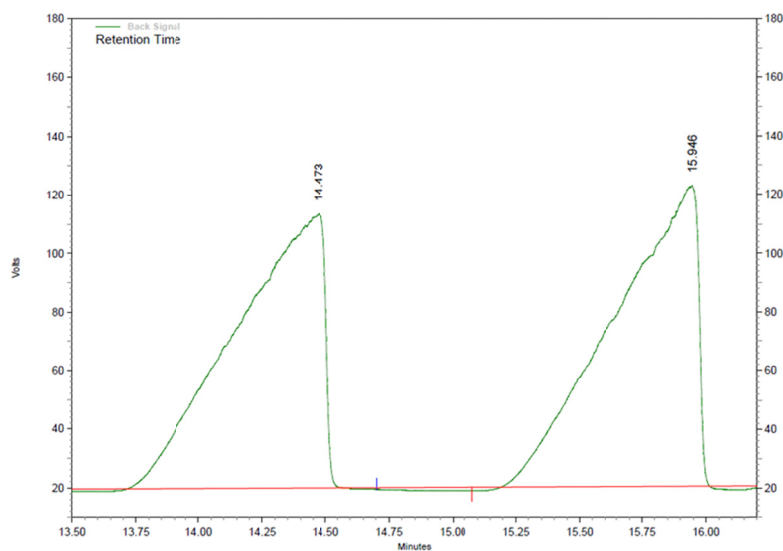
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	14.636	BV	0.3062	31.68022	1.22719	1.06463
2	16.315	VB	0.3792	2944.03320	94.83414	98.93537



(R)-N-acetyl-*m*-chlorophenylalanine methyl ester (9h)



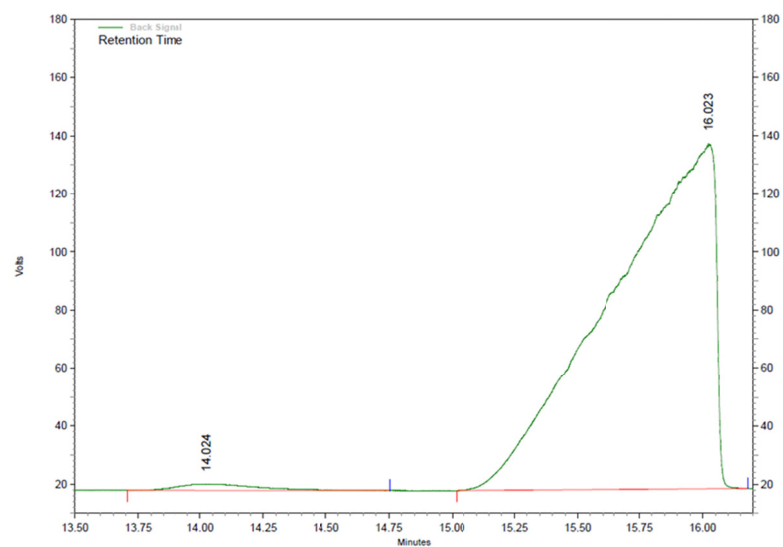
Chromatograms are illustrated below for a 97% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
14.473	17268597	48.86	719181	47.65
15.946	18076614	51.14	790210	52.35

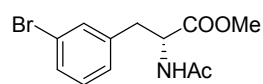
Totals	35345211	100.00	1509391	100.00
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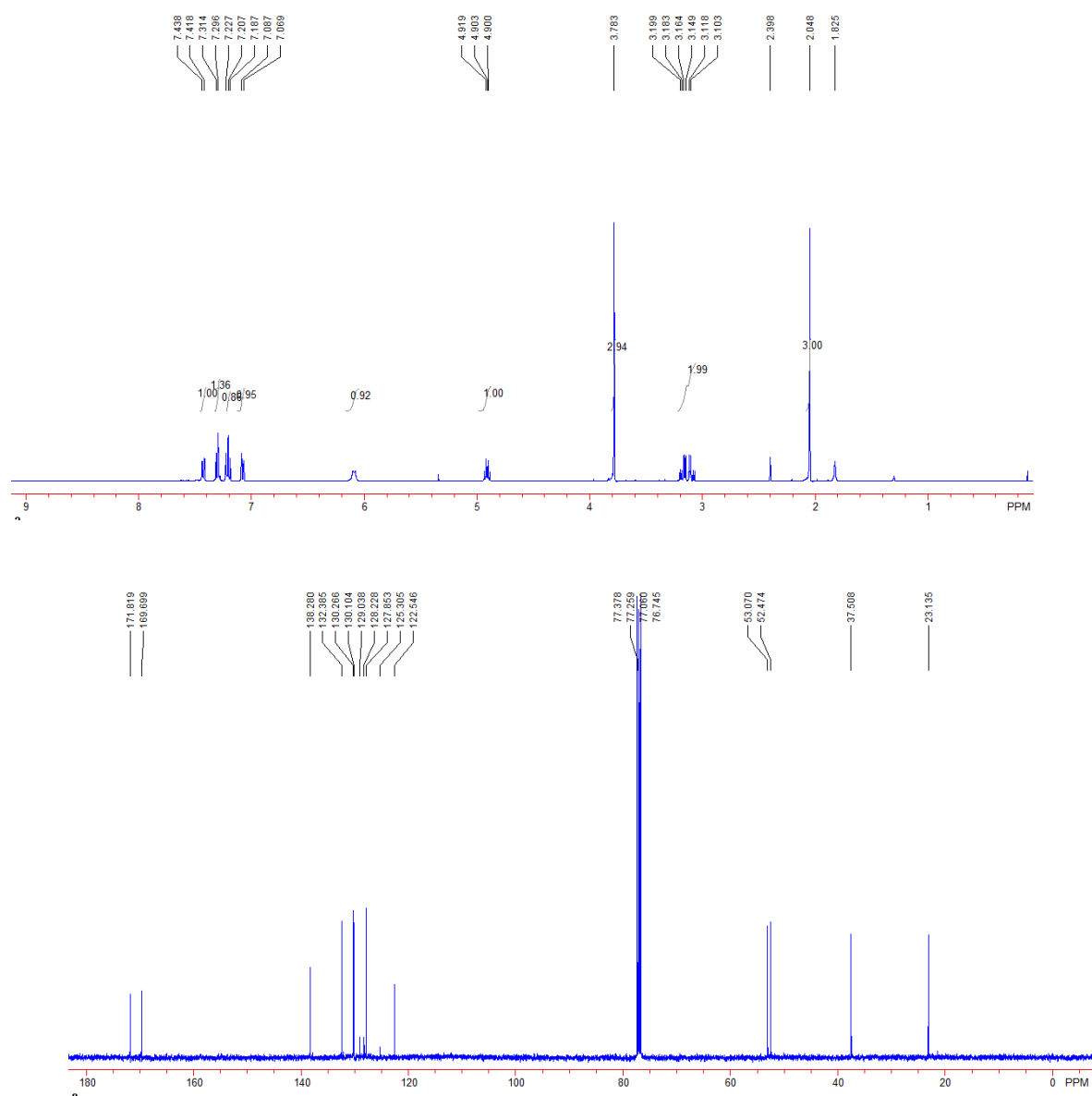
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
14.024	374266	1.41	16741	1.80
16.023	26233943	98.59	913579	98.20

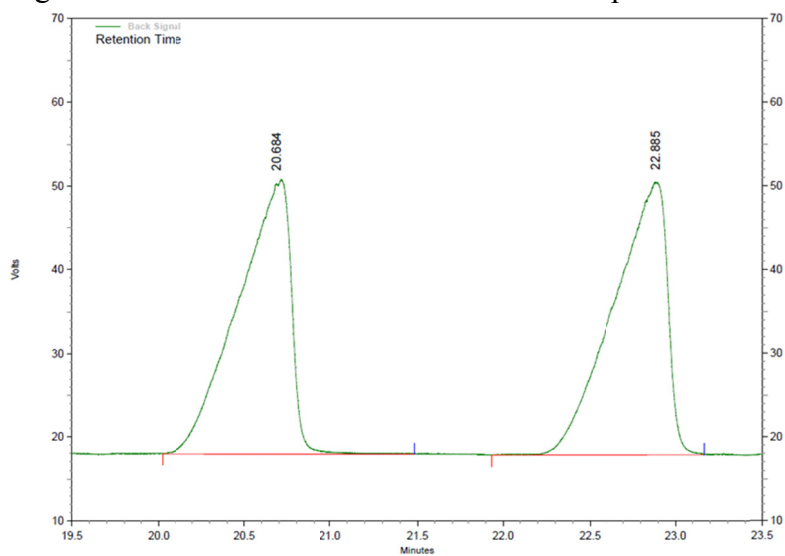
Totals	26608209	100.00	930320	100.00
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(R)-N-acetyl-*m*-bromophenylalanine methyl ester (9i)

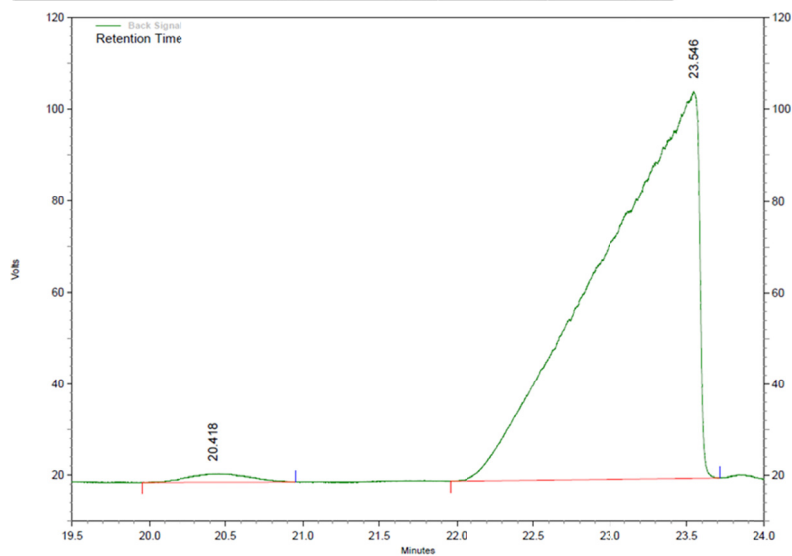


Chromatograms are illustrated below for a 97% ee sample:



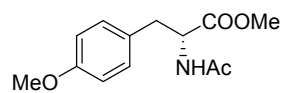
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
20.684	5381657	49.58	248654	49.83
22.885	5472450	50.42	250372	50.17
Totals	10854107	100.00	499026	100.00

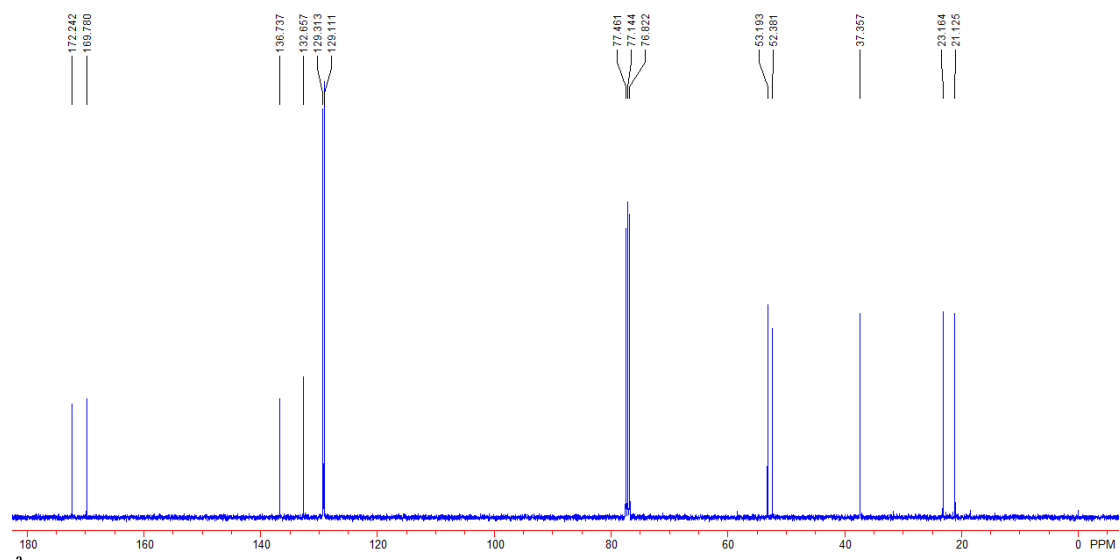
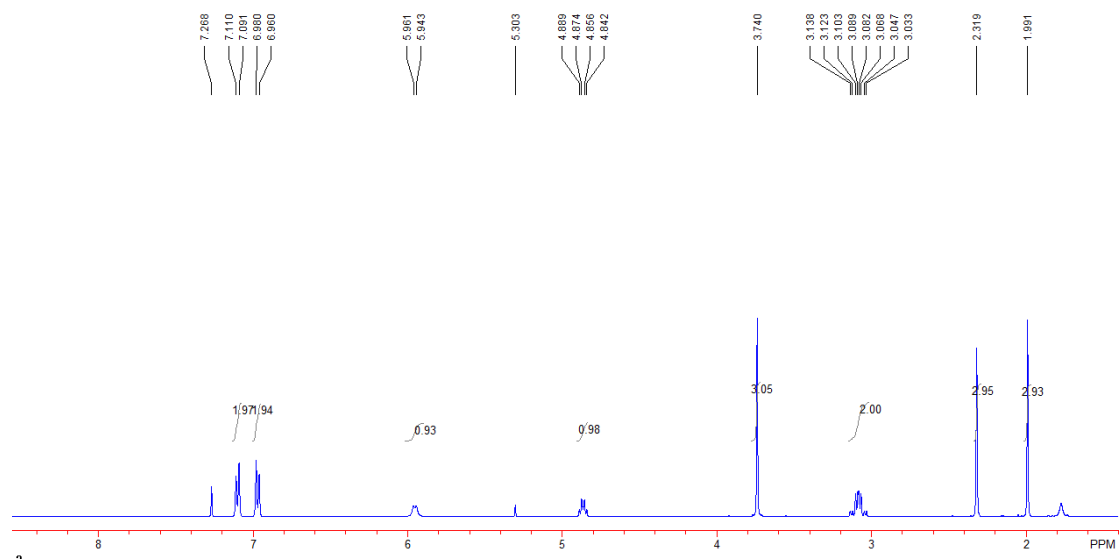


**Back Signal
Results**

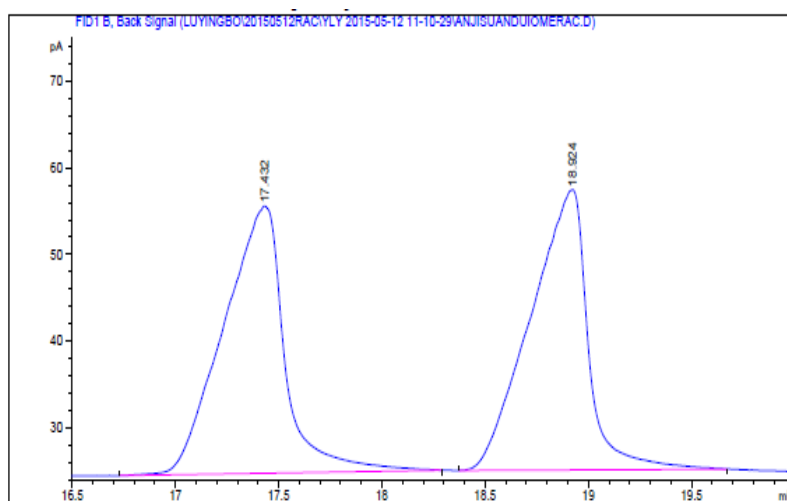
Retention Time	Area	Area %	Height	Height %
20.418	392241	1.35	13924	2.10
23.546	28769960	98.65	649998	97.90
Totals	29162201	100.00	663922	100.00



(R)-N-acetyl-p-methoxyphenylalanine methyl ester (9j):

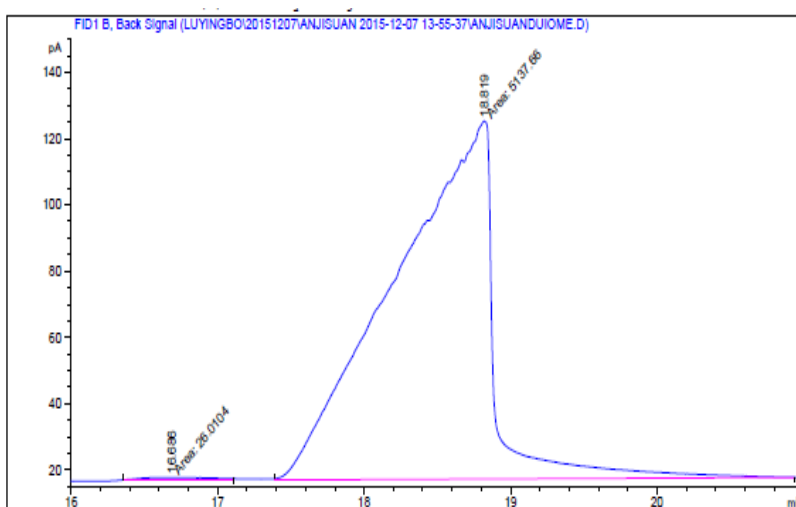


Chromatograms are illustrated below for a 99% ee sample:



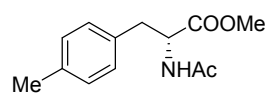
Signal 1: FID1 B, Back Signal

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	17.432	BB	0.2682	640.06787	30.83572	50.41868
2	18.924	BB	0.2458	629.43750	32.37667	49.58132

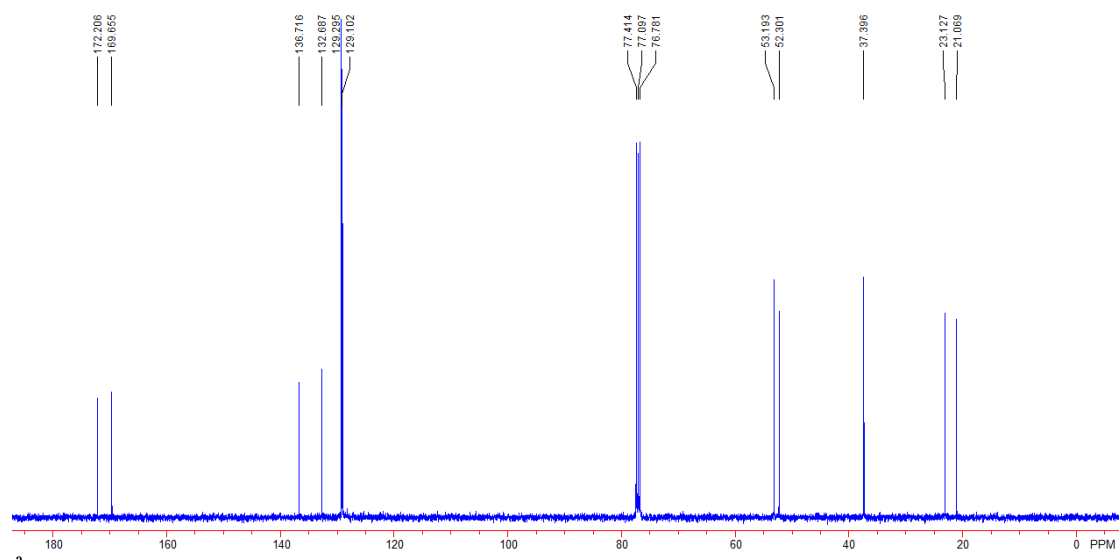
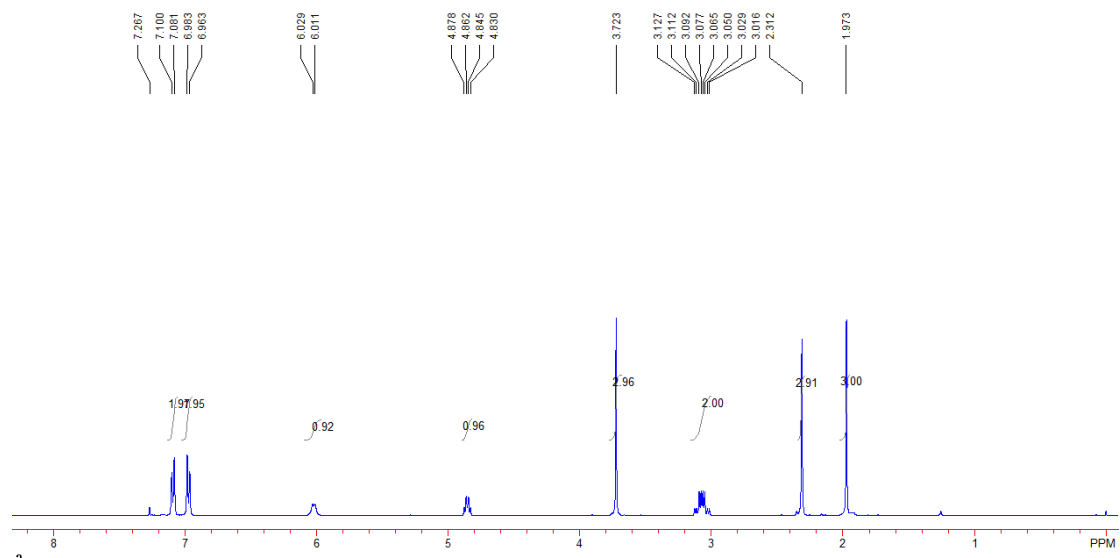


Signal 1: FID1 B, Back Signal

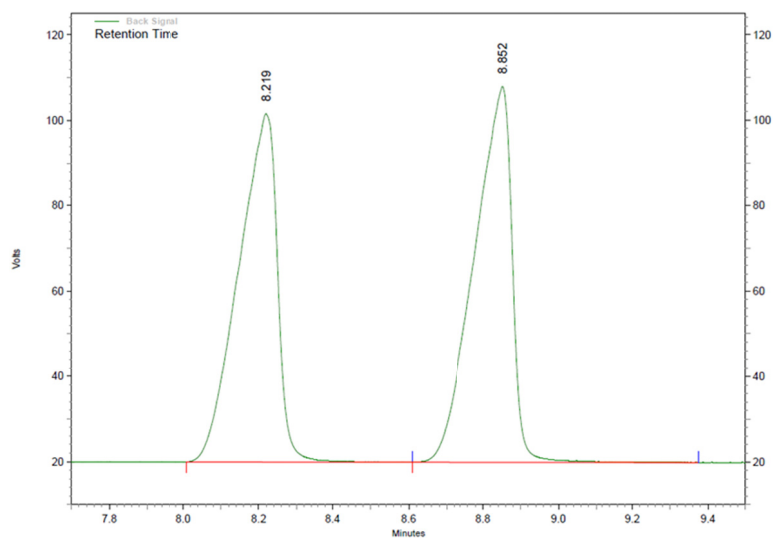
Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Height [pA]	Area %
1	16.686	MM	0.5646	26.01039	7.67761e-1	0.50372
2	18.819	MM	0.7925	5137.65820	108.04829	99.49628



(*R*)-*N*-acetyl-*p*-methylphenylalanine methyl ester (9k):

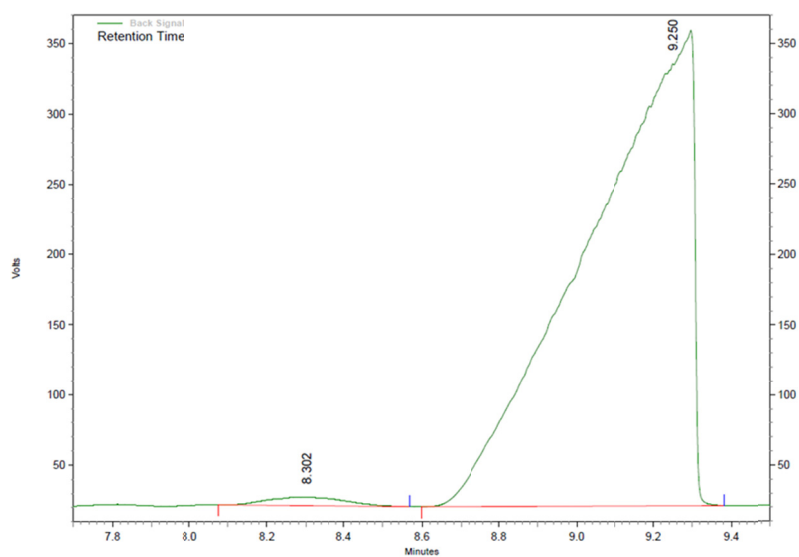


Chromatograms are illustrated below for a 97% ee sample:



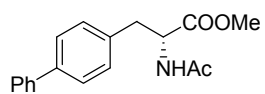
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
8.219	4477217	48.54	627661	48.12
8.852	4747106	51.46	676838	51.88
Totals	9224323	100.00	1304499	100.00

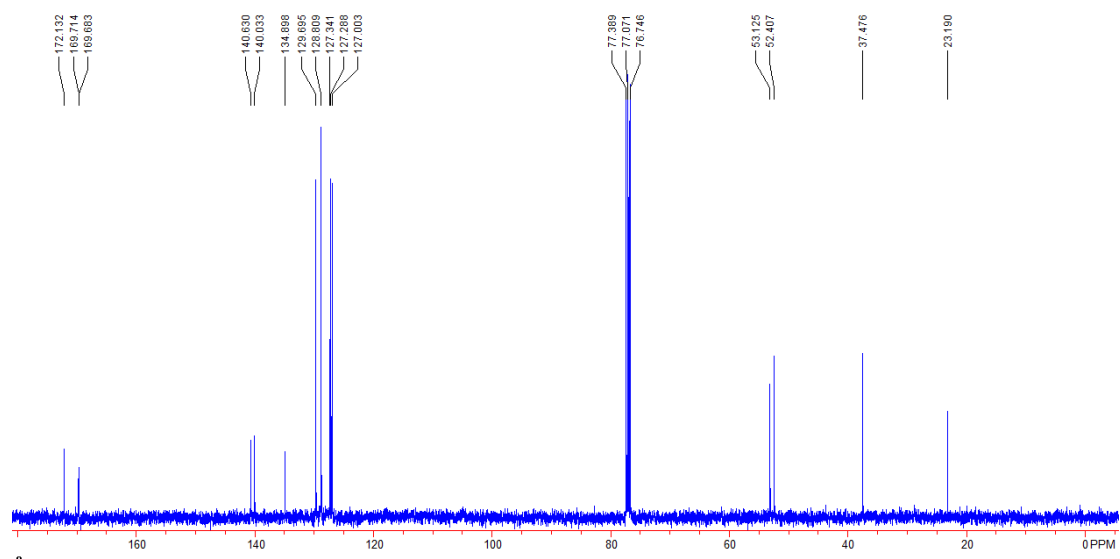
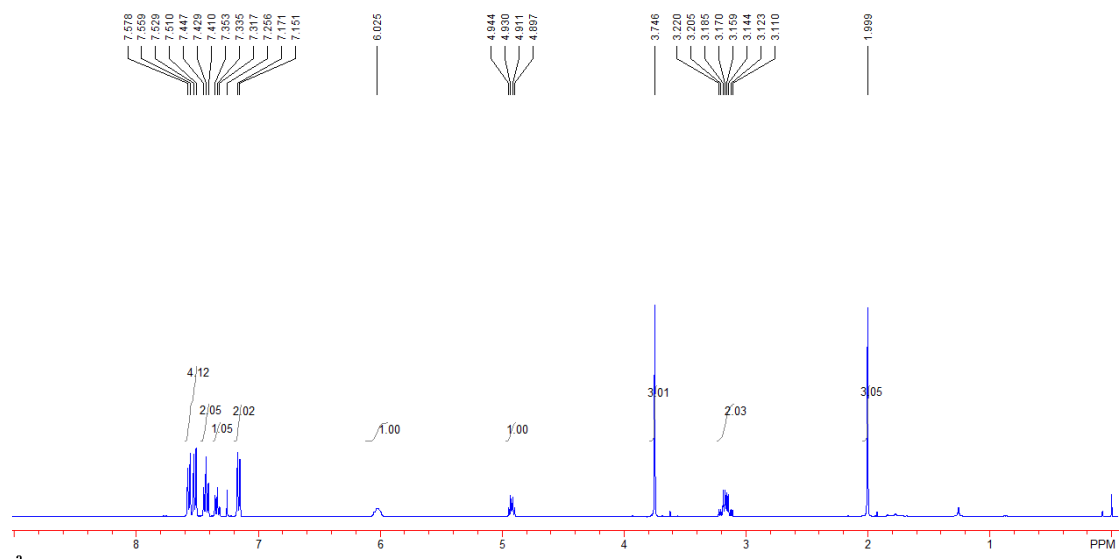


**Back Signal
Results**

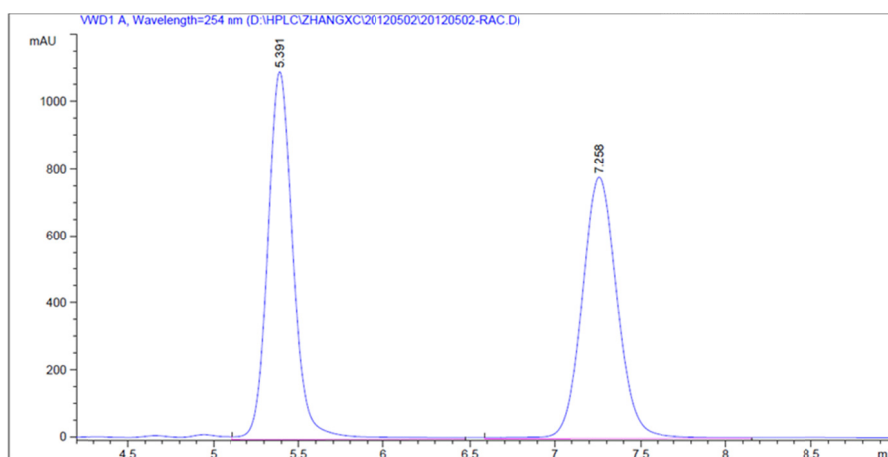
Retention Time	Area	Area %	Height	Height %
8.302	644901	1.30	45638	1.86
9.250	49104057	98.70	2412804	98.14
Totals	49748958	100.00	2458442	100.00



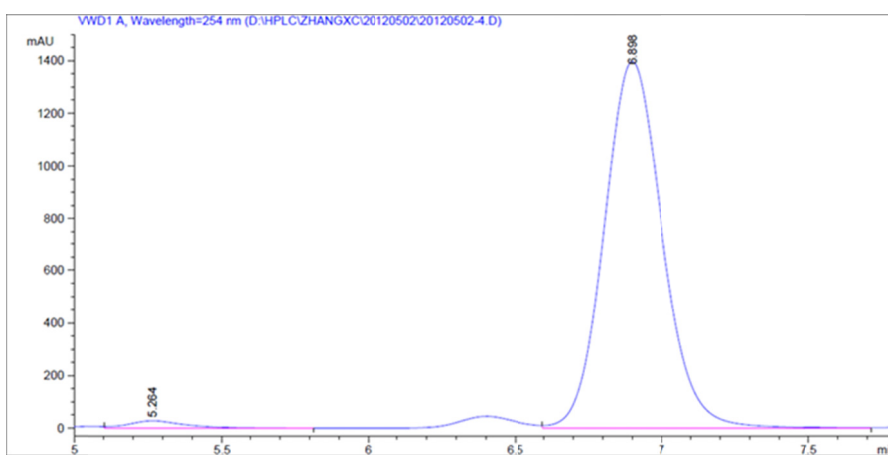
(*R*)-*N*-acetyl-*p*-phenylphenylalanine methyl ester (9l)



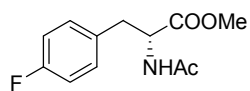
Chromatograms are illustrated below for a 97% ee sample:



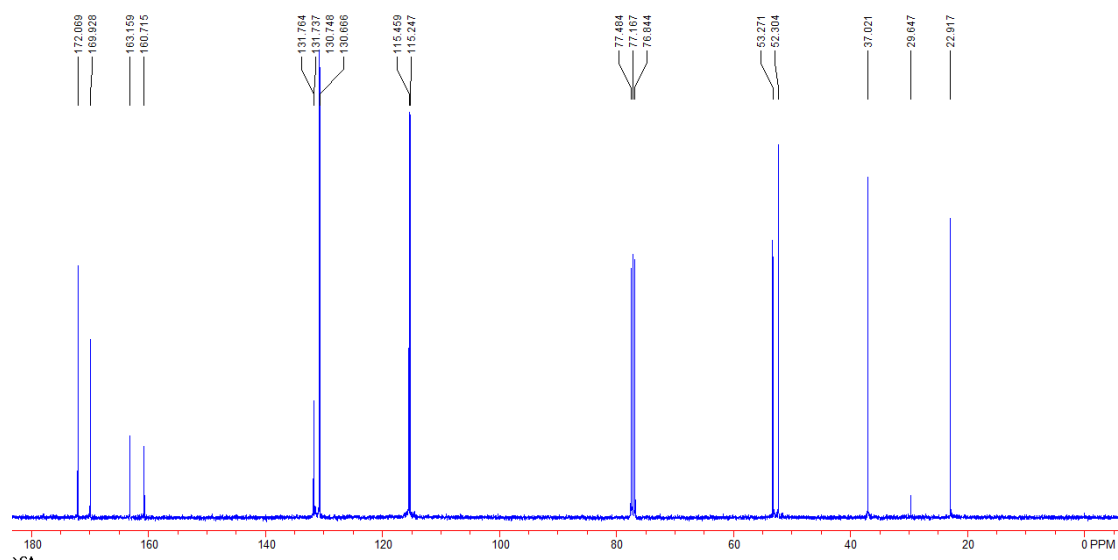
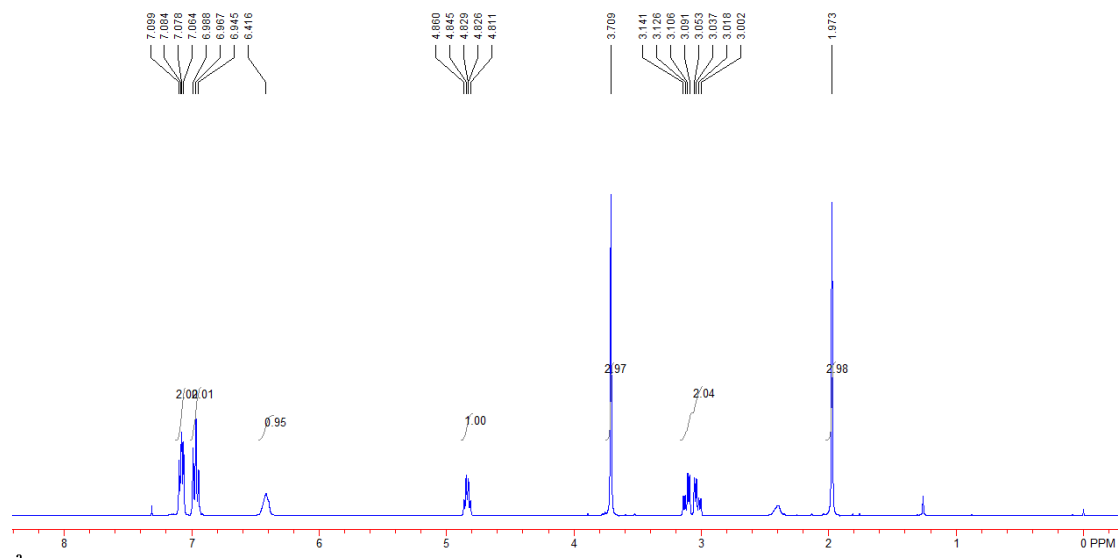
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.391	VB	0.1570	1.13303e4	1095.80725	50.4325
2	7.258	BB	0.2207	1.11360e4	778.64490	49.5675



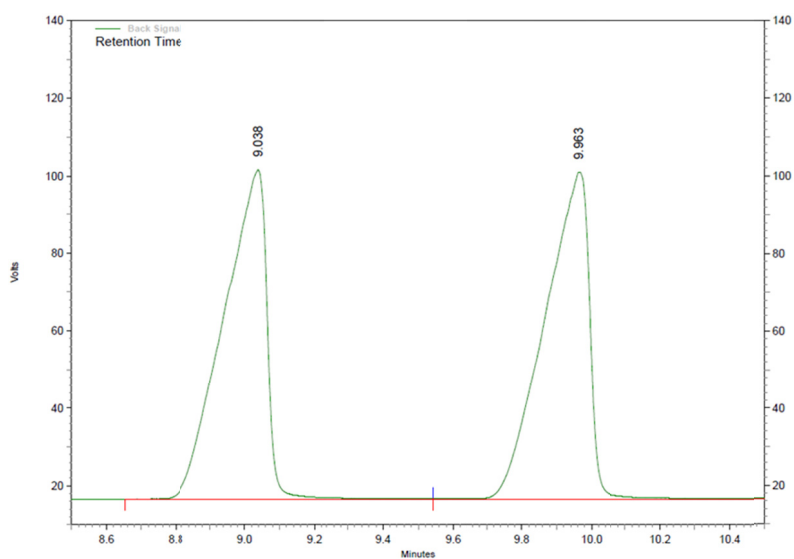
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.264	VB	0.1922	370.23151	27.98816	1.8769
2	6.898	VV	0.2140	1.93550e4	1397.05432	98.1231



(R)-N-acetyl-p-fluorophenylalanine methyl ester (9m)



Chromatograms are illustrated below for a 98% ee sample:

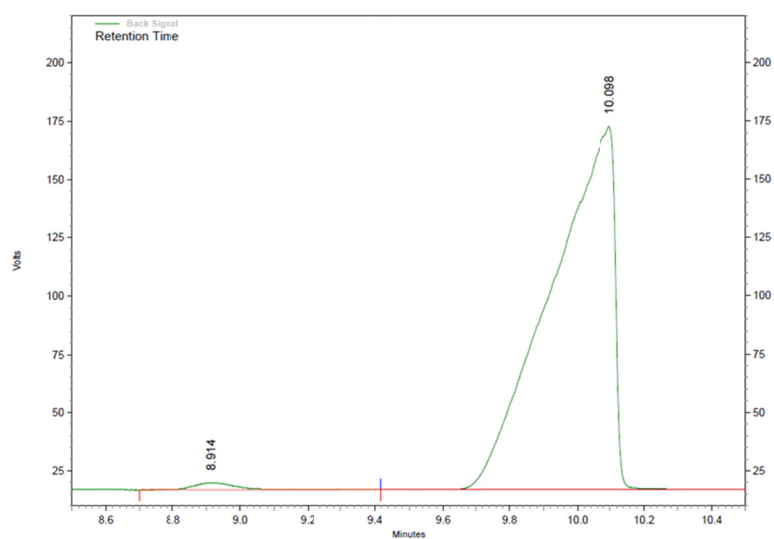


Back Signal

Results

Retention Time	Area	Area %	Height	Height %
9.038	5598585	49.25	652871	50.16
9.963	5769781	50.75	648602	49.84

Totals	11368366	100.00	1301473	100.00
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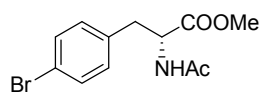


Back Signal

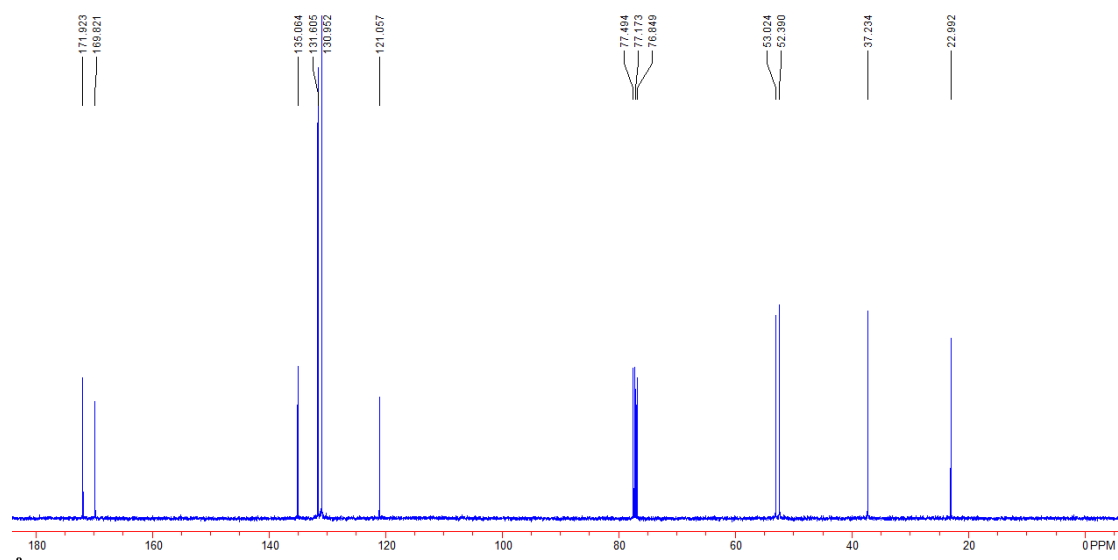
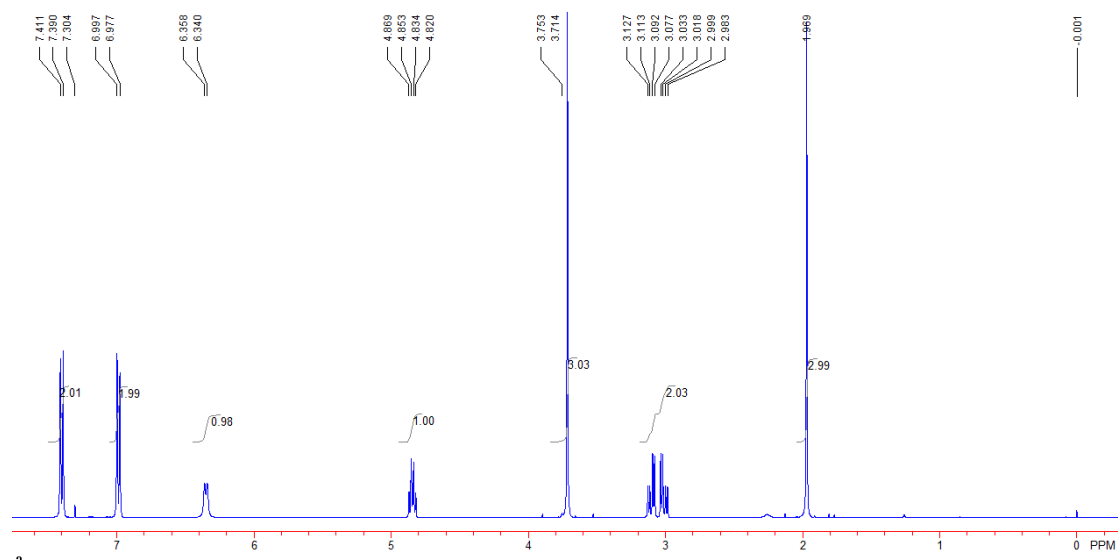
Results

Retention Time	Area	Area %	Height	Height %
8.914	197957	1.23	22936	1.88
10.098	1589139	98.77	1197139	98.12

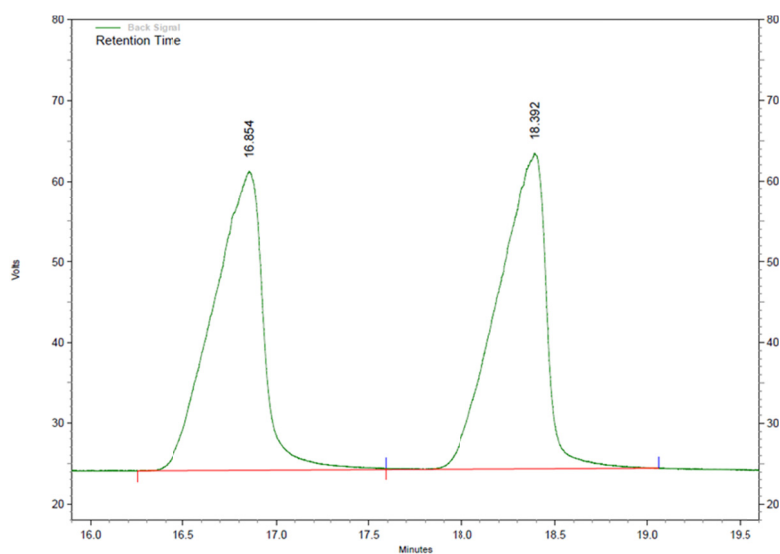
Totals	1608936	100.00	1220075	100.00
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(R)-N-acetyl-p-bromophenylalanine methyl ester (9n)



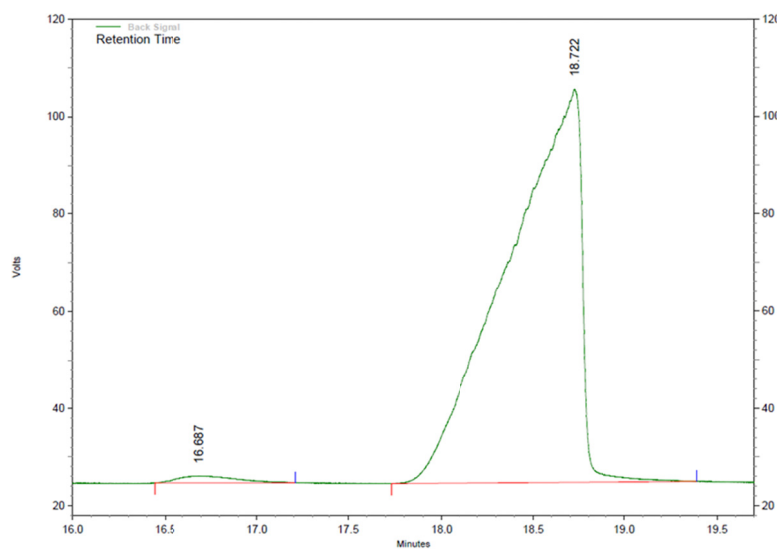
Chromatograms are illustrated below for a 97% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
16.854	5321595	49.42	285059	48.64
18.392	5447077	50.58	301046	51.36

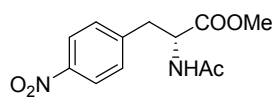
Totals	10768672	100.00	586105	100.00
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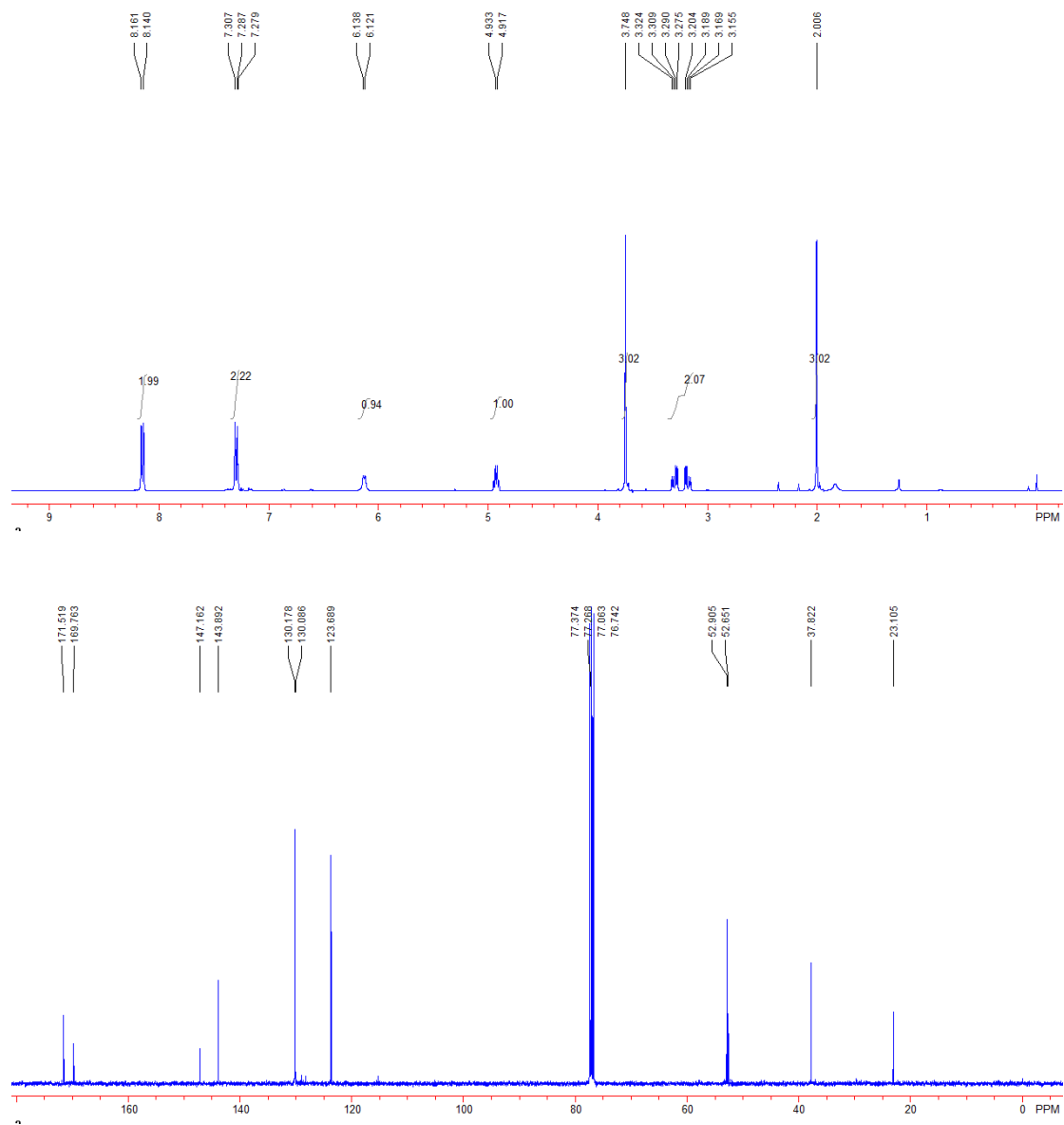
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
16.687	244375	1.39	11236	1.78
18.722	17370529	98.61	621410	98.22

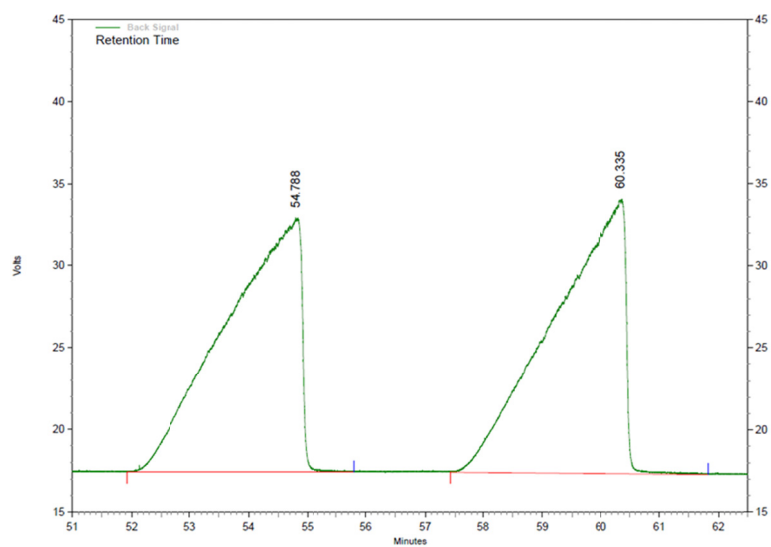
Totals	17614904	100.00	632646	100.00
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(R)-N-acetyl-p-nitrophenylalanine methyl ester (9o)



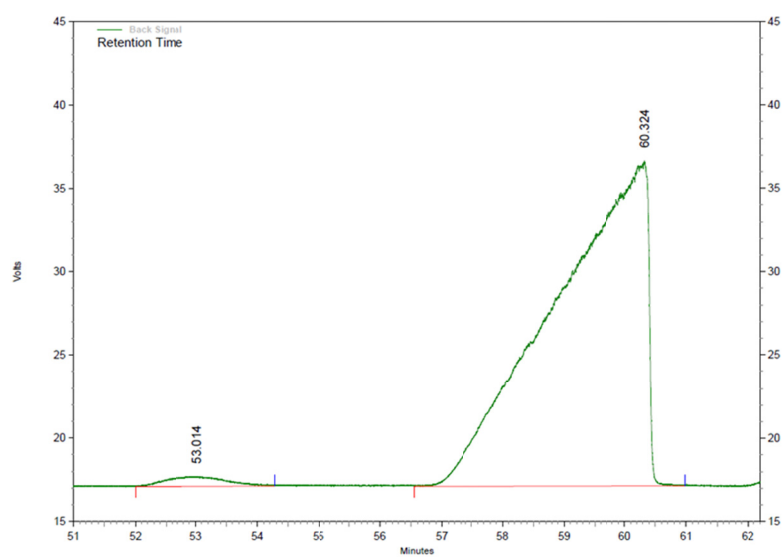
Chromatograms are illustrated below for a 96% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
54.788	10611826	49.09	117831	47.96
60.335	11005443	50.91	127834	52.04

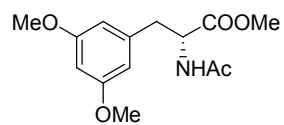
Totals	21617269	100.00	245665	100.00
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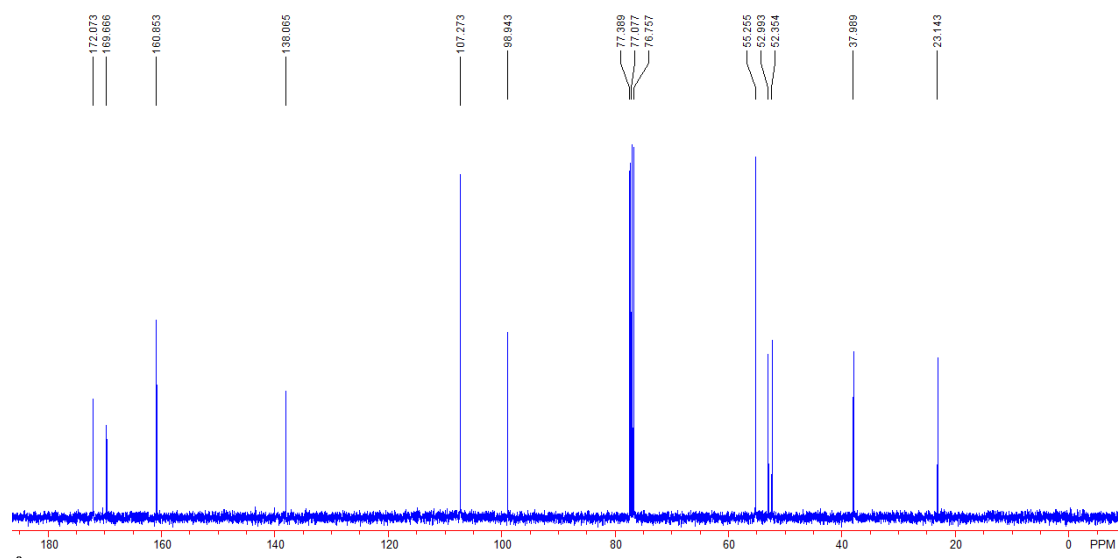
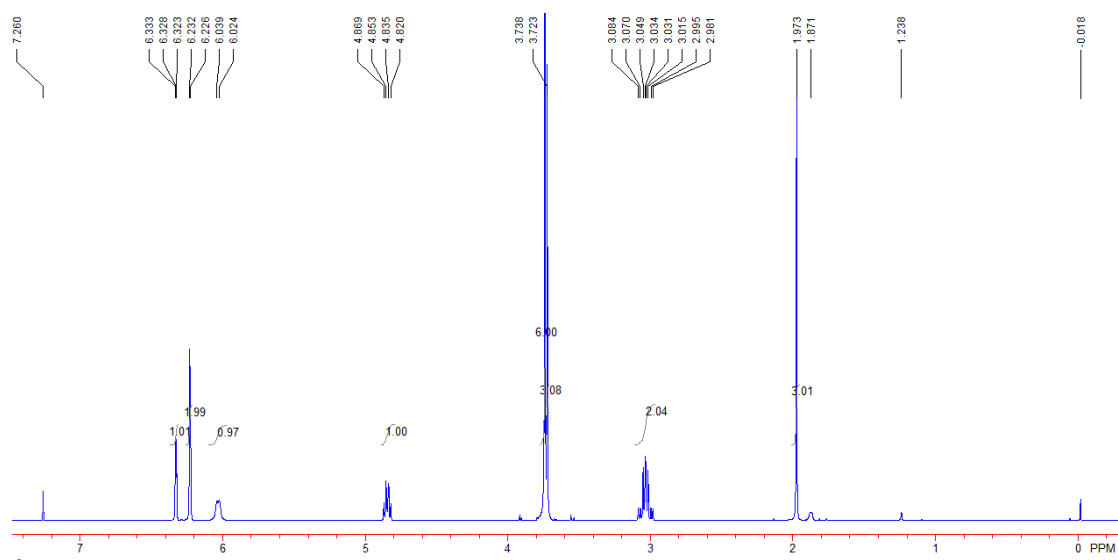
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
53.014	310986	1.92	4581	2.96
60.324	15845988	98.08	150191	97.04

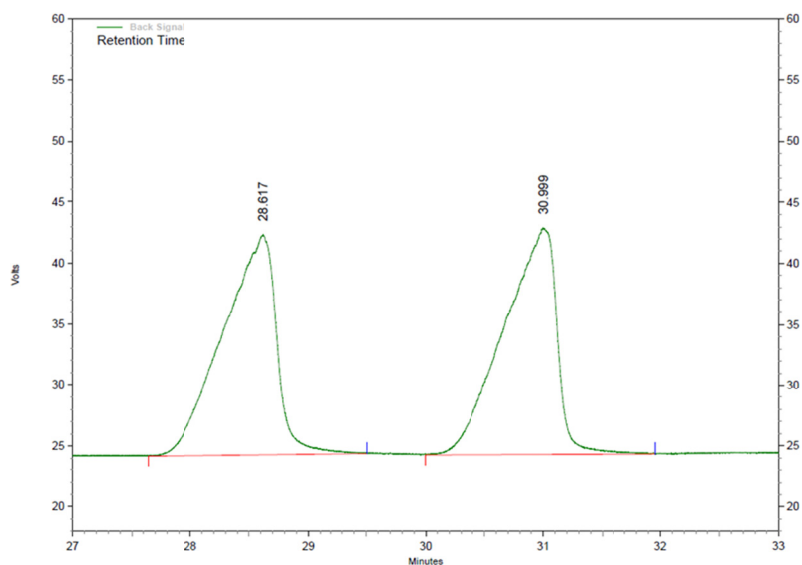
Totals	16156974	100.00	154772	100.00
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(R)-N-acetyl-3,5-bis(methoxyl)phenylalanine methyl ester
(9p)

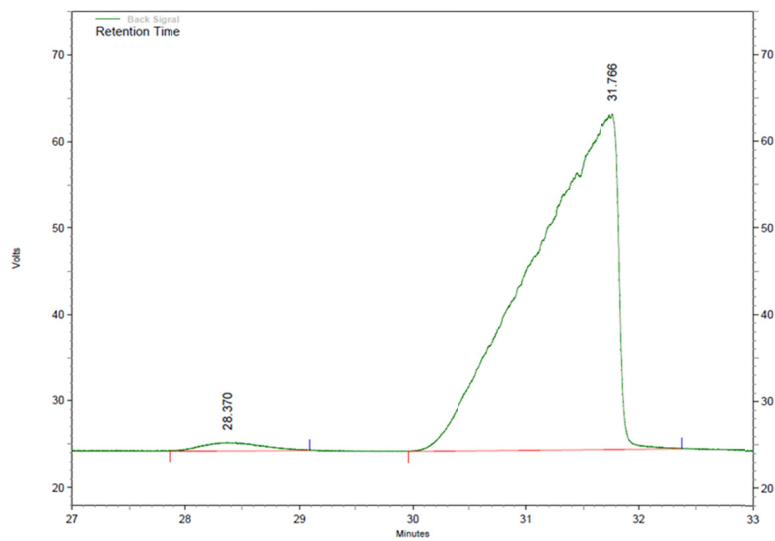


Chromatograms are illustrated below for a 96% ee sample:



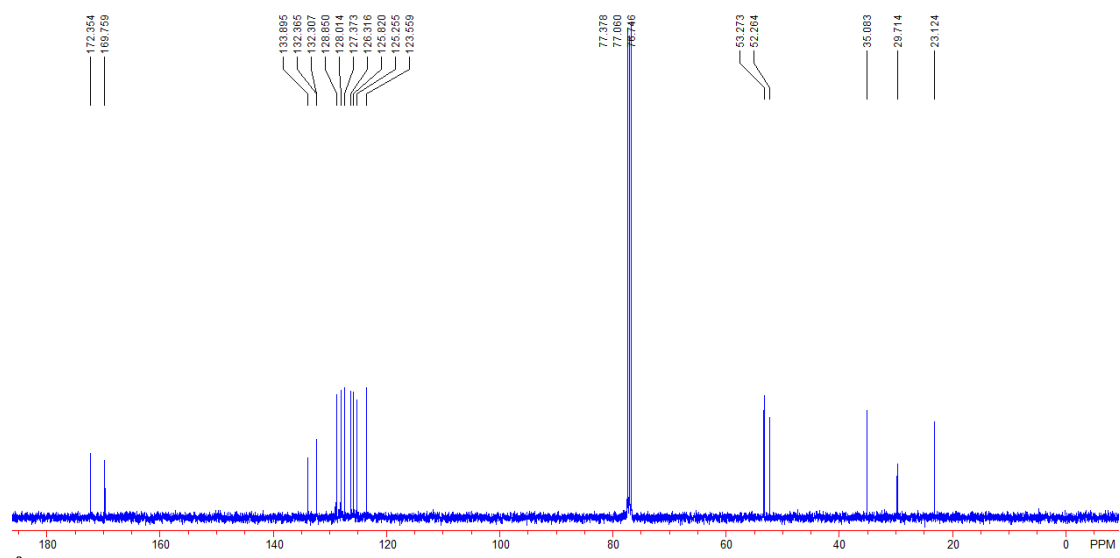
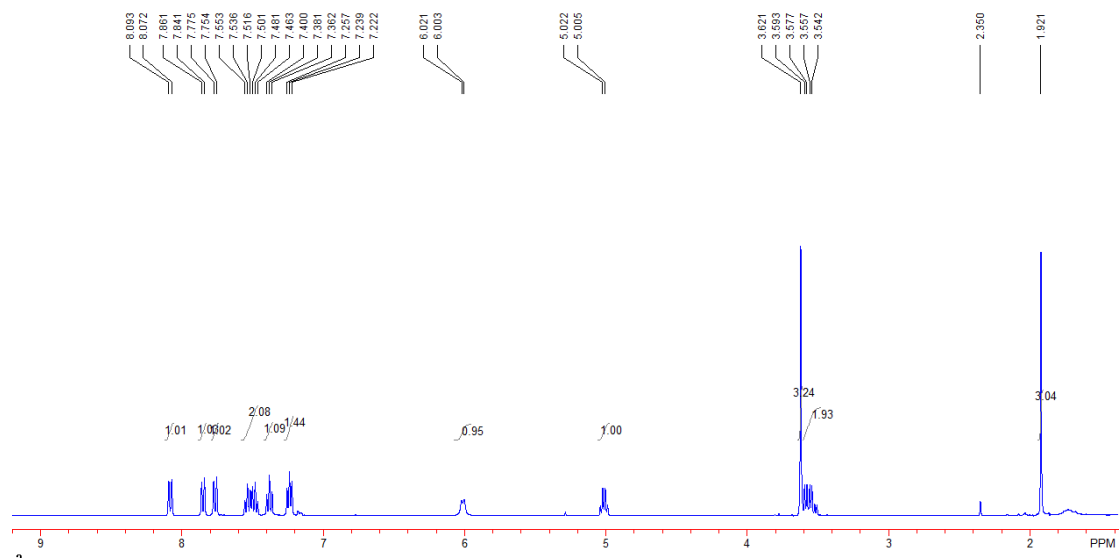
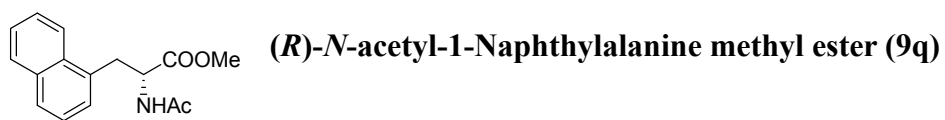
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
28.617	4379764	49.51	138549	49.28
30.999	4466596	50.49	142592	50.72
Totals	8846360	100.00	281141	100.00

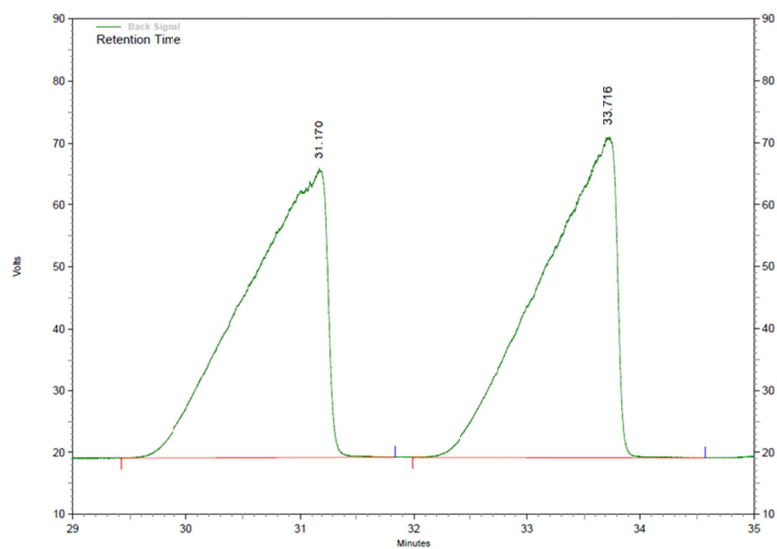


**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
28.370	272556	1.70	7408	2.42
31.766	15764076	98.30	298336	97.58
Totals	16036632	100.00	305744	100.00



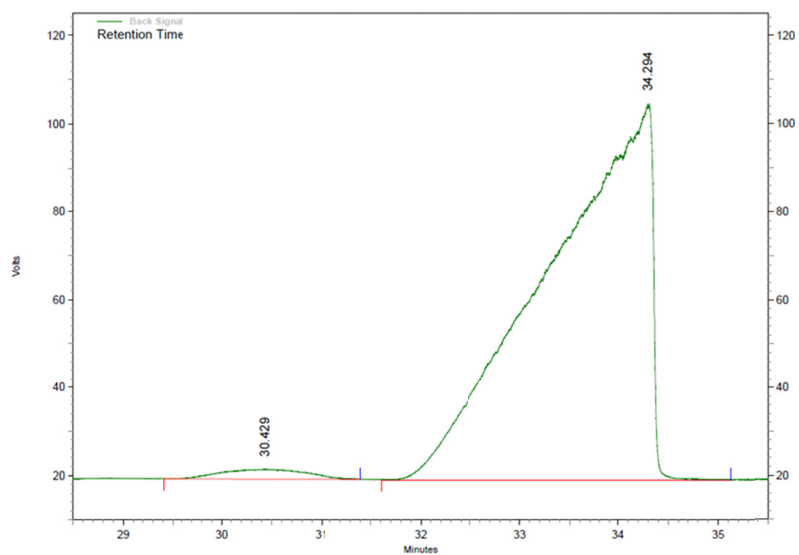
Chromatograms are illustrated below for a 96% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
31.170	18027824	49.13	355387	47.18
33.716	18667254	50.87	397921	52.82

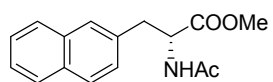
Totals	36695078	100.00	753308	100.00
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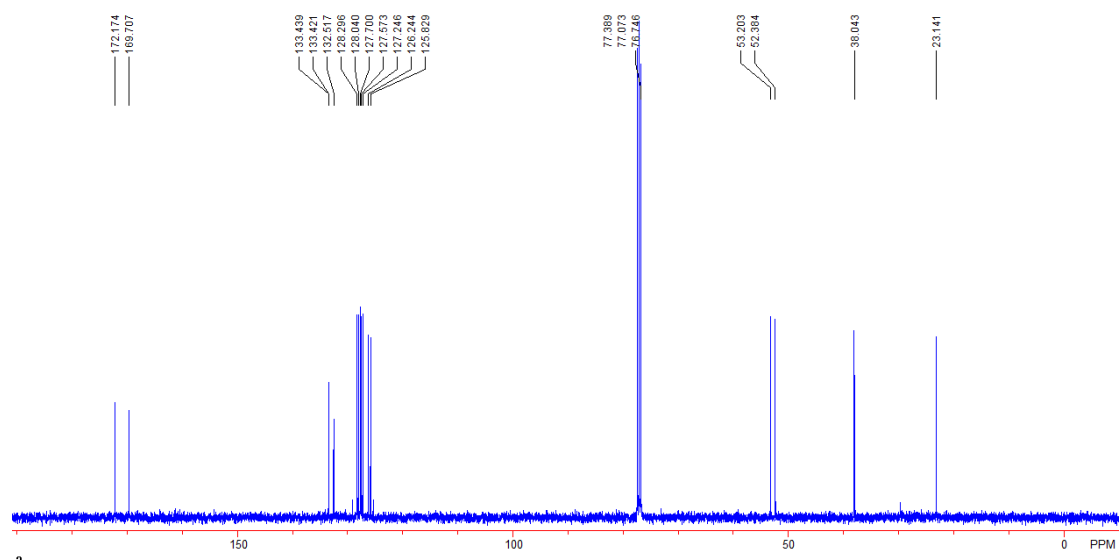
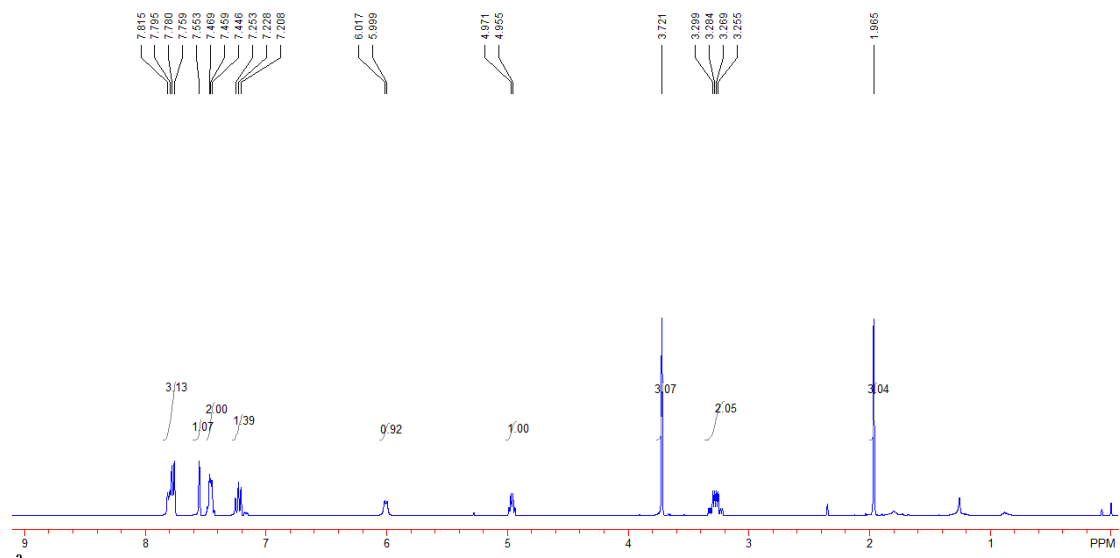
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
30.429	984295	2.01	16532	2.46
34.294	47925620	97.99	656635	97.54

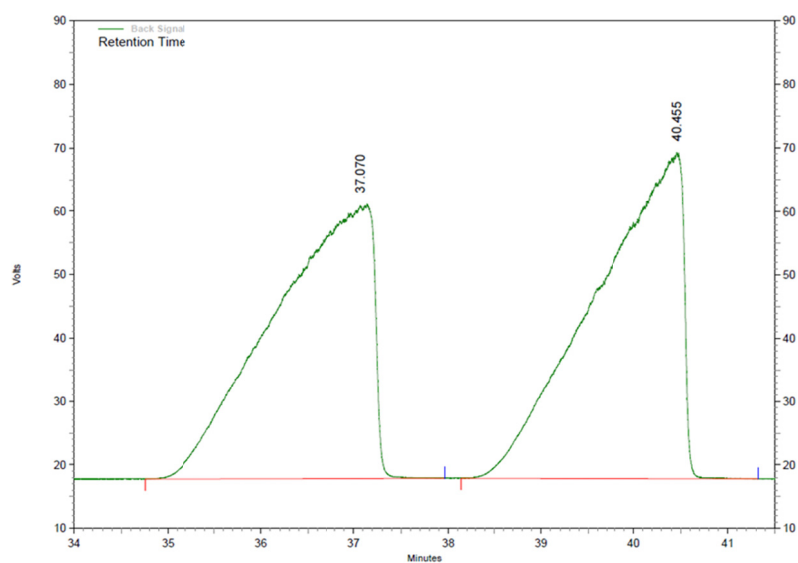
Totals	48909915	100.00	673167	100.00
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(R)-N-acetyl-2-Naphthylalanine methyl ester (9r)



Chromatograms are illustrated below for a 98% ee sample:

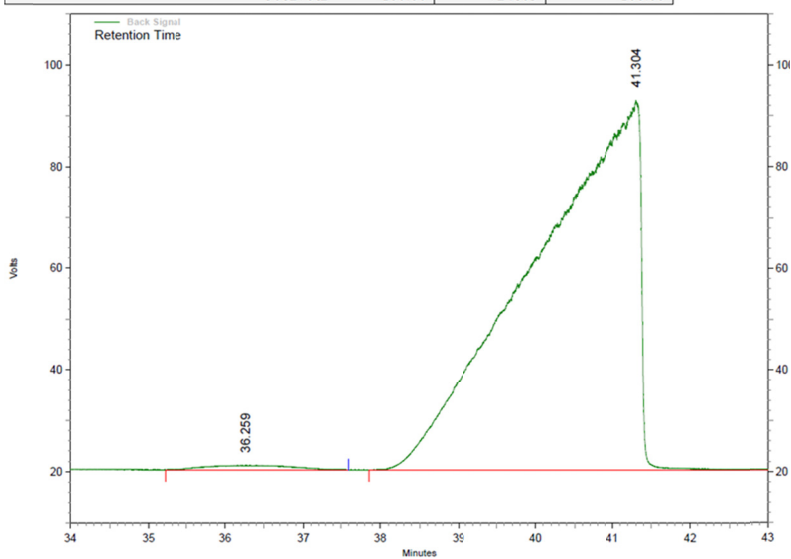


Back Signal

Results

Retention Time	Area	Area %	Height	Height %
37.070	24962777	49.11	330681	45.62
40.455	25864365	50.89	394122	54.38

Totals	50827082	100.00	724803	100.00
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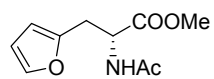


Back Signal

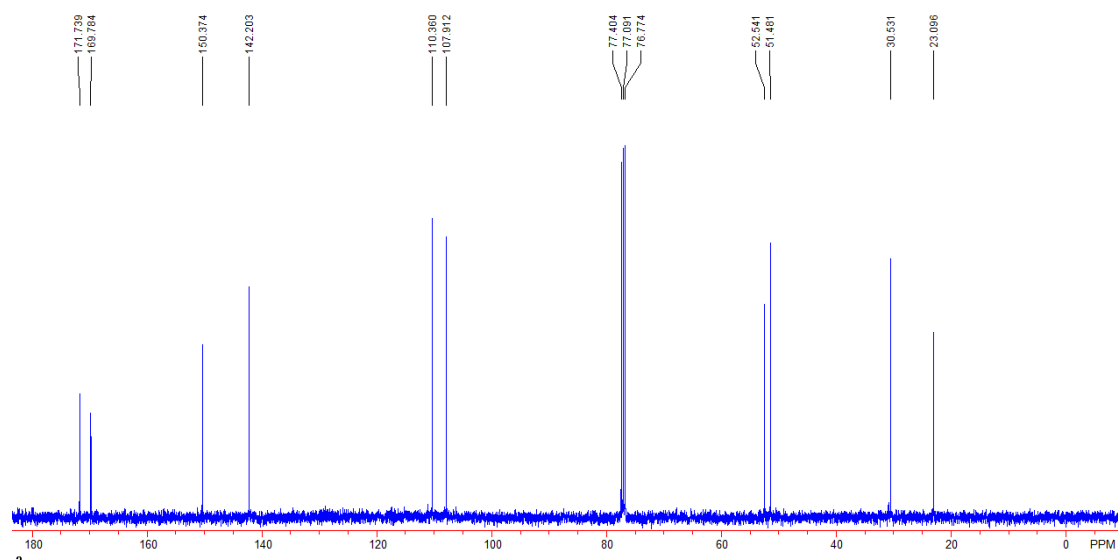
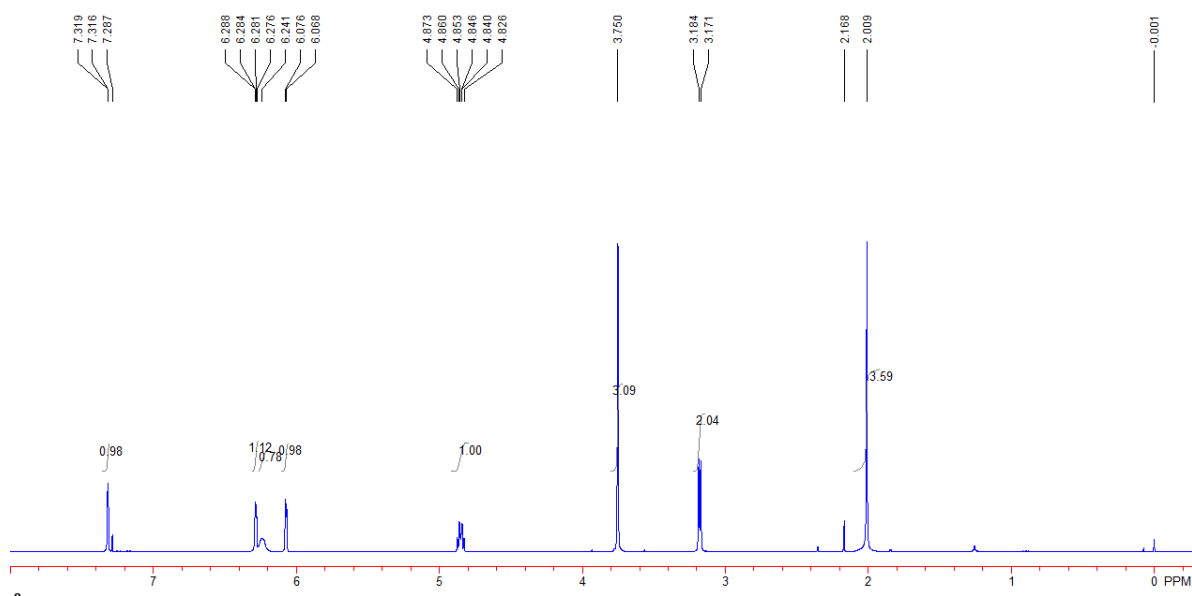
Results

Retention Time	Area	Area %	Height	Height %
36.259	565612	1.05	7104	1.25
41.304	53532056	98.95	559316	98.75

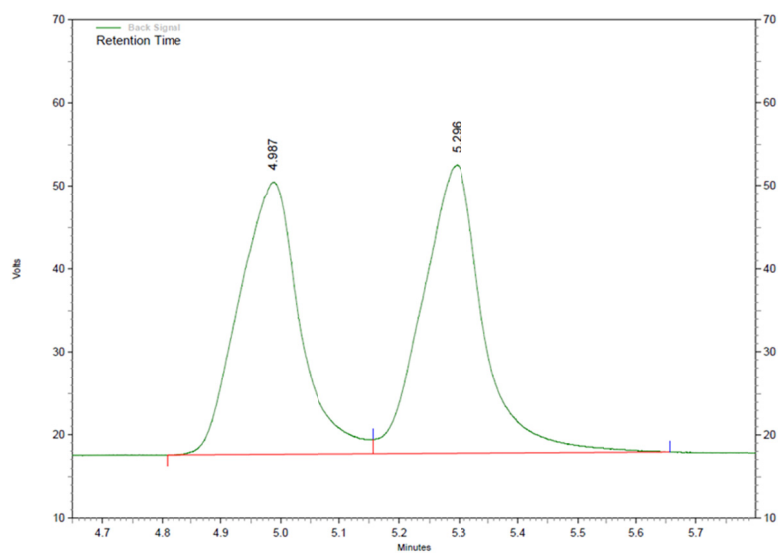
Totals	54097668	100.00	566420	100.00
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(R)-N-acetyl-2-furanylalanine methyl ester (9s)



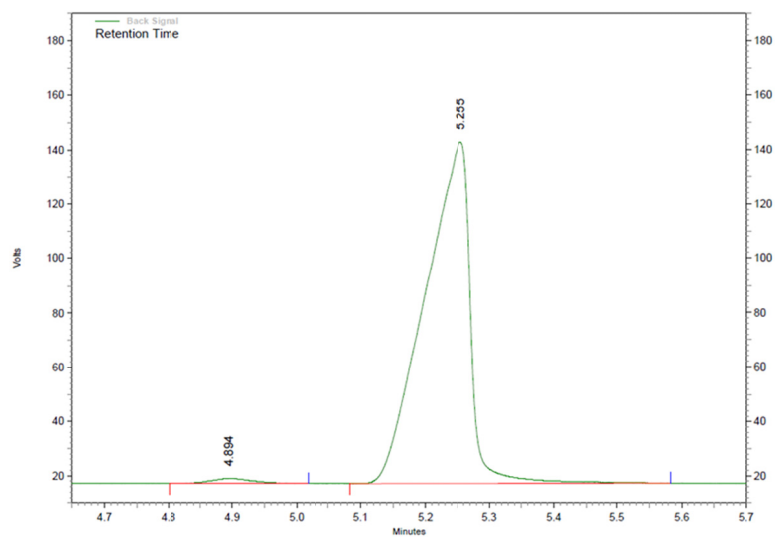
Chromatograms are illustrated below for a 97% ee sample:



**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
4.987	1789678	48.58	252223	48.56
5.296	1894422	51.42	267165	51.44

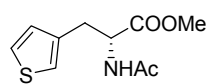
Totals	3684100	100.00	519388	100.00
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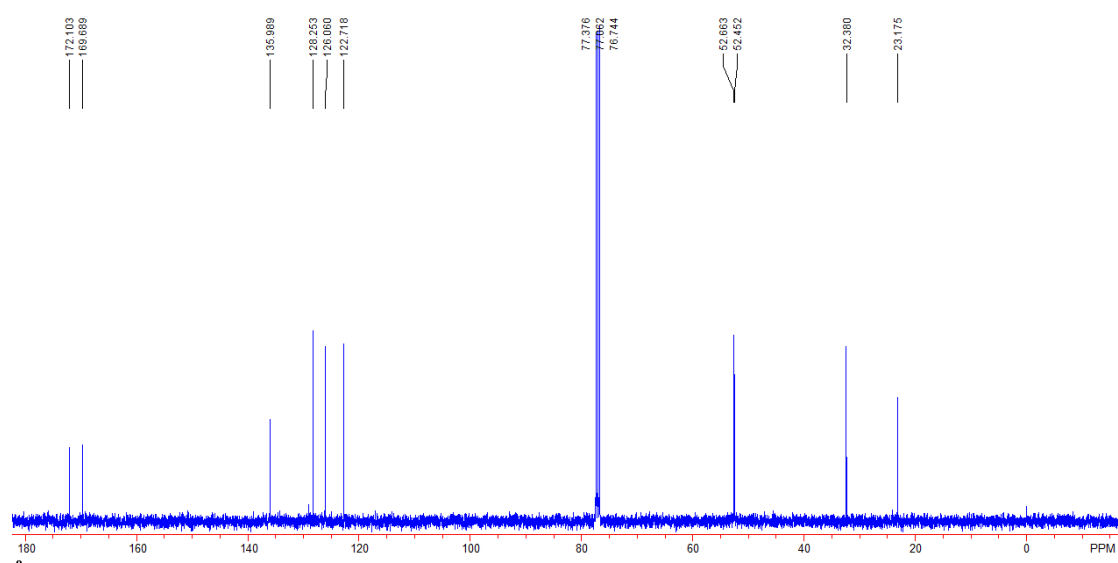
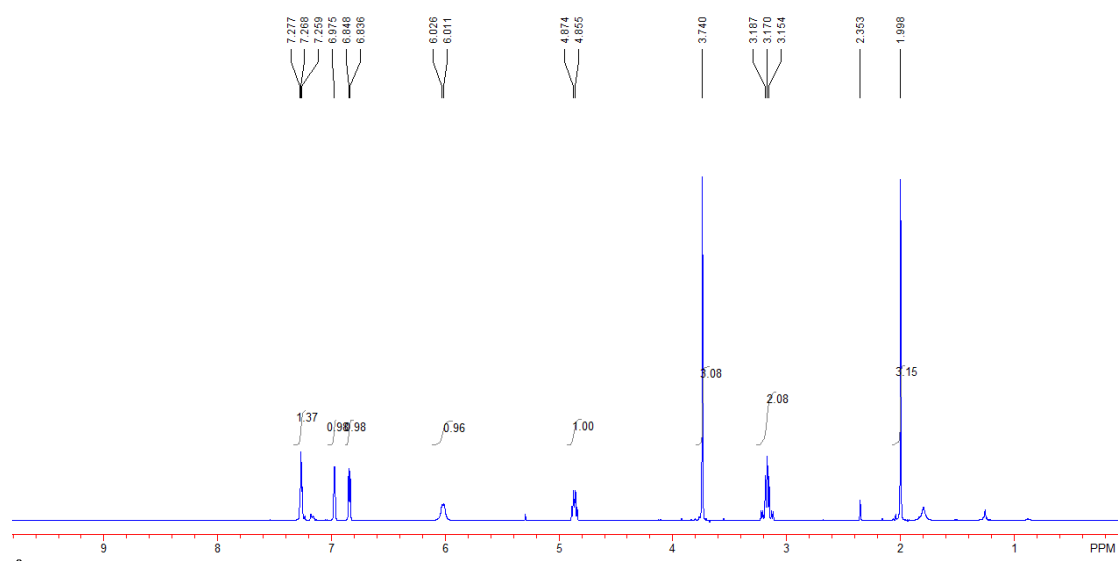
**Back Signal
Results**

Retention Time	Area	Area %	Height	Height %
4.894	64316	1.33	13764	1.41
5.255	4786251	98.67	965529	98.59

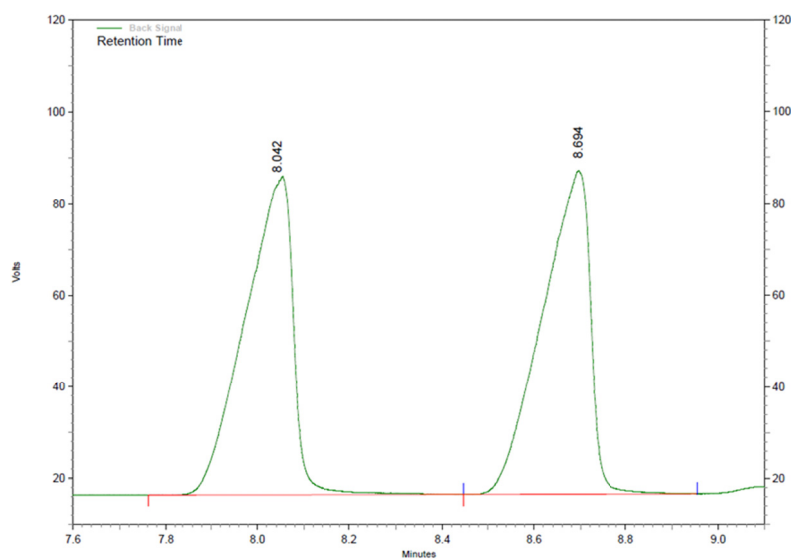
Totals	4850667	100.00	979293	100.00
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(R)-N-acetyl-3-thiophenylalanine methyl ester (9t)



Chromatograms are illustrated below for a 97% ee sample:

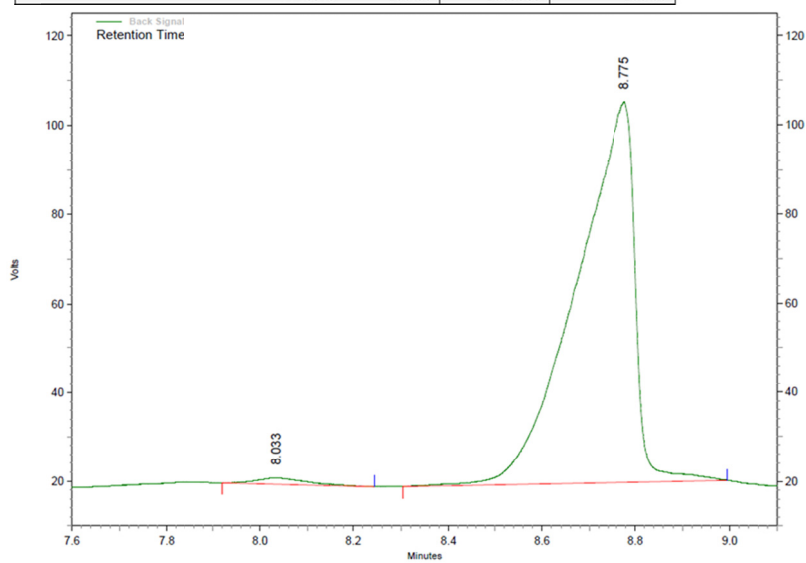


Back Signal

Results

Retention Time	Area	Area %	Height	Height %
8.042	3839954	49.57	520283	48.93
8.694	3906622	50.43	543100	51.07

Totals	7746576	100.00	1063383	100.00
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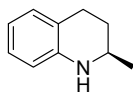


Back Signal

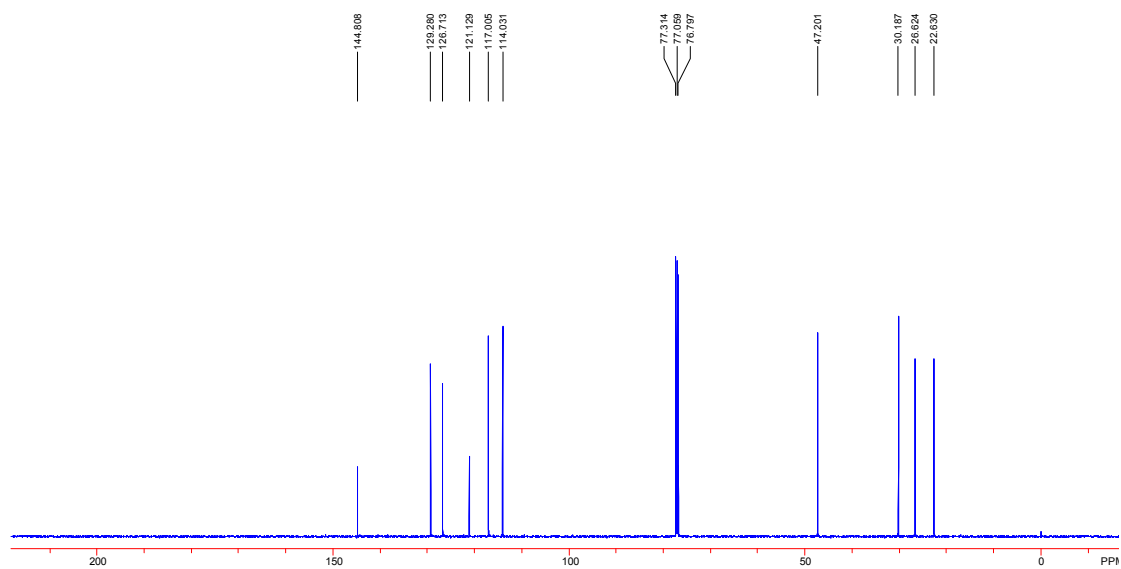
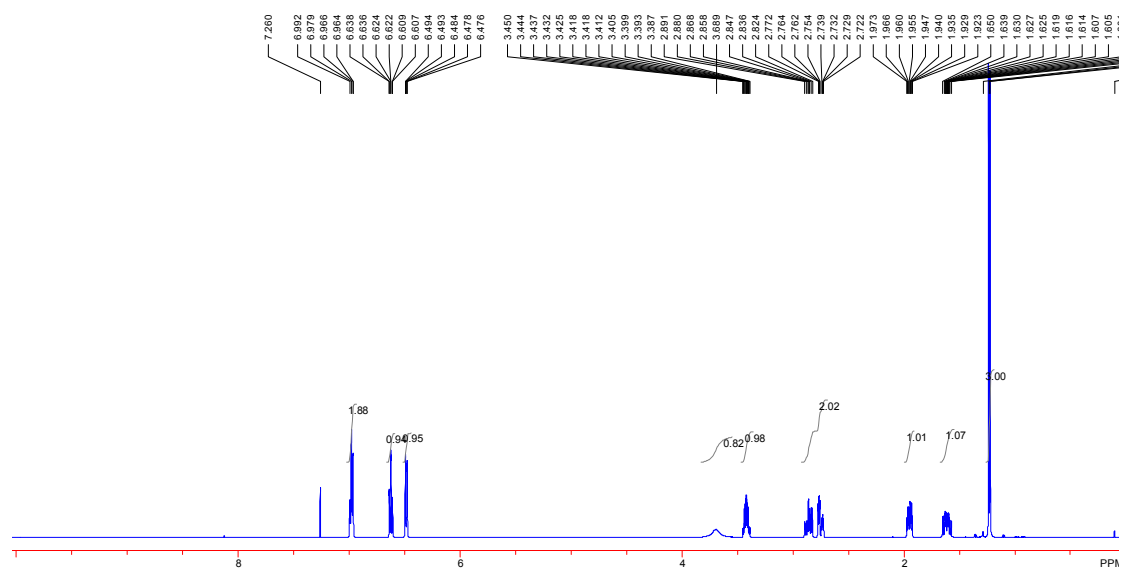
Results

Retention Time	Area	Area %	Height	Height %
8.033	82524	1.42	11017	1.65
8.775	5738406	98.58	656355	98.35

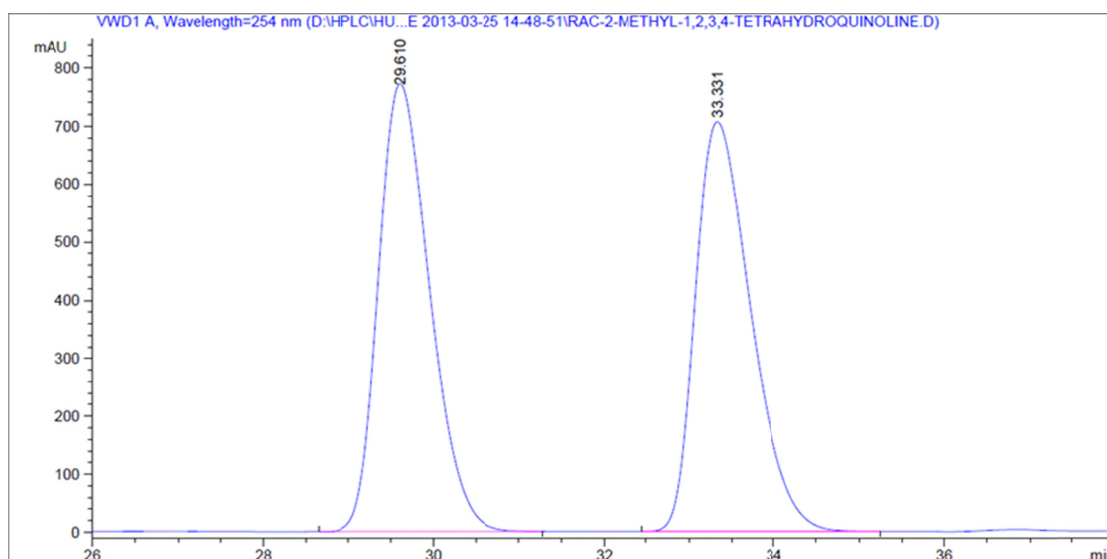
Totals	5820930	100.00	667372	100.00
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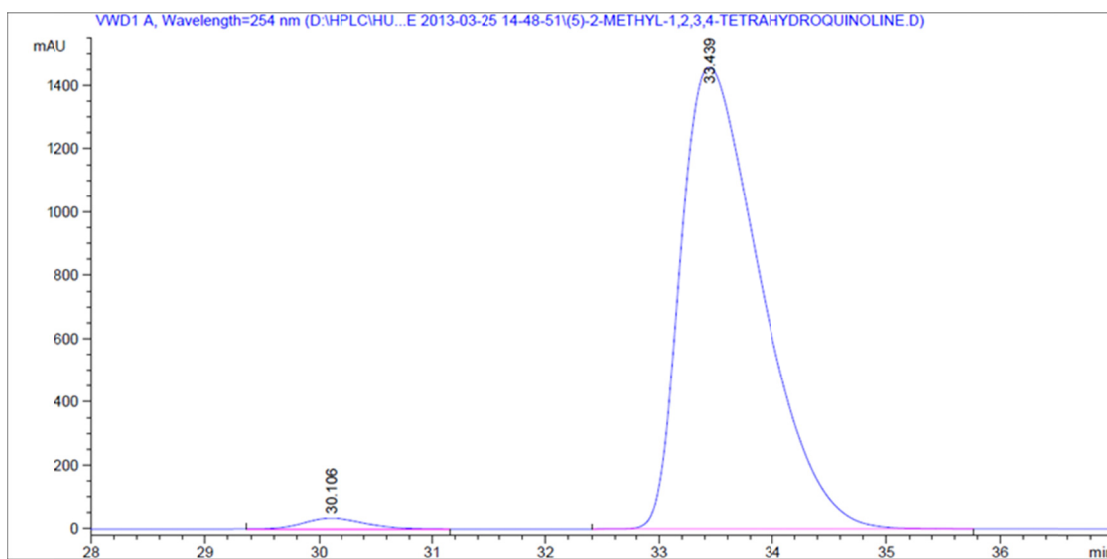
(R)-2-Methyl-1,2,3,4-tetrahydroquinoline (11a)



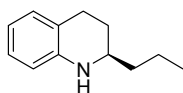
Chromatograms are illustrated below for a 97% ee sample:



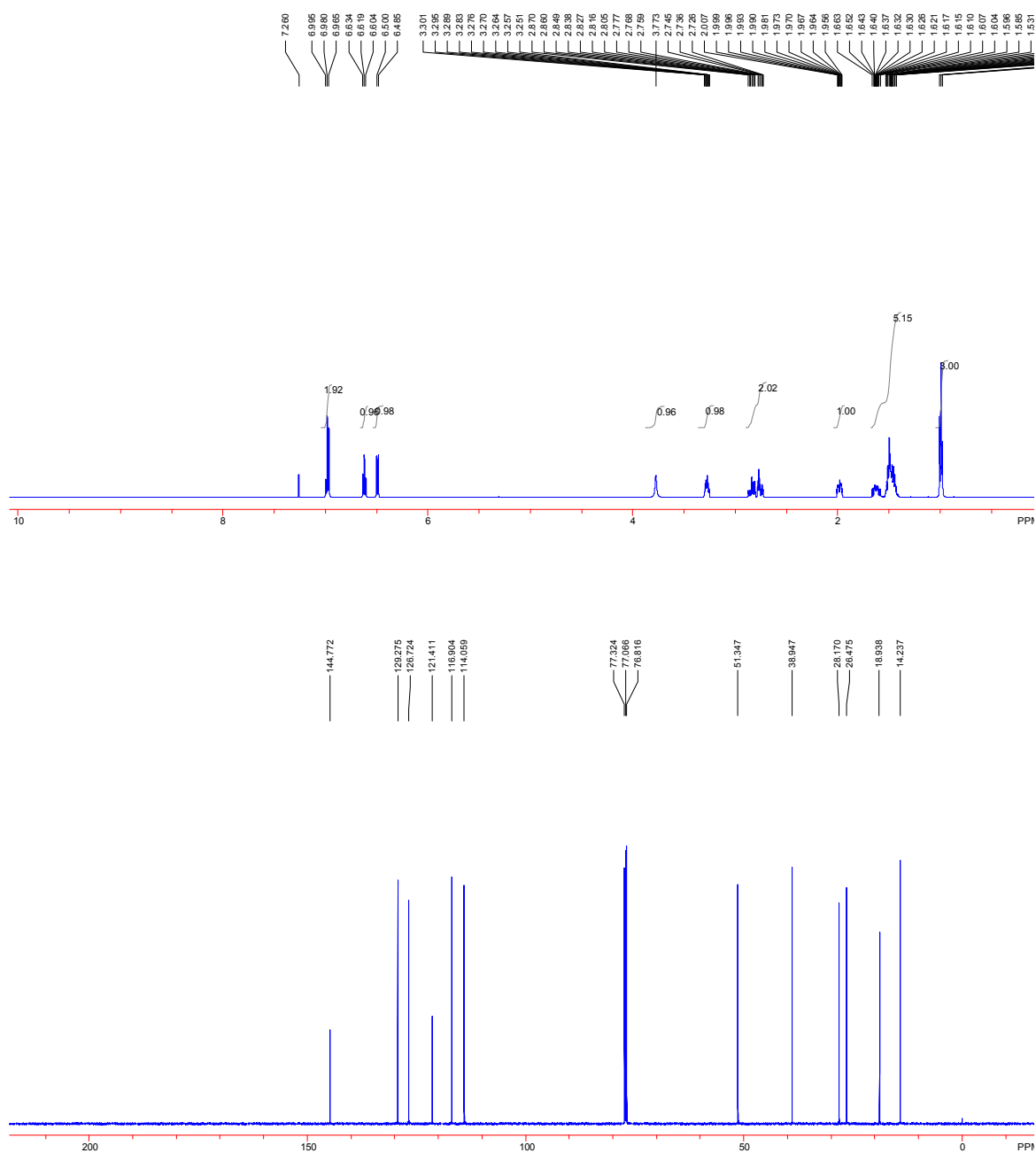
Peak #	RetTime [min]	Type	Width [min]	Area mAU * s	Height [mAU]	Area %
1	29.610	BB	0.6456	3.20930e4	771.33887	50.2080
2	33.331	BB	0.7004	3.18271e4	706.38940	49.7920



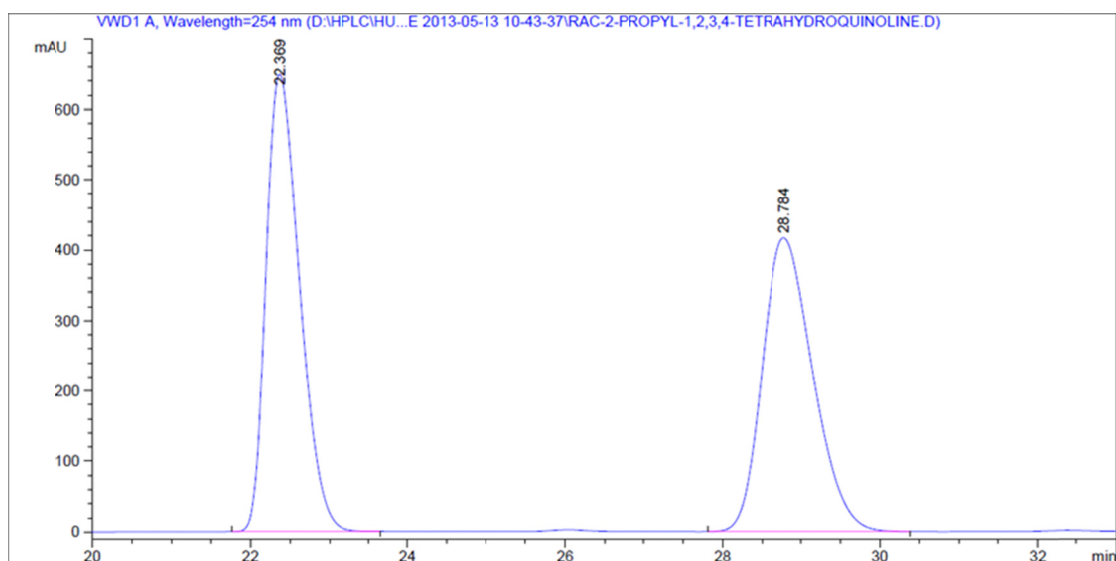
Peak #	RetTime [min]	Type	Width [min]	Area mAU * s	Height [mAU]	Area %
1	30.106	BB	0.5721	1254.61414	33.85627	1.7316
2	33.439	BB	0.7534	7.12007e4	1457.52283	98.2684



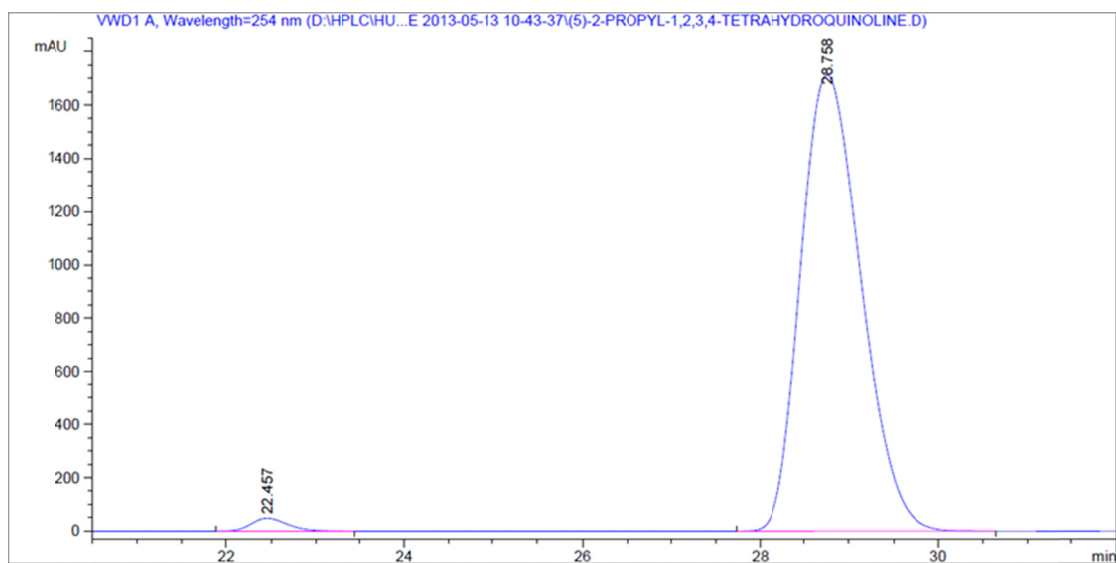
(R)-2-Propyl-1,2,3,4-tetrahydroquinoline (11b)



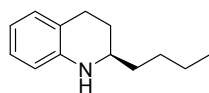
Chromatograms are illustrated below for a 97% ee sample:



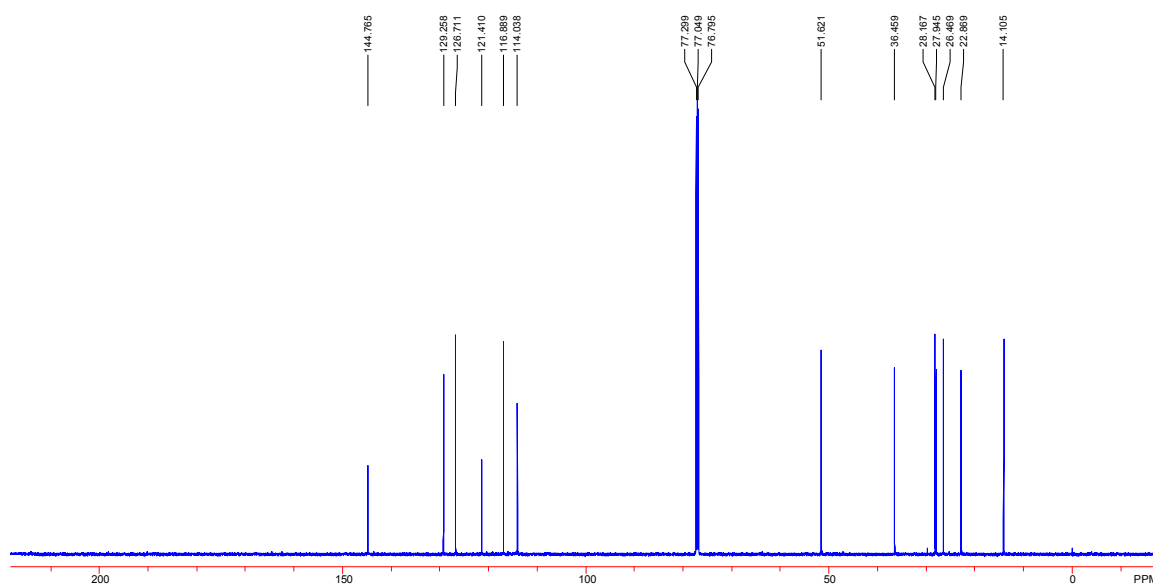
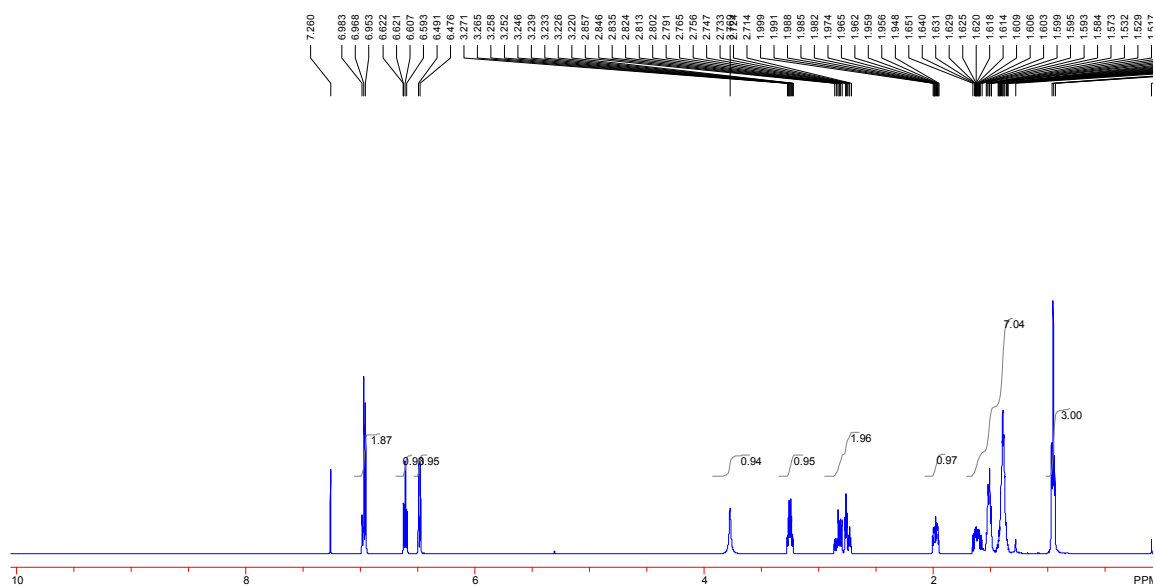
Peak #	RetTime [min]	Type	Width [min]	Area mAU * s	Height [mAU]	Area %
1	22.369	BB	0.4599	1.91090e4	649.25940	50.5377
2	28.784	BB	0.6969	1.87024e4	416.72189	49.4623



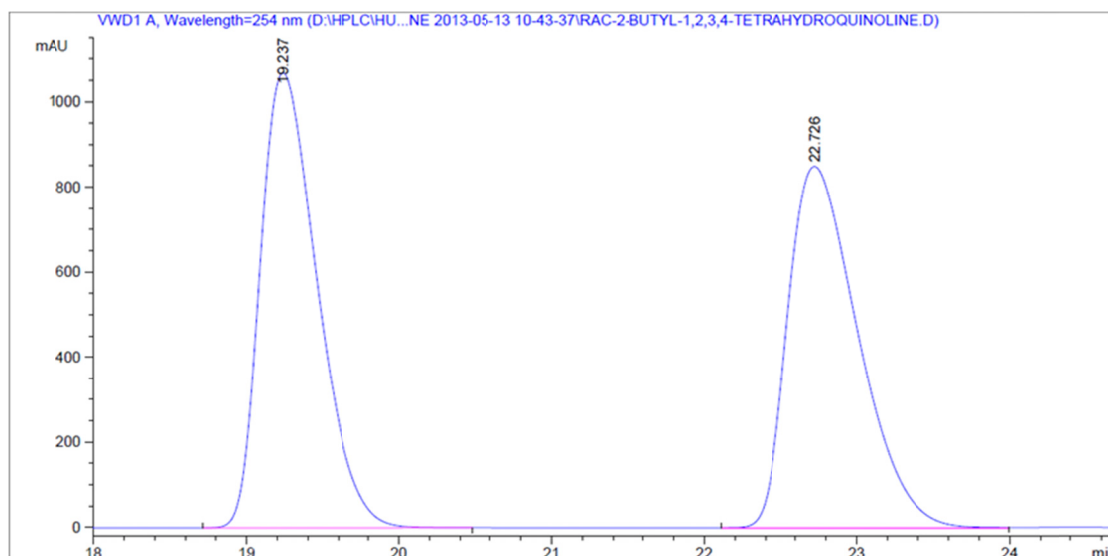
Peak #	RetTime [min]	Type	Width [min]	Area mAU * s	Height [mAU]	Area %
1	22.457	BB	0.4333	1364.44775	48.46962	1.6713
2	28.758	BB	0.7407	8.02741e4	1712.04346	98.3287



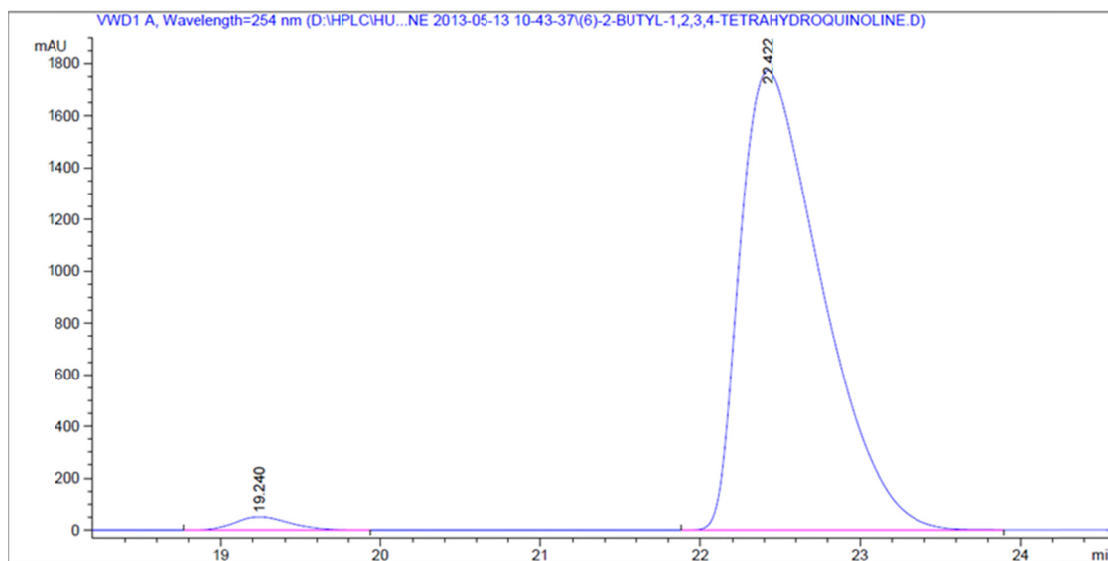
(R)-2-Butyl-1,2,3,4-tetrahydroquinoline (11c)



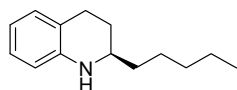
Chromatograms are illustrated below for a 96% ee sample:



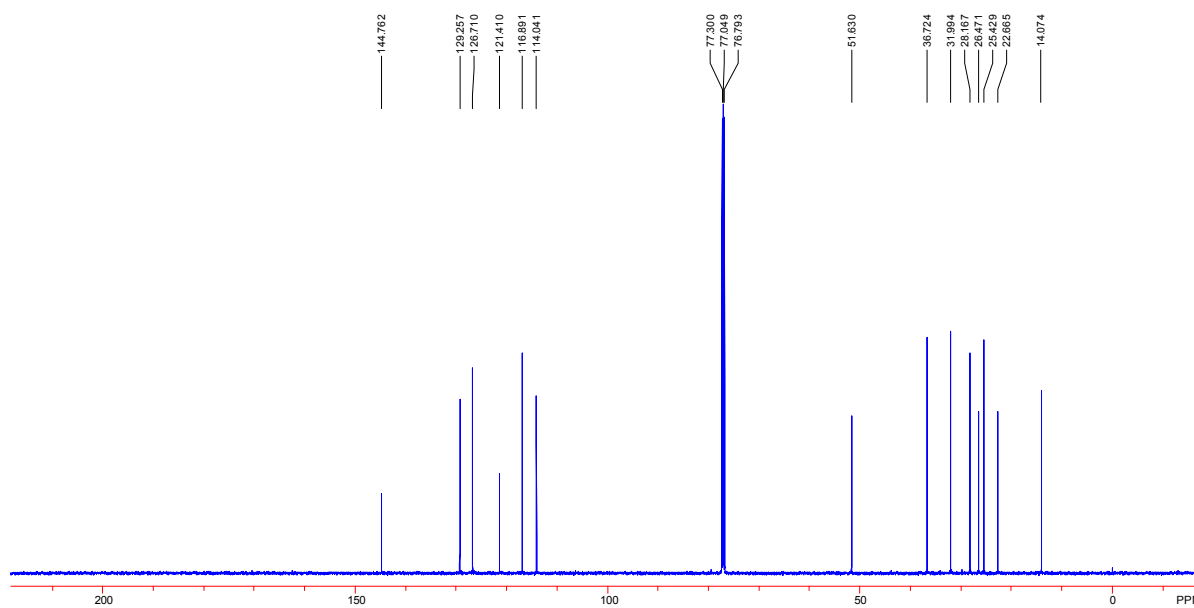
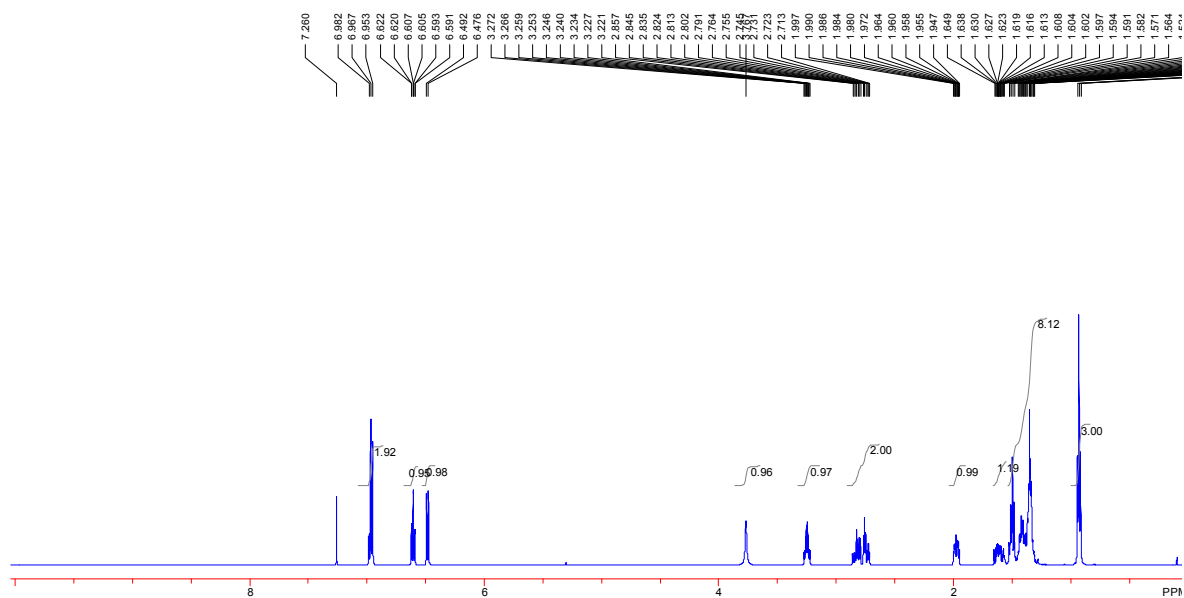
Peak #	RetTime [min]	Type	Width [min]	Area mAU * s	Height [mAU]	Area %
1	19.237	BB	0.4025	2.75344e4	1068.72534	50.4556
2	22.726	BB	0.4964	2.70371e4	849.68958	49.5444



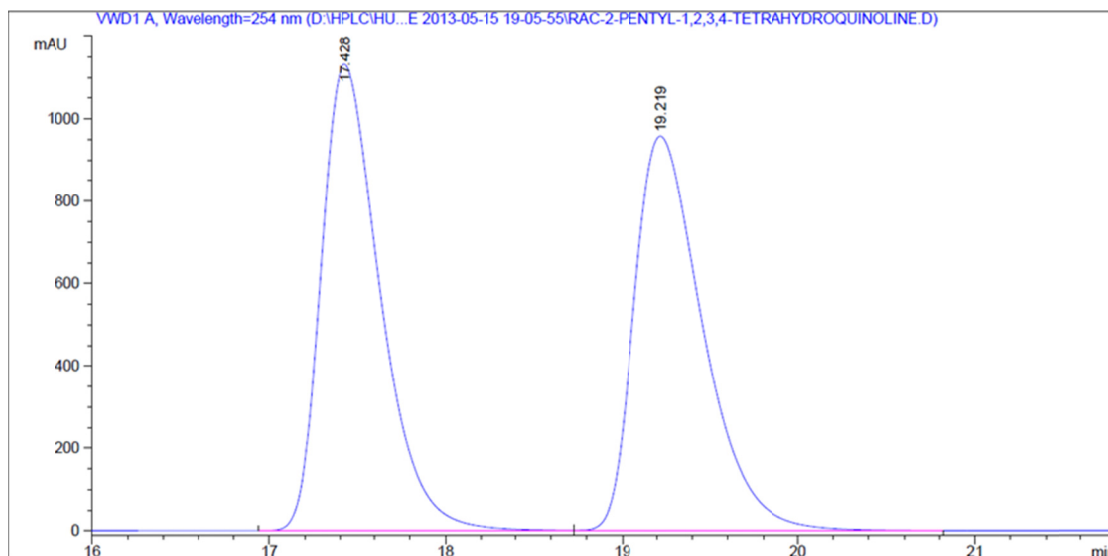
Peak #	RetTime [min]	Type	Width [min]	Area mAU * s	Height [mAU]	Area %
1	19.240	BB	0.3656	1204.33997	51.04116	1.8668
2	22.422	BB	0.5532	6.33078e4	1774.04541	98.1332



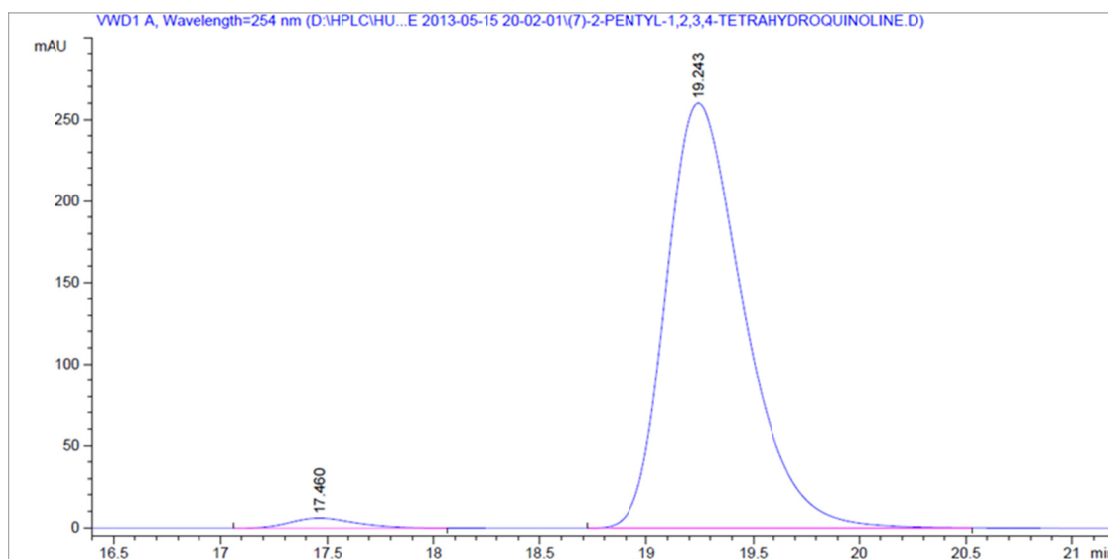
(R)-2-Pentyl-1,2,3,4-tetrahydroquinoline (11d)



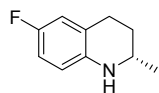
Chromatograms are illustrated below for a 96% ee sample:



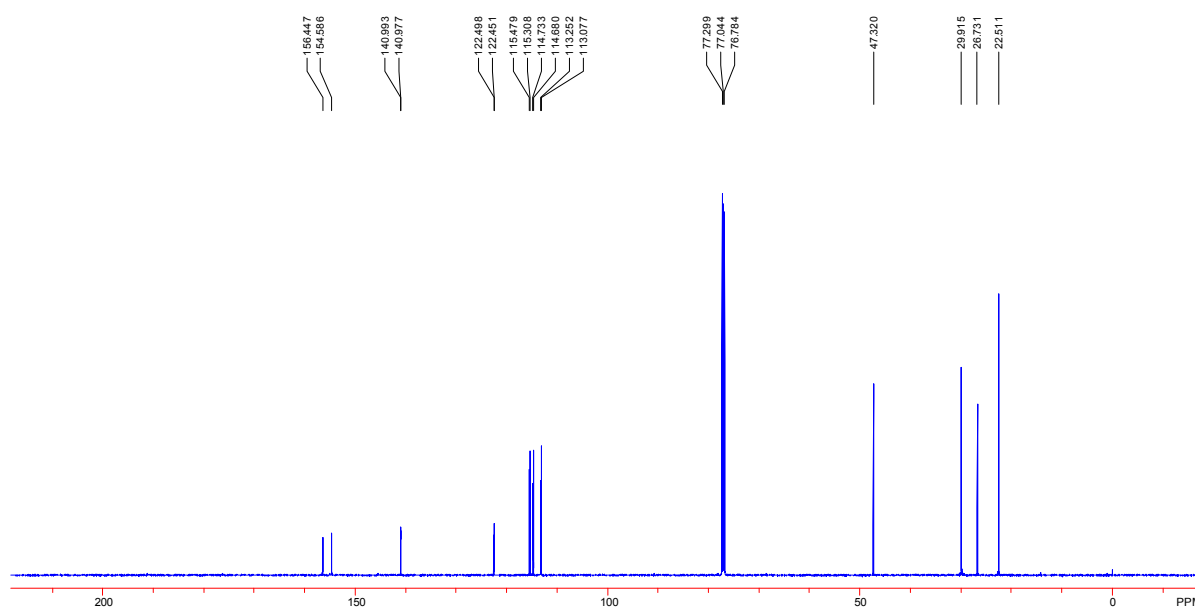
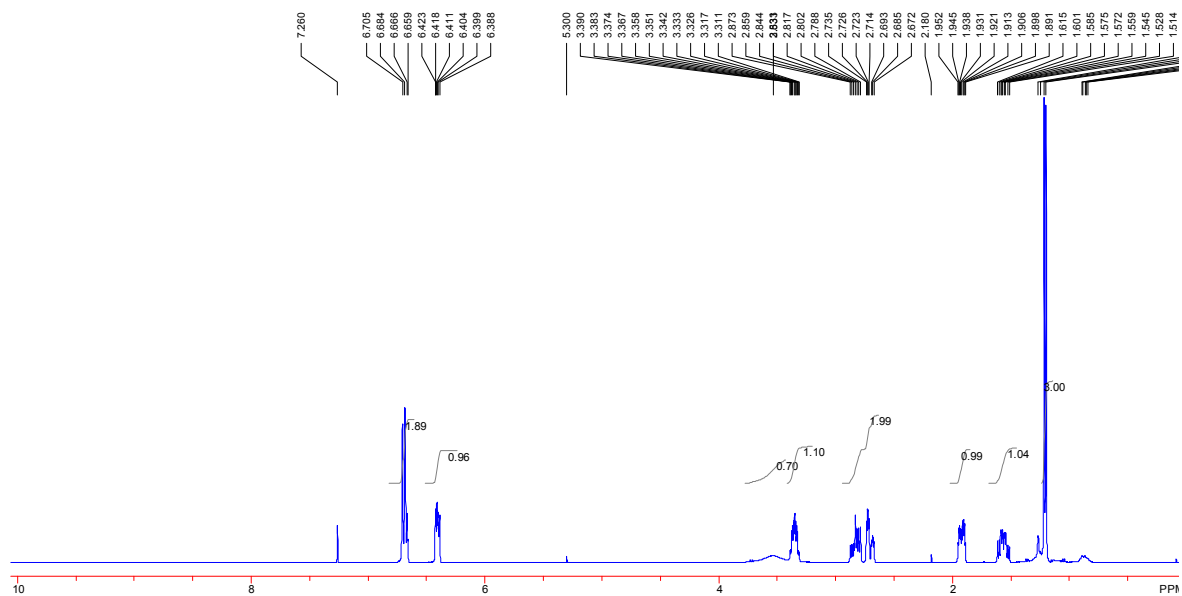
Peak #	RetTime [min]	Type	Width [min]	Area mAU*s	Height [mAU]	Area %
1	17.428	BV	0.3592	2.65259e4	1132.35278	50.6464
2	19.219	VB	0.4153	2.58489e4	957.86127	49.3536



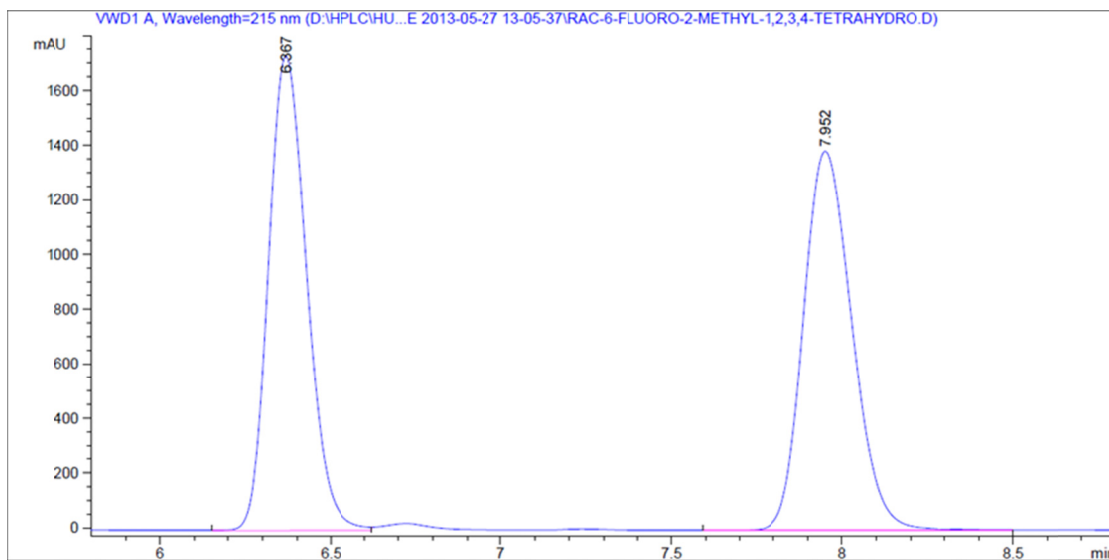
Peak #	RetTime [min]	Type	Width [min]	Area mAU*s	Height [mAU]	Area %
1	17.460	BB	0.3352	135.01524	6.17390	2.0110
2	19.243	BB	0.3880	6578.73193	260.35593	97.9890



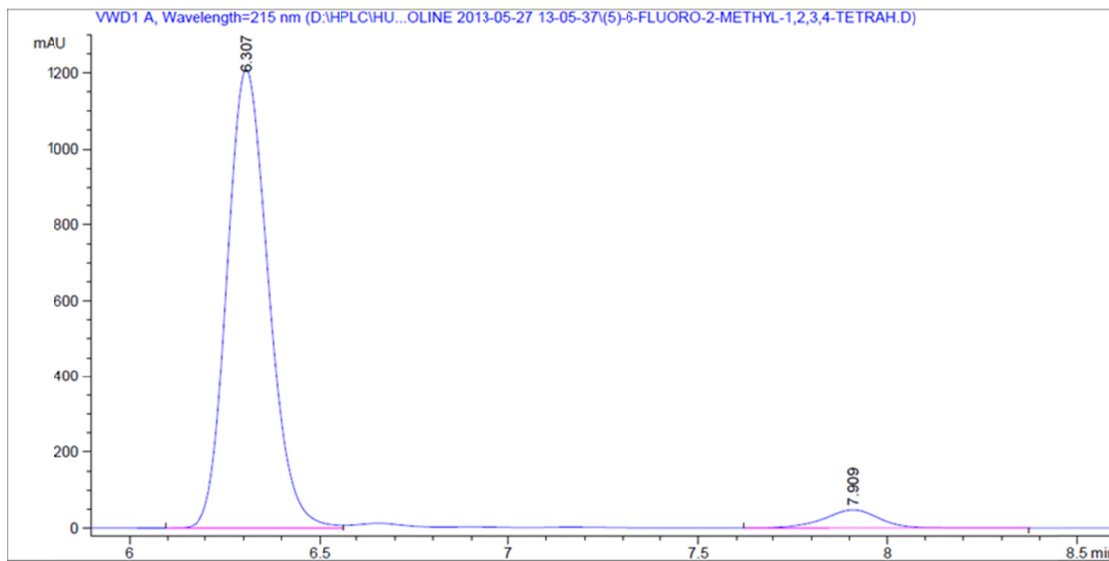
(S)-6-Fluoro-2-methyl-1,2,3,4-tetrahydroquinoline (11e)



Chromatograms are illustrated below for a 90% ee sample:



Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height [mAU]	Area %
1	6.367	VV	0.1210	1.34662e4	1735.57593	49.6571
2	7.952	VB	0.1540	1.36522e4	1383.36597	50.3429



Peak #	RetTime [min]	Type	Width [min]	Area mAU	Height [mAU]	Area %
1	6.307	VV	0.1169	9095.05566	1208.74548	95.0095
2	7.909	BB	0.1521	477.73148	47.58569	4.9905