Supporting Information

Jørgensen–Hayashi Catalyst Supported on Poly(ethylene glycol)s as Highly Efficient and Reusable Organocatalysts for Enamine-Catalyzed Asymmetric Michael Reaction

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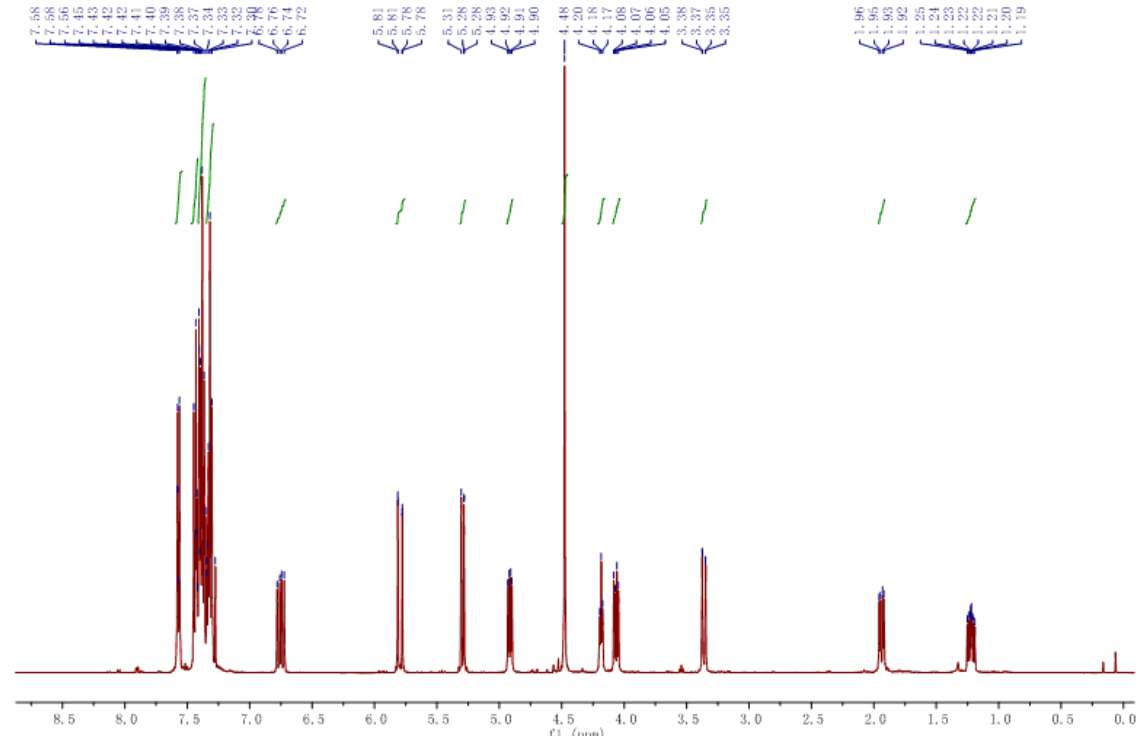
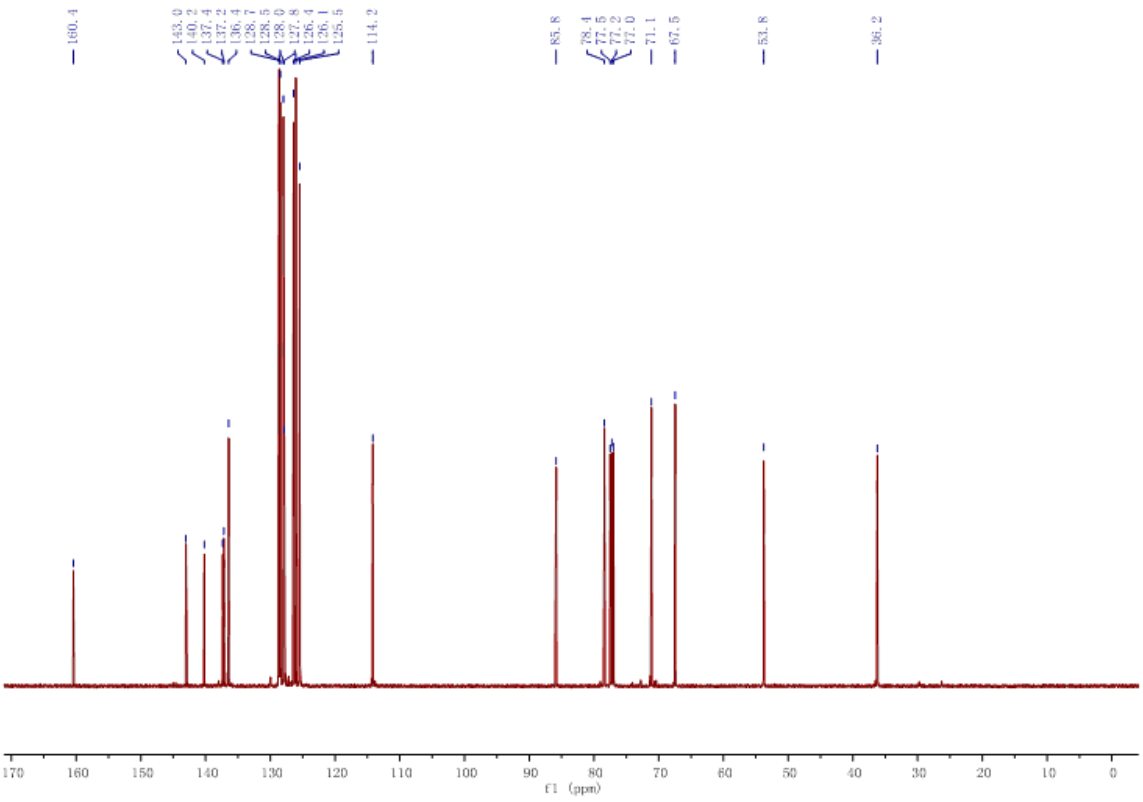
Compound 4





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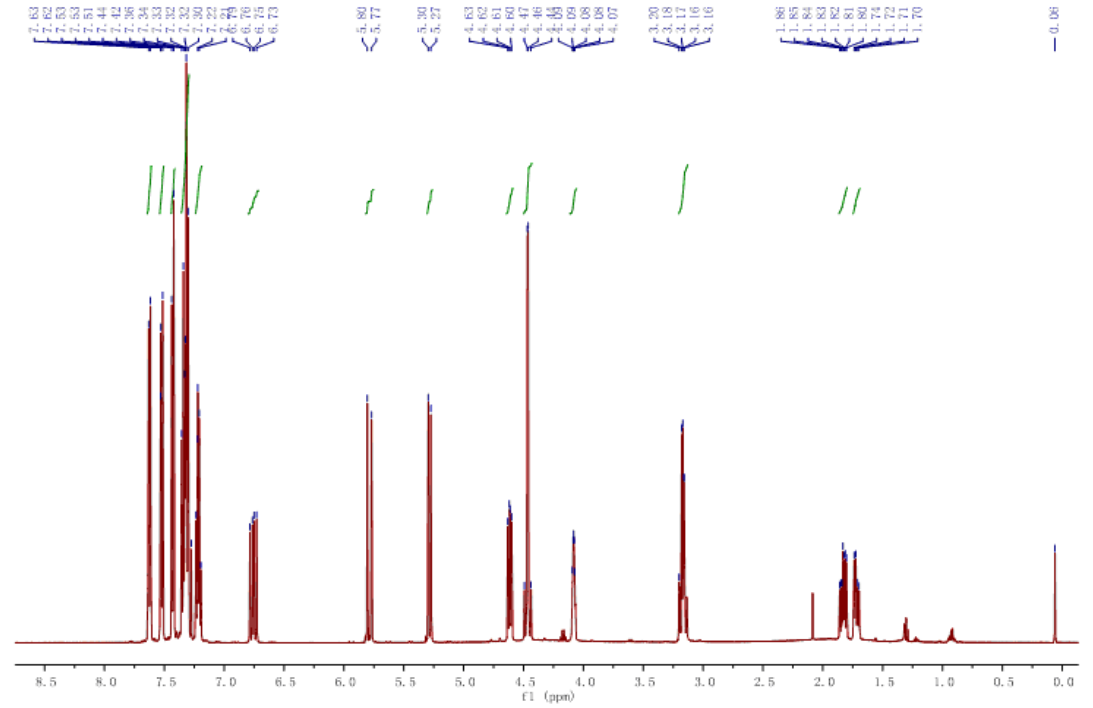
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4.46
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4.08
4.07
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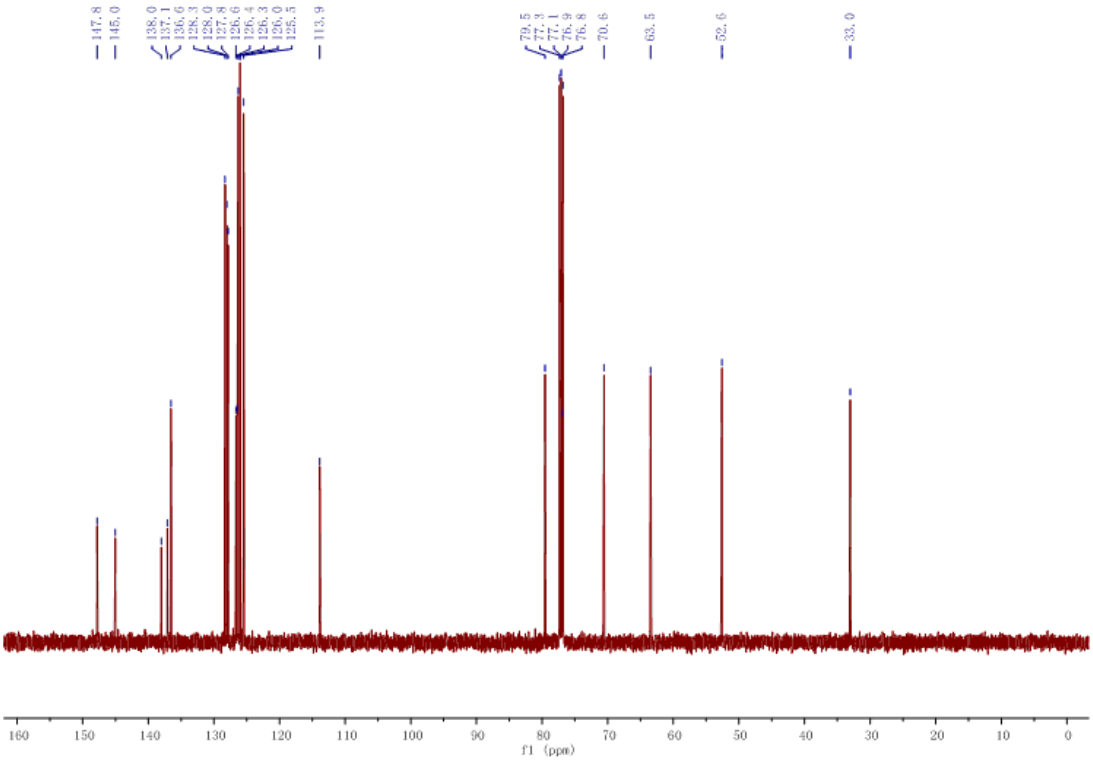
f1 (ppm)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125.5
113.9
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77.1
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f1 (ppm)

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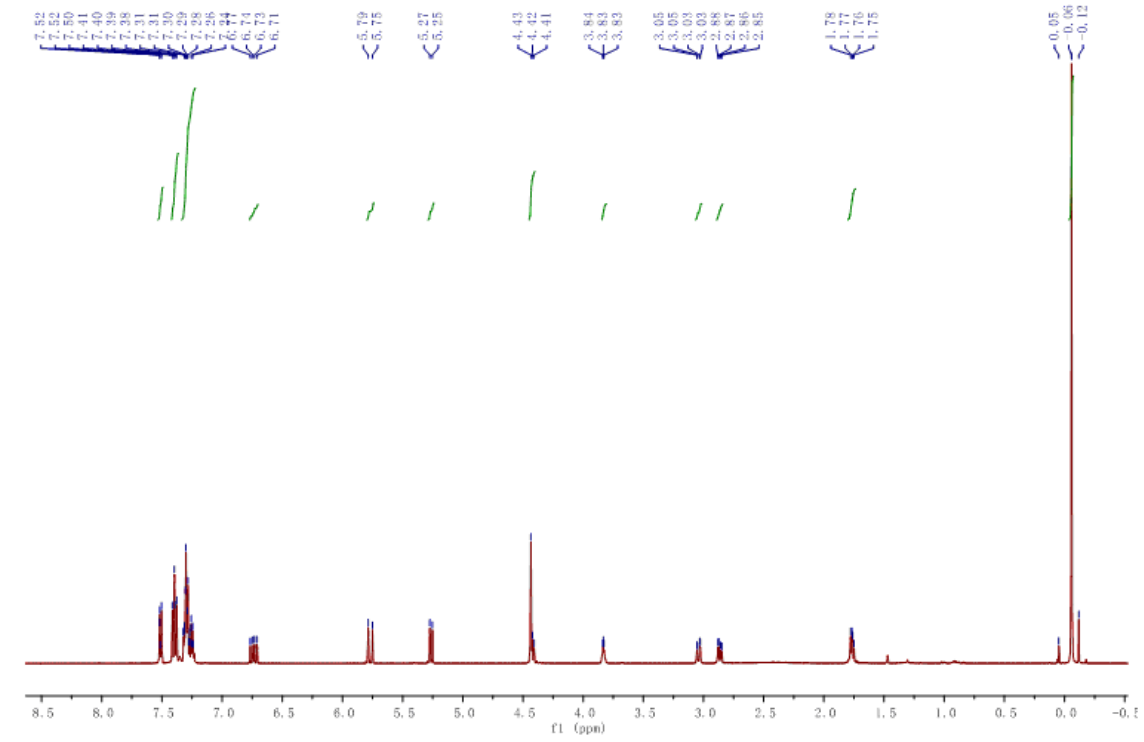
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3.05
3.03
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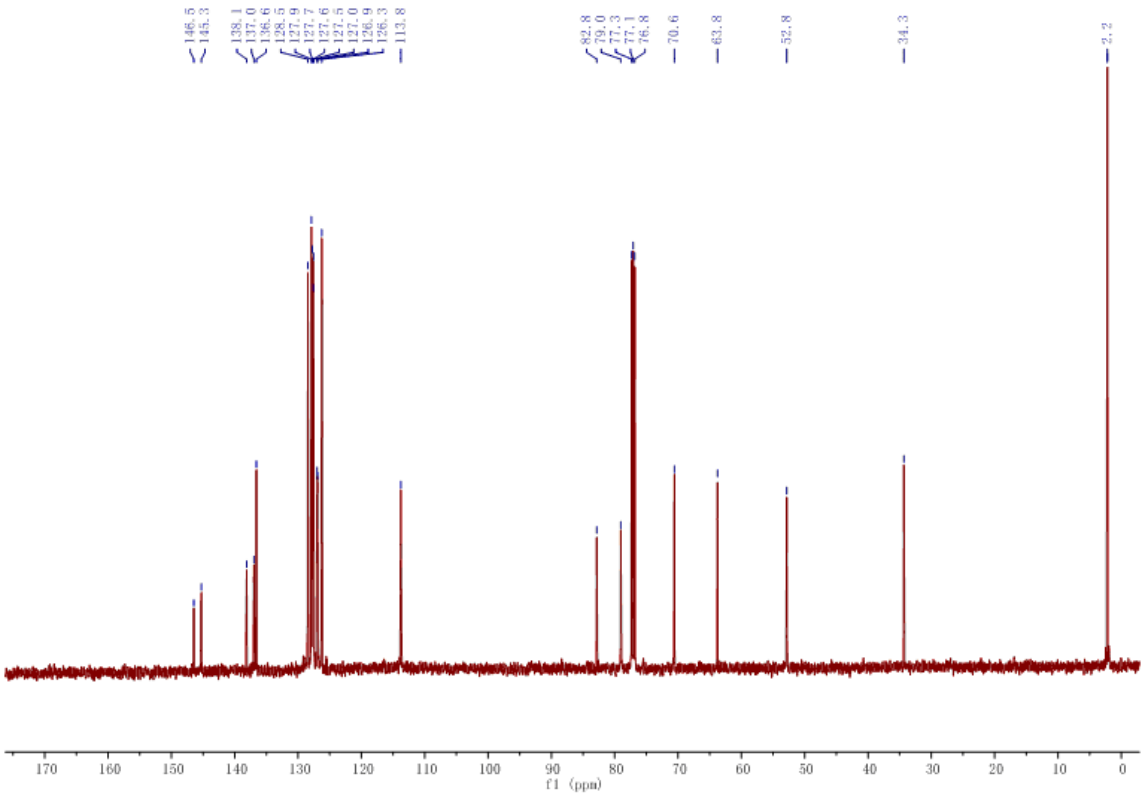
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126.3
113.8
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77.1
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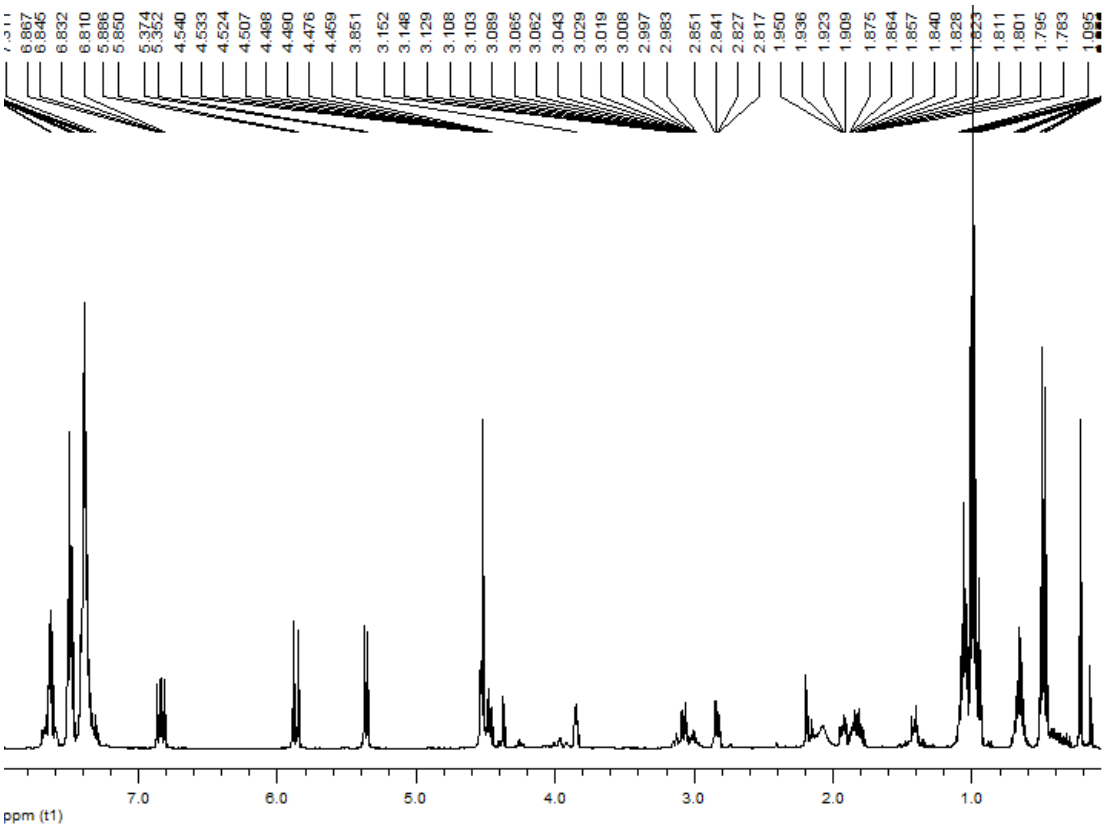
70.6
63.8
52.8
34.3
f1 (ppm)

Compound 1b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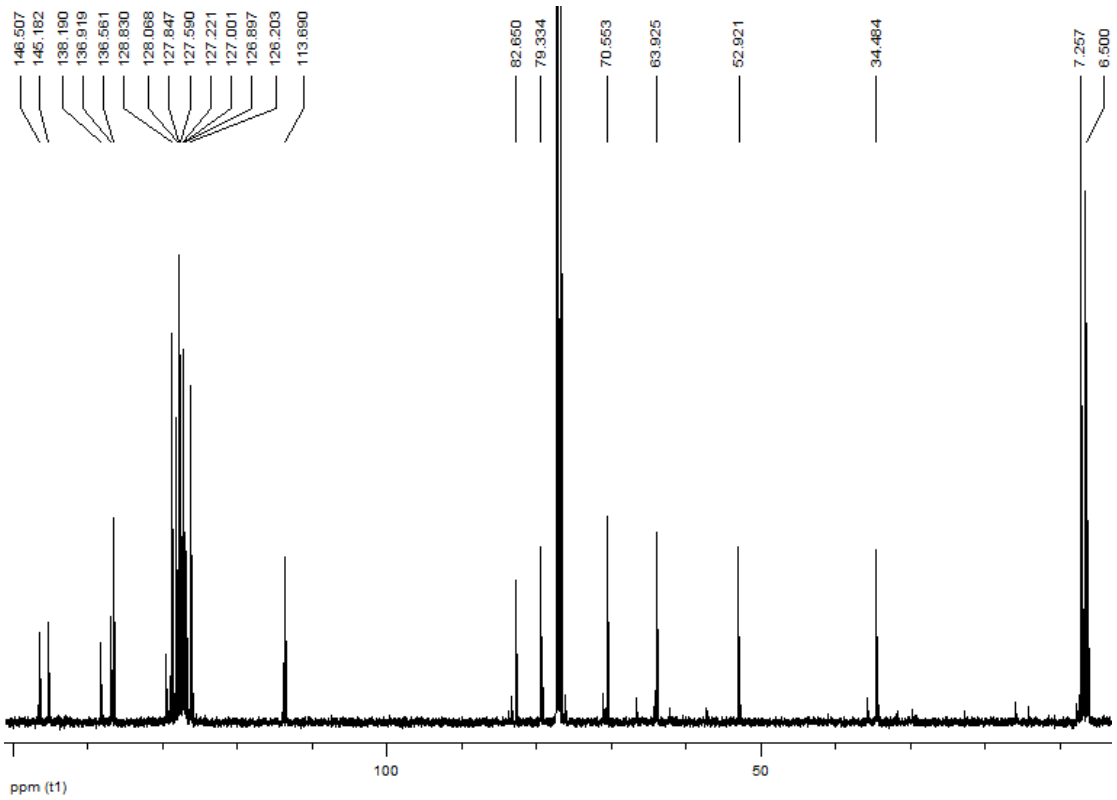
1.0
ppm (t1)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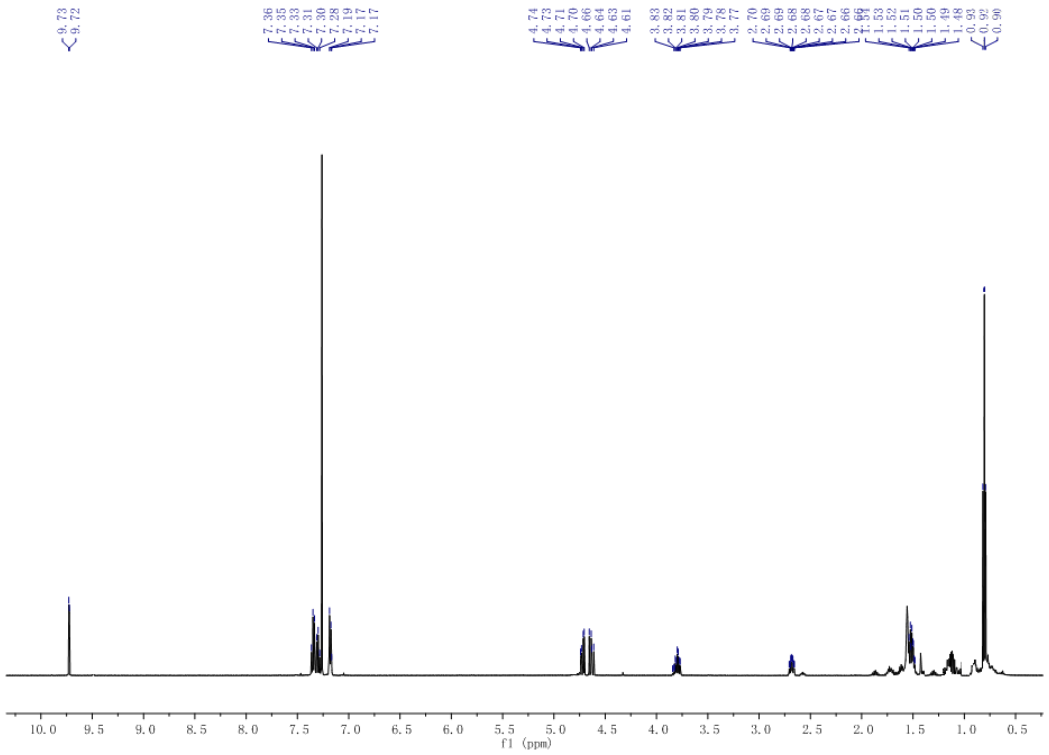
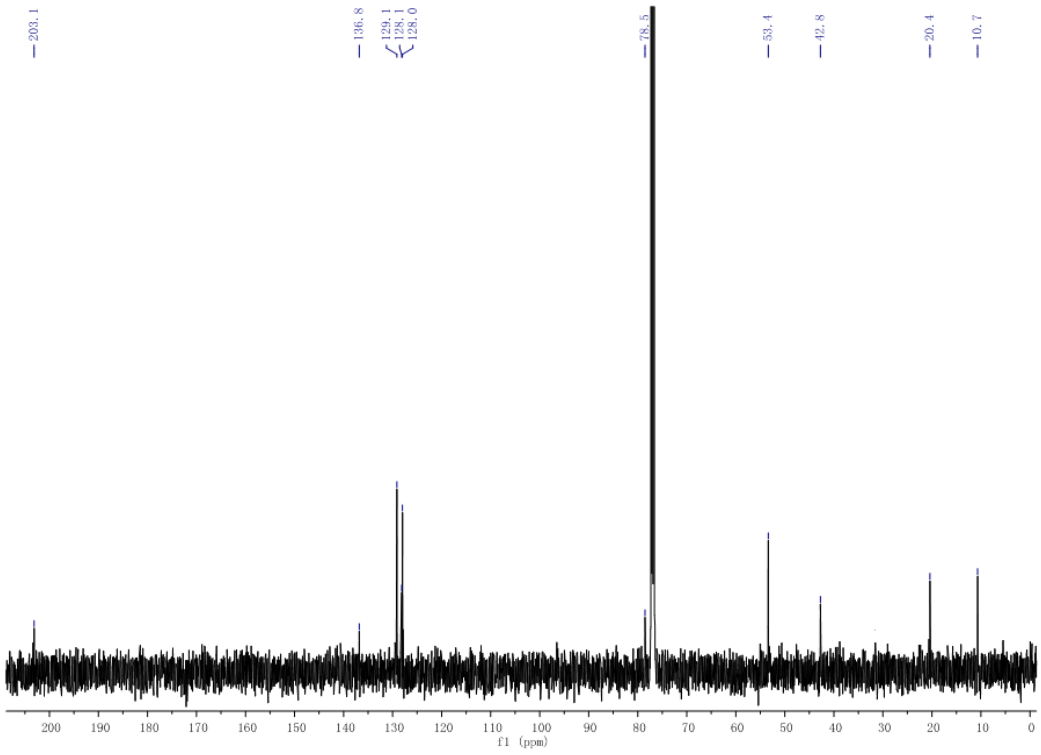
50
ppm (t1)

Compound 8aa





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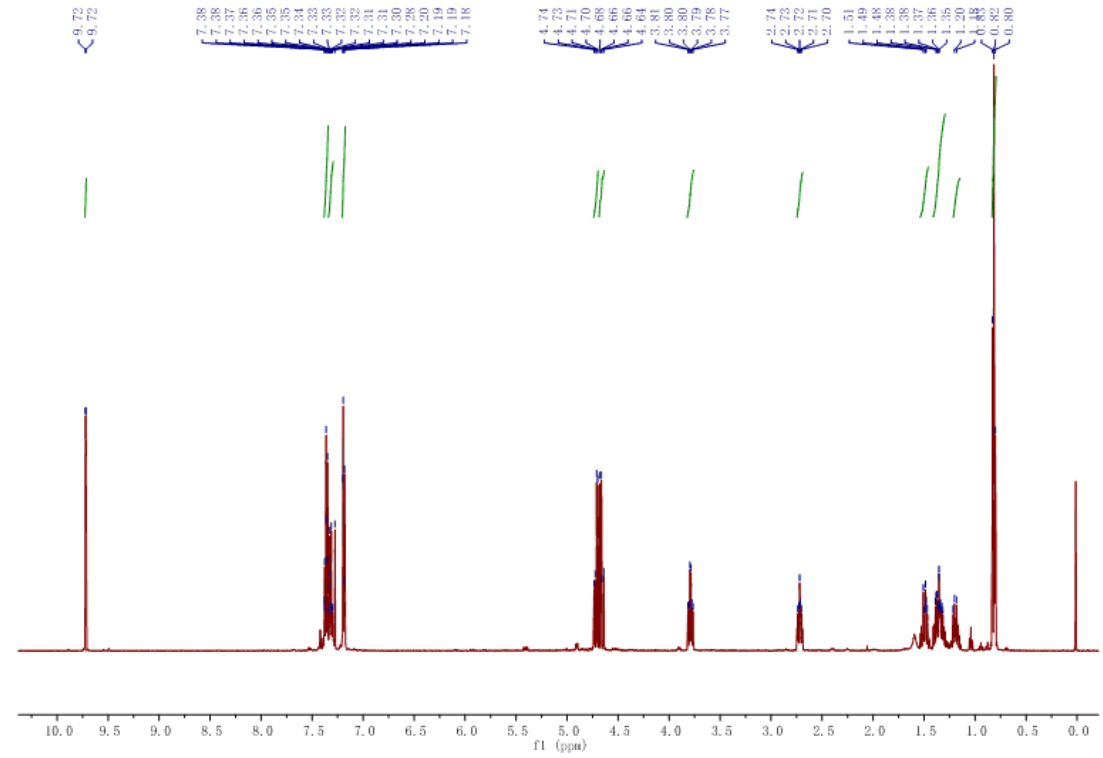

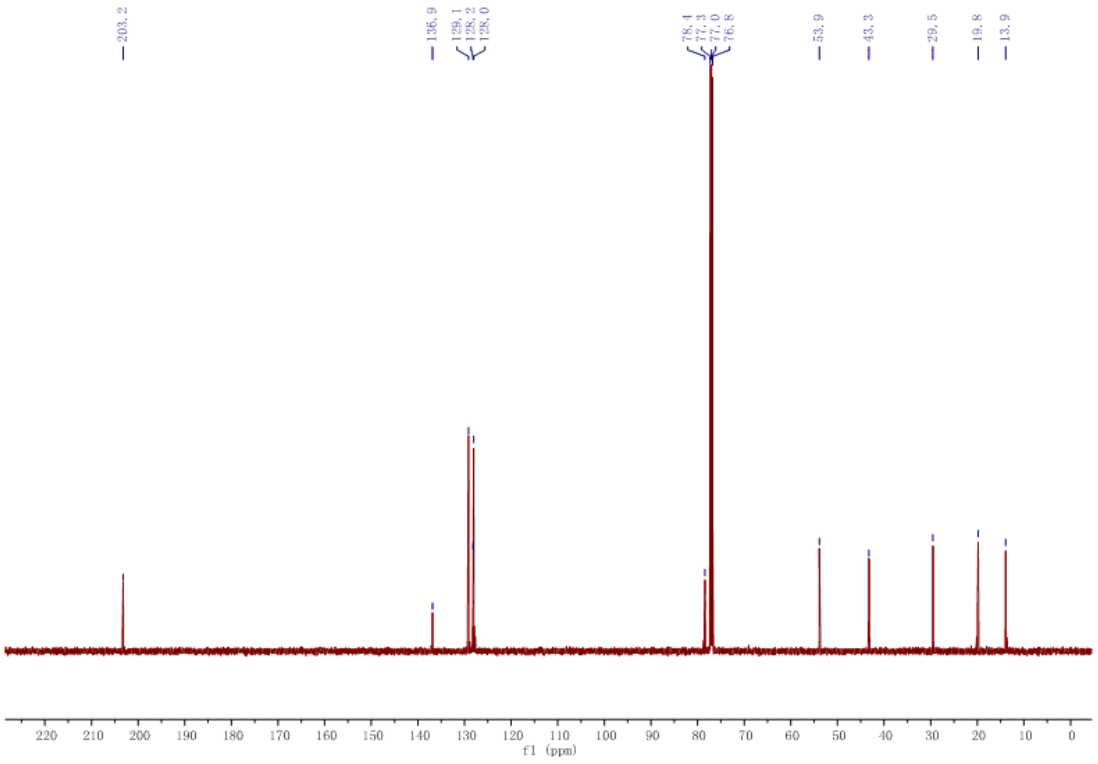

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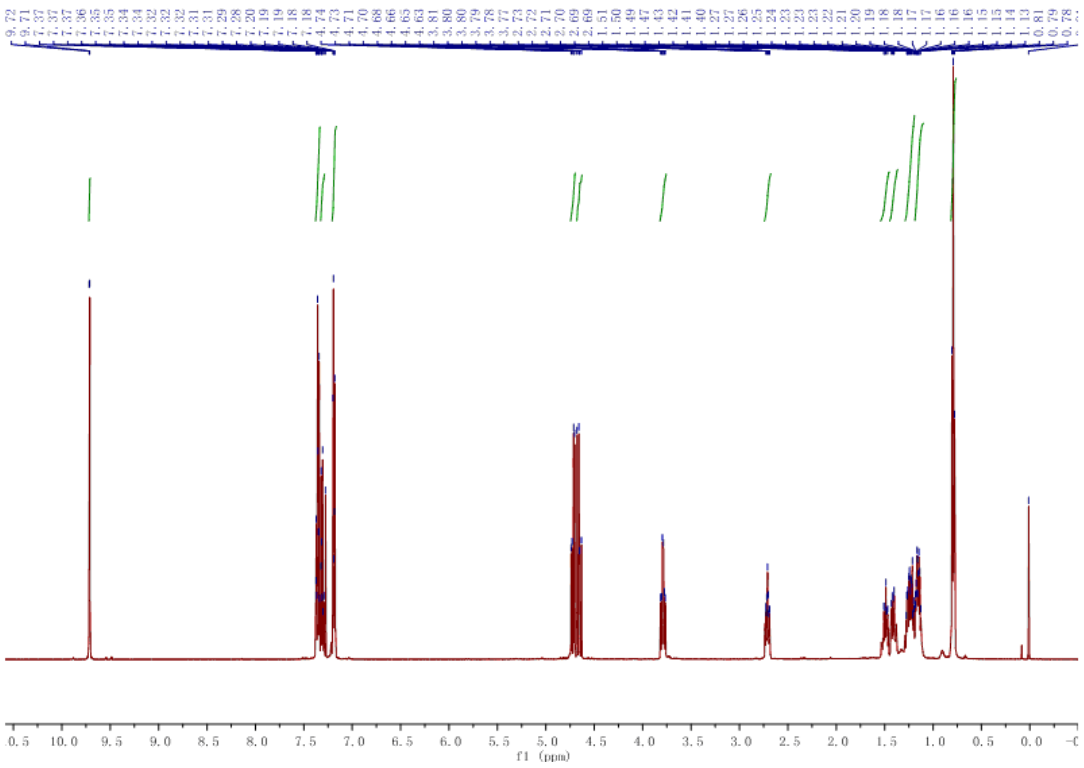

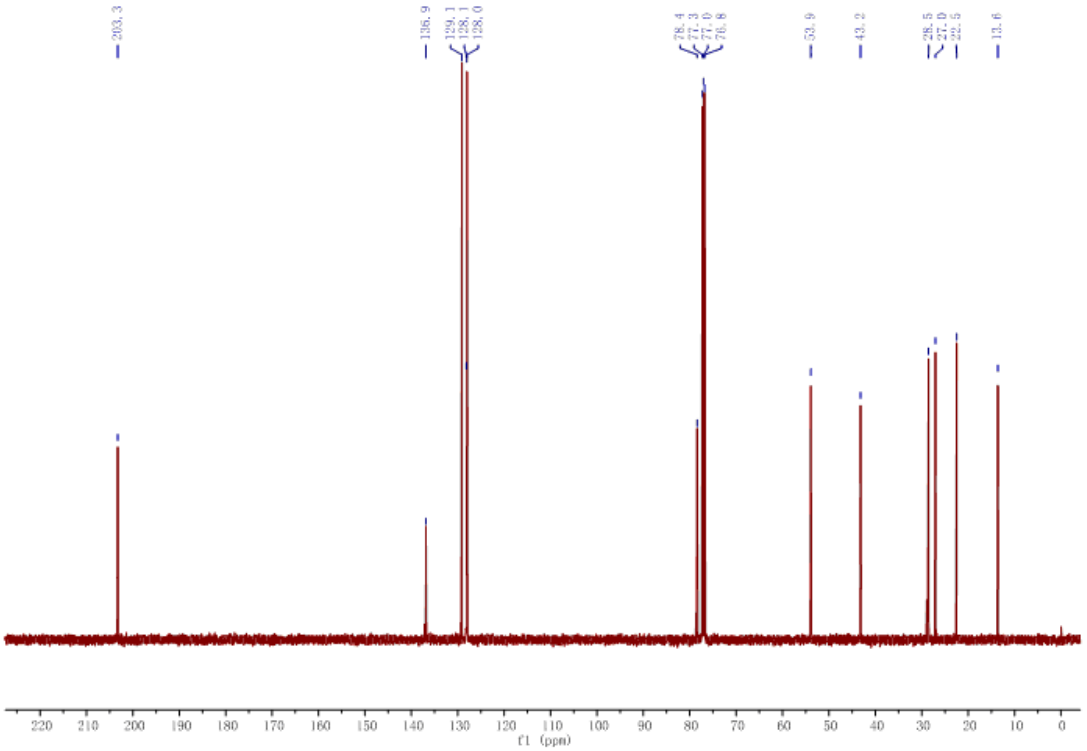

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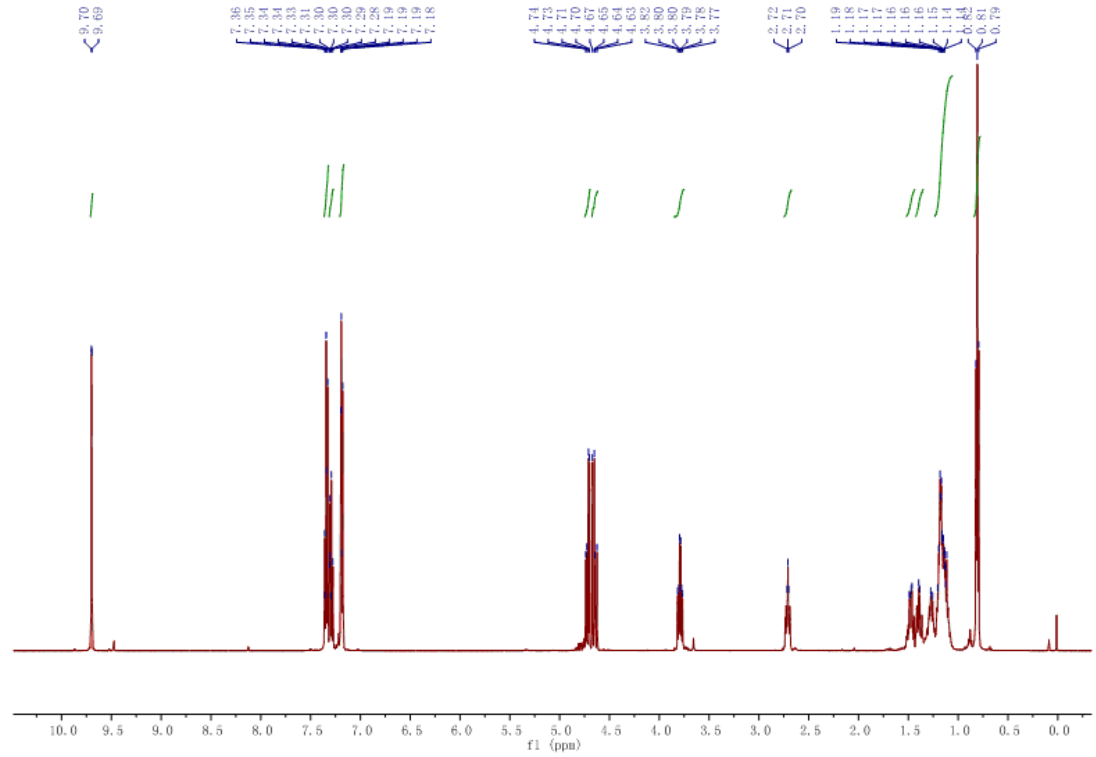

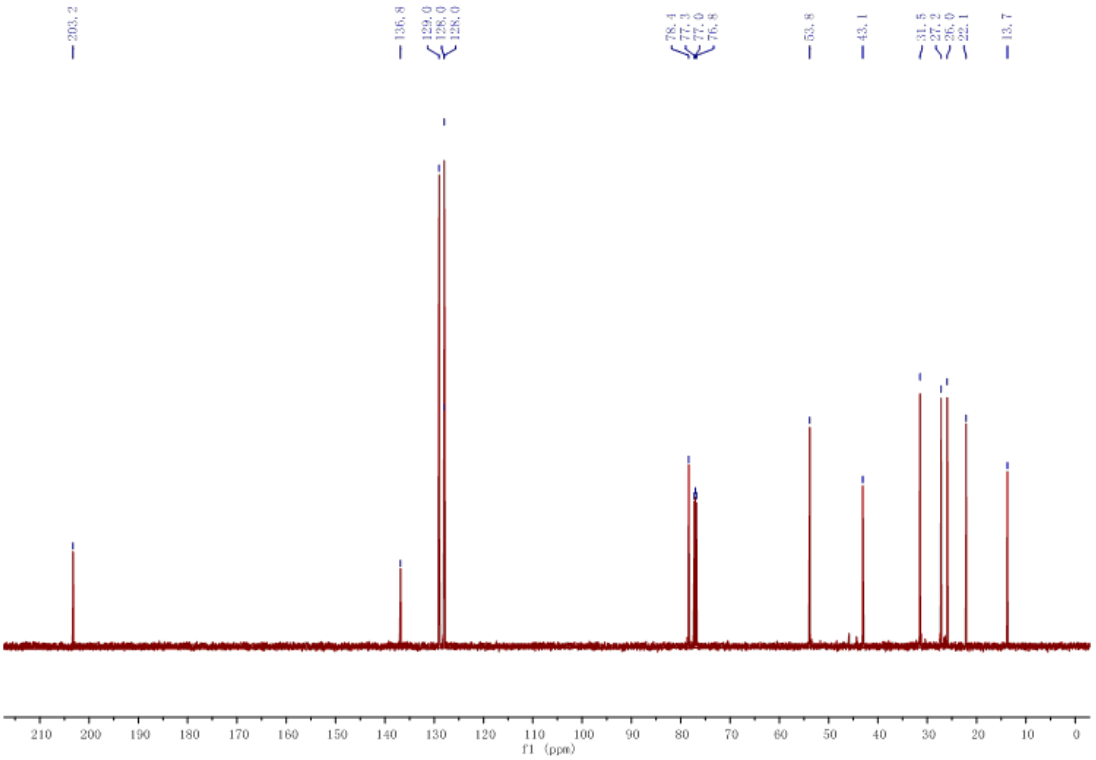

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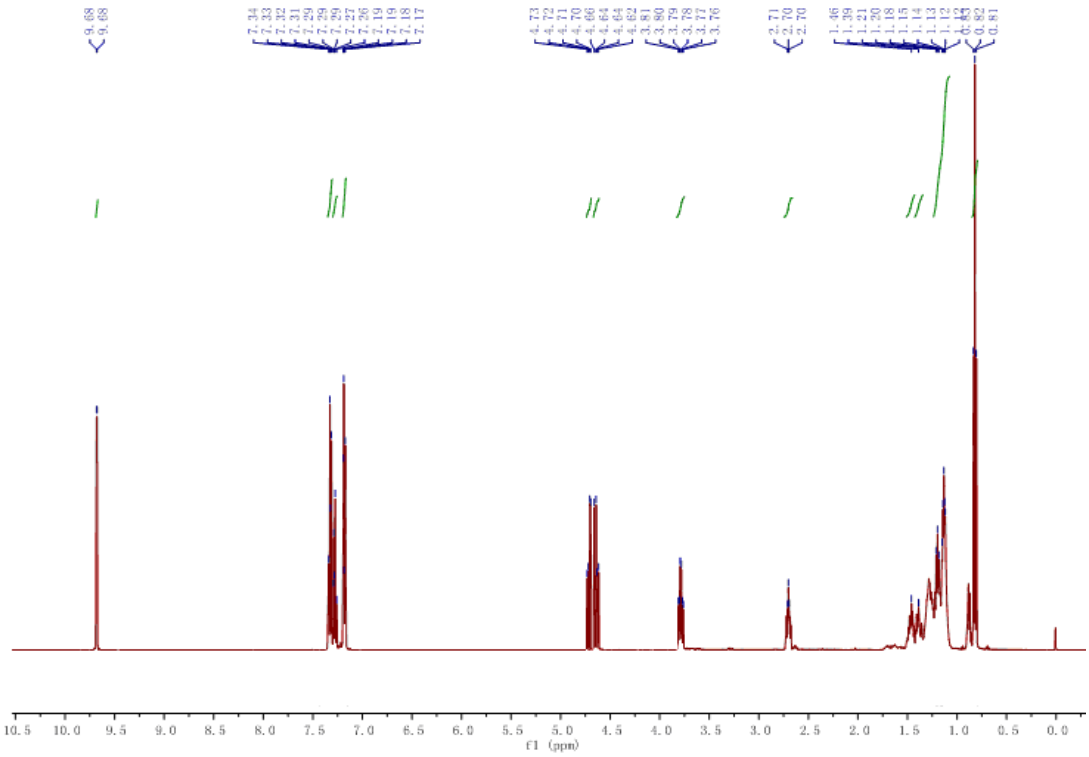

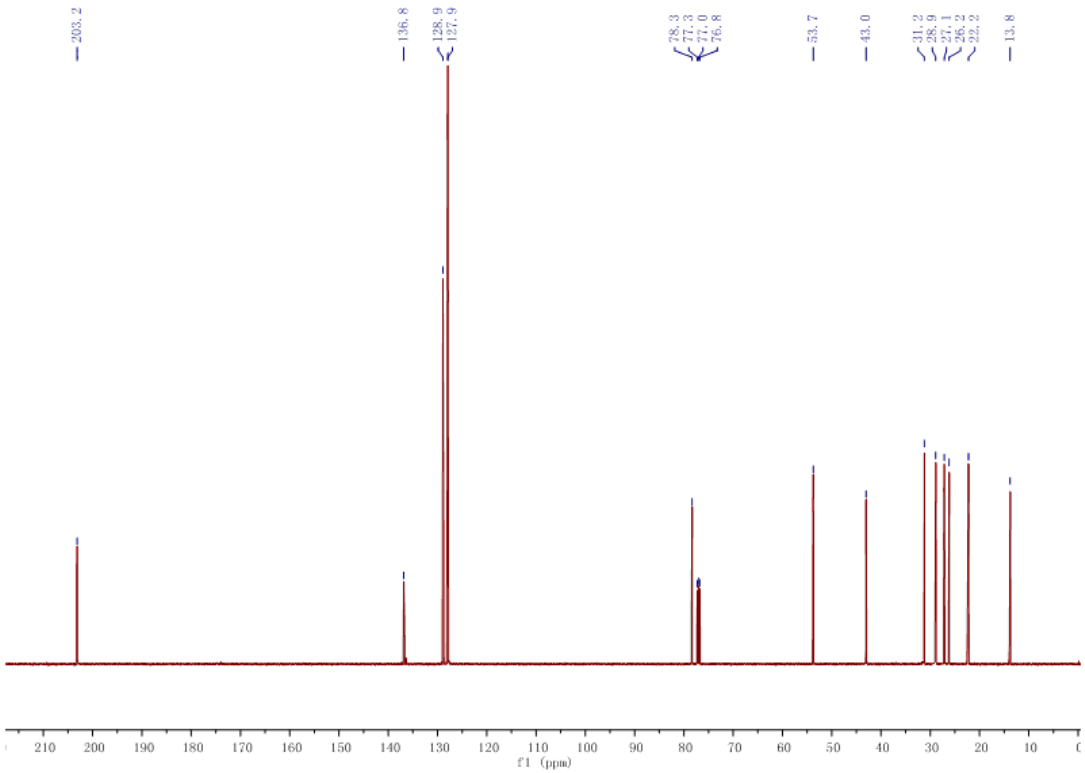

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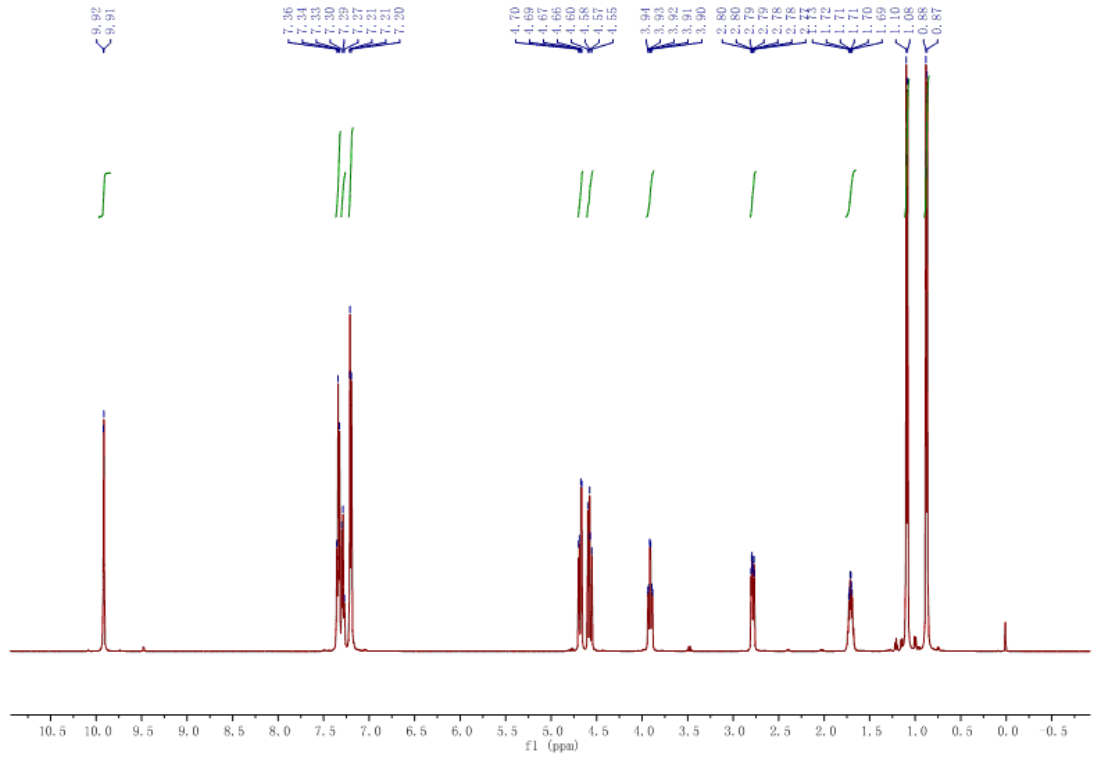

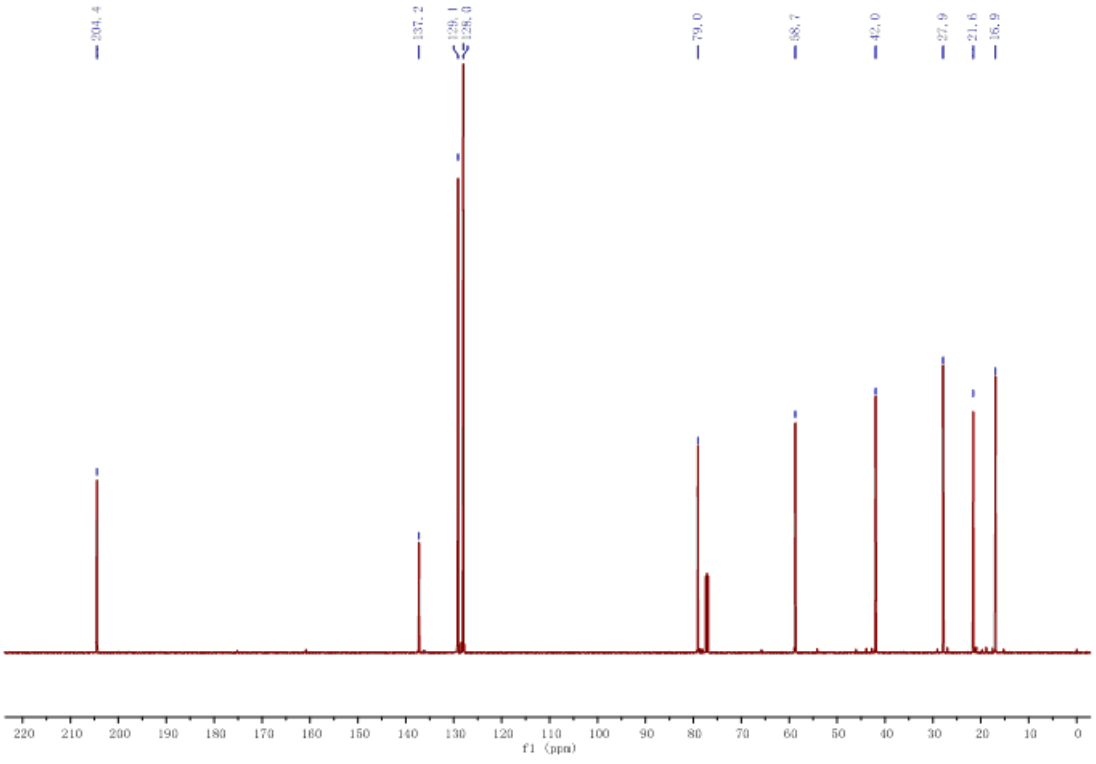

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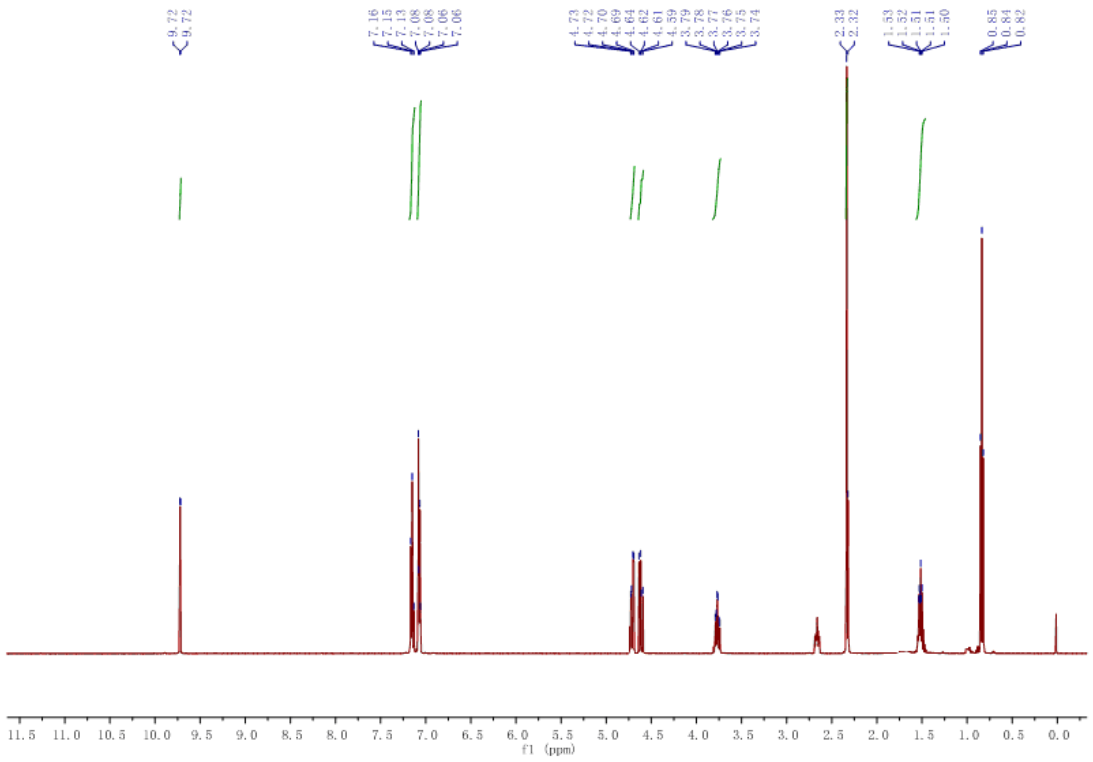

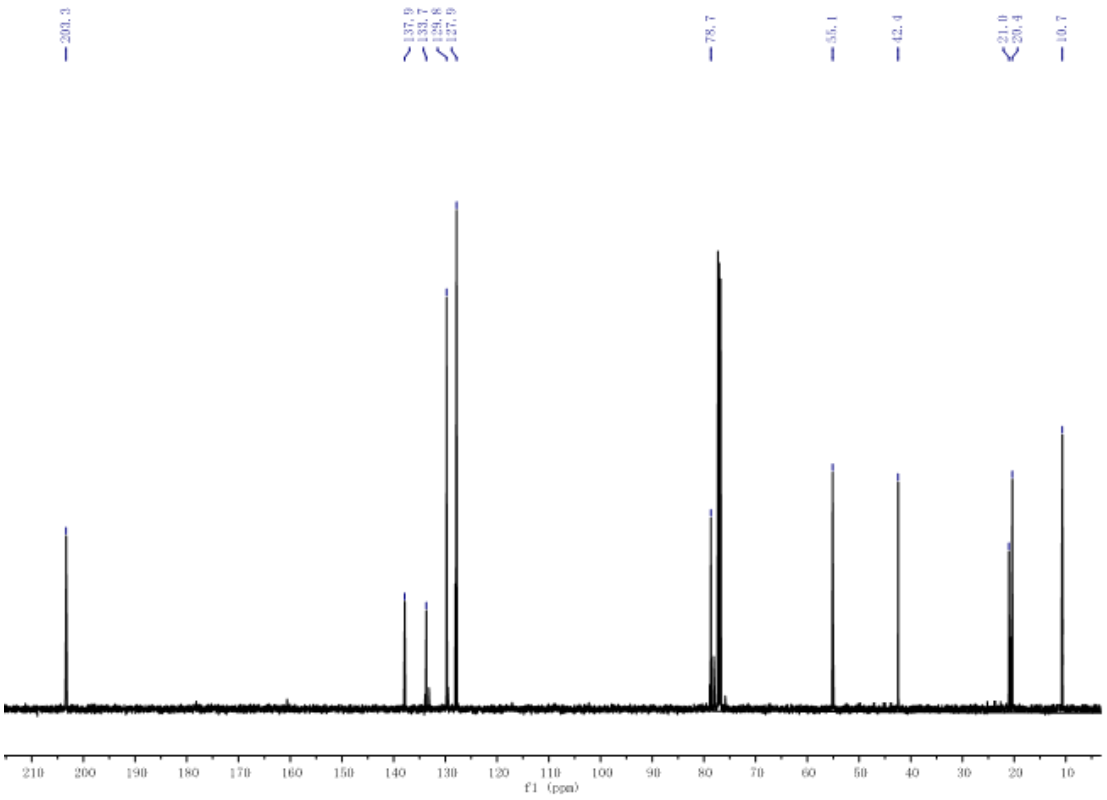

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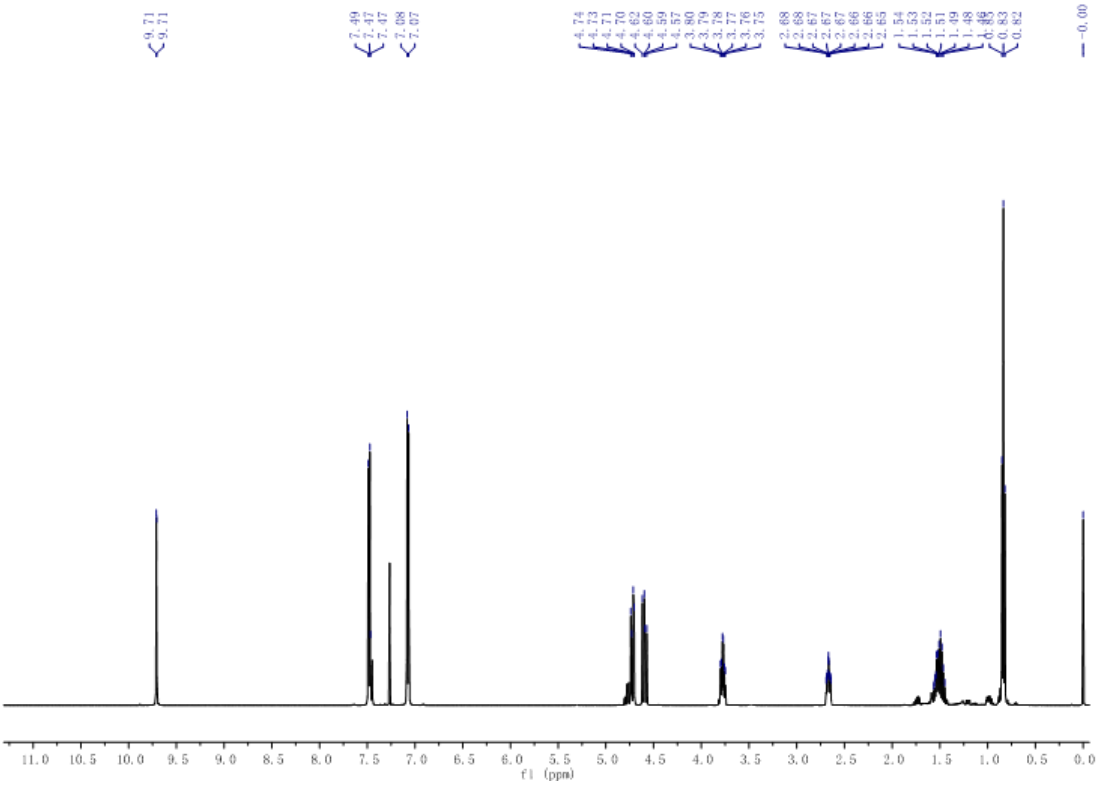

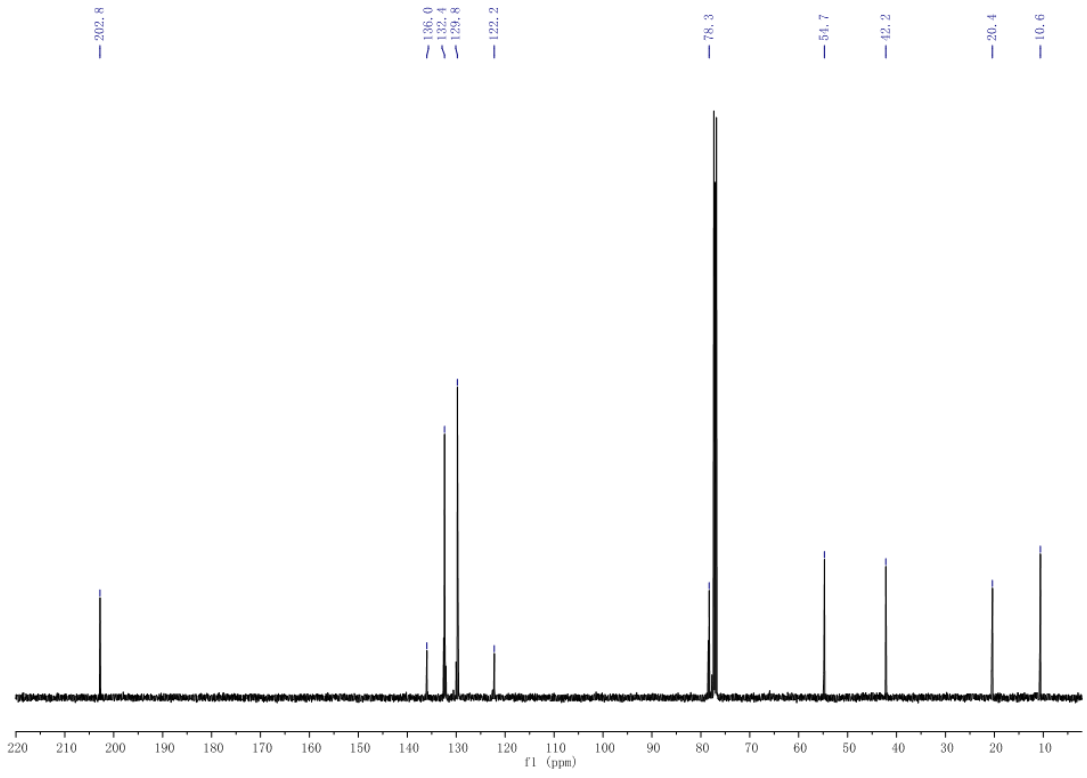

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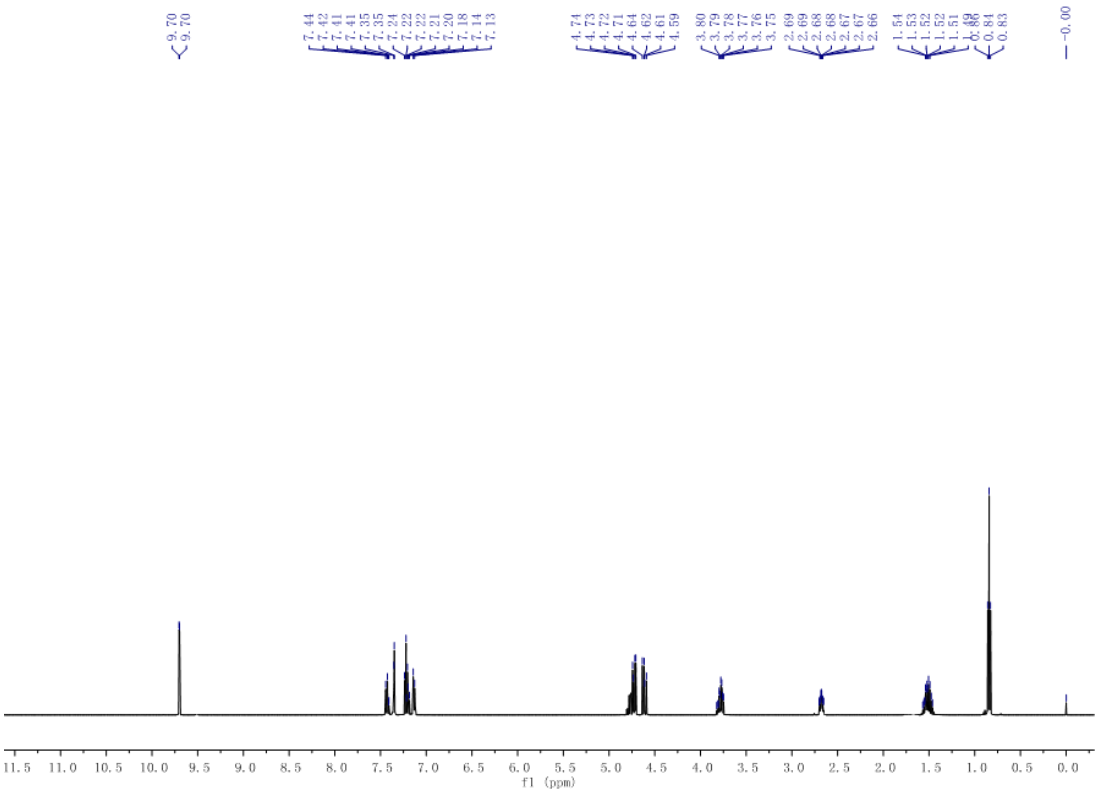

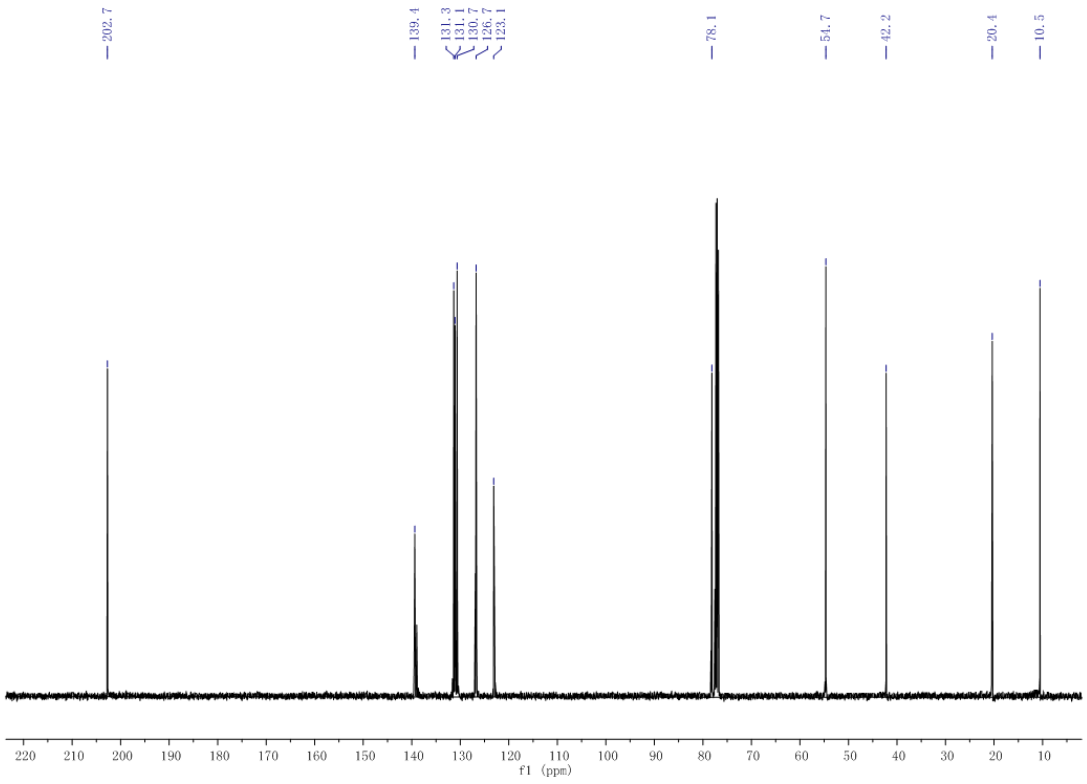

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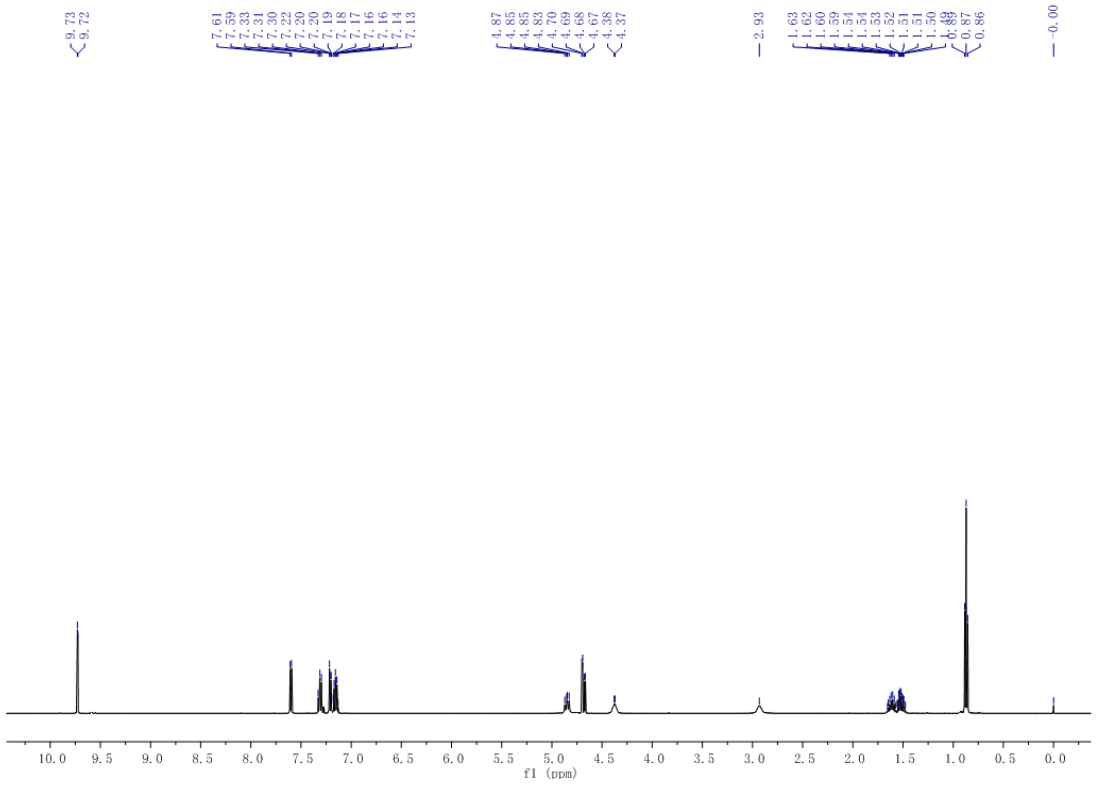

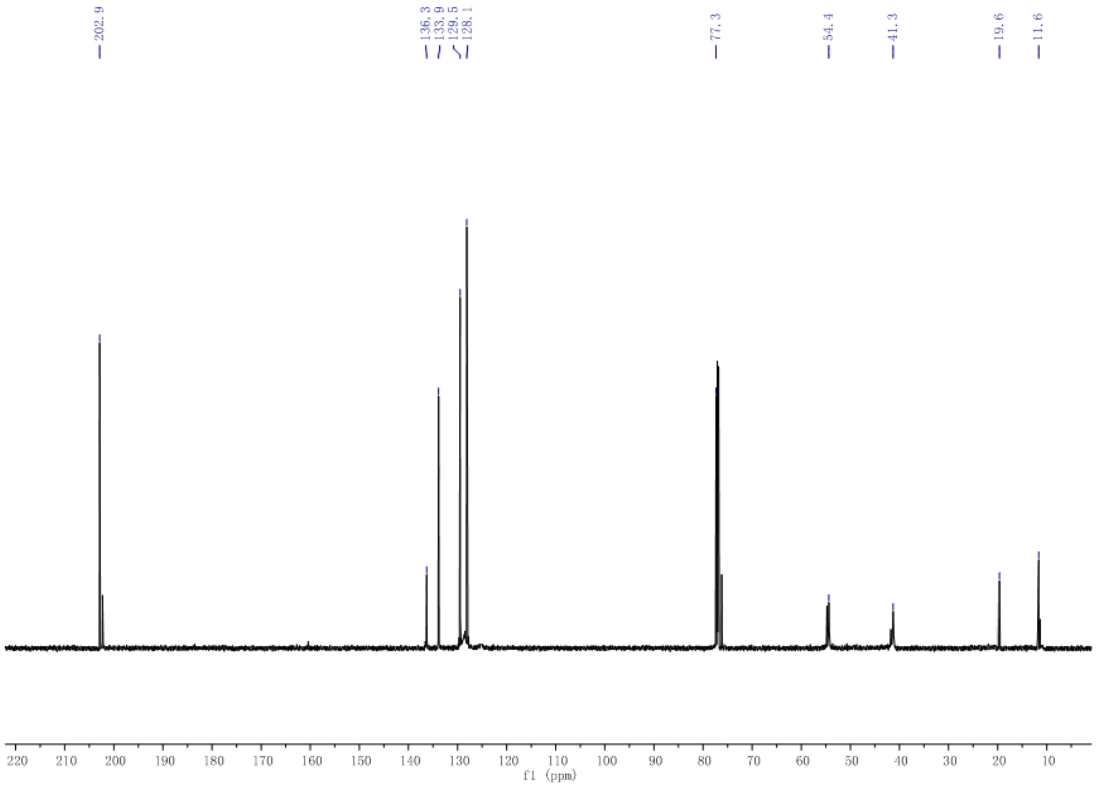

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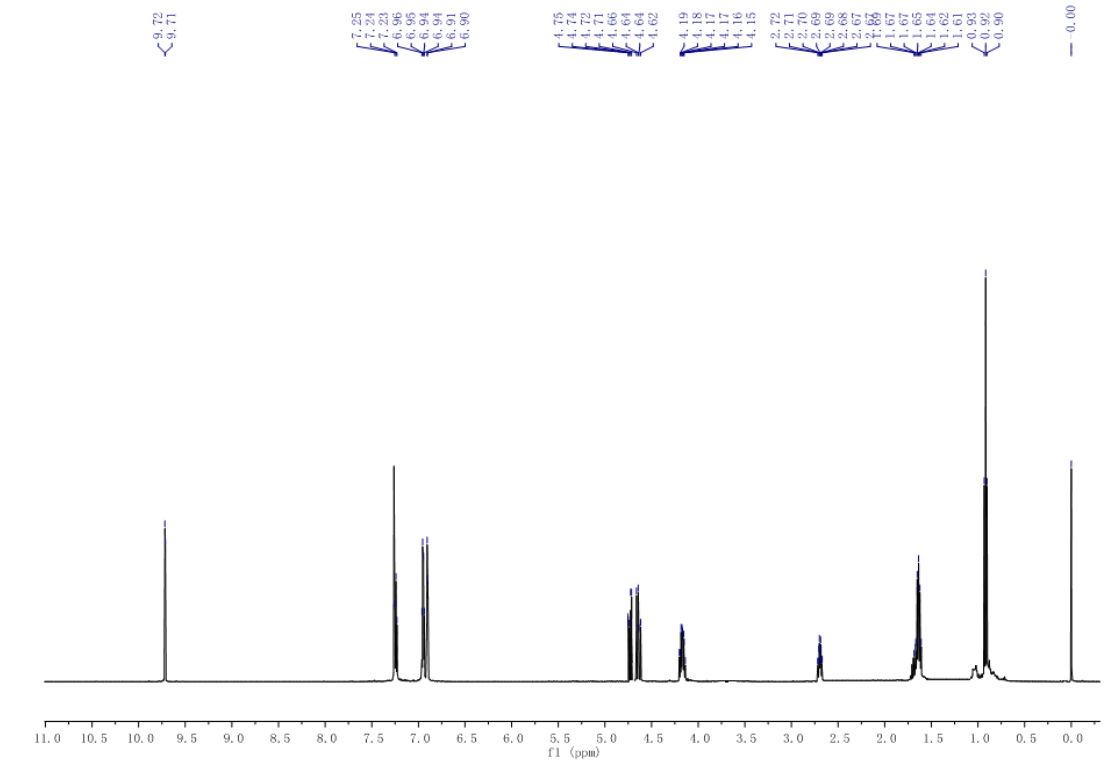

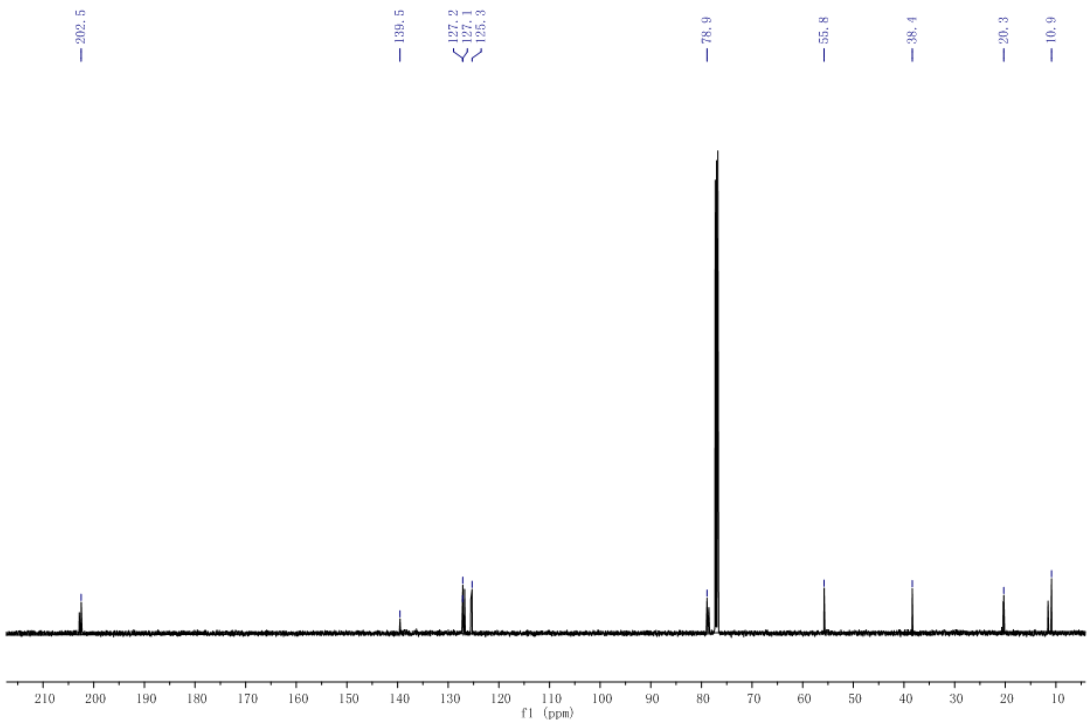

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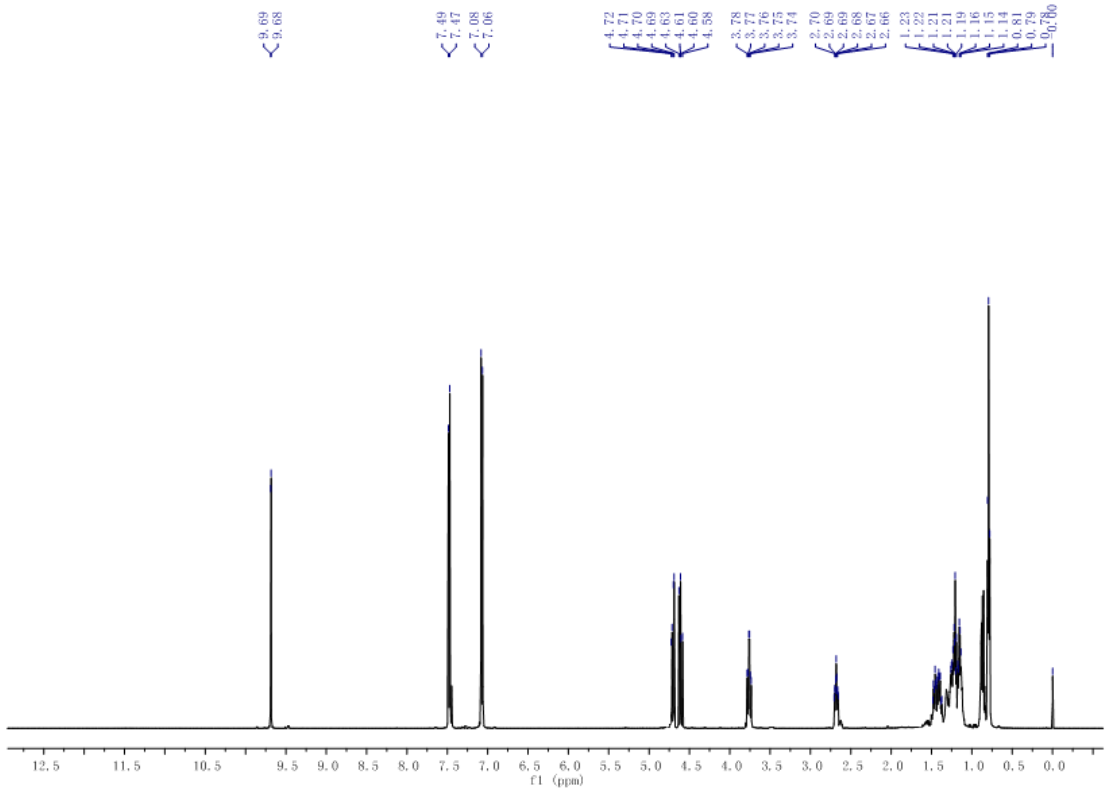

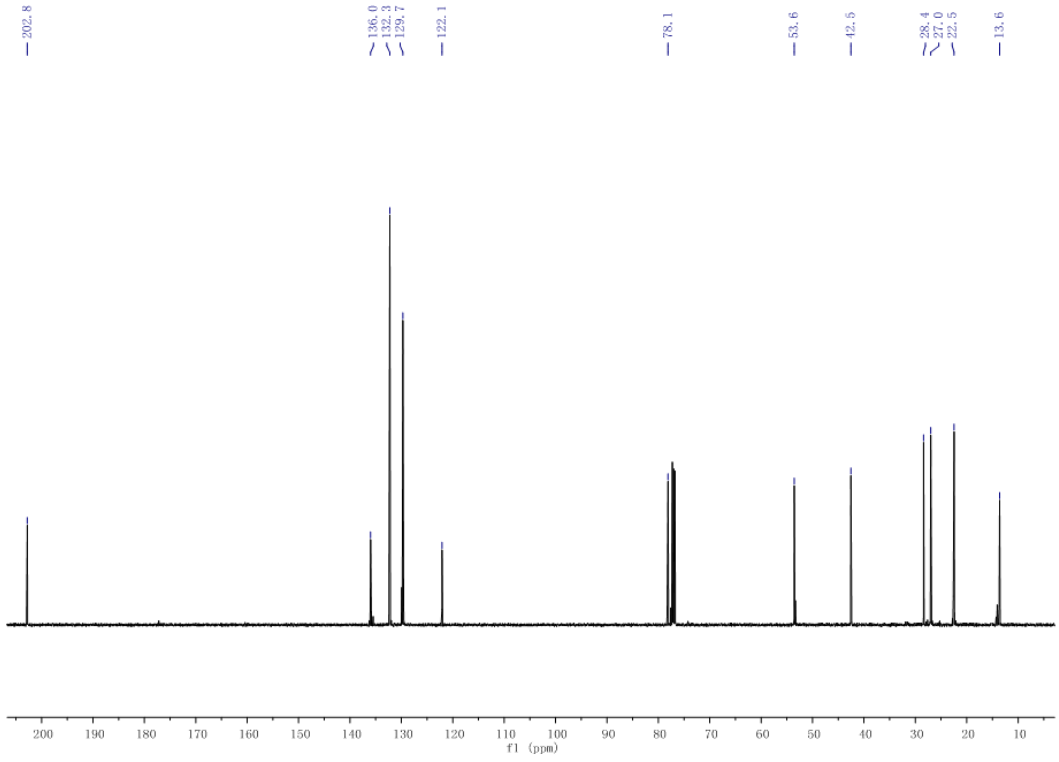

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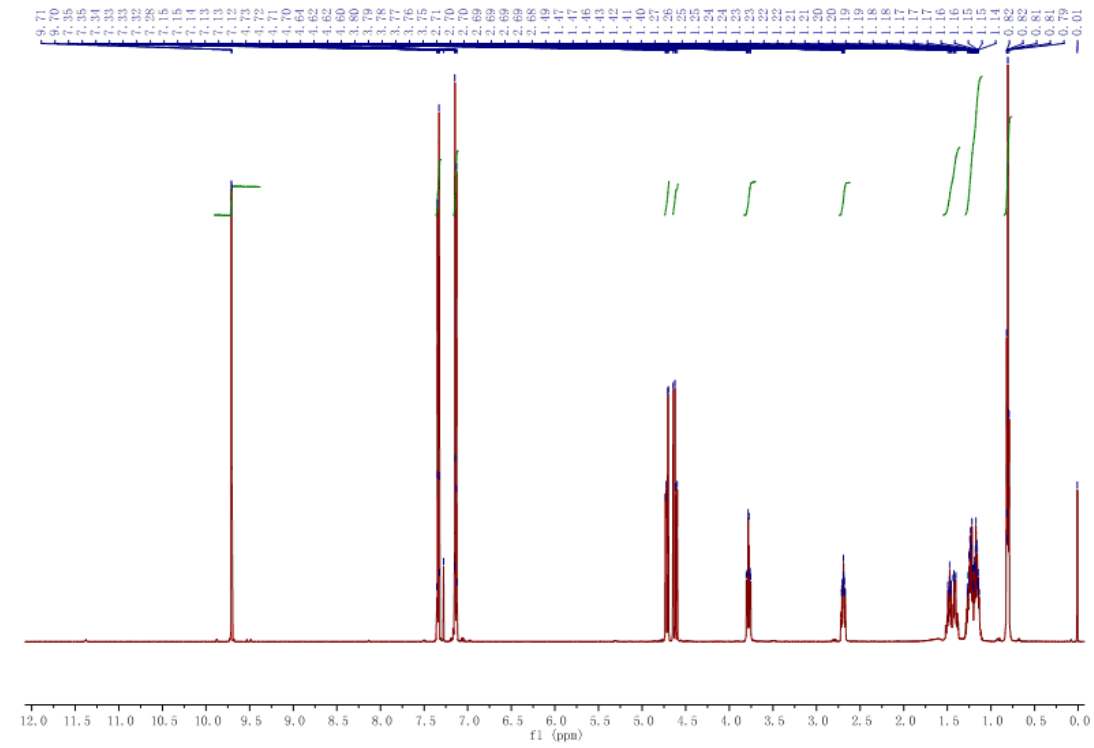

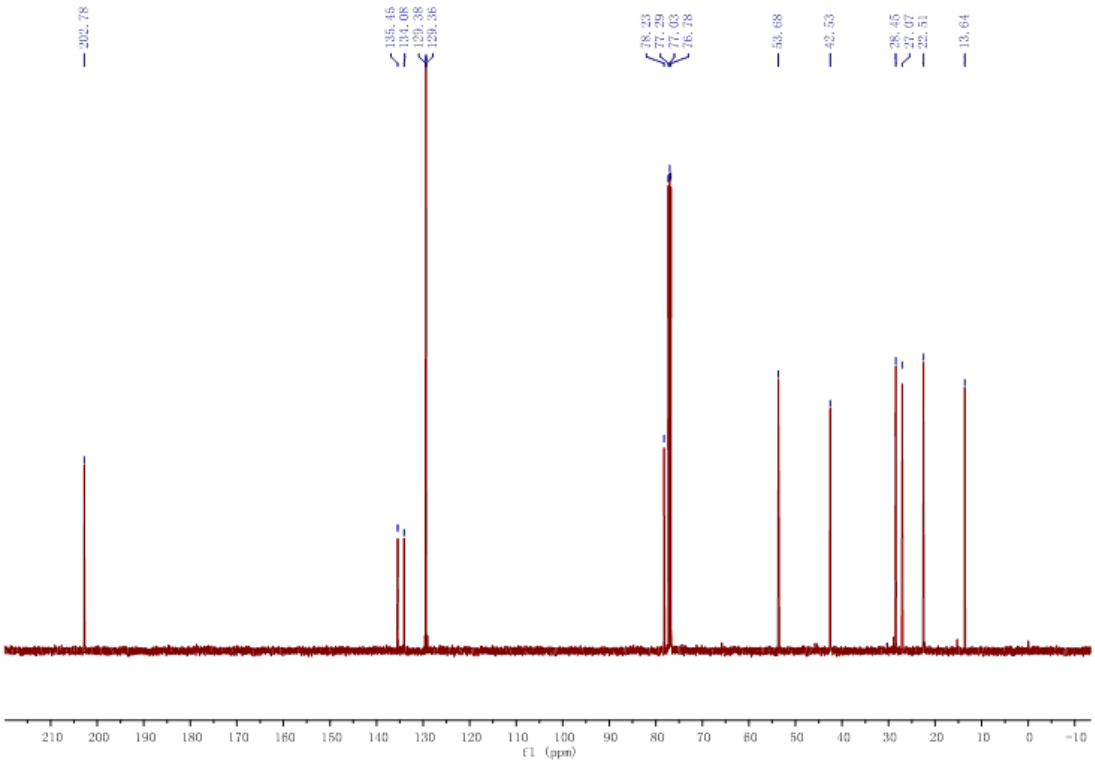

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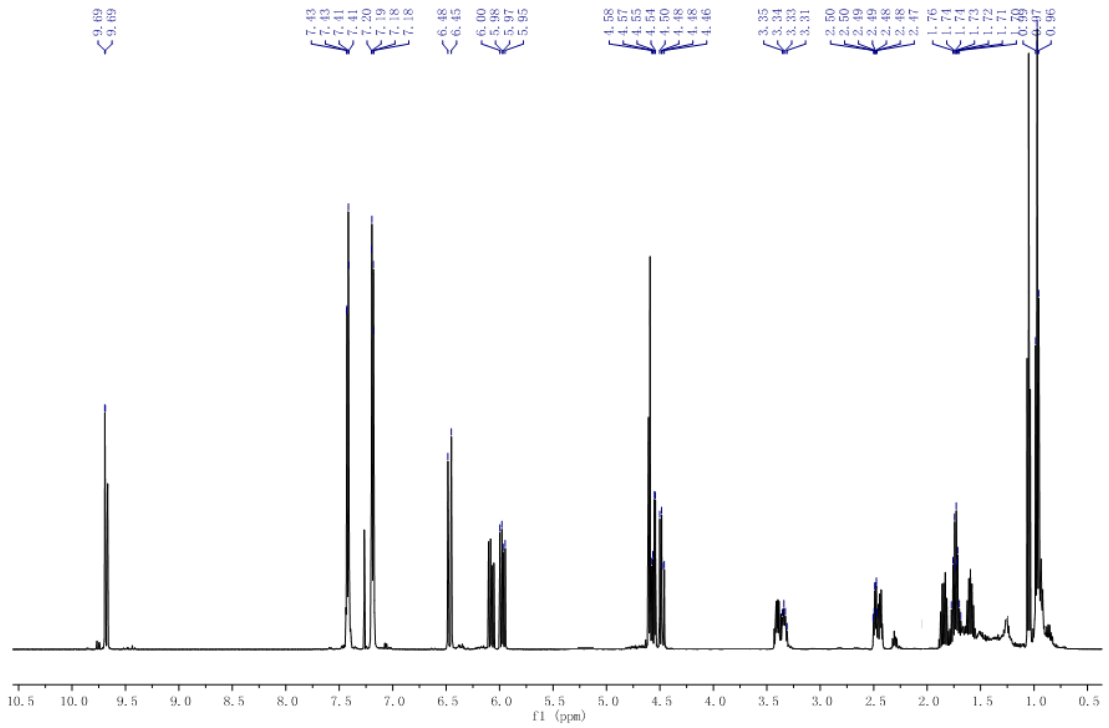
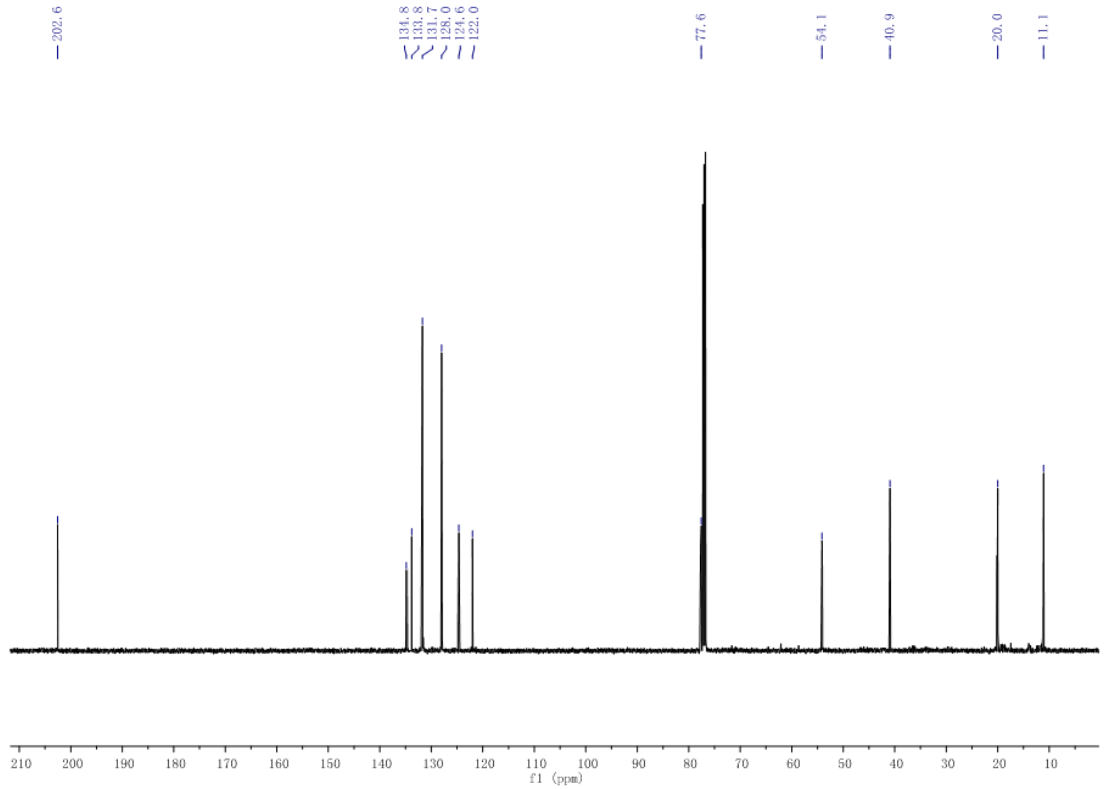
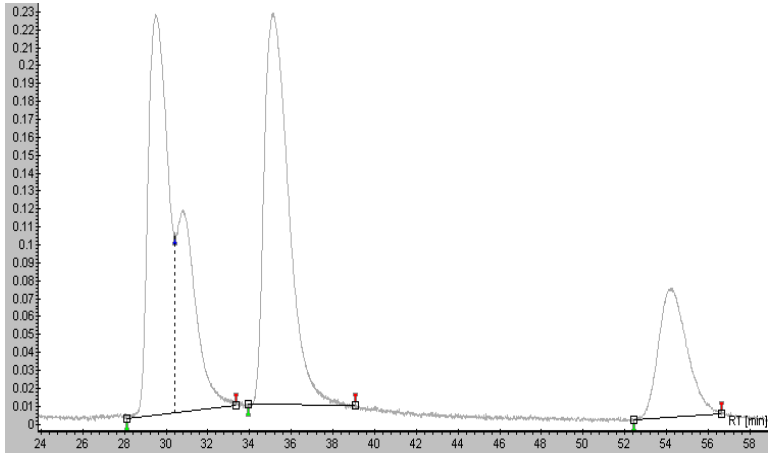




2. HPLC spectra of Michael adducts

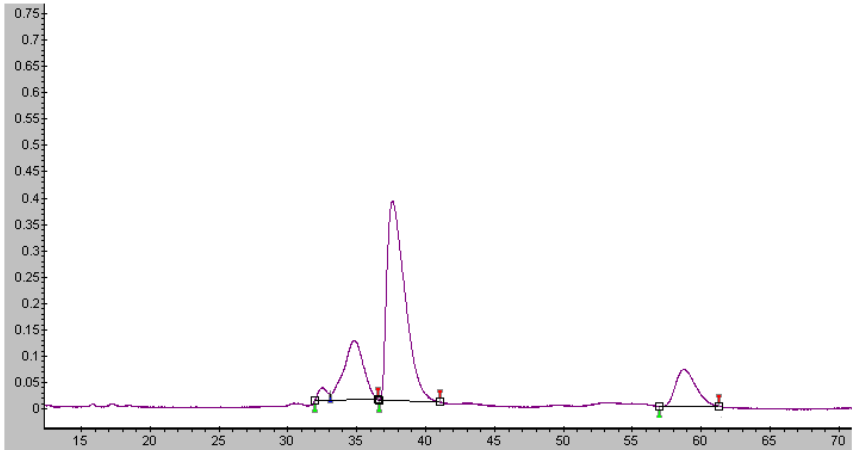
8aa

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	28.110	29.496	30.410	31.293
2	30.410	30.802	33.347	15.988
3	33.934	35.121	39.073	38.017
4	52.434	54.221	56.643	14.702

Asymmetric adduct



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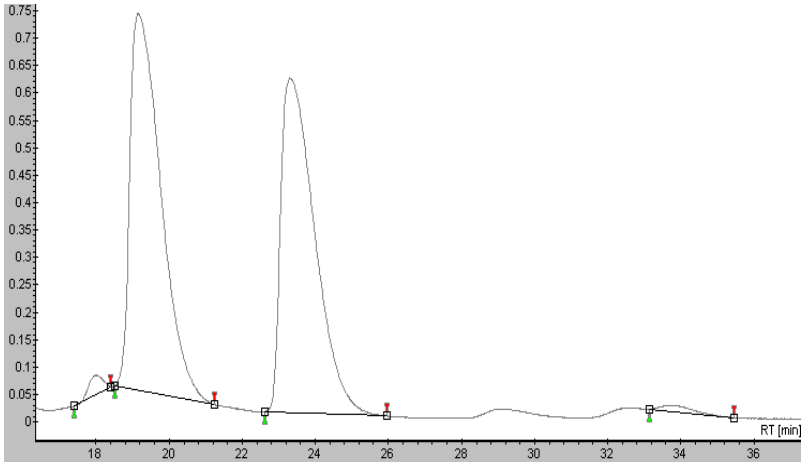
1	31.951	32.482	33.076	2.034
2	33.076	34.854	36.538	20.923
3	36.625	37.573	41.039	63.739
4	56.965	58.752	61.293	13.303

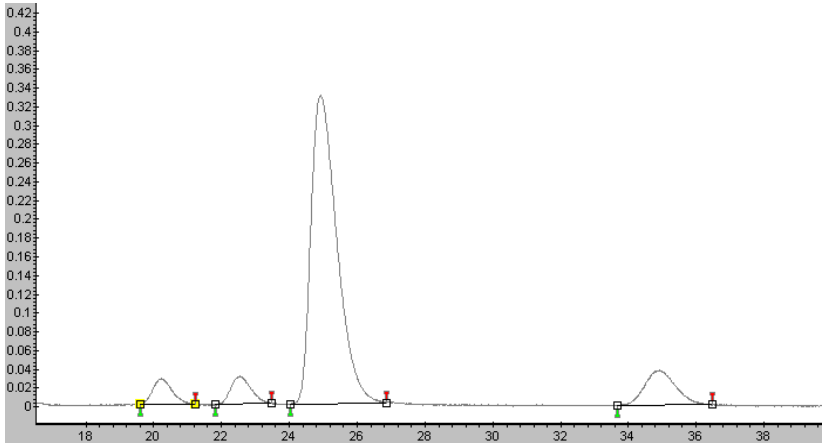
8ba

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	17.402	17.959	18.398	1.128
2	18.516	19.172	21.241	49.685
3	22.619	23.305	25.960	48.347
4	33.140	33.851	35.455	1.839

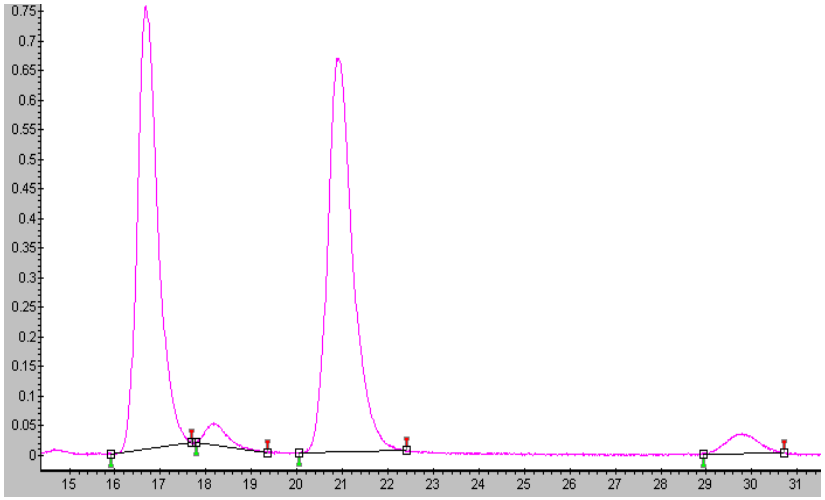
Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	19.605	20.212	21.230	4.887
2	21.817	22.518	23.477	5.402
3	24.030	24.932	26.864	79.184
4	33.675	34.877	36.475	10.527

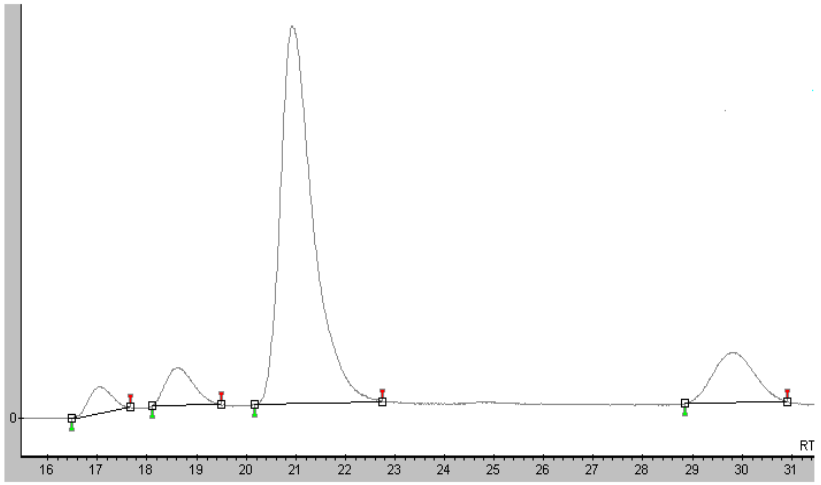
8ca

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	16.006	16.679	17.650	46.228
2	17.750	18.185	18.870	2.031
3	20.240	20.905	22.158	49.486
4	29.157	29.771	30.577	2.255

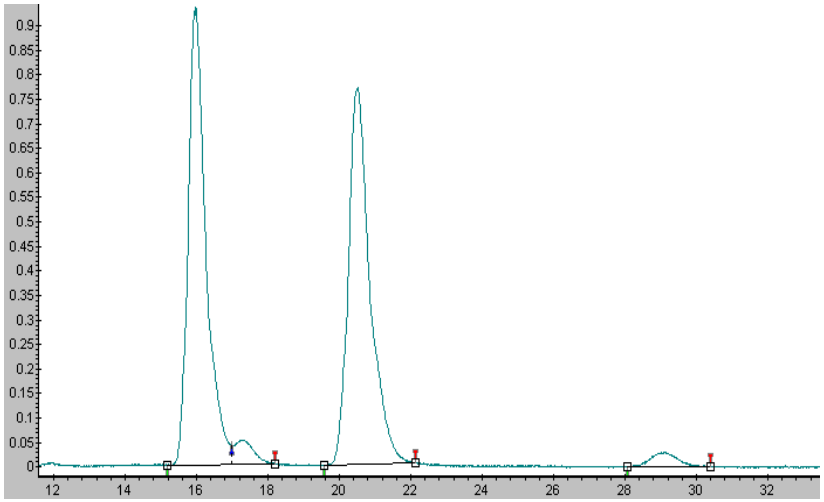
Asymmetric adduct



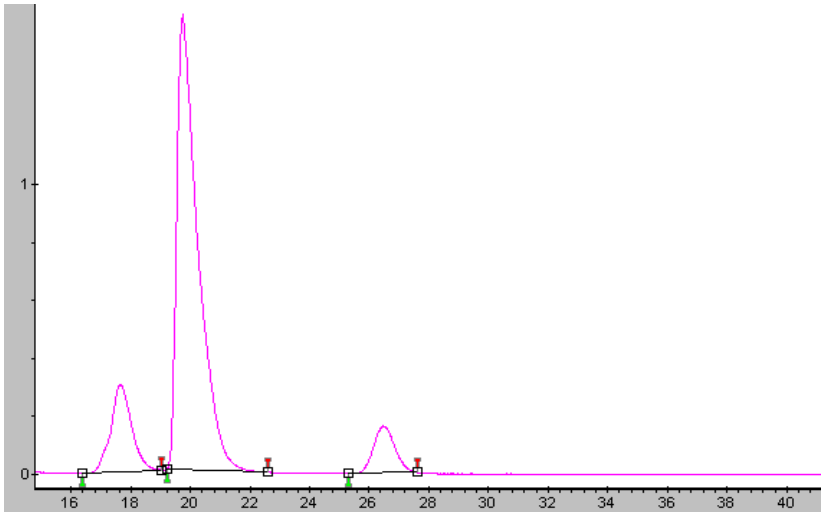
#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	16.482	17.039	17.666	3.944
2	18.106	18.612	19.499	6.475
3	20.171	20.918	22.747	76.630
4	28.848	29.811	30.913	12.951

8da

Racemic adduct



Asymmetric adduct

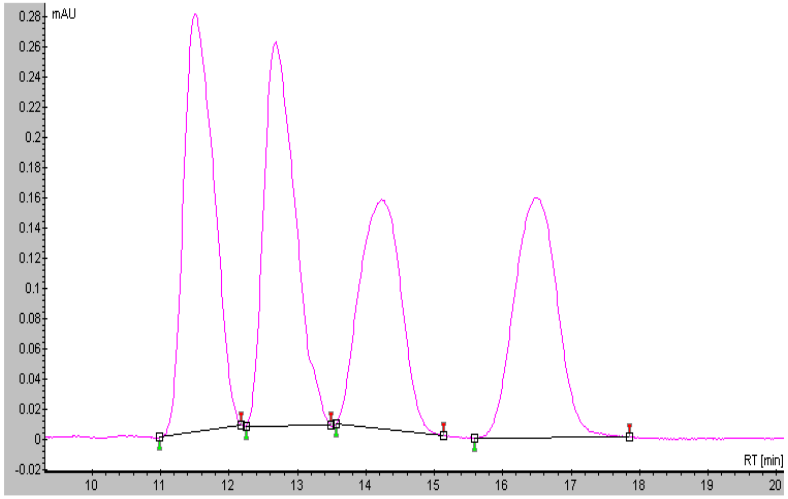


#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	15.172	15.959	16.978	47.593
2	16.978	17.279	18.192	2.815
3	19.571	20.492	22.131	47.302
4	28.073	29.065	30.404	2.290

#	Start [Min]	Time [Min]	End [Min]	Area [%]
1				
2	16.495	17.652	18.899	13.286
3	19.095	19.745	22.480	79.240
4	25.522	26.491	22.131	7.474

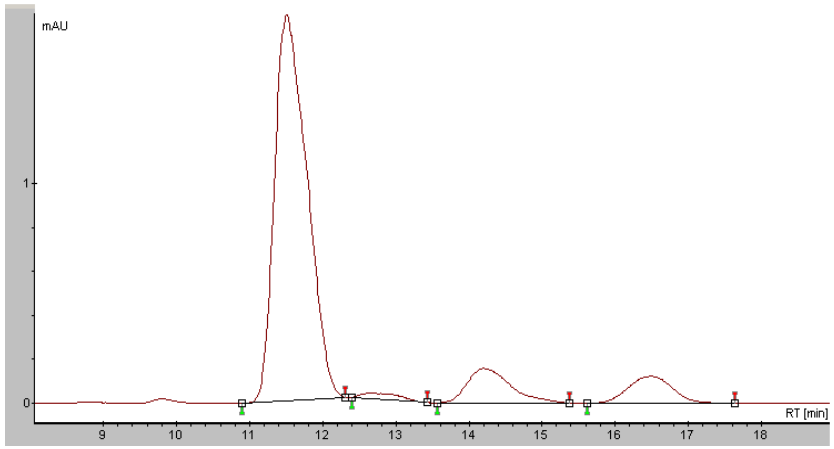
8ea

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	10.981	11.506	12.174	28.277
2	12.250	12.679	13.488	27.129
3	13.563	14.239	15.133	21.441
4	15.586	16.492	17.851	23.153

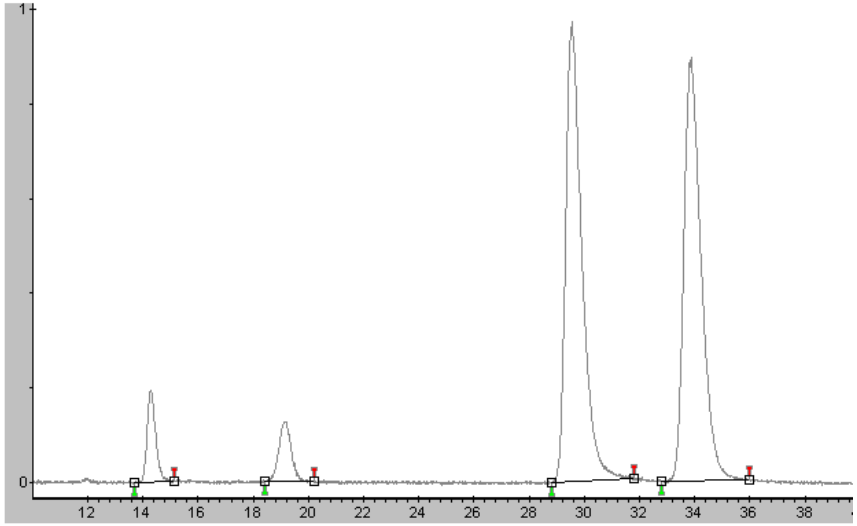
Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	10.888	11.493	12.312	81.005
2	12.390	12.866	13.427	1.540
3	13.566	14.199	15.378	9.694
4	15.610	16.479	17.638	7.761

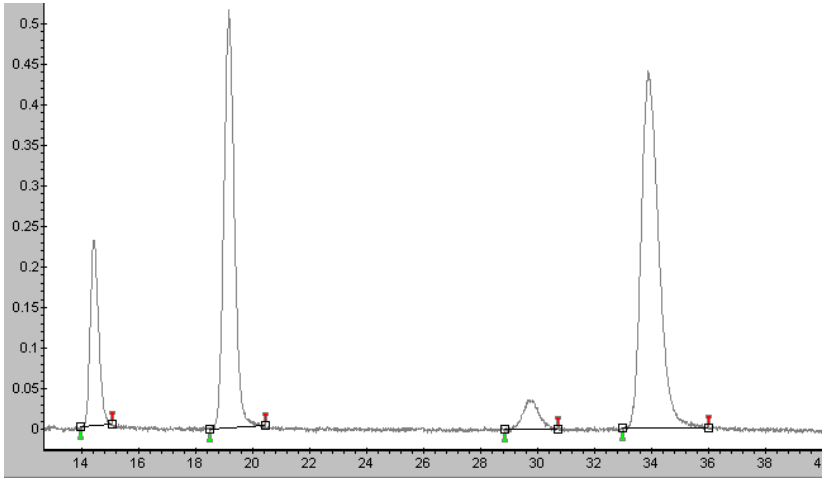
8fa

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	13.695	14.292	15.138	4.828
2	18.421	19.145	20.212	4.532
3	28.818	29.571	31.803	45.709
4	32.798	33.878	35.982	44.932

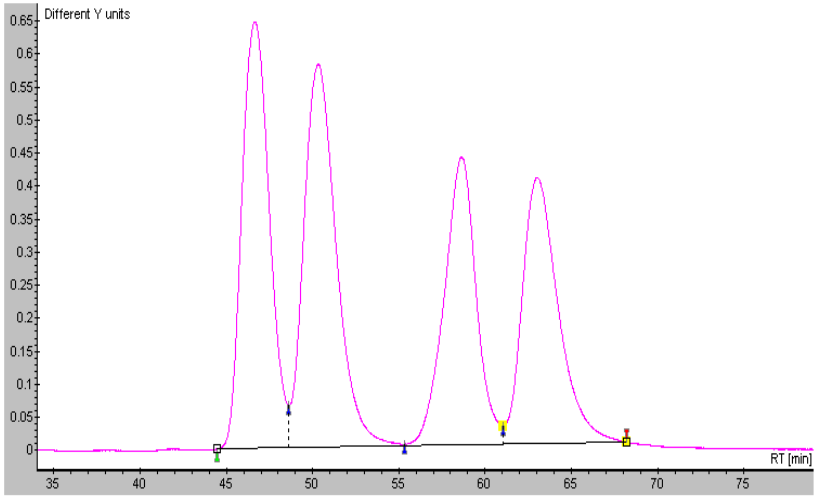
Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	13.865	14.439	15.131	12.776
2	18.345	19.159	20.147	34.290
3	28.911	29.745	30.713	3.715
4	33.002	33.878	35.388	49.218

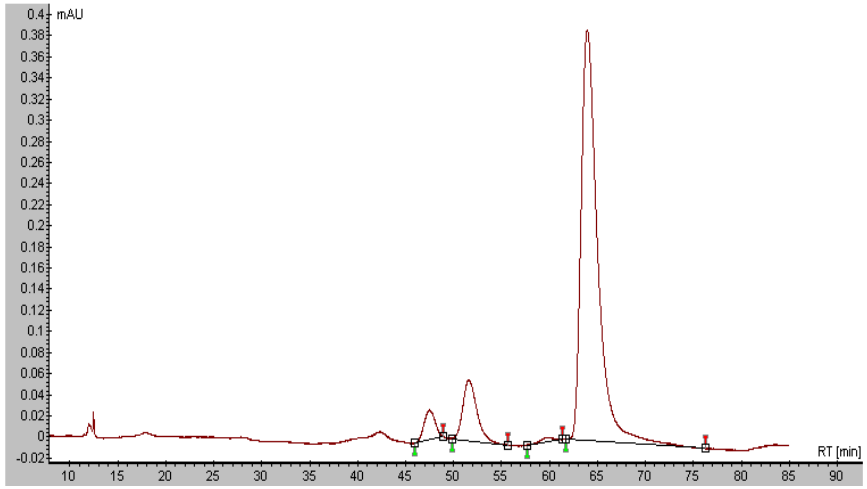
8ab

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	44.451	46.650	48.636	27.318
2	48.636	50.329	55.300	28.975
3	55.300	58.646	61.031	21.413
4	61.031	63.031	68.202	22.295

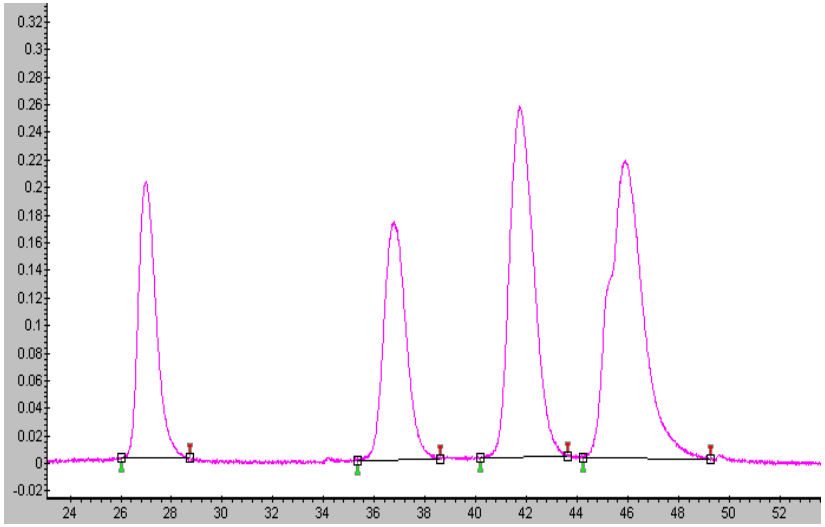
Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	45.962	47.476	48.958	4.143
2	49.835	51.595	55.607	10.506
3	57.652	59.725	61.306	0.668
4	61.744	63.937	76.284	84.683

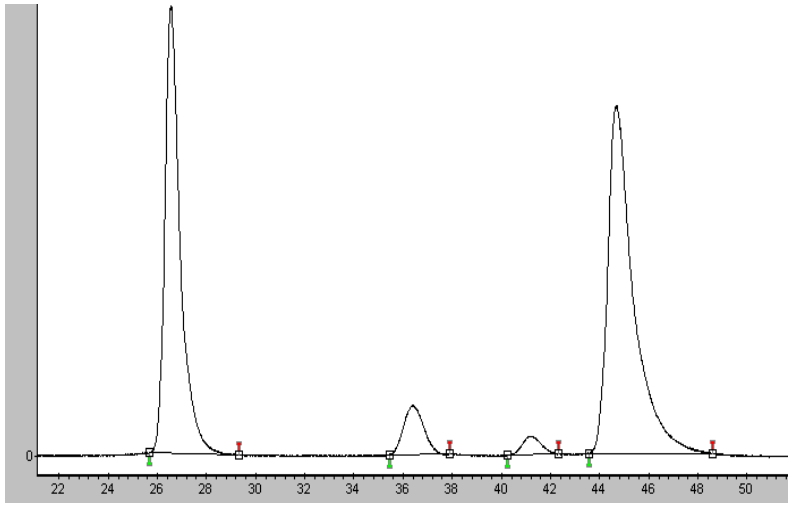
8ac

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	26.135	26.985	28.743	17.291
2	35.475	36.784	38.557	18.228
3	40.548	41.744	43.772	29.666
4	44.389	45.917	49.130	34.815

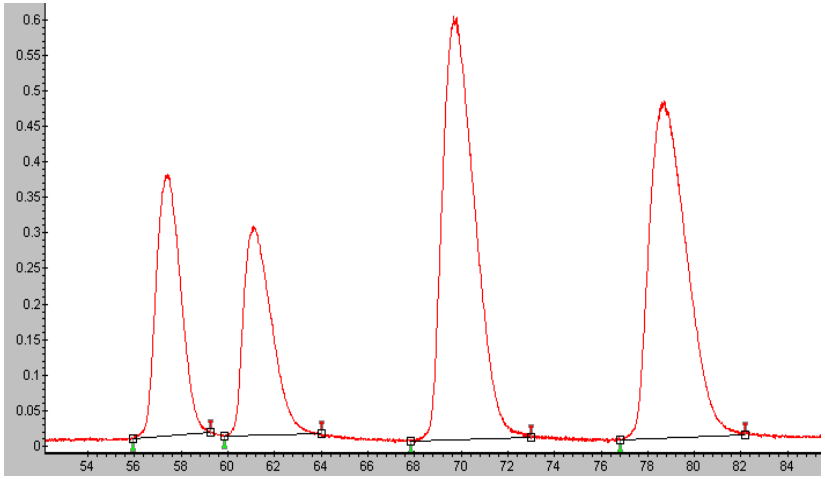
Asymmetric adduct



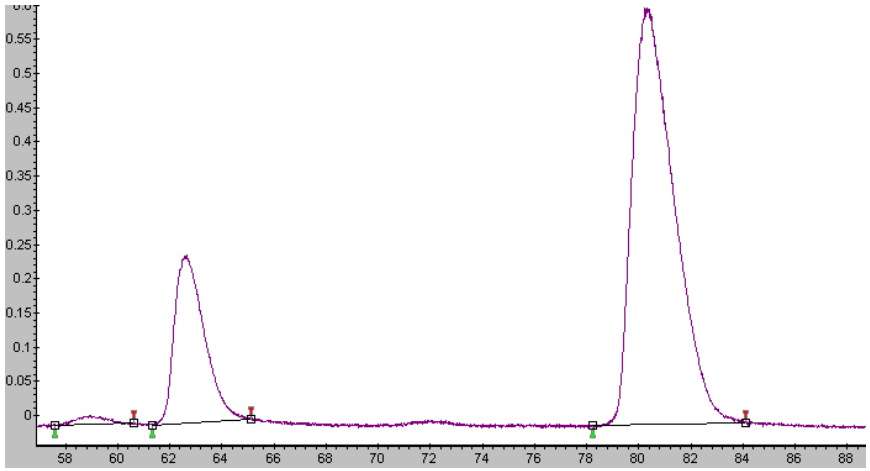
#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	25.673	26.531	29.318	40.093
2	35.455	36.397	37.900	5.651
3	40.253	41.210	42.330	2.064
4	43.576	44.663	48.605	52.192

8ad

Racemic adduct



Asymmetric adduct

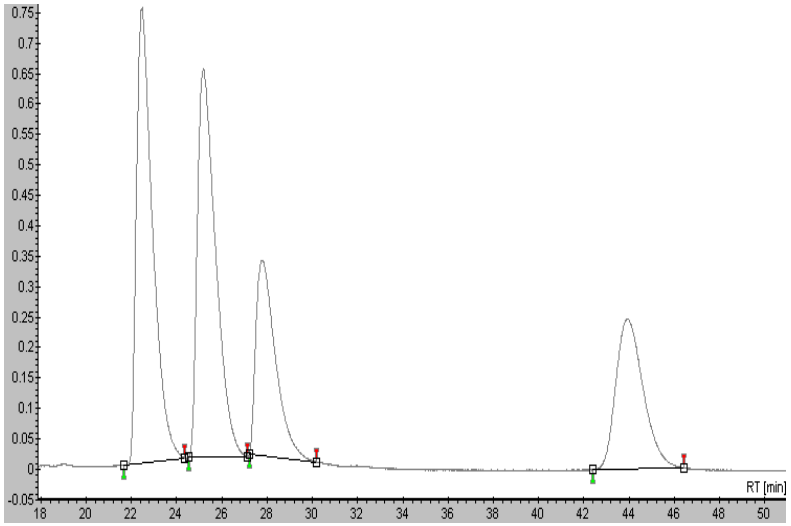


#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	55.928	57.433	59.252	16.669
2	59.848	61.111	64.016	15.187
3	67.837	69.682	72.997	35.484
4	76.818	78.585	82.177	32.659

#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	57.589	58.952	60.618	1.002
2	61.329	62.618	65.116	21.990
3				
4	78.229	80.238	84.099	77.008

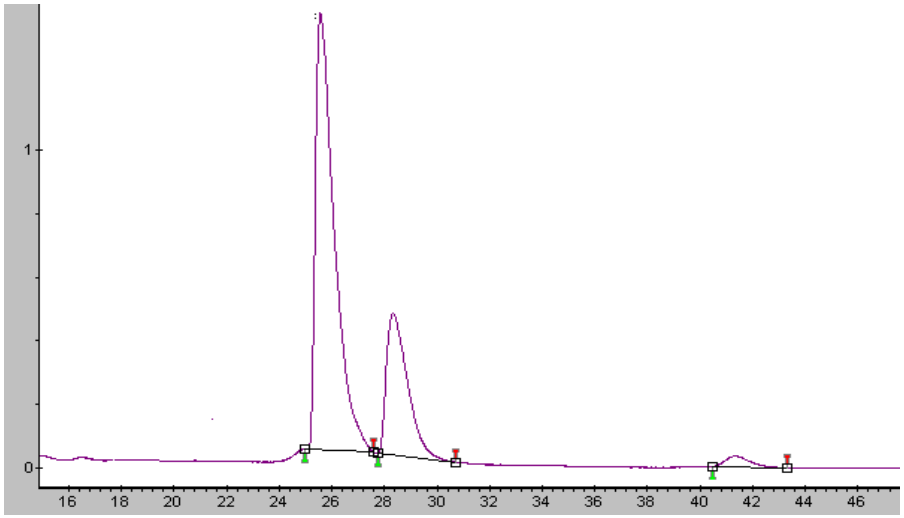
8ae

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	21.668	22.478	24.352	32.950
2	24.537	25.198	27.128	31.686
3	27.221	27.798	30.182	17.027
4	42.399	43.930	46.424	18.337

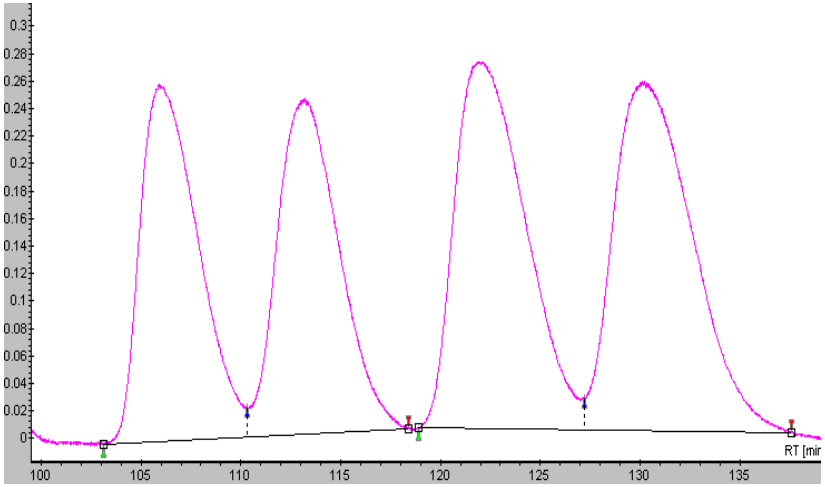
Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1				
2	25.157	29.997	27.863	71.754
3	28.000	28.786	30.799	25.968
4	40.411	41.356	43.120	2.278

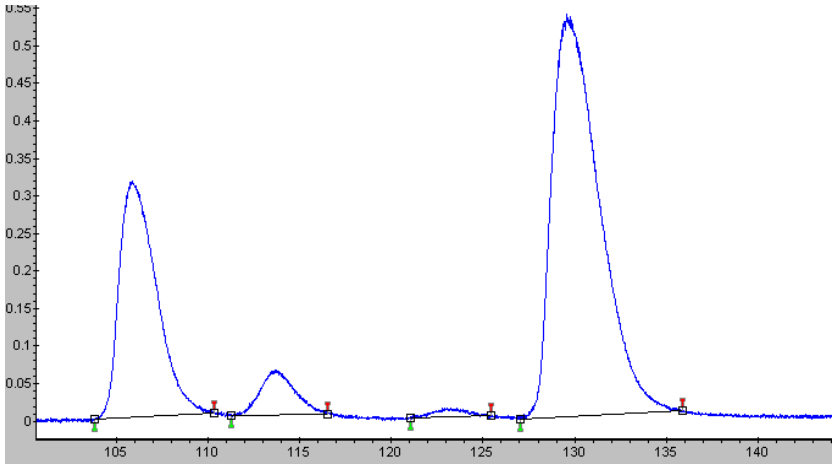
8af

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	103.124	105.968	110.317	21.660
2	110.317	113.201	118.402	21.731
3	118.903	121.980	127.211	27.481
4	127.211	130.132	137.582	29.128

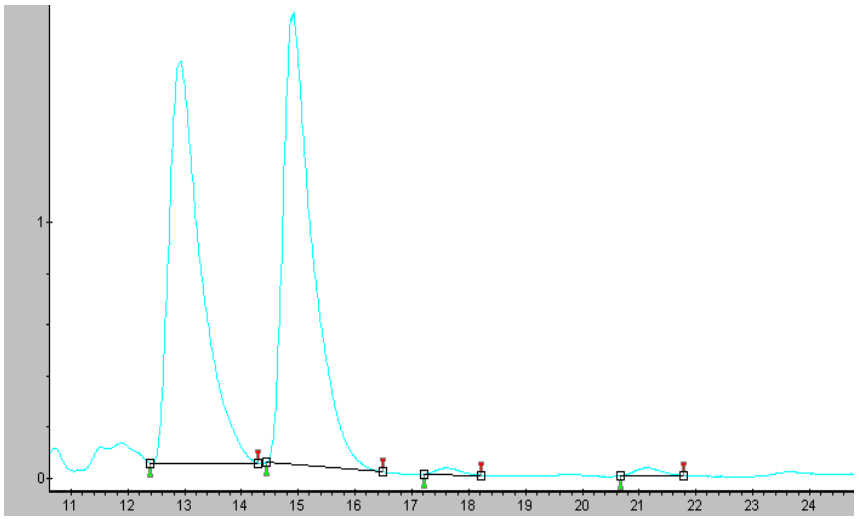
Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	103.829	105.861	110.344	29.594
2	111.275	113.667	116.527	5.184
3	121.048	123.112	125.436	0.784
4	127.032	129.573	135.874	64.438

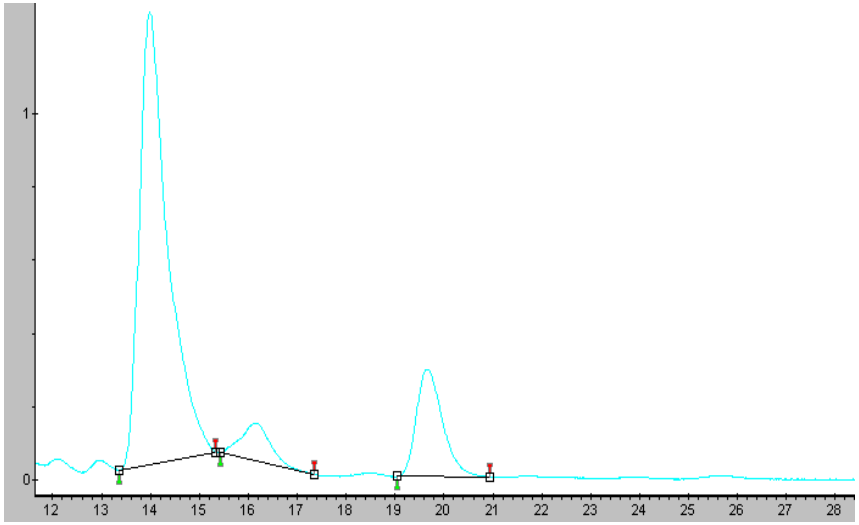
8cc

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	12.389	12.919	14.289	48.586
2	14.438	14.919	16.487	50.078
3	17.213	17.612	18.216	0.560
4	20.671	21.118	21.781	0.776

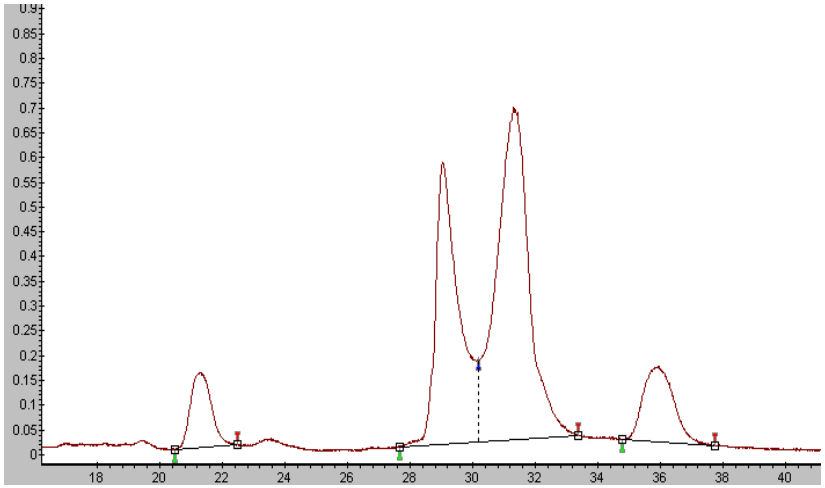
Asymmetric adduct



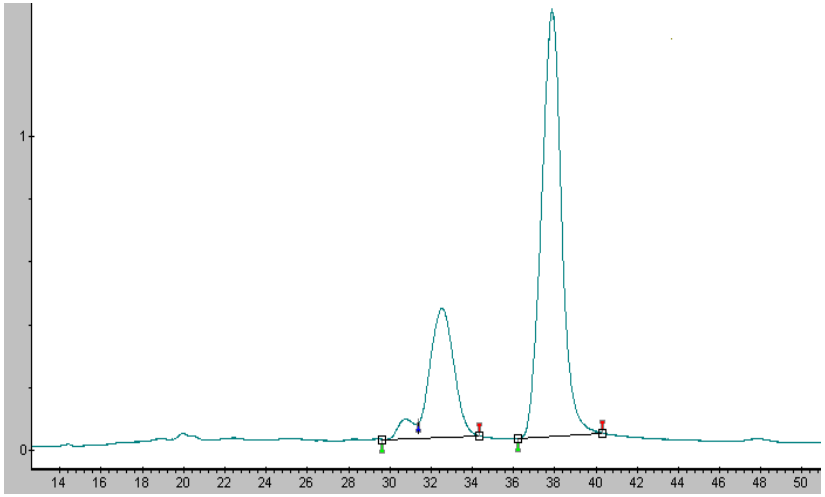
#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	13.359	13.972	15.328	76.691
2	15.428	16.159	17.347	6.610
3	19.043	19.652	20.937	16.699
4				

8cg

Racemic adduct



Asymmetric adduct

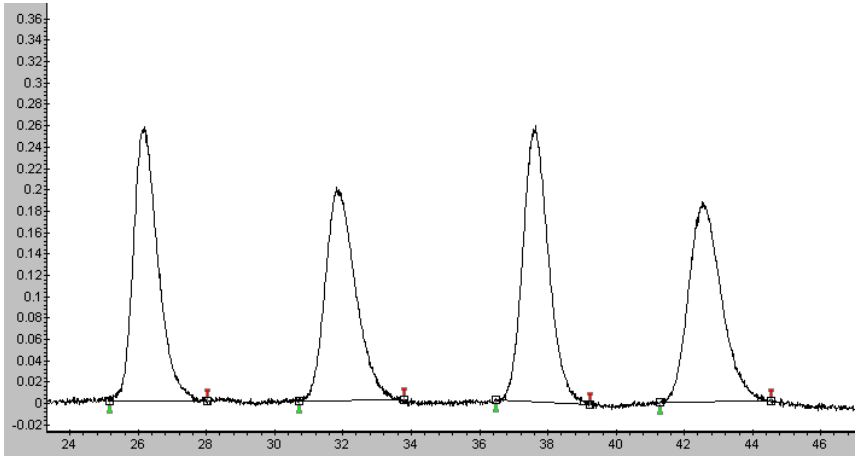


#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	20.272	21.265	22.473	7.328
2	27.662	29.038	30.183	31.000
3	30.183	31.291	33.370	50.827
4	34.779	35.877	37.744	10.844

#	Start [Min]	Time [Min]	End [Min]	Area [%]
1				
2	29.617	30.762	31.380	2.689
3	31.380	32.548	34.337	25.388
4	36.213	37.866	40.306	71.923

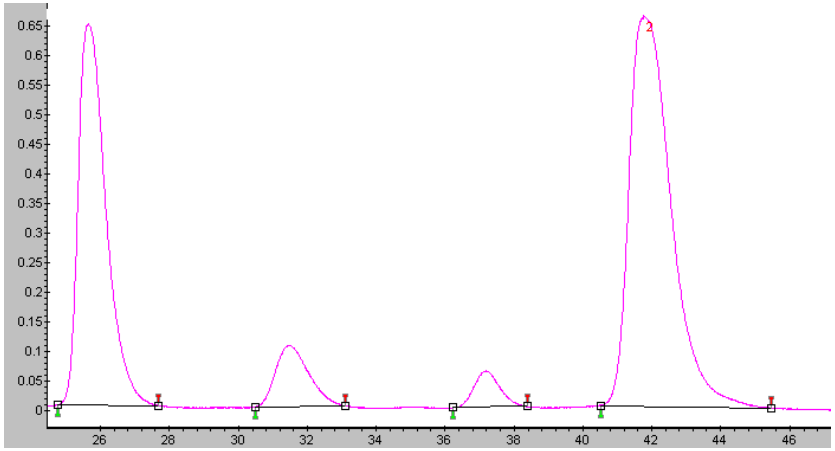
8ah

Racemic adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	25.157	26.145	28.022	25.173
2	30.709	31.851	33.786	24.019
3	36.474	37.611	39.233	26.333
4	41.284	42.557	44.538	24.475

Asymmetric adduct



#	Start [Min]	Time [Min]	End [Min]	Area [%]
1	24.759	25.638	27.678	35.392
2	30.493	31.478	33.103	6.764
3	36.228	37.184	38.391	3.104
4	40.520	41.757	45.465	54.740