

**Squaramide-catalyzed asymmetric Michael/cyclization cascade reaction of
3-isothiocyanato oxindoles with chalcones for synthesis of pyrrolidinyl
spirooxindoles**

Ye Lin, Lei Liu and Da-Ming Du*

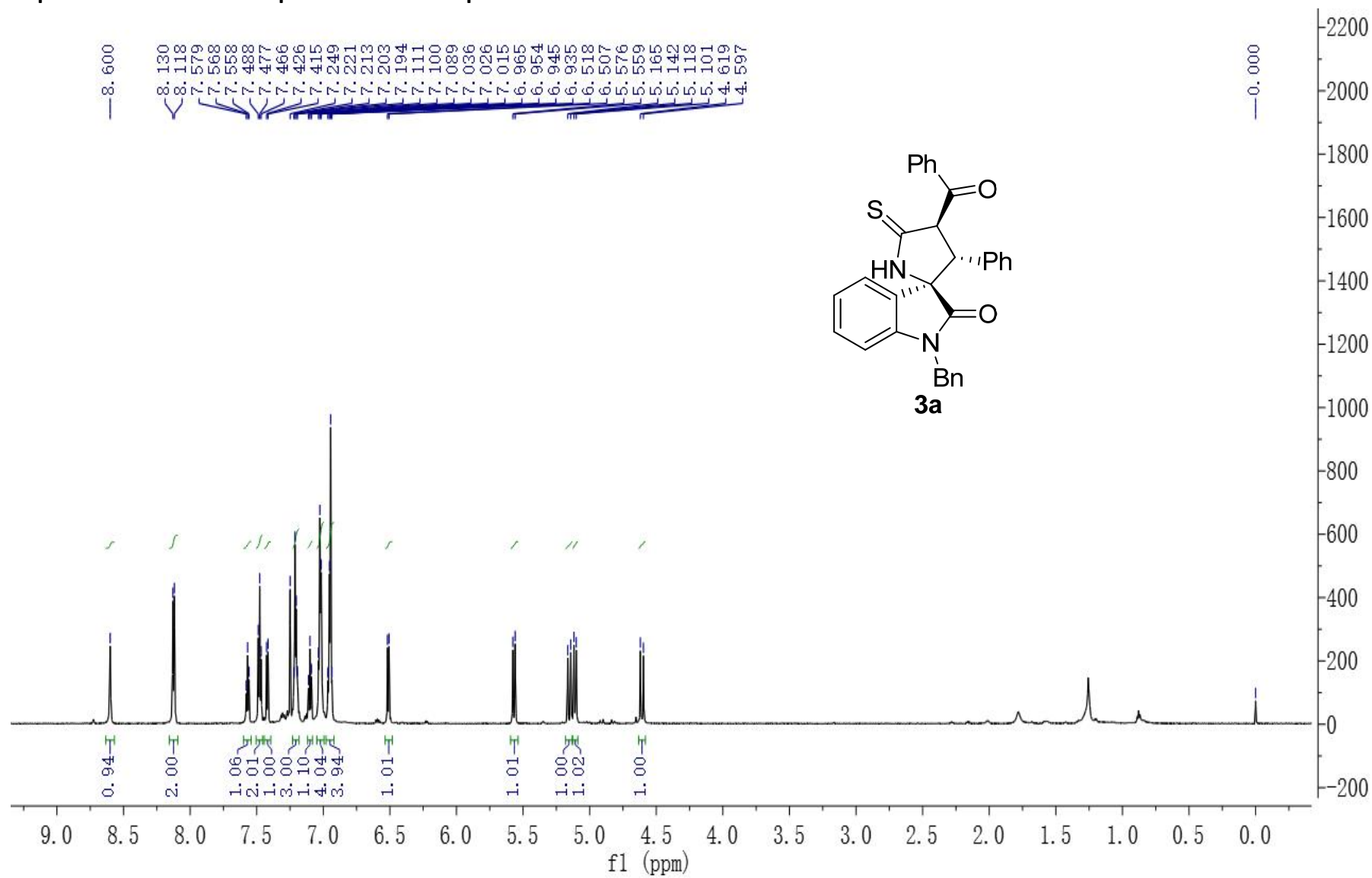
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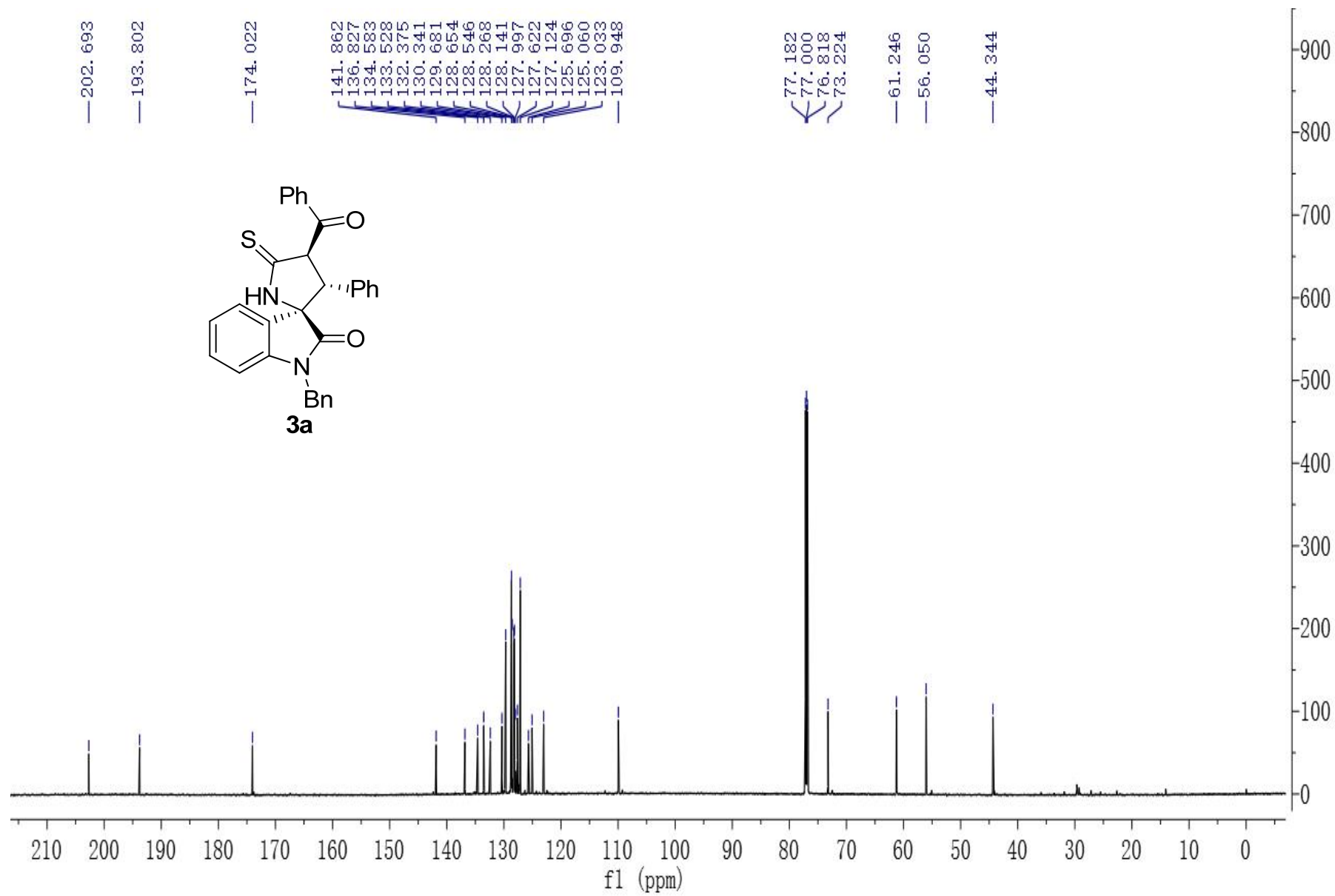
Supporting Information

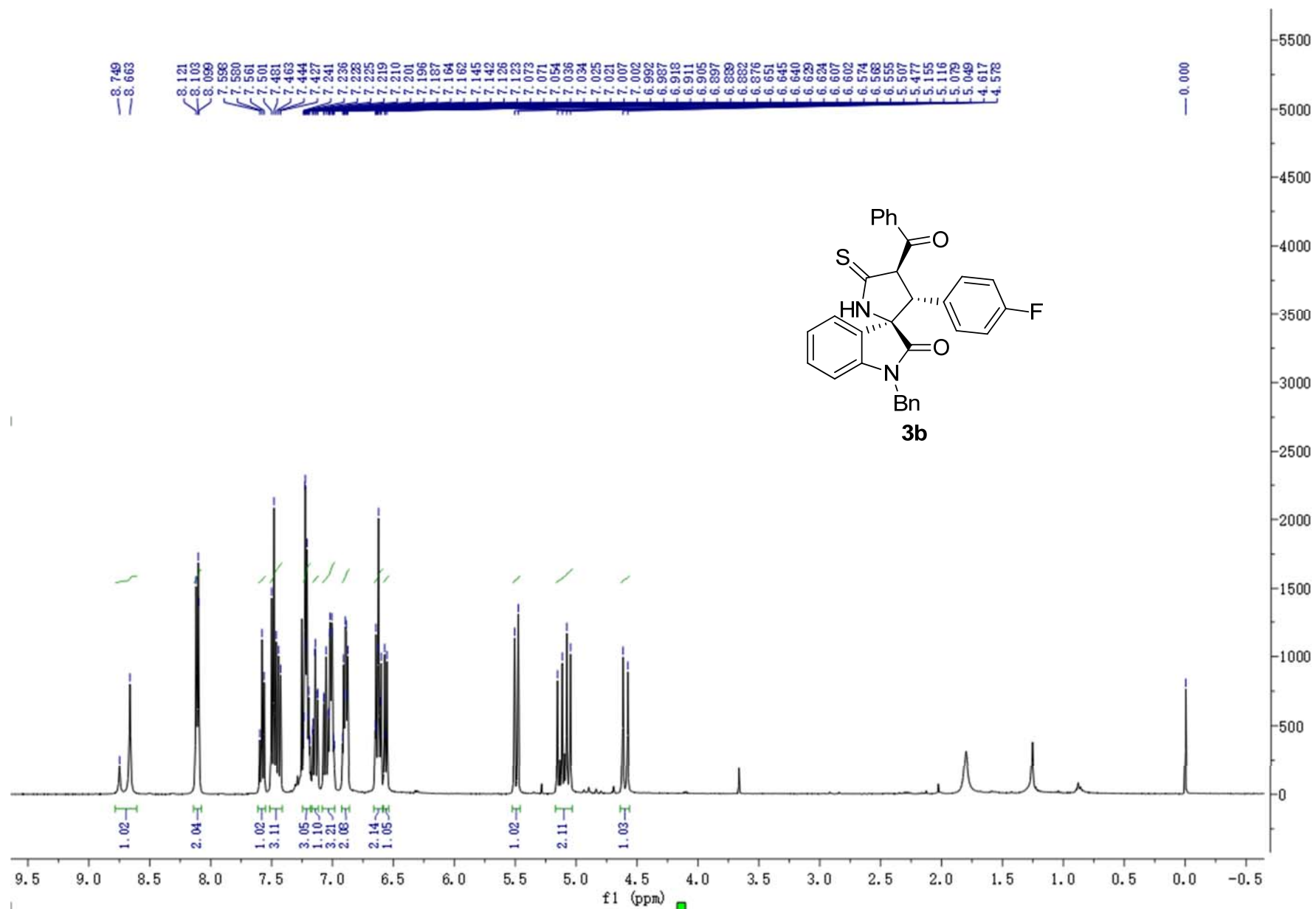
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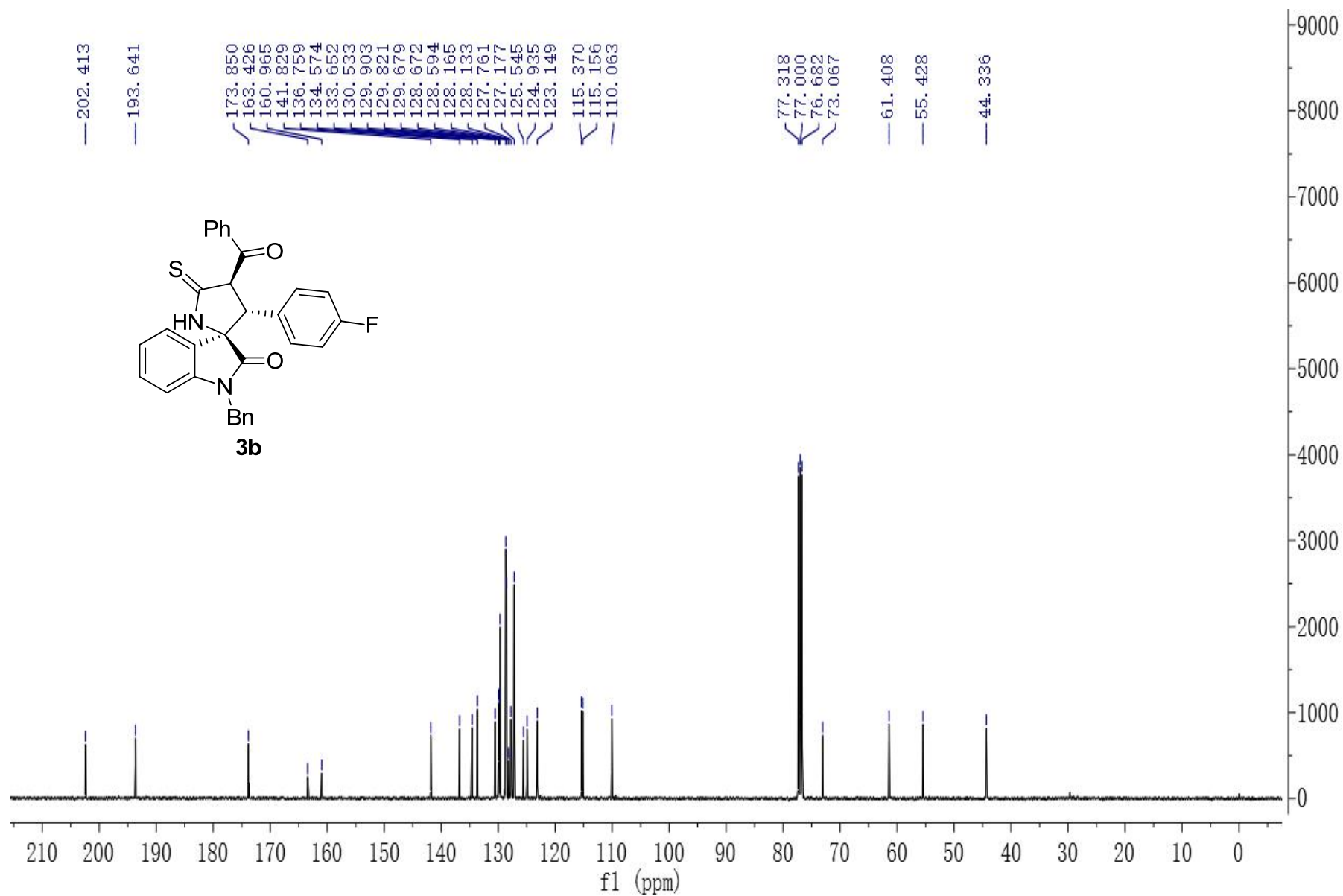
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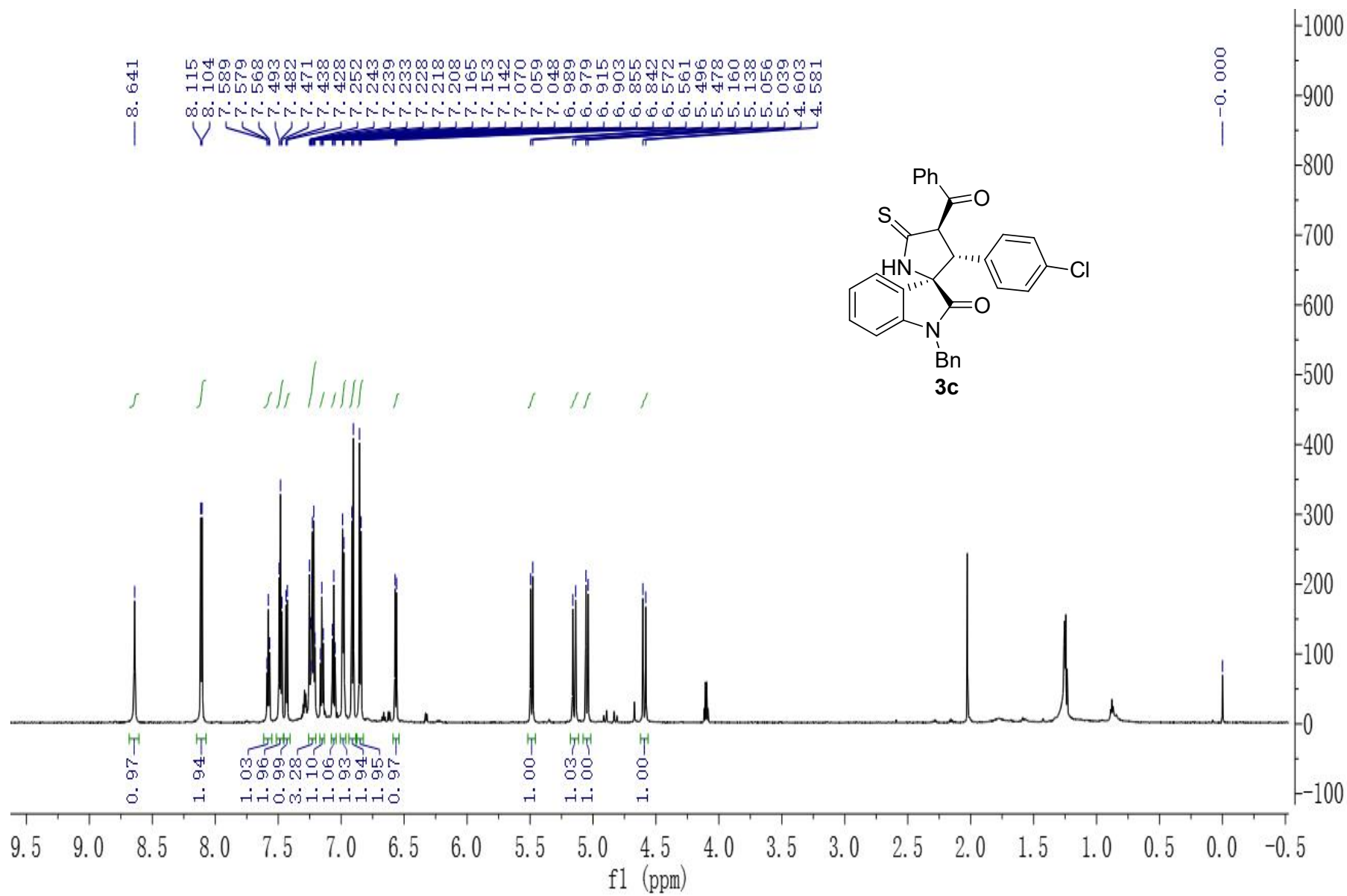
Copies of ^1H and ^{13}C NMR spectra of new compounds

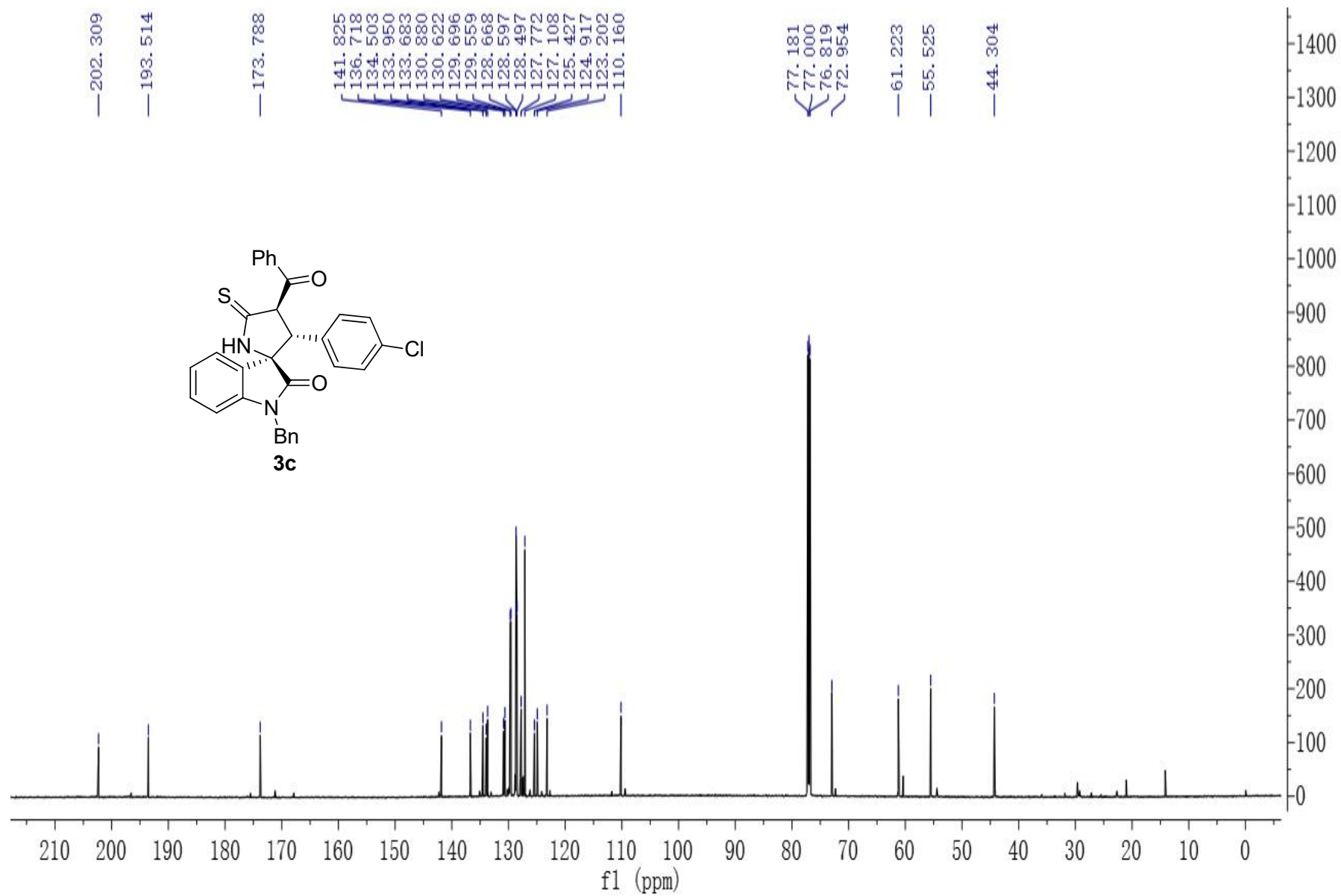


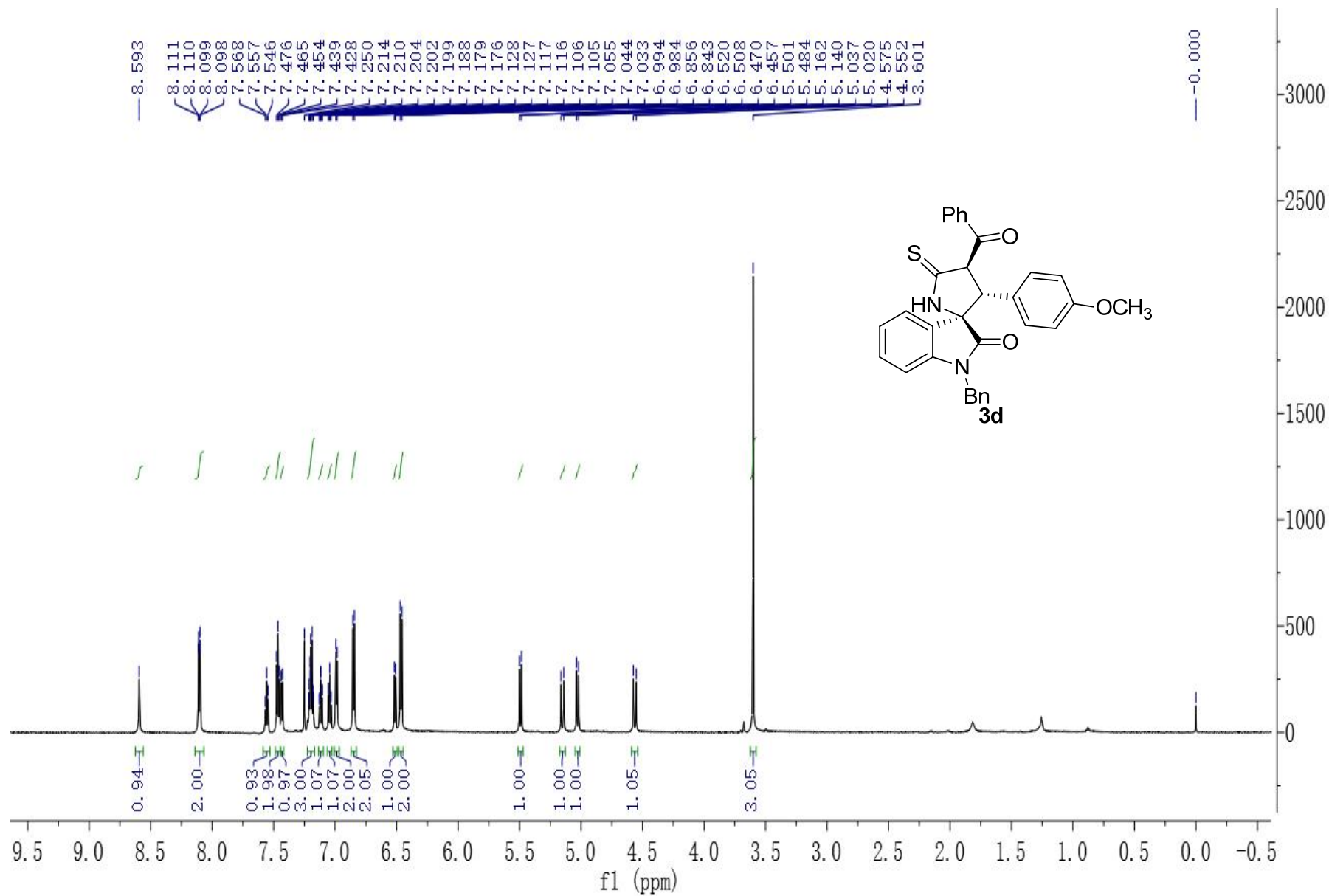


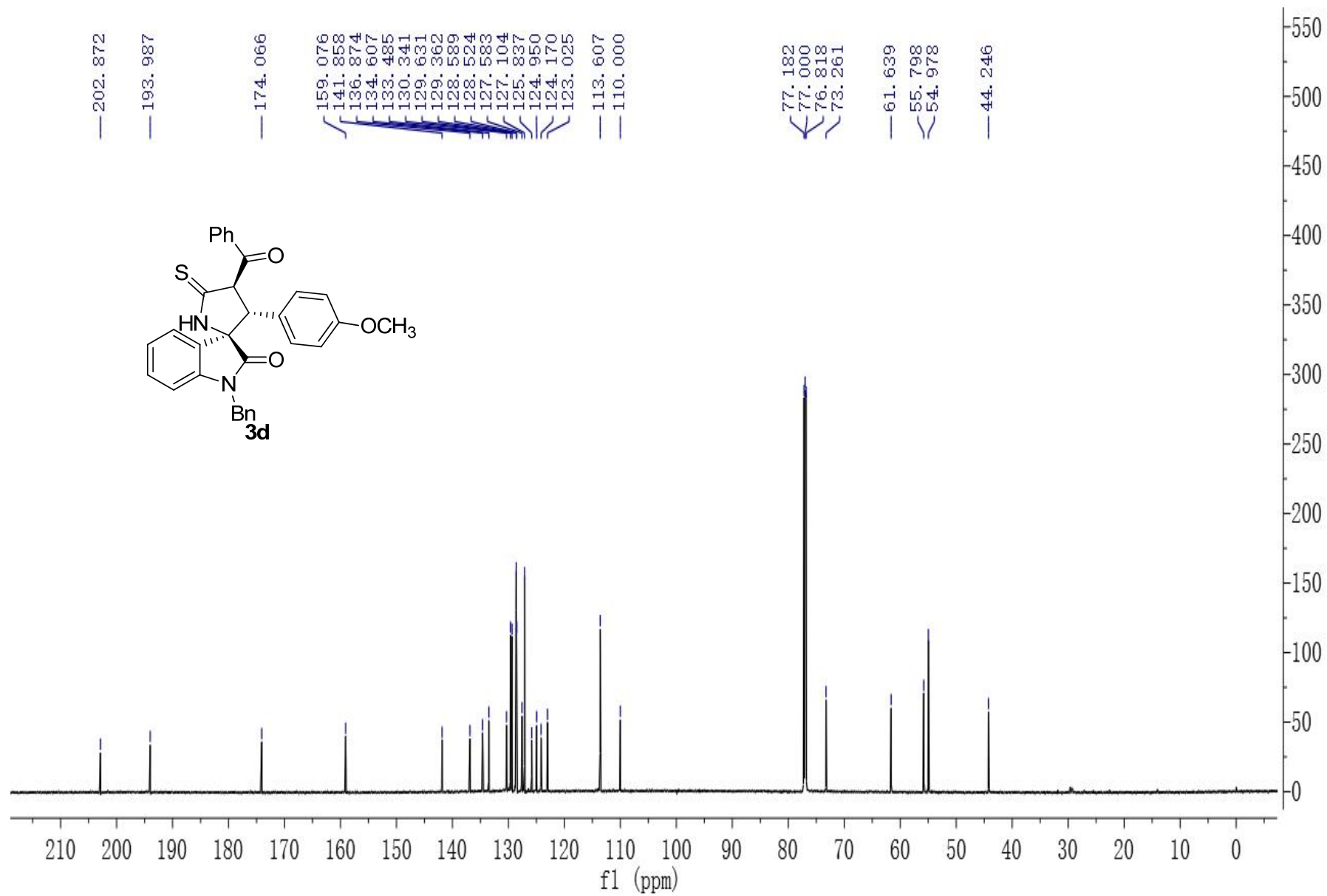


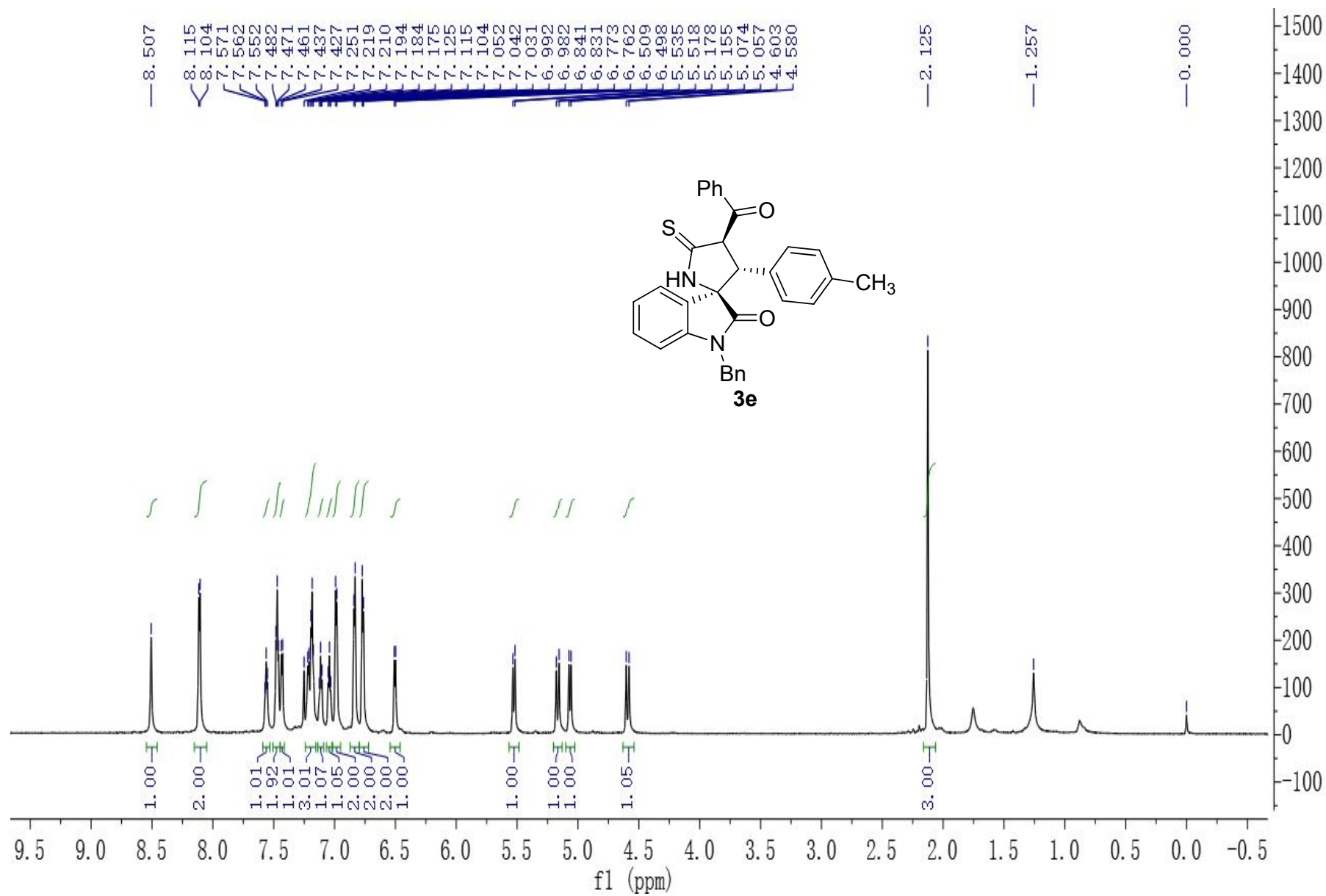


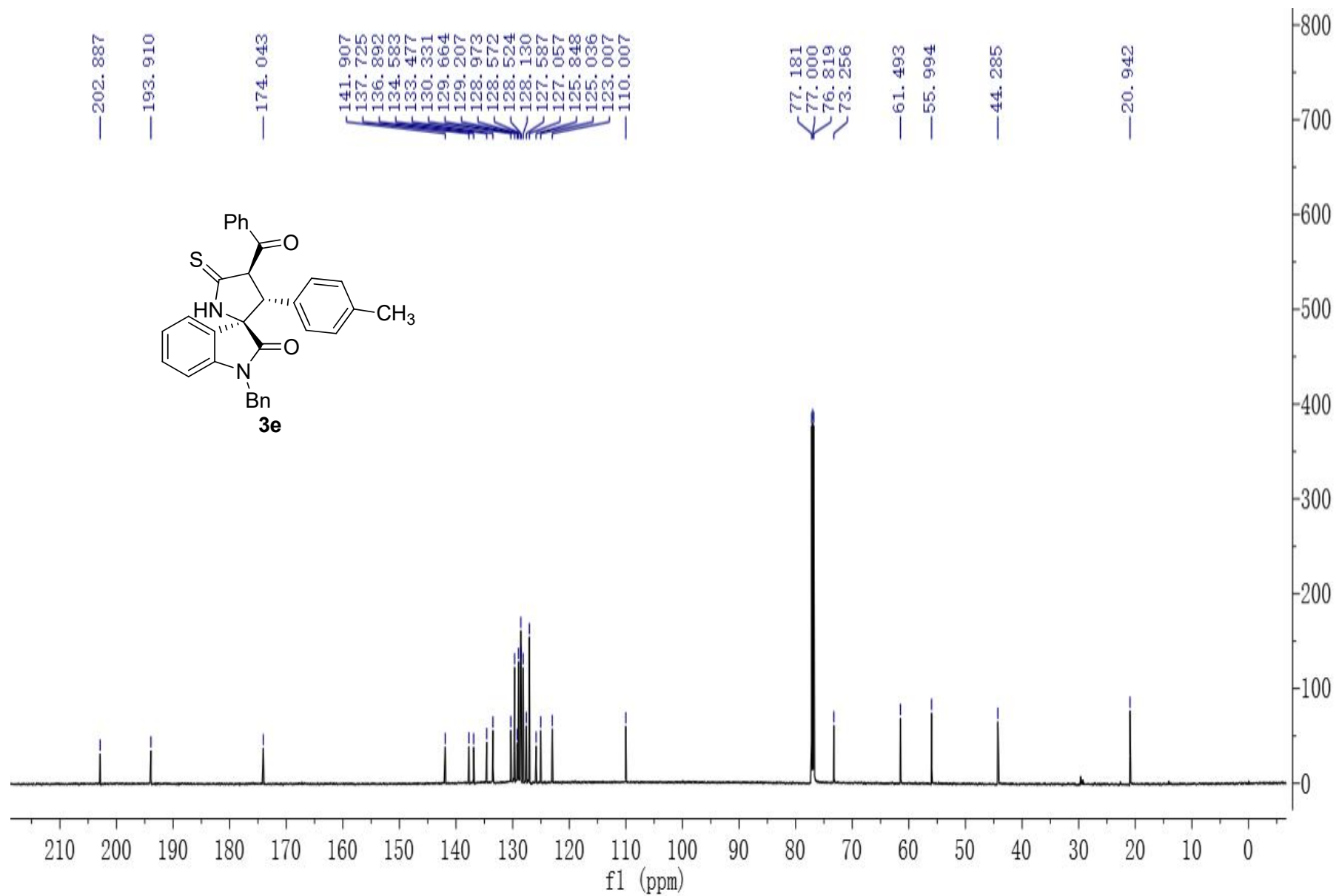


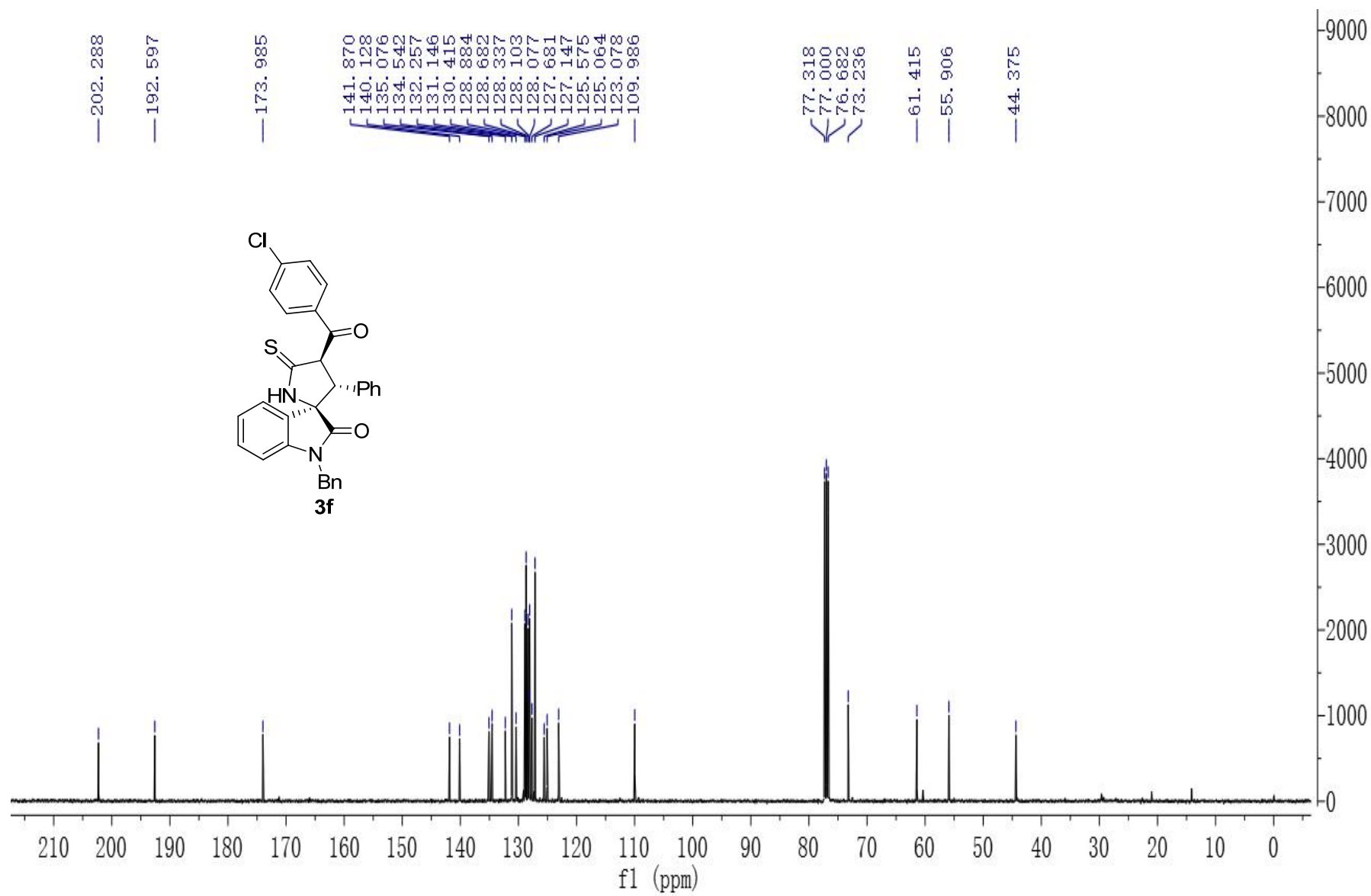


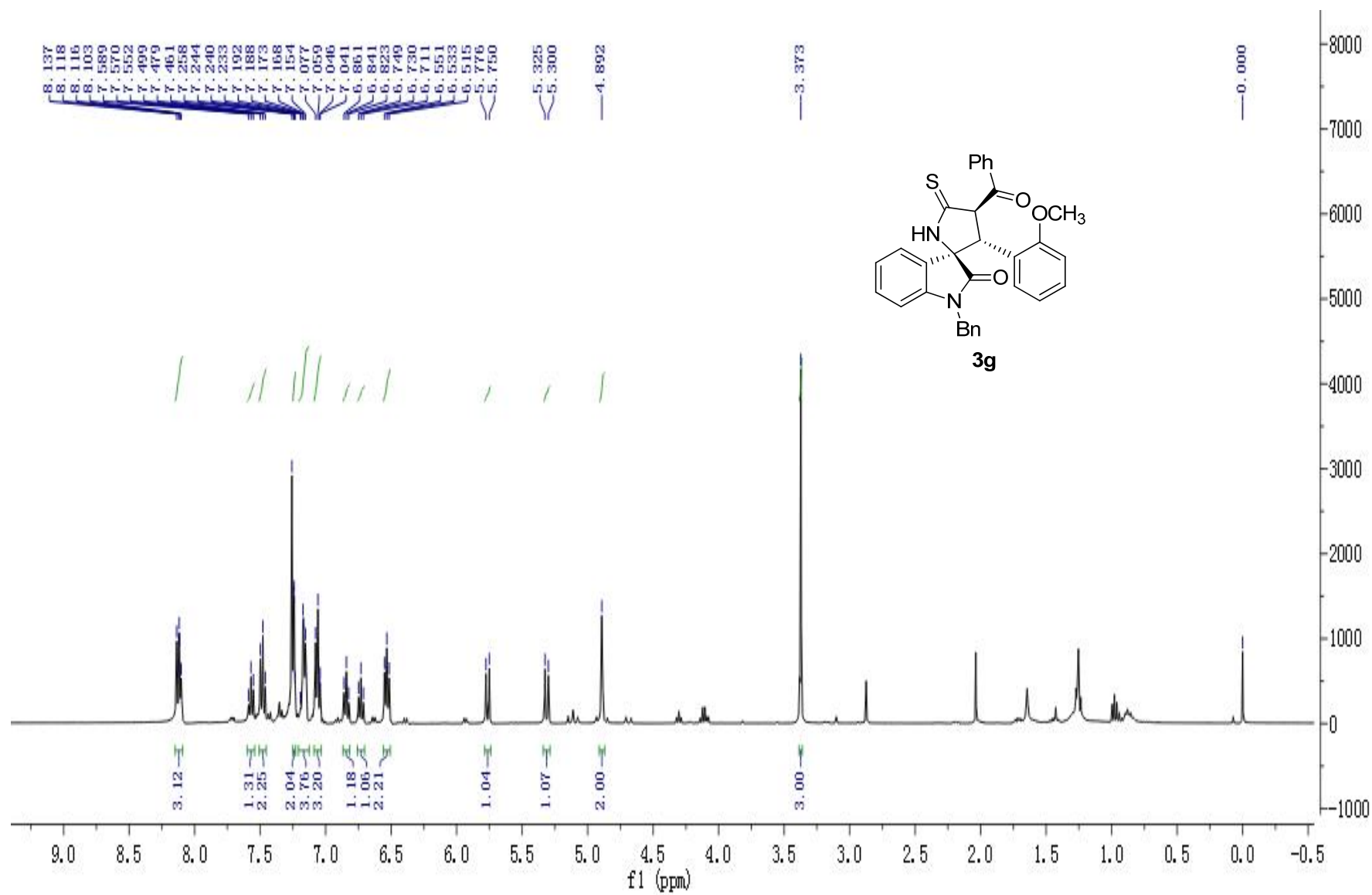


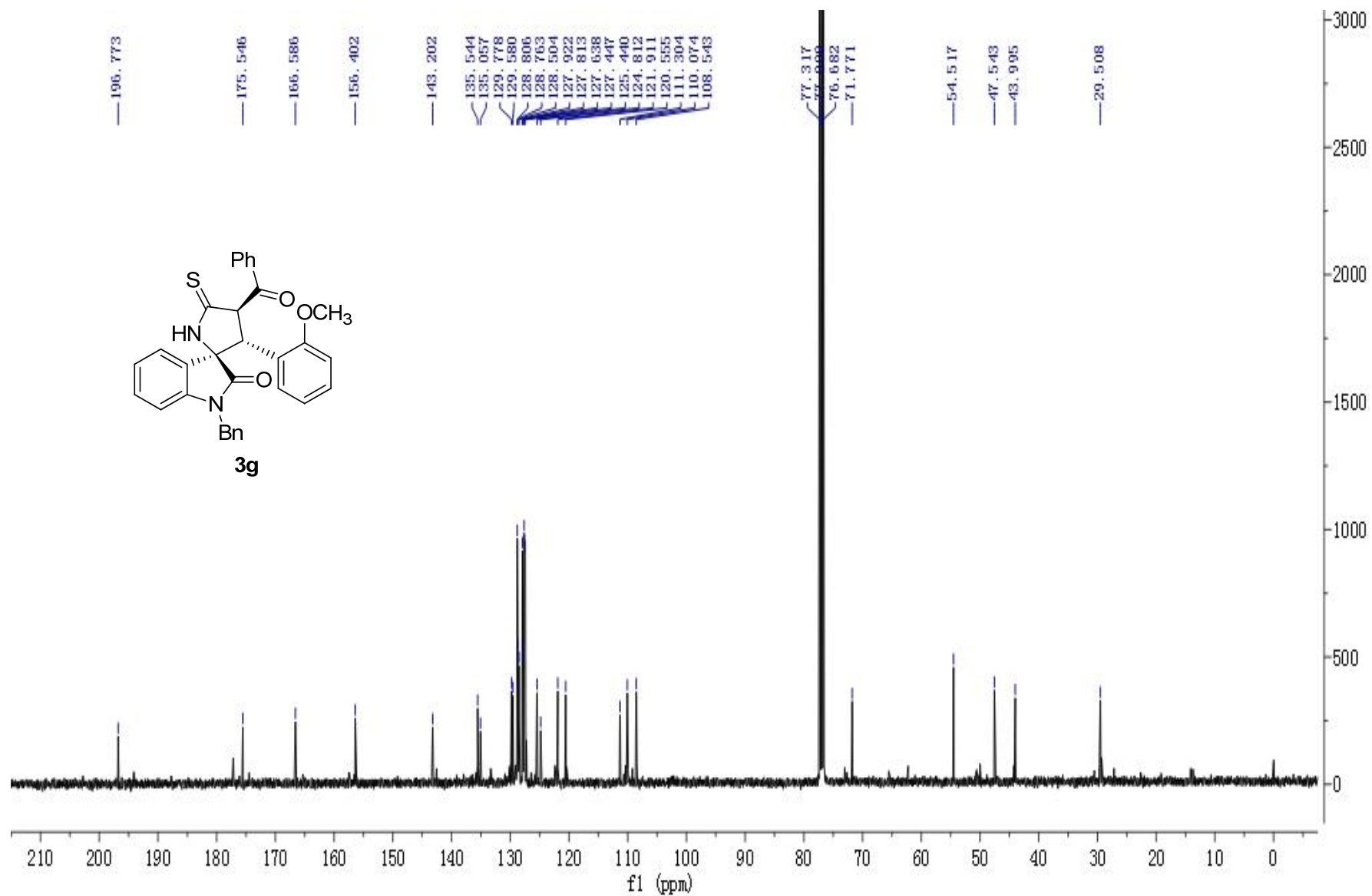


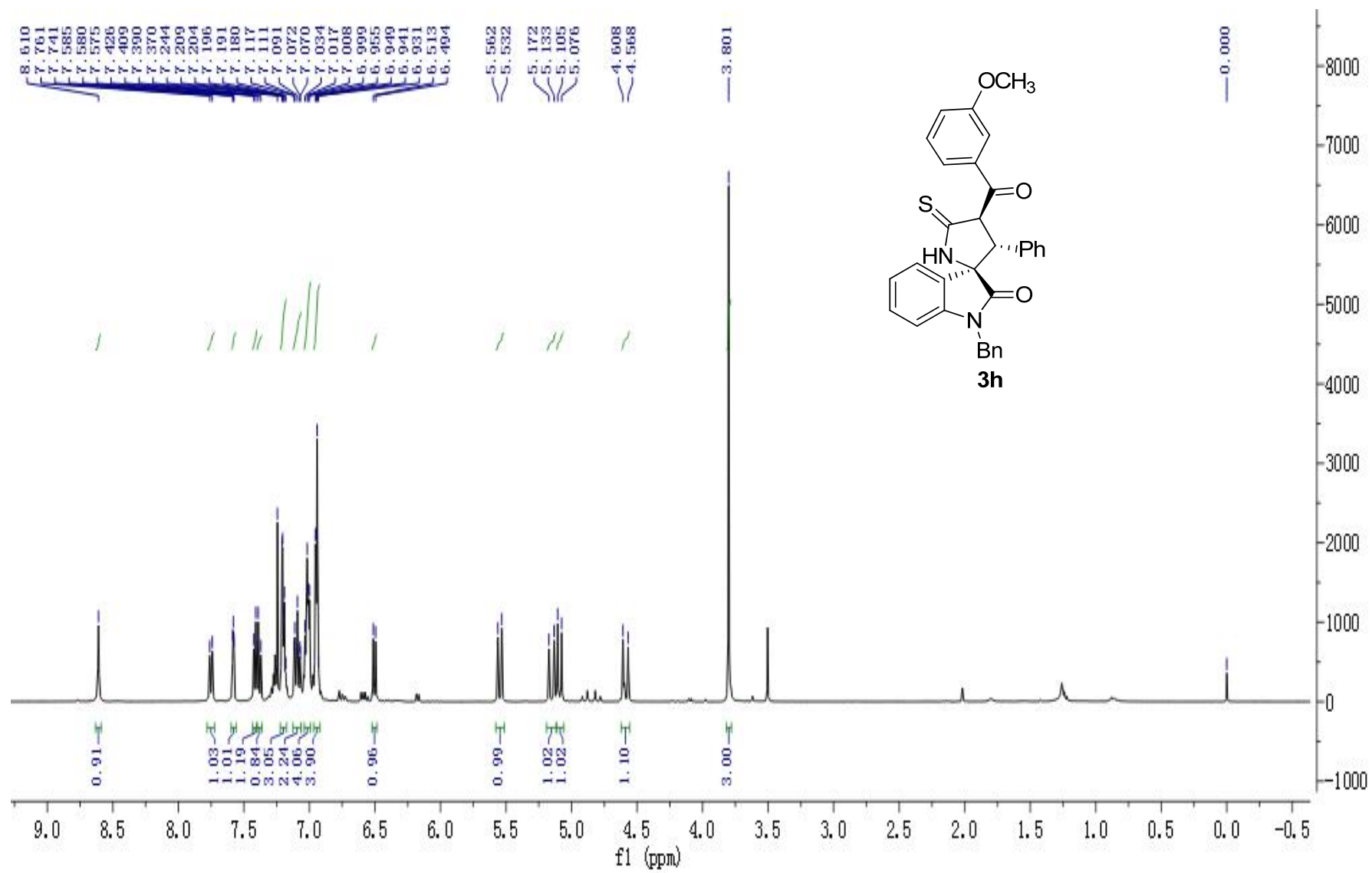


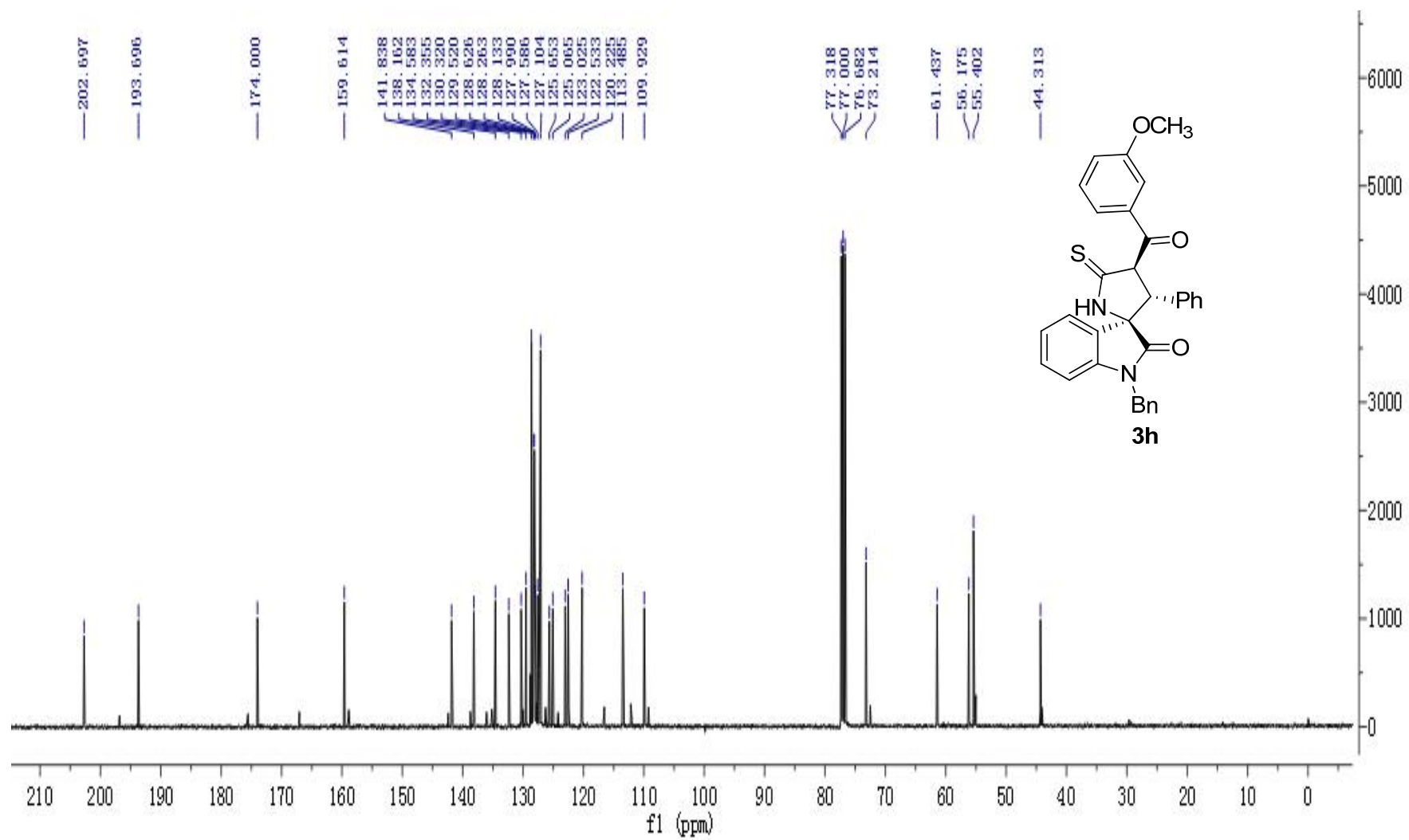


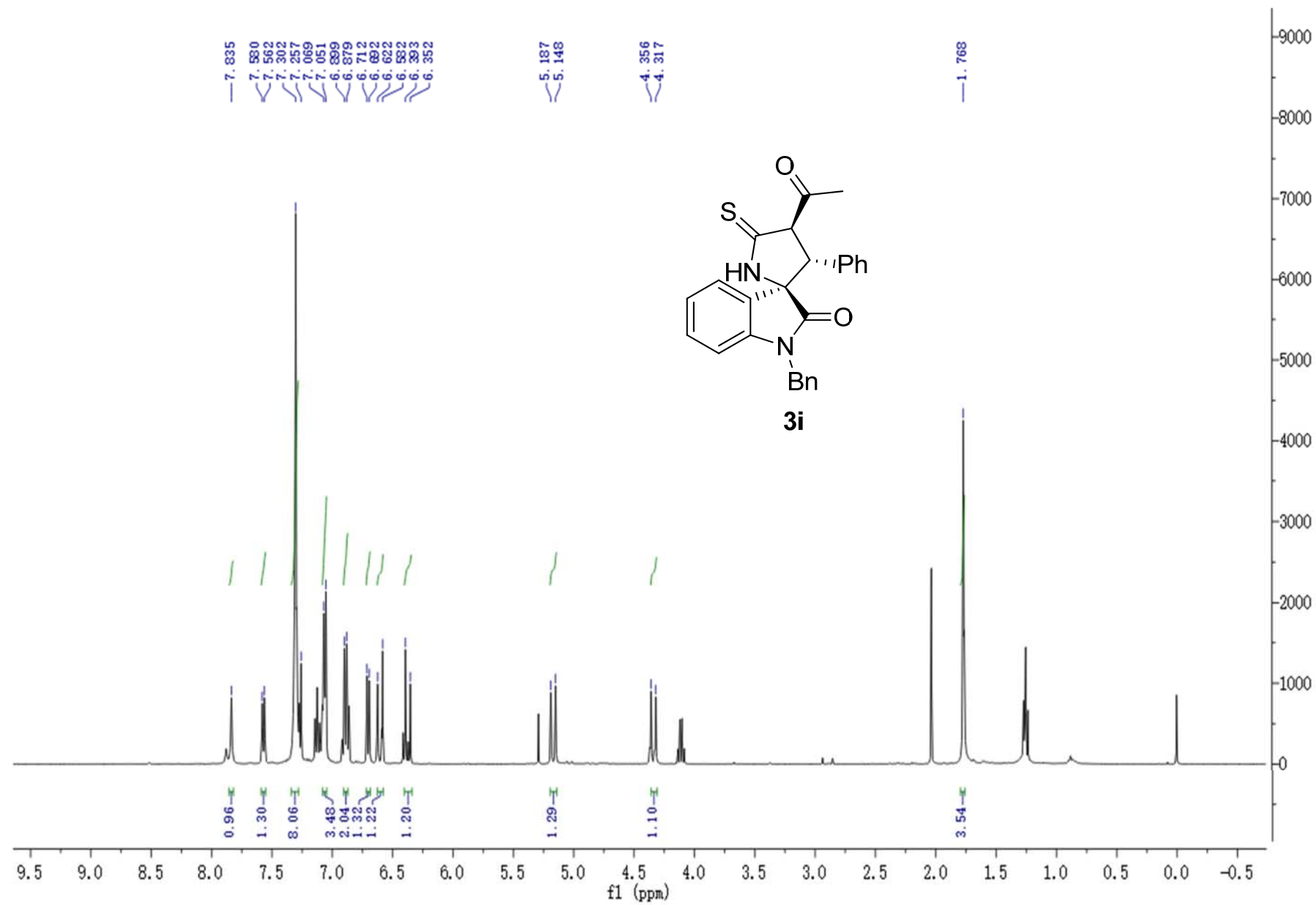


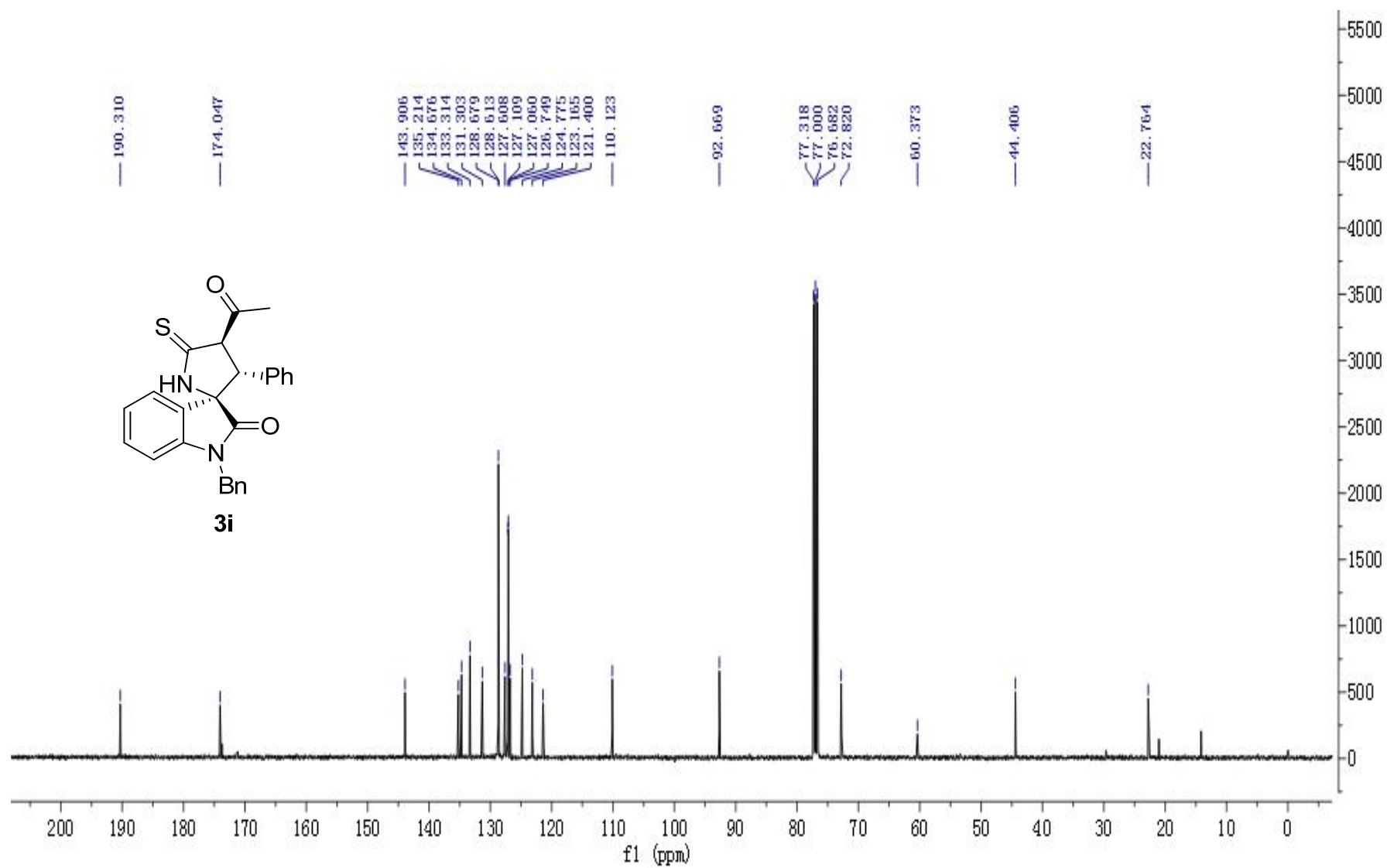


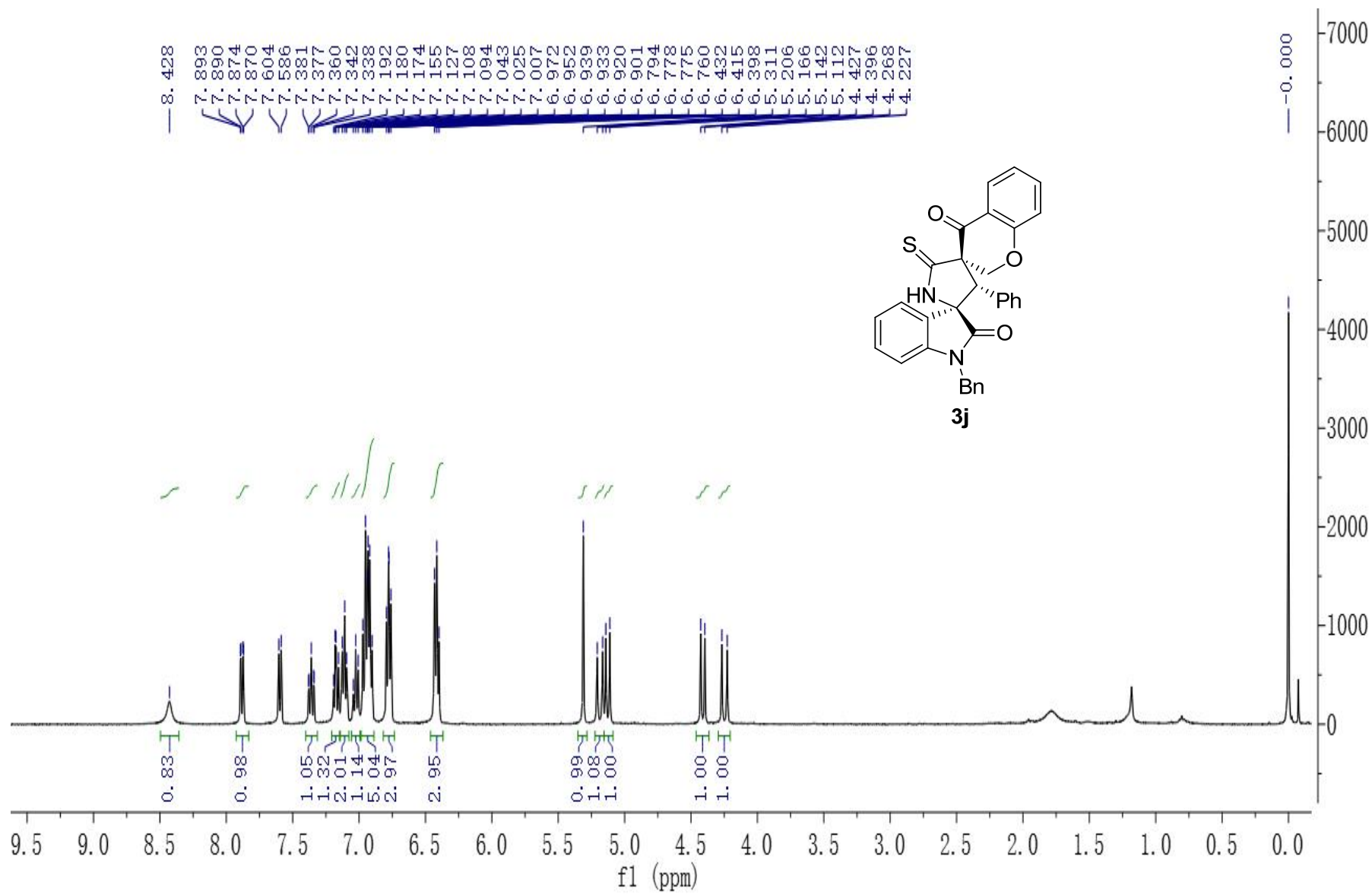


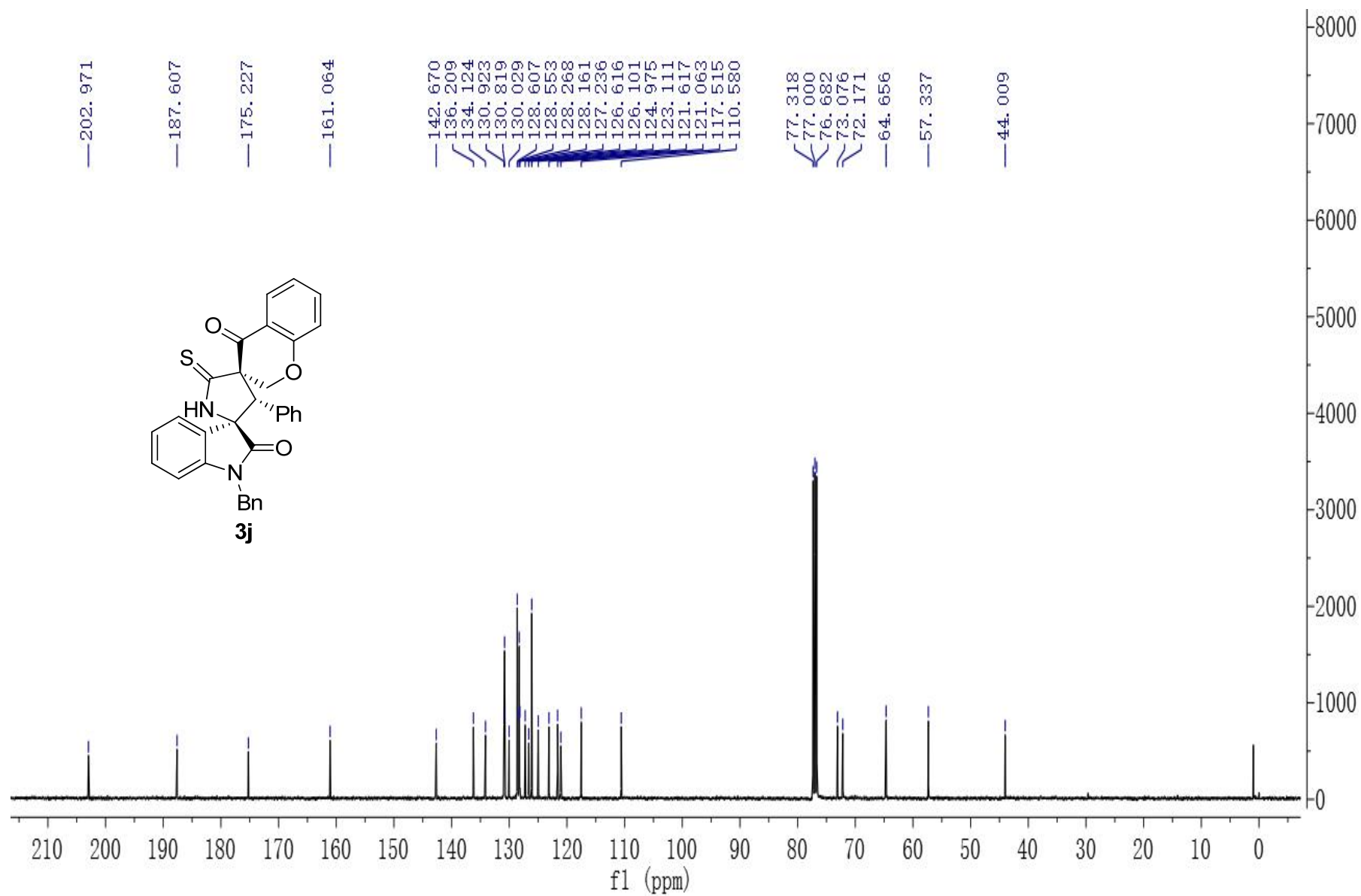


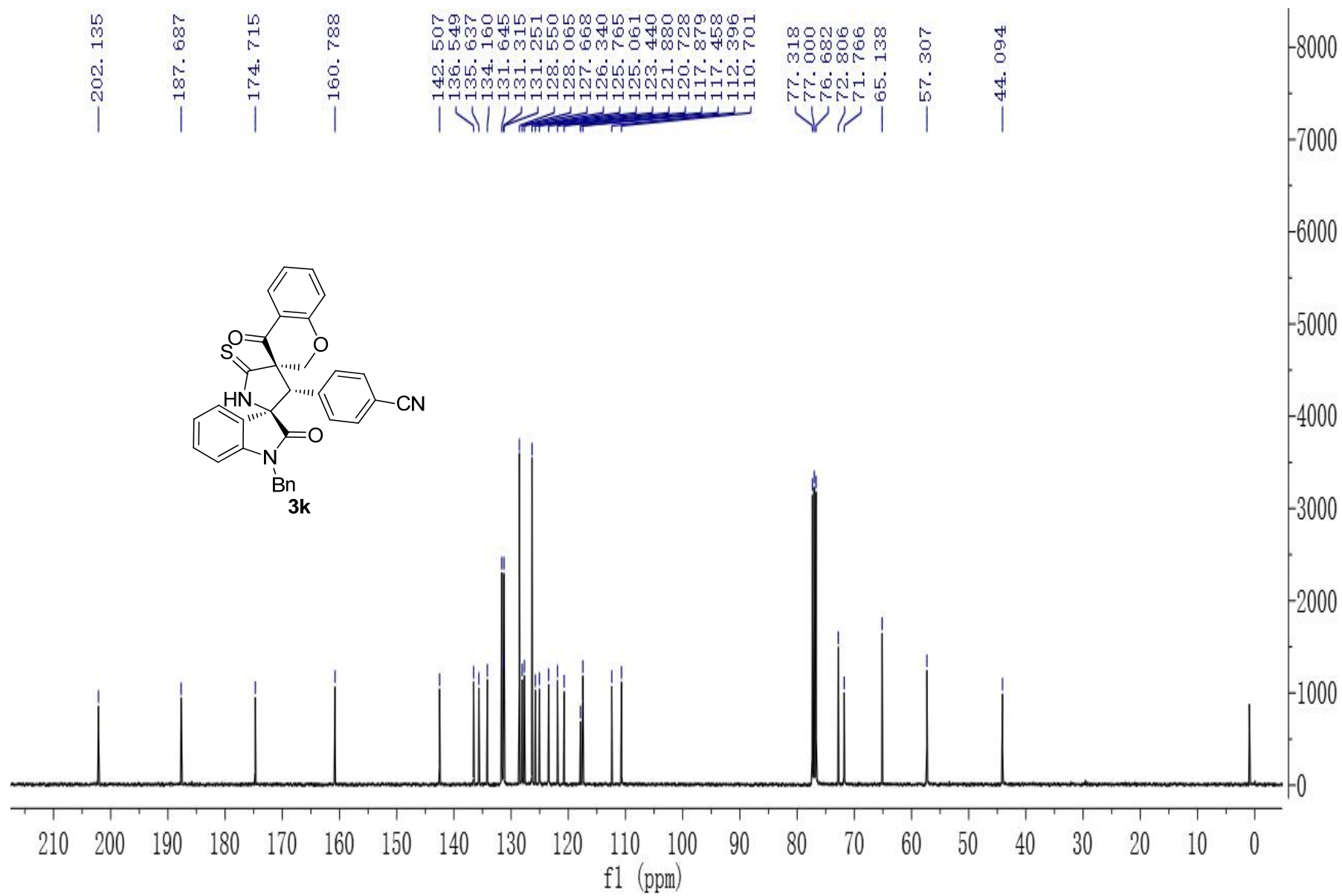


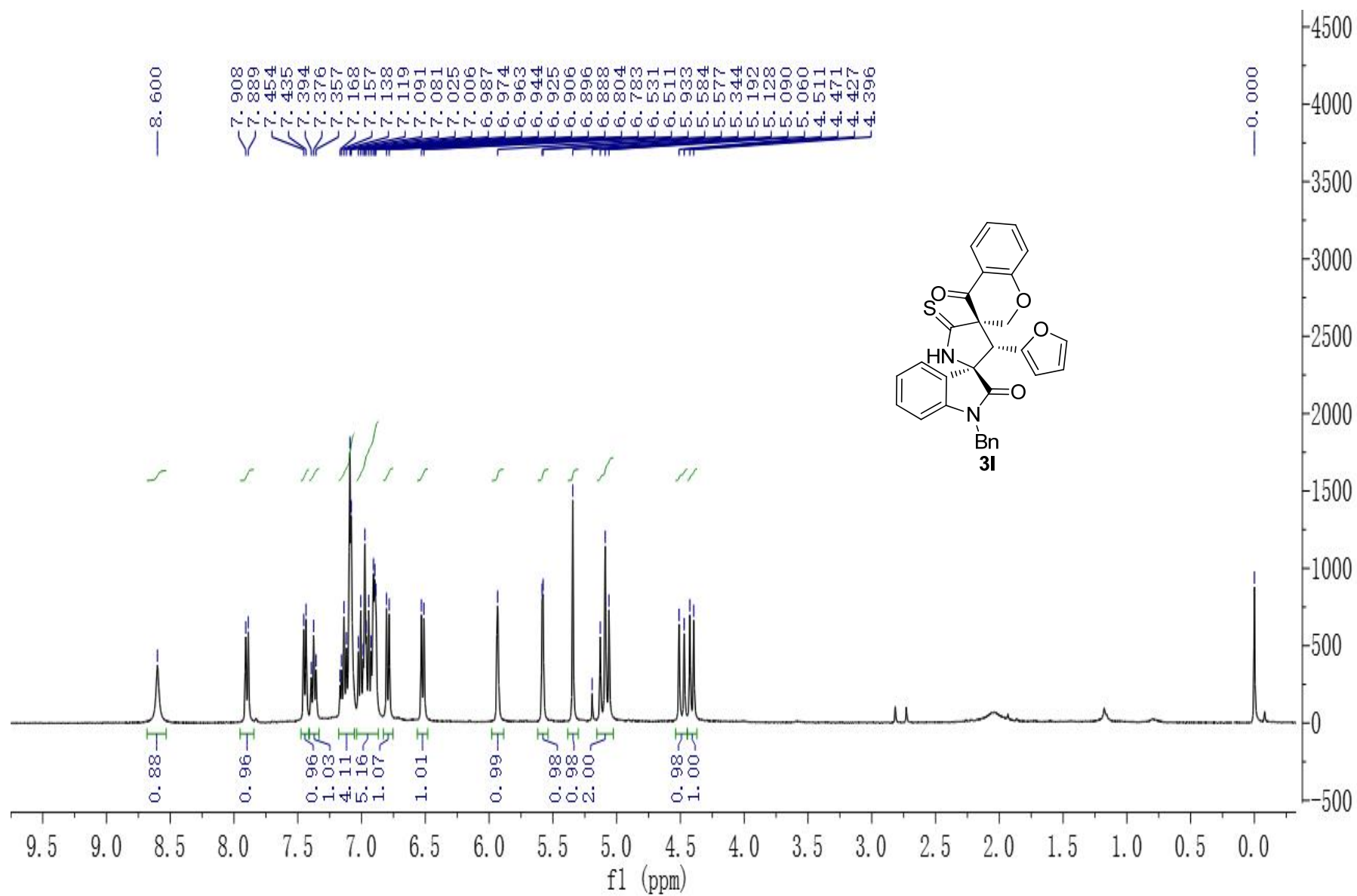


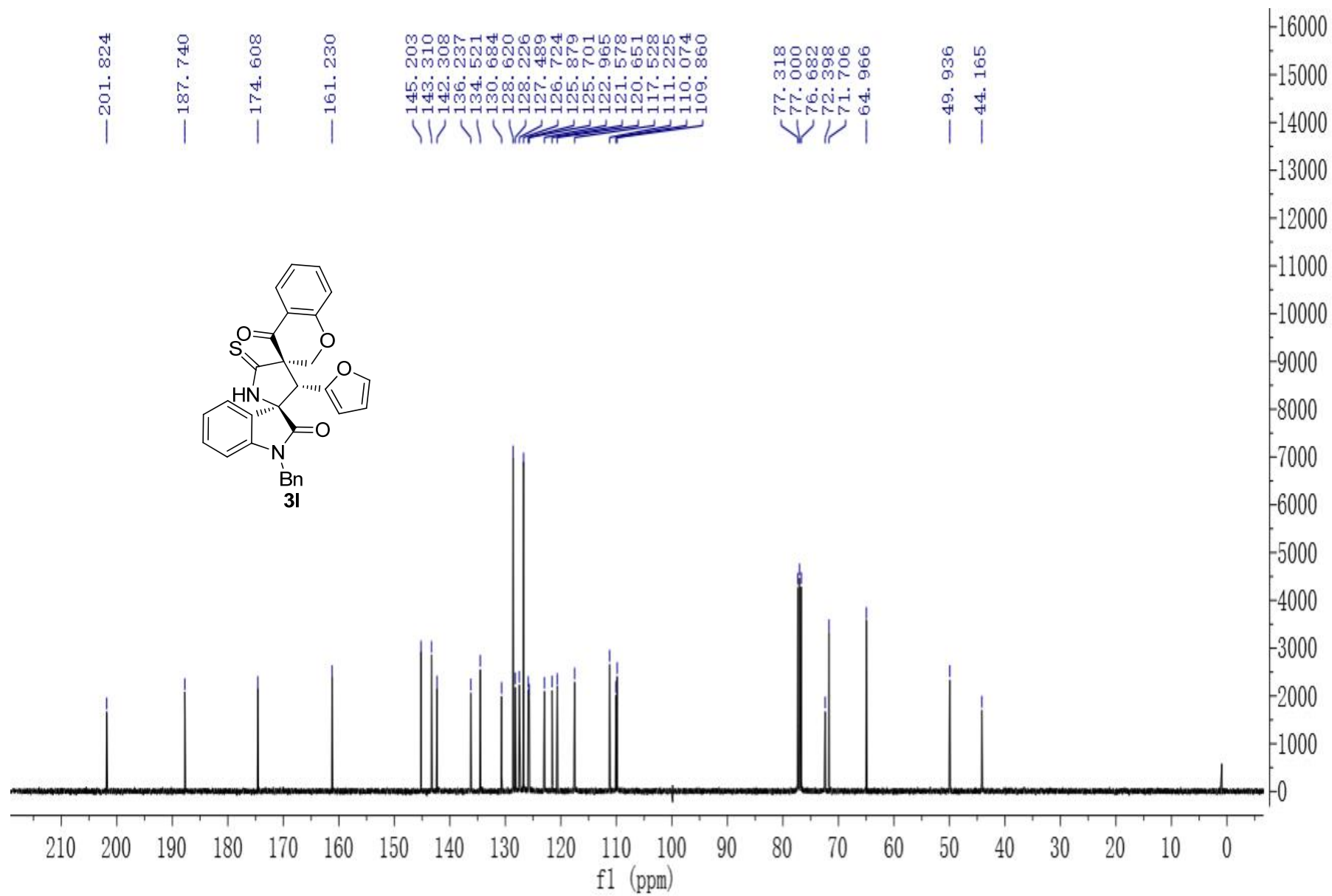


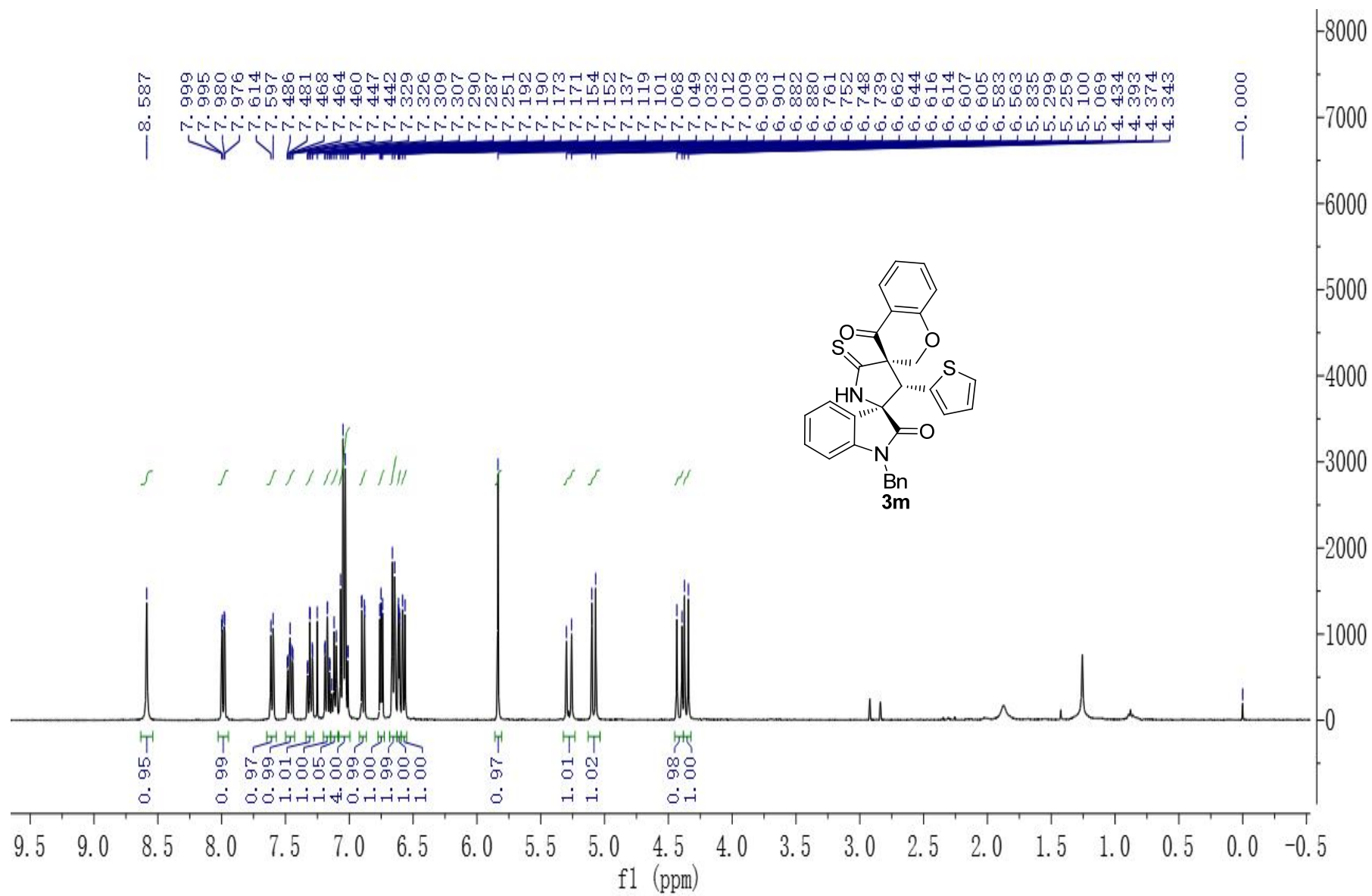


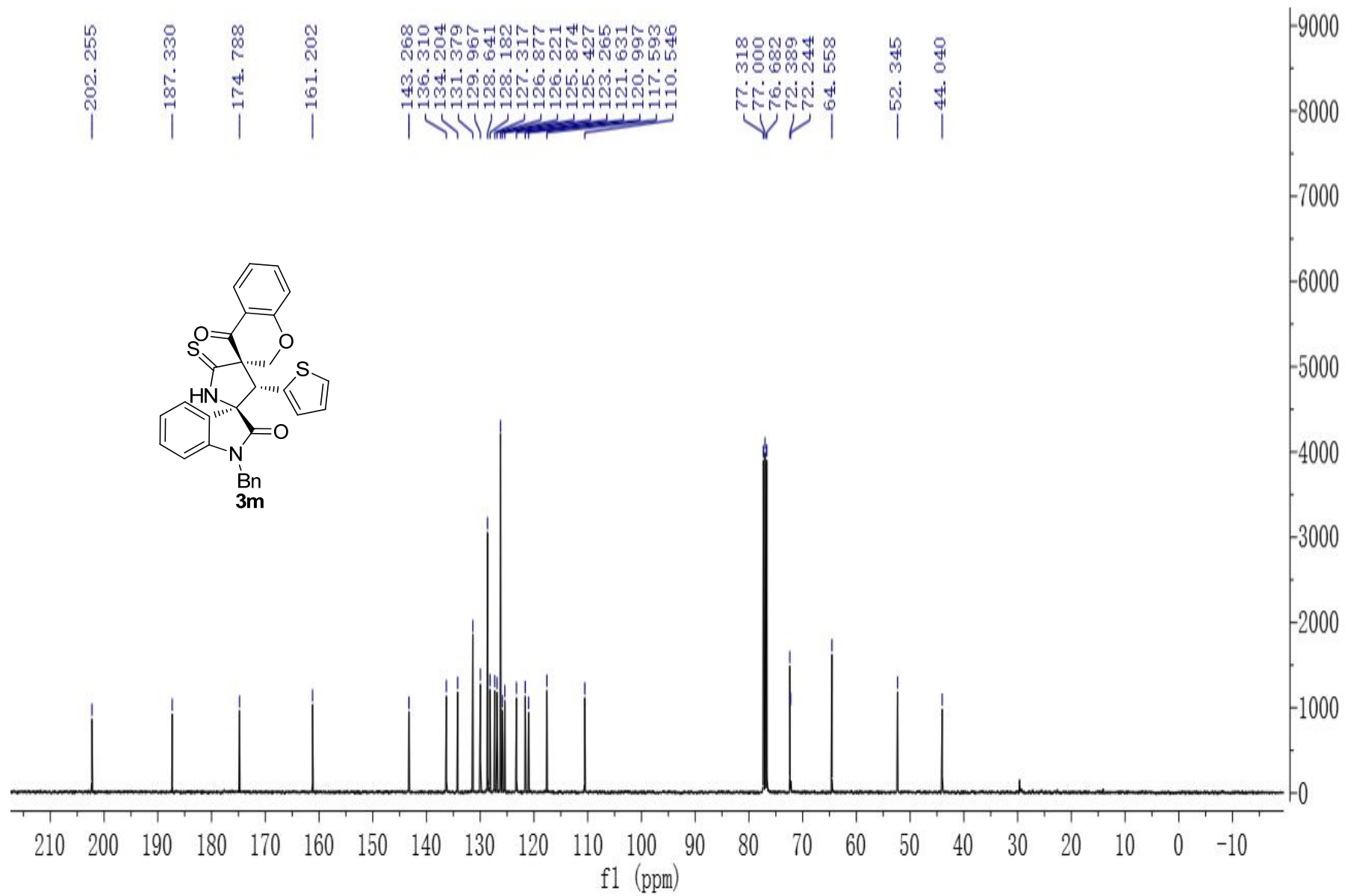


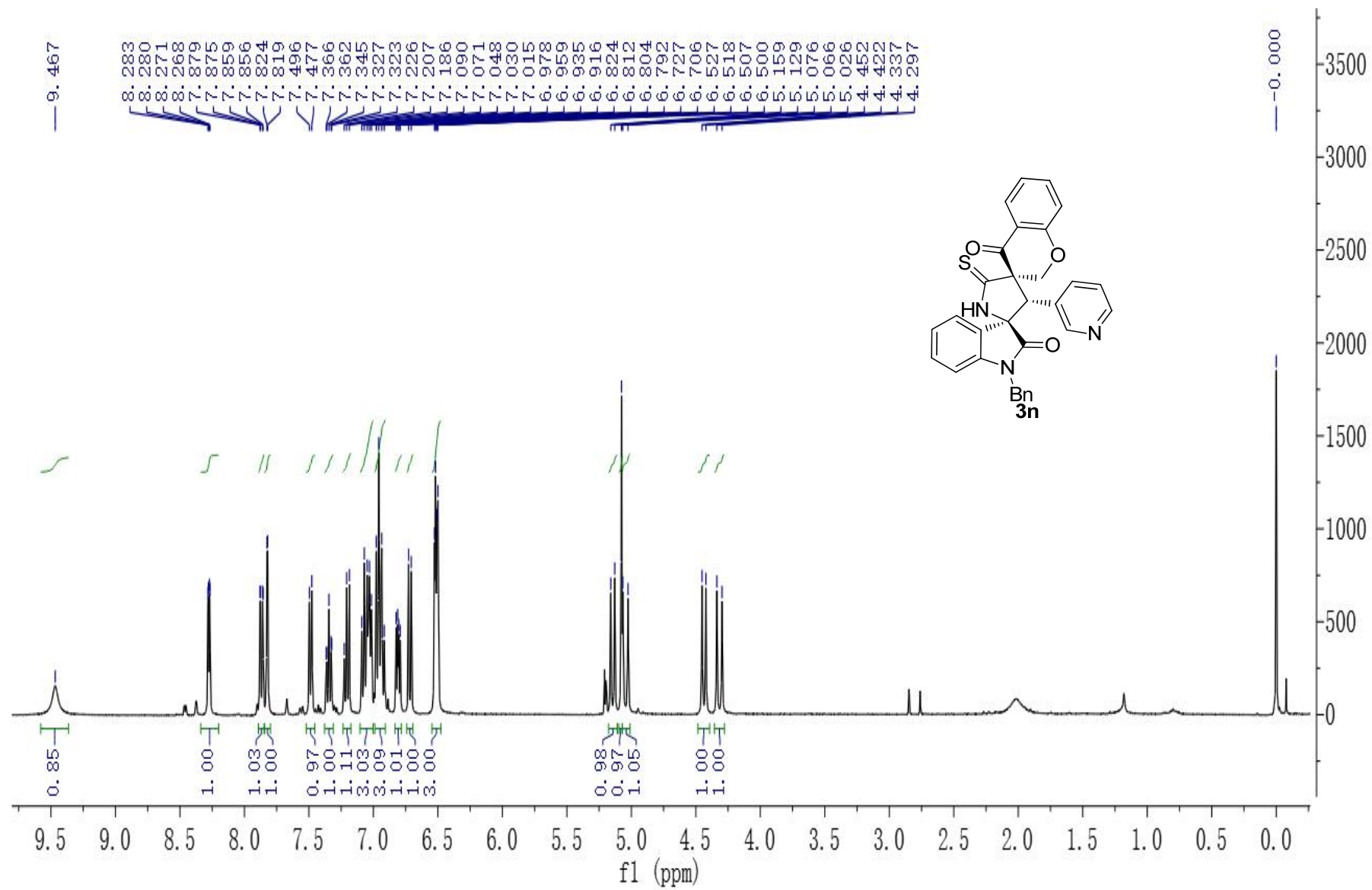


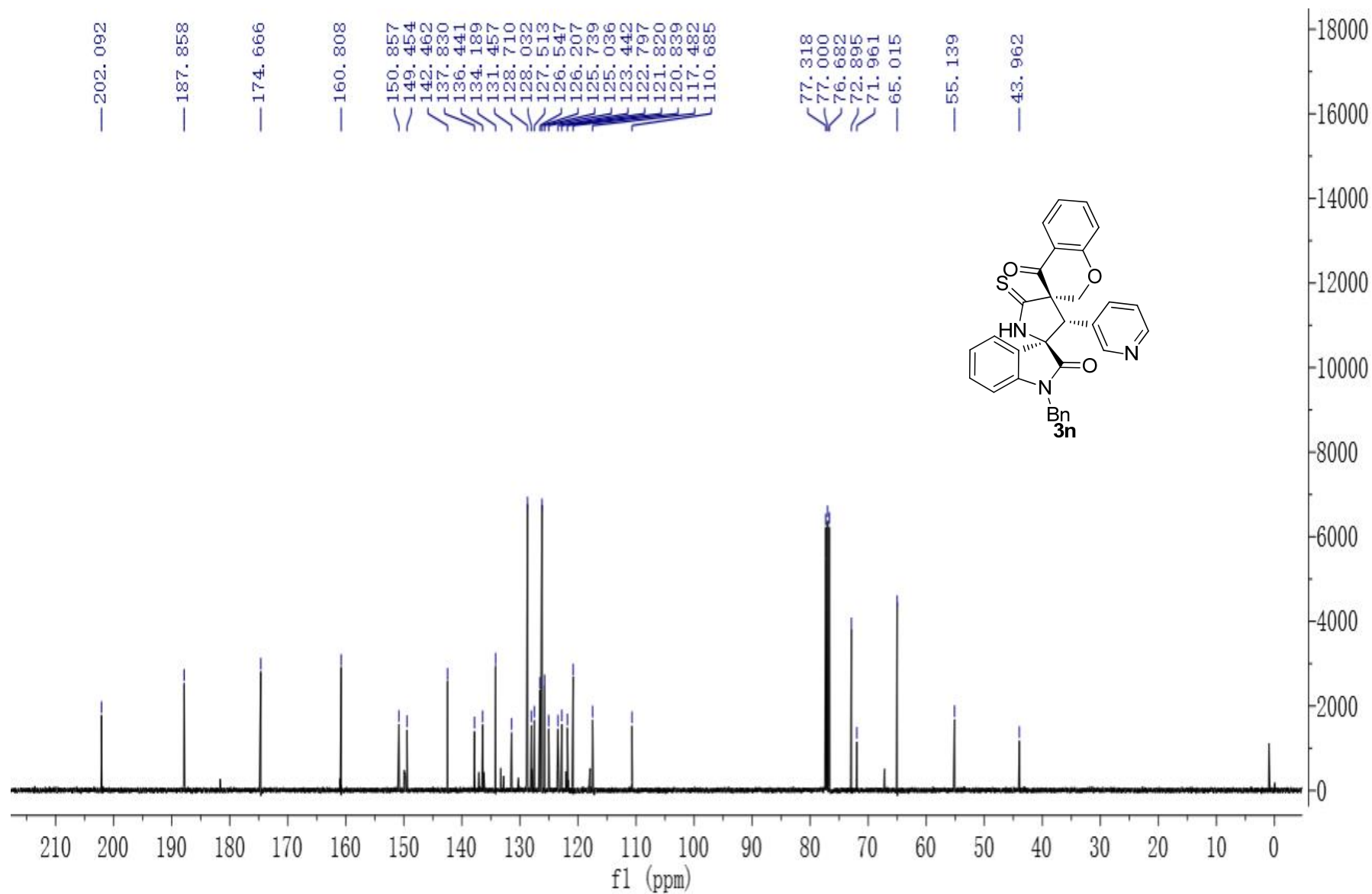


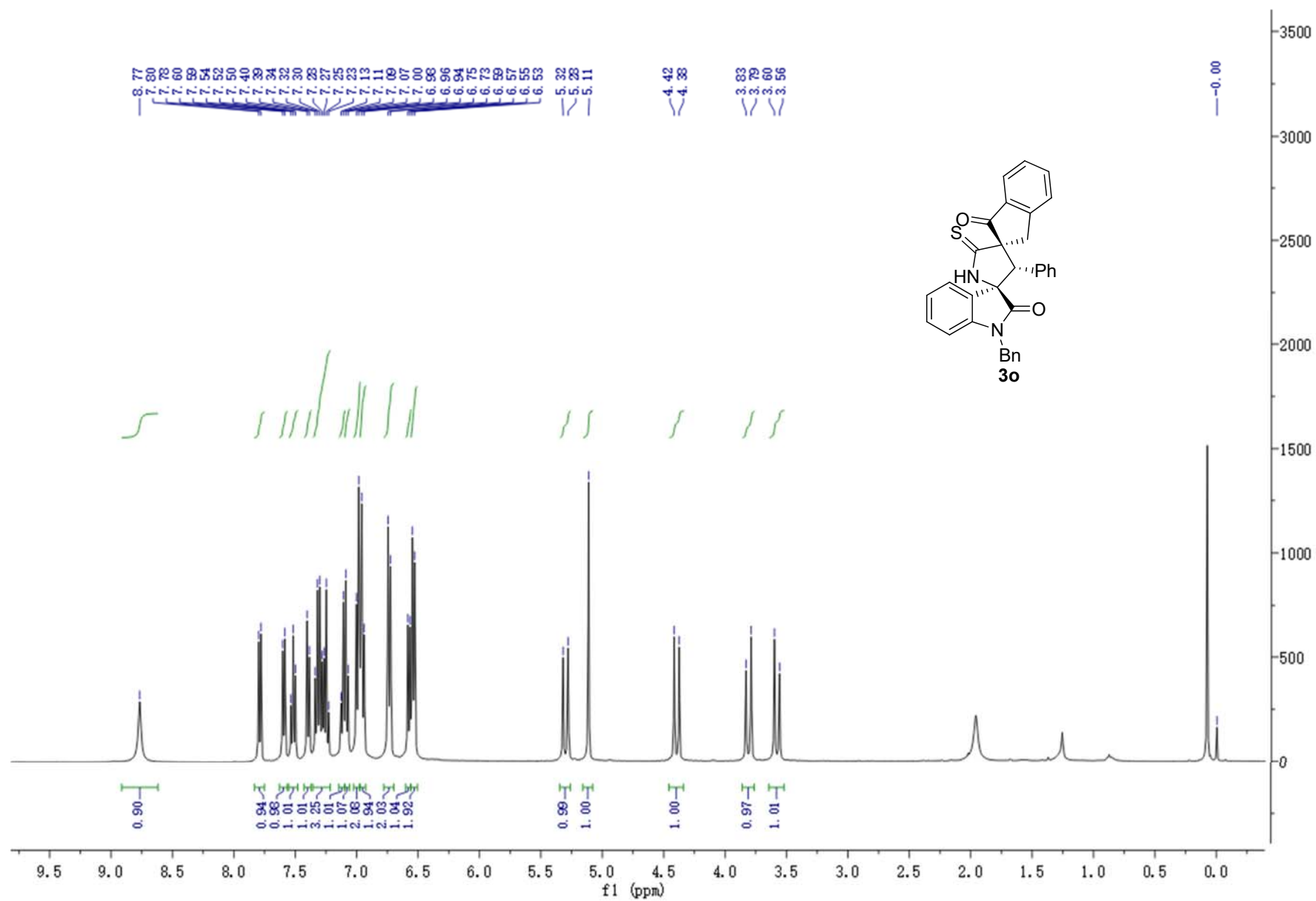


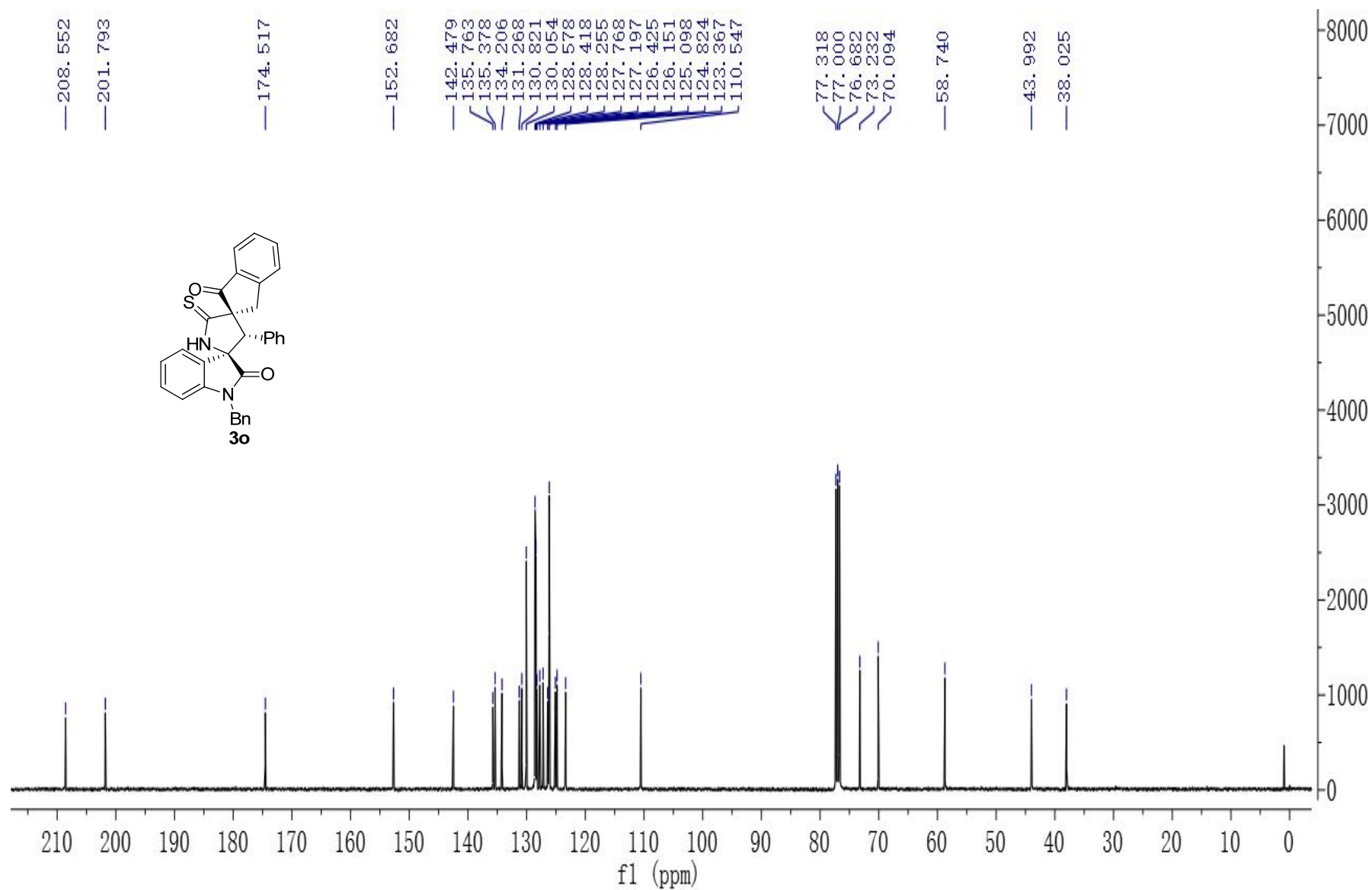


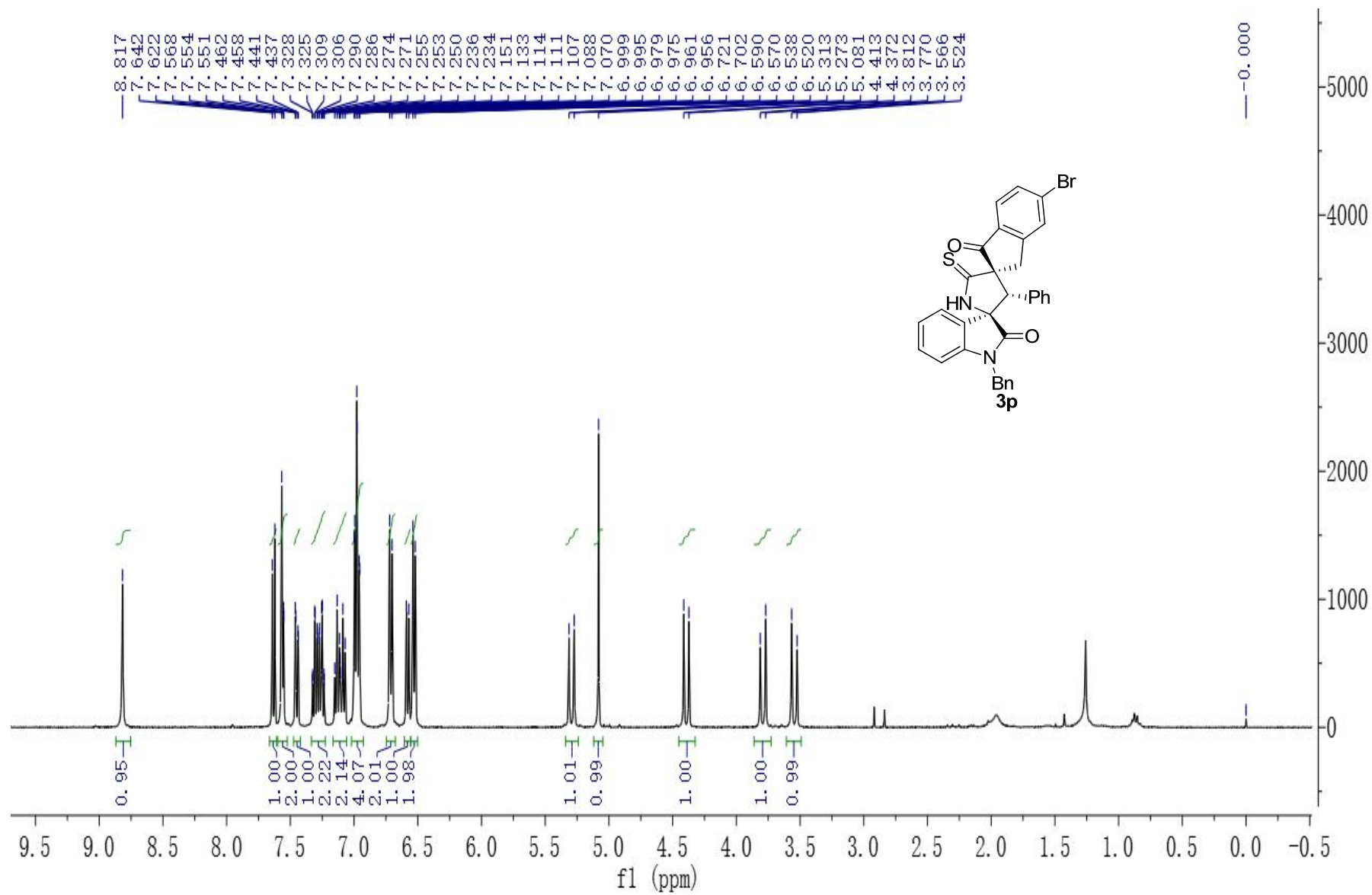


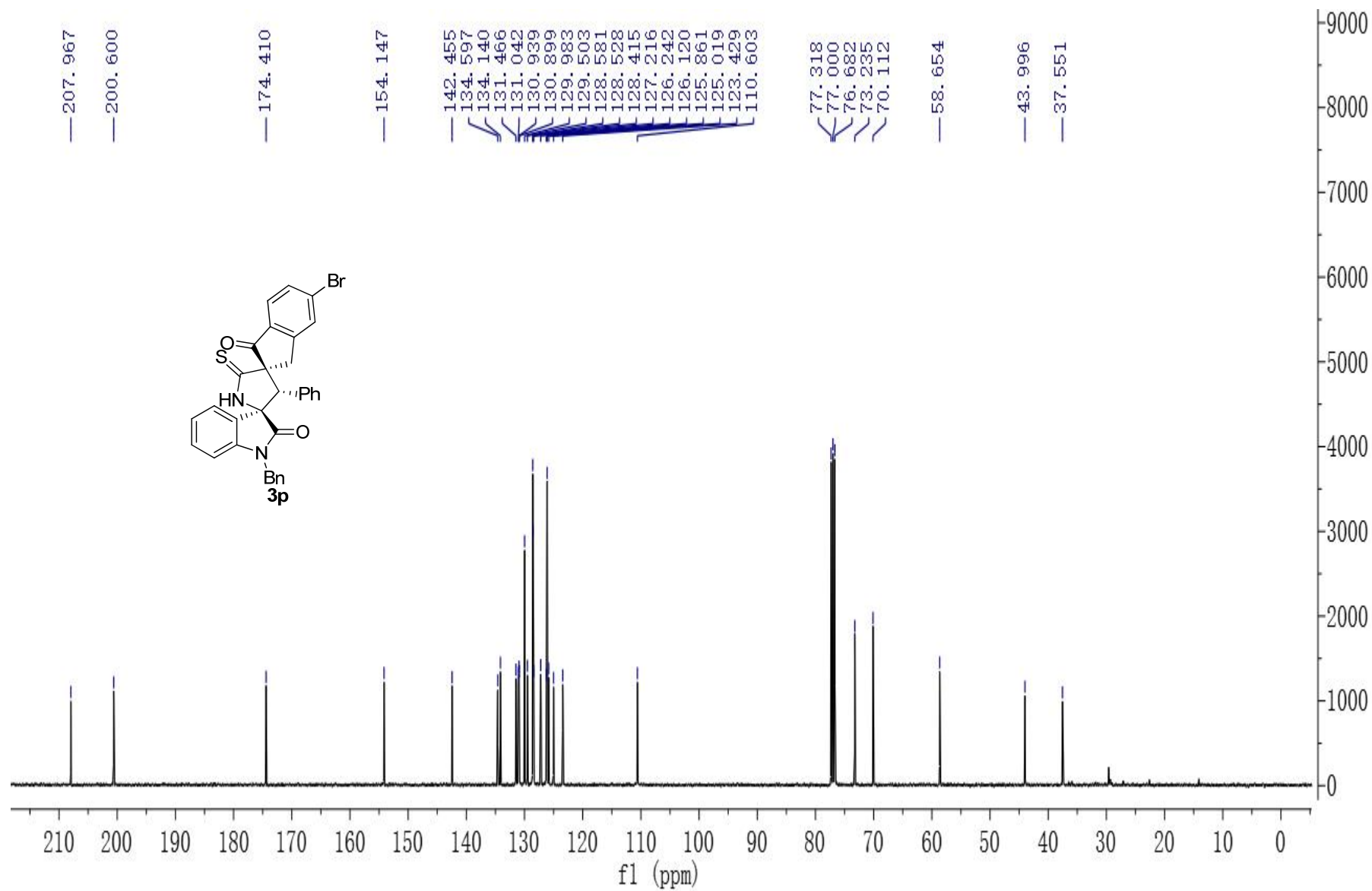


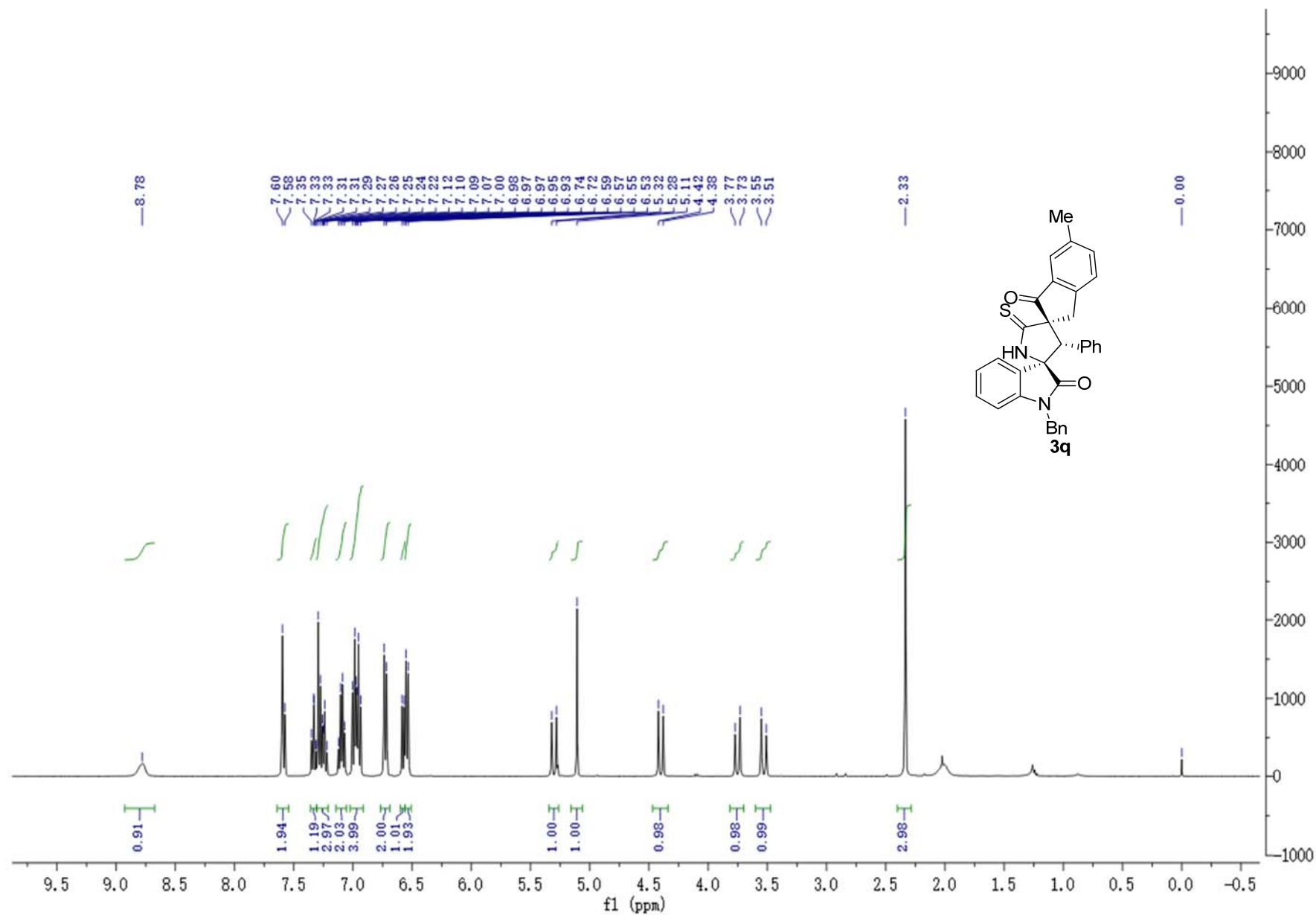


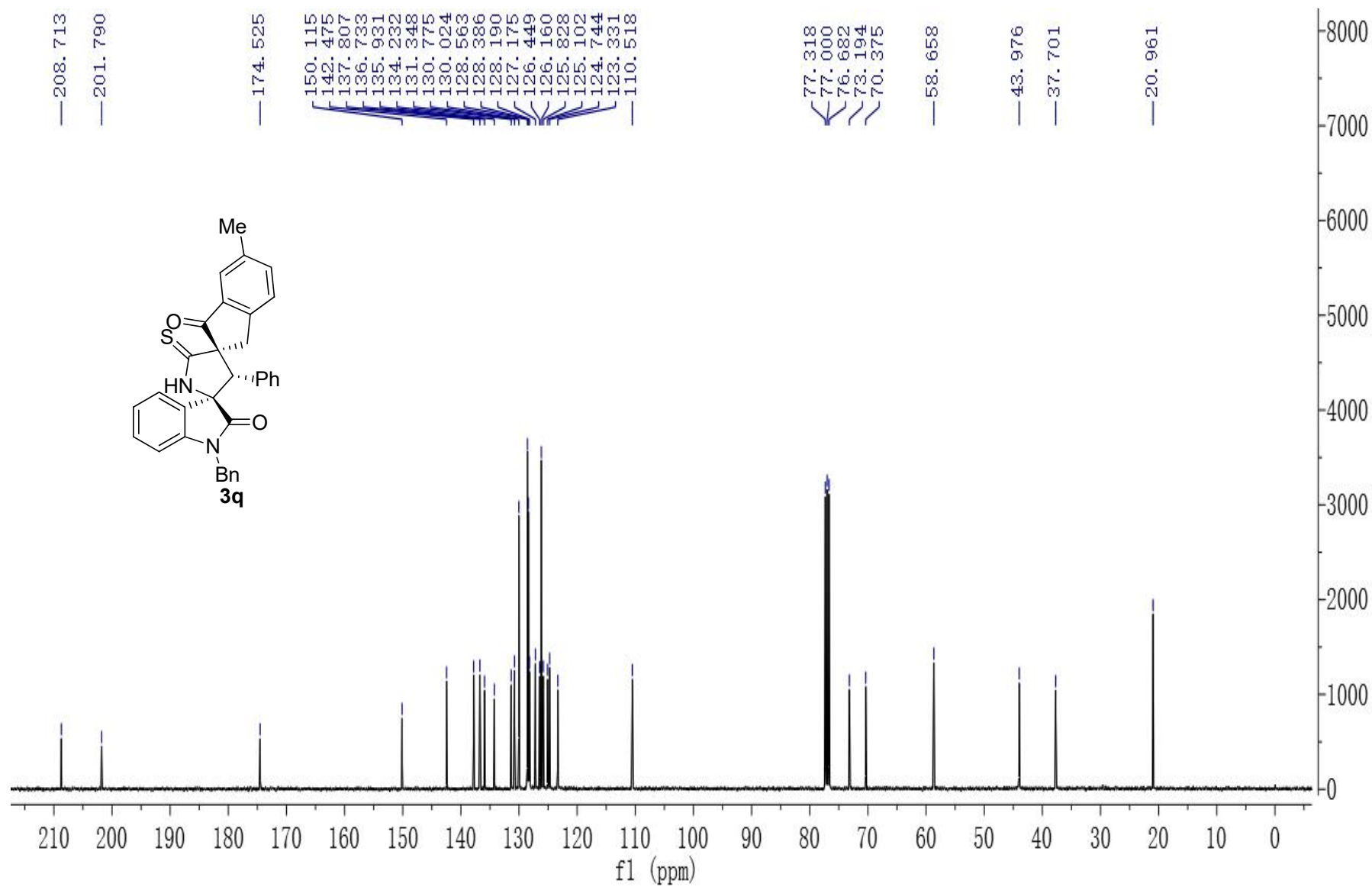


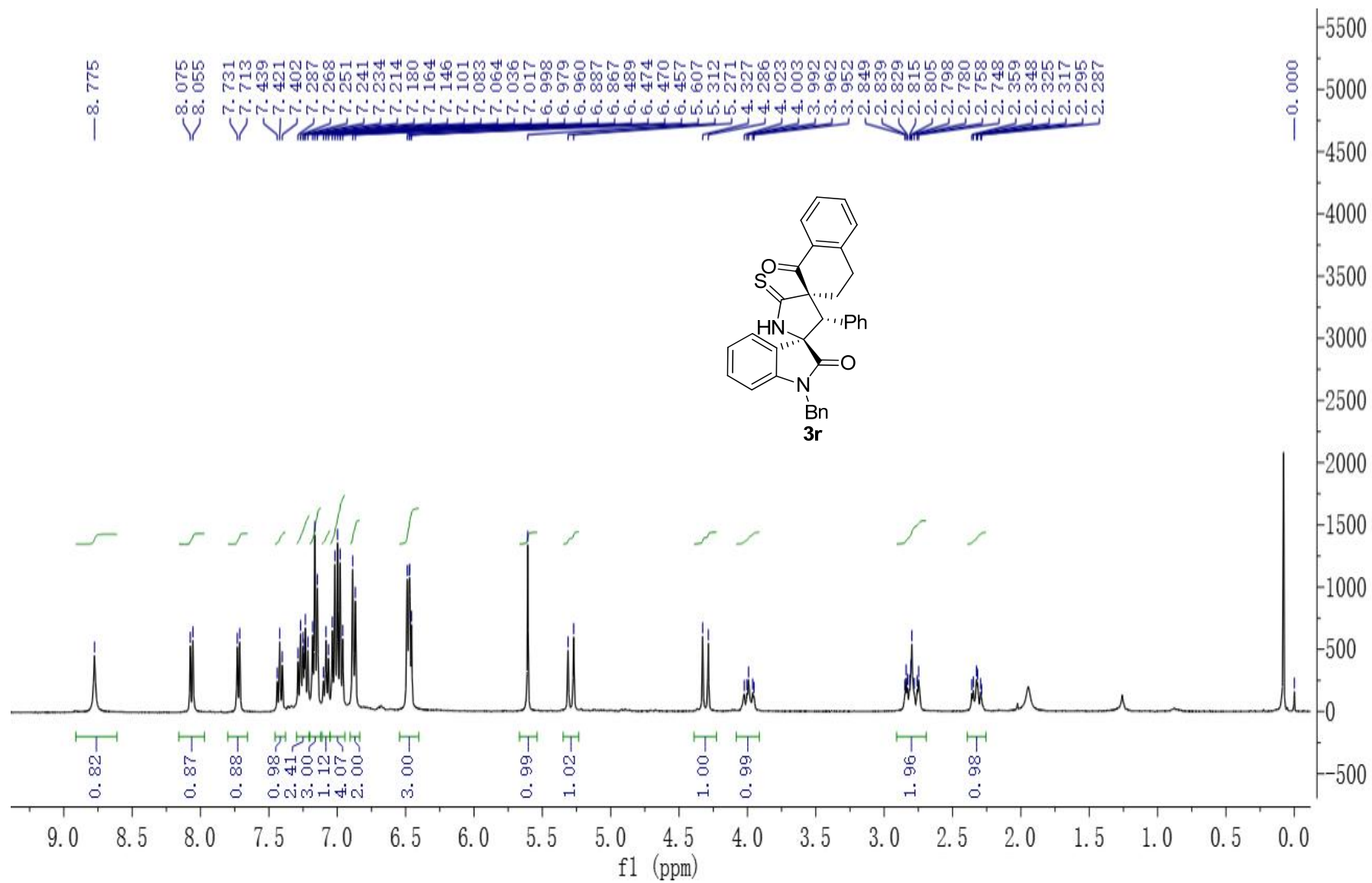


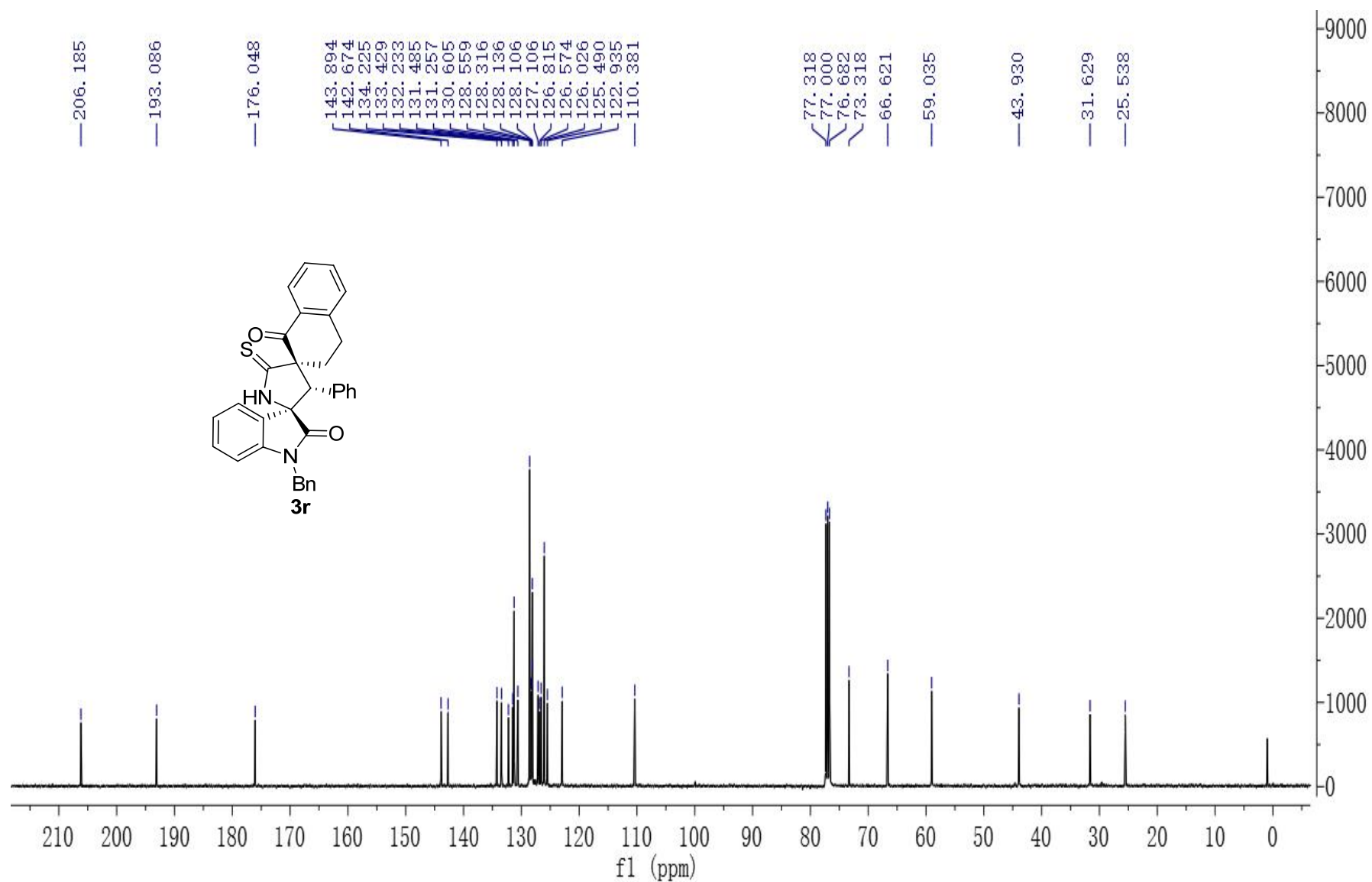


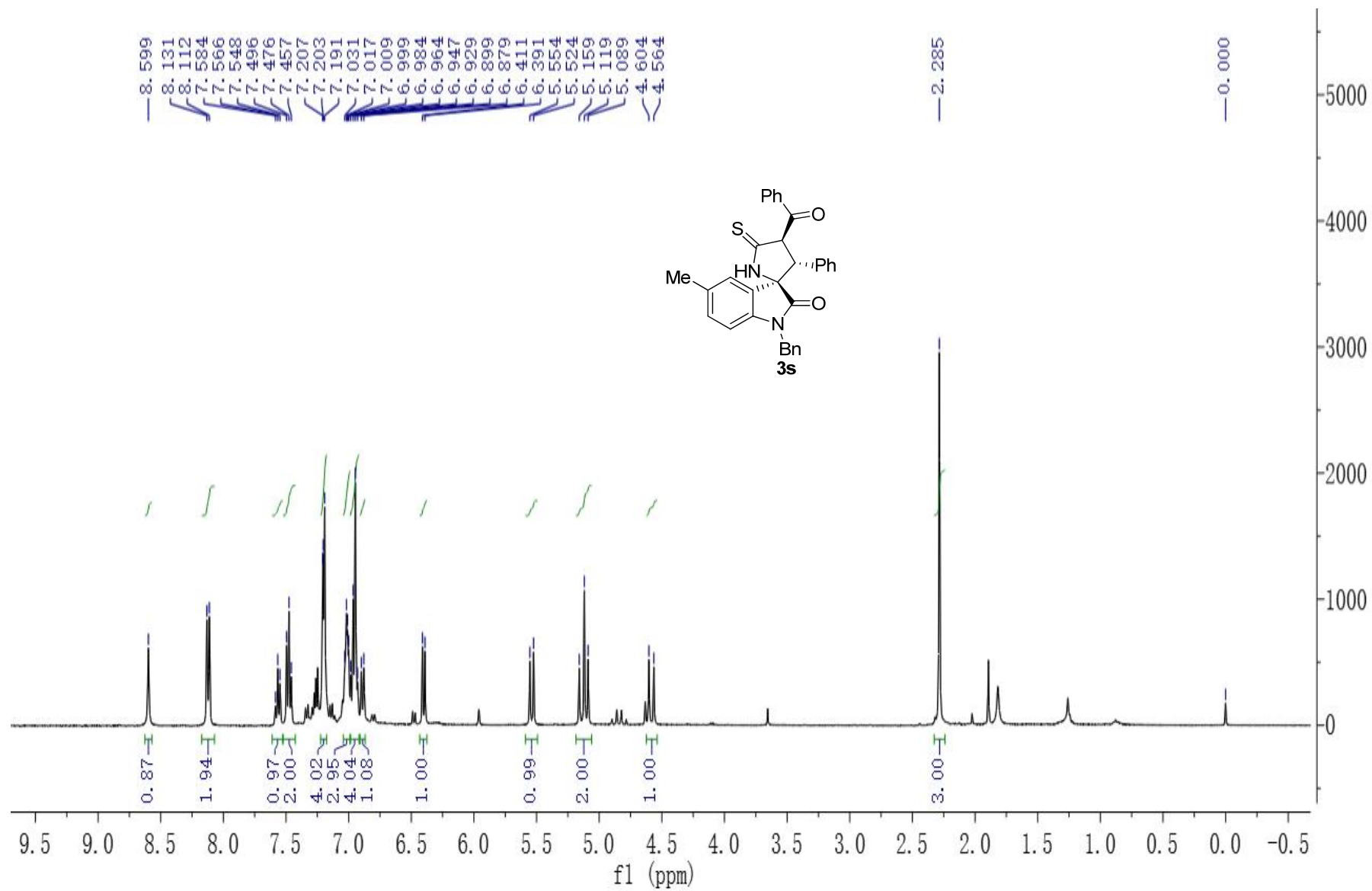


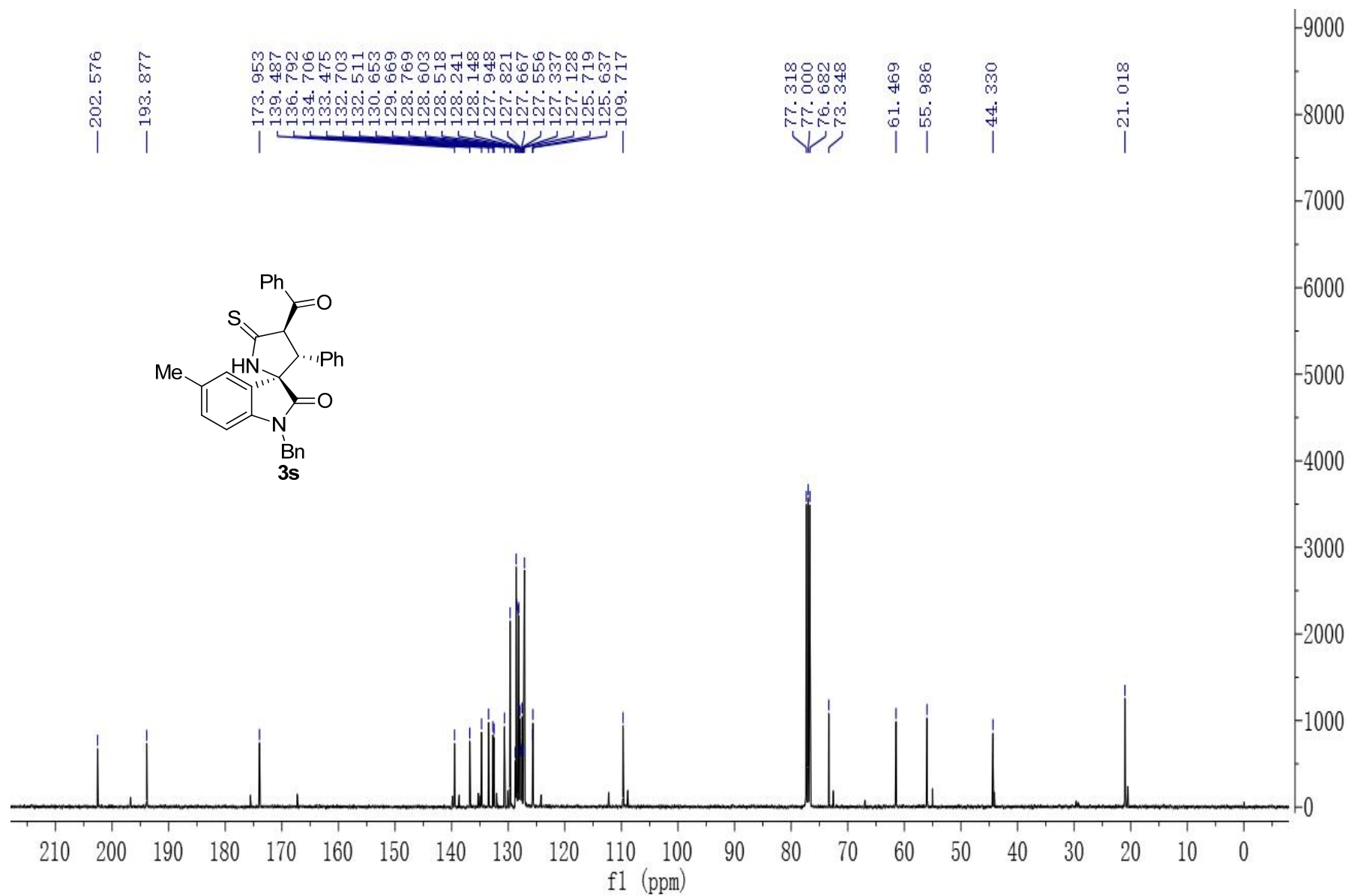


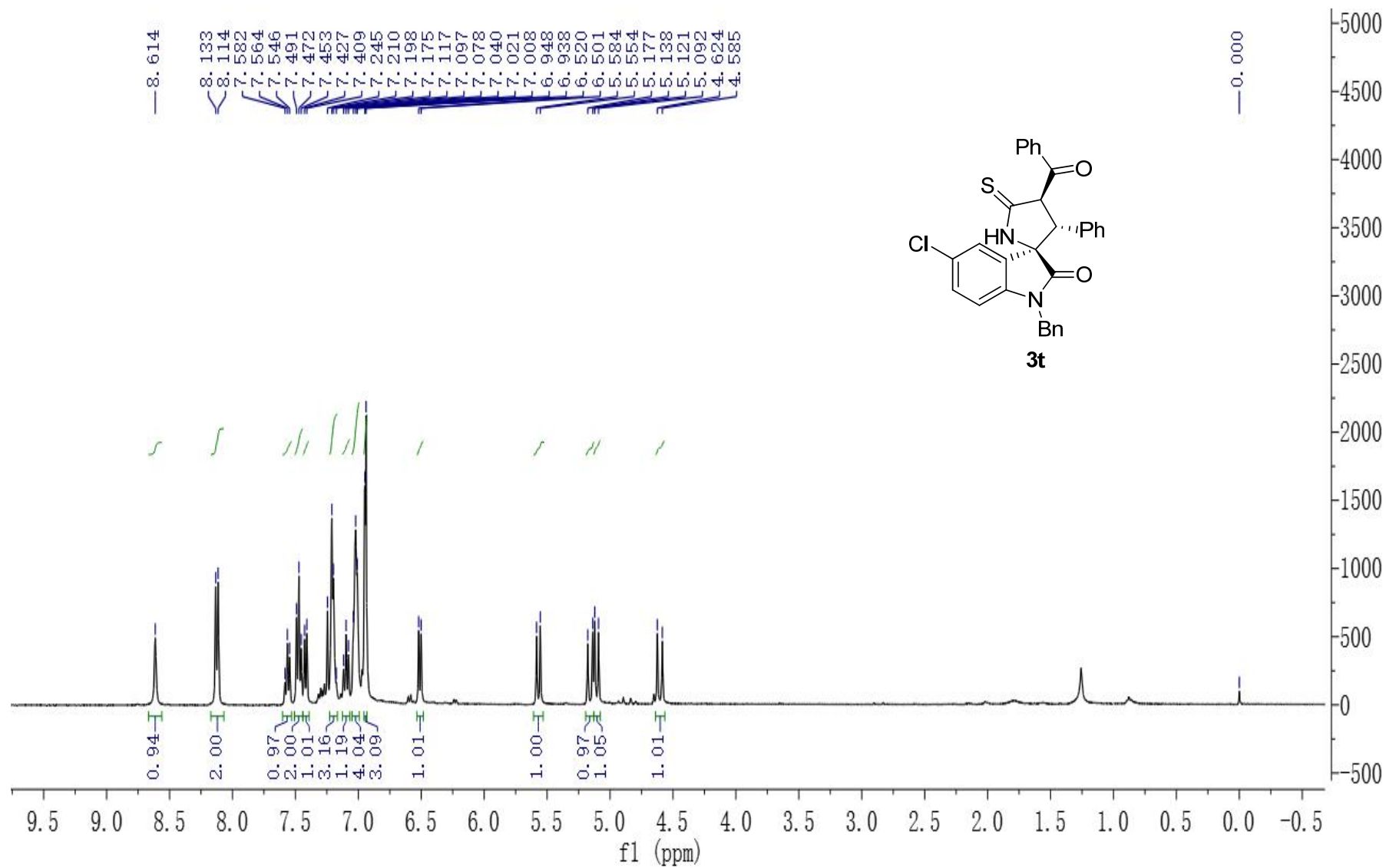


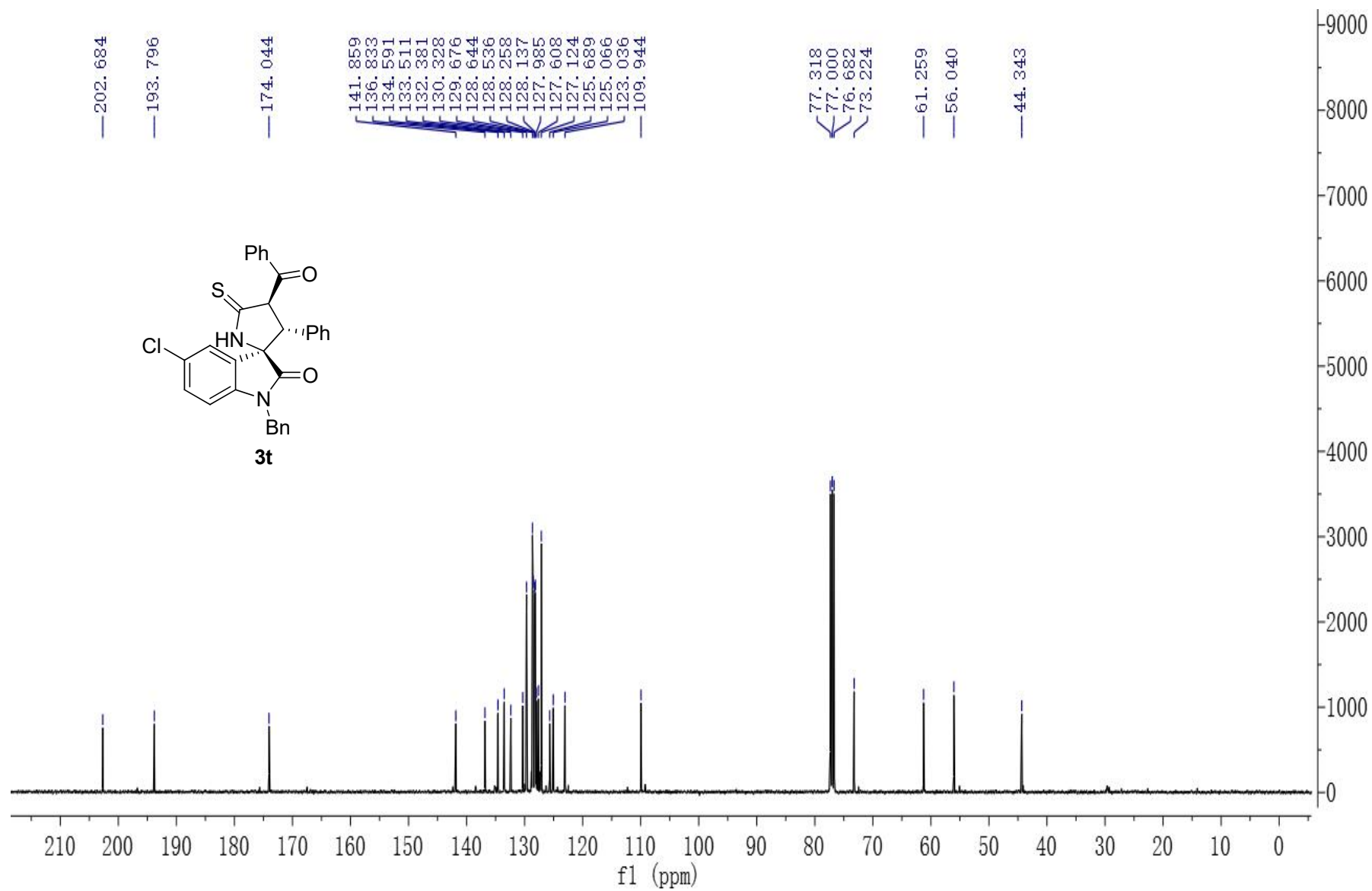


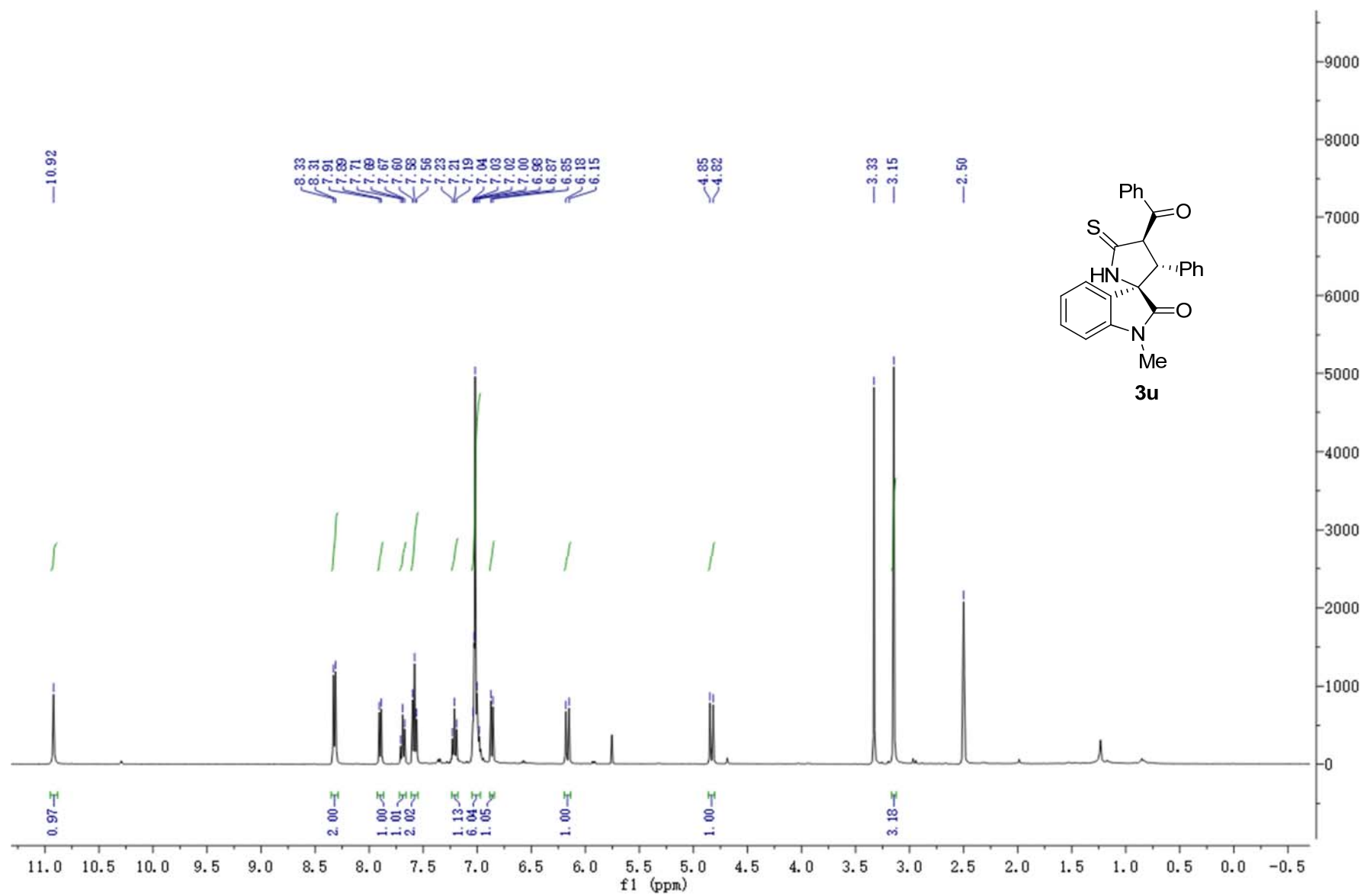


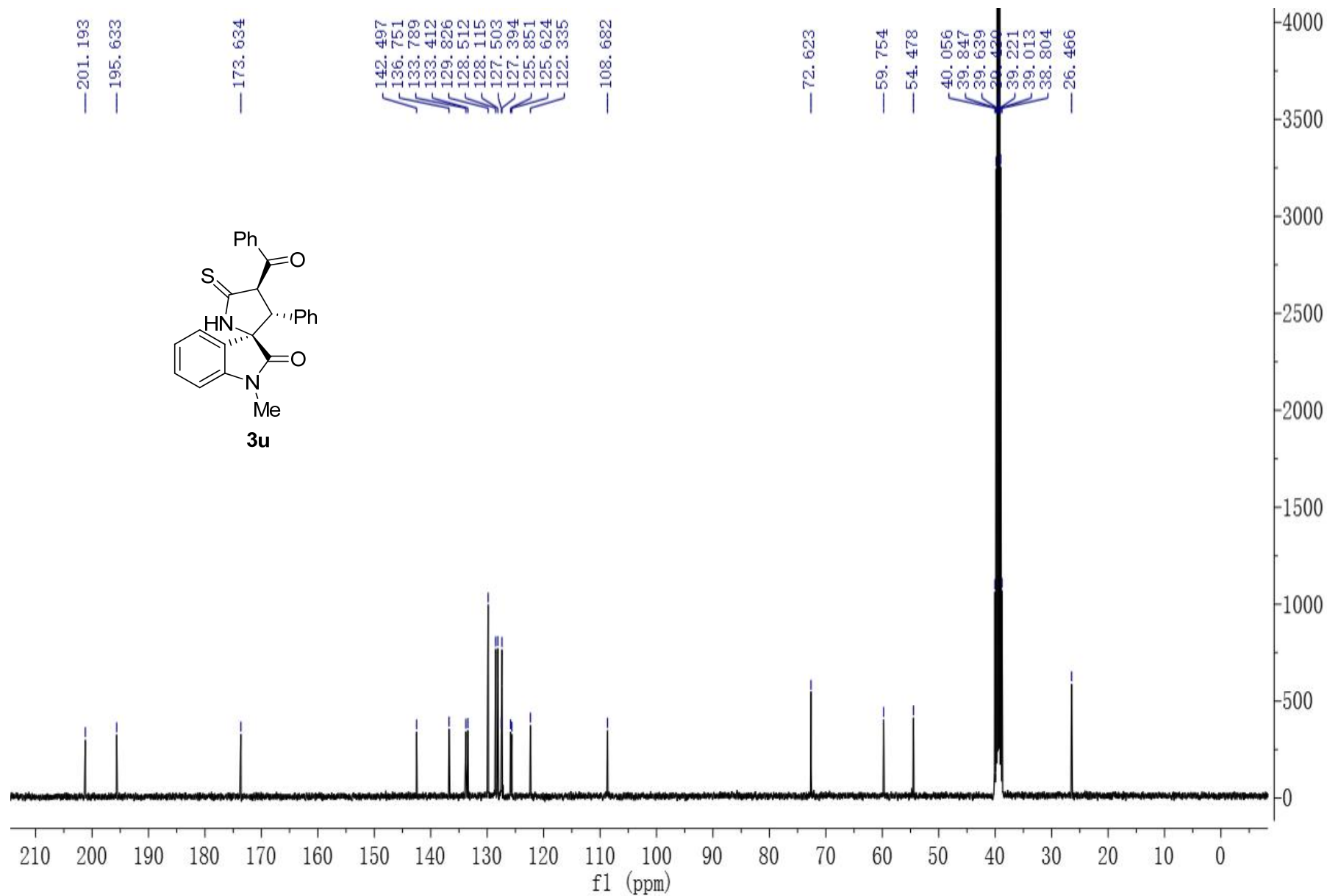


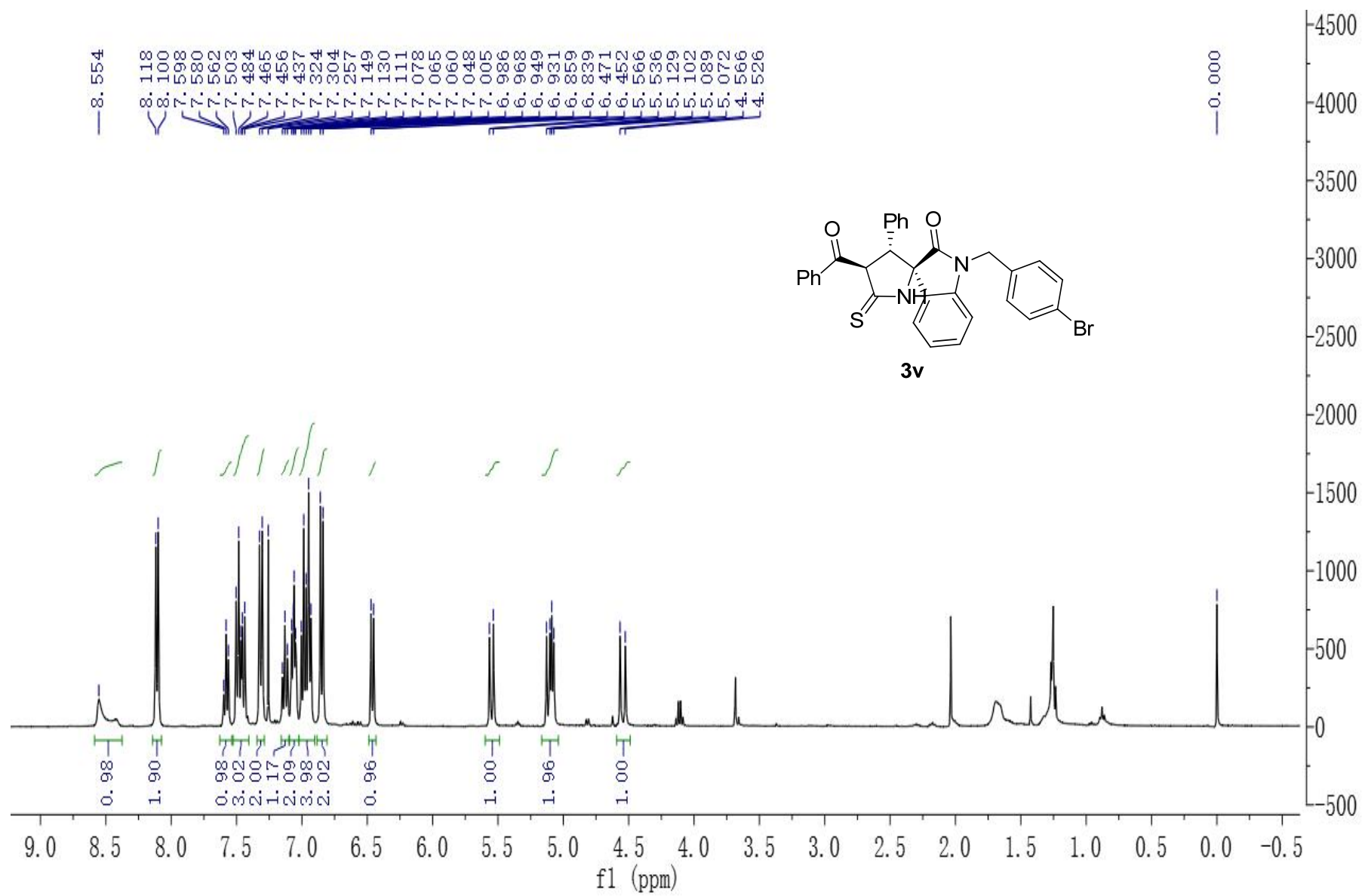


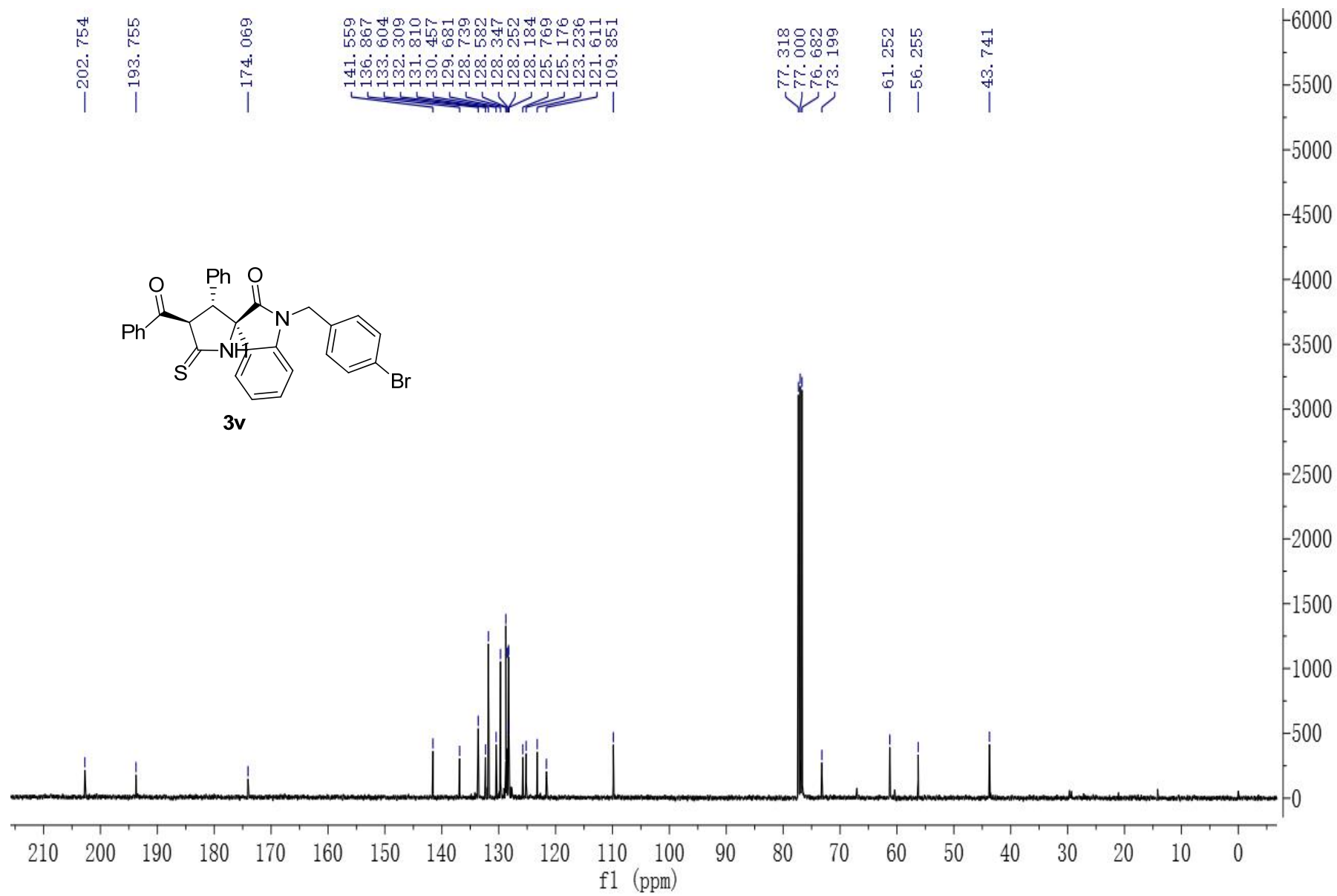


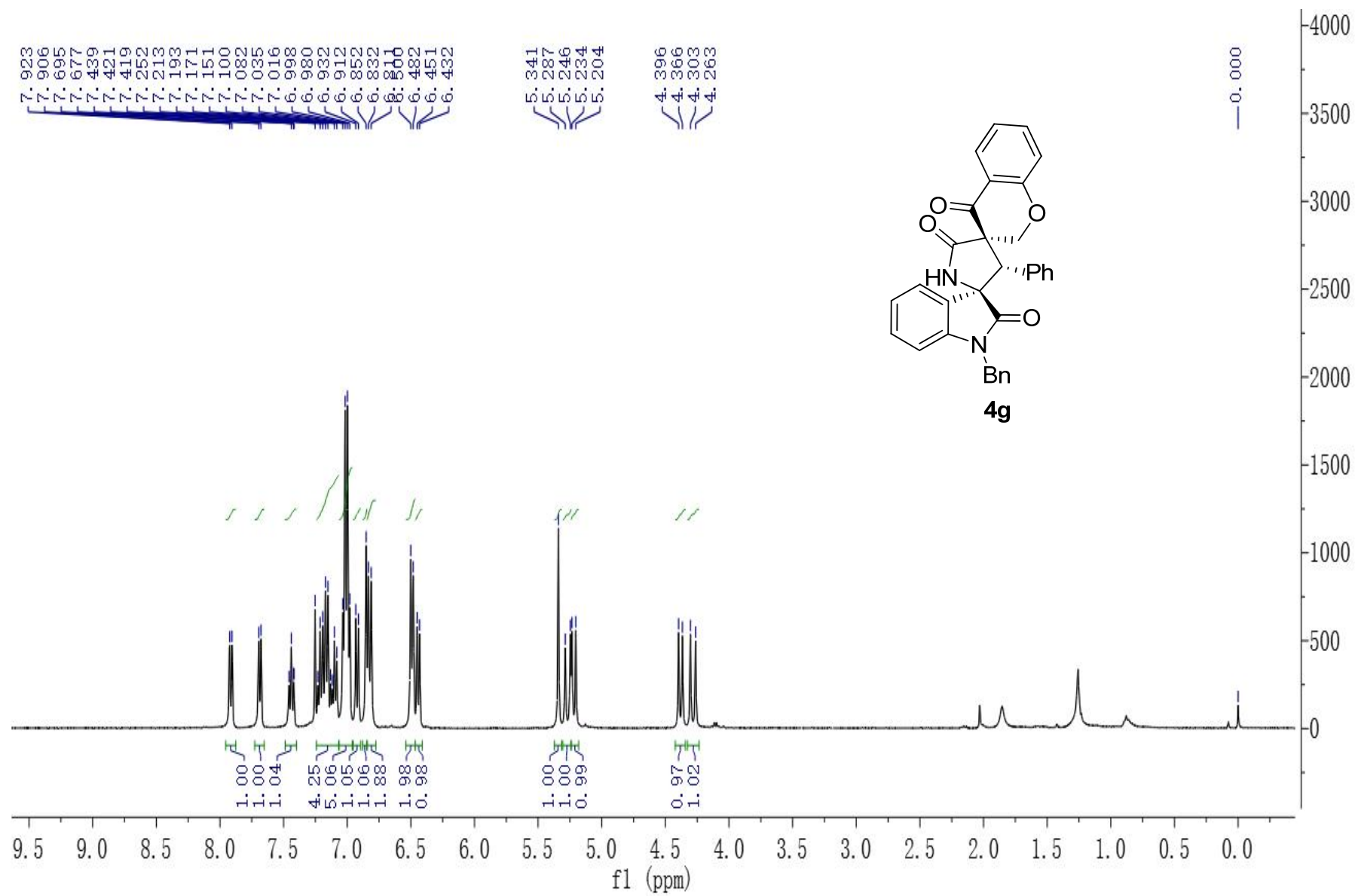


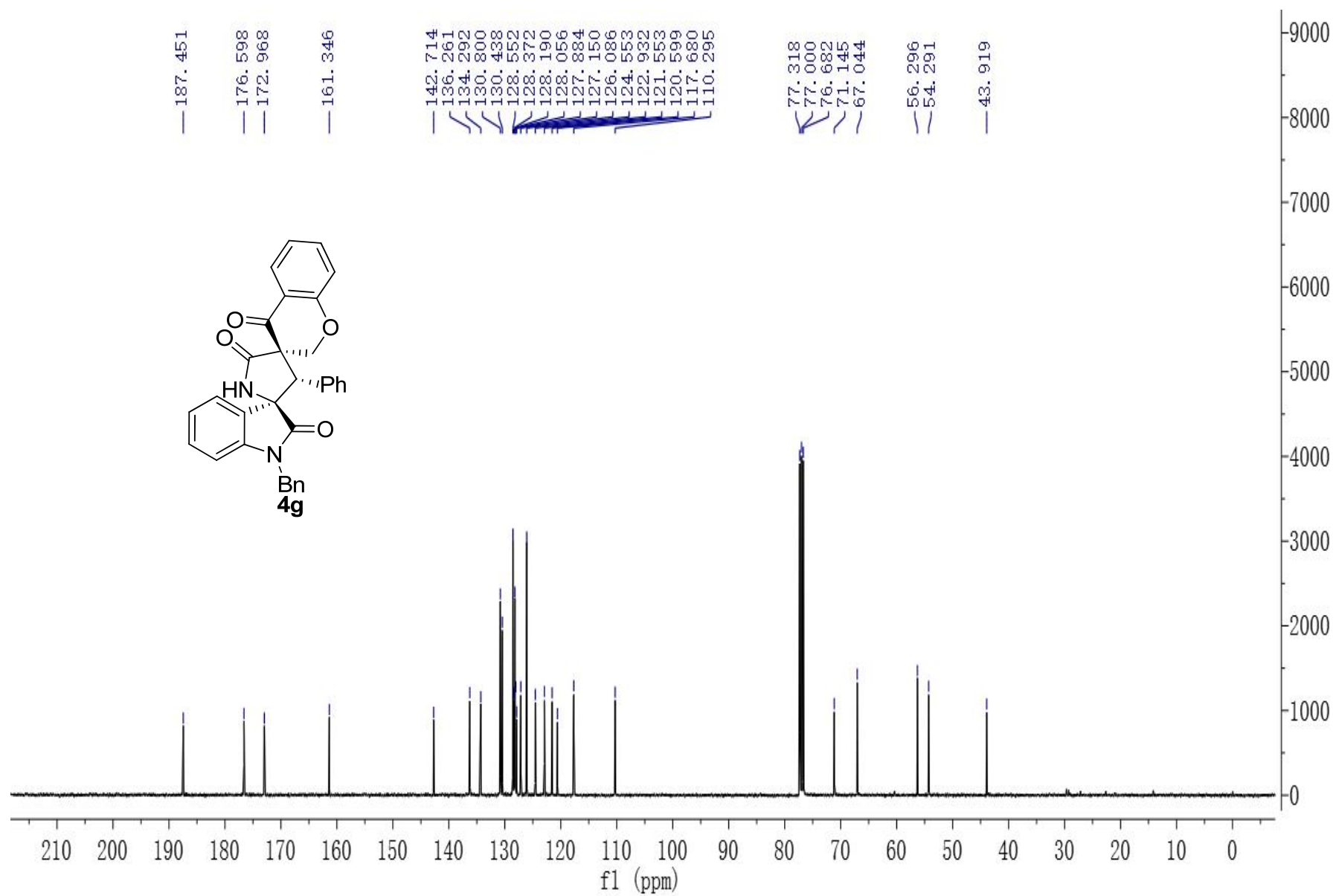


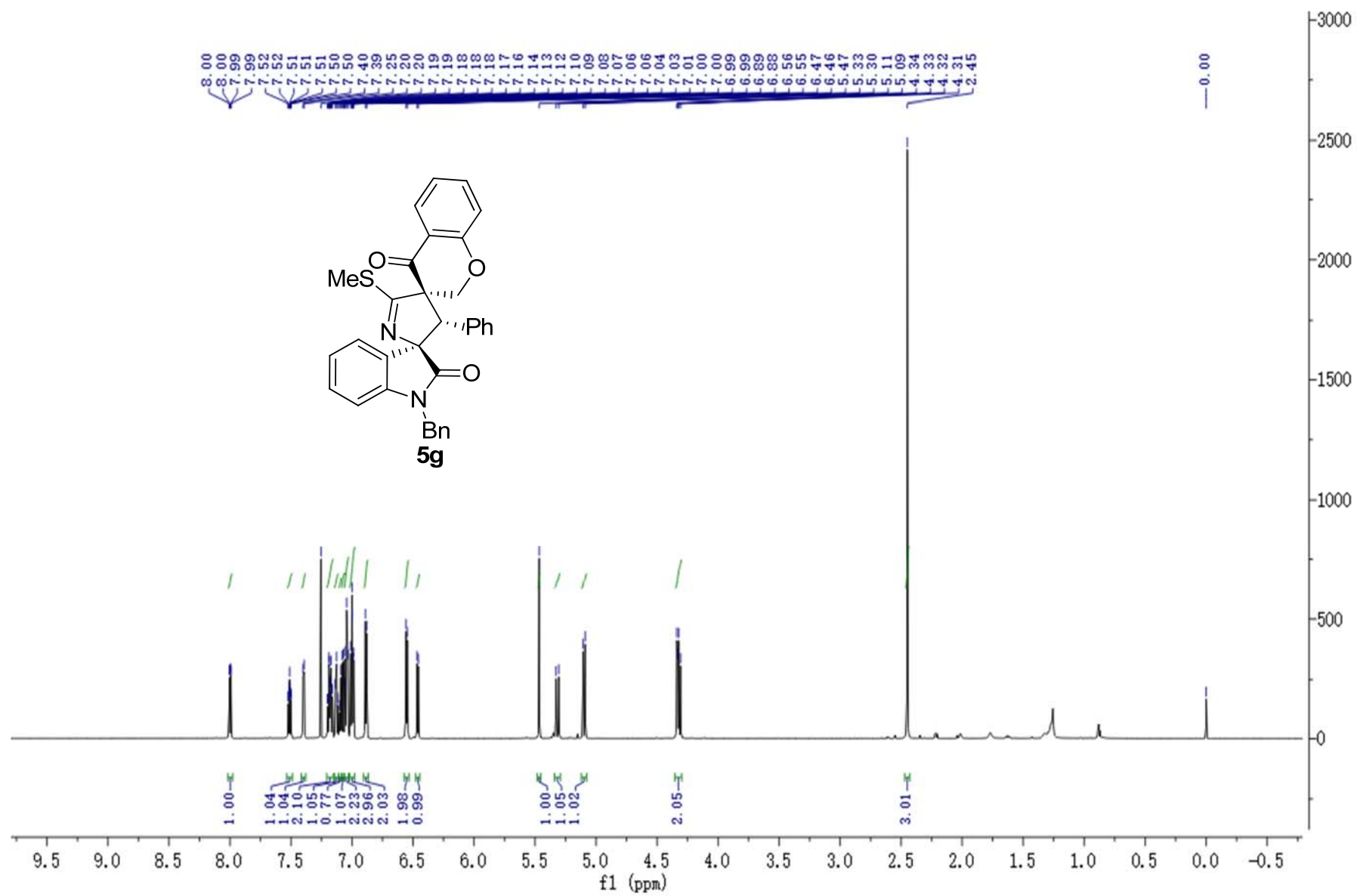


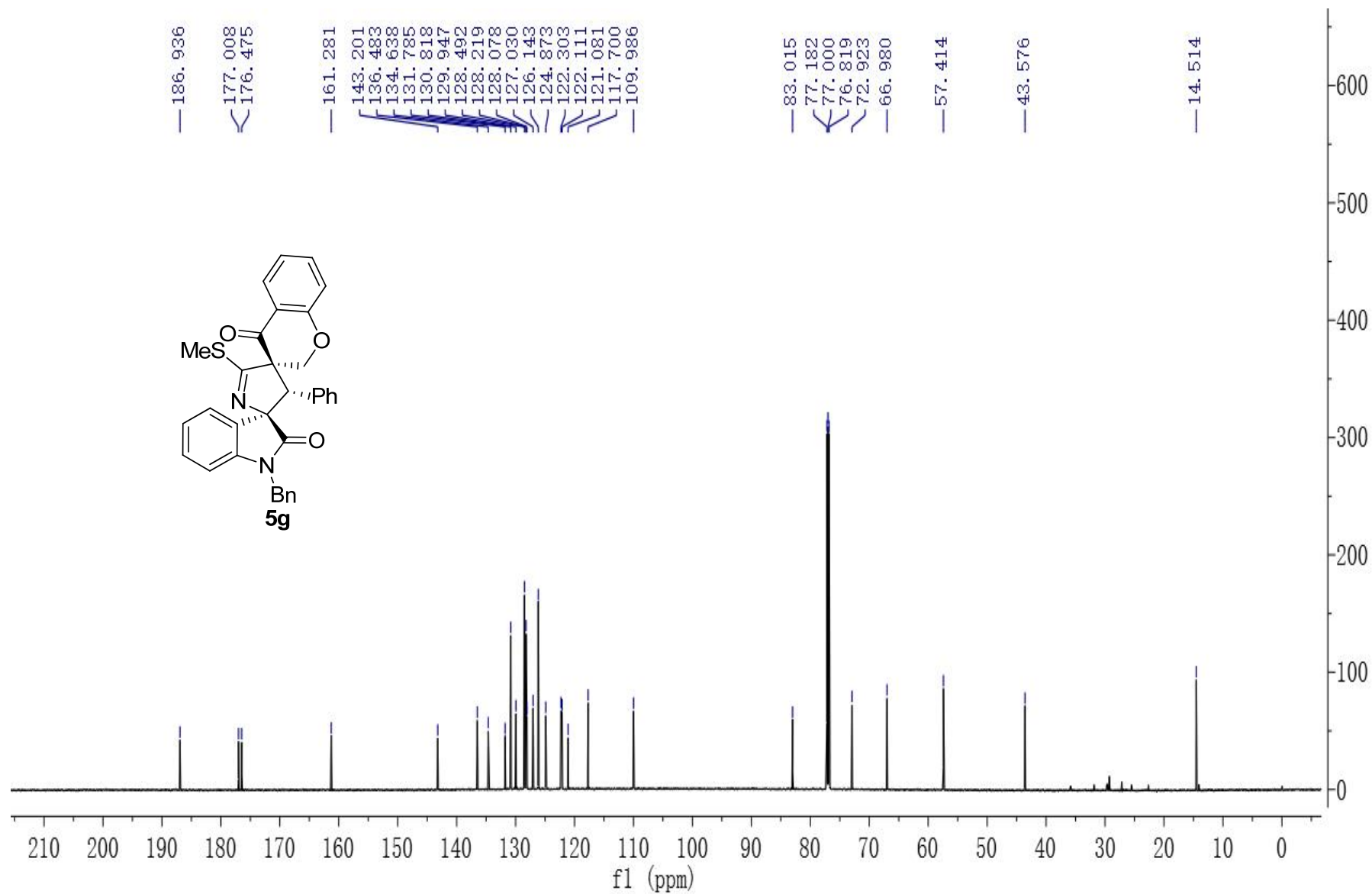




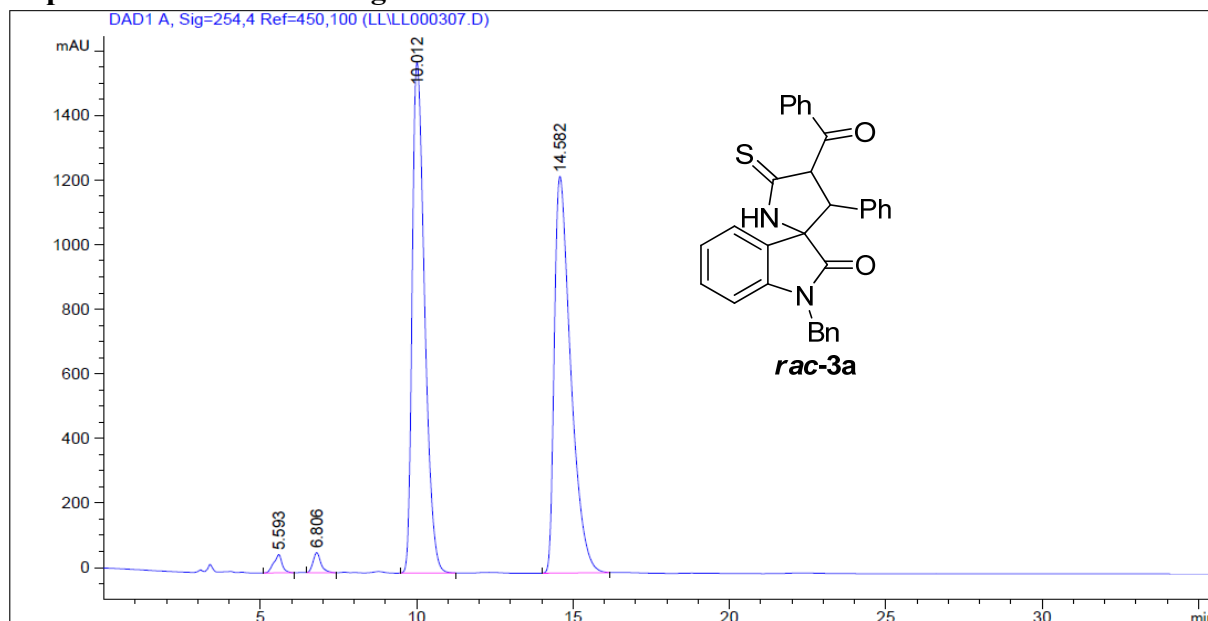




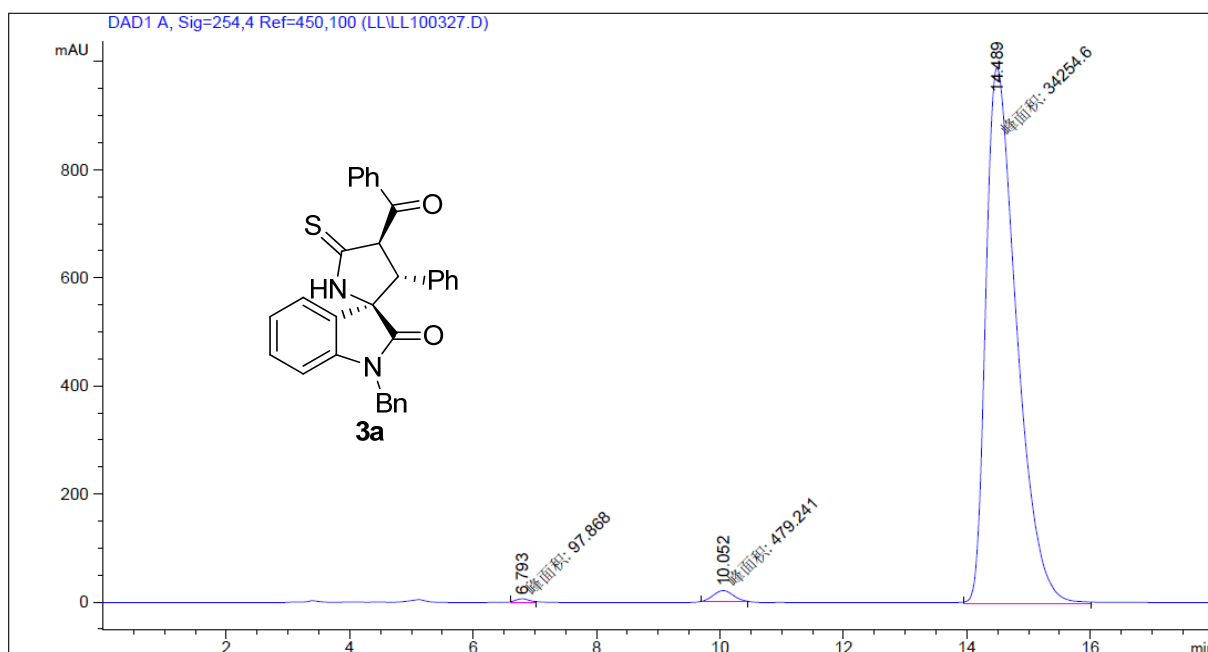




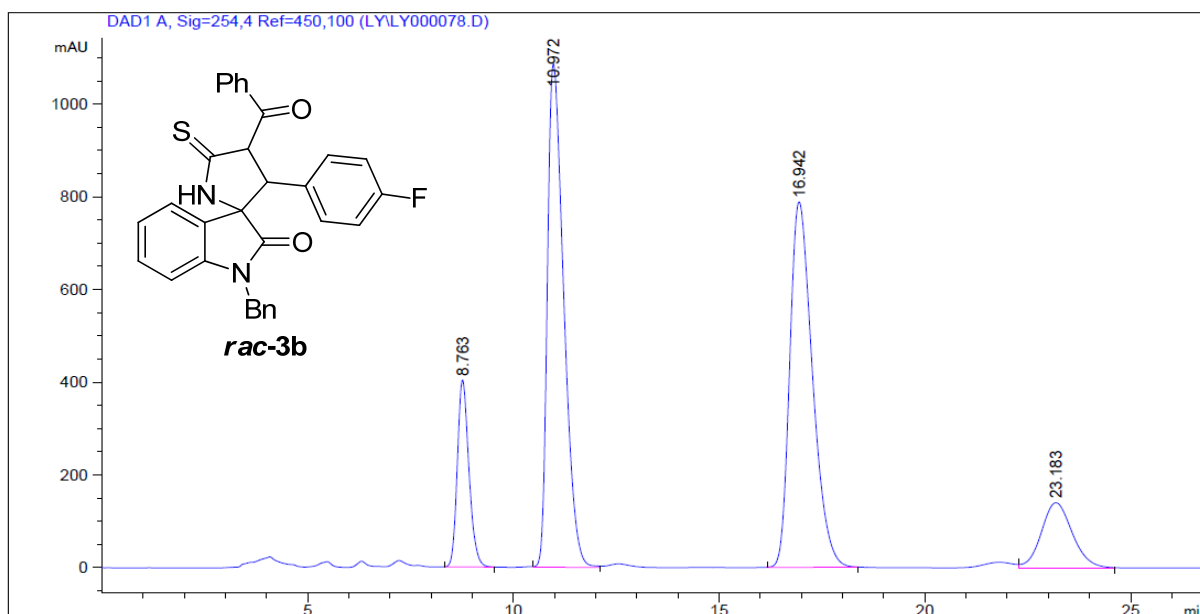
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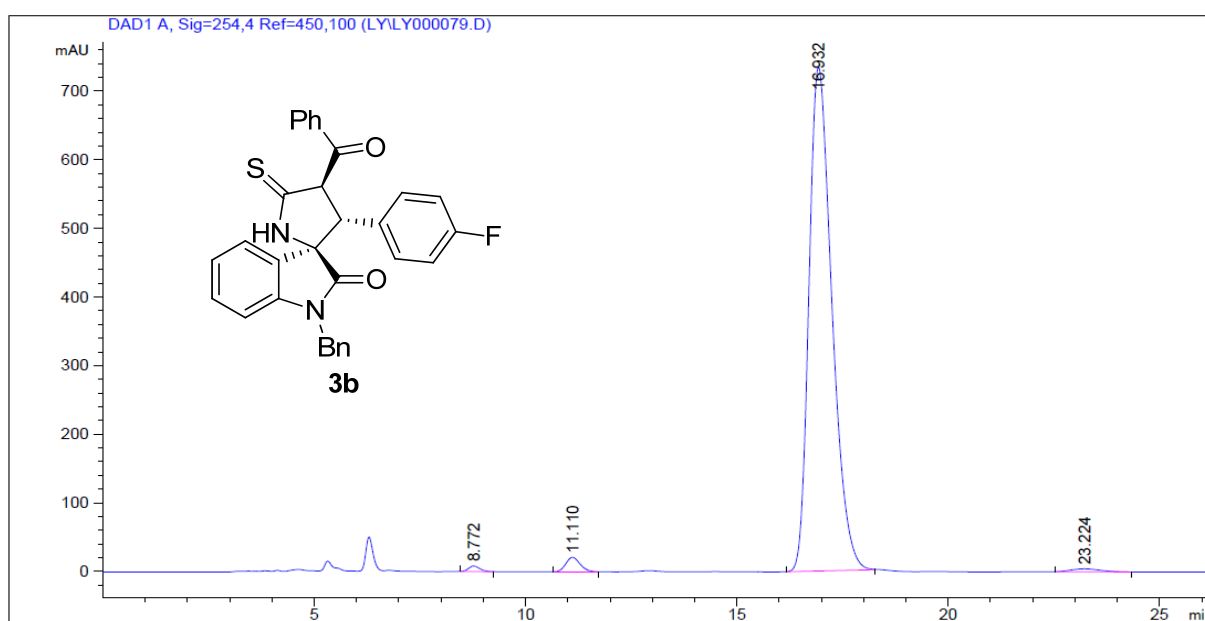
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3	10.012	BB	0.4256	4.36153e4	1582.12781	48.1566
4	14.582	BB	0.5476	4.48058e4	1228.22571	49.4711



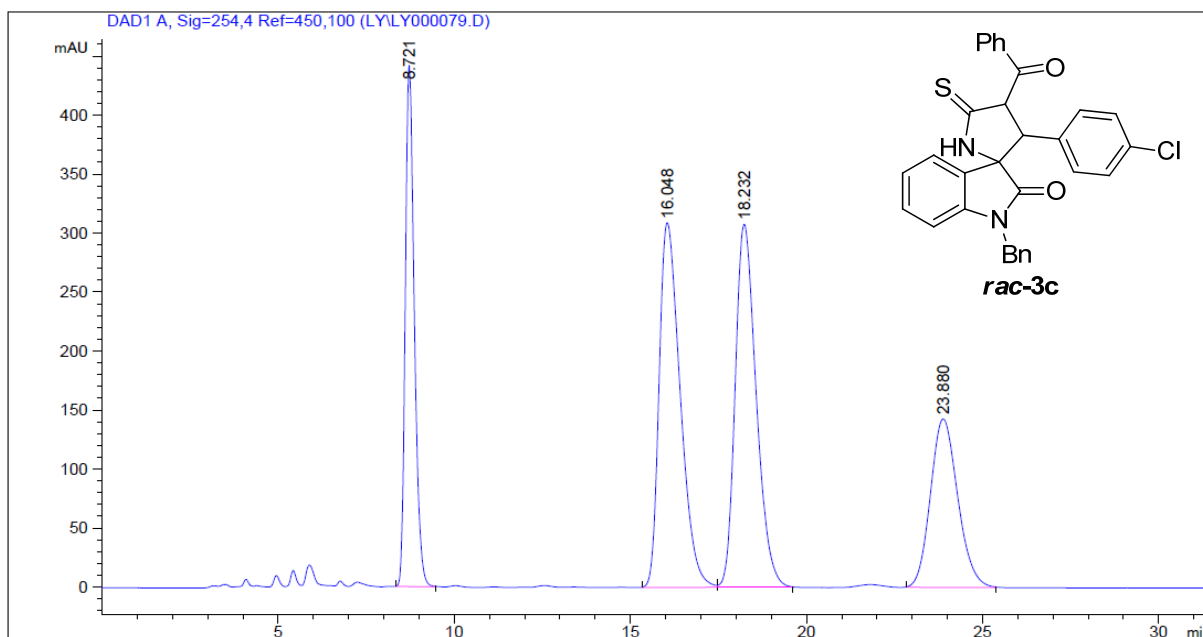
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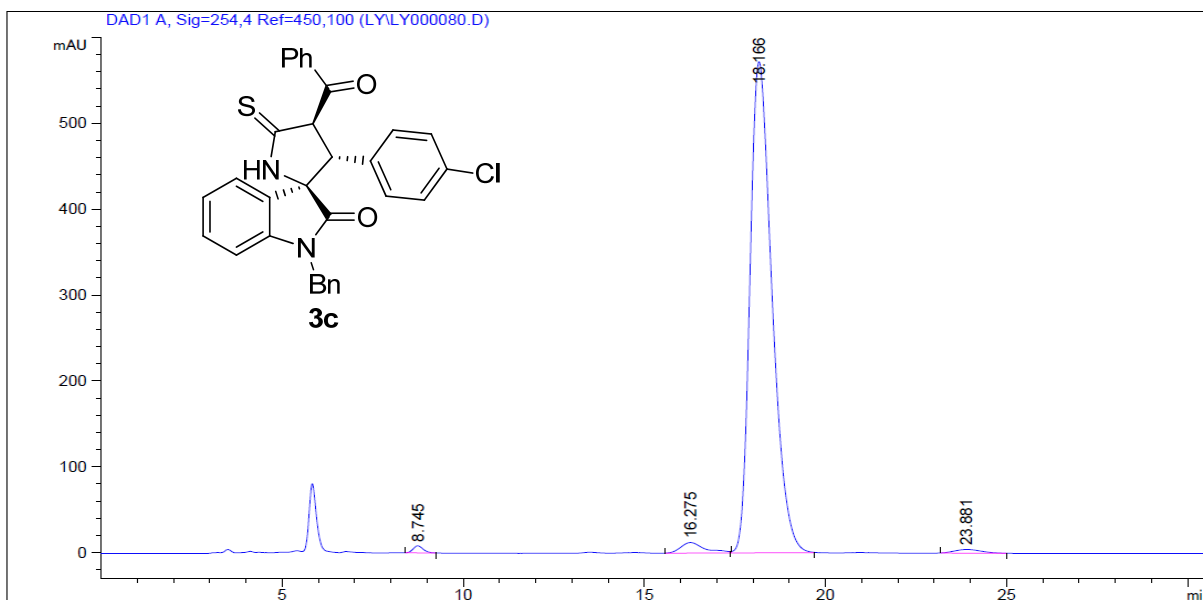
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3	16.942	BB	0.5889	3.01943e4	788.23779	40.0517
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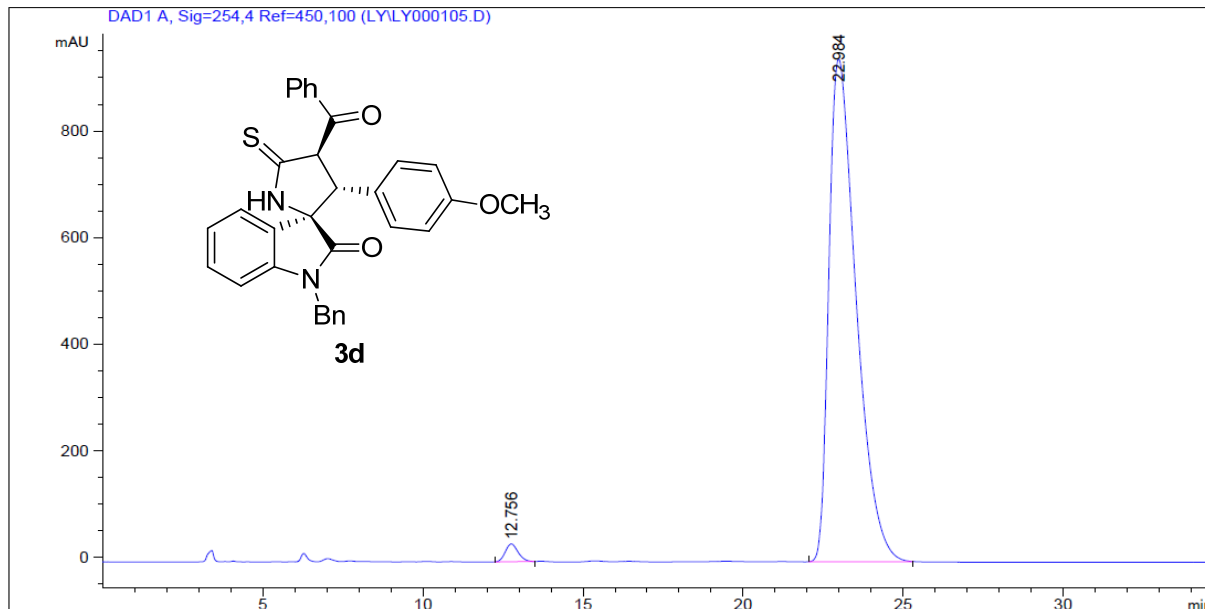
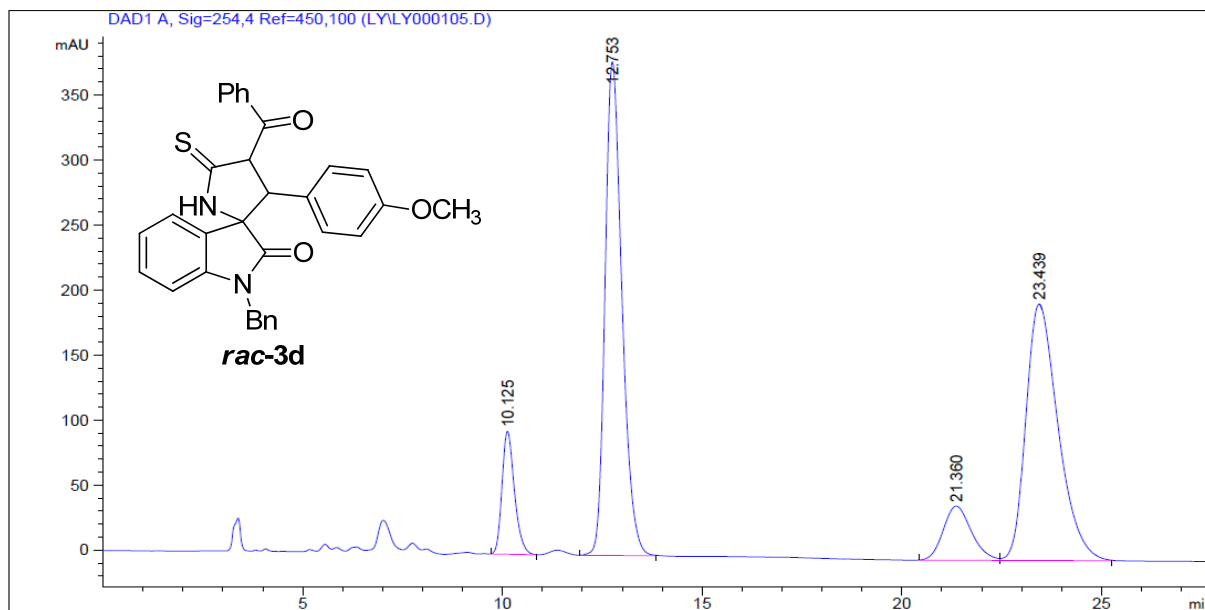
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3	16.932	BB	0.5798	2.76753e4	734.16034	96.9585
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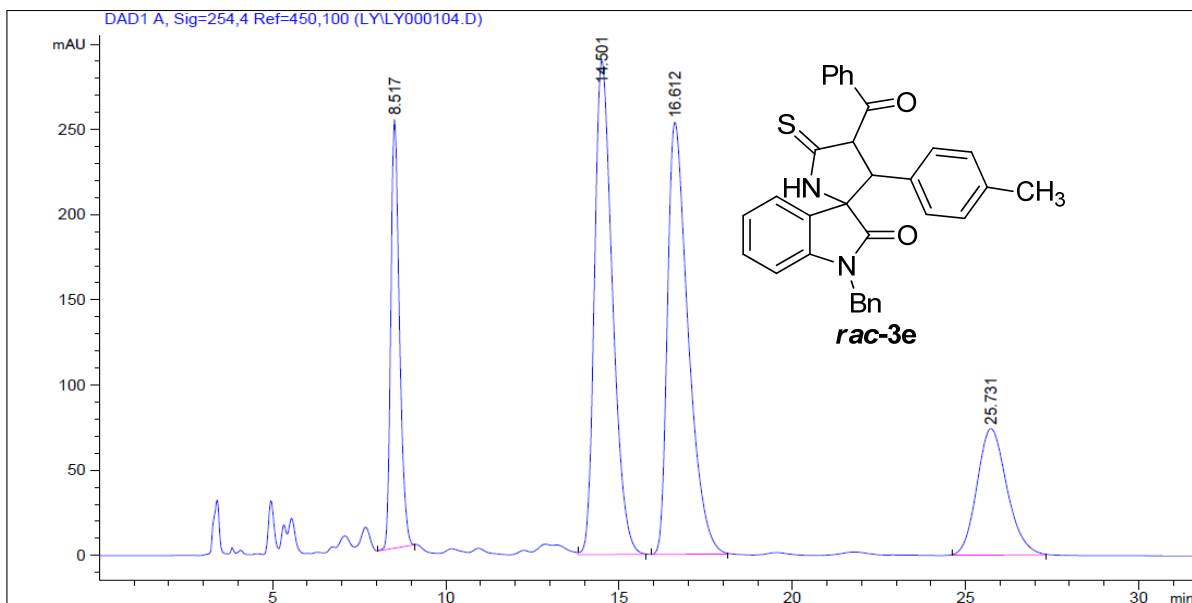


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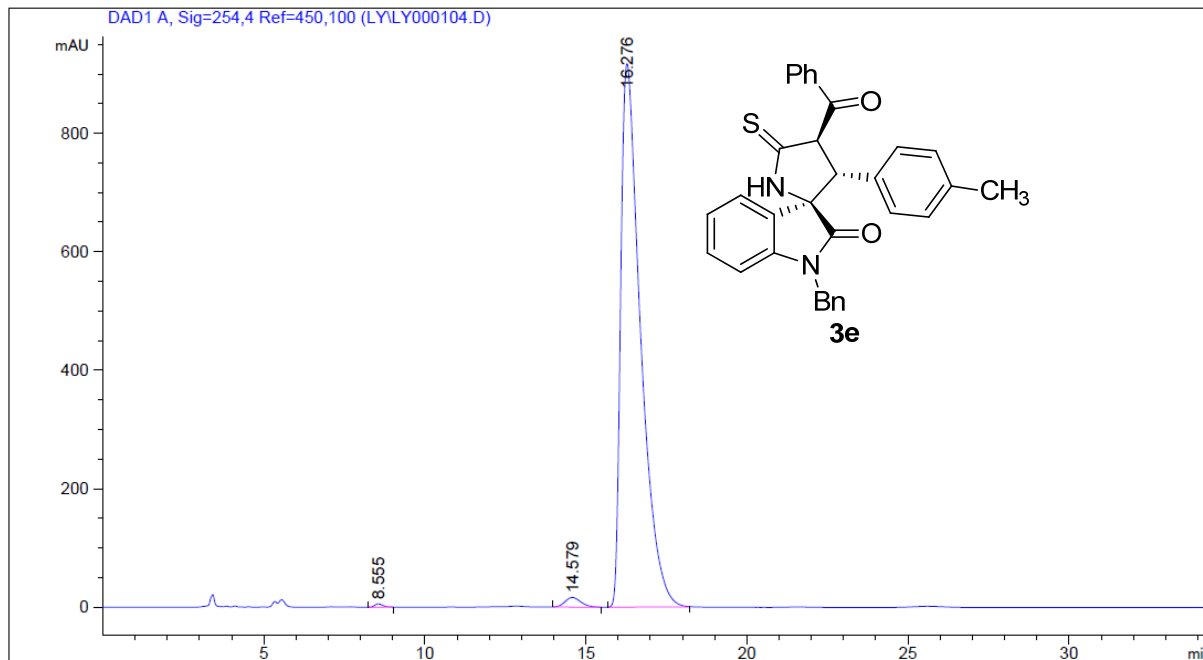


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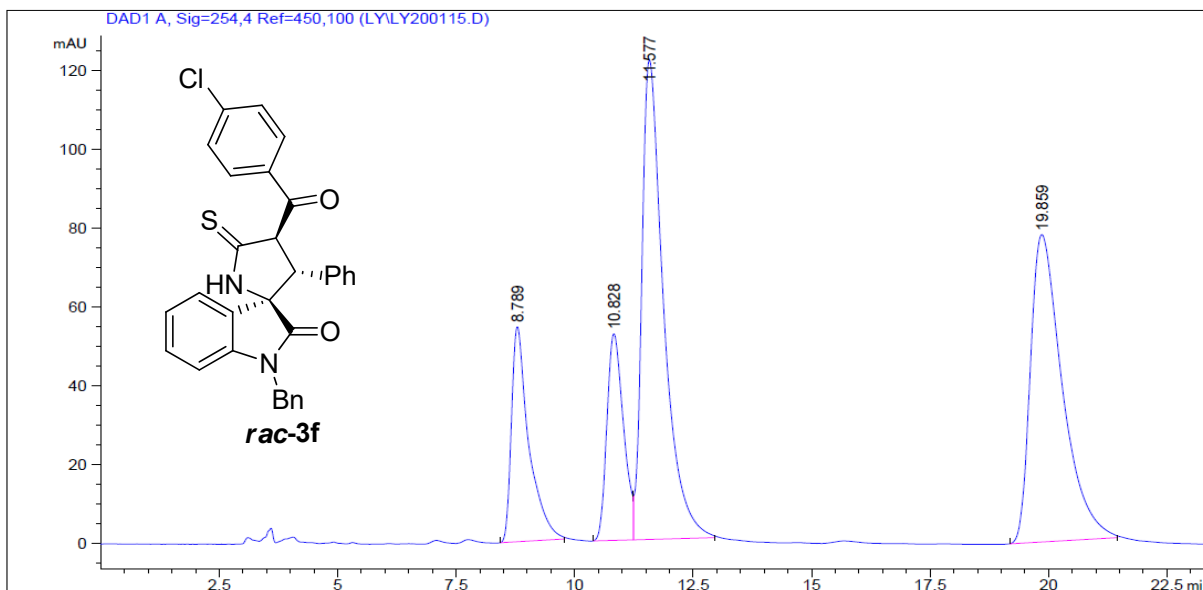




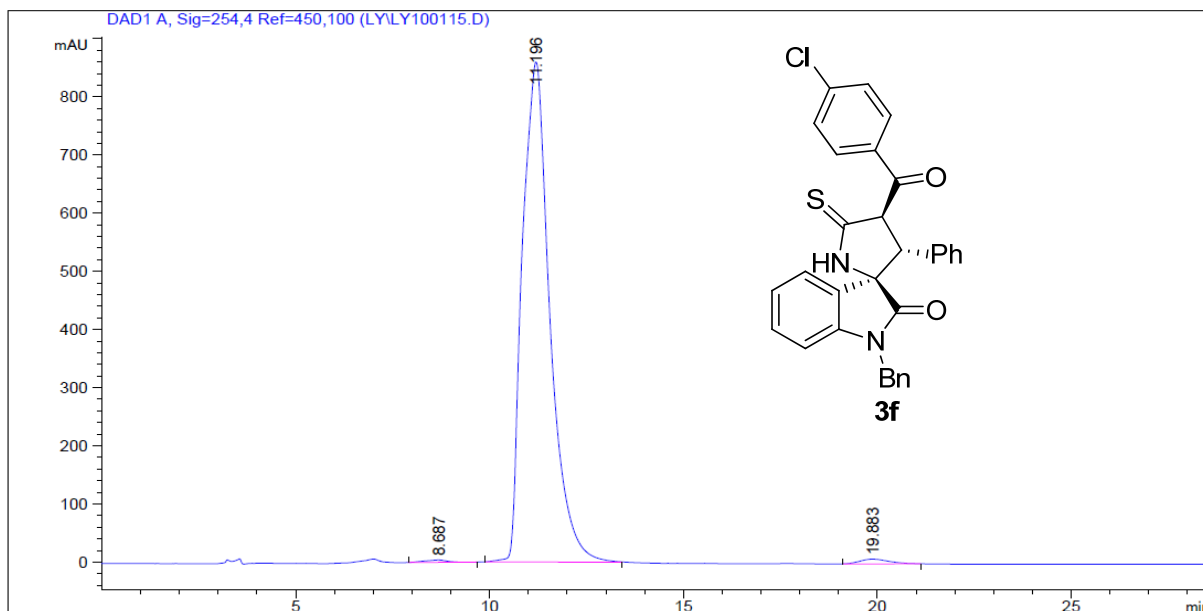
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2	14.501	VB	0.5564	1.04897e4	289.73096	35.1165
3	16.612	BB	0.6247	1.05322e4	253.49046	35.2586
4	25.731	BB	0.9042	4466.40332	74.21075	14.9522



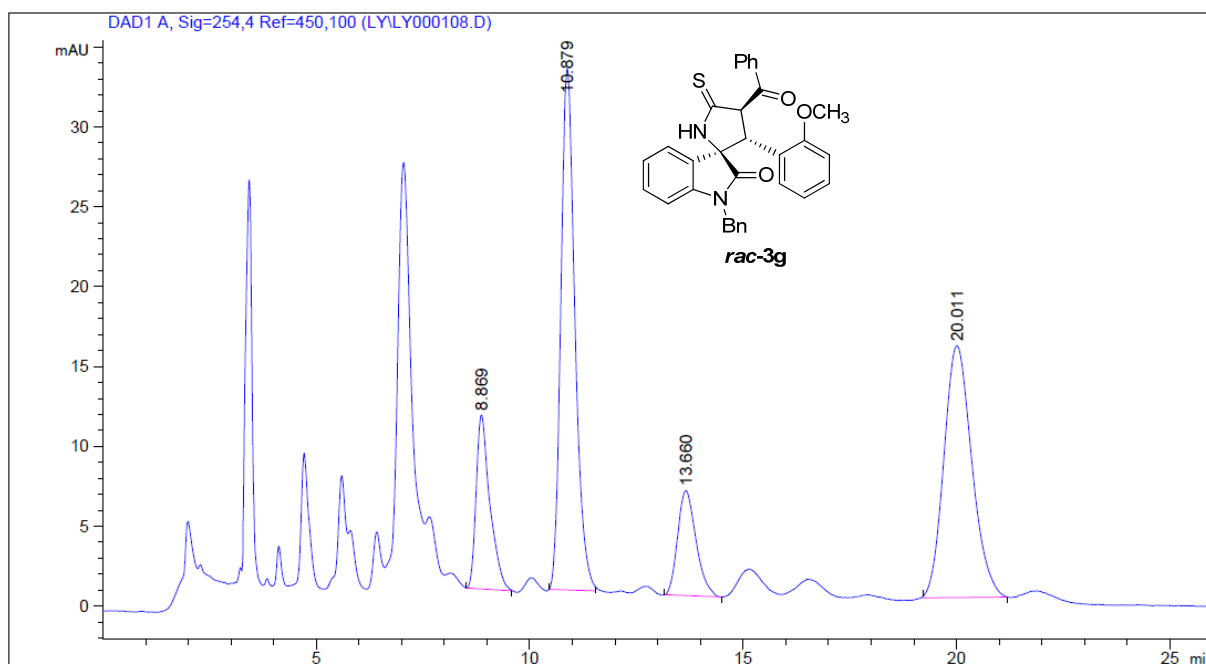
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3	16.276	BB	0.6362	3.91914e4	917.70544	98.3650



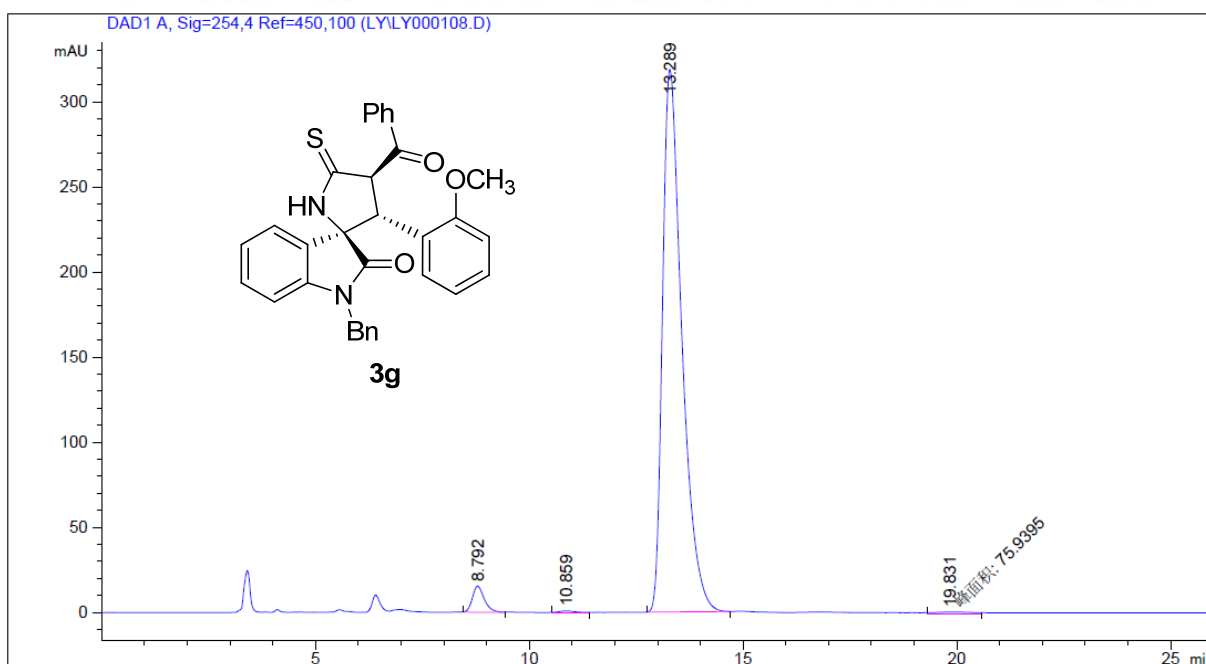
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2	10.828	BV	0.3680	1276.39209	52.42789	12.5217
3	11.577	VB	0.4762	3882.26562	121.68952	38.0860
4	19.859	BB	0.7074	3645.99487	77.99178	35.7682



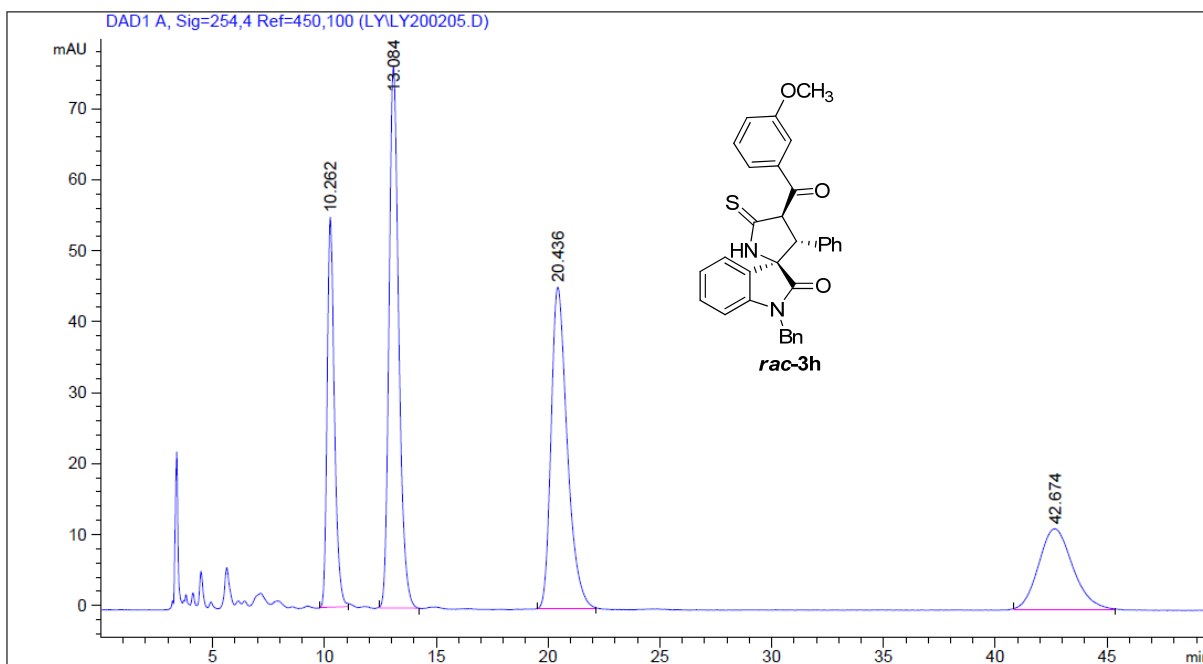
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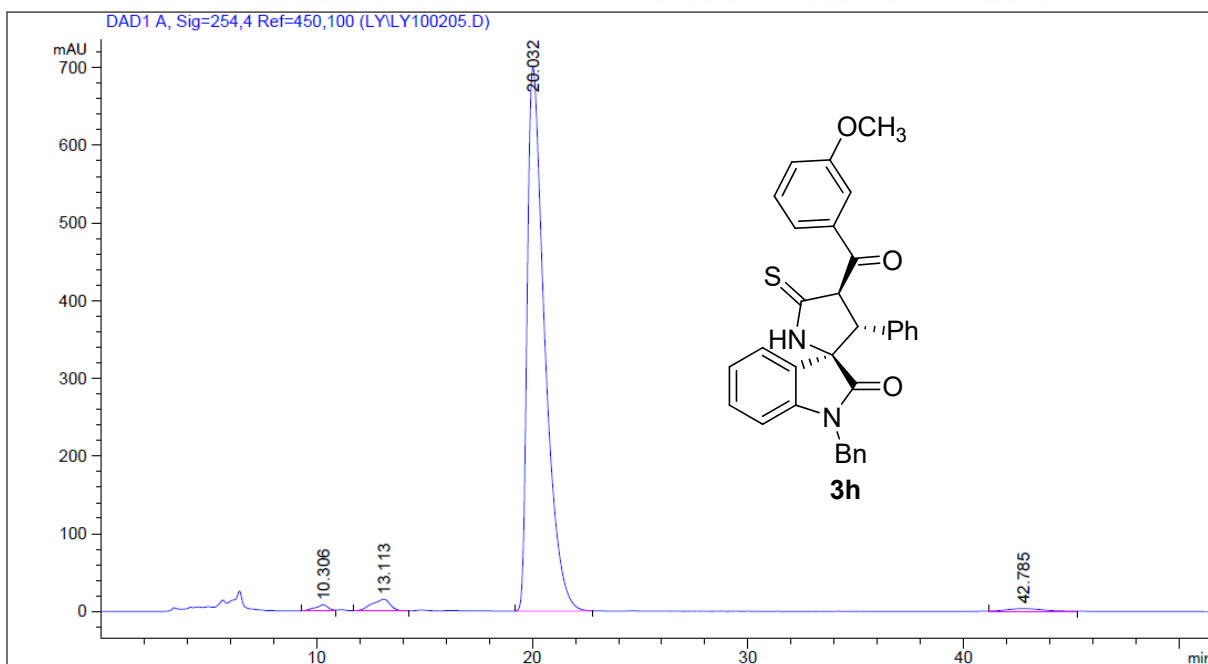
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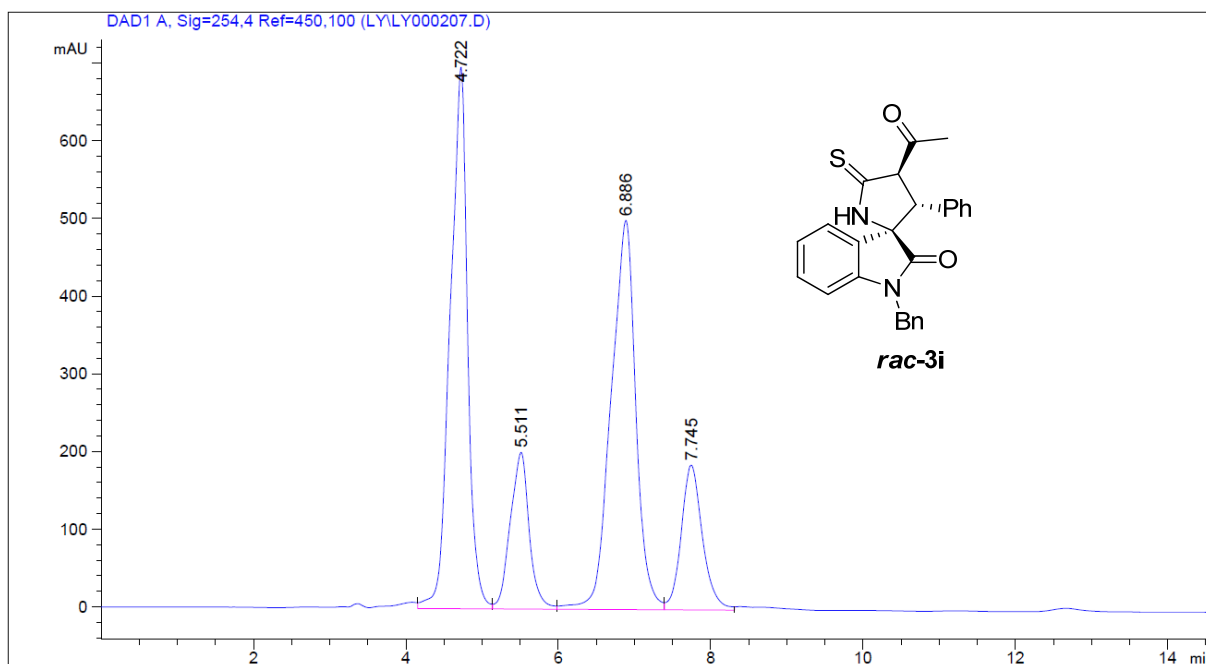
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2	10.859	BB	0.3385	21.38058	9.22068e-1	0.2051
3	13.289	BB	0.4750	1.00304e4	318.86804	96.2247
4	19.831	MM	1.0844	75.93945	1.16717	0.7285



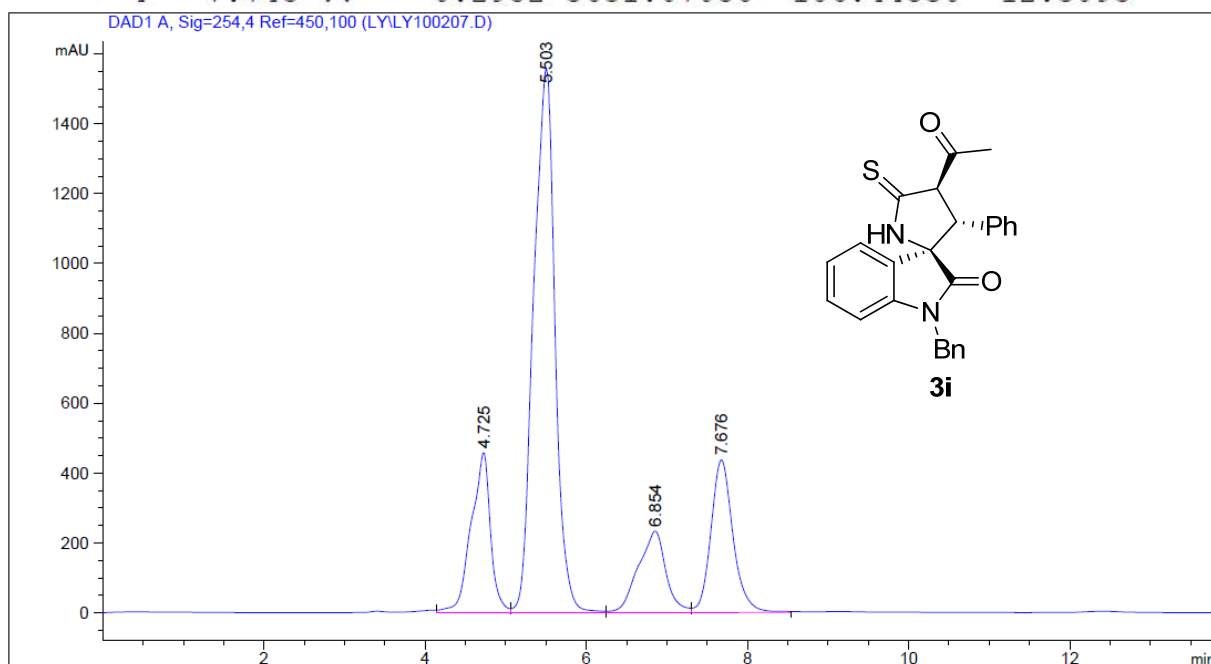
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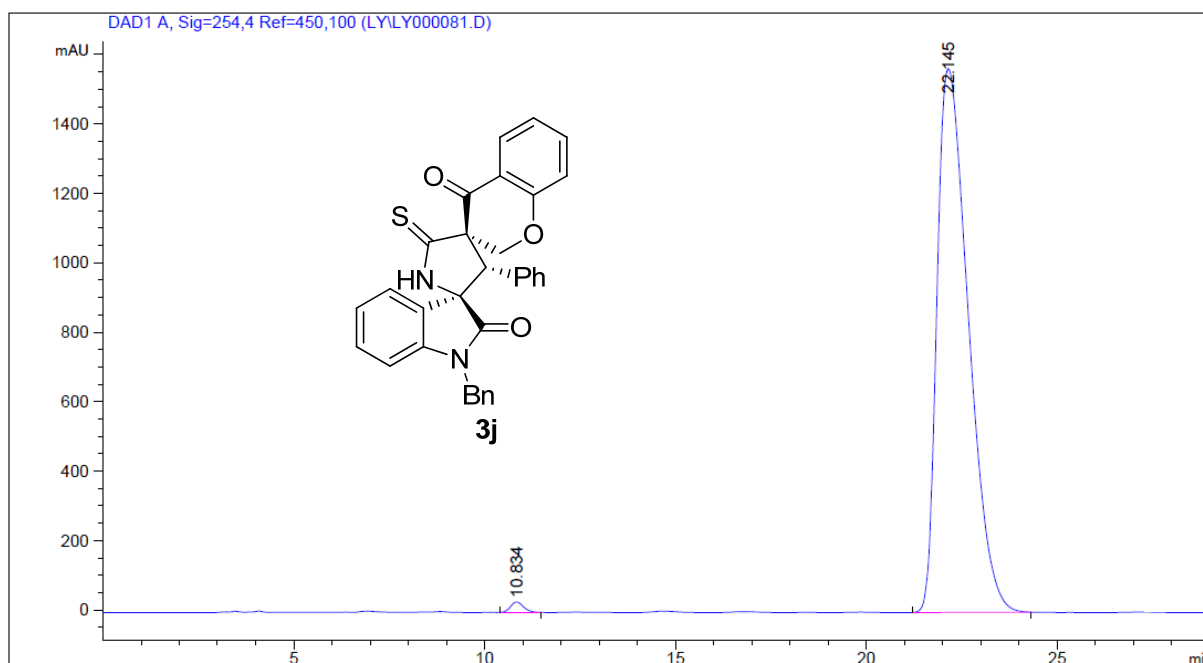
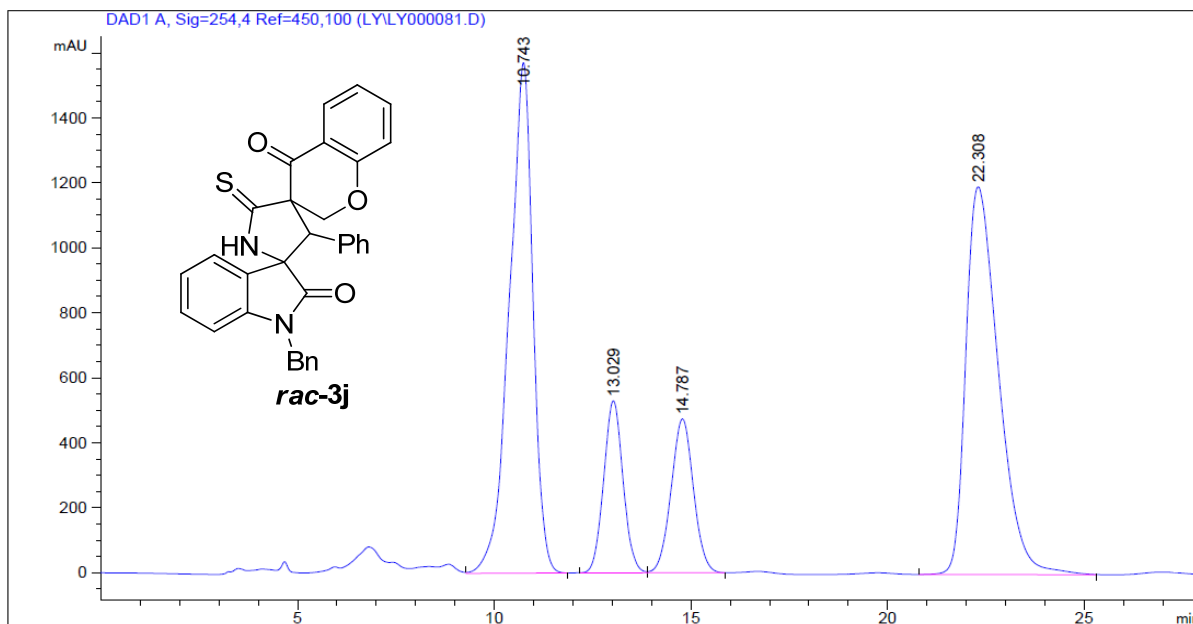
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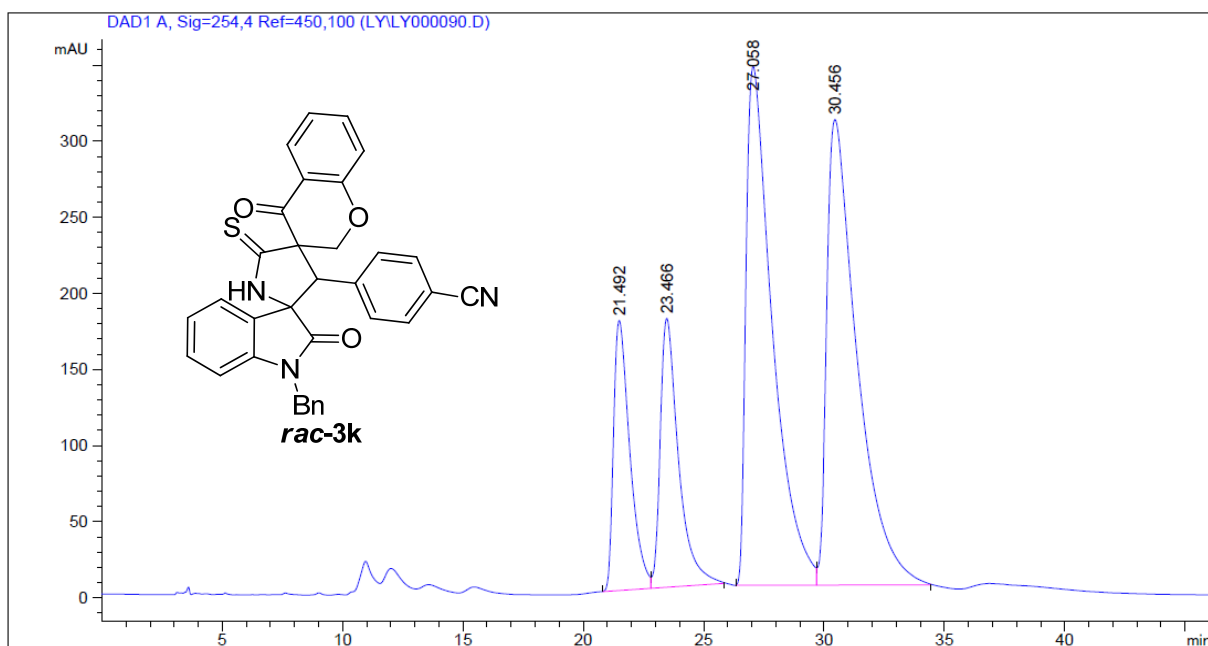


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1	4.722	VV	0.2210	1.10631e4	697.75409	37.5039
2	5.511	VV	0.2499	3490.44092	201.73074	11.8325
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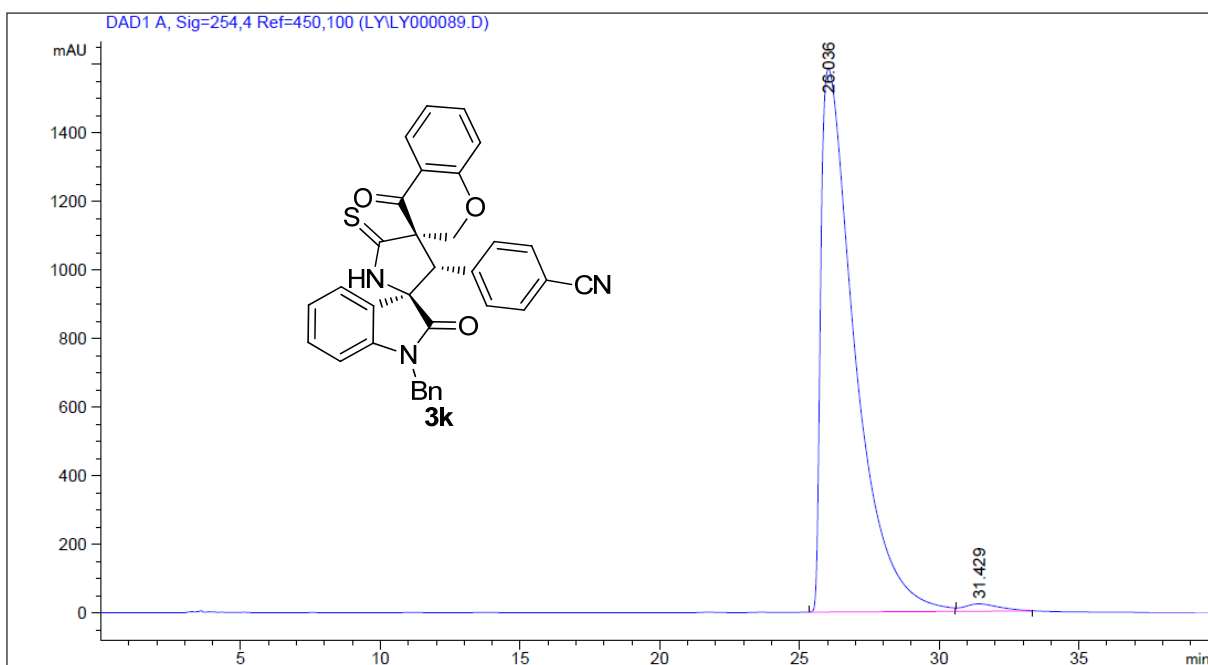


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1	4.725	VV	0.2316	7677.59131	457.86414	15.2762
2	5.503	VV	0.2627	2.86699e4	1558.15210	57.0449
3	6.854	VV	0.3294	5542.05566	233.10382	11.0271
4	7.676	VB	0.2894	8368.94629	436.98013	16.6518

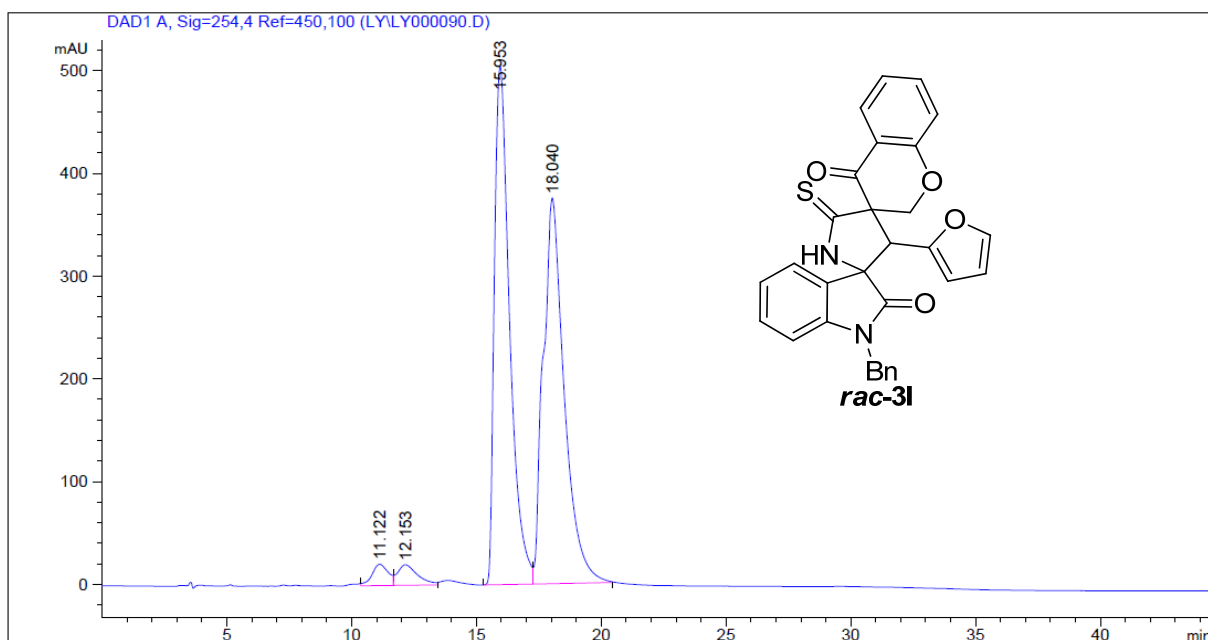




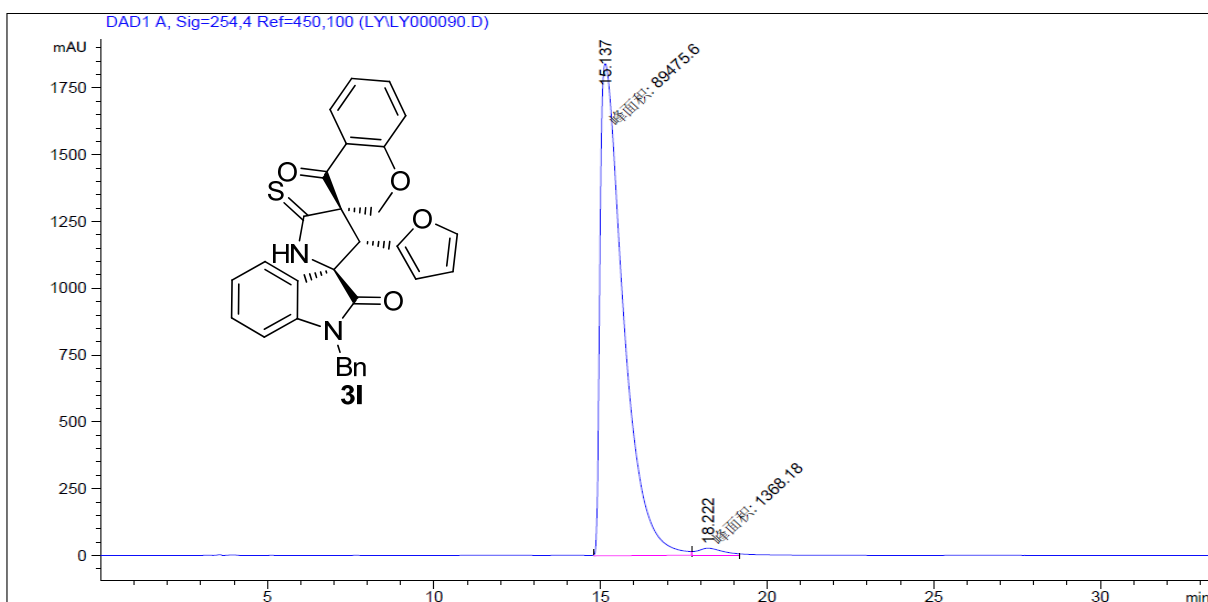
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.492	BV	0.7121	8366.10645	177.43916	11.8492
2	23.466	VB	0.7861	9331.65039	176.69844	13.2168
3	27.058	BV	1.0904	2.60107e4	340.81253	36.8398
4	30.456	VB	1.2817	2.68963e4	305.91937	38.0942



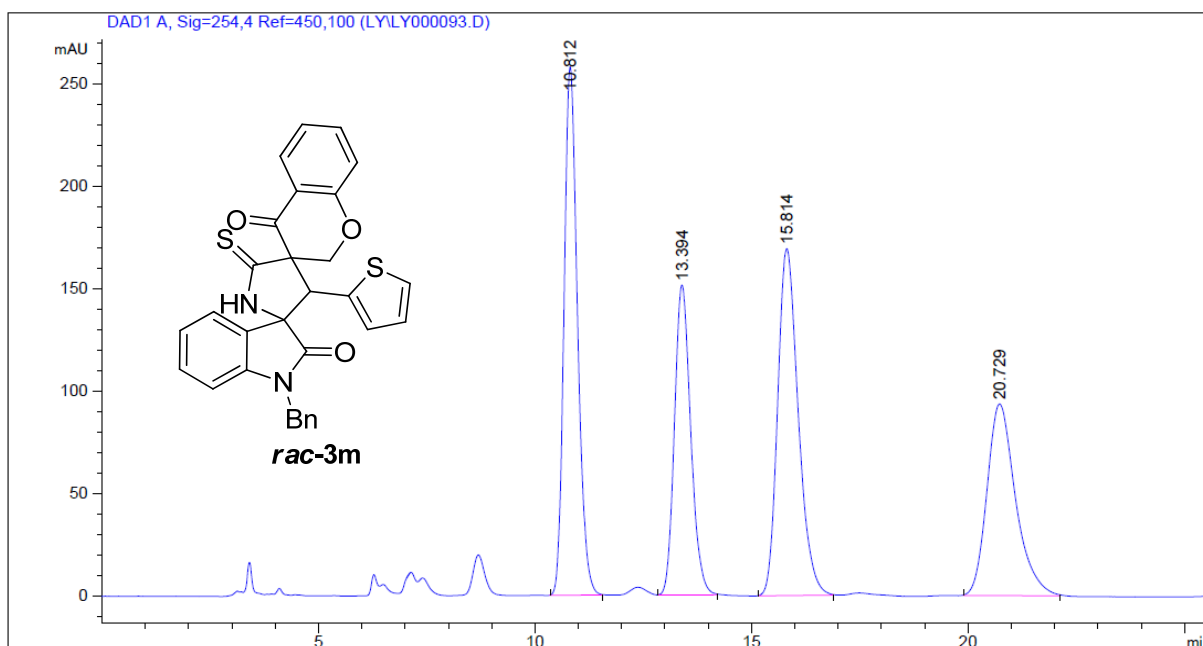
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	26.036	BB	1.2234	1.34075e5	1584.17444	98.6023
2	31.429	BB	1.0551	1900.50269	21.54591	1.3977



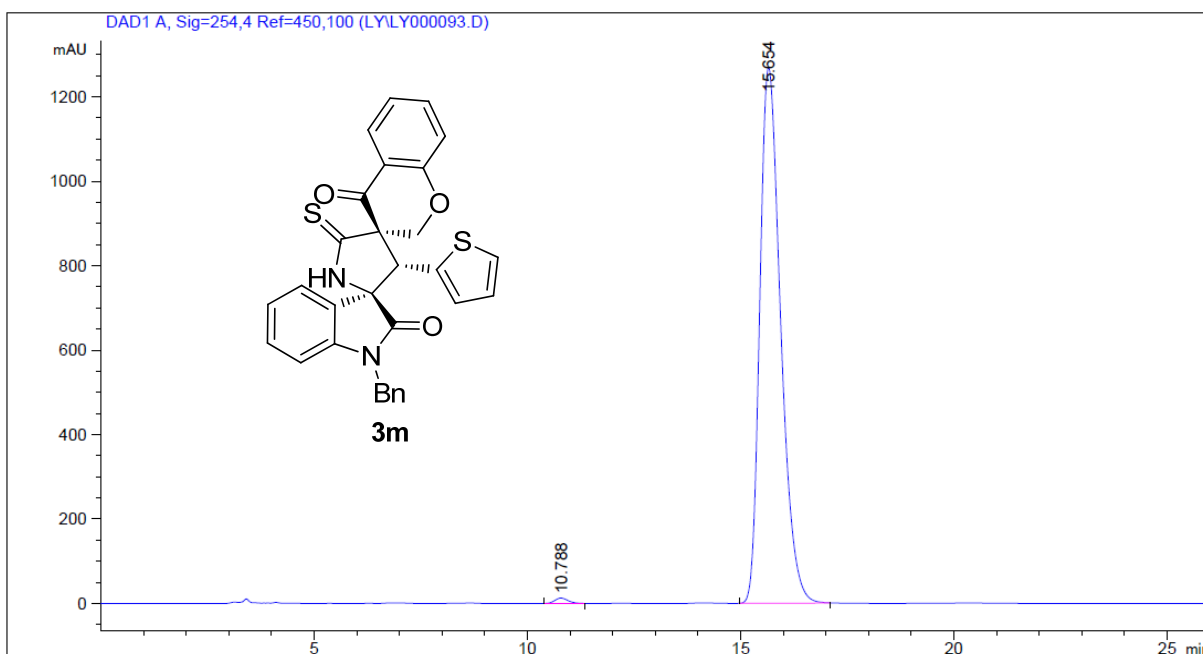
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.122	BV	0.6709	934.43201	20.76844	2.0542
2	12.153	VB	0.7665	1124.55273	20.04609	2.4721
3	15.953	BV	0.6566	2.14716e4	504.39429	47.2019
4	18.040	VB	0.8144	2.19583e4	375.39554	48.2717



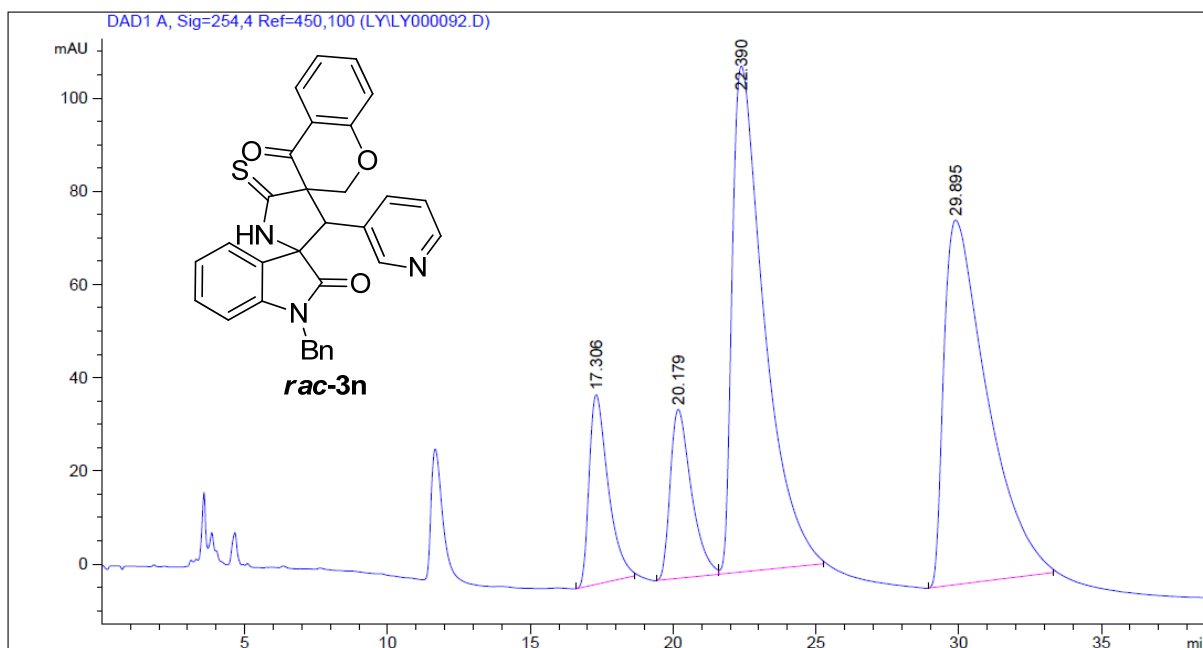
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	15.137	MM	0.8095	8.94756e4	1842.29272	98.4939
2	18.222	MM	0.8816	1368.18262	25.86441	1.5061



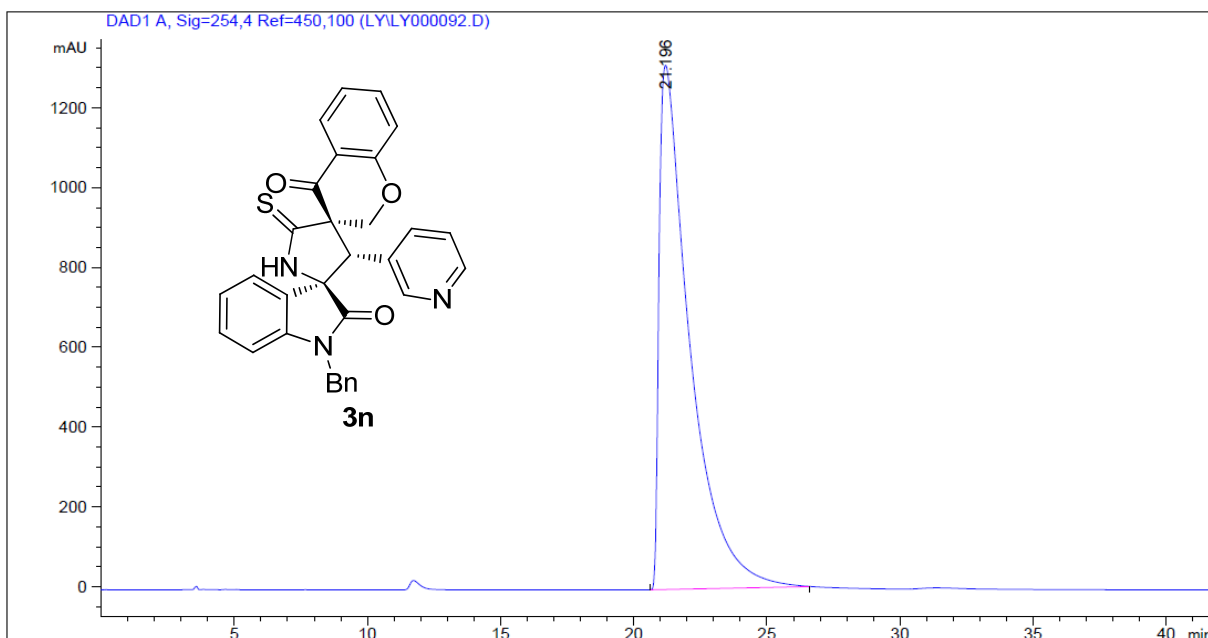
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.812	BB	0.3317	5567.63574	258.10785	28.6921
2	13.394	VB	0.3999	3943.13257	151.38336	20.3205
3	15.814	BB	0.5072	5595.38232	169.45058	28.8351
4	20.729	BB	0.6899	4298.58789	93.57465	22.1523



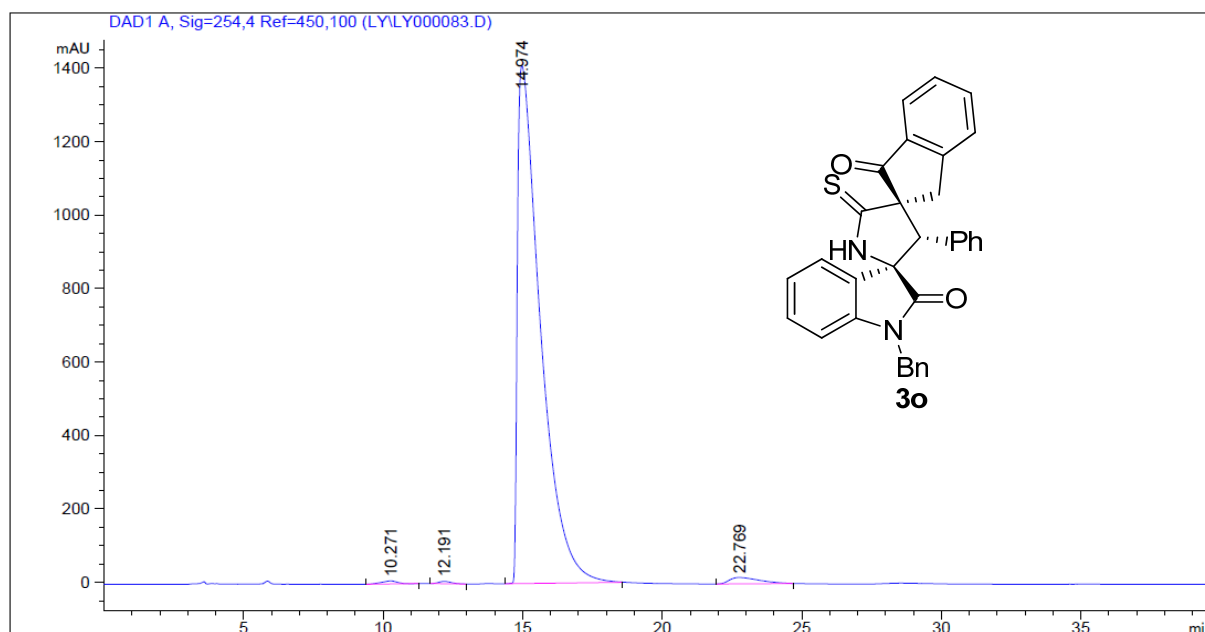
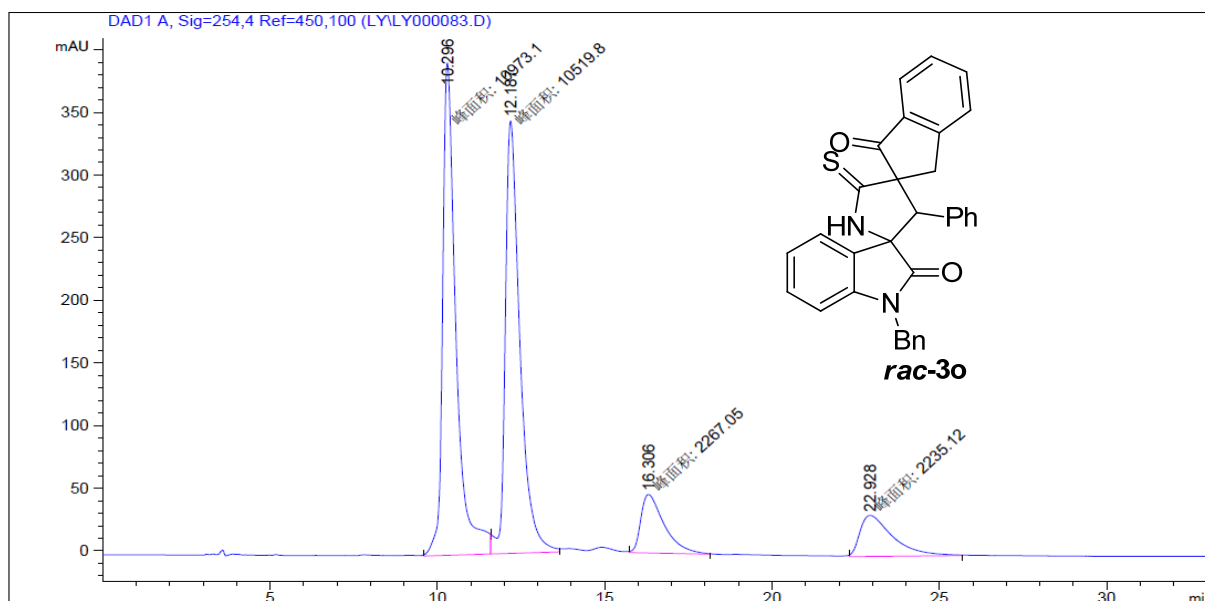
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.788	BB	0.3297	280.40192	12.99628	0.6482
2	15.654	BB	0.5211	4.29771e4	1269.10571	99.3518

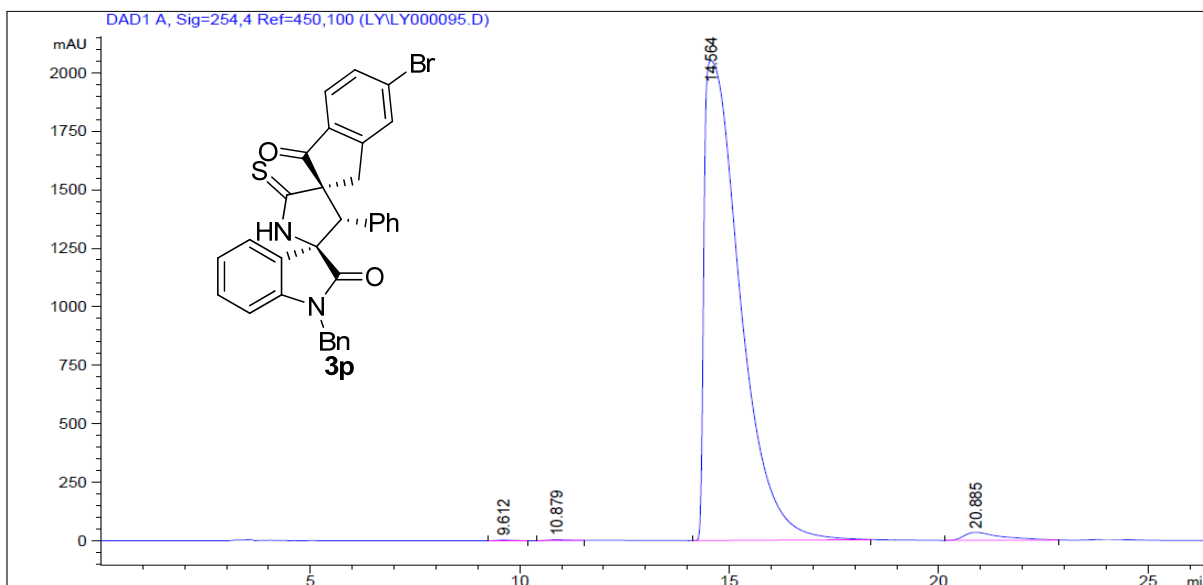
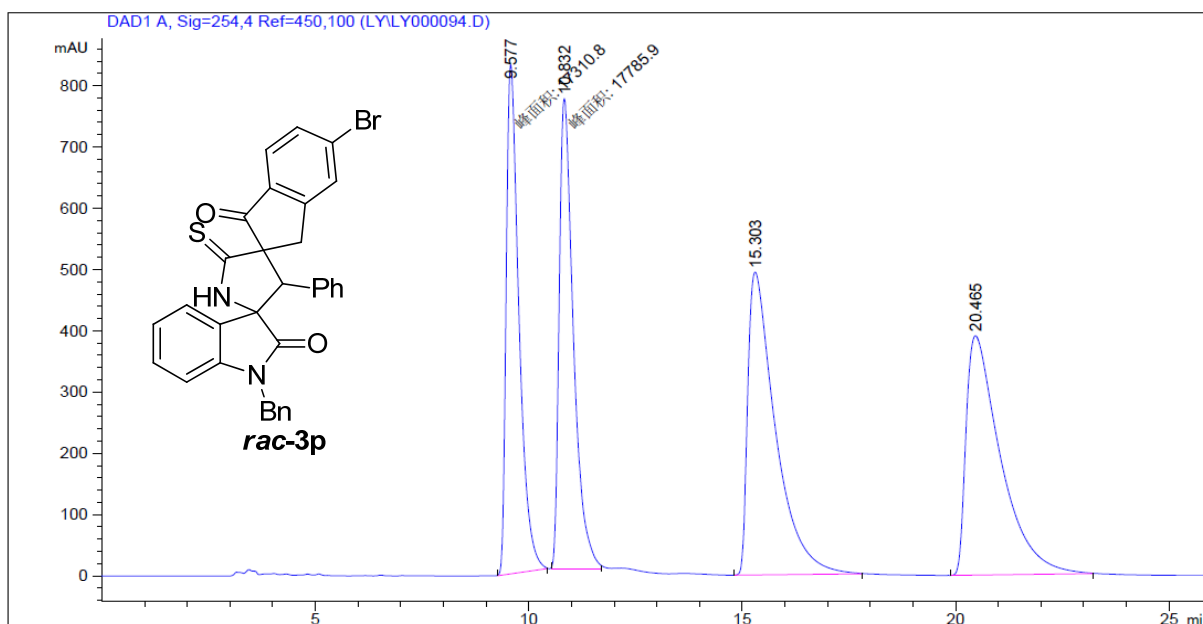


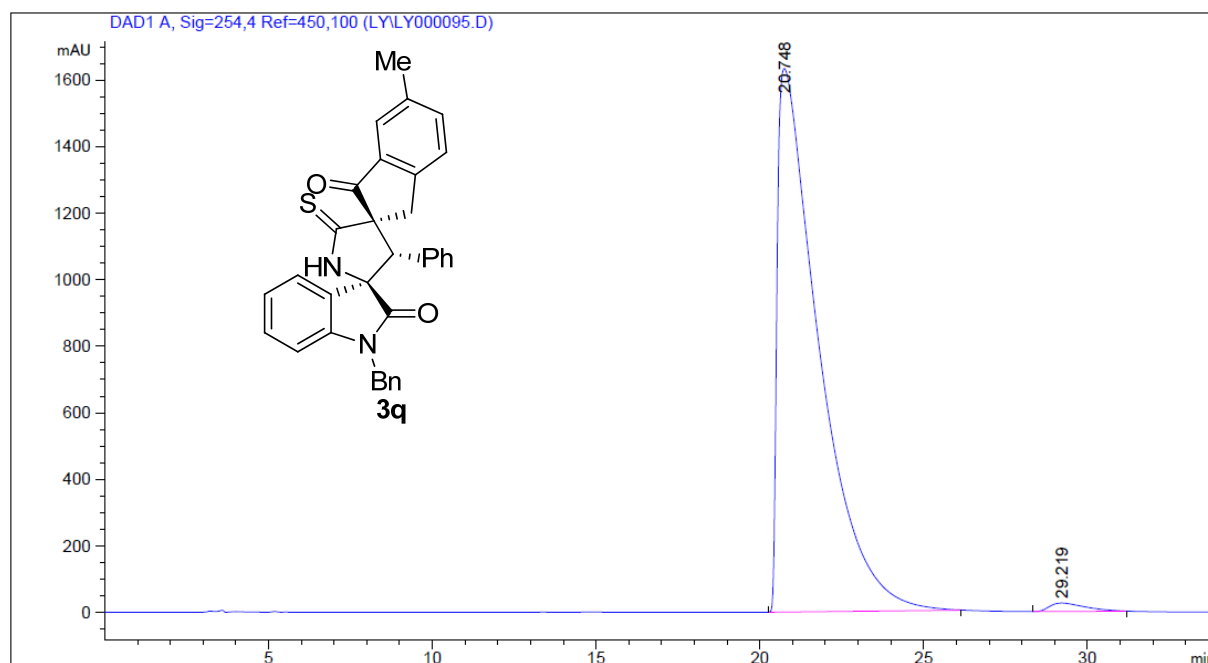
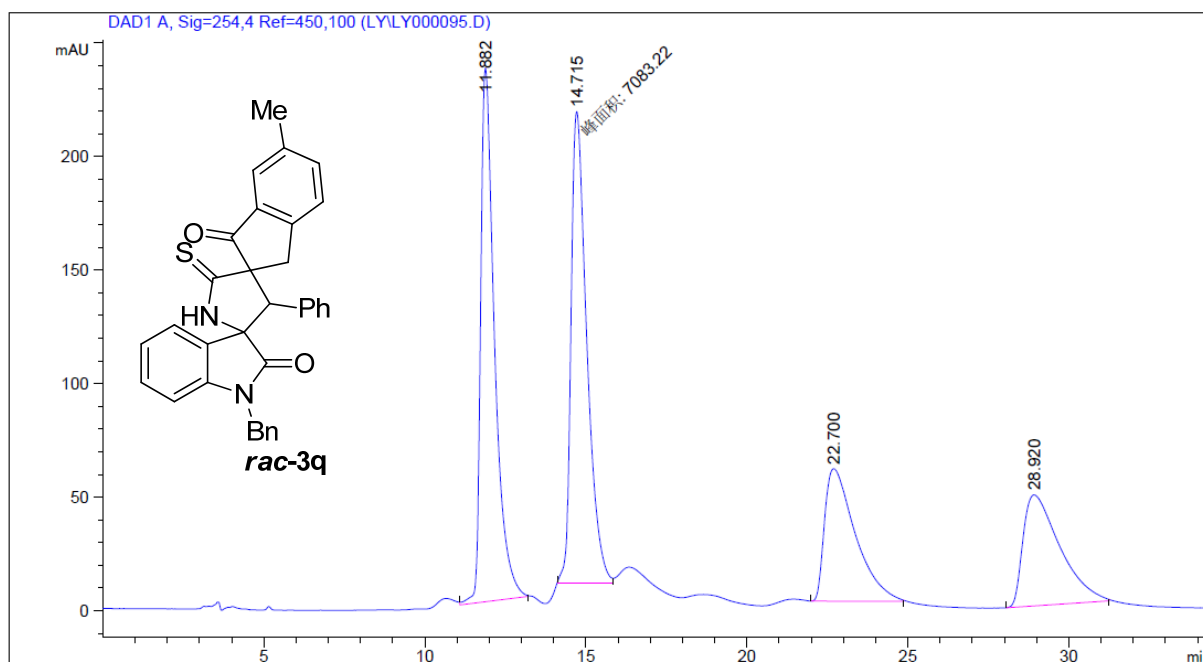
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.306	BB	0.6883	1885.87659	40.72181	9.2088
2	20.179	BB	0.7602	1865.05054	36.25354	9.1071
3	22.390	BB	1.1289	8496.51465	108.58144	41.4890
4	29.895	BB	1.4633	8231.53223	78.24814	40.1950

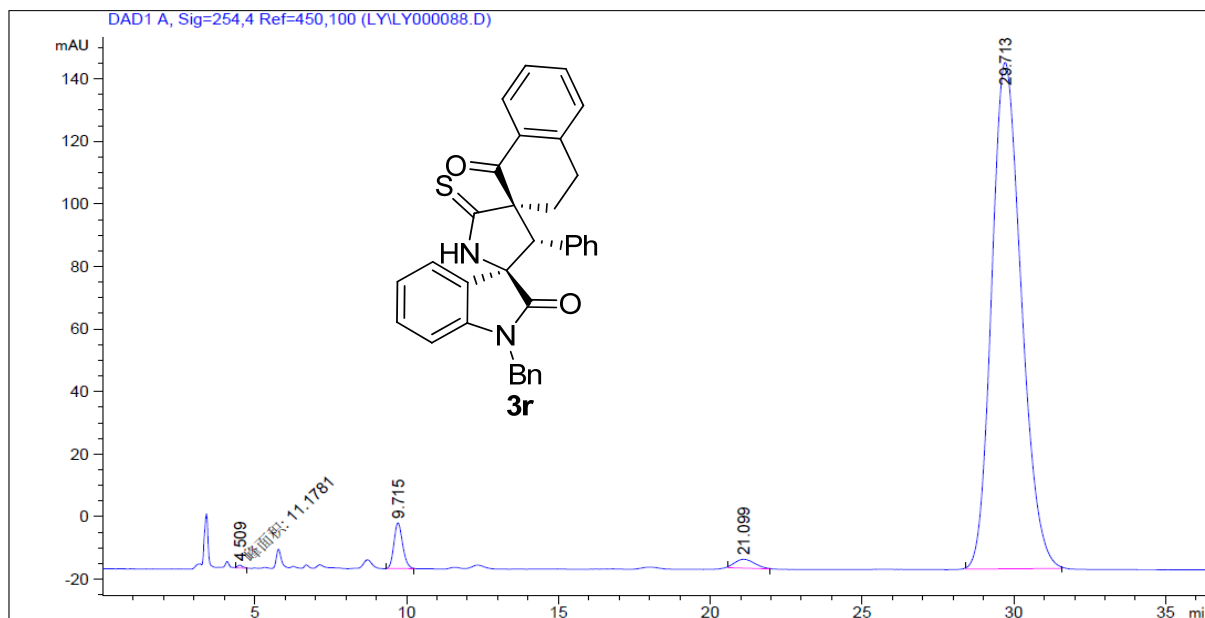
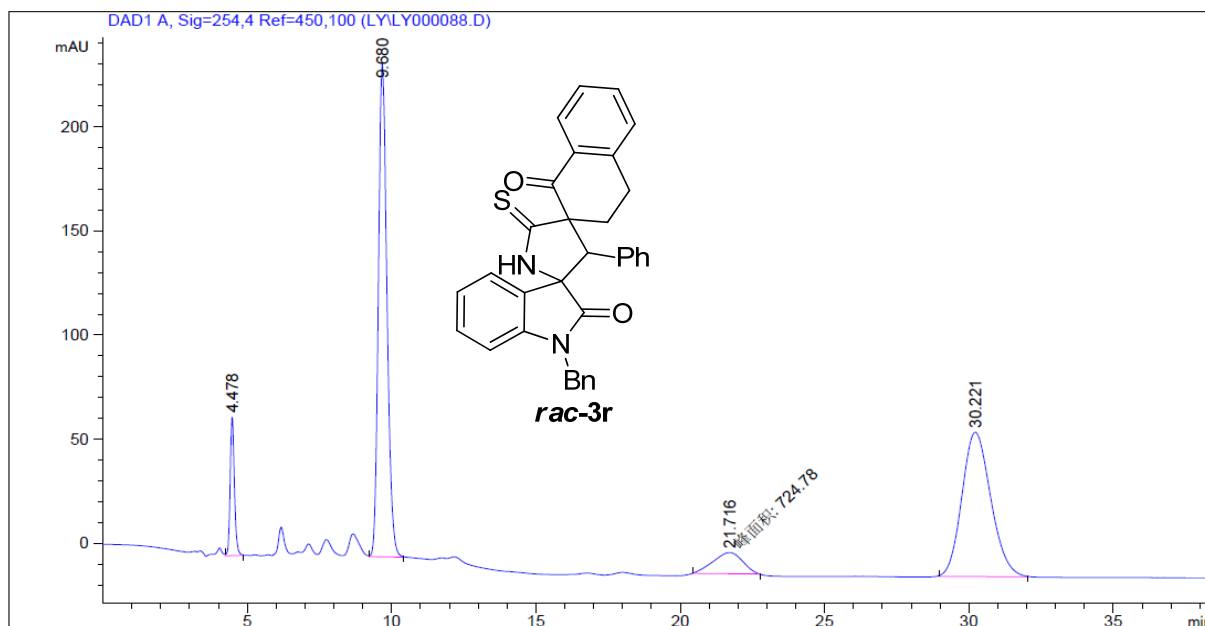


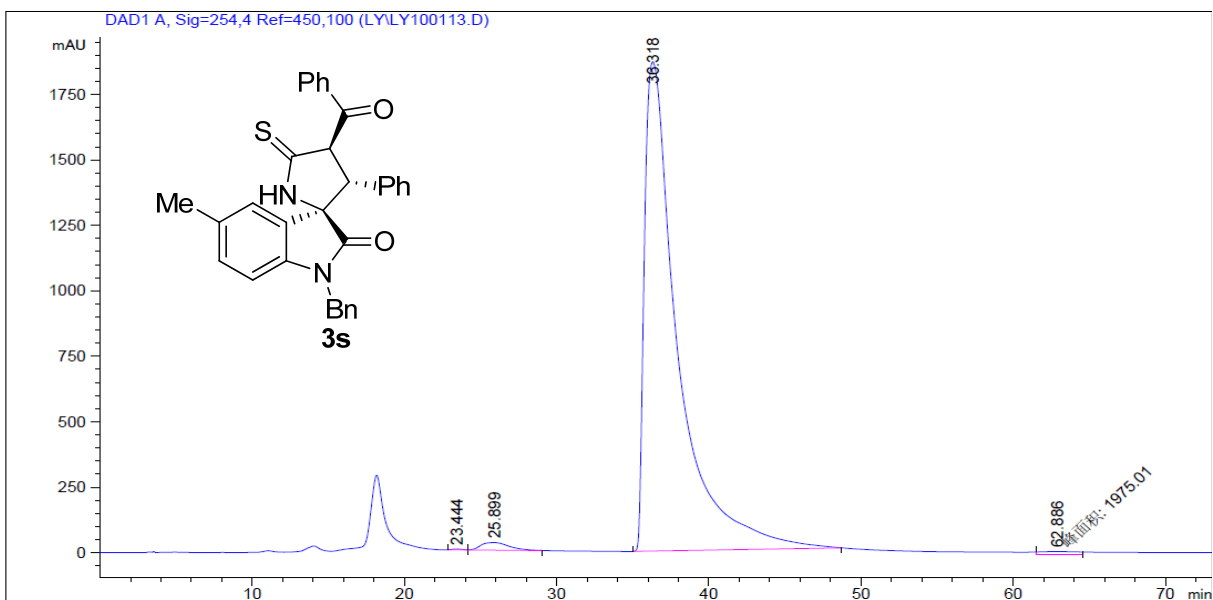
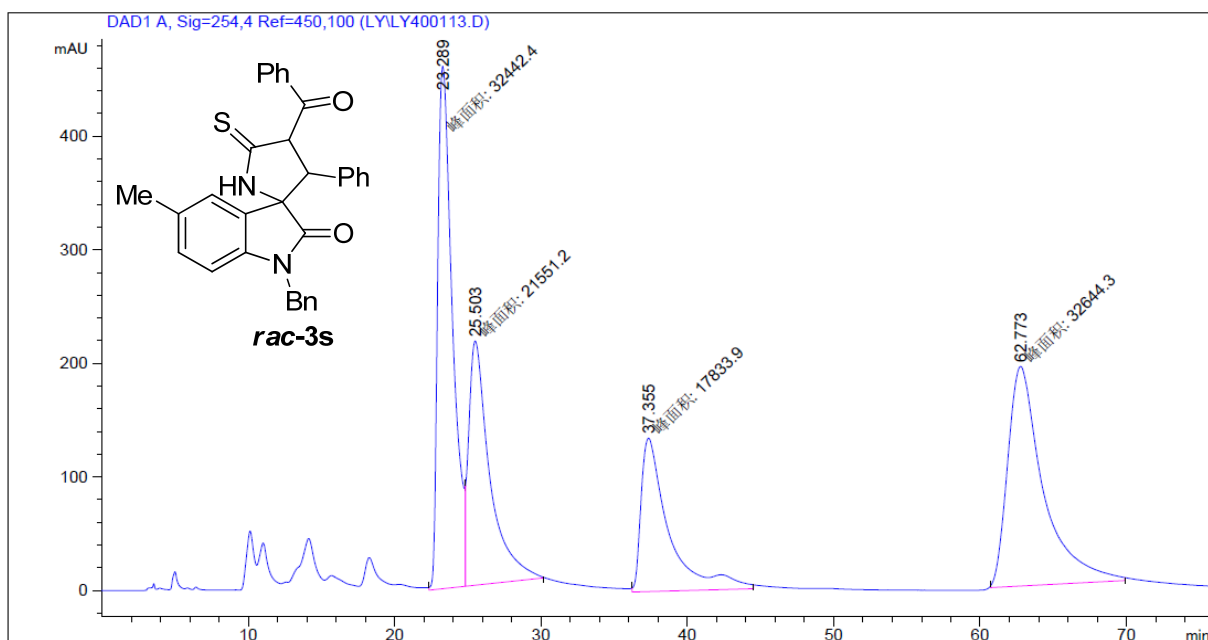
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	21.196	BB	1.1270	1.05472e5	1313.18213	100.0000

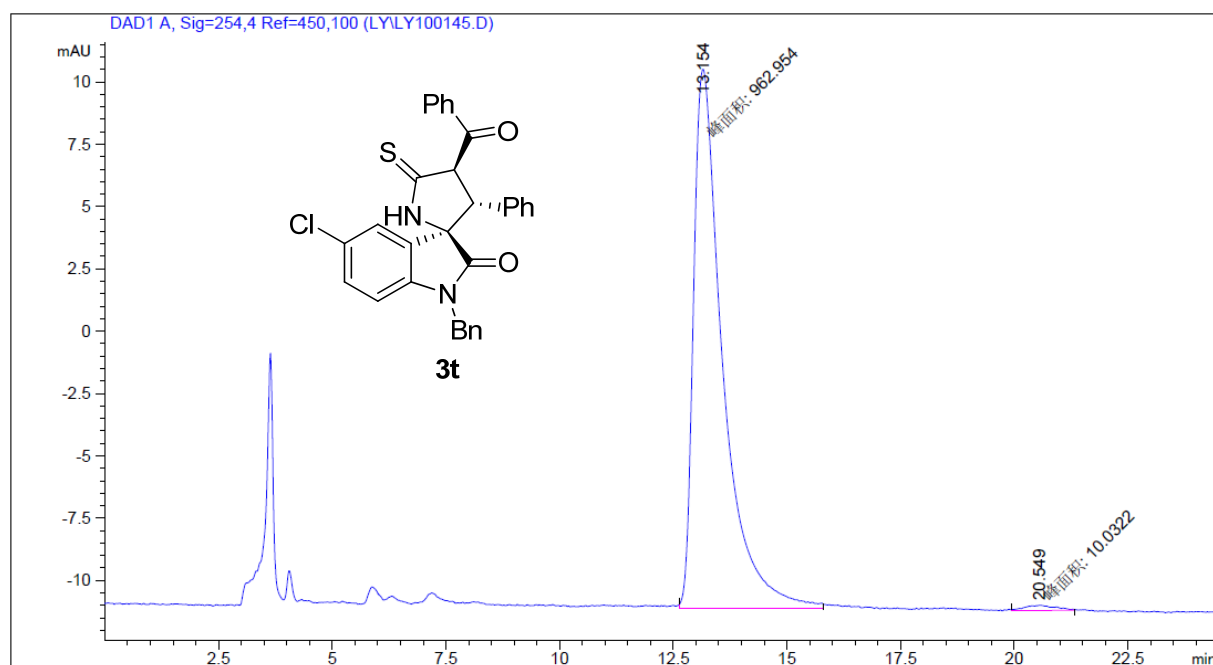
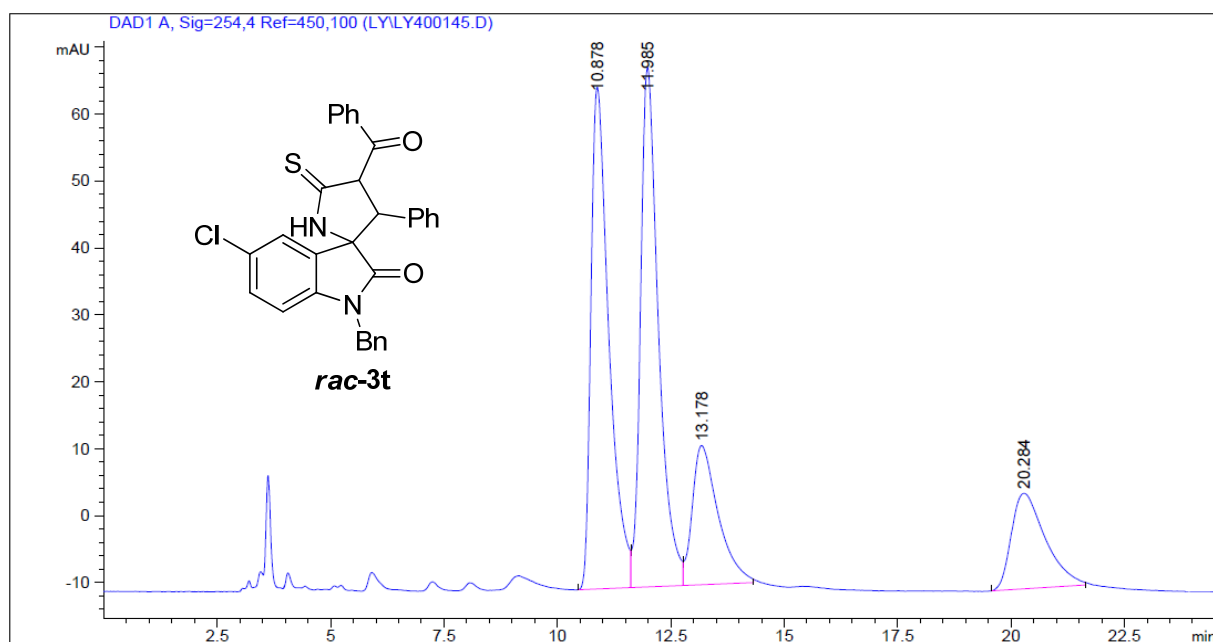


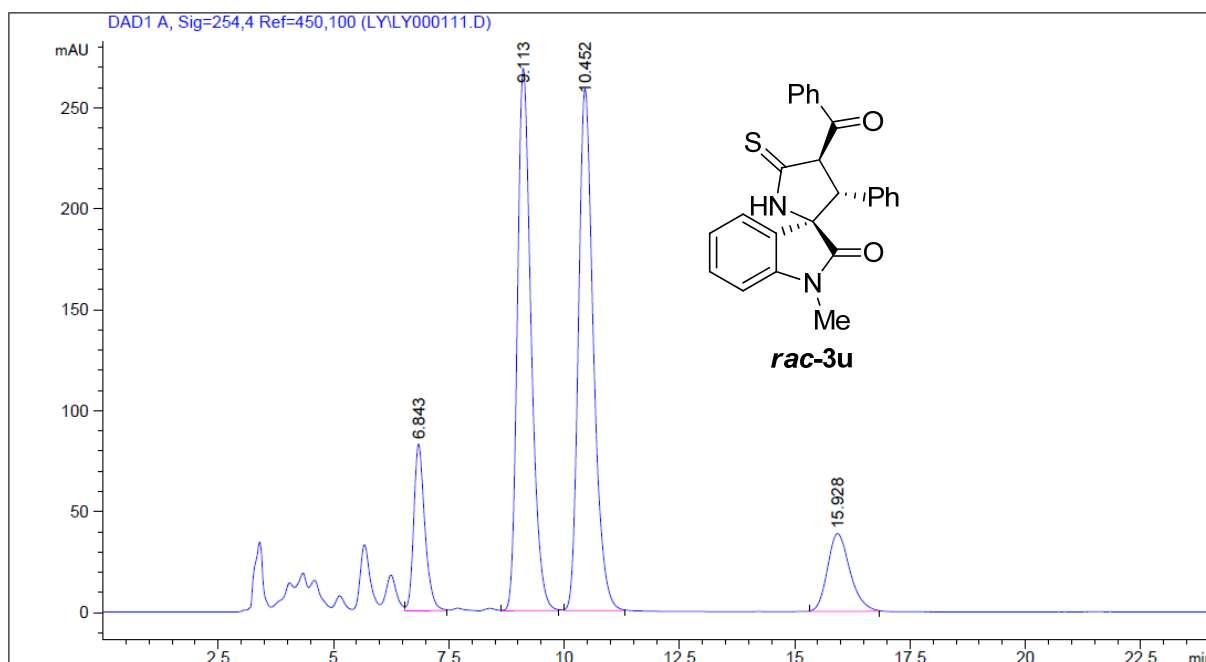




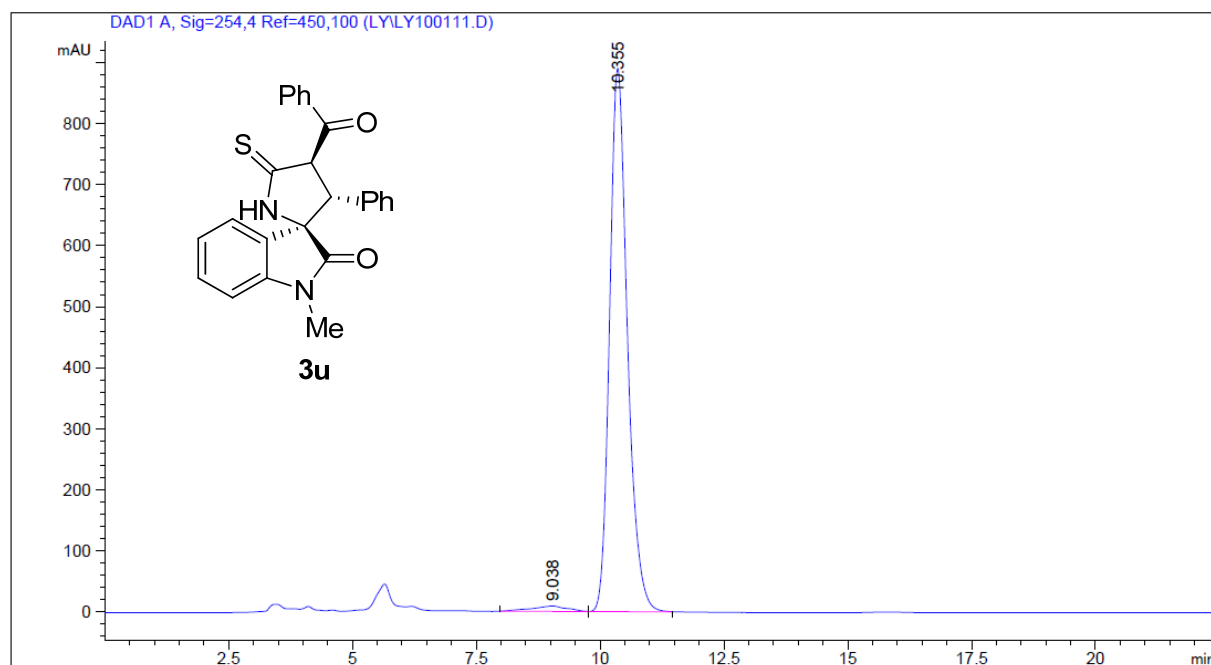




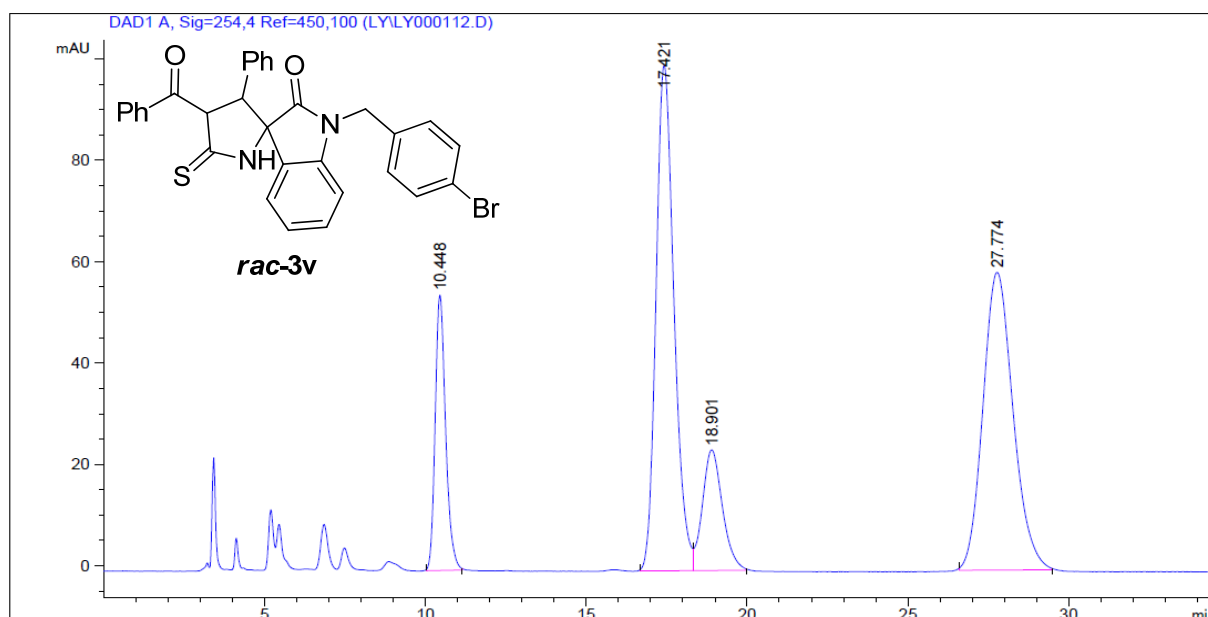




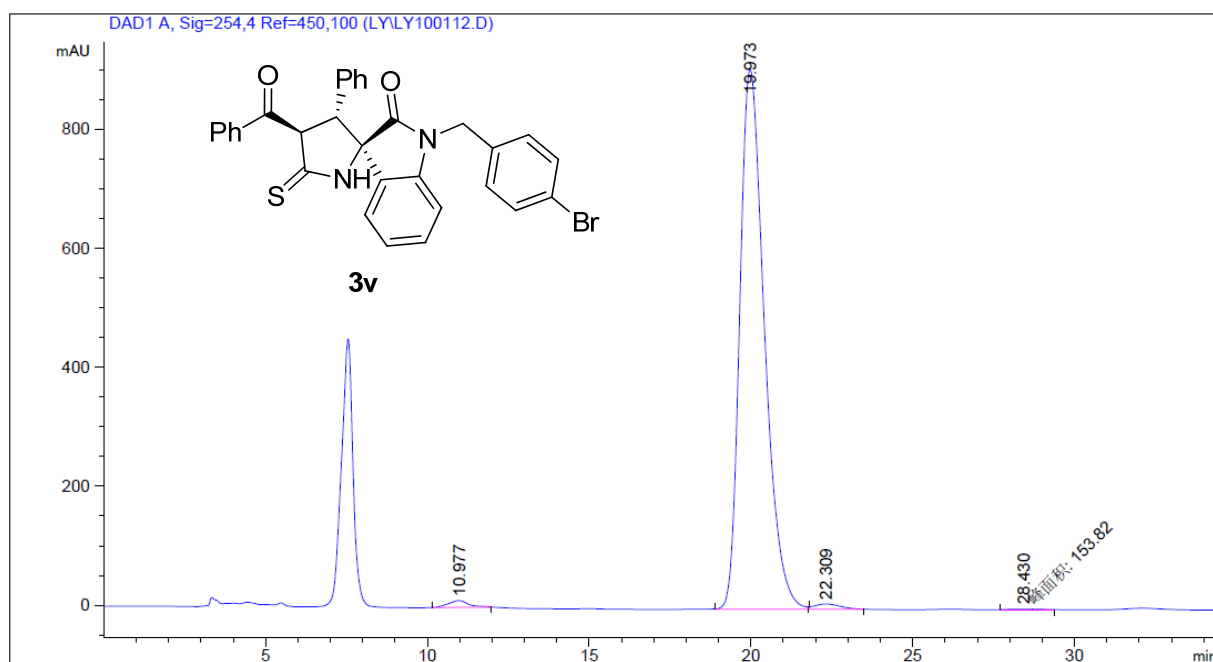
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.843	VB	0.2541	1389.67102	82.67780	9.8474
2	9.113	VB	0.3163	5581.18701	268.72287	39.5492
3	10.452	BB	0.3433	5835.81250	258.60776	41.3535
4	15.928	BB	0.5150	1305.33667	38.55472	9.2498



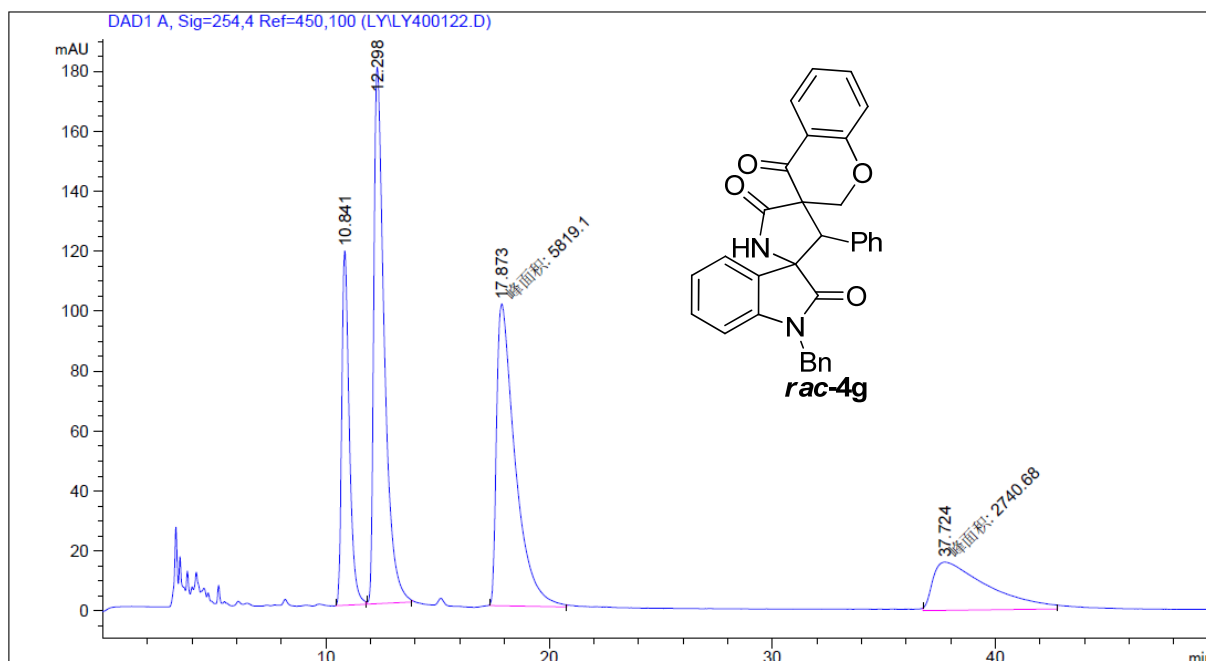
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.038	BV	0.6334	445.56345	9.00218	1.9664
2	10.355	VB	0.3792	2.22130e4	889.80389	98.0336



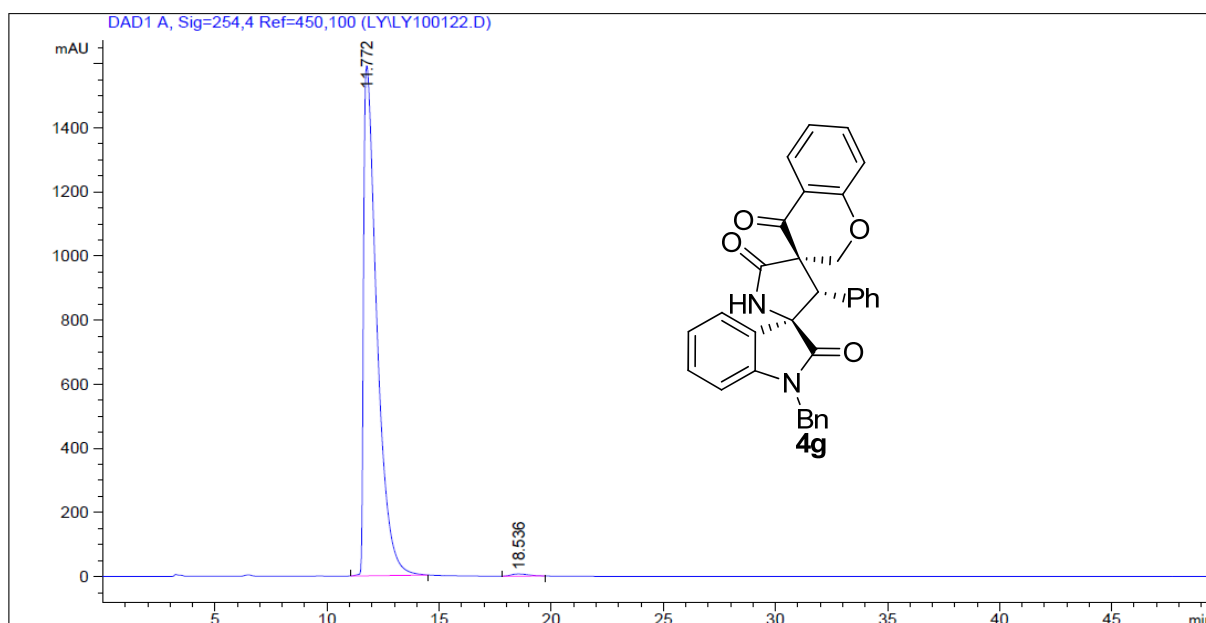
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.448	BB	0.3432	1226.01575	54.34480	12.3181
2	17.421	BV	0.5889	3873.17480	99.77929	38.9149
3	18.901	VB	0.6407	1029.70581	23.80232	10.3458
4	27.774	BB	0.9613	3824.03198	58.75922	38.4212



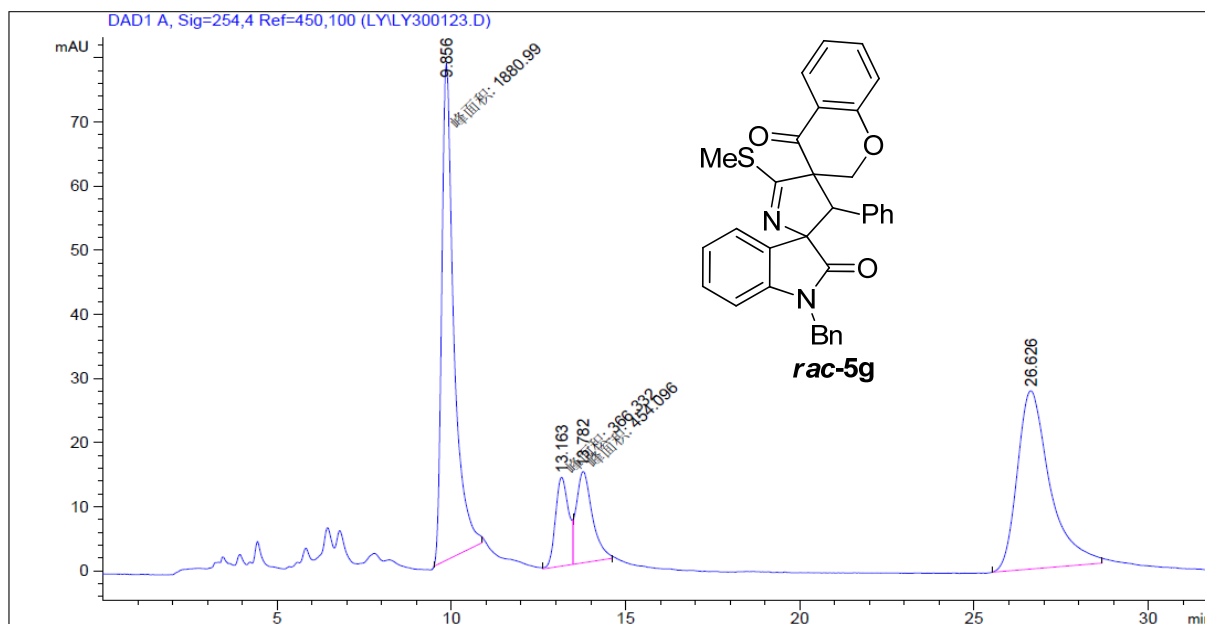
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.977	BB	0.6078	506.85223	11.59849	1.0366
2	19.973	BB	0.8098	4.77443e4	907.49097	97.6437
3	22.309	BB	0.6534	491.49002	9.02380	1.0052
4	28.430	MM	1.3253	153.82027	1.93435	0.3146



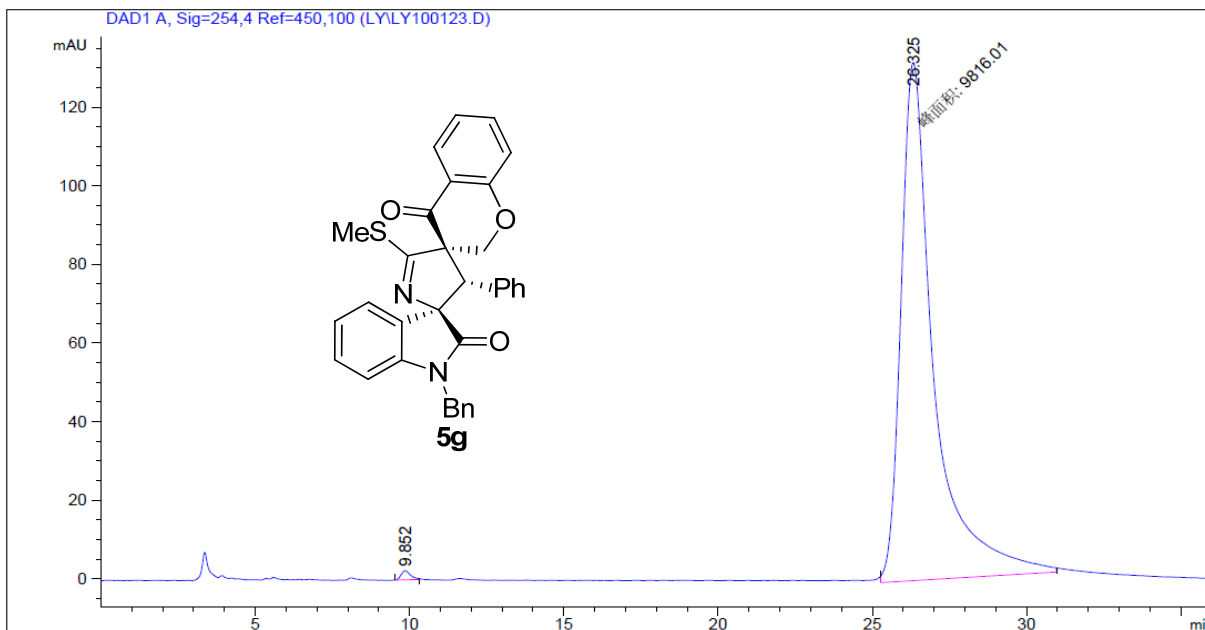
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	10.841	BB	0.3571	2786.95630	118.20641	16.1779
2	12.298	BB	0.4894	5880.19189	178.94301	34.1337
3	17.873	MM	0.9630	5819.10352	100.70854	33.7791
4	37.724	MM	2.8407	2740.68262	16.07963	15.9093



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.772	BB	0.6041	6.54983e4	1591.74475	99.4340
2	18.536	BB	0.6433	372.85046	6.89006	0.5660



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.856	MM	0.4043	1880.98950	77.54160	41.7011
2	13.163	MF	0.4403	366.33215	13.86557	8.1215
3	13.782	FM	0.5316	454.09555	14.23680	10.0672
4	26.626	BB	0.9754	1809.23303	27.79550	40.1102



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	9.852	BB	0.2966	49.30463	2.33265	0.4998
2	26.325	MM	1.2411	9816.00684	131.82187	99.5002