

A Chiral Relay Race: Stereoselective Synthesis of Axially Chiral

Biaryl Diketones through Ring-Opening of Optical

Dihydrophenanthrene-9,10-diols

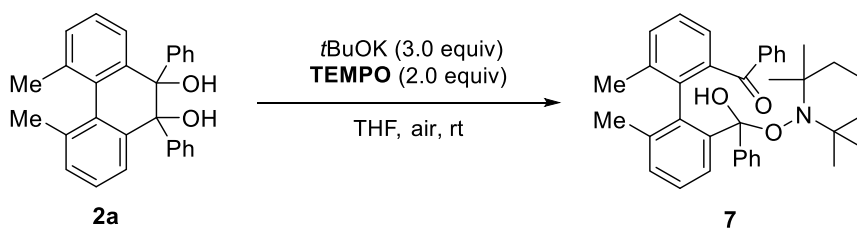
Lei Shi,¹ Jiawei Zhu,¹ Biqiong Hong² and Zhenhua Gu^{*1,2}

1. Hefei National Research Center for Physical Sciences at the Microscale and Department of Chemistry, University of Science and Technology of China, 96 Jinzhai Road, Hefei, Anhui 230026, P. R. China

2. College of Materials and Chemical Engineering, Minjiang University, Fuzhou, Fujian, 350108, China

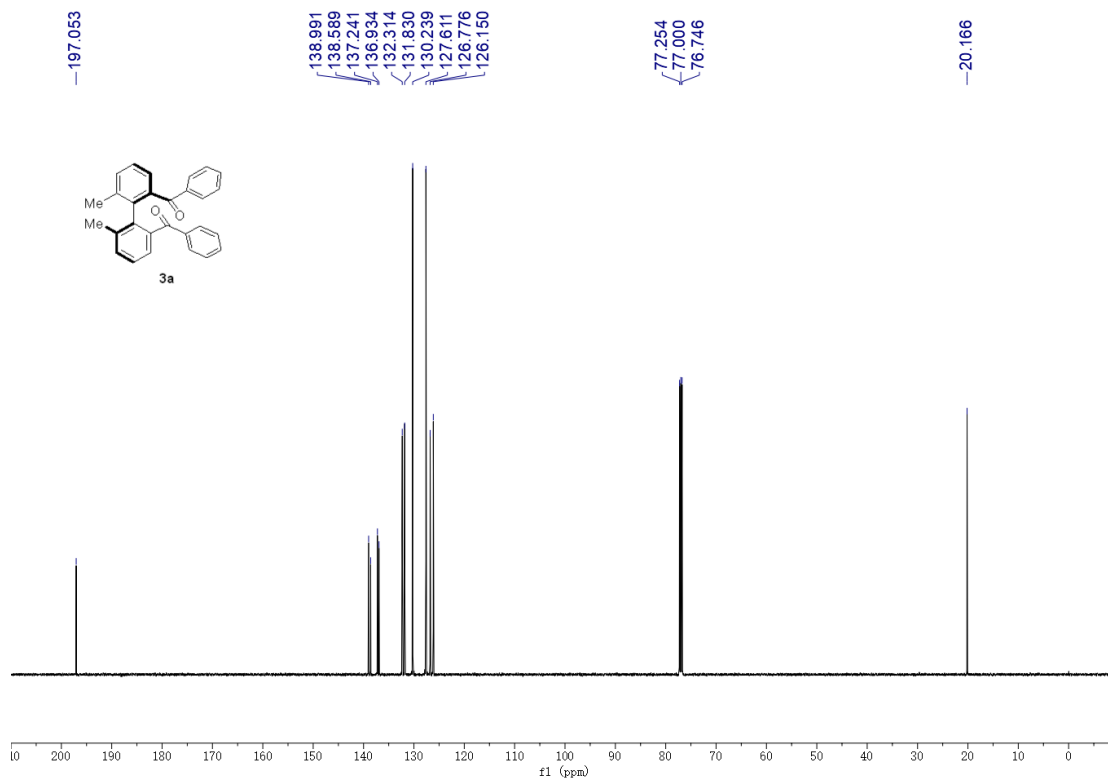
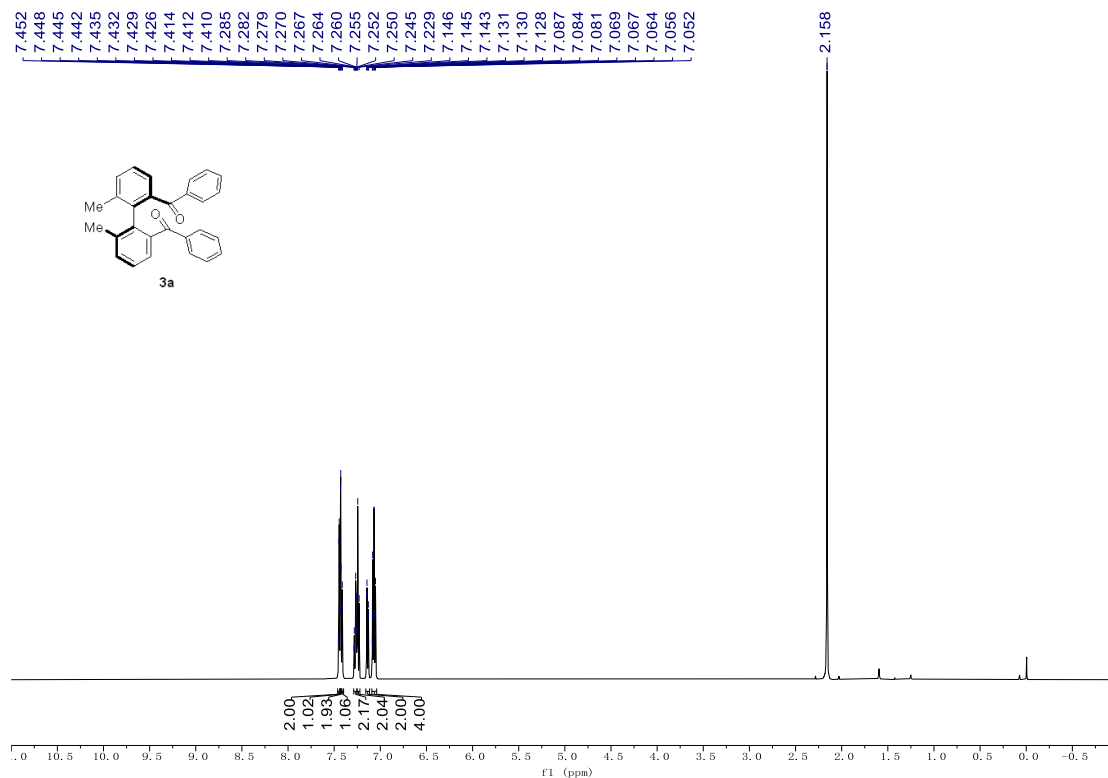
Email: zhgu@ustc.edu.cn

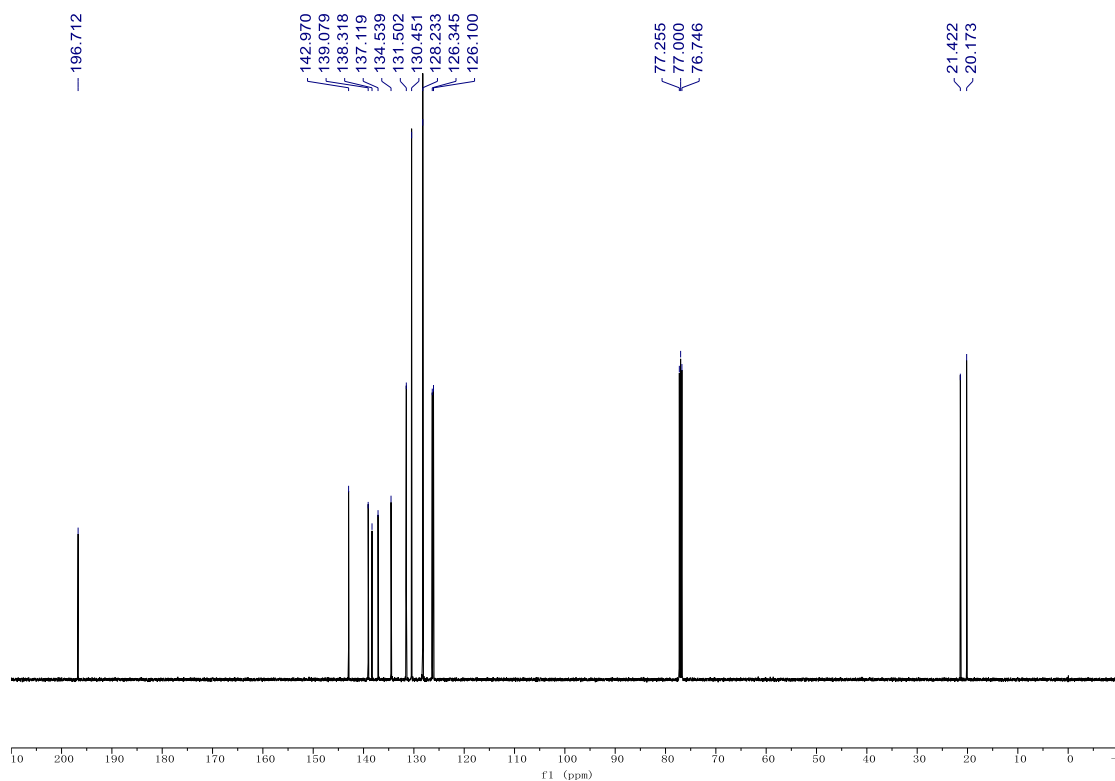
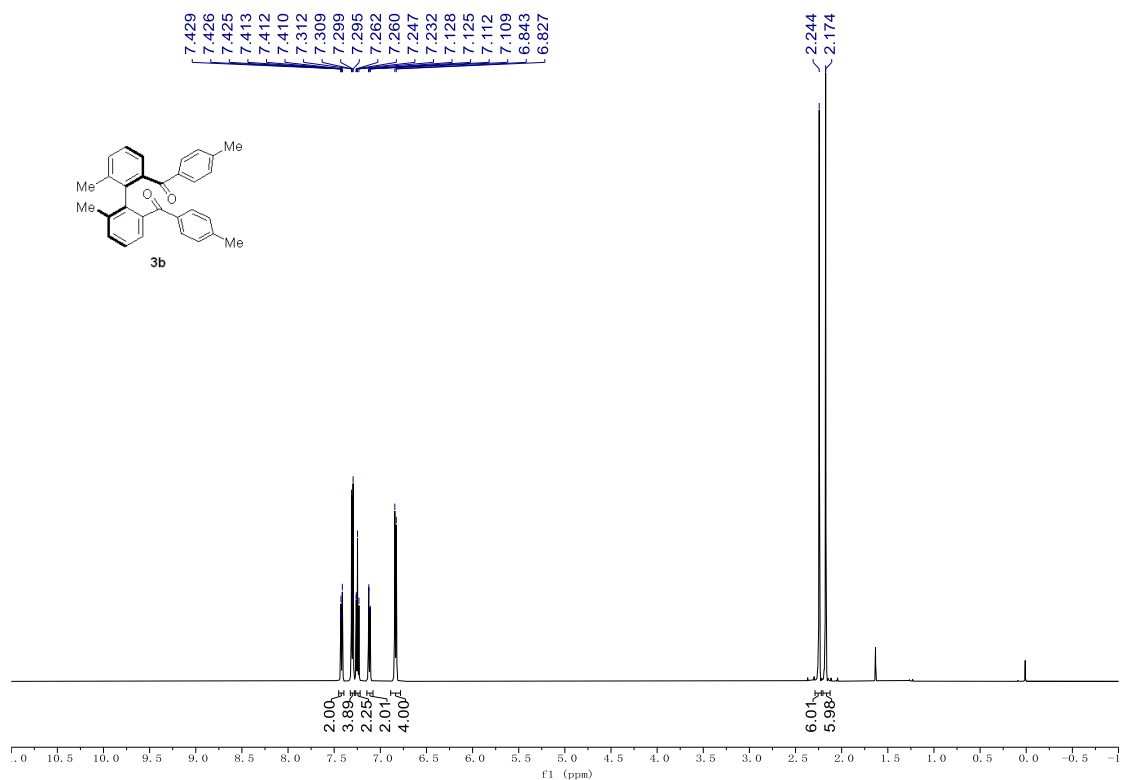
Free radical capture experiment

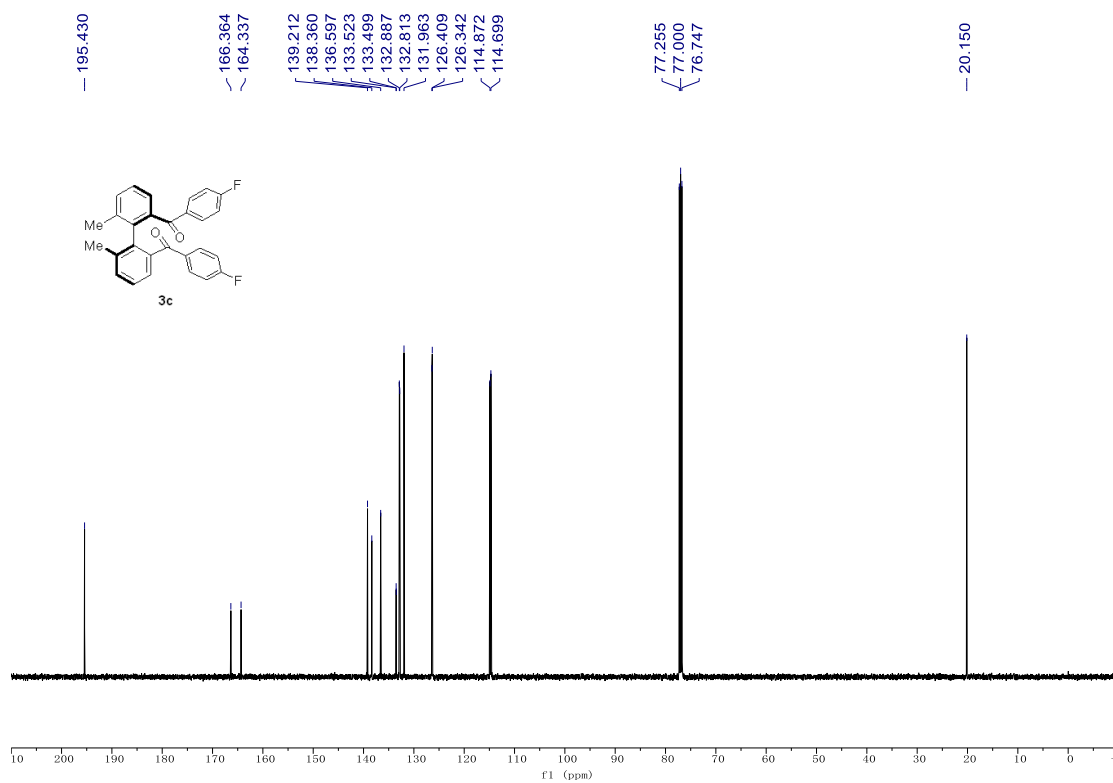
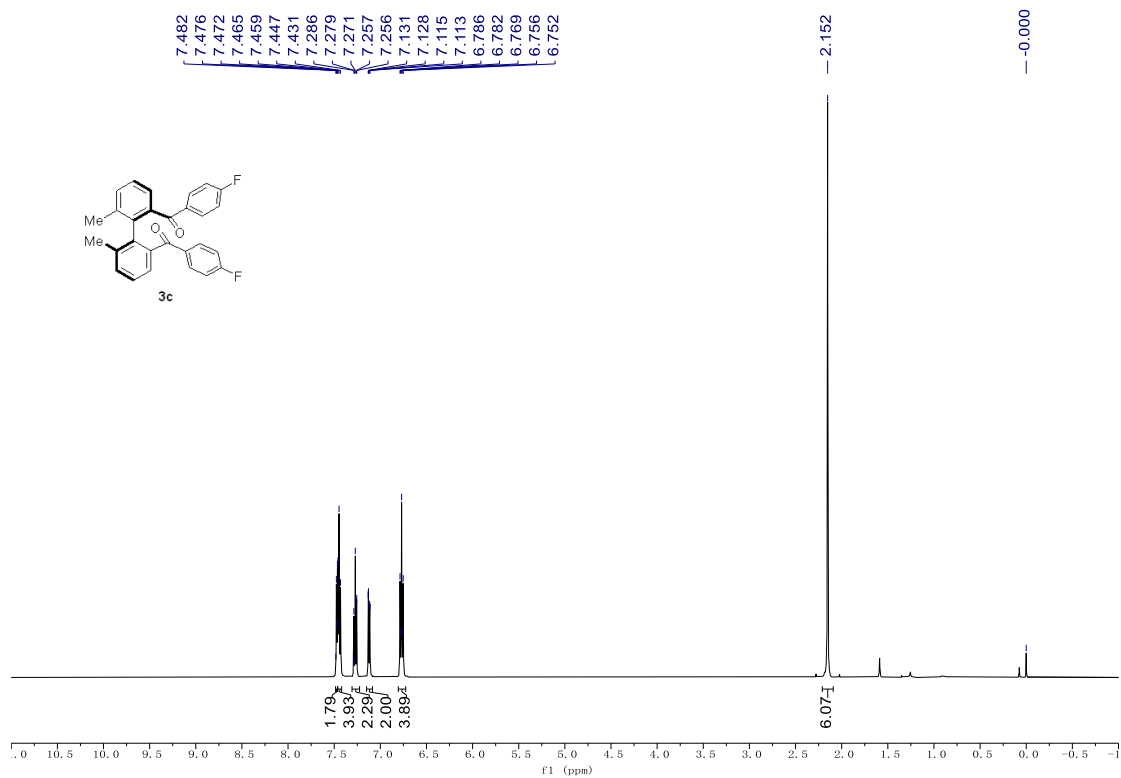


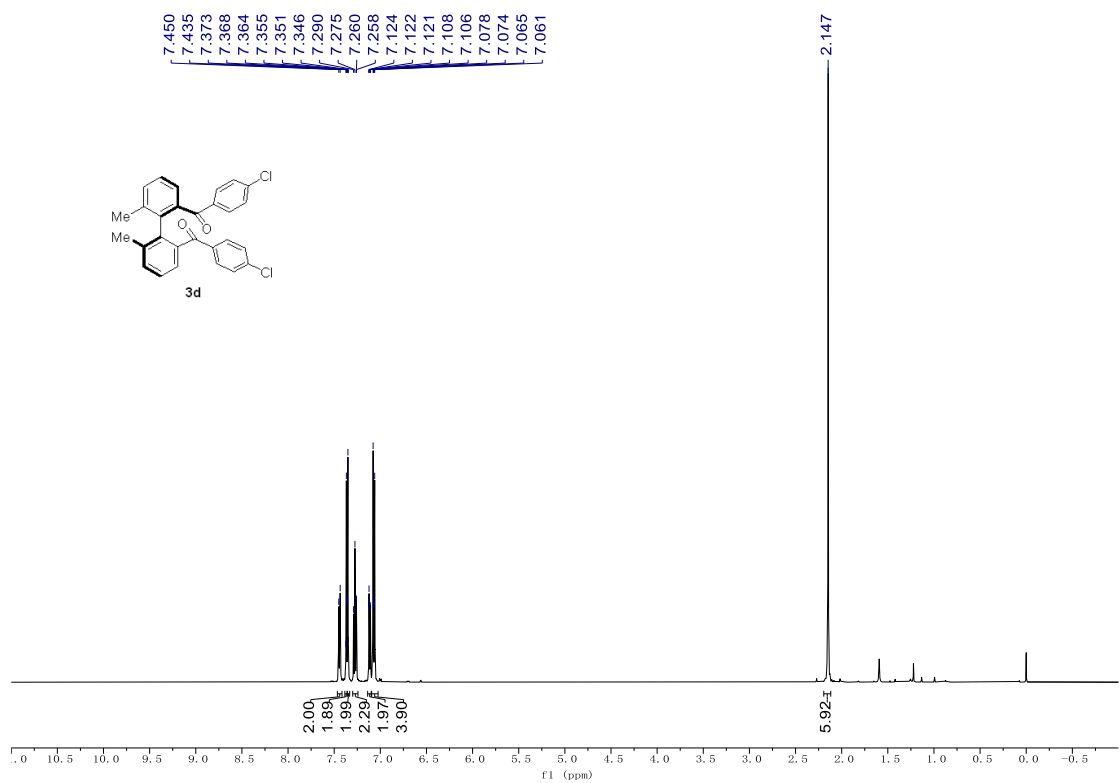
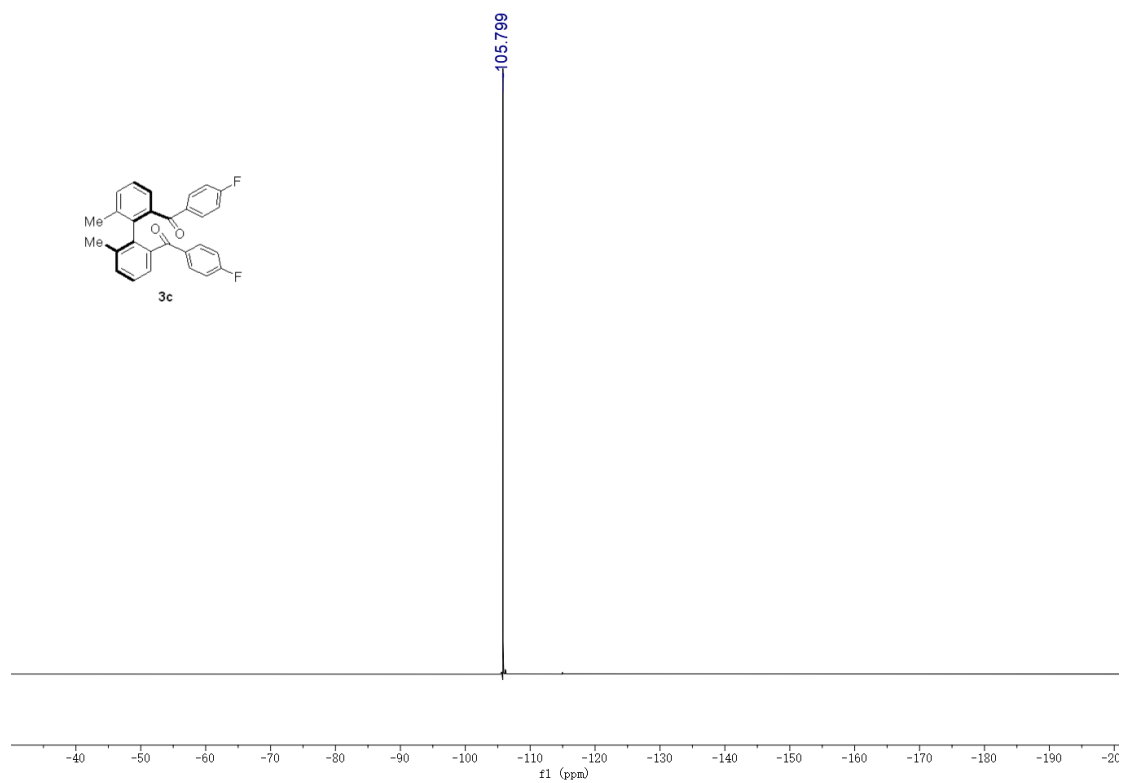
Under air atmosphere, a solution of **2a** (39.2 mg, 0.10 mmol, 1.0 equiv) in THF (2 mL) was added $t\text{BuOK}$ (33.6 mg, 0.30 mmol, 3.0 equiv) and **TEMPO** (31.3 mg, 0.20 mmol, 2.0 equiv) at room temperature, then the mixture was stirred at the same temperature for 30 min. 0.5 mL of the reaction mixture was taken out and it was passed through a short pad of silica gel. **7** was detected by the analysis of HRMS. HRMS (ESI) calcd for $\text{C}_{37}\text{H}_{42}\text{NO}_3$ $[\text{M}+\text{H}]^+$ 548.3159, found 548.3168. HRMS (ESI) calcd for $\text{C}_{37}\text{H}_{41}\text{NO}_3\text{Na}$ $[\text{M}+\text{Na}]^+$ 570.2979, found 570.2992.

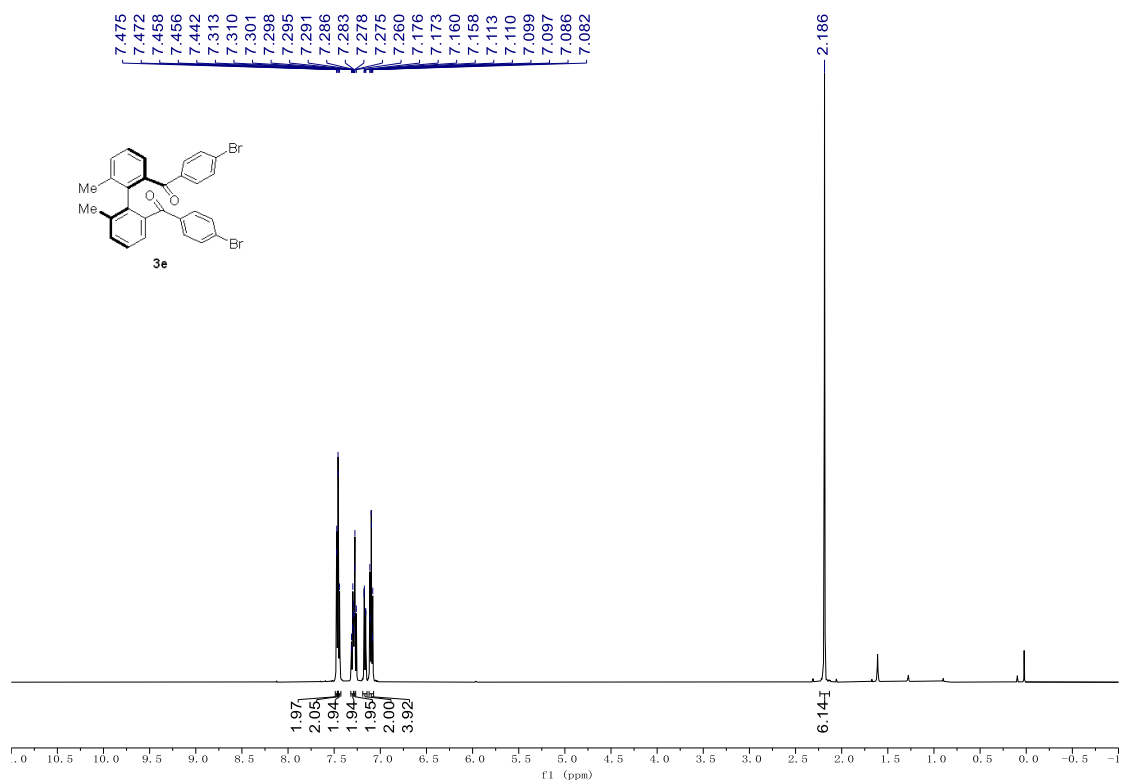
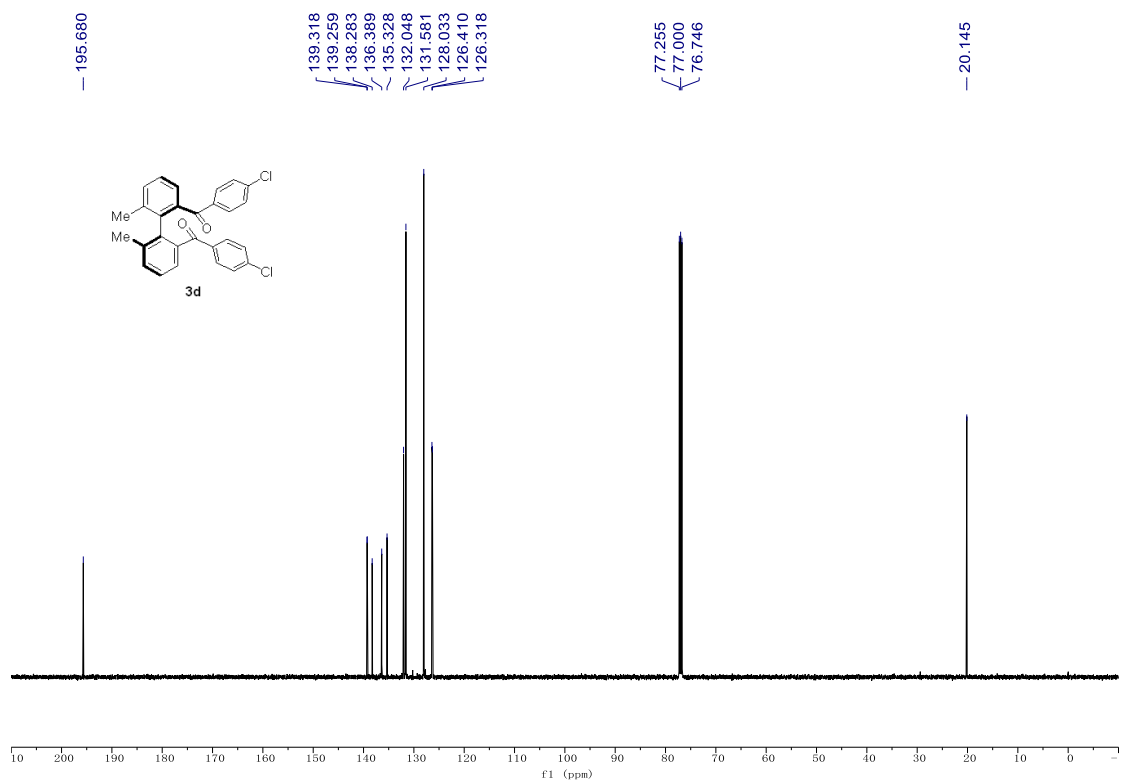
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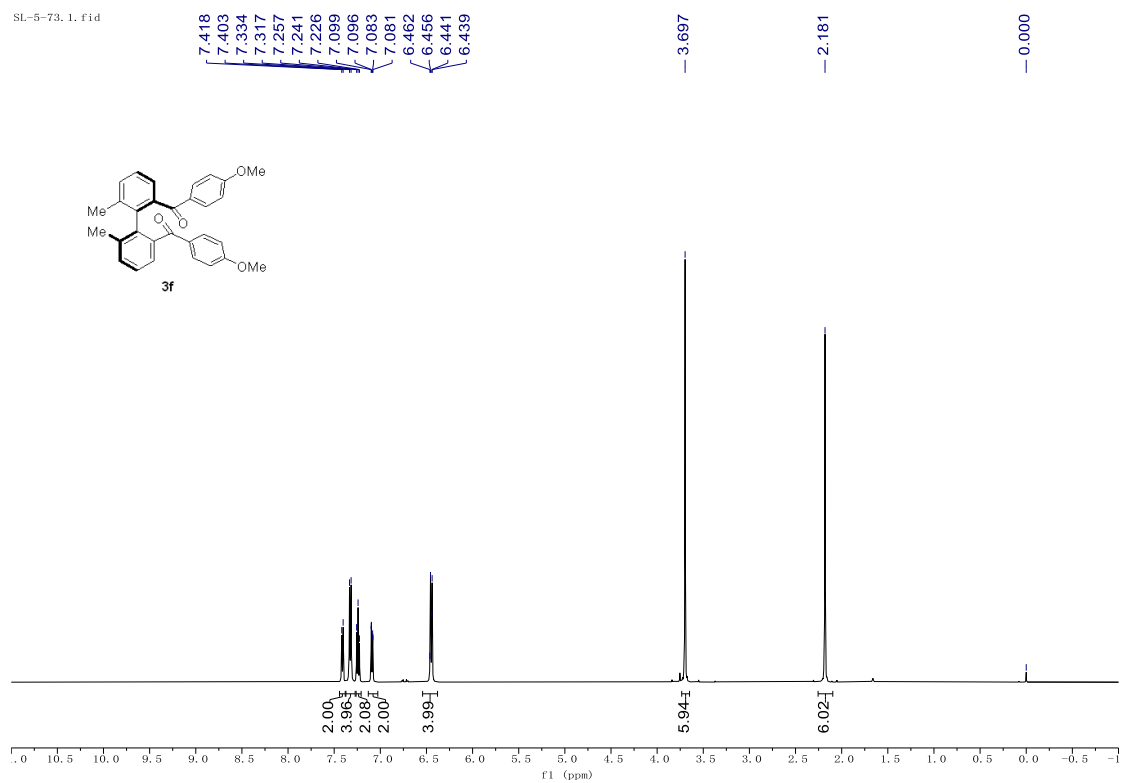
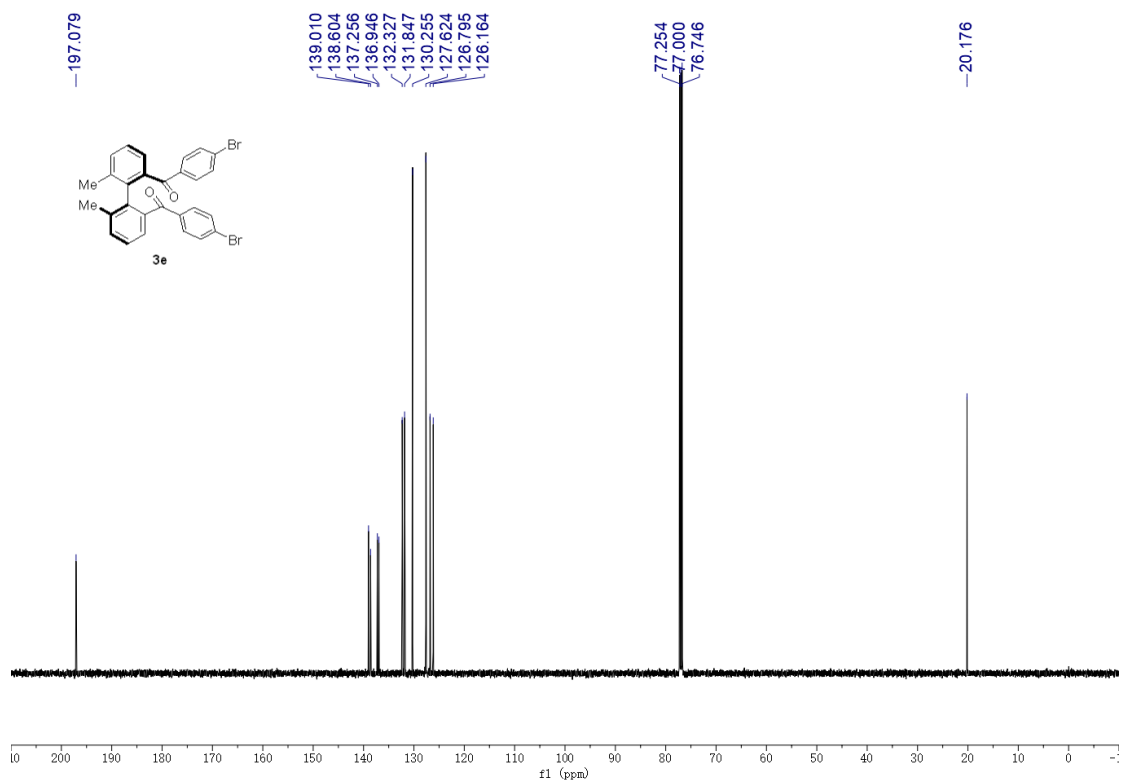


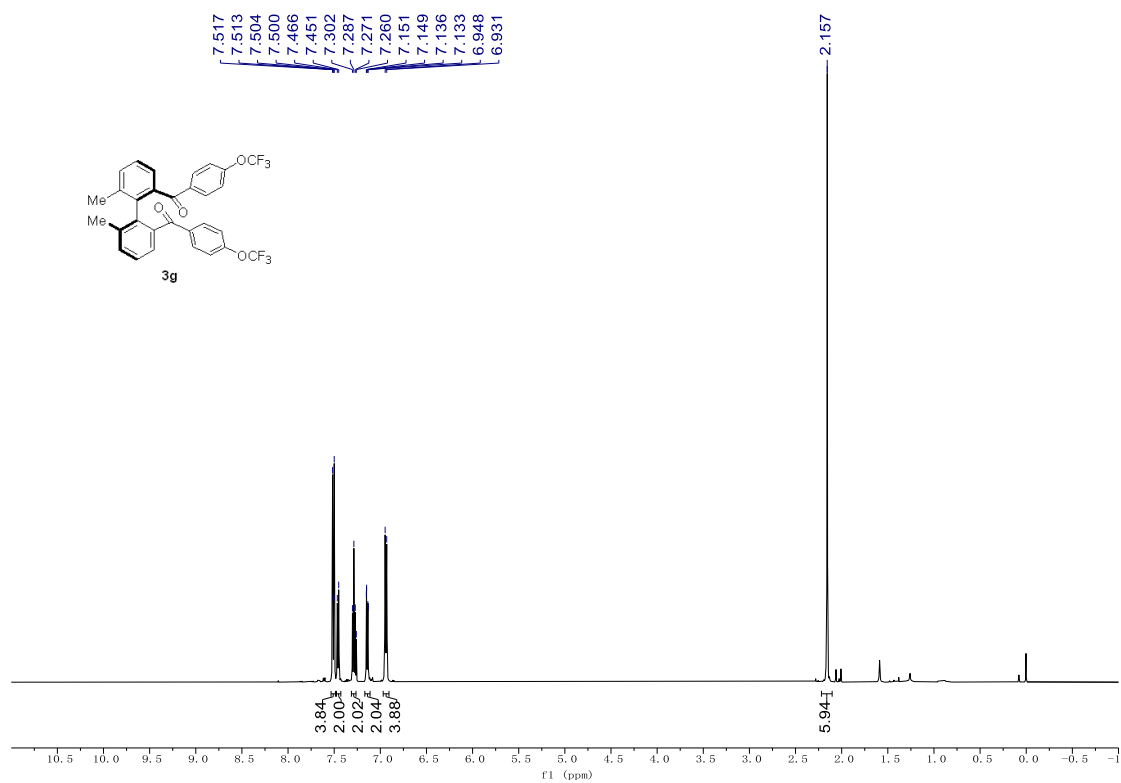
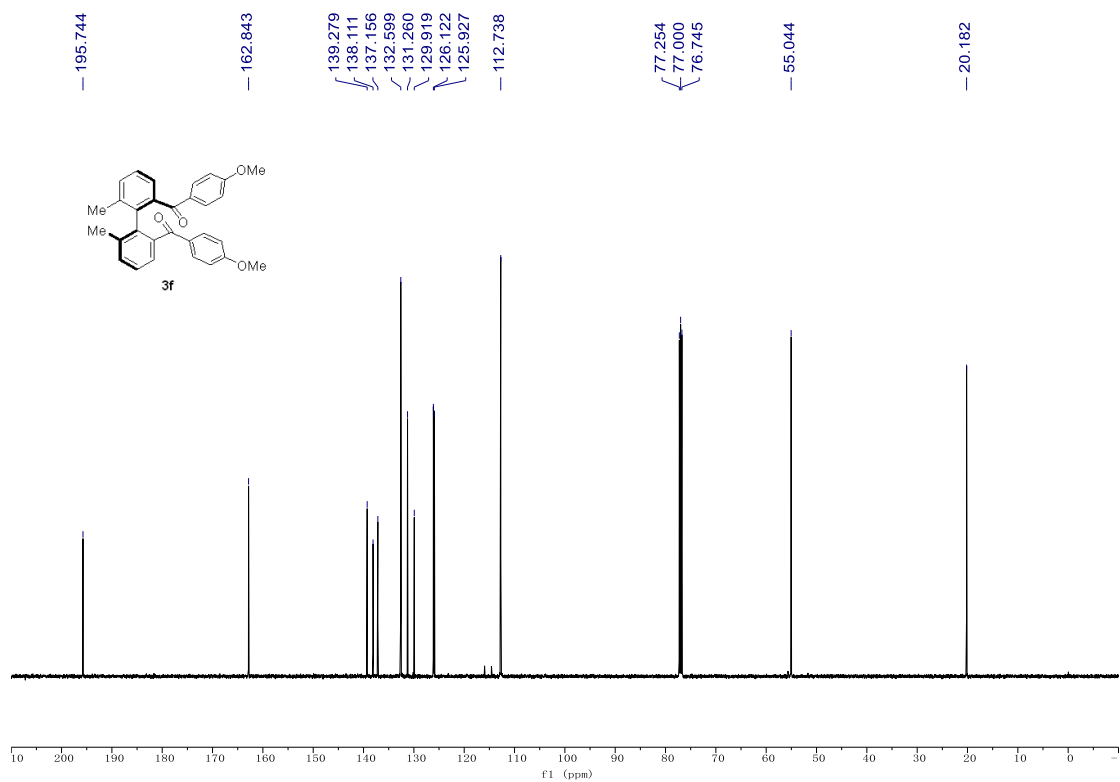


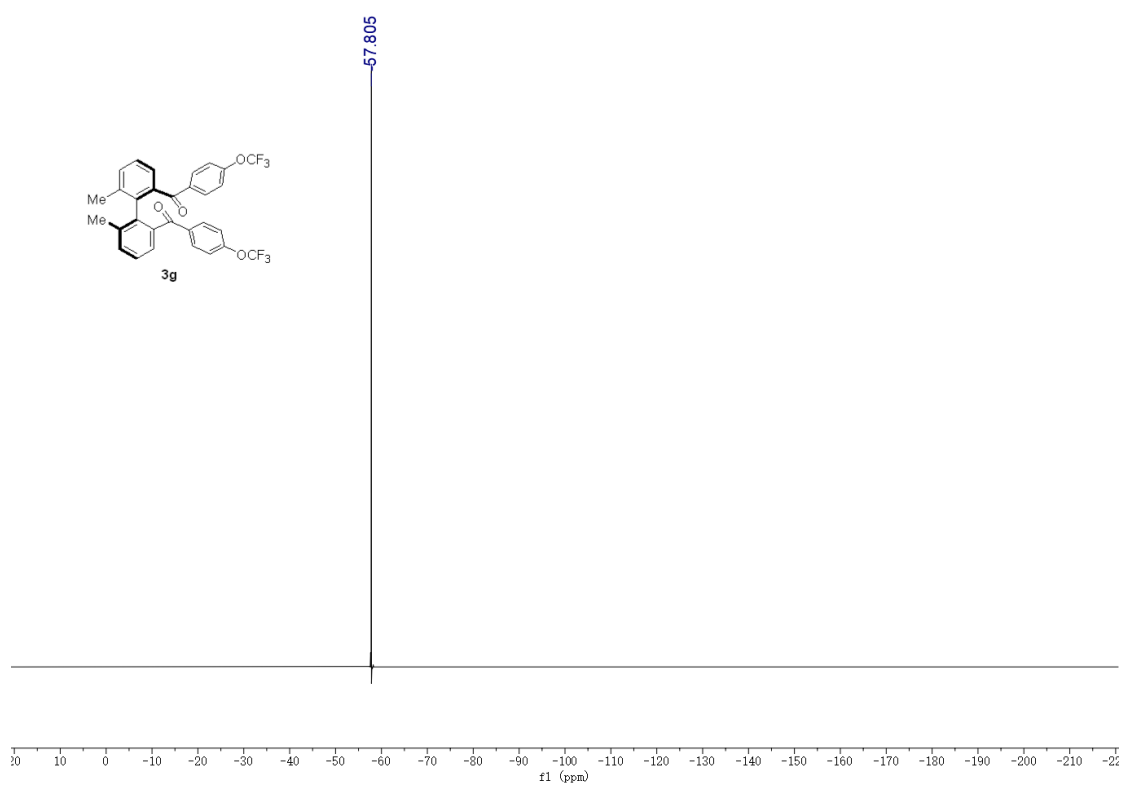
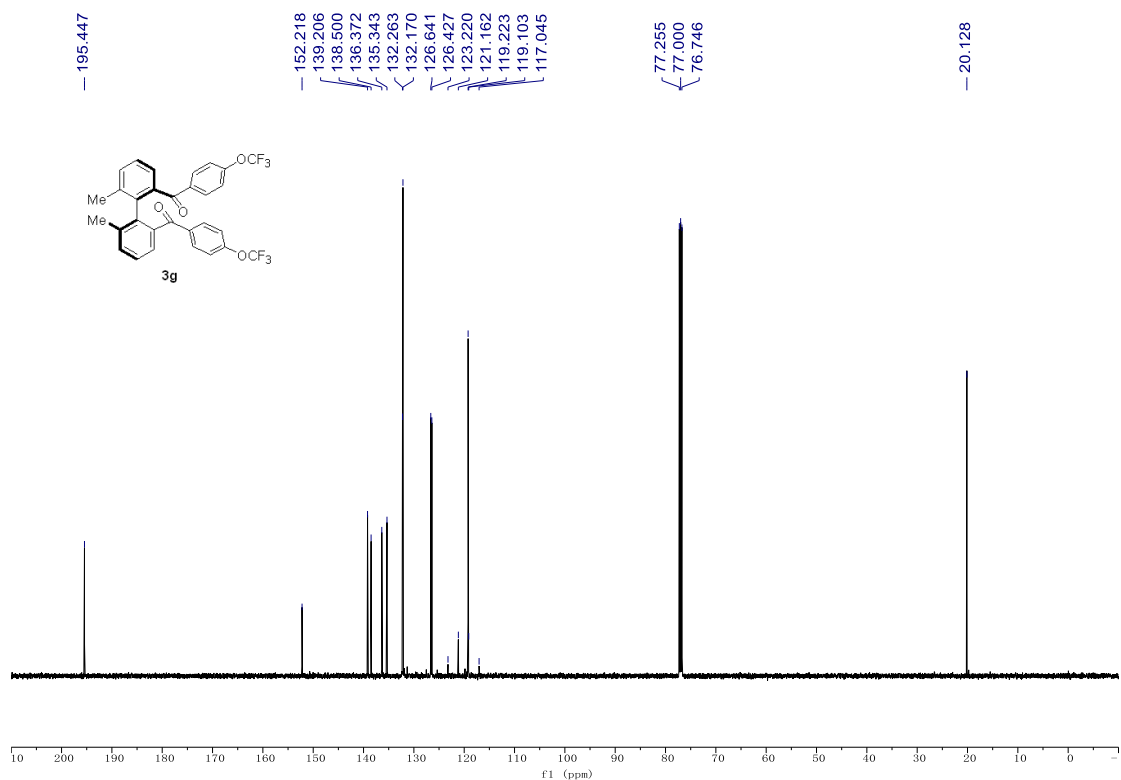


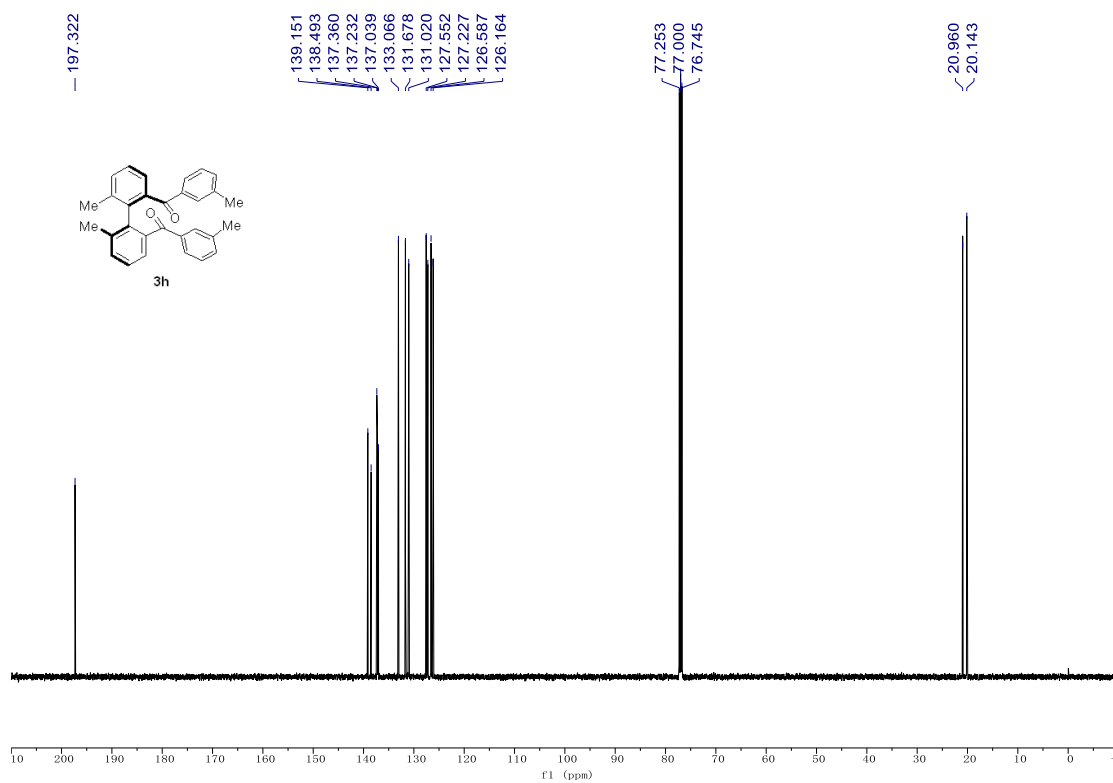
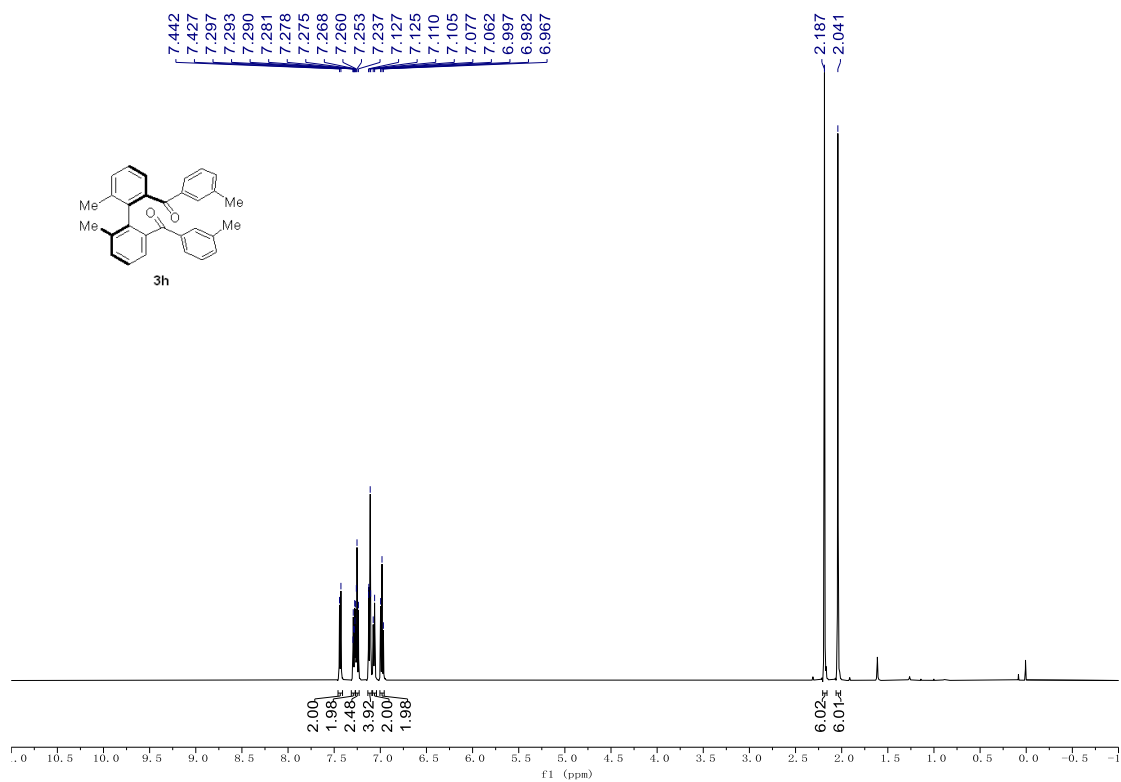


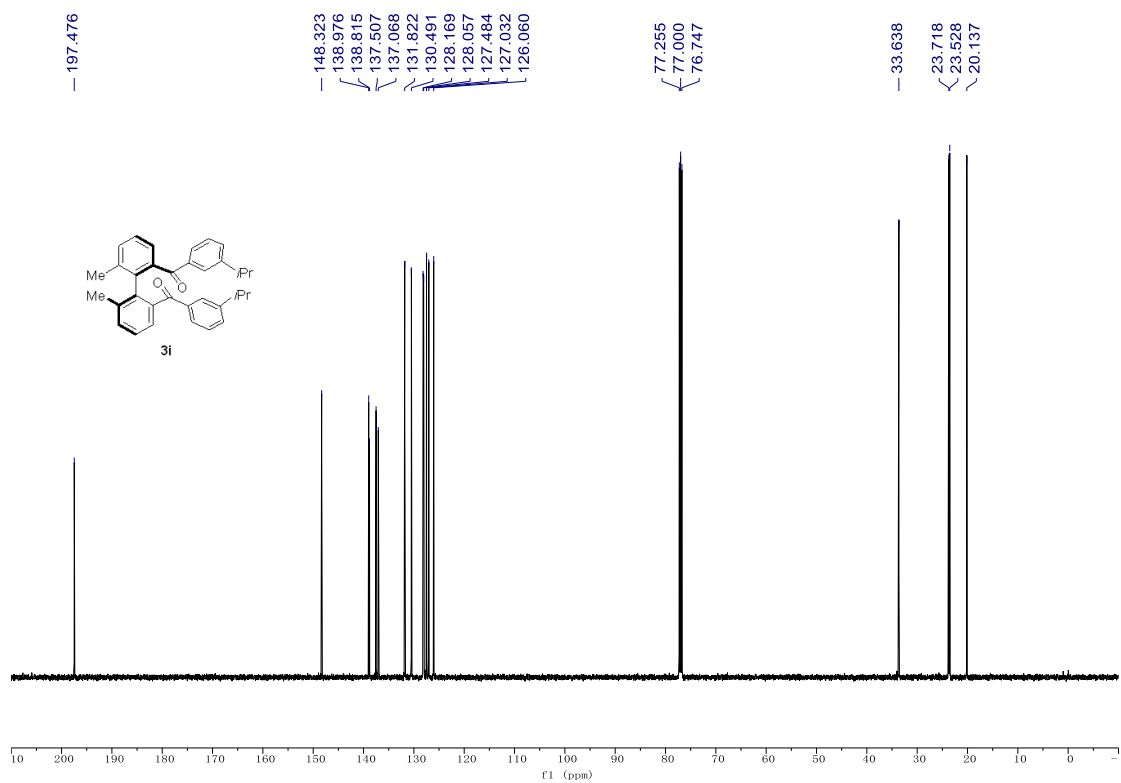
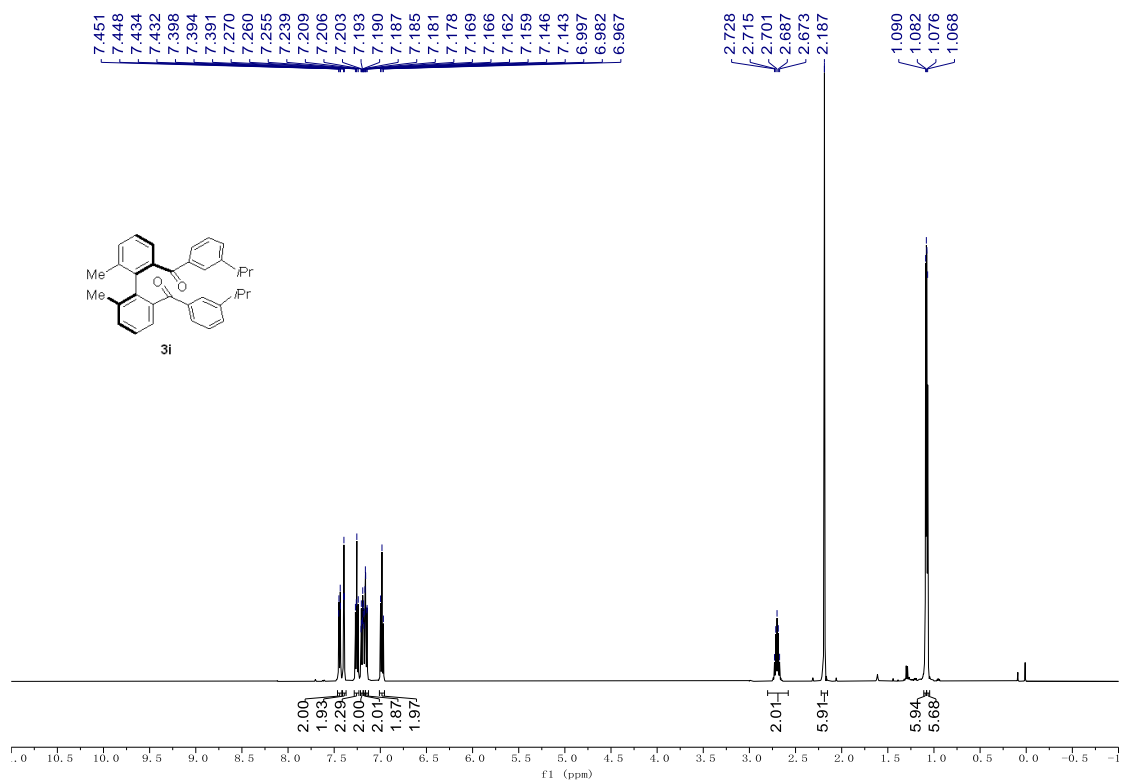


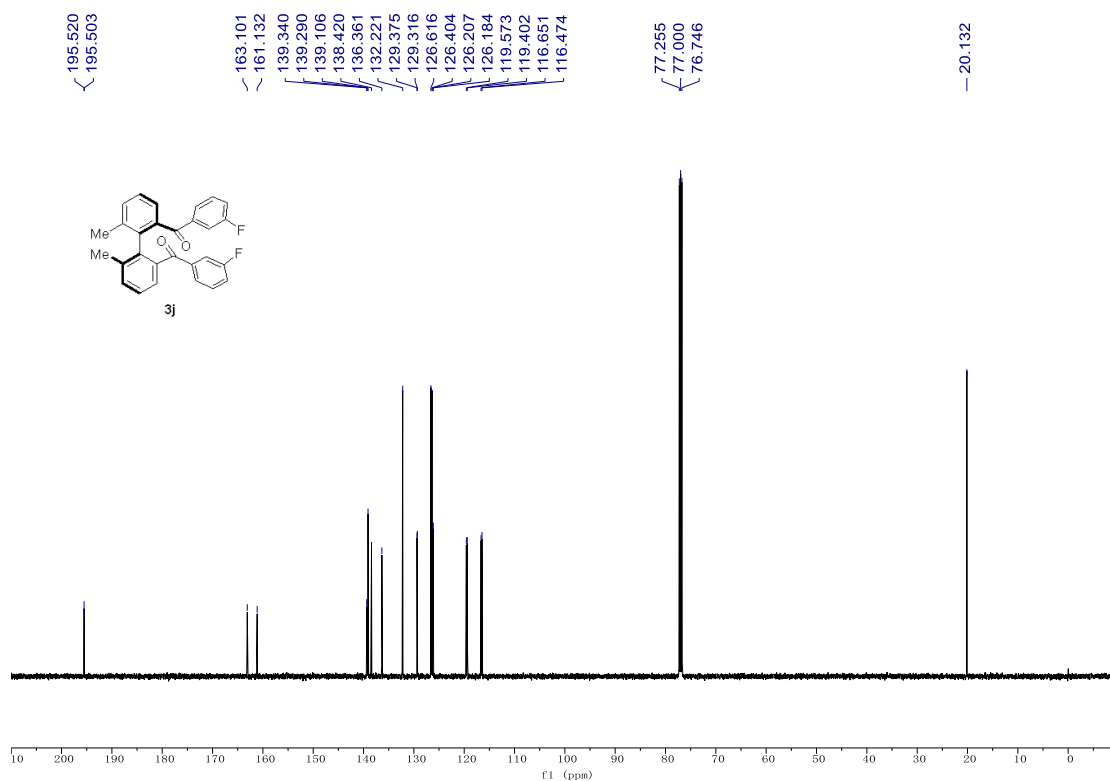
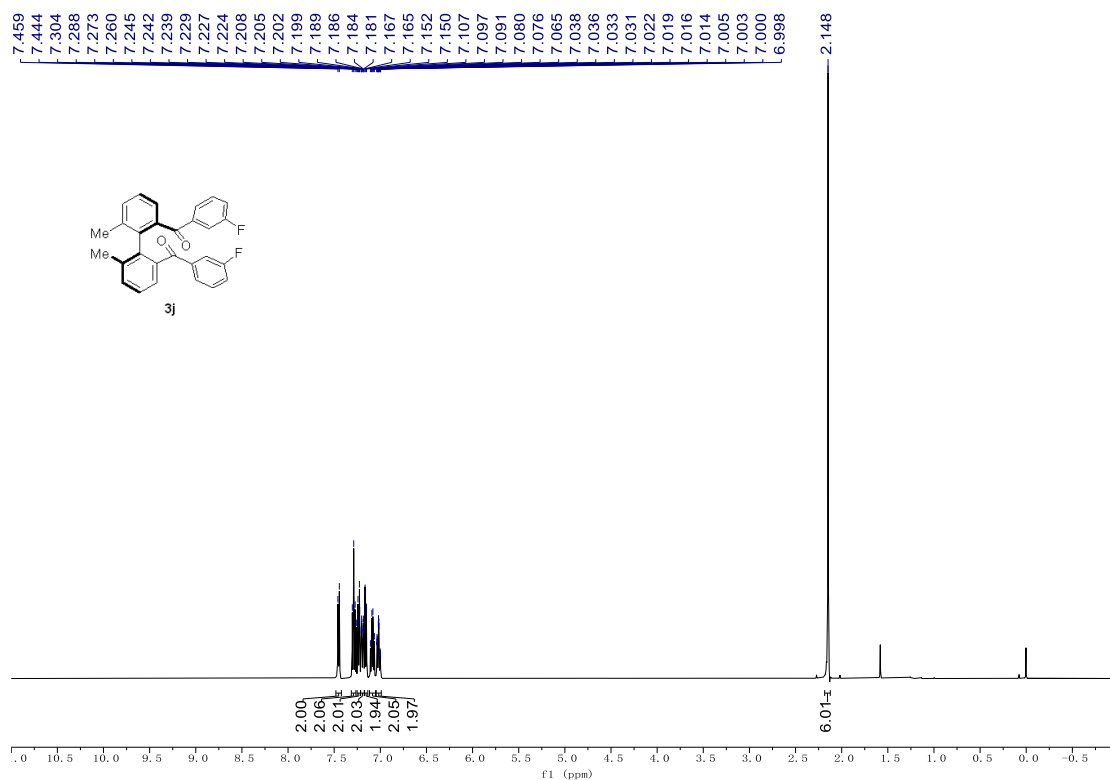


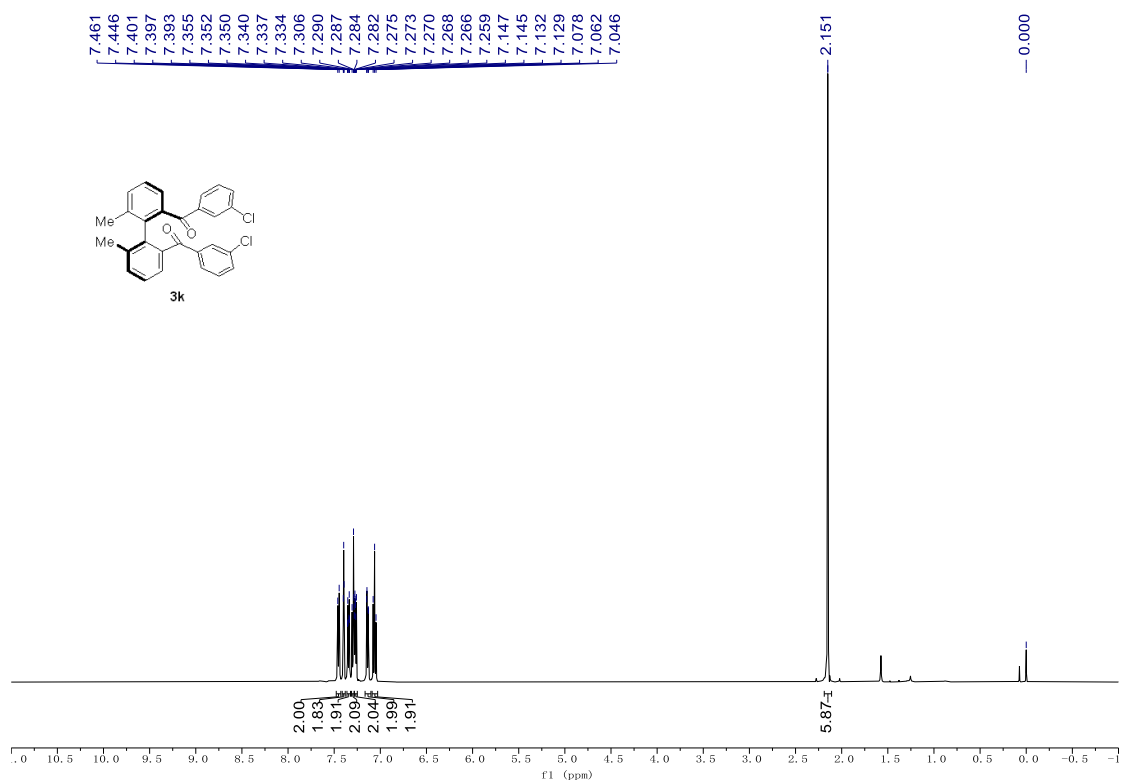
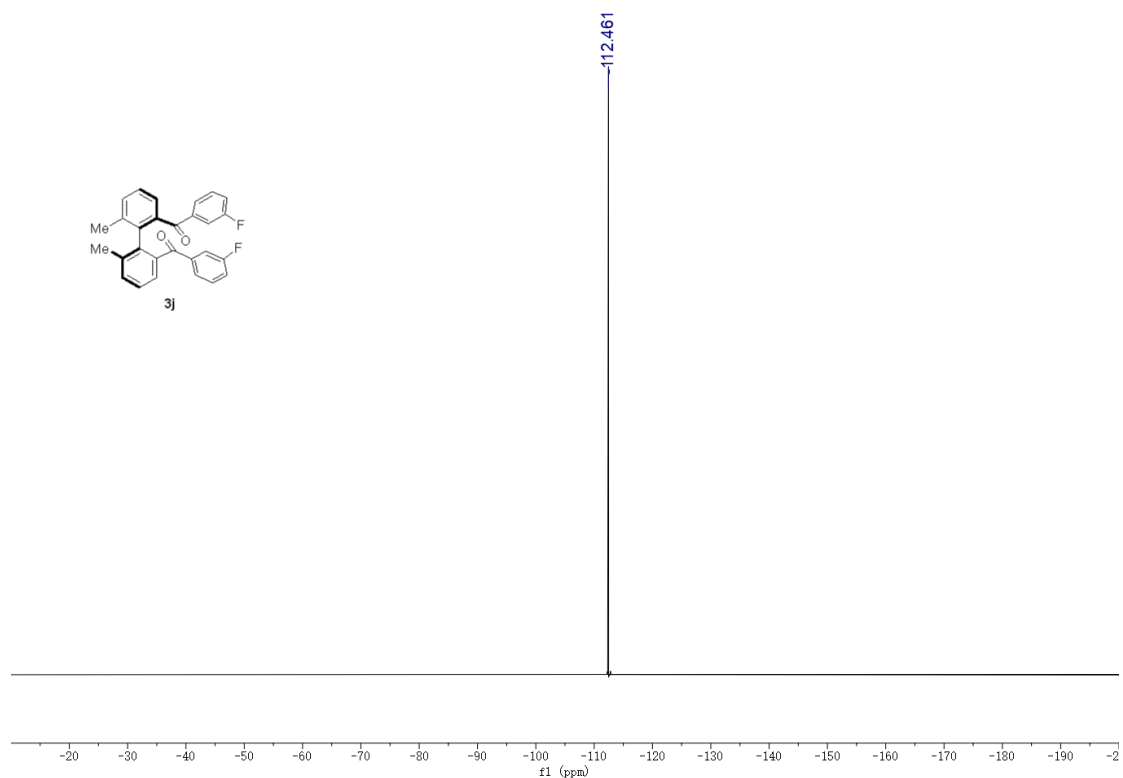


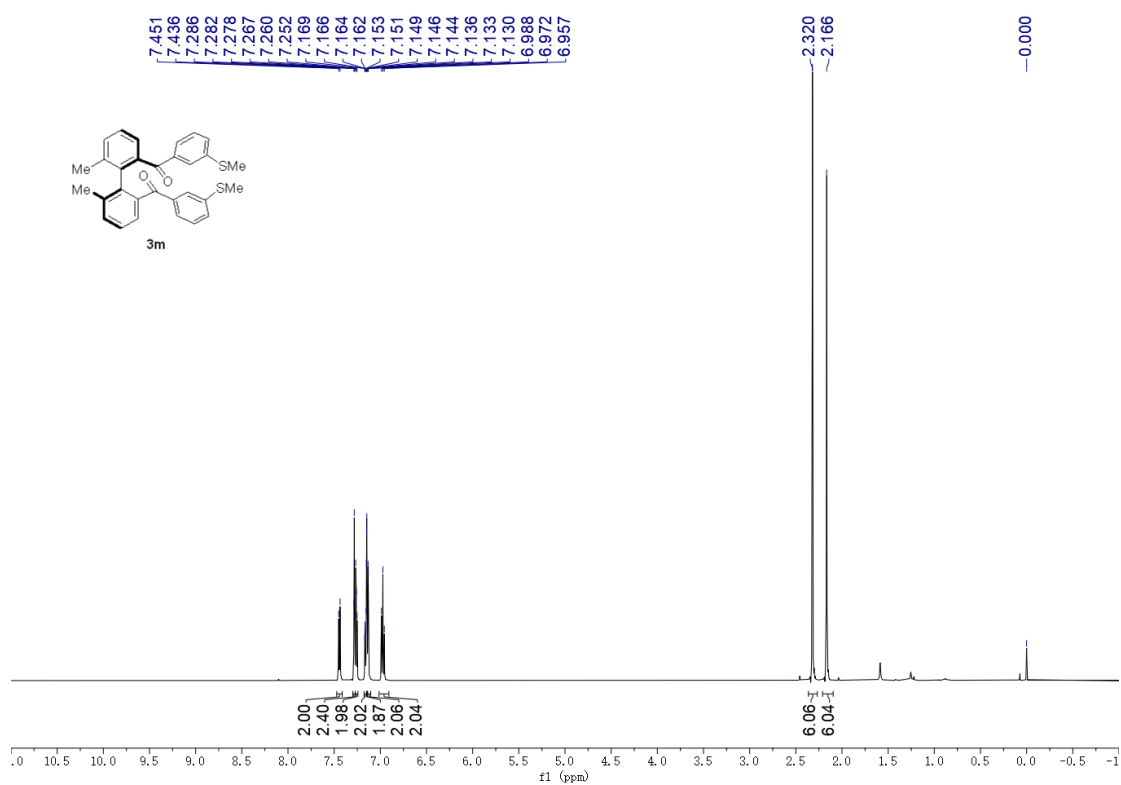
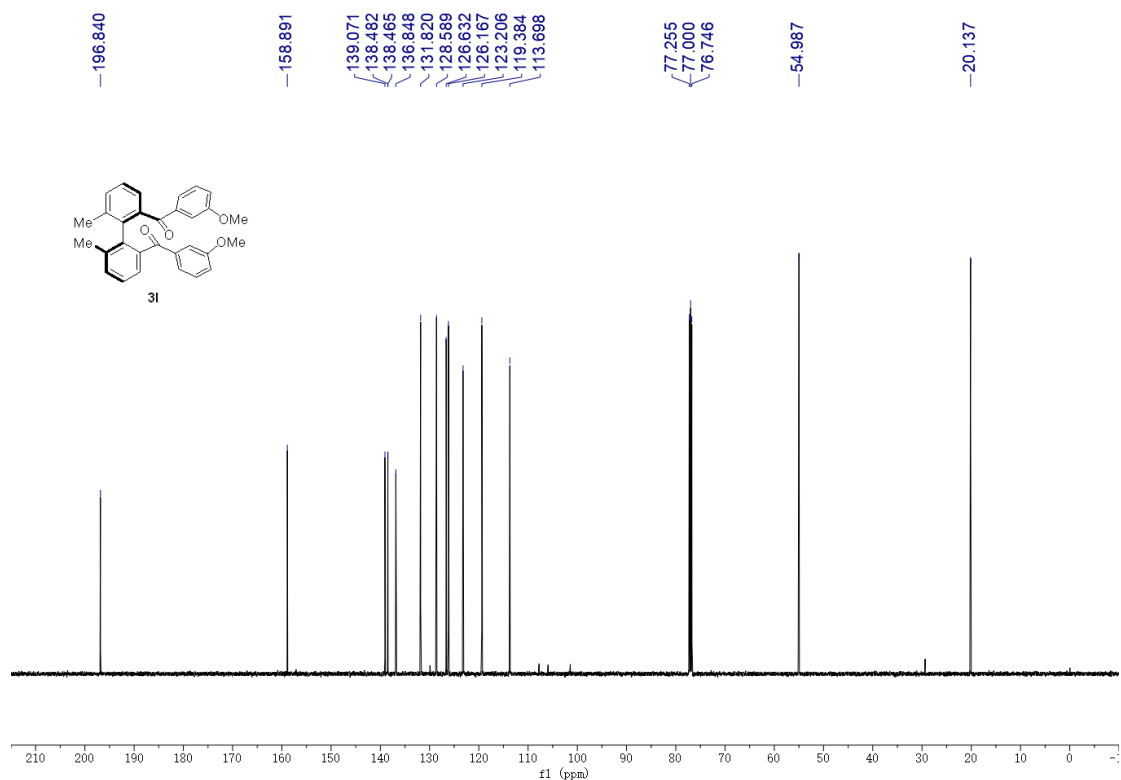


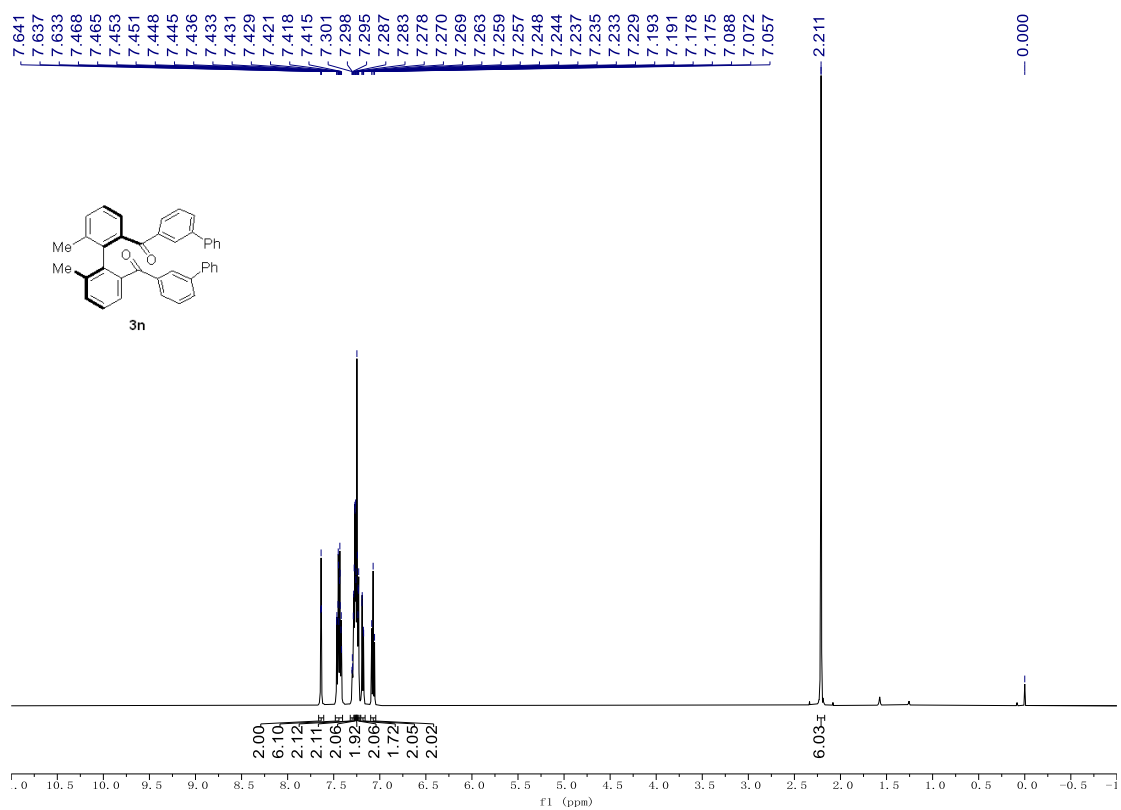
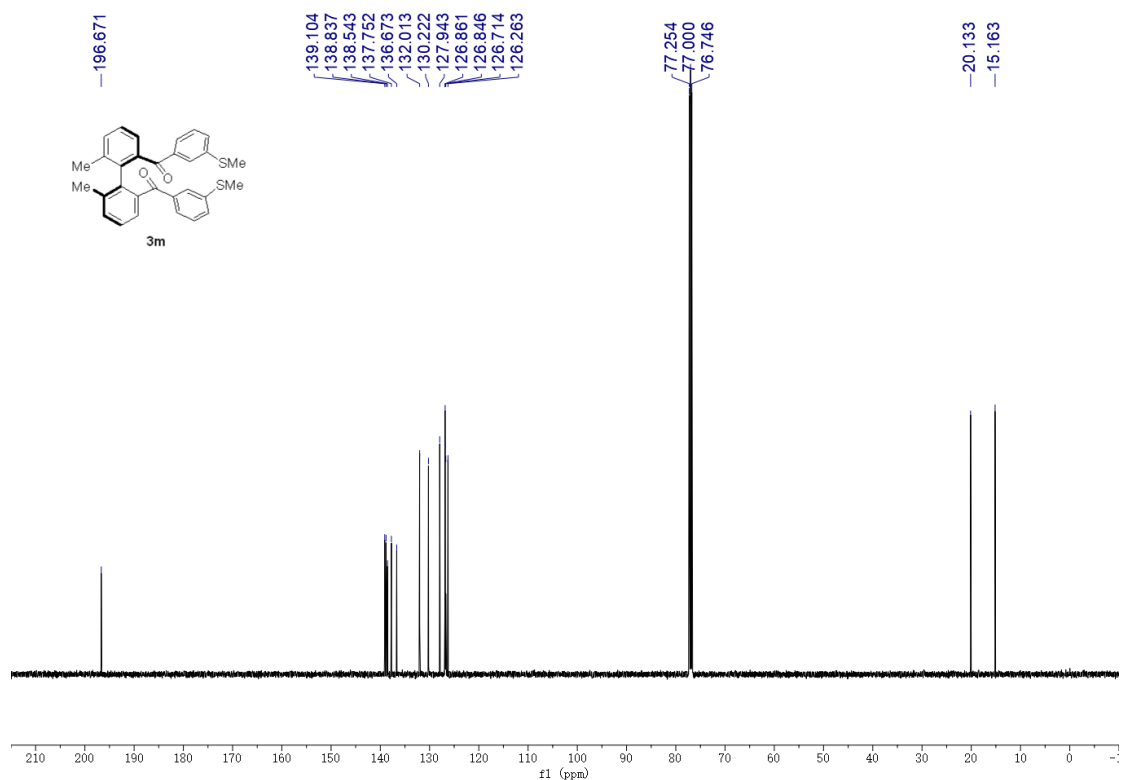


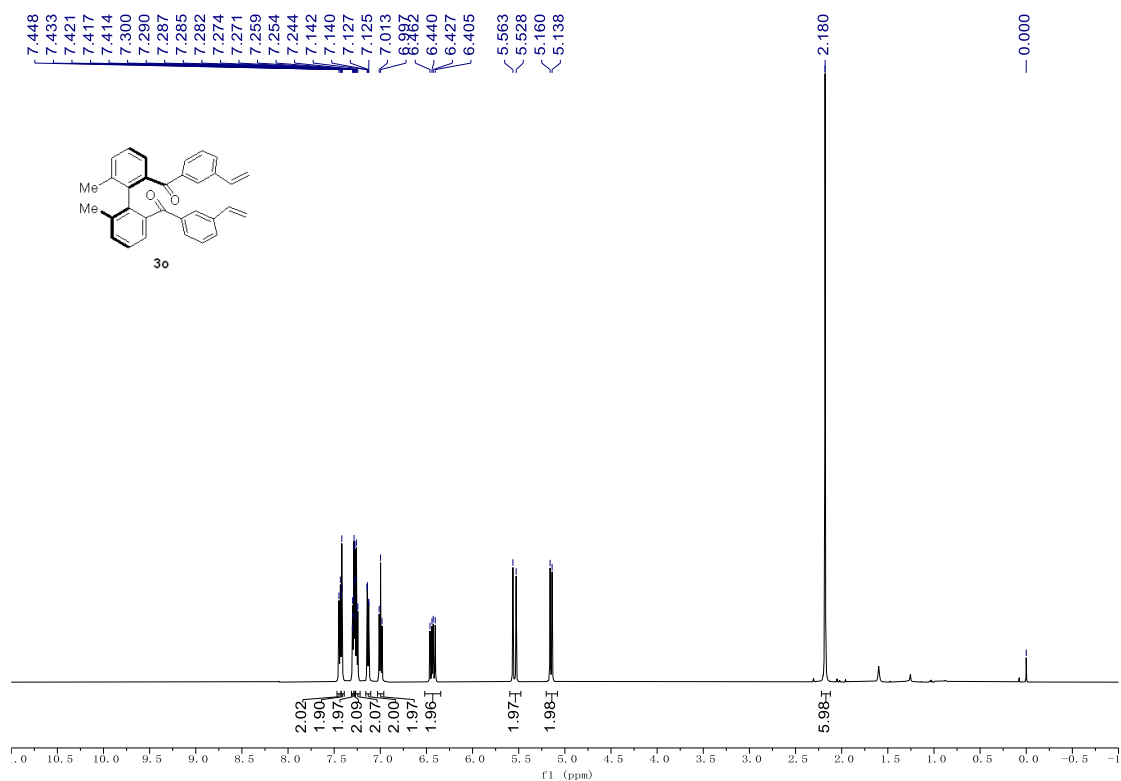
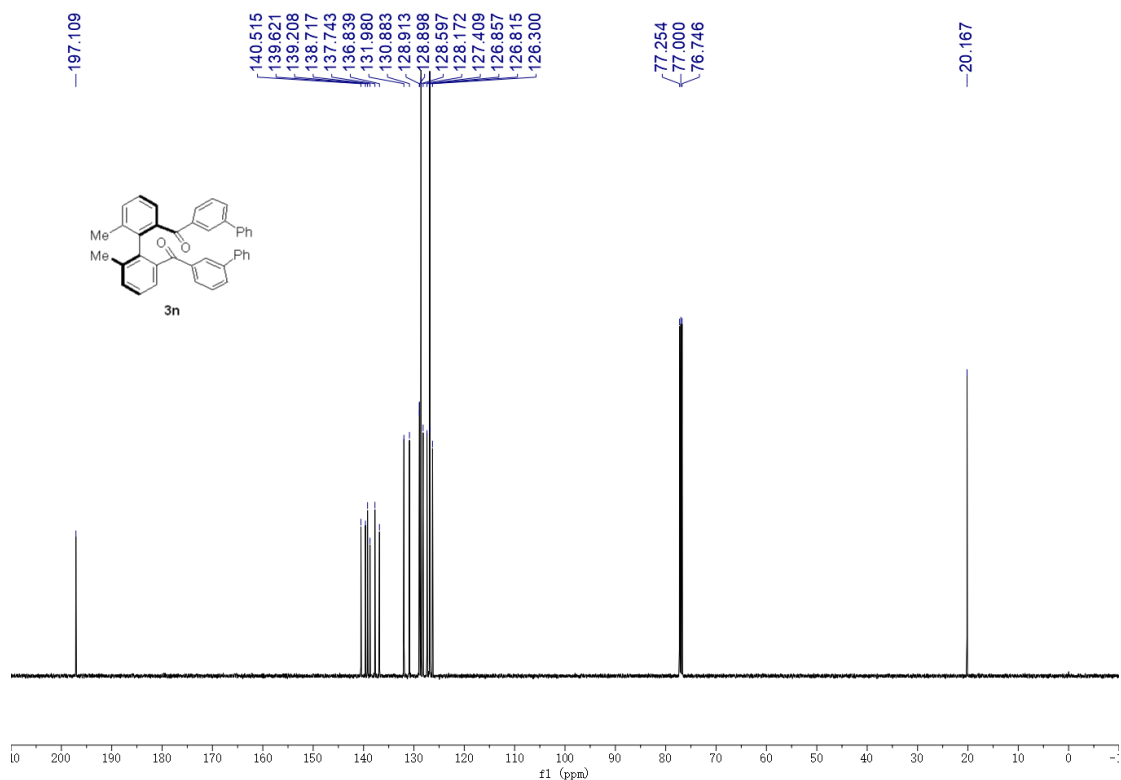


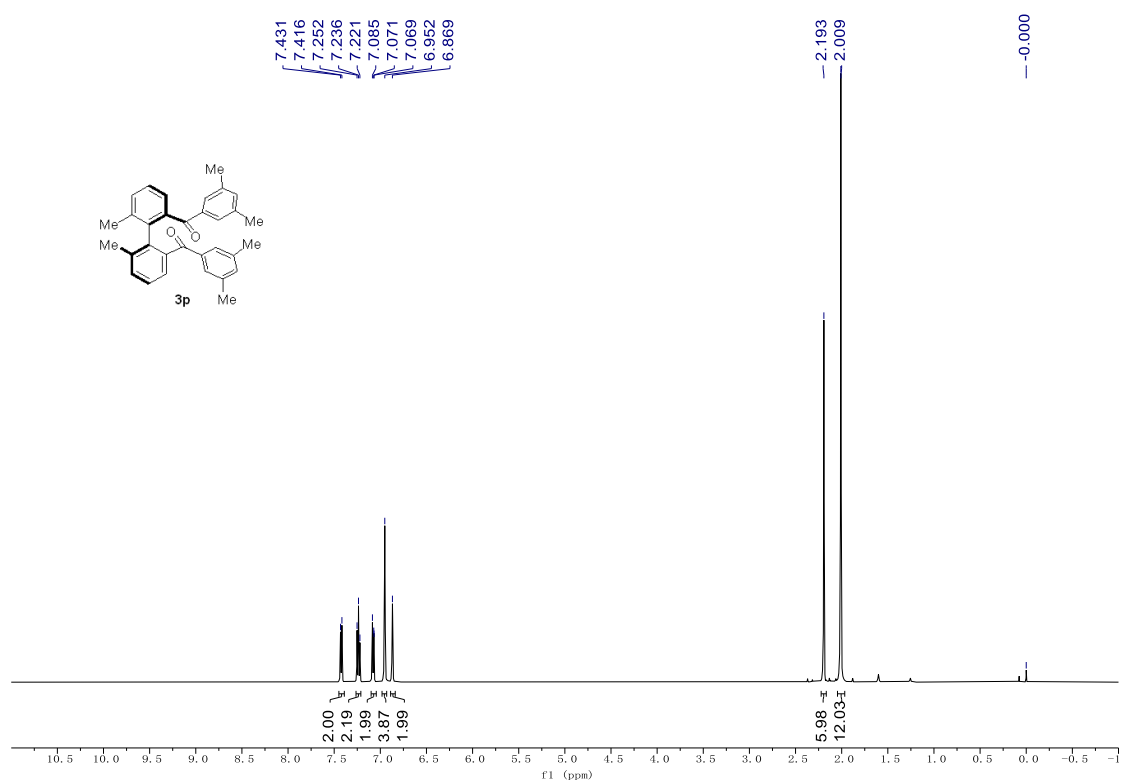
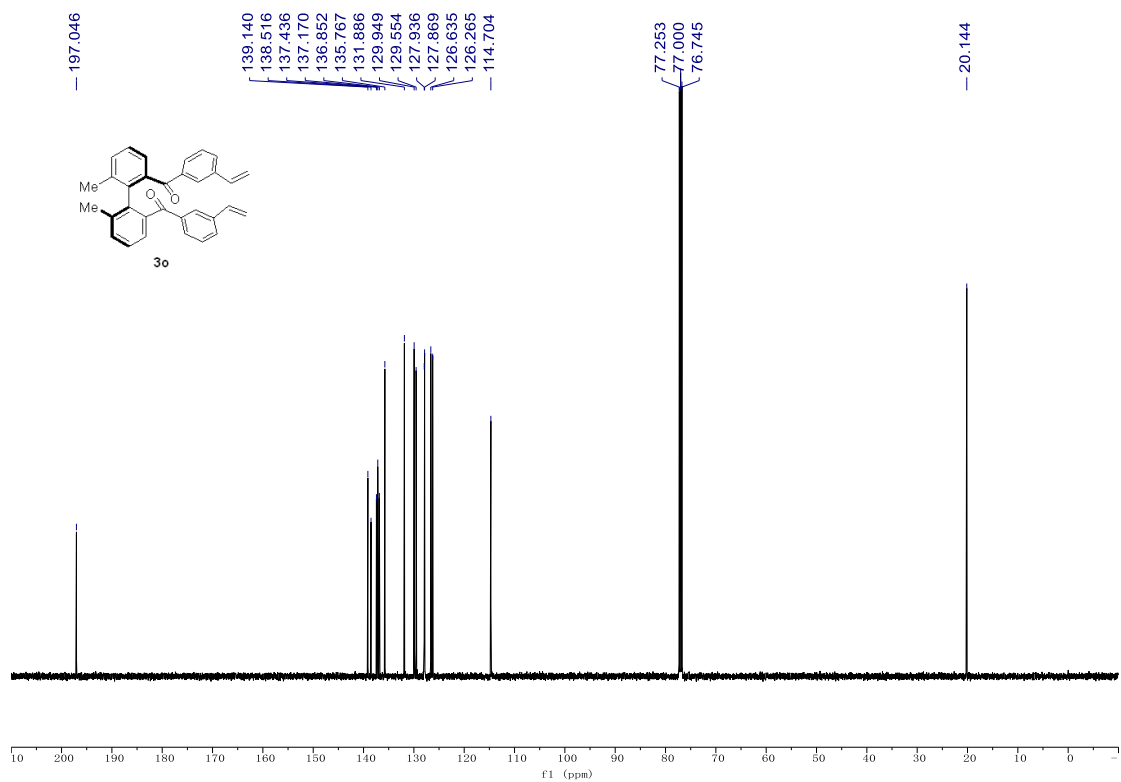


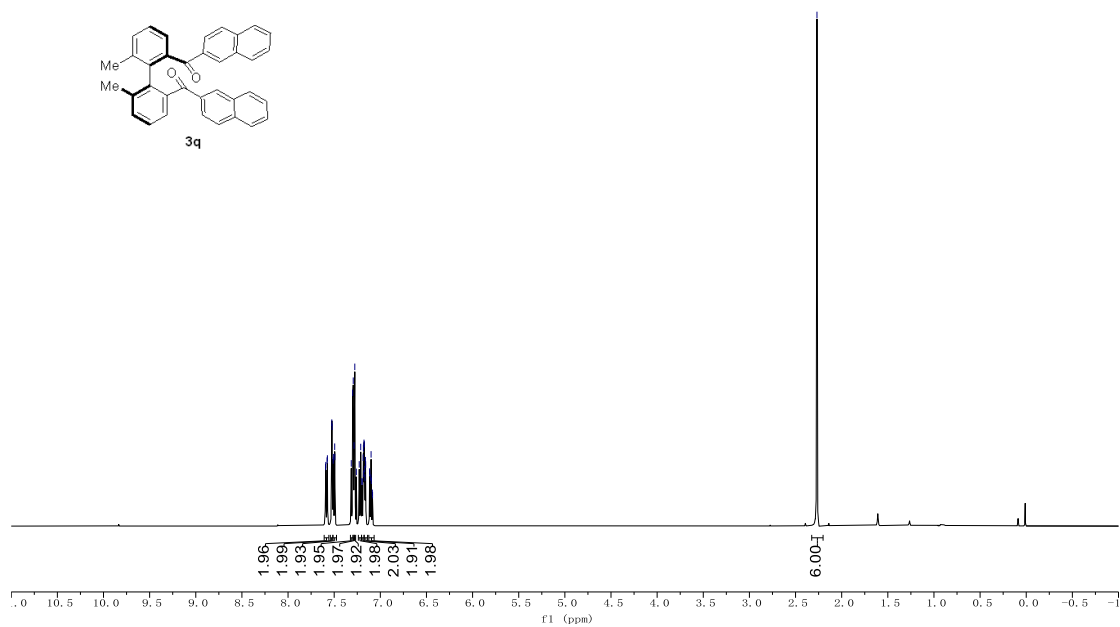


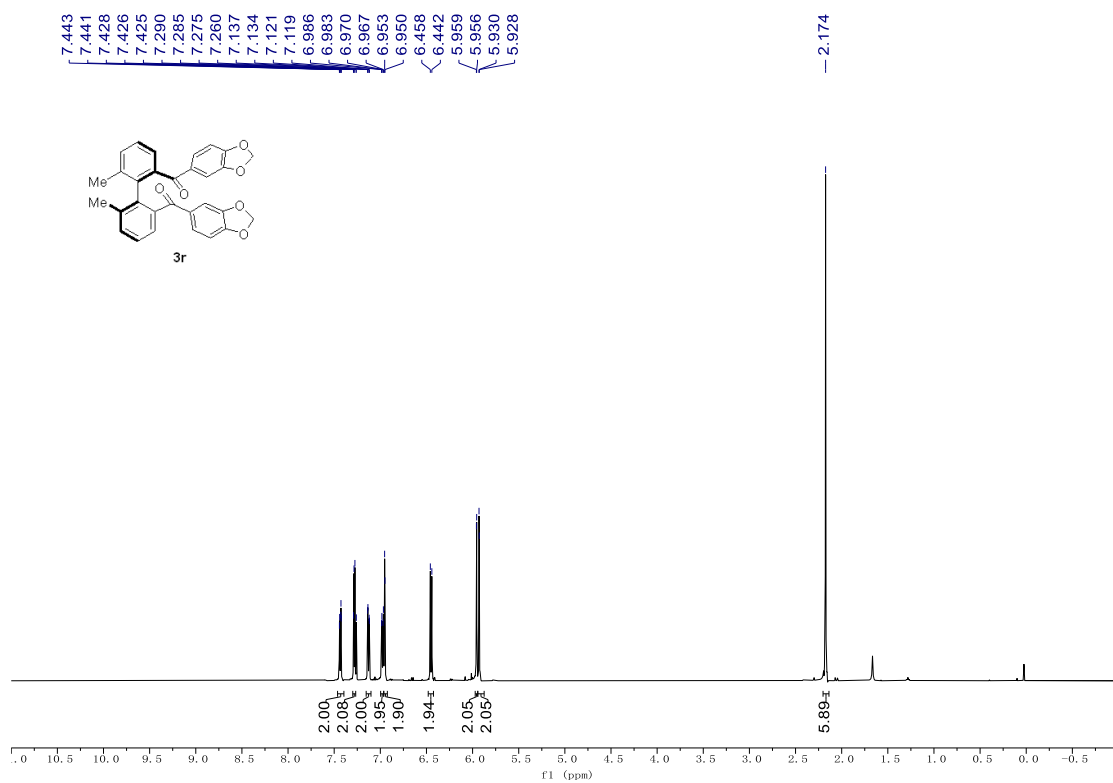
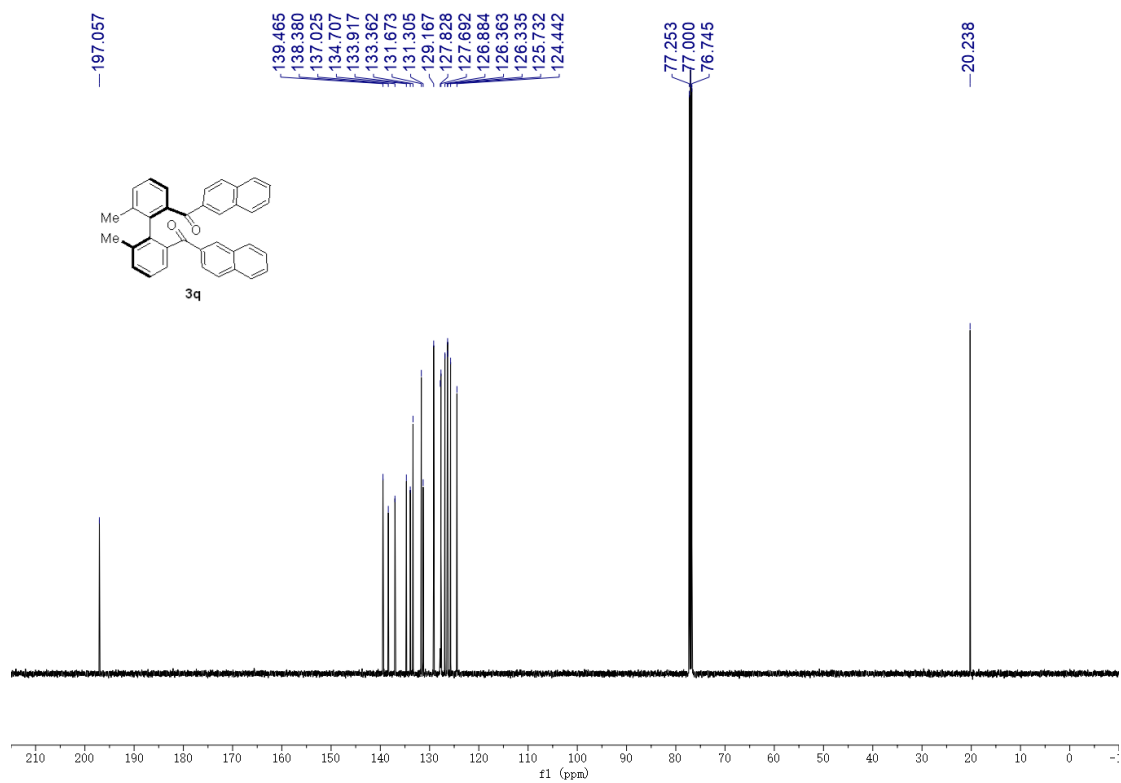


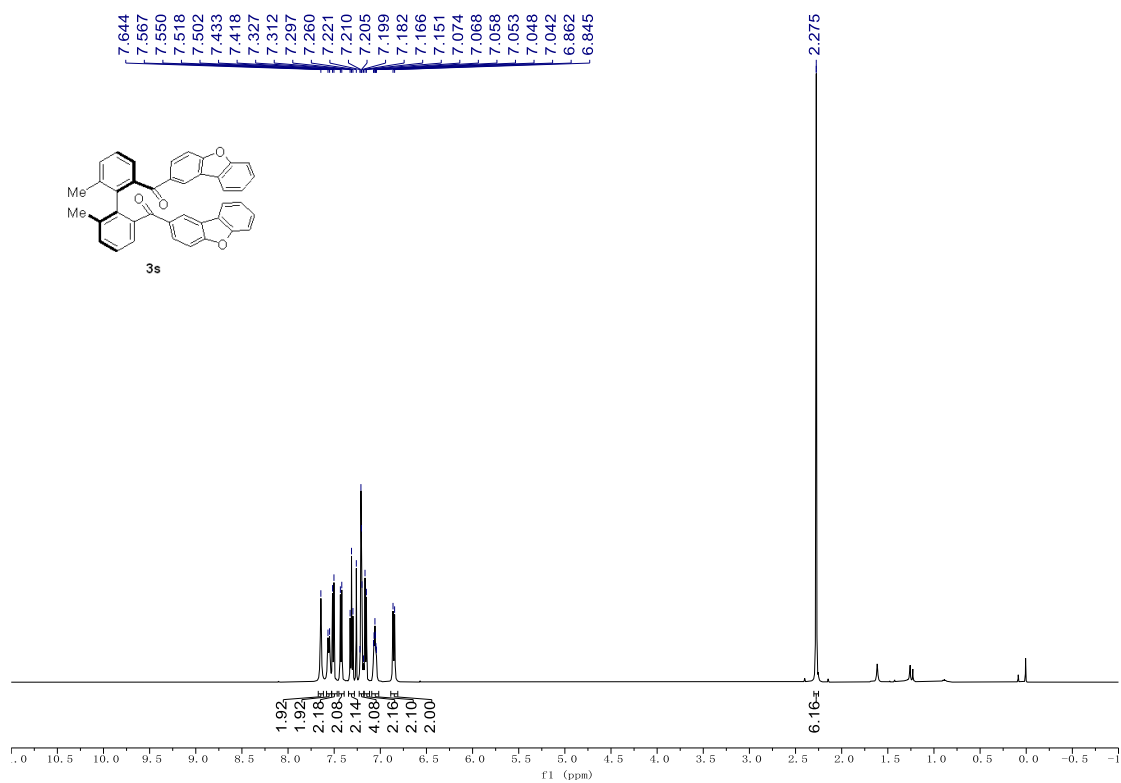
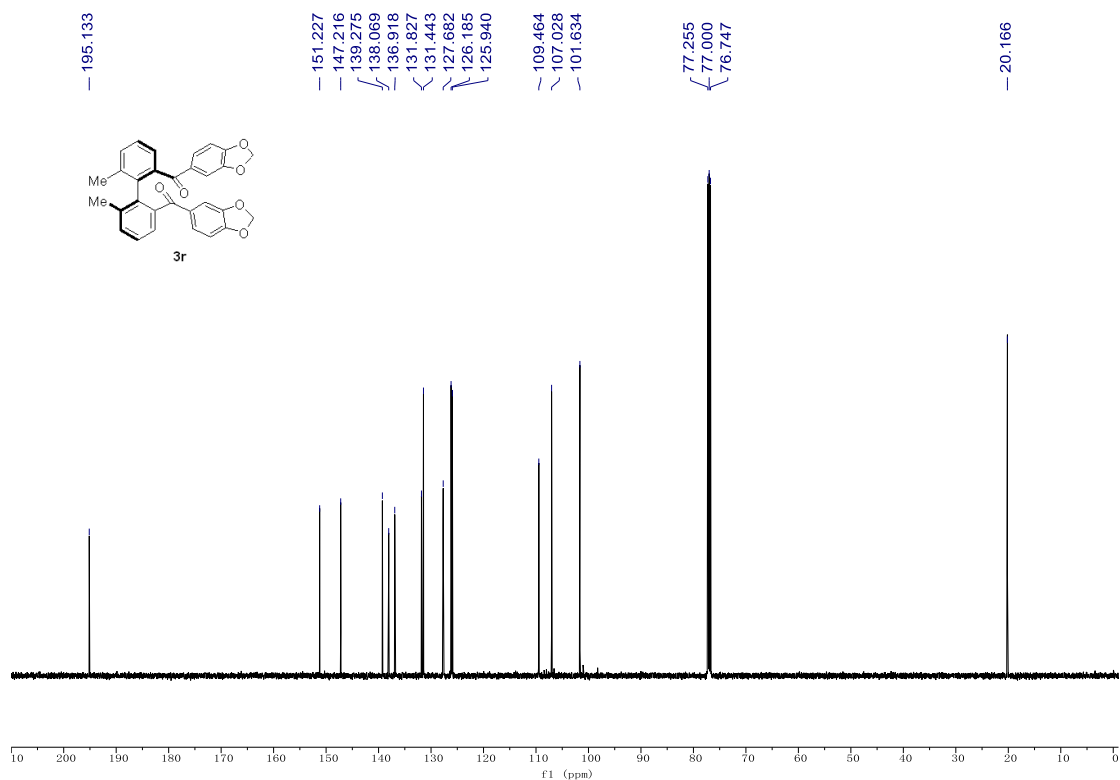


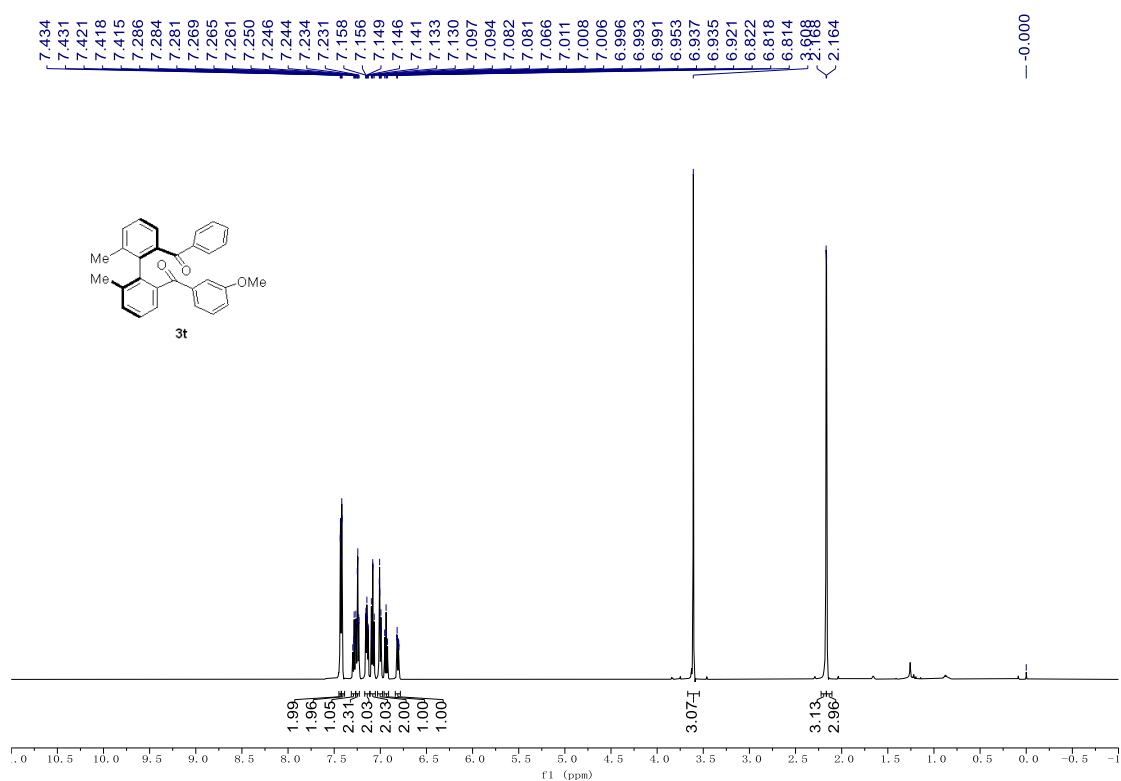
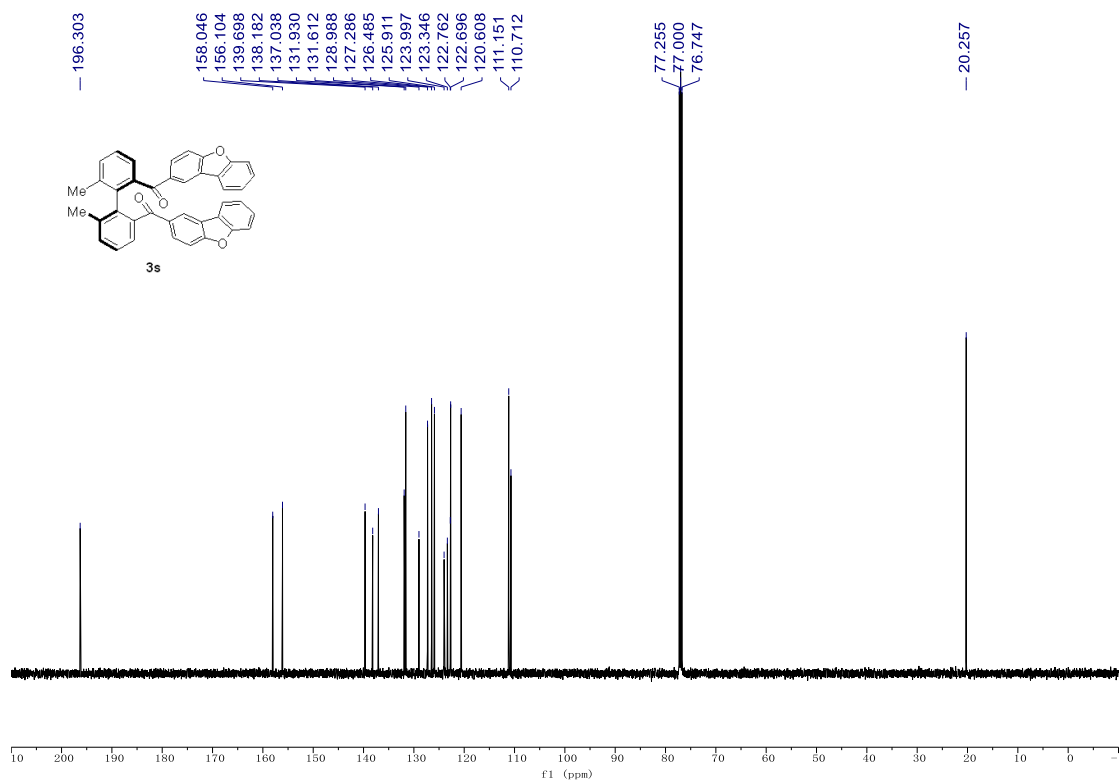


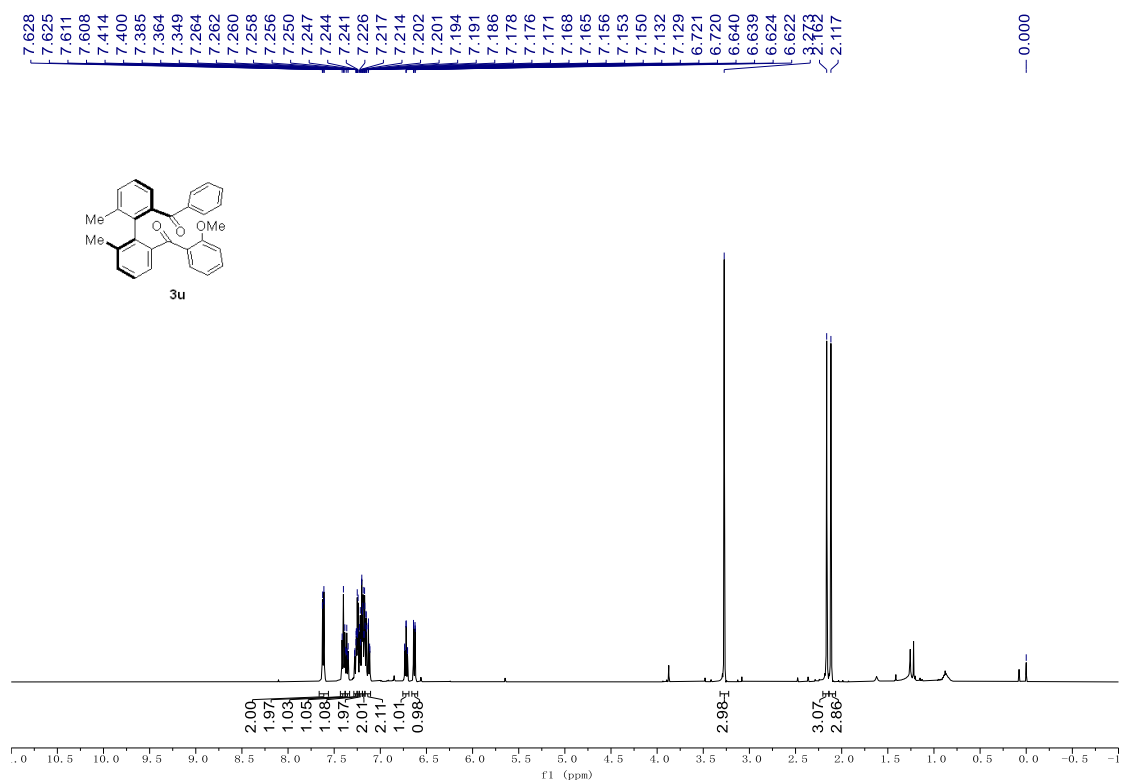
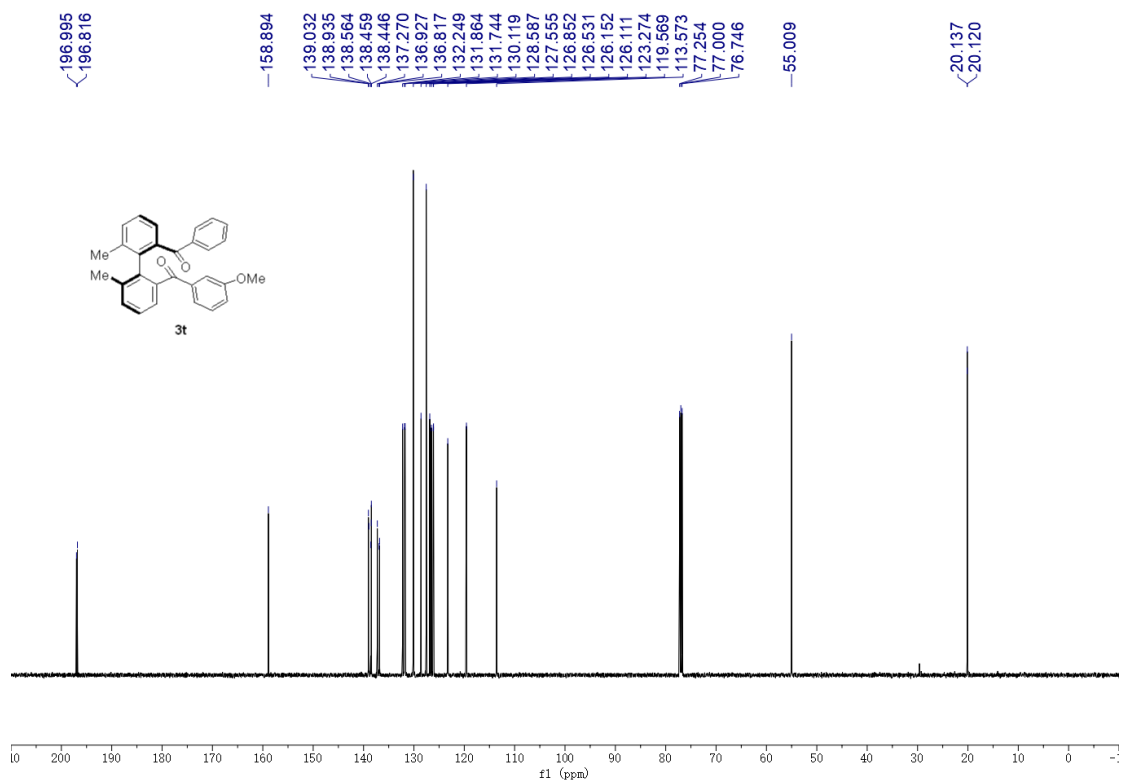


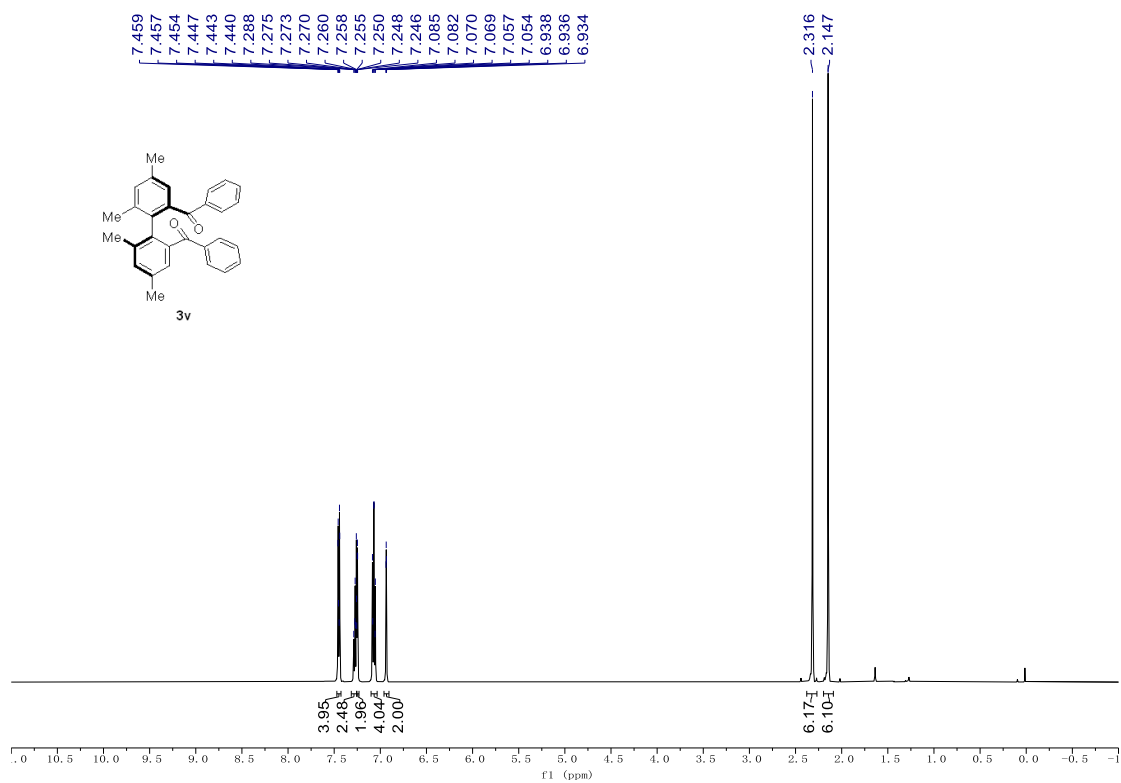
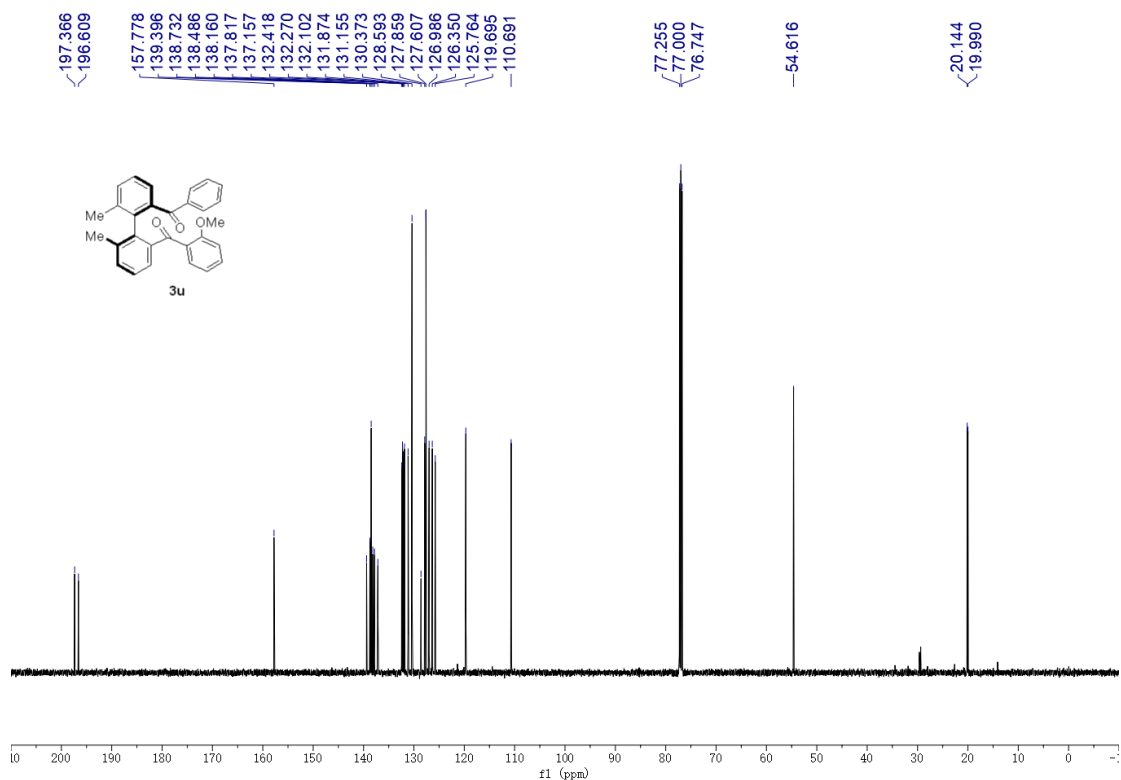


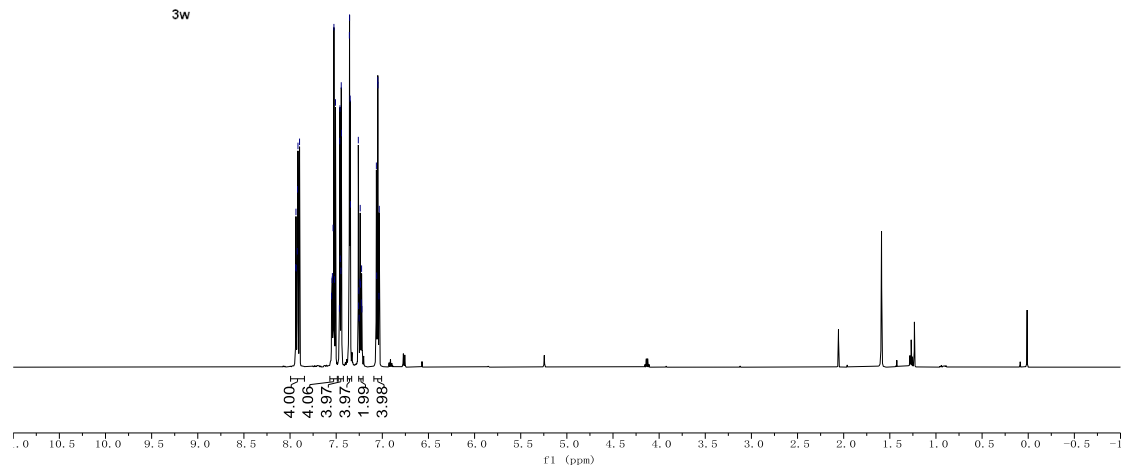
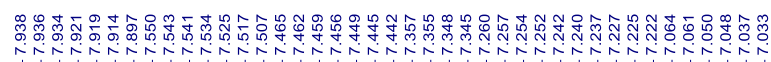


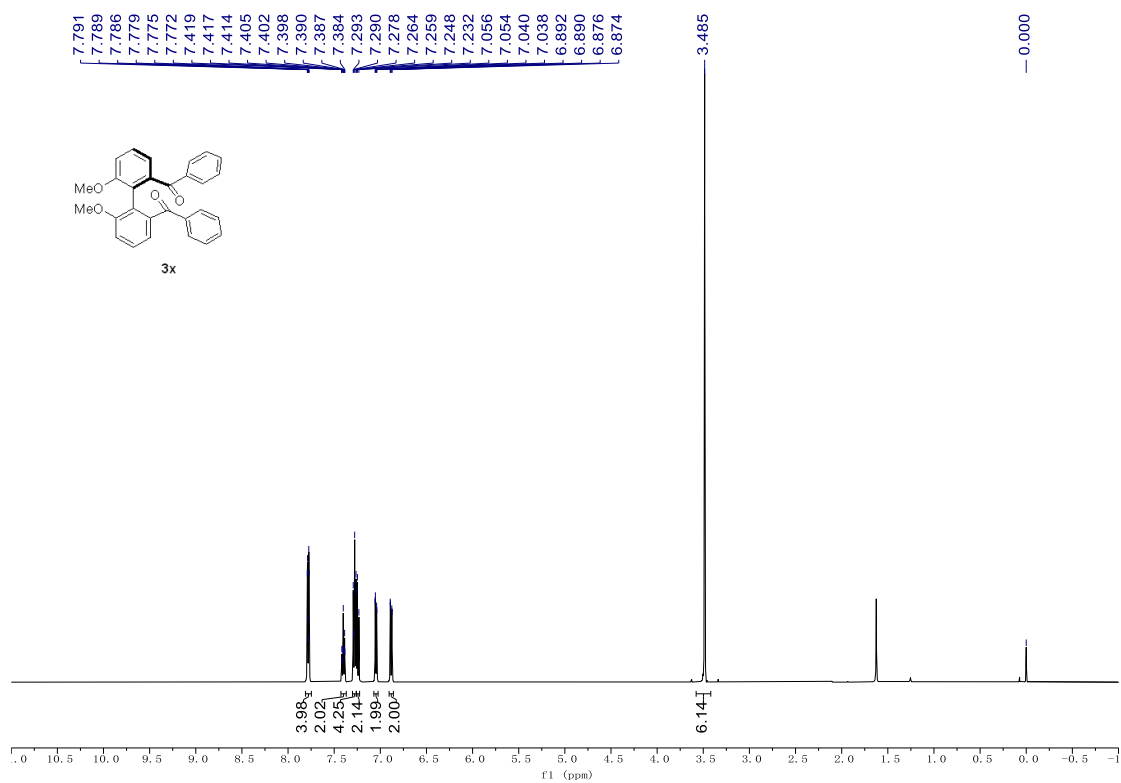
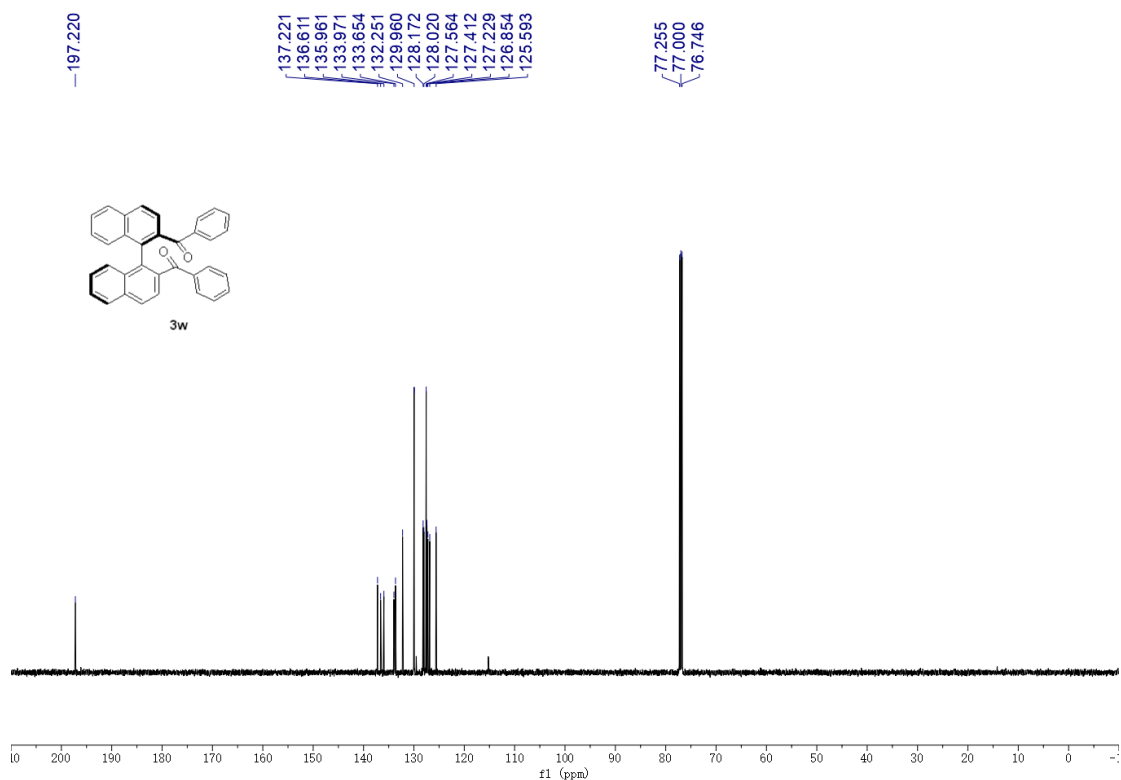


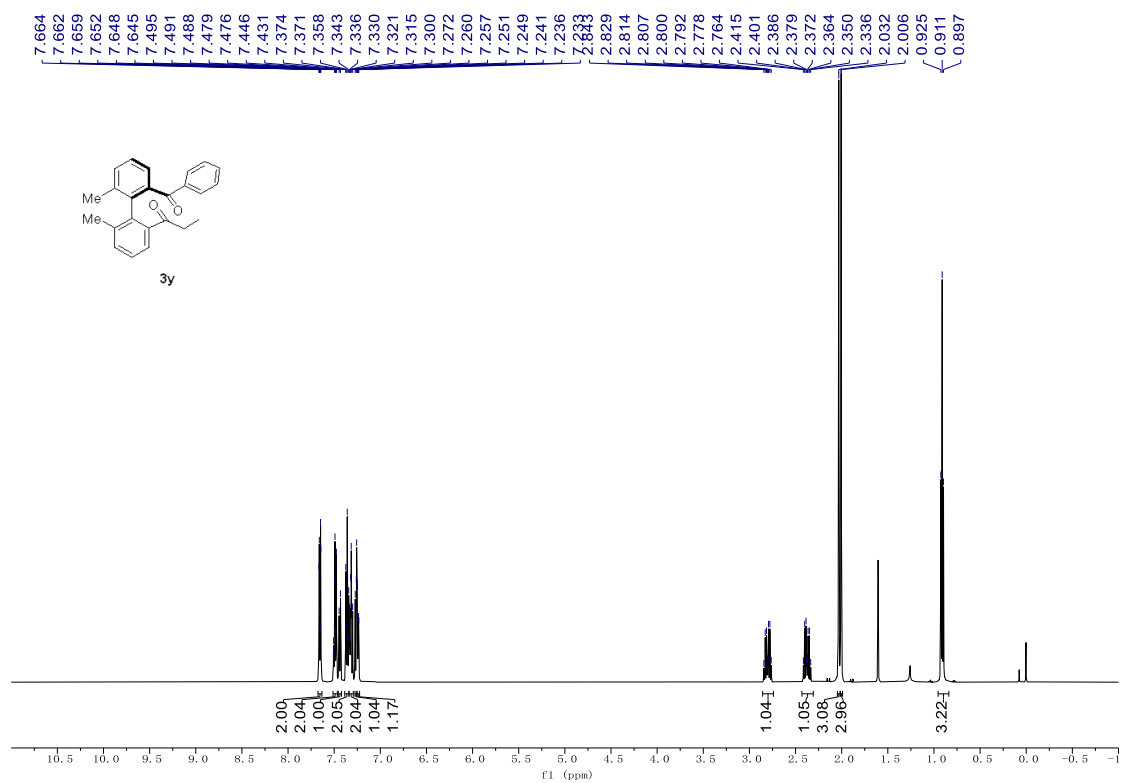
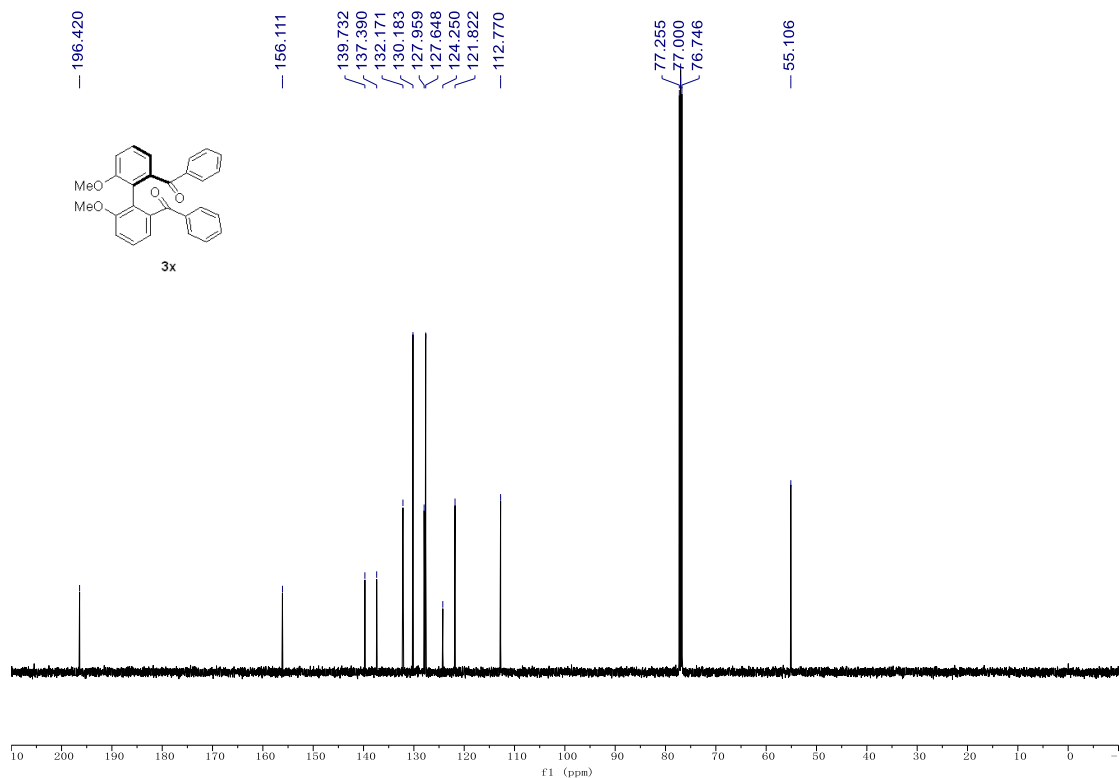


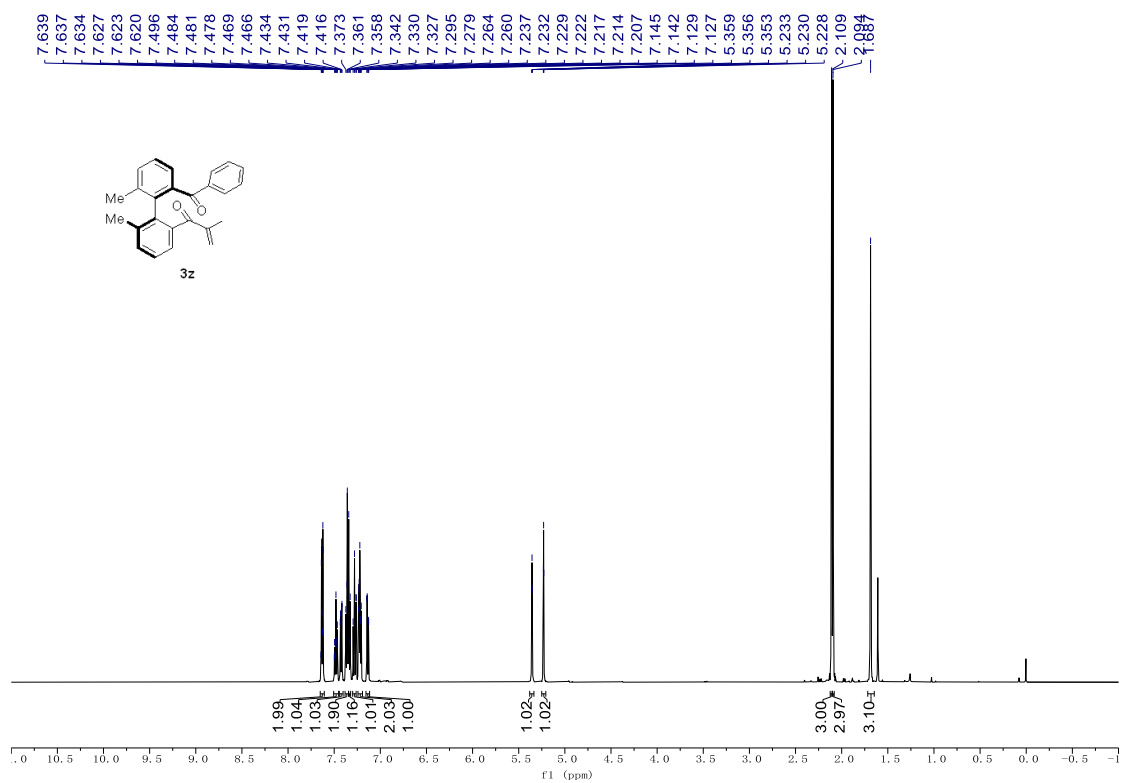
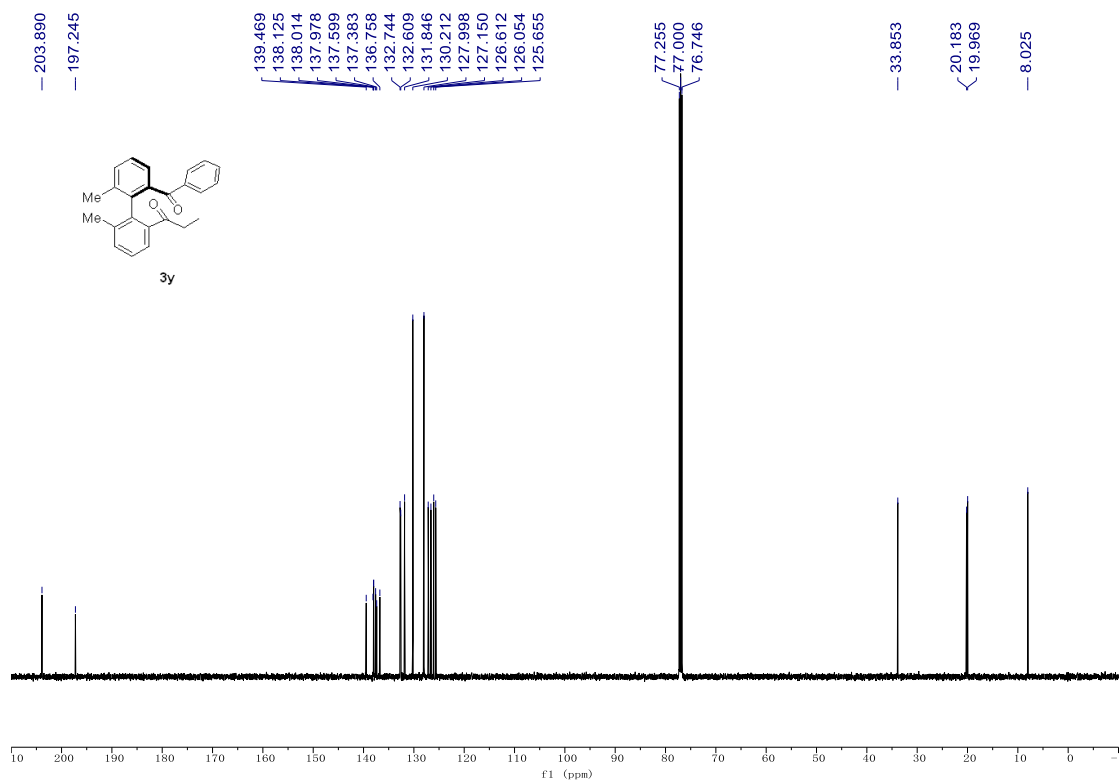


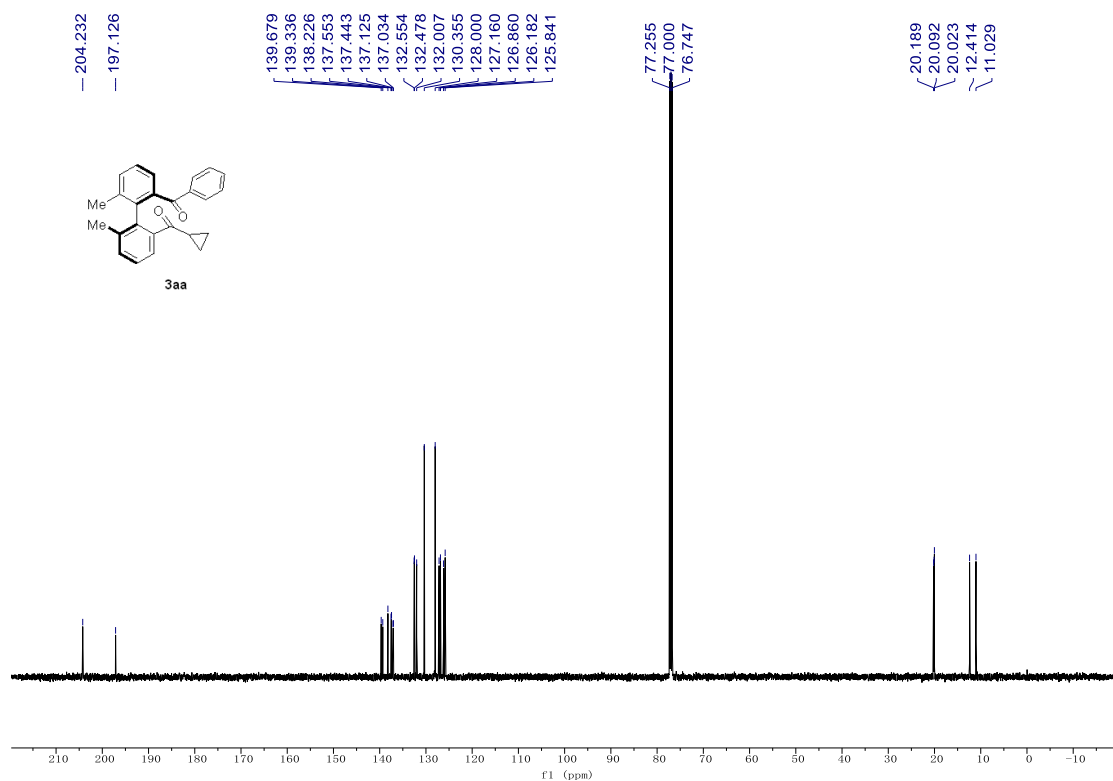
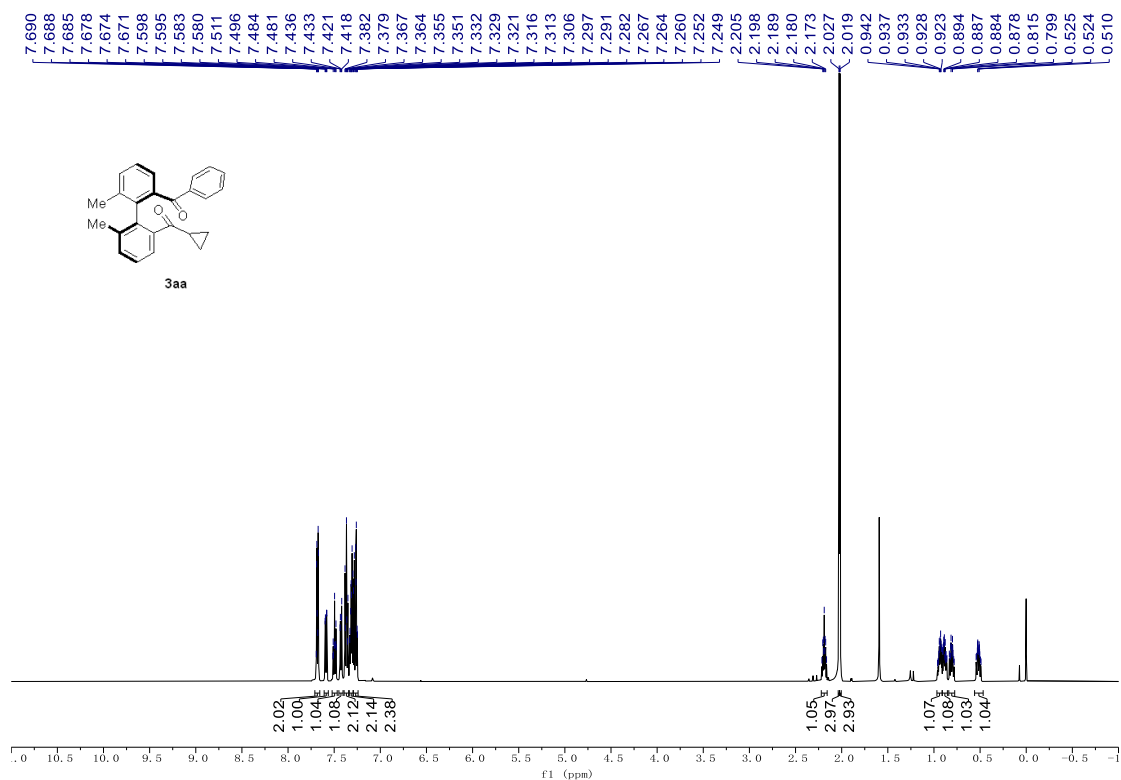


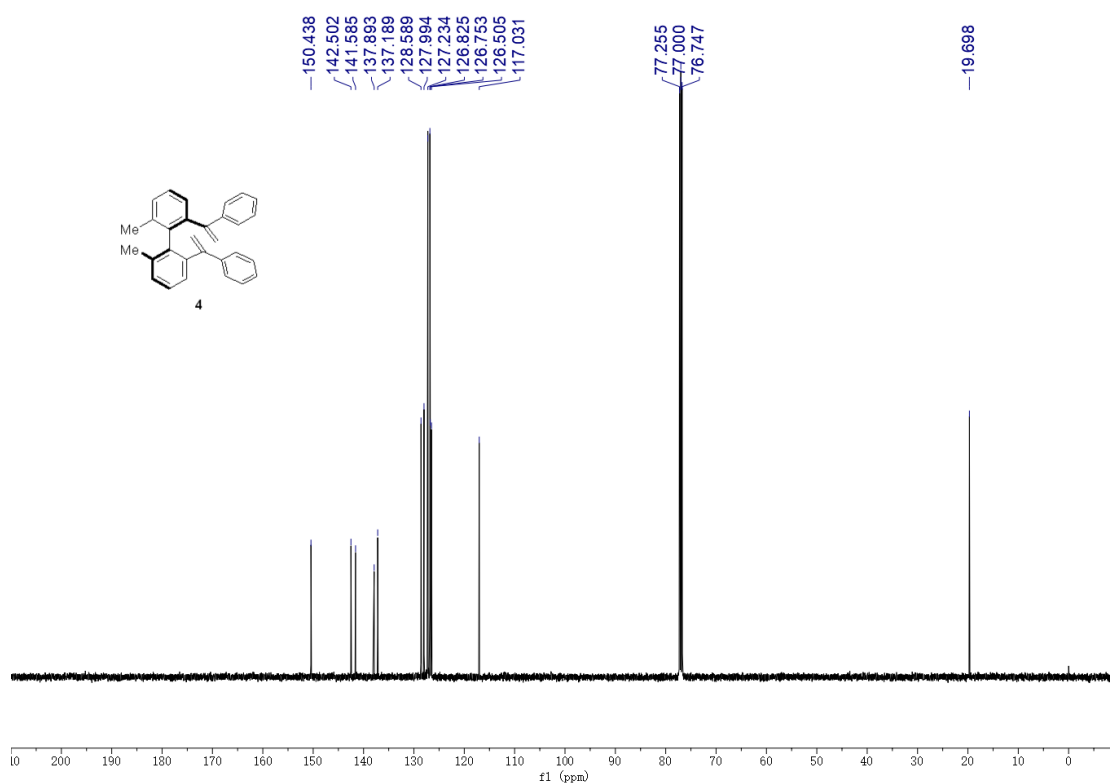
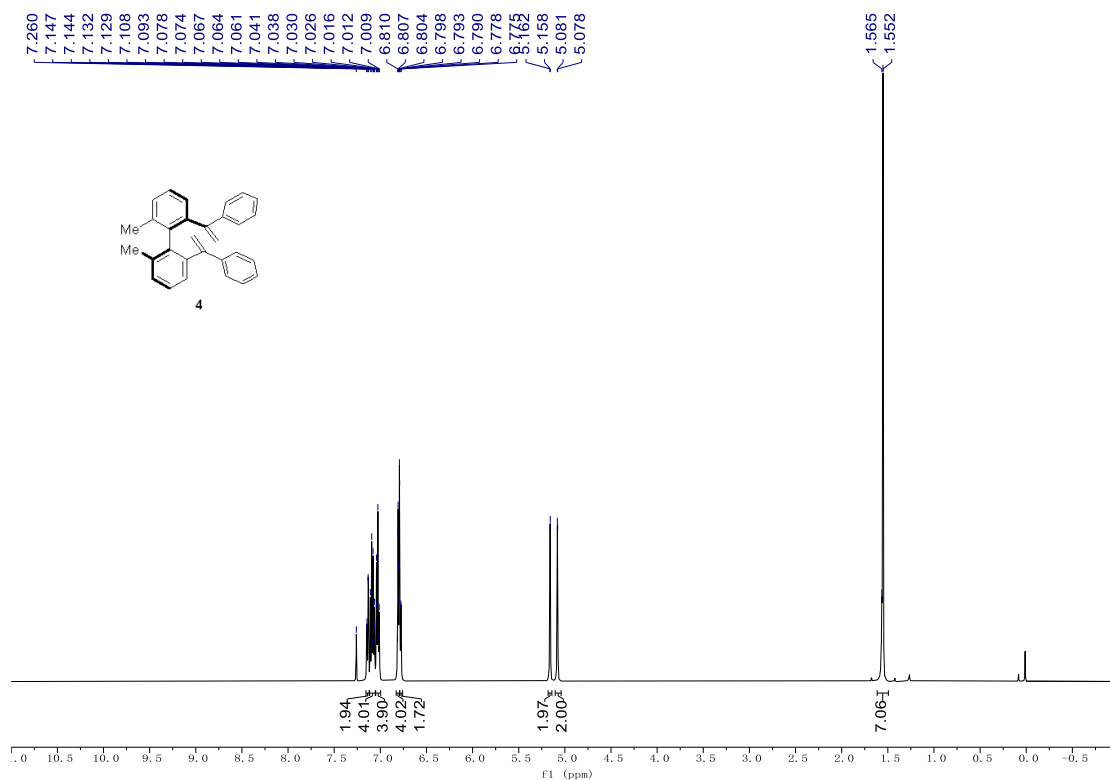


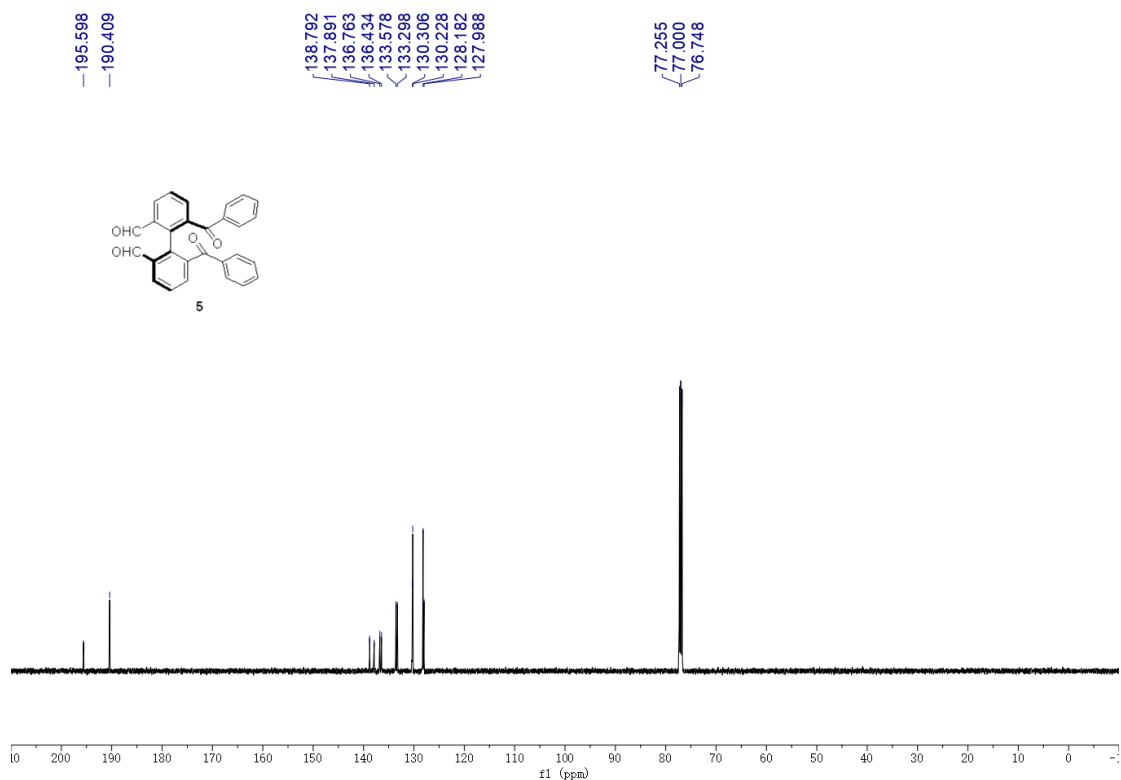
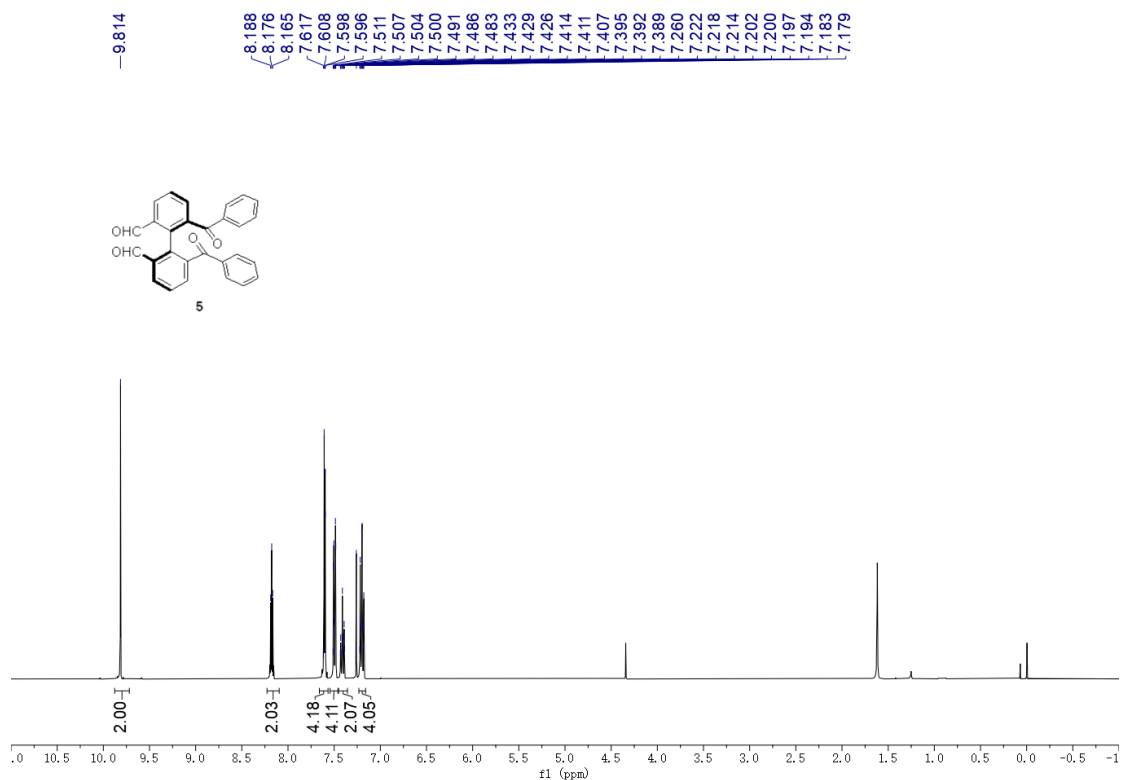


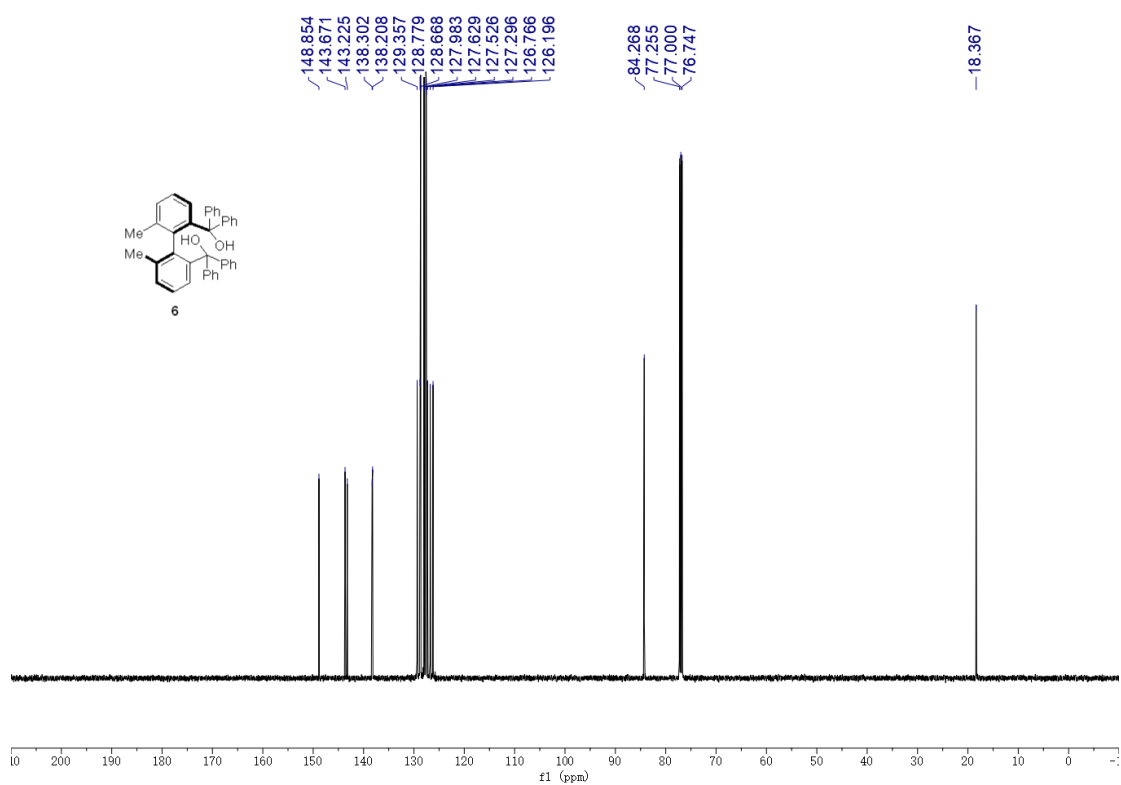
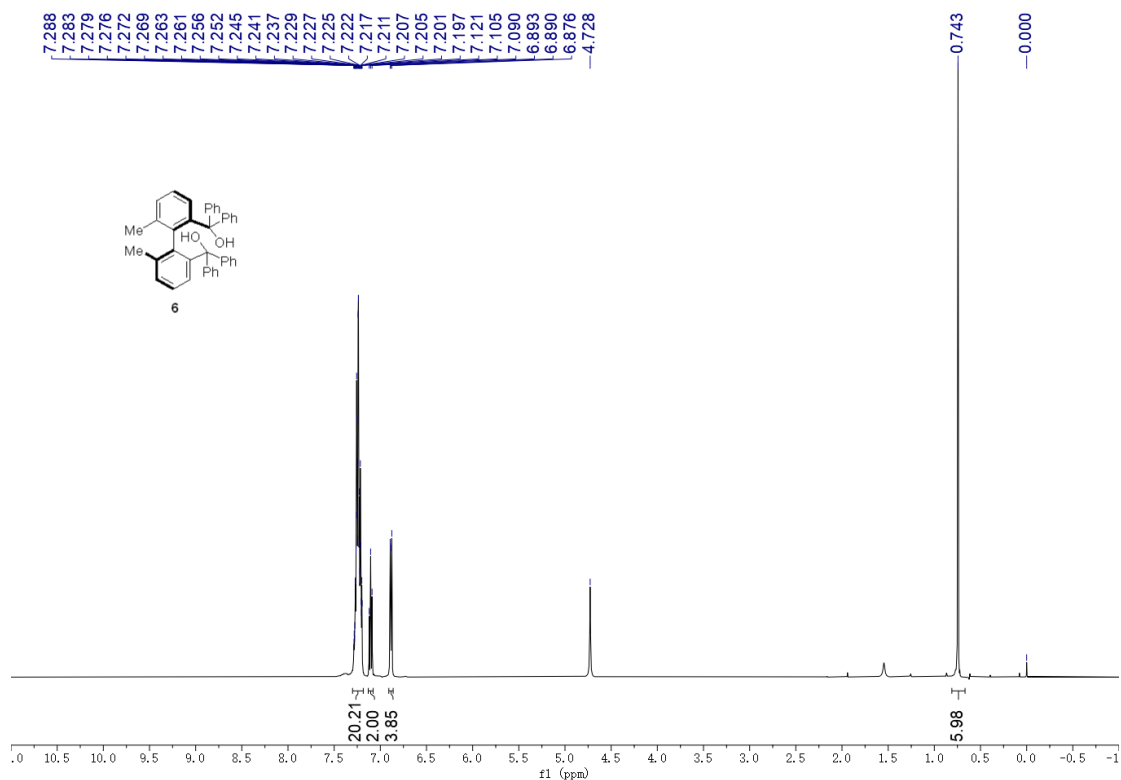






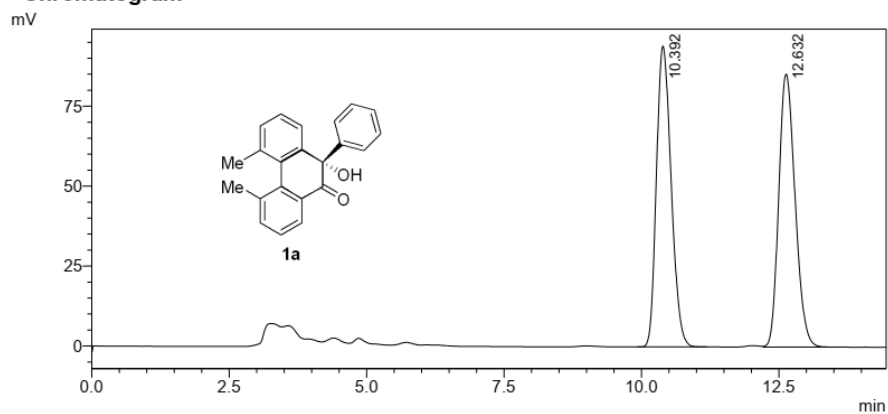






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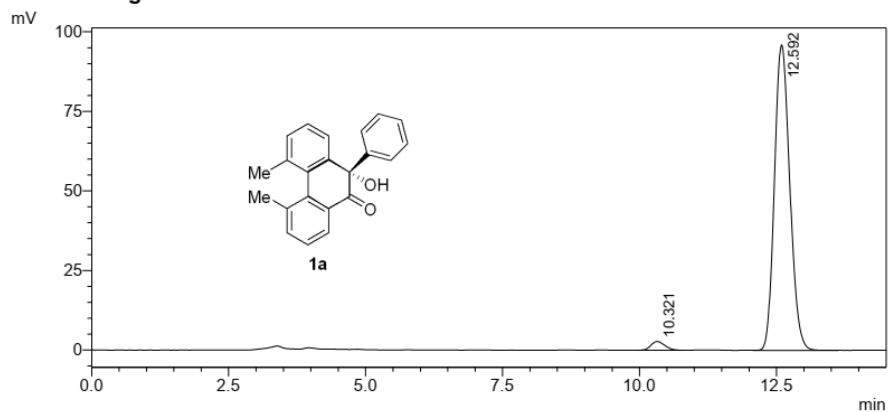


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.392	1754130	94046	49.825			
2	12.632	1766461	85386	50.175			
Total		3520591	179432				

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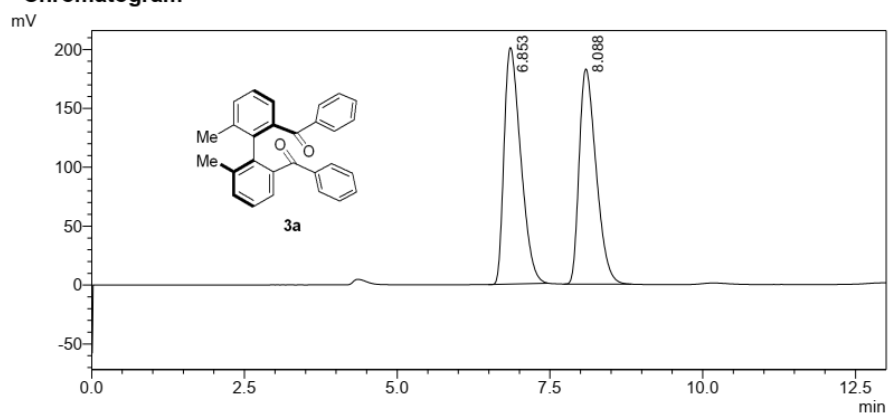


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.321	48969	2756	2.549			
2	12.592	1872157	95967	97.451			
Total		1921126	98724				

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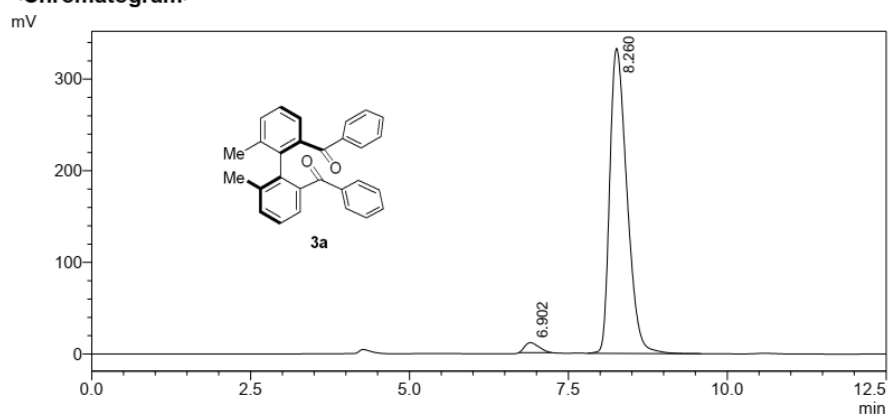


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	6.853	3803104	200752	51.830			
2	8.088	3534565	182606	48.170			
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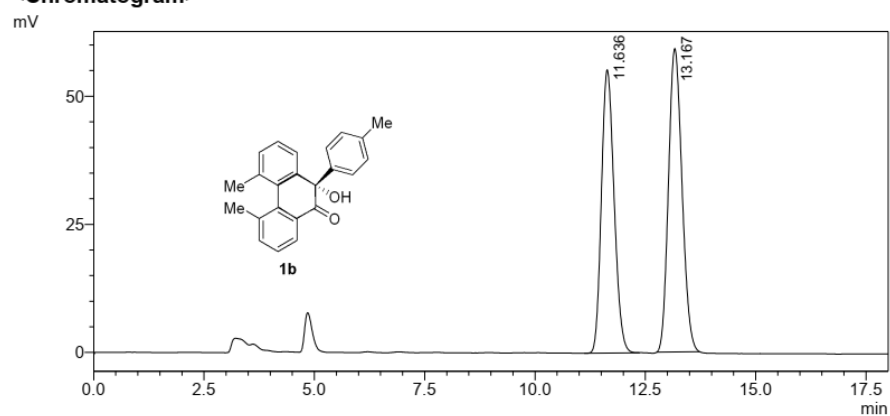


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	6.902	167066	10815	2.601			
2	8.260	6256364	332719	97.399			
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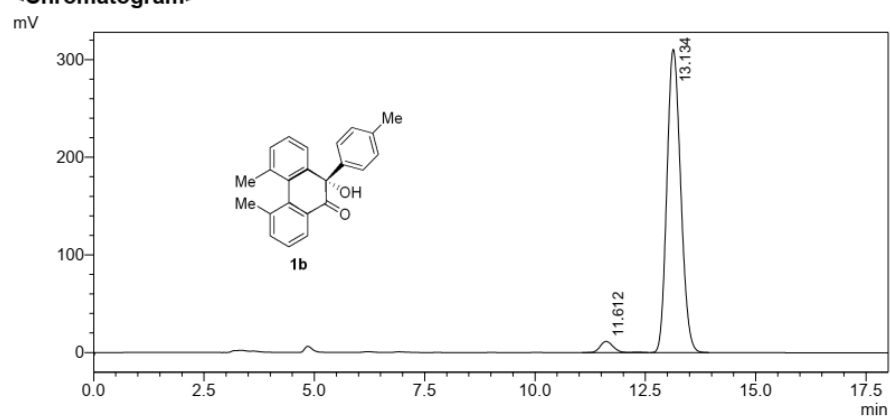


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.636	1105765	55245	46.703			
2	13.167	1261906	59198	53.297			
Total		2367671	114442				

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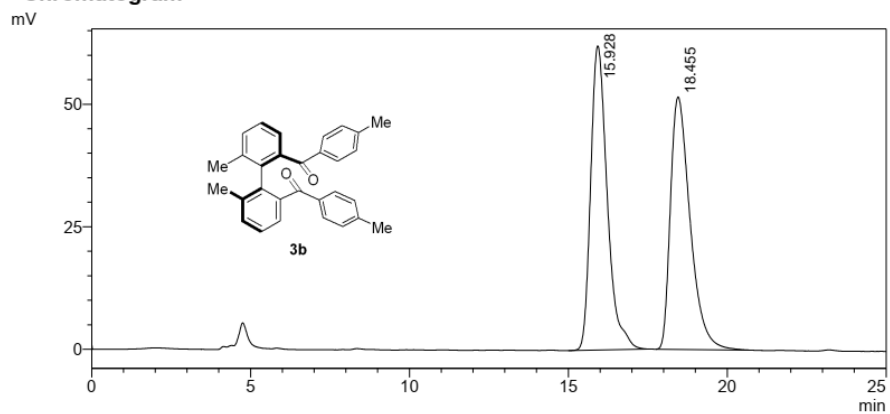


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.612	240825	11496	3.444			
2	13.134	6752127	310440	96.556			
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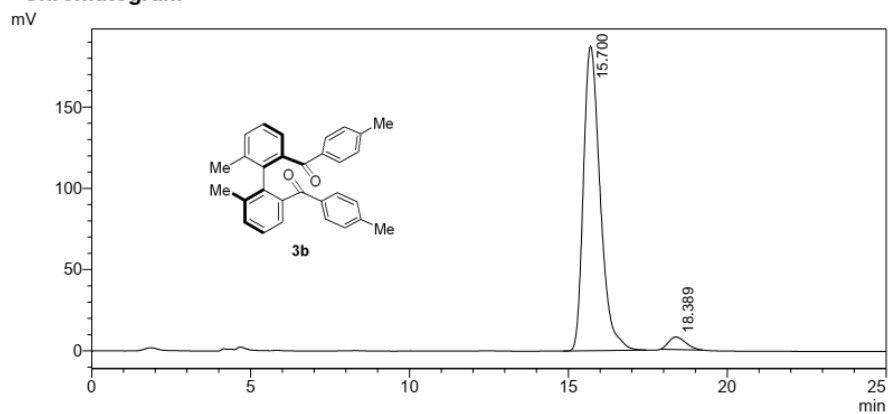


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	15.928	2252486	62062	50.354			
2	18.455	2220809	51504	49.646			
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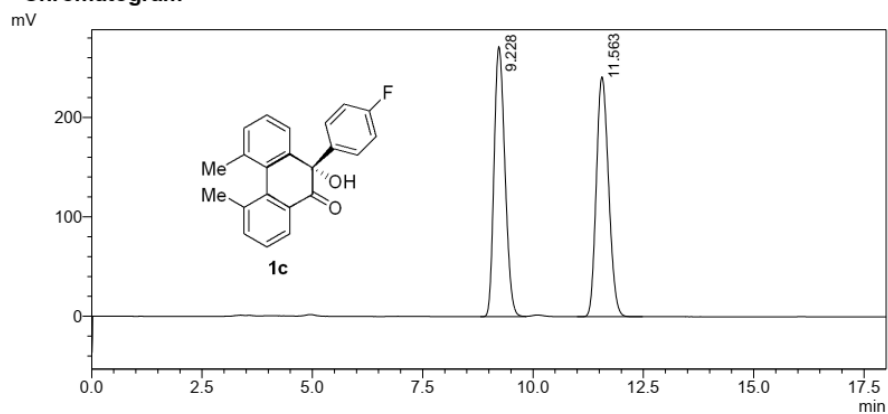


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	15.700	6866008	187479	95.961			
2	18.389	289000	7717	4.039			
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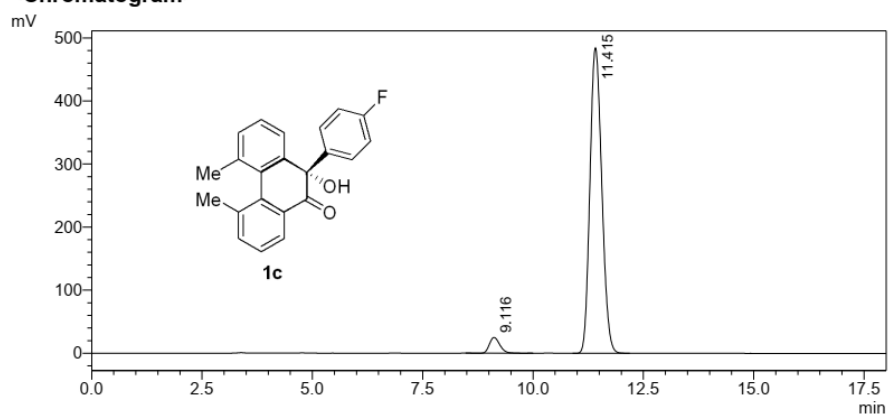


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.228	4668822	271447	50.000			
2	11.563	4668787	241110	50.000			
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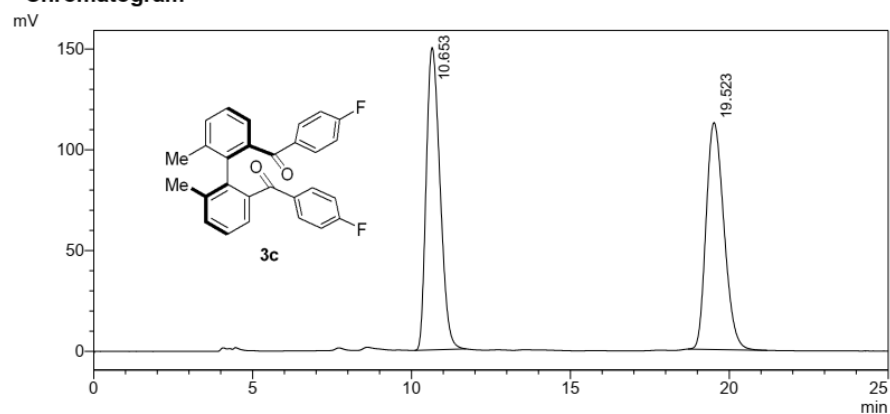


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.116	398965	24760	4.218			
2	11.415	9059023	484174	95.782			
Total		9457988	508934				

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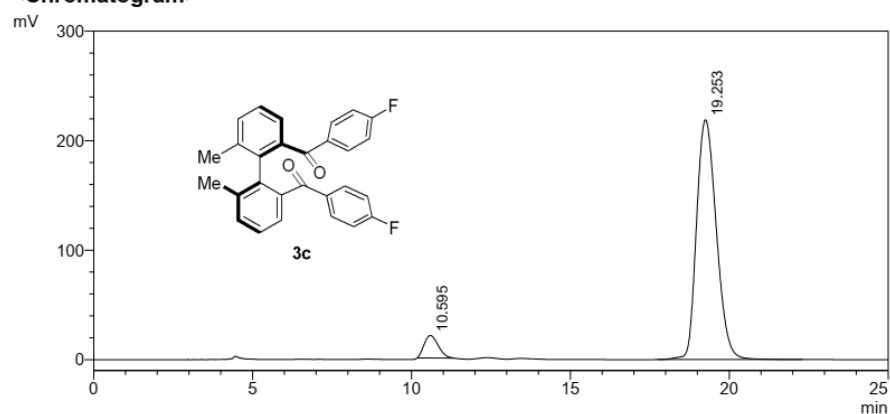


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.653	4509207	149993	50.649			
2	19.523	4393664	112539	49.351			
Total		8902871	262533				

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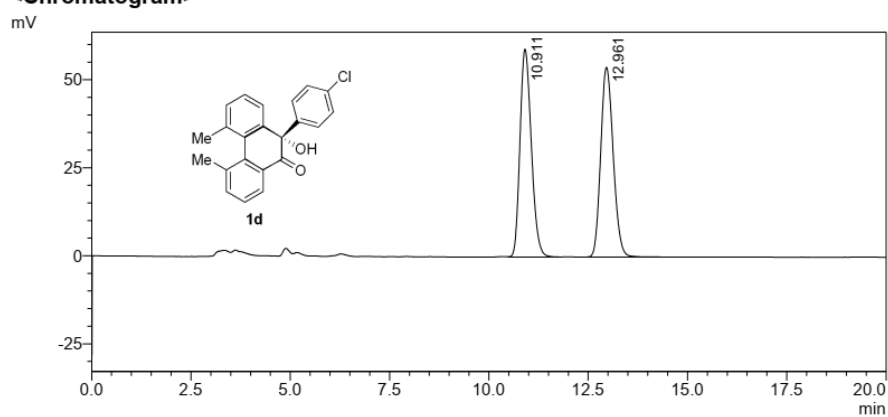


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.595	629564	20524	6.227			
2	19.253	9480863	219017	93.773			
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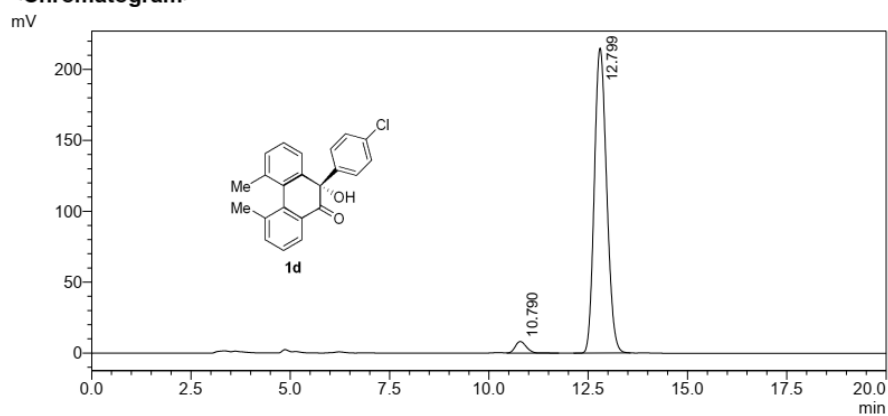


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.911	1172430	59004	49.886			
2	12.961	1177766	53905	50.114			
Total		2350196	112909				

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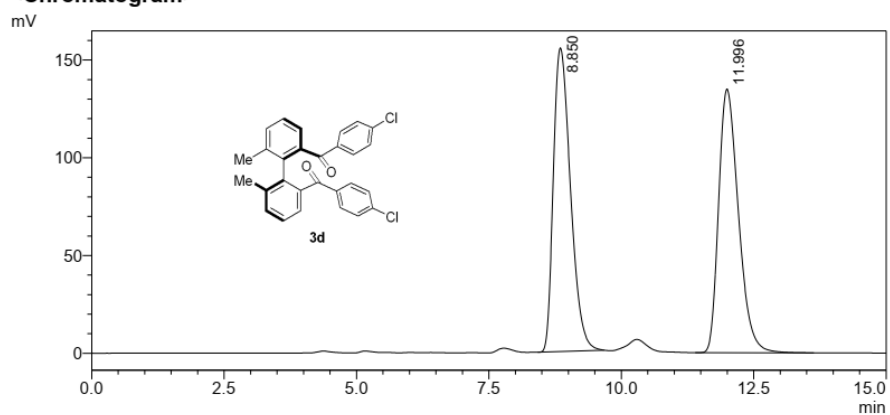


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.790	162224	8227	3.376			
2	12.799	4642815	215025	96.624			
Total		4805039	223252				

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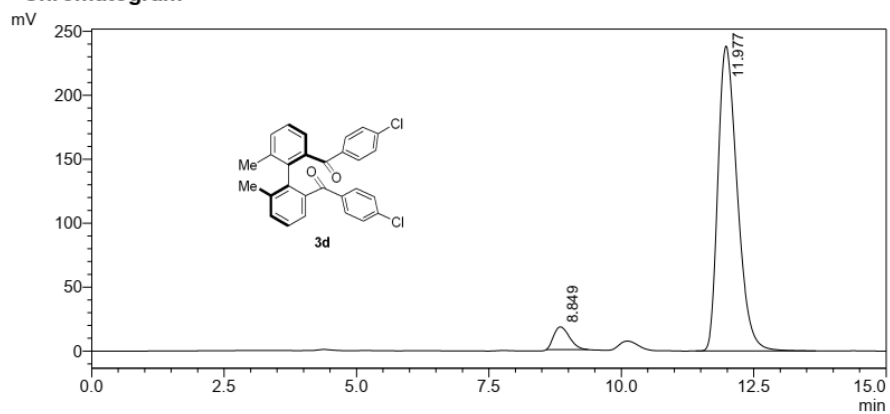


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.850	3493031	155297	49.861			
2	11.996	3512483	134849	50.139			
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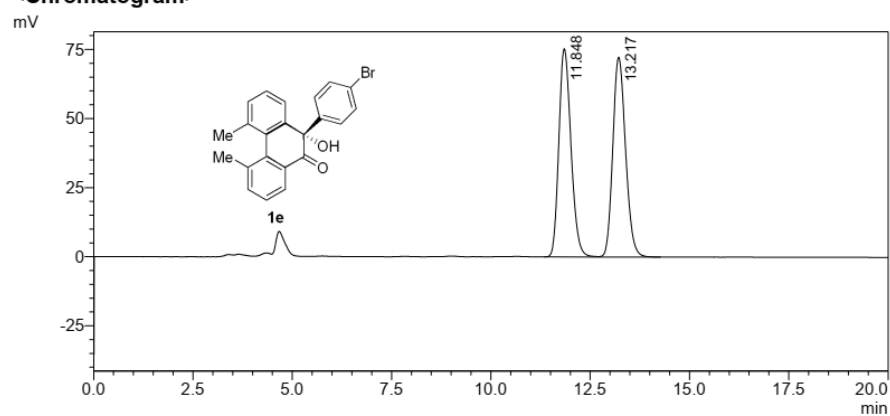


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.849	365378	17694	5.700			
2	11.977	6044466	238353	94.300			
Total		6409844	256047				

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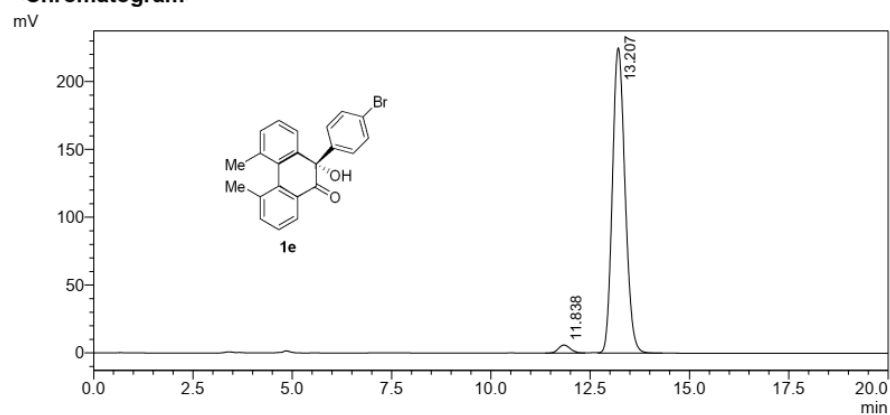


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.848	1600900	75307	49.779			
2	13.217	1615134	72252	50.221			
Total		3216034	147559				

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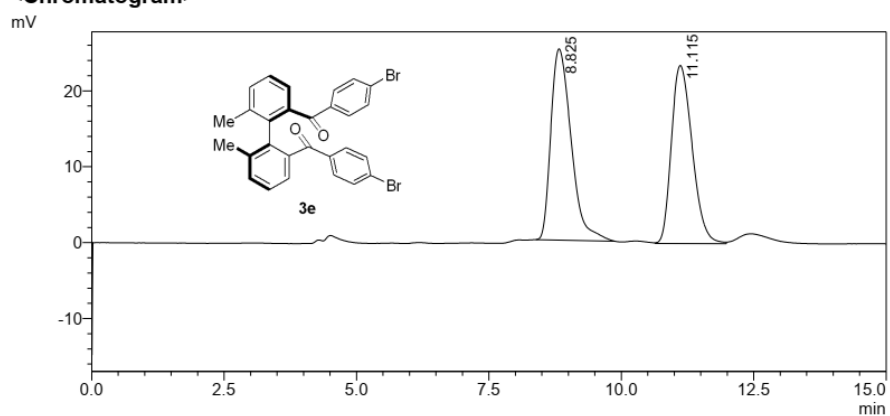


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.838	125548	5938	2.450			
2	13.207	4998206	224875	97.550			
Total		5123754	230813				

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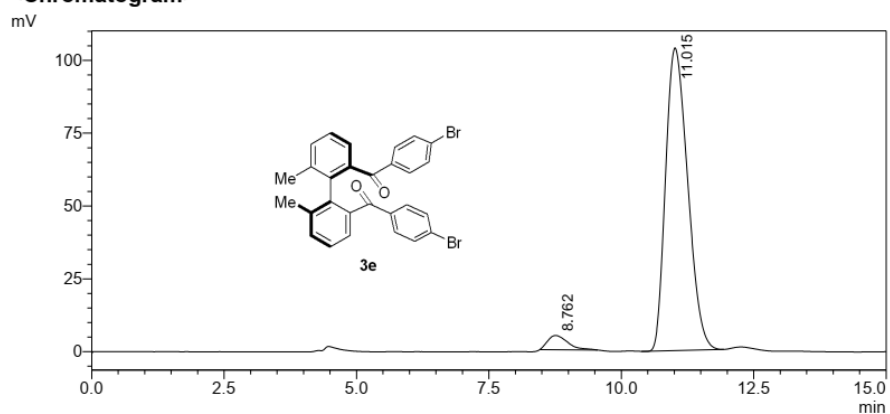


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.825	671956	25191	51.163			
2	11.115	641417	23470	48.837			
Total		1313374	48660				

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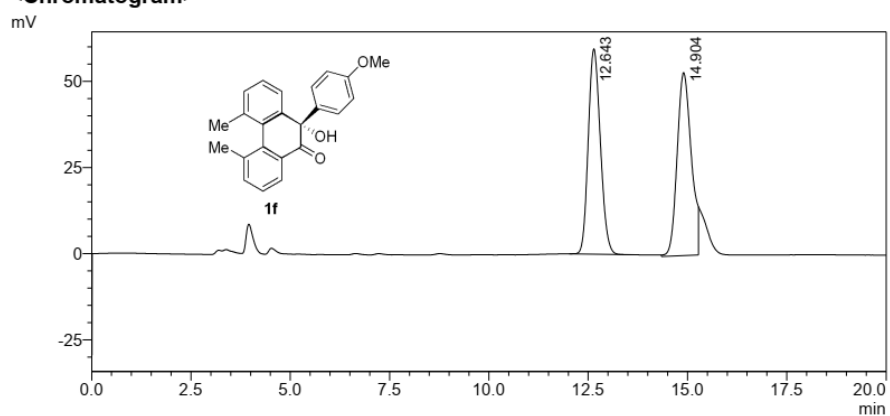


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.762	130854	4925	4.155			
2	11.015	3018602	103875	95.845			
Total		3149456	108800				

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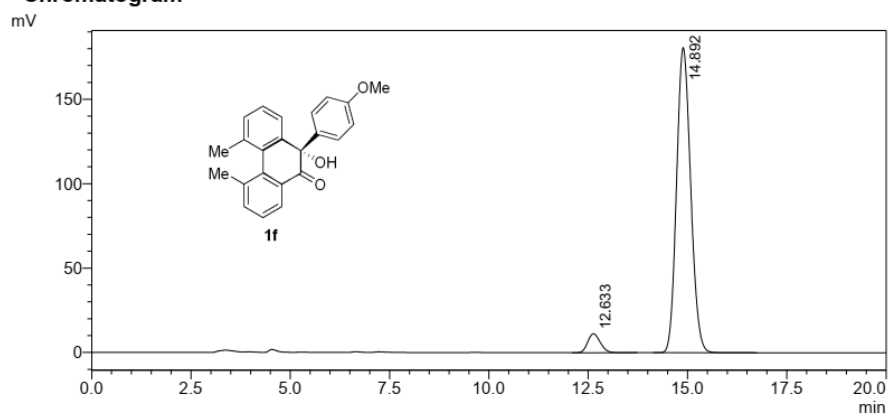


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.643	1262361	59555	49.007			
2	14.904	1313513	53106	50.993			
Total		2575874	112661				

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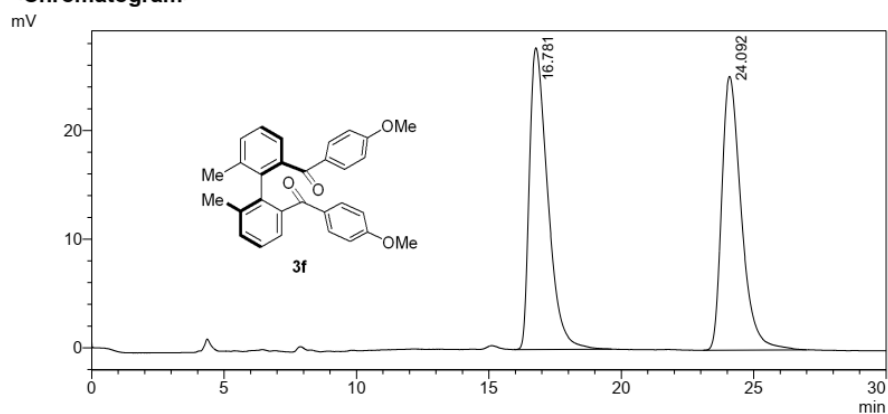


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.633	250777	11273	5.314			
2	14.892	4468186	180765	94.686			
Total		4718963	192038				

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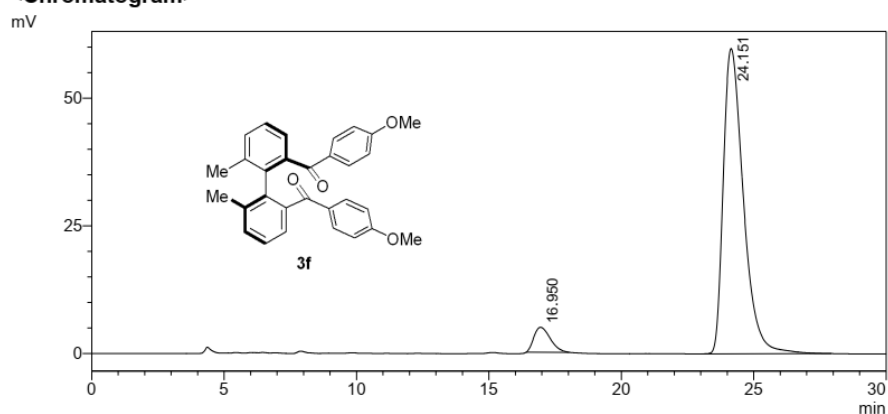


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.781	1337192	27758	50.841			
2	24.092	1292967	25203	49.159			
Total		2630159	52961				

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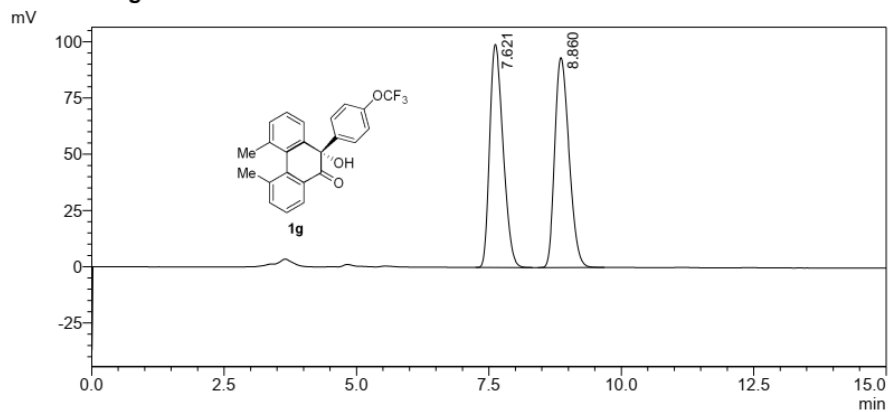


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.950	209817	4884	6.222			
2	24.151	3162426	59804	93.778			
Total		3372244	64688				

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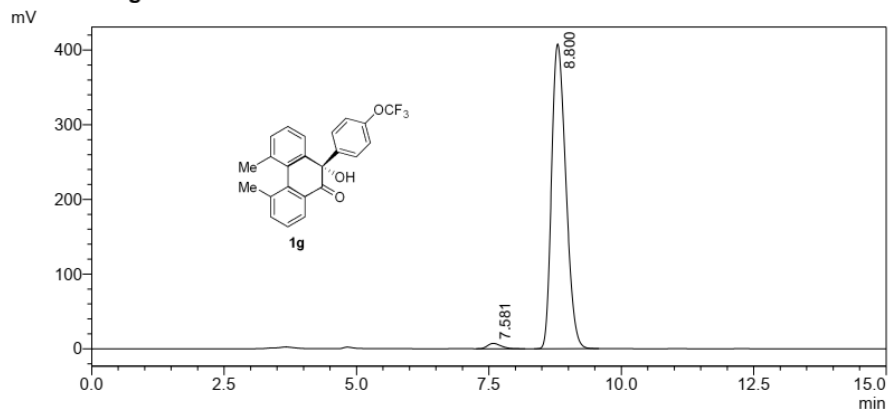


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.621	1746858	99200	49.944			
2	8.860	1750757	93304	50.056			
Total		3497615	192505				

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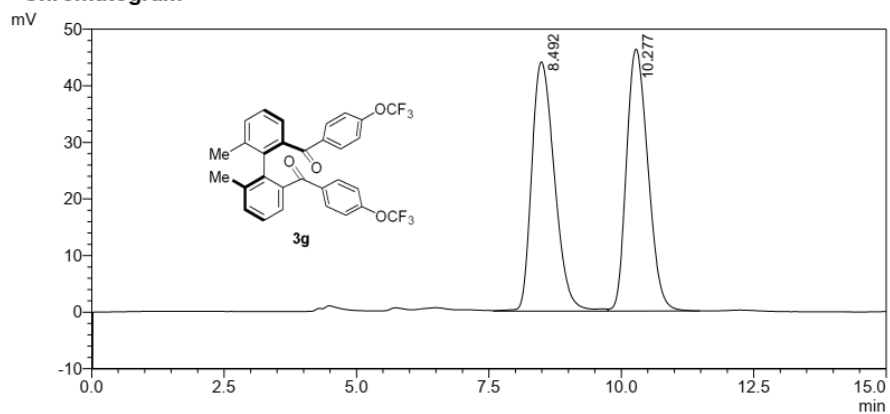


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.581	126385	7188	1.631			
2	8.800	7622506	407888	98.369			
Total		7748891	415076				

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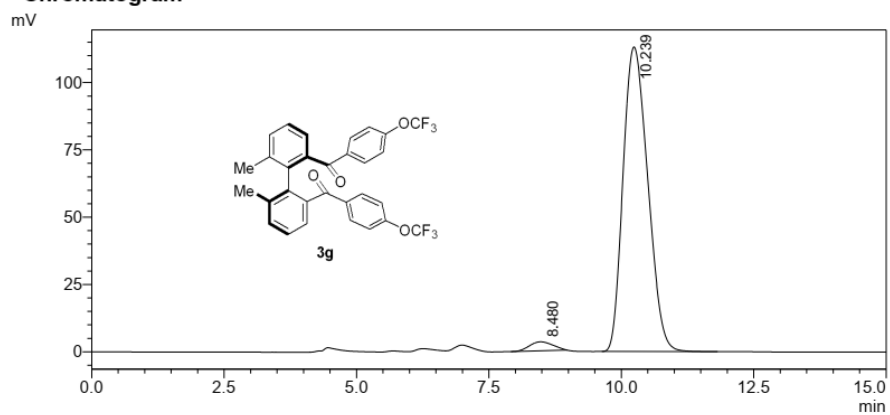


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.492	1321264	44059	50.256			
2	10.277	1307812	46273	49.744			
Total		2629075	90332				

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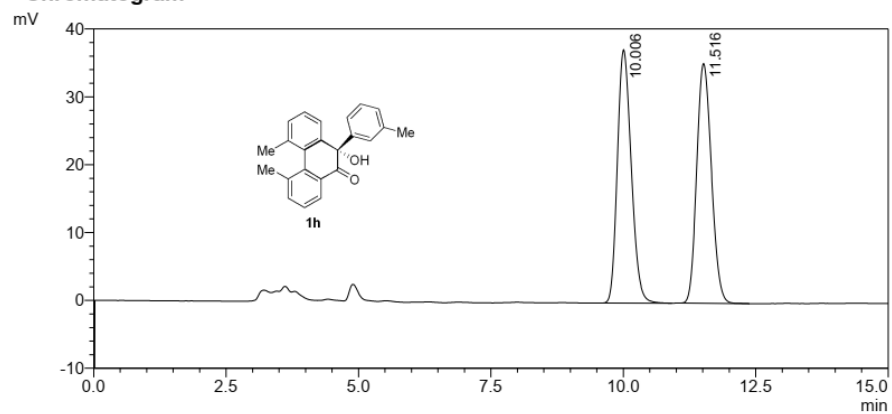


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Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.480	102273	3331	2.711			
2	10.239	3670377	113119	97.289			
Total		3772650	116449				

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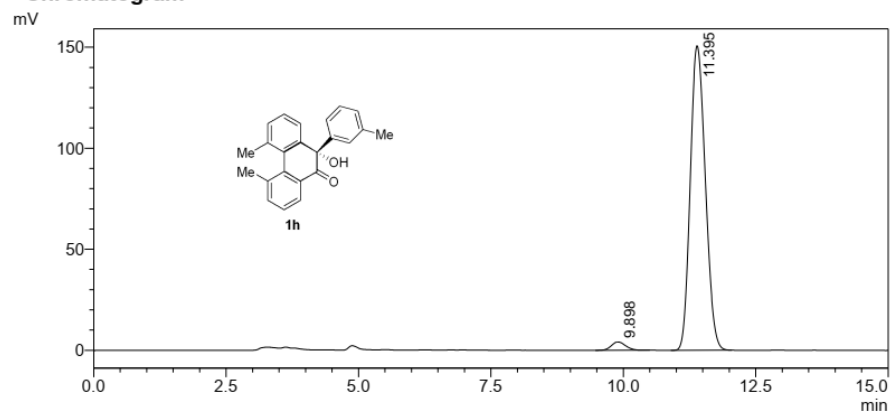


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.006	682204	37359	50.051			
2	11.516	680821	35314	49.949			
Total		1363025	72672				

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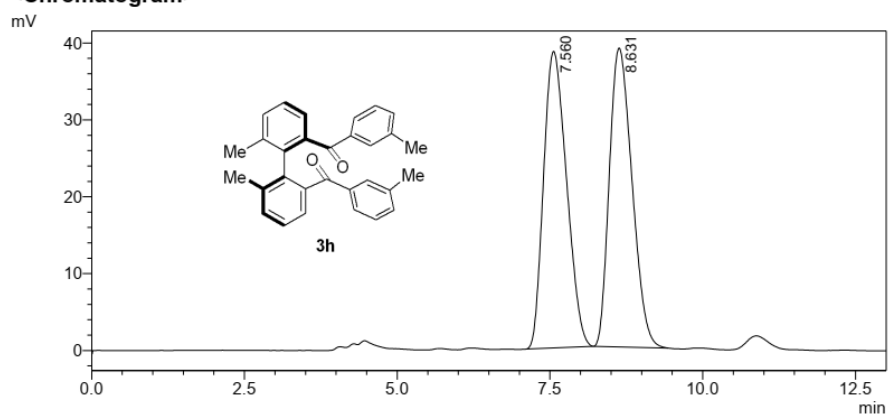


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.898	76376	4098	2.492			
2	11.395	2989049	150657	97.508			
Total		3065425	154755				

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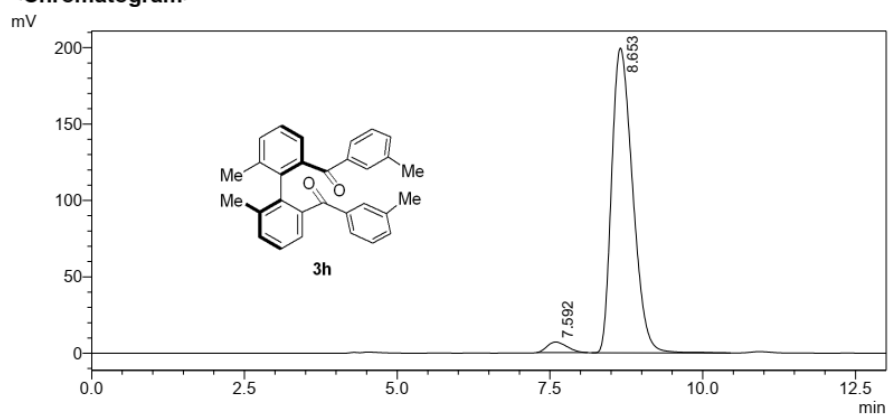


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.560	1007829	38581	50.119			
2	8.631	1003052	38875	49.881			
Total		2010881	77456				

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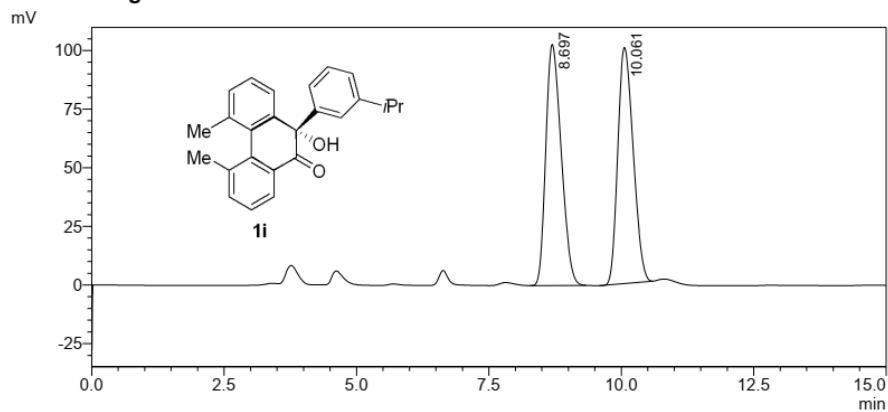


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.592	157233	6924	3.194			
2	8.653	4766237	199421	96.806			
Total		4923470	206346				

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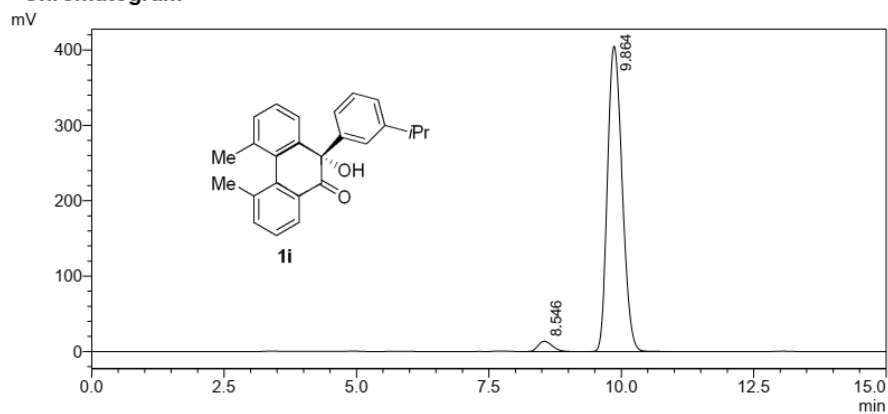


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.697	2084753	102767	50.601		M	
2	10.061	2035268	100638	49.399		M	
Total		4120022	203405				

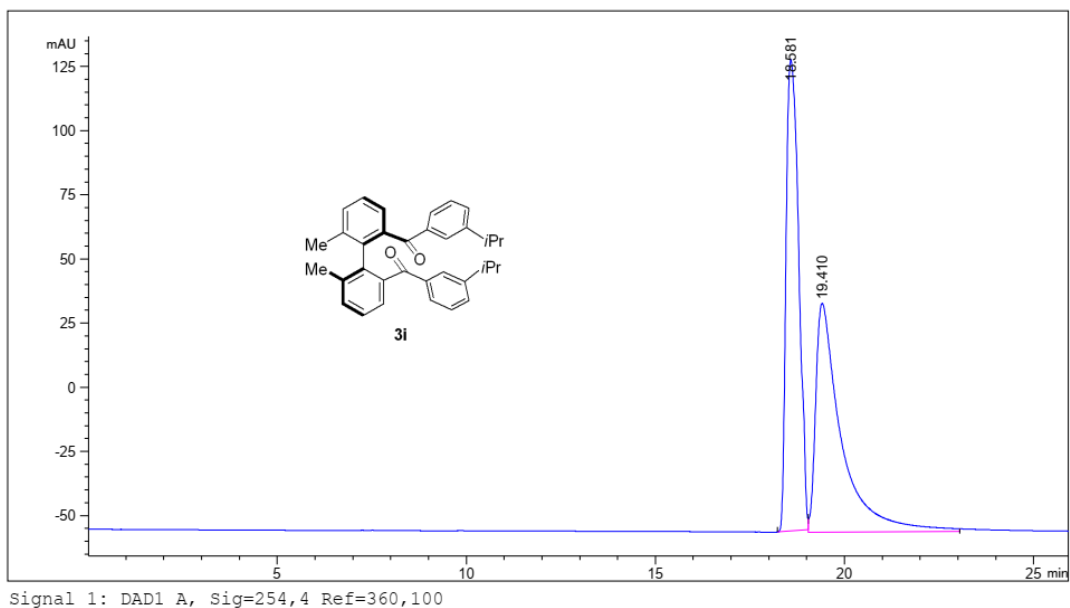
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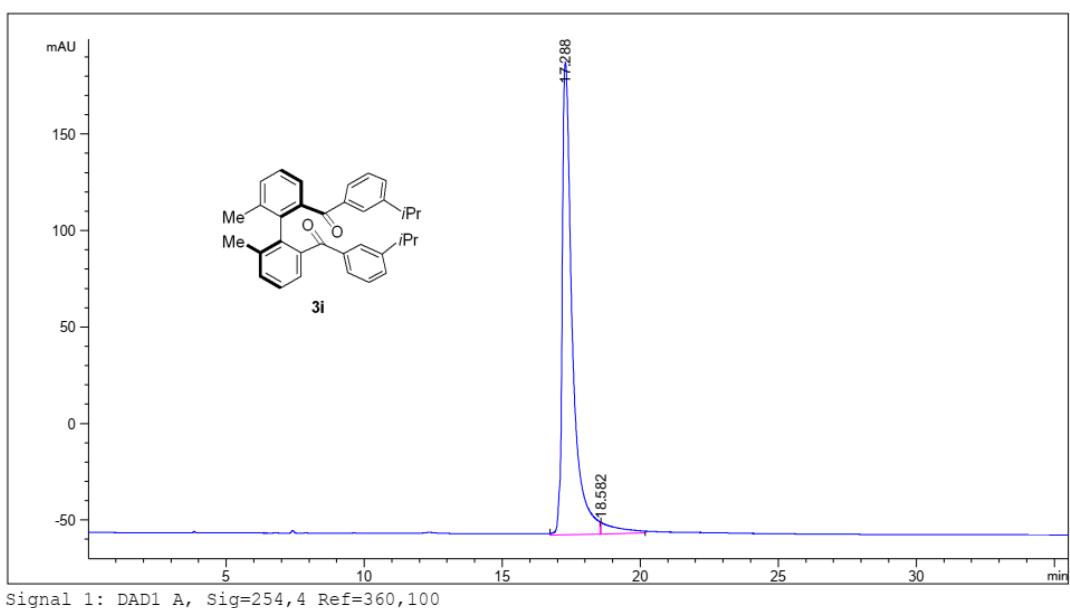
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Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.546	255373	13569	3.170		M	
2	9.864	7801635	404920	96.830		M	
Total		8057009	418489				

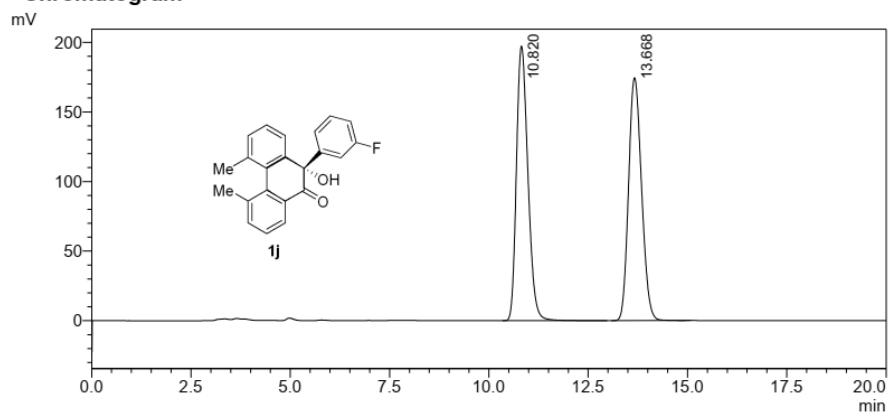


Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	18.581	BV	0.3760	4249.53760	183.62791	50.1707
2	19.410	MM	0.7879	4220.61426	89.28460	49.8293



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	17.288	MM	0.4252	6245.22021	244.77715	96.0970
2	18.582	MM	0.5013	253.65062	5.92736	3.9030

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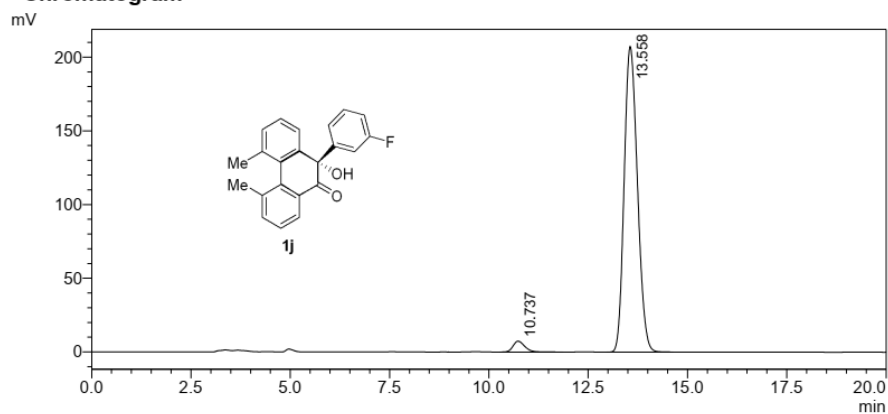


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.820	3960052	197146	49.948			
2	13.668	3968298	174478	50.052			
Total		7928349	371625				

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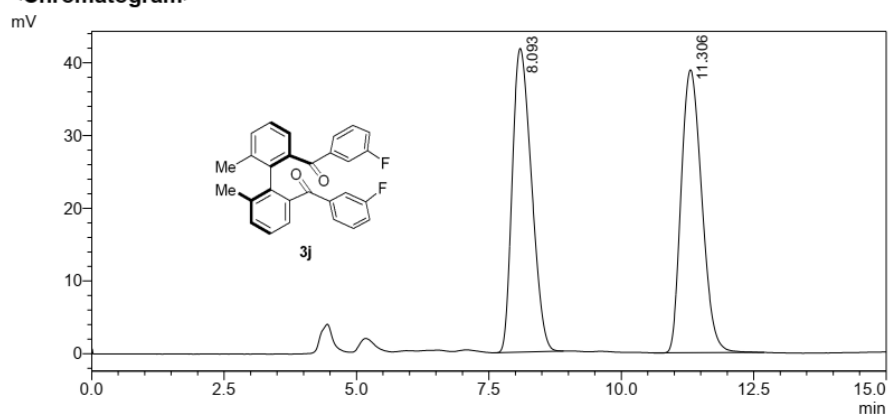


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.737	154393	7359	3.109			
2	13.558	4812187	207352	96.891			
Total		4966580	214711				

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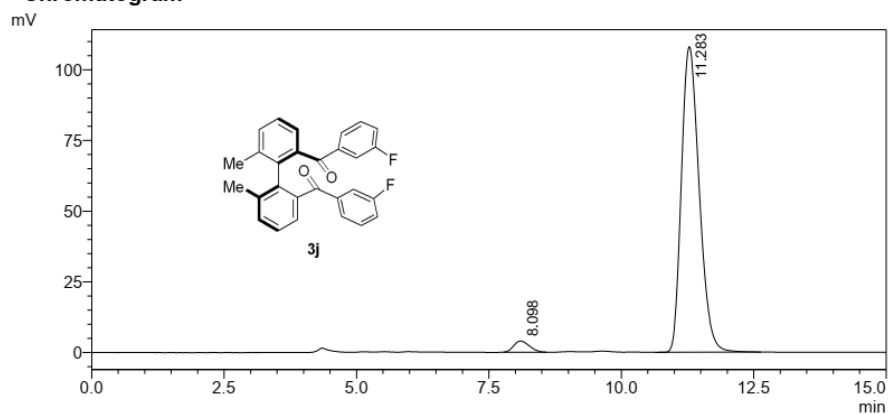


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.093	1052522	41726	49.970			
2	11.306	1053789	38884	50.030			
Total		2106311	80610				

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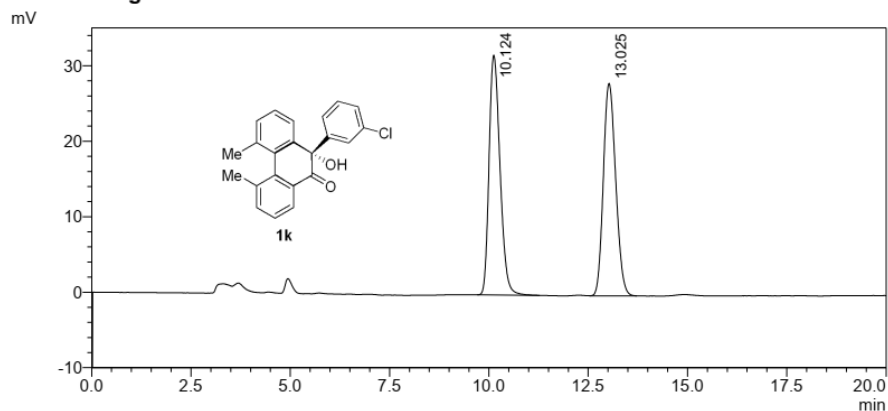


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Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.098	80999	3932	3.108			
2	11.283	2524892	108028	96.892			
Total		2605891	111960				

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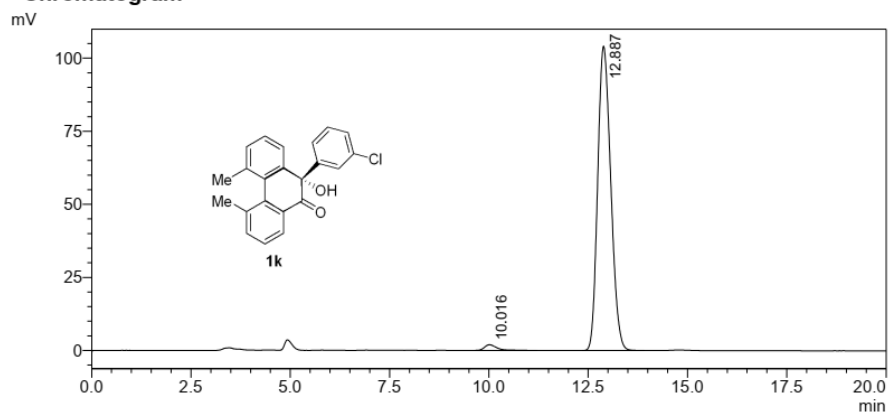


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.124	609553	31747	50.053			
2	13.025	608274	28126	49.947			
Total		1217827	59873				

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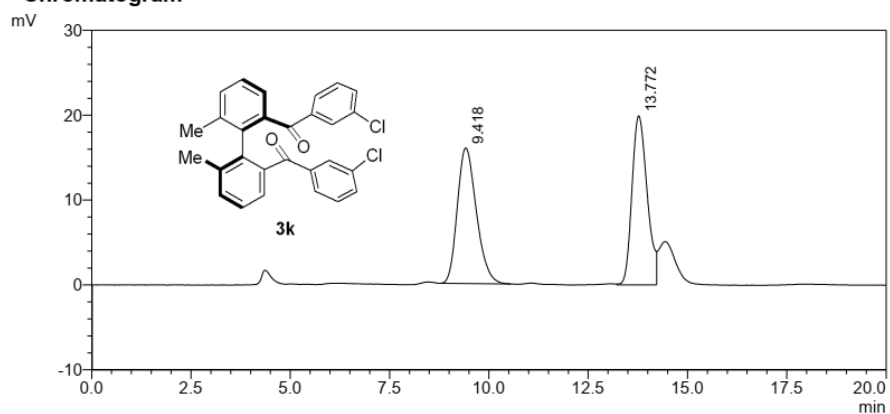


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.016	45009	1972	1.854			
2	12.887	2383321	104101	98.146			
Total		2428330	106074				

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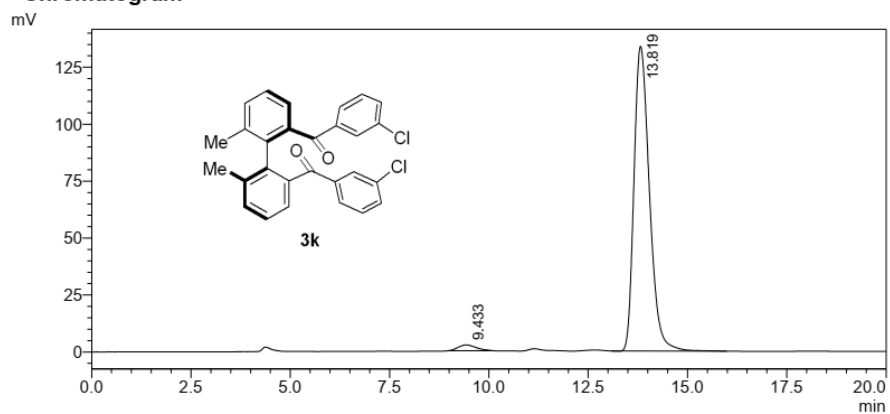


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.418	534012	15973	50.128			
2	13.772	531291	19936	49.872			
Total		1065303	35909				

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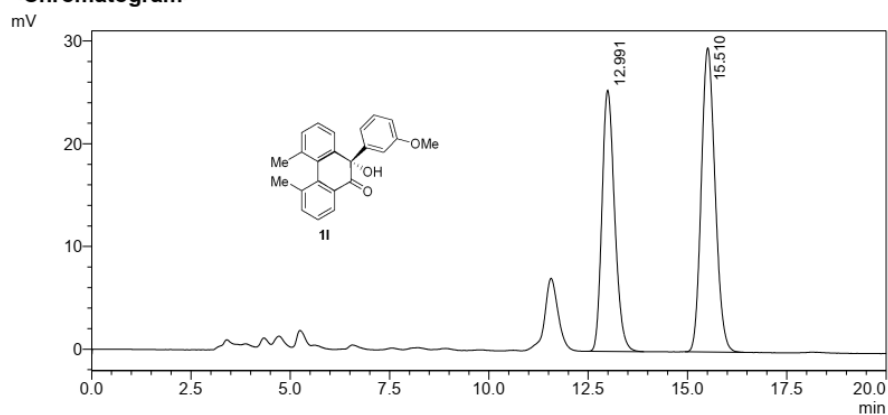


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.433	78280	2497	2.118			
2	13.819	3617034	133730	97.882			
Total		3695314	136227				

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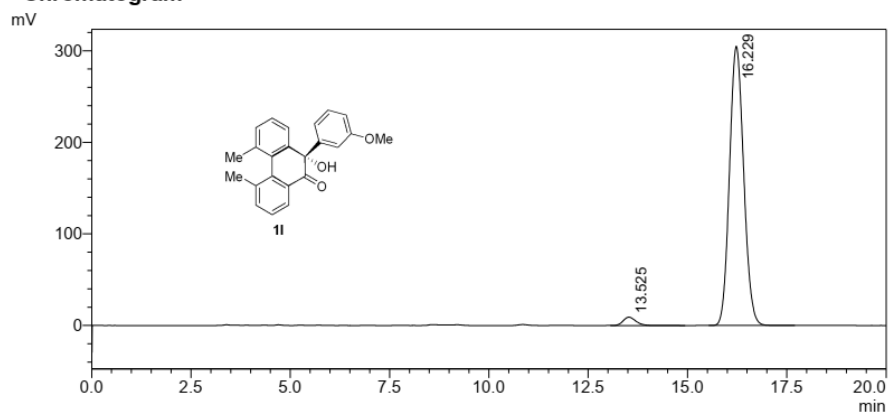


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.991	564901	25431	44.072			
2	15.510	716856	29606	55.928			
Total		1281757	55037				

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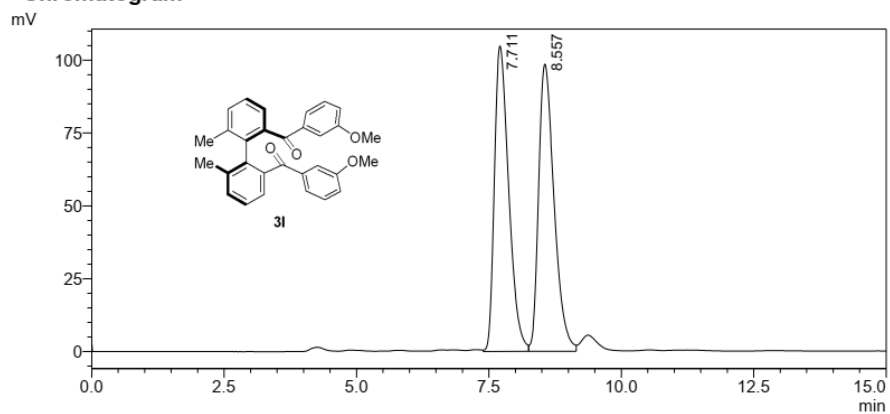


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	13.525	207299	9140	2.664			
2	16.229	7573810	304696	97.336			
Total		7781108	313836				

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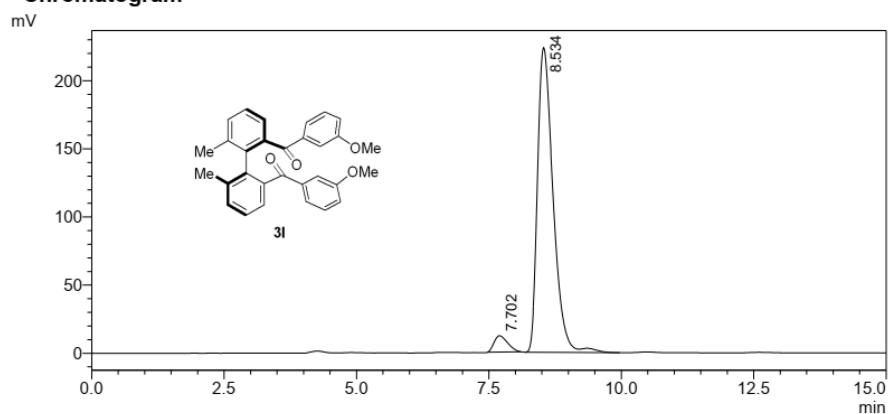


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.711	1976851	104771	49.711			
2	8.557	1999828	98579	50.289			
Total		3976679	203349				

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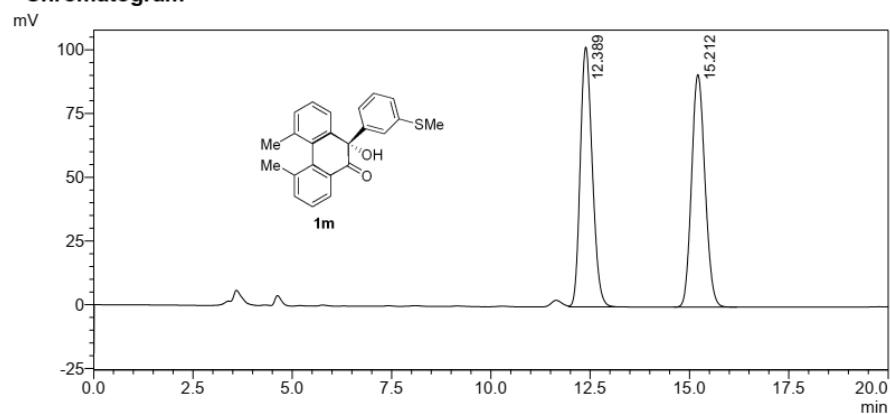


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.702	212745	11968	4.445			
2	8.534	4573331	223531	95.555			
Total		4786076	235498				

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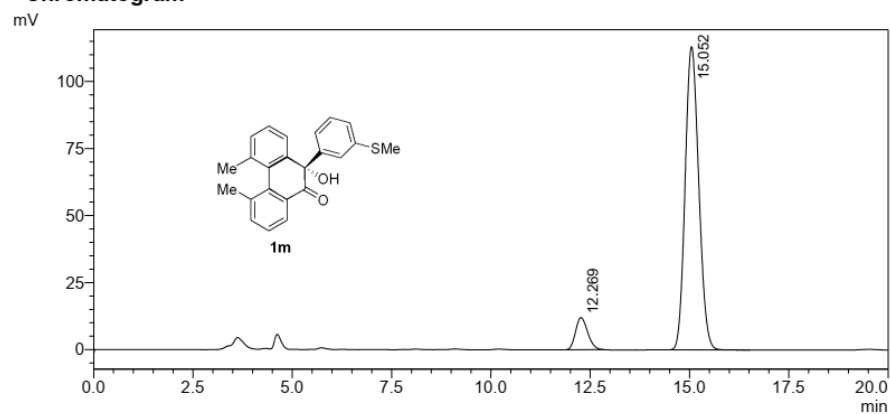


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.389	2147809	101893	50.013			
2	15.212	2146668	91195	49.987			
Total		4294478	193088				

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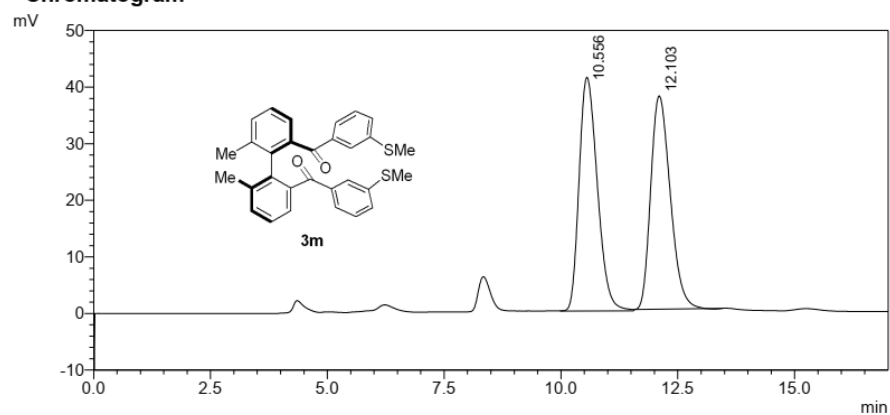


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.269	254278	11996	8.621			
2	15.052	2695405	113035	91.379			
Total		2949683	125031				

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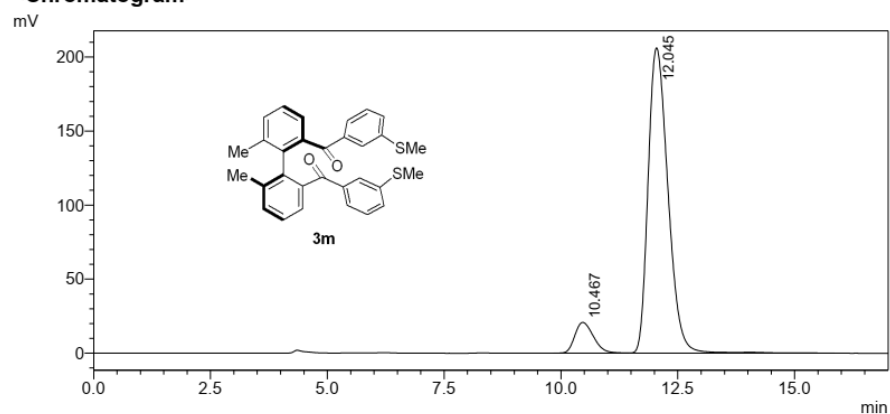


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.556	1123543	41305	50.668			
2	12.103	1093925	37682	49.332			
Total		2217468	78987				

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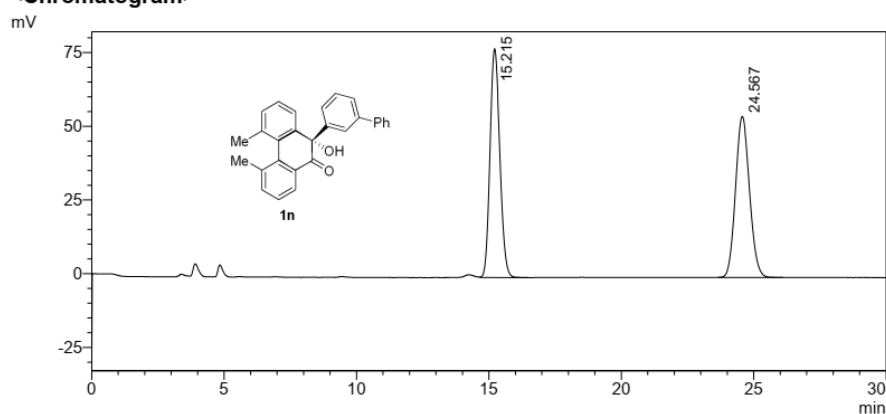


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.467	579641	20809	8.651			
2	12.045	6120293	206172	91.349			
Total		6699934	226981				

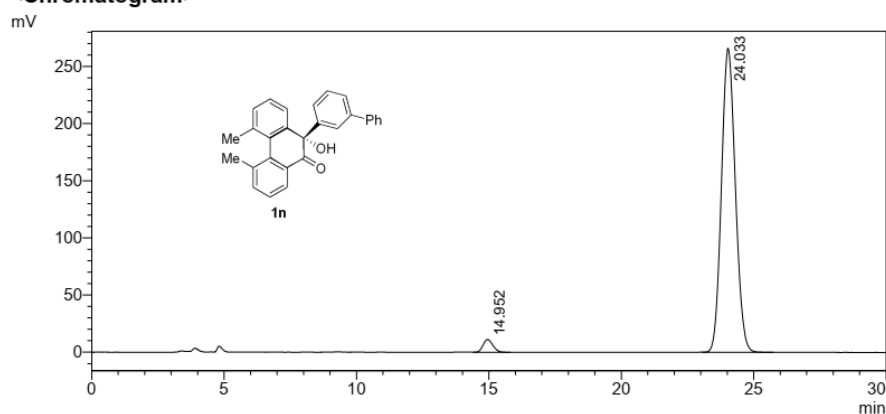
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<Peak Table>

Detector A Channel 1 254nm						
Peak#	Ret. Time	Area	Height	Conc.	Unit	Name
1	15.215	2001710	77543	50.002		
2	24.567	2001520	54595	49.998		
Total		4003230	132138			

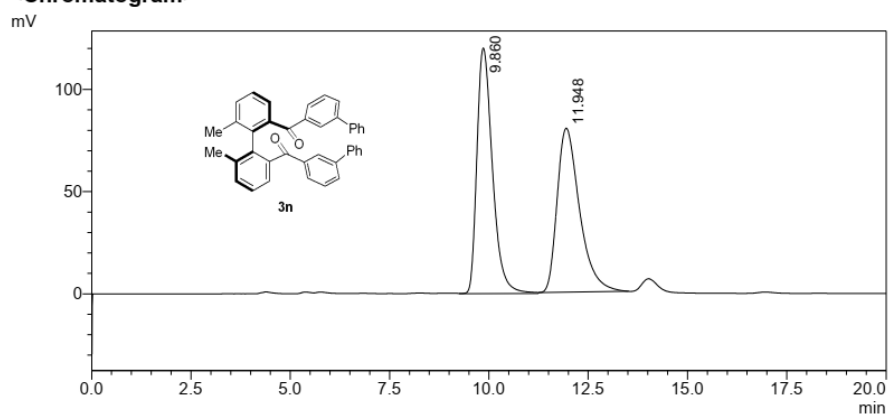
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<Peak Table>

Detector A Channel 1 254nm						
Peak#	Ret. Time	Area	Height	Conc.	Unit	Name
1	14.952	285263	11117	2.849		
2	24.033	9726831	265960	97.151		
Total		10012094	277078			

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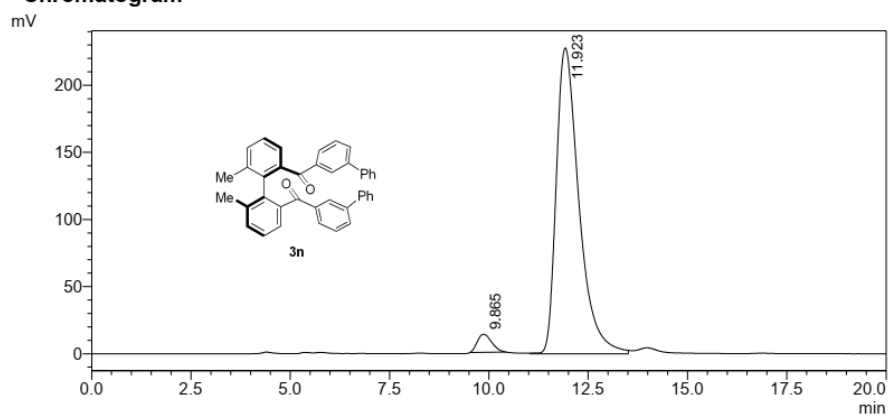


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.860	3268242	120107	50.921			
2	11.948	3149957	80177	49.079			
Total		6418198	200283				

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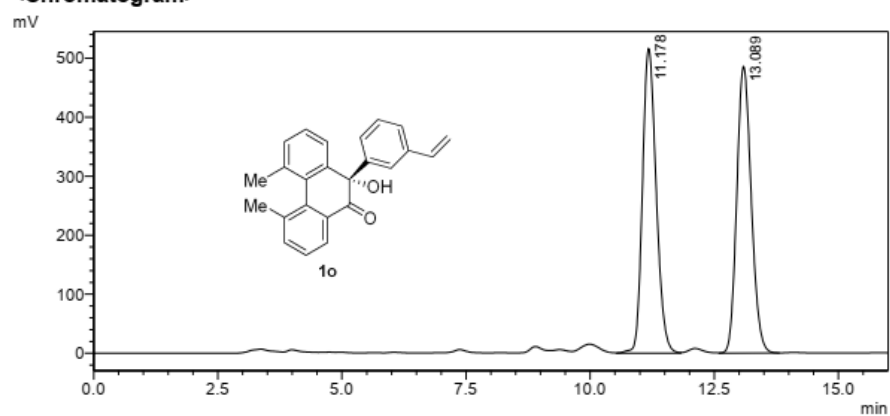


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.865	338448	13482	3.603			
2	11.923	9055898	227852	96.397			
Total		9394346	241334				

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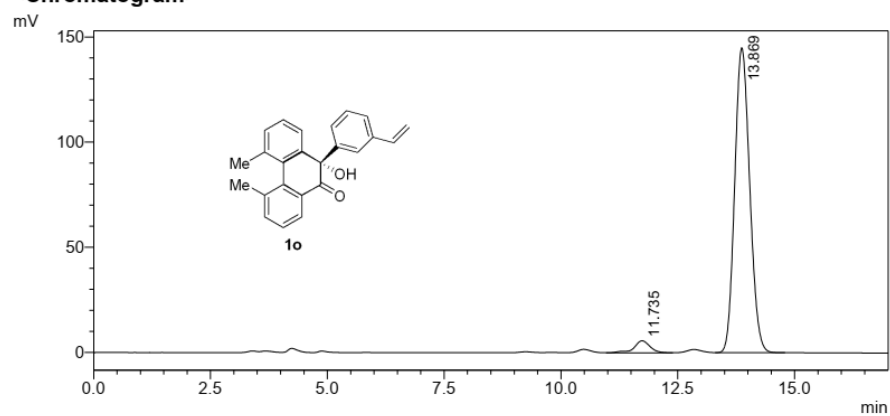


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.178	9914469	515863	50.201			
2	13.089	9835225	485681	49.799			
Total		19749694	1001543				

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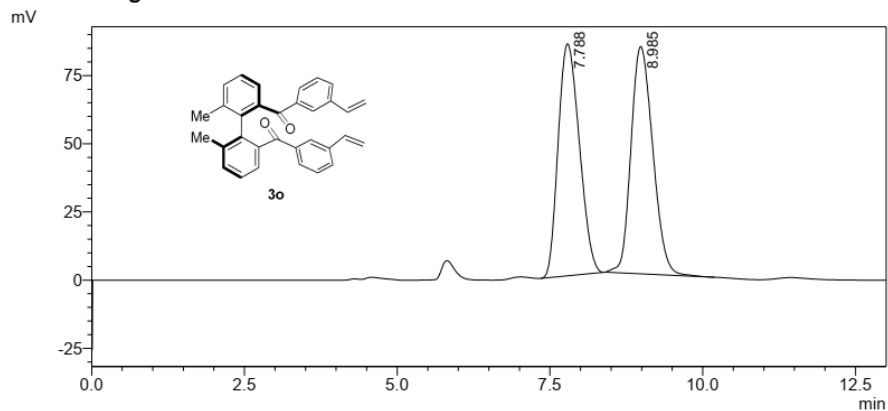


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.735	137297	5721	4.065			
2	13.869	3240567	144936	95.935			
Total		3377864	150657				

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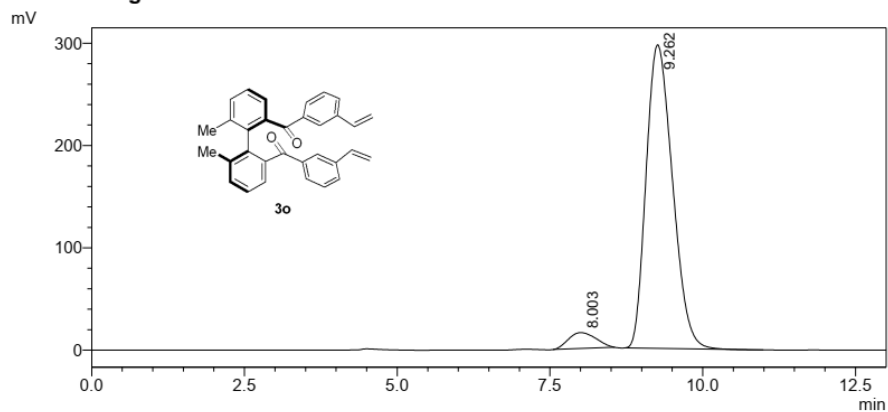


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.788	2050502	85008	49.733			
2	8.985	2072516	83369	50.267			
Total		4123018	168377				

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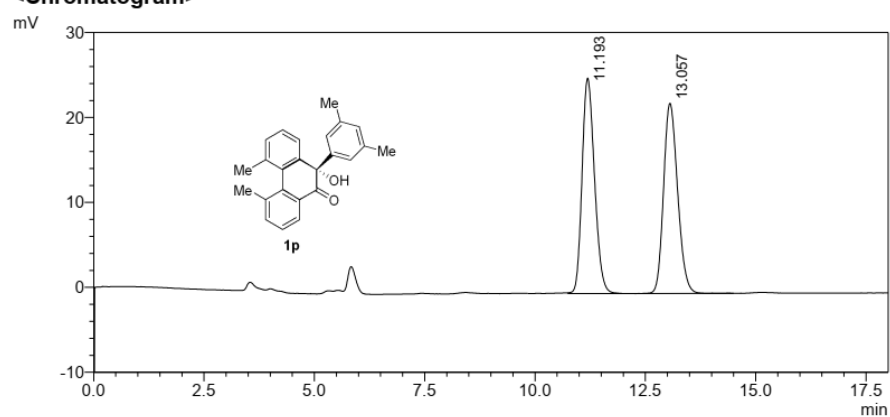


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.003	488553	15566	5.195			
2	9.262	8916071	296618	94.805			
Total		9404624	312184				

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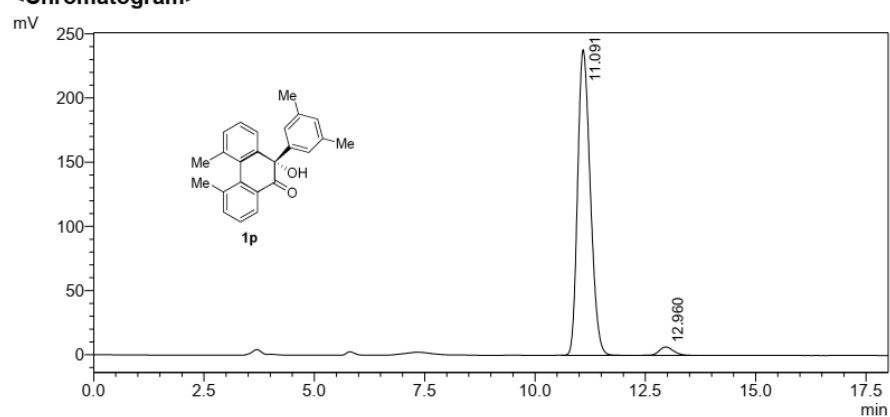


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.193	498008	25348	50.120			
2	13.057	495628	22405	49.880			
Total		993636	47753				

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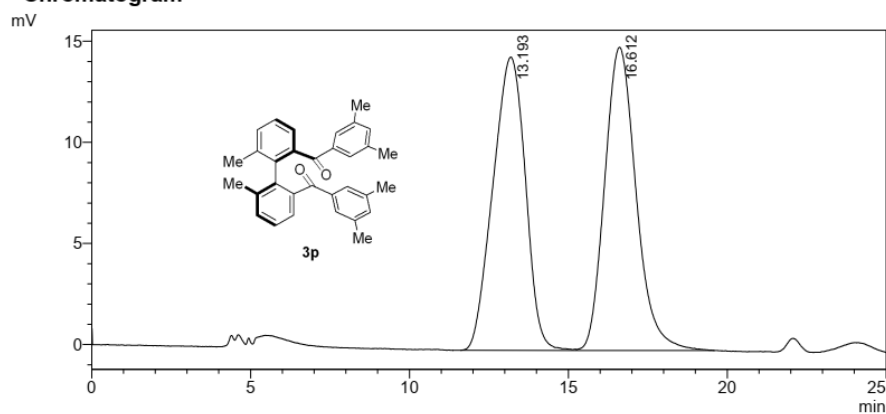


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	11.091	4747802	238031	97.010			
2	12.960	146346	6530	2.990			
Total		4894148	244561				

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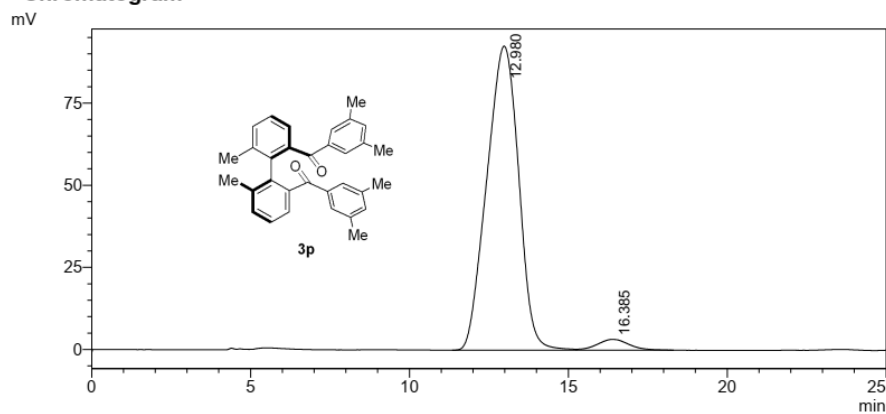


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	13.193	1032111	14507	50.001			
2	16.612	1032078	14994	49.999			
Total		2064189	29501				

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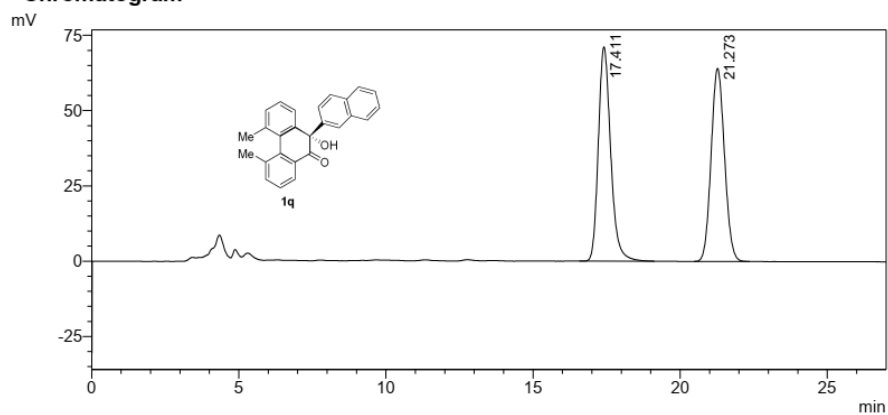


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.980	6457181	92567	96.571			
2	16.385	229249	3305	3.429			
Total		6686430	95872				

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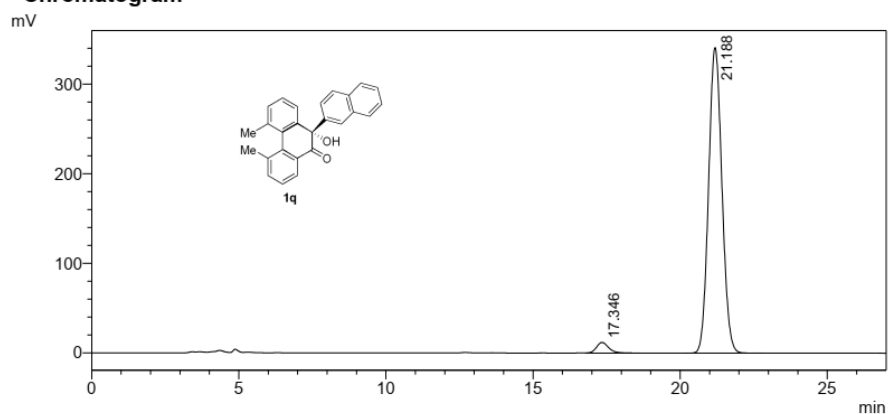


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	17.411	2076907	71123	50.563			
2	21.273	2030681	64135	49.437			
Total		4107588	135259				

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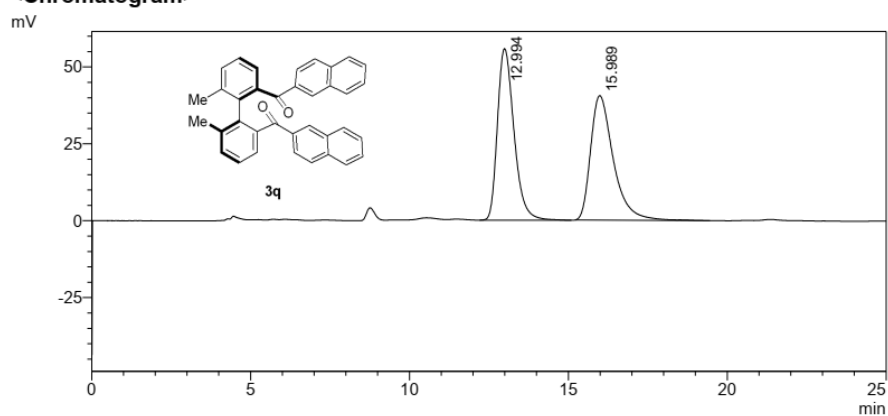


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	17.346	342467	11827	3.086			
2	21.188	10753770	340887	96.914			
Total		11096237	352715				

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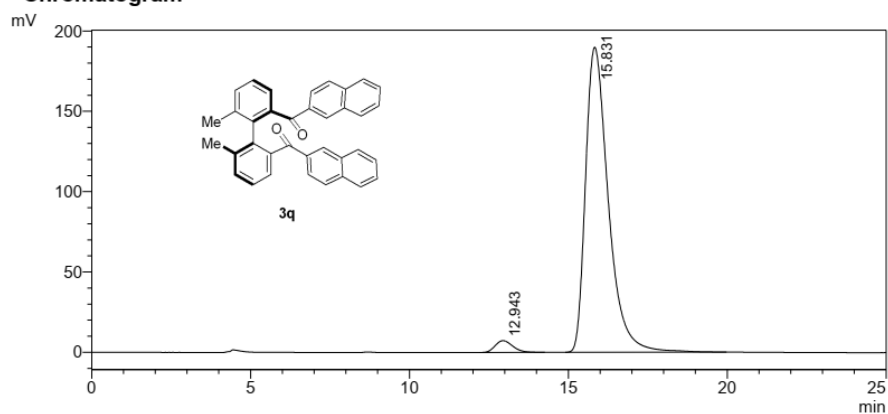


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.994	2022663	55787	50.102			
2	15.989	2014432	40458	49.898			
Total		4037094	96245				

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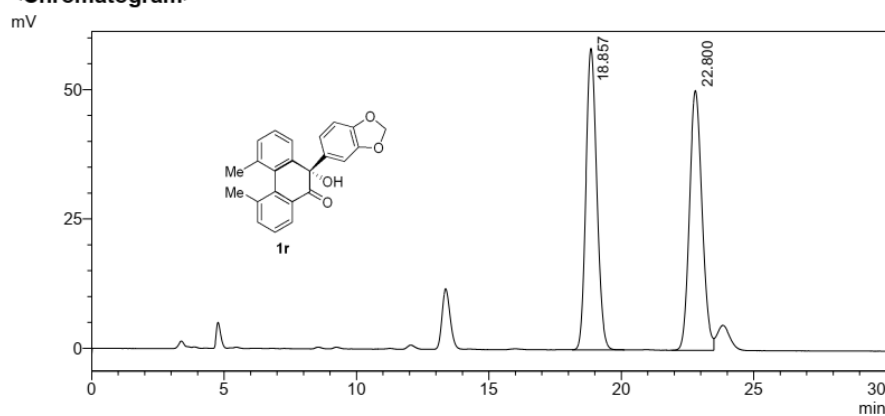


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.943	281601	7316	2.888			
2	15.831	9469953	189857	97.112			
Total		9751554	197174				

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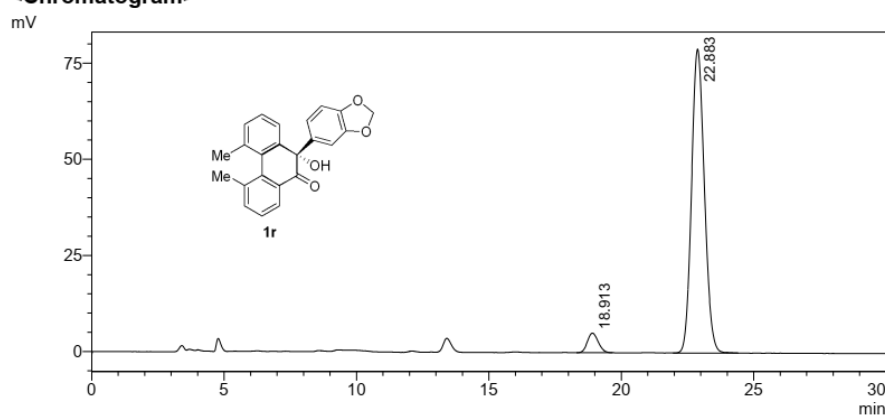


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	18.857	1659765	58248	50.000			
2	22.800	1659765	50209	50.000			
Total		3319530	108457				

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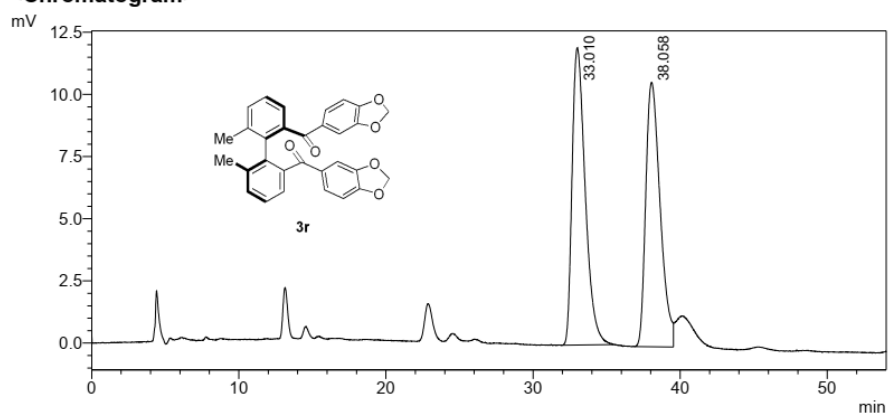


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	18.913	145520	5095	5.184			
2	22.883	2661513	79027	94.816			
Total		2807033	84122				

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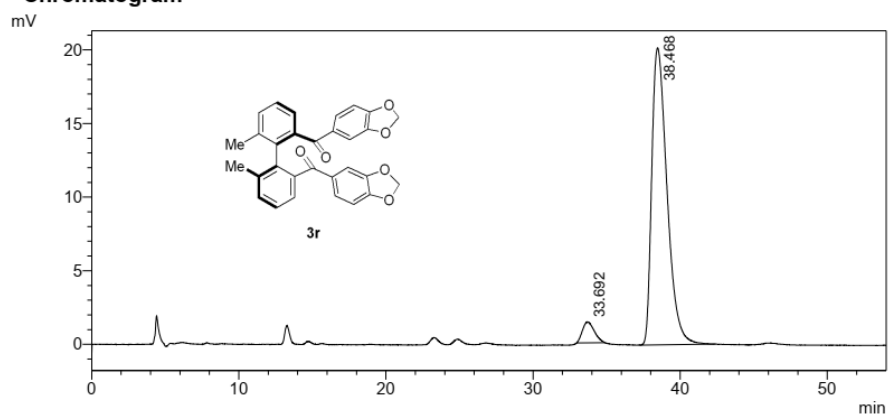


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	33.010	743404	11950	50.719			
2	38.058	722321	10633	49.281			
Total		1465725	22583				

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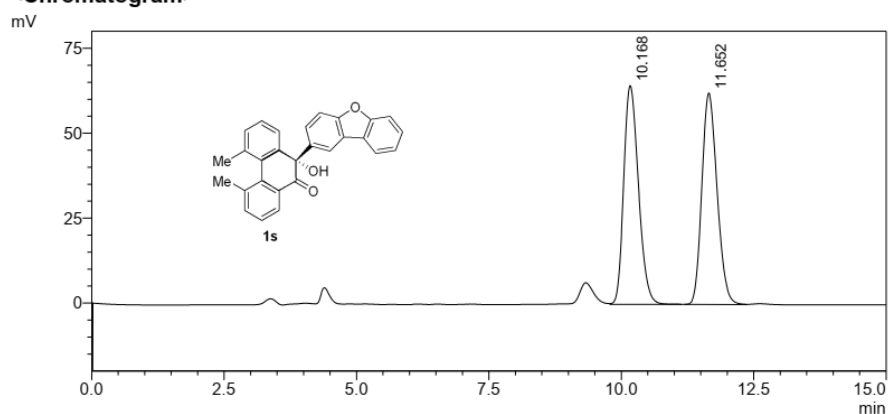


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	33.692	78825	1421	5.139			
2	38.468	1454901	20172	94.861			
Total		1533726	21594				

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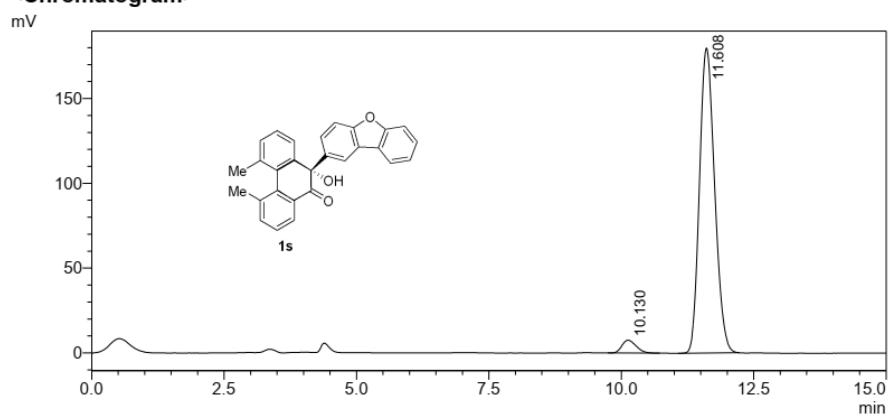


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.168	1243517	64351	49.954			
2	11.652	1245798	62216	50.046			
Total		2489315	126566				

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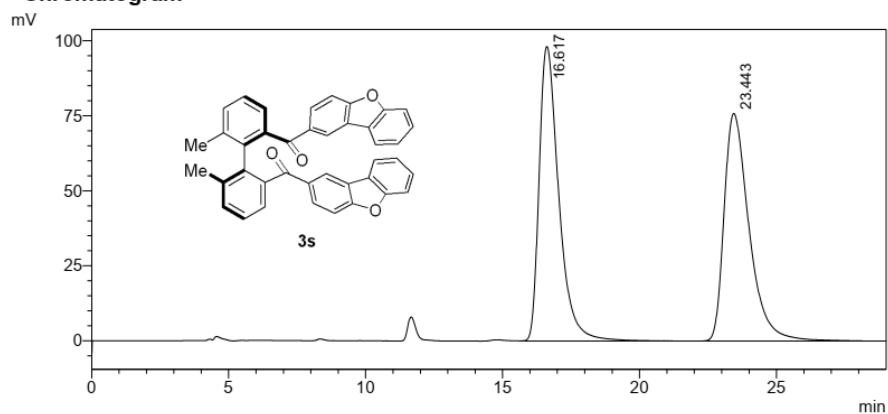


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	10.130	141300	7556	3.795			
2	11.608	3581819	179758	96.205			
Total		3723119	187314				

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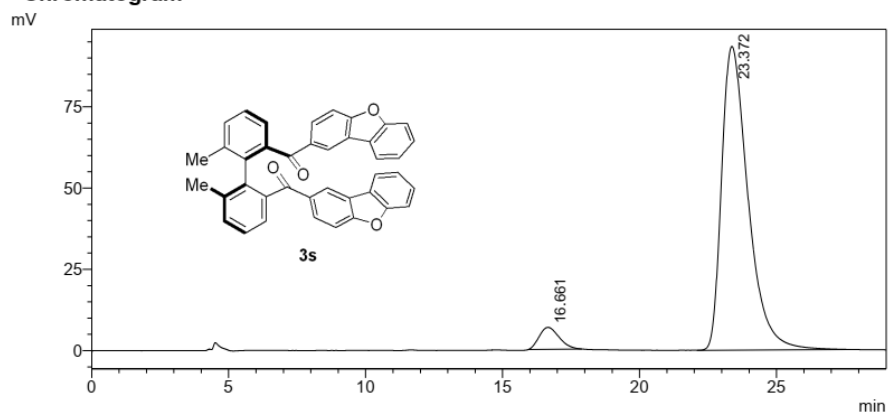


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.617	4894659	98164	50.446			
2	23.443	4808110	75849	49.554			
Total		9702768	174014				

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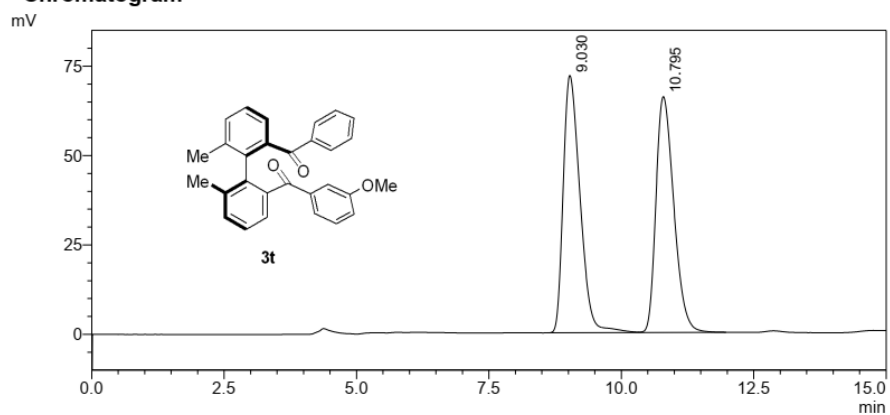


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.661	338502	6718	5.115			
2	23.372	6279906	93419	94.885			
Total		6618408	100137				

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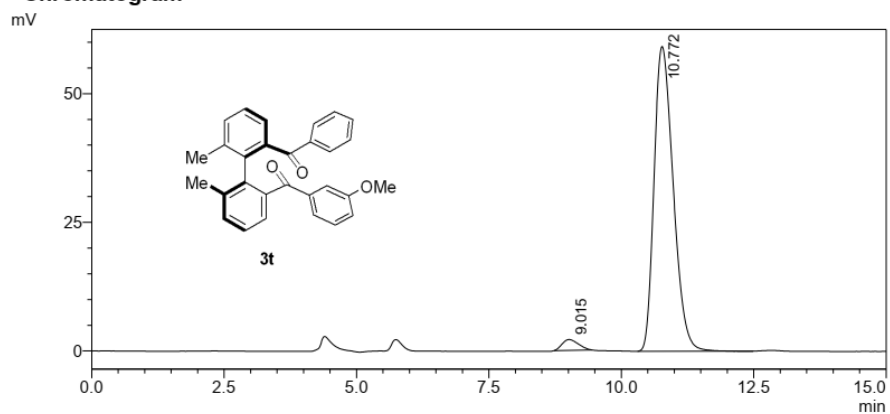


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.030	1592299	71972	50.694			
2	10.795	1548672	65973	49.306			
Total		3140971	137945				

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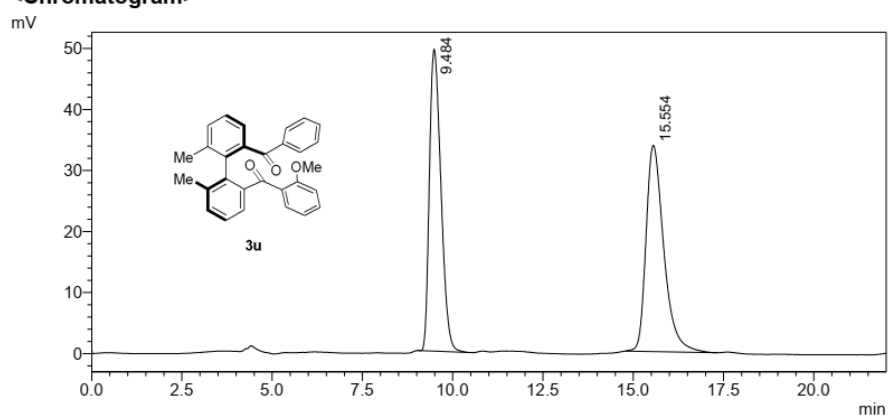


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.015	44584	2098	2.906			
2	10.772	1489785	59210	97.094			
Total		1534370	61308				

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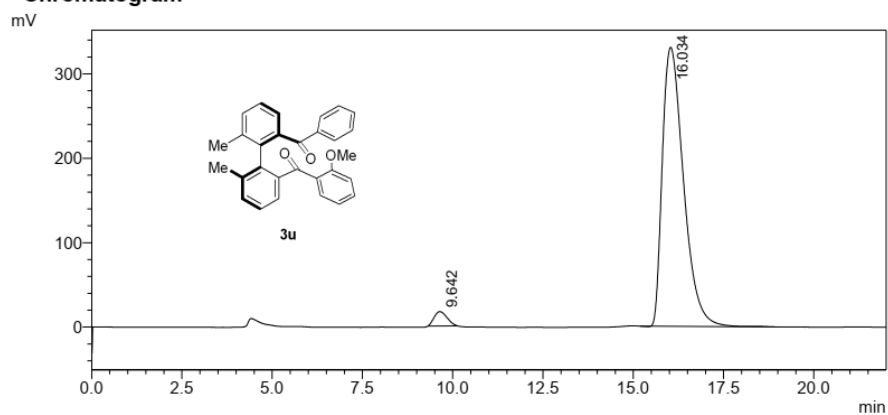


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.484	1097094	49441	48.704			
2	15.554	1155486	33767	51.296			
Total		2252580	83208				

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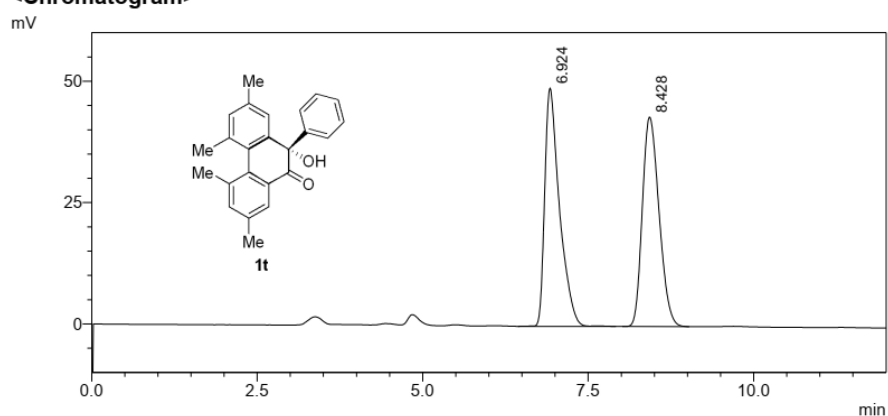


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	9.642	421988	17027	3.032			
2	16.034	13493722	330655	96.968			
Total		13915710	347682				

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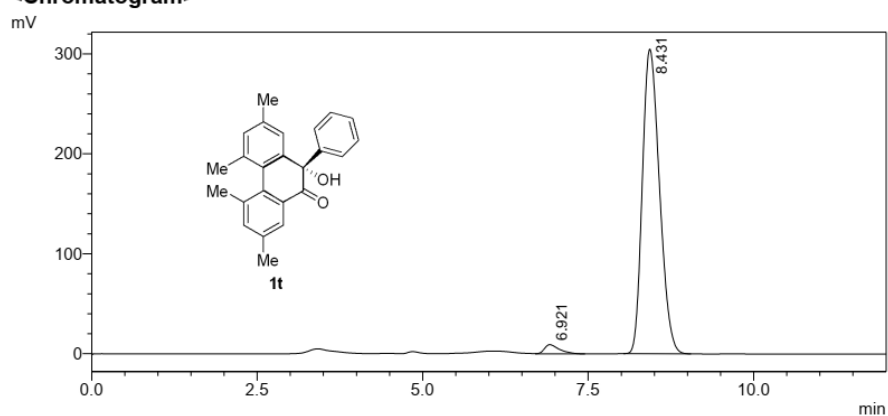


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	6.924	758957	49057	50.052			
2	8.428	757367	43132	49.948			
Total		1516323	92189				

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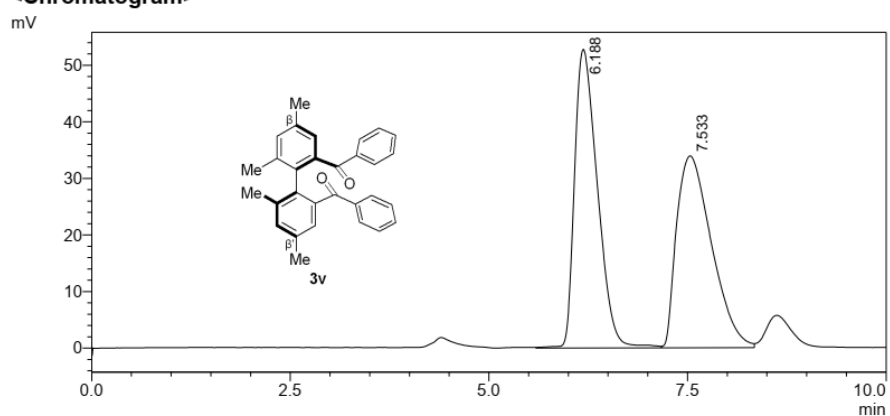


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	6.921	144859	9292	2.571			
2	8.431	5488625	304570	97.429			
Total		5633484	313862				

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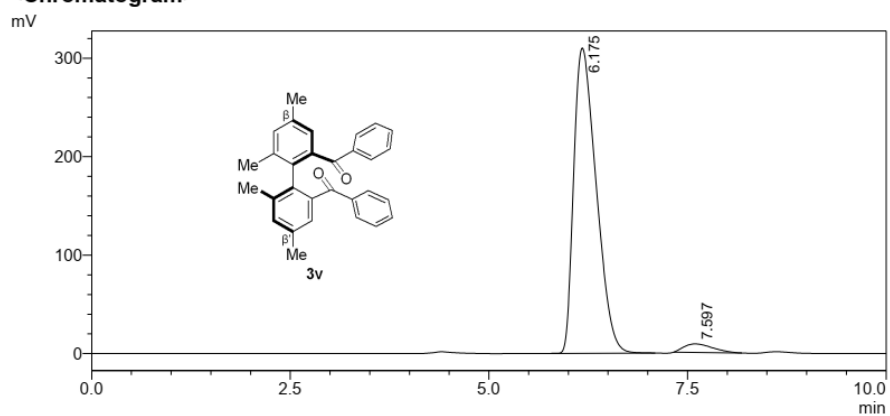


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	6.188	1057723	52753	50.505			
2	7.533	1036572	33919	49.495			
Total		2094295	86672				

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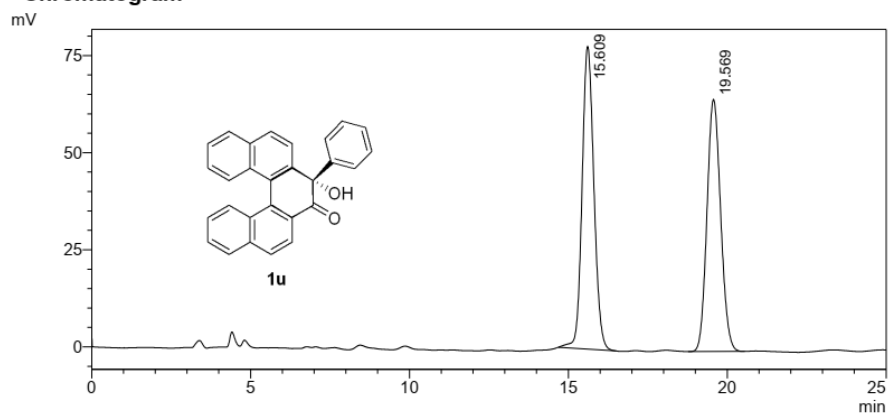


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	6.175	6100256	310008	96.528			
2	7.597	219444	8684	3.472			
Total		6319700	318692				

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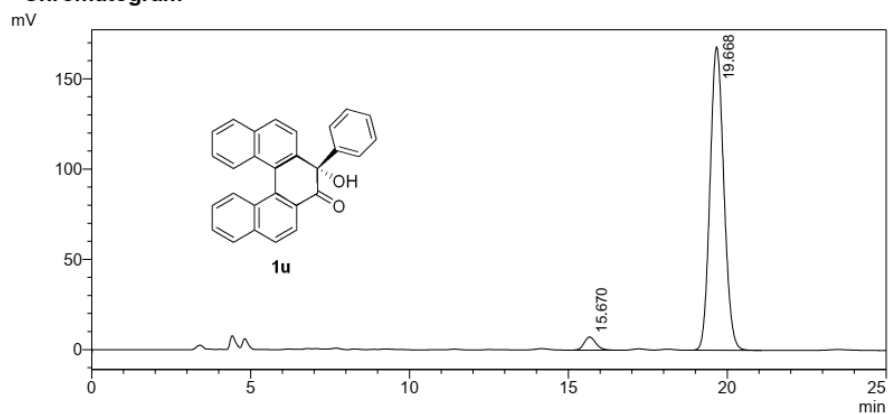


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	15.609	2012461	77908	50.903			
2	19.569	1941074	64915	49.097			
Total		3953535	142823				

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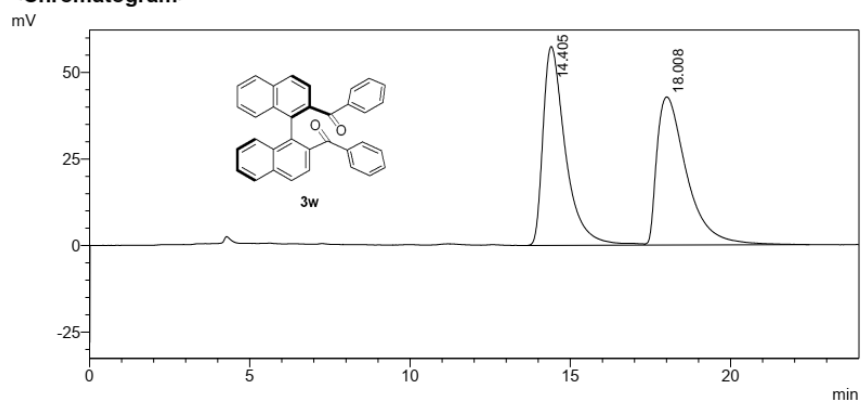


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	15.670	187318	7266	3.549			
2	19.668	5090215	168053	96.451			
Total		5277534	175319				

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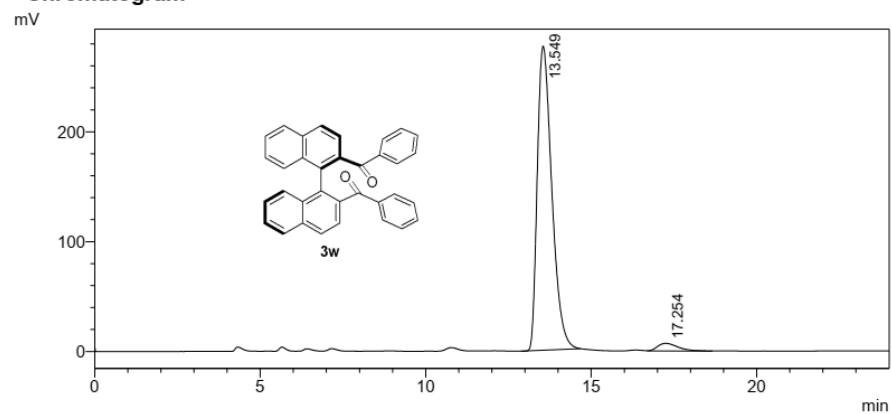


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	14.405	2798198	57473	50.285			
2	18.008	2766520	42779	49.715			
Total		5564718	100251				

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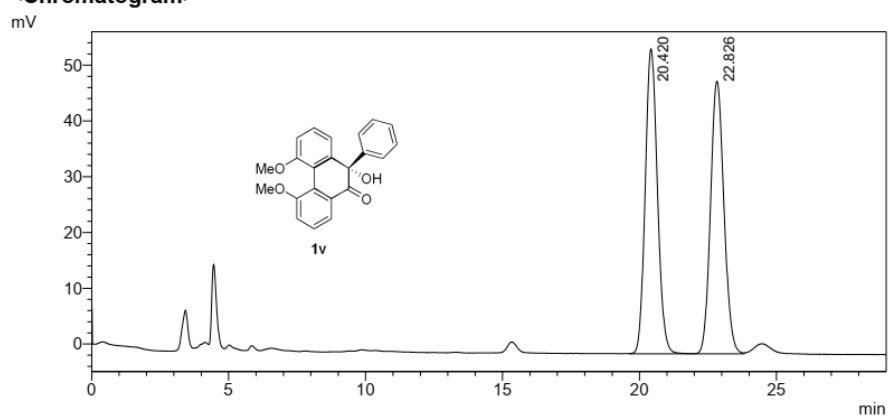


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	13.549	8440868	276718	96.554			
2	17.254	301238	6944	3.446			
Total		8742106	283662				

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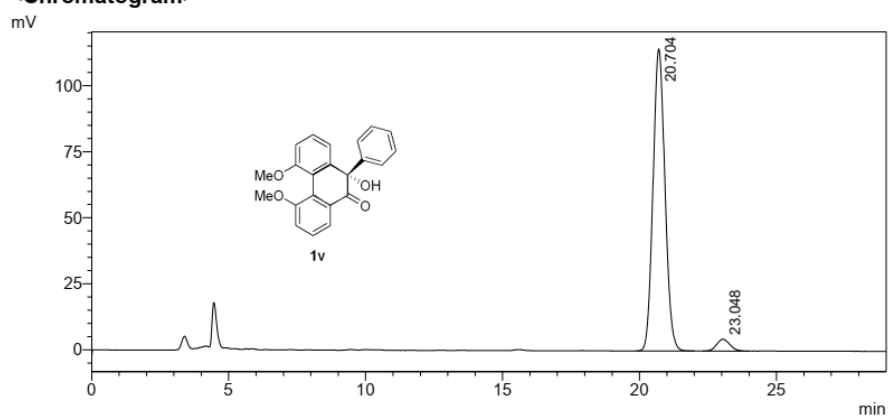


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	20.420	1691778	54666	50.414			
2	22.826	1663972	48848	49.586			
Total		3355750	103514				

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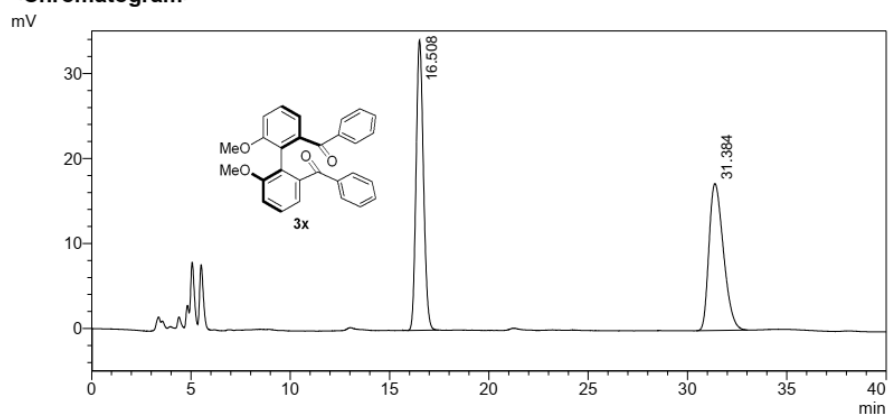


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	20.704	3469505	114320	95.850			
2	23.048	150223	4487	4.150			
Total		3619728	118807				

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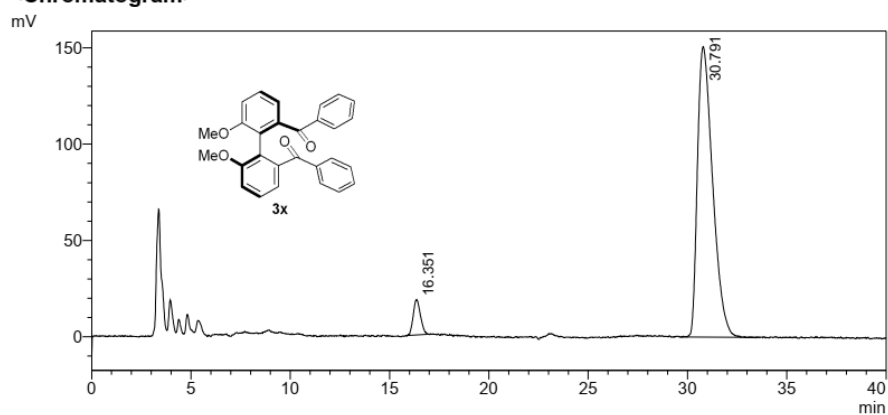


<Peak Table>

Detector A Channel 1 210nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.508	880851	34137	50.152			
2	31.384	875509	17294	49.848			
Total		1756360	51431				

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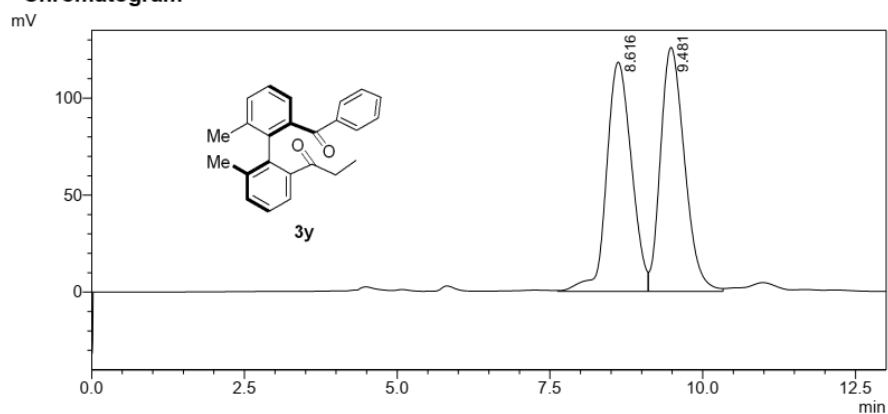


<Peak Table>

Detector A Channel 2 210nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	16.351	464575	18195	5.474			
2	30.791	8022900	150817	94.526			
Total		8487475	169013				

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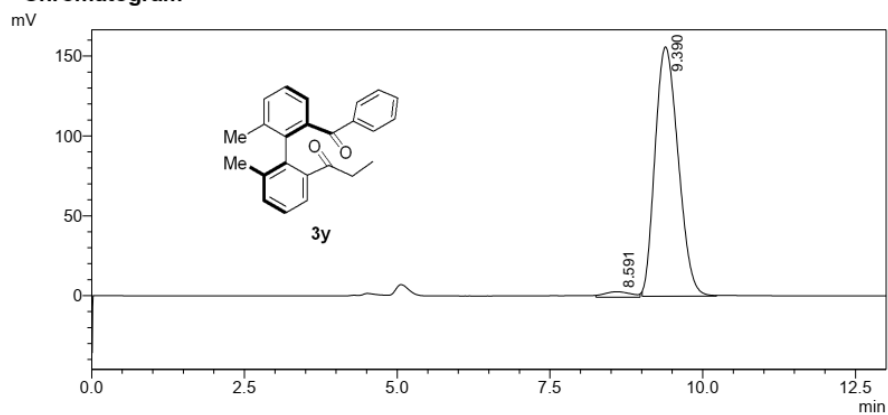


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.616	3348777	118261	49.331			
2	9.481	3439577	125829	50.669			
Total		6788354	244090				

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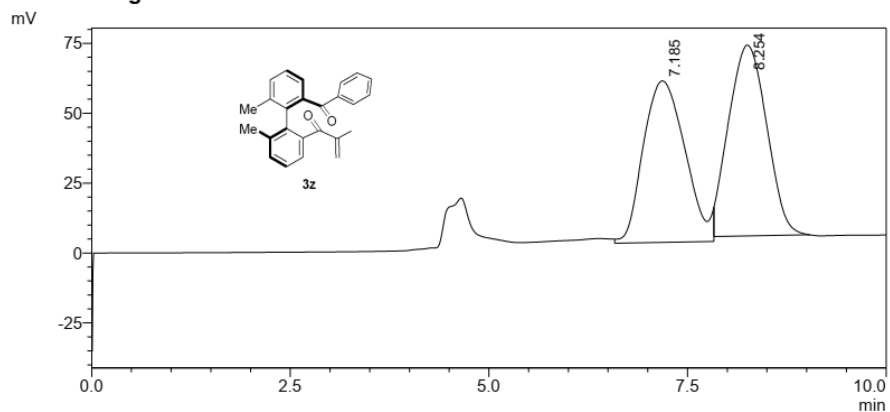


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	8.591	107068	3442	2.537			
2	9.390	4112820	156161	97.463			
Total		4219888	159603				

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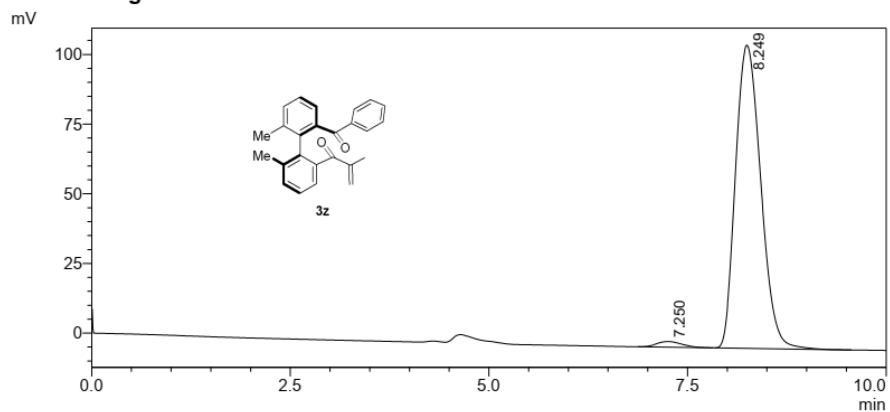


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.185	2120854	57778	48.296			
2	8.254	2270535	68199	51.704			
Total		4391390	125977				

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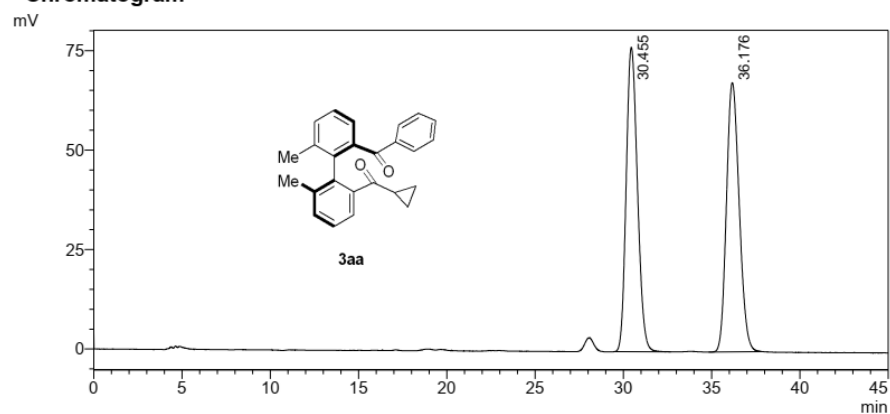


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	7.250	44587	2013	1.822			
2	8.249	2403005	108789	98.178			
Total		2447592	110802				

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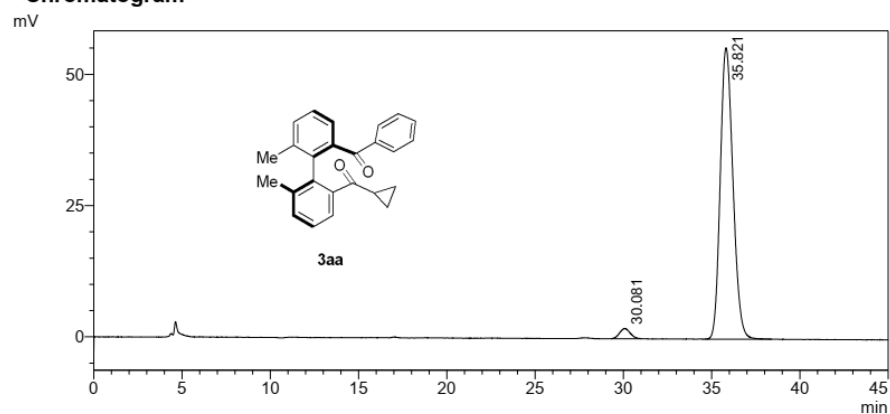


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	30.455	3385735	76495	49.984			
2	36.176	3387913	67677	50.016			
Total		6773648	144172				

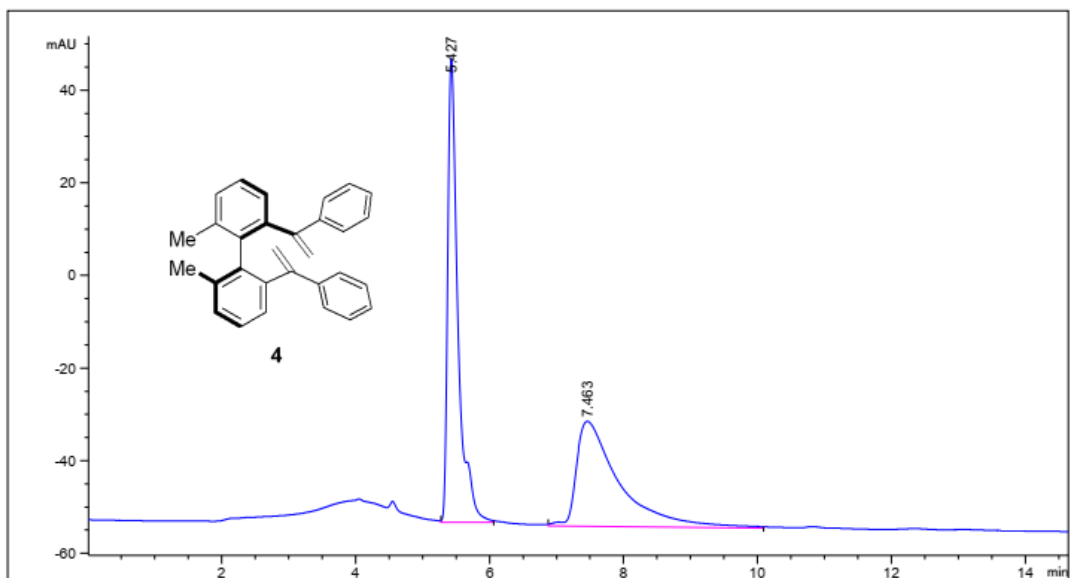
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<Peak Table>

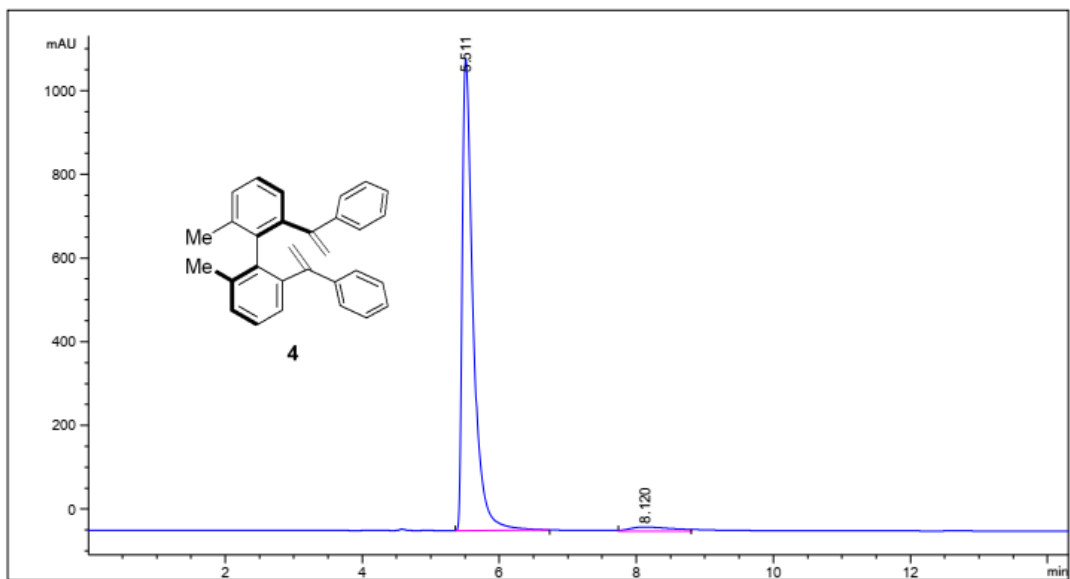
Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	30.081	81664	1947	2.858			
2	35.821	2776071	55487	97.142			
Total		2857735	57434				



Signal 1: DAD1 A, Sig=254,4 Ref=360,100

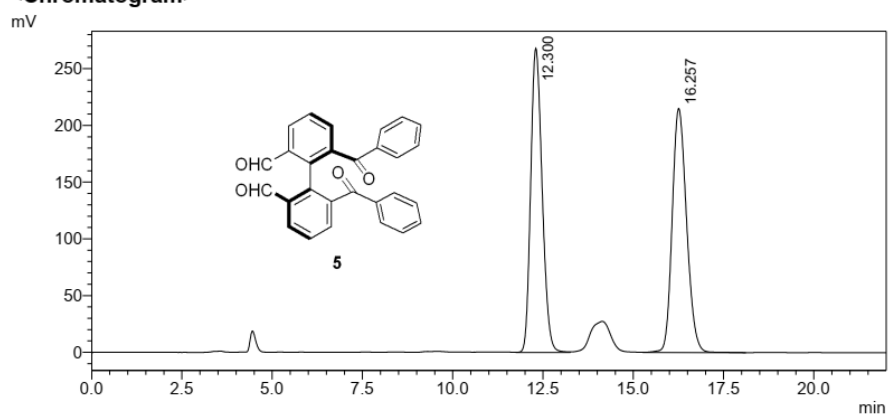
Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.427	MM	0.1776	1065.67090	100.02626	51.1863
2	7.463	MM	0.7457	1016.27515	22.71397	48.8137



Signal 1: DAD1 A, Sig=254,4 Ref=360,100

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.511	BB	0.1684	1.26104e4	1128.08789	96.5156
2	8.120	MM	0.7375	455.25446	10.28883	3.4844

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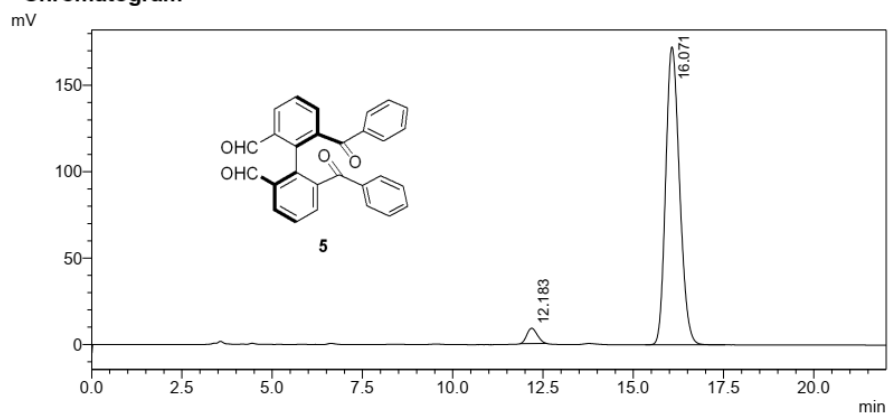


<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.300	5920567	268079	49.761			
2	16.257	5977374	215171	50.239			
Total		11897940	483250				

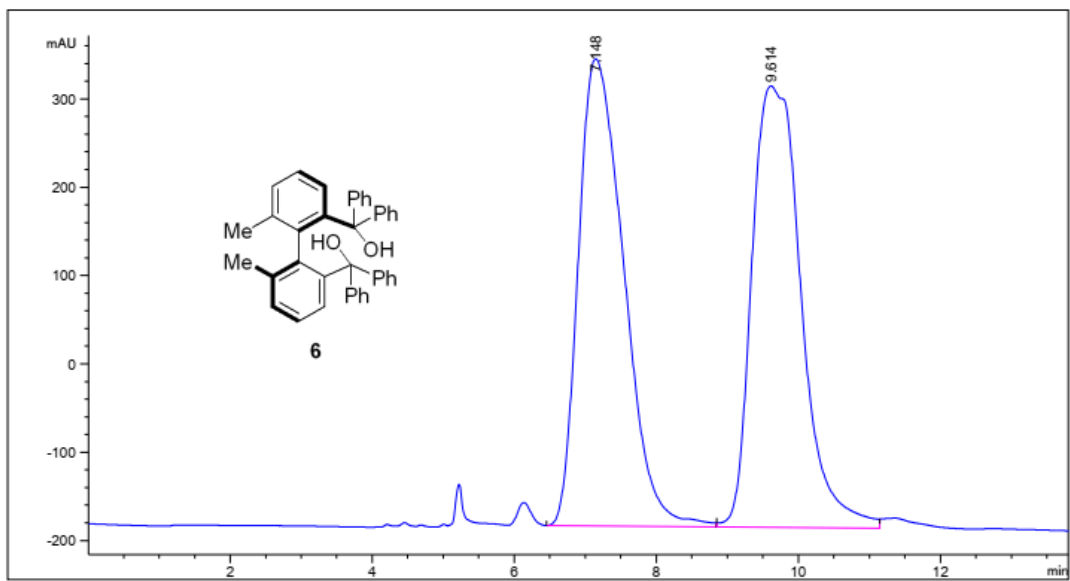
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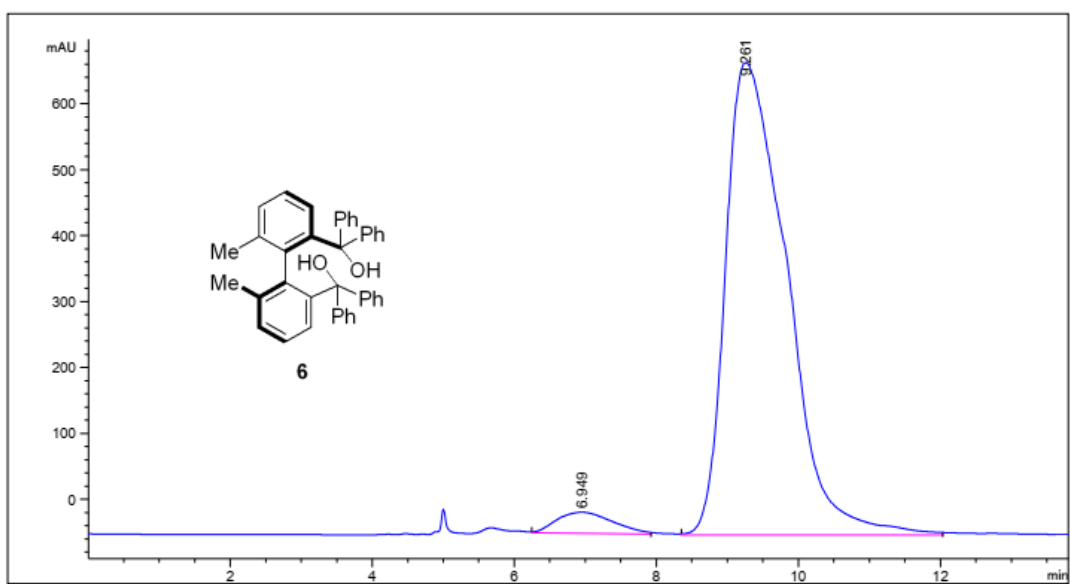
<Peak Table>

Detector A Channel 1 254nm

Peak#	Ret. Time	Area	Height	Conc.	Unit	Mark	Name
1	12.183	179033	8870	3.740			
2	16.071	4607472	172376	96.260			
Total		4786505	181246				



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.148	VB	0.7214	2.34489e4	528.77924	49.3565
2	9.614	BB	0.6736	2.40604e4	499.83356	50.6435



Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.949	MM	0.9096	1745.80261	31.98970	3.9179
2	9.261	MM	0.9957	4.28138e4	716.62024	96.0821