

Electronic Supplementary Information

Enantioselective Formal [2+2] Cycloaddition of Ketenes with Nitroso Compounds Catalyzed by N-heterocyclic Carbenes

Tong Wang, Xue-Liang Huang and Song Ye*

Beijing National Laboratory for Molecular Sciences, Laboratory of
Chemical Biology, Institute of Chemistry, Chinese Academy of Sciences,

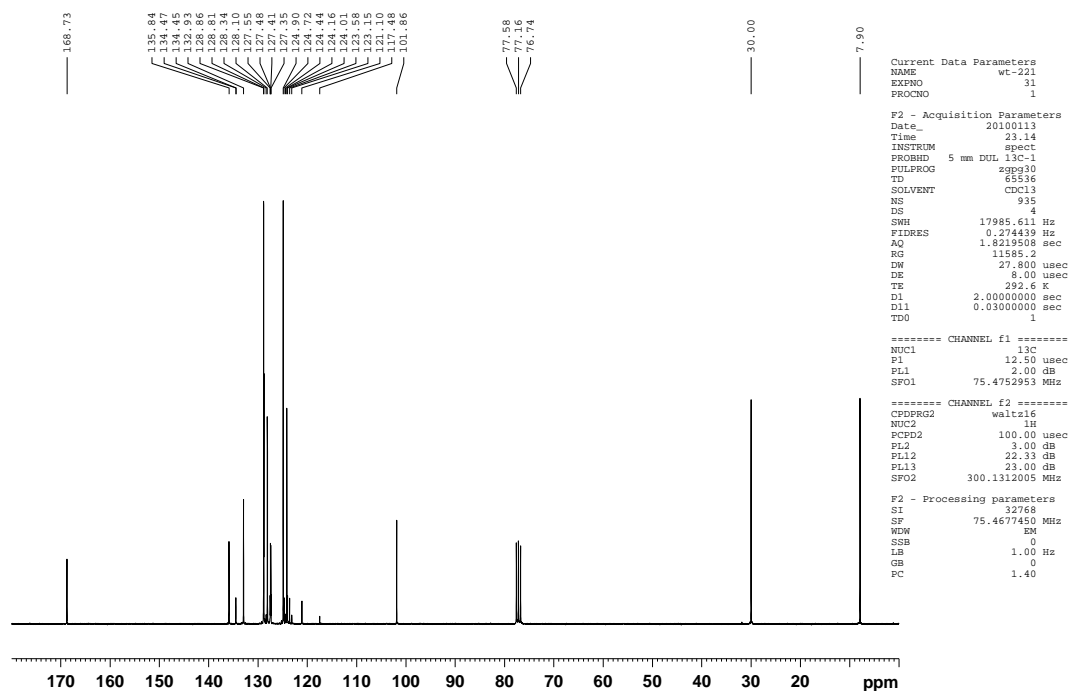
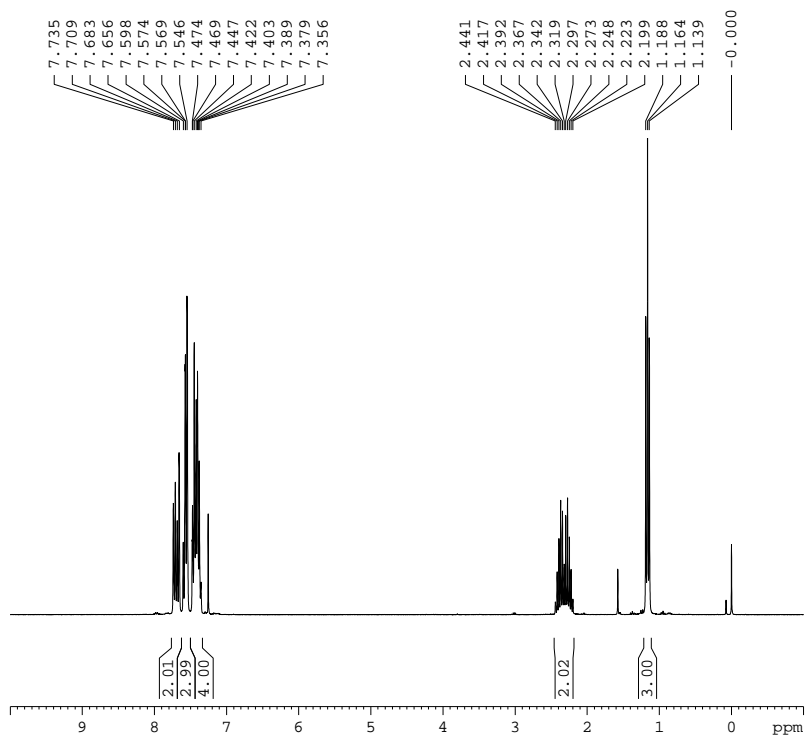
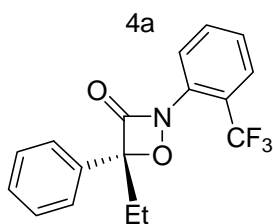
Beijing 100190, China

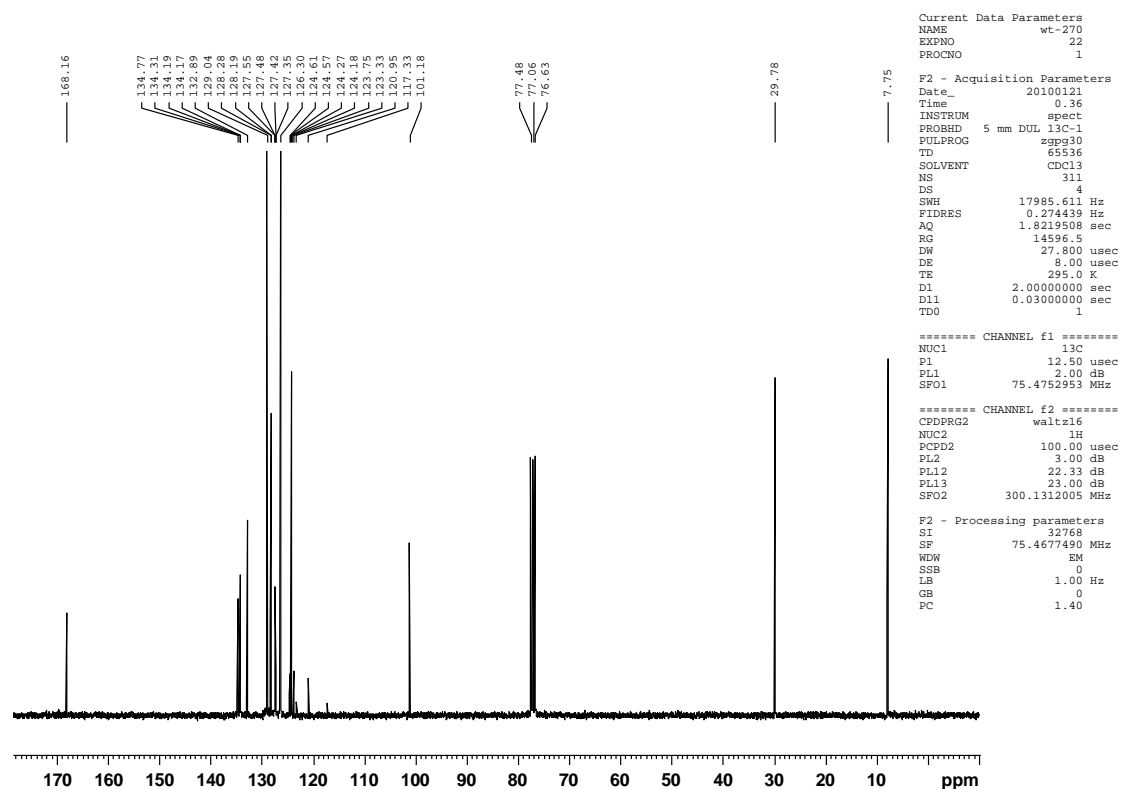
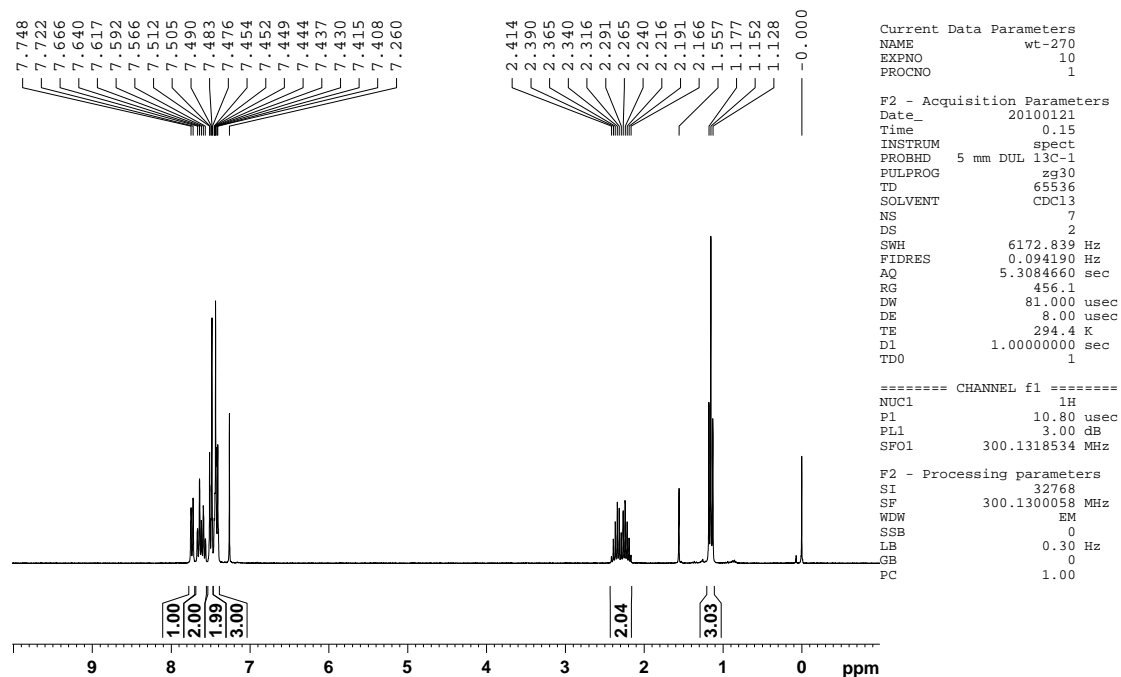
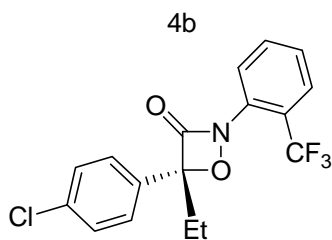
songye@iccas.ac.cn

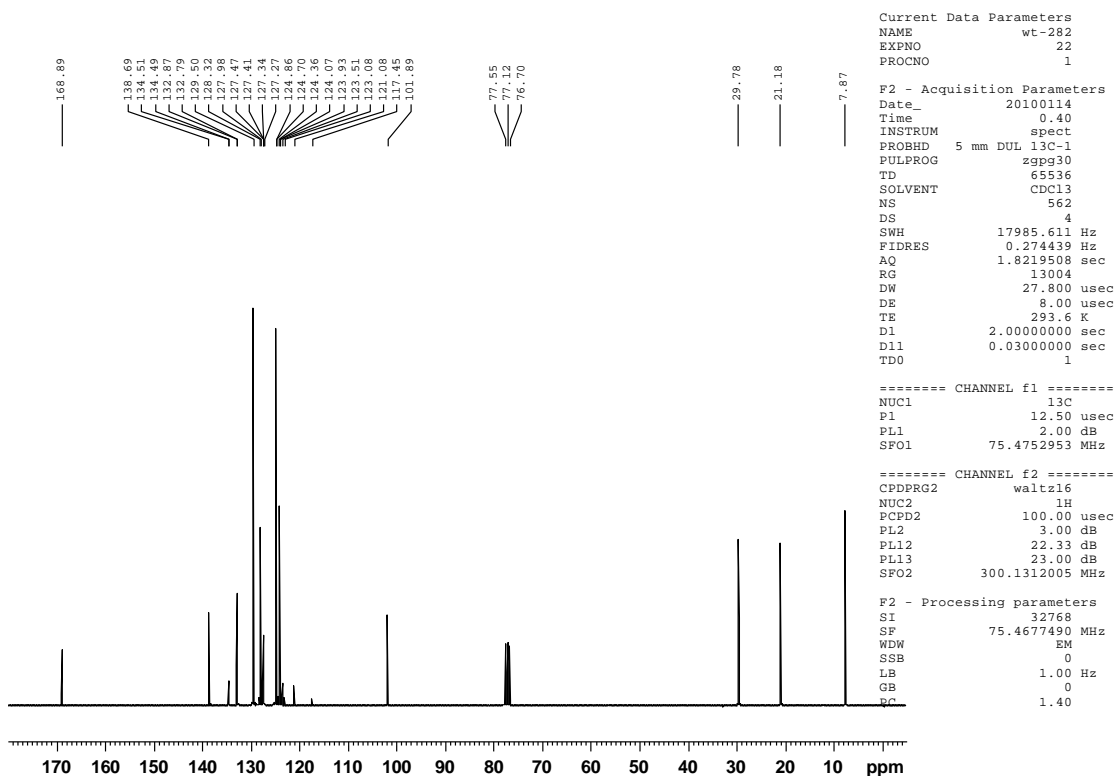
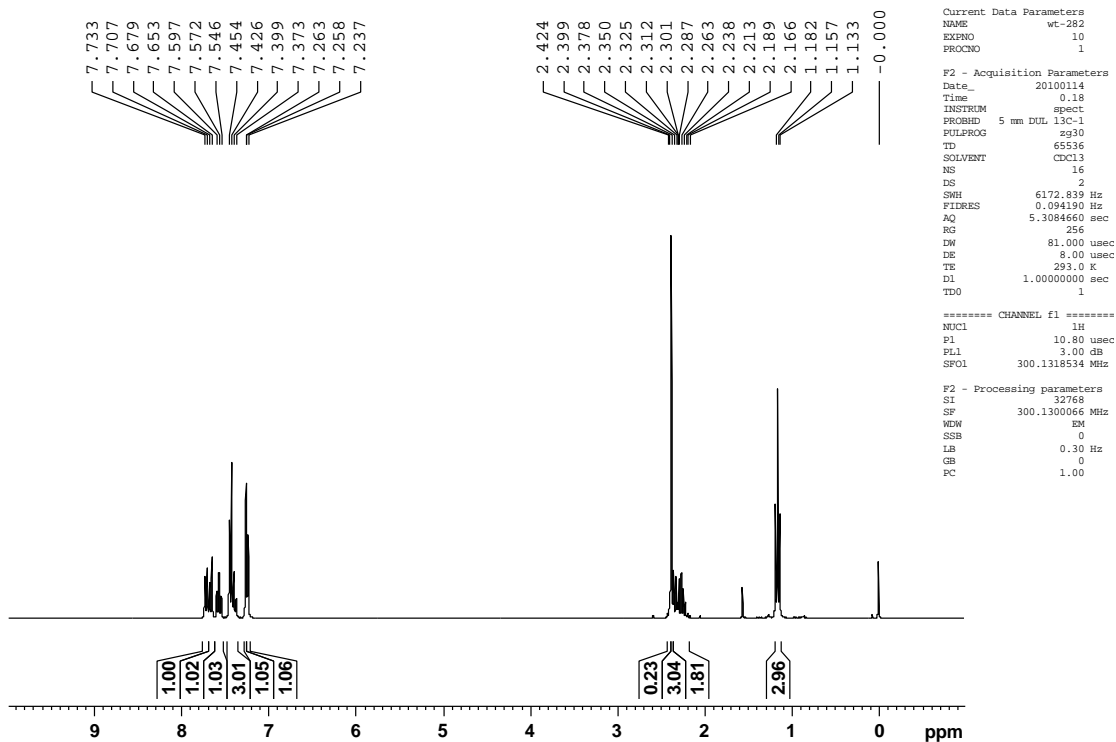
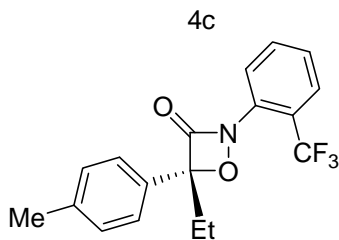
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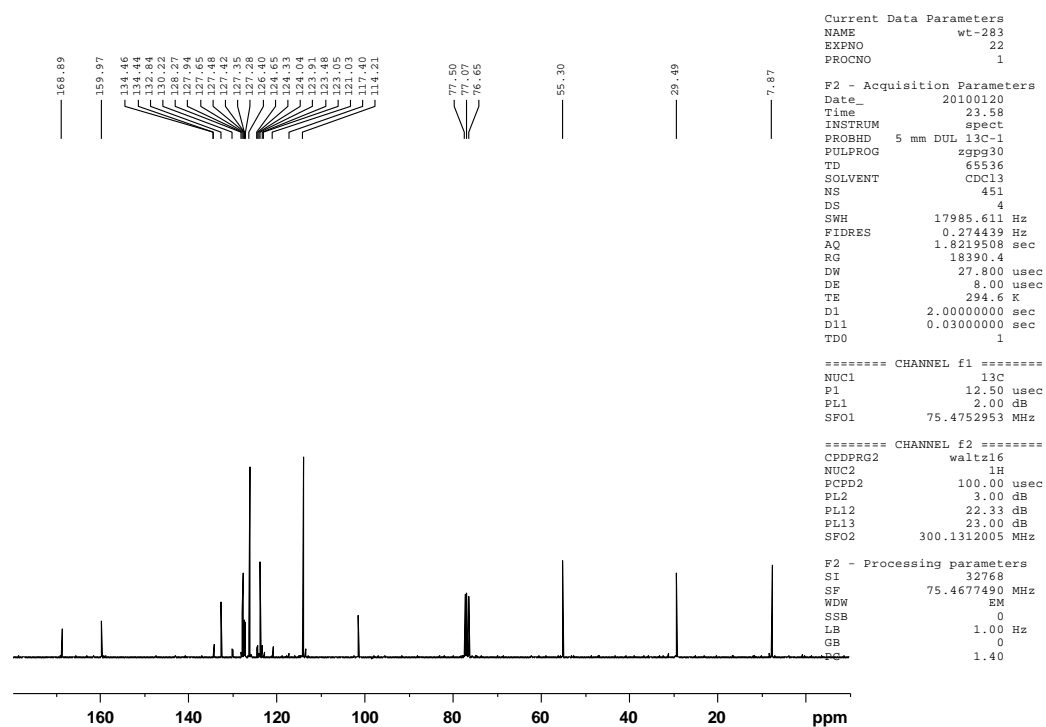
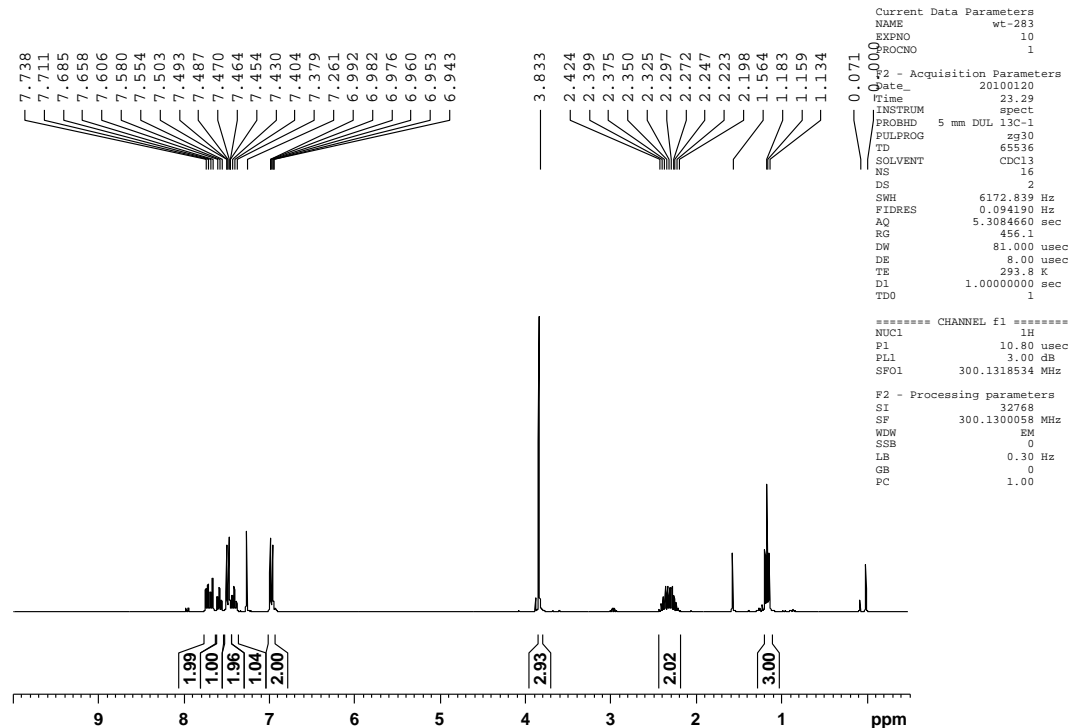
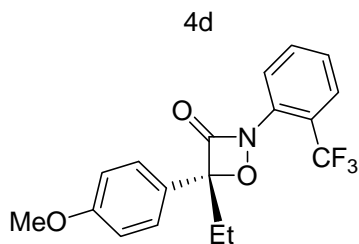
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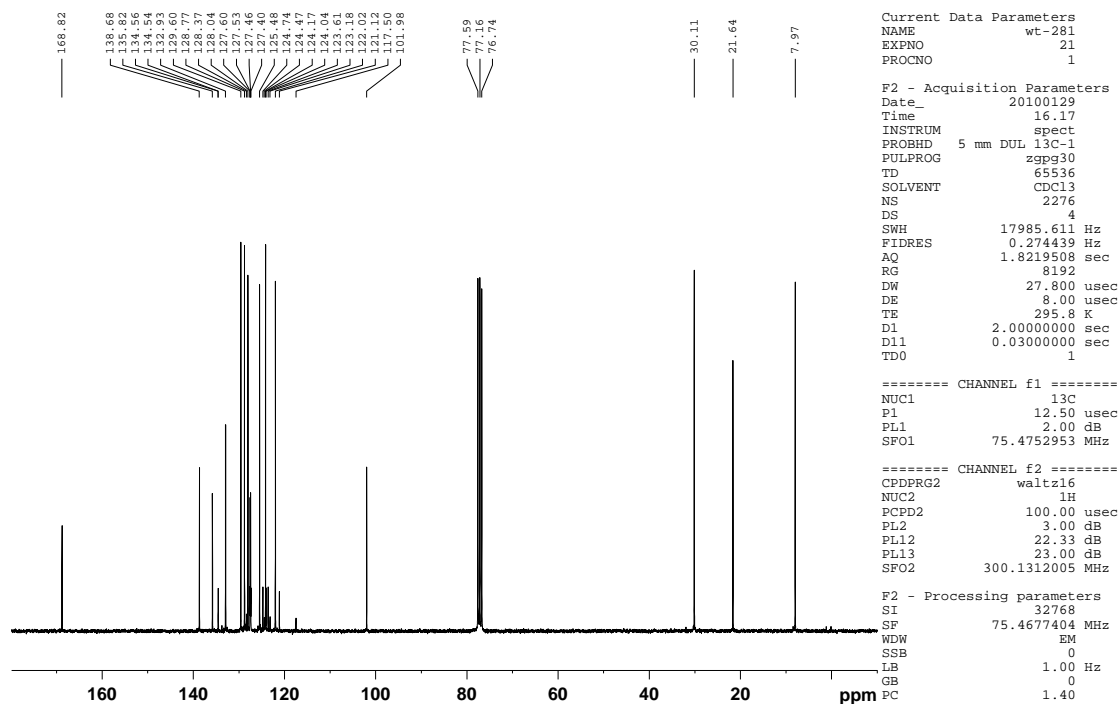
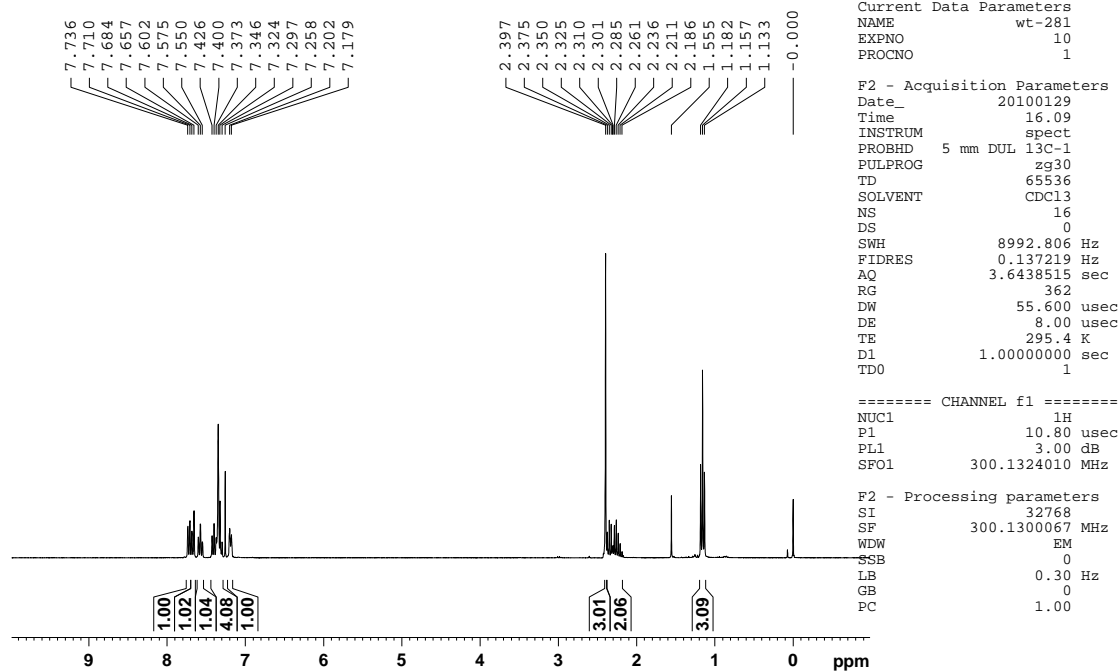
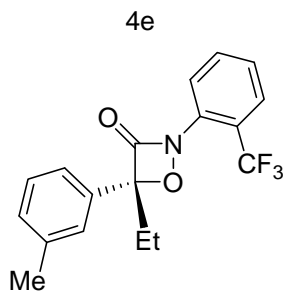
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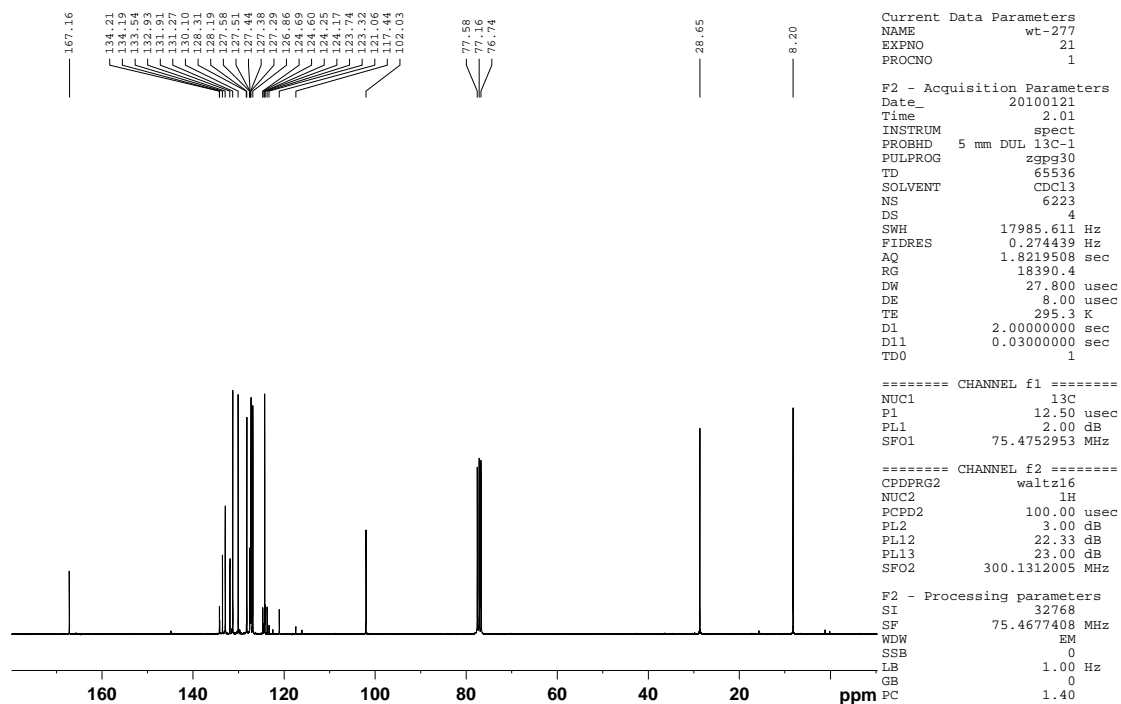
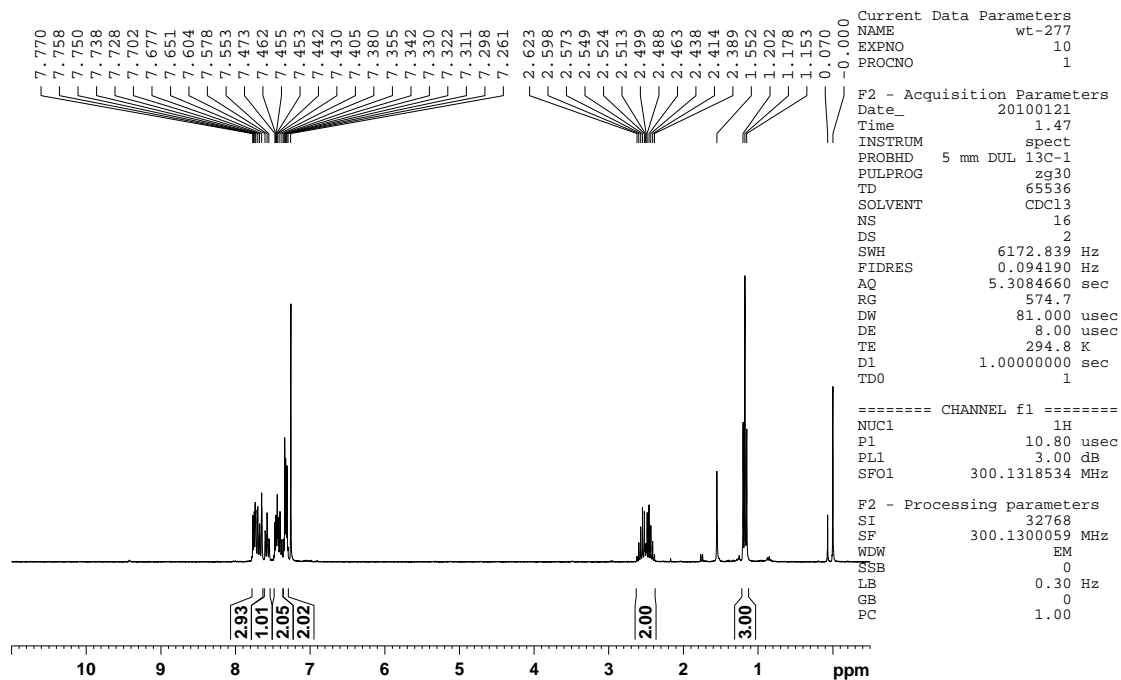
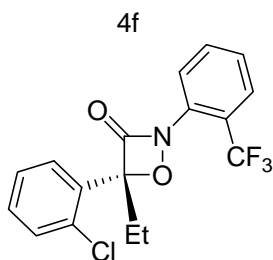




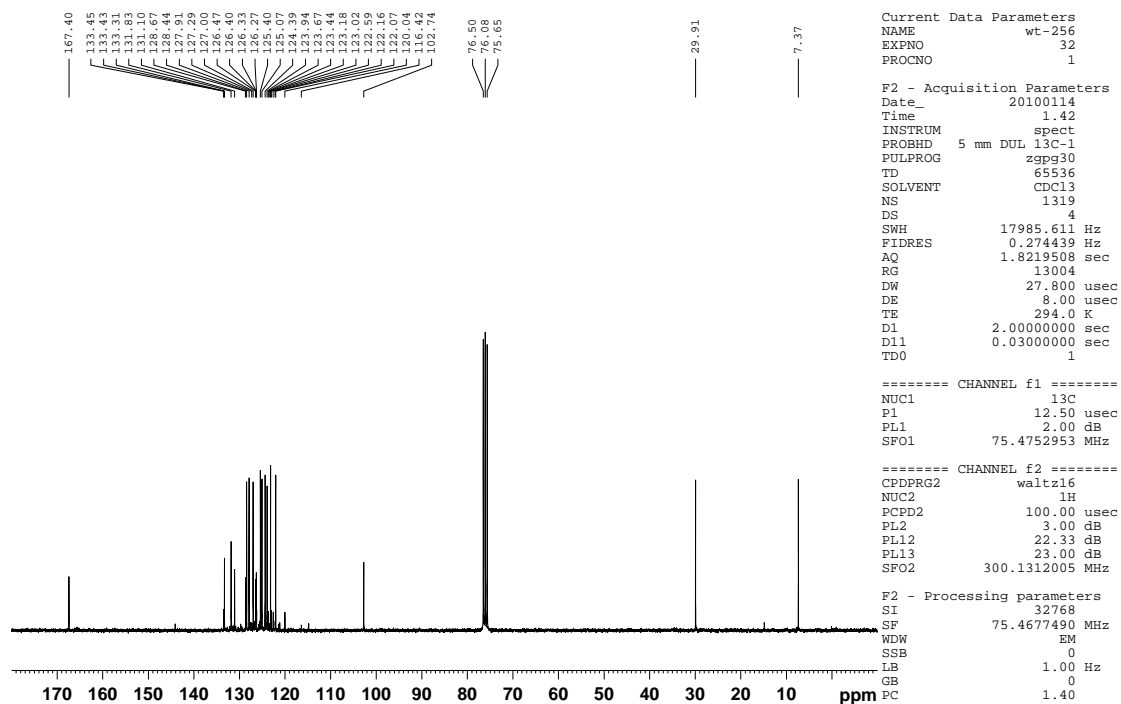
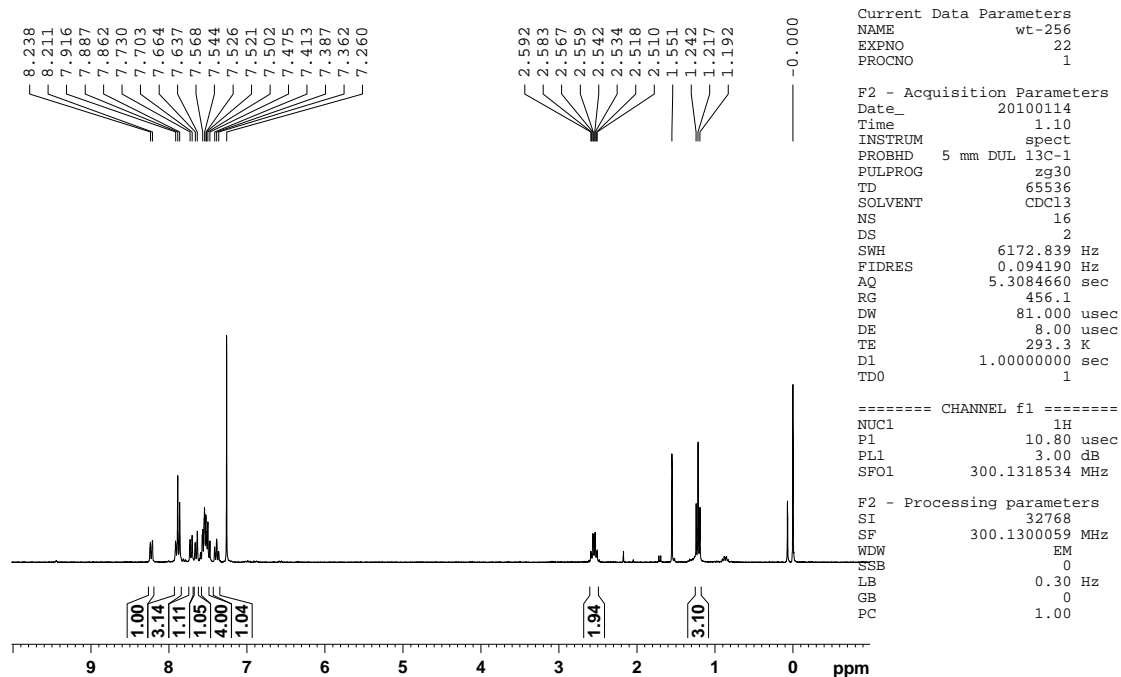
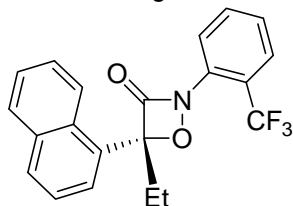


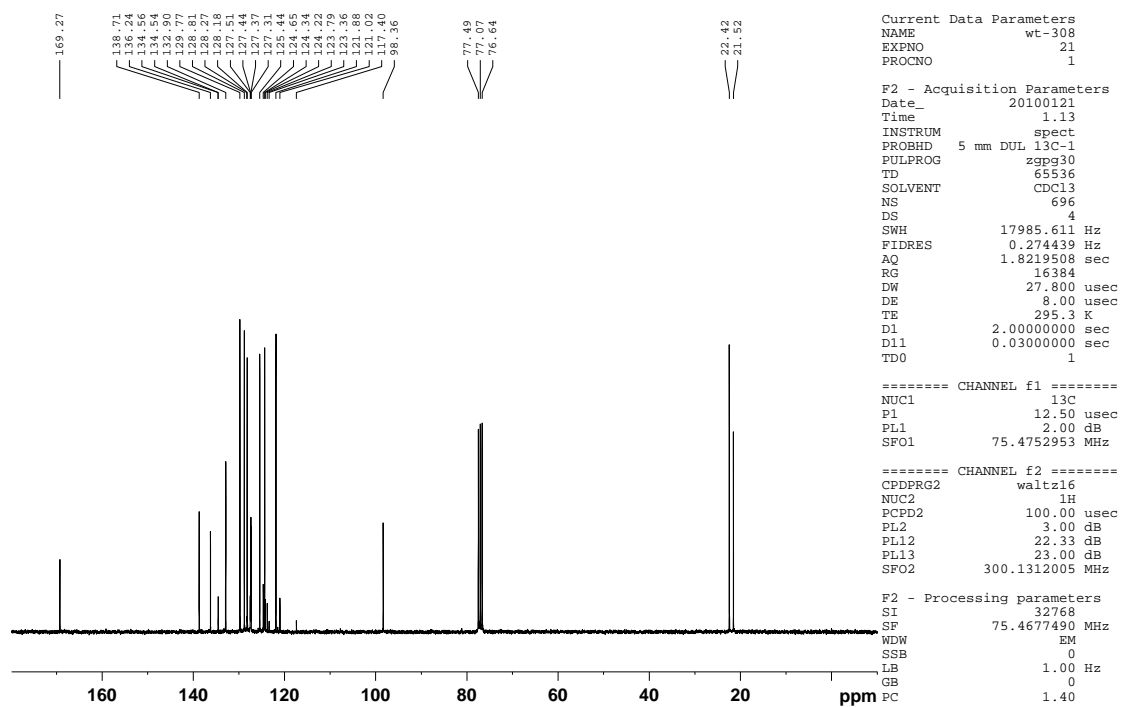
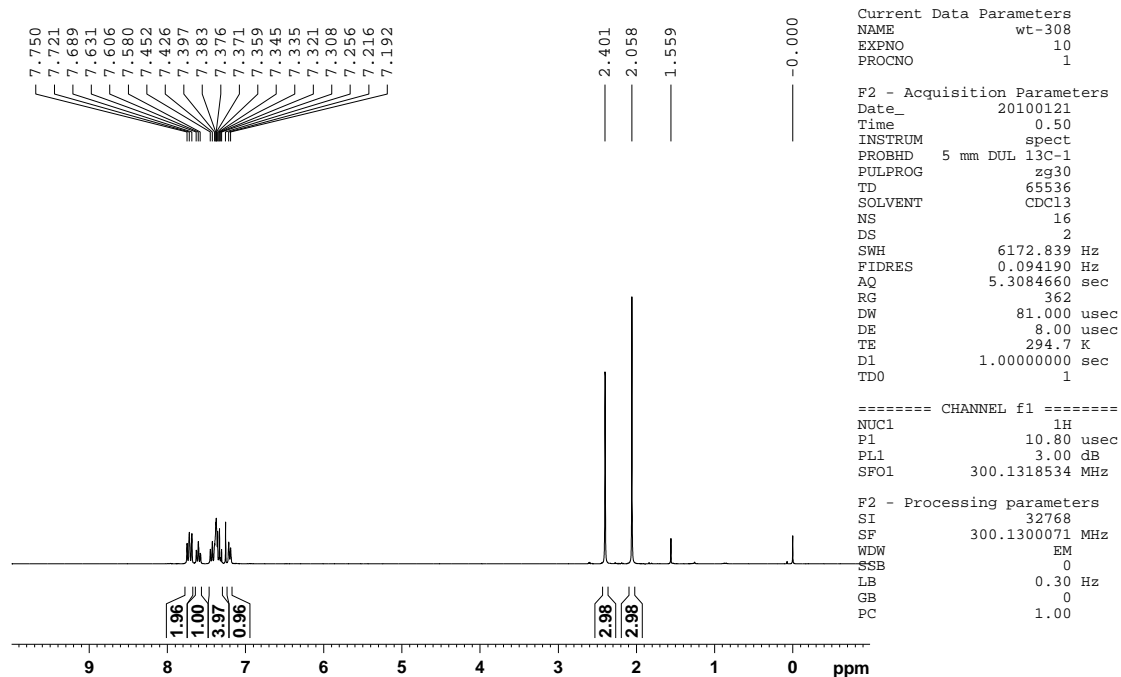
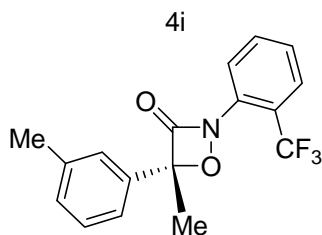




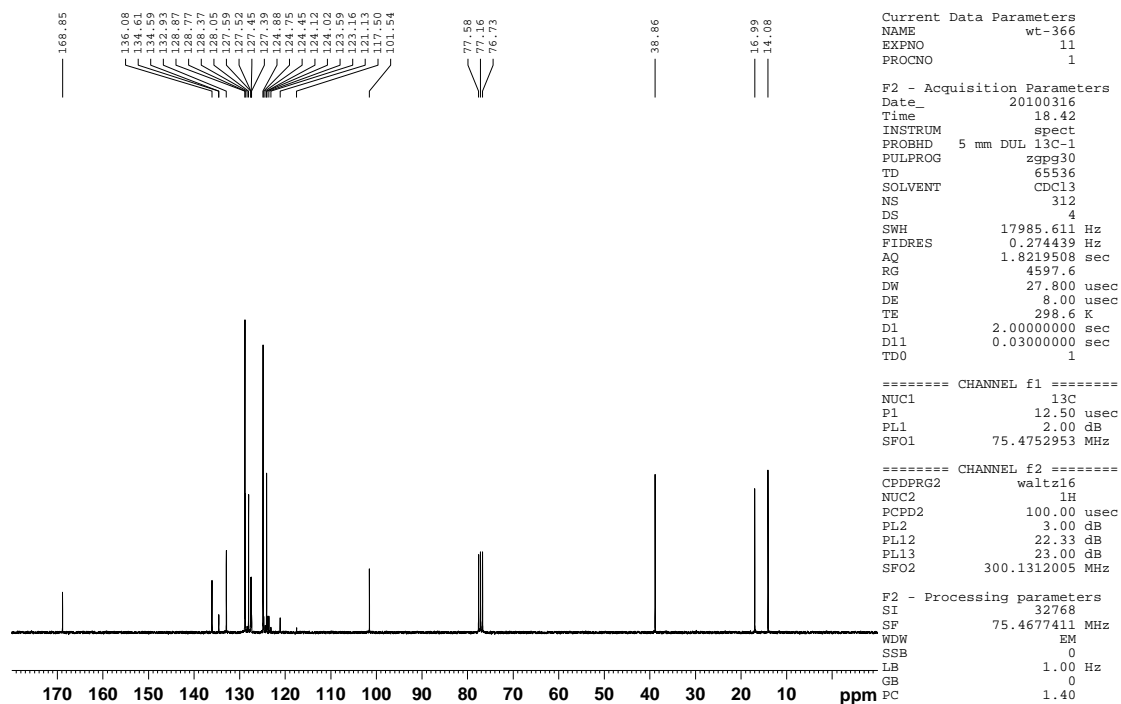
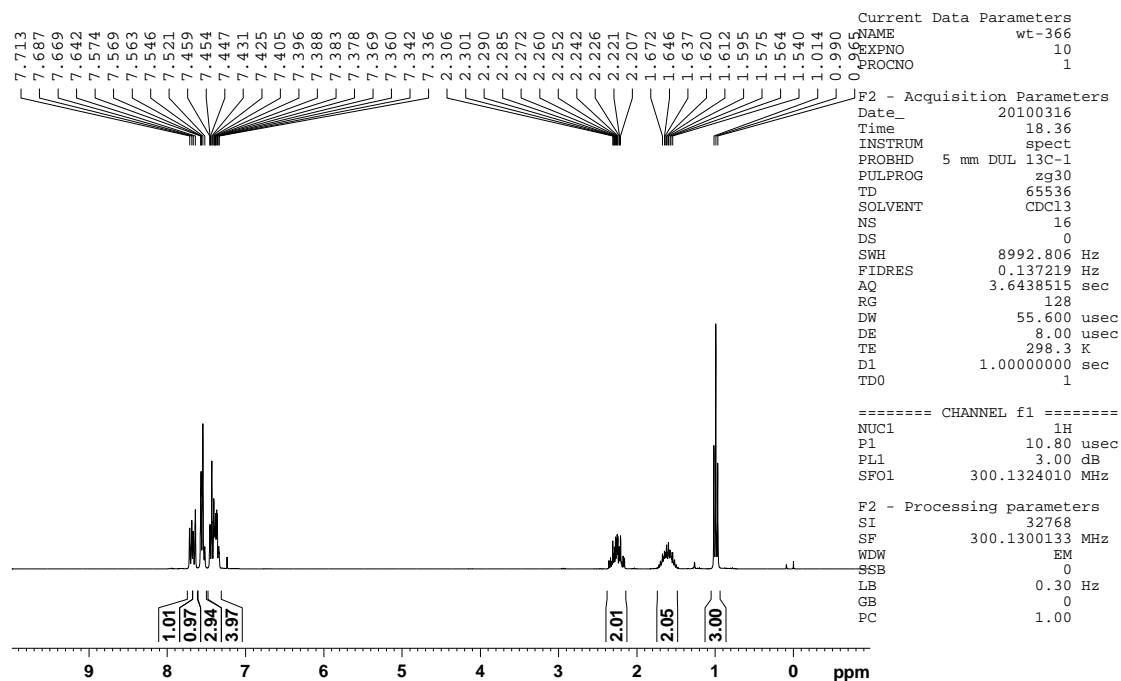
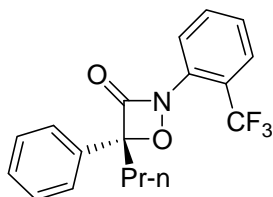


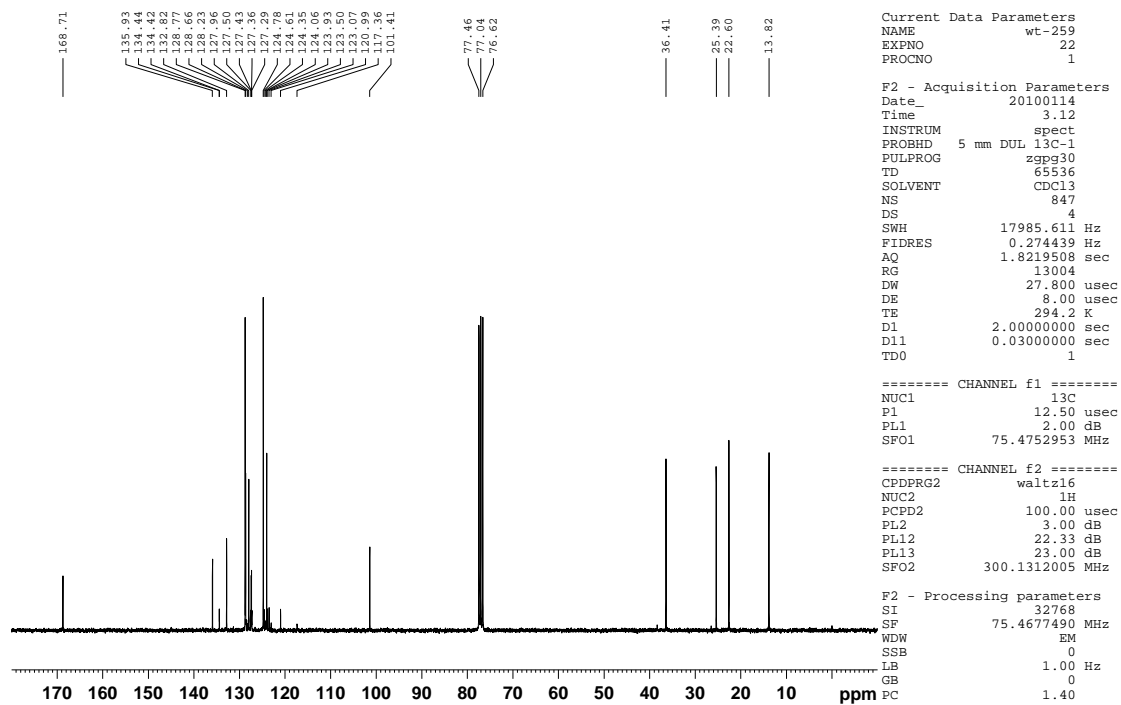
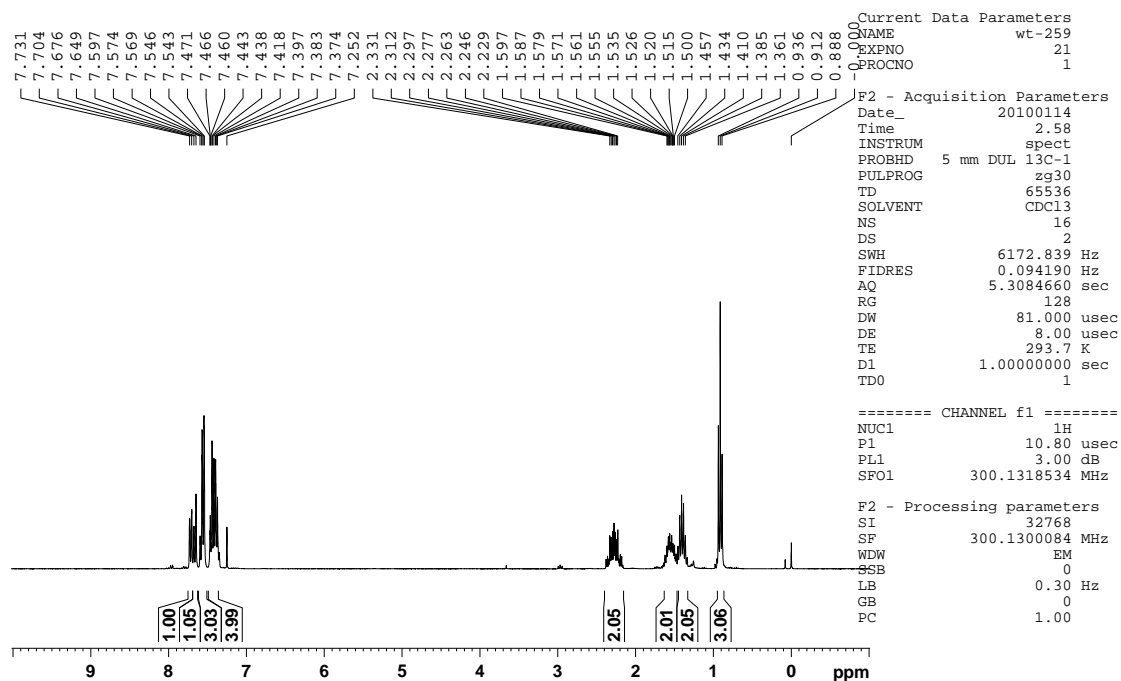
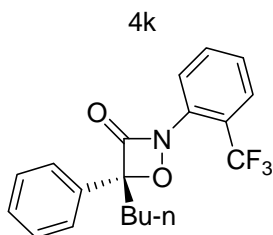
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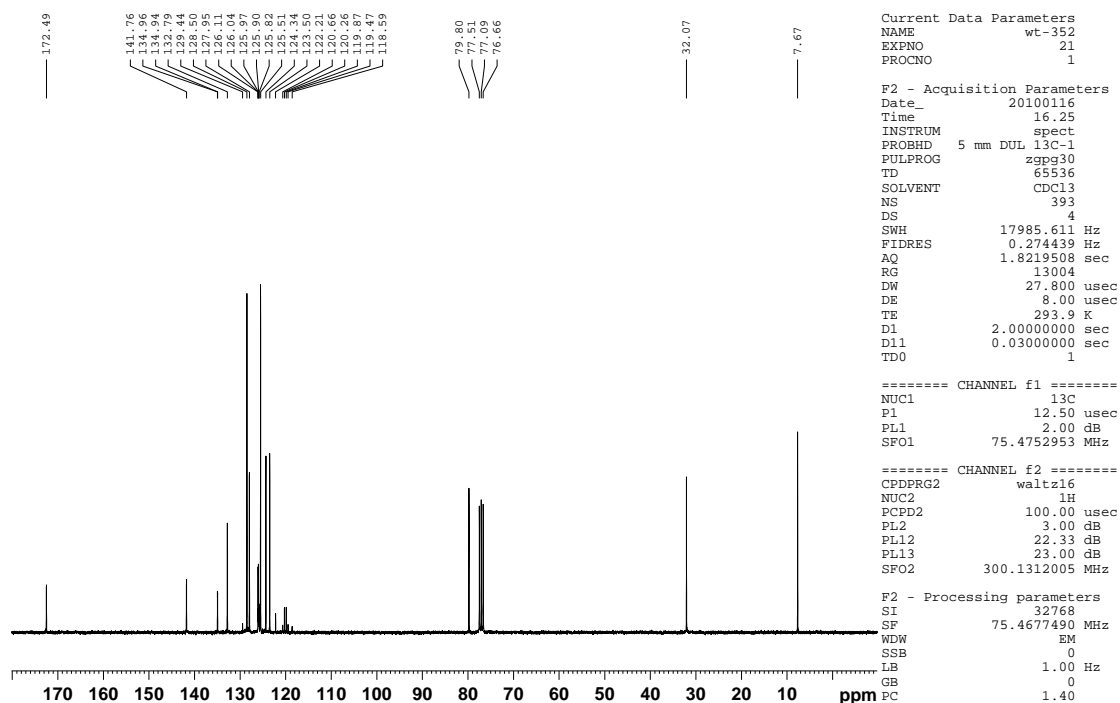
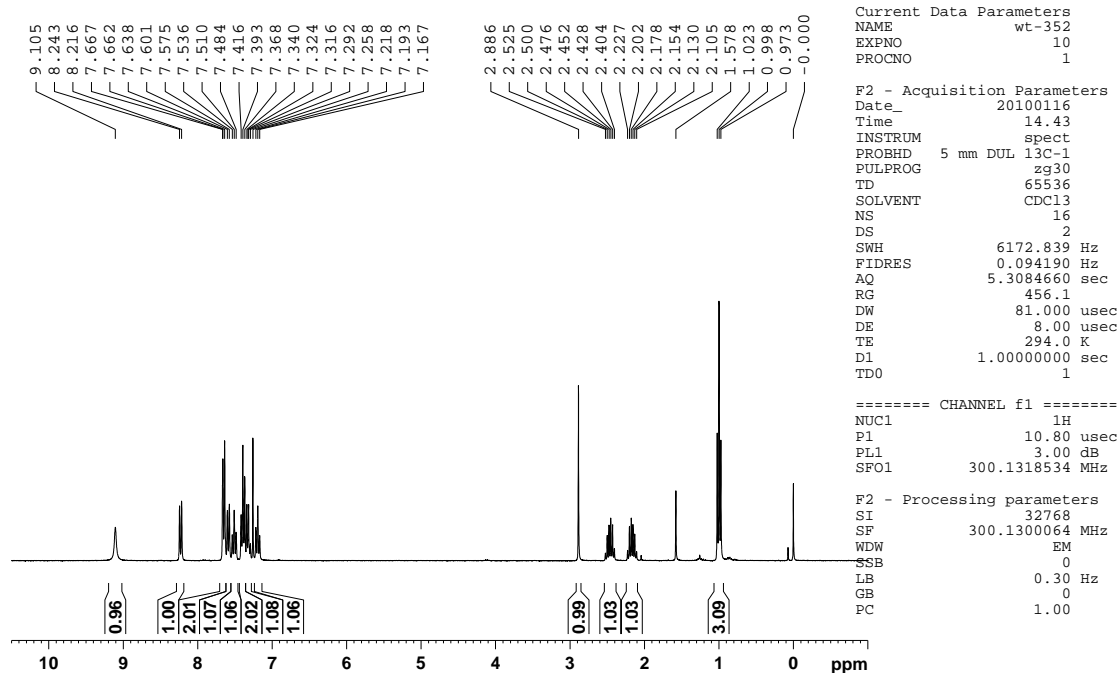
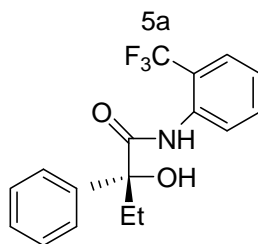


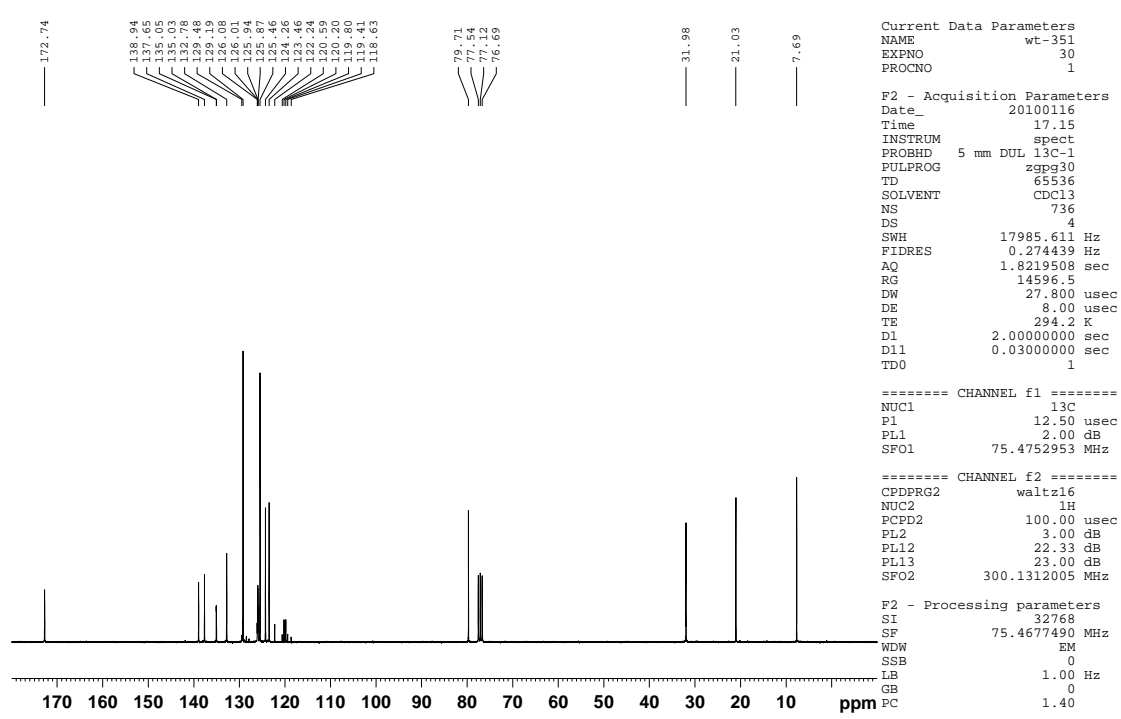
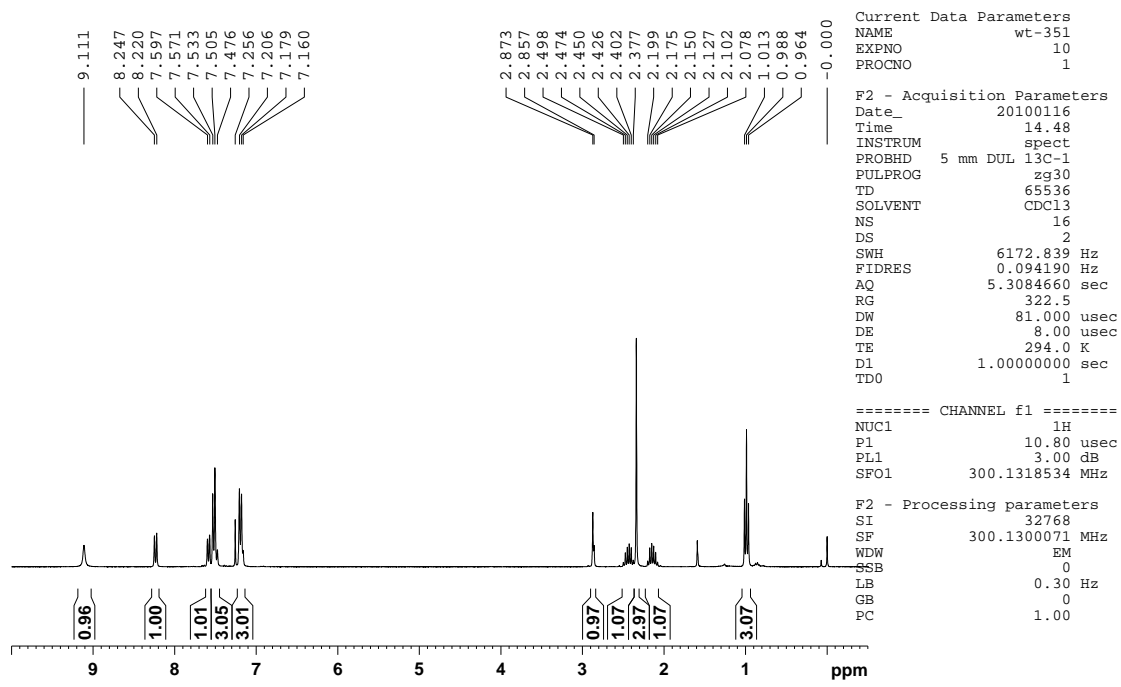
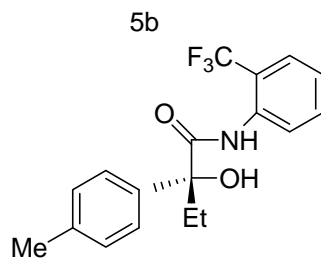


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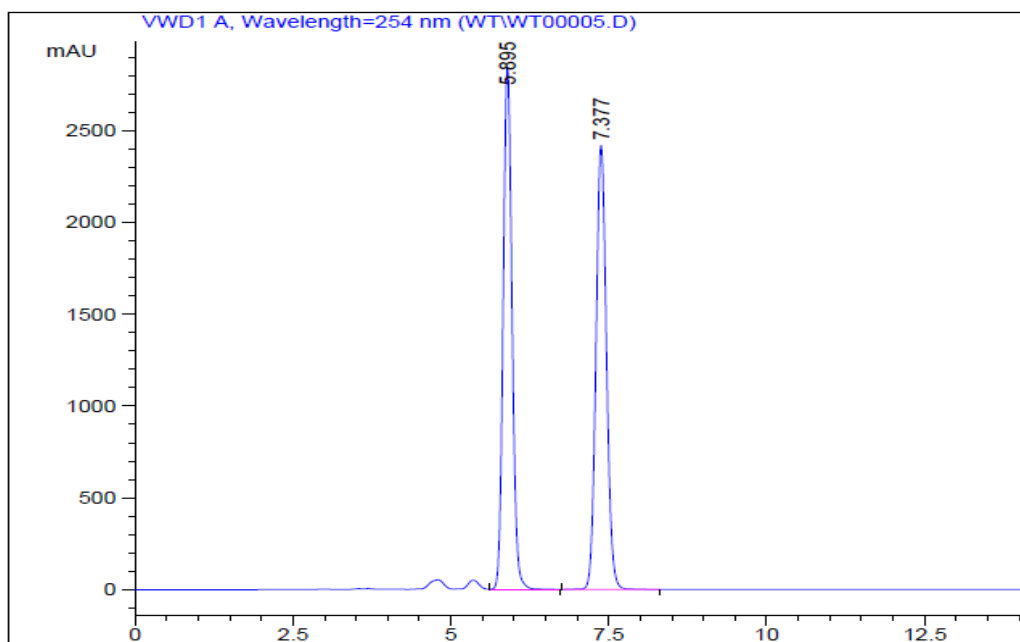






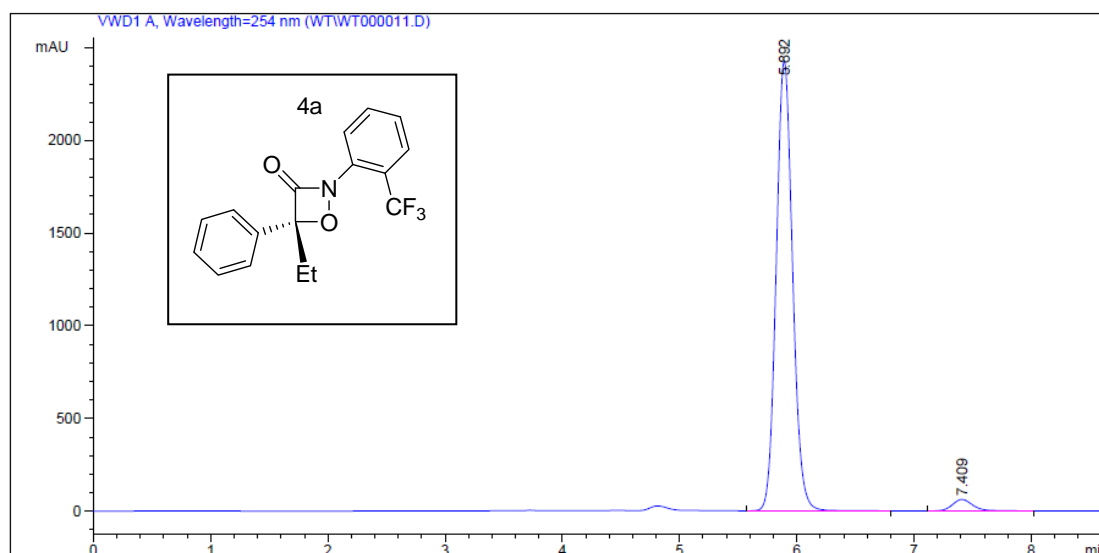


Part III Copies of HPLC spectra



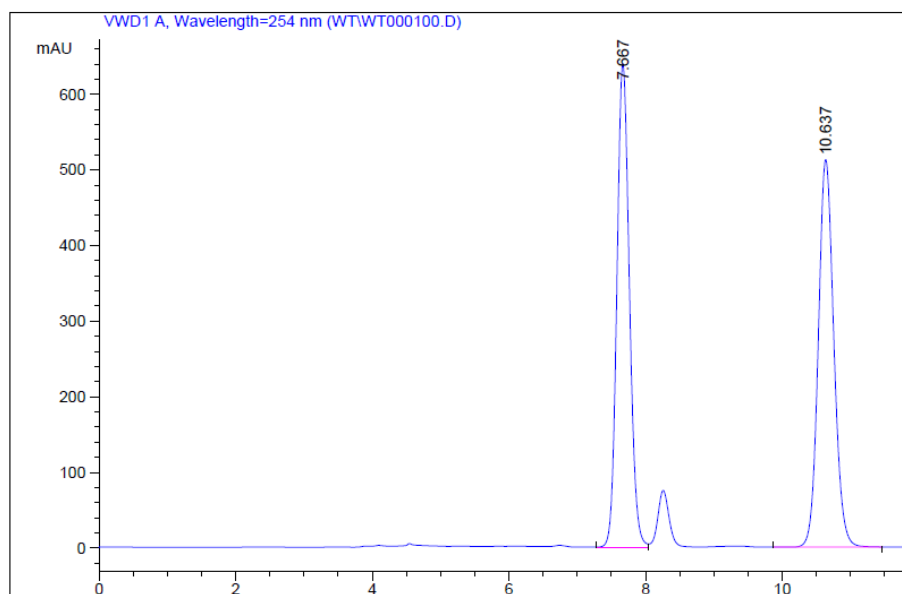
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1	5.895	VB	0.1520	2.78133e4	2843.62207	49.9084
2	7.377	BB	0.1798	2.79154e4	2419.15967	50.0916

Sample Info : AD-H Hex:Ipr=99:1 mL/min

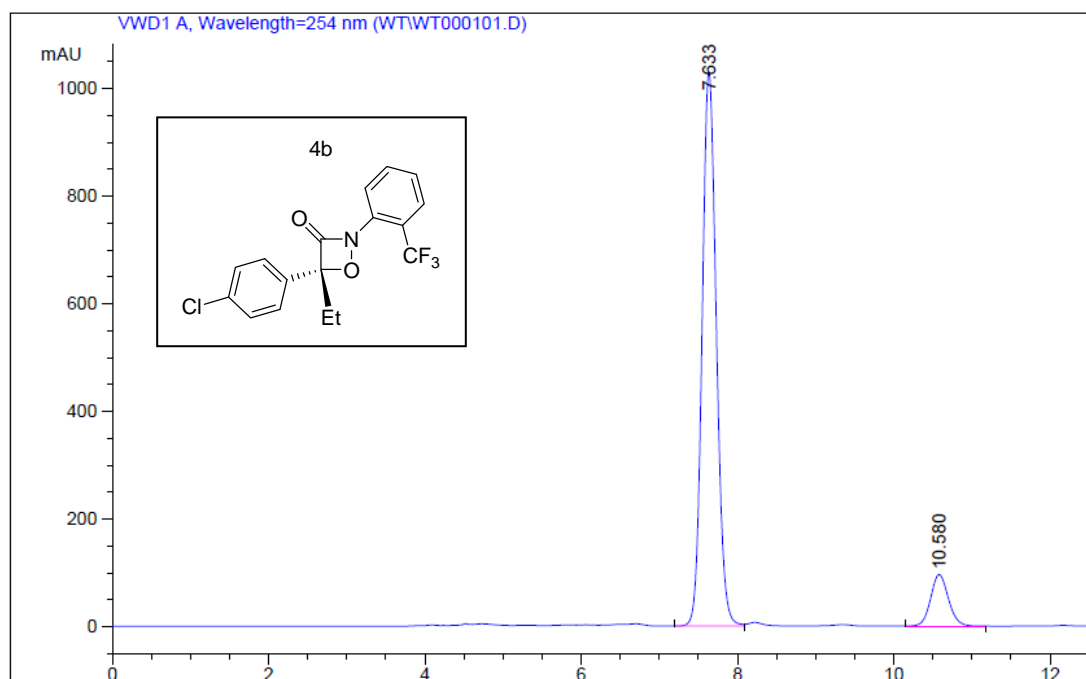


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1	5.892	VB	0.1512	2.35810e4	2427.33716	96.9117
2	7.409	VB	0.1857	751.46790	61.72149	3.0883

Sample Info :
 99:1 AD-H 1ML/min

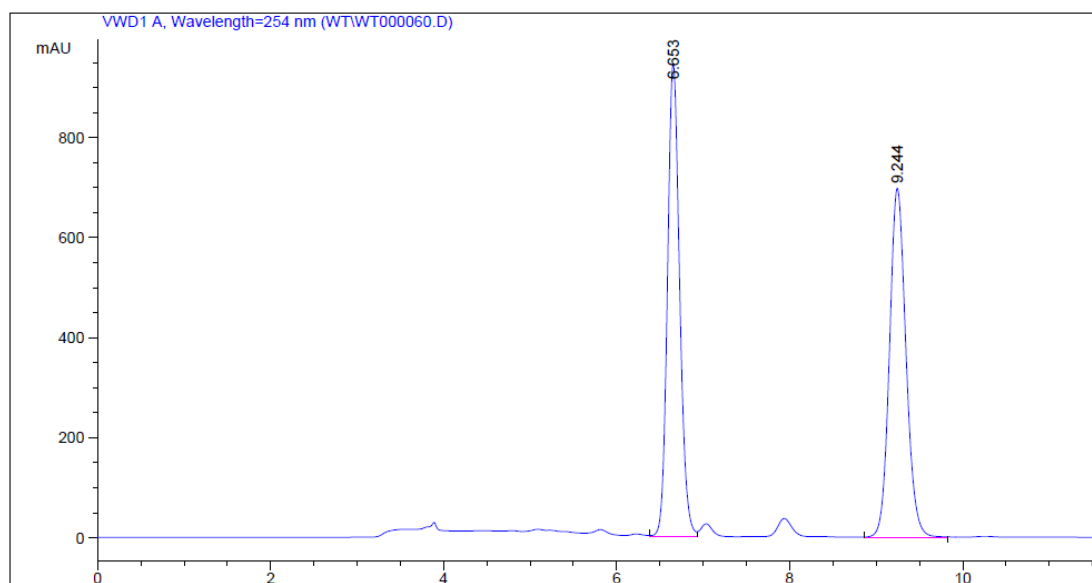


Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.667	VV	0.1961	8117.27295	639.68127	50.0627
2	10.637	VB	0.2440	8096.94043	512.53278	49.9373

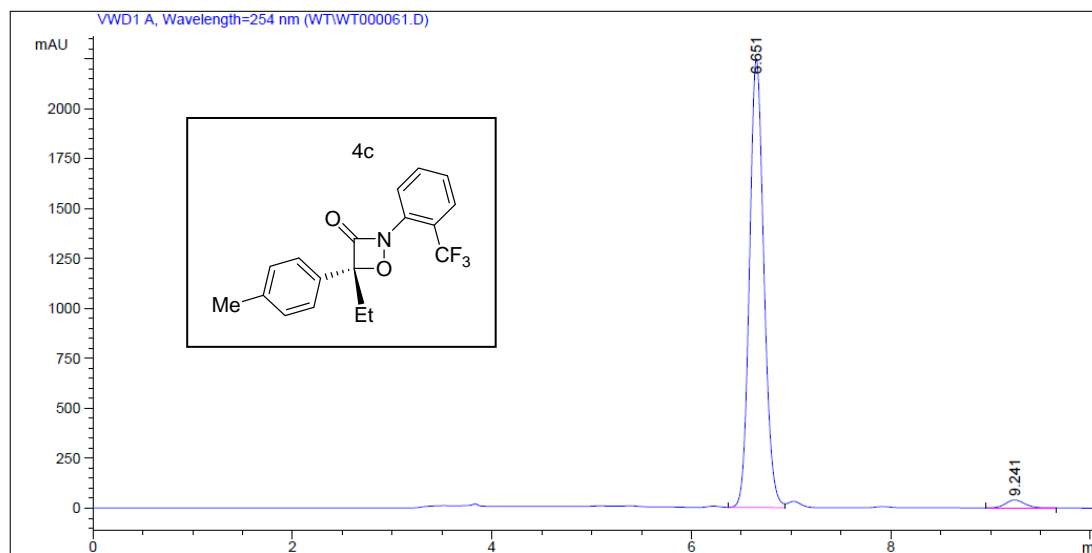


Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	7.633	VV	0.1953	1.29938e4	1029.73047	89.5527
2	10.580	BB	0.2428	1515.87634	95.84657	10.4473

Sample Info : AD-H Hex:Ipr=99:1 1.0
 ml/min

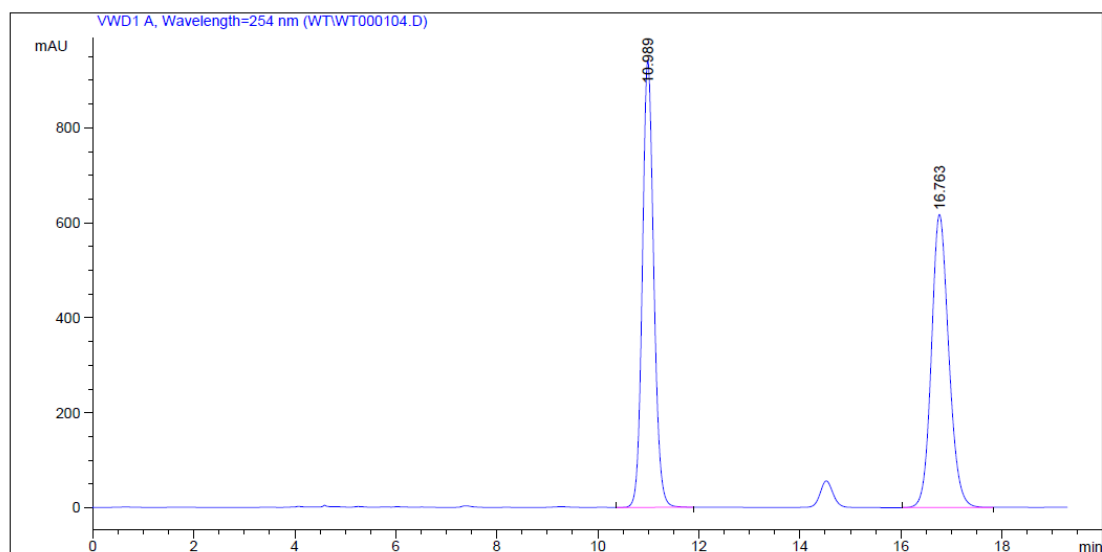


Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.653	VV	0.1502	9234.64844	946.43304	50.0252
2	9.244	BB	0.2039	9225.33398	697.29059	49.9748

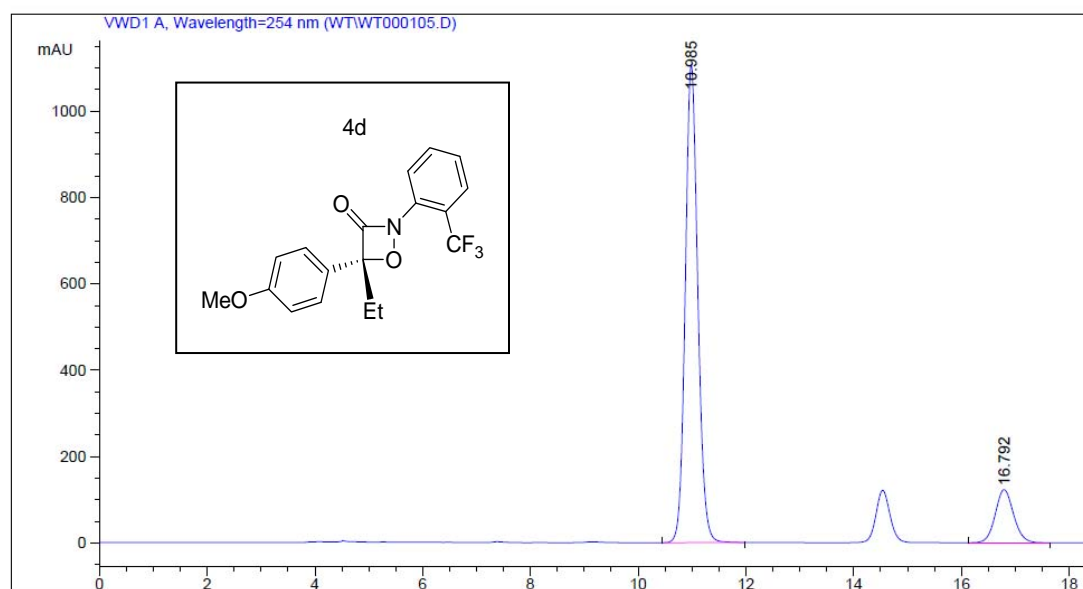


Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	6.651	VV	0.1549	2.25625e4	2248.11304	97.7028
2	9.241	BB	0.2049	530.49792	39.82845	2.2972

Sample Info : 99:1 AD-H 1ML/min

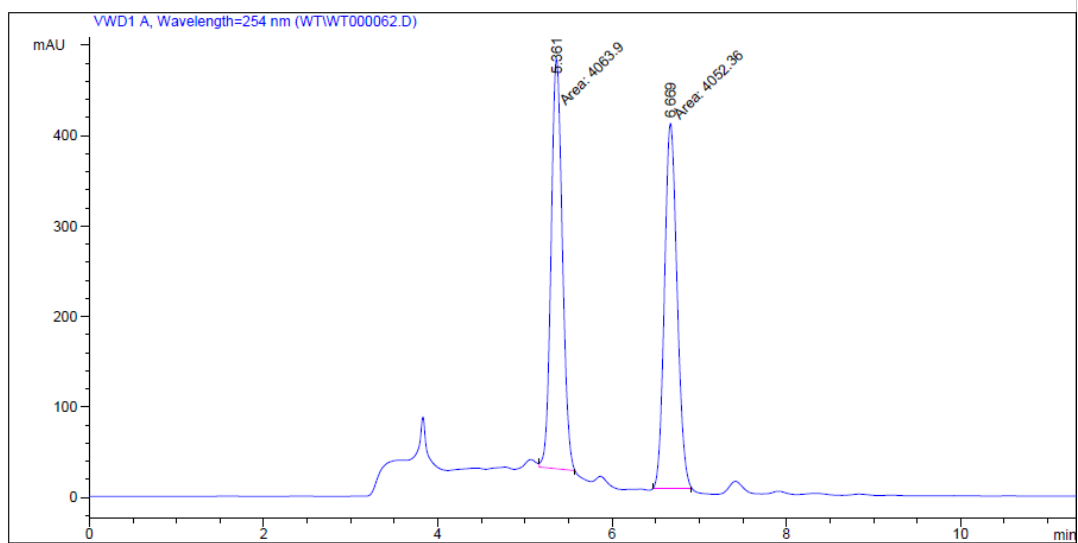


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1	10.989	VB	0.2410	1.47413e4	940.90192	50.0301
2	16.763	BB	0.3659	1.47236e4	616.67273	49.9699

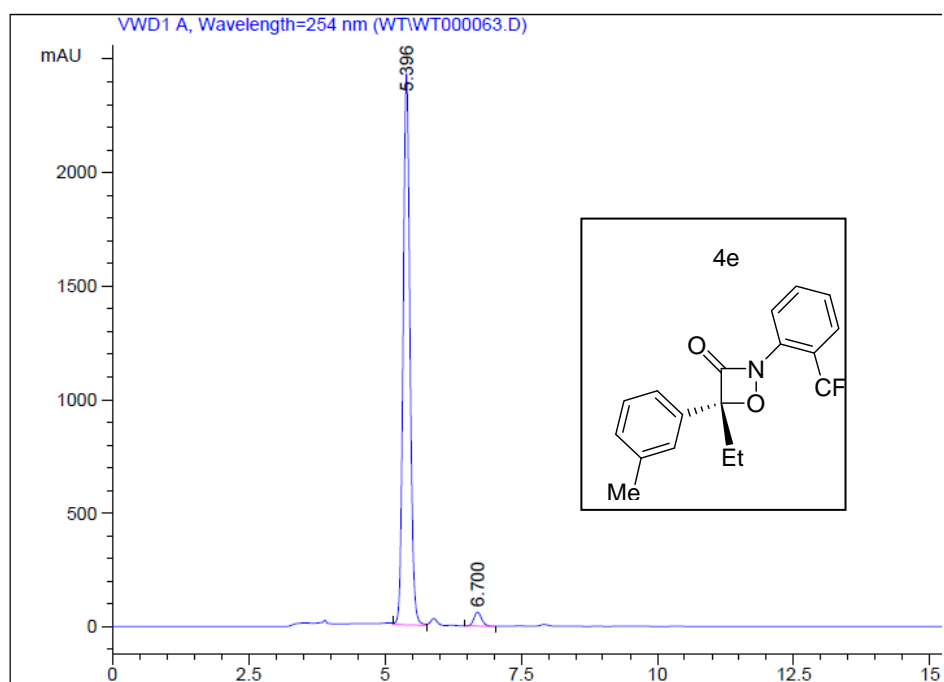


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1	10.985	BB	0.2460	1.77991e4	1106.17871	85.9670
2	16.792	BB	0.3631	2905.47998	122.93707	14.0330

Sample Info : AD-H Hex:Ipr=99:1 1.0
 ml/min

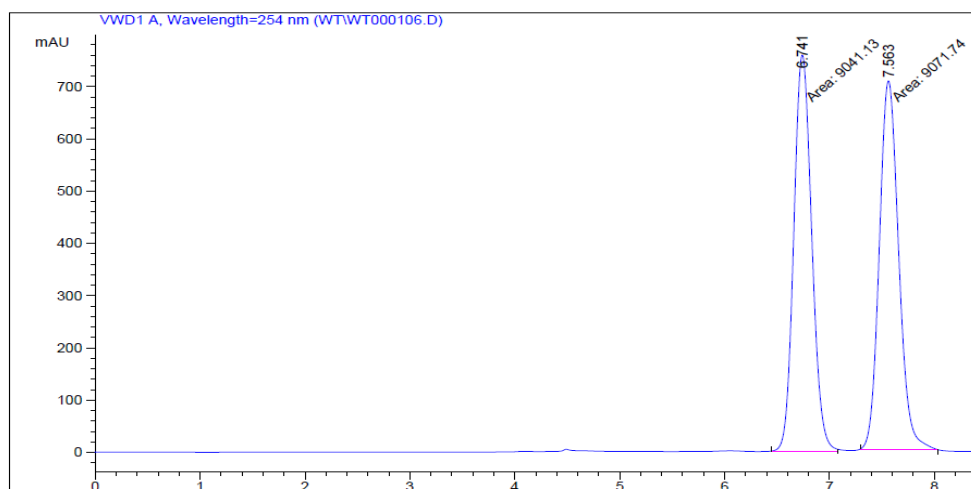


Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	5.361	MM	0.1488	4063.89526	455.18875	50.0710
2	6.669	MM	0.1668	4052.36401	404.95282	49.9290

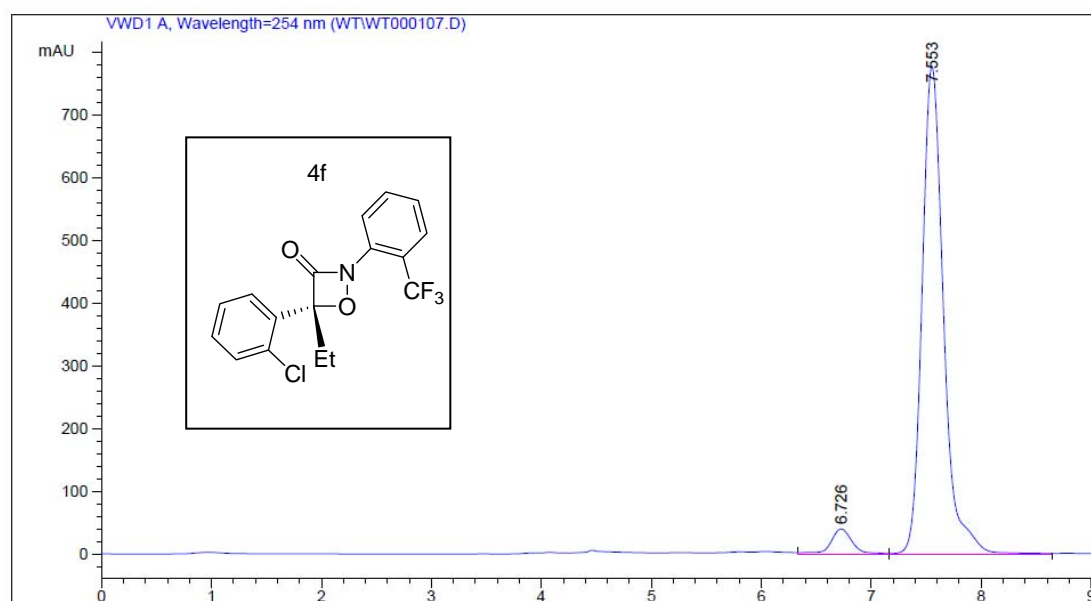


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1	5.396	VV	0.1337	2.11885e4	2430.68848	97.2165
2	6.700	VB	0.1533	606.66498	61.32587	2.7835

Sample Info : 99:1 AD-H 1ML/min

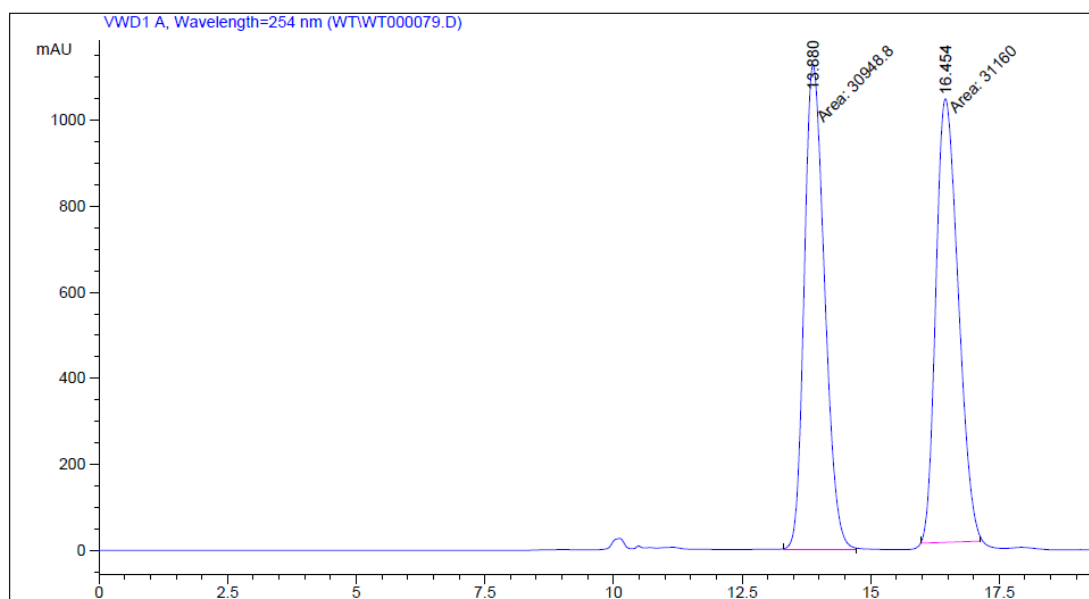


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1	6.741	MM	0.1985	9041.12598	759.21857	49.9155
2	7.563	MM	0.2141	9071.73730	706.15393	50.0845

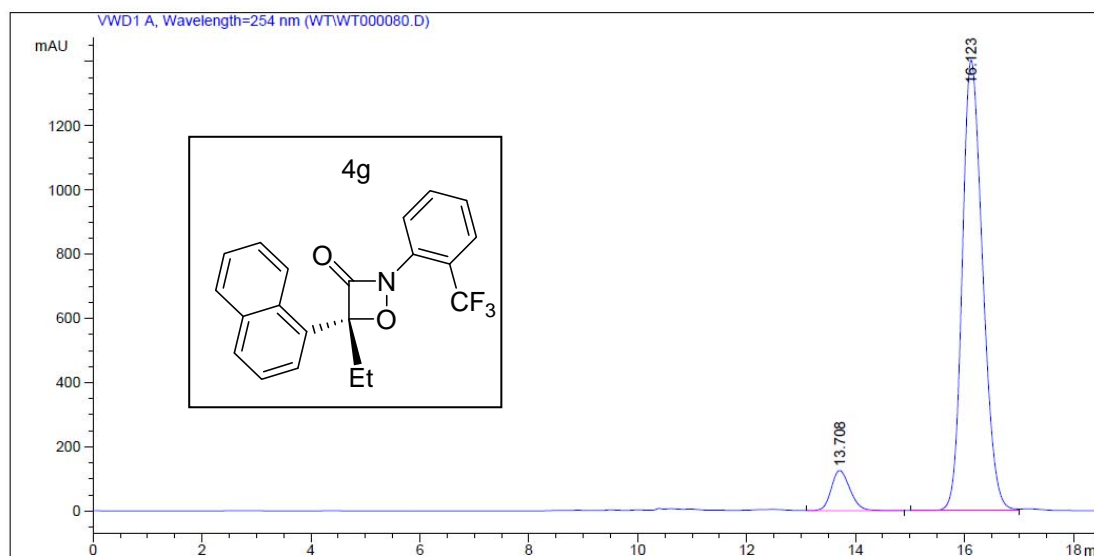


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1	6.726	VV	0.2063	538.43683	39.69611	4.8655
2	7.553	VB	0.2091	1.05280e4	776.73254	95.1345

Sample Info : ad-h, 99:1, 0.5ml/min

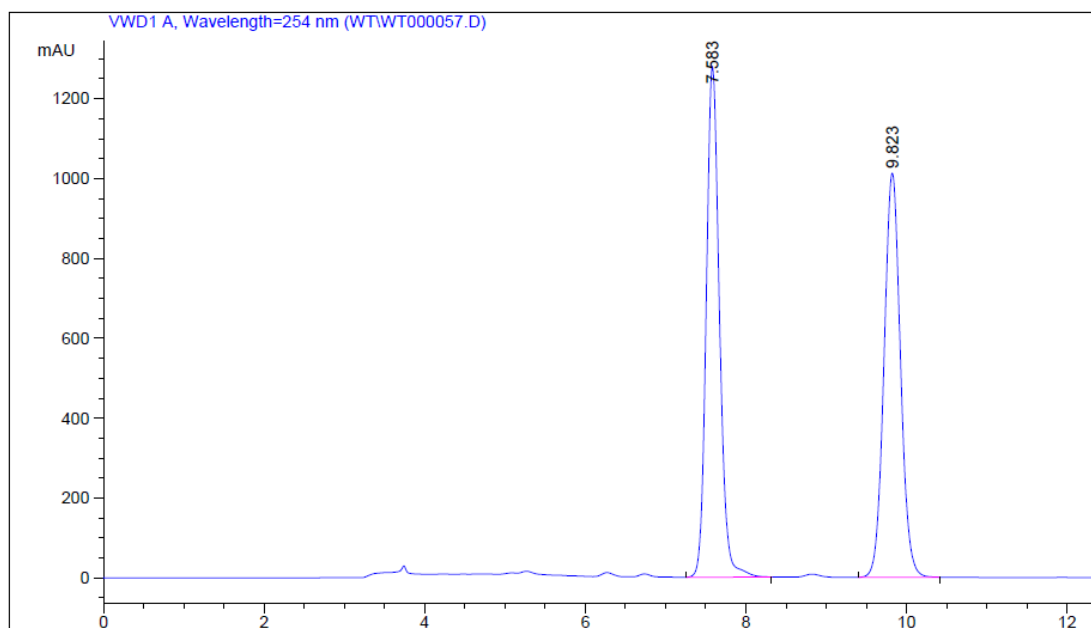


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1	13.880	MM	0.4573	3.09488e4	1128.06274	49.8300
2	16.454	MM	0.5034	3.11600e4	1031.72327	50.1700

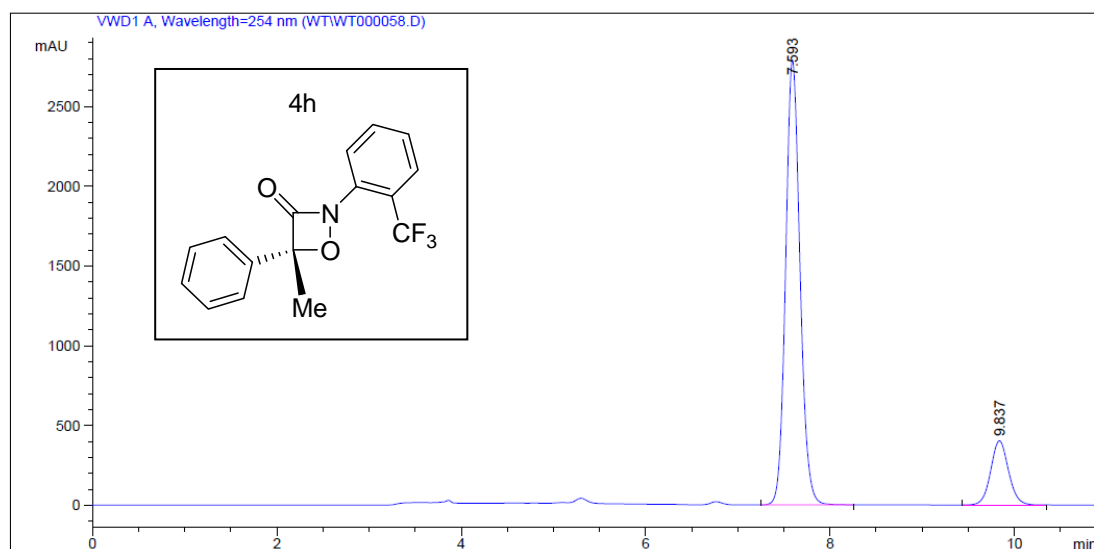


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1	13.708	VB	0.3652	3026.20679	125.11395	7.6476
2	16.123	BV	0.3999	3.65446e4	1403.42432	92.3524

Sample Info : AD-H Hex:Ipr=99:1 1.0
 ml/min

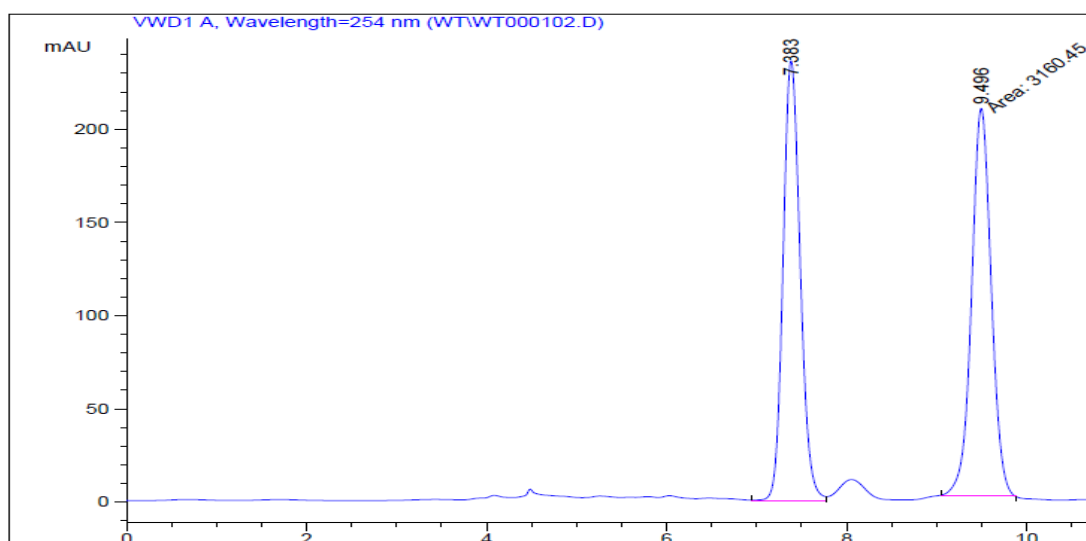


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1	7.583	BB	0.1753	1.45900e4	1279.33301	50.3497
2	9.823	BB	0.2197	1.43873e4	1012.11053	49.6503

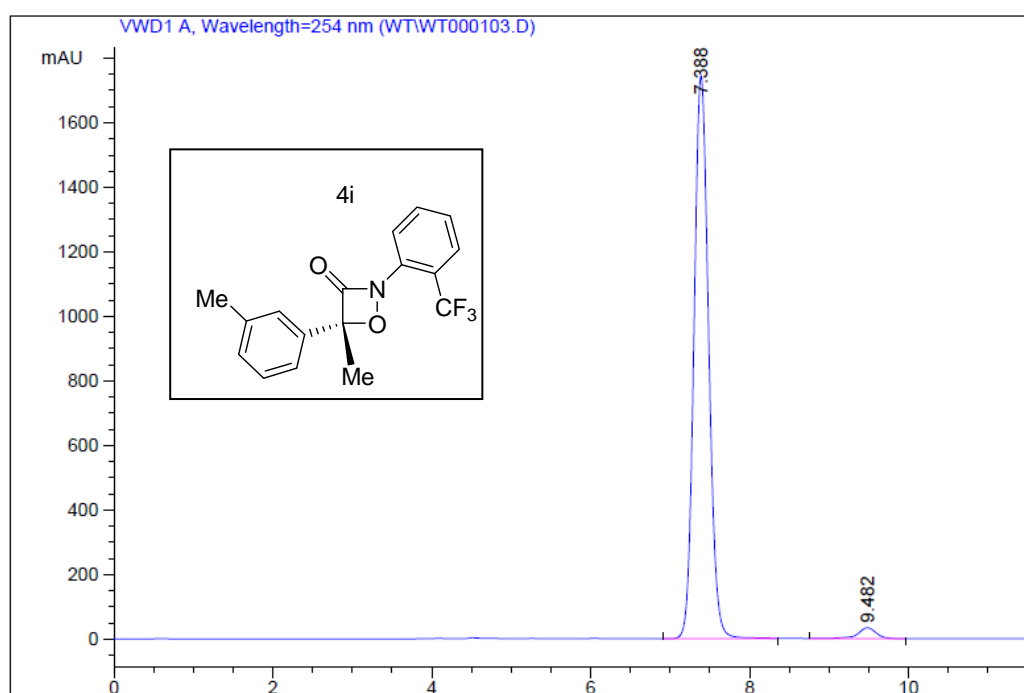


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1	7.593	BB	0.1671	3.02095e4	2789.78320	84.7675
2	9.837	BB	0.2067	5428.58447	402.97238	15.2325

Sample Info : 99:1 AD-H 1ML/min

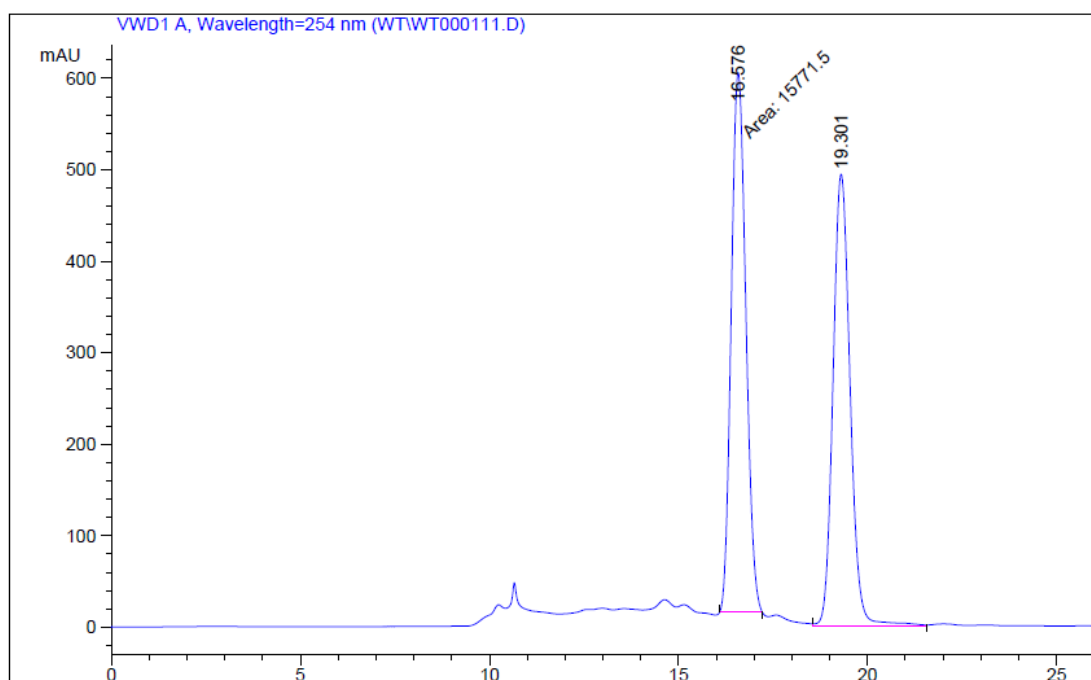


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1	7.383	VV	0.2065	3116.55420	235.90666	49.6503
2	9.496	MM	0.2532	3160.45337	207.99496	50.3497

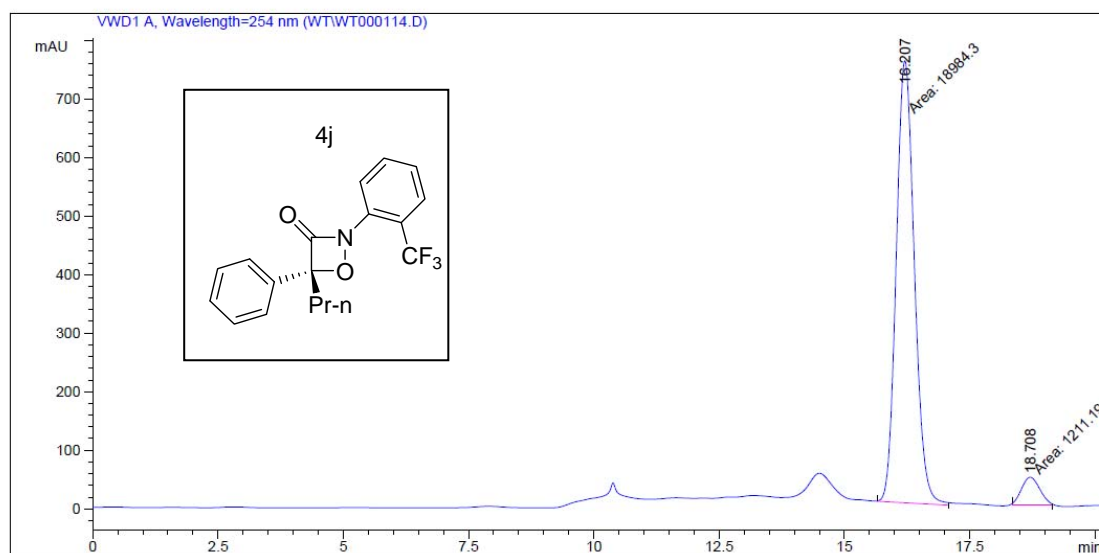


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1	7.388	VB	0.2002	2.23319e4	1745.30627	97.5719
2	9.482	BB	0.2466	555.72583	33.63765	2.4281

Sample Info : AD-H Hex:Ipr=99:1 0.5ml/min

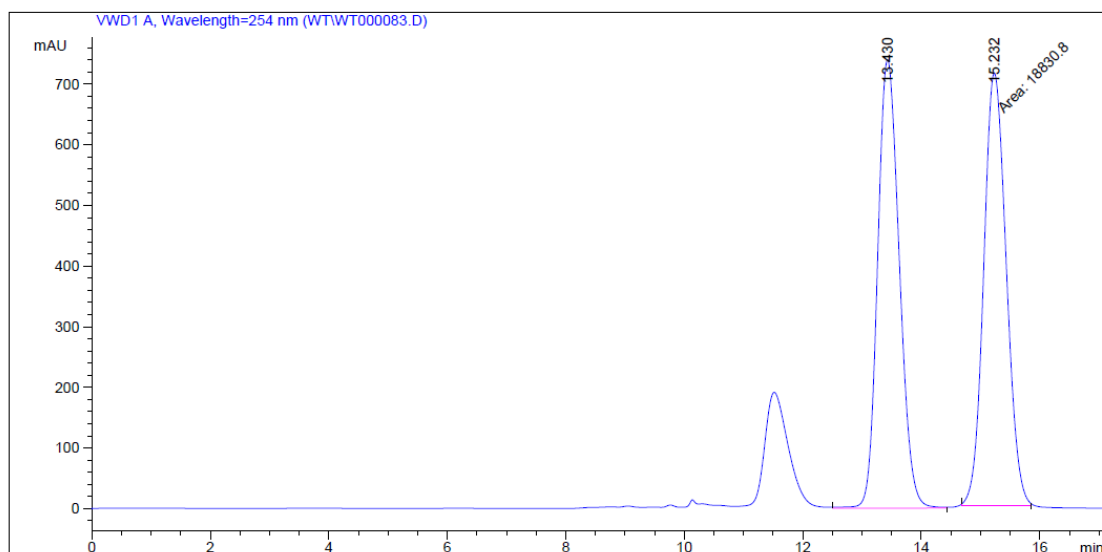


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1	16.576	MM	0.4458	1.57715e4	589.60999	50.2233
2	19.301	VV	0.4912	1.56313e4	494.37830	49.7767

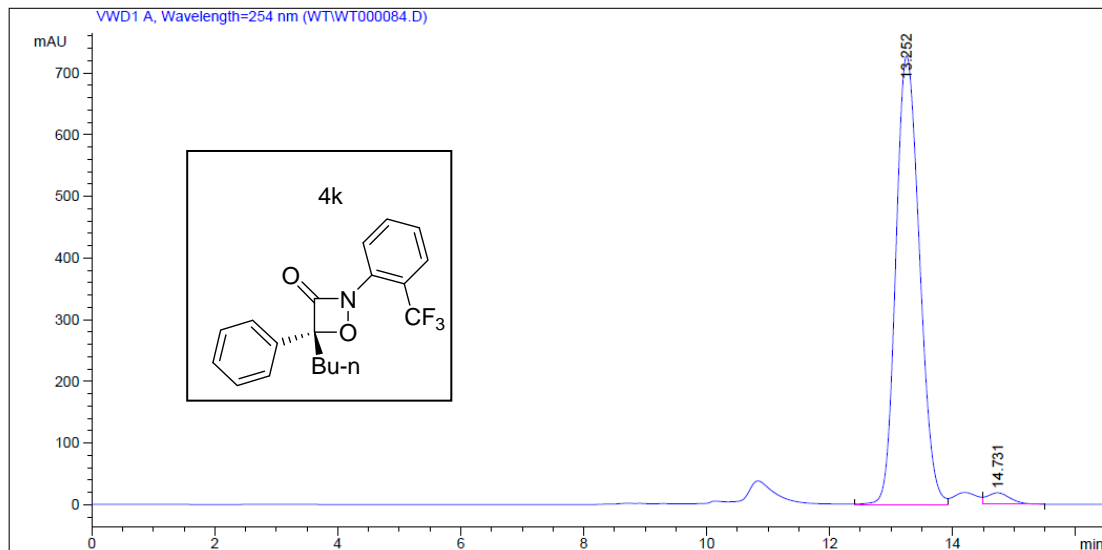


Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	16.207	MM	0.4189	1.89843e4	755.30267	94.0026
2	18.708	MM	0.4232	1211.19434	47.69992	5.9974

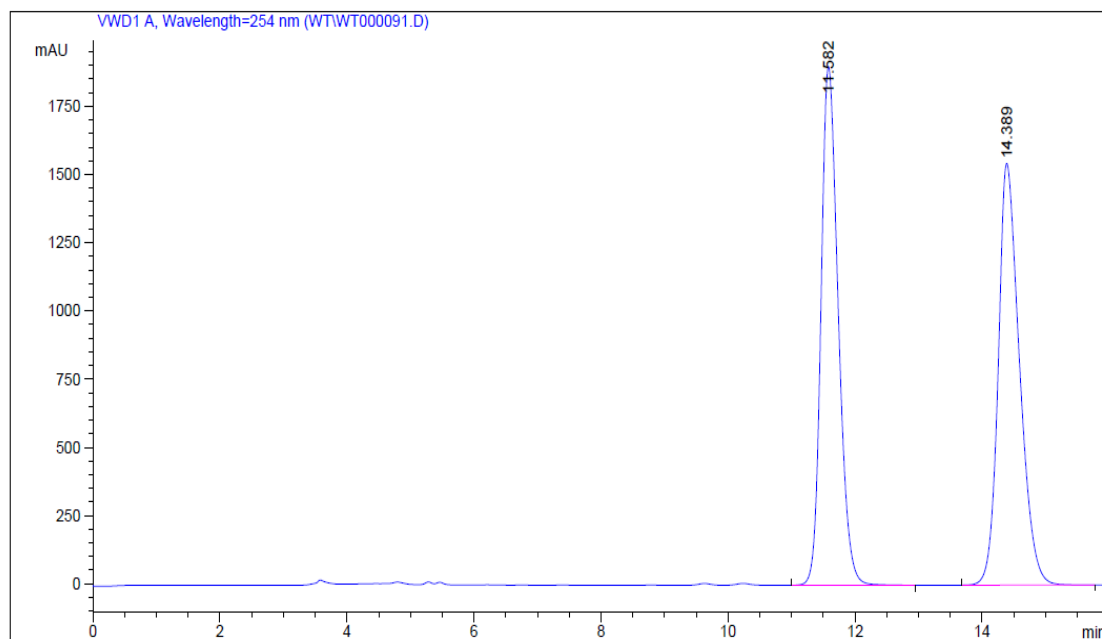
Sample Info : ad-h,99:1,0.5ml/min



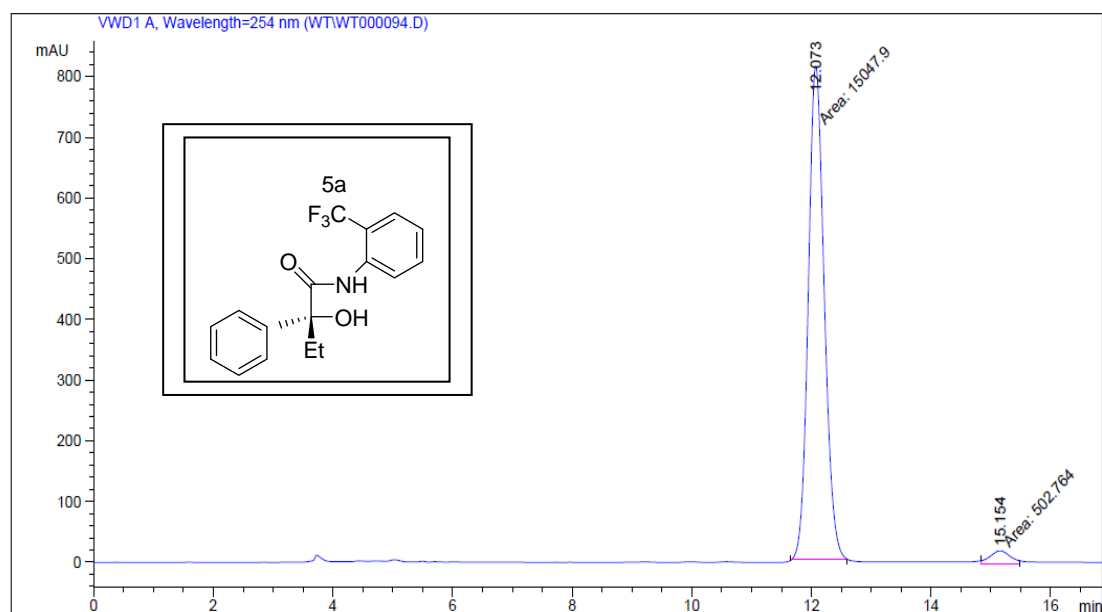
Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	13.430	BB	0.3826	1.87992e4	739.24585	49.9579
2	15.232	MM	0.4398	1.88308e4	713.60132	50.0421



Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	13.252	BV	0.4115	1.93989e4	727.56683	97.5008
2	14.731	VB	0.3934	497.24149	18.59924	2.4992

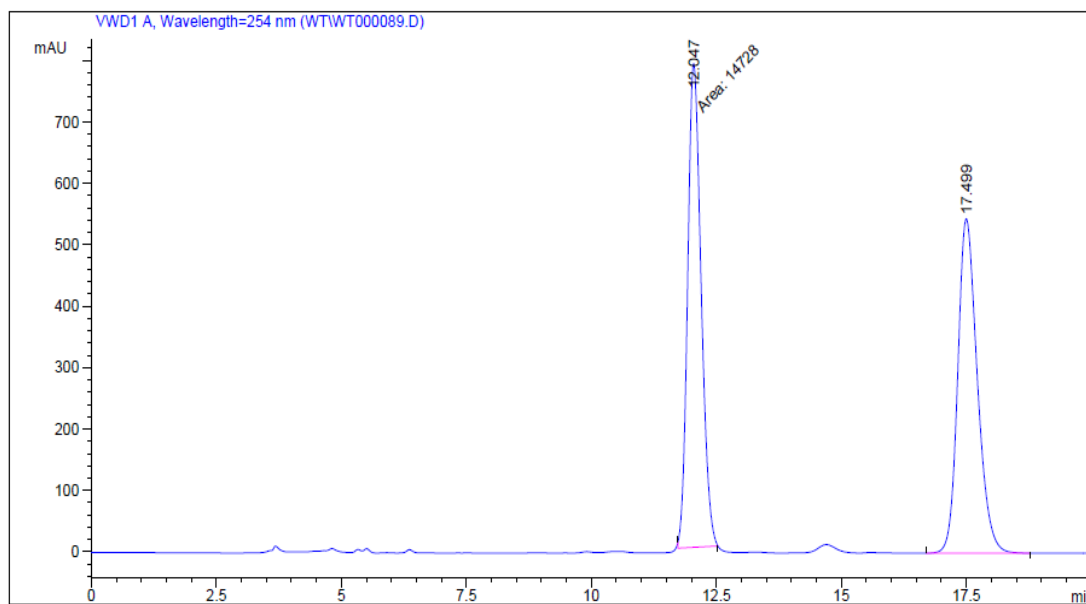


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1	11.582	BB	0.2891	3.57191e4	1900.95178	49.8363
2	14.389	BB	0.3472	3.59538e4	1545.16443	50.1637

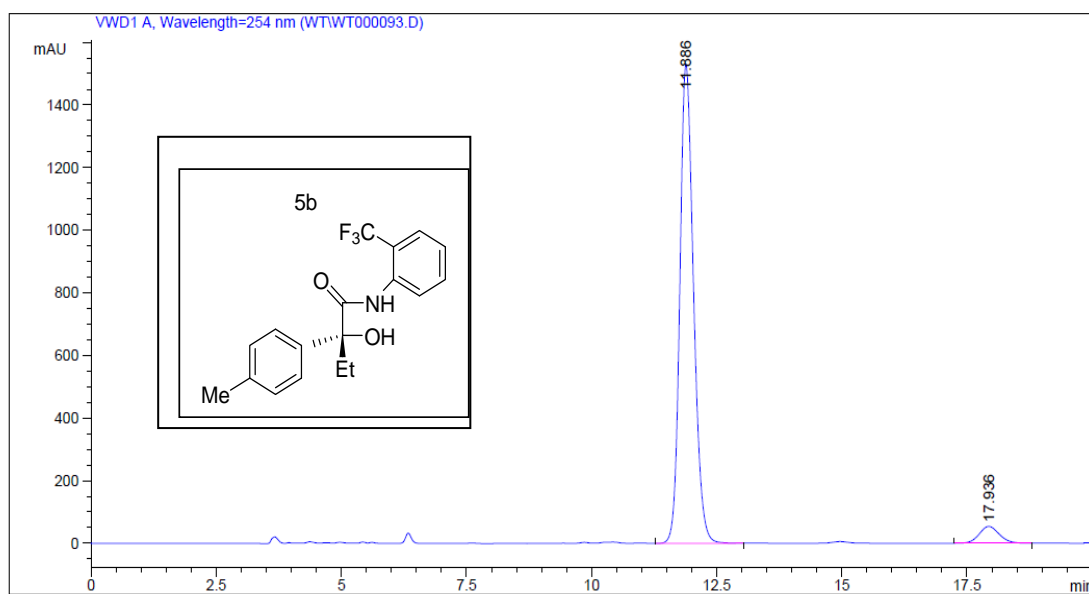


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1	12.073	MM	0.3084	1.50479e4	813.10797	96.7669
2	15.154	MM	0.3951	502.76425	21.20945	3.2331

Sample Info : AD-H, 95:5, 1ml/min



Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	12.047	MM	0.3116	1.47280e4	787.64697	49.9221
2	17.499	BB	0.4142	1.47739e4	544.34454	50.0779



Peak #	RetTime [min]	Type	Width [min]	Area mAU *s	Height [mAU]	Area %
1	11.886	VB	0.2914	2.90505e4	1530.16760	95.0082
2	17.936	BV	0.4349	1526.31775	53.94192	4.9918

Part IV Copies of CD spectra

