

Josiphos-Catalyzed Asymmetric Homodimerization of Ketoketenes

Supporting Information Spectra

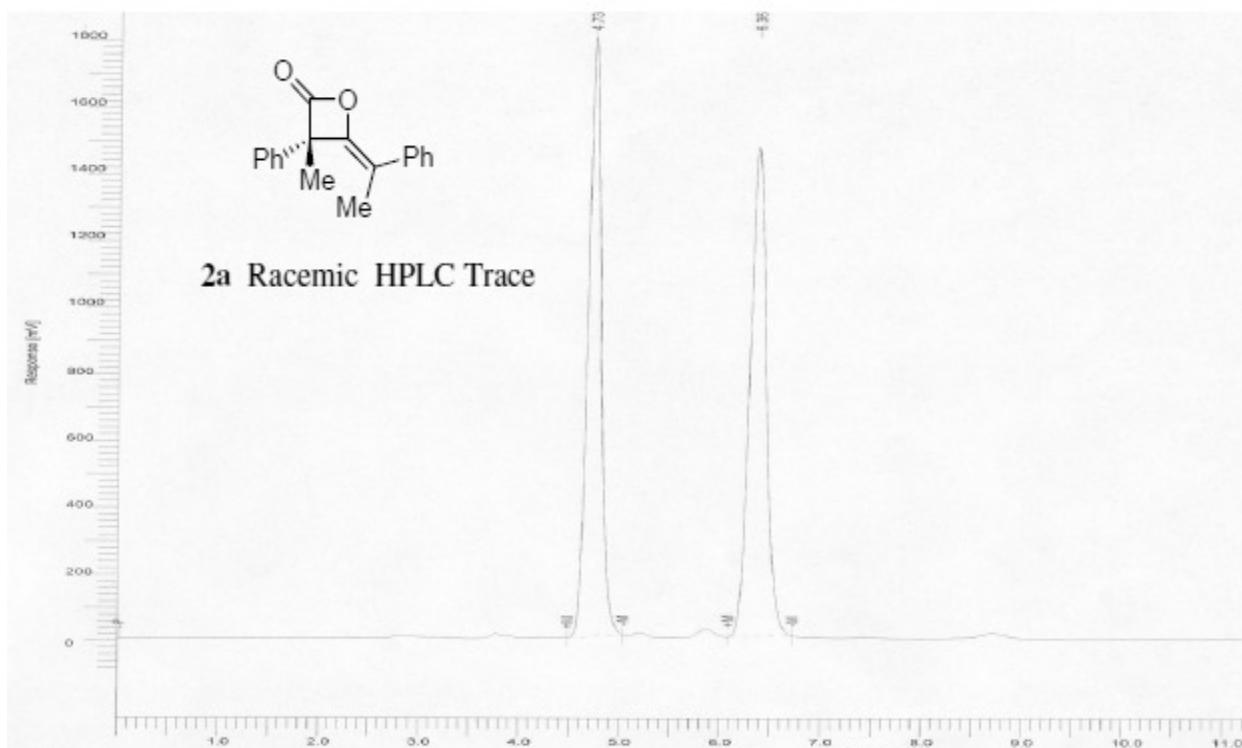
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USA.*

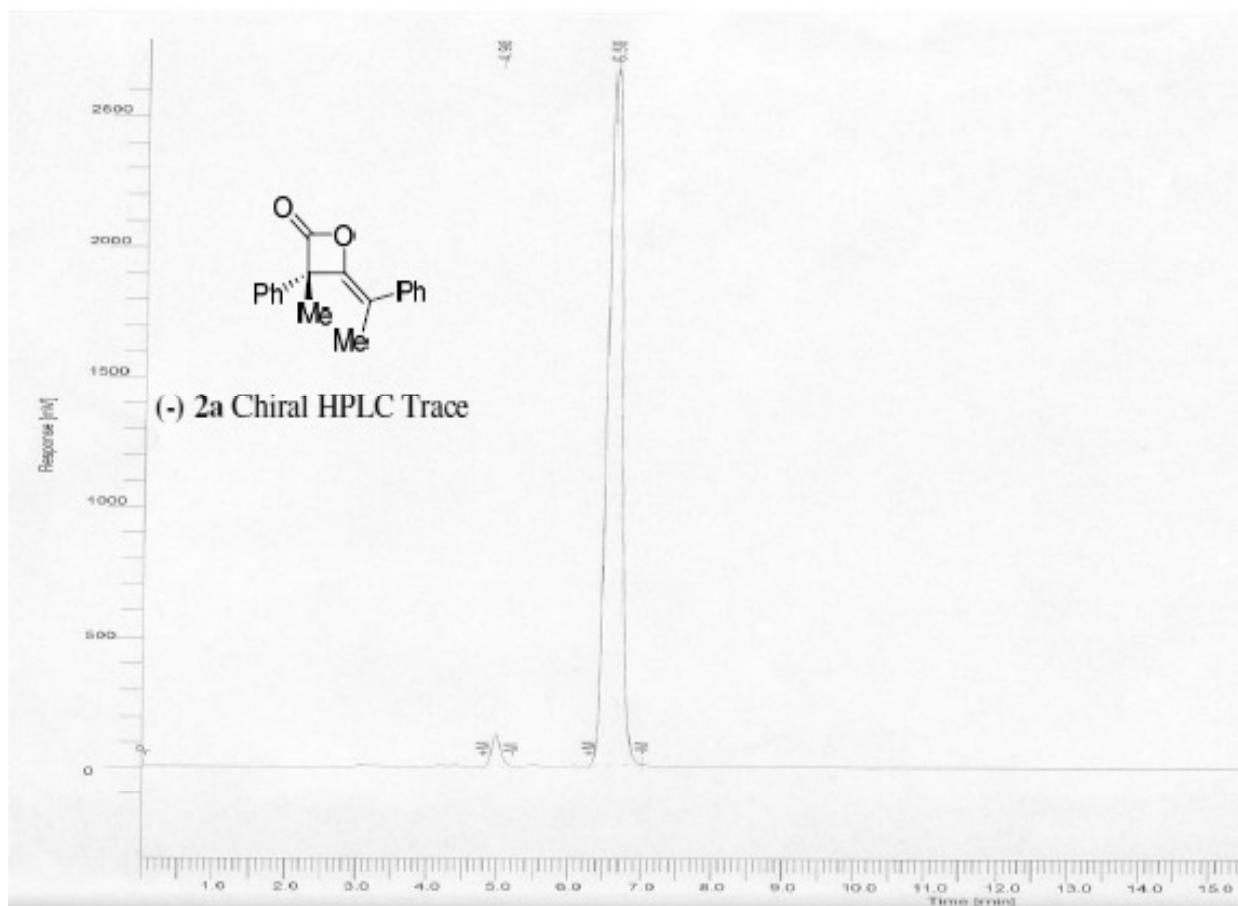
Table of contents:

Racemic HPLC of 2a	SI-3
Chiral HPLC of (-)-2a	SI-4
Chiral HPLC of (+)-2a	SI-5
¹H NMR of (-)-2a	SI-6
¹³C NMR of (-)-2a	SI-6
¹H NMR of (+)-2a	SI-7
¹³C NMR of (+)-2a	SI-7
Racemic HPLC of 2b	SI-8
Chiral HPLC of (-)-2b	SI-9
Chiral HPLC of (+)-2b	SI-10
¹H NMR of (-)-2b	SI-11
¹³C NMR of (-)-2b	SI-11
¹H NMR of (+)-2b	SI-12
¹³C NMR of (+)-2b	SI-12
Racemic HPLC of 2c	SI-13
Chiral HPLC of 2c	SI-14
¹H NMR of 2c	SI-15
¹³C NMR of 2c	SI-15
Racemic HPLC of 2d	SI-16
Chiral HPLC of 2d	SI-17
¹H NMR of 2d	SI-18
¹³C NMR of 2d	SI-18
Racemic HPLC of 2e	SI-19
Chiral HPLC of 2e	SI-20
¹H NMR of 2e	SI-21
¹³C NMR of 2e	SI-21
Racemic HPLC of 2f	SI-22
Chiral HPLC of 2f	SI-23
¹H NMR of 2f	SI-24

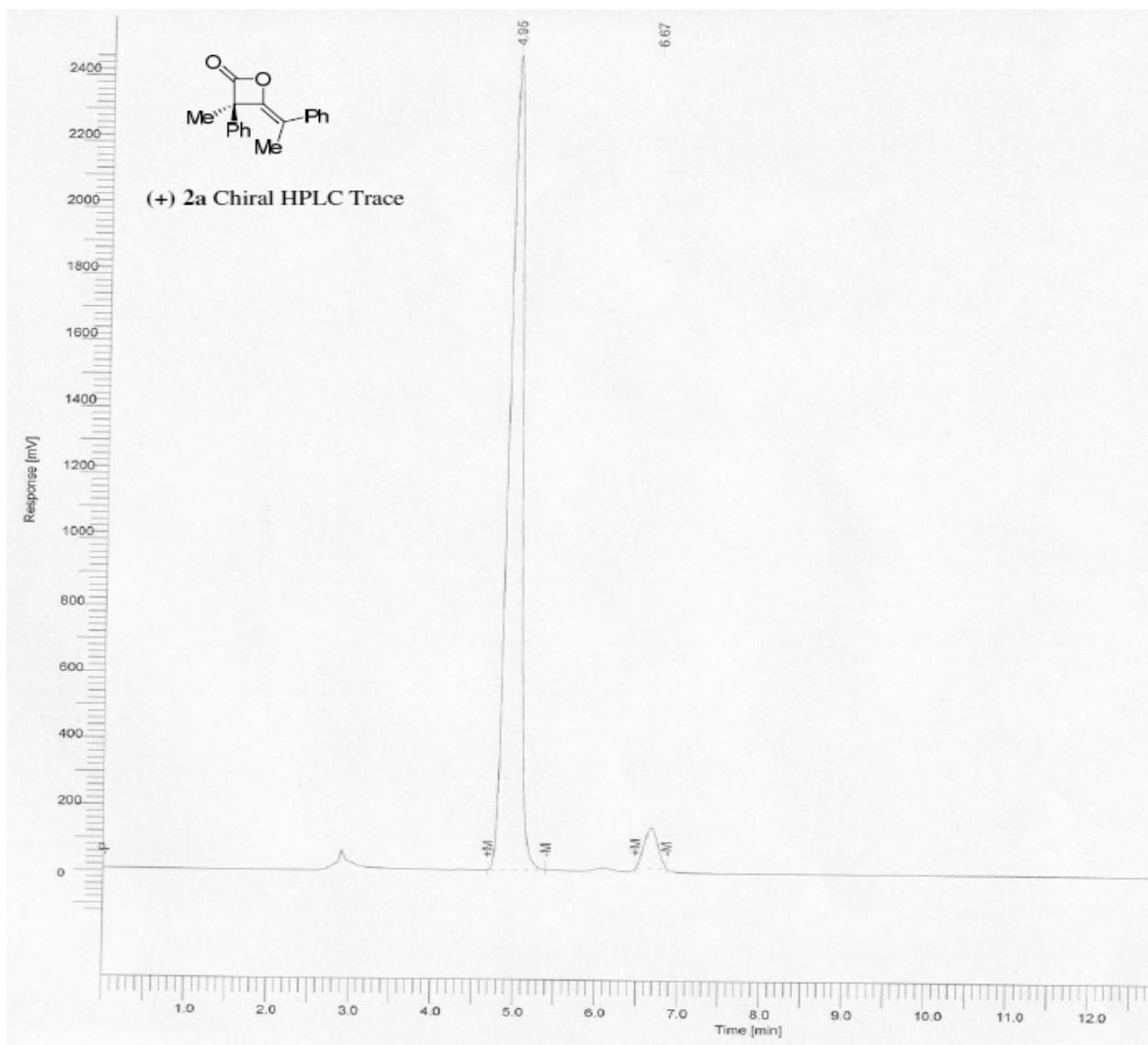
¹³ C NMR of 2f	SI-24
Racemic HPLC of 2g	SI-25
Chiral HPLC of 2g	SI-26
¹ H NMR of 2g	SI-27
¹³ C NMR of 2g	SI-27
Racemic HPLC of 2h	SI-28
Chiral HPLC of 2h (Method B)	SI-29
Chiral HPLC of 2h (Method C)	SI-30
¹ H NMR of 2h	SI-31
¹³ C NMR of 2h	SI-31
¹ H NMR of 5i	SI-32
¹³ C NMR of 5i	SI-32
¹ H NMR of 5j	SI-33
¹³ C NMR of 5j	SI-33
¹ H NMR of 2k	SI-34
¹³ C NMR of 2k	SI-34
¹ H NMR of 8a	SI-35
¹³ C NMR of 8a	SI-35
¹ H NMR of 9a	SI-36
¹³ C NMR of 9a	SI-36
Racemic HPLC of 10b	SI-37
Chiral HPLC of 10b	SI-38
¹ H NMR of 10b	SI-39
¹³ C NMR of 10b	SI-39



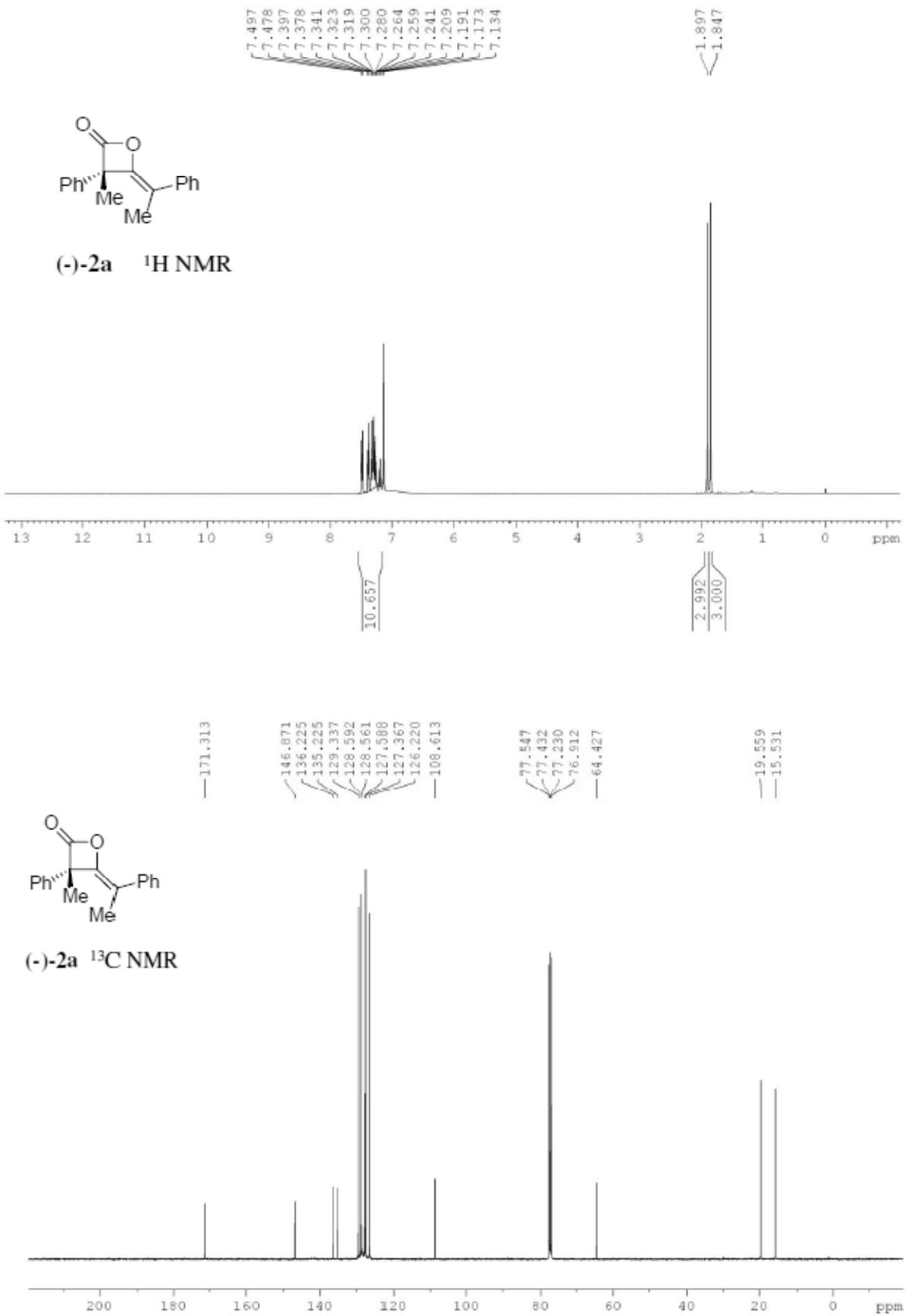
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1	4.728	16516433.87	1.80e+06	49.74	49.74	*BB	9.1938
2	6.357	16686754.36	1.47e+06	50.26	50.26	*BB	11.3813
		33203188.23	3.26e+06	100.00	100.00		

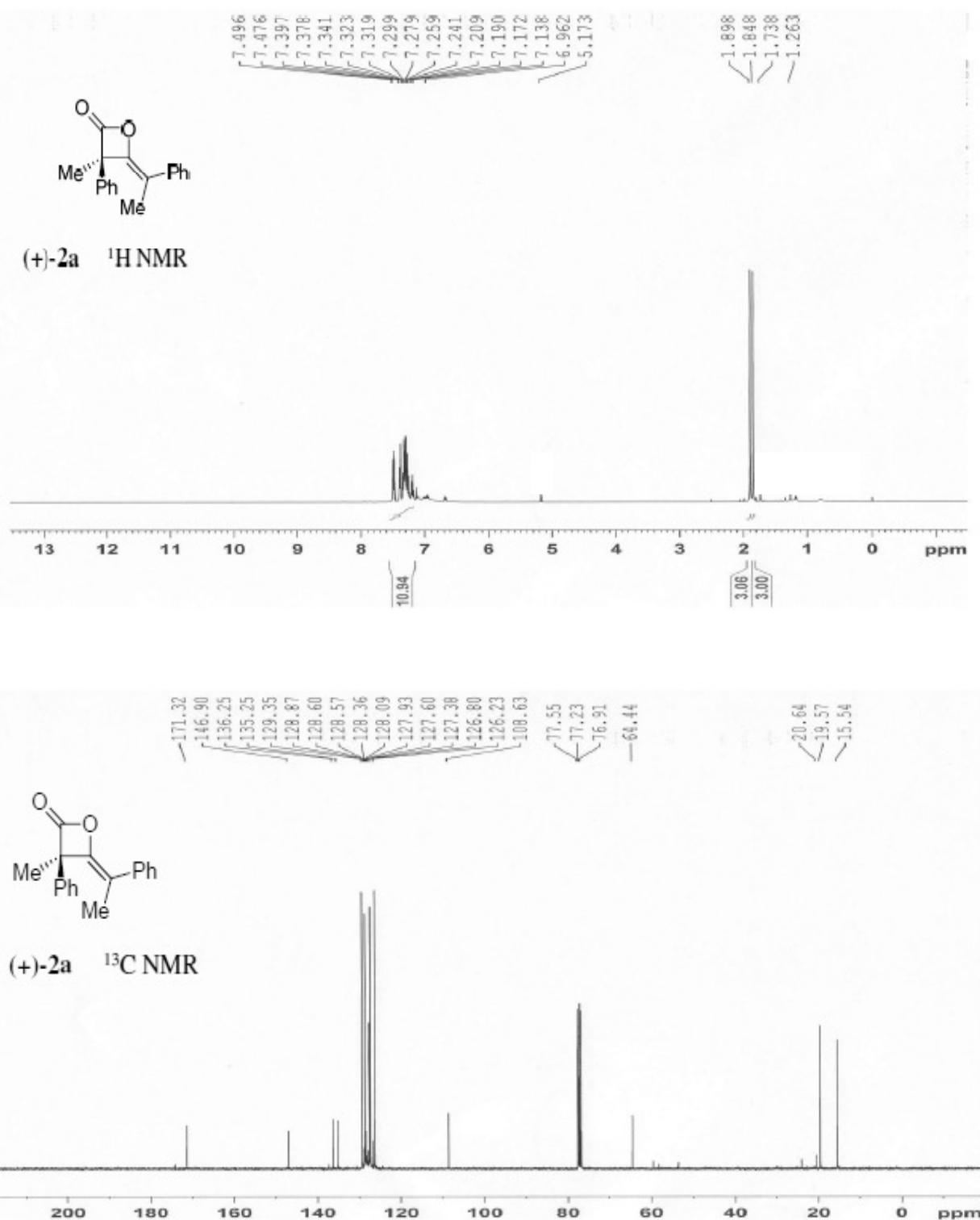


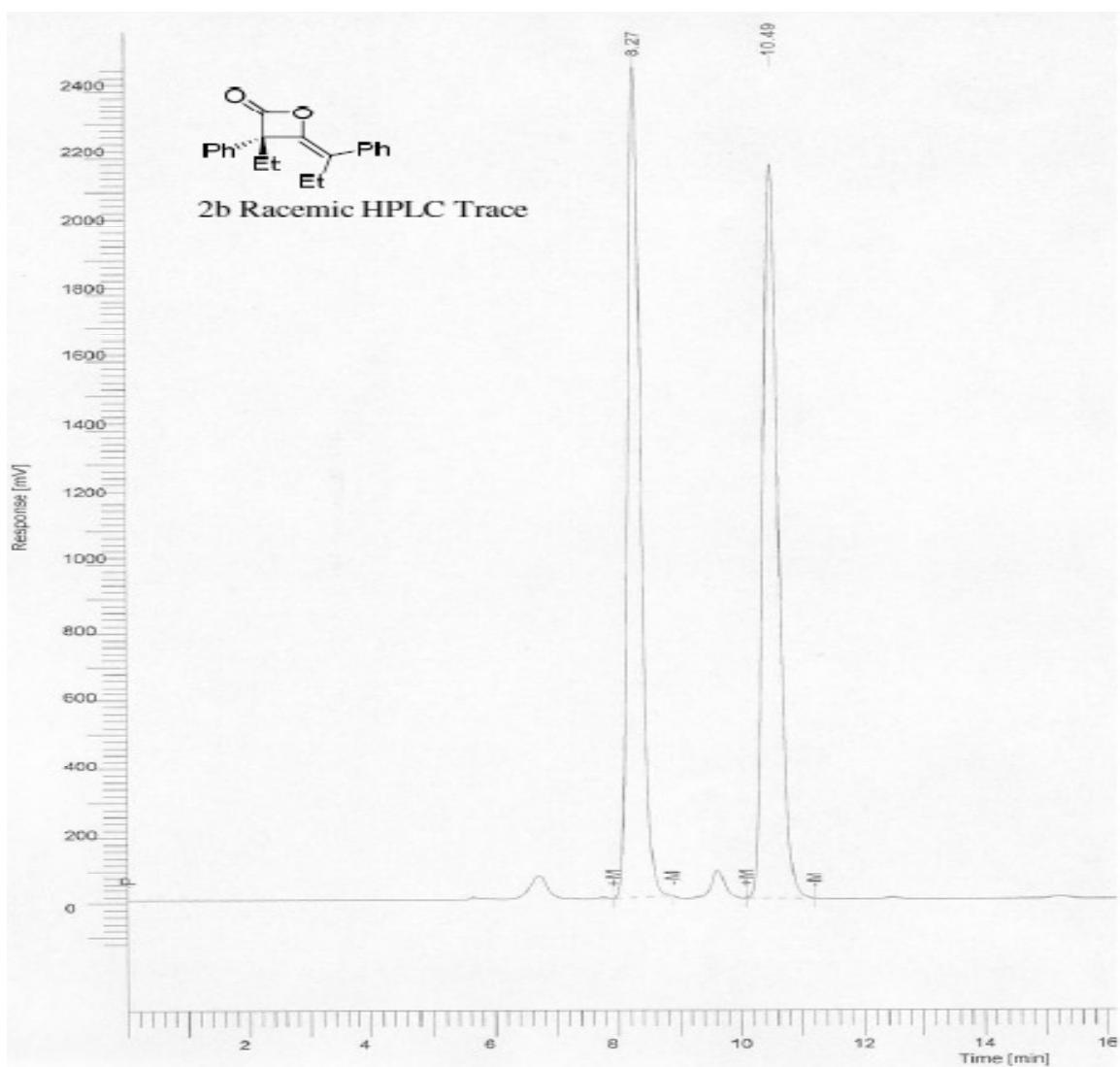
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1	4.977	1083220.46	123432.70	3.13	3.13	*BB	8.7758
2	6.581	33524019.36	2.66e+06	96.87	96.87	*BB	12.5831
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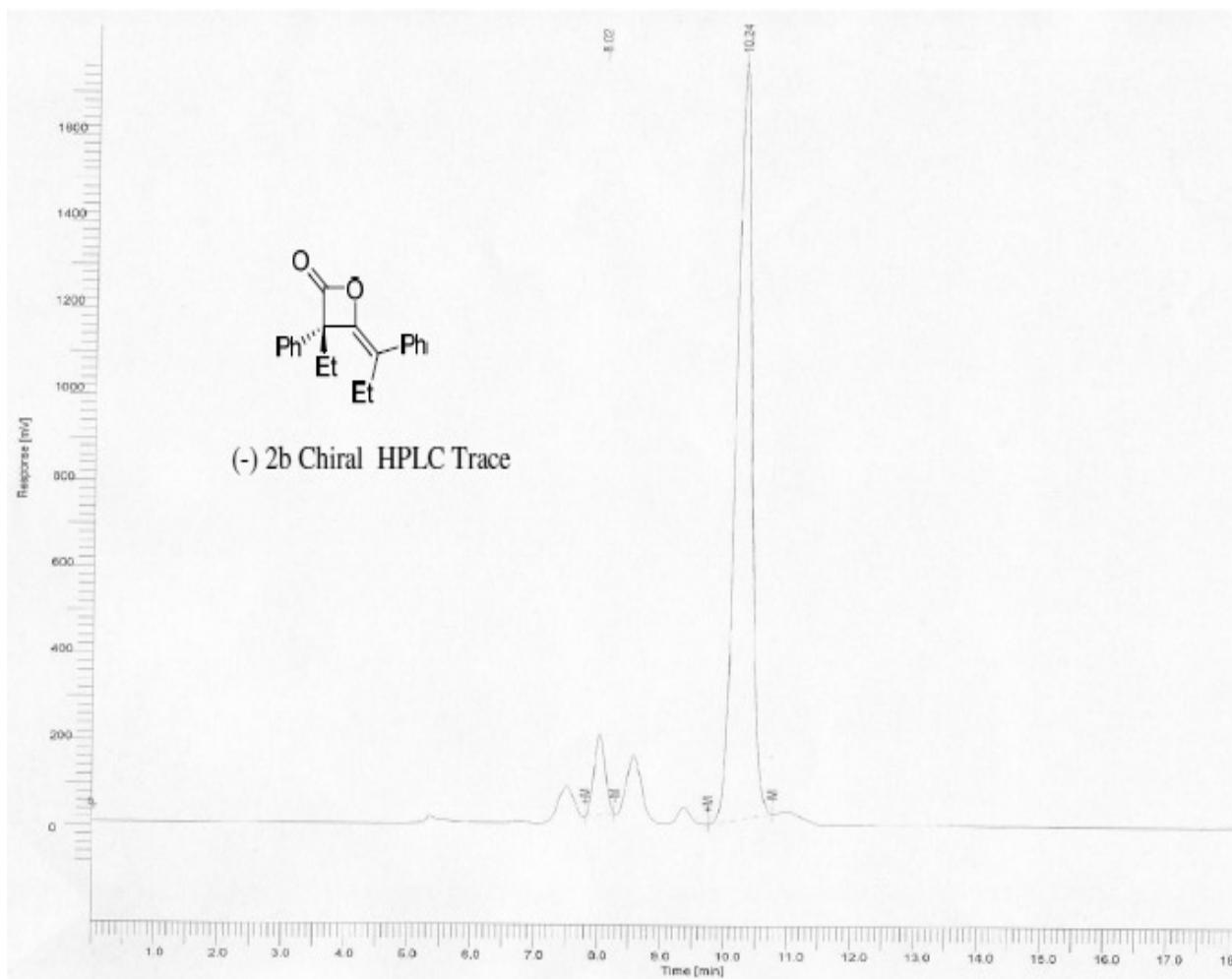
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1	4.948	27962830.53	2.46e+06	95.14	95.14	*BB	11.3678
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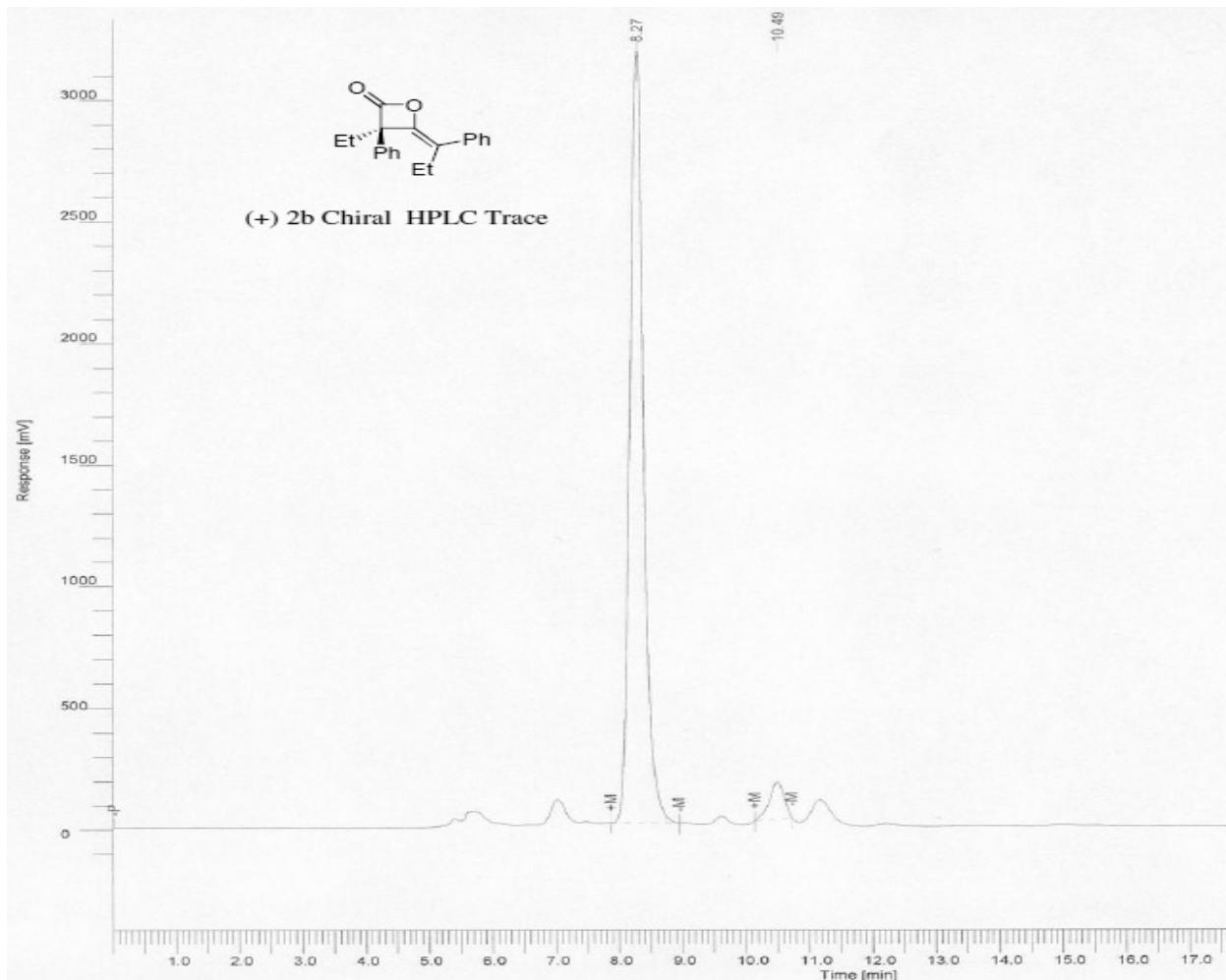




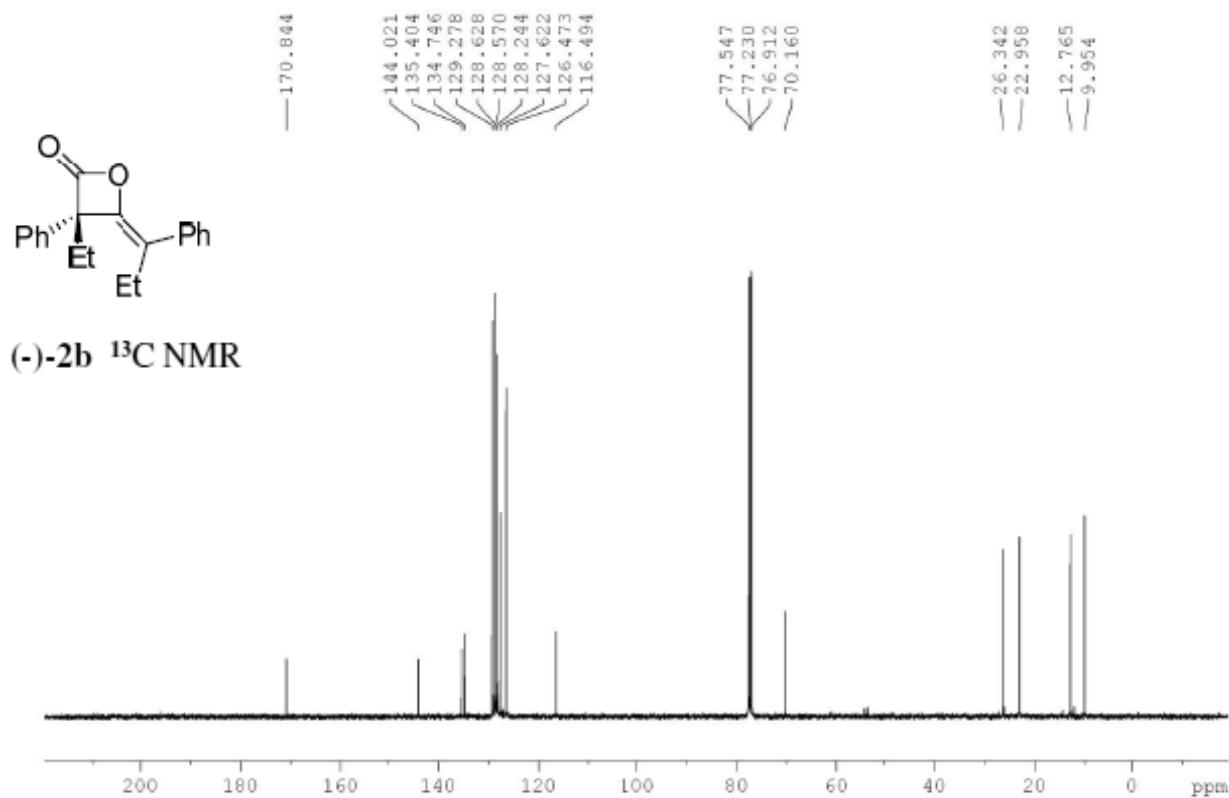
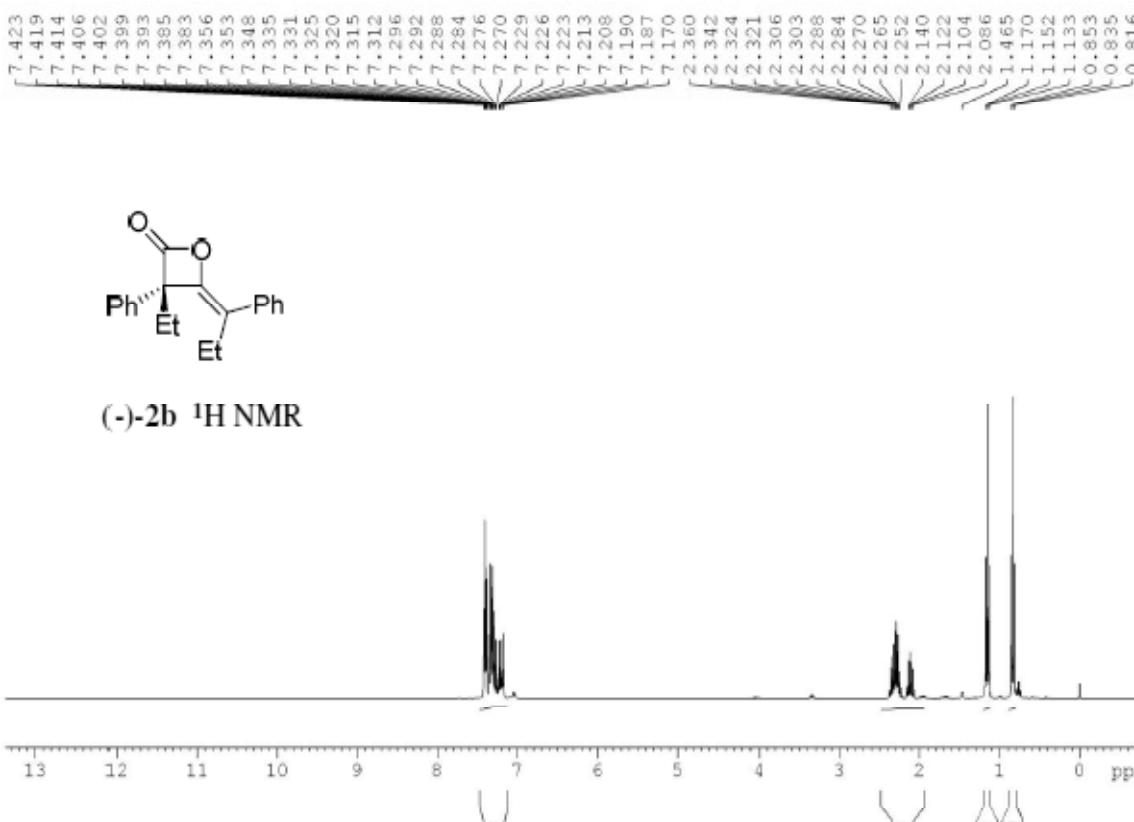
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1	8.273	36312071.24	2.45e+06	49.19	49.19	*BB	14.8038
2	10.494	37506565.80	2.16e+06	50.81	50.81	*BB	17.3342
		73818637.04	4.62e+06	100.00	100.00		

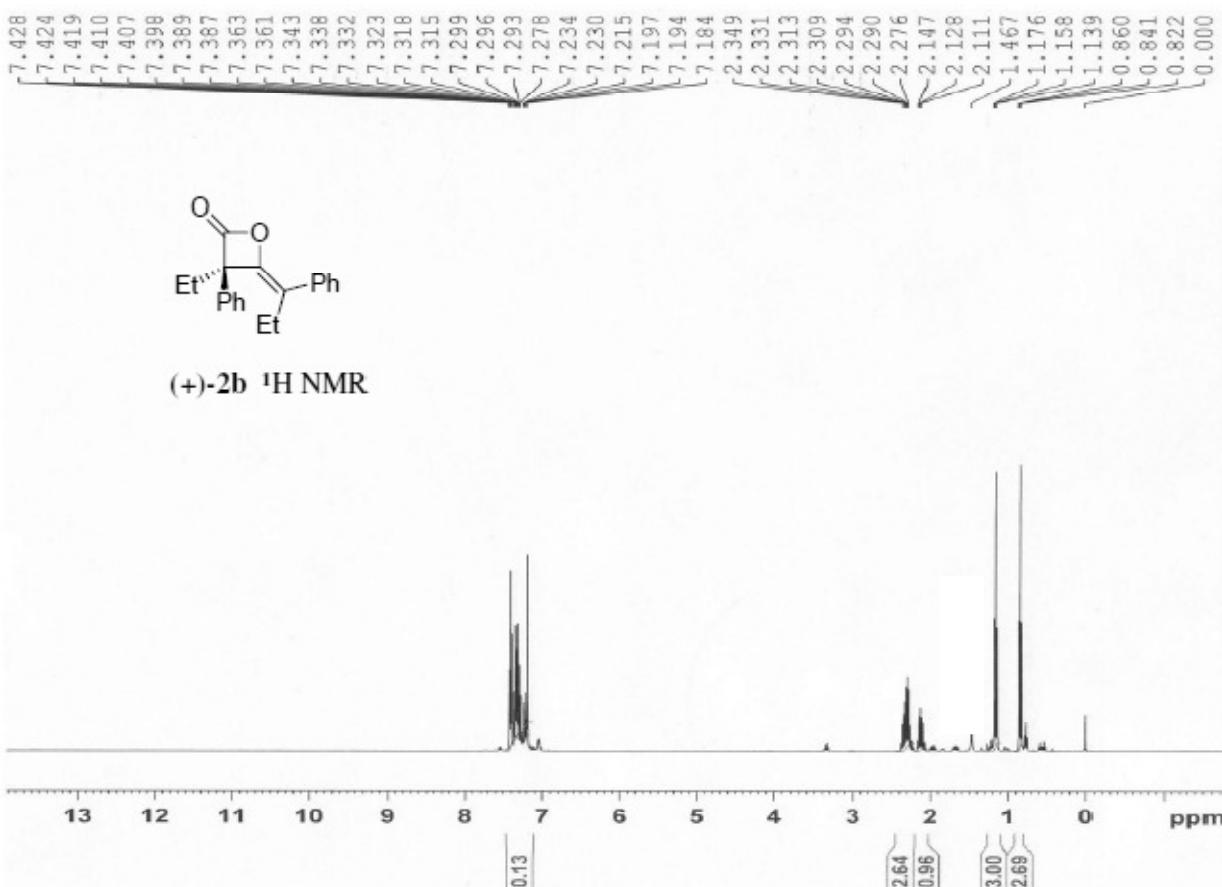
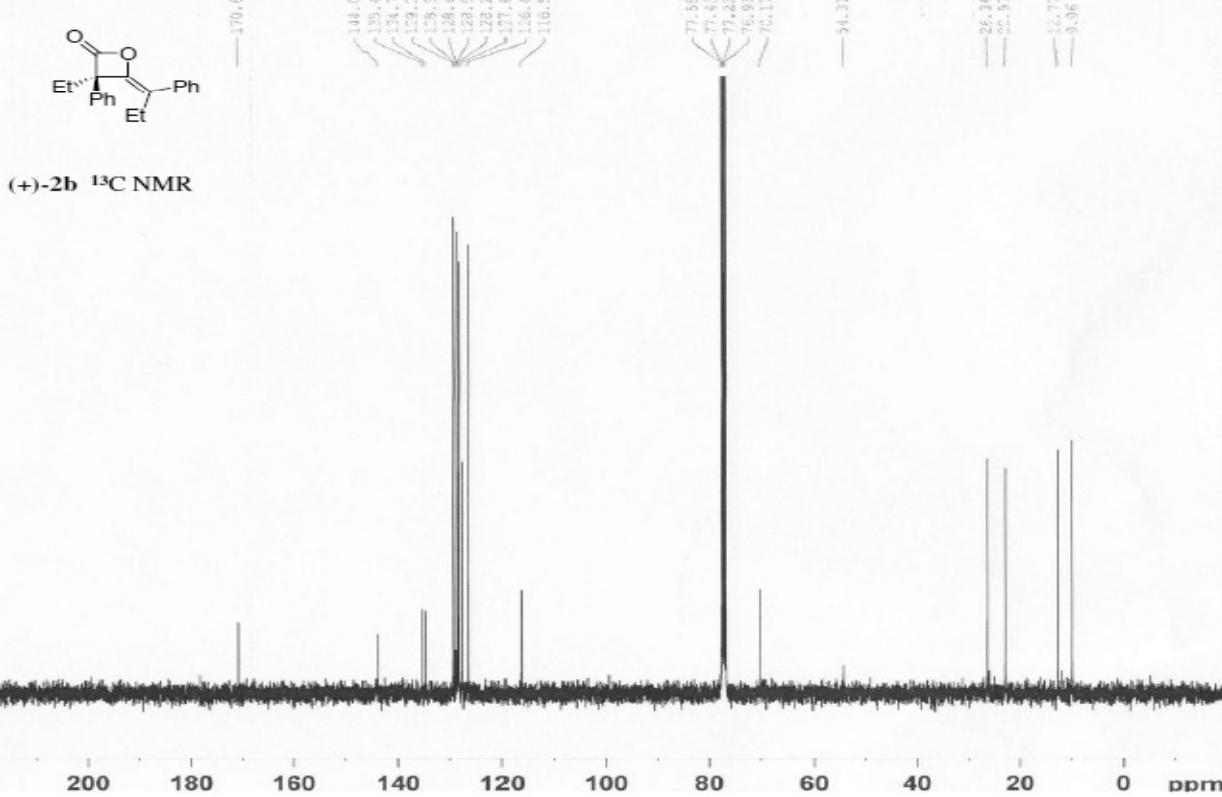


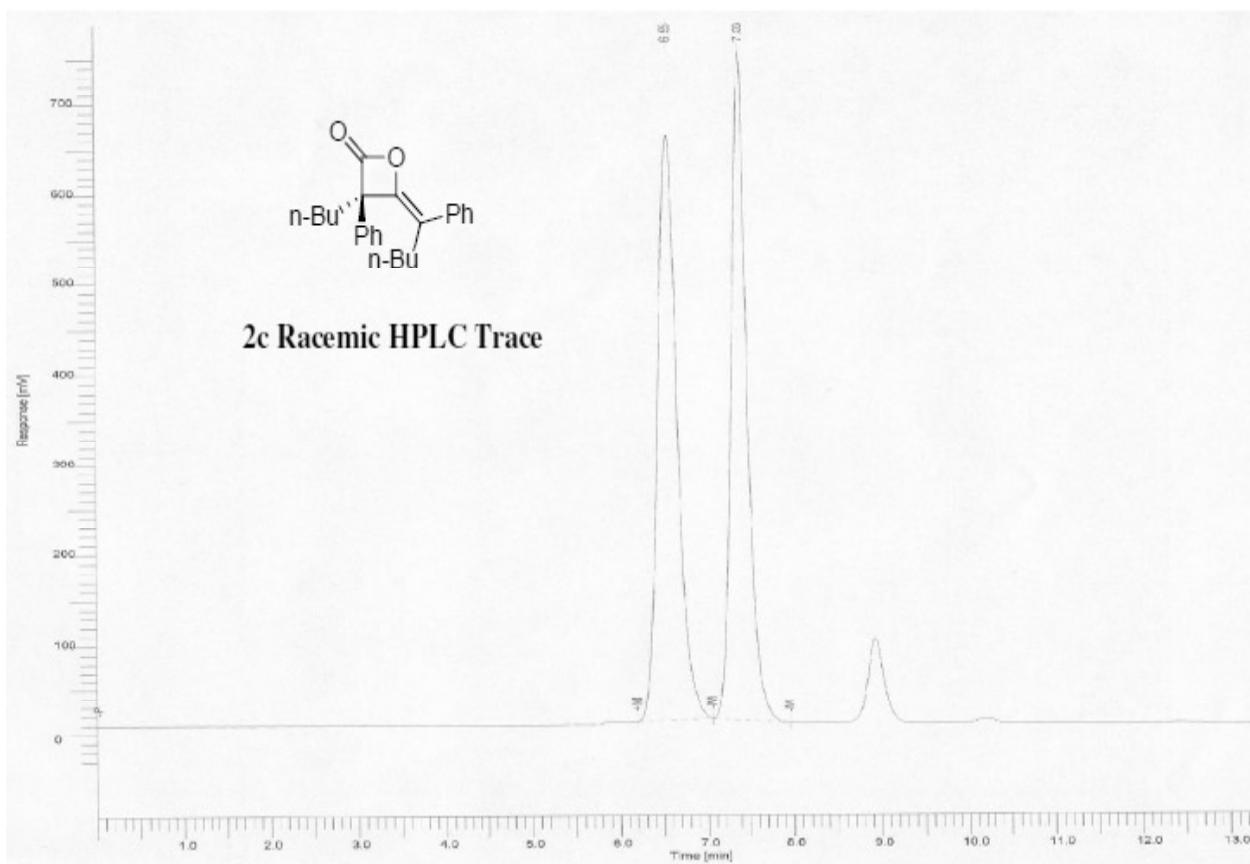
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1	8.022	2326568.44	187044.46	7.08	7.08	*BB	12.4386
2	10.239	30517894.92	1.75e+06	92.92	92.92	*BB	17.3896
		32844463.35	1.94e+06	100.00	100.00		



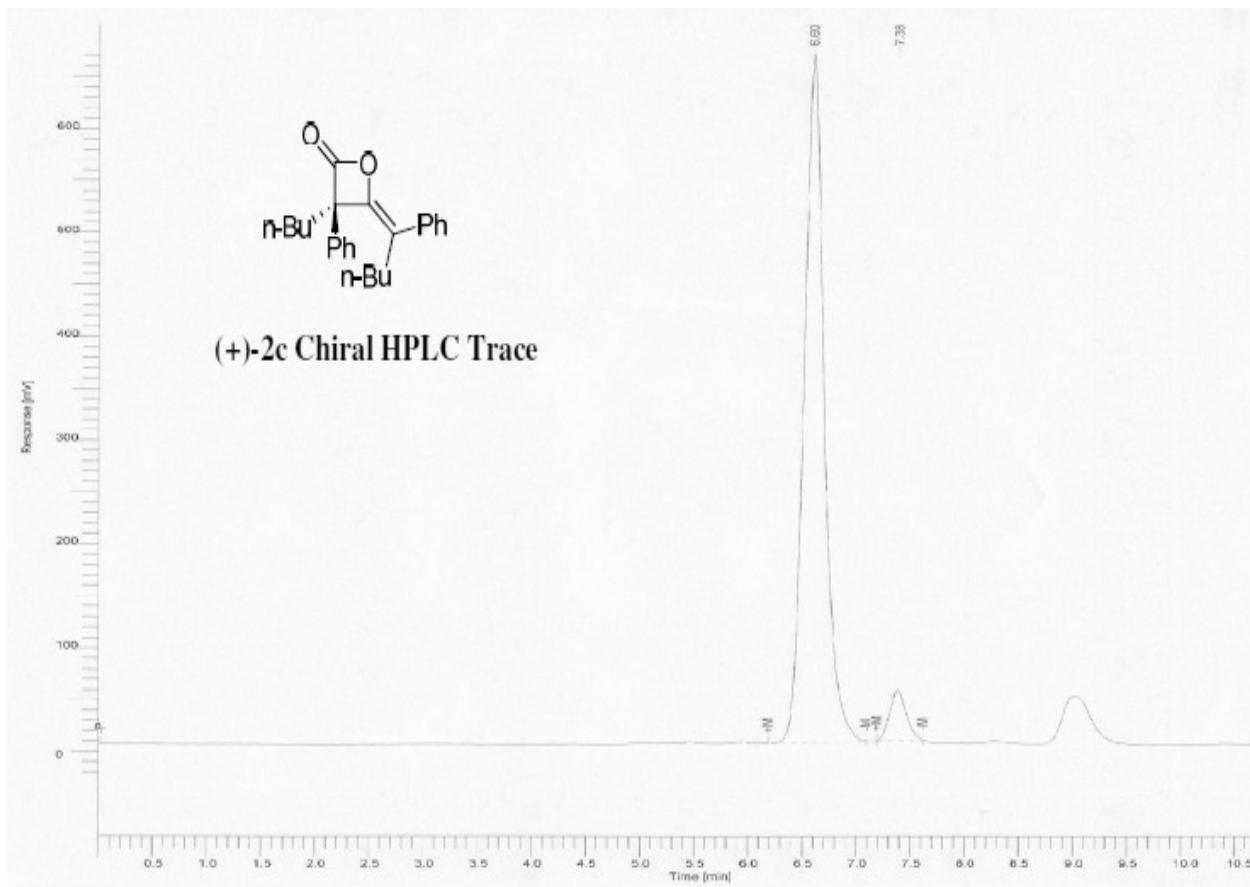
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1	8.270	47571648.95	3.17e+06	95.12	95.12	*BB	15.0040
2	10.494	2442570.29	153262.99	4.88	4.88	*BB	15.9371
		50014219.24	3.32e+06	100.00	100.00		



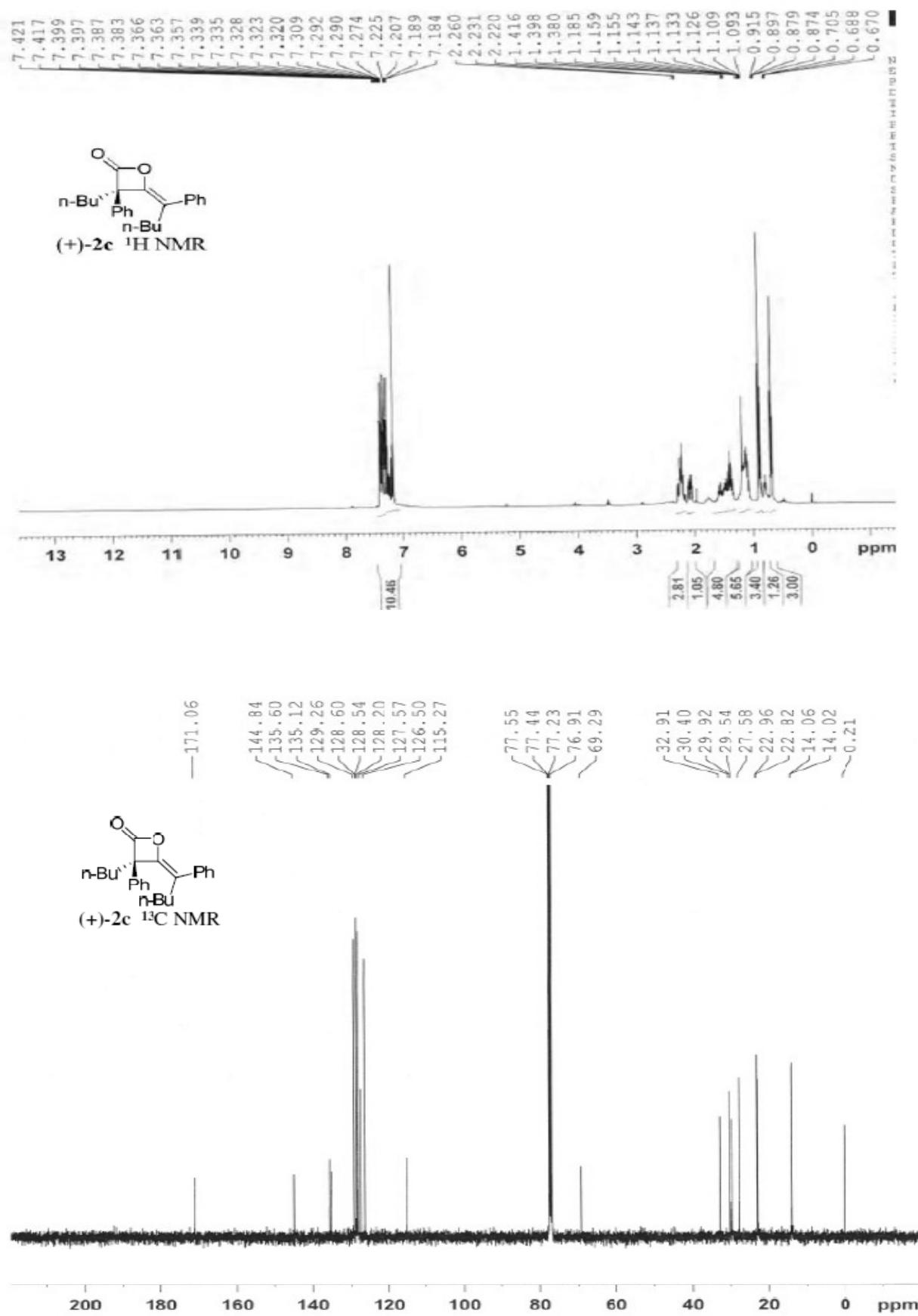
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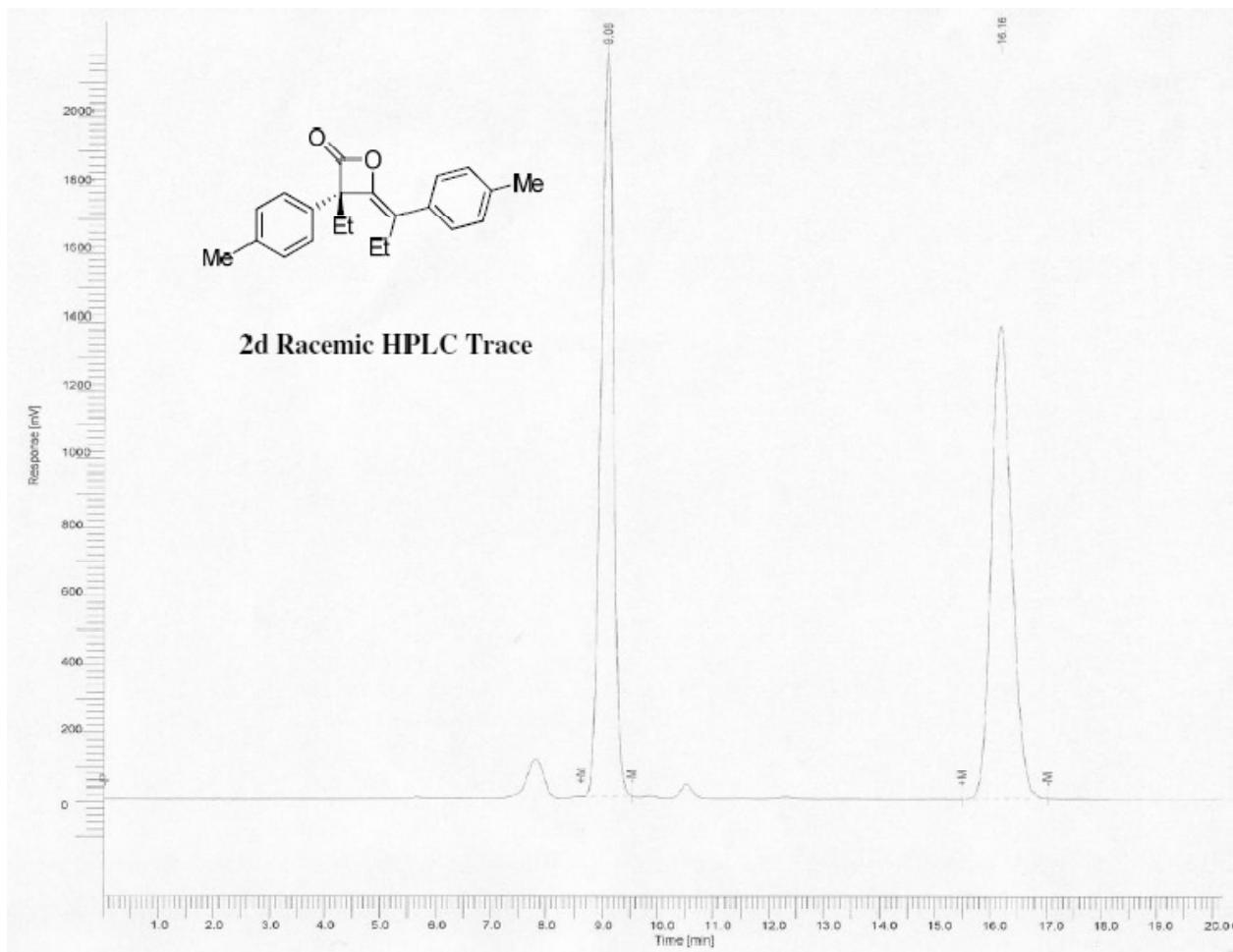


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	6.549	10059196.44	650372.55	49.95	49.95	*BB	15.4668
2	7.384	10078908.92	743460.27	50.05	50.05	*BB	13.5568
		20138105.37	1.39e+06	100.00	100.00		

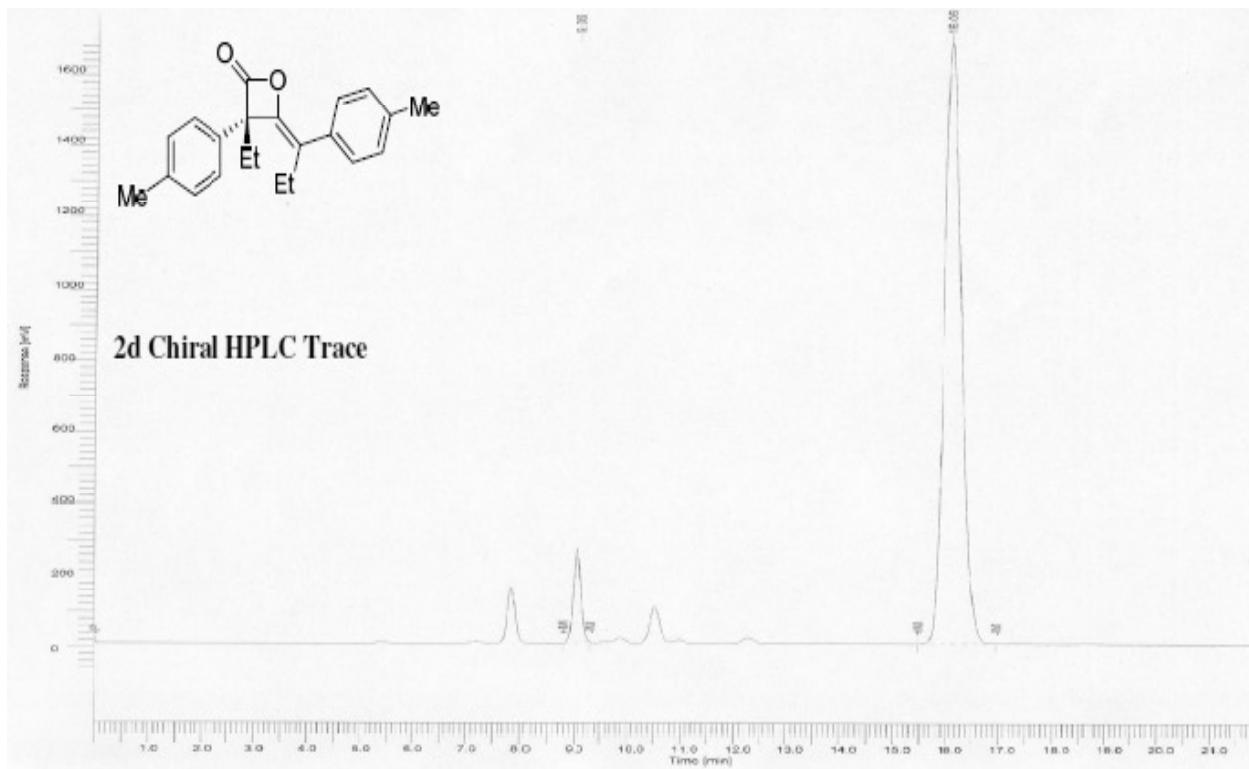


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	6.599	8546253.62	663373.03	94.32	94.32	*BB	12.8830
2	7.384	515090.01	48103.84	5.68	5.68	*BB	10.7079
		9061343.63	711476.86	100.00	100.00		

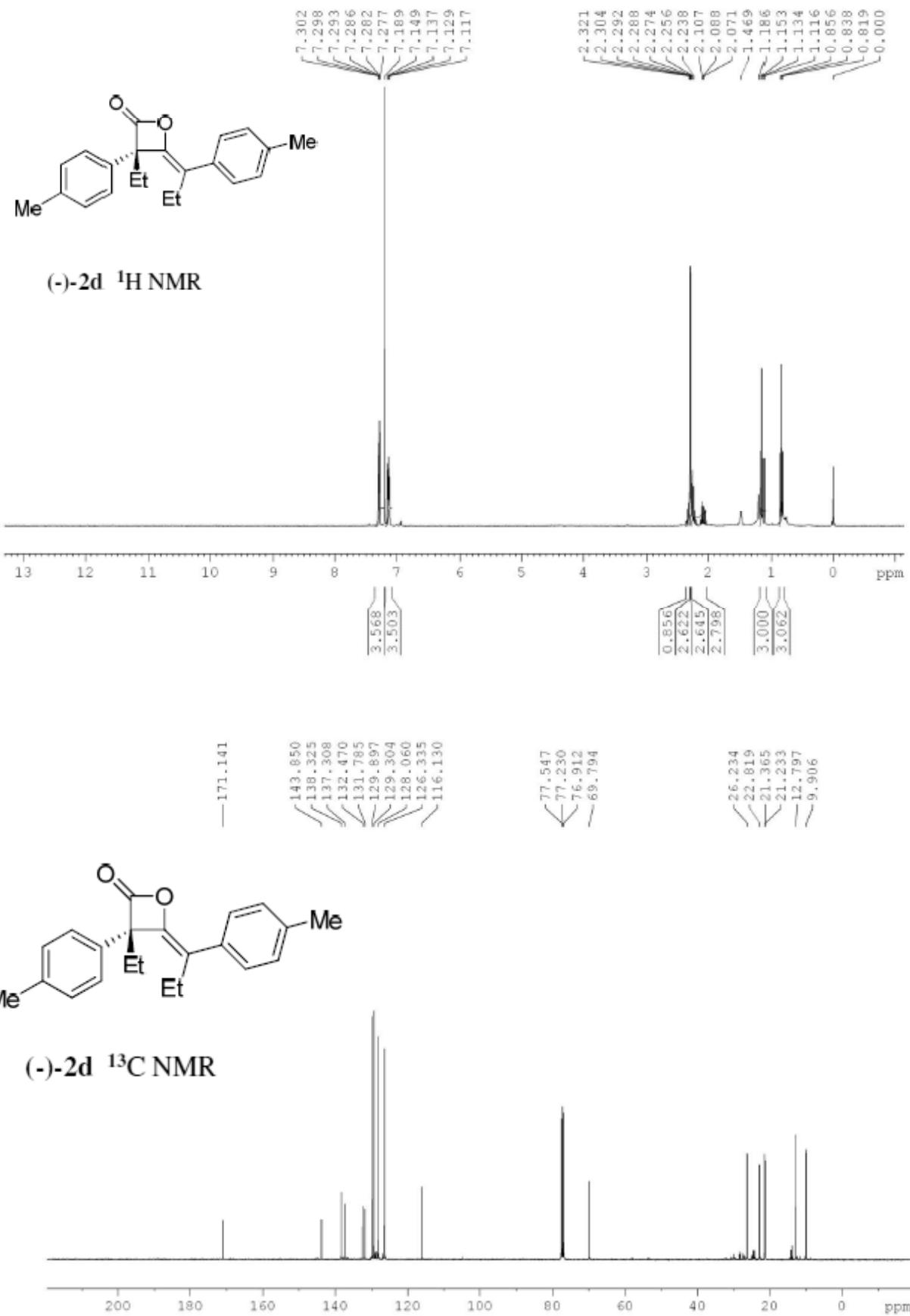


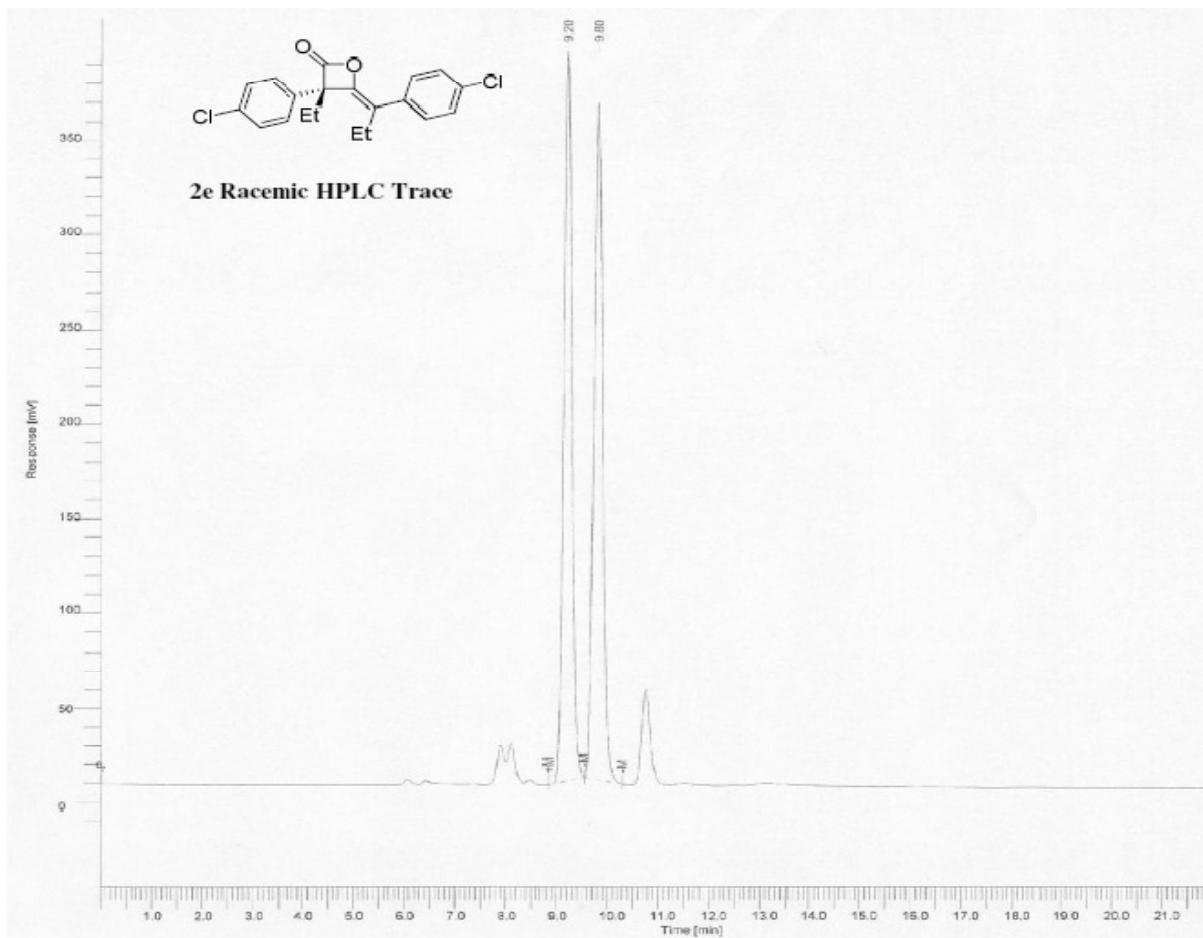


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	9.064	34805845.84	2.17e+06	49.65	49.65	*BB	16.0471
2	16.162	35299521.69	1.38e+06	50.35	50.35	*BB	25.5544
		70105367.54	3.55e+06	100.00	100.00		

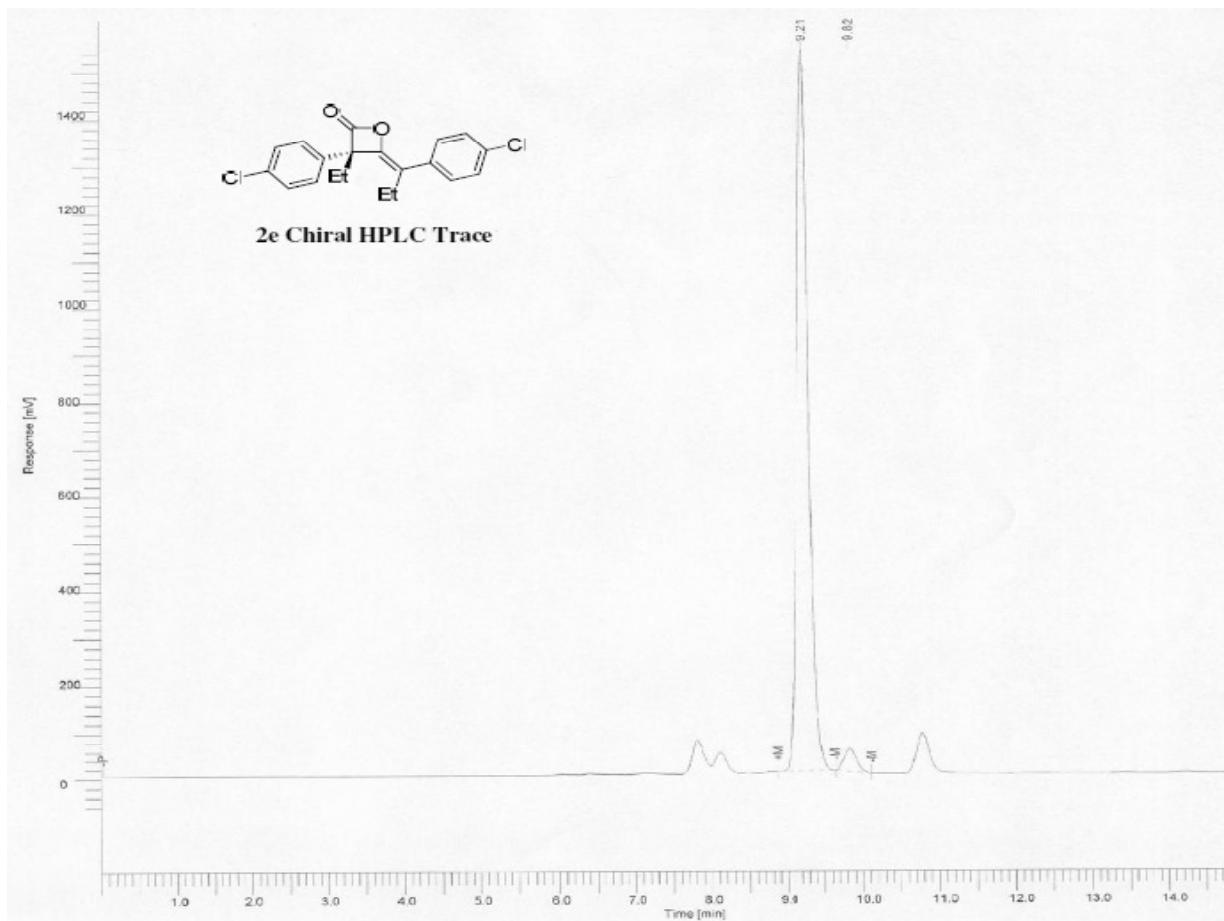


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	9.062	3060059.18	269466.59	7.29	7.29	*BB	11.3560
2	16.064	38902823.86	1.68e+06	92.71	92.71	*BB	23.1311
		41962883.05	1.95e+06	100.00	100.00		

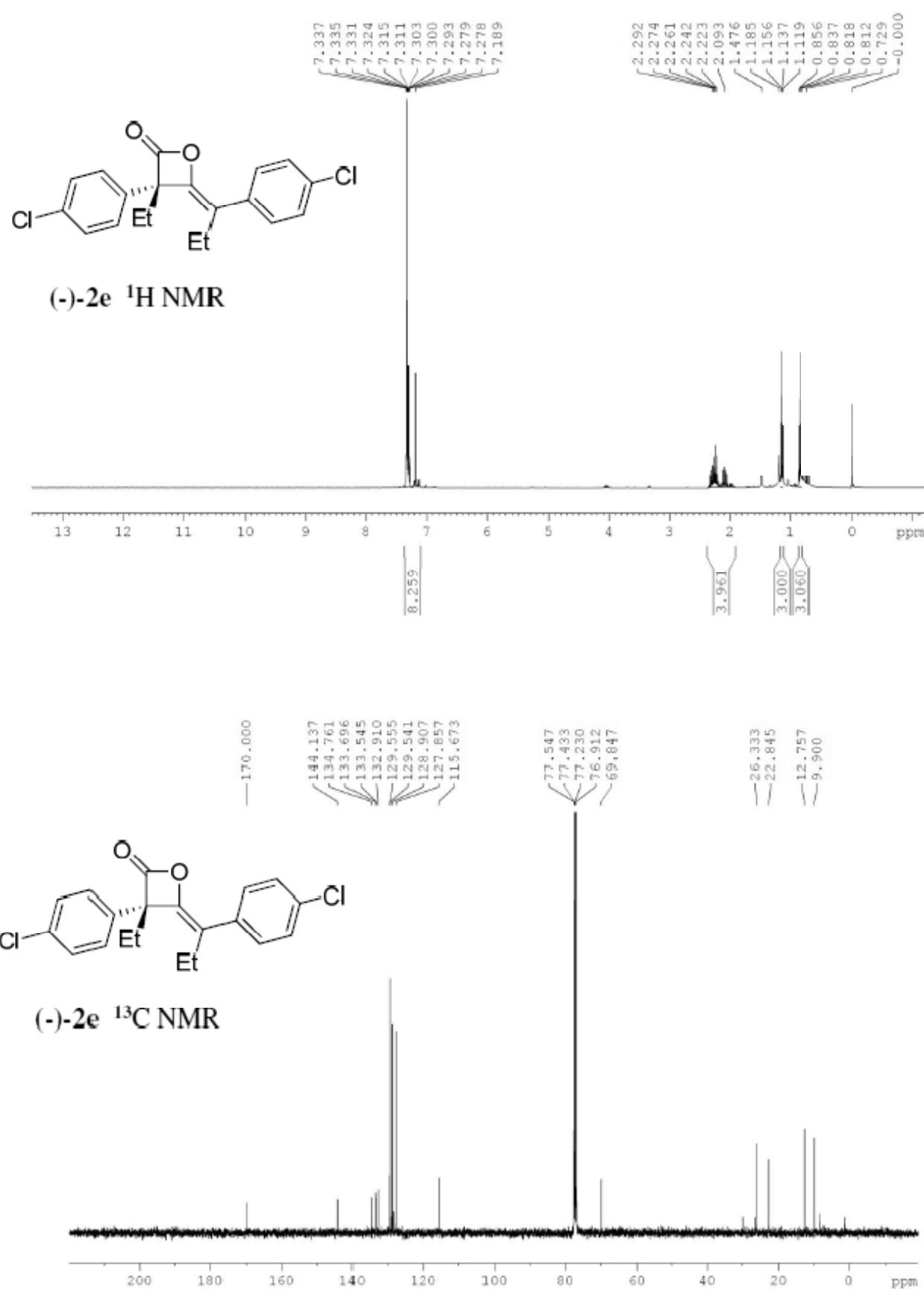


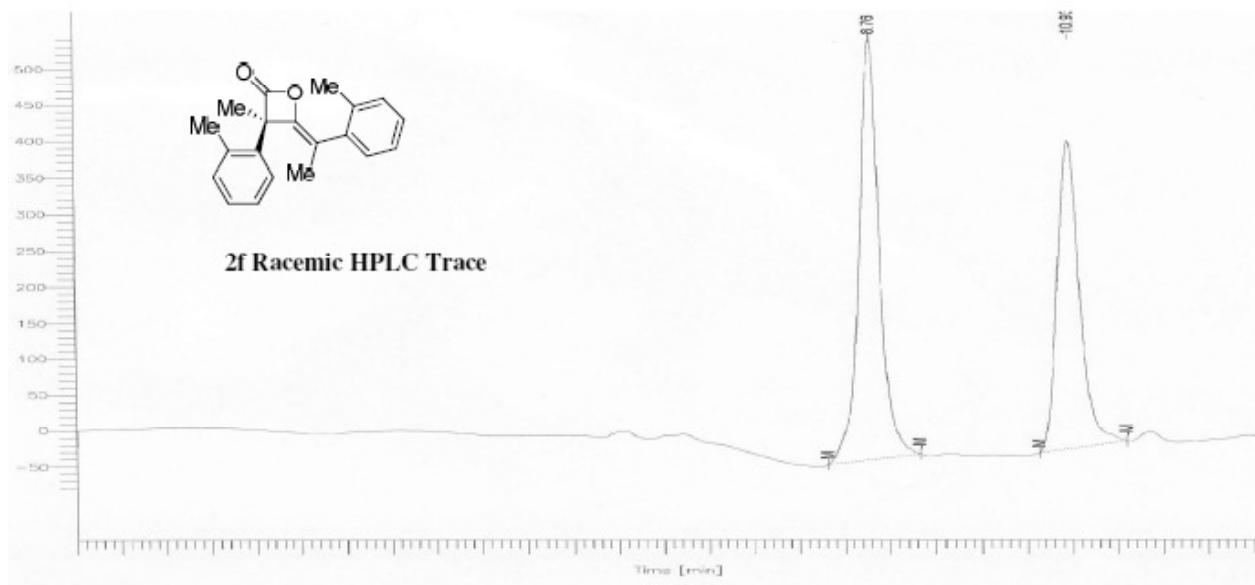


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	9.202	4227277.08	385917.71	49.86	49.86	*BB	10.9538
2	9.800	4251447.13	358033.89	50.14	50.14	*BB	11.8744
			8478724.22	743951.60	100.00	100.00	

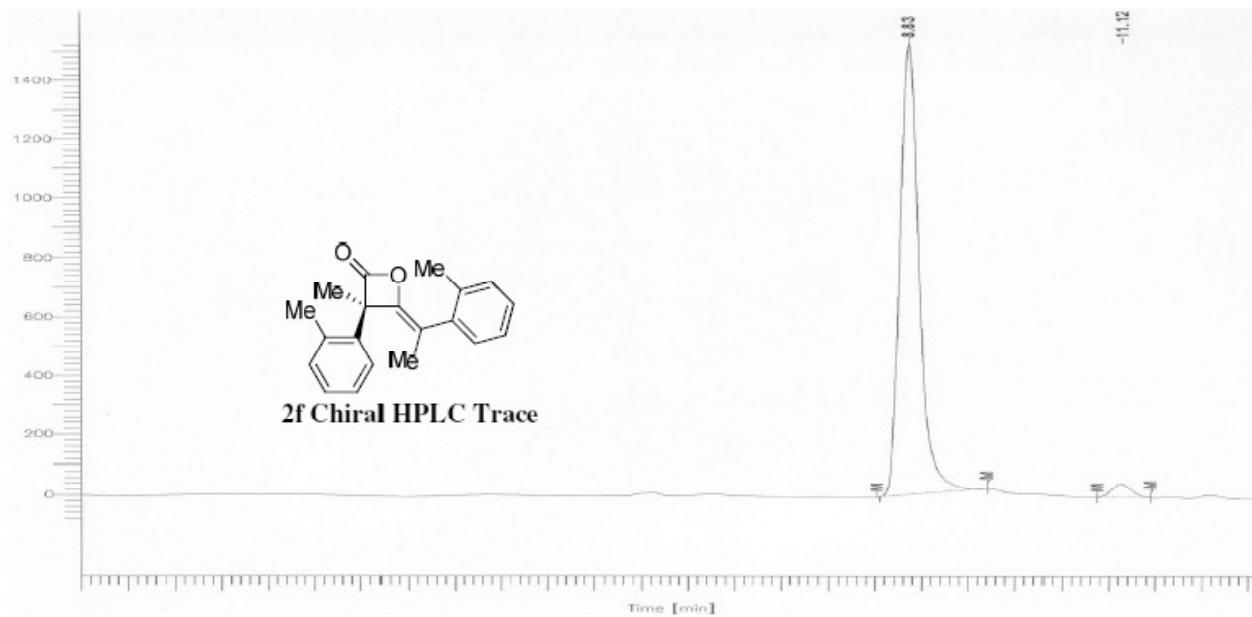


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	9.210	17067489.73	1.53e+06	96.75	96.75	*BB	11.1567
2	9.822	572524.07	51494.20	3.25	3.25	*BB	11.1182
		17640013.80	1.58e+06	100.00	100.00		

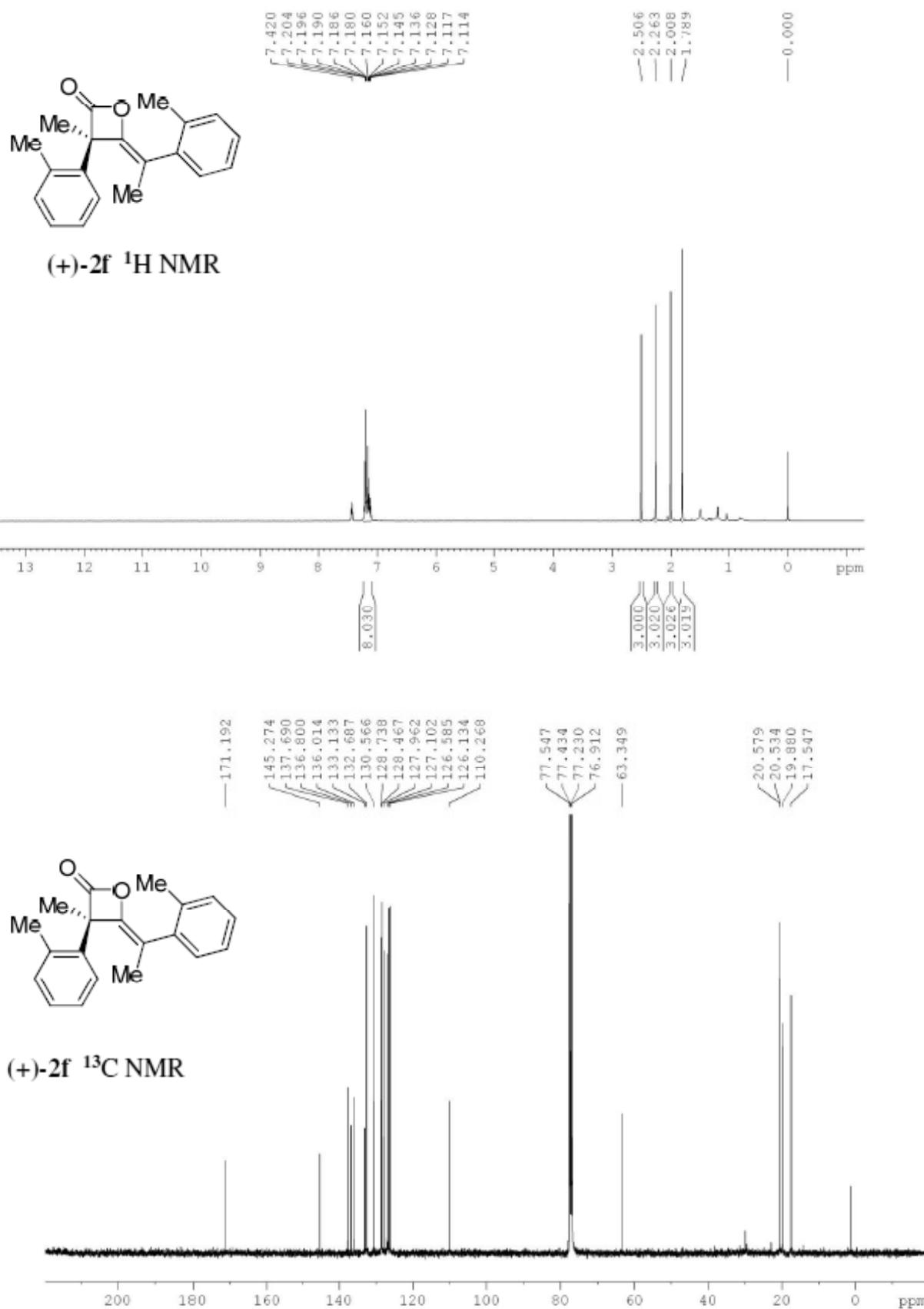


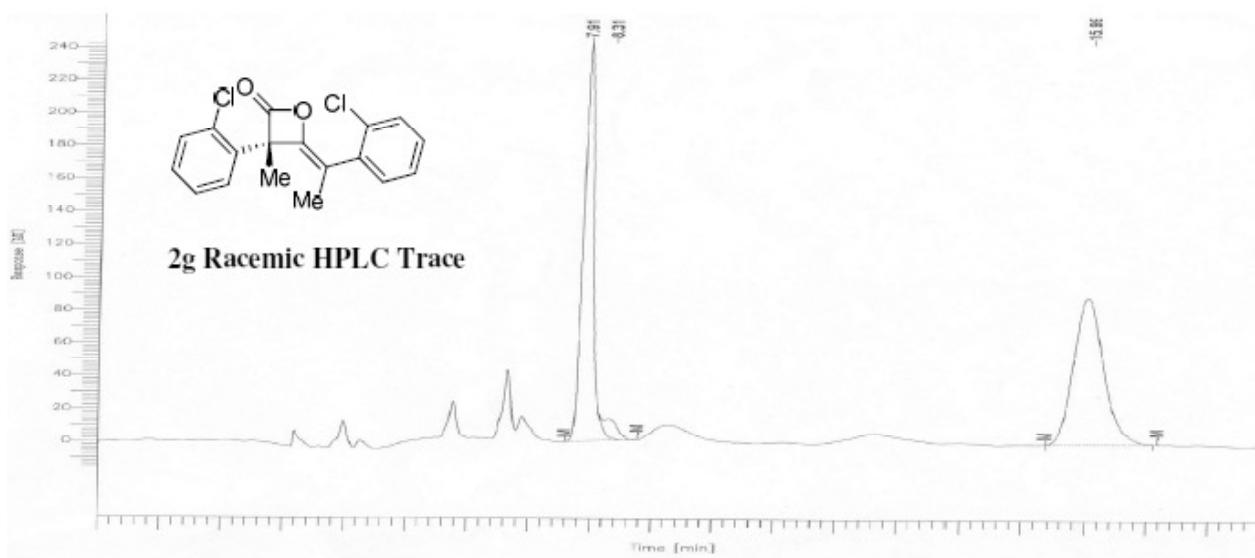


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	Area BL	Area/Height [s]
1	8.758	9132024.32	581571.28	55.48	0.00	*BB	15.70
2	10.932	7328666.44	425777.10	44.52	0.00	*BB	17.21
			16460690.76	1.01e+06	100.00	0.00	

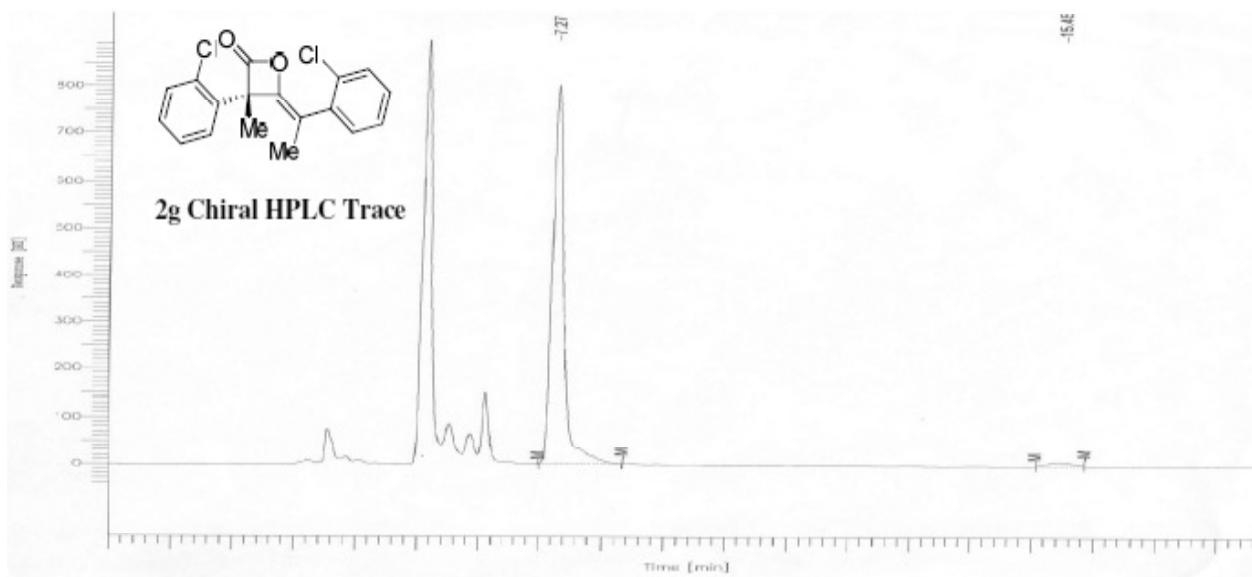


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1	8.834	21660629.21	1.53e+06	96.94	0.00	*BB	14.20
2	11.121	682637.51	45112.18	3.06	0.00	*BB	15.13
		22343266.72	1.57e+06	100.00	0.00		

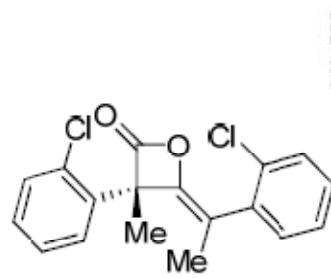
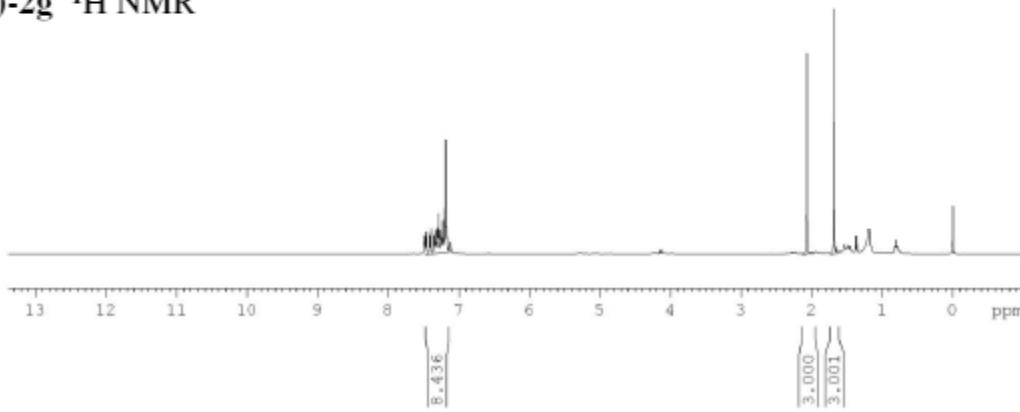
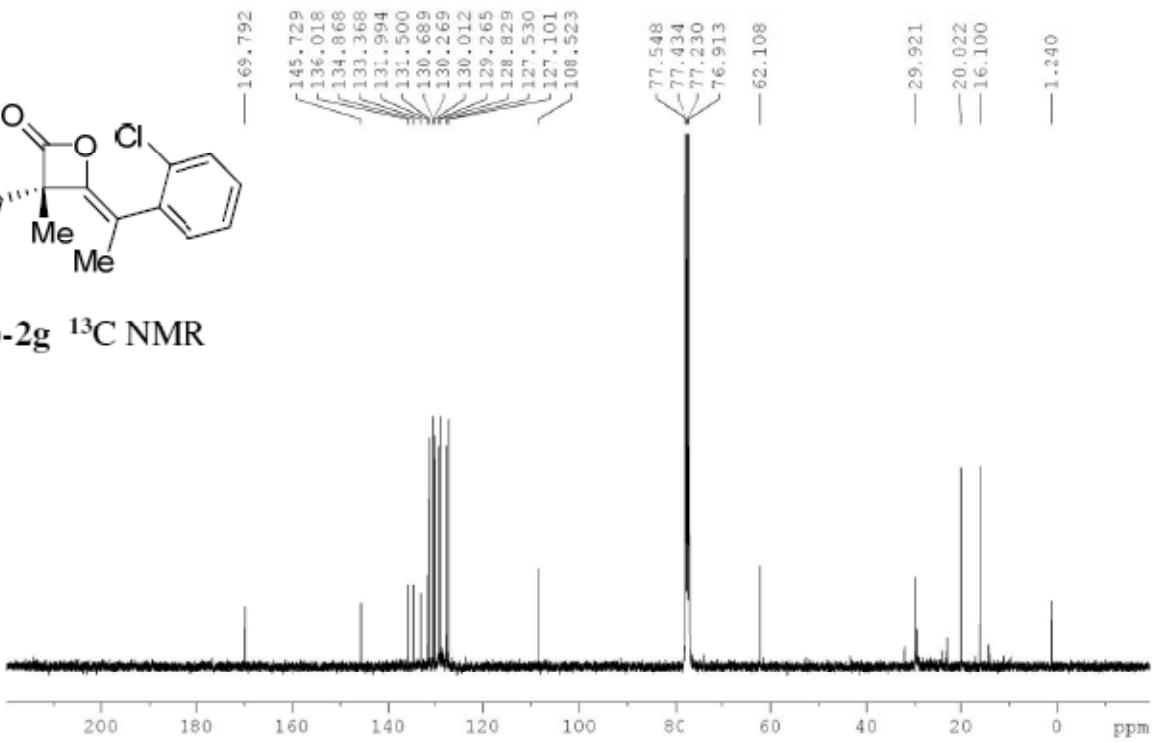


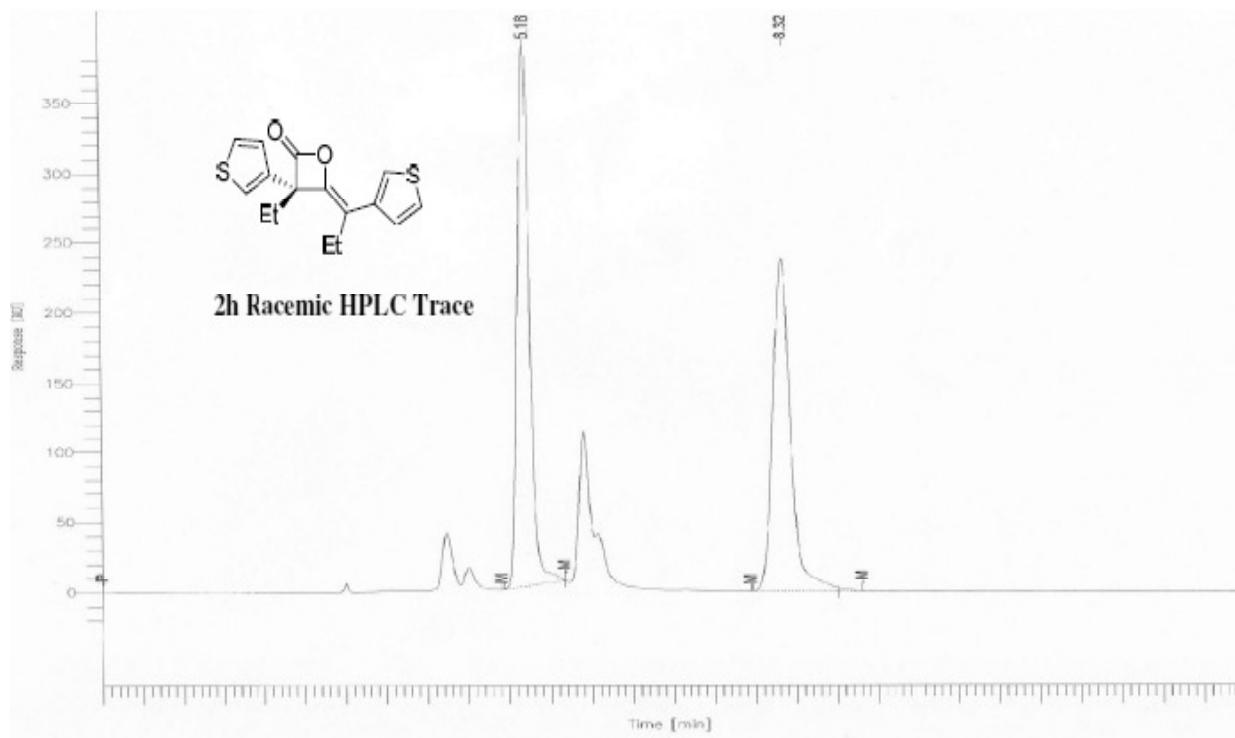


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL [s]	Area/Height [s]
1	7.911	2922402.81	242781.07	47.53	0.00	*BE	12.04
2	8.310	179375.04	11094.52	2.92	0.00	*EB	16.17
3	15.986	3047025.15	89316.59	49.55	0.00	*BB	34.11
		6148803.00	343192.18	100.00	0.00		

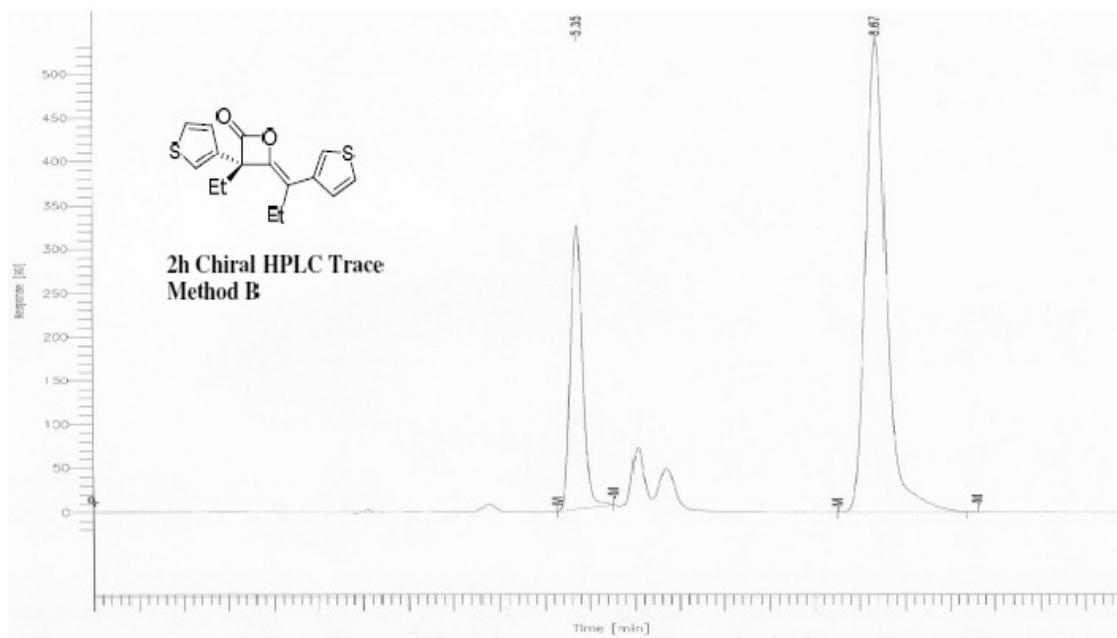


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	Area BL [s]	Area/Height [s]
1	7.269	10718992.31	802520.84	98.07	0.00	*BB	13.36
2	15.450	210773.23	8338.48	1.93	0.00	*BB	25.28
		10929765.55	810859.32	100.00	0.00		

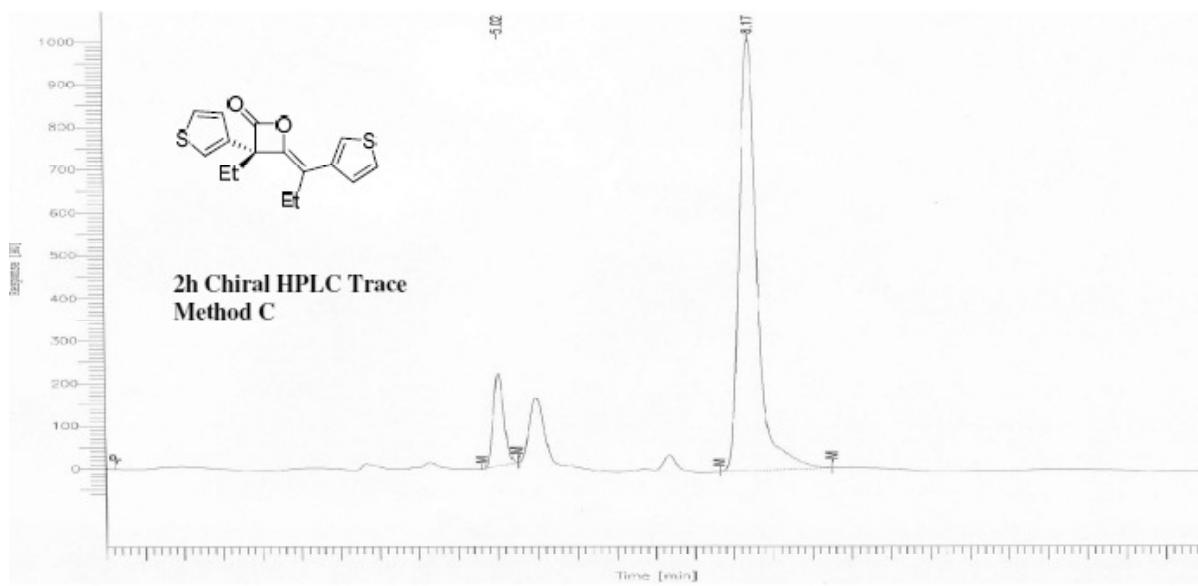
(-)-2g ^1H NMR(-)-2g ^{13}C NMR



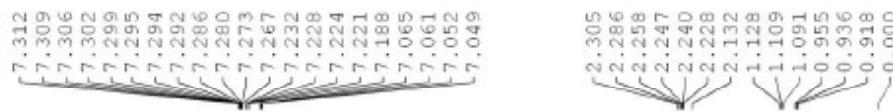
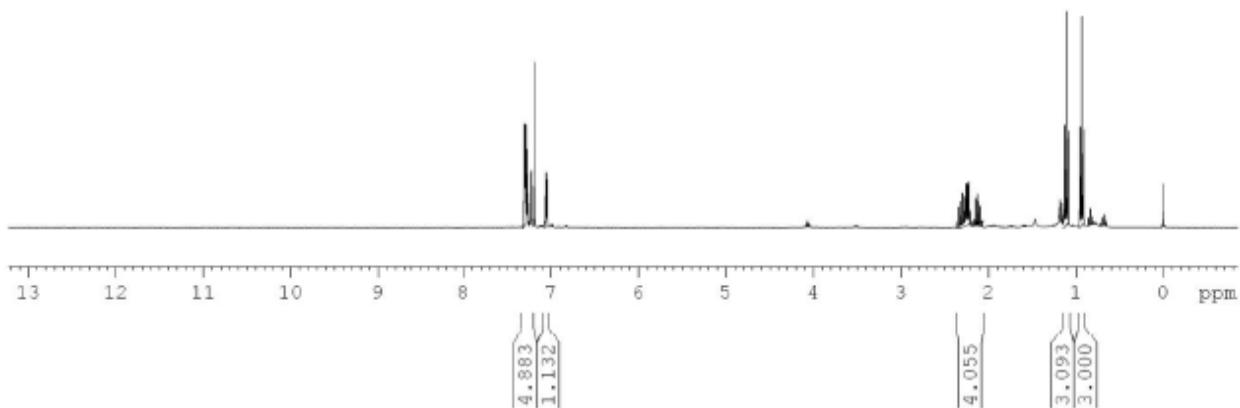
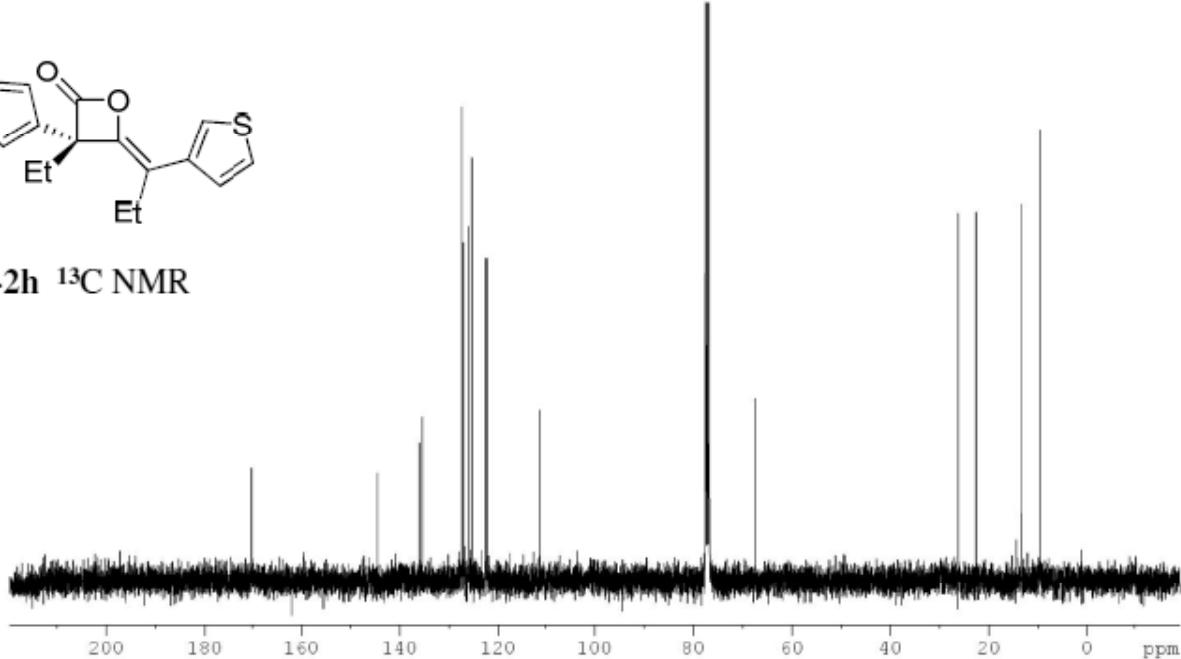
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1	5.181	3592723.91	386139.55	50.02	0.00	*BB	9.30
2	8.315	3589887.97	237248.47	49.98	0.00	*BB	15.13
		7182611.88	623388.02	100.00	0.00		

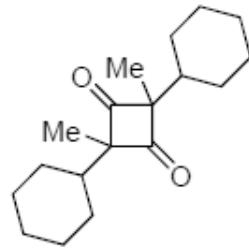
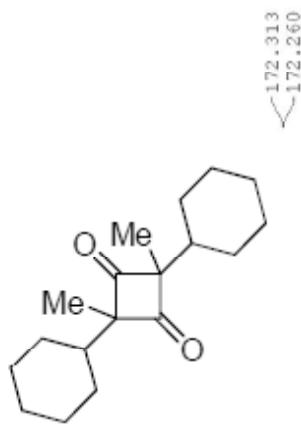
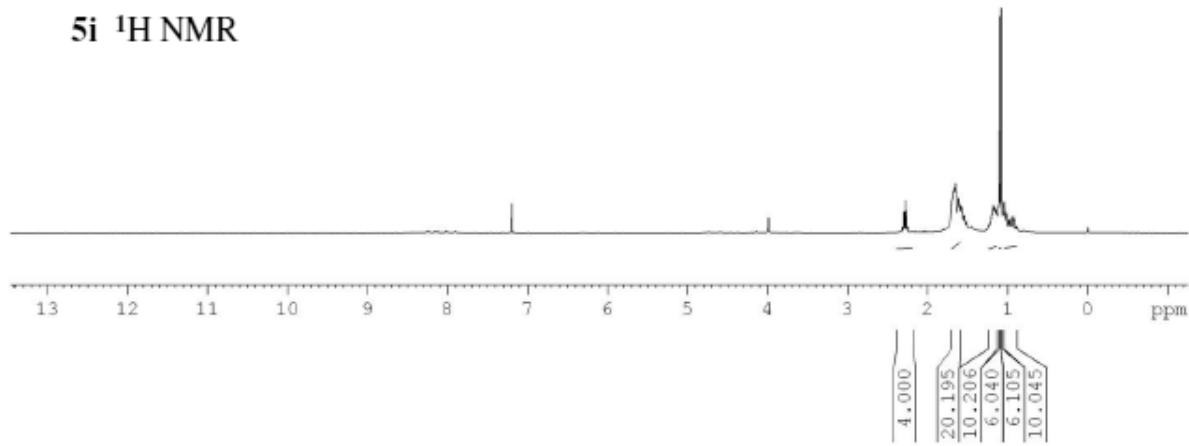
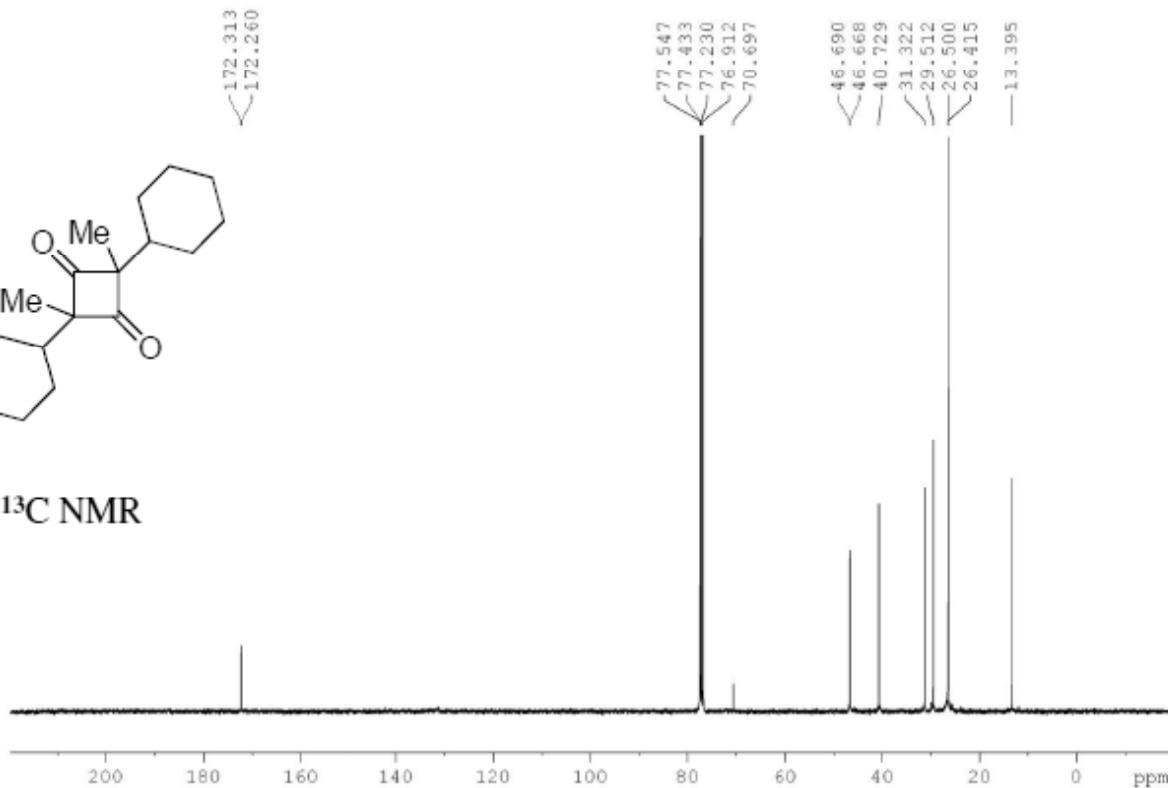


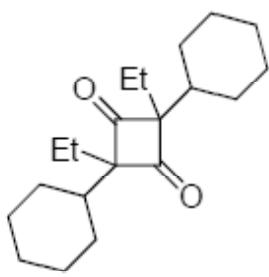
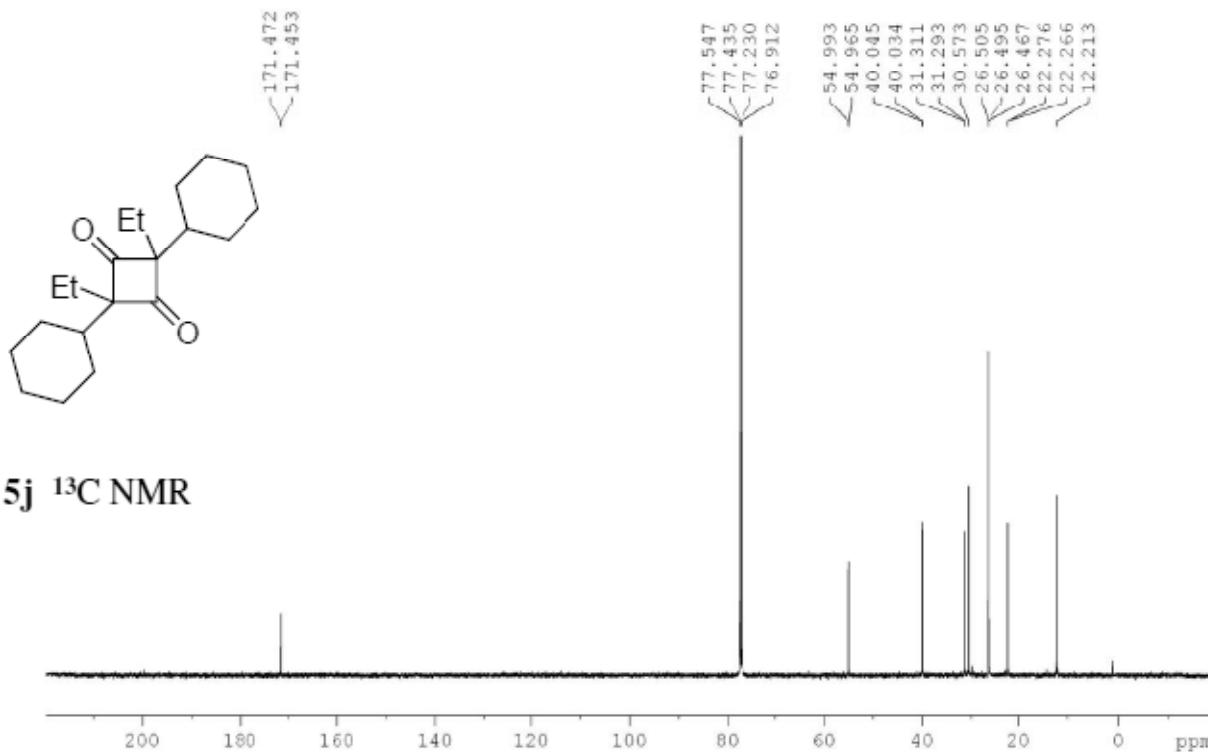
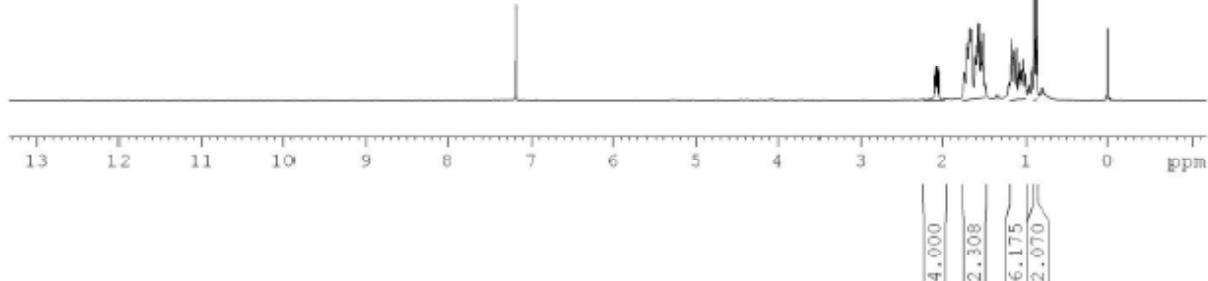
Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	Area BL	Area/Height [s]
1	5.350	3074594.57	324648.65	26.93	0.00	*BB	9.47
2	8.665	8343817.23	536663.48	73.07	0.00	*BB	15.55
			11418411.80	861312.13	100.00	0.00	

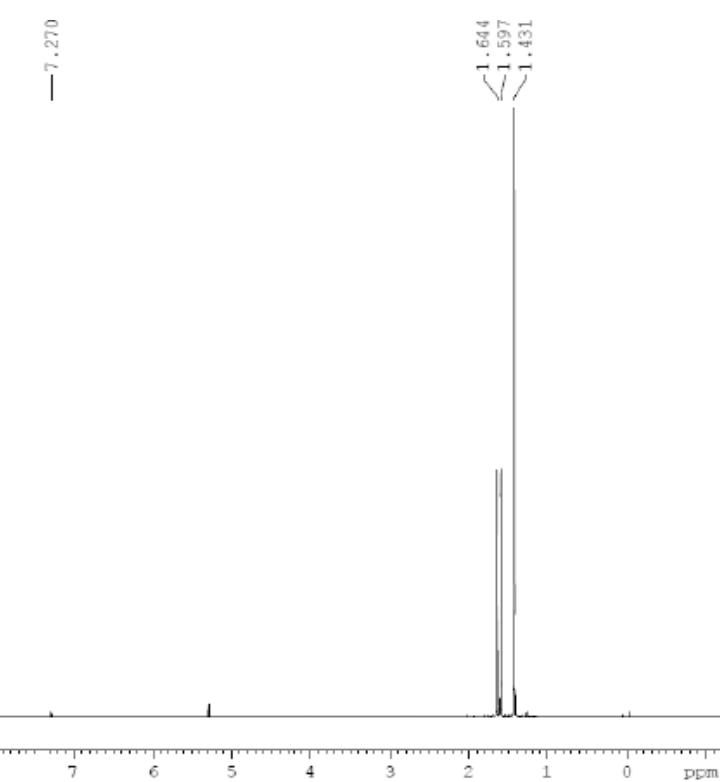


Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	5.016	2016397.58	217287.21	11.25	0.00	*BB	9.28
2	8.169	15913583.56	1.01e+06	88.75	0.00	*BB	15.74
		17929981.14	1.23e+06	100.00	0.00		

(-)-2h ^1H NMR(-)-2h ^{13}C NMR

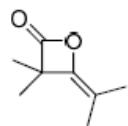
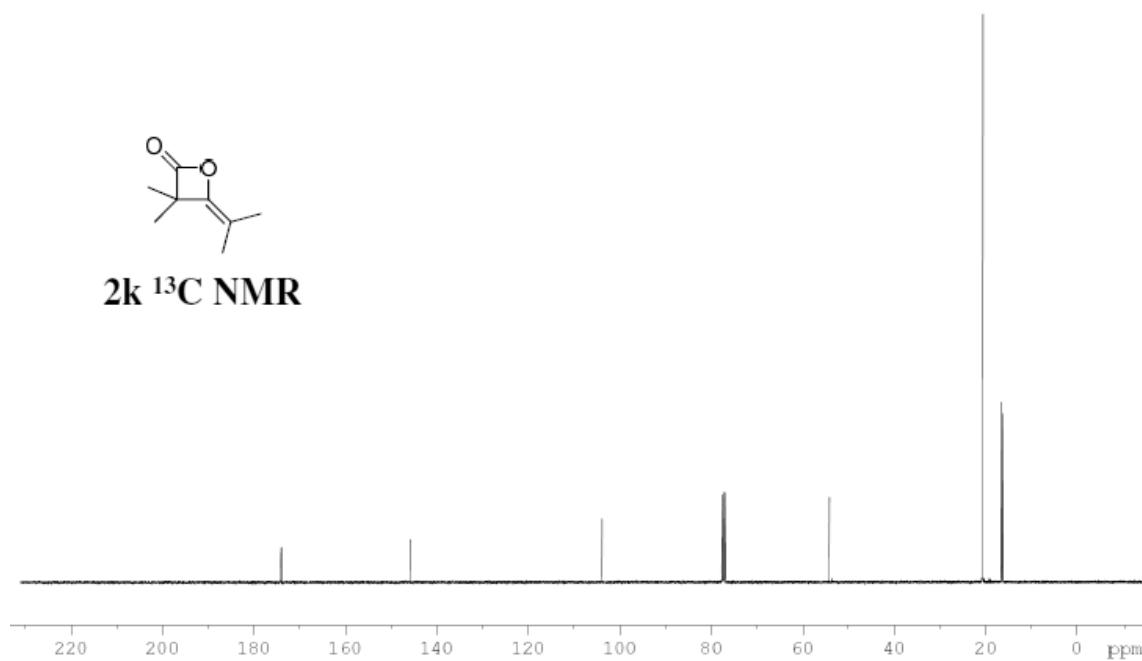
**5i** ¹H NMR**5i** ¹³C NMR

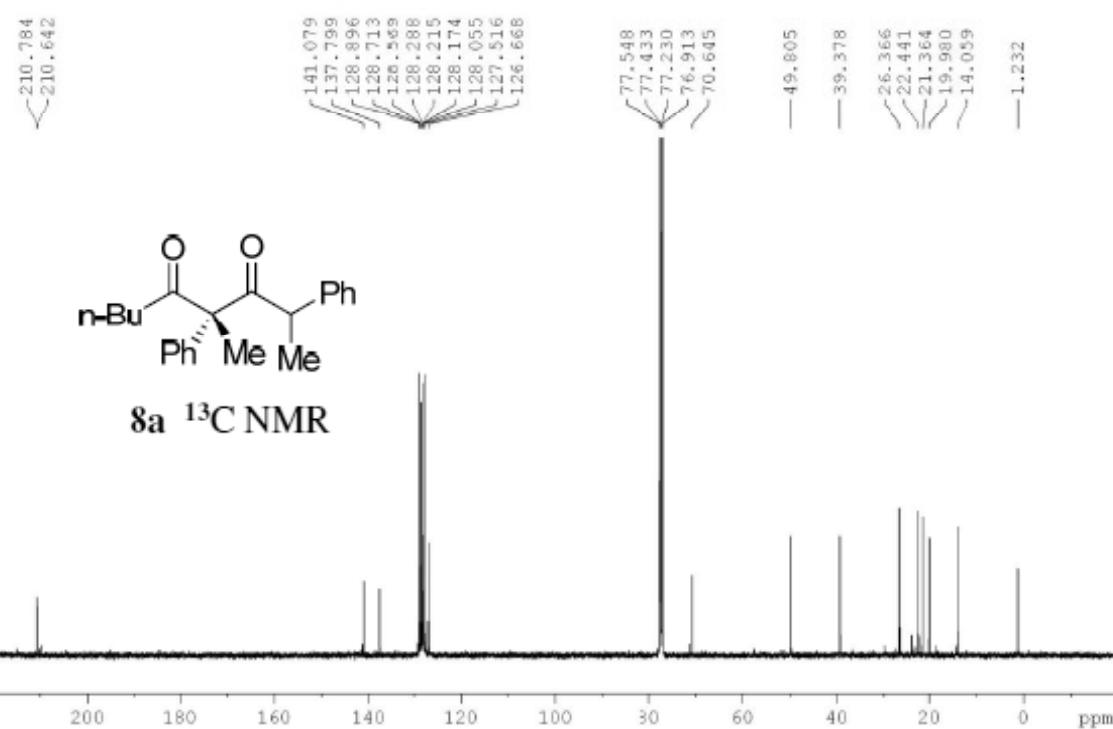
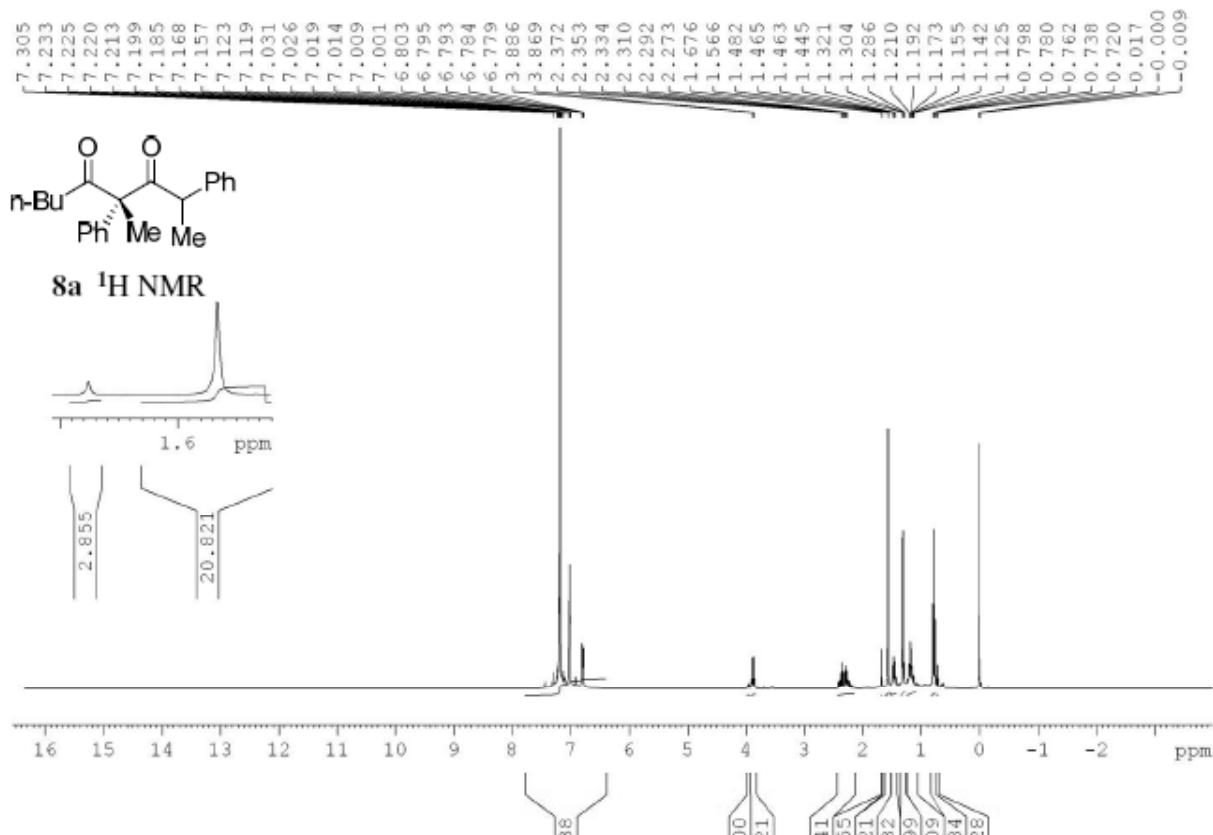
**5j** ^1H NMR

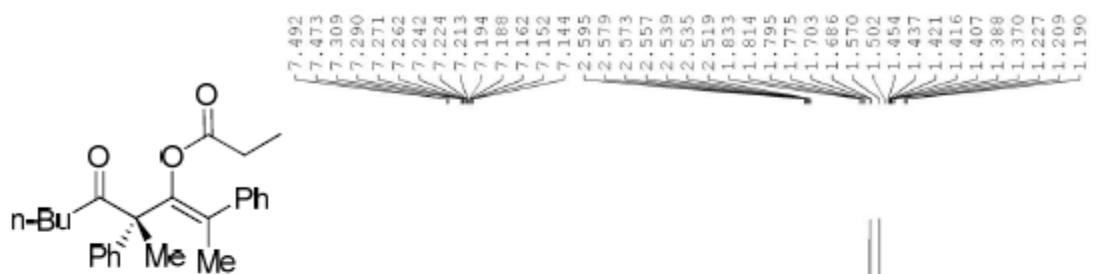
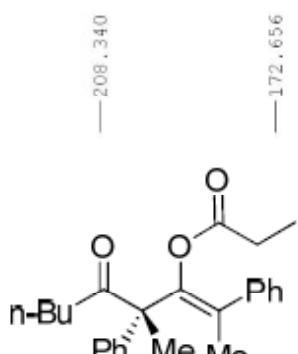
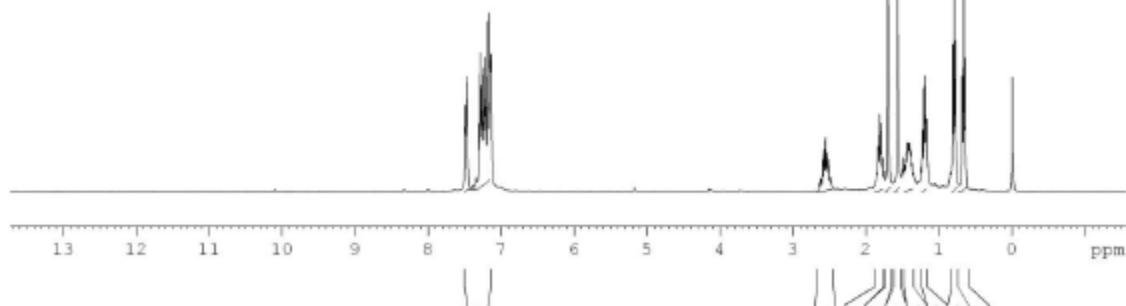
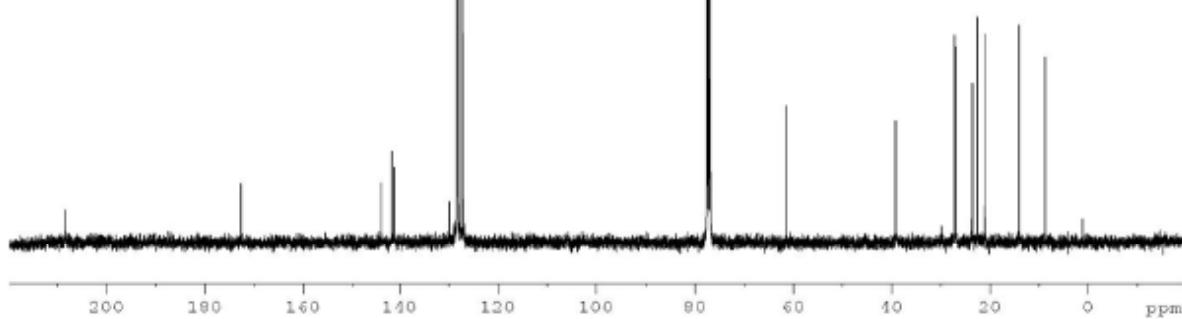
**2k** ¹H NMR

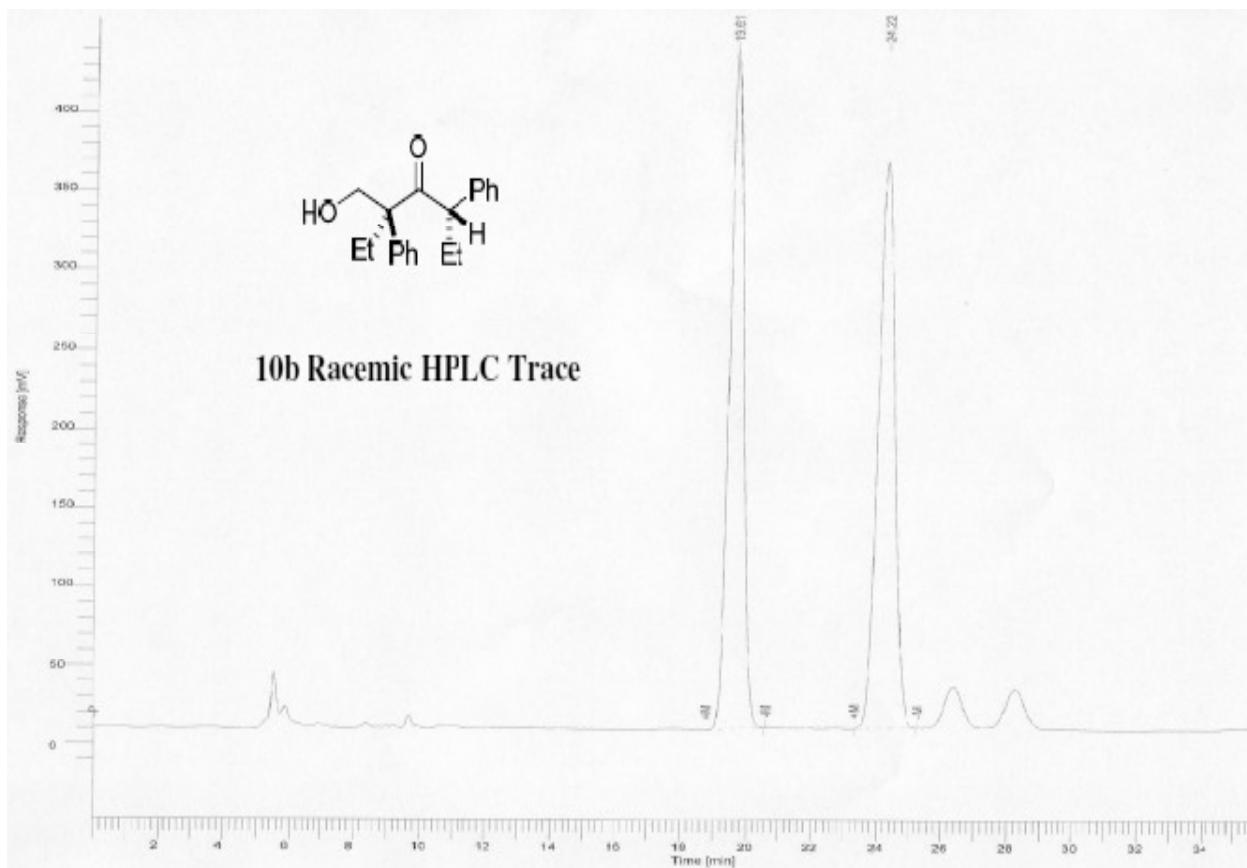
— 174.012
— 145.723
— 103.730
— 54.073

77.550
77.232
76.914

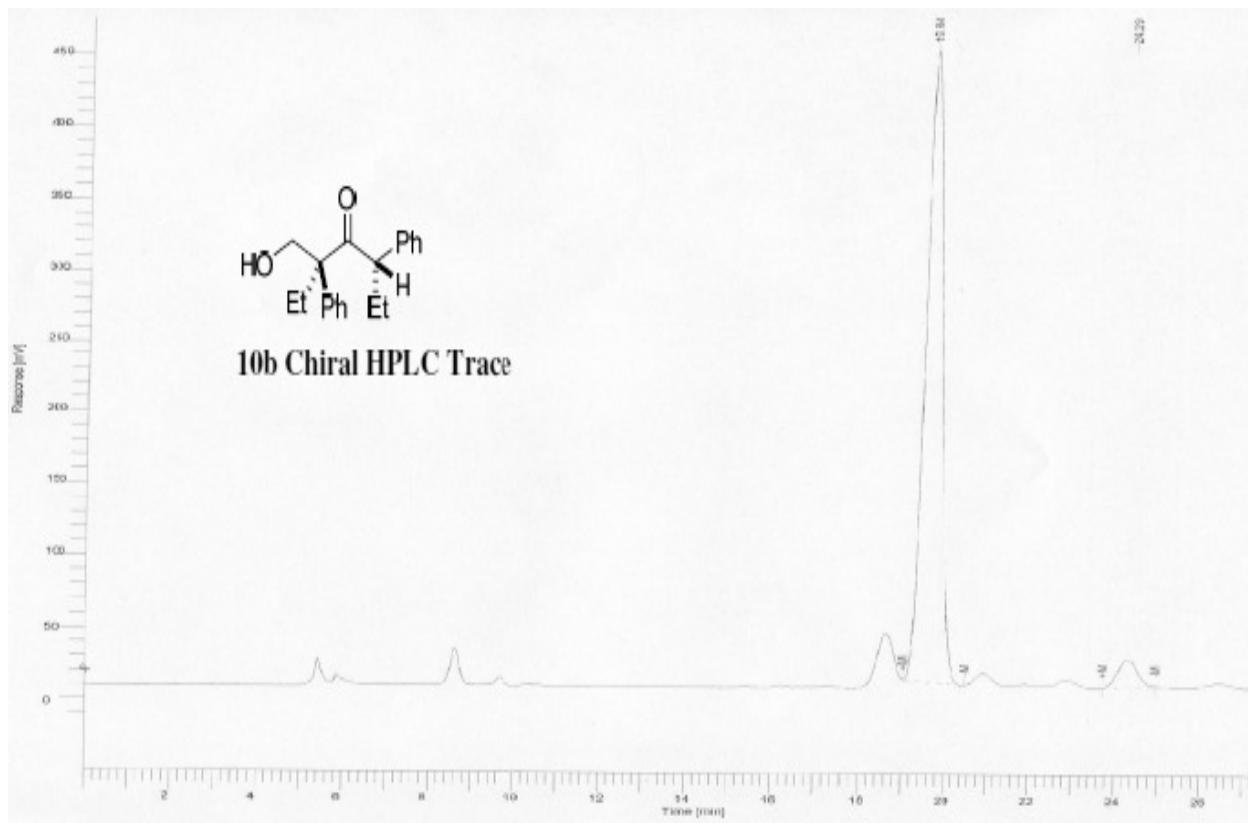
**2k** ¹³C NMR



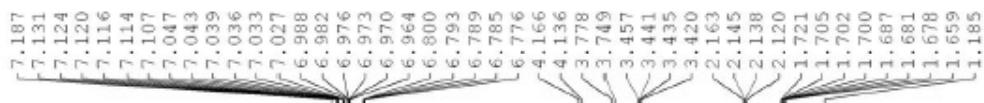
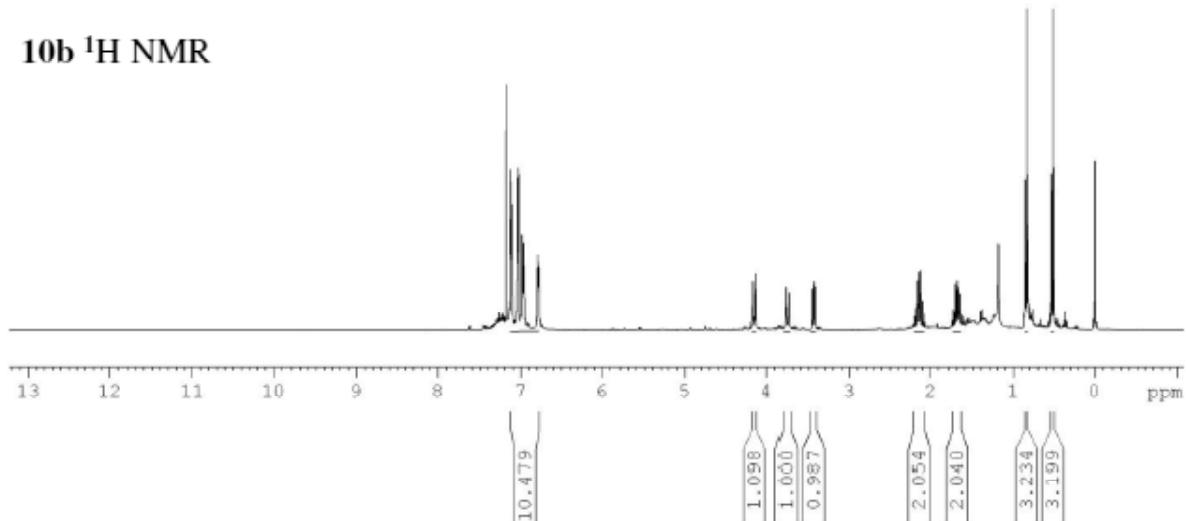
**9a** ¹H NMR**9a** ¹³C NMR



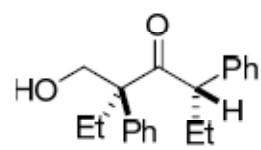
Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	19.606	12580326.07	429593.83	49.79	49.79	*BB	29.2842
2	24.223	12685639.43	358177.13	50.21	50.21	*BB	35.4172
		25265965.50	787770.97	100.00	100.00		



Peak #	Time [min]	Area [$\mu\text{V}\cdot\text{s}$]	Height [μV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	19.639	12391224.09	441752.88	95.30	95.30	*BB	28.0501
2	24.293	611311.30	19148.74	4.70	4.70	*BB	31.9244
		13002535.39	460901.62	100.00	100.00		

**10b** ^1H NMR

— 213.461

**10b** ^{13}C NMR