Supplementary Information

1. CATALYTIC STEREOSELECTIVE BORYLATIVE TRANSANNULAR REACTIONS

1.1. NMR spectra

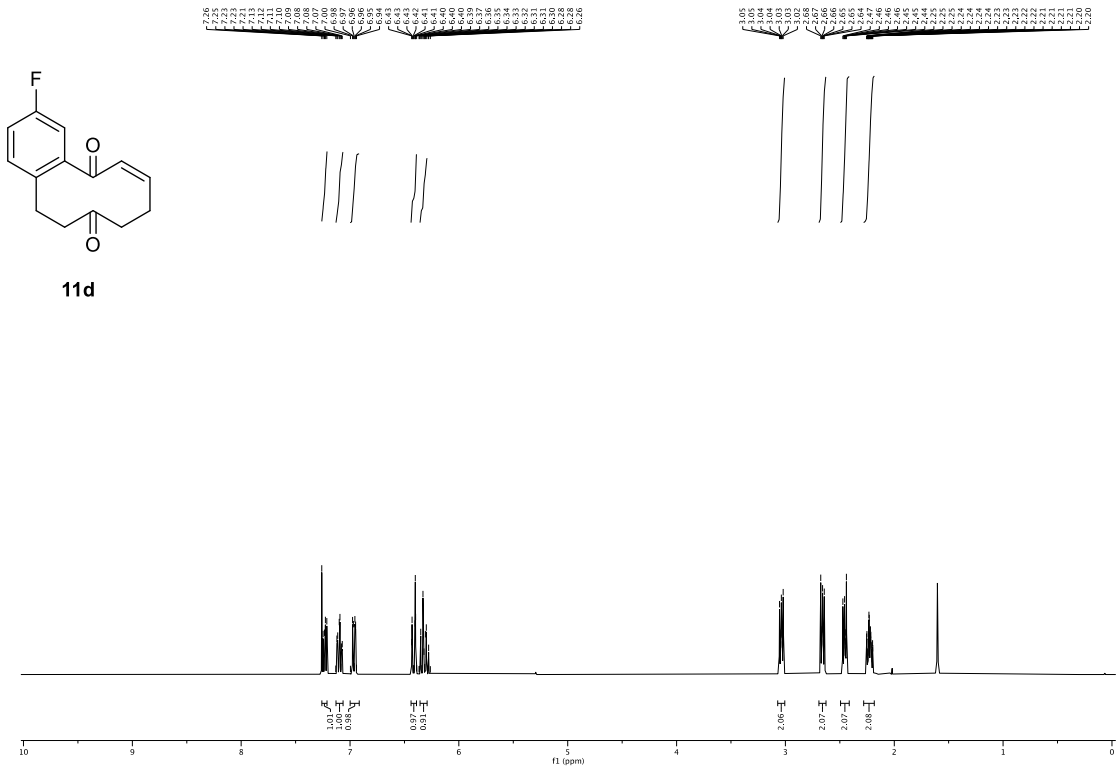


Figure SI-1. ^{1}H-NMR spectra of compound **11d**.

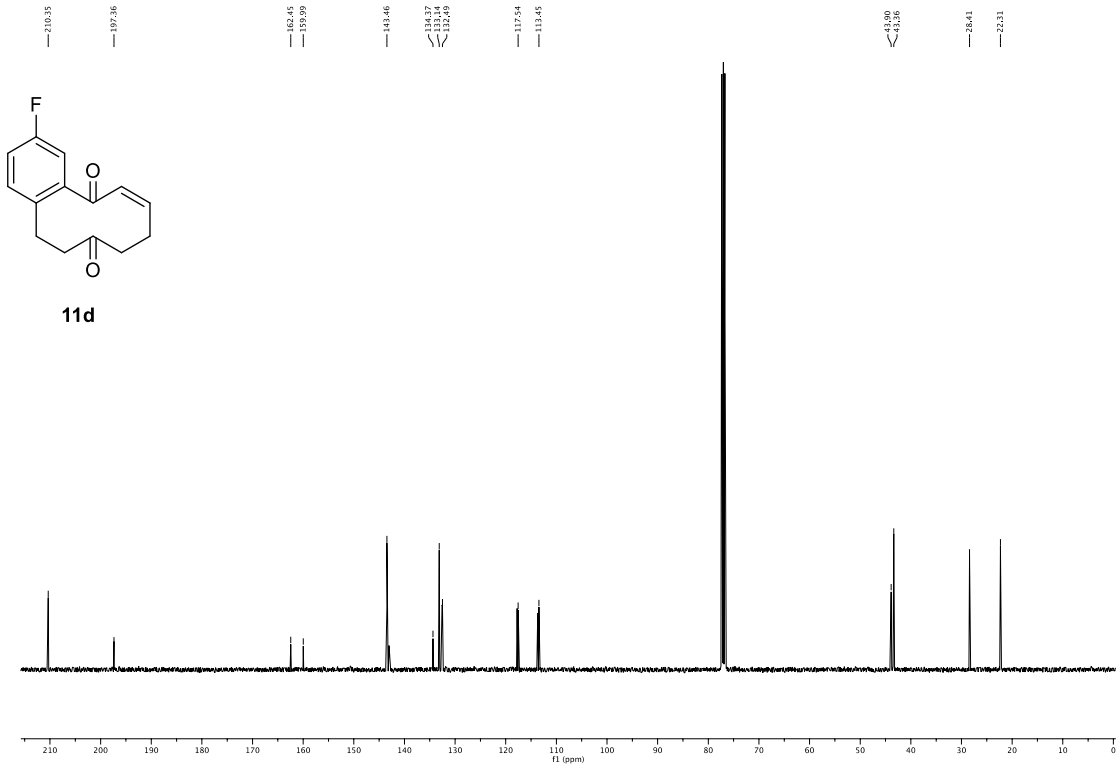


Figure SI-2. ^{13}C-NMR spectra of compound **11d**.

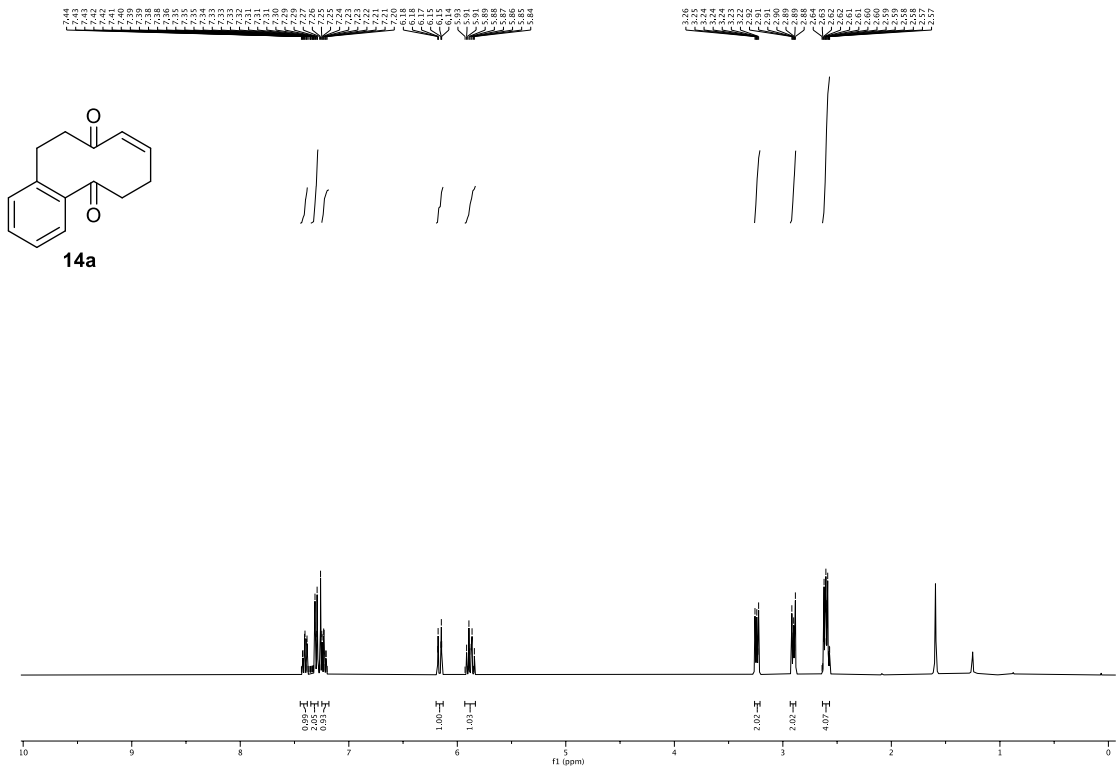


Figure SI-3. ^{1}H-NMR spectra of compound **14a**.

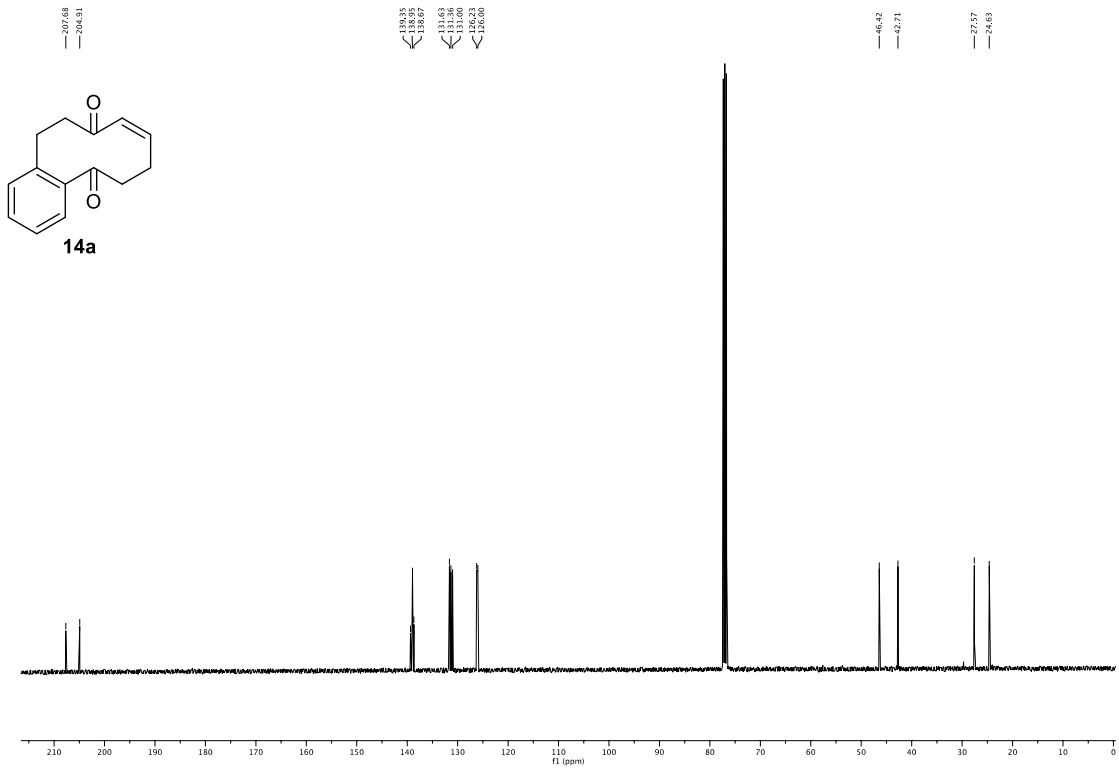


Figure SI-4. ^{13}C-NMR spectra of compound **14a**.

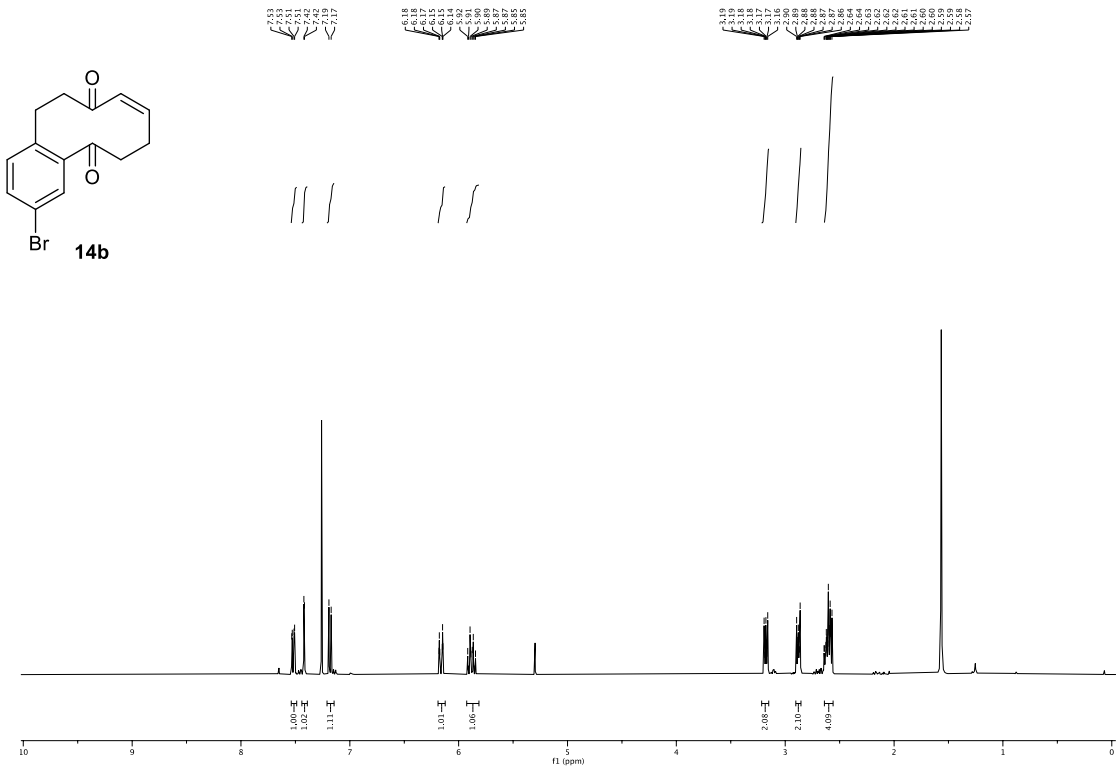


Figure SI-5. ^{1}H-NMR spectra of compound **14b**.

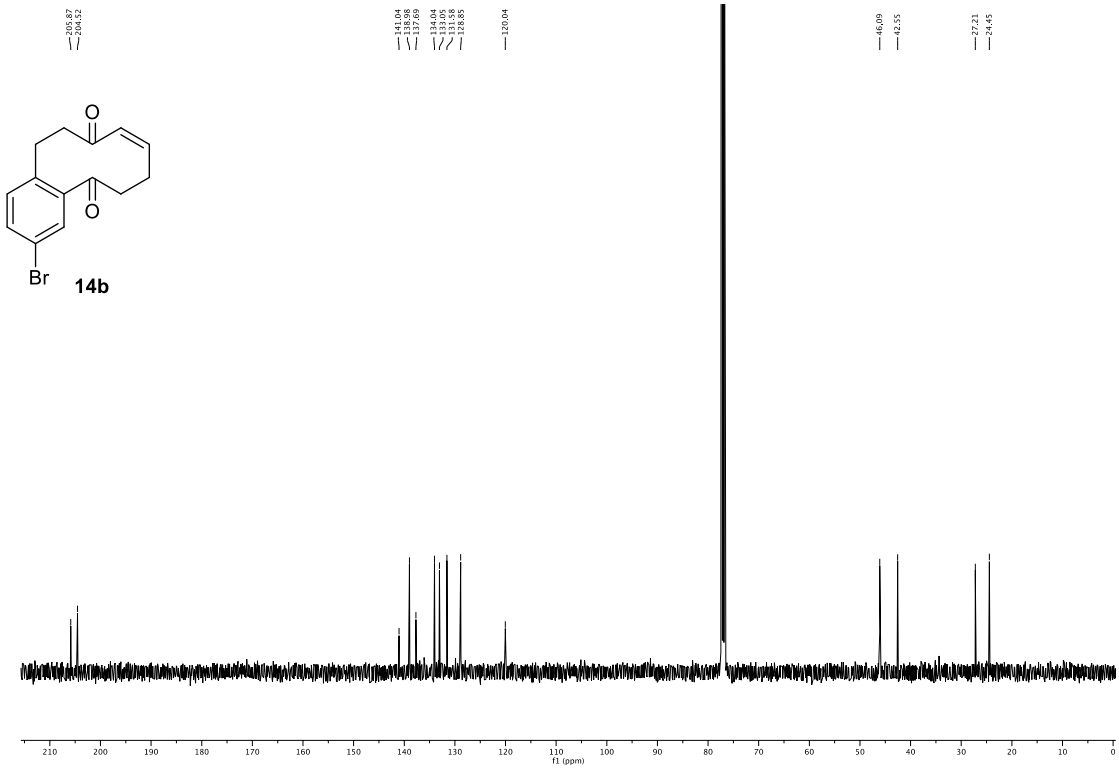


Figure SI-6. ^{13}C-NMR spectra of compound **14b**.

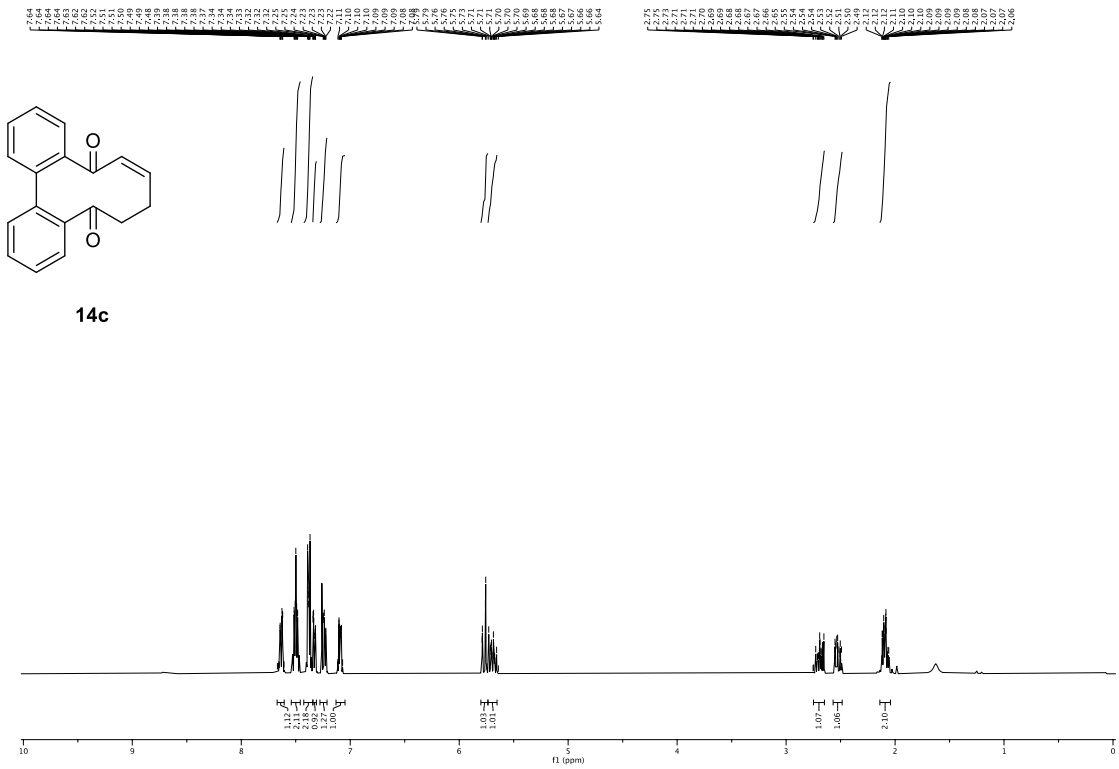


Figure SI-7. ^{1}H-NMR spectra of compound **14c**.

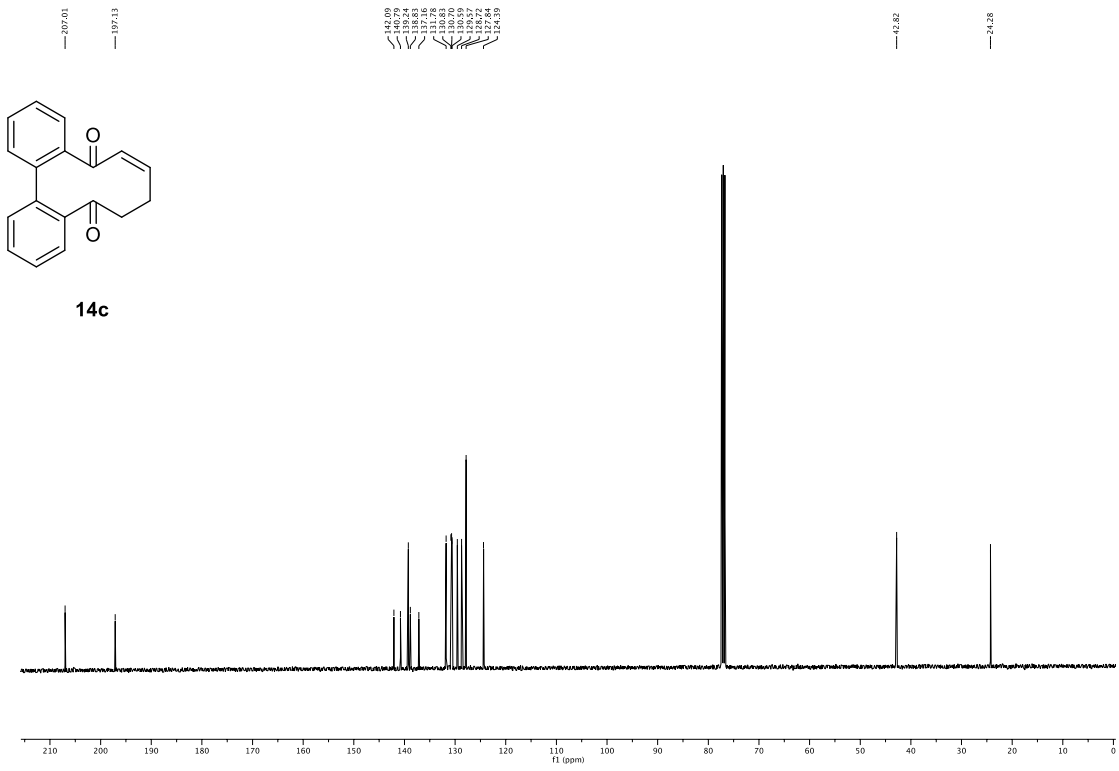


Figure SI-8. ^{13}C-NMR spectra of compound **14c**.

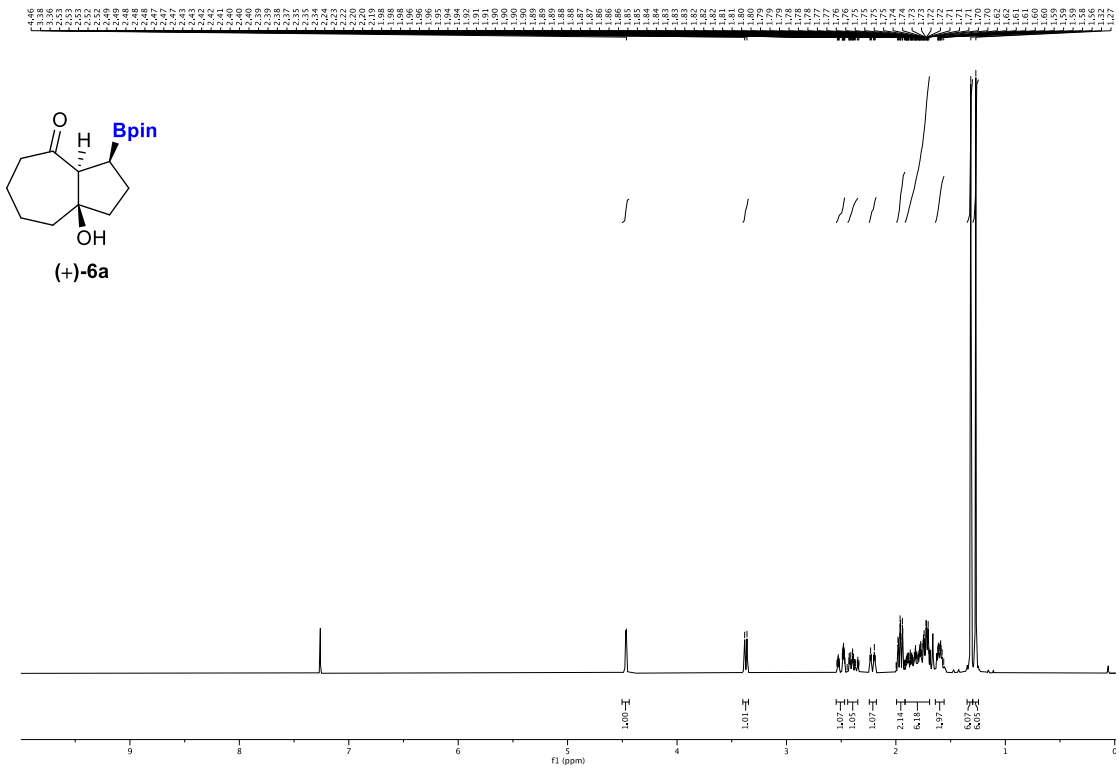


Figure SI-9. ^{1}H-NMR spectra of compound (+)-**6a**.

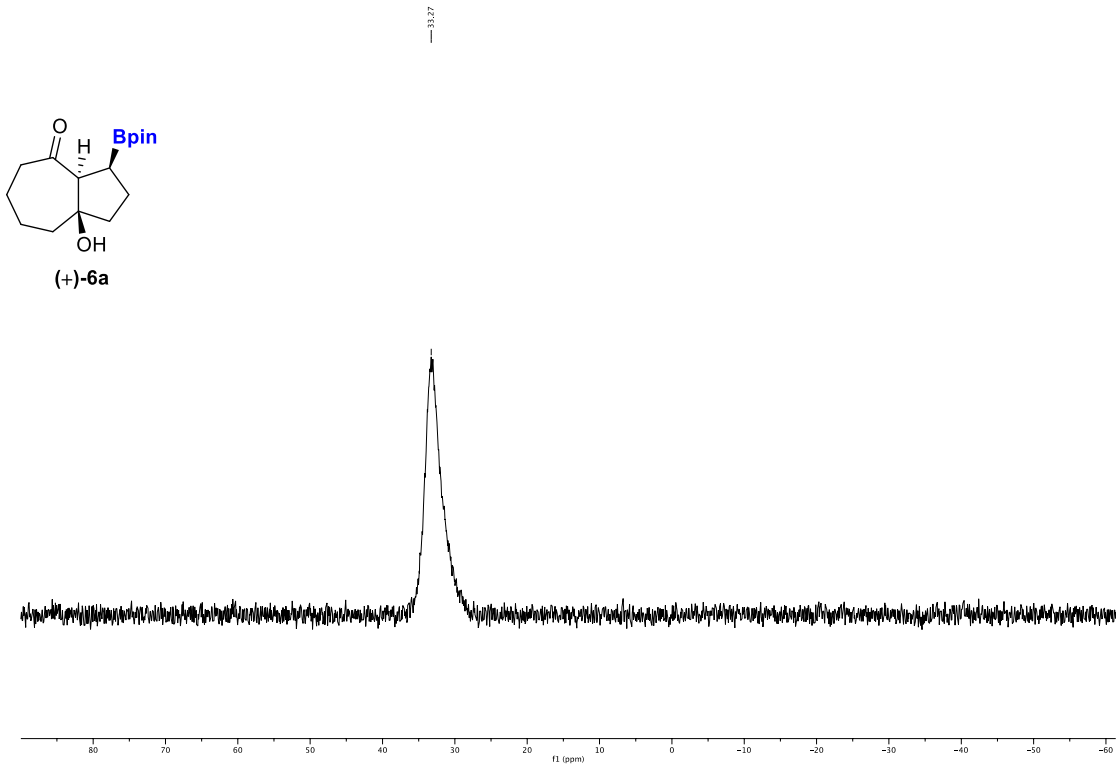


Figure SI-10. ^{11}B-NMR spectra of compound (+)-**6a**.

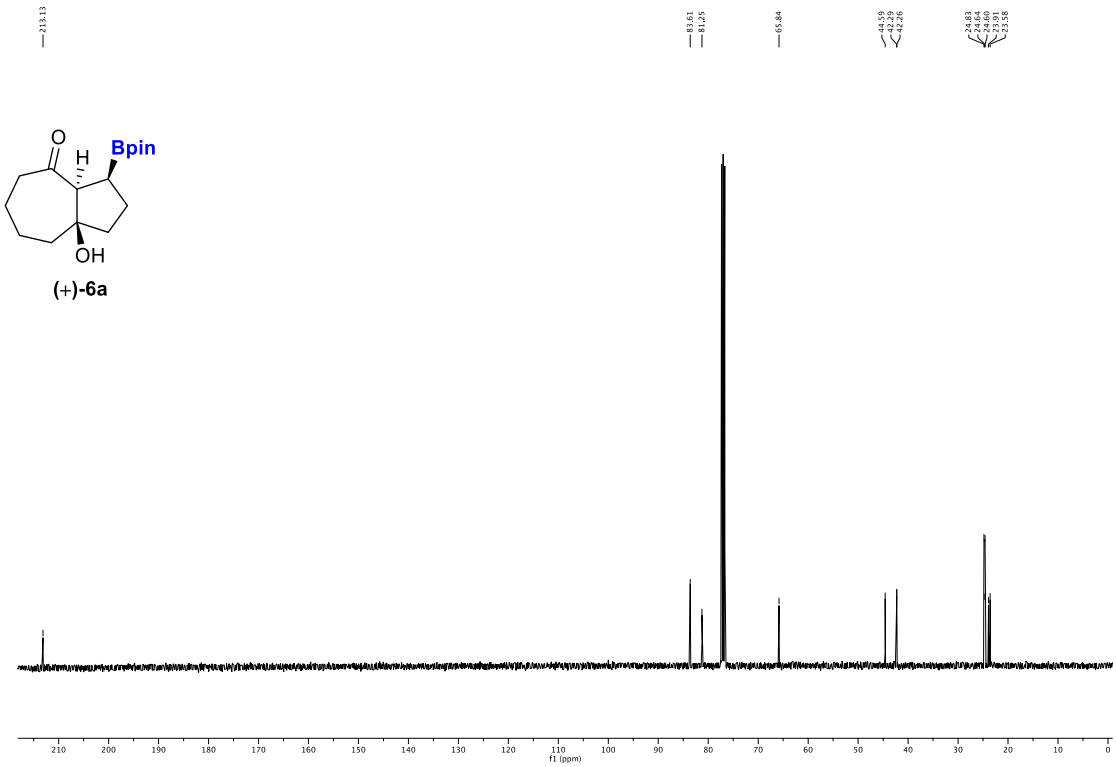


Figure SI-11. ^{13}C-NMR spectra of compound (+)-**6a**.

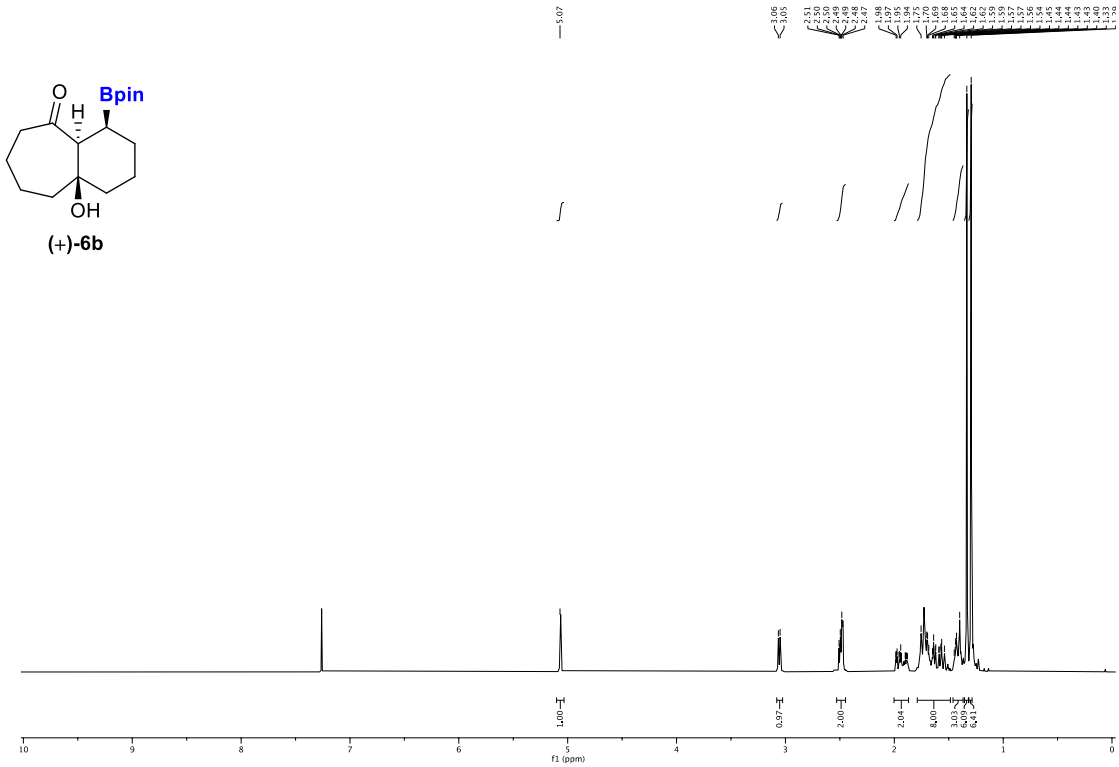


Figure SI-12. ^{1}H-NMR spectra of compound (+)-**6b**.

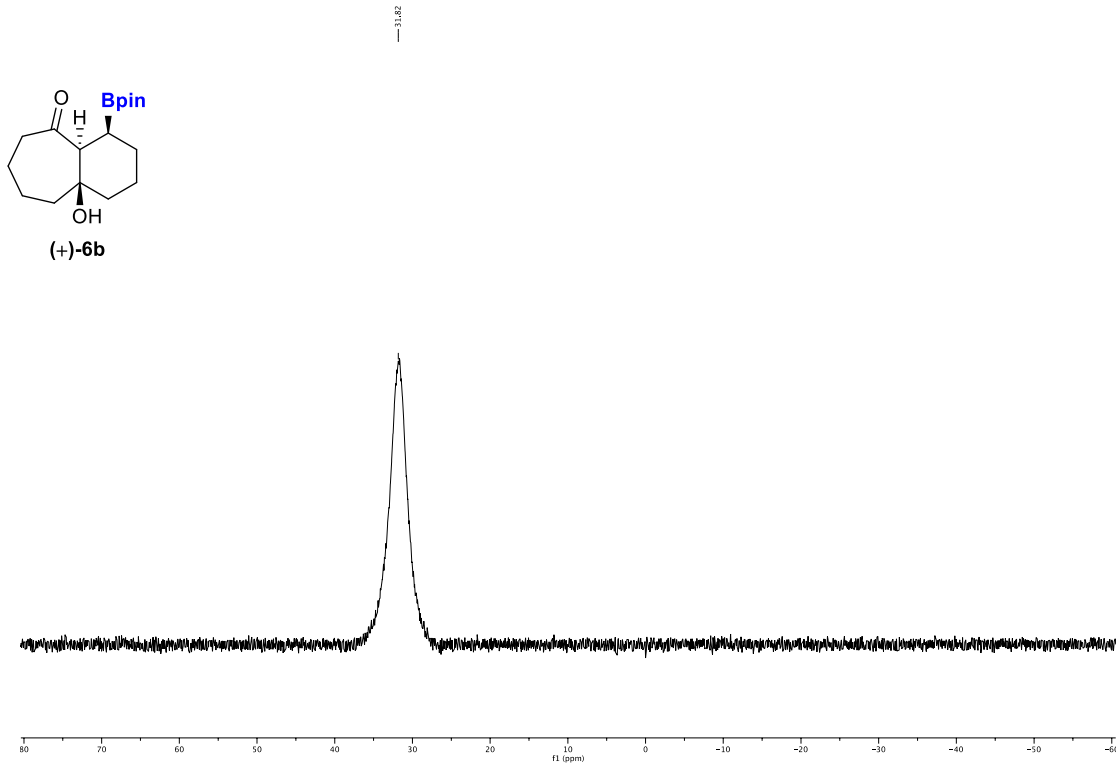


Figure SI-13. ^{11}B-NMR spectra of compound (+)-**6b**.

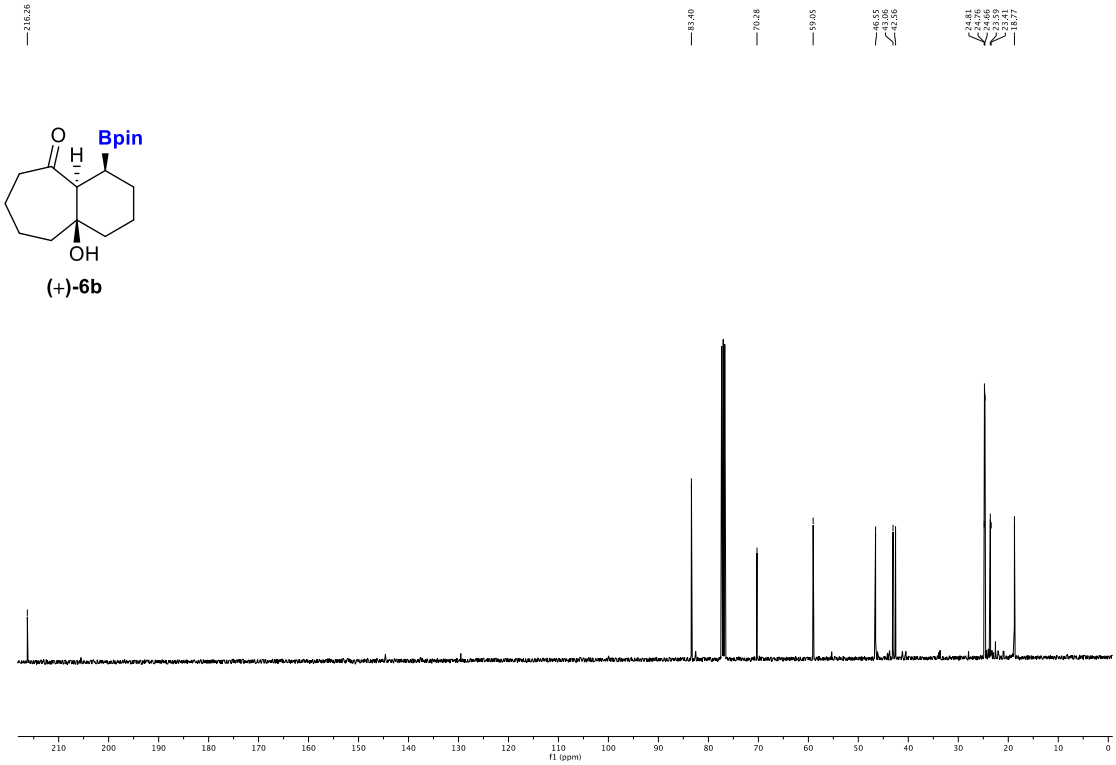


Figure SI-14. ^{13}C-NMR spectra of compound (+)-**6b**.

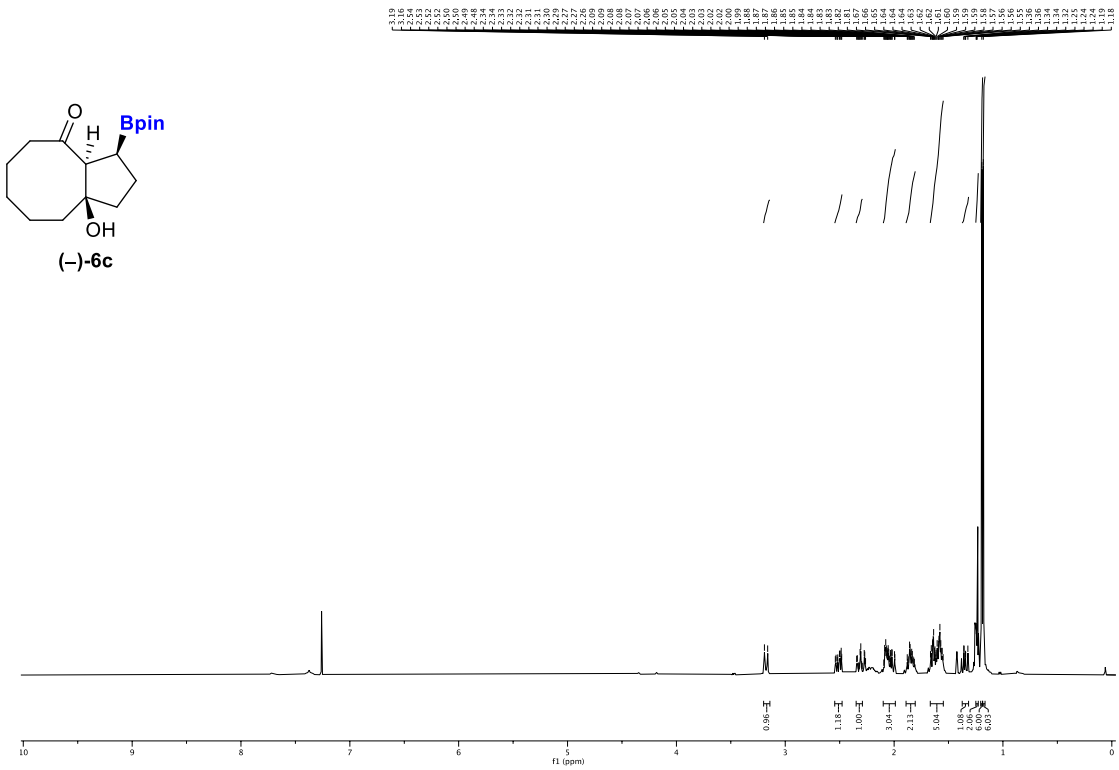


Figure SI-15. ^{1}H-NMR spectra of compound (-)-**6c**.

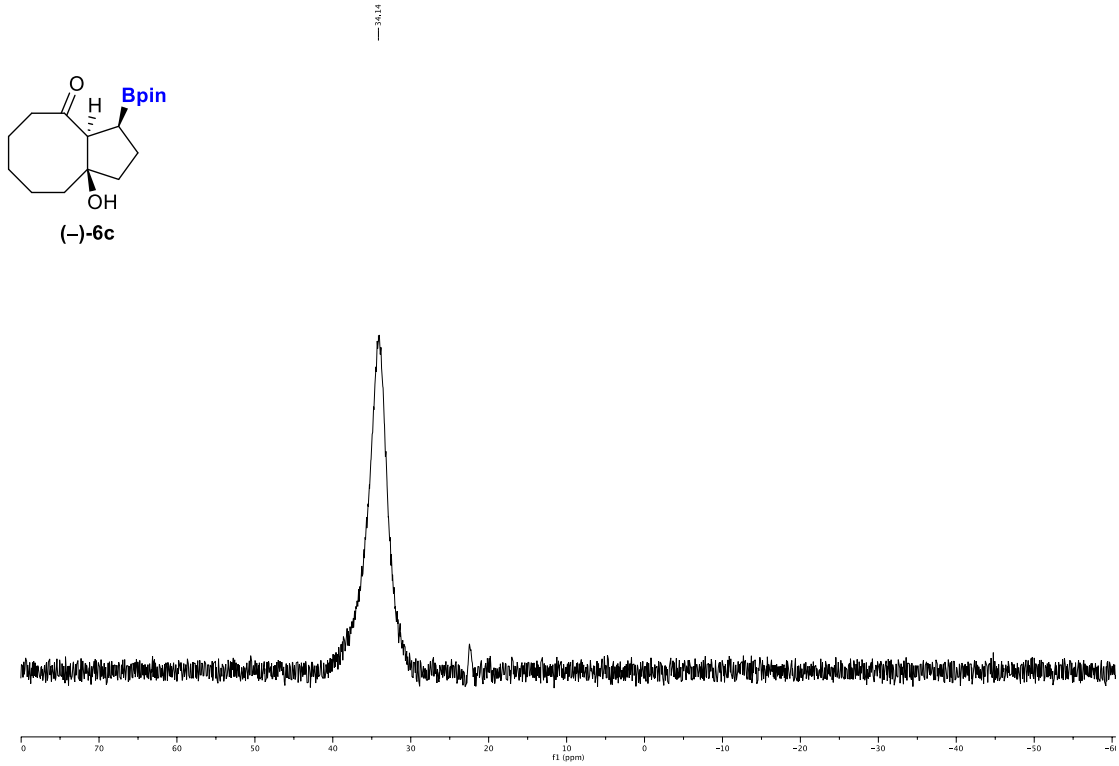


Figure SI-16. ^{11}B-NMR spectra of compound (-)-**6c**.

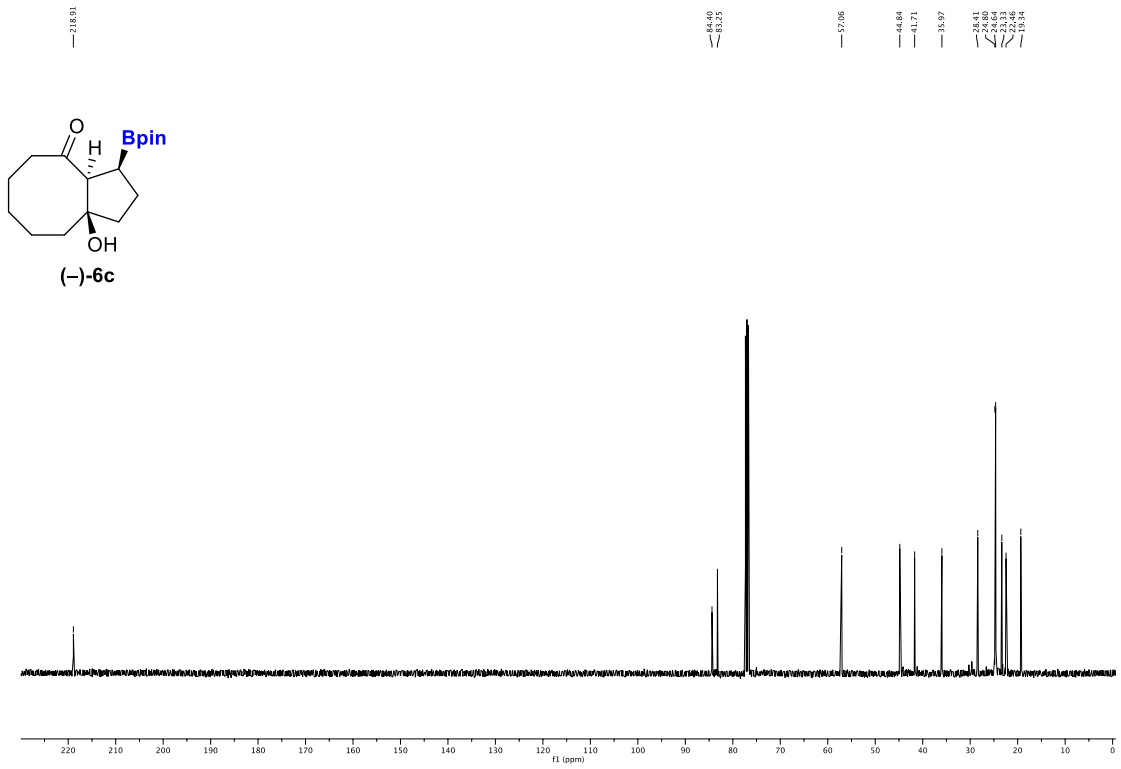


Figure SI-17. ^{13}C-NMR spectra of compound (-)-**6c**.

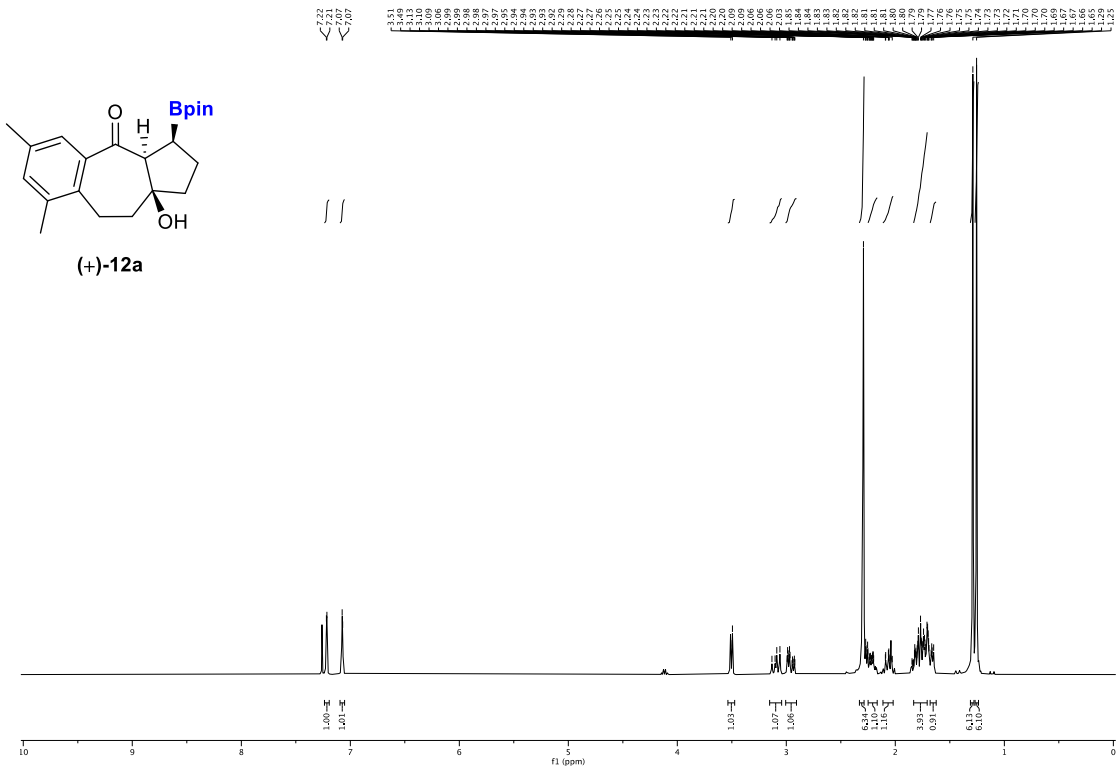


Figure SI-18. ^{1}H-NMR spectra of compound (+)-**12a**.

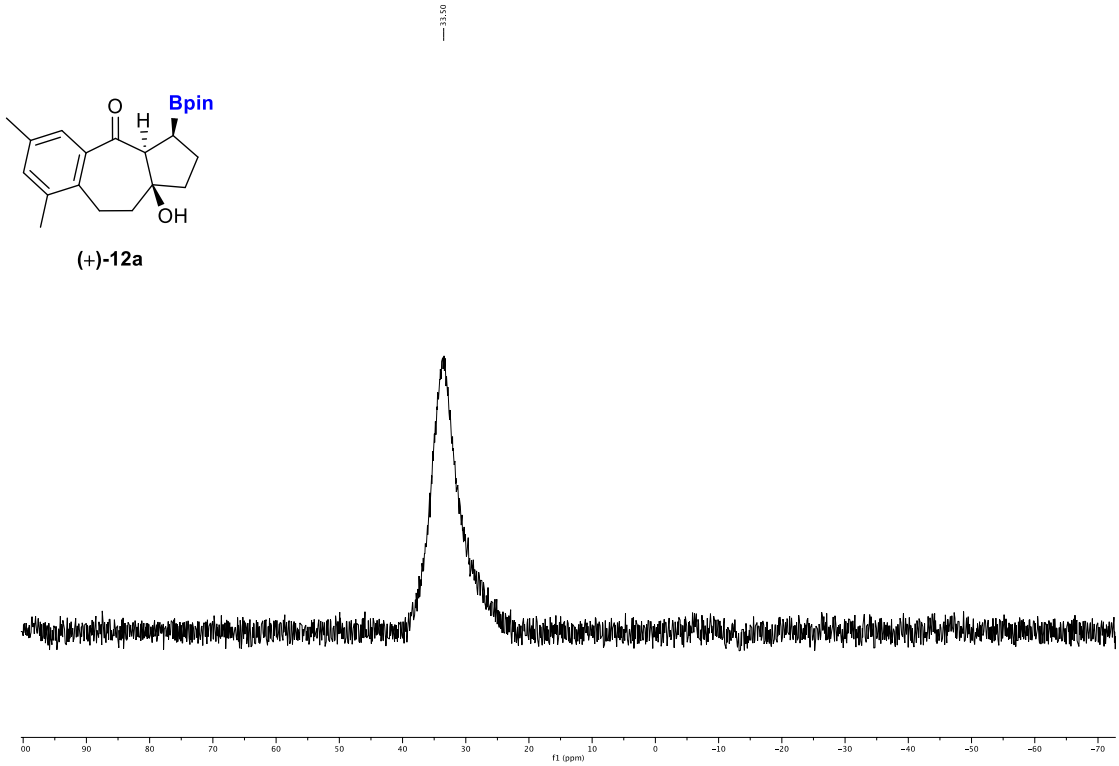


Figure SI-19. ^{11}B-NMR spectra of compound (+)-**12a**.

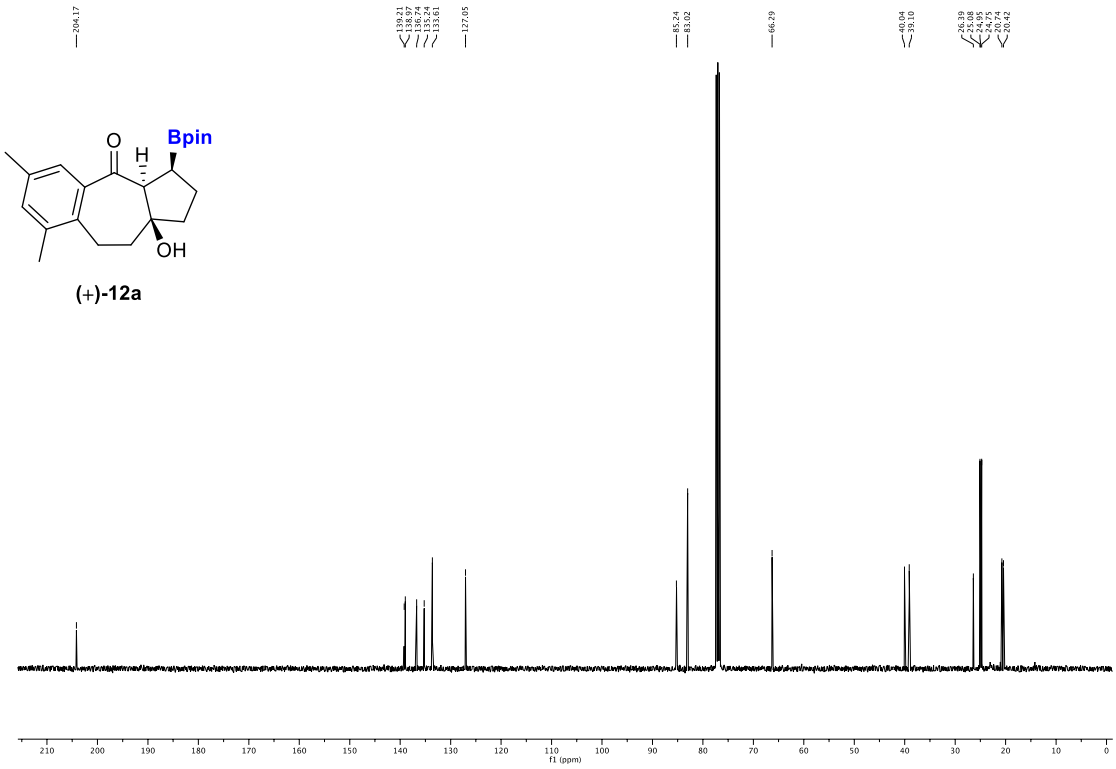


Figure SI-20. ^{13}C-NMR spectra of compound (+)-**12a**.

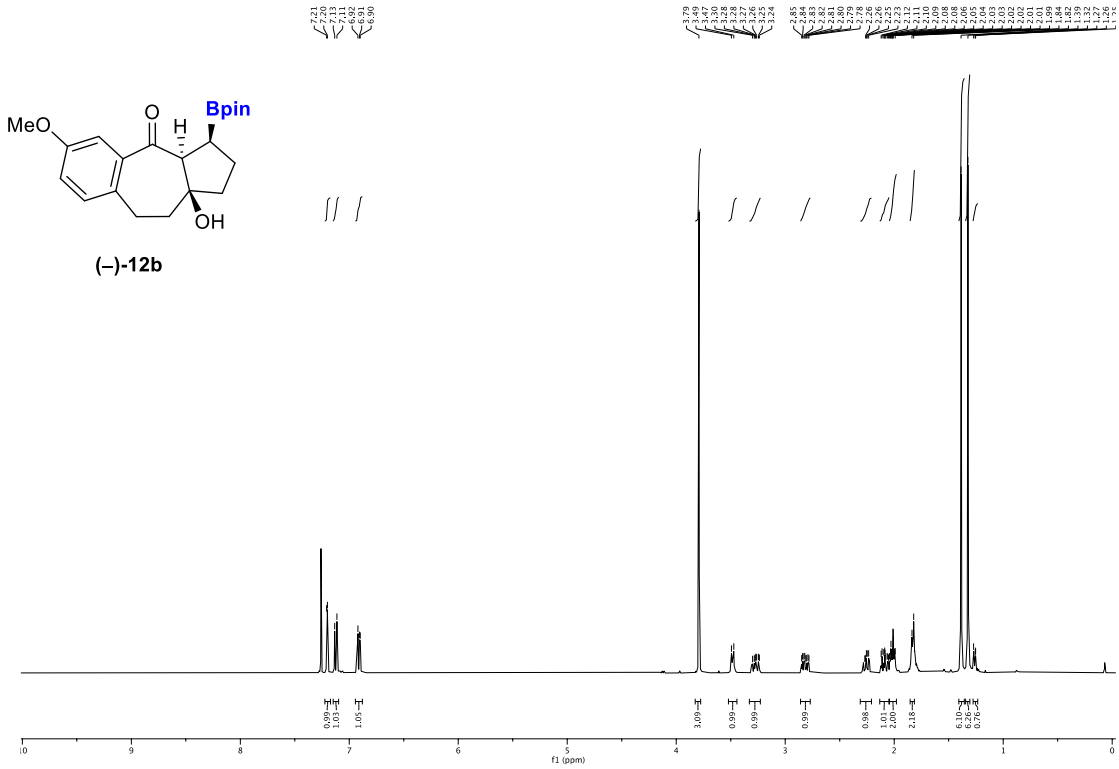


Figure SI-21. ^{1}H-NMR spectra of compound (-)-**12b**.

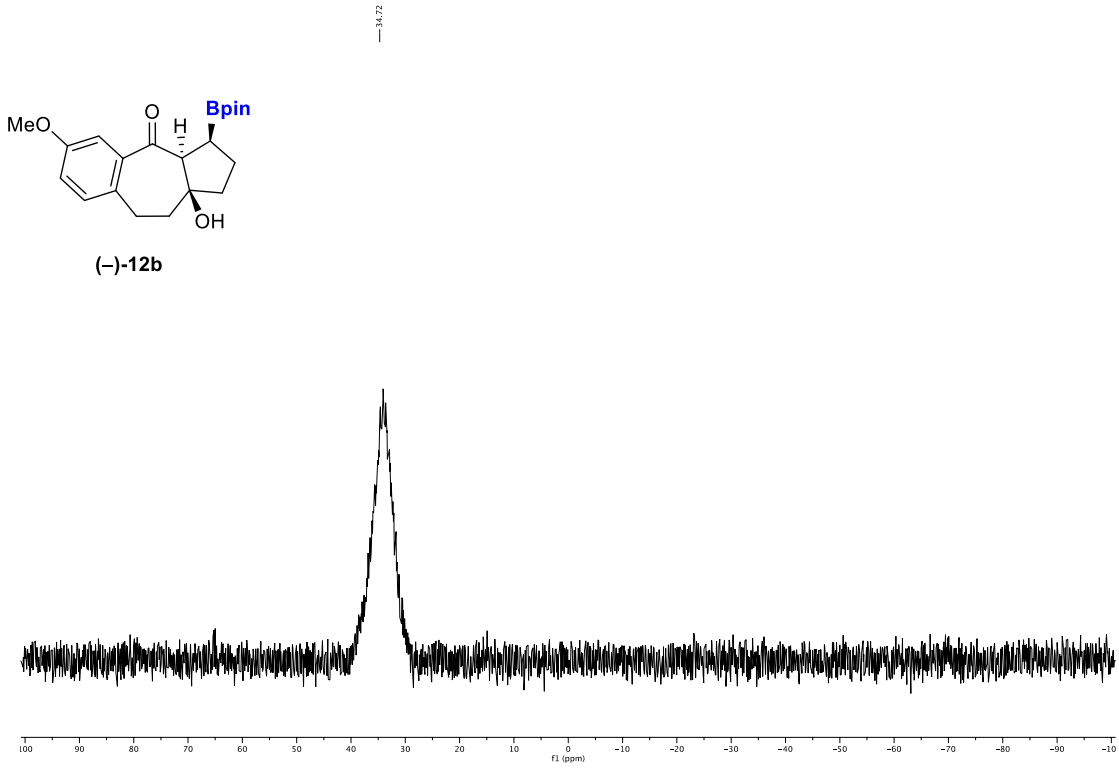


Figure SI-22. ^{11}B-NMR spectra of compound (-)-**12b**.

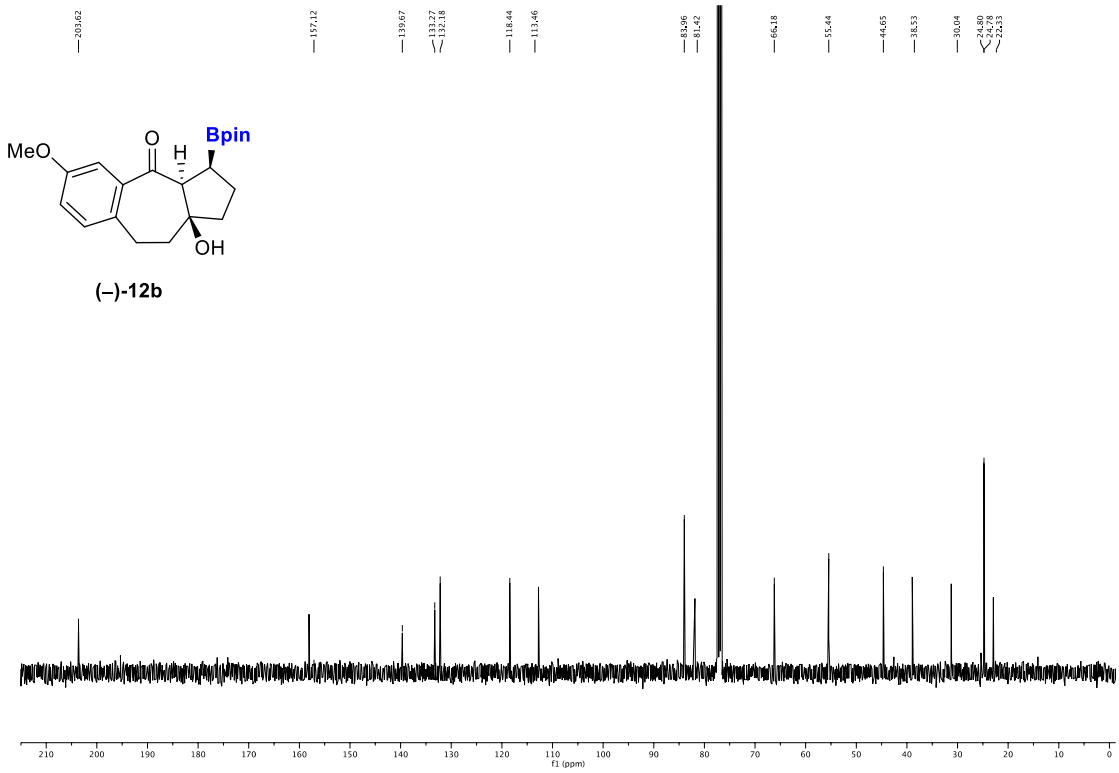


Figure SI-23. ^{13}C-NMR spectra of compound (-)-**12b**.

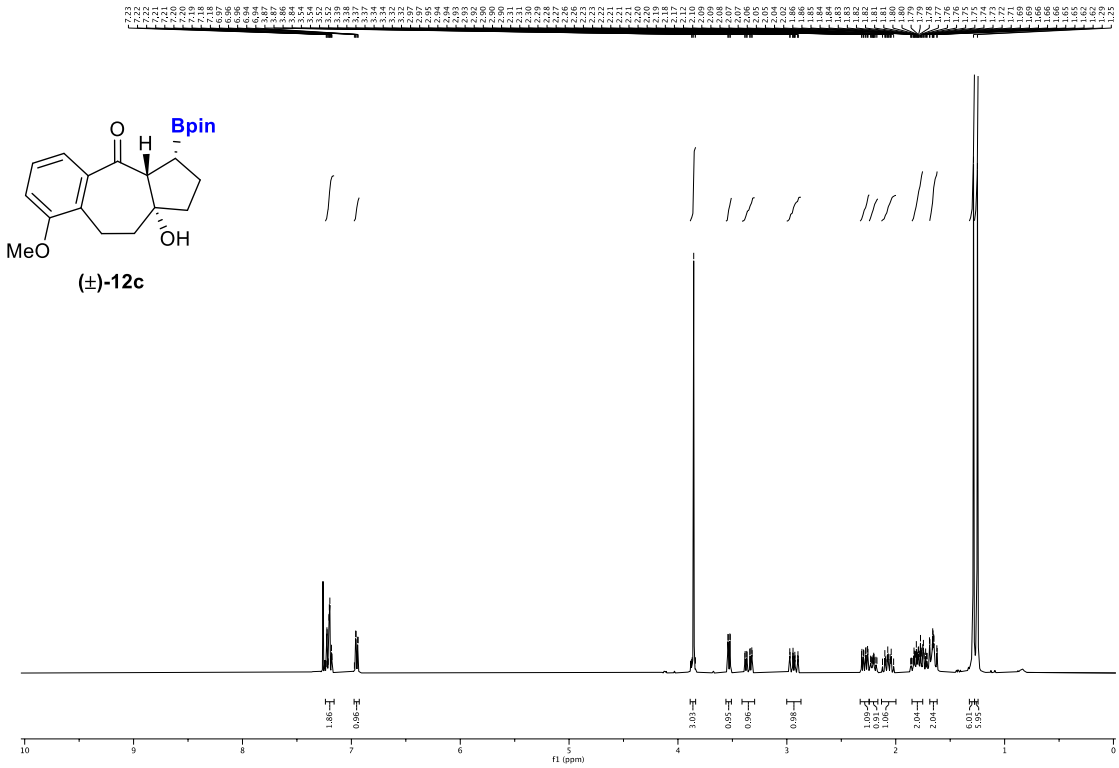


Figure SI-24. ^{1}H-NMR spectra of compound *rac*-**12c**.

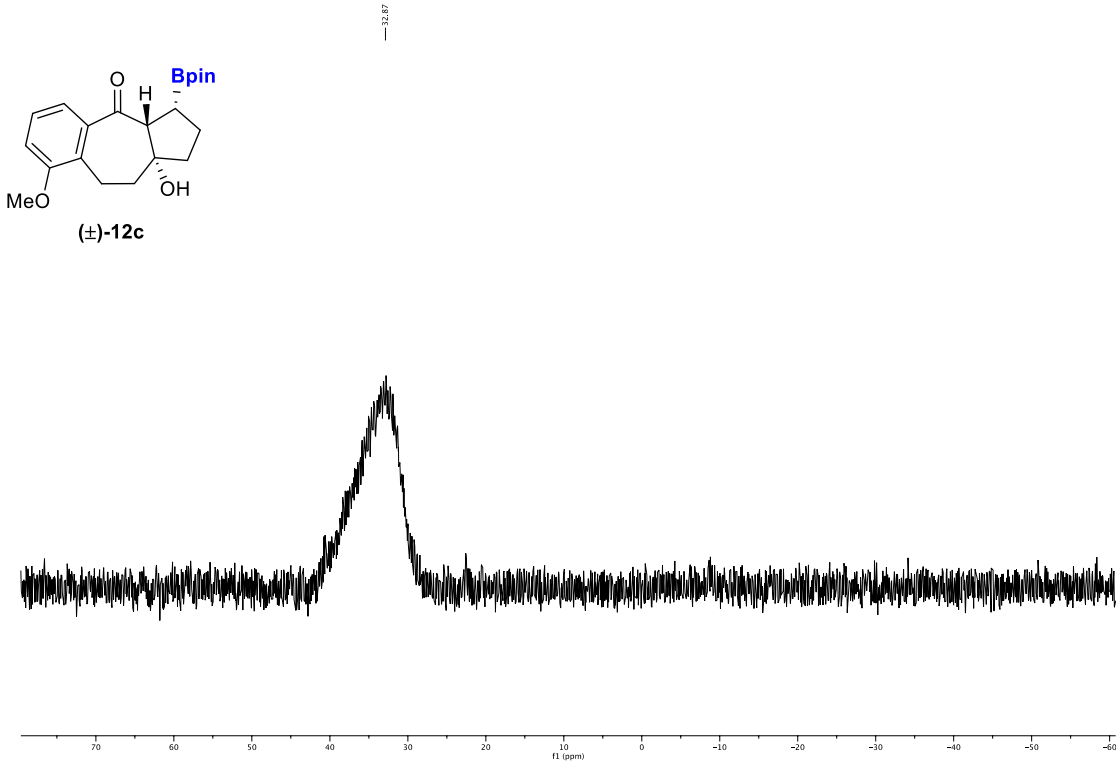


Figure SI-25. ^{11}B-NMR spectra of compound *rac*-**12c**.

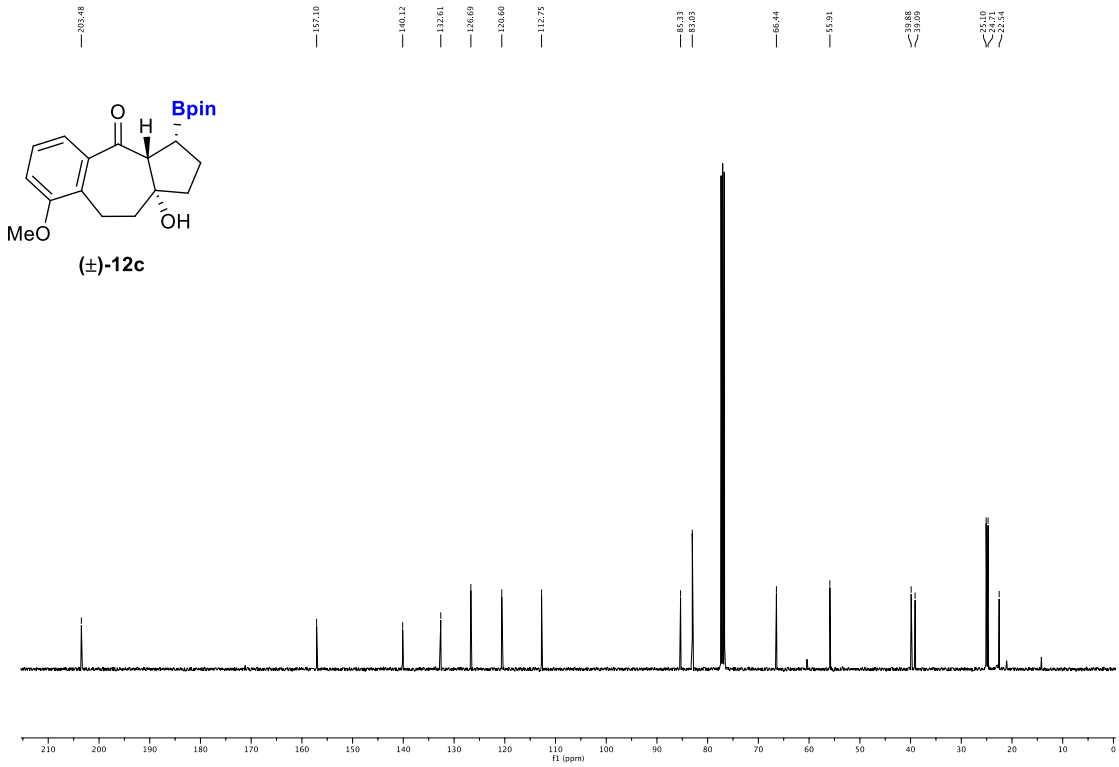


Figure SI-26. ^{13}C-NMR spectra of compound *rac*-**12c**.

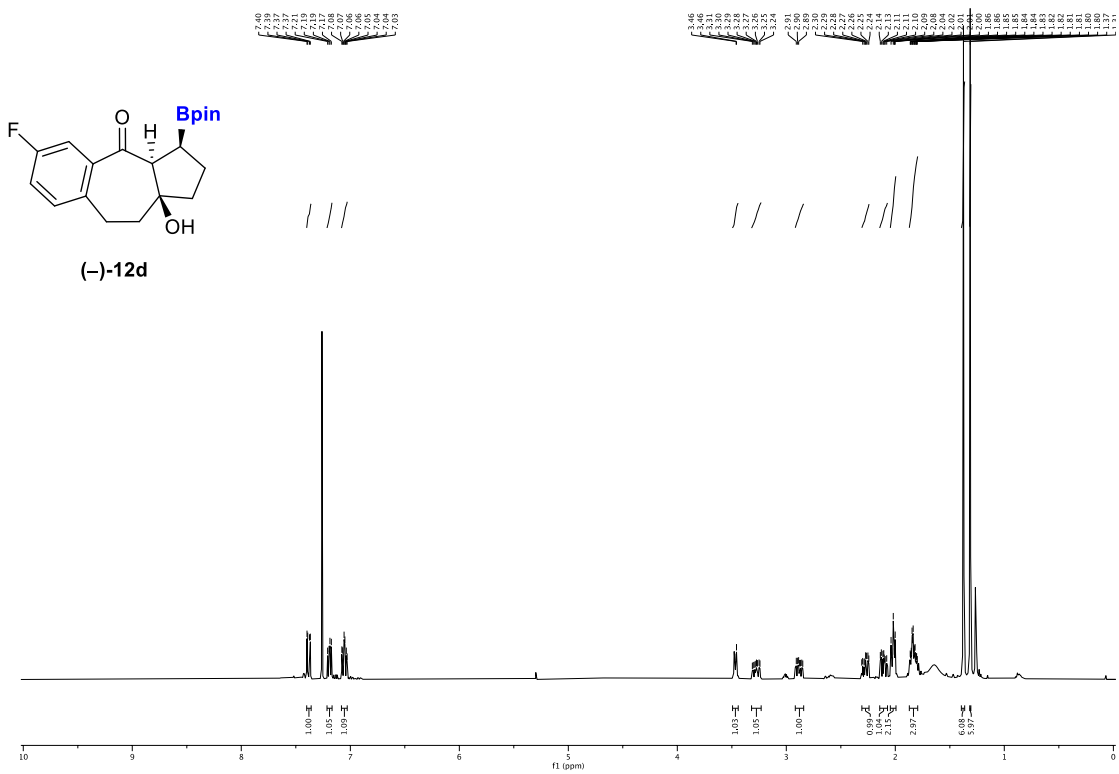


Figure SI-27. ^{1}H-NMR spectra of compound (-)-**12d**.

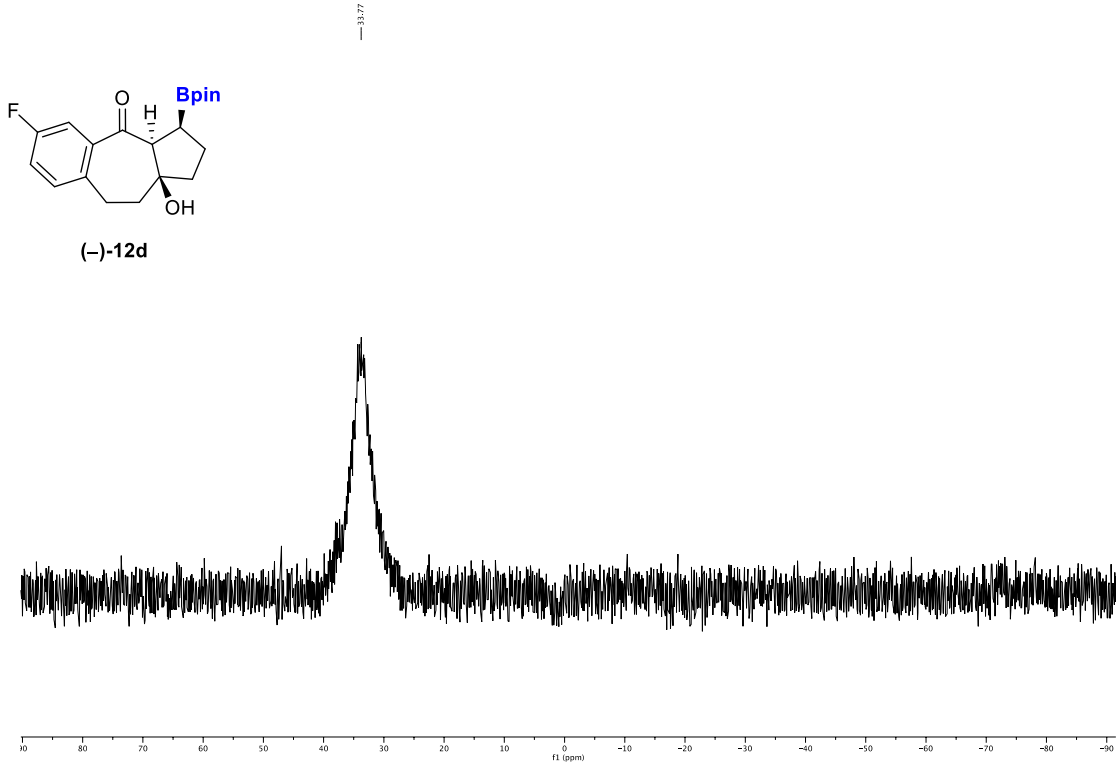


Figure SI-28. ^{11}B-NMR spectra of compound (-)-**12d**.

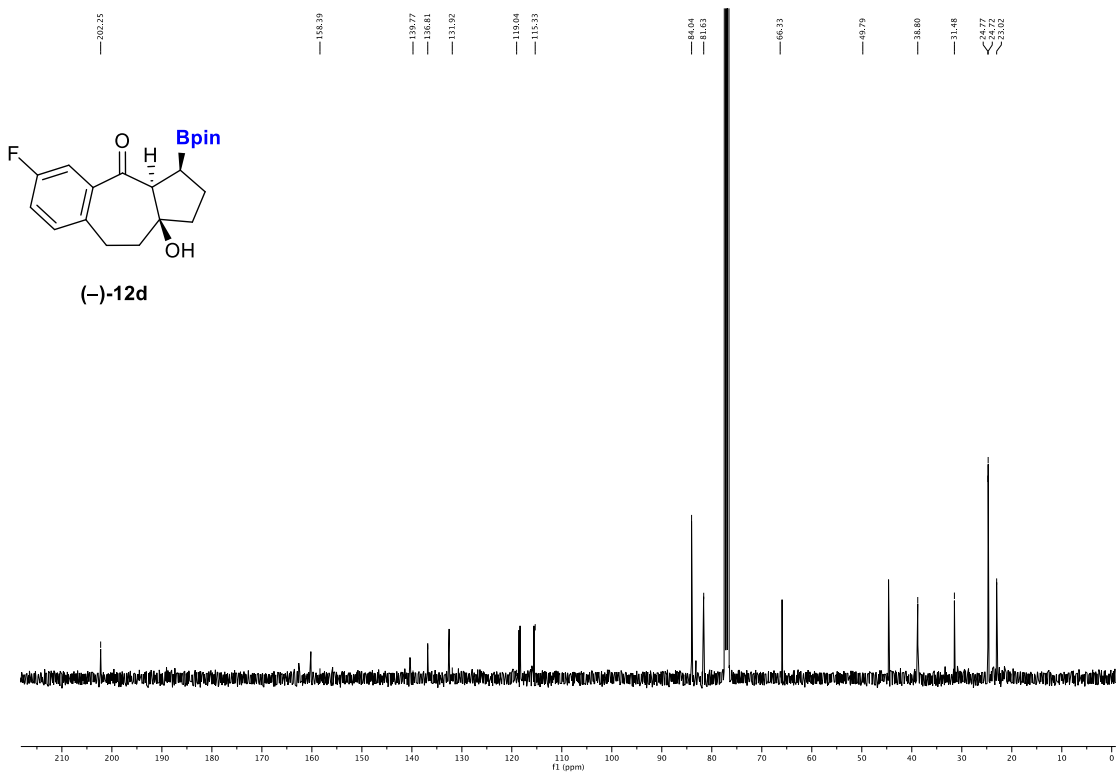


Figure SI-29. ^{13}C-NMR spectra of compound (-)-**12d**.

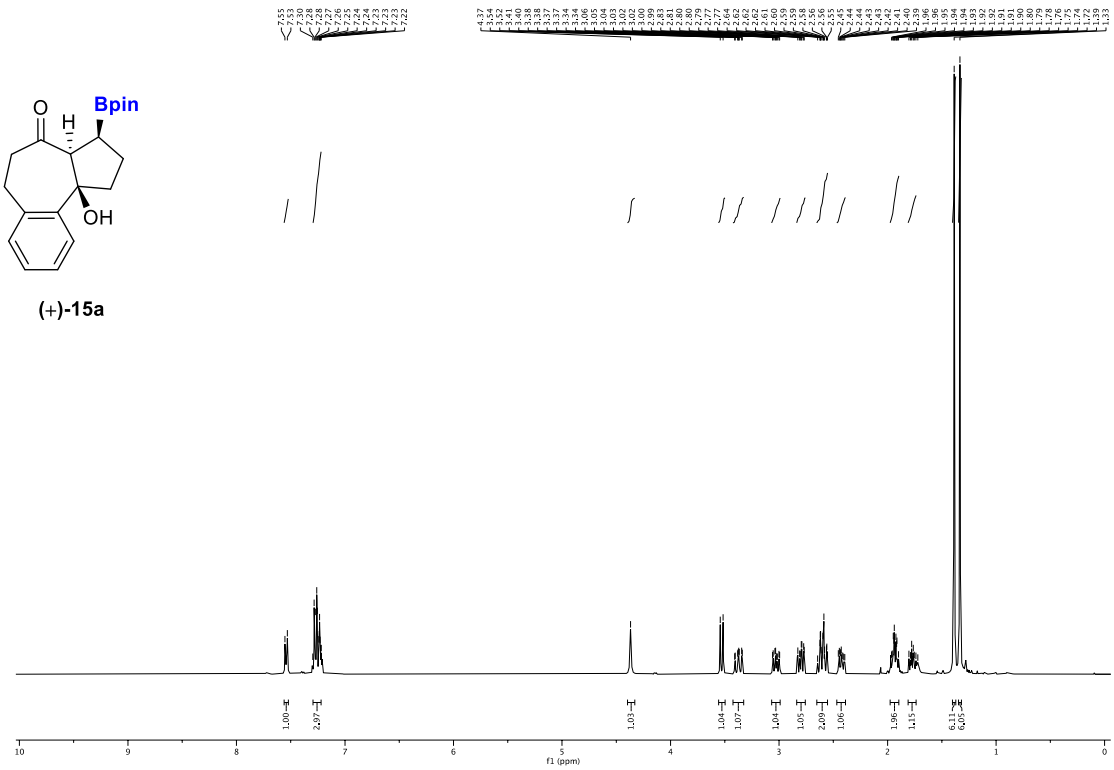


Figure SI-30. ^{1}H-NMR spectra of compound (+)-**15a**.

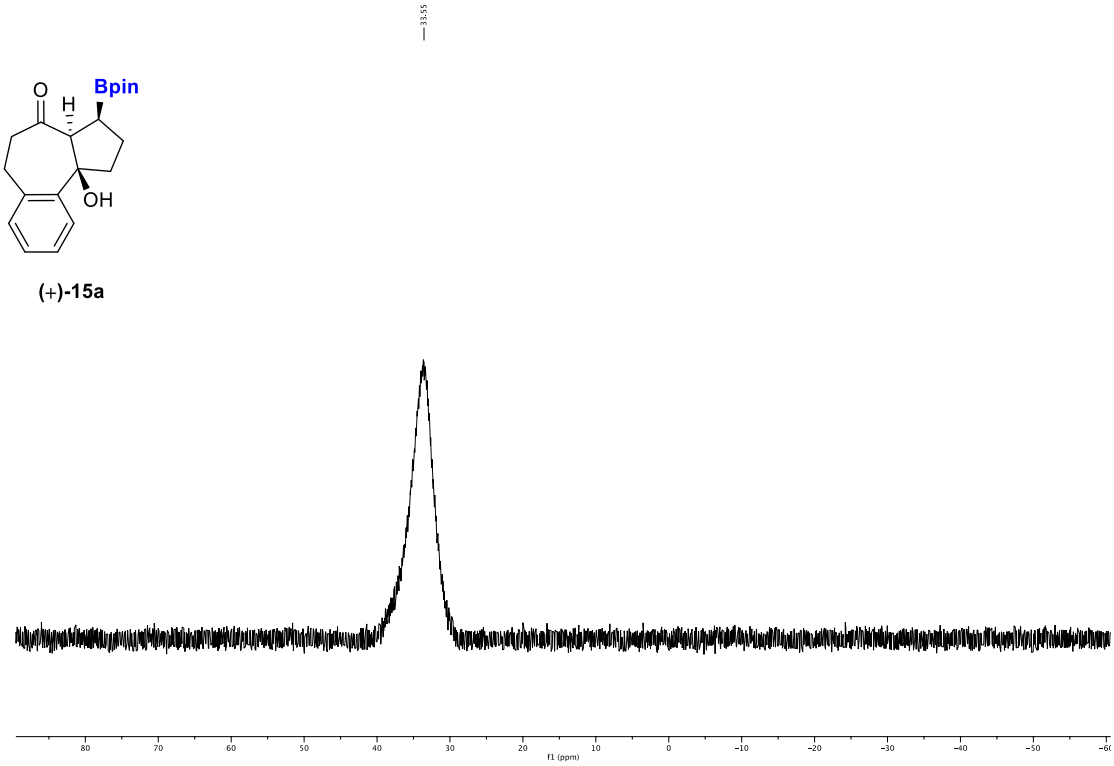


Figure SI-31. ^{11}B-NMR spectra of compound (+)-**15a**.

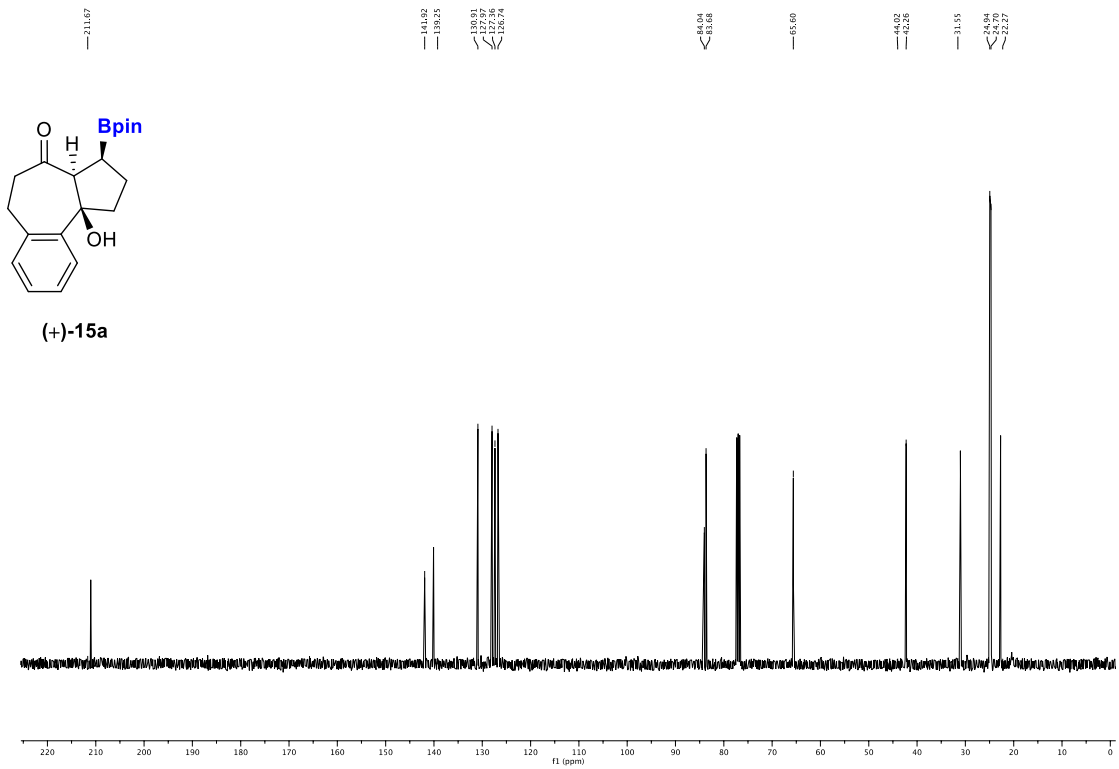


Figure SI-32. ^{13}C-NMR spectra of compound (+)-**15a**.

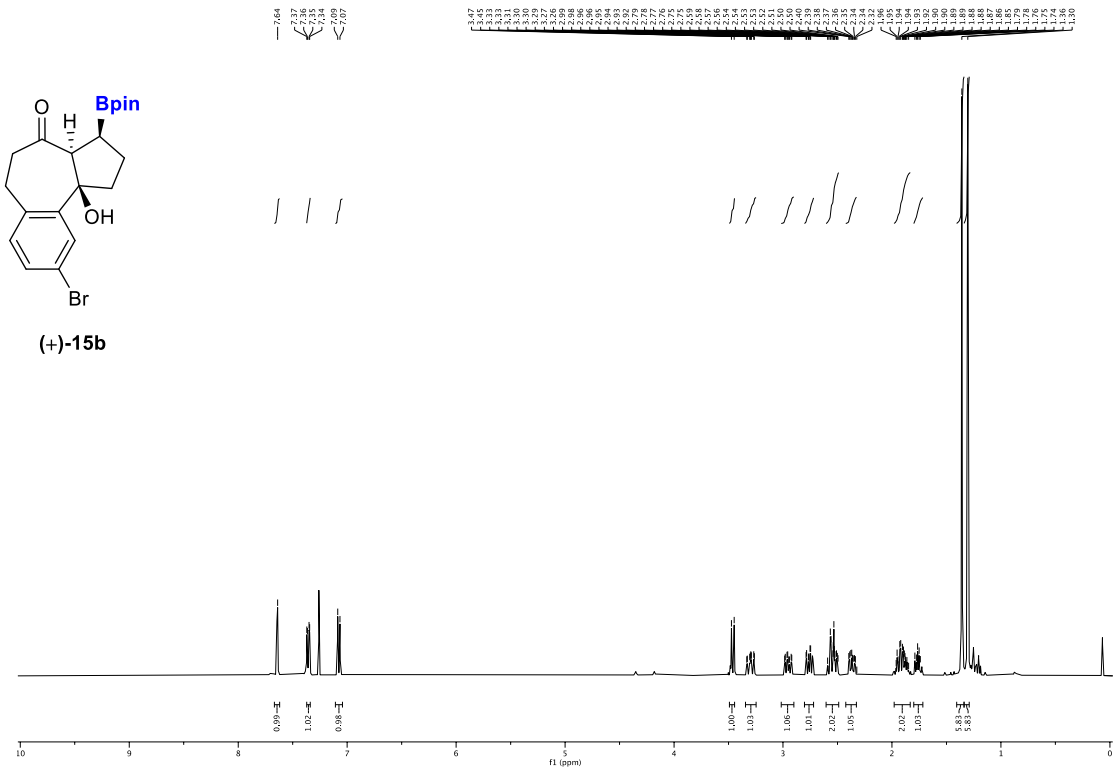


Figure SI-33. ^{1}H-NMR spectra of compound (+)-**15b**.

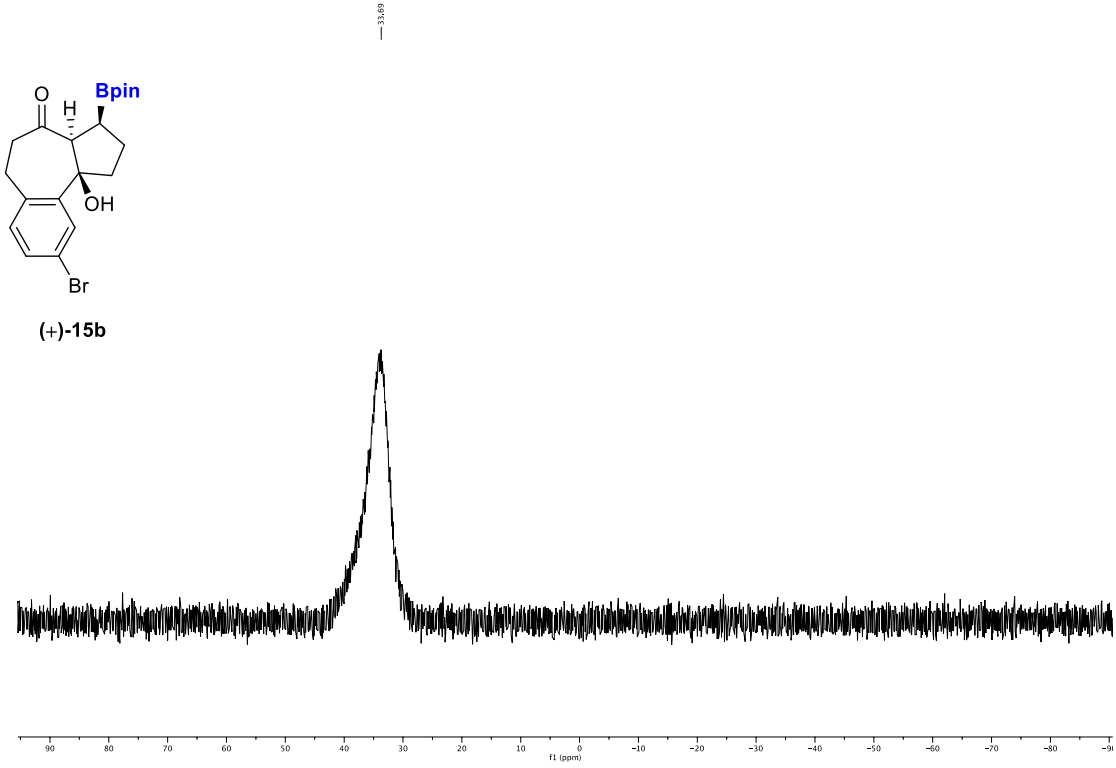


Figure SI-34. ^{11}B-NMR spectra of compound (+)-**15b**.

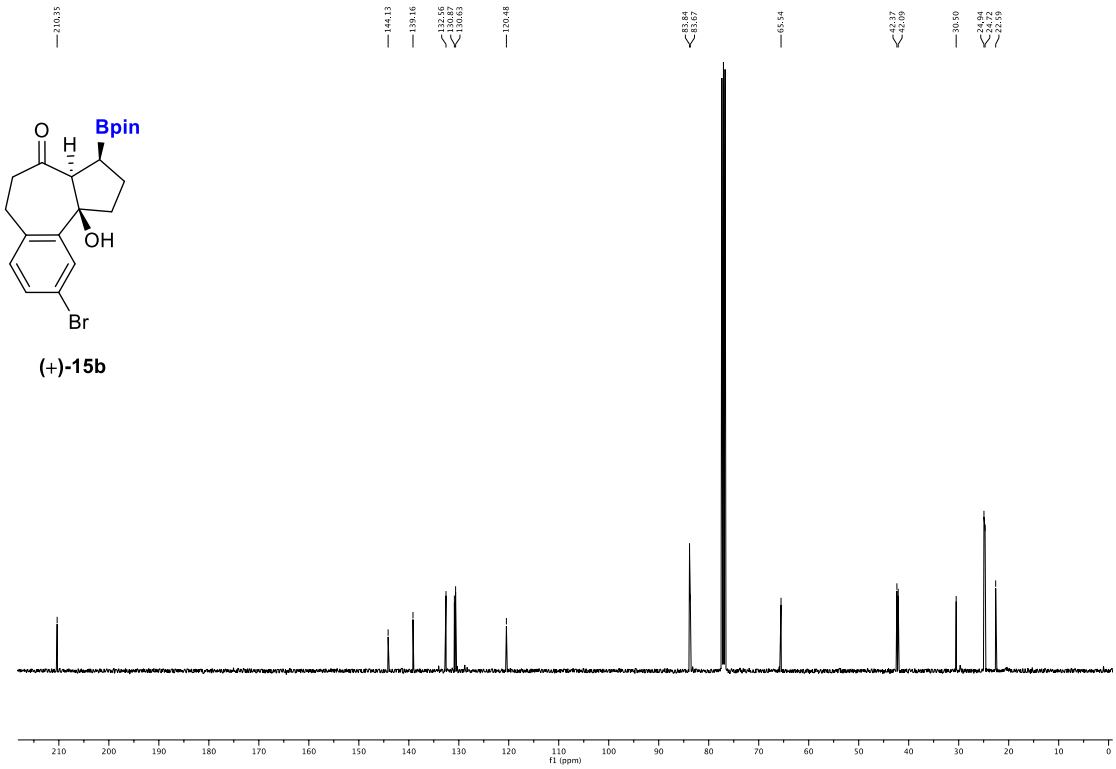


Figure SI-35. ^{13}C-NMR spectra of compound (+)-**15b**.

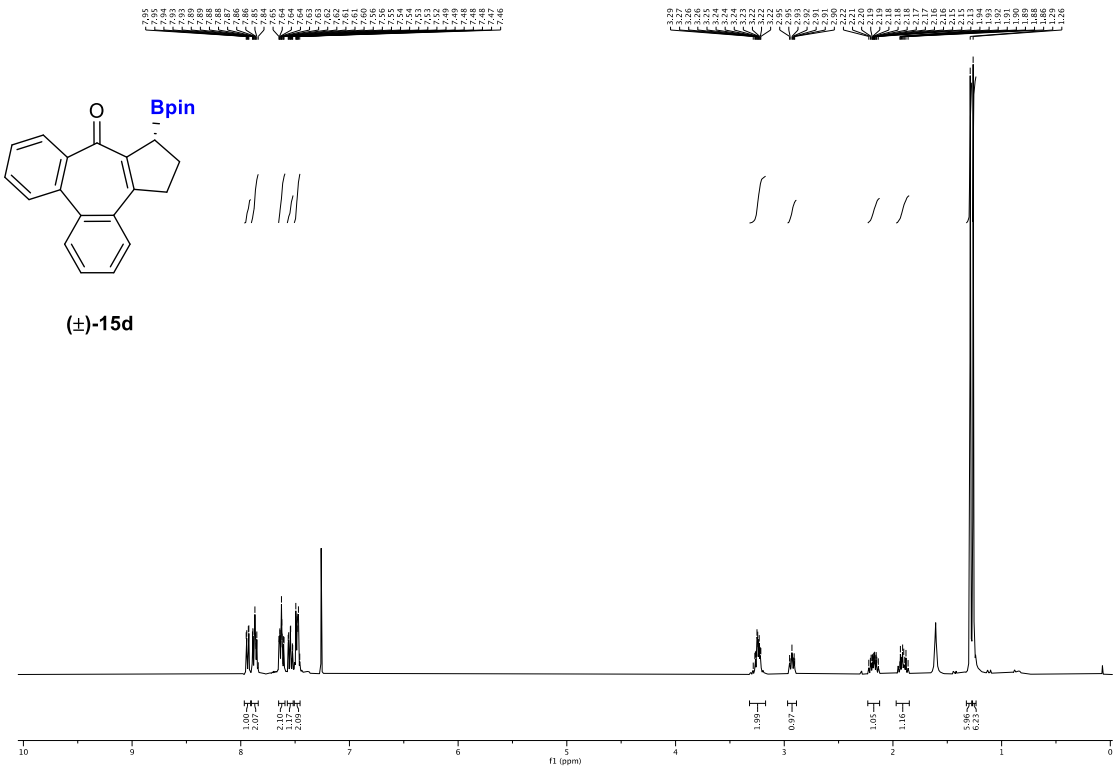


Figure SI-36. ^{1}H-NMR spectra of compound *rac*-**15d**.

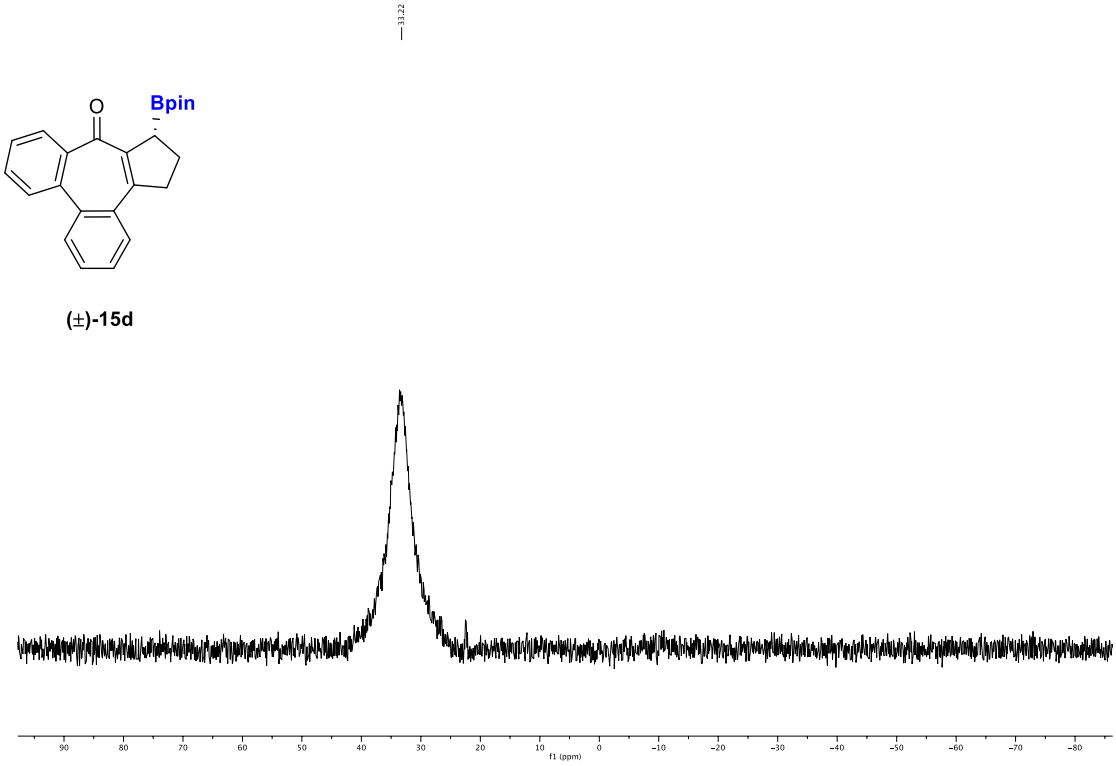


Figure SI-37. ^{11}B-NMR spectra of compound *rac*-**15d**.

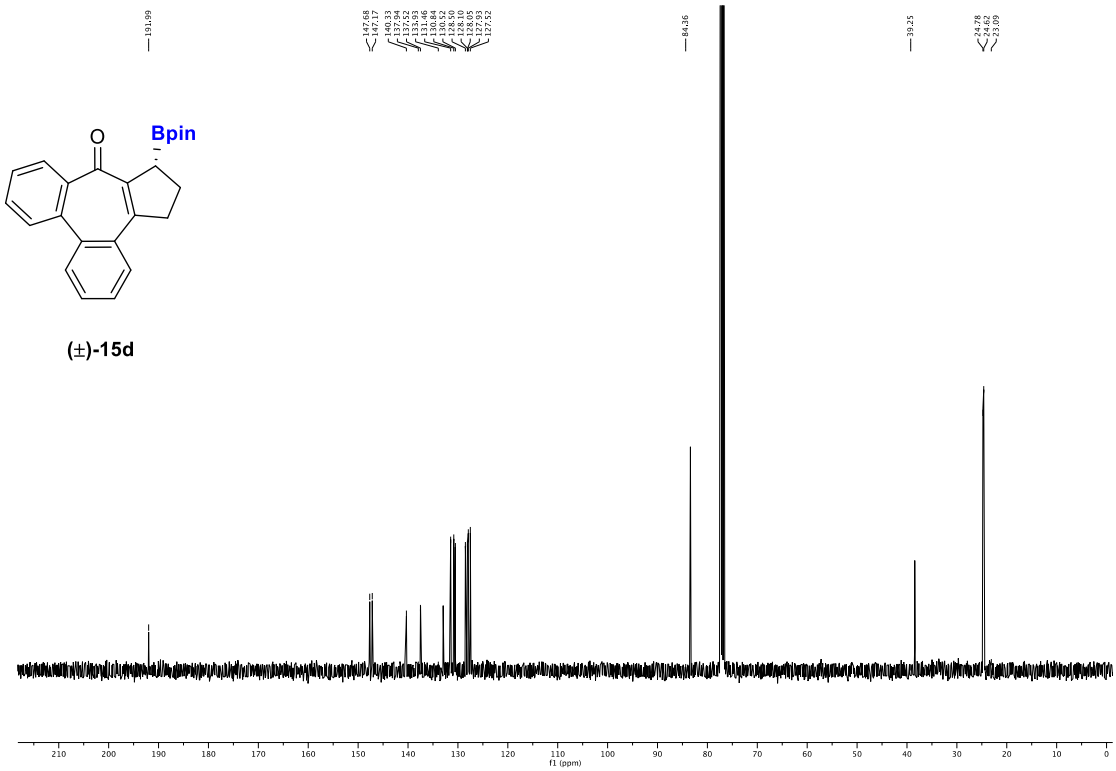


Figure SI-38. ^{13}C-NMR spectra of compound *rac*-**15d**.

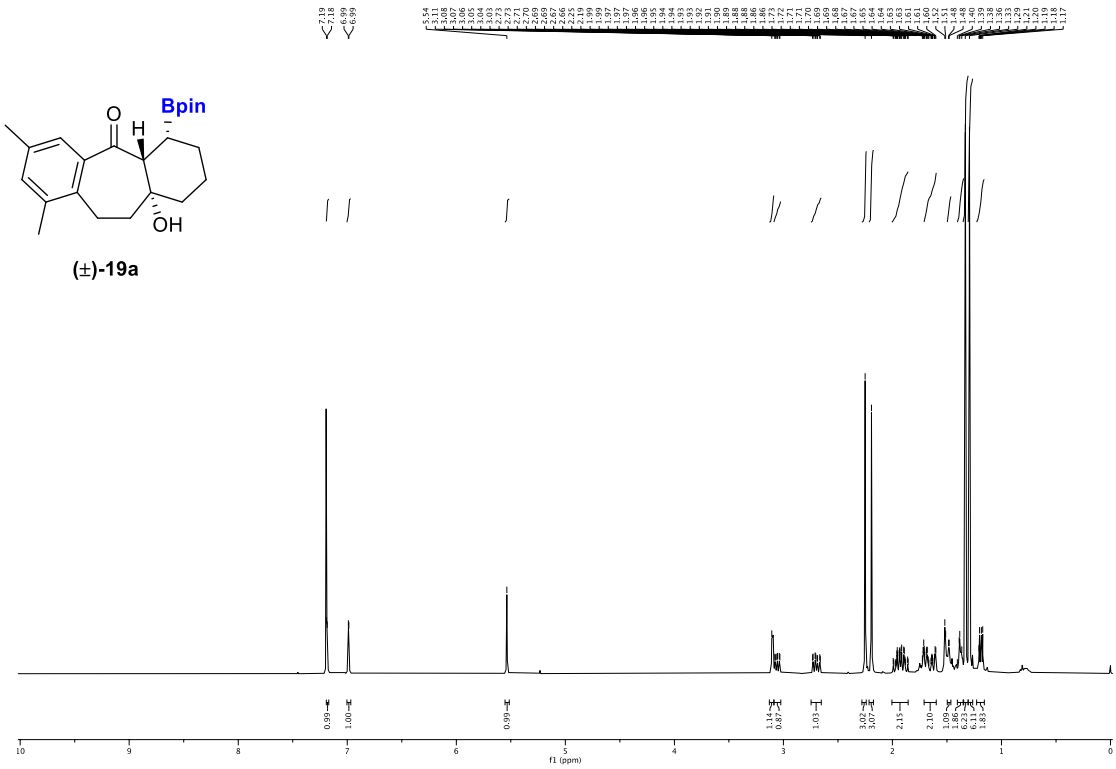


Figure SI-39. ^{1}H-NMR spectra of compound *rac*-**19a**.

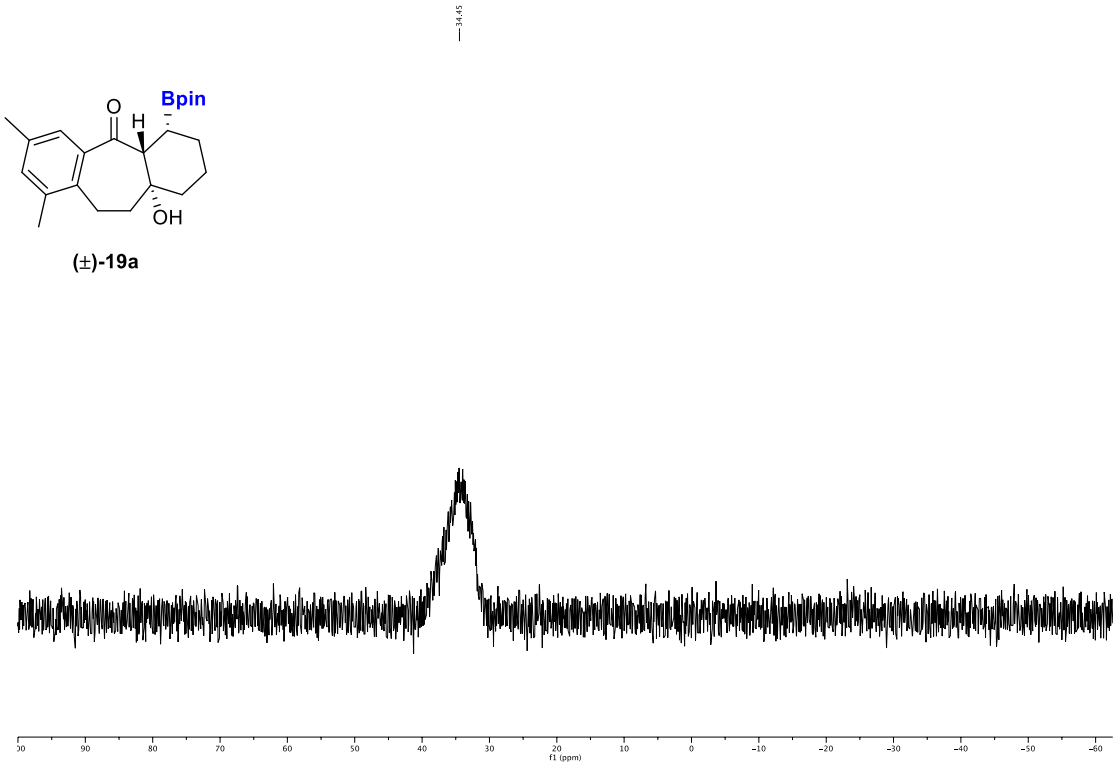


Figure SI-40. ^{11}B-NMR spectra of compound *rac*-**19a**.

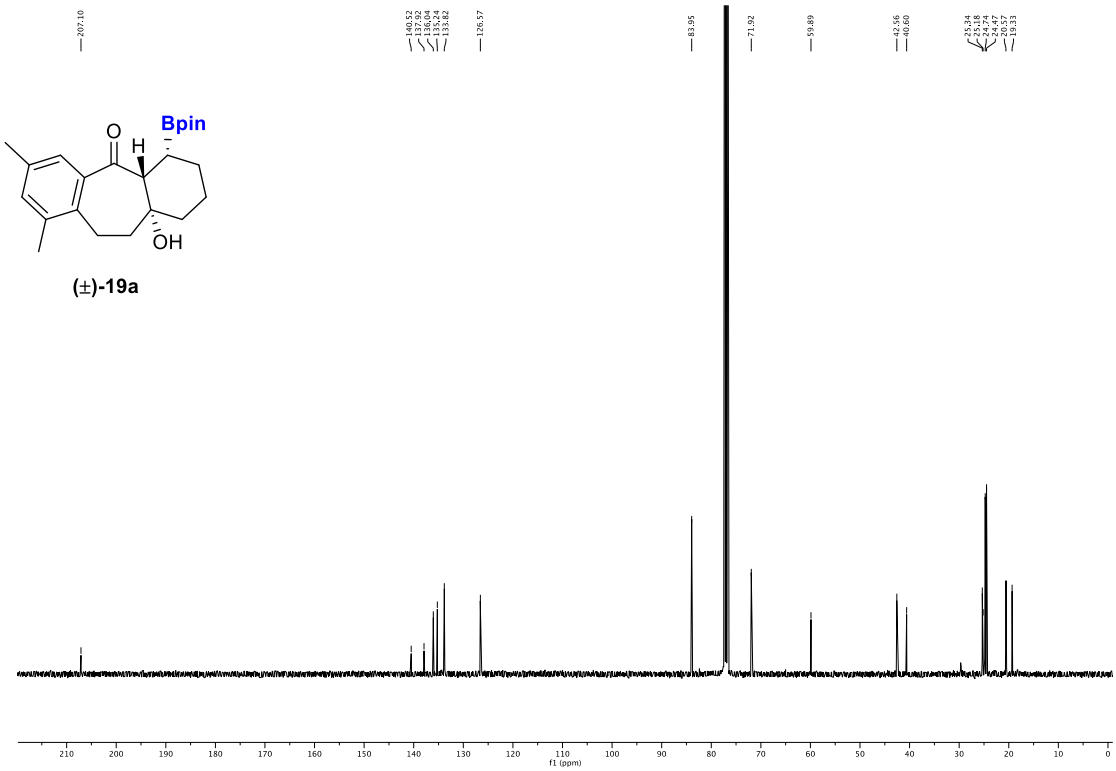


Figure SI-41. ^{13}C-NMR spectra of compound *rac*-**19a**.

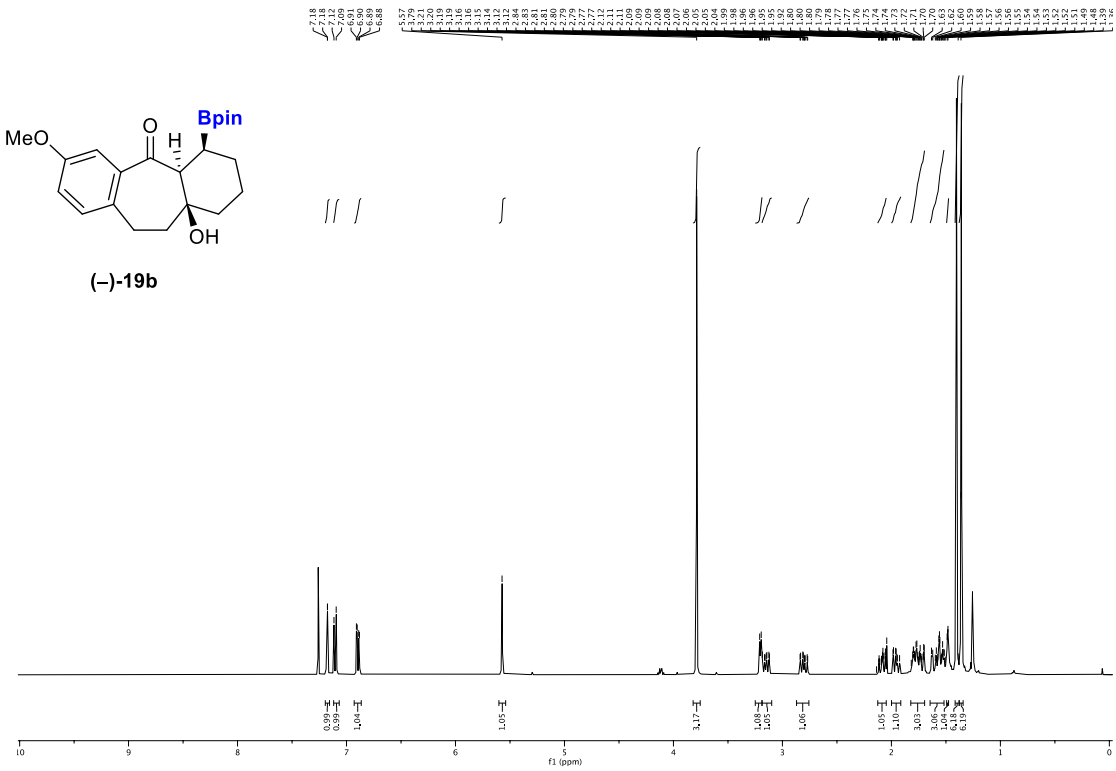


Figure SI-42. ^{1}H-NMR spectra of compound (-)-**19b**.

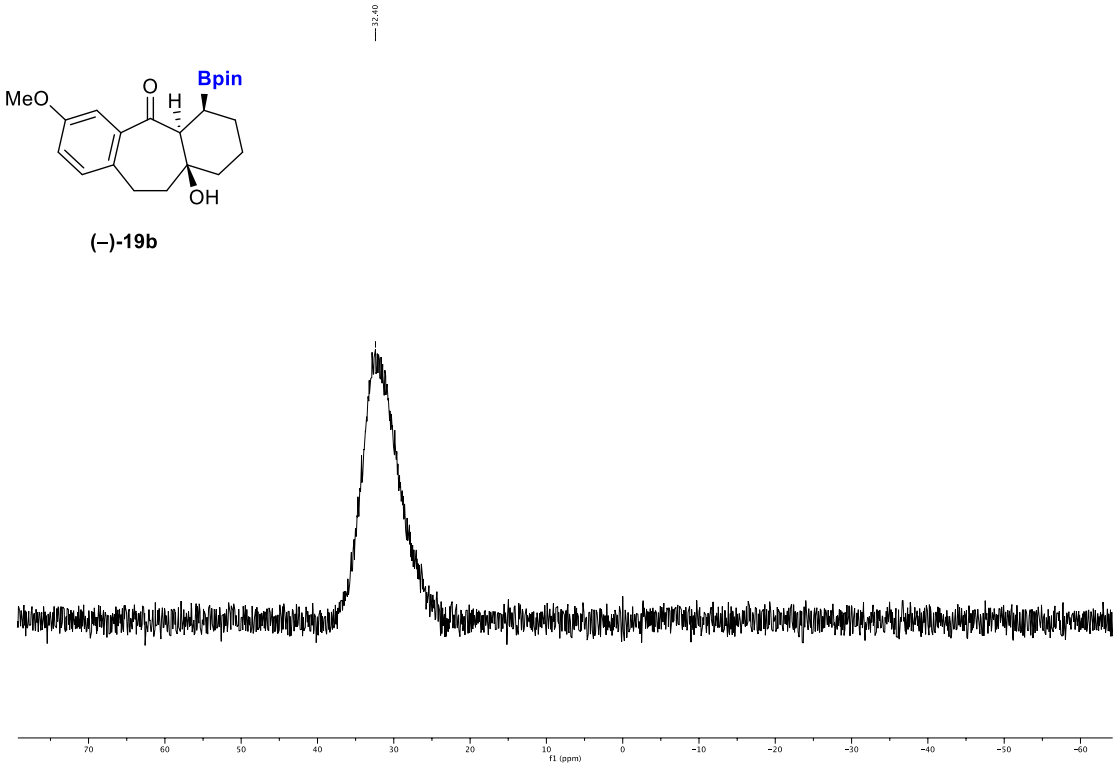


Figure SI-43. ^{11}B-NMR spectra of compound (-)-**19b**.

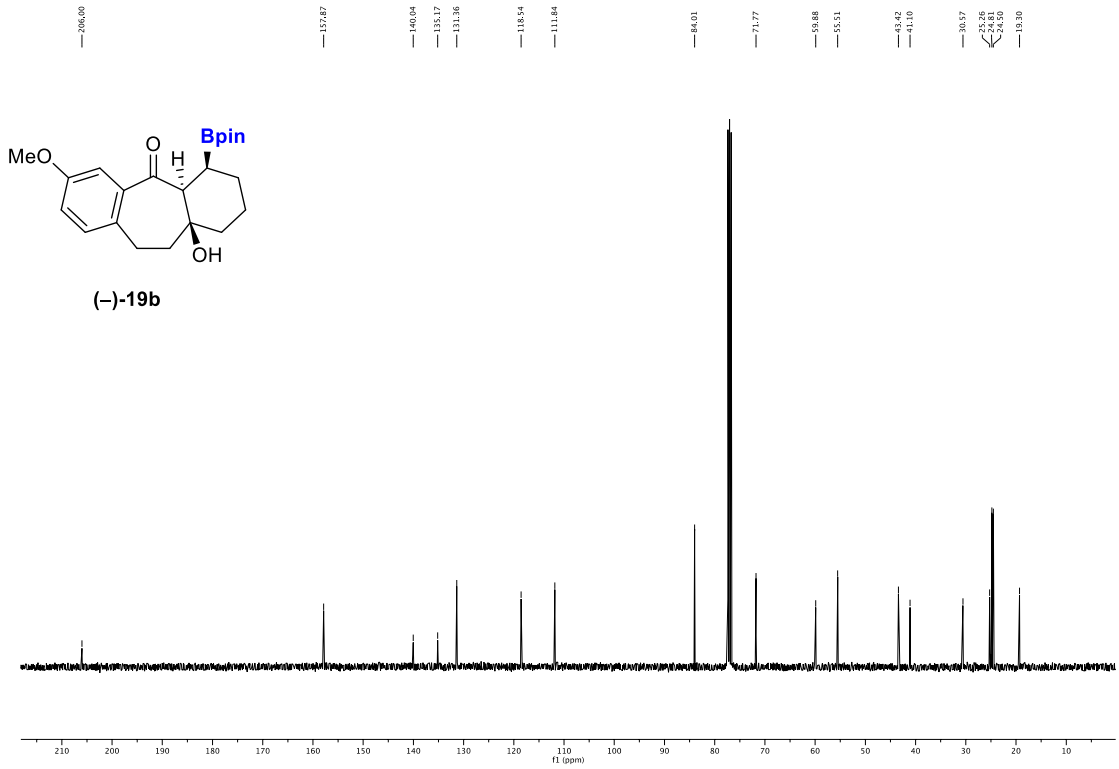


Figure SI-44. ^{13}C-NMR spectra of compound (-)-**19b**.

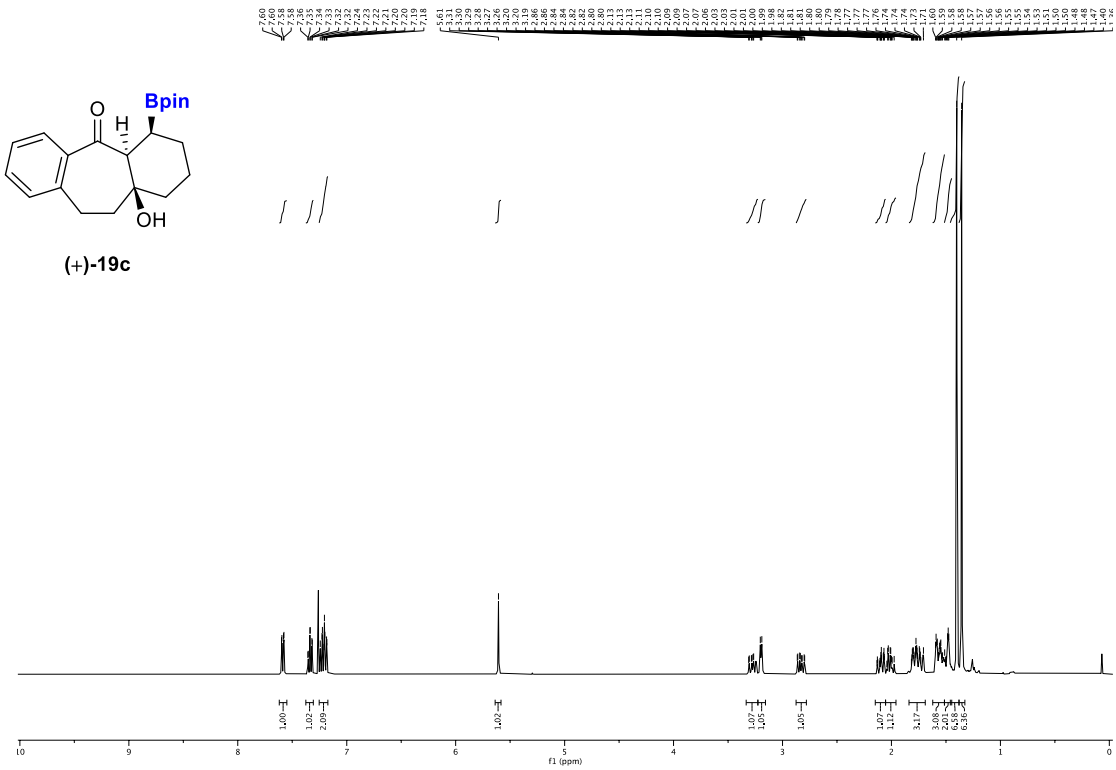


Figure SI-45. ^{1}H-NMR spectra of compound (+)-**19c**.

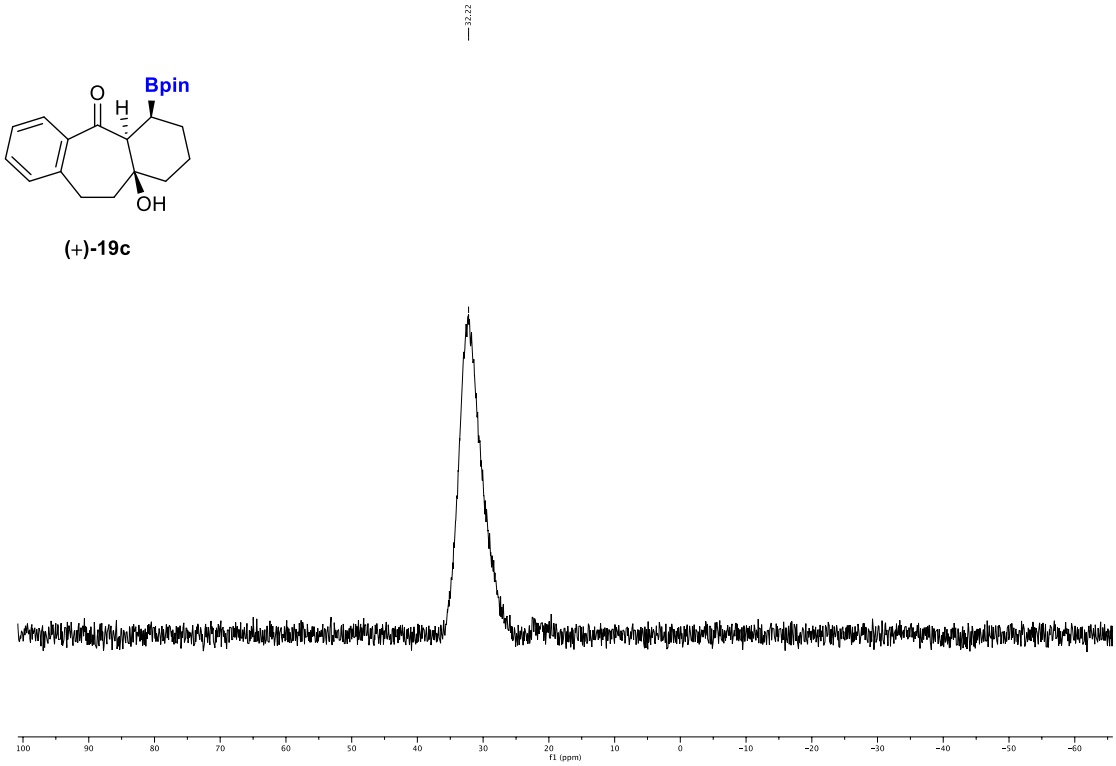


Figure SI-46. ^{11}B-NMR spectra of compound (+)-**19c**.

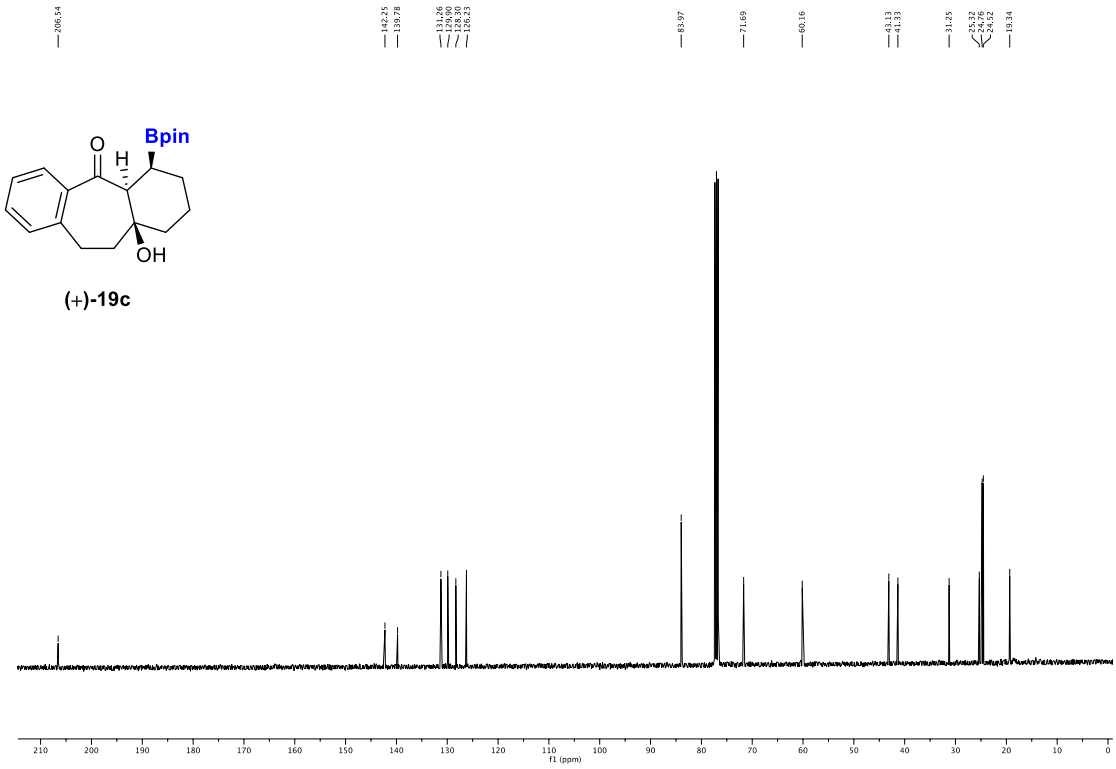


Figure SI-47. ^{13}C-NMR spectra of compound (+)-**19c**.

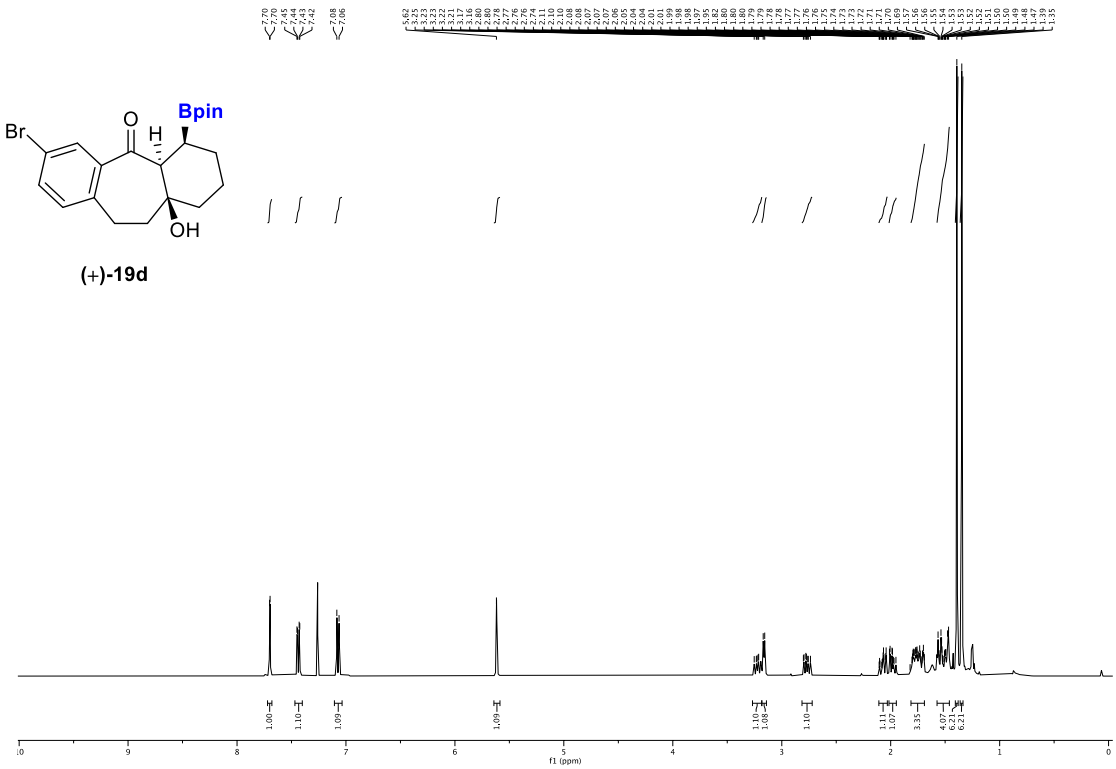


Figure SI-48. ^{1}H-NMR spectra of compound (+)-**19d**.

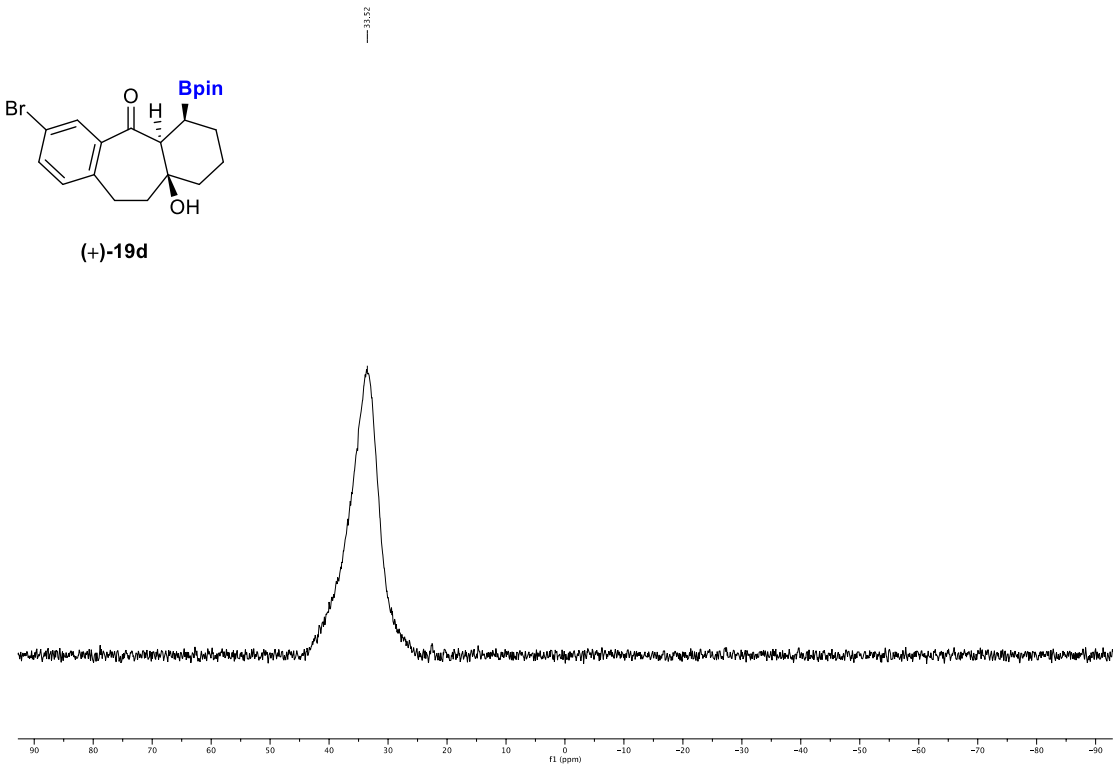


Figure SI-49. ^{11}B-NMR spectra of compound (+)-**19d**.

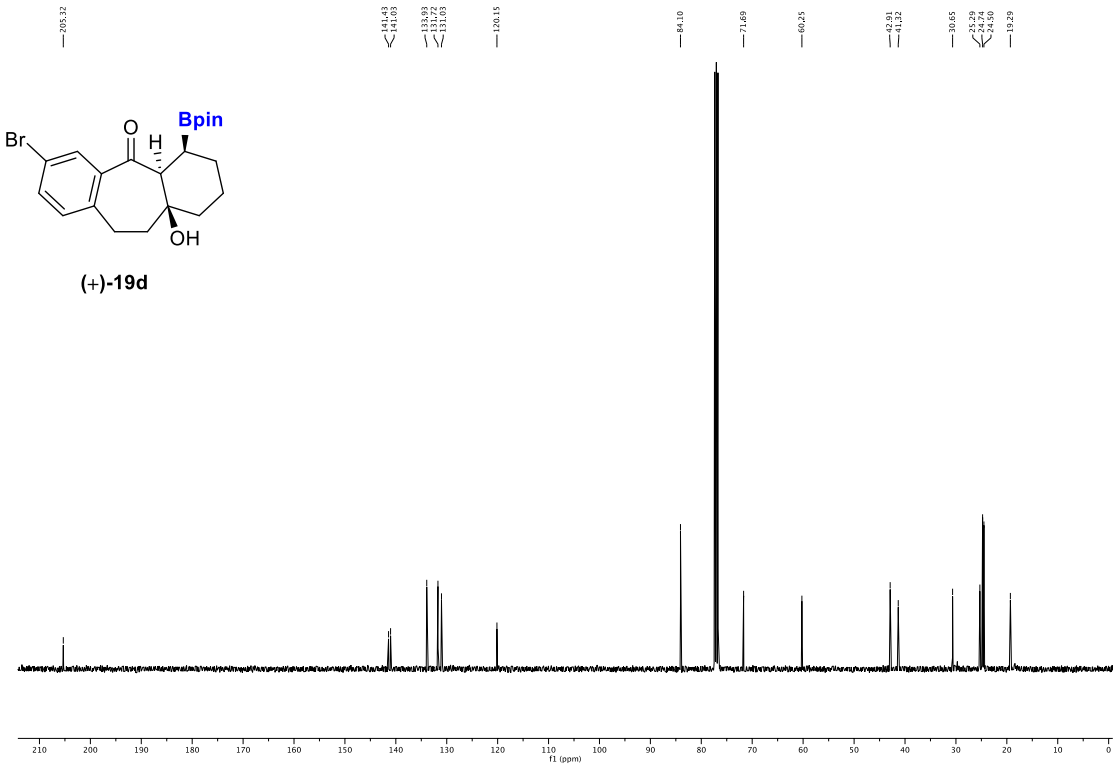


Figure SI-50. ^{13}C-NMR spectra of compound (+)-**19d**.

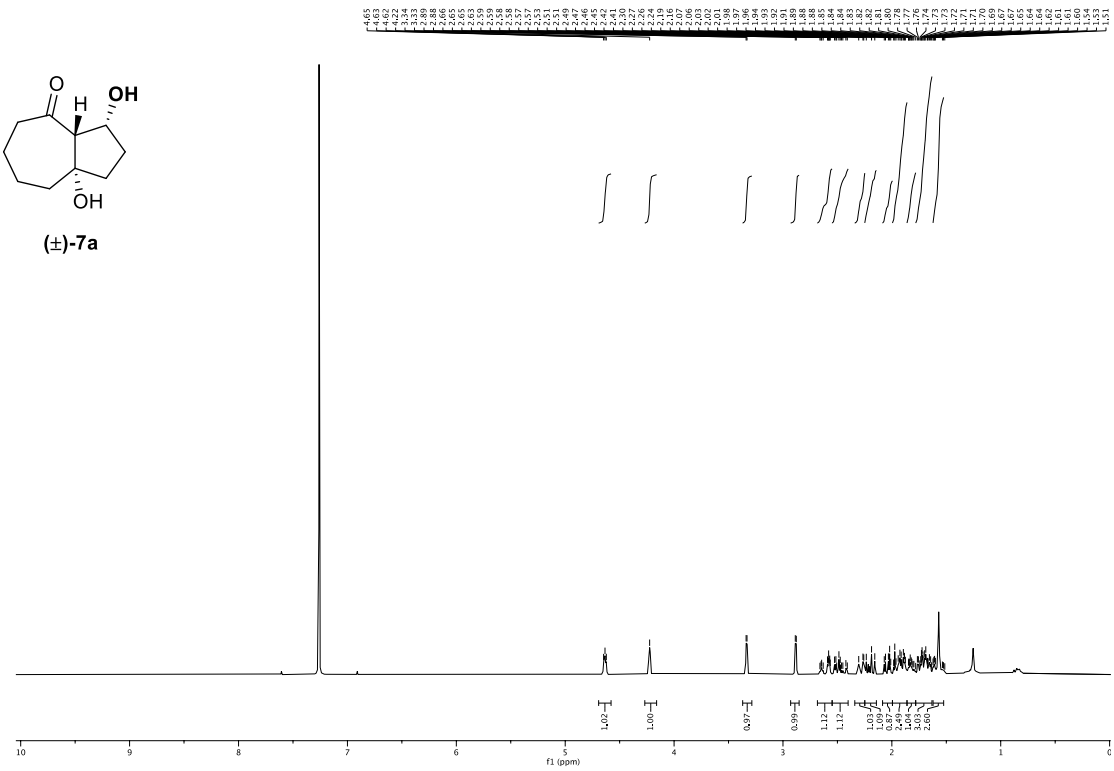


Figure SI-51. ^{1}H-NMR spectra of compound *rac*-**7a**.

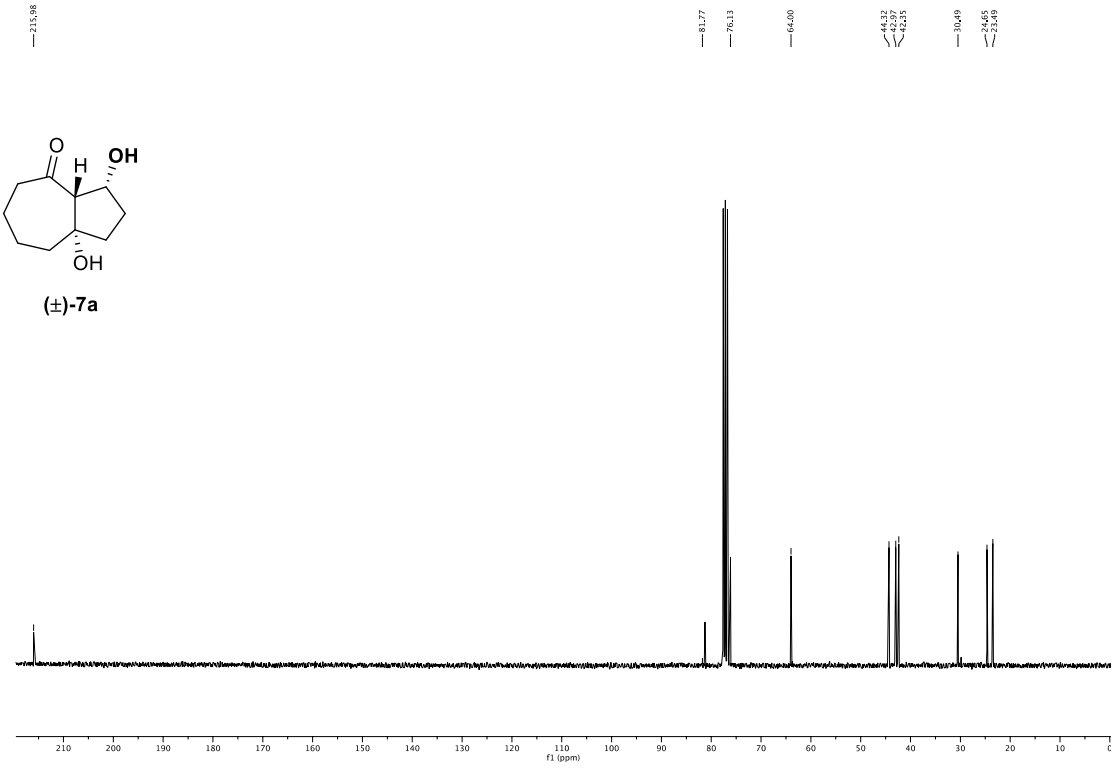


Figure SI-52. ^{13}C-NMR spectra of compound *rac*-**7a**.

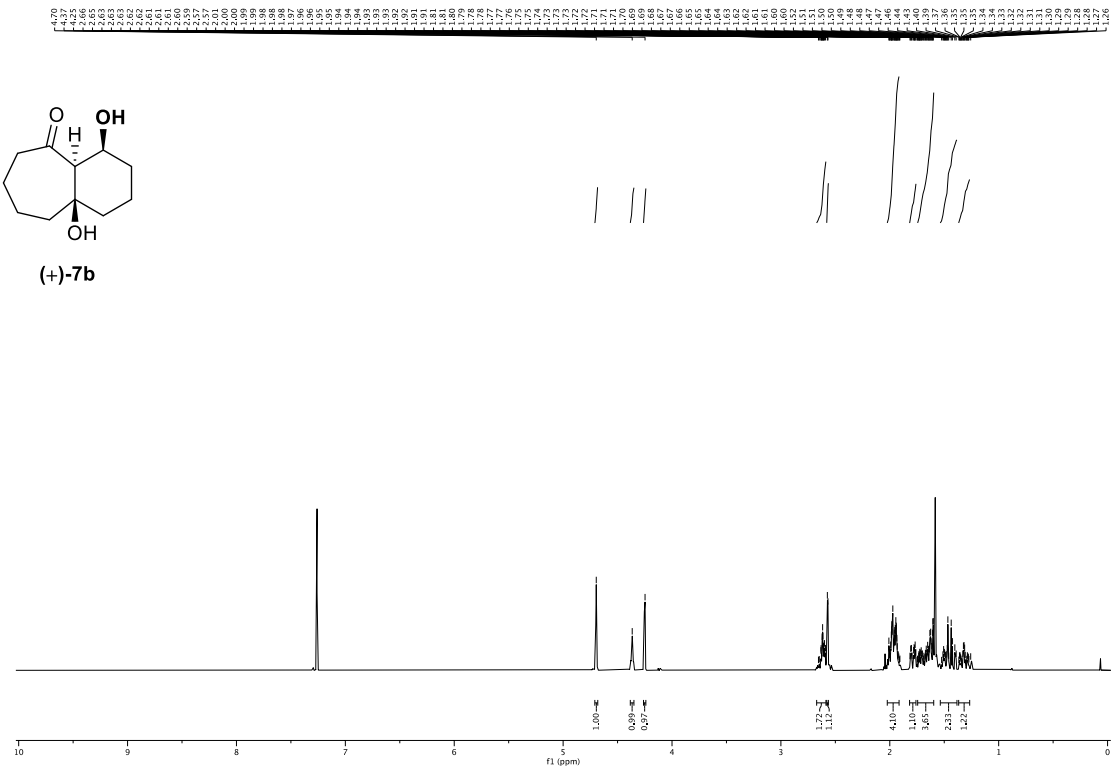


Figure SI-53. ^{1}H-NMR spectra of compound (+)-**7b**.

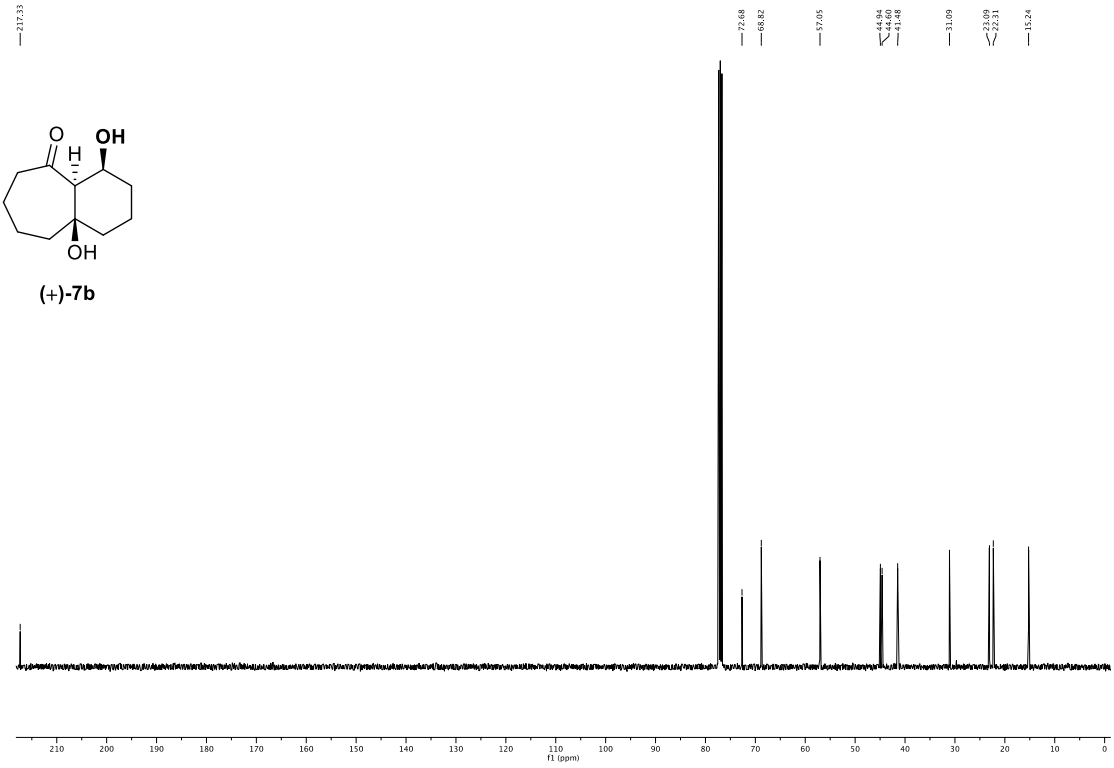
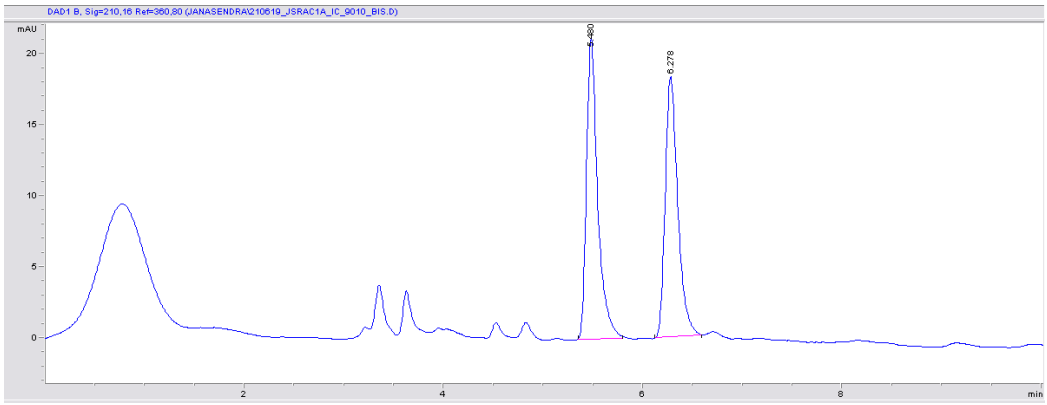
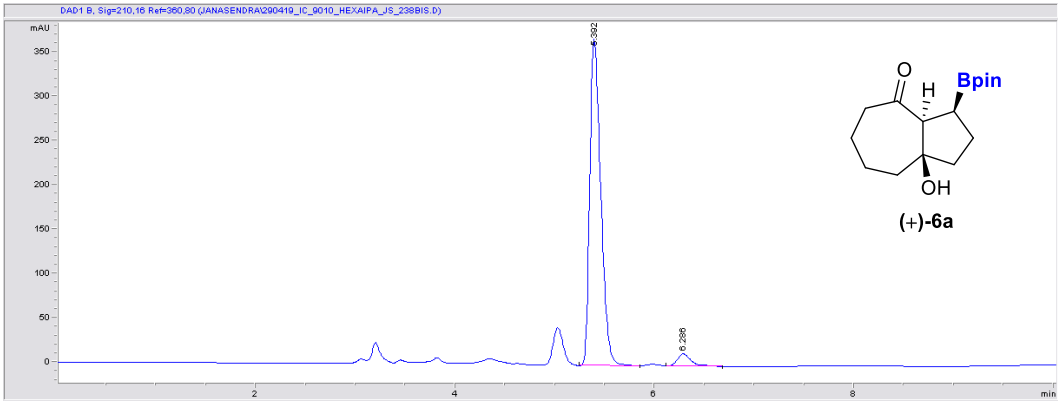


Figure SI-54. ^{13}C-NMR spectra of compound (+)-**7b**.

1.2. HPLC traces





Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.359	BB	0.1071	1237.02356	177.90732	96.3212
2	6.202	BB	0.1253	47.24601	5.78444	3.6788

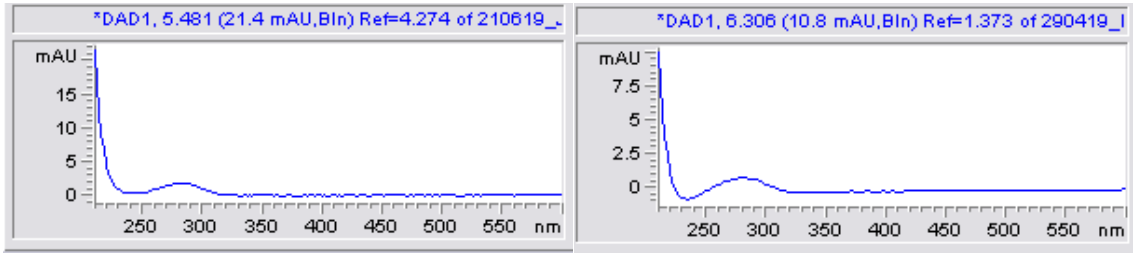
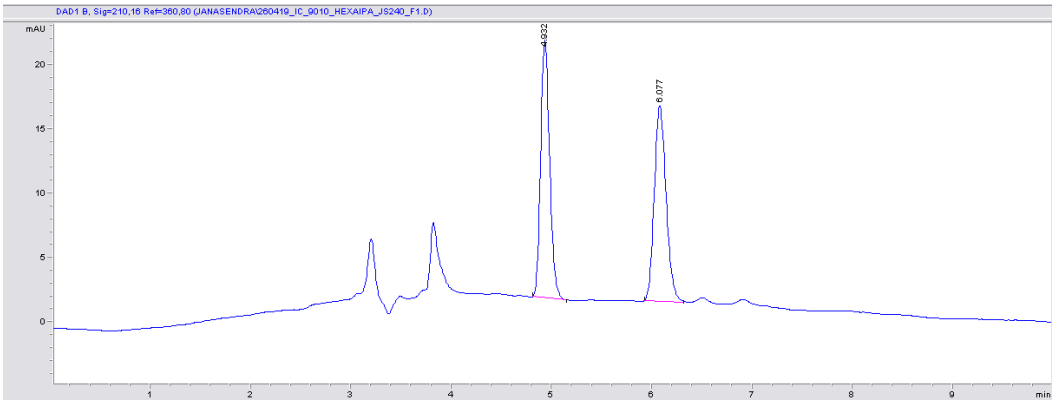
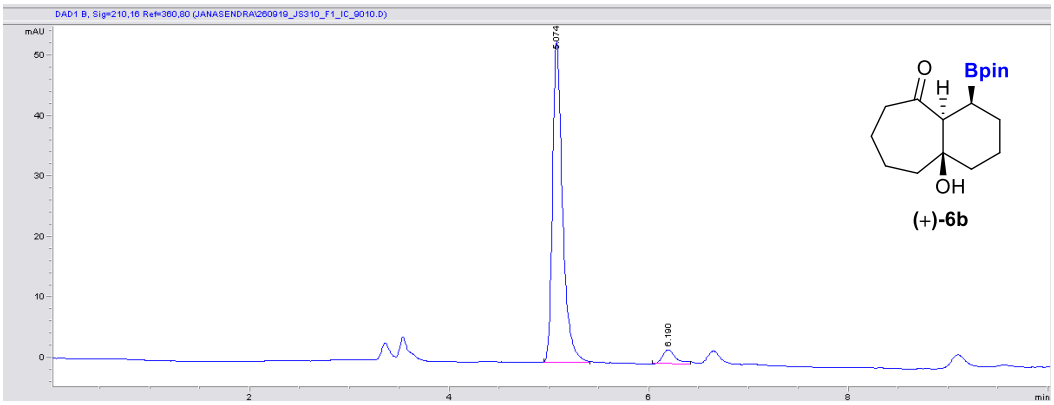


Figure SI-55. HPLC chromatogram for racemic and chiral compound (+)-**6a**.





Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.074	BB	0.1055	371.00552	53.07721	94.3210
2	6.190	BB	0.1411	22.33796	2.34599	5.6790

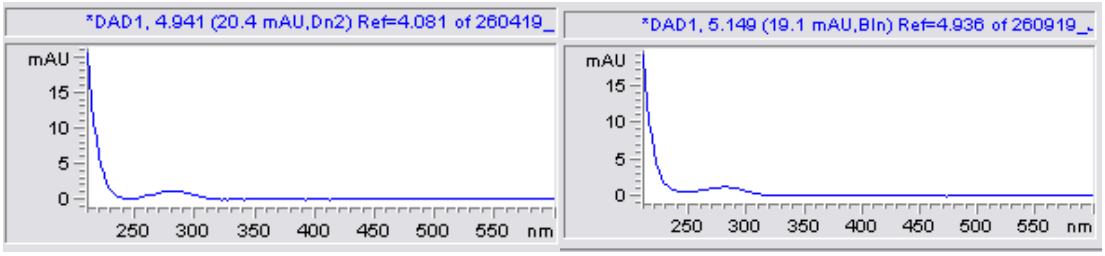
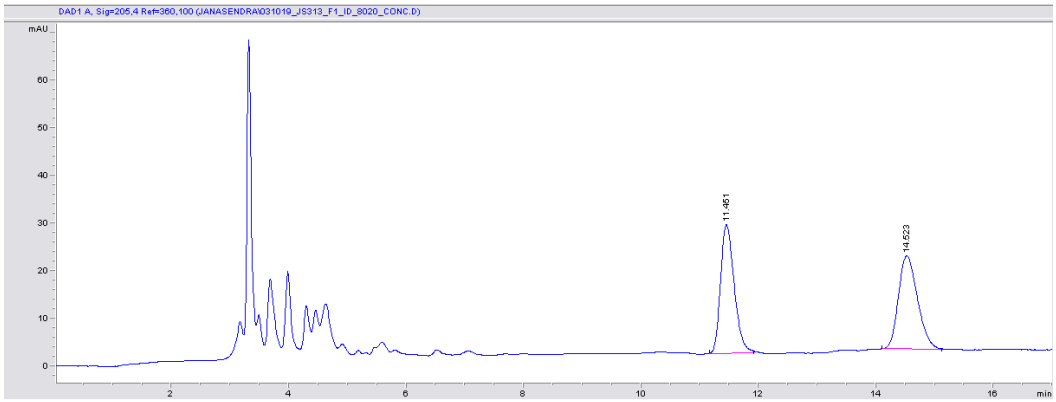
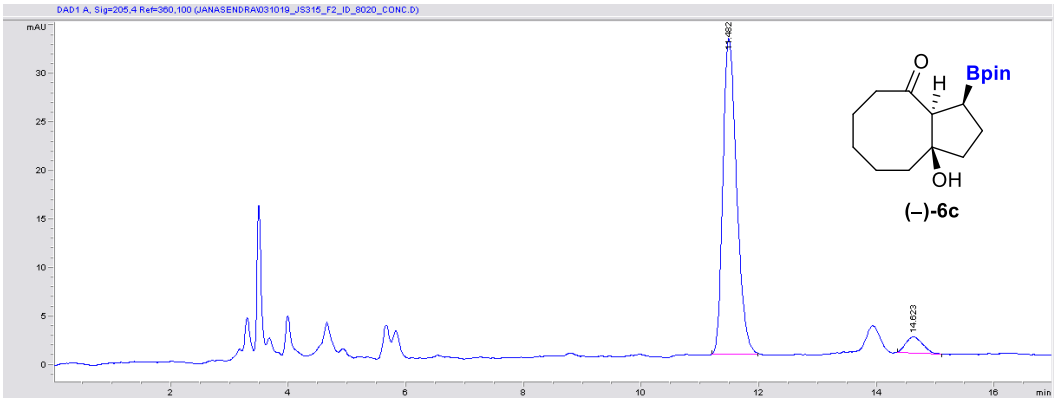


Figure SI-56. HPLC traces for racemic and chiral compound (+)-**6b**.





Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	11.482	BB	0.2516	530.75812	32.65953	93.8662
2	14.623	BB	0.2633	34.68312	1.73407	6.1338

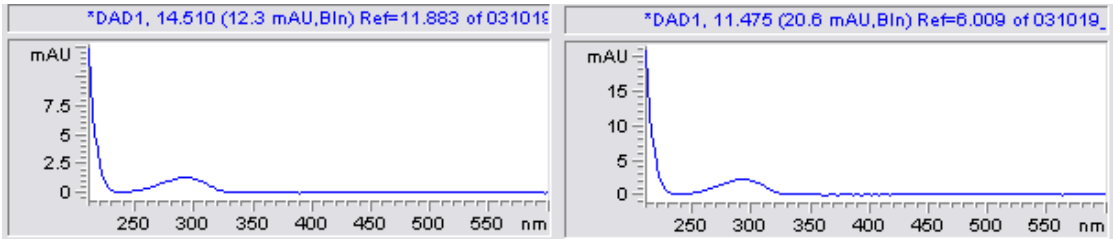
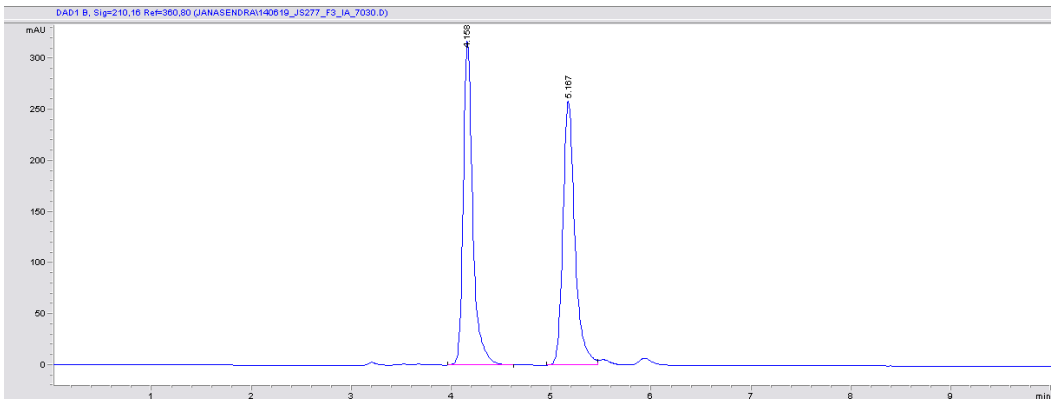
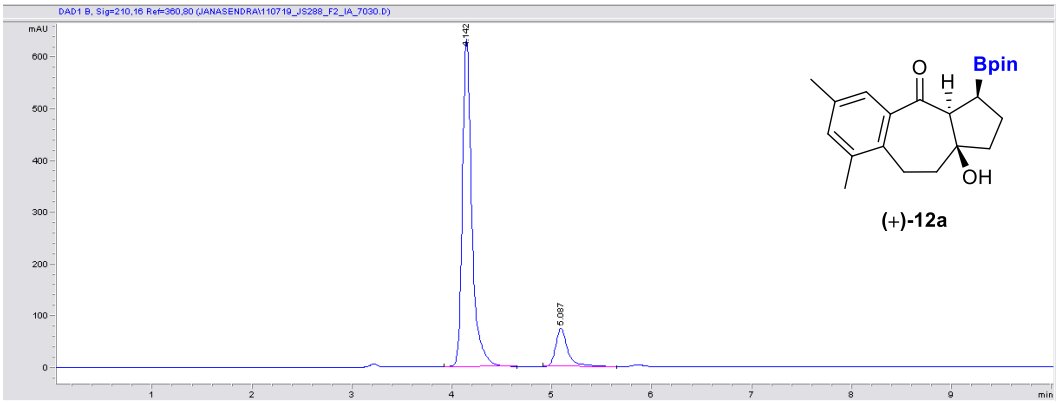


Figure SI-57. HPLC traces for racemic and chiral compound (-)-**6c**.





(+)-12a

Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	4.142	BB	0.0990	4184.52002	633.69366	86.8873
2	5.087	BB	0.1285	631.50940	73.34352	13.1127

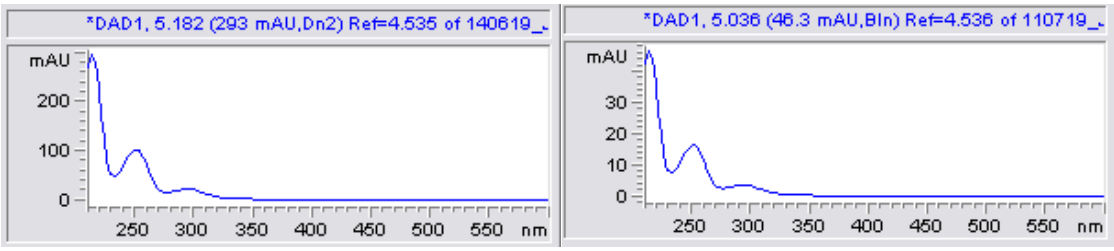
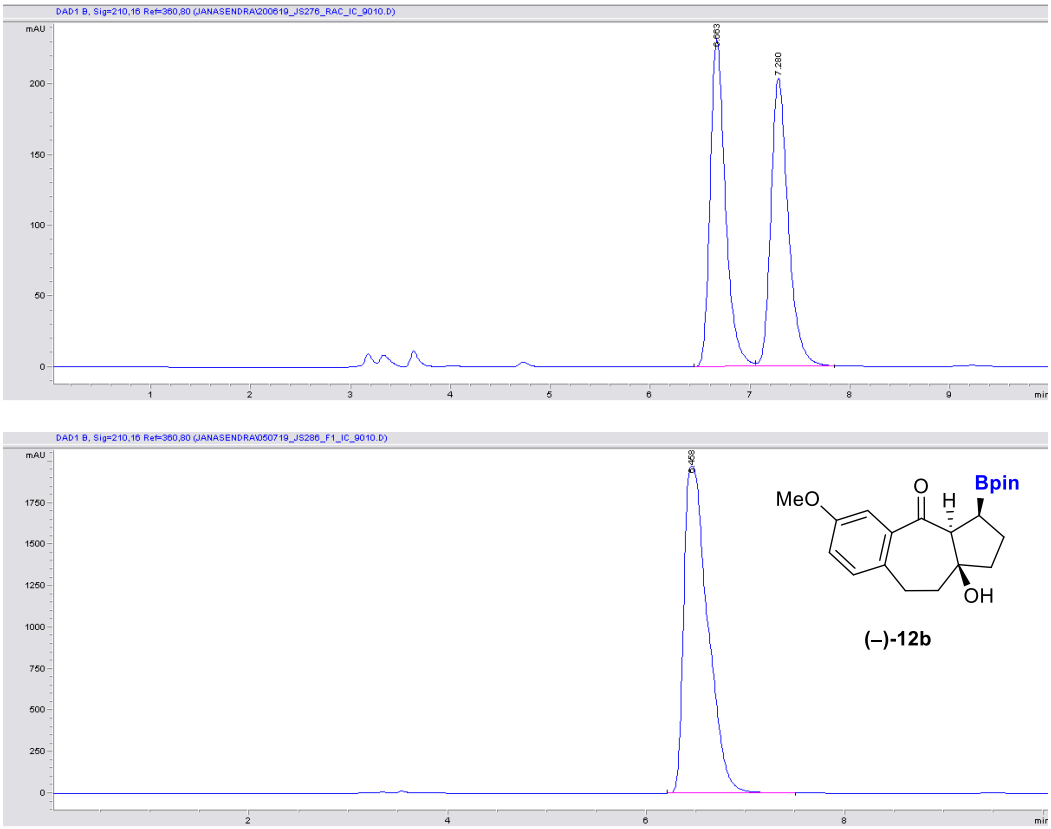


Figure SI-58. HPLC traces for racemic and chiral compound (+)-**12a**.



Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.458	BB	0.2463	3.28250e4	1971.28918	100.0000

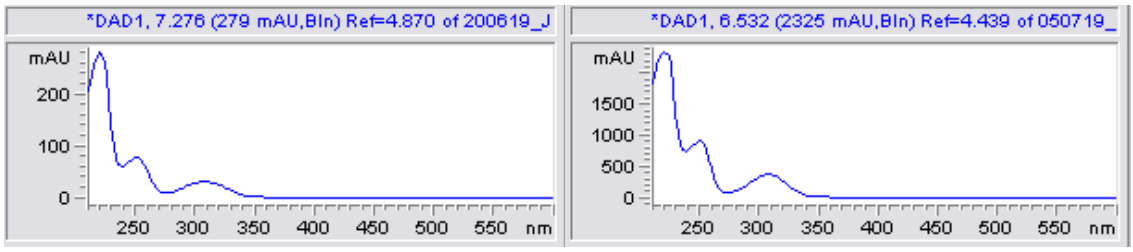
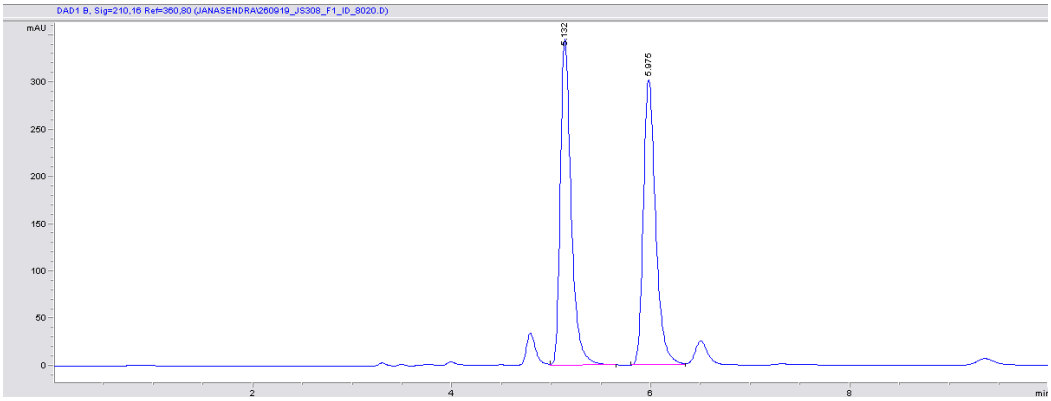
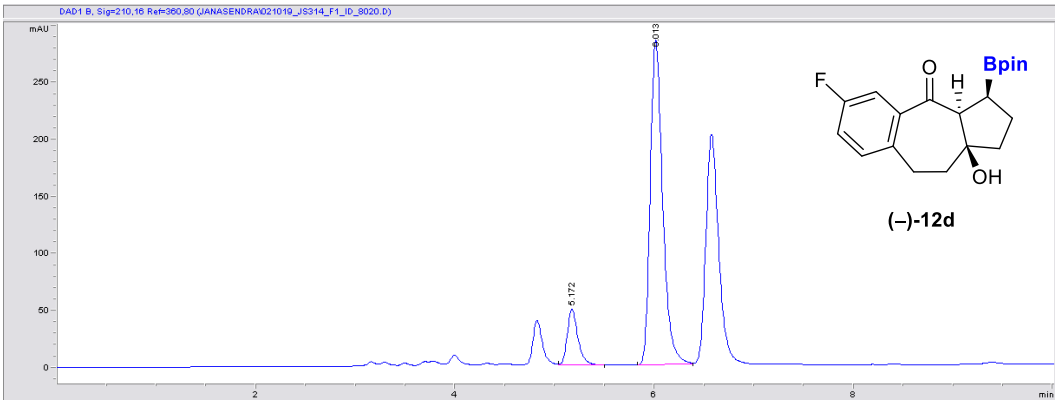


Figure SI-59. HPLC traces for racemic and chiral compound (-)-**12b**.





Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.172	VB	0.1133	370.56442	49.50987	12.9757
2	6.013	BV	0.1336	2485.26685	285.42767	87.0243

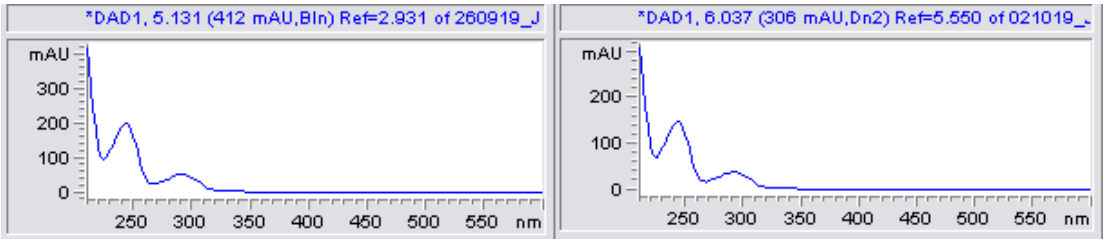
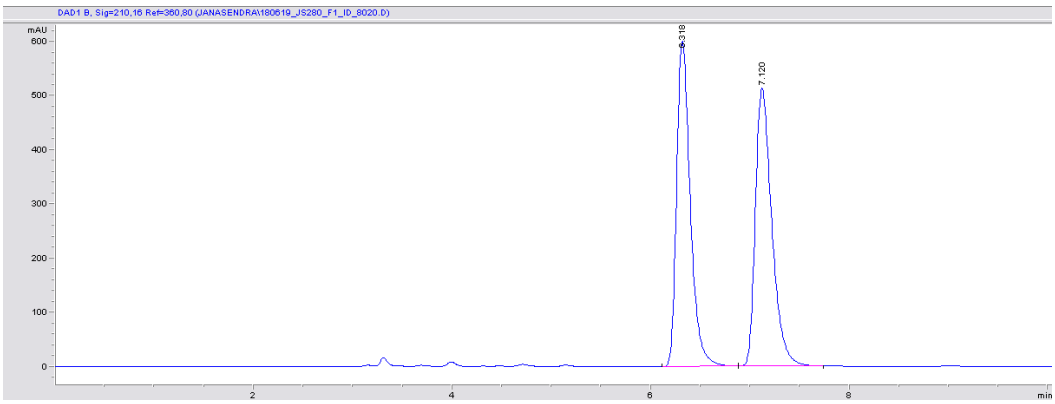
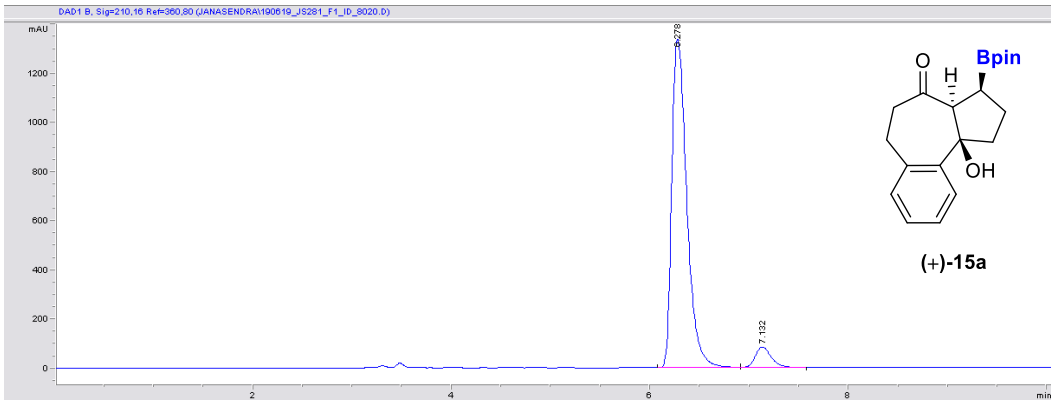


Figure SI-60. HPLC traces for racemic and chiral compound (-)-**12d**.





Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.278	BV	0.1628	1.40858e4	1337.83374	93.7491
2	7.132	VB	0.1706	939.20251	83.89516	6.2509

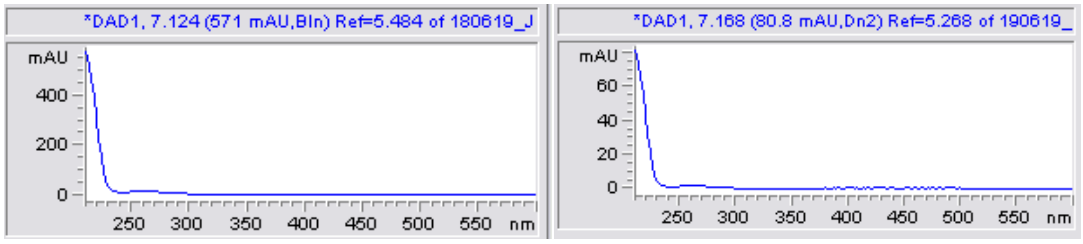
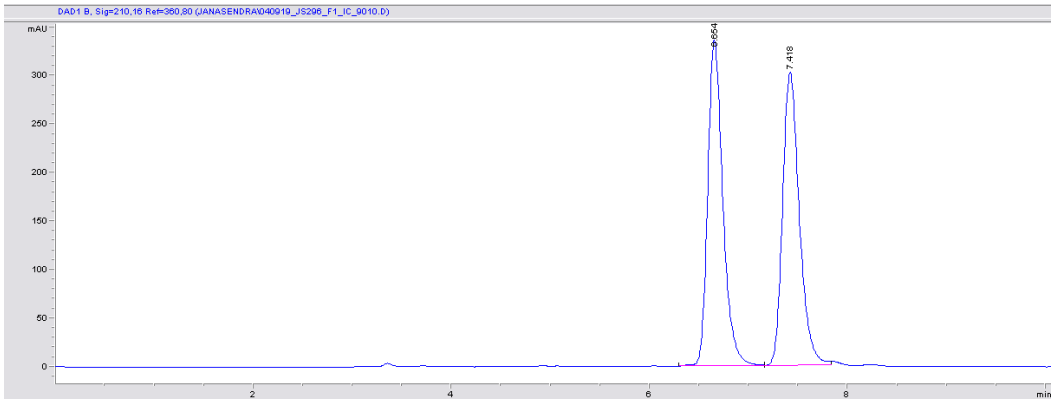
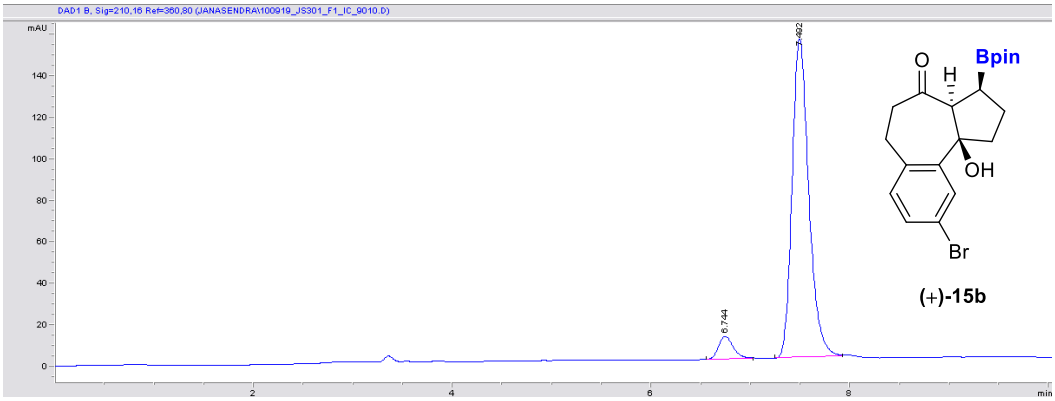


Figure SI-61. HPLC traces for racemic and chiral compound (+)-**15a**.





Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.744	BB	0.1597	114.29430	10.95368	5.9721
2	7.492	BB	0.1788	1799.50940	153.47749	94.0279

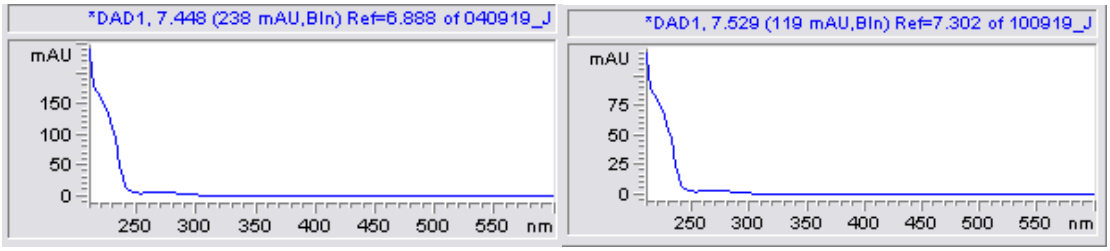
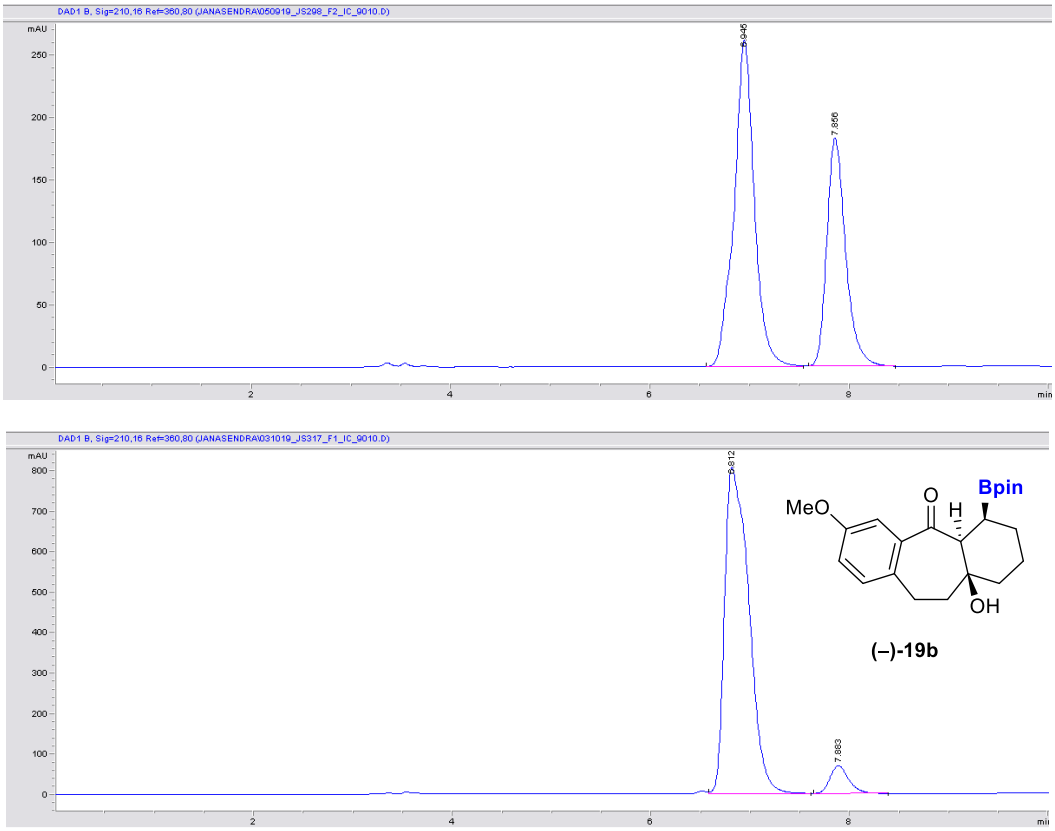


Figure SI-62. HPLC traces for racemic and chiral compound (+)-**15b**.



Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	6.812	VB	0.2315	1.36746e4	807.83240	93.7191
2	7.883	BB	0.2010	916.44800	68.98879	6.2809

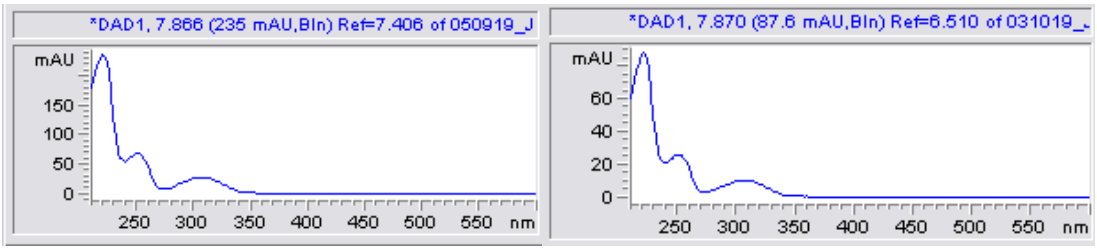
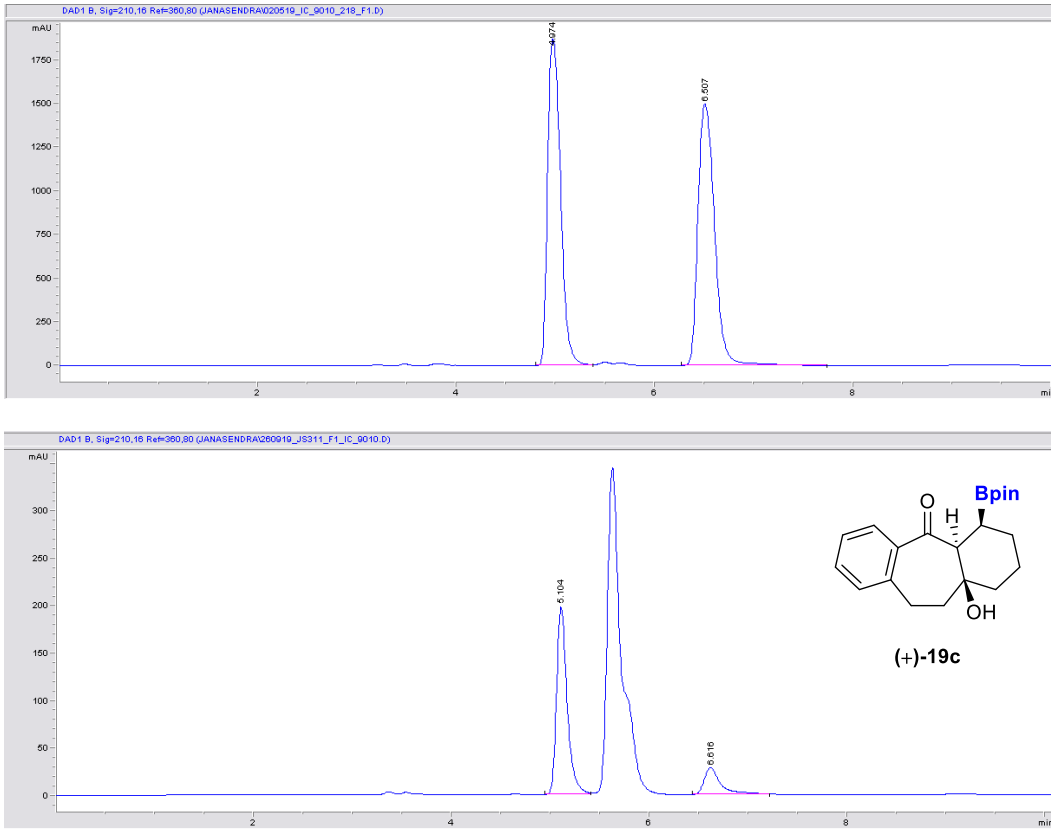


Figure SI-63. HPLC traces for racemic and chiral compound (-)-**19b**.



Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.104	BV	0.1126	1471.48047	198.29185	81.4152
2	6.616	BB	0.1731	335.89688	28.17558	18.5848

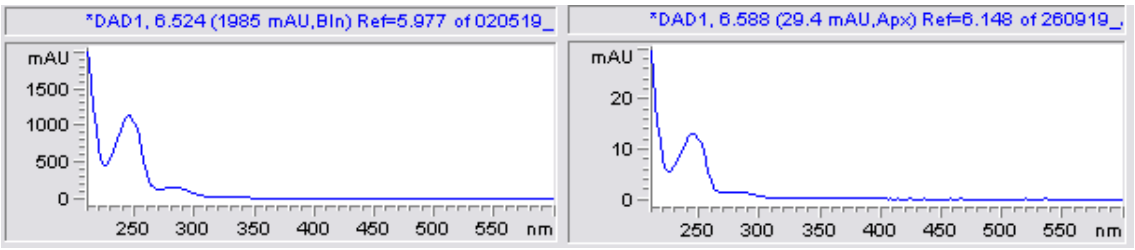
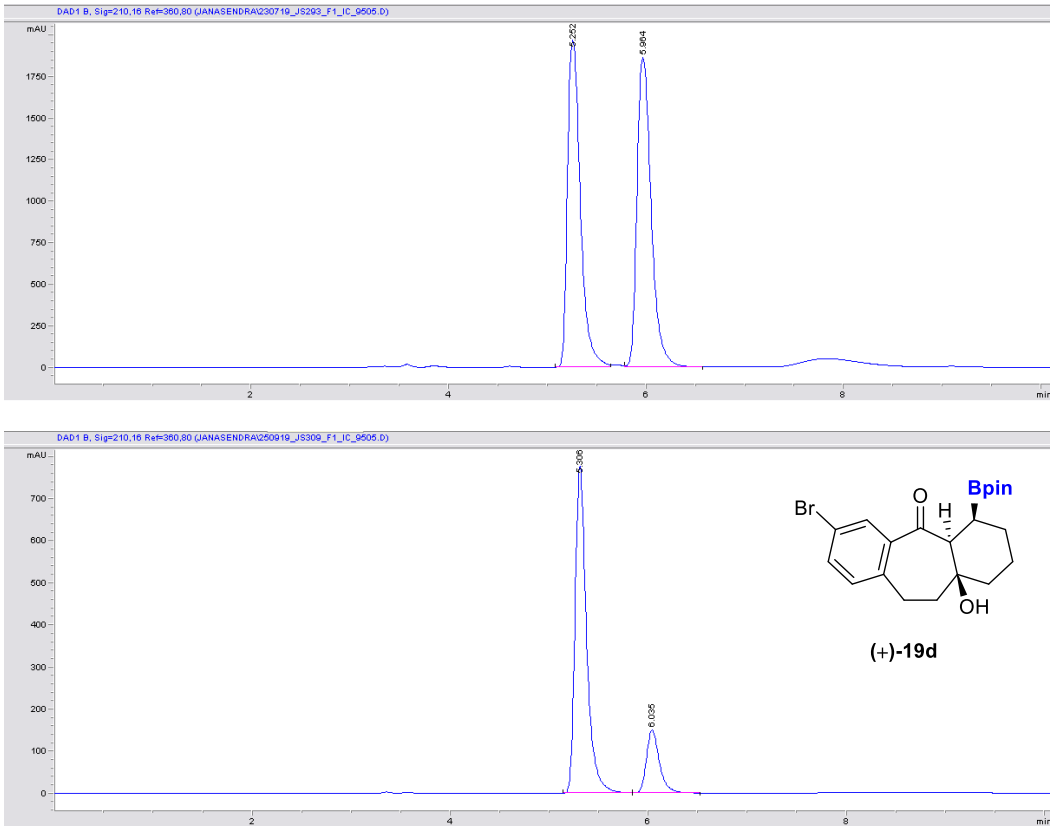


Figure SI-64. HPLC traces for racemic and chiral compound (+)-**19c**.



Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	5.306	BV	0.1221	6281.15820	778.80084	81.9872
2	6.035	VB	0.1396	1379.98901	149.67812	18.0128

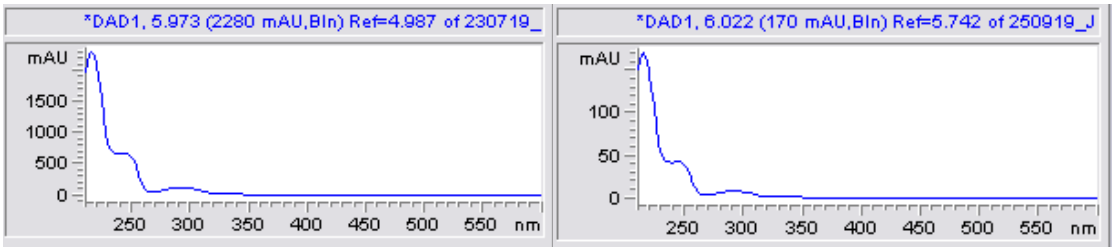
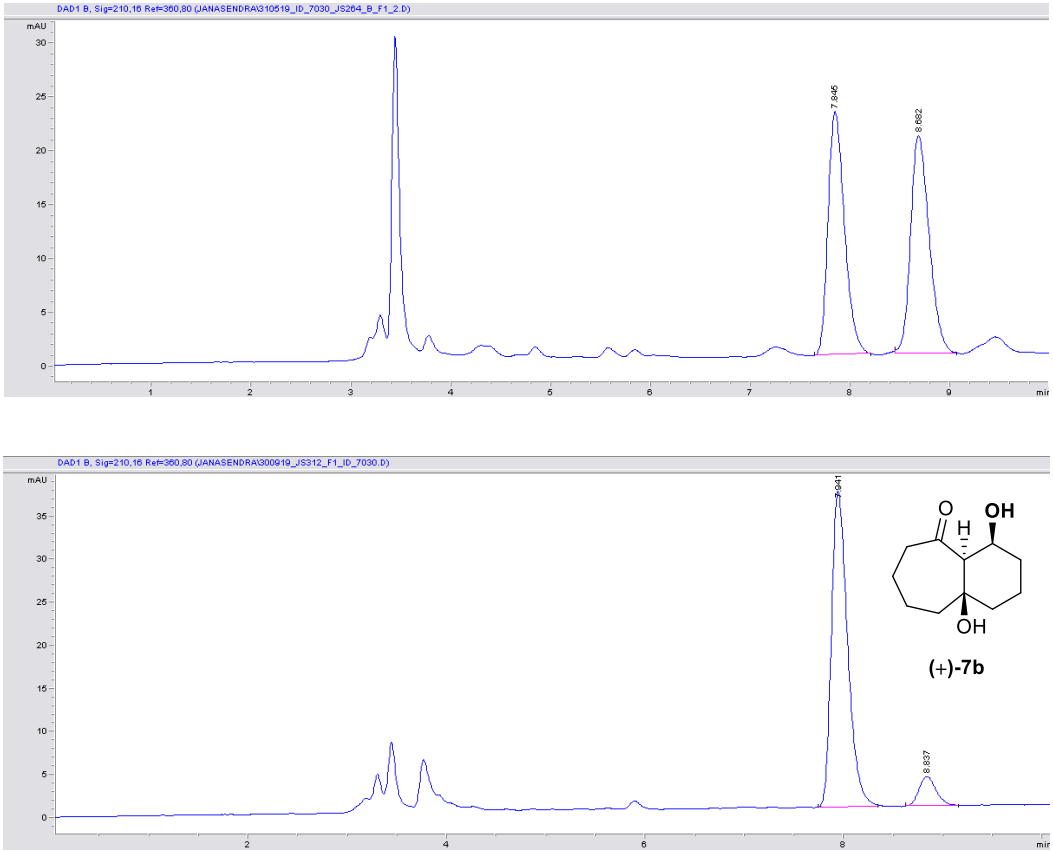


Figure SI-65. HPLC traces for racemic and chiral compound (+)-**19d**.



Peak Results

Peak #	RetTime [min]	Type	Width [min]	Area [mAU*s]	Height [mAU]	Area %
1	7.941	BB	0.1740	414.80106	36.67532	91.0637
2	8.837	BB	0.1875	40.70519	3.40479	8.9363

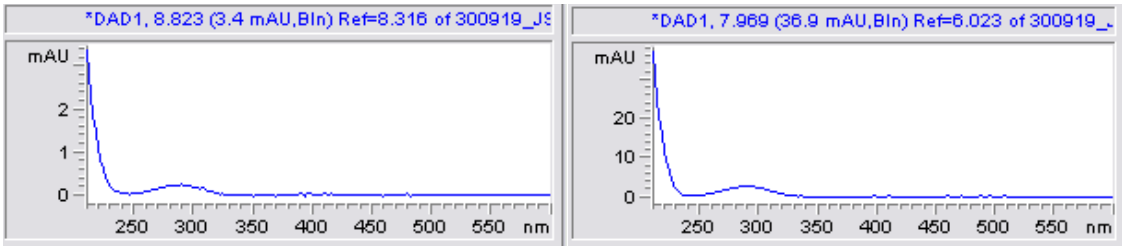


Figure SI-66. HPLC traces for racemic and chiral compound (+)-**7b**.

1.3. X-ray details

X-ray details for (+)-15a: CCDC 1944177

Summary of Data CCDC 1944177

Formula: C20 H27 B O4

Unit Cell Parameters: a = 9.03049(5)Å, b = 8.61533(5)Å, c = 11.74381(6)Å

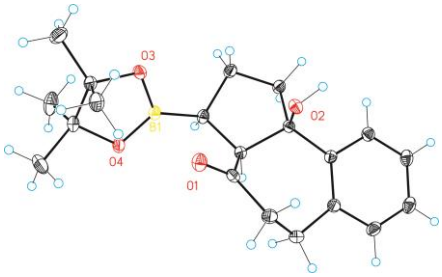


Table SI-1. Crystal data and structure refinement for (+)-**15a**.

Identification code	JS_81_F1_b	
Empirical formula	C20 H27 B O4	
Formula weight	342.22	
Temperature	100(2)K	
Wavelength	0.71073 Å	
Crystal system	monoclinic	
Space group	P 21	
Unit cell dimensions	a = 9.03049(5)Å	a = 90°.
	b = 8.61533(5)Å	b = 102.4590(5)°.
	c = 11.74381(6)Å	g = 90°.
Volume	892.159(9) $Å^3$	
Z	2	
Density (calculated)	1.274 Mg/m^3	
Absorption coefficient	0.085 mm^{-1}	
F(000)	368	
Crystal size	0.400 x 0.300 x 0.200 mm^3	
Theta range for data collection	2.310 to 28.528°.	
Index ranges	-12<=h<=12,-11<=k<=10,-15<=l<=15	
Reflections collected	56812	
Independent reflections	4407[R(int) = 0.0337]	
Completeness to theta =28.528°	100.0%	
Absorption correction	Multi-scan	
Max. and min. transmission	1.00 and 0.64	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	4407/ 1/ 231	
Goodness-of-fit on F^2	1.036	
Final R indices [I>2sigma(I)]	R1 = 0.0251, wR2 = 0.0680	
R indices (all data)	R1 = 0.0251, wR2 = 0.0680	
Largest diff. peak and hole	0.250 and -0.199 $e.Å^{-3}$	

Table SI-2. Bond lengths [Å] and angles [°] for (+)-**15a**.

Bond lengths

O1	C1	1.2166(15)
O2	C10	1.4451(13)
O3	B1	1.3729(15)
O3	C15	1.4634(14)
O4	B1	1.3762(15)
O4	C16	1.4564(14)
C1	C11	1.5029(15)
C1	C2	1.5113(15)
C2	C3	1.5309(17)
C3	C4	1.5199(18)
C4	C5	1.4017(15)
C4	C9	1.4091(15)
C5	C6	1.3877(19)
C6	C7	1.3894(18)
C7	C8	1.3904(15)
C8	C9	1.4039(16)
C9	C10	1.5230(14)
C10	C12	1.5366(16)
C10	C11	1.5610(15)
C11	C14	1.5566(15)
C12	C13	1.5314(16)
C13	C14	1.5417(17)
C14	B1	1.5788(17)
C15	C17	1.5164(16)
C15	C18	1.5226(17)
C15	C16	1.5598(17)
C16	C20	1.5200(18)
C16	C19	1.5235(17)

Angles

B1	O3	C15	106.73(9)
B1	O4	C16	107.26(9)
O1	C1	C11	121.82(10)
O1	C1	C2	121.41(11)
C11	C1	C2	116.73(10)
C1	C2	C3	115.11(10)
C4	C3	C2	117.25(10)
C5	C4	C9	118.37(11)
C5	C4	C3	116.06(10)
C9	C4	C3	125.56(10)
C6	C5	C4	122.04(12)
C5	C6	C7	119.45(11)
C6	C7	C8	119.48(11)
C7	C8	C9	121.54(11)
C8	C9	C4	118.98(10)
C8	C9	C10	116.96(10)
C4	C9	C10	123.95(10)
O2	C10	C9	109.42(8)
O2	C10	C12	109.03(9)
C9	C10	C12	115.32(9)

O2	C10	C11	105.02(9)
C9	C10	C11	114.89(9)
C12	C10	C11	102.47(8)
C1	C11	C14	115.78(9)
C1	C11	C10	107.49(8)
C14	C11	C10	106.93(9)
C13	C12	C10	102.79(10)
C12	C13	C14	104.07(9)
C13	C14	C11	104.47(9)
C13	C14	B1	115.44(10)
C11	C14	B1	117.51(10)
O3	C15	C17	108.64(10)
O3	C15	C18	107.45(9)
C17	C15	C18	109.53(10)
O3	C15	C16	102.08(9)
C17	C15	C16	115.15(10)
C18	C15	C16	113.38(10)
O4	C16	C20	108.43(10)
O4	C16	C19	106.62(10)
C20	C16	C19	110.48(11)
O4	C16	C15	102.66(9)
C20	C16	C15	114.56(10)
C19	C16	C15	113.39(11)
O3	B1	O4	112.98(10)
O3	B1	C14	123.72(10)
O4	B1	C14	122.31(10)

Table SI-3. Torsion angles [°] and symmetry operations for (+)-**15a**.

O1	C1	C2	C3	163.42(11)
C11	C1	C2	C3	-18.86(14)
C1	C2	C3	C4	73.09(13)
C2	C3	C4	C5	140.52(11)
C2	C3	C4	C9	-39.05(16)
C9	C4	C5	C6	2.49(17)
C3	C4	C5	C6	-177.11(11)
C4	C5	C6	C7	0.98(18)
C5	C6	C7	C8	-2.79(18)
C6	C7	C8	C9	1.12(18)
C7	C8	C9	C4	2.37(17)
C7	C8	C9	C10	178.66(11)
C5	C4	C9	C8	-4.09(16)
C3	C4	C9	C8	175.47(10)
C5	C4	C9	C10	179.90(10)
C3	C4	C9	C10	-0.54(17)
C8	C9	C10	O2	-87.26(12)
C4	C9	C10	O2	88.82(12)
C8	C9	C10	C12	36.06(13)
C4	C9	C10	C12	-147.86(11)
C8	C9	C10	C11	154.93(10)
C4	C9	C10	C11	-28.99(15)
O1	C1	C11	C14	-6.22(15)
C2	C1	C11	C14	176.07(9)

O1	C1	C11	C10	113.21(11)
C2	C1	C11	C10	-64.50(12)
O2	C10	C11	C1	-34.38(10)
C9	C10	C11	C1	85.88(11)
C12	C10	C11	C1	-148.28(9)
O2	C10	C11	C14	90.55(10)
C9	C10	C11	C14	-149.18(9)
C12	C10	C11	C14	-23.34(11)
O2	C10	C12	C13	-70.19(11)
C9	C10	C12	C13	166.28(9)
C11	C10	C12	C13	40.73(10)
C10	C12	C13	C14	-43.47(11)
C12	C13	C14	C11	28.15(12)
C12	C13	C14	B1	158.77(9)
C1	C11	C14	C13	116.97(10)
C10	C11	C14	C13	-2.77(11)
C1	C11	C14	B1	-12.43(14)
C10	C11	C14	B1	-132.16(10)
B1	O3	C15	C17	-147.40(11)
B1	O3	C15	C18	94.18(11)
B1	O3	C15	C16	-25.34(11)
B1	O4	C16	C20	-142.80(10)
B1	O4	C16	C19	98.23(12)
B1	O4	C16	C15	-21.22(12)
O3	C15	C16	O4	28.07(10)
C17	C15	C16	O4	145.56(10)
C18	C15	C16	O4	-87.19(11)
O3	C15	C16	C20	145.38(10)
C17	C15	C16	C20	-97.13(13)
C18	C15	C16	C20	30.12(14)
O3	C15	C16	C19	-86.55(11)
C17	C15	C16	C19	30.95(15)
C18	C15	C16	C19	158.19(11)
C15	O3	B1	O4	13.43(13)
C15	O3	B1	C14	-177.77(10)
C16	O4	B1	O3	5.97(13)
C16	O4	B1	C14	-163.00(10)
C13	C14	B1	O3	-10.83(16)
C11	C14	B1	O3	113.21(12)
C13	C14	B1	O4	156.95(10)
C11	C14	B1	O4	-79.01(14)

Symmetry operations

1 'x, y, z'

2 '-x, y+1/2, -z'

X-ray details for (+)-7b: CCDC 1960435
Summary of Data CCDC 1960435
Formula: C11 H18 O3
Unit Cell Parameters: a = 8.57876(12)Å, b = 28.8880(4)Å, c = 8.70513(11)Å

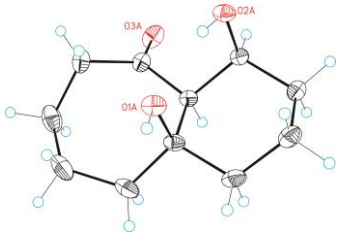


Table SI-4. Crystal data and structure refinement for (+)-**7b**.

Identification code	JS-312-f1
Empirical formula	C11 H18 O3
Formula weight	198.25
Temperature	100(2)K
Wavelength	0.71073 Å
Crystal system	monoclinic
Space group	P 21
Unit cell dimensions	a = 8.57876(12)Å a= 90°. b = 28.8880(4)Å b = 100.7205(13)°. c = 8.70513(11)Å g = 90°.
Volume	2119.68(5) $Å^3$
Z	8
Density (calculated)	1.242 Mg/m^3
Absorption coefficient	0.089 mm^{-1}
F(000)	864
Crystal size	0.200 x 0.120 x 0.100 mm^3
Theta range for data collection	2.381 to 59.377°.
Index ranges	-16<=h<=14,-67<=k<=62,-21<=l<=14
Reflections collected	149982
Independent reflections	34299[R(int) = 0.0319]
Completeness to theta =59.377°	68.2%
Absorption correction	Multi-scan
Max. and min. transmission	1.00 and 0.72
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	34299/ 745/ 882
Goodness-of-fit on F^2	0.961
Final R indices [I>2sigma(I)]	R1 = 0.0372, wR2 = 0.0885
R indices (all data)	R1 = 0.0608, wR2 = 0.0960
Largest diff. peak and hole	0.426 and -0.245 $e.Å^{-3}$

Table SI-5. Bond lengths [Å] and angles [°] for (+)-**7b**.

Bond lengths

O1A	C1A	1.4374(8)
O1A	H1A	0.784(15)
C1A	C11A	1.5376(10)
C1A	C6A	1.5401(9)
C1A	C2A	1.5447(11)
O2A	C5A	1.4388(8)
O2A	H2A	0.833(14)
C2A	C3A	1.5220(12)
C2A	H2AA	0.9900
C2A	H2AB	0.9900
O3A	C7A	1.2197(9)
C3A	C4A	1.5184(12)
C3A	H3AA	0.9900
C3A	H3AB	0.9900
C4A	C5A	1.5232(10)
C4A	H4AA	0.9900
C4A	H4AB	0.9900
C5A	C6A	1.5413(9)
C5A	H5A	1.0000
C6A	C7A	1.5304(9)
C6A	H6A	1.0000
C7A	C8A	1.5030(10)
C8A	C9A	1.5383(13)
C8A	H8AA	0.9900
C8A	H8AB	0.9900
C9A	C10A	1.5185(16)
C9A	H9AA	0.9900
C9A	H9AB	0.9900
C10A	C11A	1.5303(14)
C10A	H10C	0.9900
C10A	H10D	0.9900
C11A	H11C	0.9900
C11A	H11D	0.9900
C1B	O1B	1.4437(10)
C1B	C6B	1.5391(10)
C1B	C11B	1.5415(11)
C1B	C2B	1.5448(12)
O1B	H1B	0.860(14)
C2B	C3B	1.5228(14)
C2B	H2BA	0.9900
C2B	H2BB	0.9900
O2B	C5B	1.4386(9)
O2B	H2B	0.865(14)
C3B	C4B	1.517(3)
C3B	H3BA	0.9900
C3B	H3BB	0.9900
O3B	C7B	1.2225(10)
C4B	C5B	1.523(2)
C4B	H4BA	0.9900
C4B	H4BB	0.9900

C5B C6B 1.5369(11)
C5B H5B 1.0000
C6B C7B 1.5332(10)
C6B H6B 1.0000
C7B C8B 1.5026(14)
C8B C9B 1.5340(17)
C8B H8BA 0.9900
C8B H8BB 0.9900
C9B C10B 1.5210(19)
C9B H9BA 0.9900
C9B H9BB 0.9900
C10B C11B 1.5234(13)
C10B H10G 0.9900
C10B H10H 0.9900
C11B H11E 0.9900
C11B H11F 0.9900
C1B' O1B' 1.4382
C1B' C112 1.453(19)
C1B' C2B' 1.5431
C1B' C6B' 1.682(17)
O1B' H1B' 0.8944
C2B' C3B' 1.30(2)
C2B' H2BC 0.9900
C2B' H2BD 0.9900
O2B' C5B' 1.453(13)
O2B' H2B' 0.8456
C3B' C4B' 1.355(19)
C3B' H3BC 0.9900
C3B' H3BD 0.9900
O3B' C7B' 1.254(14)
C4B' C5B' 1.436(18)
C4B' H4BC 0.9900
C4B' H4BD 0.9900
C5B' C6B' 1.499(14)
C5B' H5B' 1.0000
C6B' C7B' 1.450(13)
C6B' H6B' 1.0000
C7B' C8B' 1.478(15)
C8B' C9B' 1.44(2)
C8B' H8BC 0.9900
C8B' H8BD 0.9900
C9B' C102 1.63(2)
C9B' H9BC 0.9900
C9B' H9BD 0.9900
C102 C112 1.44(2)
C102 H102 0.9900
C102 H103 0.9900
C112 H112 0.9900
C112 H113 0.9900
O1C C1C 1.4514(9)
O1C H1C 0.775(17)
C1C C11C 1.5366(10)
C1C C2C 1.5395(10)

C1C C6C 1.5442(9)
O2C C5C 1.4346(9)
O2C H2C 0.7959
C2C C3C 1.5242(13)
C2C H2CA 0.9900
C2C H2CB 0.9900
O3C C7C 1.2195(9)
C3C C4C 1.5281(15)
C3C H3CA 0.9900
C3C H3CB 0.9900
C4C C5C 1.5177(11)
C4C H4CA 0.9900
C4C H4CB 0.9900
C5C C6C 1.5462(10)
C5C H5C 1.0000
C6C C7C 1.5300(9)
C6C H6C 1.0000
C7C C8C 1.5029(10)
C8C C9C 1.5351(12)
C8C H8CA 0.9900
C8C H8CB 0.9900
C9C C10C 1.5180(13)
C9C H9CA 0.9900
C9C H9CB 0.9900
C10C C11C 1.5297(12)
C10C H104 0.9900
C10C H105 0.9900
C11C H116 0.9900
C11C H117 0.9900
C1C' C113 1.45(2)
C1C' O1C' 1.457(12)
C1C' C2C' 1.512(11)
C1C' C6C' 1.678(19)
O1C' H1C' 0.8270
C2C' C3C' 1.28(2)
C2C' H2CC 0.9900
C2C' H2CD 0.9900
O2C' C5C' 1.461(14)
O2C' H2C' 0.8966
C3C' C4C' 1.36(2)
C3C' H3CD 0.9900
C3C' H3CC 0.9900
O3C' C7C' 1.279(15)
C4C' C5C' 1.45(2)
C4C' H4CC 0.9900
C4C' H4CD 0.9900
C5C' C6C' 1.496(15)
C5C' H51' 1.0000
C6C' C7C' 1.458(15)
C6C' H61C 1.0000
C7C' C8C' 1.498(17)
C8C' C9C' 1.44(2)
C8C' H81' 0.9900

C8C' H82' 0.9900
C9C' C103 1.63(3)
C9C' H91' 0.9900
C9C' H92' 0.9900
C103 C113 1.44(2)
C103 H131 0.9900
C103 H132 0.9900
C113 H11G 0.9900
C113 H11H 0.9900
C1D O1D 1.4516(11)
C1D C11D 1.5362(13)
C1D C6D 1.5403(11)
C1D C2D 1.5475(13)
O1D H1D 0.7662
C2D C3D 1.5288(16)
C2D H2DA 0.9900
C2D H2DB 0.9900
O2D C5D 1.4342(10)
O2D H2D 0.796(16)
C3D C4D 1.5217(18)
C3D H3DA 0.9900
C3D H3DB 0.9900
O3D C7D 1.2203(9)
C4D C5D 1.5235(13)
C4D H4DA 0.9900
C4D H4DB 0.9900
C5D C6D 1.5469(10)
C5D H5D 1.0000
C6D C7D 1.5330(10)
C6D H6D 1.0000
C7D C8D 1.5017(11)
C8D C9D 1.554(2)
C8D H8DA 0.9900
C8D H8DB 0.9900
C9D C10D 1.529(2)
C9D H9DA 0.9900
C9D H9DB 0.9900
C10D C11D 1.525(2)
C10D H141 0.9900
C10D H142 0.9900
C11D H143 0.9900
C11D H144 0.9900
C1D' O1D' 1.444(11)
C1D' C114 1.46(2)
C1D' C2D' 1.514(10)
C1D' C6D' 1.680(17)
O1D' H1D' 0.9353
C2D' C3D' 1.29(2)
C2D' H2DC 0.9900
C2D' H2DD 0.9900
O2D' C5D' 1.462(12)
O2D' H2D' 0.8348
C3D' C4D' 1.371(19)

C3D' H3DC 0.9900
C3D' H3DD 0.9900
O3D' C7D' 1.250(12)
C4D' C5D' 1.462(19)
C4D' H4DC 0.9900
C4D' H4DD 0.9900
C5D' C6D' 1.499(14)
C5D' H5D' 1.0000
C6D' C7D' 1.448(12)
C6D' H6D' 1.0000
C7D' C8D' 1.474(14)
C8D' C9D' 1.44(2)
C8D' H8DC 0.9900
C8D' H8DD 0.9900
C9D' C104 1.64(3)
C9D' H9DC 0.9900
C9D' H9DD 0.9900
C104 C114 1.45(2)
C104 H145 0.9900
C104 H146 0.9900
C114 H147 0.9900
C114 H148 0.9900

Angles
C1A O1A H1A 109.5
O1A C1A C11A 111.61(6)
O1A C1A C6A 106.33(5)
C11A C1A C6A 113.04(6)
O1A C1A C2A 109.72(6)
C11A C1A C2A 107.91(6)
C6A C1A C2A 108.16(6)
C5A O2A H2A 107.5(9)
C3A C2A C1A 113.75(6)
C3A C2A H2AA 108.8
C1A C2A H2AA 108.8
C3A C2A H2AB 108.8
C1A C2A H2AB 108.8
H2AA C2A H2AB 107.7
C4A C3A C2A 111.06(7)
C4A C3A H3AA 109.4
C2A C3A H3AA 109.4
C4A C3A H3AB 109.4
C2A C3A H3AB 109.4
H3AA C3A H3AB 108.0
C3A C4A C5A 111.40(6)
C3A C4A H4AA 109.3
C5A C4A H4AA 109.3
C3A C4A H4AB 109.3
C5A C4A H4AB 109.3
H4AA C4A H4AB 108.0
O2A C5A C4A 110.96(6)
O2A C5A C6A 110.21(5)
C4A C5A C6A 111.49(5)

O2A C5A H5A 108.0
C4A C5A H5A 108.0
C6A C5A H5A 108.0
C7A C6A C1A 119.03(6)
C7A C6A C5A 107.26(5)
C1A C6A C5A 111.52(5)
C7A C6A H6A 106.1
C1A C6A H6A 106.1
C5A C6A H6A 106.1
O3A C7A C8A 120.20(7)
O3A C7A C6A 117.95(6)
C8A C7A C6A 121.83(6)
C7A C8A C9A 111.77(7)
C7A C8A H8AA 109.3
C9A C8A H8AA 109.3
C7A C8A H8AB 109.3
C9A C8A H8AB 109.3
H8AA C8A H8AB 107.9
C10A C9A C8A 113.93(7)
C10A C9A H9AA 108.8
C8A C9A H9AA 108.8
C10A C9A H9AB 108.8
C8A C9A H9AB 108.8
H9AA C9A H9AB 107.7
C9A C10A C11A 116.39(7)
C9A C10A H10C 108.2
C11A C10A H10C 108.2
C9A C10A H10D 108.2
C11A C10A H10D 108.2
H10C C10A H10D 107.3
C10A C11A C1A 117.24(7)
C10A C11A H11C 108.0
C1A C11A H11C 108.0
C10A C11A H11D 108.0
C1A C11A H11D 108.0
H11C C11A H11D 107.2
O1B C1B C6B 106.07(9)
O1B C1B C11B 111.58(7)
C6B C1B C11B 113.59(7)
O1B C1B C2B 110.03(10)
C6B C1B C2B 108.71(6)
C11B C1B C2B 106.85(7)
C1B O1B H1B 109.5
C3B C2B C1B 113.34(8)
C3B C2B H2BA 108.9
C1B C2B H2BA 108.9
C3B C2B H2BB 108.9
C1B C2B H2BB 108.9
H2BA C2B H2BB 107.7
C5B O2B H2B 108.4(9)
C4B C3B C2B 110.58(12)
C4B C3B H3BA 109.5
C2B C3B H3BA 109.5

C4B C3B H3BB 109.5
C2B C3B H3BB 109.5
H3BA C3B H3BB 108.1
C3B C4B C5B 111.37(14)
C3B C4B H4BA 109.4
C5B C4B H4BA 109.4
C3B C4B H4BB 109.4
C5B C4B H4BB 109.4
H4BA C4B H4BB 108.0
O2B C5B C4B 111.16(11)
O2B C5B C6B 109.81(6)
C4B C5B C6B 112.07(10)
O2B C5B H5B 107.9
C4B C5B H5B 107.9
C6B C5B H5B 107.9
C7B C6B C5B 106.87(6)
C7B C6B C1B 118.32(6)
C5B C6B C1B 111.53(6)
C7B C6B H6B 106.5
C5B C6B H6B 106.5
C1B C6B H6B 106.5
O3B C7B C8B 119.98(7)
O3B C7B C6B 117.63(8)
C8B C7B C6B 122.38(7)
C7B C8B C9B 112.80(8)
C7B C8B H8BA 109.0
C9B C8B H8BA 109.0
C7B C8B H8BB 109.0
C9B C8B H8BB 109.0
H8BA C8B H8BB 107.8
C10B C9B C8B 113.87(8)
C10B C9B H9BA 108.8
C8B C9B H9BA 108.8
C10B C9B H9BB 108.8
C8B C9B H9BB 108.8
H9BA C9B H9BB 107.7
C9B C10B C11B 115.15(9)
C9B C10B H10G 108.5
C11B C10B H10G 108.5
C9B C10B H10H 108.5
C11B C10B H10H 108.5
H10G C10B H10H 107.5
C10B C11B C1B 117.43(7)
C10B C11B H11E 107.9
C1B C11B H11E 107.9
C10B C11B H11F 107.9
C1B C11B H11F 107.9
H11E C11B H11F 107.2
O1B' C1B' C112 99.3(13)
O1B' C1B' C2B' 109.9
C112 C1B' C2B' 123.2(13)
O1B' C1B' C6B' 99.8(14)
C112 C1B' C6B' 112.9(10)

C2B' C1B' C6B' 108.7(10)
C1B' O1B' H1B' 122.3
C3B' C2B' C1B' 116.8(12)
C3B' C2B' H2BC 108.1
C1B' C2B' H2BC 108.1
C3B' C2B' H2BD 108.1
C1B' C2B' H2BD 108.1
H2BC C2B' H2BD 107.3
C5B' O2B' H2B' 109.5
C2B' C3B' C4B' 122.5(16)
C2B' C3B' H3BC 106.7
C4B' C3B' H3BC 106.7
C2B' C3B' H3BD 106.7
C4B' C3B' H3BD 106.7
H3BC C3B' H3BD 106.6
C3B' C4B' C5B' 120.9(14)
C3B' C4B' H4BC 107.1
C5B' C4B' H4BC 107.1
C3B' C4B' H4BD 107.1
C5B' C4B' H4BD 107.1
H4BC C4B' H4BD 106.8
C4B' C5B' O2B' 101.8(11)
C4B' C5B' C6B' 115.6(9)
O2B' C5B' C6B' 111.0(9)
C4B' C5B' H5B' 109.4
O2B' C5B' H5B' 109.4
C6B' C5B' H5B' 109.4
C7B' C6B' C5B' 111.4(10)
C7B' C6B' C1B' 124.3(10)
C5B' C6B' C1B' 109.2(8)
C7B' C6B' H6B' 103.1
C5B' C6B' H6B' 103.1
C1B' C6B' H6B' 103.1
O3B' C7B' C6B' 115.8(11)
O3B' C7B' C8B' 118.9(11)
C6B' C7B' C8B' 125.3(11)
C9B' C8B' C7B' 109.9(14)
C9B' C8B' H8BC 109.7
C7B' C8B' H8BC 109.7
C9B' C8B' H8BD 109.7
C7B' C8B' H8BD 109.7
H8BC C8B' H8BD 108.2
C8B' C9B' C102 115.5(17)
C8B' C9B' H9BC 108.4
C102 C9B' H9BC 108.4
C8B' C9B' H9BD 108.4
C102 C9B' H9BD 108.4
H9BC C9B' H9BD 107.5
C112 C102 C9B' 115.2(14)
C112 C102 H102 108.5
C9B' C102 H102 108.5
C112 C102 H103 108.5
C9B' C102 H103 108.5

H102 C102 H103 107.5
C102 C112 C1B' 128.0(14)
C102 C112 H112 105.3
C1B' C112 H112 105.3
C102 C112 H113 105.3
C1B' C112 H113 105.3
H112 C112 H113 106.0
C1C O1C H1C 102.3(12)
O1C C1C C11C 107.86(7)
O1C C1C C2C 109.56(6)
C11C C1C C2C 107.57(6)
O1C C1C C6C 109.86(6)
C11C C1C C6C 114.21(6)
C2C C1C C6C 107.70(6)
C5C O2C H2C 114.6
C3C C2C C1C 113.62(6)
C3C C2C H2CA 108.8
C1C C2C H2CA 108.8
C3C C2C H2CB 108.8
C1C C2C H2CB 108.8
H2CA C2C H2CB 107.7
C2C C3C C4C 111.06(7)
C2C C3C H3CA 109.4
C4C C3C H3CA 109.4
C2C C3C H3CB 109.4
C4C C3C H3CB 109.4
H3CA C3C H3CB 108.0
C5C C4C C3C 111.17(7)
C5C C4C H4CA 109.4
C3C C4C H4CA 109.4
C5C C4C H4CB 109.4
C3C C4C H4CB 109.4
H4CA C4C H4CB 108.0
O2C C5C C4C 107.32(7)
O2C C5C C6C 110.68(6)
C4C C5C C6C 111.21(6)
O2C C5C H5C 109.2
C4C C5C H5C 109.2
C6C C5C H5C 109.2
C7C C6C C1C 119.67(6)
C7C C6C C5C 107.52(5)
C1C C6C C5C 111.72(6)
C7C C6C H6C 105.6
C1C C6C H6C 105.6
C5C C6C H6C 105.6
O3C C7C C8C 119.79(7)
O3C C7C C6C 117.46(7)
C8C C7C C6C 122.74(6)
C7C C8C C9C 112.17(6)
C7C C8C H8CA 109.2
C9C C8C H8CA 109.2
C7C C8C H8CB 109.2
C9C C8C H8CB 109.2

H8CA C8C H8CB 107.9
C10C C9C C8C 114.15(7)
C10C C9C H9CA 108.7
C8C C9C H9CA 108.7
C10C C9C H9CB 108.7
C8C C9C H9CB 108.7
H9CA C9C H9CB 107.6
C9C C10C C11C 115.29(7)
C9C C10C H104 108.5
C11C C10C H104 108.5
C9C C10C H105 108.5
C11C C10C H105 108.5
H104 C10C H105 107.5
C10C C11C C1C 117.45(6)
C10C C11C H116 107.9
C1C C11C H116 107.9
C10C C11C H117 107.9
C1C C11C H117 107.9
H116 C11C H117 107.2
C113 C1C' O1C' 98.4(15)
C113 C1C' C2C' 130.3(17)
O1C' C1C' C2C' 108.1(14)
C113 C1C' C6C' 108.9(14)
O1C' C1C' C6C' 99.2(15)
C2C' C1C' C6C' 107.4(13)
C1C' O1C' H1C' 106.2
C3C' C2C' C1C' 120.2(16)
C3C' C2C' H2CC 107.3
C1C' C2C' H2CC 107.3
C3C' C2C' H2CD 107.3
C1C' C2C' H2CD 107.3
H2CC C2C' H2CD 106.9
C5C' O2C' H2C' 97.9
C2C' C3C' C4C' 128(2)
C2C' C3C' H3CD 105.3
C4C' C3C' H3CD 105.3
C2C' C3C' H3CC 105.3
C4C' C3C' H3CC 105.3
H3CD C3C' H3CC 106.0
C3C' C4C' C5C' 113.5(15)
C3C' C4C' H4CC 108.9
C5C' C4C' H4CC 108.9
C3C' C4C' H4CD 108.9
C5C' C4C' H4CD 108.9
H4CC C4C' H4CD 107.7
C4C' C5C' O2C' 98.6(13)
C4C' C5C' C6C' 113.5(13)
O2C' C5C' C6C' 108.8(12)
C4C' C5C' H51' 111.8
O2C' C5C' H51' 111.8
C6C' C5C' H51' 111.8
C7C' C6C' C5C' 110.8(12)
C7C' C6C' C1C' 123.2(13)

C5C' C6C' C1C' 111.2(11)
C7C' C6C' H61C 102.9
C5C' C6C' H61C 102.9
C1C' C6C' H61C 102.9
O3C' C7C' C6C' 108.6(14)
O3C' C7C' C8C' 111.5(15)
C6C' C7C' C8C' 117.8(15)
C9C' C8C' C7C' 110.0(17)
C9C' C8C' H81' 109.7
C7C' C8C' H81' 109.7
C9C' C8C' H82' 109.7
C7C' C8C' H82' 109.7
H81' C8C' H82' 108.2
C8C' C9C' C103 115.9(19)
C8C' C9C' H91' 108.3
C103 C9C' H91' 108.3
C8C' C9C' H92' 108.3
C103 C9C' H92' 108.3
H91' C9C' H92' 107.4
C113 C103 C9C' 115.3(17)
C113 C103 H131 108.5
C9C' C103 H131 108.5
C113 C103 H132 108.5
C9C' C103 H132 108.5
H131 C103 H132 107.5
C103 C113 C1C' 128(2)
C103 C113 H11G 105.3
C1C' C113 H11G 105.3
C103 C113 H11H 105.3
C1C' C113 H11H 105.3
H11G C113 H11H 106.0
O1D C1D C11D 108.13(9)
O1D C1D C6D 109.61(7)
C11D C1D C6D 114.44(7)
O1D C1D C2D 109.26(9)
C11D C1D C2D 107.25(8)
C6D C1D C2D 108.04(7)
C1D O1D H1D 107.7
C3D C2D C1D 113.81(8)
C3D C2D H2DA 108.8
C1D C2D H2DA 108.8
C3D C2D H2DB 108.8
C1D C2D H2DB 108.8
H2DA C2D H2DB 107.7
C5D O2D H2D 109.5
C4D C3D C2D 110.92(11)
C4D C3D H3DA 109.5
C2D C3D H3DA 109.5
C4D C3D H3DB 109.5
C2D C3D H3DB 109.5
H3DA C3D H3DB 108.0
C3D C4D C5D 110.64(10)
C3D C4D H4DA 109.5

C5D C4D H4DA 109.5
C3D C4D H4DB 109.5
C5D C4D H4DB 109.5
H4DA C4D H4DB 108.1
O2D C5D C4D 107.38(8)
O2D C5D C6D 110.66(6)
C4D C5D C6D 111.38(8)
O2D C5D H5D 109.1
C4D C5D H5D 109.1
C6D C5D H5D 109.1
C7D C6D C1D 118.78(6)
C7D C6D C5D 107.89(5)
C1D C6D C5D 111.53(6)
C7D C6D H6D 105.9
C1D C6D H6D 105.9
C5D C6D H6D 105.9
O3D C7D C8D 119.95(7)
O3D C7D C6D 117.48(7)
C8D C7D C6D 122.57(6)
C7D C8D C9D 112.37(11)
C7D C8D H8DA 109.1
C9D C8D H8DA 109.1
C7D C8D H8DB 109.1
C9D C8D H8DB 109.1
H8DA C8D H8DB 107.9
C10D C9D C8D 113.43(14)
C10D C9D H9DA 108.9
C8D C9D H9DA 108.9
C10D C9D H9DB 108.9
C8D C9D H9DB 108.9
H9DA C9D H9DB 107.7
C11D C10D C9D 115.56(13)
C11D C10D H141 108.4
C9D C10D H141 108.4
C11D C10D H142 108.4
C9D C10D H142 108.4
H141 C10D H142 107.5
C10D C11D C1D 117.81(10)
C10D C11D H143 107.9
C1D C11D H143 107.9
C10D C11D H144 107.9
C1D C11D H144 107.9
H143 C11D H144 107.2
O1D' C1D' C114 99.5(13)
O1D' C1D' C2D' 108.9(12)
C114 C1D' C2D' 126.1(13)
O1D' C1D' C6D' 102.5(12)
C114 C1D' C6D' 109.6(11)
C2D' C1D' C6D' 107.7(10)
C1D' O1D' H1D' 110.5
C3D' C2D' C1D' 116.9(14)
C3D' C2D' H2DC 108.1
C1D' C2D' H2DC 108.1

C3D' C2D' H2DD 108.1
C1D' C2D' H2DD 108.1
H2DC C2D' H2DD 107.3
C5D' O2D' H2D' 108.5
C2D' C3D' C4D' 123.5(18)
C2D' C3D' H3DC 106.5
C4D' C3D' H3DC 106.5
C2D' C3D' H3DD 106.5
C4D' C3D' H3DD 106.5
H3DC C3D' H3DD 106.5
C3D' C4D' C5D' 114.5(13)
C3D' C4D' H4DC 108.6
C5D' C4D' H4DC 108.6
C3D' C4D' H4DD 108.6
C5D' C4D' H4DD 108.6
H4DC C4D' H4DD 107.6
C4D' C5D' O2D' 99.5(11)
C4D' C5D' C6D' 115.0(10)
O2D' C5D' C6D' 108.9(8)
C4D' C5D' H5D' 110.9
O2D' C5D' H5D' 110.9
C6D' C5D' H5D' 110.9
C7D' C6D' C5D' 108.7(9)
C7D' C6D' C1D' 124.1(9)
C5D' C6D' C1D' 110.6(8)
C7D' C6D' H6D' 103.7
C5D' C6D' H6D' 103.7
C1D' C6D' H6D' 103.7
O3D' C7D' C6D' 117.7(9)
O3D' C7D' C8D' 118.8(9)
C6D' C7D' C8D' 123.5(9)
C9D' C8D' C7D' 107.6(14)
C9D' C8D' H8DC 110.2
C7D' C8D' H8DC 110.2
C9D' C8D' H8DD 110.2
C7D' C8D' H8DD 110.2
H8DC C8D' H8DD 108.5
C8D' C9D' C104 113.8(17)
C8D' C9D' H9DC 108.8
C104 C9D' H9DC 108.8
C8D' C9D' H9DD 108.8
C104 C9D' H9DD 108.8
H9DC C9D' H9DD 107.7
C114 C104 C9D' 112.3(15)
C114 C104 H145 109.1
C9D' C104 H145 109.1
C114 C104 H146 109.1
C9D' C104 H146 109.1
H145 C104 H146 107.9
C104 C114 C1D' 128.0(16)
C104 C114 H147 105.3
C1D' C114 H147 105.3
C104 C114 H148 105.3

C1D' C114 H148 105.3
H147 C114 H148 106.0

Table SI-6. Torsion angles [°] for (+)-**7b**.

O1A C1A C2A C3A -60.14(8)
C11A C1A C2A C3A 178.06(7)
C6A C1A C2A C3A 55.46(8)
C1A C2A C3A C4A -55.27(9)
C2A C3A C4A C5A 53.76(8)
C3A C4A C5A O2A 67.93(8)
C3A C4A C5A C6A -55.33(8)
O1A C1A C6A C7A -63.41(7)
C11A C1A C6A C7A 59.39(8)
C2A C1A C6A C7A 178.80(6)
O1A C1A C6A C5A 62.30(7)
C11A C1A C6A C5A -174.90(6)
C2A C1A C6A C5A -55.49(7)
O2A C5A C6A C7A 65.49(7)
C4A C5A C6A C7A -170.83(6)
O2A C5A C6A C1A -66.49(7)
C4A C5A C6A C1A 57.19(7)
C1A C6A C7A O3A -174.06(6)
C5A C6A C7A O3A 58.22(8)
C1A C6A C7A C8A 4.67(9)
C5A C6A C7A C8A -123.06(7)
O3A C7A C8A C9A 110.18(9)
C6A C7A C8A C9A -68.51(9)
C7A C8A C9A C10A 81.95(9)
C8A C9A C10A C11A -63.72(10)
C9A C10A C11A C1A 63.77(10)
O1A C1A C11A C10A 41.48(10)
C6A C1A C11A C10A -78.33(9)
C2A C1A C11A C10A 162.11(7)
O1B C1B C2B C3B -60.00(12)
C6B C1B C2B C3B 55.76(10)
C11B C1B C2B C3B 178.71(9)
C1B C2B C3B C4B -56.34(15)
C2B C3B C4B C5B 54.64(19)
C3B C4B C5B O2B 68.15(17)
C3B C4B C5B C6B -55.15(18)
O2B C5B C6B C7B 62.35(7)
C4B C5B C6B C7B -173.59(11)
O2B C5B C6B C1B -68.39(8)
C4B C5B C6B C1B 55.67(12)
O1B C1B C6B C7B -60.64(10)
C11B C1B C6B C7B 62.28(9)
C2B C1B C6B C7B -178.92(7)
O1B C1B C6B C5B 63.91(10)
C11B C1B C6B C5B -173.17(6)
C2B C1B C6B C5B -54.37(8)
C5B C6B C7B O3B 52.64(9)
C1B C6B C7B O3B 179.45(8)

C5B C6B C7B C8B -128.59(8)
C1B C6B C7B C8B -1.78(11)
O3B C7B C8B C9B 115.38(10)
C6B C7B C8B C9B -63.36(11)
C7B C8B C9B C10B 83.06(10)
C8B C9B C10B C11B -66.27(12)
C9B C10B C11B C1B 63.90(12)
O1B C1B C11B C10B 41.69(14)
C6B C1B C11B C10B -78.14(10)
C2B C1B C11B C10B 162.00(9)
O1B' C1B' C2B' C3B' 64(2)
C112 C1B' C2B' C3B' -179.4(18)
C6B' C1B' C2B' C3B' -44.0(18)
C1B' C2B' C3B' C4B' 40(3)
C2B' C3B' C4B' C5B' -34(3)
C3B' C4B' C5B' O2B' -85(2)
C3B' C4B' C5B' C6B' 36(2)
C4B' C5B' C6B' C7B' 178.5(12)
O2B' C5B' C6B' C7B' -66.2(12)
C4B' C5B' C6B' C1B' -40.5(14)
O2B' C5B' C6B' C1B' 74.8(11)
O1B' C1B' C6B' C7B' 63.6(13)
C112 C1B' C6B' C7B' -41.0(16)
C2B' C1B' C6B' C7B' 178.6(12)
O1B' C1B' C6B' C5B' -71.2(12)
C112 C1B' C6B' C5B' -175.8(11)
C2B' C1B' C6B' C5B' 43.8(12)
C5B' C6B' C7B' O3B' -54.4(16)
C1B' C6B' C7B' O3B' 171.6(12)
C5B' C6B' C7B' C8B' 124.3(14)
C1B' C6B' C7B' C8B' -10(2)
O3B' C7B' C8B' C9B' -115.0(17)
C6B' C7B' C8B' C9B' 66.4(19)
C7B' C8B' C9B' C102 -82(2)
C8B' C9B' C102 C112 65(2)
C9B' C102 C112 C1B' -58(3)
O1B' C1B' C112 C102 -45(2)
C2B' C1B' C112 C102 -165.9(17)
C6B' C1B' C112 C102 60(2)
O1C C1C C2C C3C -63.44(9)
C11C C1C C2C C3C 179.57(7)
C6C C1C C2C C3C 56.03(8)
C1C C2C C3C C4C -55.84(9)
C2C C3C C4C C5C 54.01(9)
C3C C4C C5C O2C 65.88(8)
C3C C4C C5C C6C -55.30(9)
O1C C1C C6C C7C -63.70(8)
C11C C1C C6C C7C 57.62(8)
C2C C1C C6C C7C 177.02(6)
O1C C1C C6C C5C 63.15(8)
C11C C1C C6C C5C -175.52(6)
C2C C1C C6C C5C -56.12(7)
O2C C5C C6C C7C 71.68(7)

C4C	C5C	C6C	C7C	-169.13(6)
O2C	C5C	C6C	C1C	-61.52(7)
C4C	C5C	C6C	C1C	57.68(8)
C1C	C6C	C7C	O3C	-175.88(6)
C5C	C6C	C7C	O3C	55.34(8)
C1C	C6C	C7C	C8C	2.99(9)
C5C	C6C	C7C	C8C	-125.80(7)
O3C	C7C	C8C	C9C	114.00(8)
C6C	C7C	C8C	C9C	-64.84(8)
C7C	C8C	C9C	C10C	82.32(9)
C8C	C9C	C10C	C11C	-67.24(9)
C9C	C10C	C11C	C1C	65.22(9)
O1C	C1C	C11C	C10C	46.09(9)
C2C	C1C	C11C	C10C	164.19(7)
C6C	C1C	C11C	C10C	-76.34(8)
C113	C1C'	C2C'	C3C'	-165(3)
O1C'	C1C'	C2C'	C3C'	77(3)
C6C'	C1C'	C2C'	C3C'	-29(3)
C1C'	C2C'	C3C'	C4C'	31(5)
C2C'	C3C'	C4C'	C5C'	-37(4)
C3C'	C4C'	C5C'	O2C'	-68(2)
C3C'	C4C'	C5C'	C6C'	46(3)
C4C'	C5C'	C6C'	C7C'	169.2(17)
O2C'	C5C'	C6C'	C7C'	-82.2(19)
C4C'	C5C'	C6C'	C1C'	-49.8(18)
O2C'	C5C'	C6C'	C1C'	58.8(18)
C113	C1C'	C6C'	C7C'	-40(2)
O1C'	C1C'	C6C'	C7C'	62(2)
C2C'	C1C'	C6C'	C7C'	174.8(19)
C113	C1C'	C6C'	C5C'	-175.0(17)
O1C'	C1C'	C6C'	C5C'	-72.8(18)
C2C'	C1C'	C6C'	C5C'	39.6(19)
C5C'	C6C'	C7C'	O3C'	-46(2)
C1C'	C6C'	C7C'	O3C'	178.5(17)
C5C'	C6C'	C7C'	C8C'	-174.0(17)
C1C'	C6C'	C7C'	C8C'	51(2)
O3C'	C7C'	C8C'	C9C'	149(2)
C6C'	C7C'	C8C'	C9C'	-85(3)
C7C'	C8C'	C9C'	C103	78(3)
C8C'	C9C'	C103	C113	-16(4)
C9C'	C103	C113	C1C'	-63(4)
O1C'	C1C'	C113	C103	-32(3)
C2C'	C1C'	C113	C103	-154(3)
C6C'	C1C'	C113	C103	71(3)
O1D	C1D	C2D	C3D	-64.17(12)
C11D	C1D	C2D	C3D	178.85(10)
C6D	C1D	C2D	C3D	55.01(12)
C1D	C2D	C3D	C4D	-55.69(15)
C2D	C3D	C4D	C5D	54.87(15)
C3D	C4D	C5D	O2D	64.67(12)
C3D	C4D	C5D	C6D	-56.64(13)
O1D	C1D	C6D	C7D	-62.64(11)
C11D	C1D	C6D	C7D	59.02(9)

C2D C1D C6D C7D 178.40(7)
O1D C1D C6D C5D 63.77(10)
C11D C1D C6D C5D -174.58(7)
C2D C1D C6D C5D -55.20(9)
O2D C5D C6D C7D 70.81(7)
C4D C5D C6D C7D -169.81(8)
O2D C5D C6D C1D -61.34(8)
C4D C5D C6D C1D 58.04(10)
C1D C6D C7D O3D -176.01(7)
C5D C6D C7D O3D 55.87(8)
C1D C6D C7D C8D 2.71(10)
C5D C6D C7D C8D -125.40(7)
O3D C7D C8D C9D 112.81(11)
C6D C7D C8D C9D -65.89(12)
C7D C8D C9D C10D 82.27(17)
C8D C9D C10D C11D -65.5(2)
C9D C10D C11D C1D 64.3(2)
O1D C1D C11D C10D 45.11(13)
C6D C1D C11D C10D -77.35(12)
C2D C1D C11D C10D 162.82(11)
O1D' C1D' C2D' C3D' 67(2)
C114 C1D' C2D' C3D' -175.3(18)
C6D' C1D' C2D' C3D' -43.4(19)
C1D' C2D' C3D' C4D' 48(3)
C2D' C3D' C4D' C5D' -45(3)
C3D' C4D' C5D' O2D' -73(2)
C3D' C4D' C5D' C6D' 43(2)
C4D' C5D' C6D' C7D' 177.0(11)
O2D' C5D' C6D' C7D' -72.4(10)
C4D' C5D' C6D' C1D' -43.5(14)
O2D' C5D' C6D' C1D' 67.1(11)
O1D' C1D' C6D' C7D' 59.3(15)
C114 C1D' C6D' C7D' -45.7(15)
C2D' C1D' C6D' C7D' 174.0(11)
O1D' C1D' C6D' C5D' -72.7(13)
C114 C1D' C6D' C5D' -177.7(11)
C2D' C1D' C6D' C5D' 42.0(13)
C5D' C6D' C7D' O3D' -58.1(13)
C1D' C6D' C7D' O3D' 169.2(11)
C5D' C6D' C7D' C8D' 123.7(12)
C1D' C6D' C7D' C8D' -9.0(17)
O3D' C7D' C8D' C9D' -107.3(15)
C6D' C7D' C8D' C9D' 70.9(16)
C7D' C8D' C9D' C104 -87.4(18)
C8D' C9D' C104 C114 67(3)
C9D' C104 C114 C1D' -62(3)
O1D' C1D' C114 C104 -40(2)
C2D' C1D' C114 C104 -161.9(19)
C6D' C1D' C114 C104 67(2)

Symmetry operations
1 'x, y, z'
2 '-x, y+1/2, -z'

2. TRANSANNULAR ENANTIOSELECTIVE (3+2) CYCLOADDITION OF CYCLOALKENONE HYDRAZONES

2.1. NMR spectra

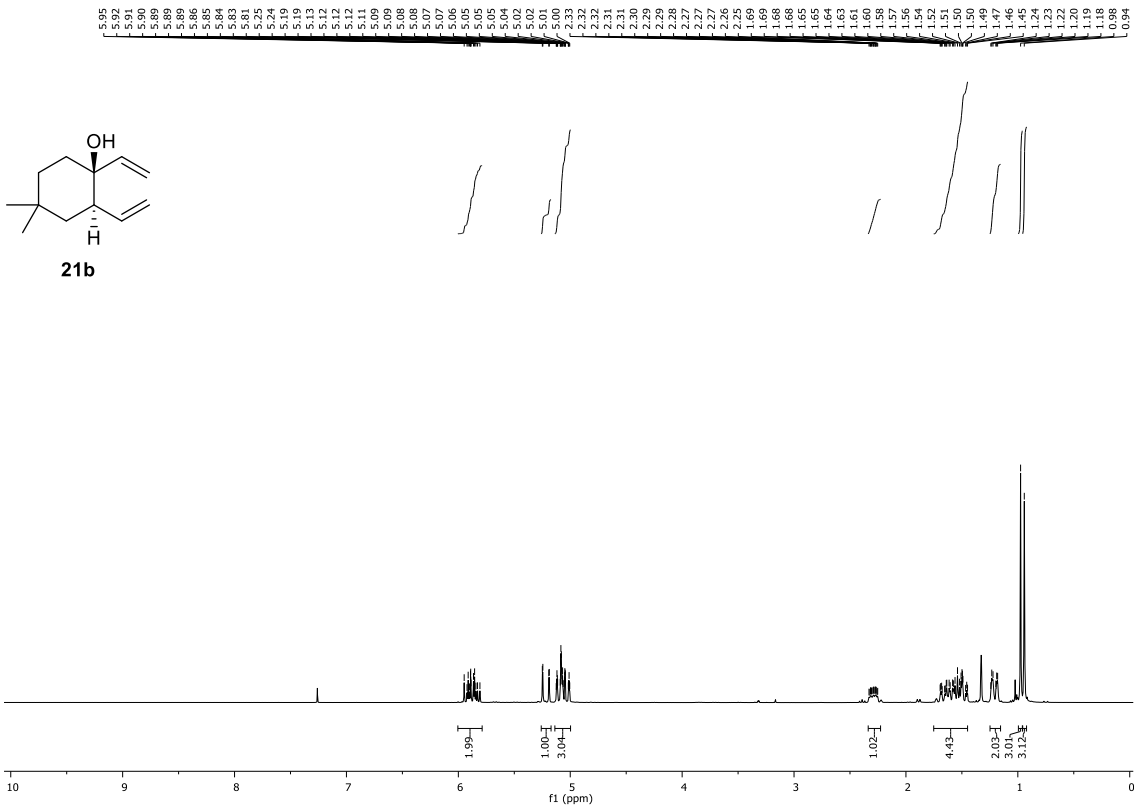


Figure SI-67. ^{1}H-NMR spectra of compound **21b**.

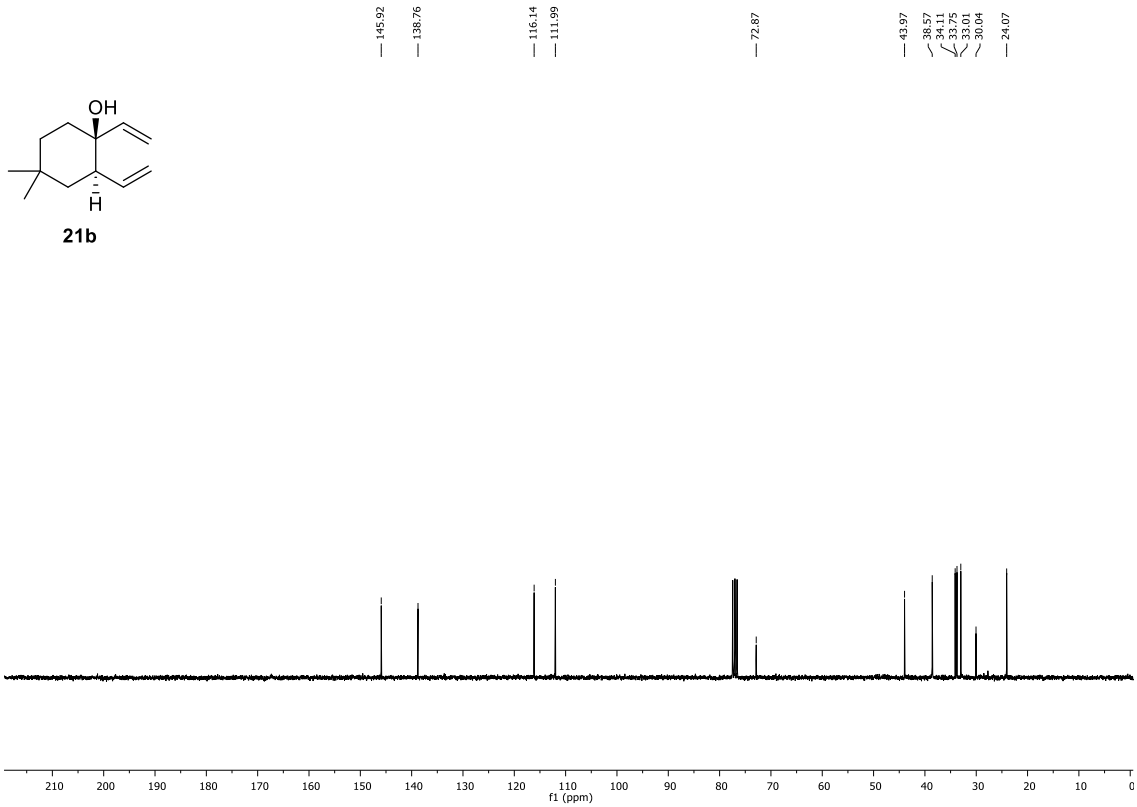


Figure SI-68. ^{13}C-NMR spectra of compound **21b**.

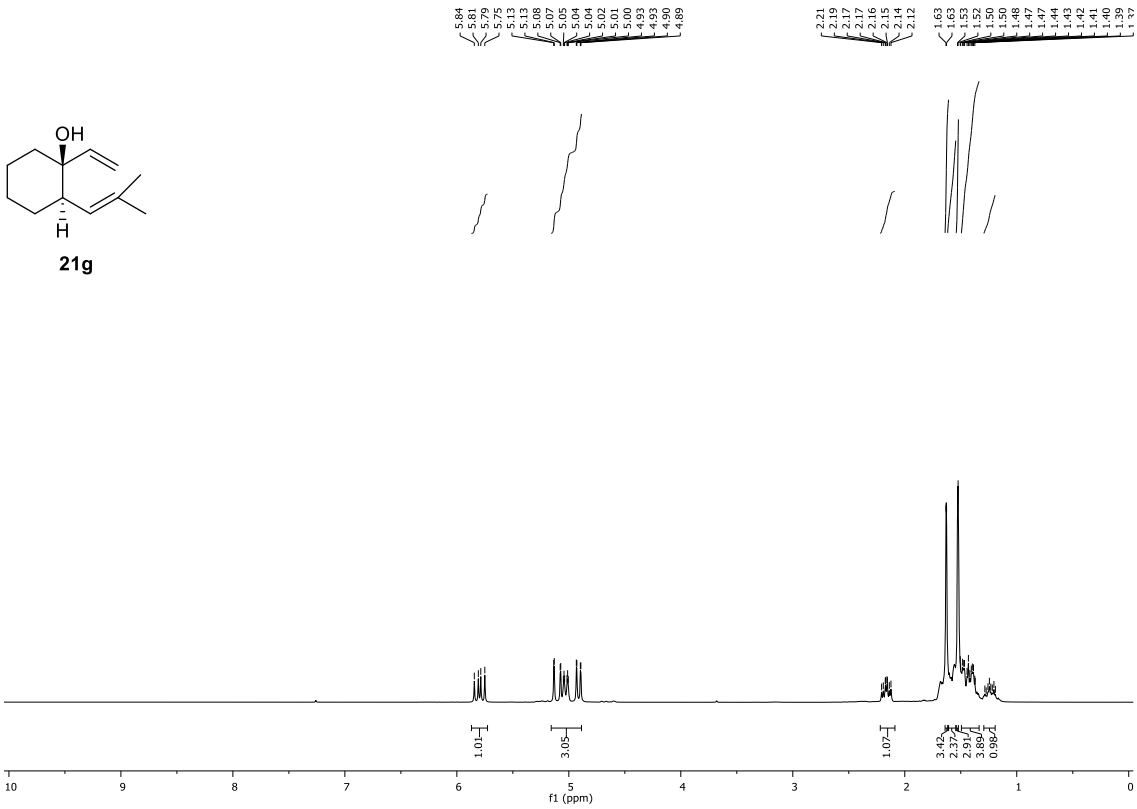


Figure SI-69. ^{1}H-NMR spectra of compound **21g**.

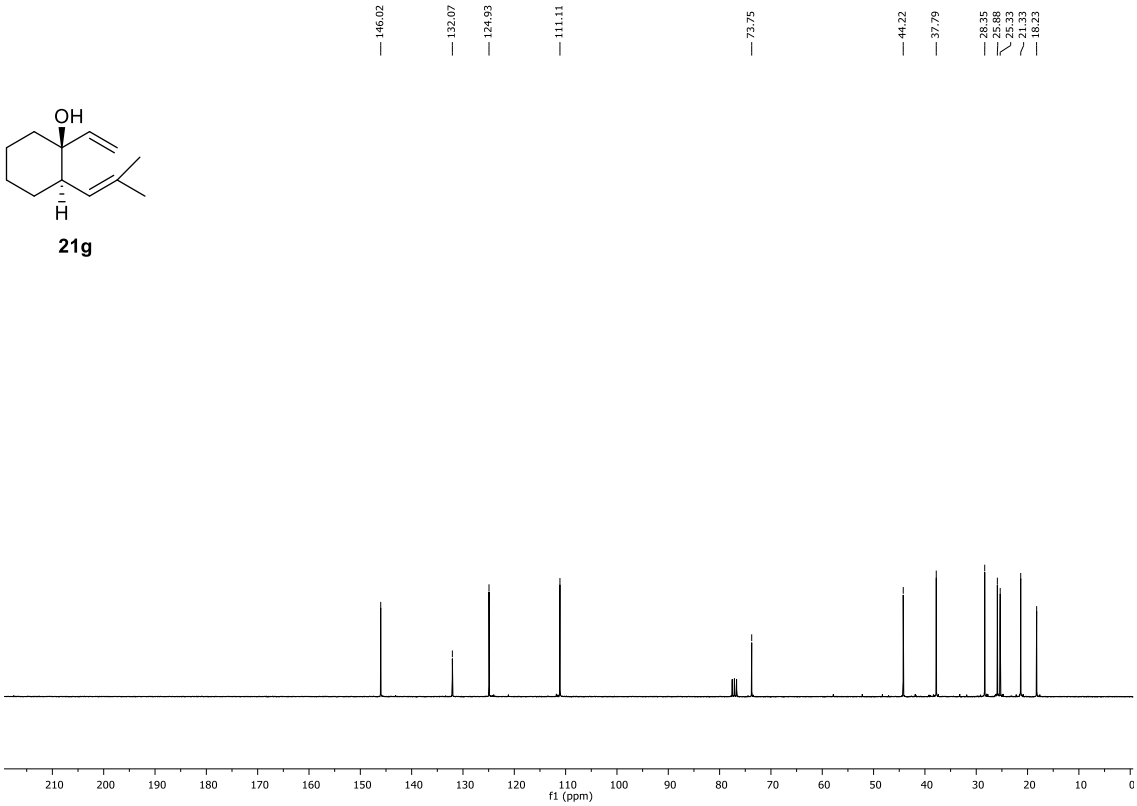


Figure SI-70. ^{13}C-NMR spectra of compound **21g**.

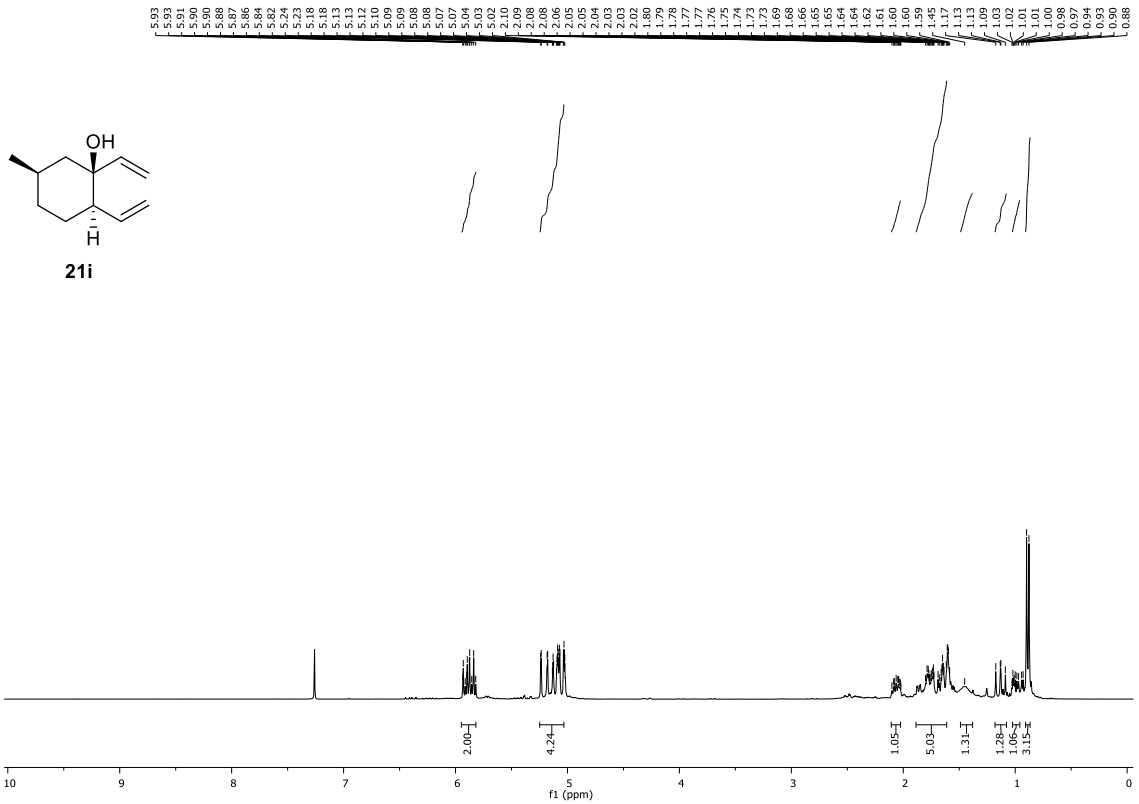


Figure SI-71. ^{1}H-NMR spectra of compound **21i**.

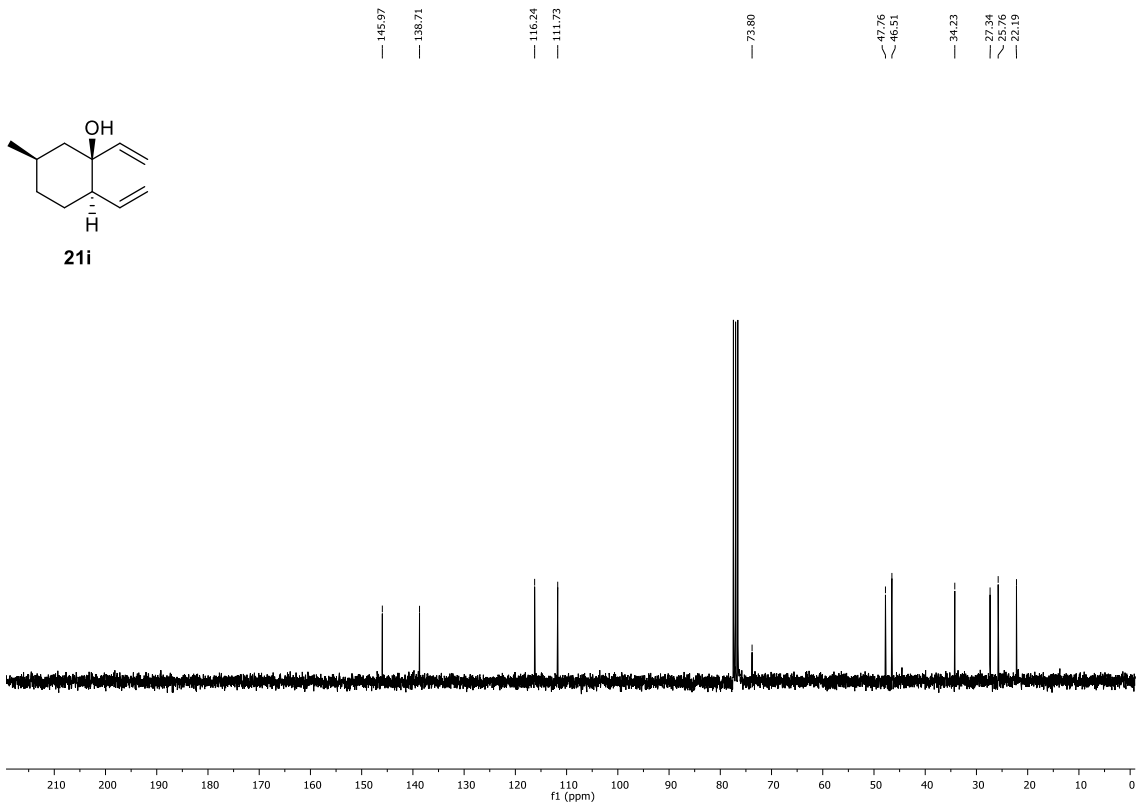


Figure SI-72. ^{13}C-NMR spectra of compound **21i**.

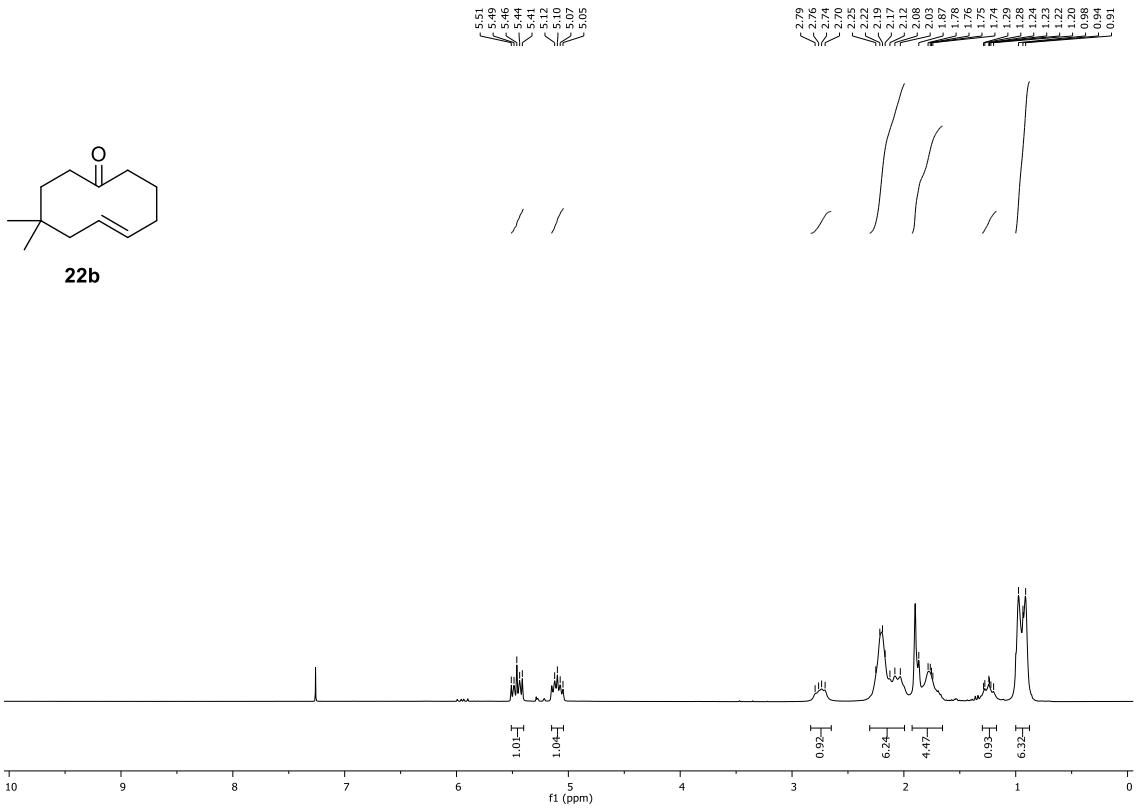


Figure SI-73. ^{1}H-NMR spectra of compound **22b**.

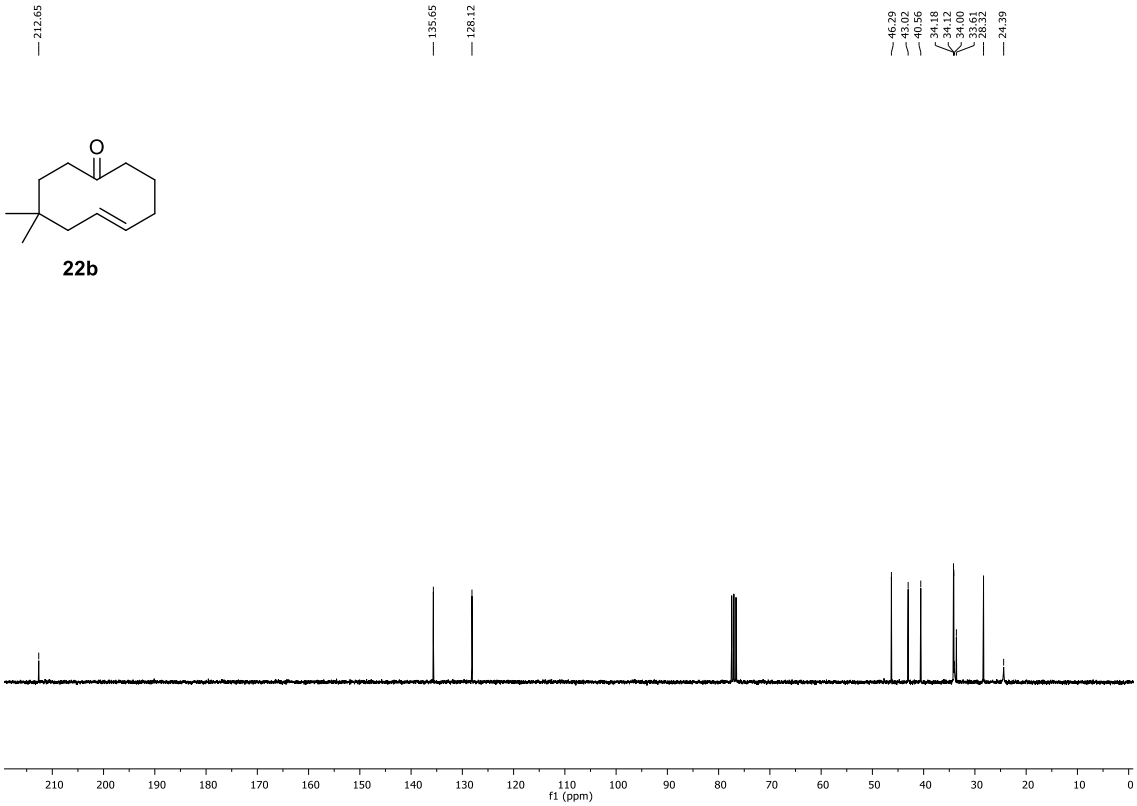


Figure SI-74. ^{13}C-NMR spectra of compound **22b**.

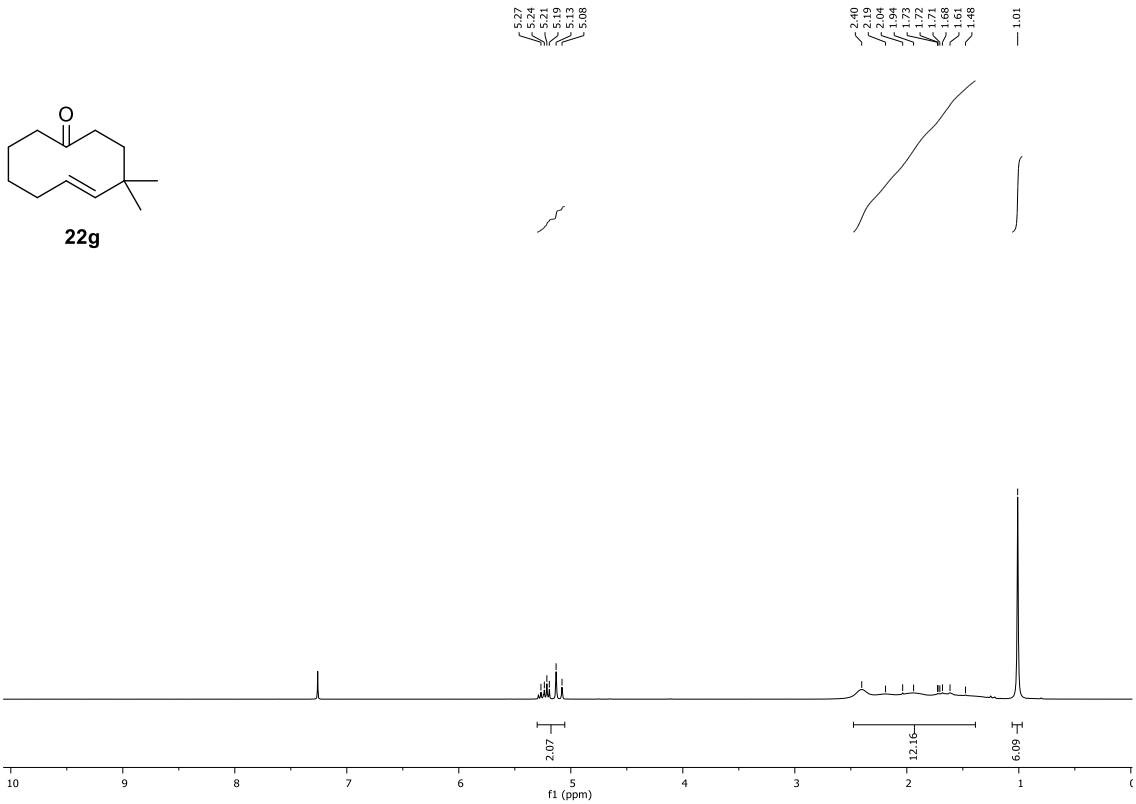


Figure SI-75. ^{1}H-NMR spectra of compound **22g**.

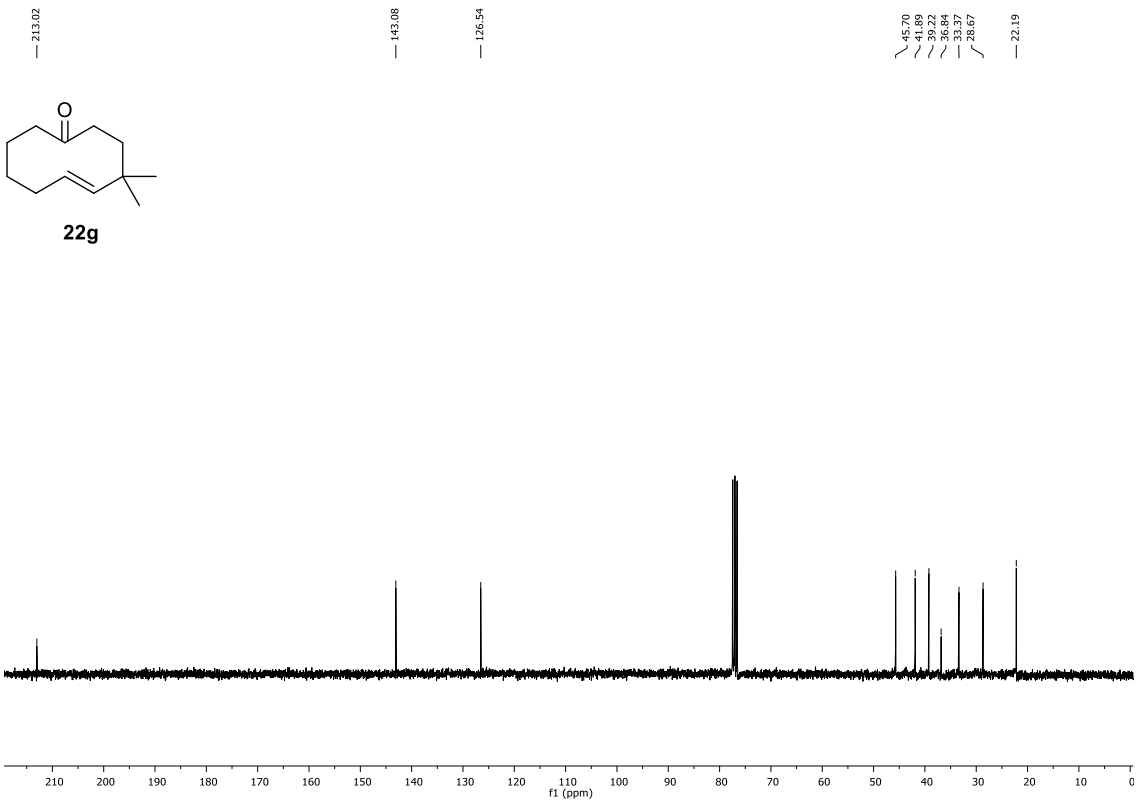


Figure SI-76. ^{13}C-NMR spectra of compound **22g**.

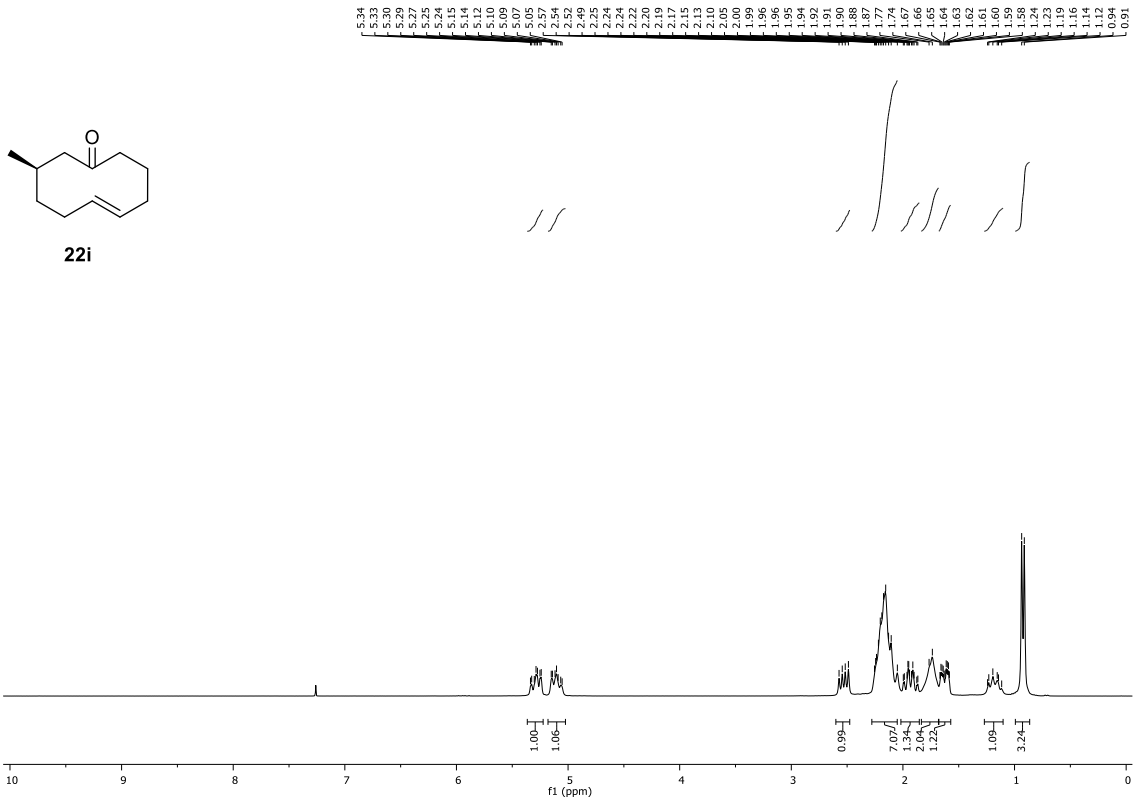


Figure SI-77. ^{1}H-NMR spectra of compound **22i**.

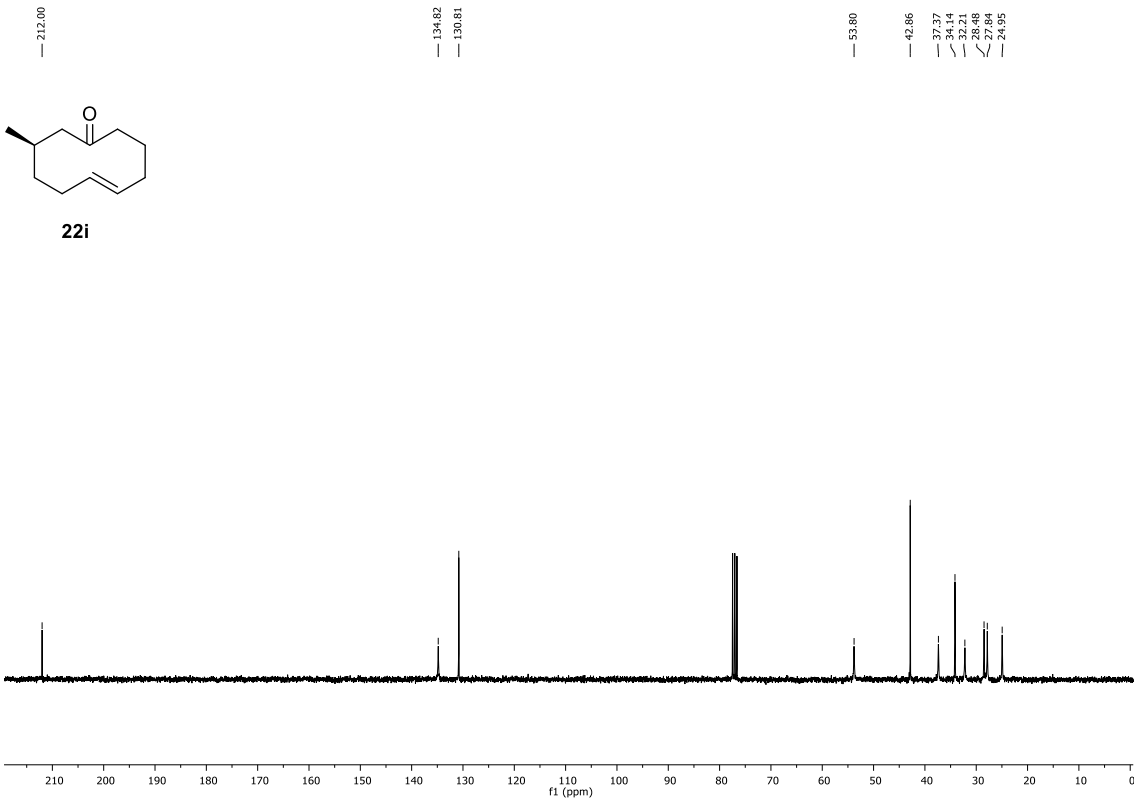


Figure SI-78. ^{13}C-NMR spectra of compound **22i**.

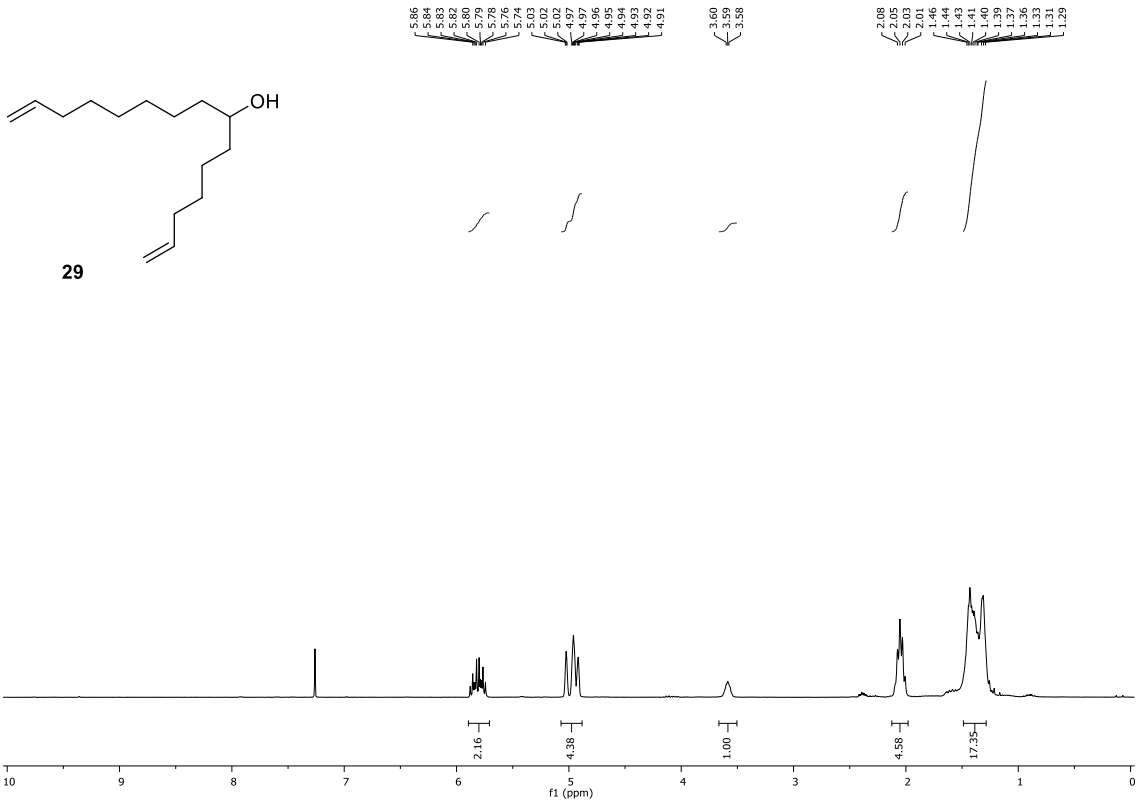


Figure SI-79. ^{1}H-NMR spectra of compound **29**.

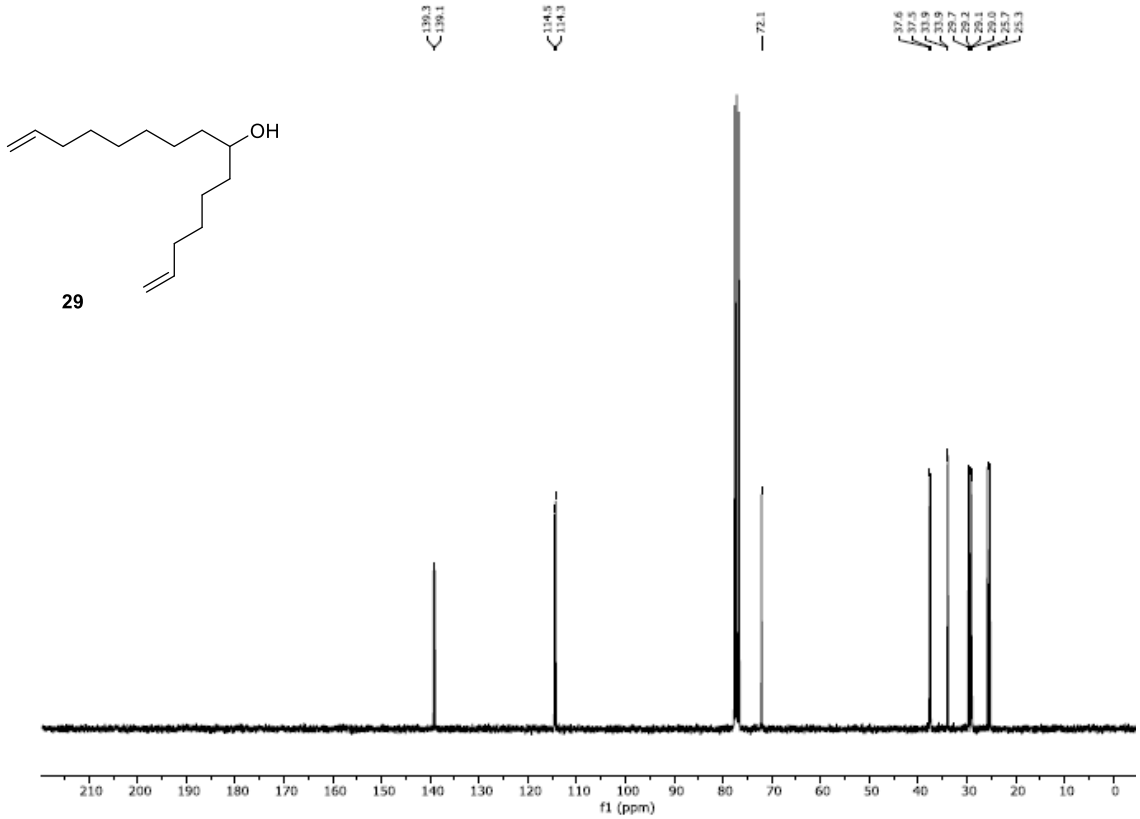


Figure SI-80. ^{13}C-NMR spectra of compound **29**.

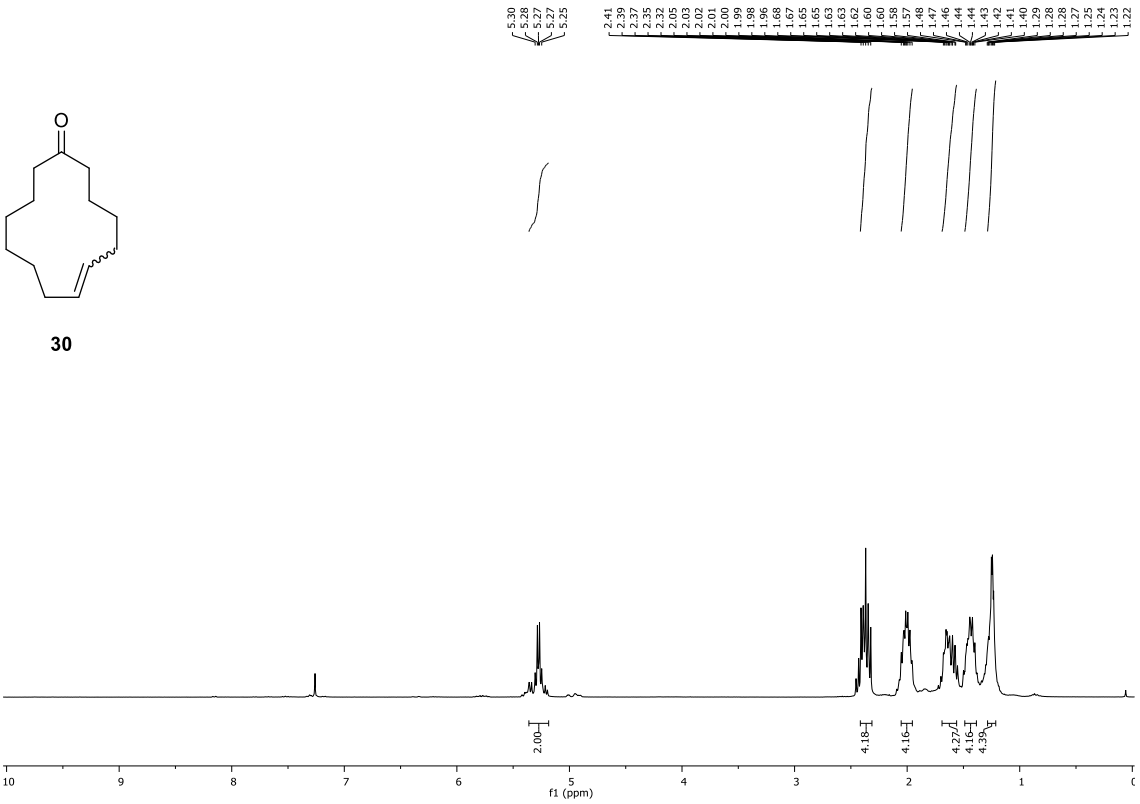


Figure SI-81. ^{1}H-NMR spectra of compound **30**.

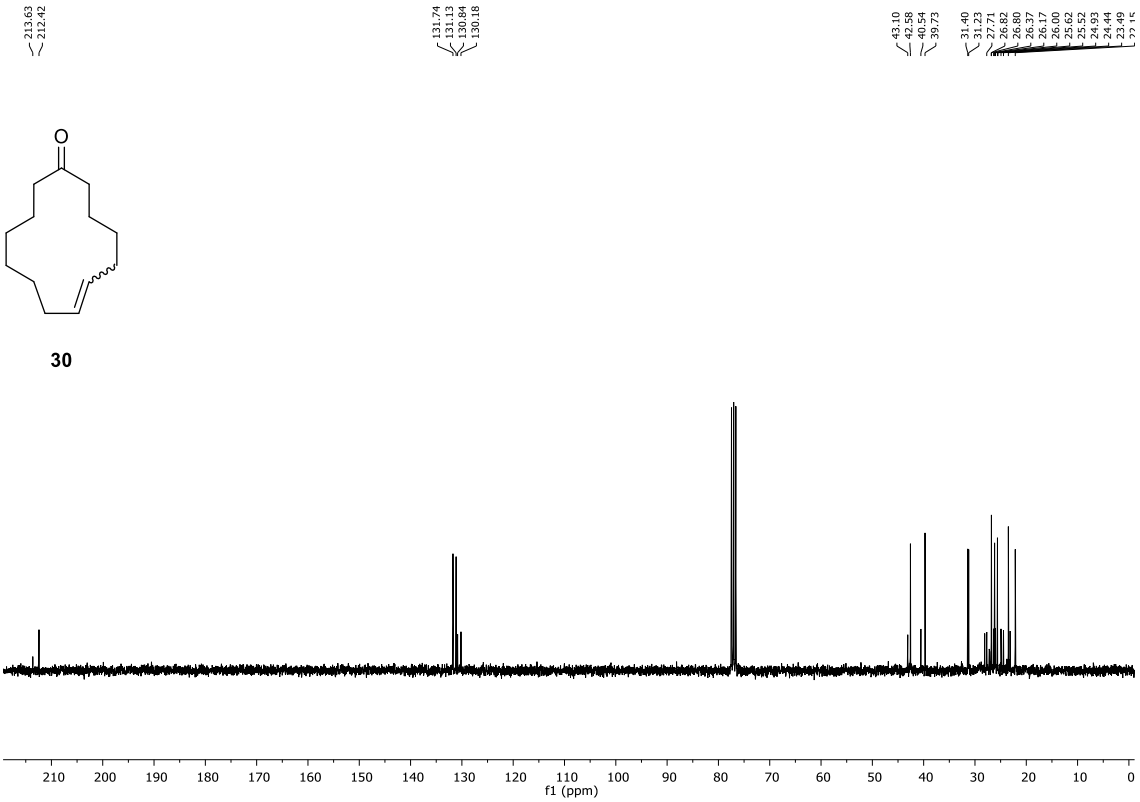


Figure SI-82. ^{13}C-NMR spectra of compound **30**.

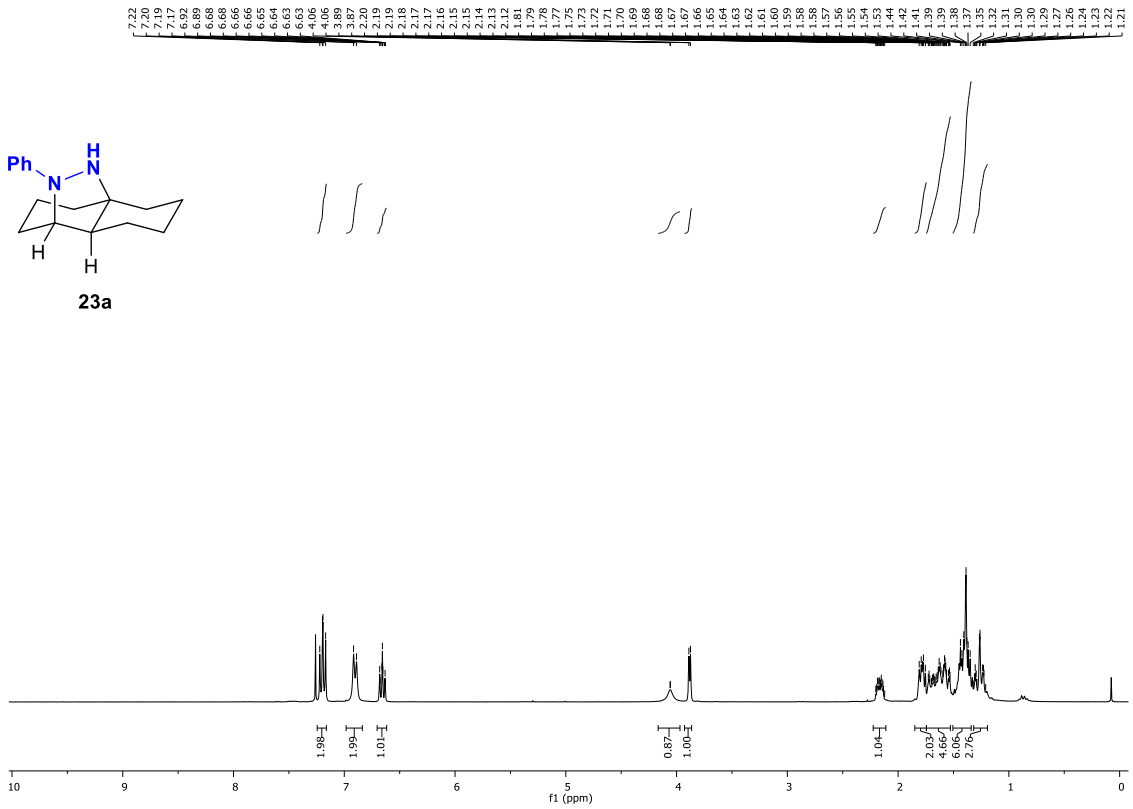


Figure SI-83. ^{1}H-NMR spectra of compound **23a**.

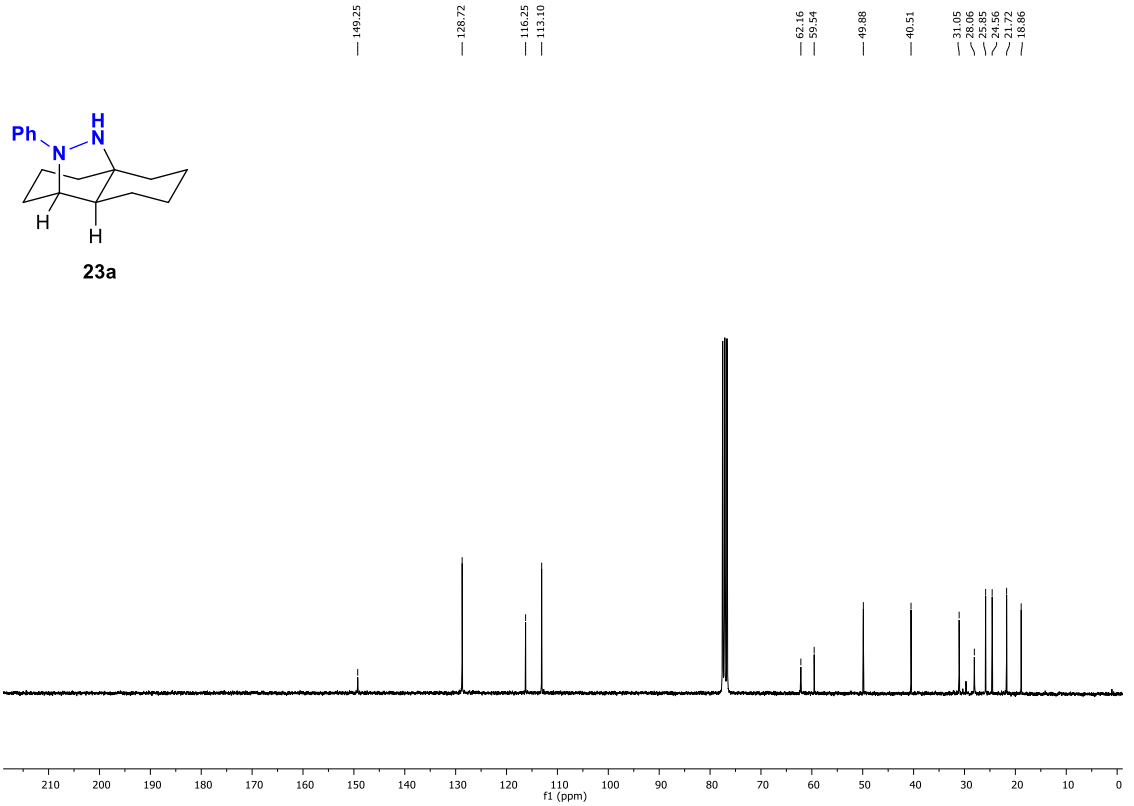
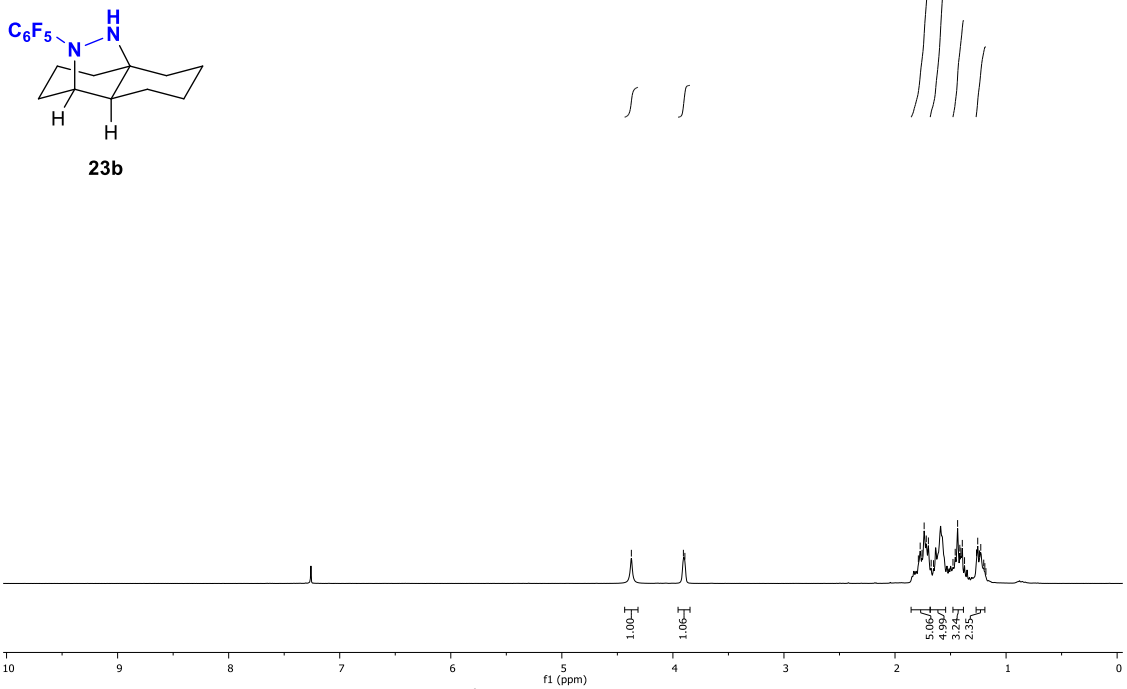
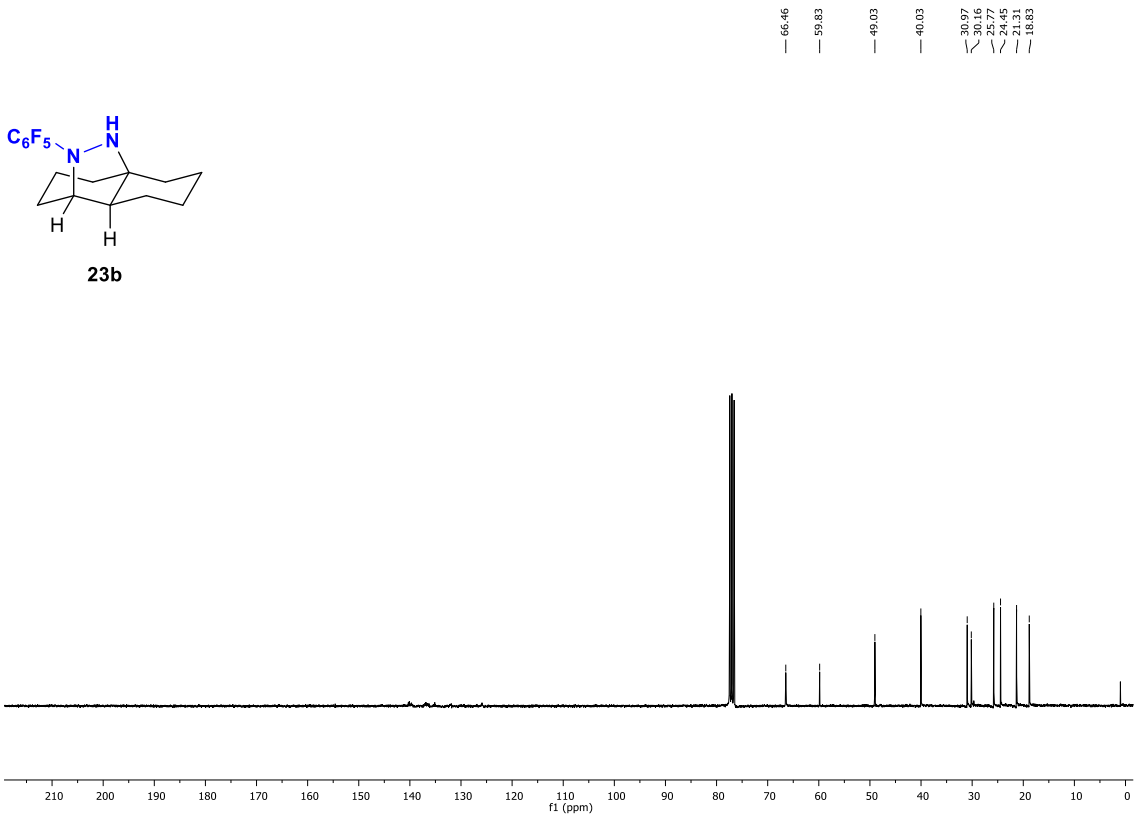


Figure SI-84. ^{13}C-NMR spectra of compound **23a**.



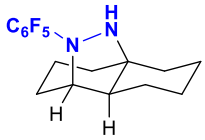
23b

Figure SI-85. ^{1}H-NMR spectra of compound **23b**.



23b

Figure SI-86. ^{13}C-NMR spectra of compound **23b**.



23b

Figure SI-87. ^{19}F-NMR spectra of compound **23b**.

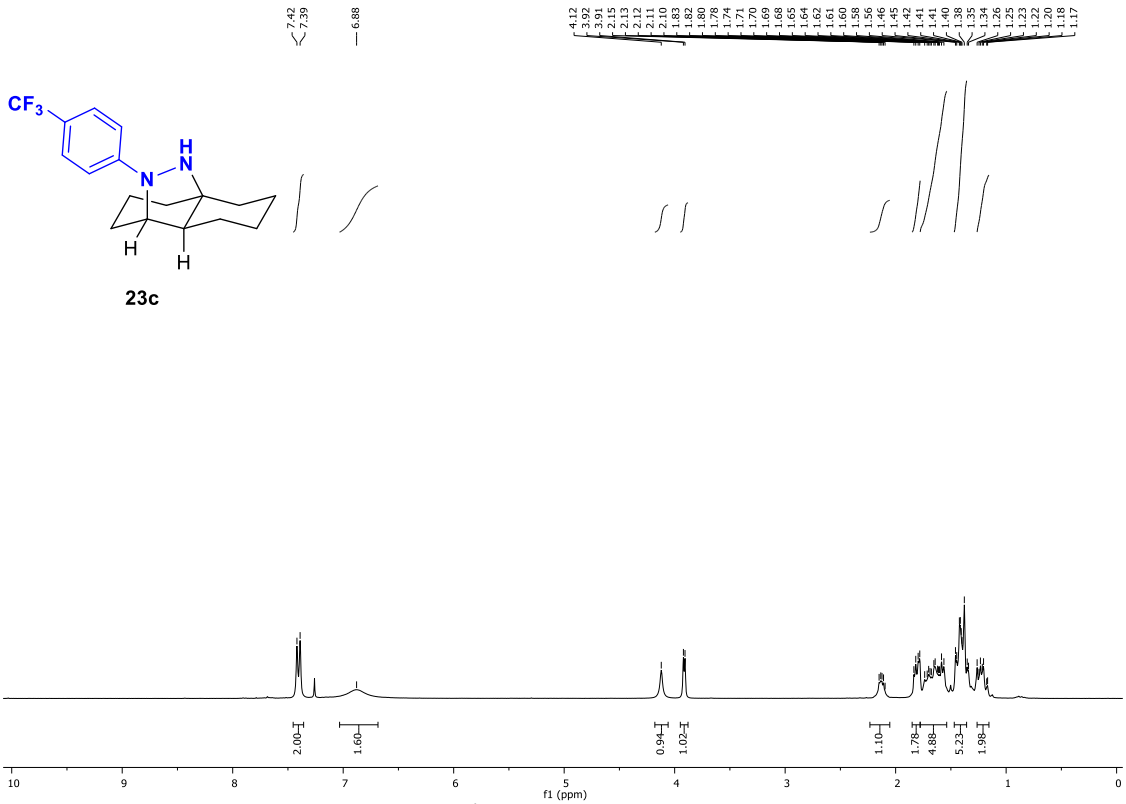


Figure SI-88. ^{1}H-NMR spectra of compound **23c**.

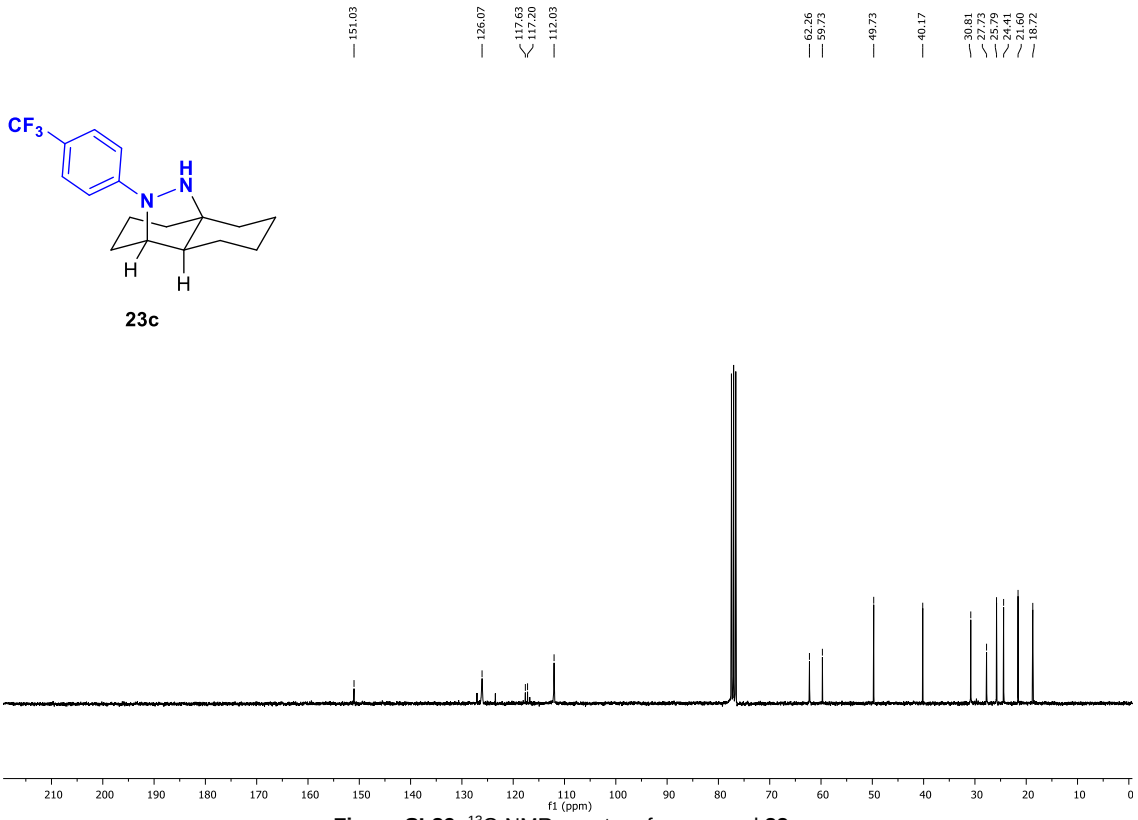


Figure SI-89. ^{13}C-NMR spectra of compound **23c**.

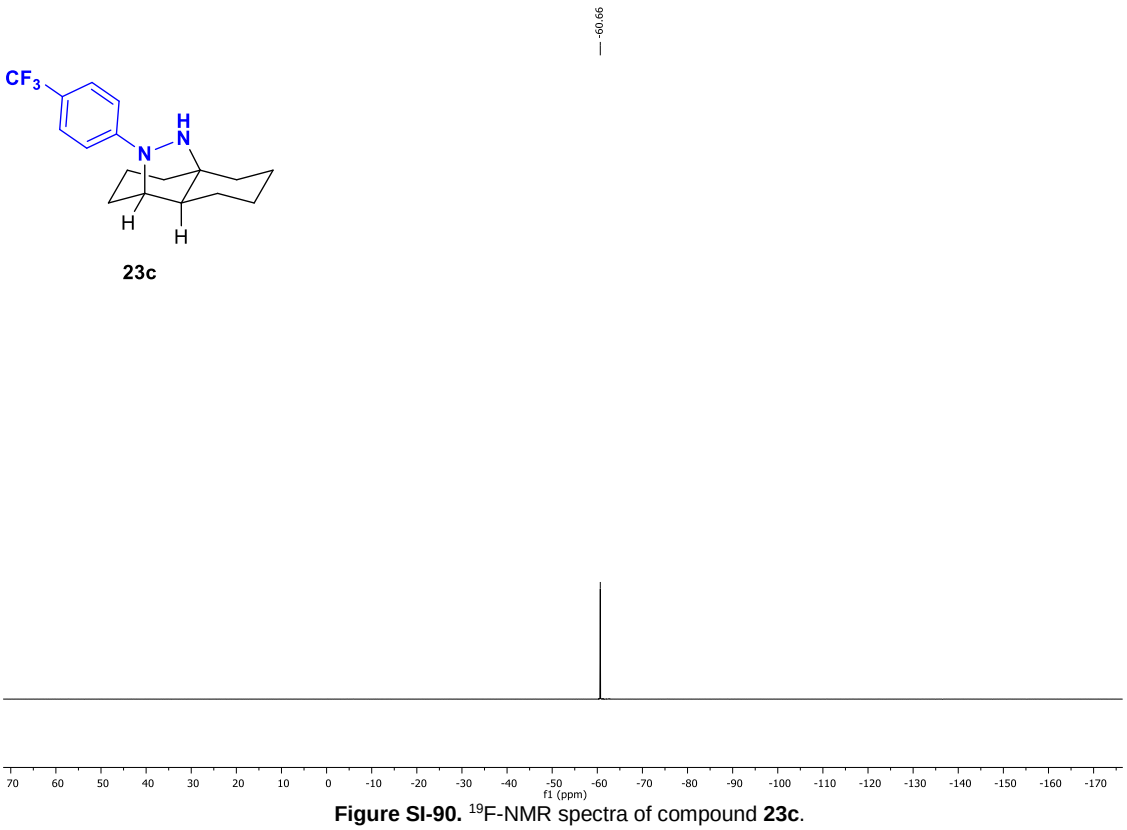


Figure SI-90. ^{19}F-NMR spectra of compound **23c**.

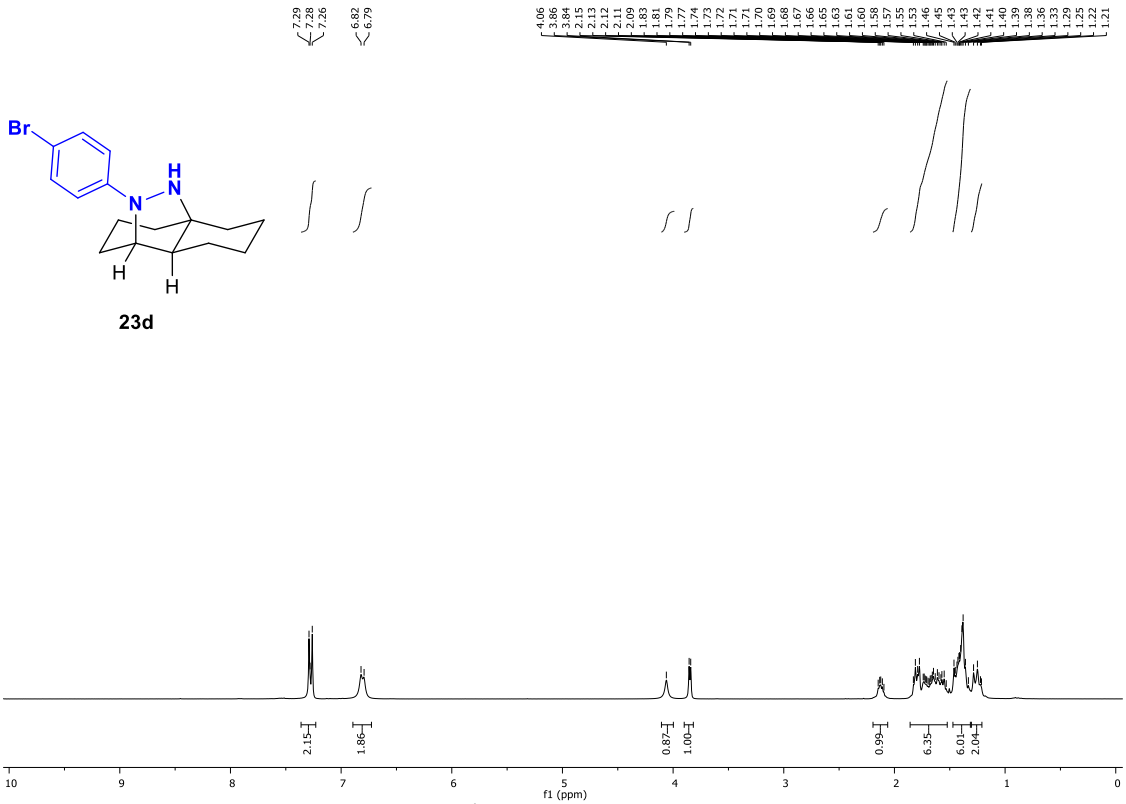


Figure SI-91. ^{1}H-NMR spectra of compound **23d**.

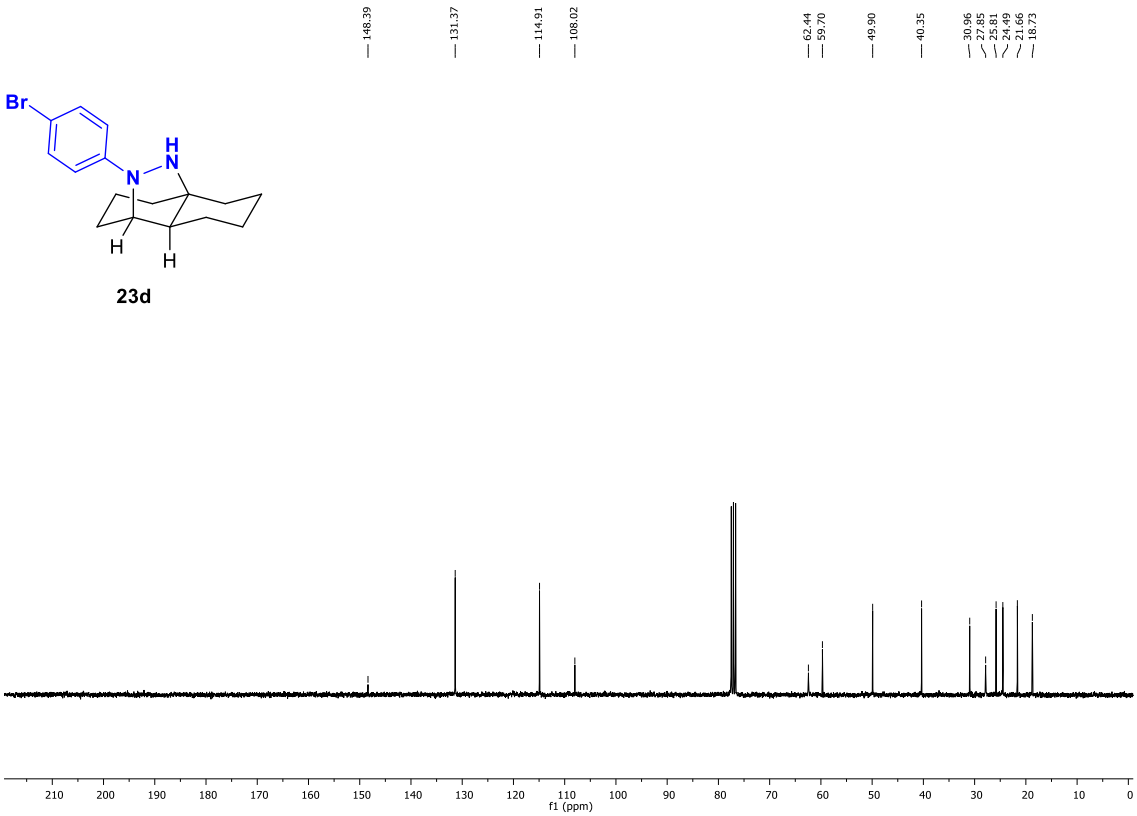


Figure SI-92. ^{13}C-NMR spectra of compound **23d**.

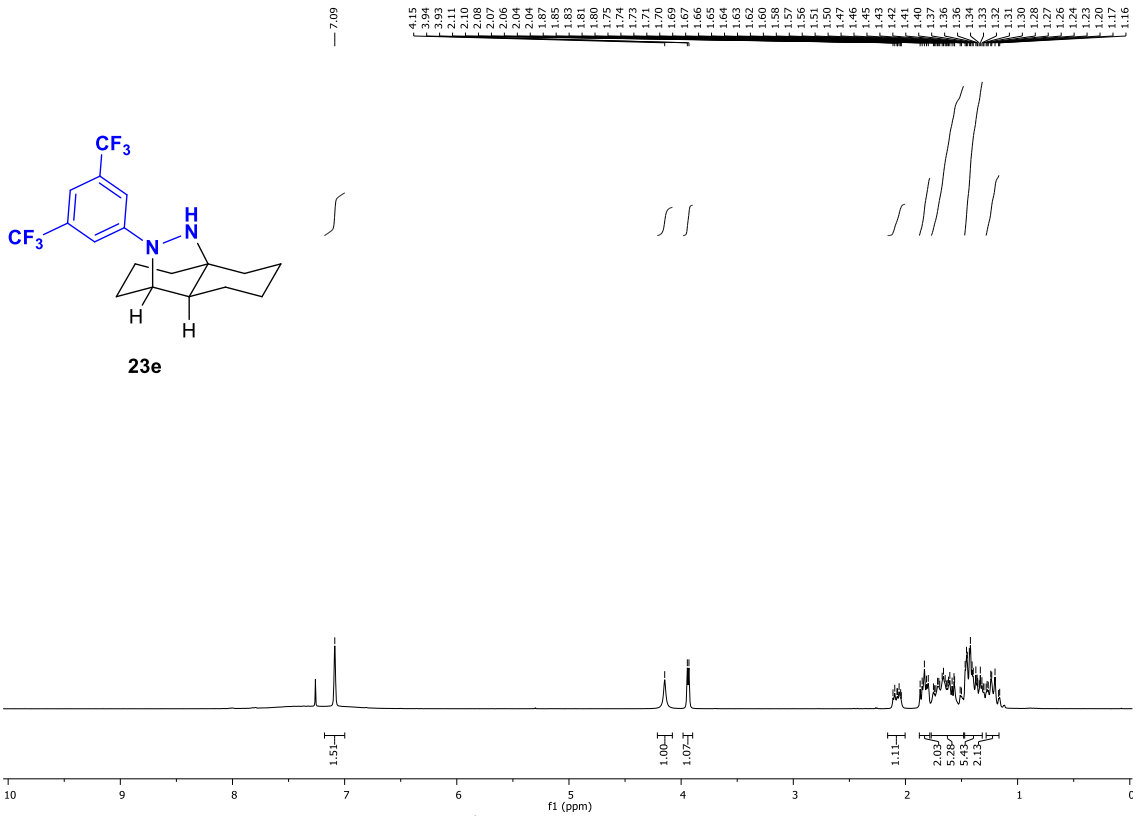


Figure SI-93. ^{1}H-NMR spectra of compound **23e**.

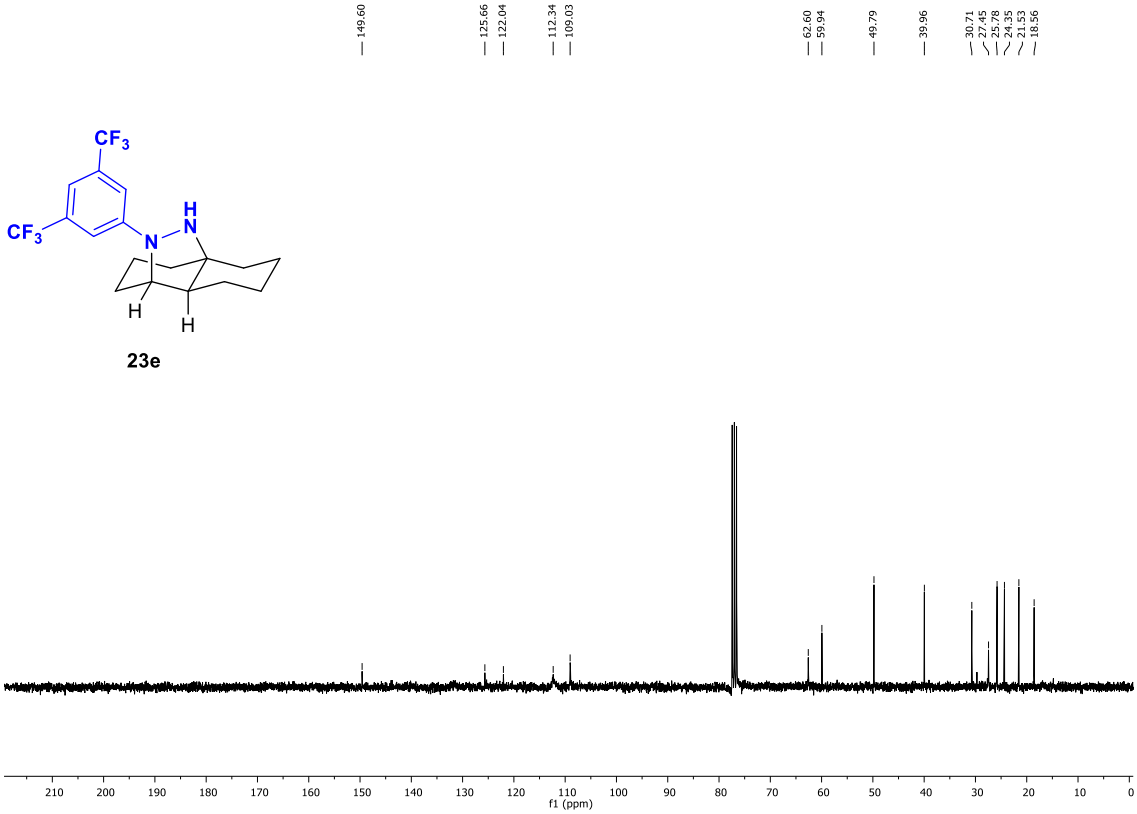


Figure SI-94. ^{13}C-NMR spectra of compound **23e**.

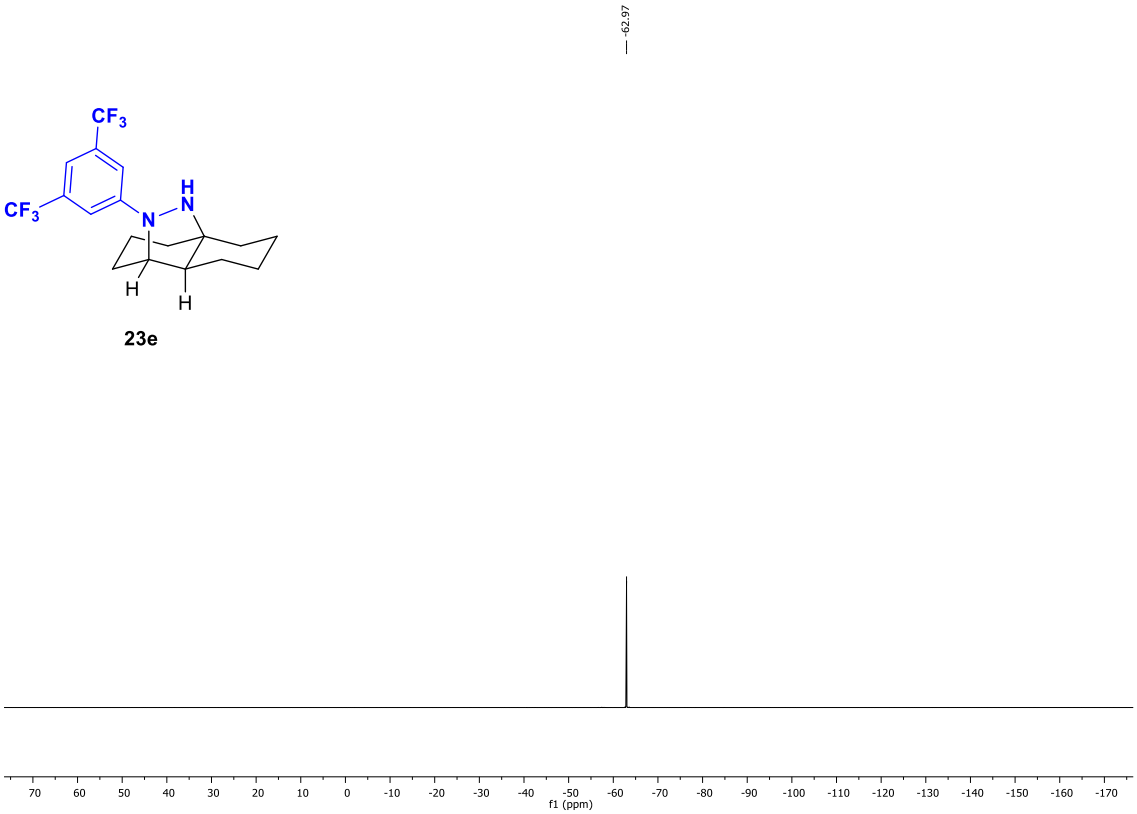


Figure SI-95. ^{19}F-NMR spectra of compound **23e**.

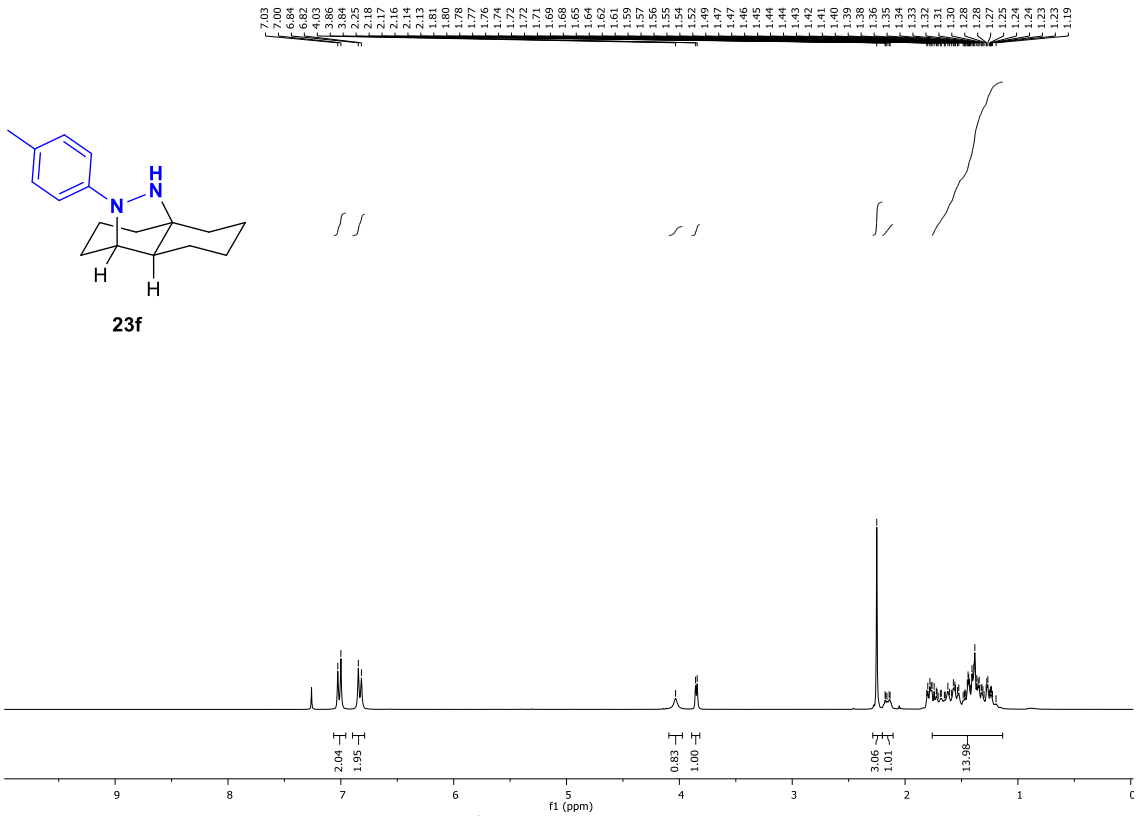


Figure SI-96. ^{1}H-NMR spectra of compound **23f**.

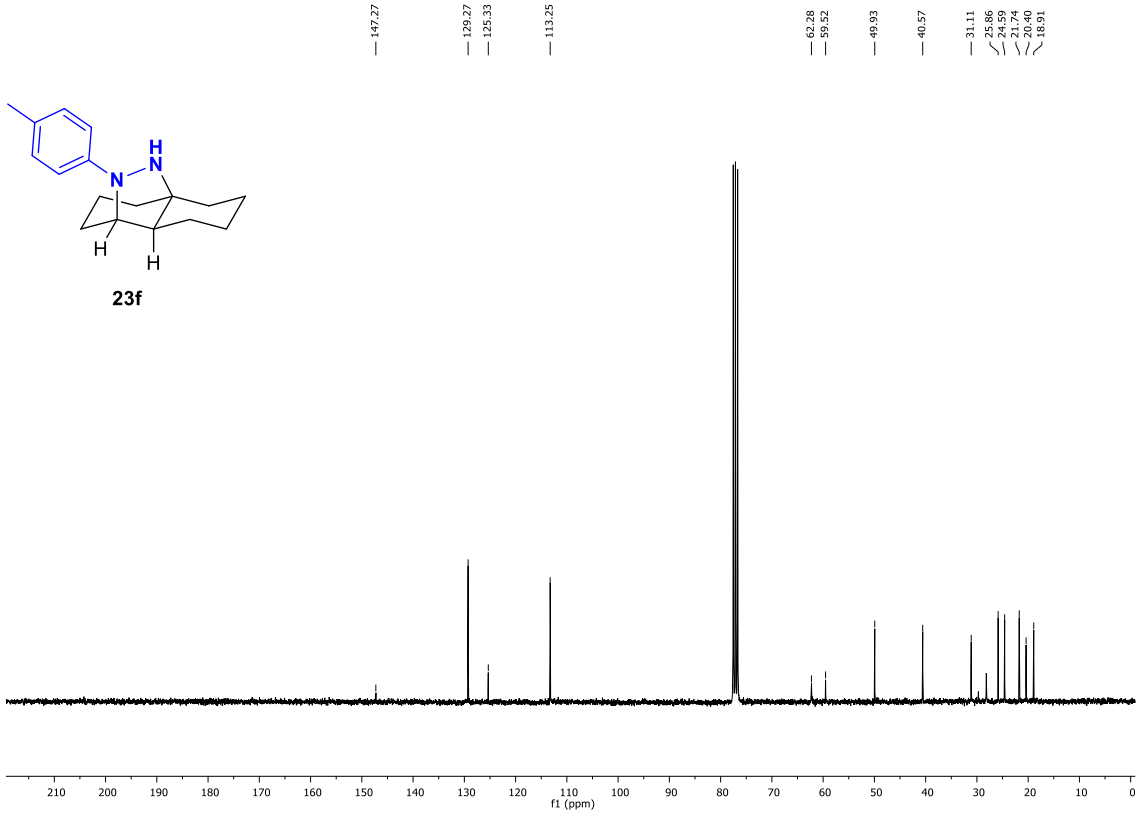


Figure SI-97. ^{13}C-NMR spectra of compound **23f**.

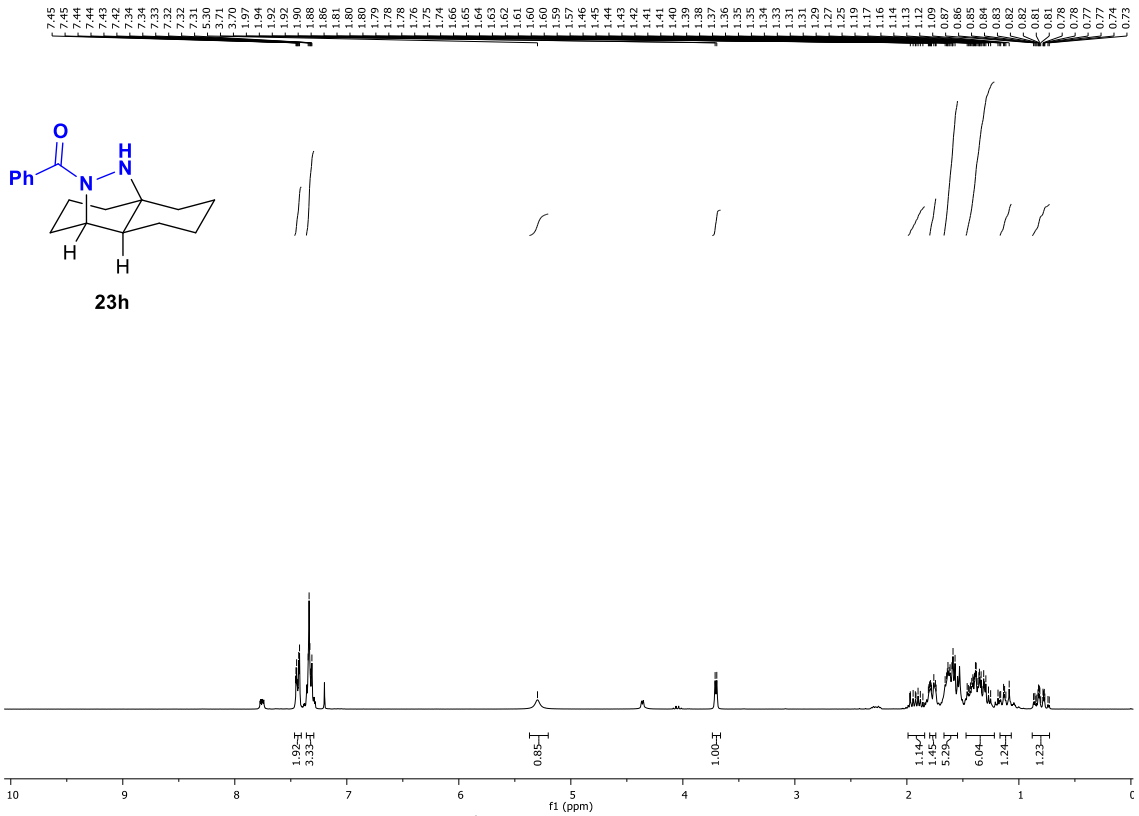


Figure SI-98. ^{1}H-NMR spectra of compound **23h**.

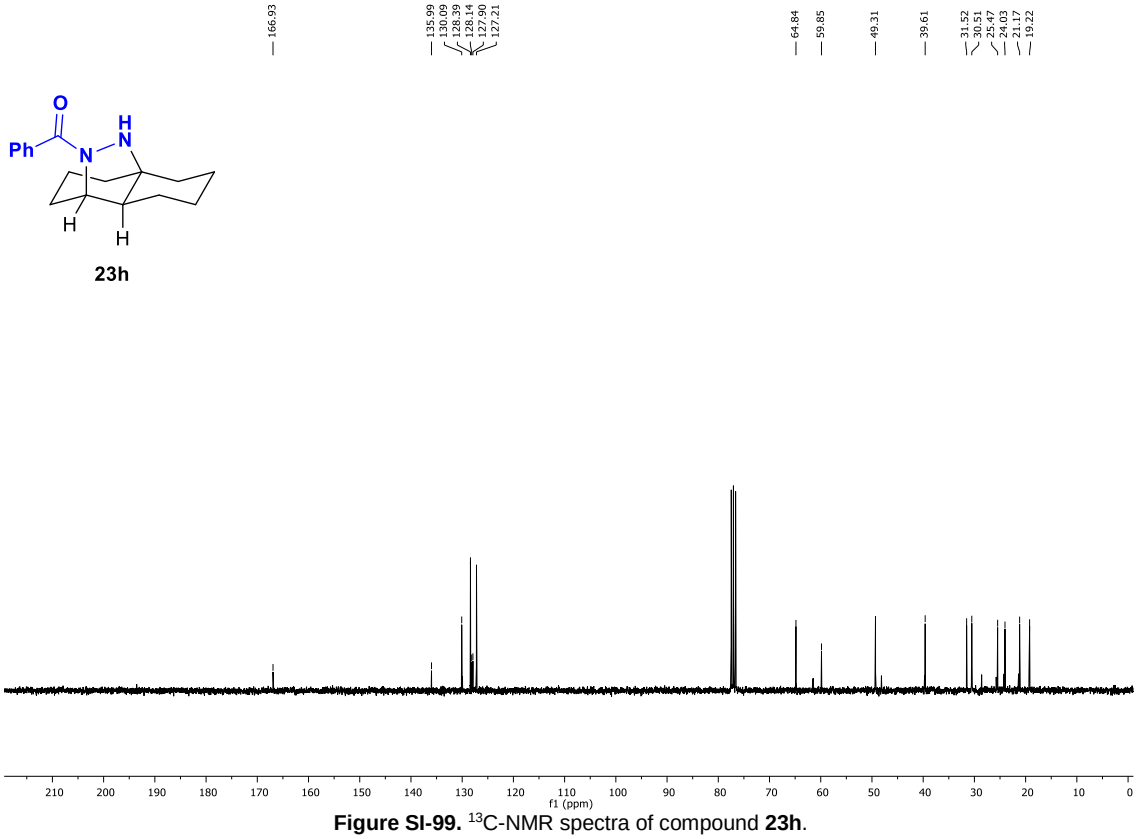


Figure SI-99. ^{13}C-NMR spectra of compound **23h**.

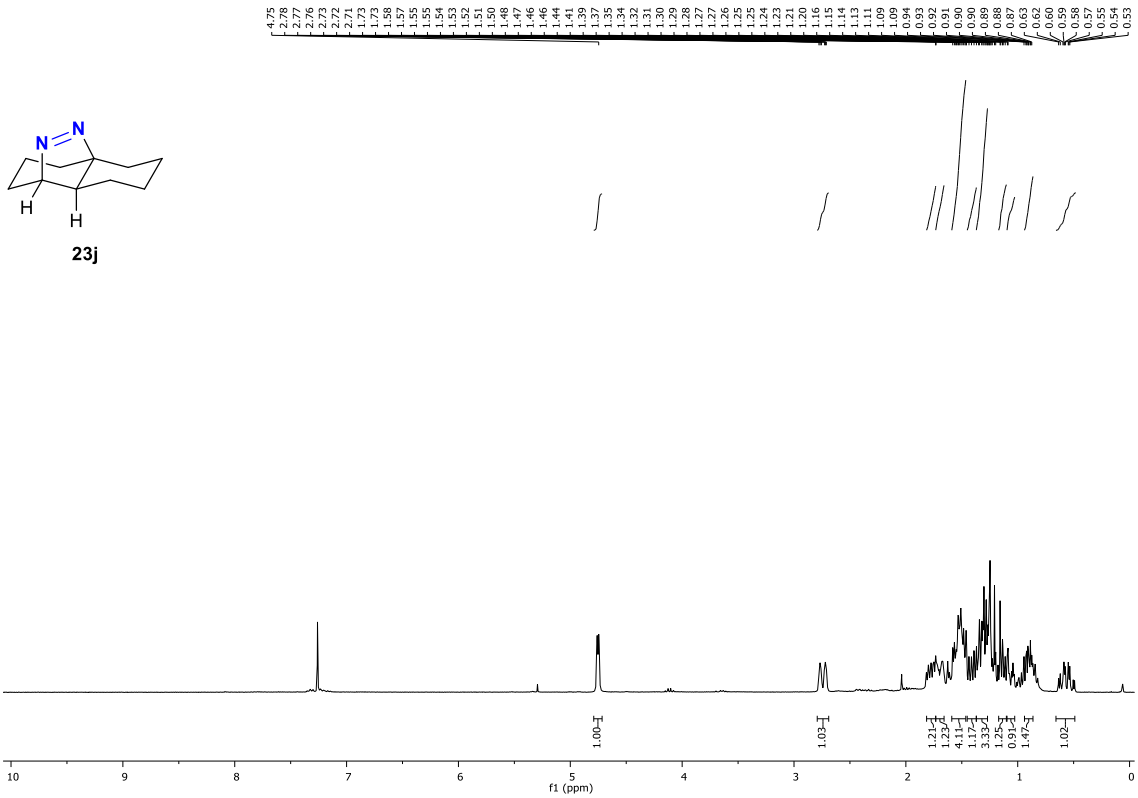


Figure SI-100. ^{1}H-NMR spectra of compound **23j**.

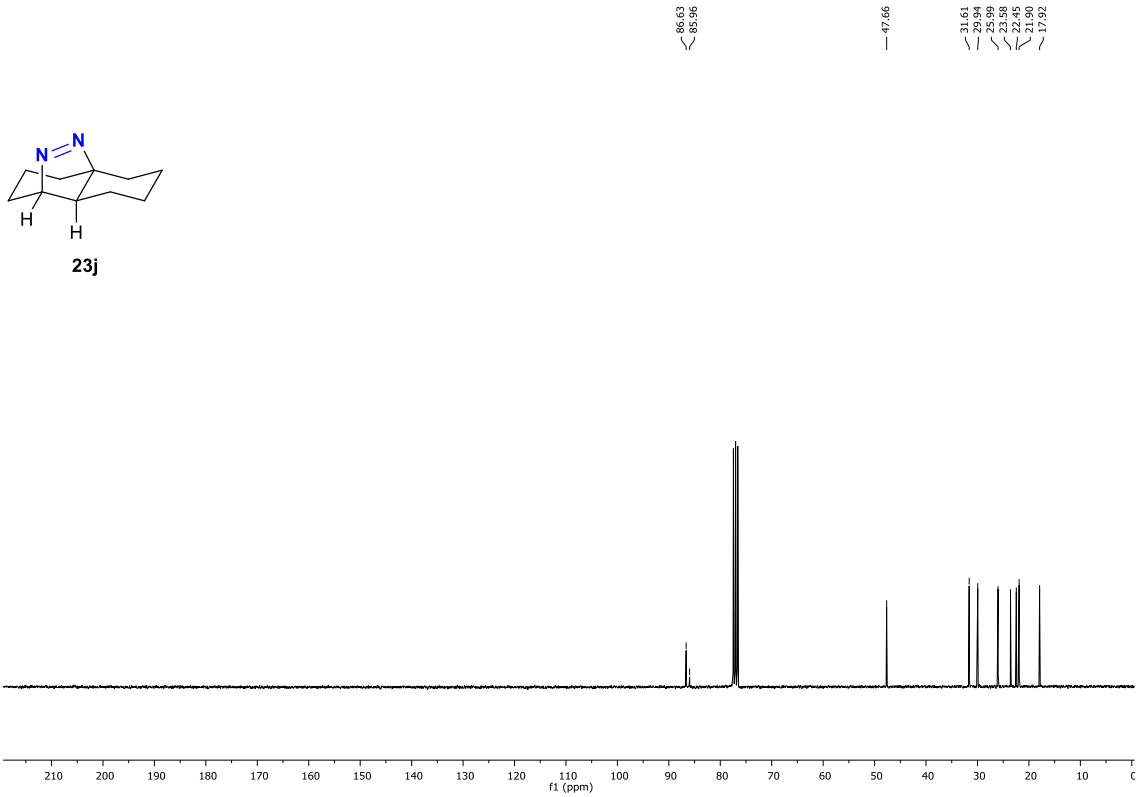
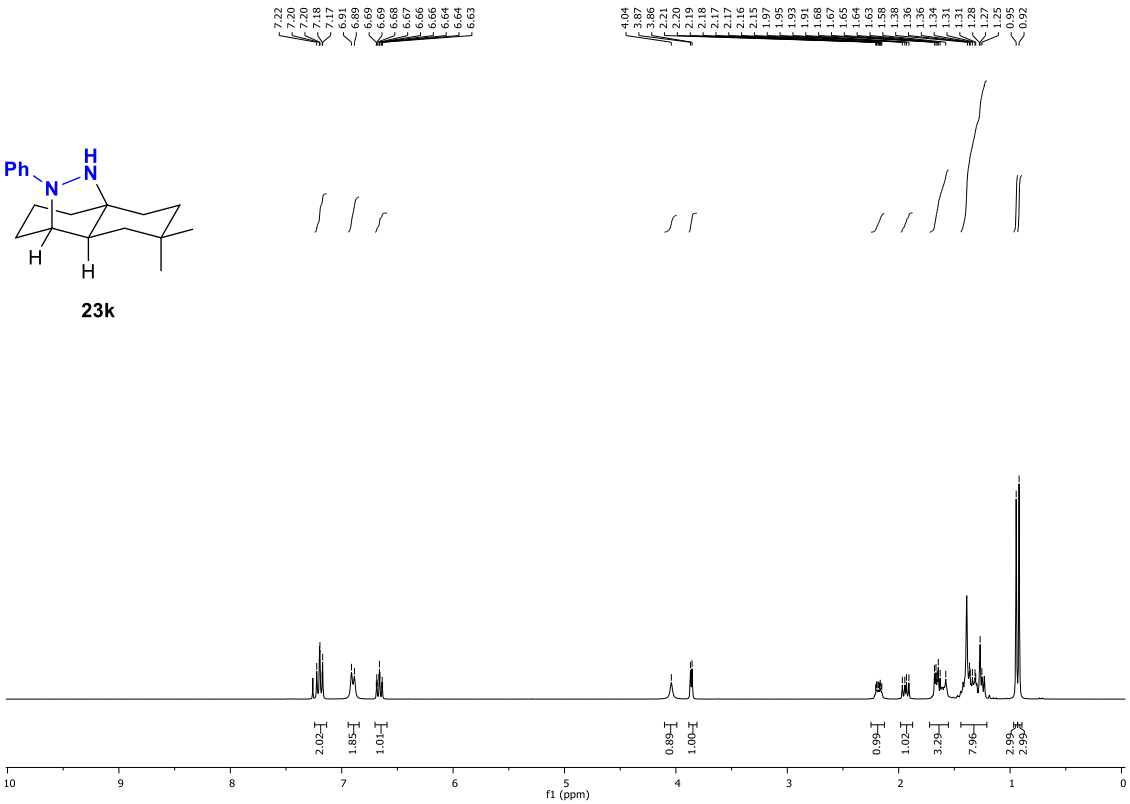
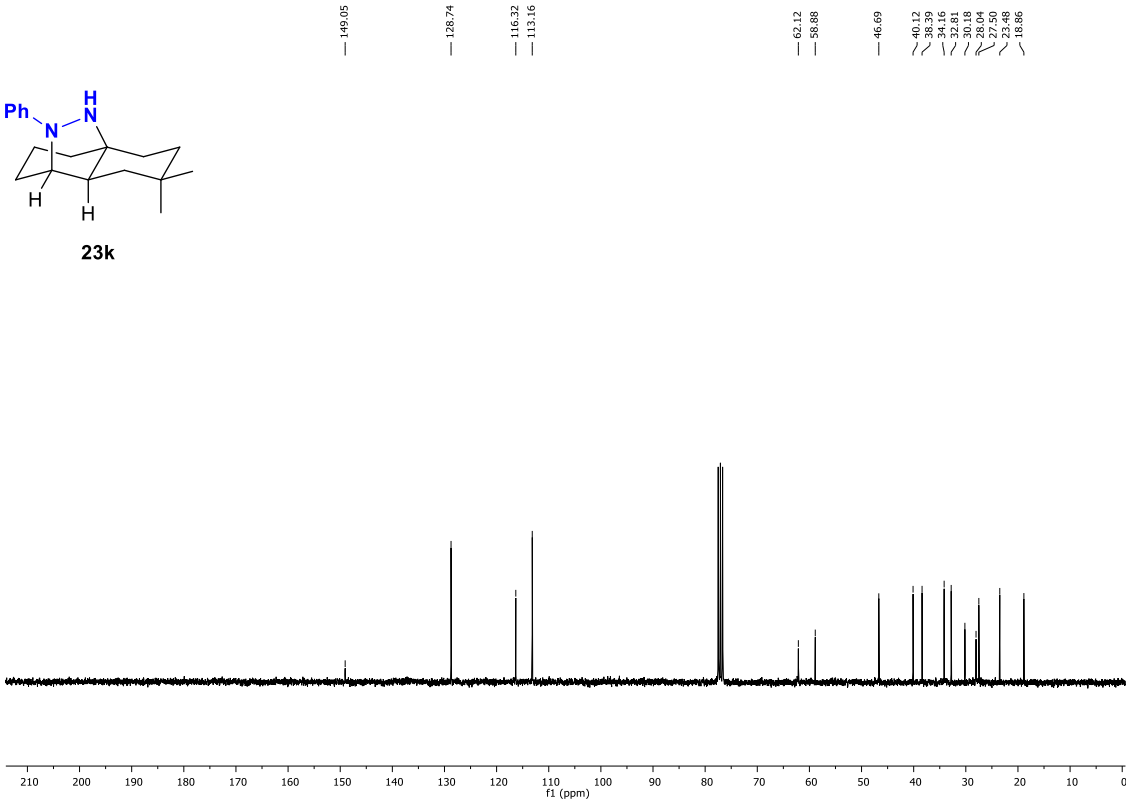


Figure SI-101. ^{13}C-NMR spectra of compound **23j**.



23k

Figure SI-102. ^{1}H-NMR spectra of compound **23k**.



23k

Figure SI-103. ^{13}C-NMR spectra of compound **23k**.

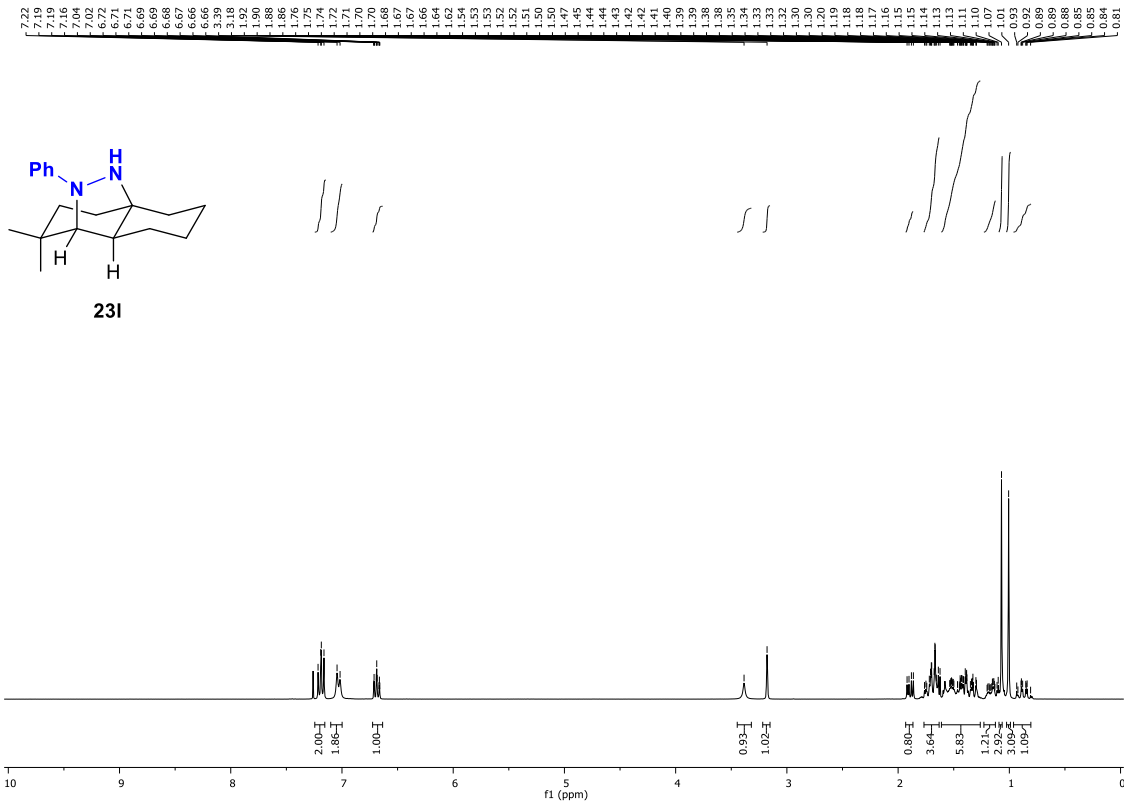


Figure SI-104. ^{1}H-NMR spectra of compound **23l**.

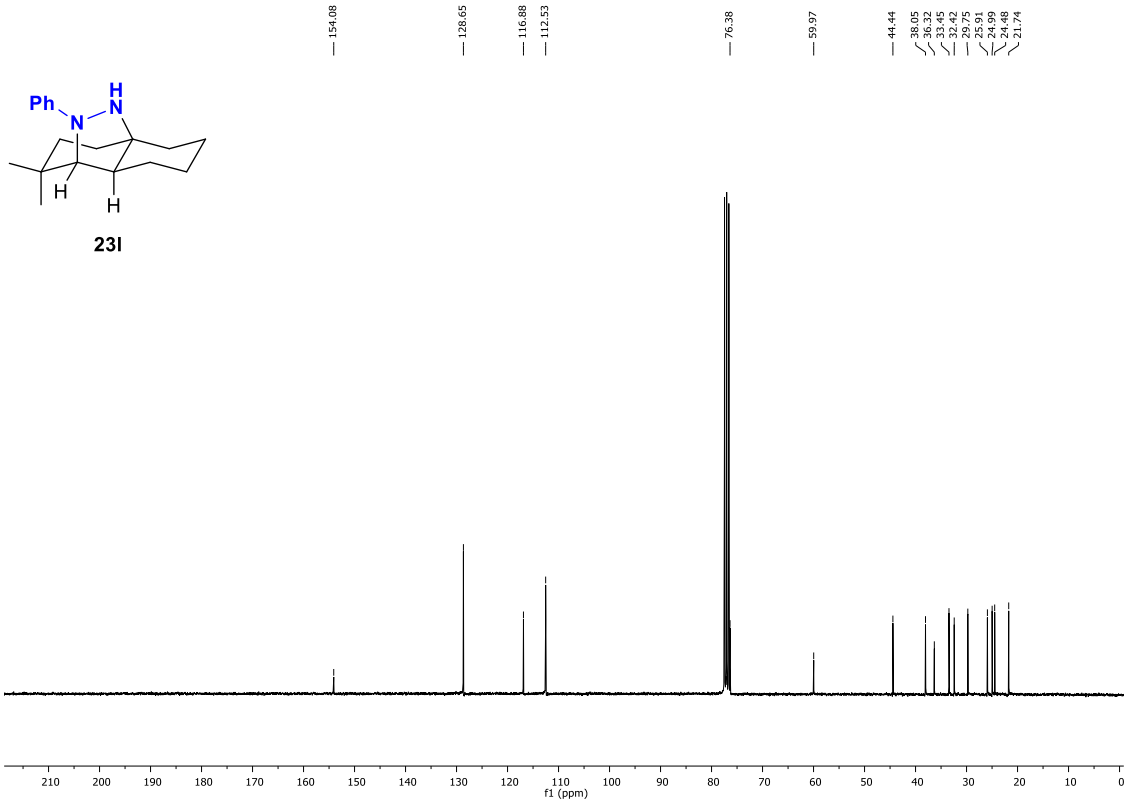


Figure SI-105. ^{13}C-NMR spectra of compound **23l**.

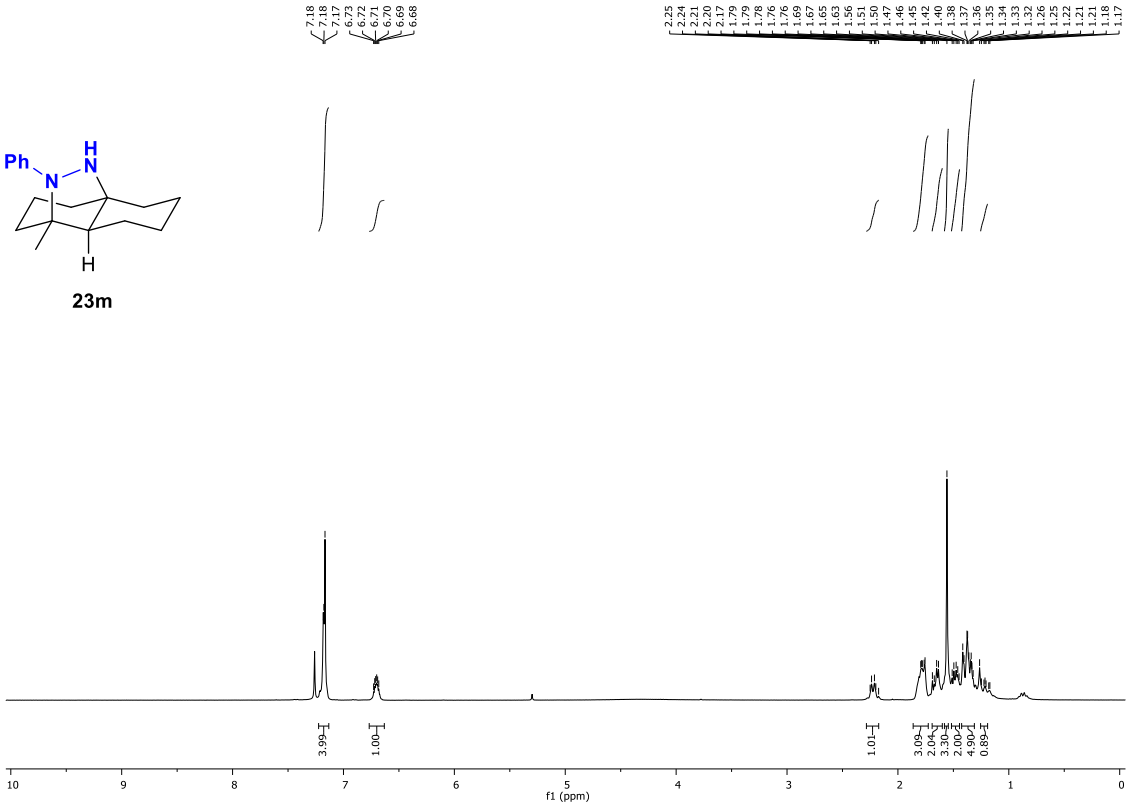


Figure SI-106. ^{1}H-NMR spectra of compound **23m**.

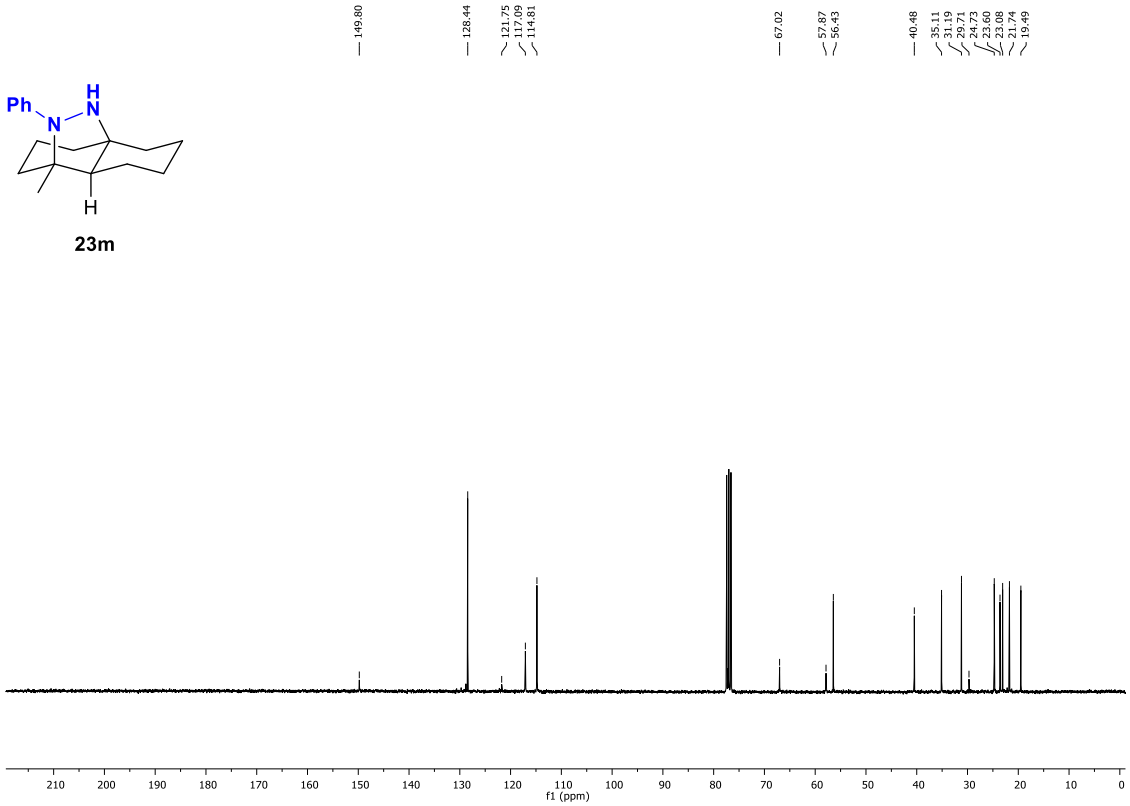


Figure SI-107. ^{13}C-NMR spectra of compound **23m**.

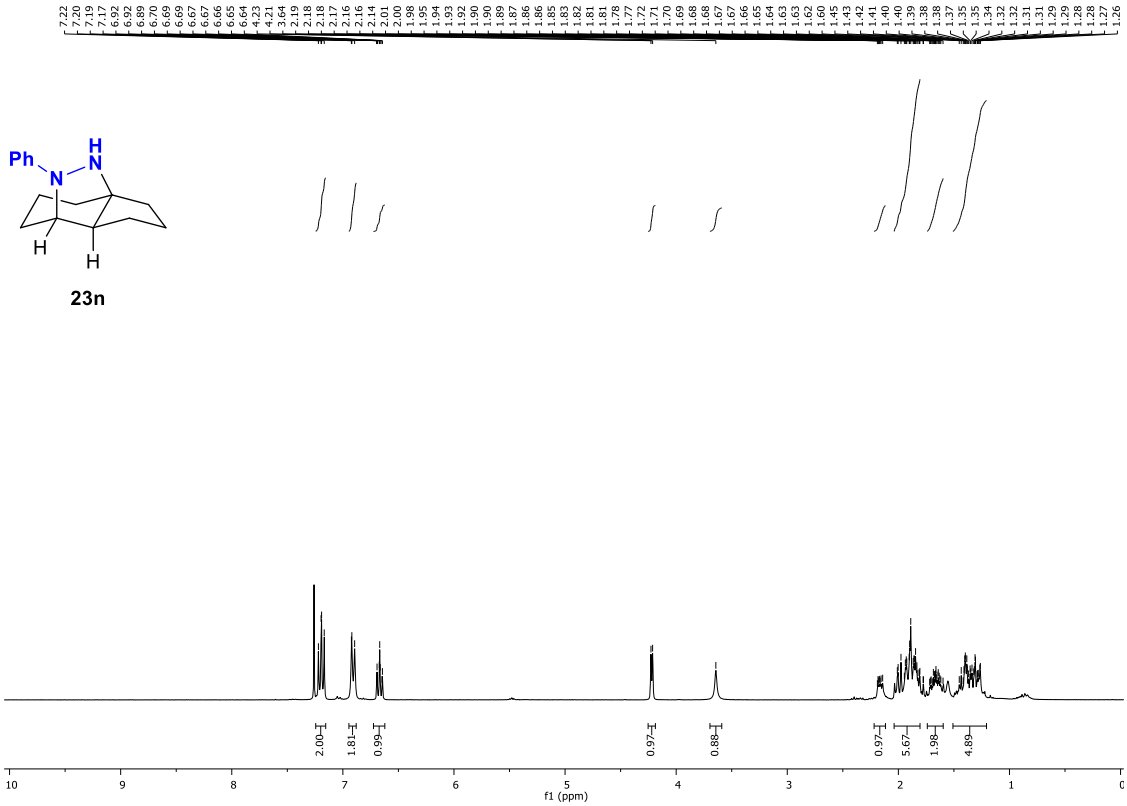


Figure SI-108. ^{1}H-NMR spectra of compound **23n**.

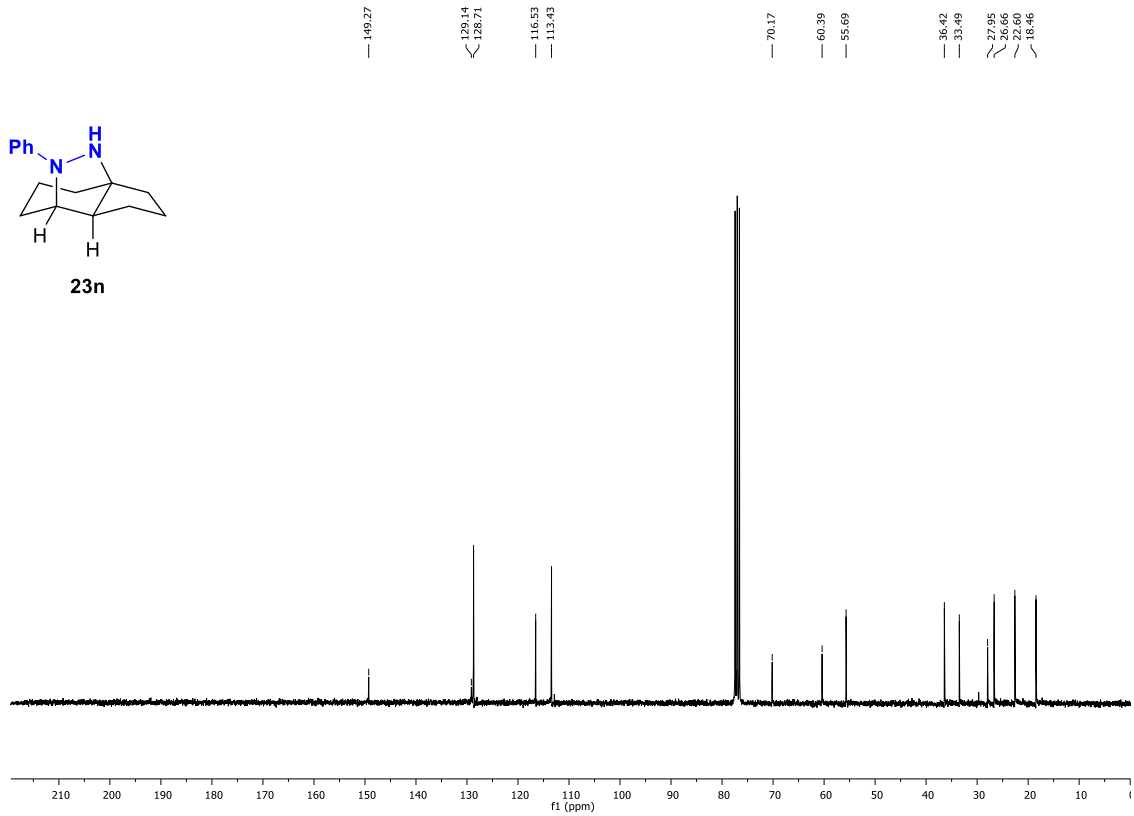


Figure SI-109. ^{13}C-NMR spectra of compound **23n**.

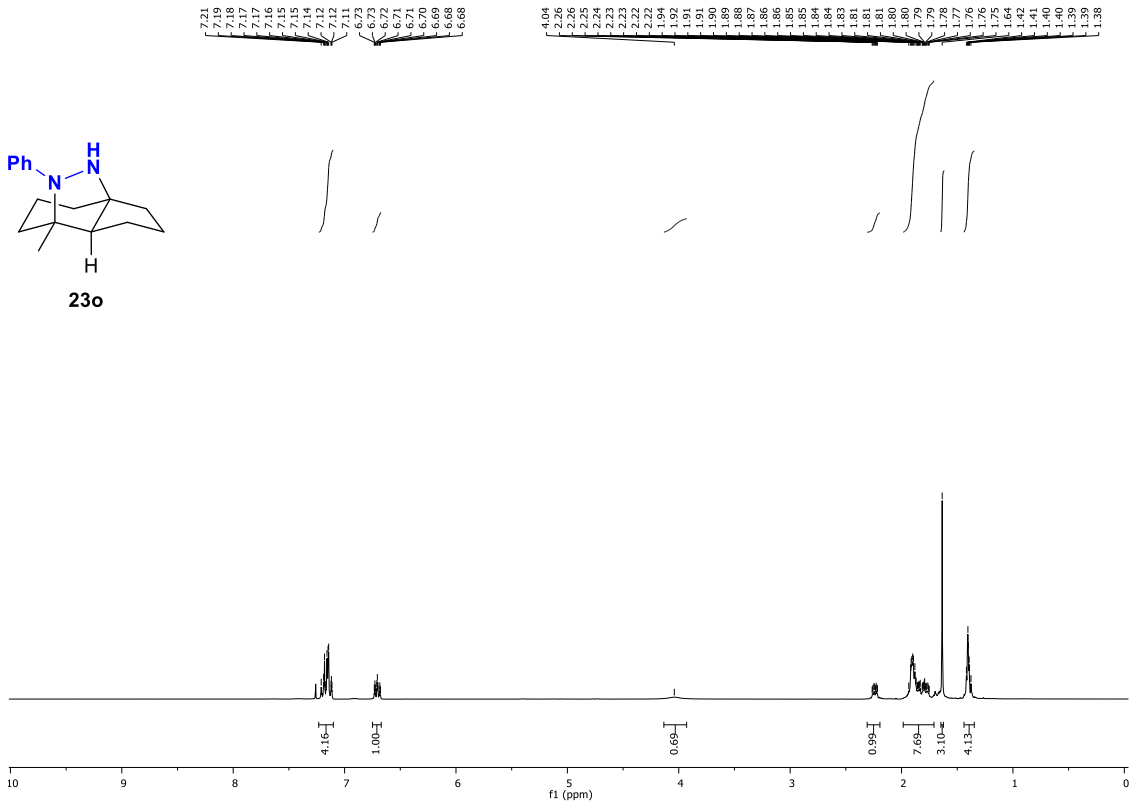


Figure SI-110. ^{1}H-NMR spectra of compound **23o**.

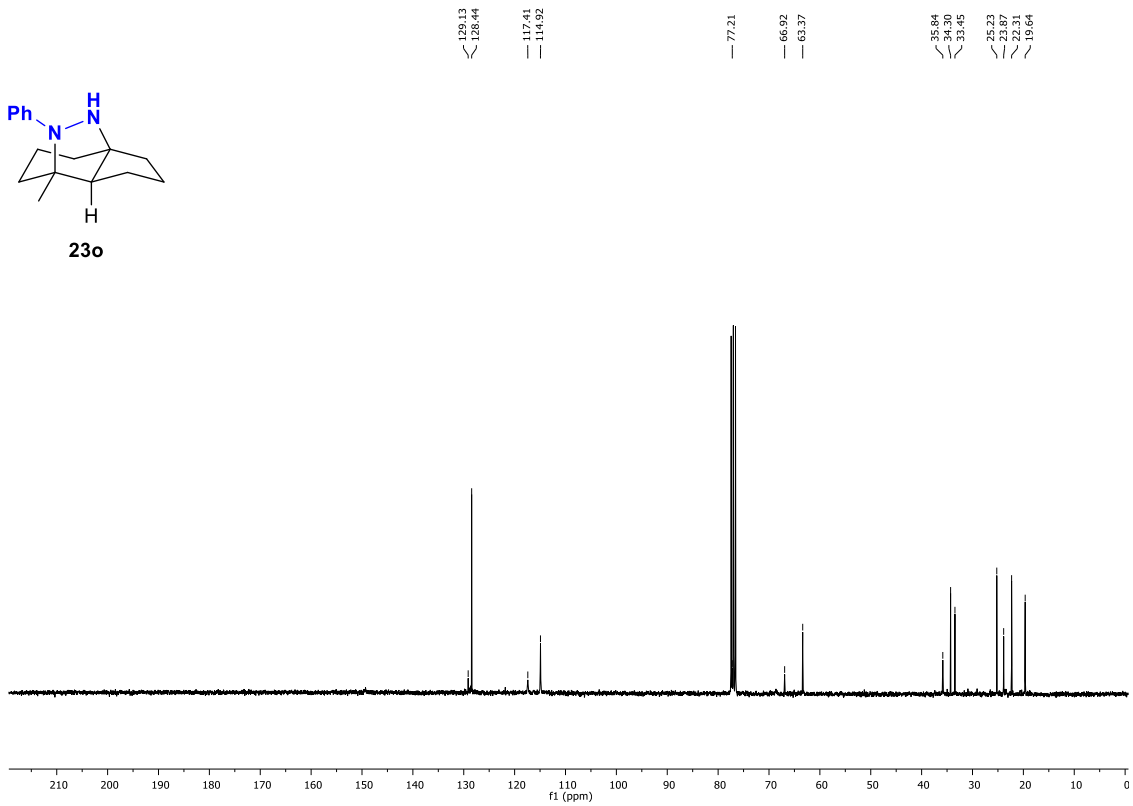


Figure SI-111. ^{13}C-NMR spectra of compound **23o**.

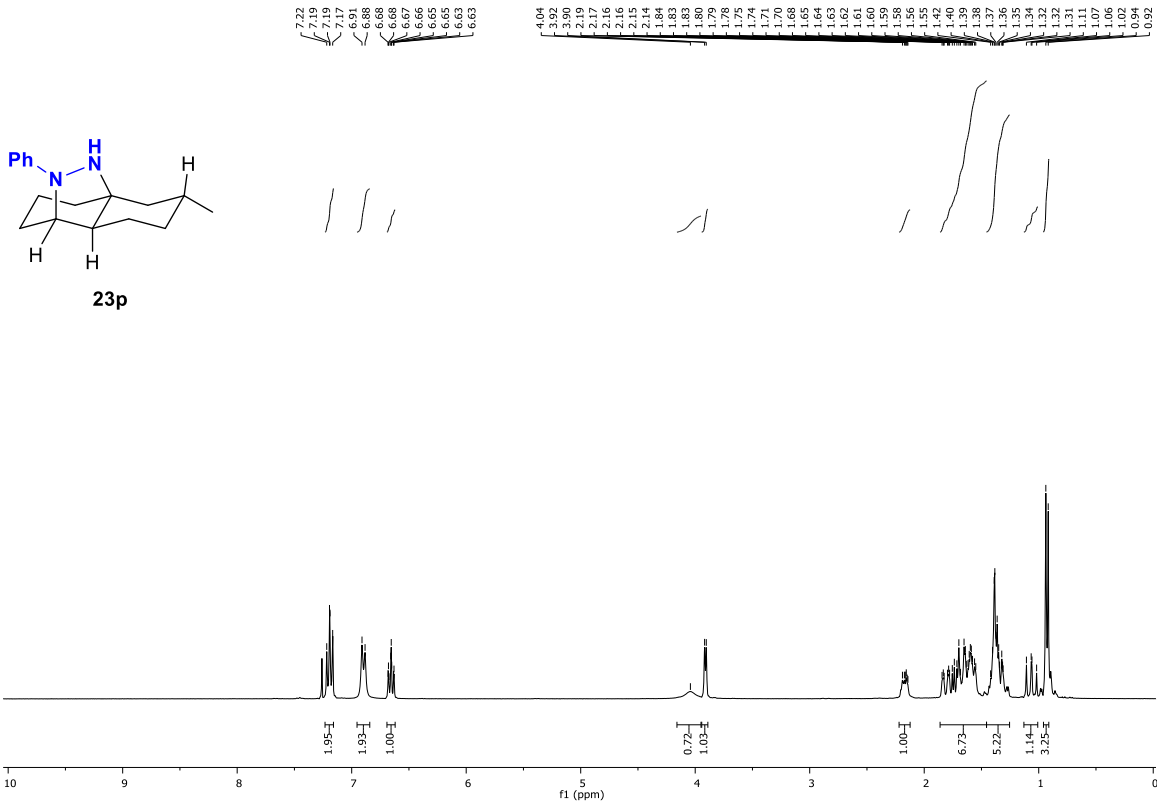


Figure SI-112. ^{1}H-NMR spectra of compound **23p**.

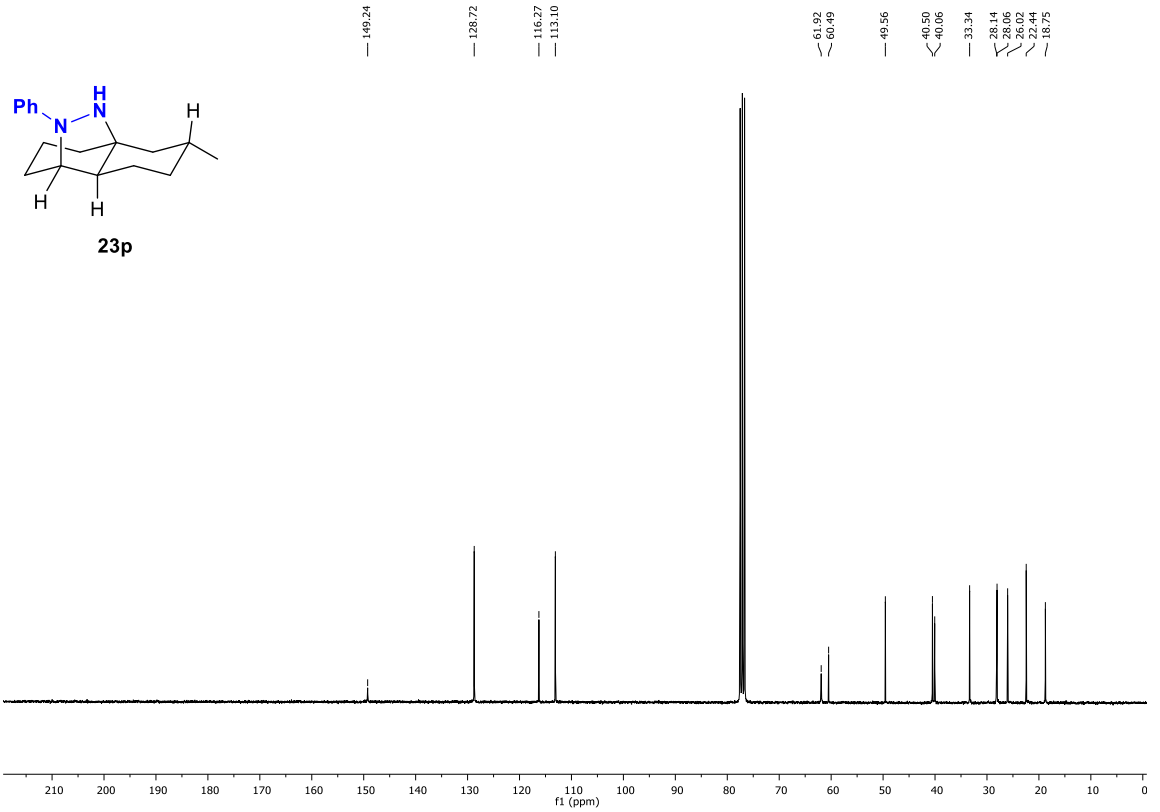


Figure SI-113. ^{13}C-NMR spectra of compound **23p**.

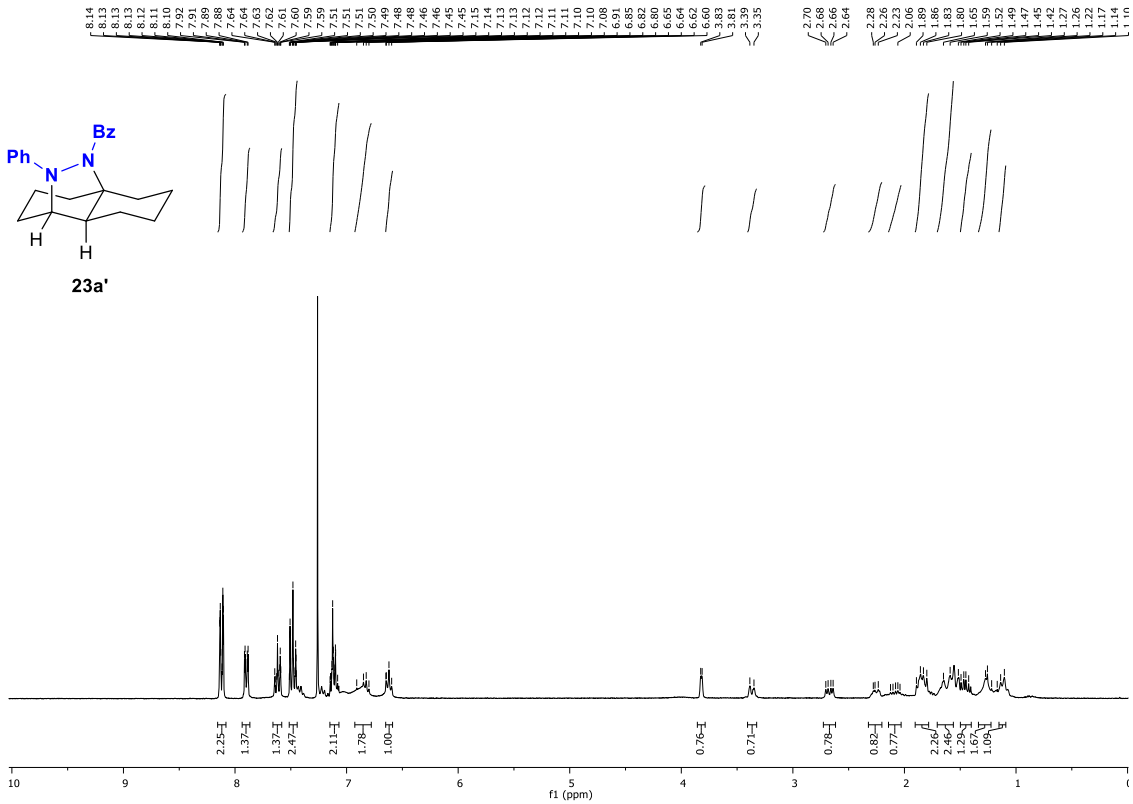


Figure SI-114. ^{1}H-NMR spectra of compound **23a'**.

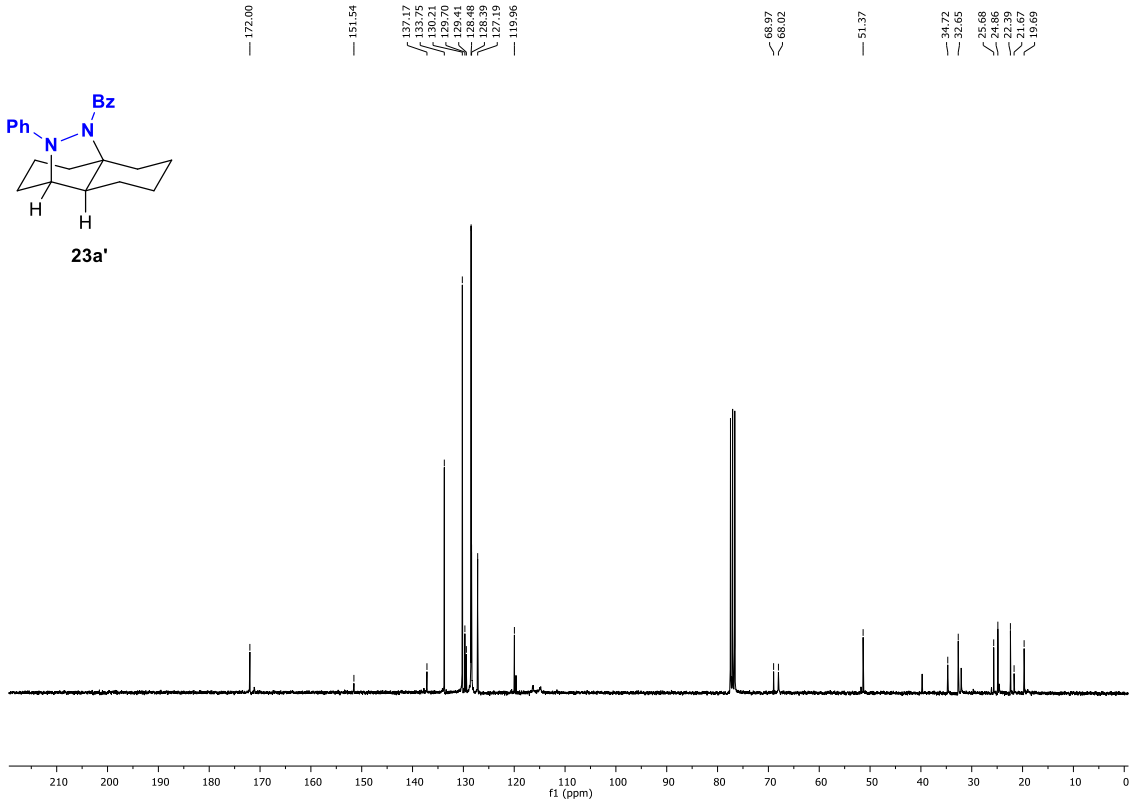


Figure SI-115. ^{13}C-NMR spectra of compound **23a'**.

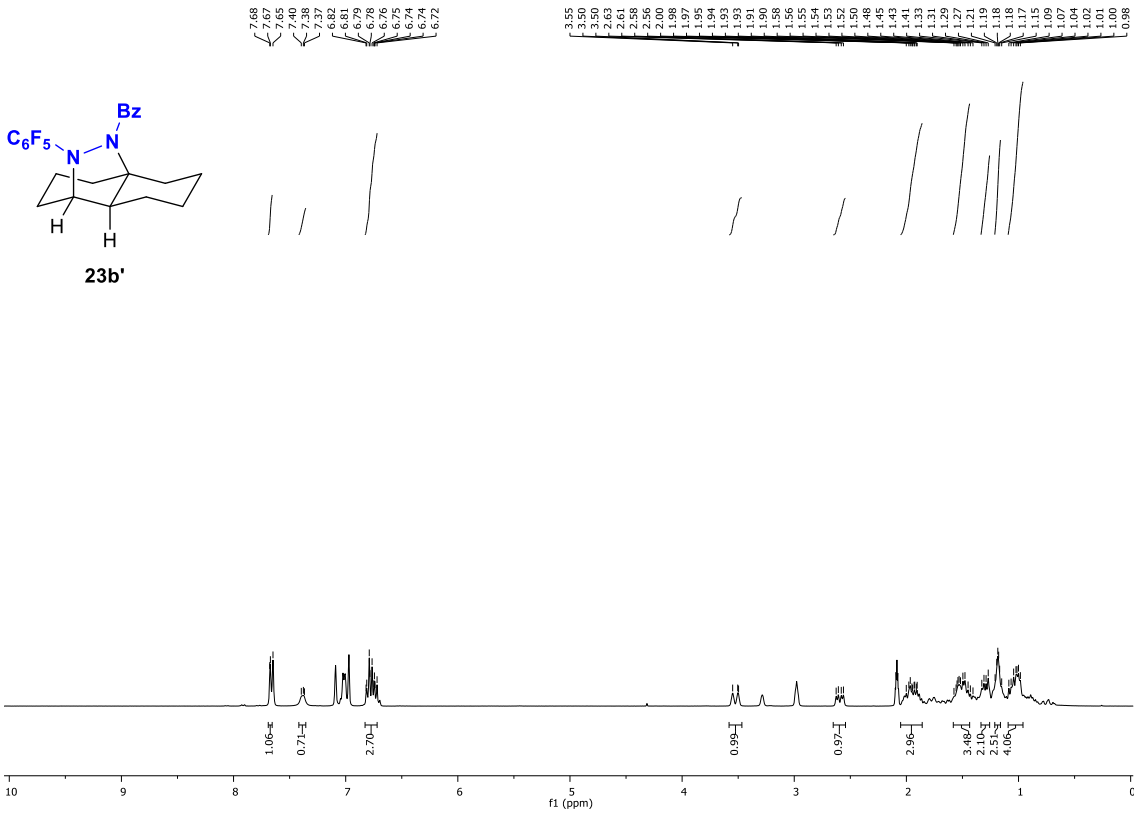


Figure SI-116. ^{1}H-NMR spectra of compound **23b'**.

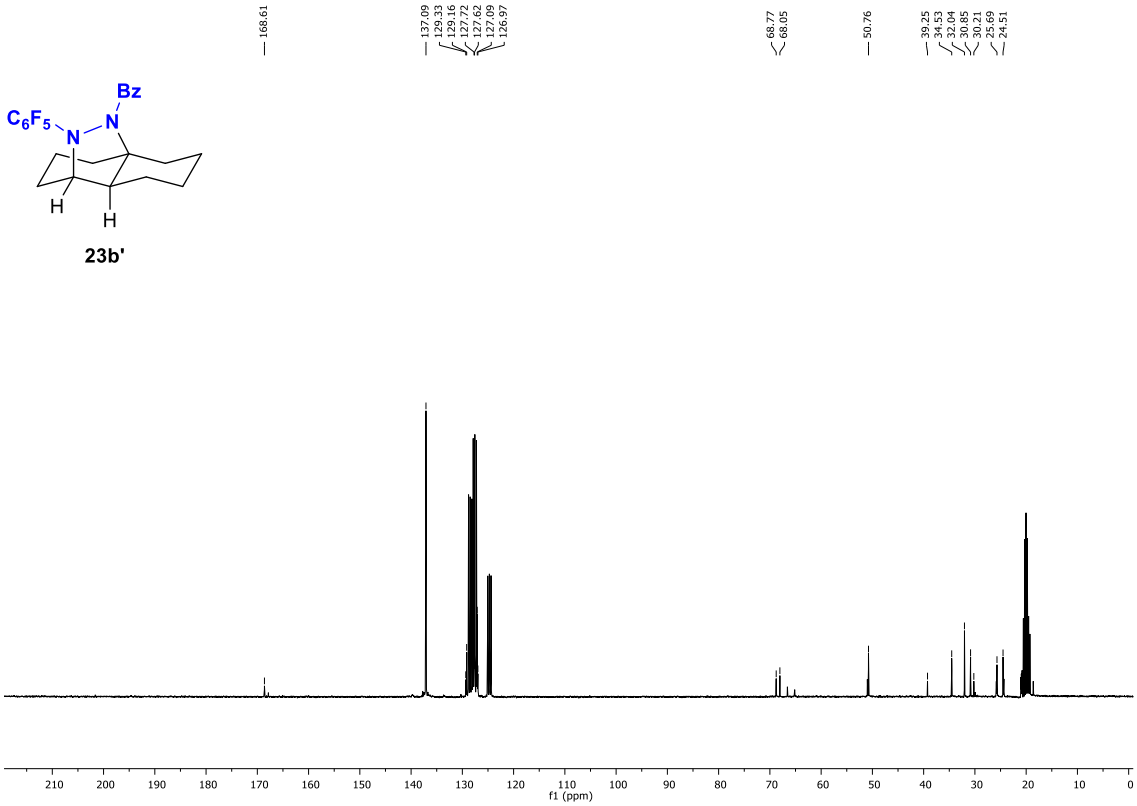


Figure SI-117. ^{13}C-NMR spectra of compound **23b'**.

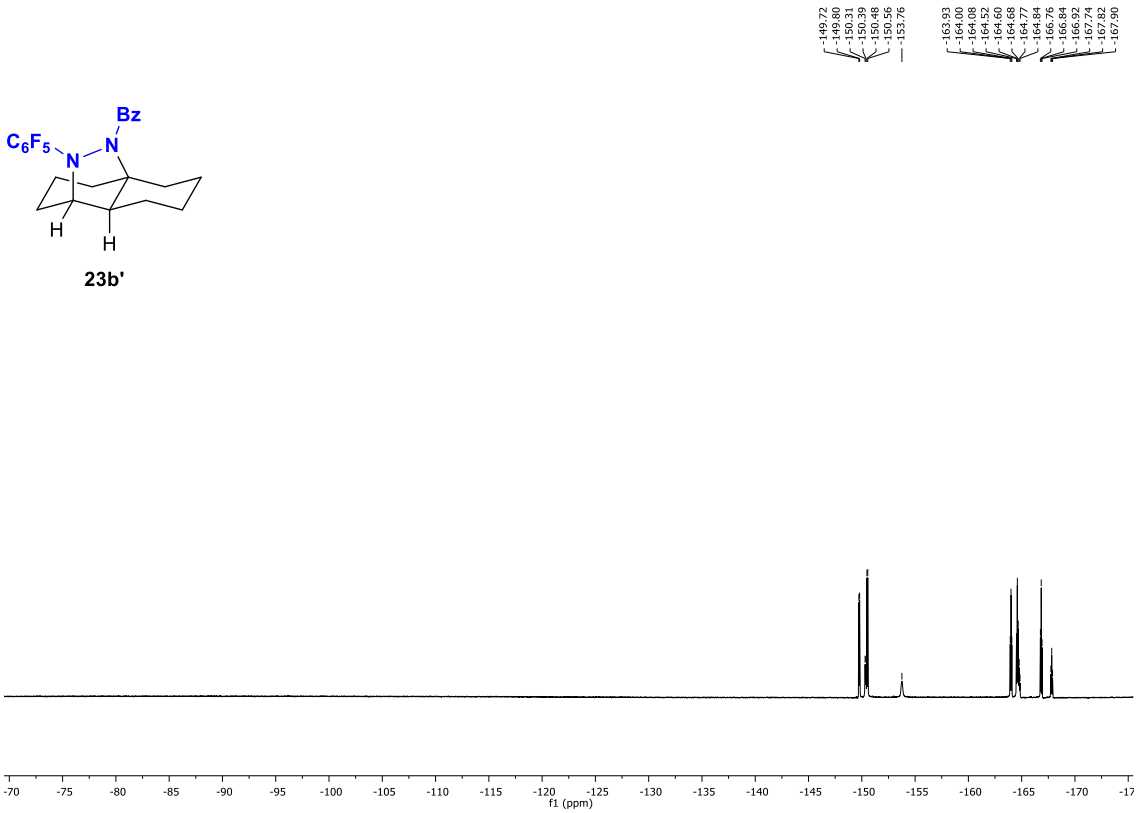


Figure SI-118. ^{19}F-NMR spectra of compound **23b'**.

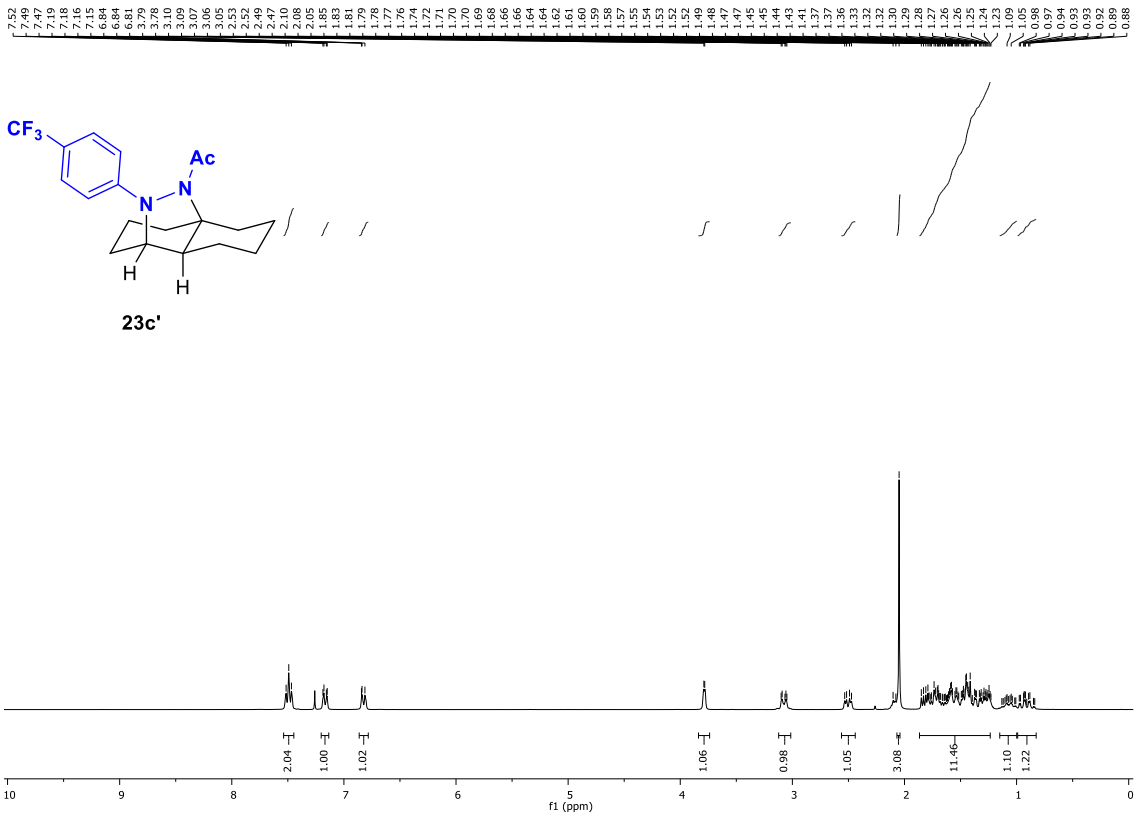


Figure SI-119. ^{1}H-NMR spectra of compound **23c'**.

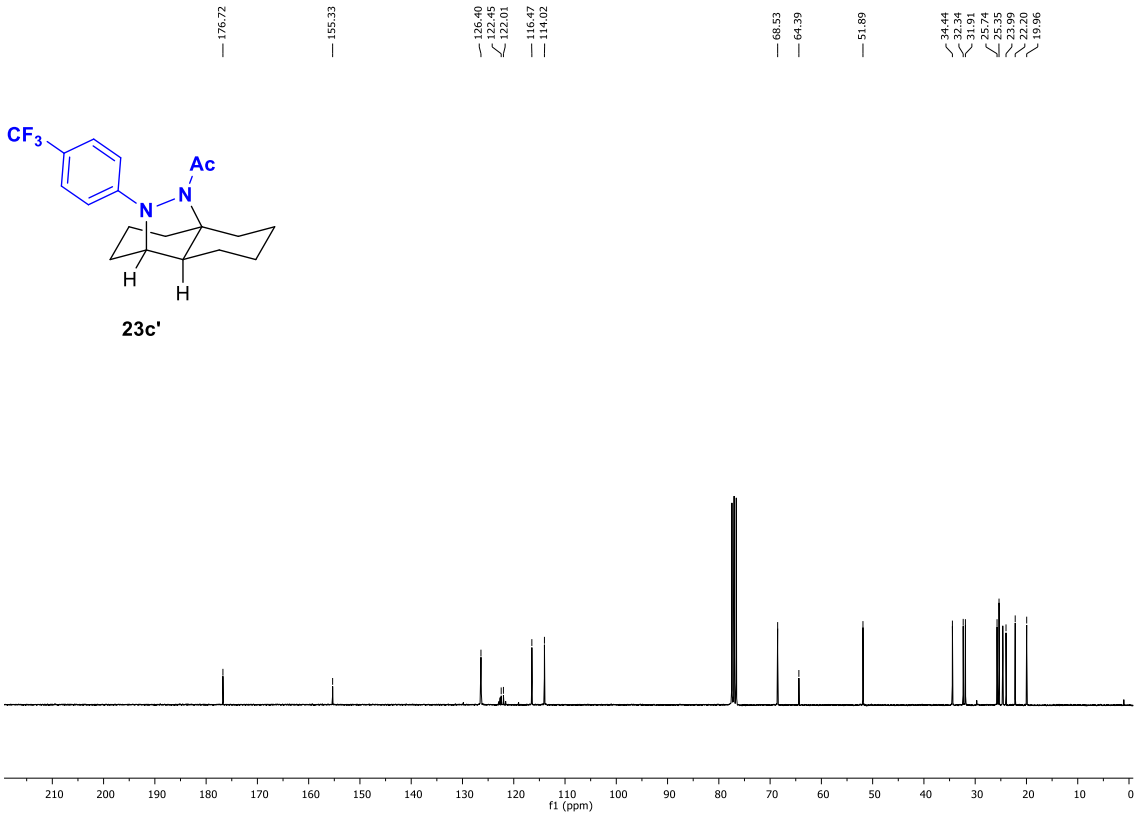


Figure SI-120. ^{13}C-NMR spectra of compound **23c'**.

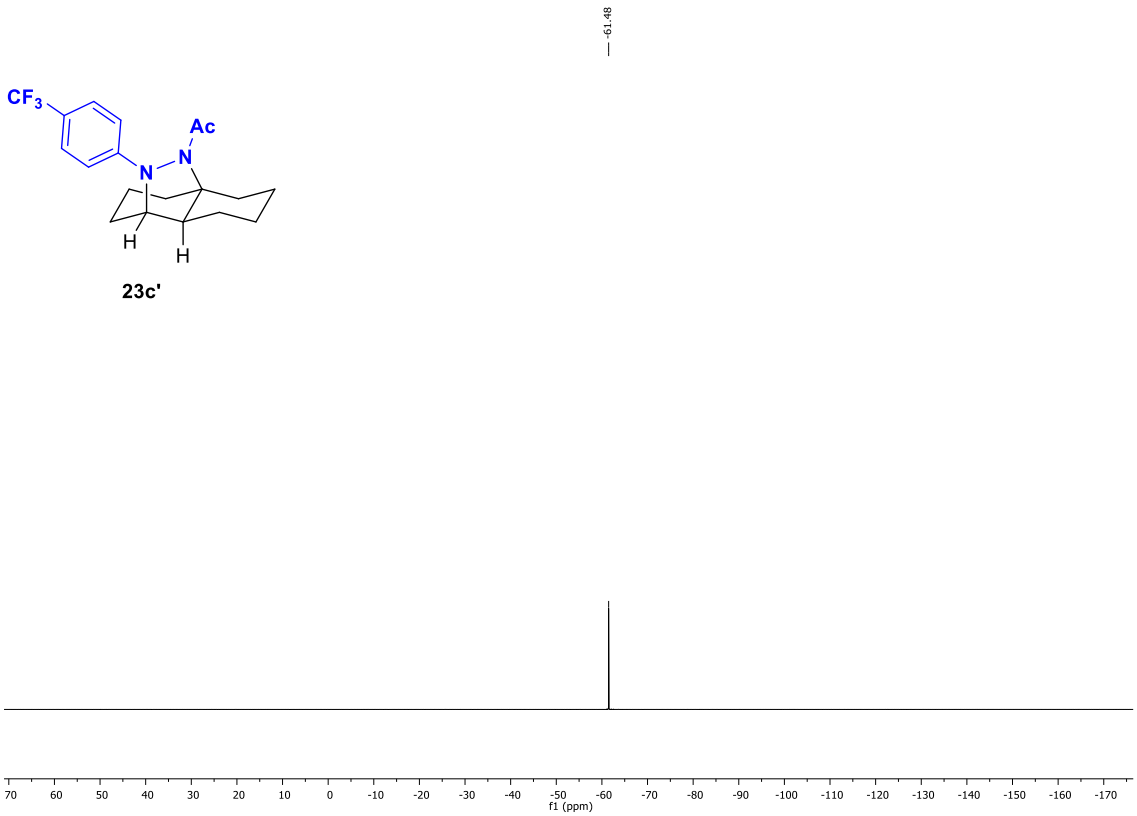


Figure SI-121. ^{19}F-NMR spectra of compound **23c'**.

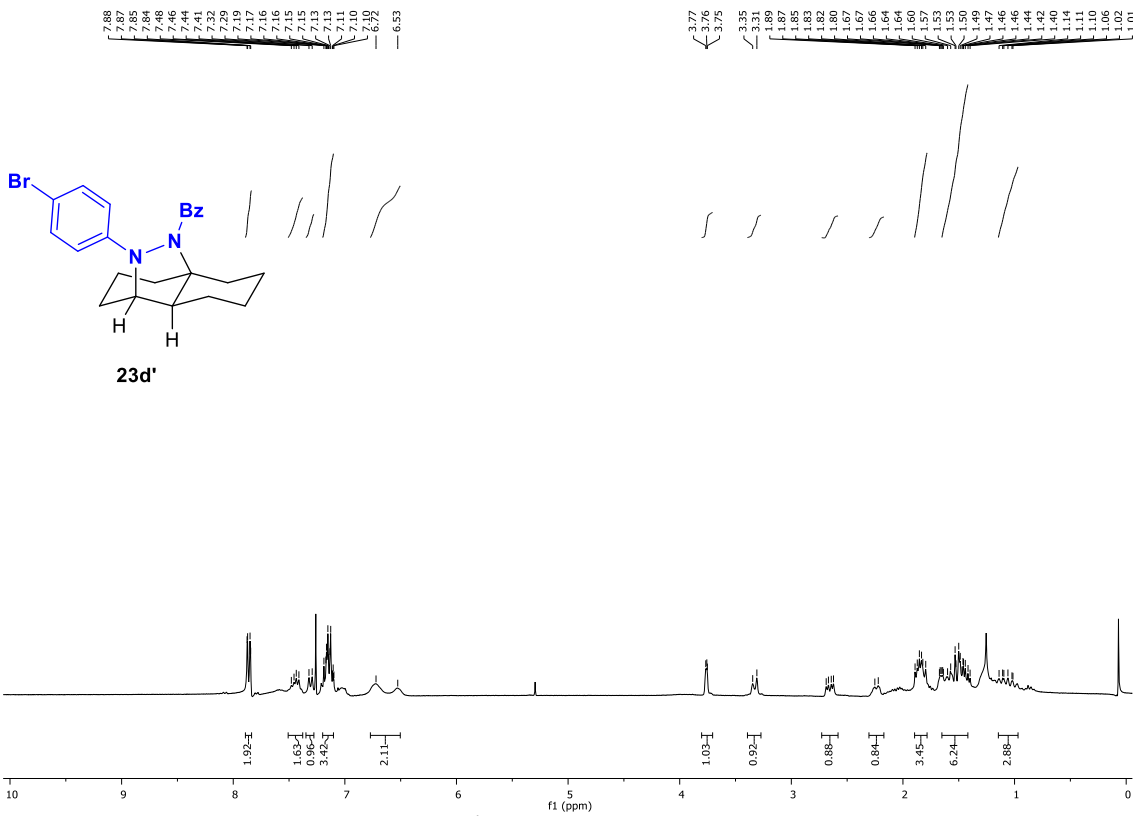


Figure SI-122. ^{1}H-NMR spectra of compound **23d'**.

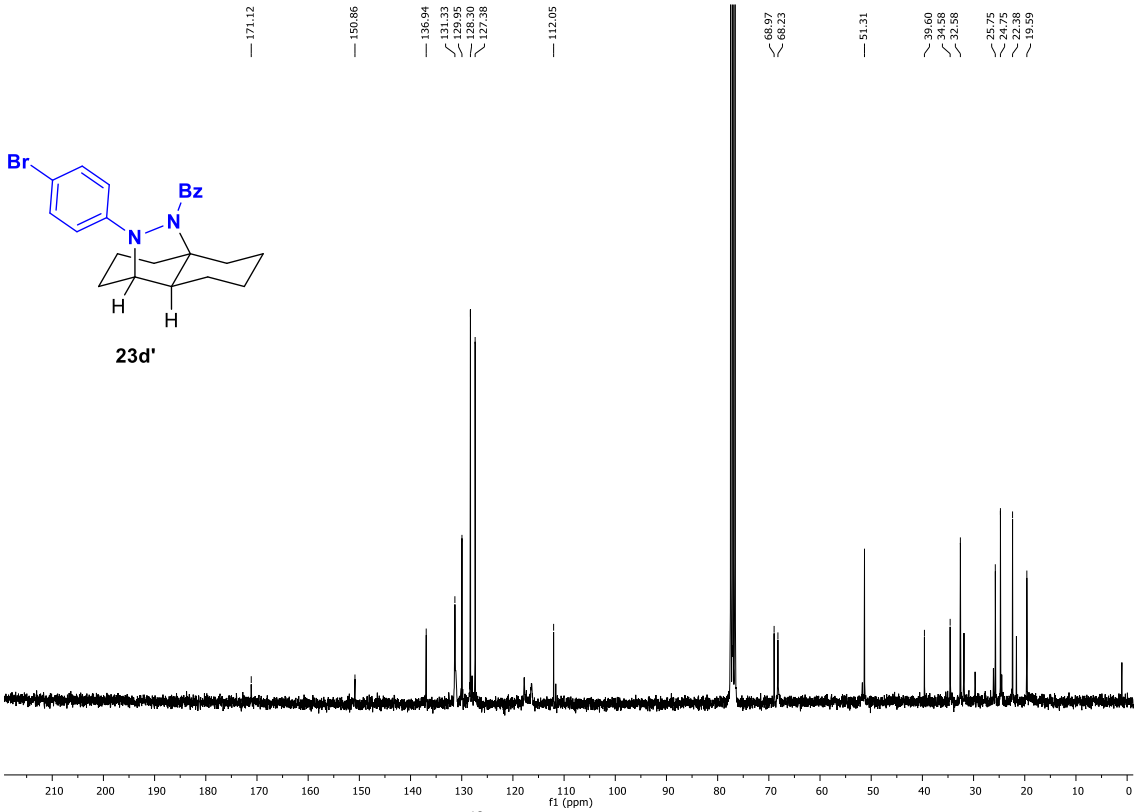


Figure SI-123. ^{13}C-NMR spectra of compound **23d'**.

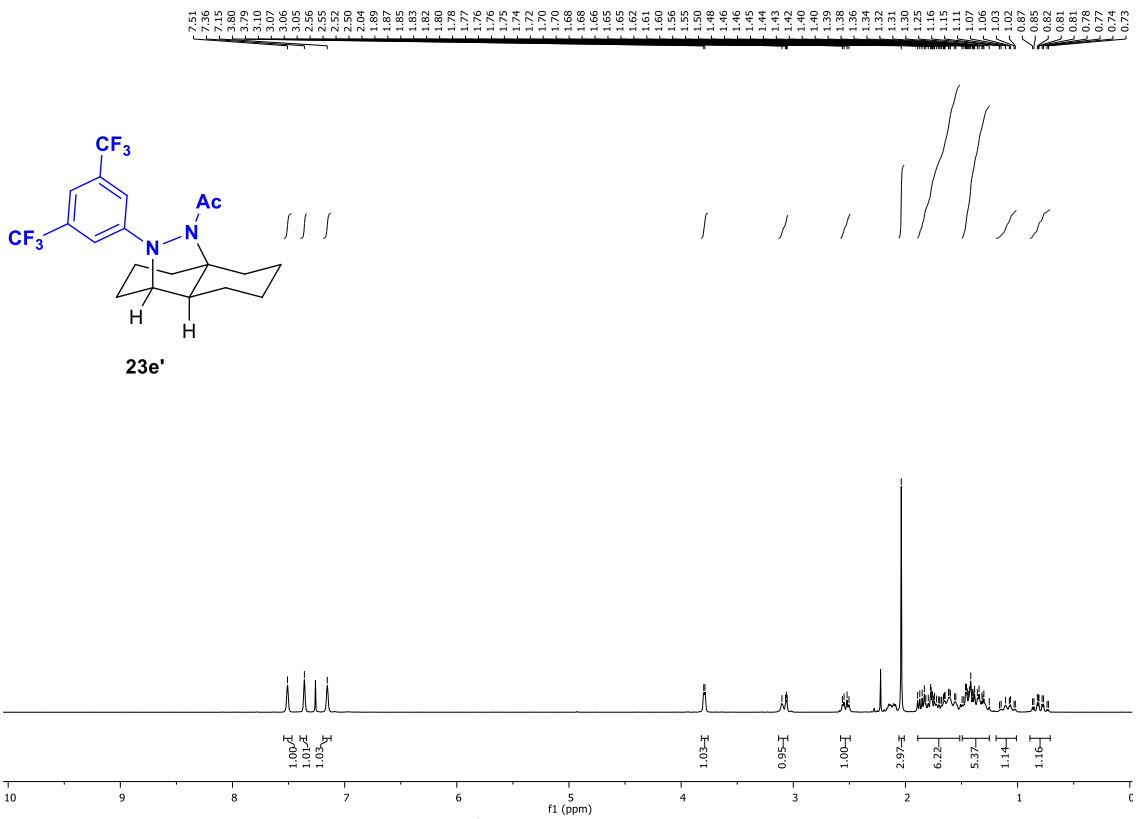


Figure SI-124. ^{1}H-NMR spectra of compound **23e'**.

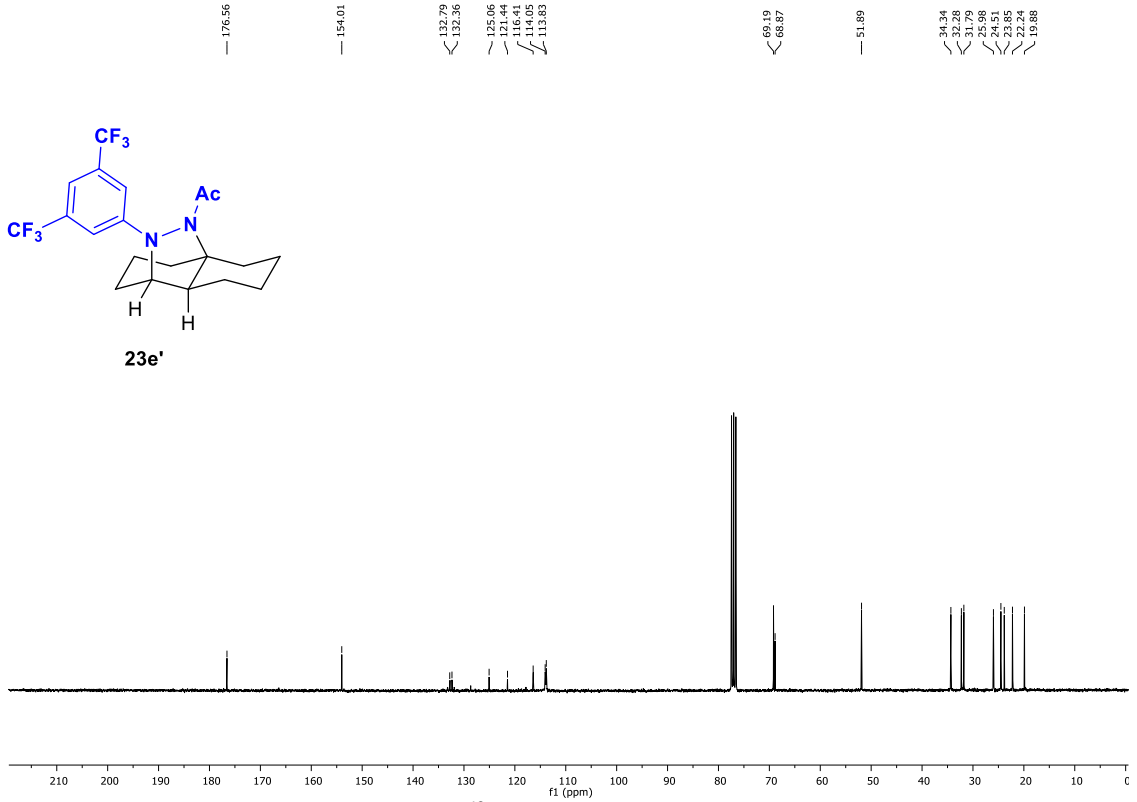


Figure SI-125. ^{13}C-NMR spectra of compound **23e'**.

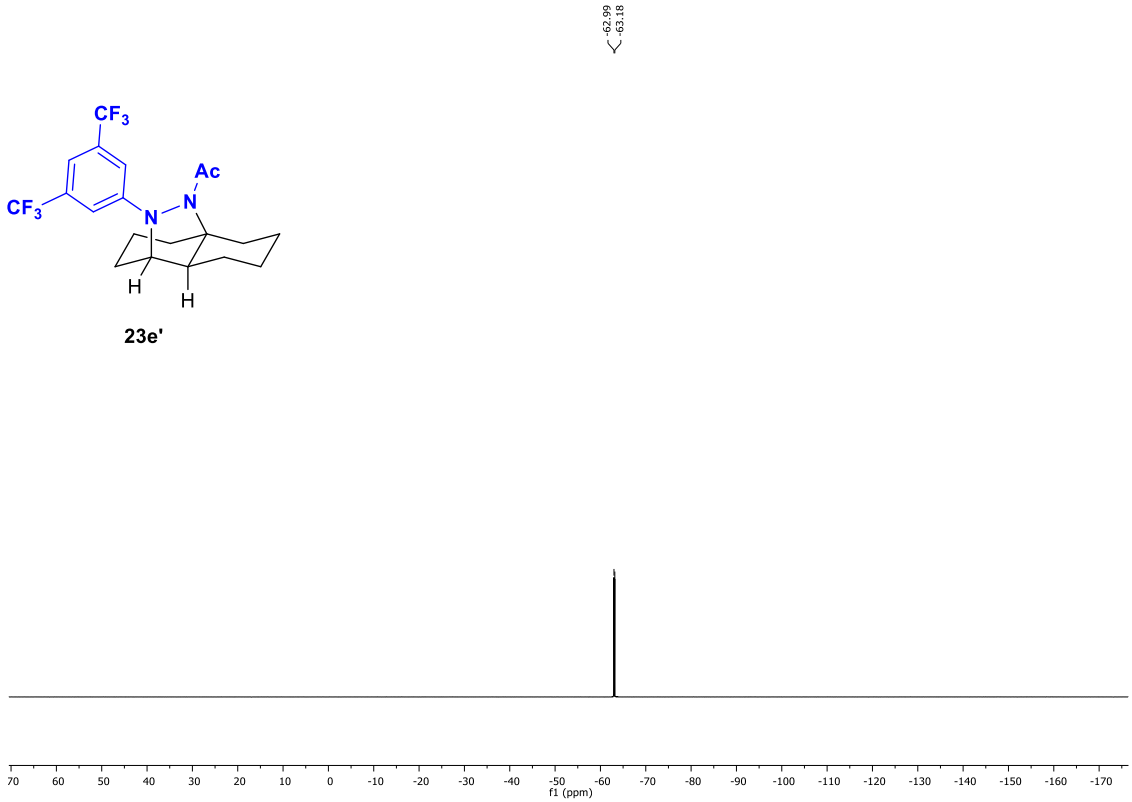


Figure SI-126. ^{19}F-NMR spectra of compound **23e'**.

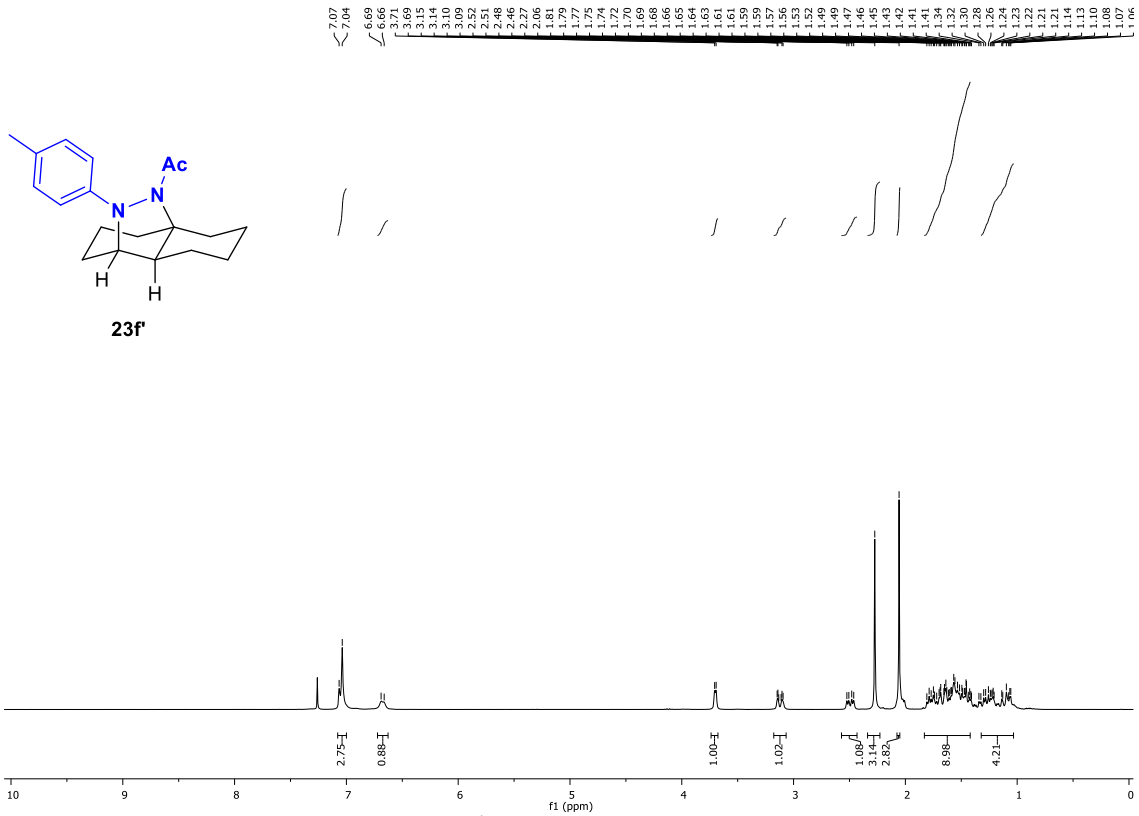


Figure SI-127. ^{1}H-NMR spectra of compound **23f'**.

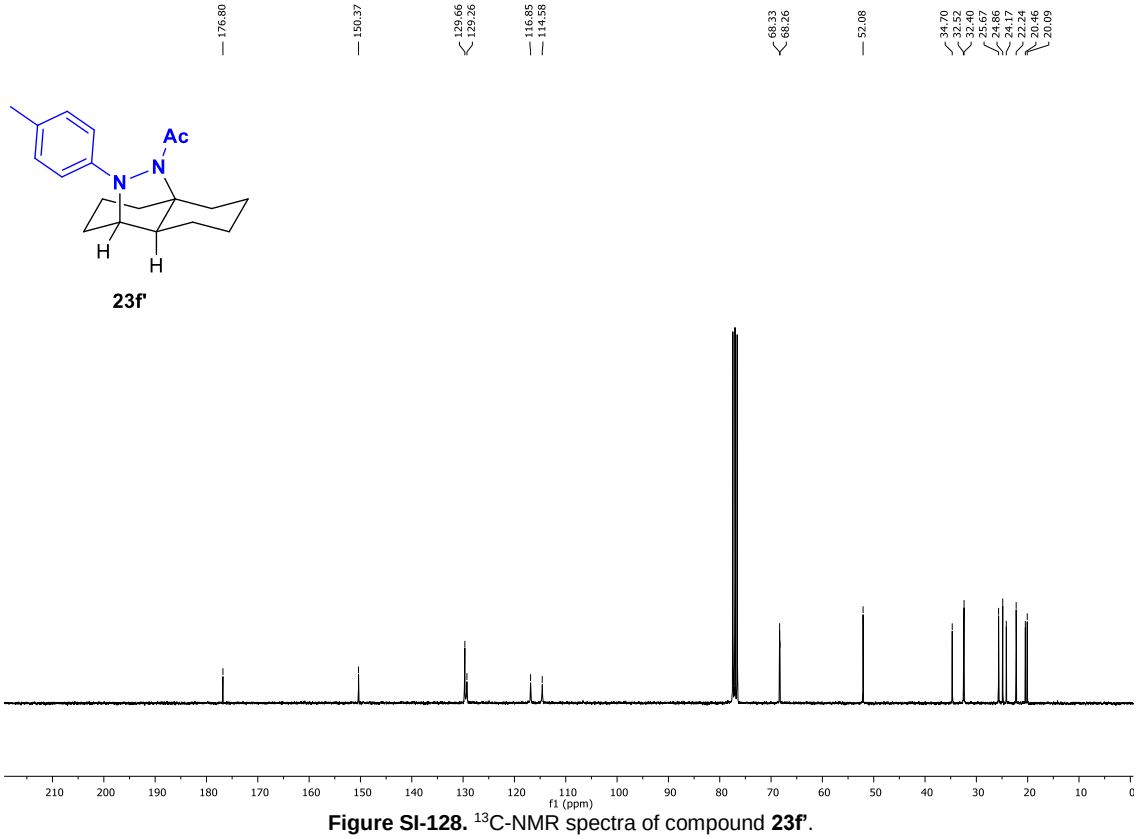


Figure SI-128. ^{13}C-NMR spectra of compound **23f'**.

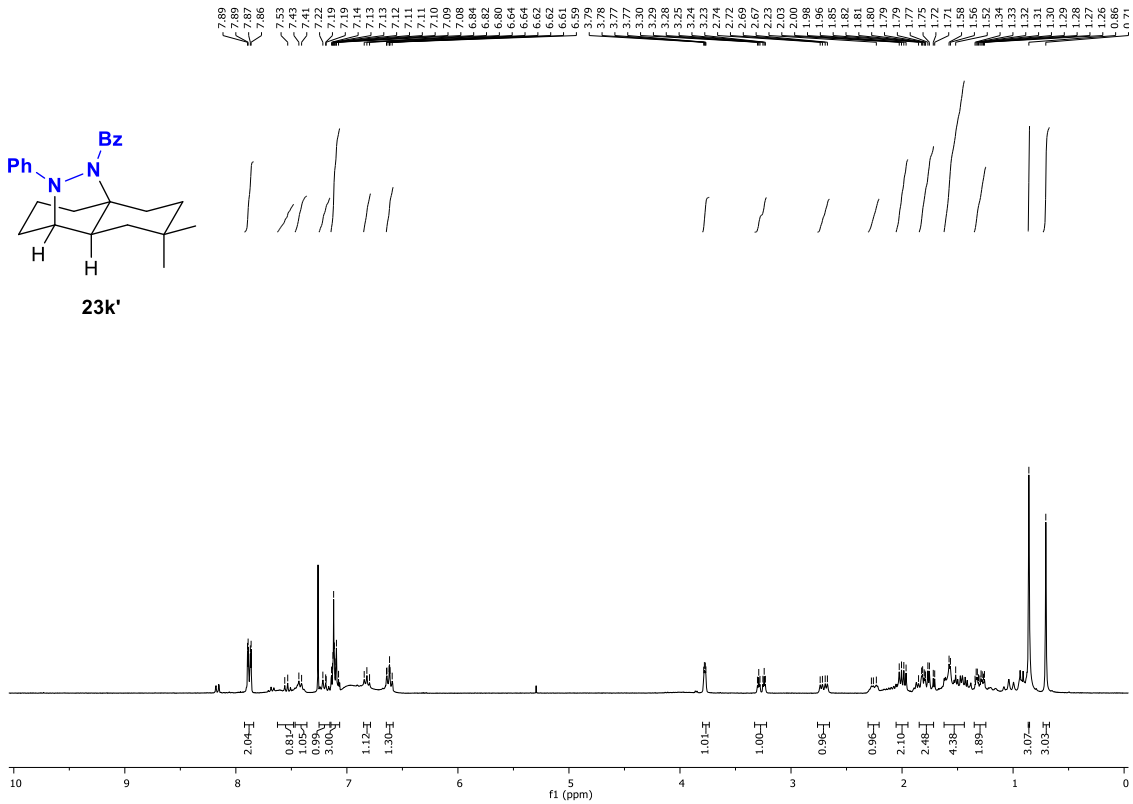


Figure SI-129. ^{1}H-NMR spectra of compound **23k'**.

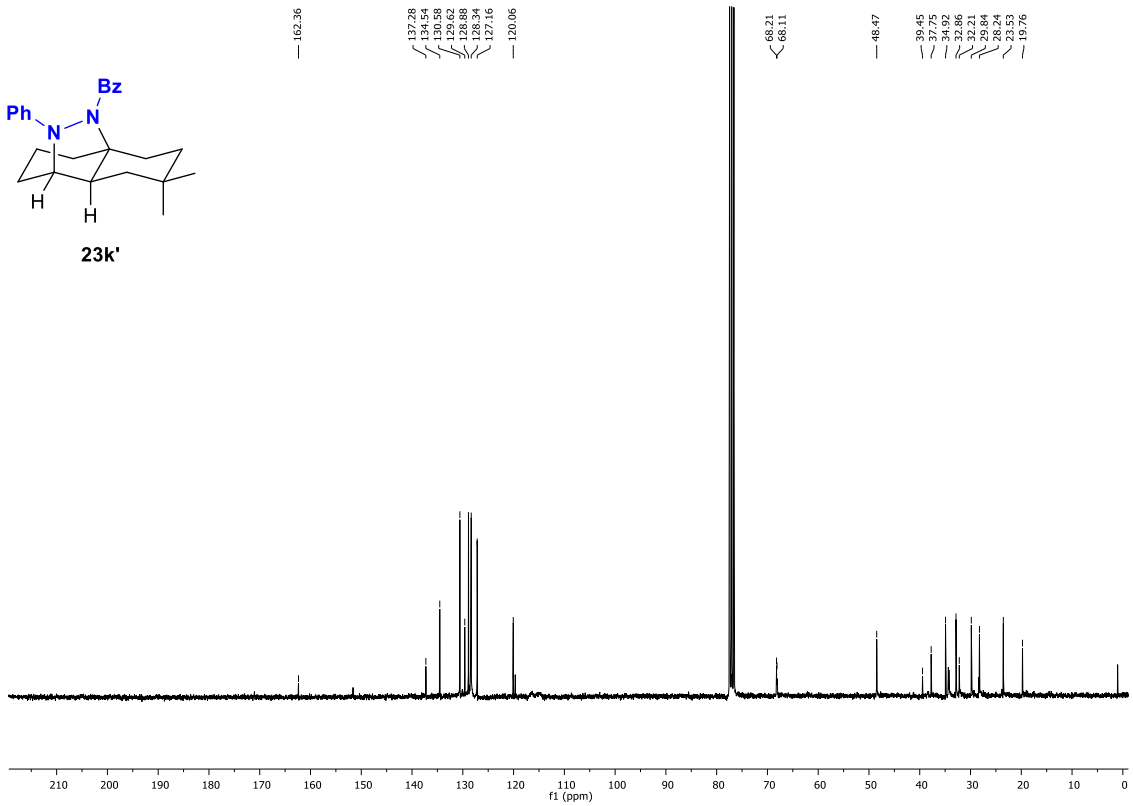


Figure SI-130. ^{13}C-NMR spectra of compound **23k'**.

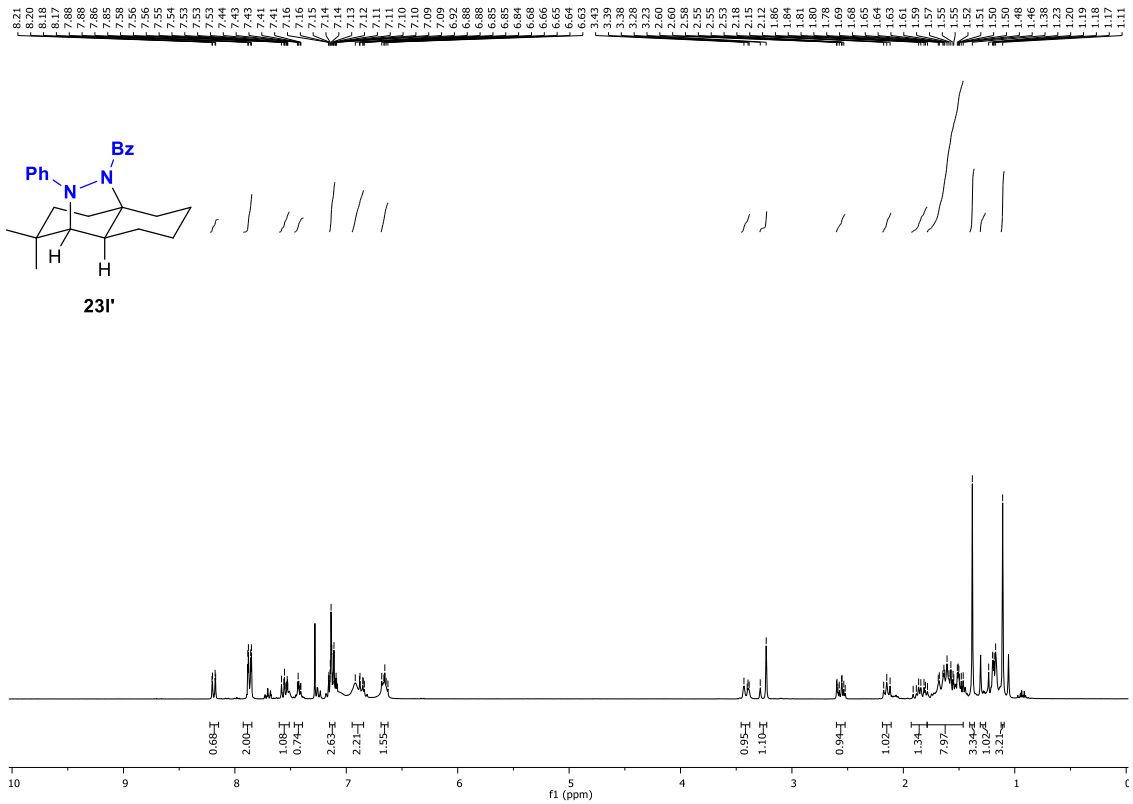


Figure SI-131. ^{1}H-NMR spectra of compound **23l'**.

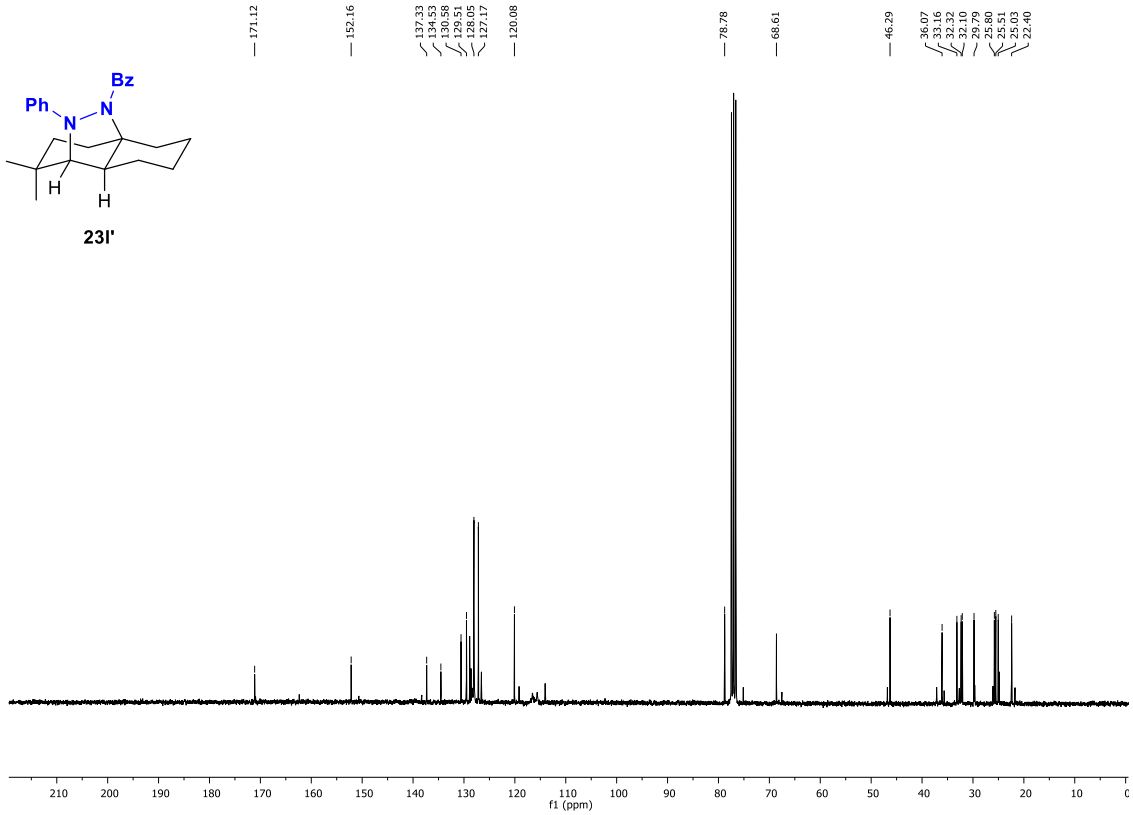


Figure SI-132. ^{13}C-NMR spectra of compound **23l'**.

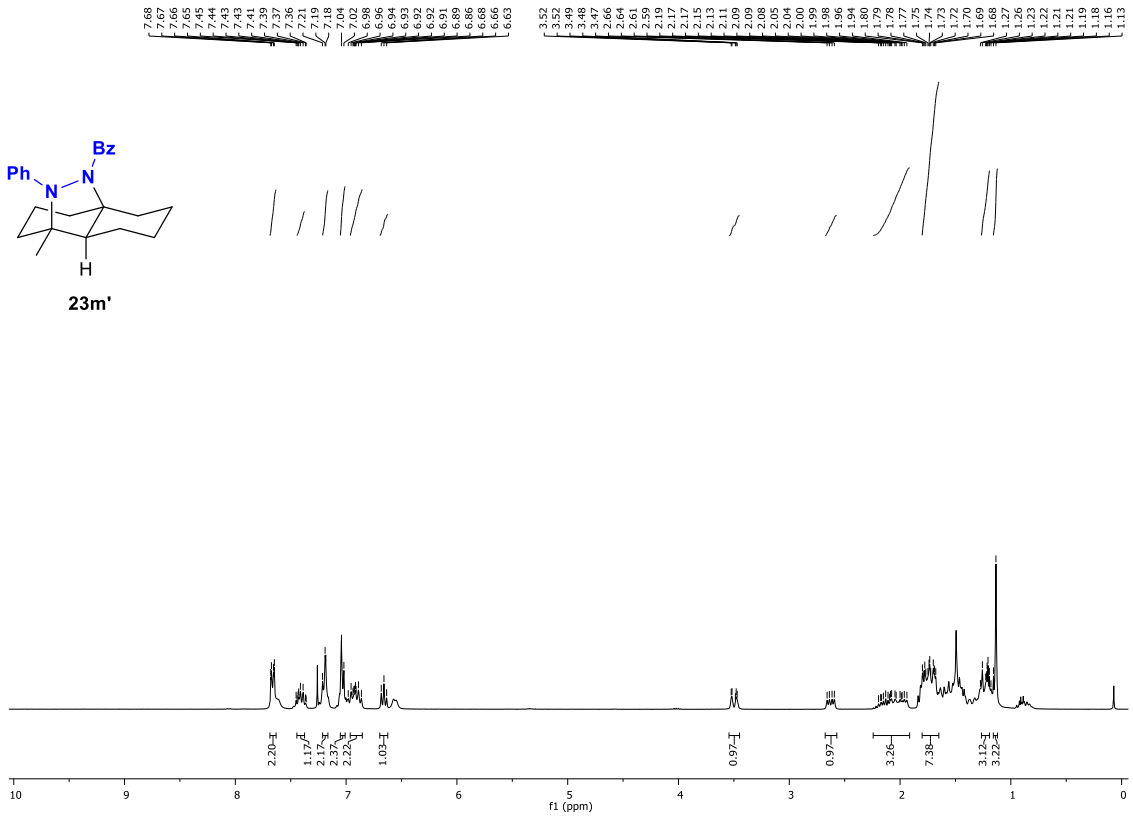


Figure SI-133. ^{1}H-NMR spectra of compound **23m'**.

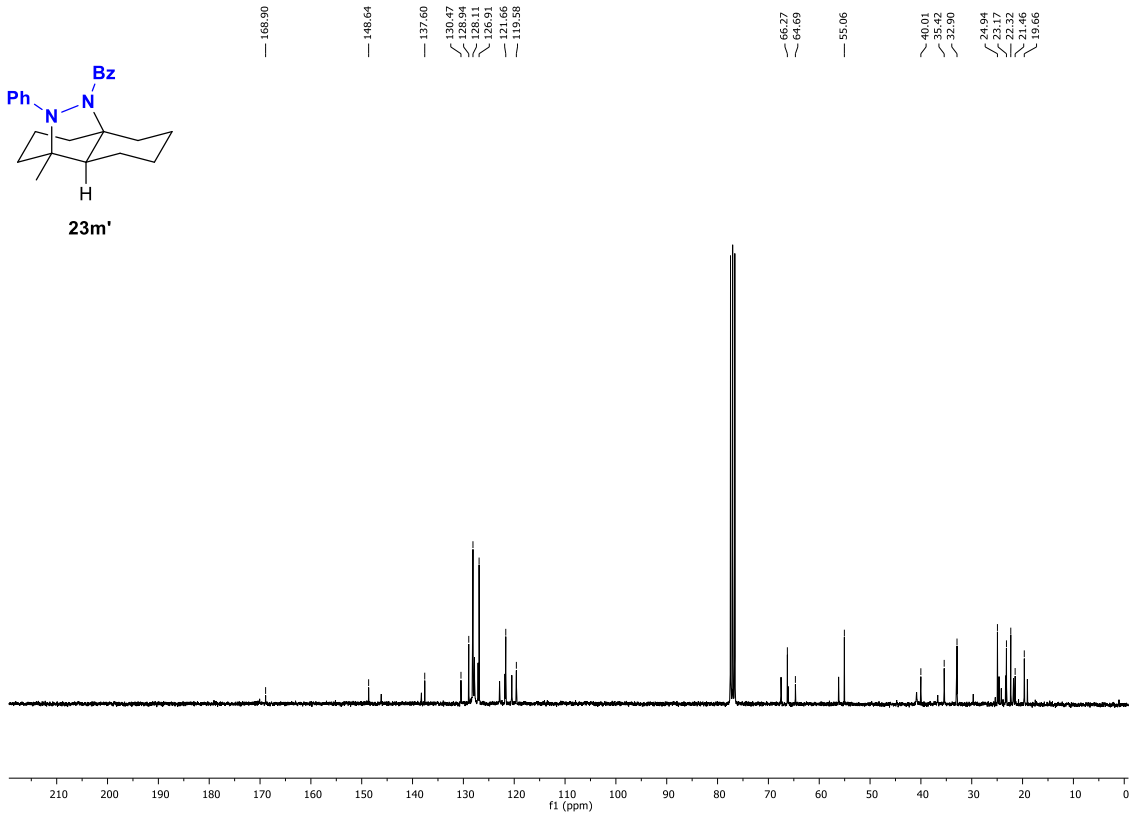


Figure SI-134. ^{13}C-NMR spectra of compound **23m'**.

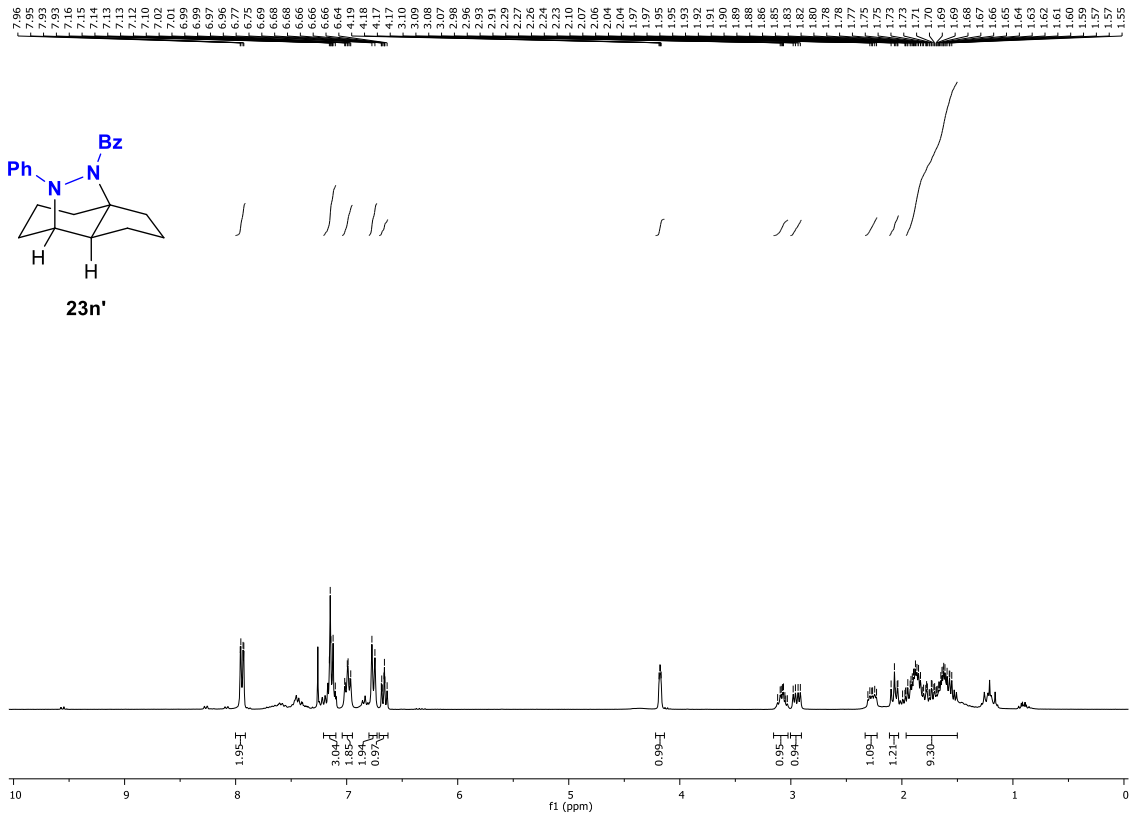


Figure SI-135. ^{1}H-NMR spectra of compound **23n'**.

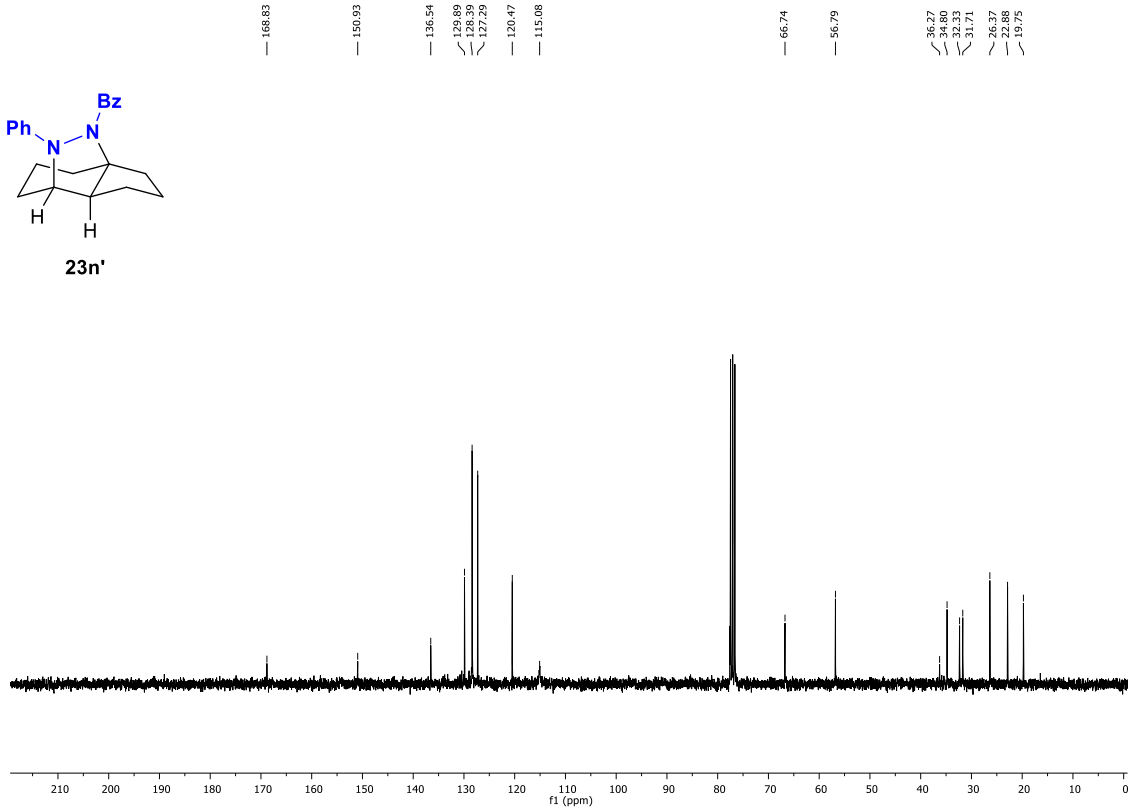


Figure SI-136. ^{13}C-NMR spectra of compound **23n'**.

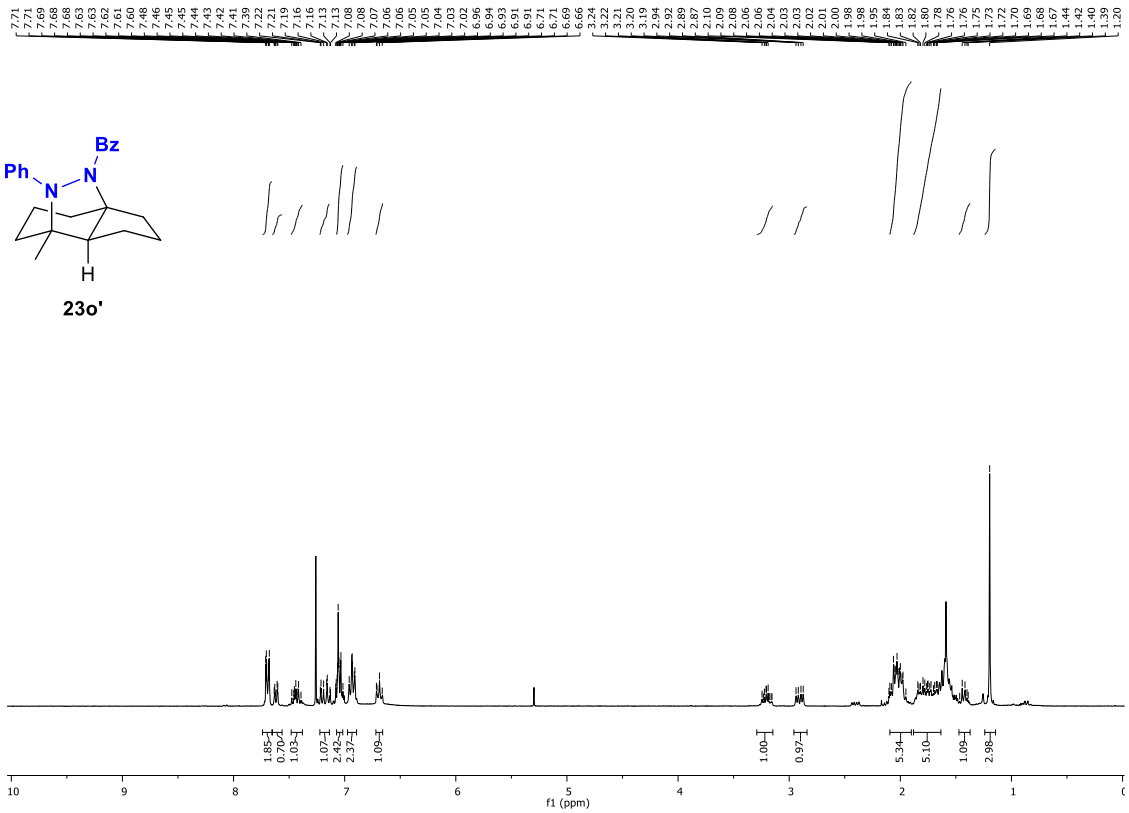


Figure SI-137. ^{1}H-NMR spectra of compound **23o'**.

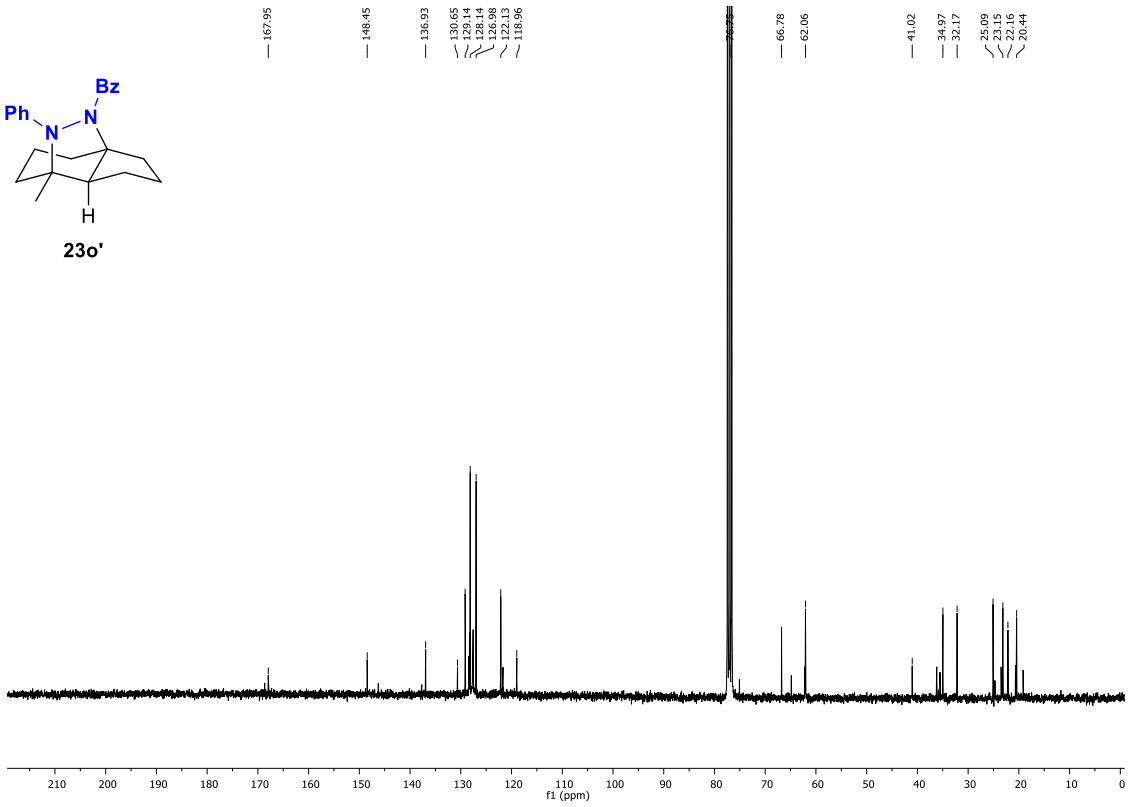


Figure SI-138. ^{13}C-NMR spectra of compound **23o'**.

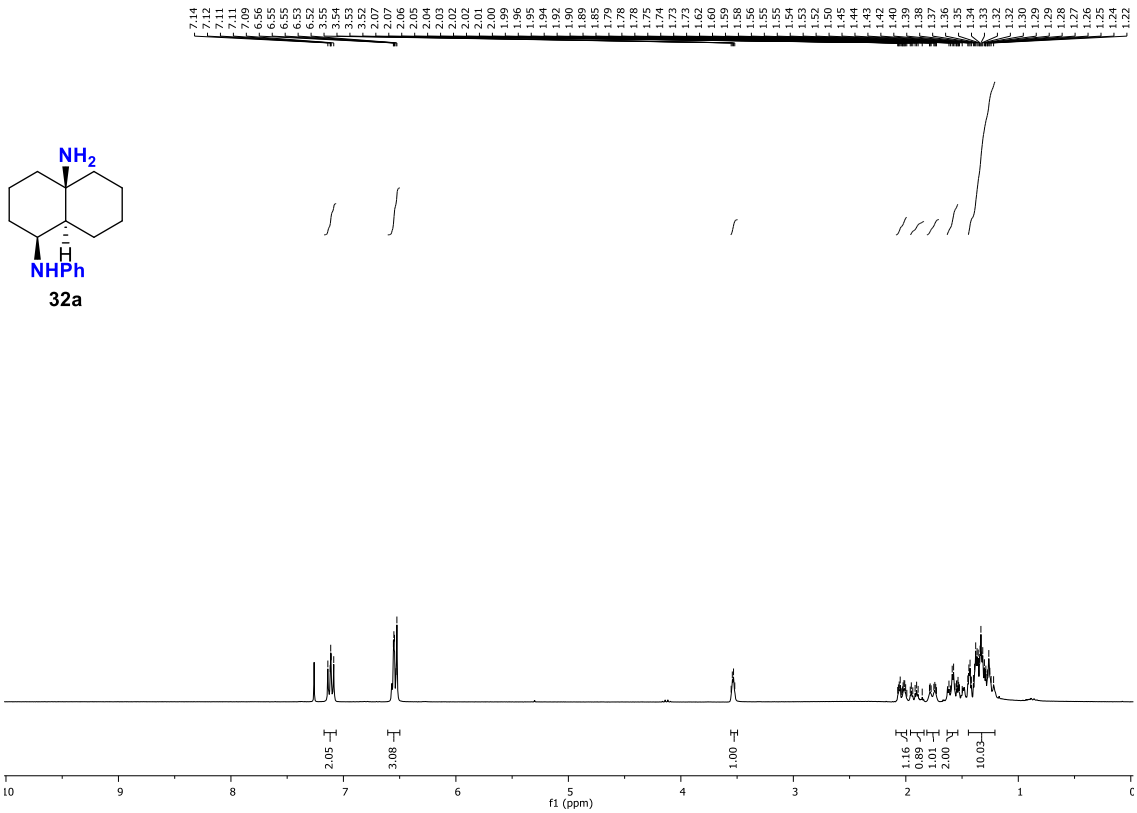


Figure SI-139. ^{1}H-NMR spectra of compound **32a**.

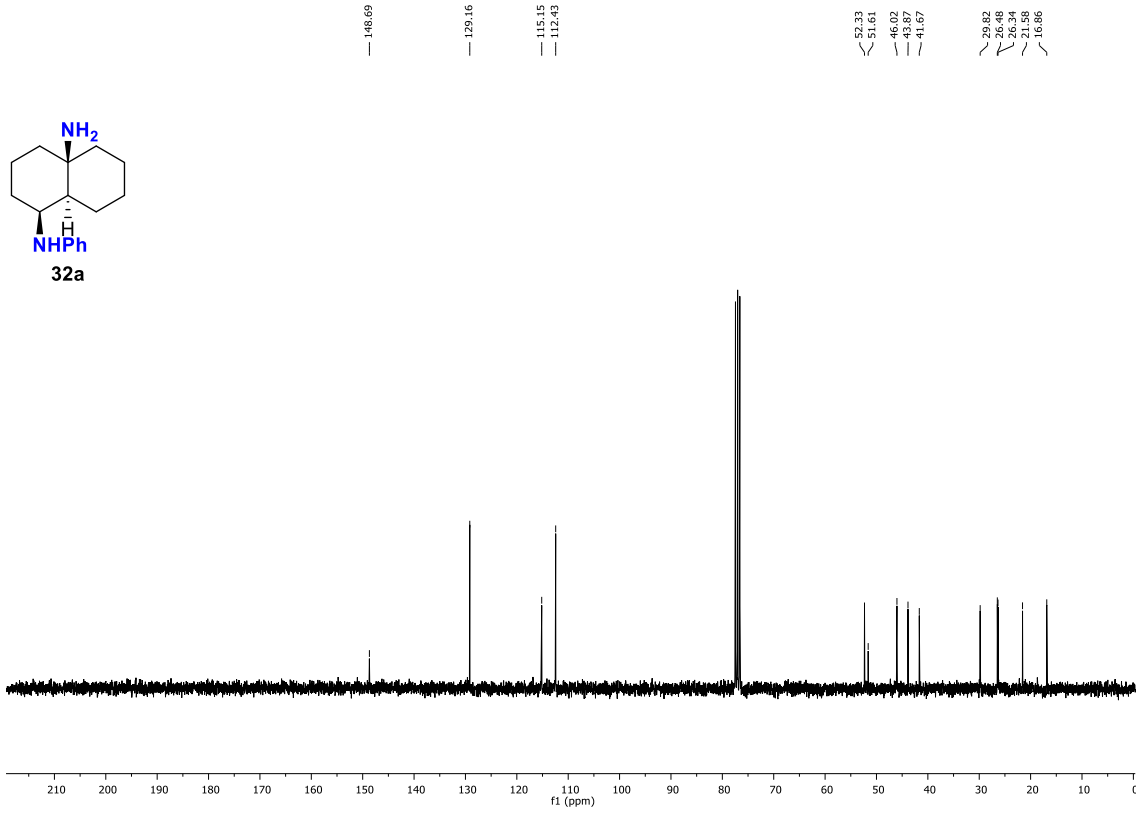


Figure SI-140. ^{13}C-NMR spectra of compound **32a**.

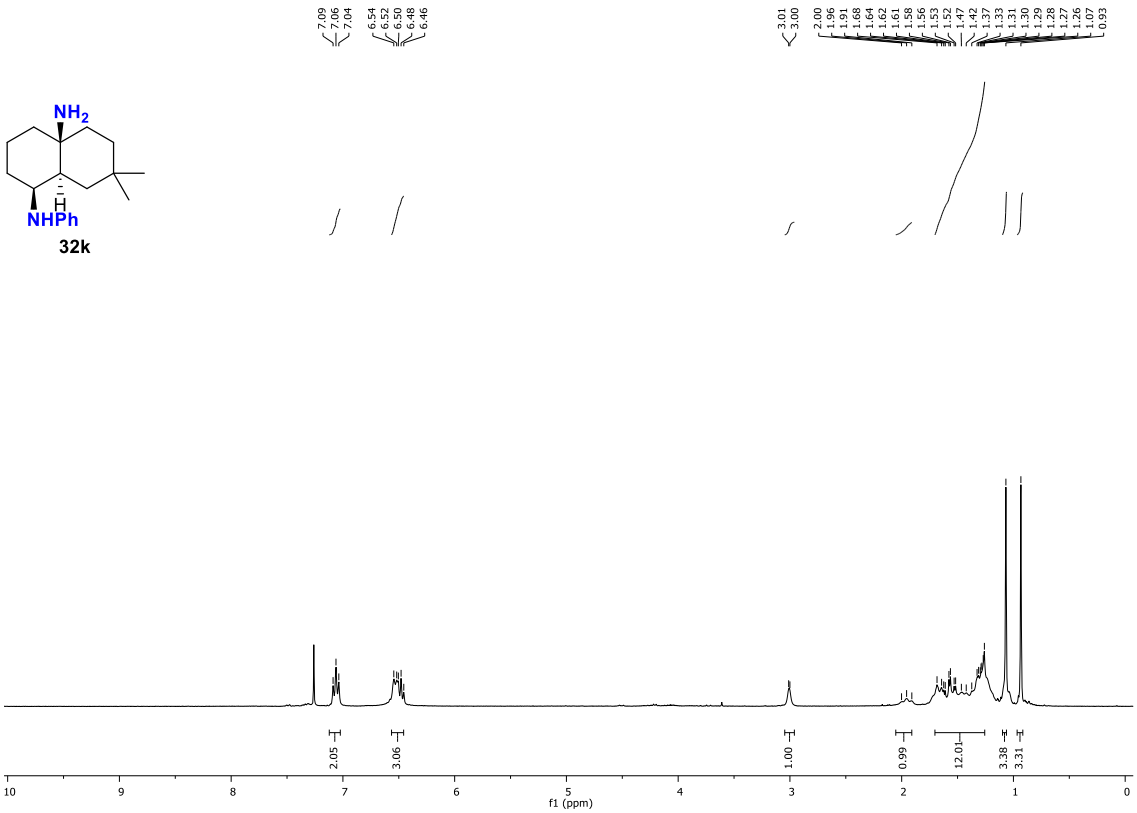


Figure SI-141. ^{1}H-NMR spectra of compound **32k**.

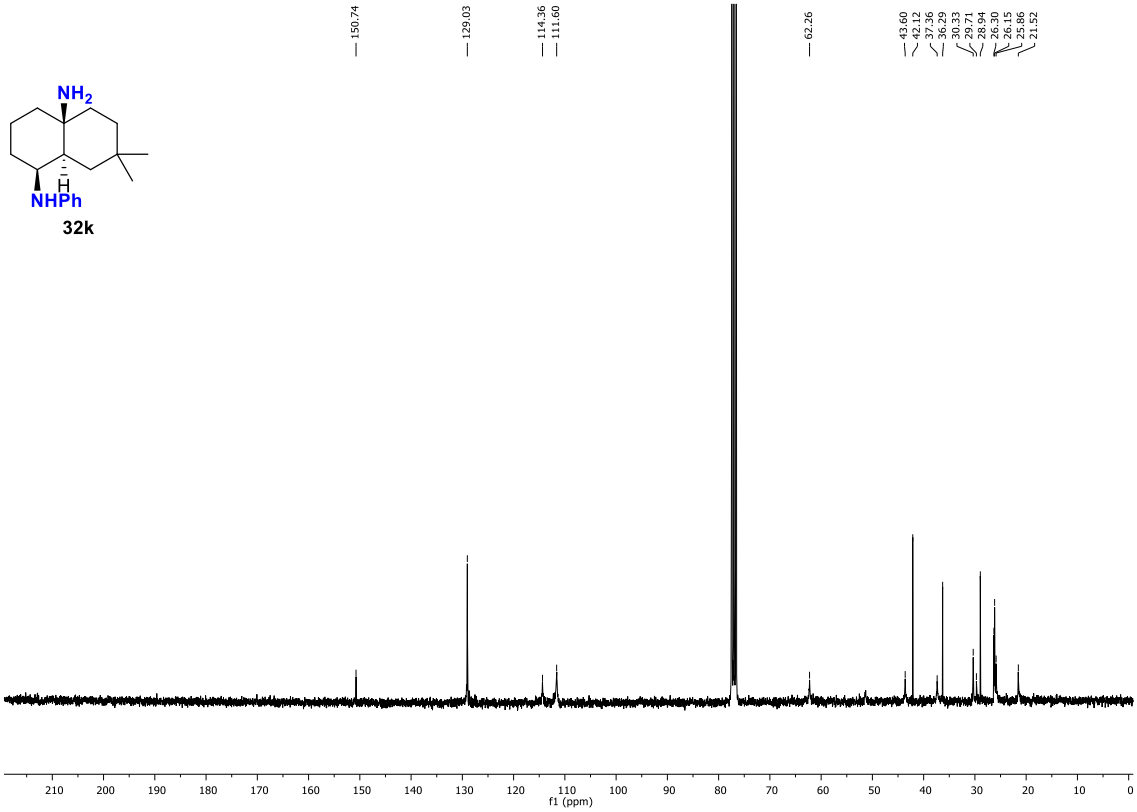


Figure SI-142. ^{13}C-NMR spectra of compound **32k**.

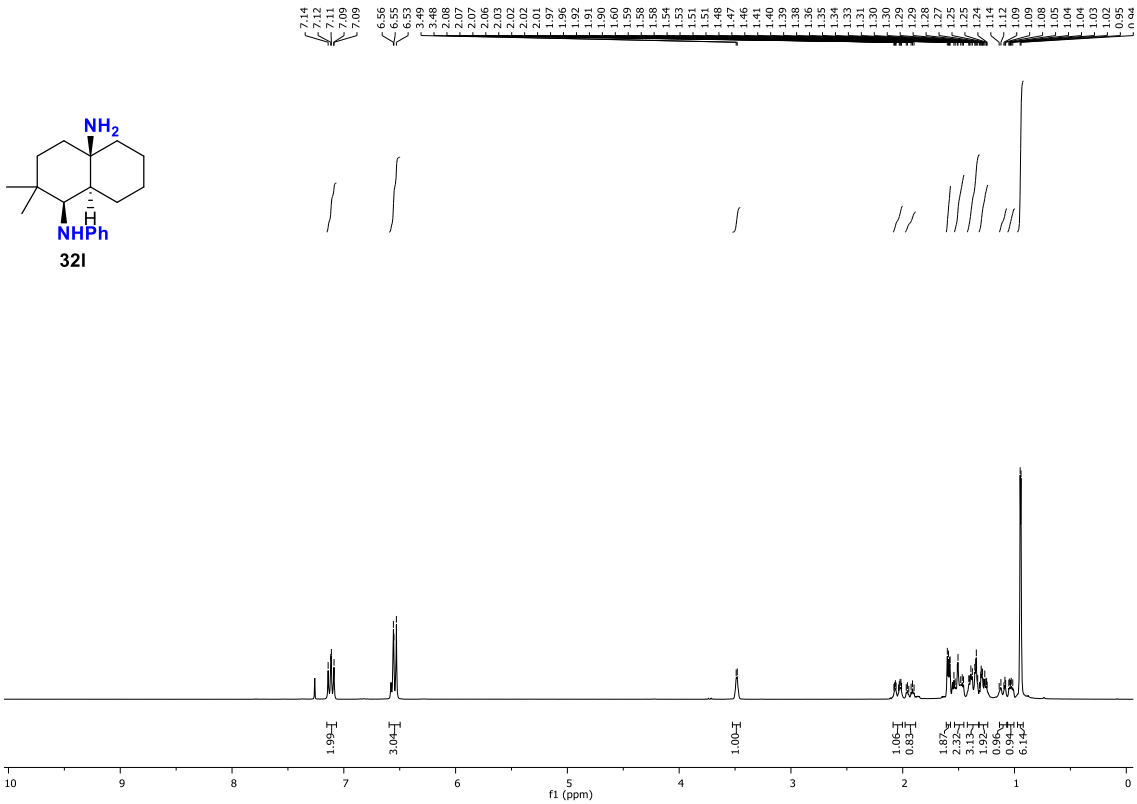


Figure SI-143. ^{1}H-NMR spectra of compound **32l**.

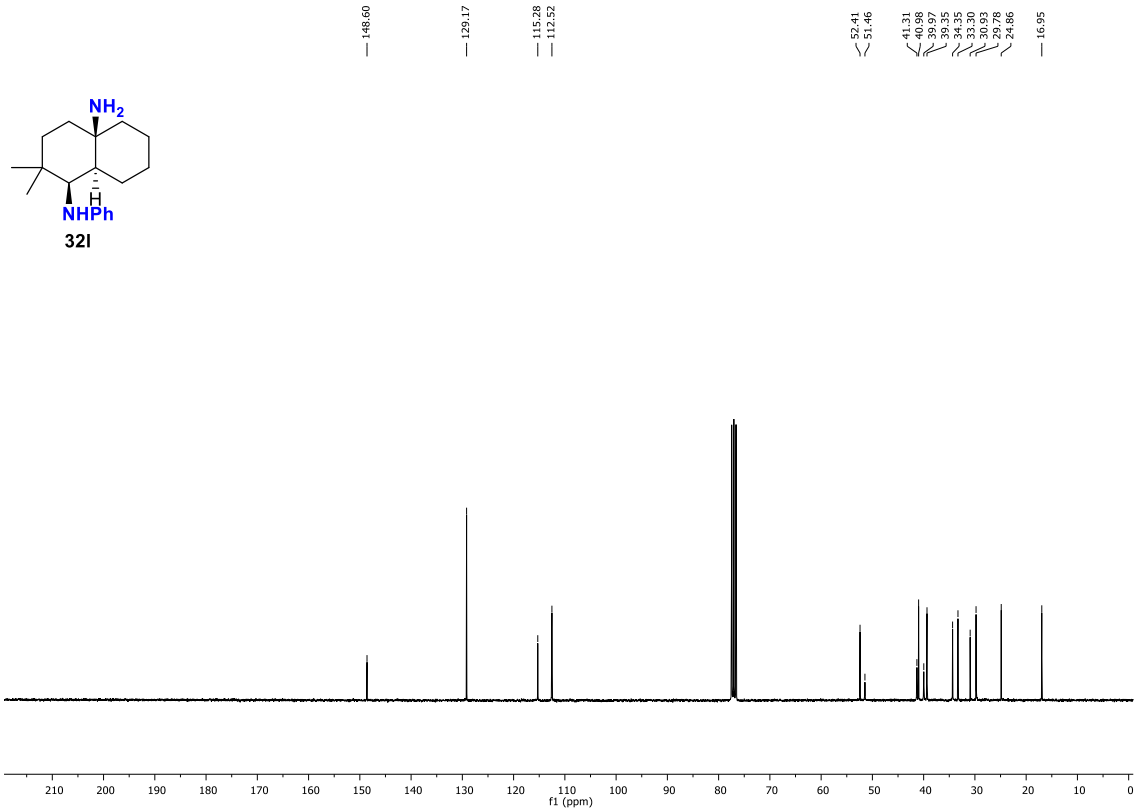


Figure SI-144. ^{13}C-NMR spectra of compound **32l**.

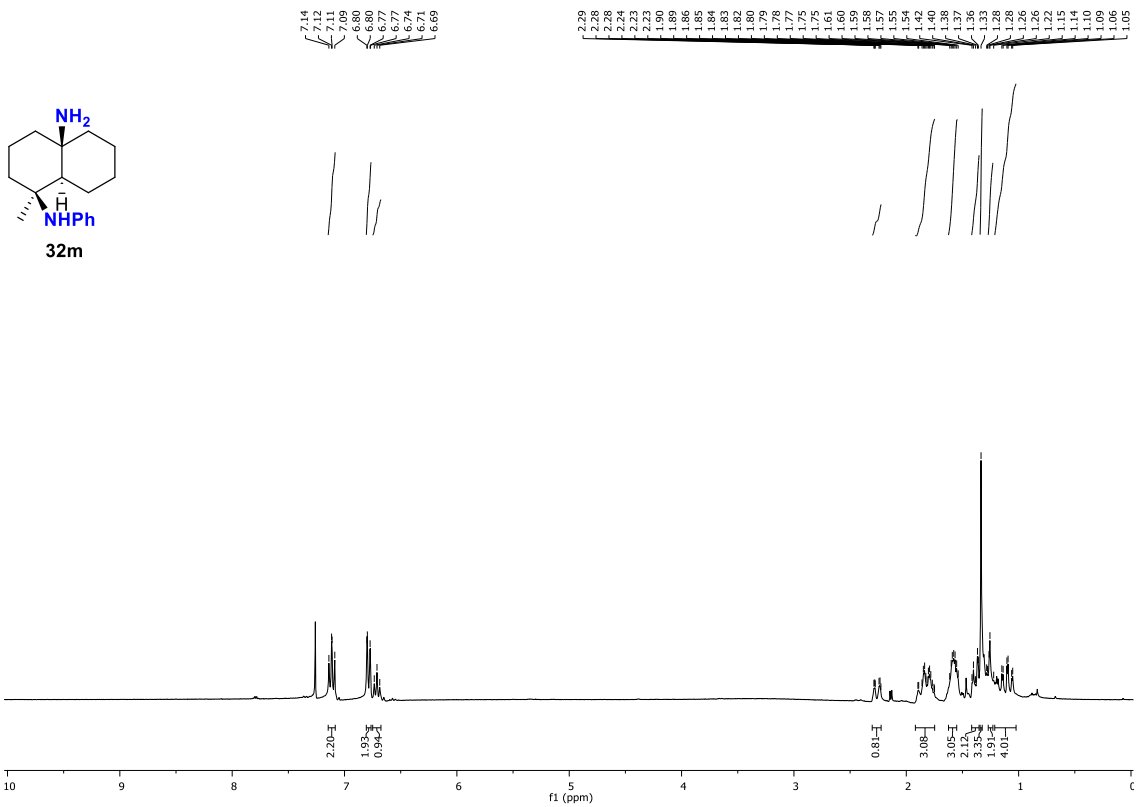


Figure SI-145. ^{1}H-NMR spectra of compound **32m**.

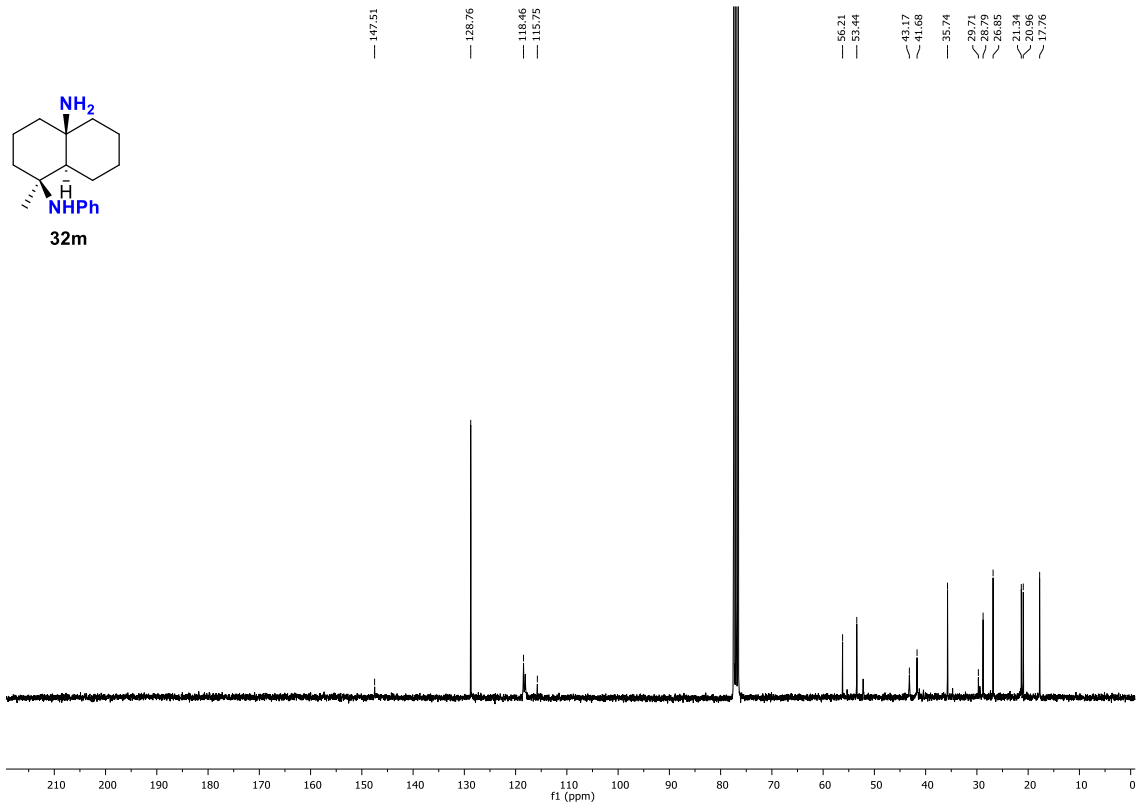


Figure SI-146. ^{13}C-NMR spectra of compound **32m**.

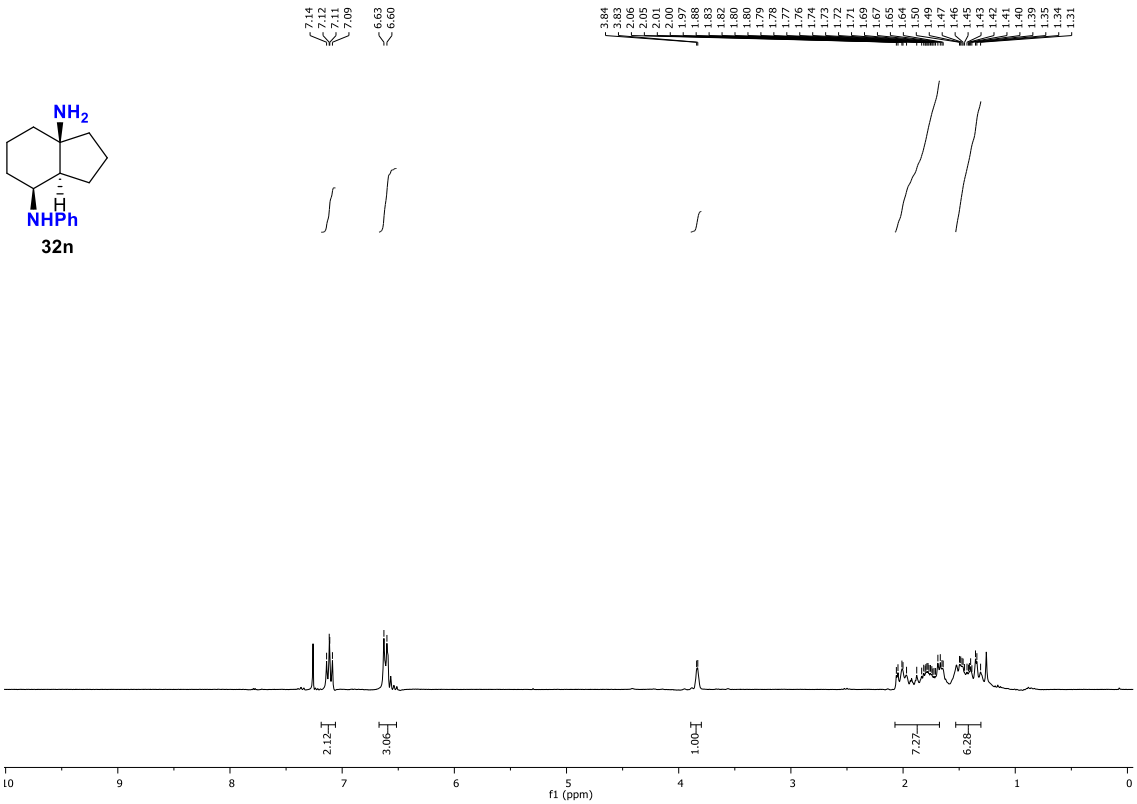


Figure SI-147. ^{1}H-NMR spectra of compound **32n**.

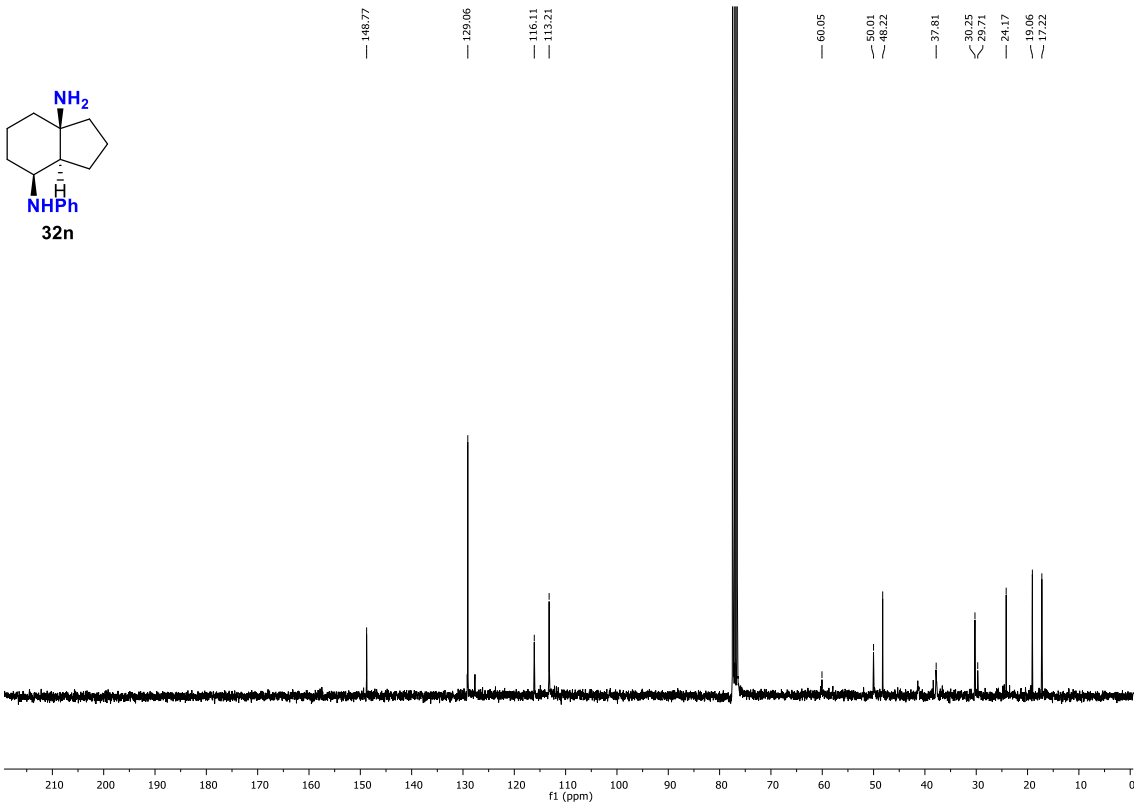


Figure SI-148. ^{13}C-NMR spectra of compound **32n**.

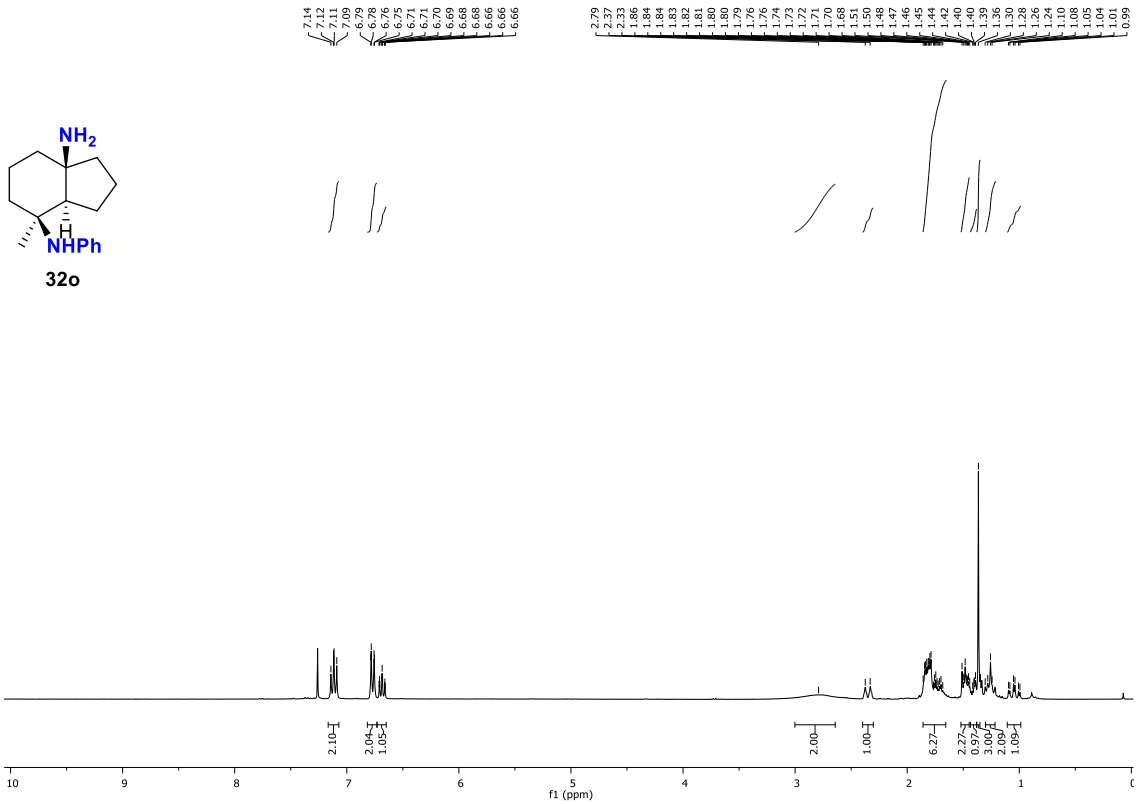


Figure SI-149. ^{1}H-NMR spectra of compound **32o**.

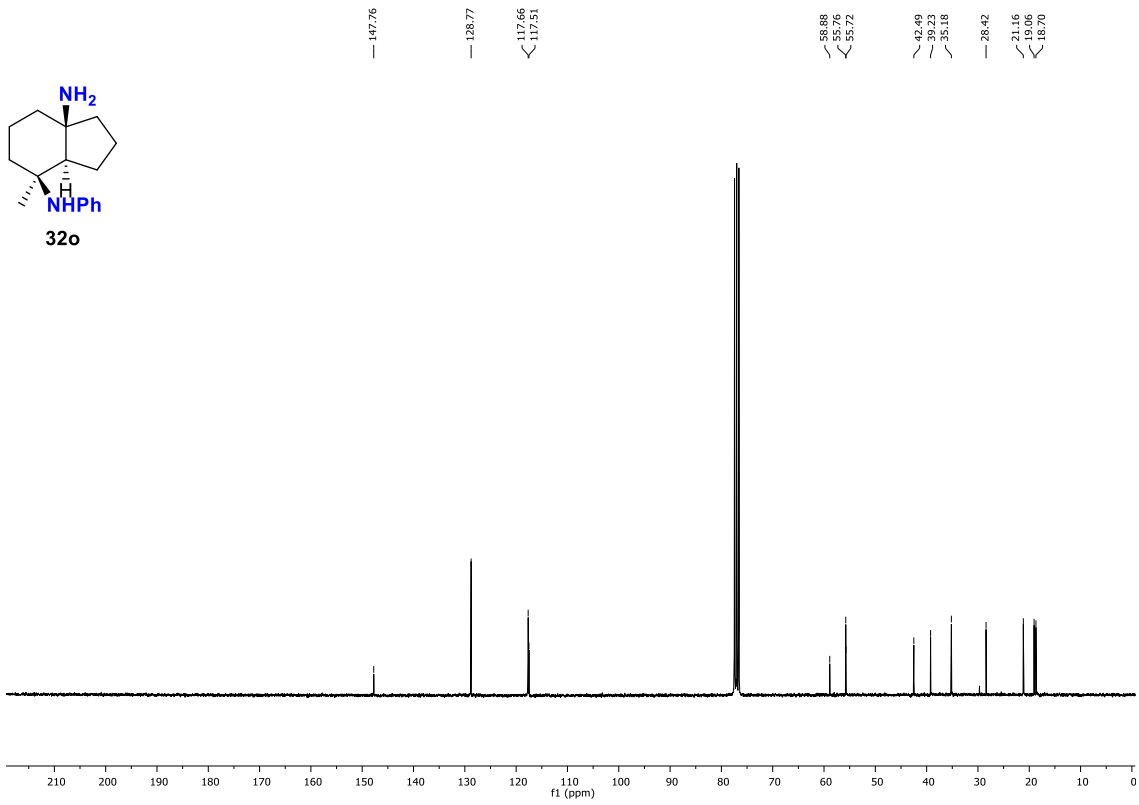


Figure SI-150. ^{13}C-NMR spectra of compound **32o**.

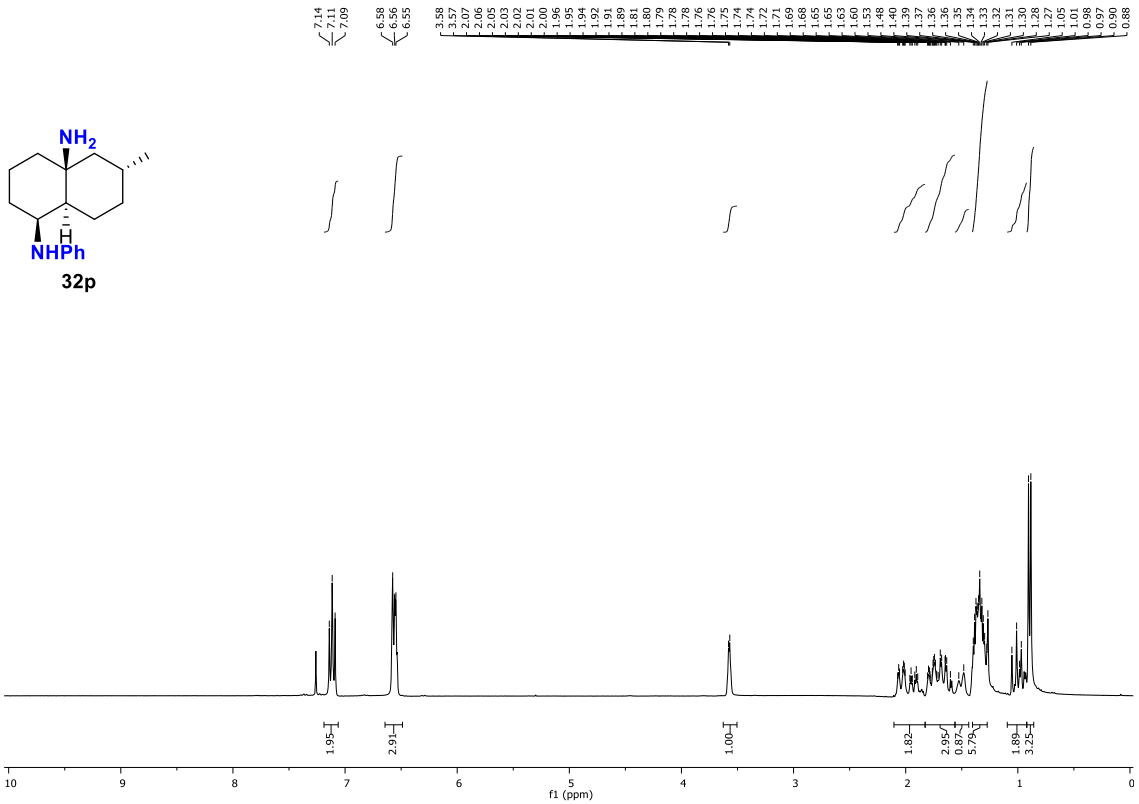


Figure SI-151. ^{1}H-NMR spectra of compound **32p**.

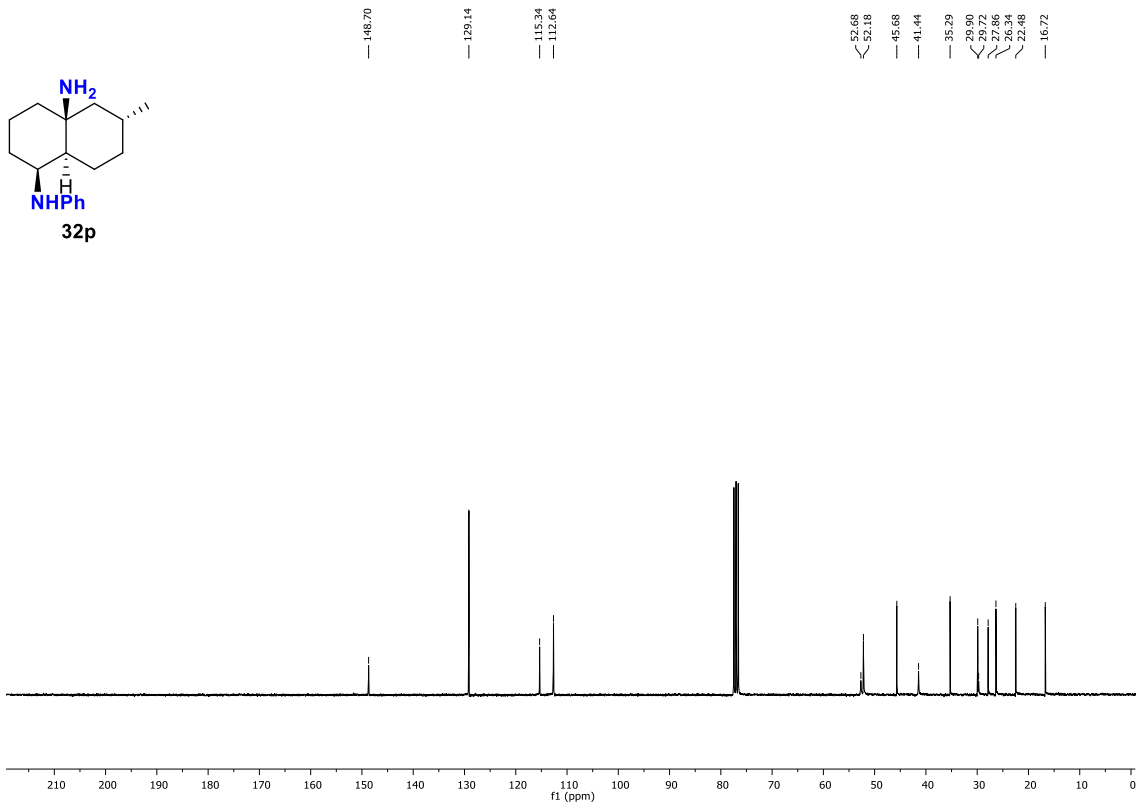
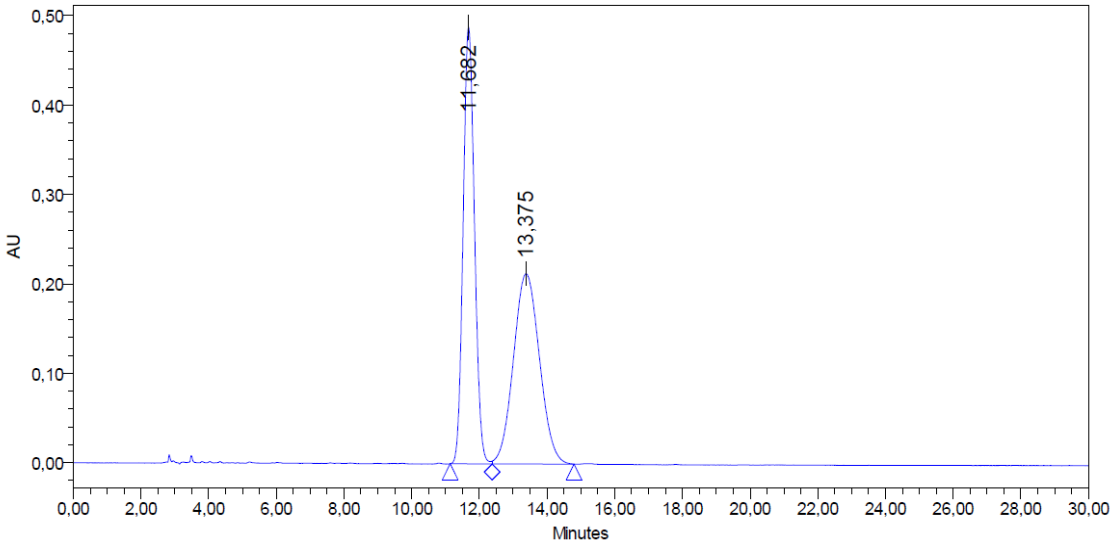
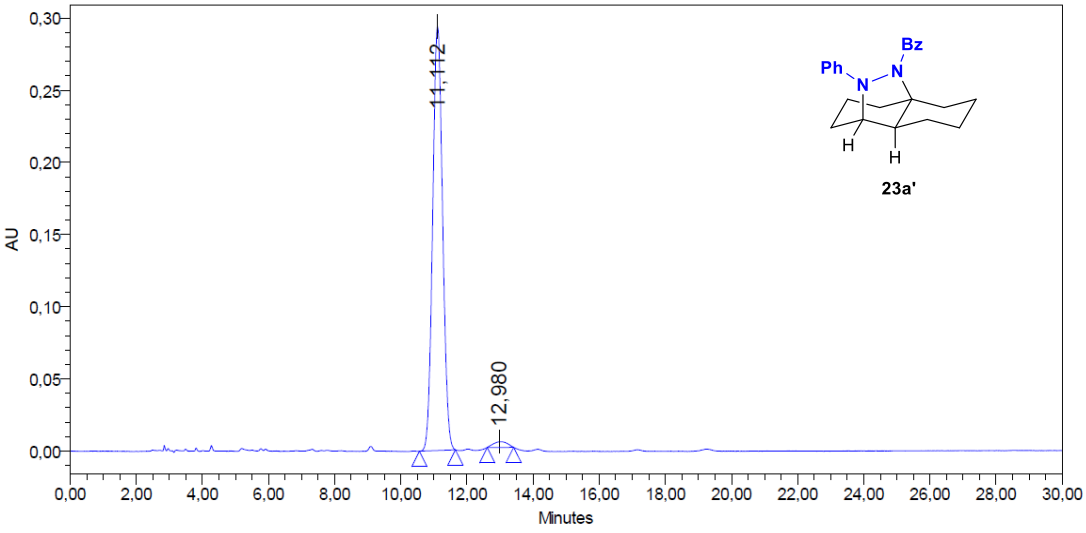


Figure SI-152. ^{13}C-NMR spectra of compound **32p**.

2.2. HPLC traces





Peak Results

	RT	Area	Height	% Area
1	11,112	6118788	293941	98,12
2	12,980	117240	3961	1,88

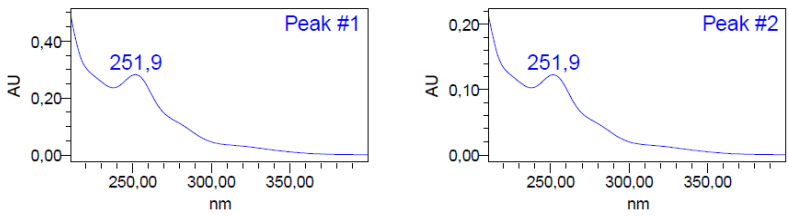
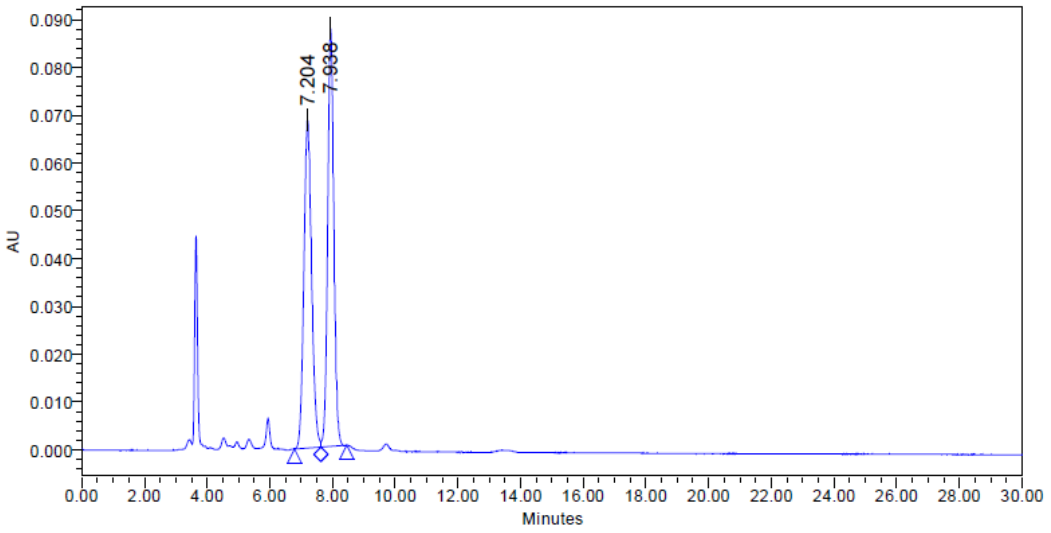
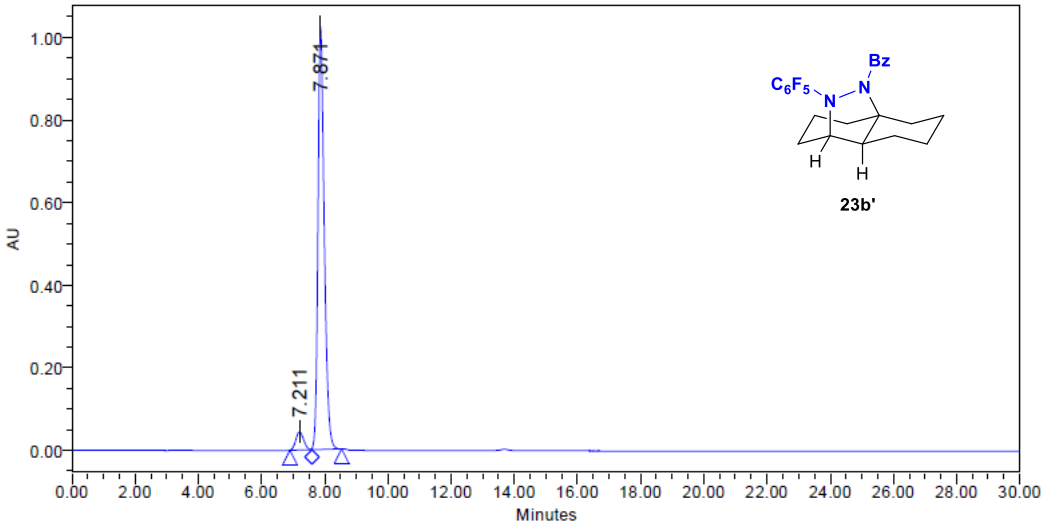


Figure SI-153. HPLC traces for racemic and compound **23a'**.





23b'

Peak Results

	RT	Area	Height	% Area
1	7.211	748560	43660	5.05
2	7.871	14067878	1023347	94.95

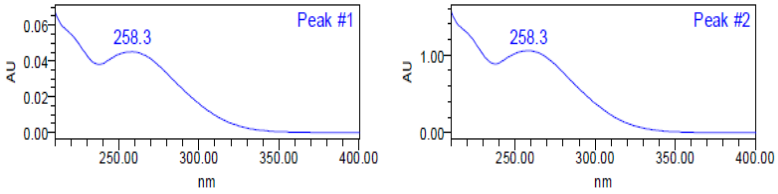
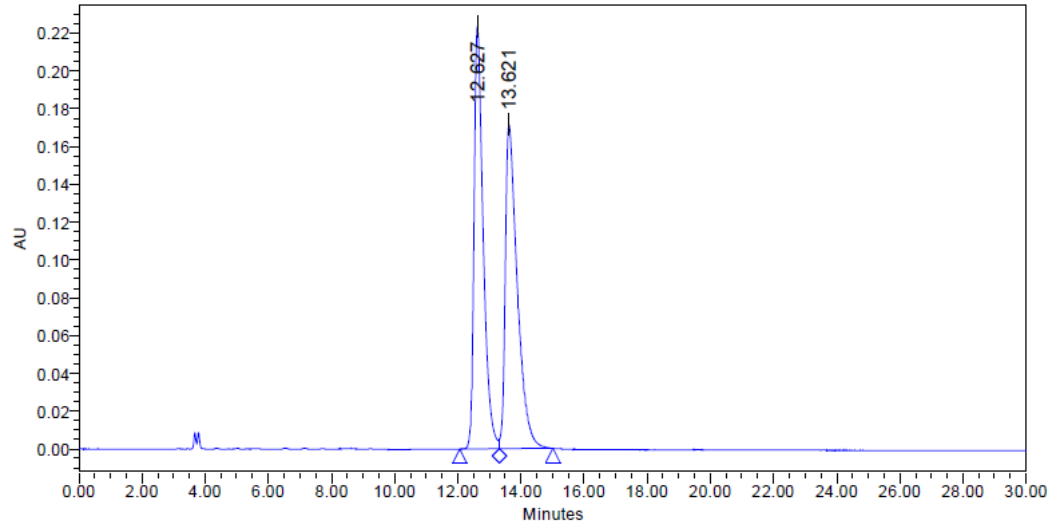
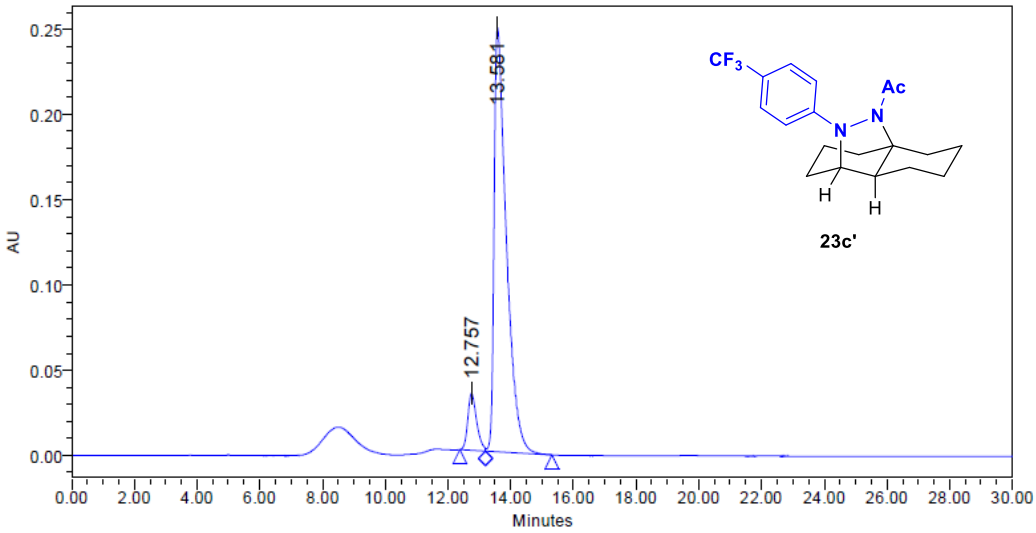


Figure SI-154. HPLC traces for racemic and compound **23b'**.

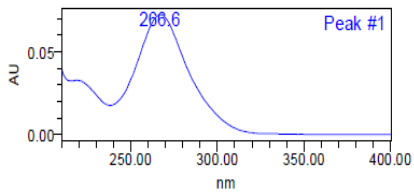




23c'

Peak Results

	RT	Area	Height	% Area
1	12.757	649885	33297	8.83
2	13.581	6708819	248571	91.17



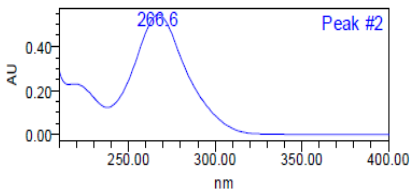
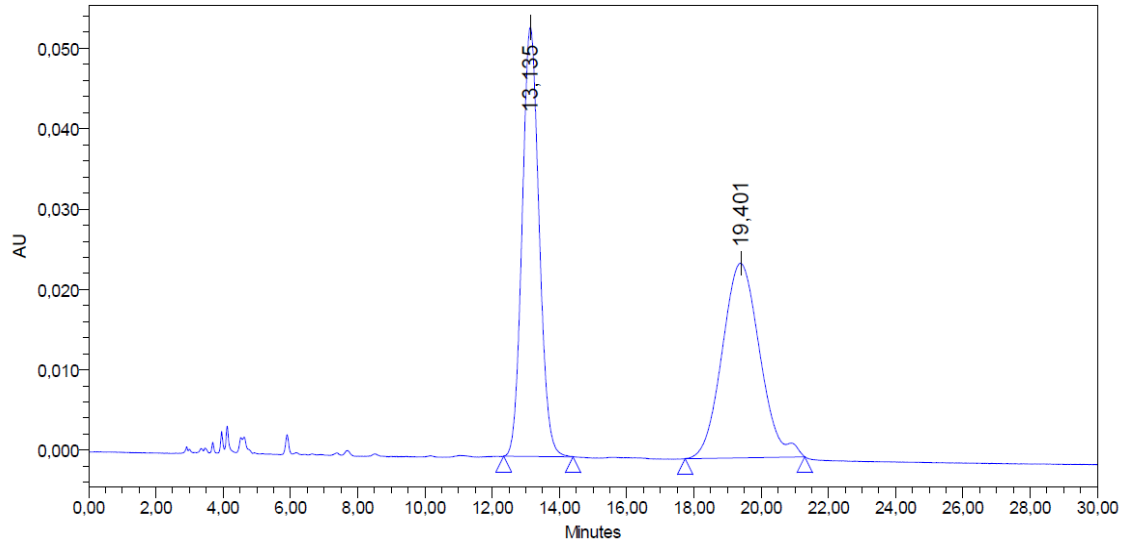
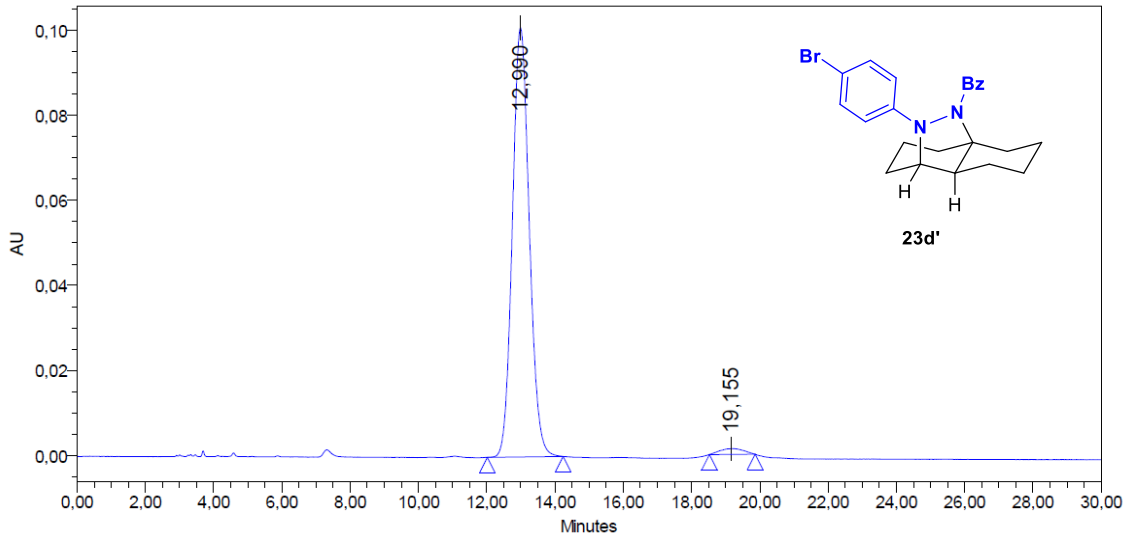


Figure SI-155. HPLC traces for racemic and compound **23c'**.





Peak Results

	RT	Area	Height	% Area
1	12,990	3463474	100964	98,14
2	19,155	65812	1374	1,86

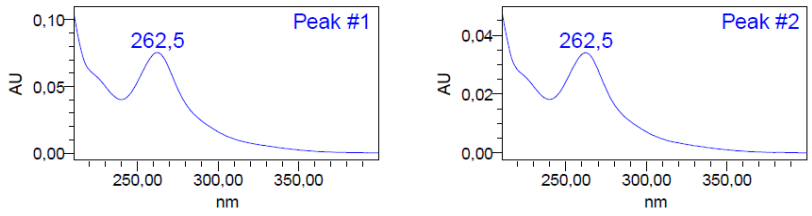
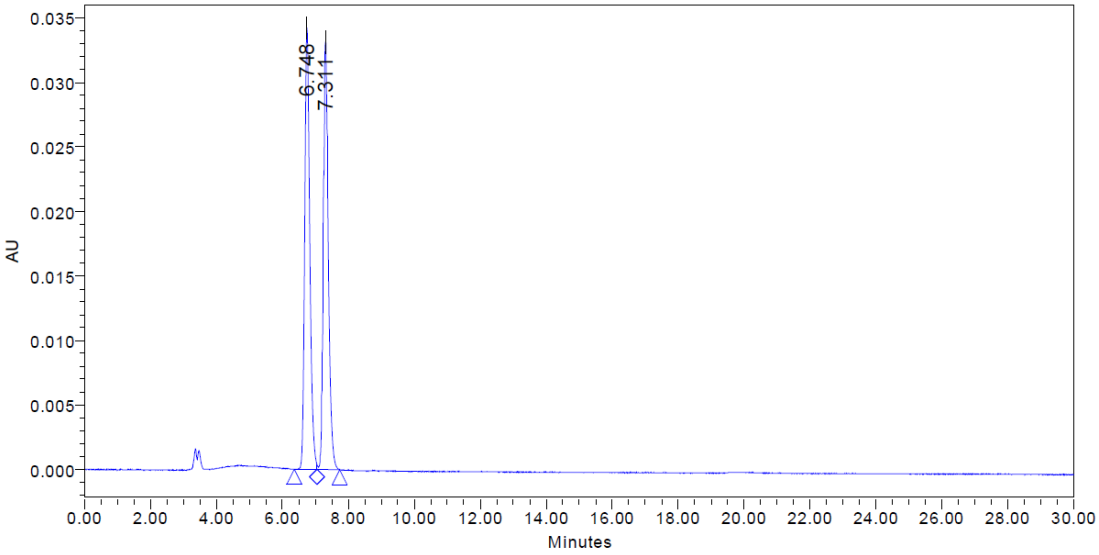
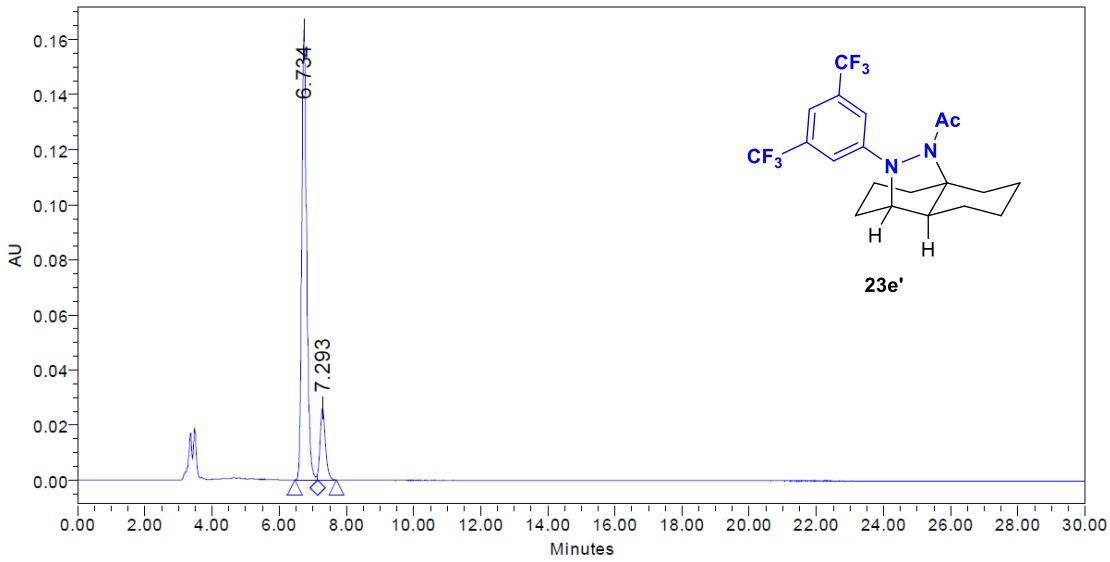


Figure SI-156. HPLC traces for racemic and compound **23d'**.





Peak Results

	RT	Area	Height	% Area
1	6.734	1722655	163423	85.95
2	7.293	281670	26139	14.05

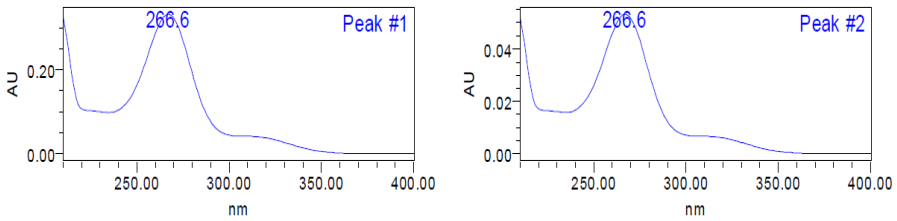
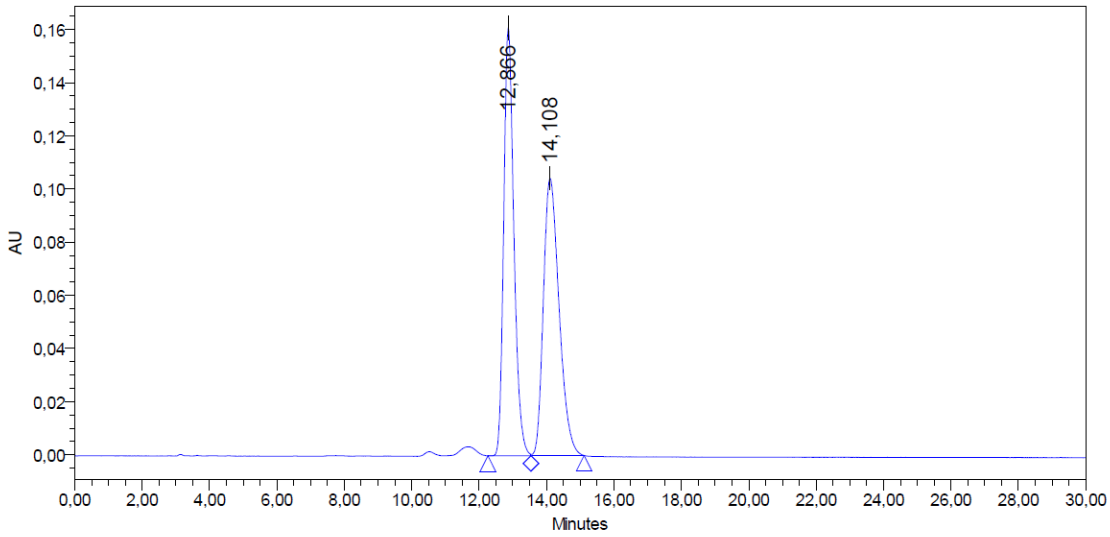
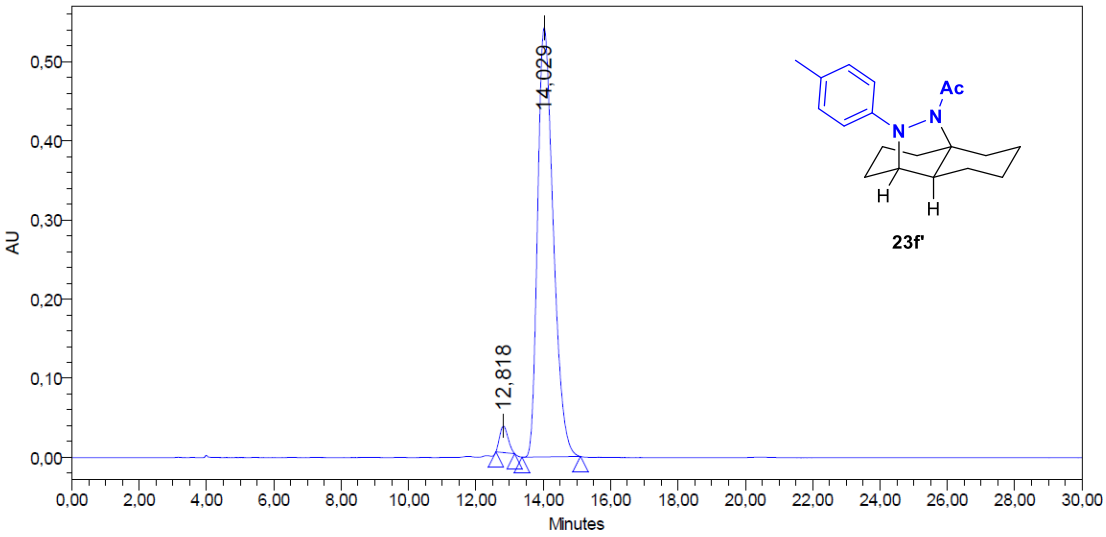


Figure SI-157. HPLC traces for racemic and compound **23e'**.





23f'

Peak Results

	RT	Area	Height	% Area
1	12,818	570287	33353	3,15
2	14,029	17519011	542380	96,85

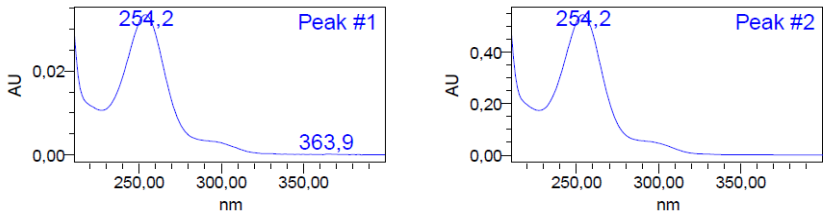
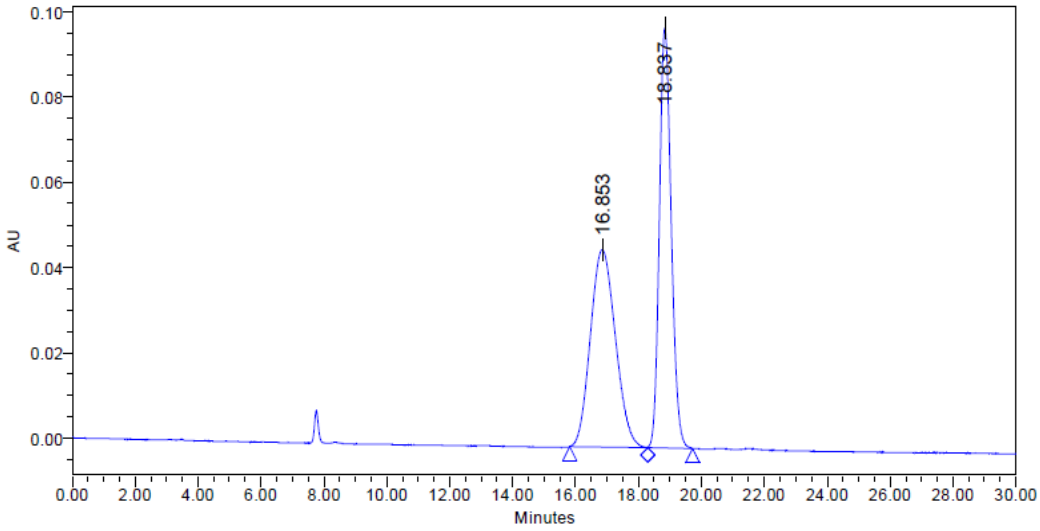
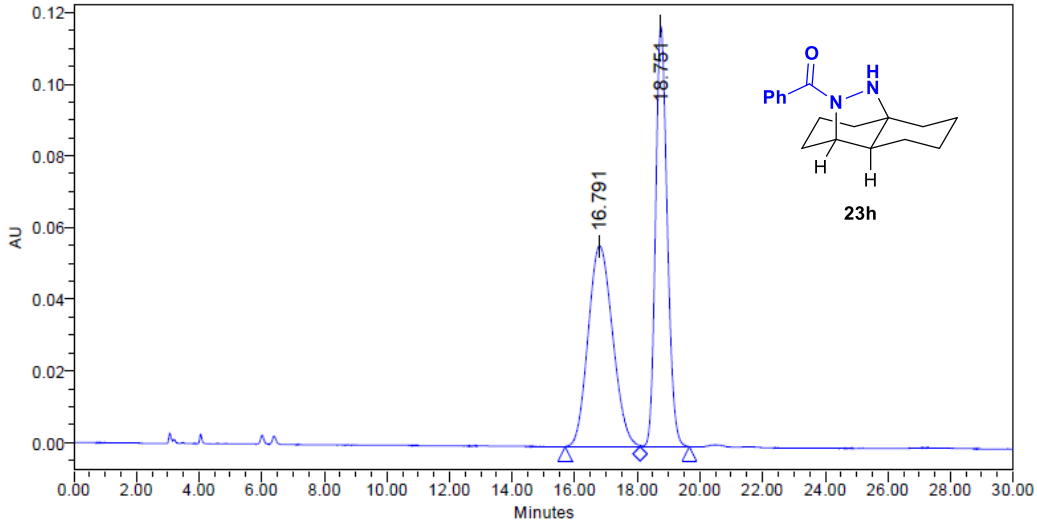


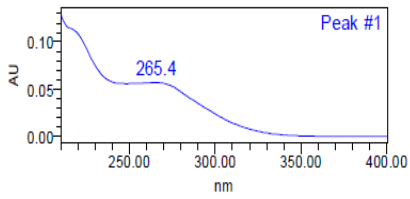
Figure SI-158. HPLC traces for racemic and compound **23f'**.





Peak Results

	RT	Area	Height	% Area
1	16.791	3022452	56020	49.98
2	18.751	3024633	117359	50.02



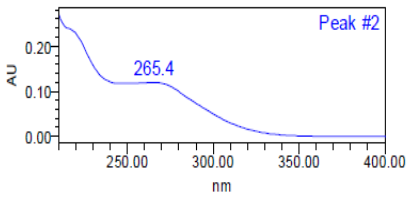
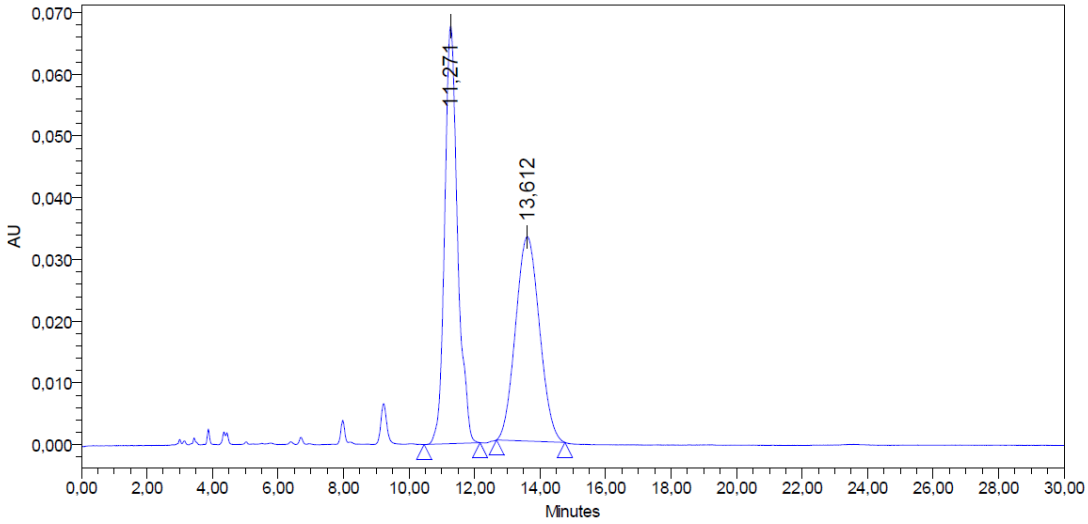
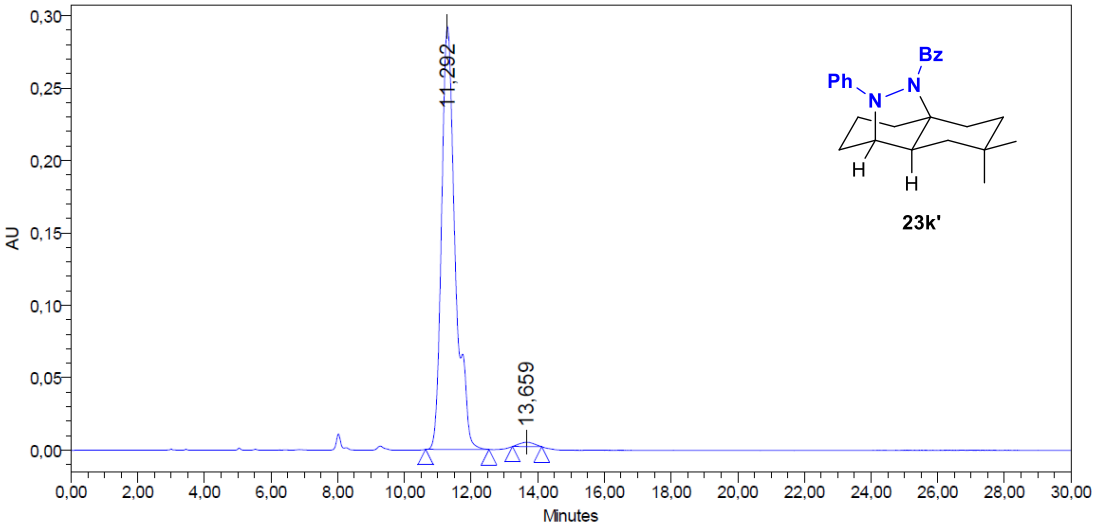


Figure SI-159. HPLC traces for racemic and compound **23h**.





Peak Results

	RT	Area	Height	% Area
1	11,292	8320436	292327	98,87
2	13,659	95486	3086	1,13

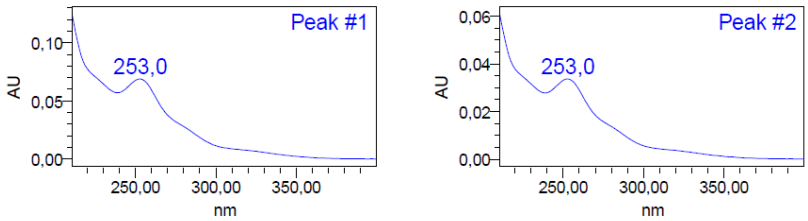
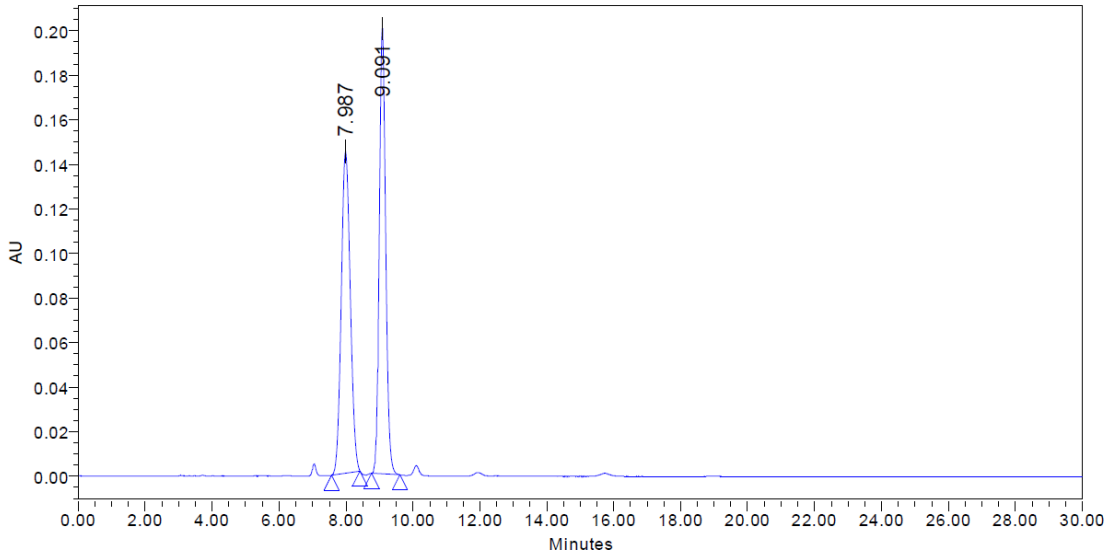
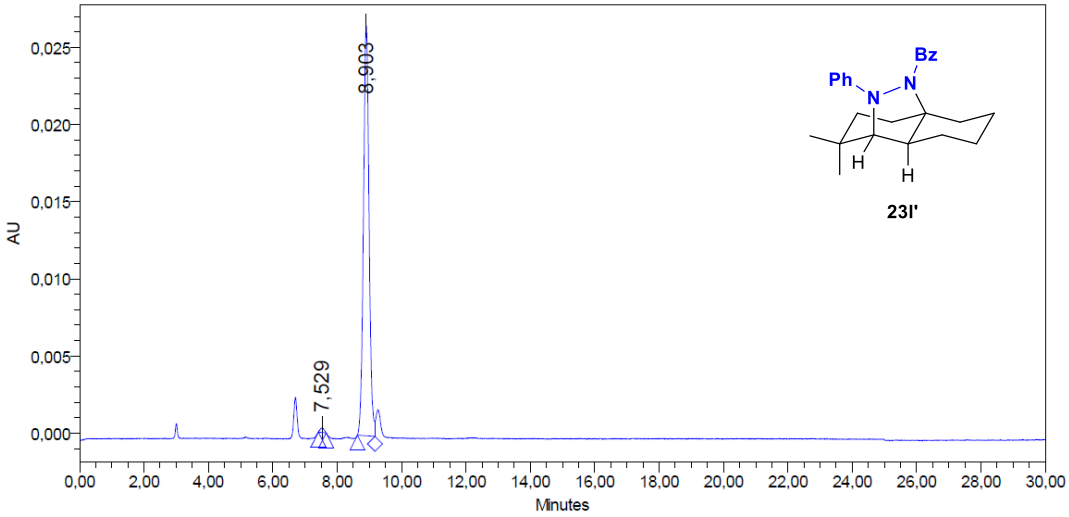


Figure SI-160. HPLC traces for racemic and compound **23k'**.





Peak Results

	RT	Area	Height	% Area
1	7,529	2576	317	0,80
2	8,903	319020	26579	99,20

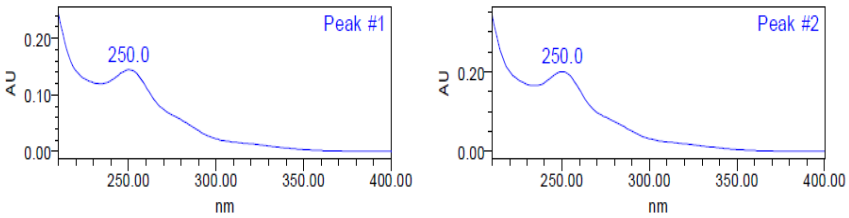
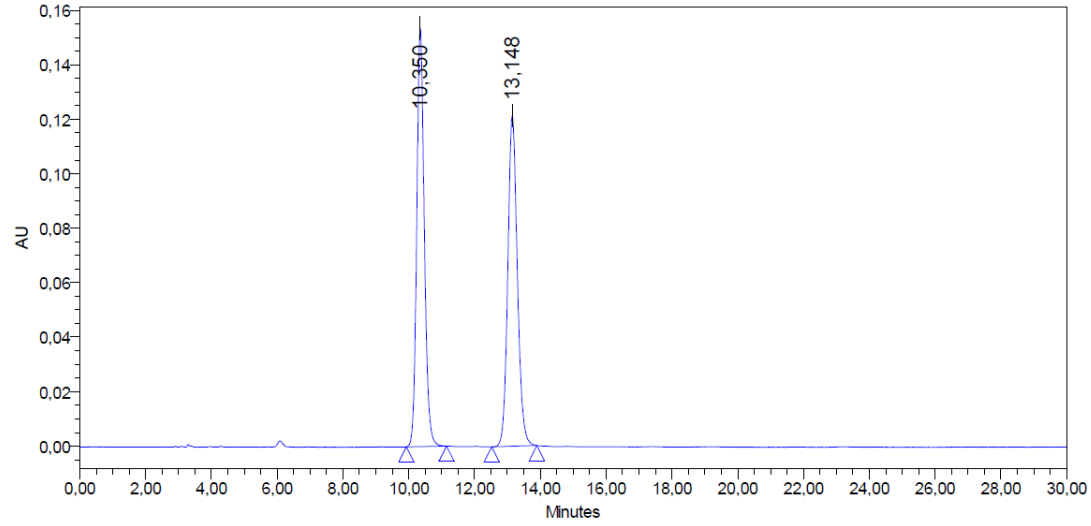
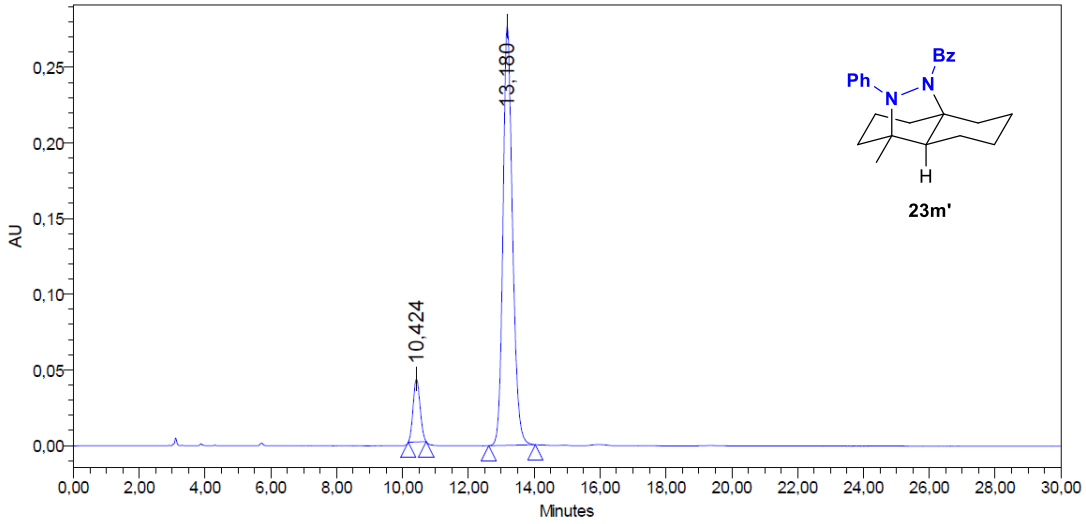


Figure SI-161. HPLC traces for racemic and compound **23l'**.

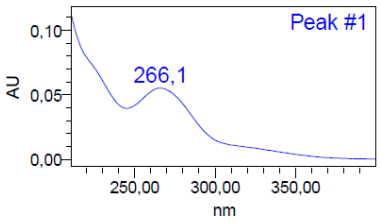




23m'

Peak Results

	RT	Area	Height	% Area
1	10,424	610017	41676	9,86
2	13,180	5577237	277322	90,14



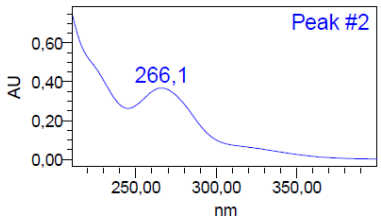
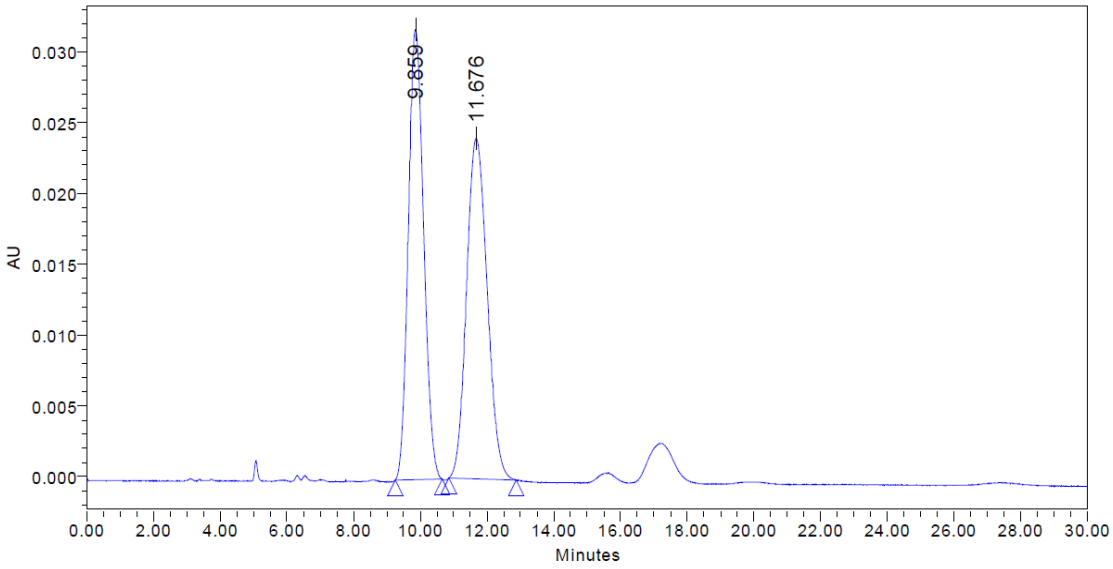
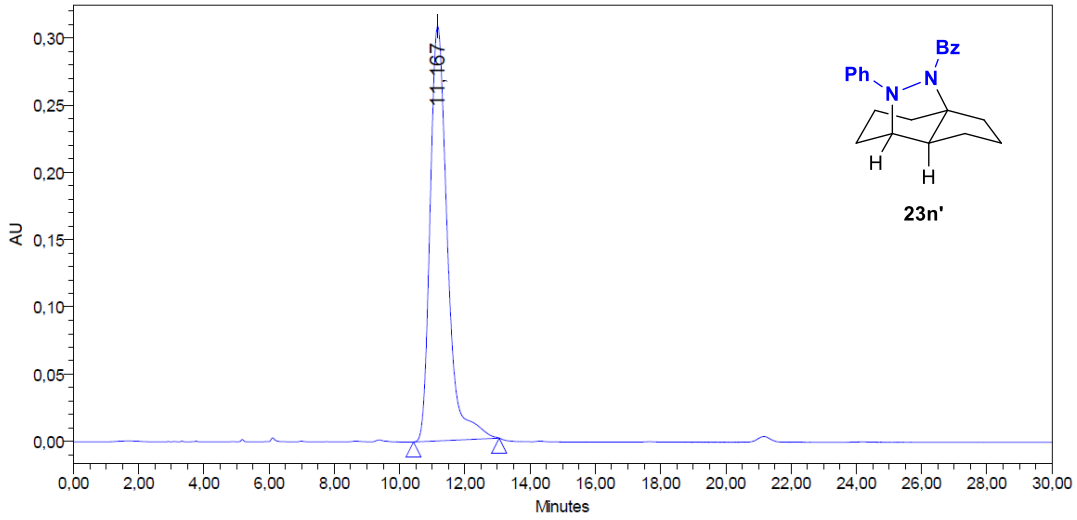


Figure SI-162. HPLC traces for racemic and compound **23m'**.





Peak Results

	RT	Area	Height	% Area
1	11,167	11318645	308517	100,00

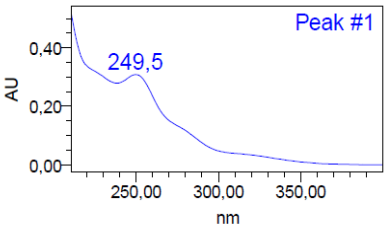
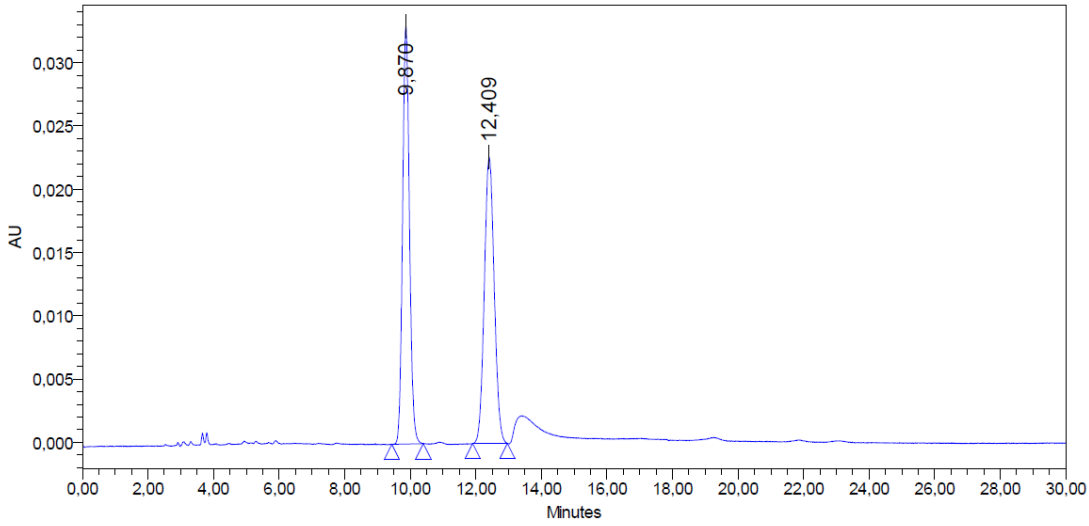
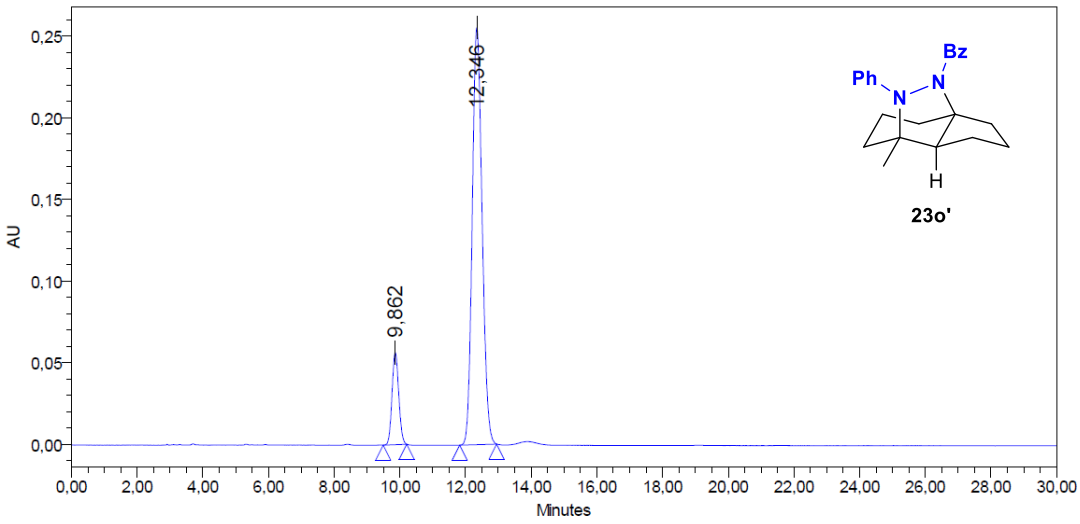


Figure SI-163. HPLC traces for racemic and compound **23n'**.





Peak Results

	RT	Area	Height	% Area
1	9,862	797434	56429	13,03
2	12,346	5321302	255278	86,97

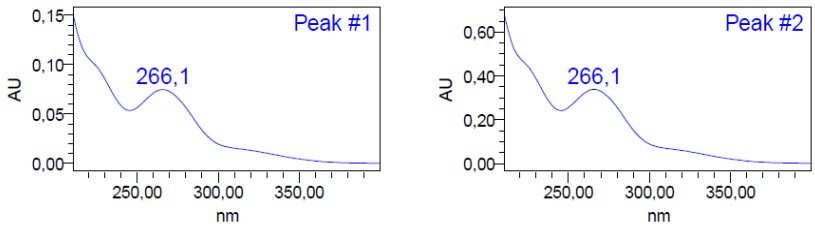
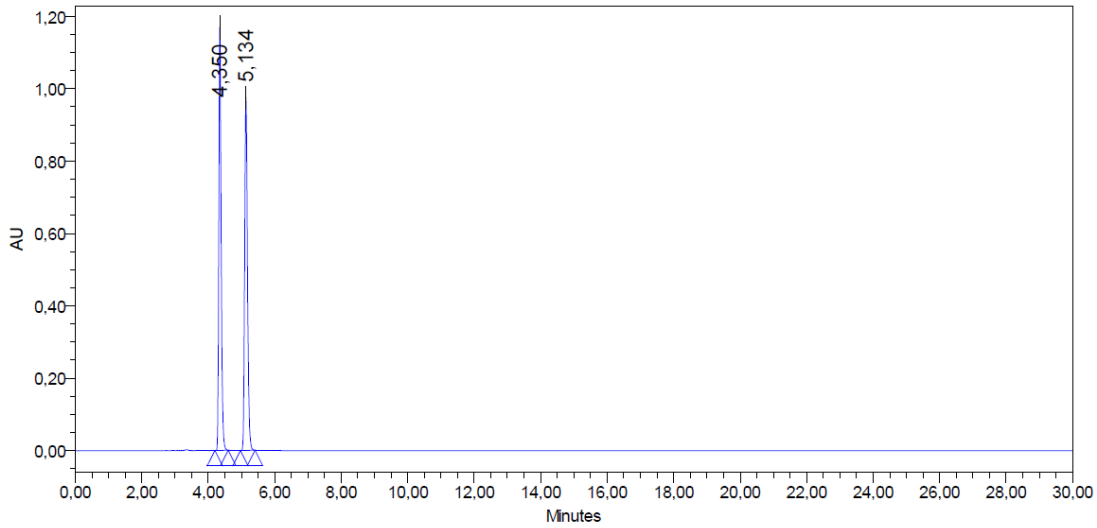
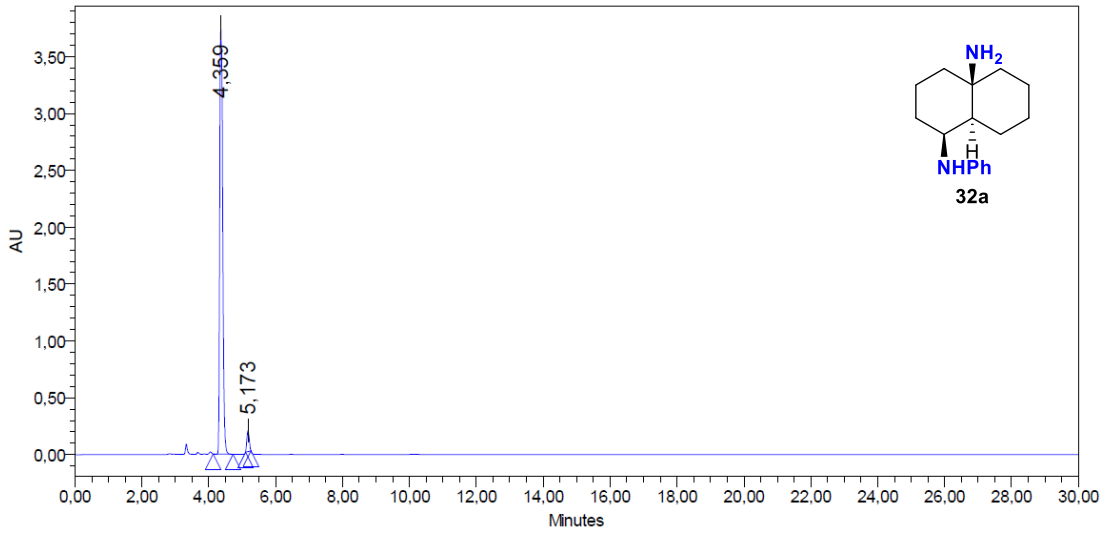


Figure SI-164. HPLC traces for racemic and compound **23o'**.





Peak Results

	RT	Area	Height	% Area
1	4,359	23521853	3748377	96,24
2	5,173	918361	185240	3,76

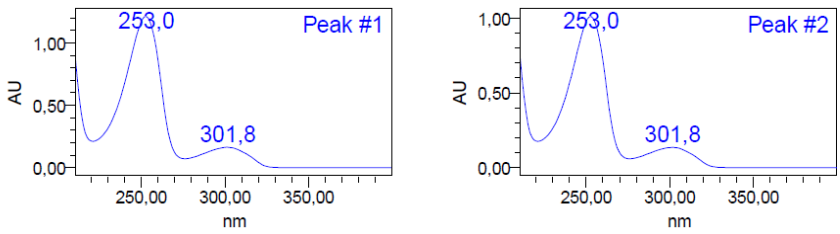
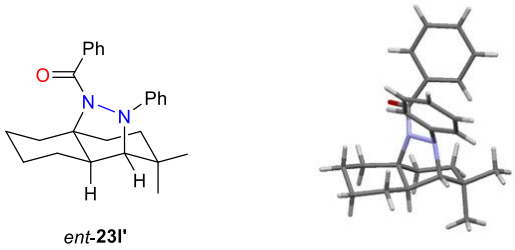


Figure SI-165. HPLC traces for racemic and compound **32a**.

2.3. X-ray details

Summary of Data CCDC 2091628

Crystal Data for *ent*-**23l'** $C_{25}H_{30}N_2O$ (M =374.51 g/mol): orthorhombic, space group $P2_12_12_1$ (no. 19), a = 10.09480(5) Å, b = 12.79812(6) Å, c = 15.78055(7) Å, V = 2038.760(17) Å^3, Z = 4, T = 150.01(10) K, μ(CuKα) = 0.572 mm^{-1}, *Dcalc* = 1.220 g/cm^3, 38523 reflections measured (8.896° ≤ 2Θ ≤ 145.932°), 4064 unique (R_{int} = 0.0309, R_{sigma} = 0.0134) which were used in all calculations. The final R_1 was 0.0285 (I > 2σ(I)) and wR_2 was 0.0744 (all data).



ent-**23l'**

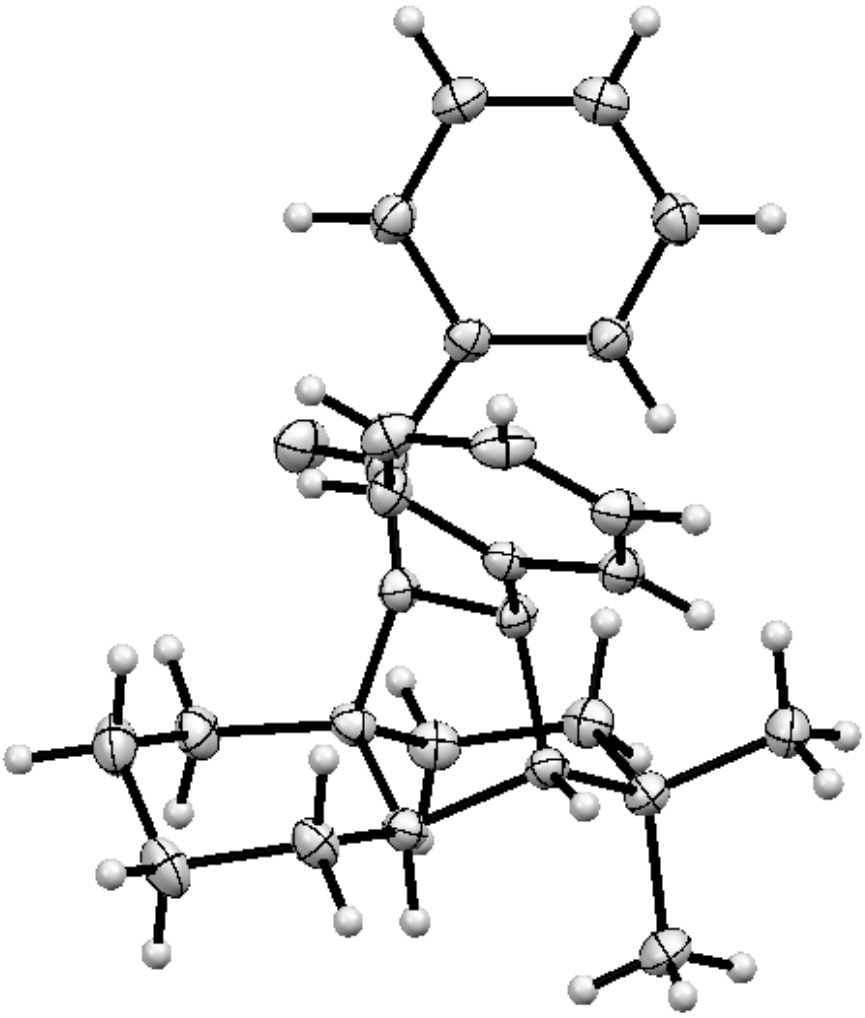


Figure SI-166. X-Ray structure and ORTEP diagram (50% probability) for *ent*-**23l'**.

Table SI-7. Crystal data and structure refinement for *ent*-**23l'**.

Identification code	a20200290_JS250Brem
Empirical formula	$C_{25}H_{30}N_2O$
Formula weight	374.51
Temperature/K	150.01(10)
Crystal system	orthorhombic
Space group	$P2_12_12_1$
a/Å	10.09480(5)
b/Å	12.79812(6)
c/Å	15.78055(7)
α/°	90
β/°	90
γ/°	90
Volume/Å^3	2038.760(17)
Z	4
ρ_{calc}g/cm^3	1.220
μ/mm^{-1}	0.572
F(000)	808.0
Crystal size/mm^3	0.542 × 0.260 × 0.240
Radiation	CuKα (λ = 1.54184)
2Θ range for data collection/°	8.896 to 145.932
Index ranges	-12 ≤ h ≤ 12, -15 ≤ k ≤ 15, -19 ≤ l ≤ 19
Reflections collected	38523
Independent reflections	4064 [R_{int} = 0.0309, R_{sigma} = 0.0134]
Data/restraints/parameters	4064/0/255
Goodness-of-fit on F^2	1.085
Final R indexes [I>=2σ (I)]	R_1 = 0.0285, wR_2 = 0.0741
Final R indexes [all data]	R_1 = 0.0287, wR_2 = 0.0744
Largest diff. peak/hole / e Å^{-3}	0.17/-0.17
Flack parameter	0.00(6)

3. SWITCHABLE BRØNSTED ACID-CATALYZED RING CONTRACTION/ ENANTIOSELECTIVE ALLYLATION

3.1. NMR spectra

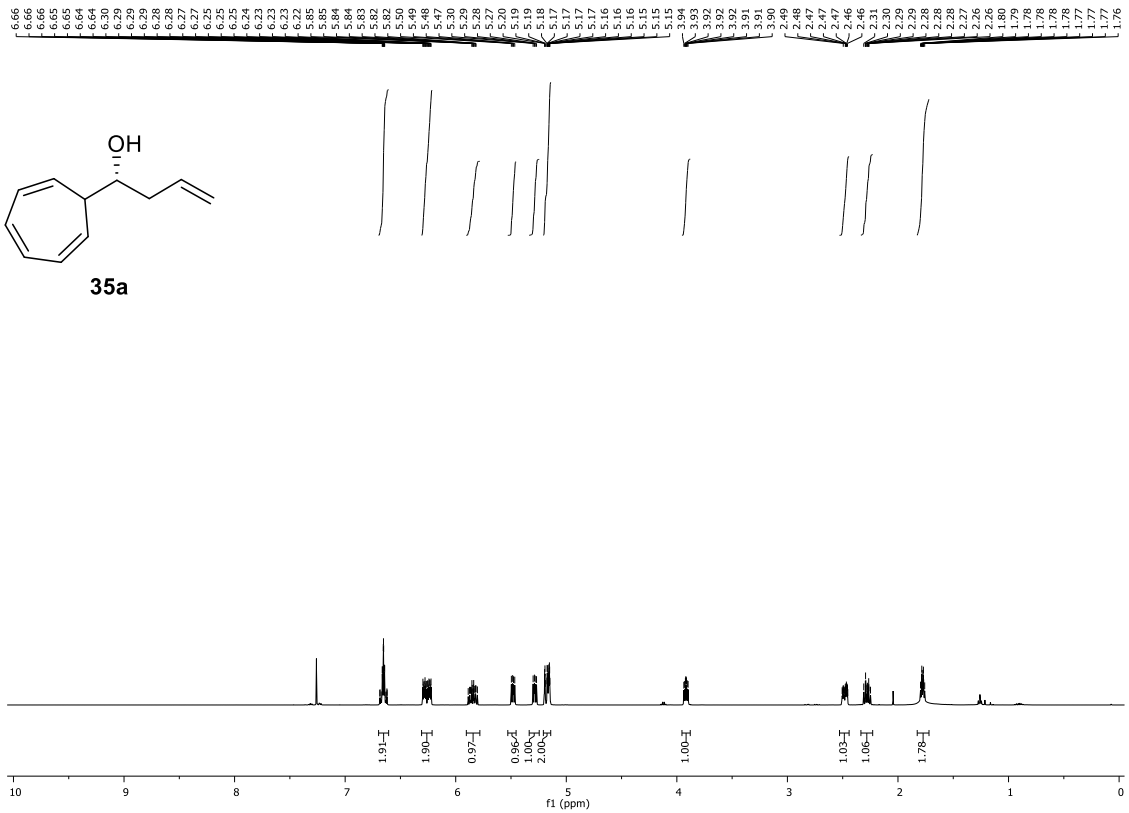


Figure SI-167. ^{1}H-NMR spectra of compound **35a**.

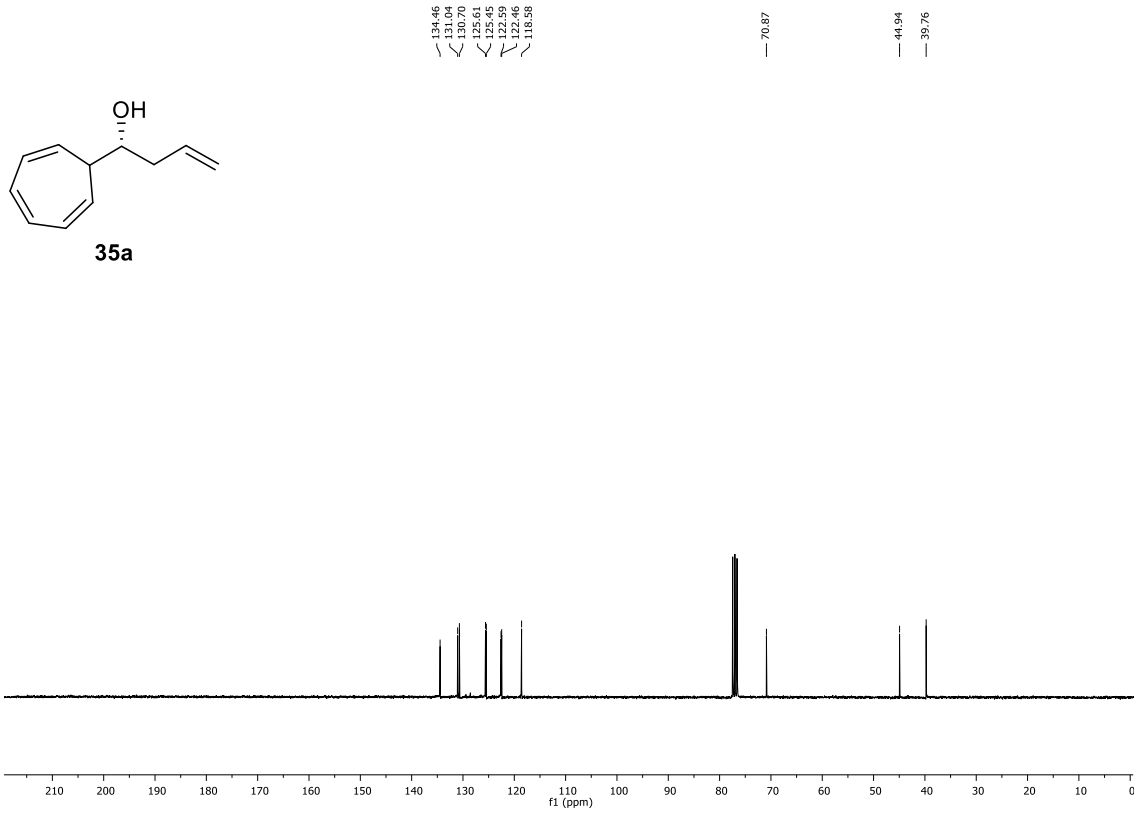


Figure SI-168. ^{13}C-NMR spectra of compound **35a**.

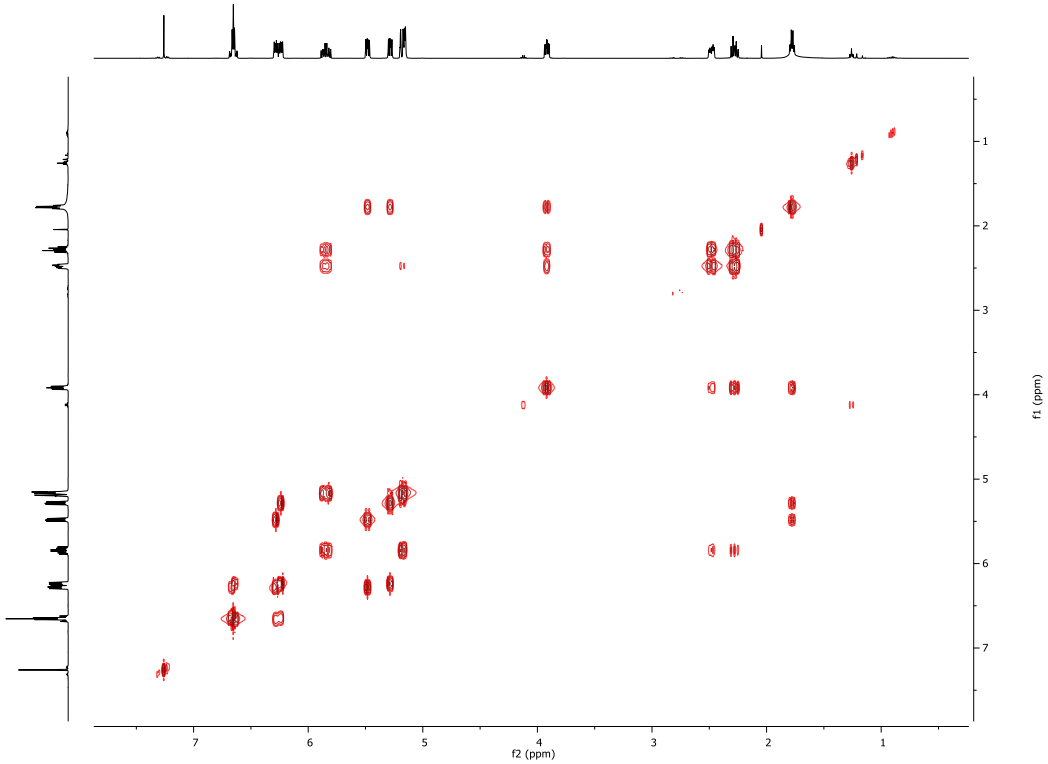


Figure SI-169. COSY-NMR spectra of compound **35a**.

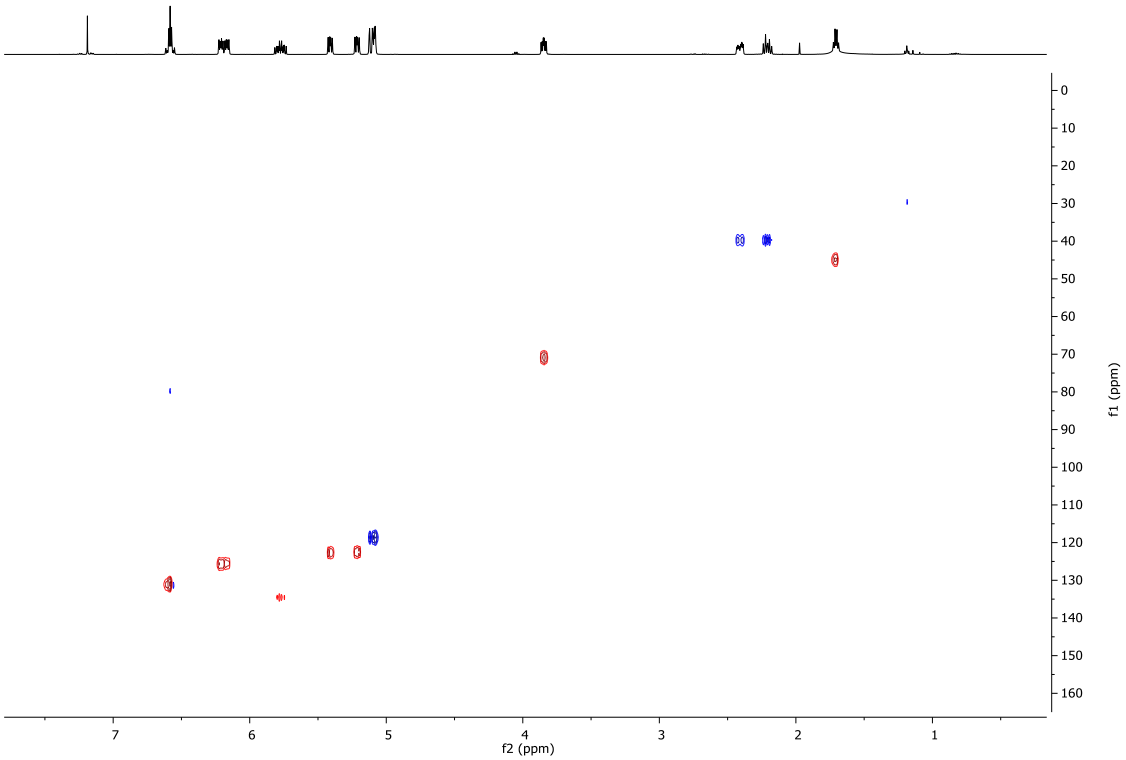


Figure SI-170. HSQC-NMR spectra of compound **35a**.

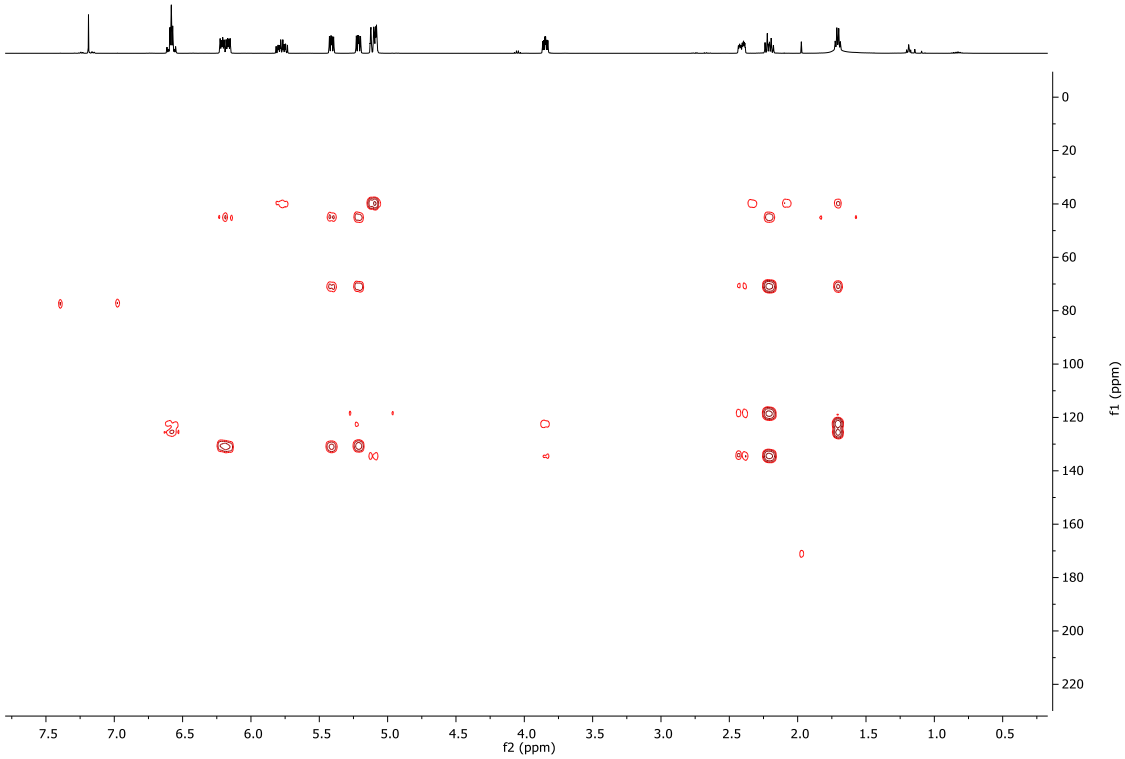


Figure SI-171. HMBC-NMR spectra of compound **35a**.

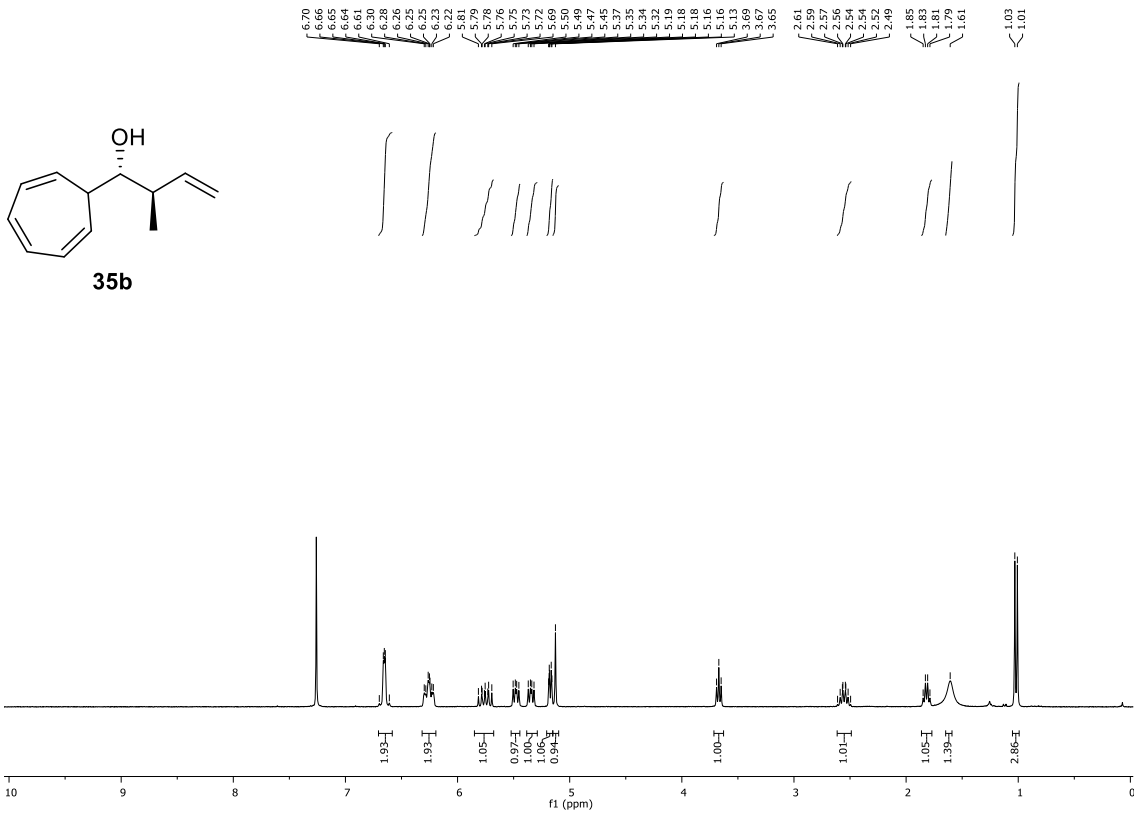


Figure SI-112. ^{1}H-NMR spectra of compound **35b**.

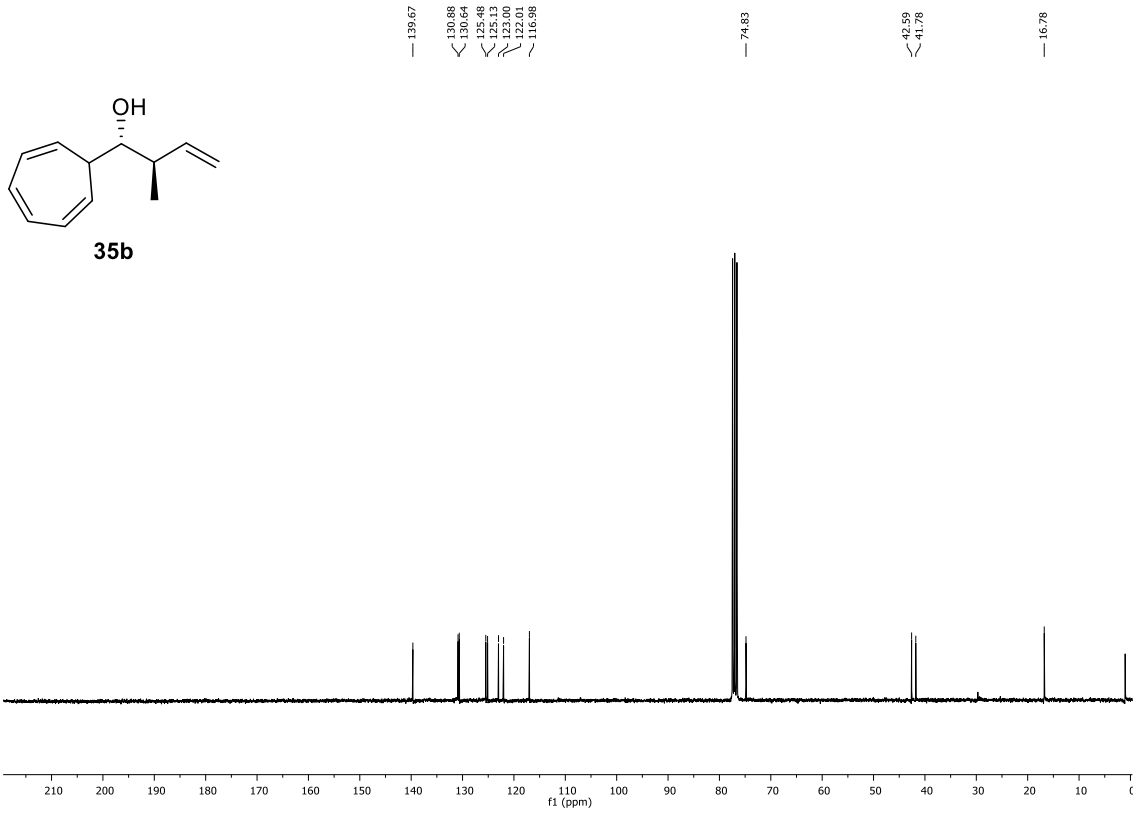


Figure SI-173. ^{13}C-NMR spectra of compound **35b**.

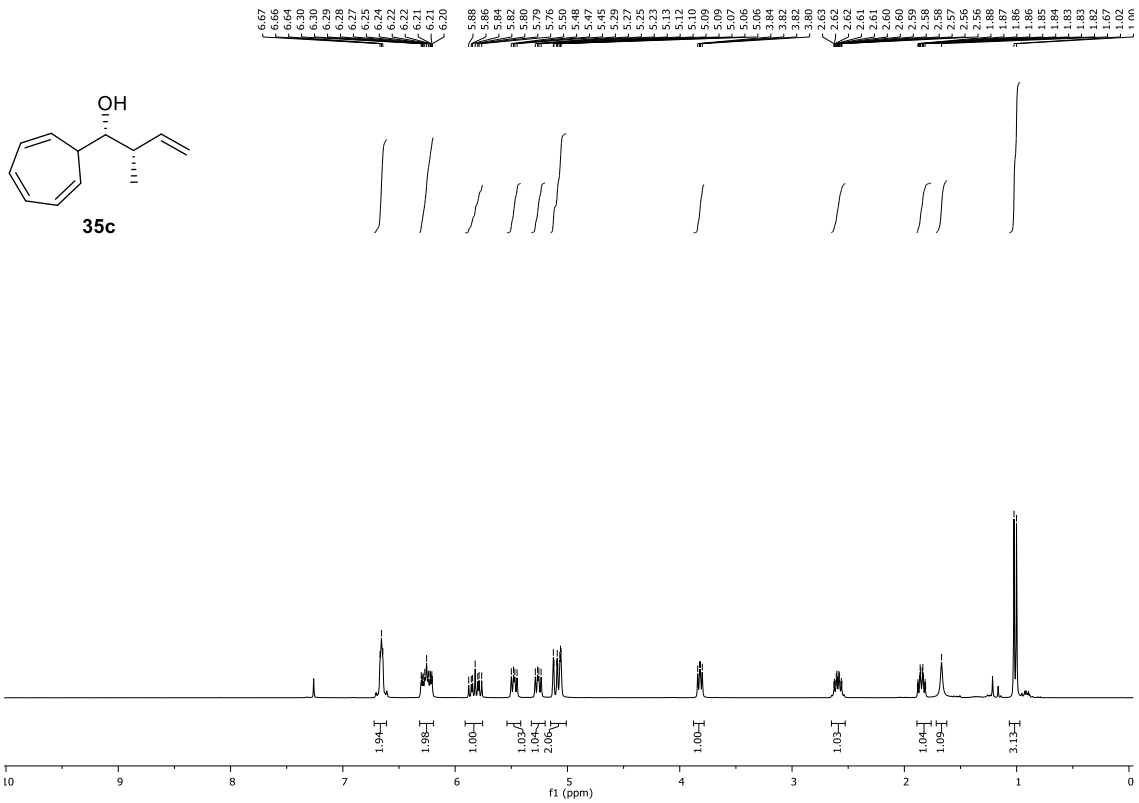


Figure SI-174. ^{1}H-NMR spectra of compound **35c**.

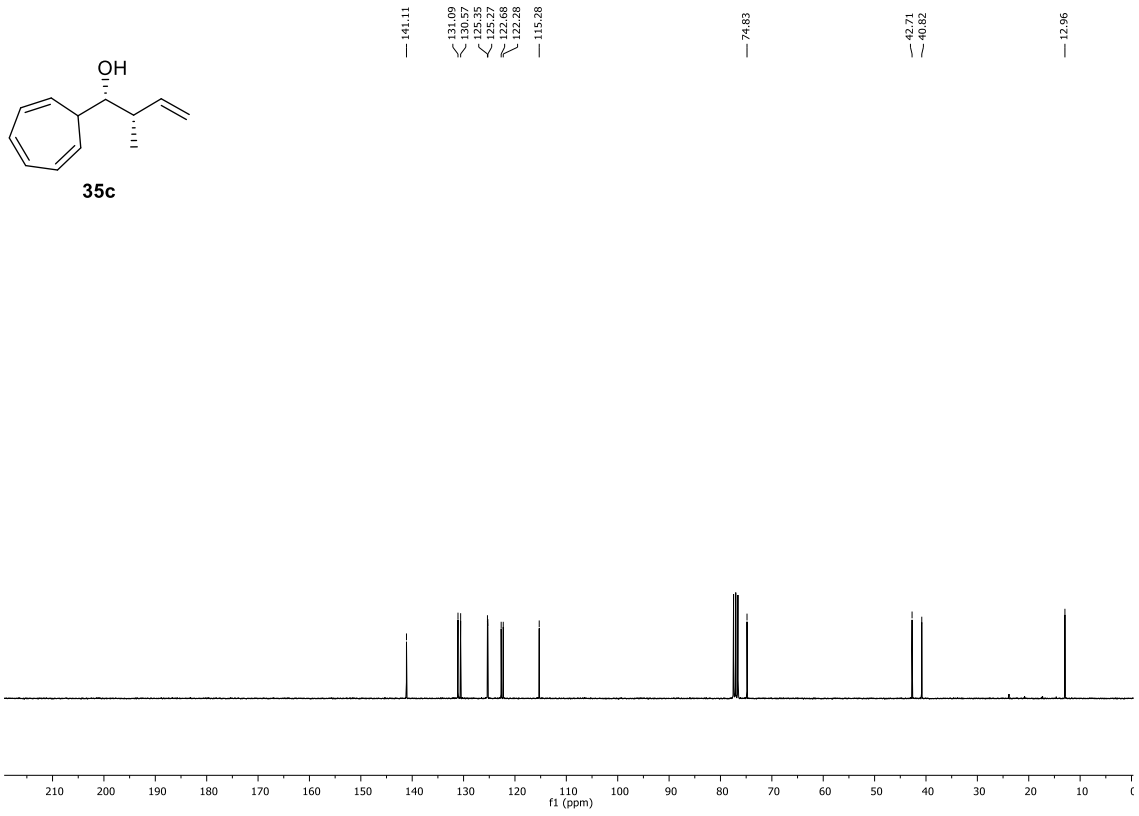


Figure SI-175. ^{13}C-NMR spectra of compound **35c**.

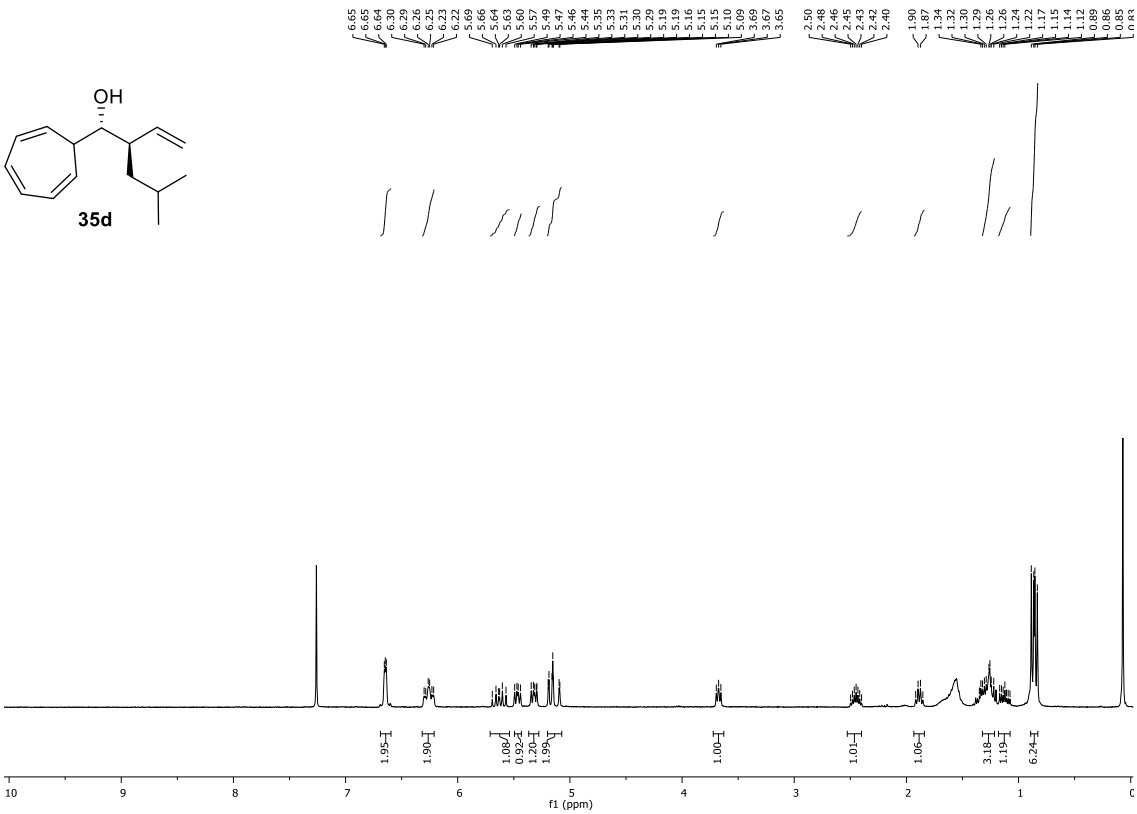


Figure SI-176. ^{1}H-NMR spectra of compound **35d**.

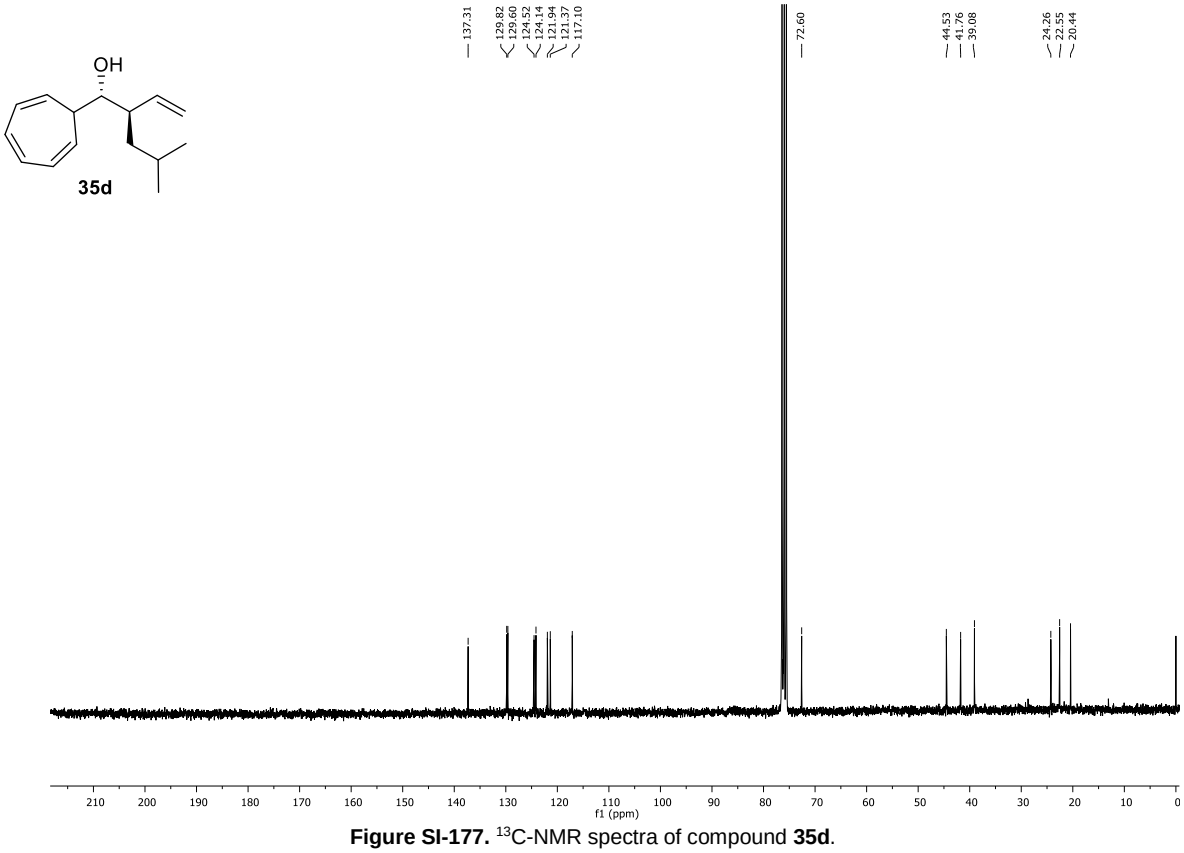


Figure SI-177. ^{13}C-NMR spectra of compound **35d**.

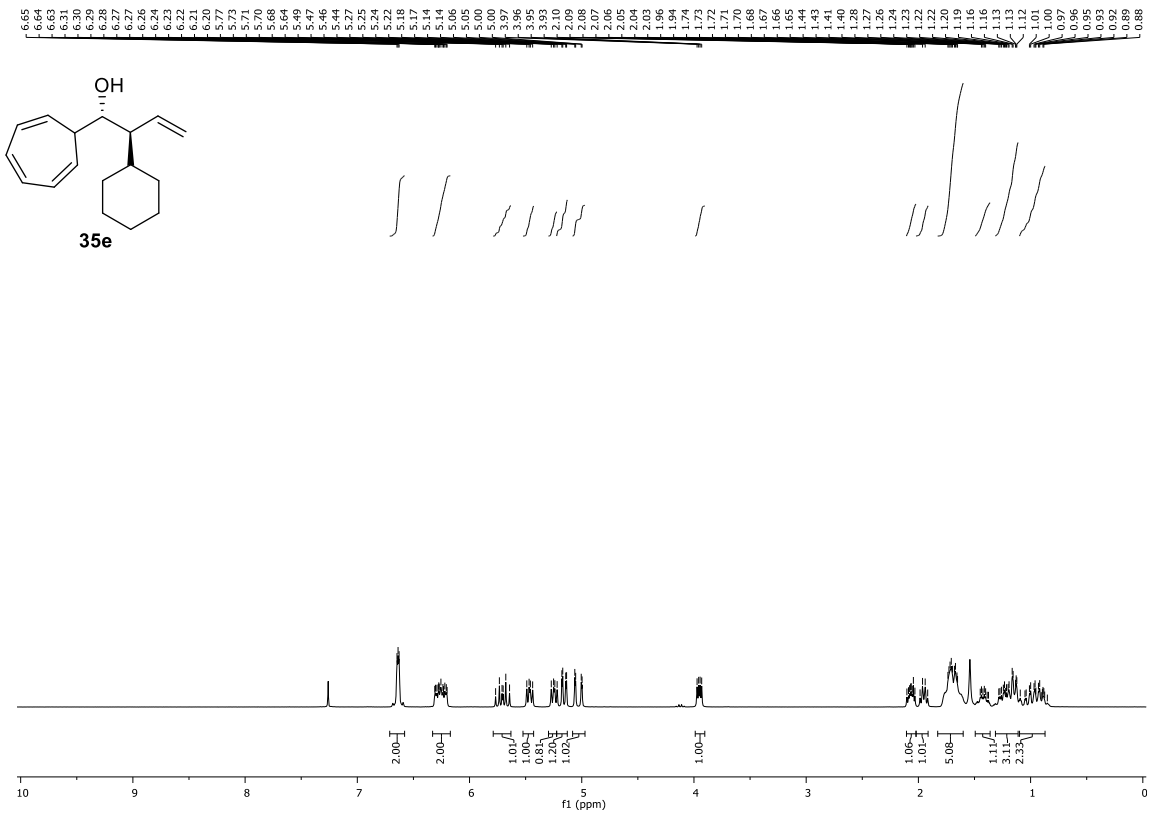


Figure SI-178. ^{1}H-NMR spectra of compound **35e**.

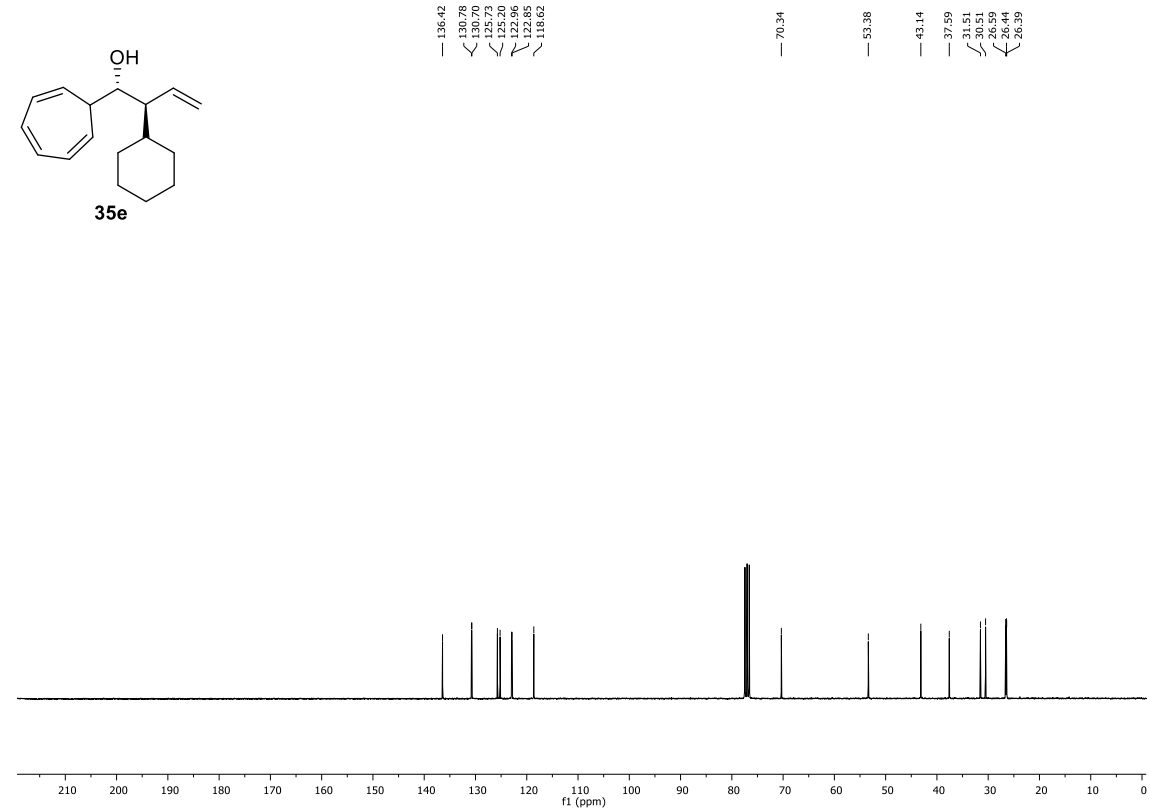


Figure SI-179. ^{13}C-NMR spectra of compound **35e**.

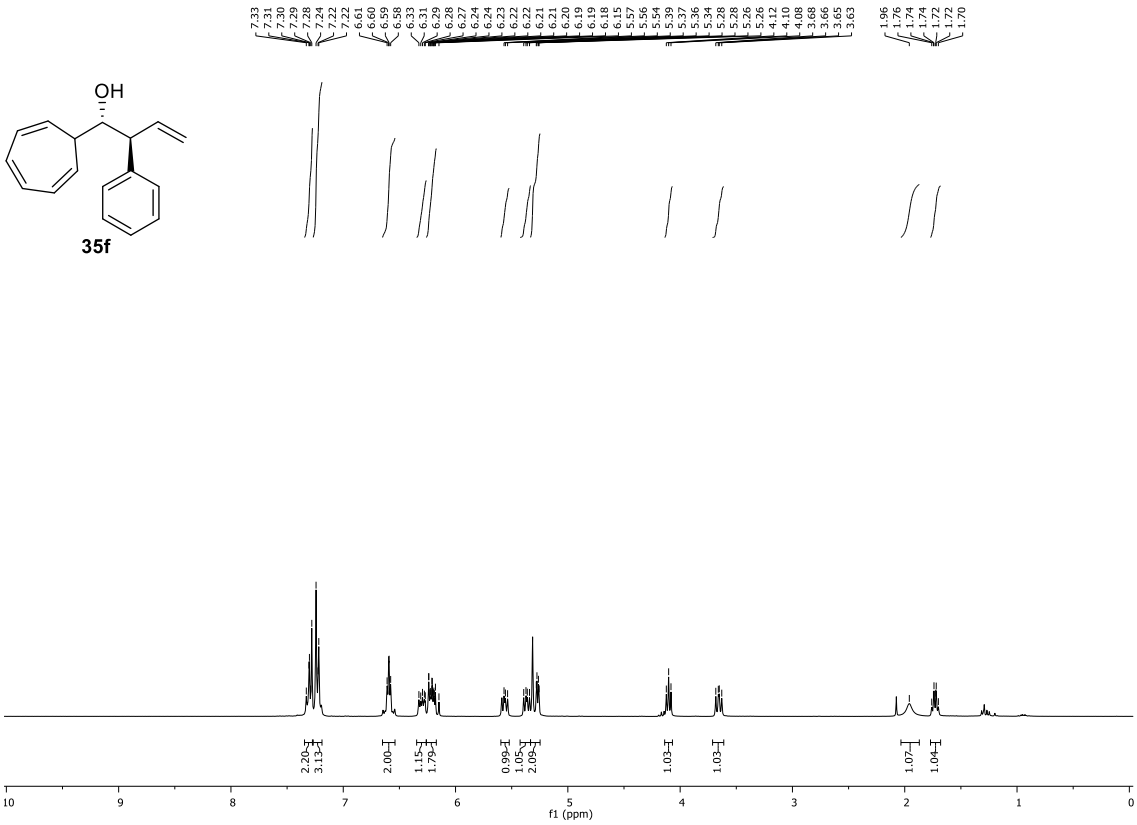


Figure SI-180. ^{1}H-NMR spectra of compound **35f**.

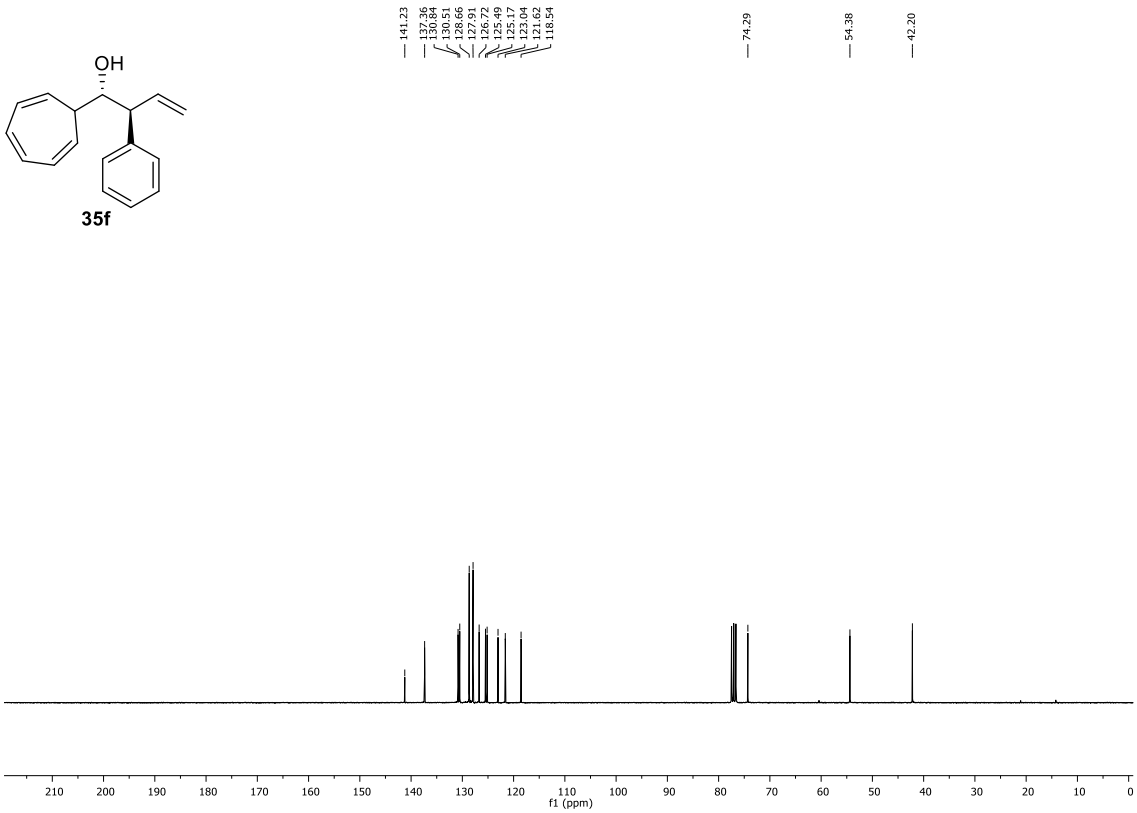


Figure SI-181. ^{13}C-NMR spectra of compound **35f**.

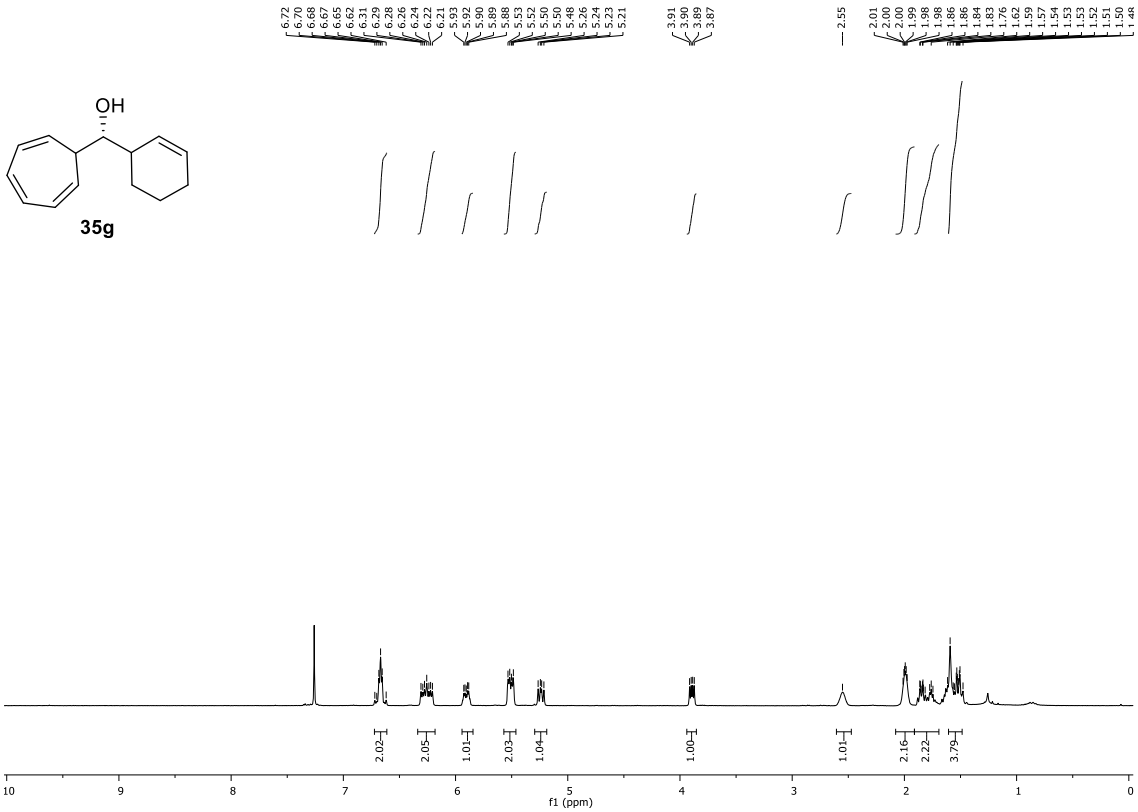


Figure SI-182. ^{1}H-NMR spectra of compound **35g**.

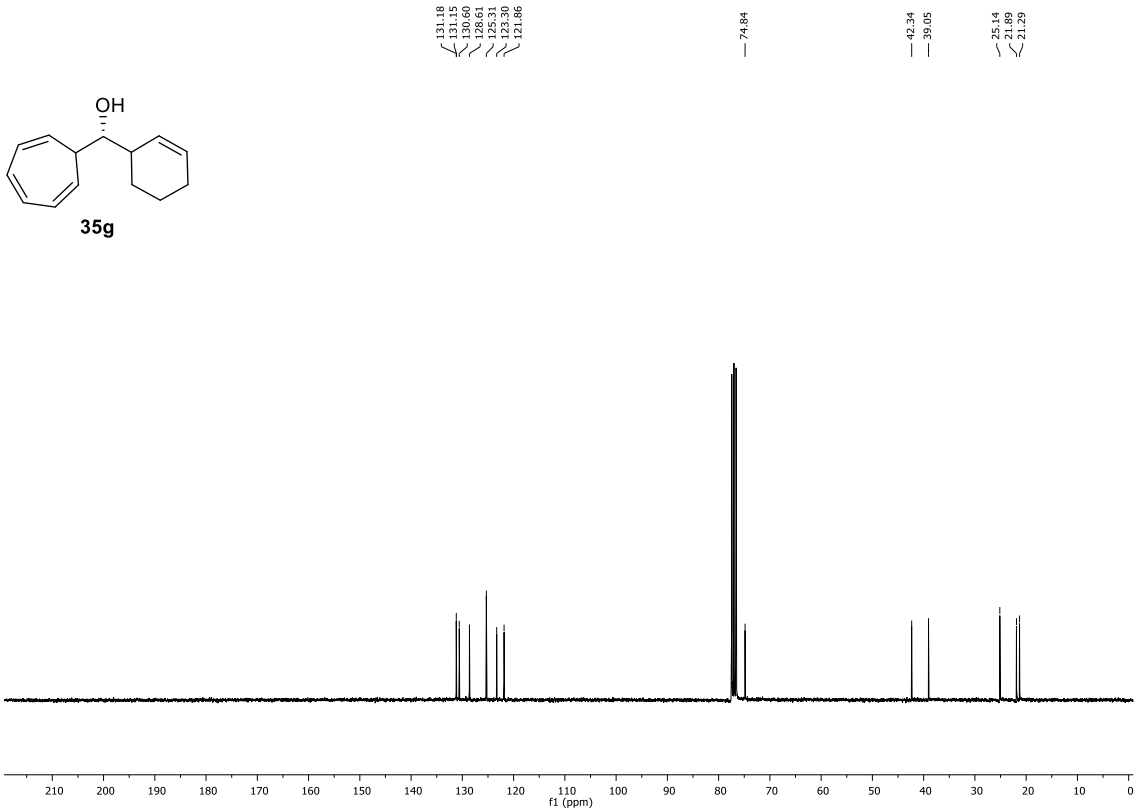


Figure SI-183. ^{13}C-NMR spectra of compound **35g**.

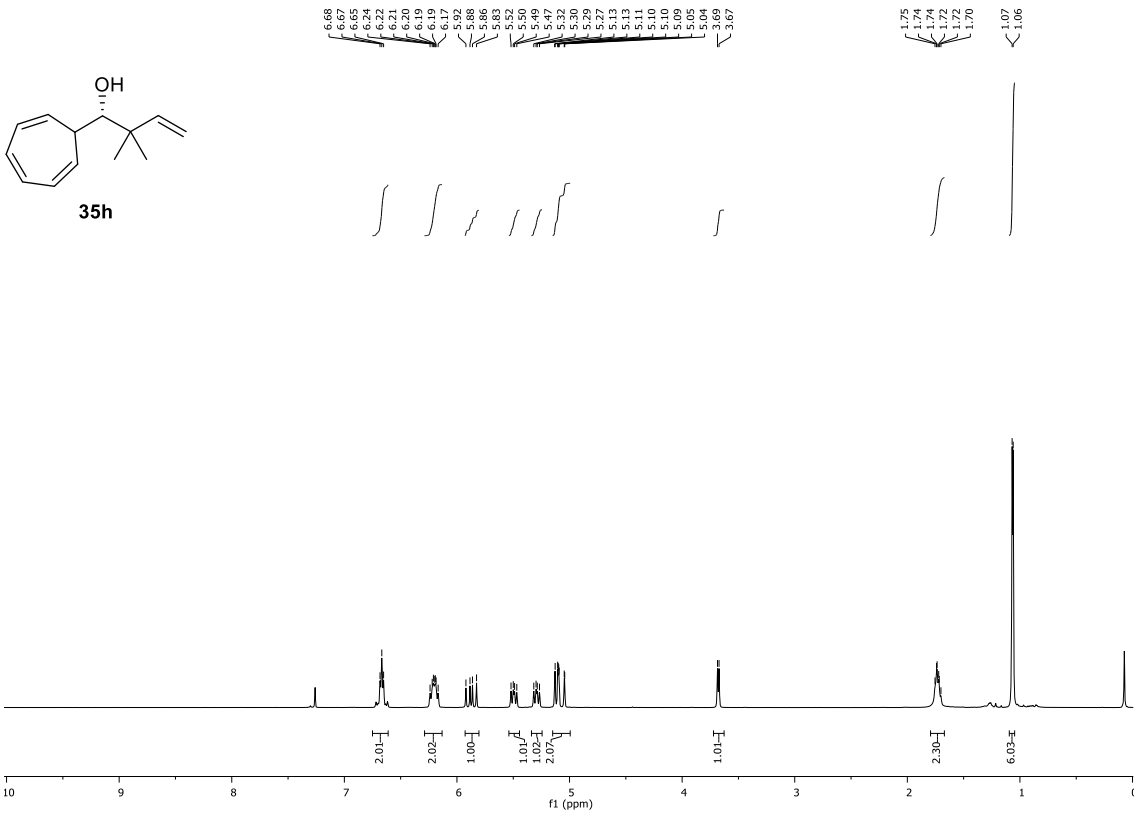


Figure SI-184. ^{1}H-NMR spectra of compound **35h**.

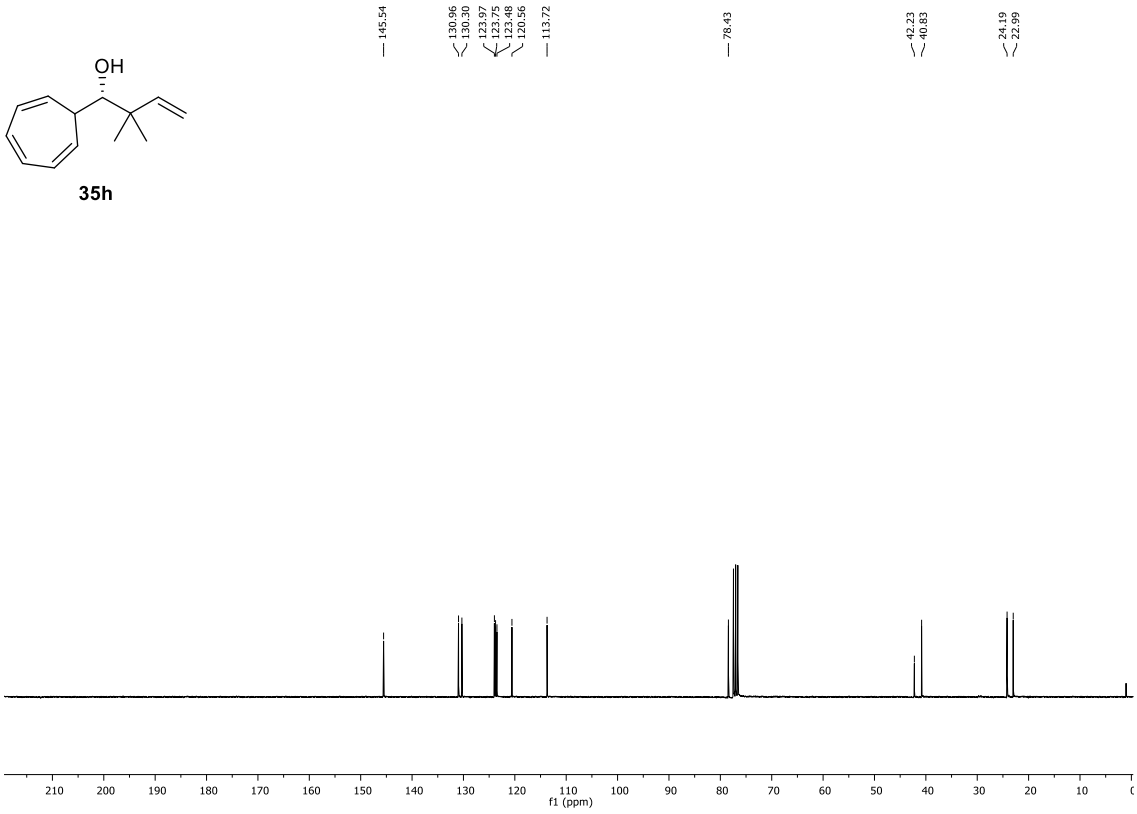


Figure SI-185. ^{13}C-NMR spectra of compound **35h**.

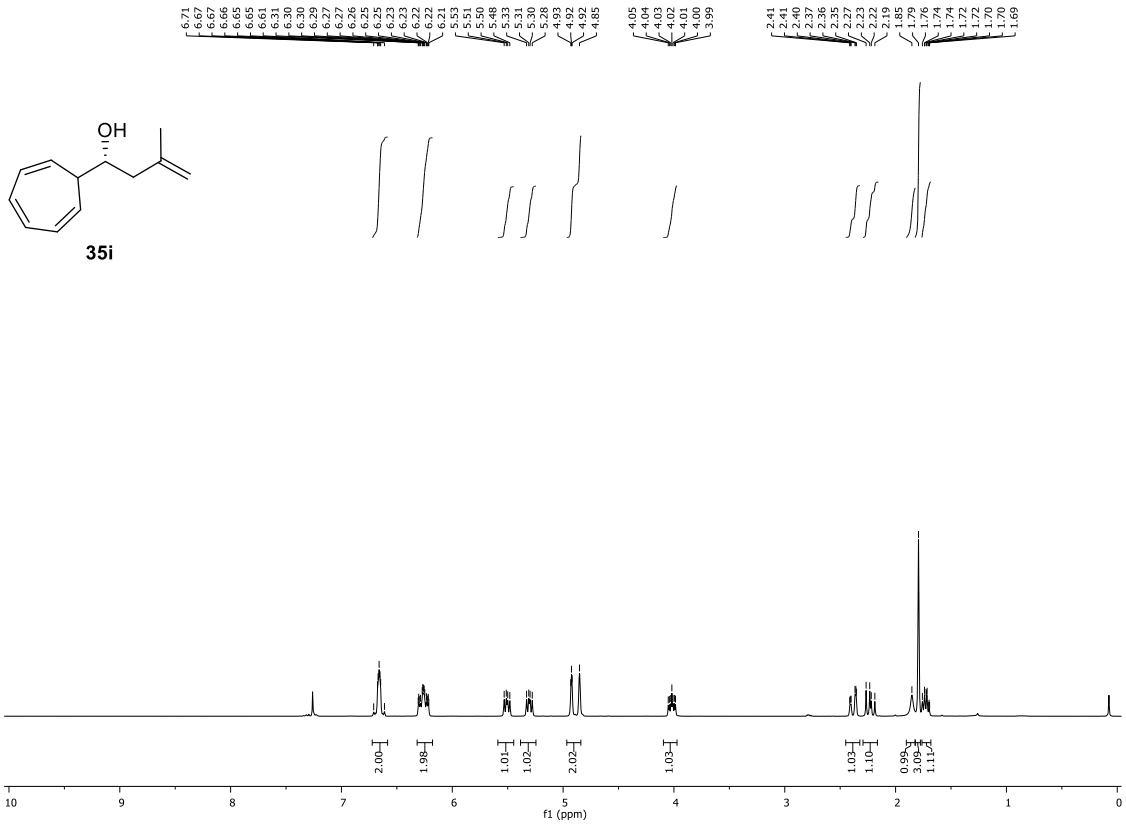


Figure SI-186. ^{1}H-NMR spectra of compound **35i**.

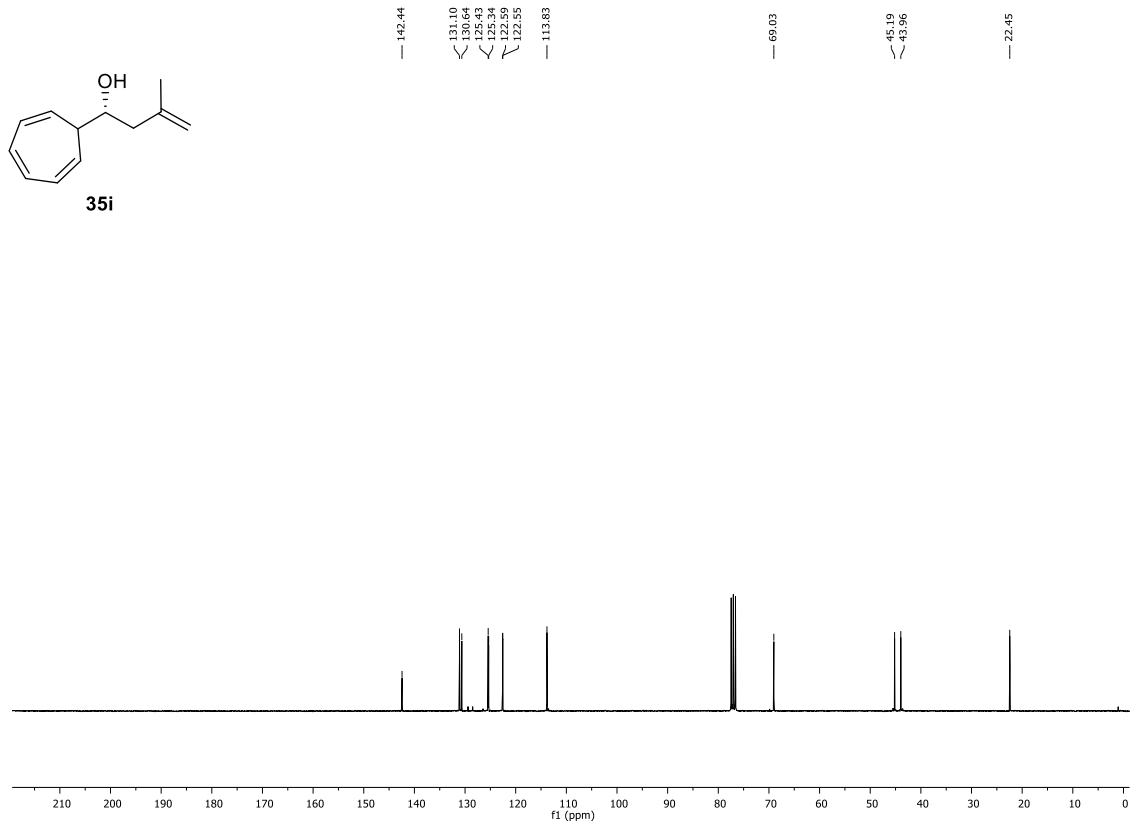


Figure SI-187. ^{13}C-NMR spectra of compound **35i**.

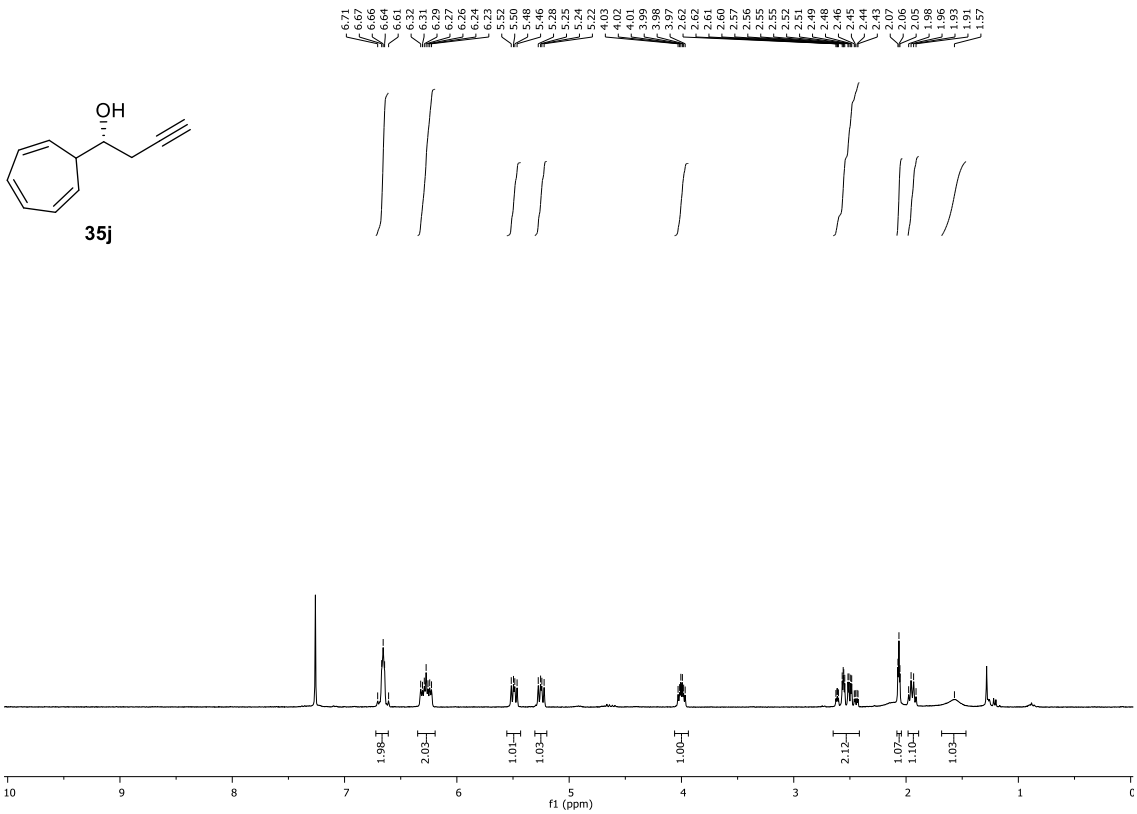


Figure SI-188. ^{1}H-NMR spectra of compound **35j**.

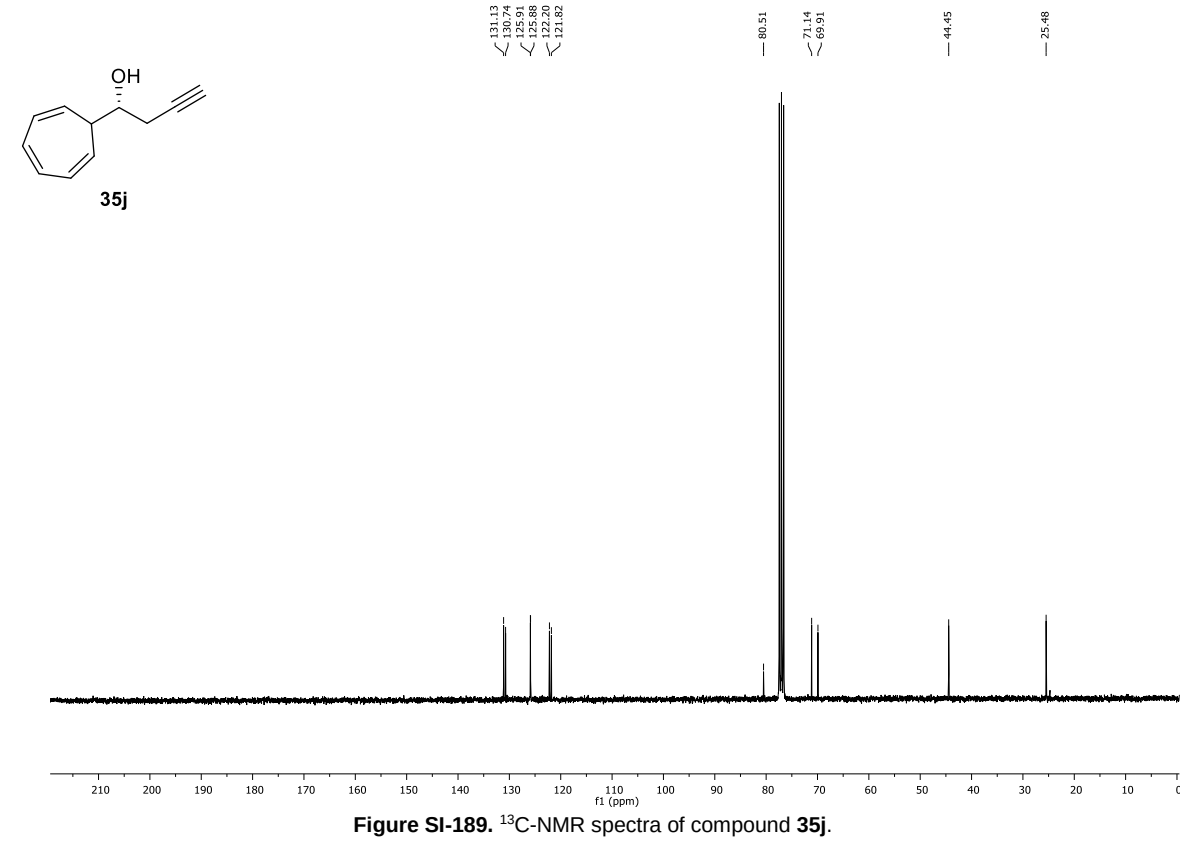
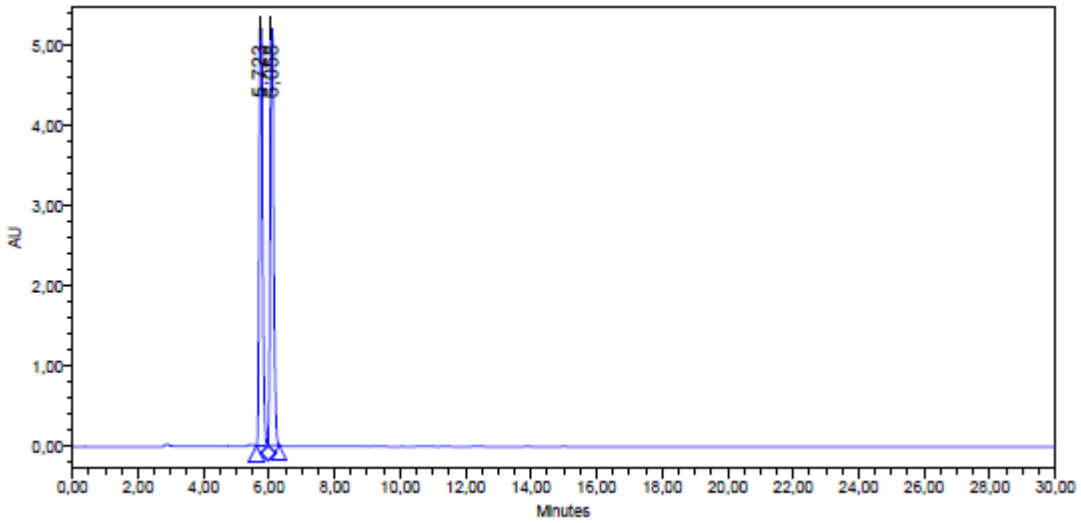
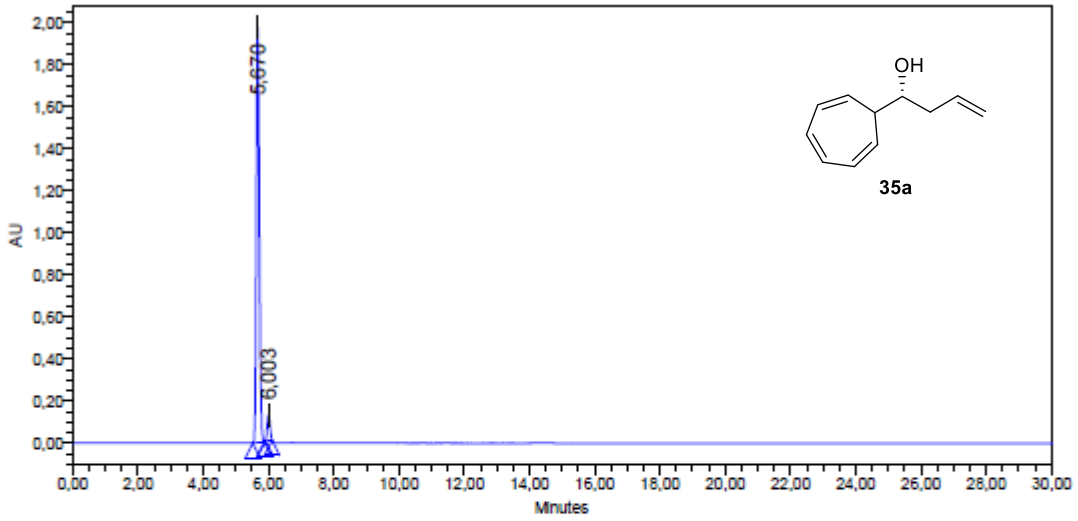


Figure SI-189. ^{13}C-NMR spectra of compound **35j**.

3.2. HPLC traces

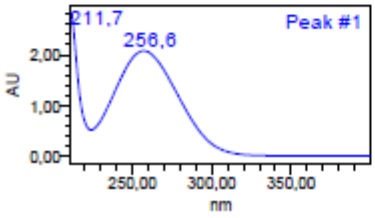




35a

Peak Results

	RT	Area	Height	% Area
1	5,670	12653308	1975715	94,55
2	6,003	729265	121718	5,45



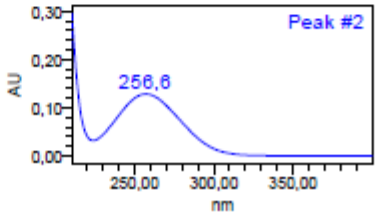
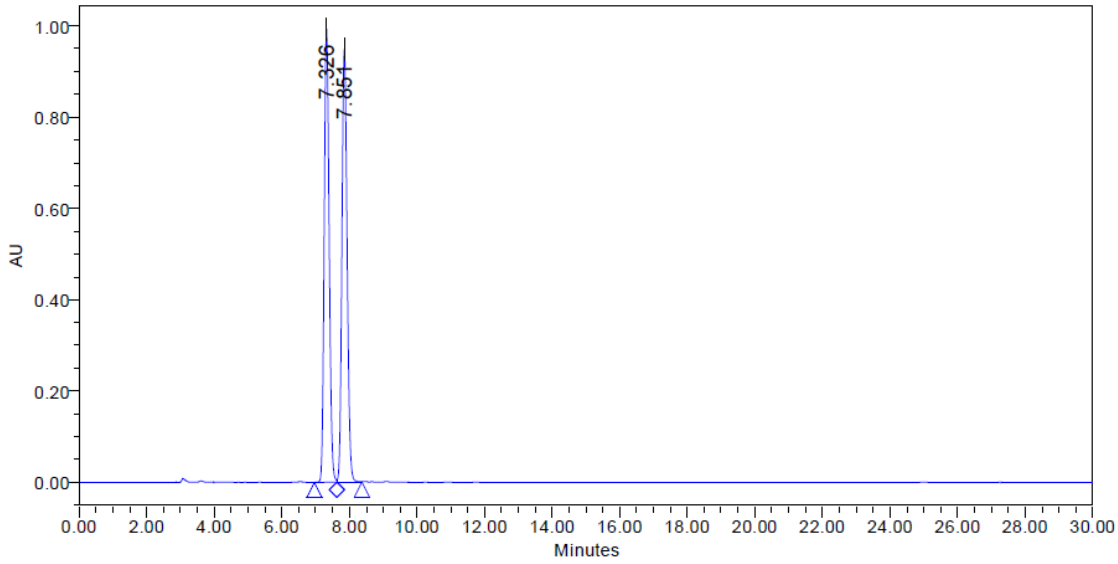
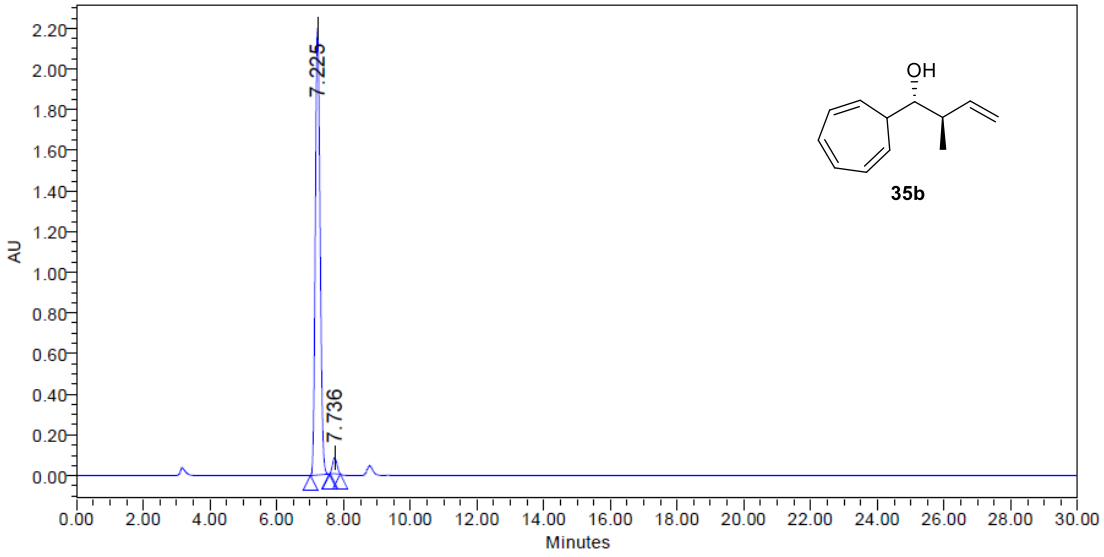


Figure SI-190. HPLC traces for racemic and compound **35a**.





Peak Results

	RT	Area	Height	% Area
1	7.225	21816969	2199040	96.79
2	7.736	723156	78616	3.21

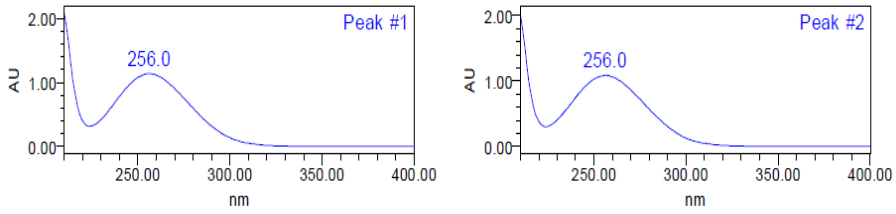
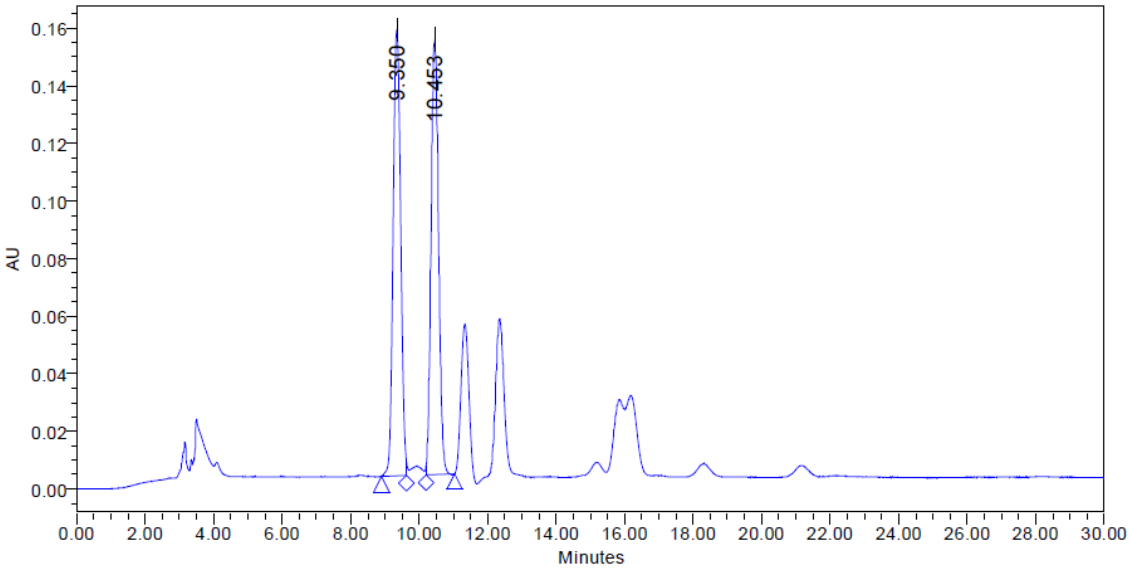
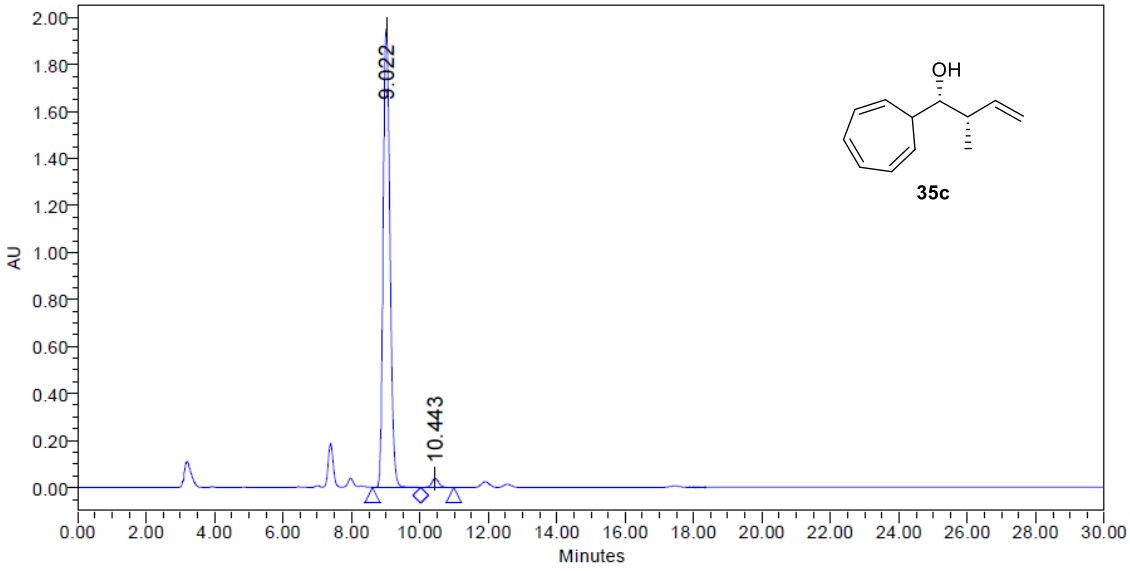


Figure SI-191. HPLC traces for racemic and compound **35b**.





Peak Results

	RT	Area	Height	% Area
1	9.022	27038099	1949889	98.04
2	10.443	539227	36789	1.96

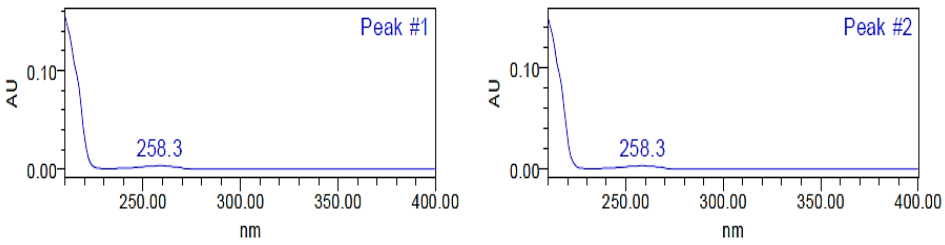
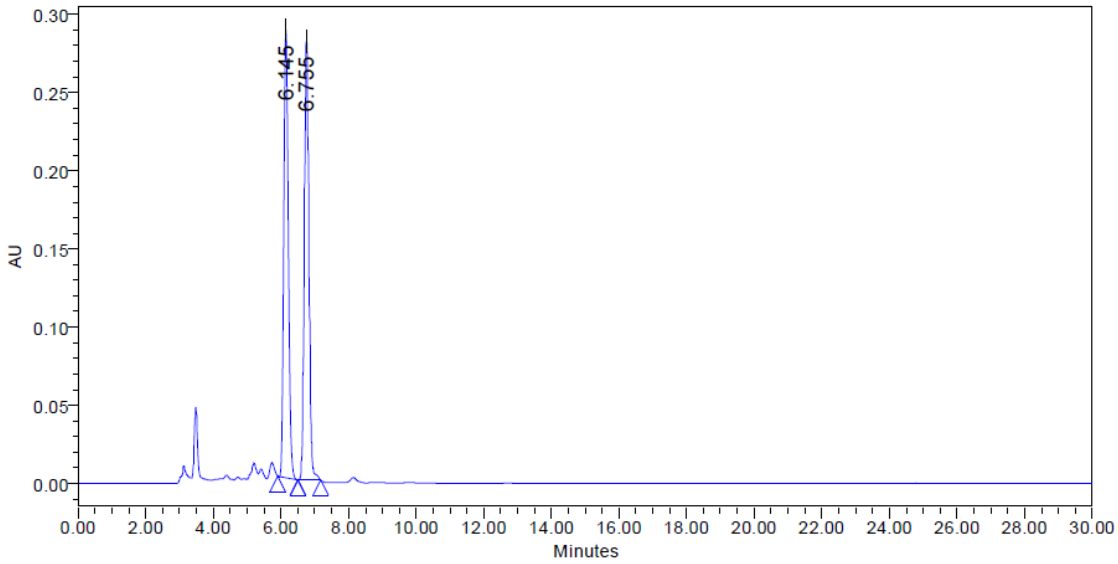
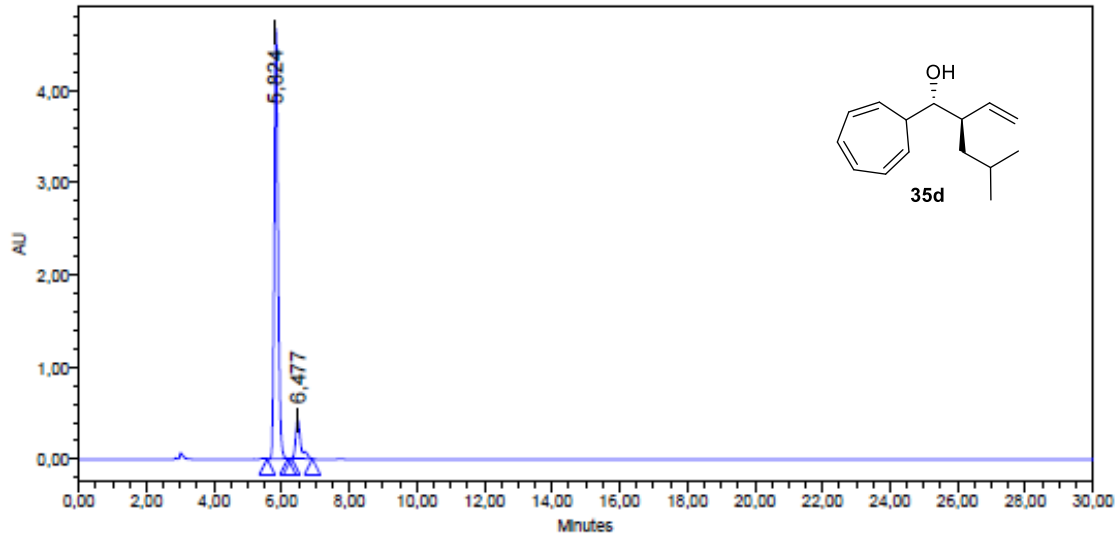


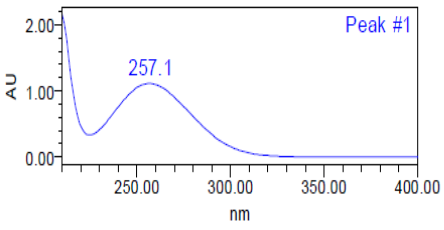
Figure SI-192. HPLC traces for racemic and compound **35c**.





Peak Results

	RT	Area	Height	% Area
1	5,824	35601059	4672388	88,96
2	6,477	4416233	420532	11,04



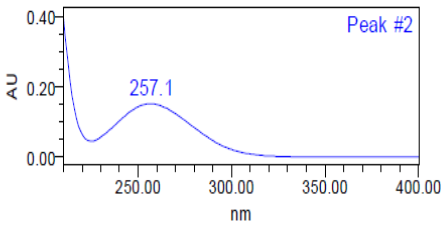
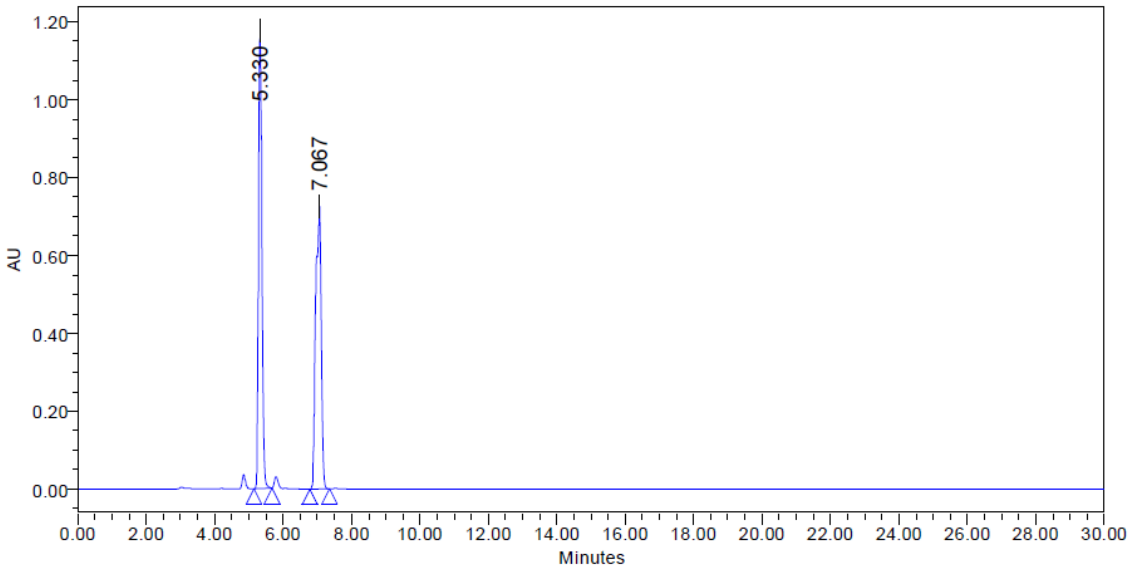
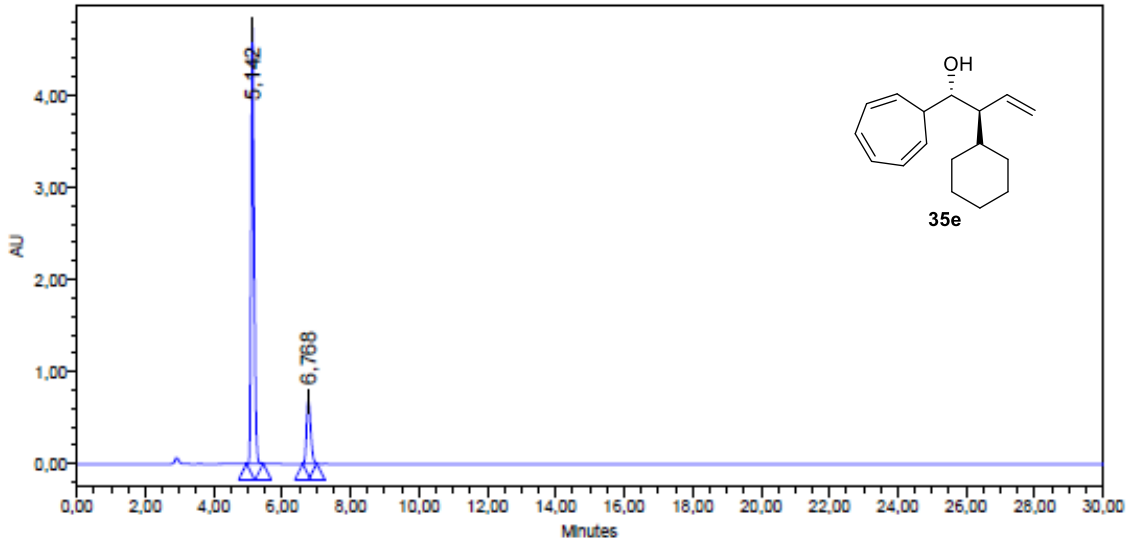


Figure SI-193. HPLC traces for racemic and compound **35d**.





Peak Results

	RT	Area	Height	% Area
1	5,142	28053971	4725264	82,79
2	6,768	5833649	681455	17,21

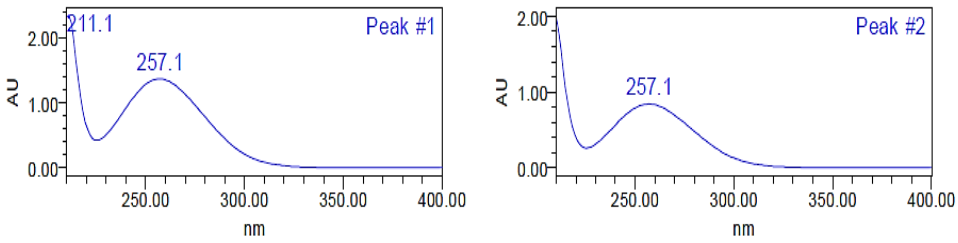
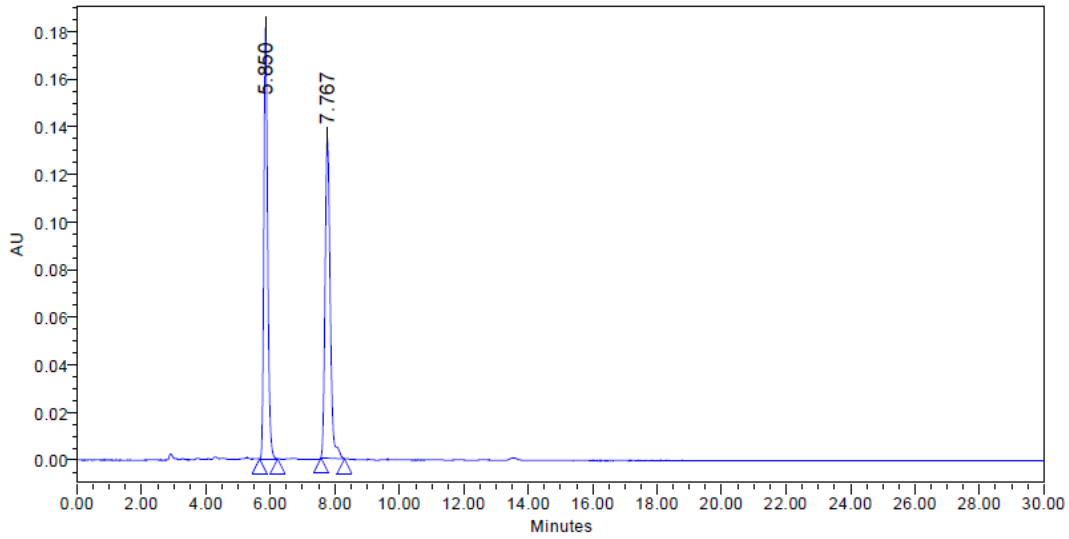
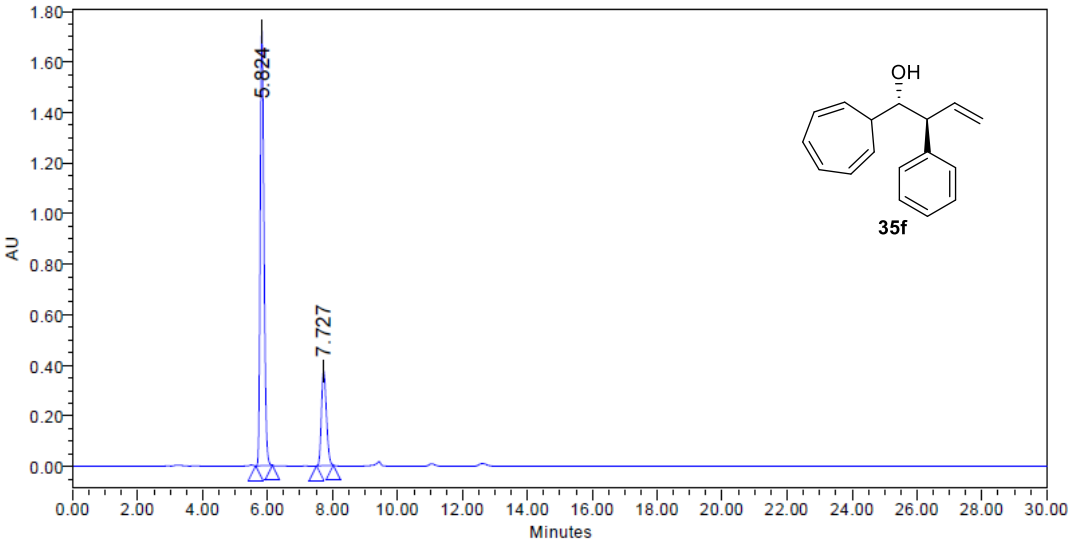


Figure SI-194. HPLC traces for racemic and compound **35e**.





Peak Results

	RT	Area	Height	% Area
1	5.824	13804315	1719650	77.66
2	7.727	3970549	373241	22.34

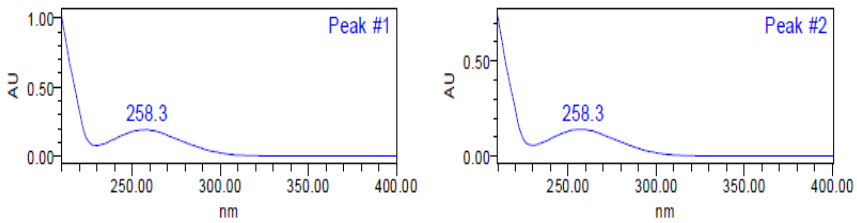
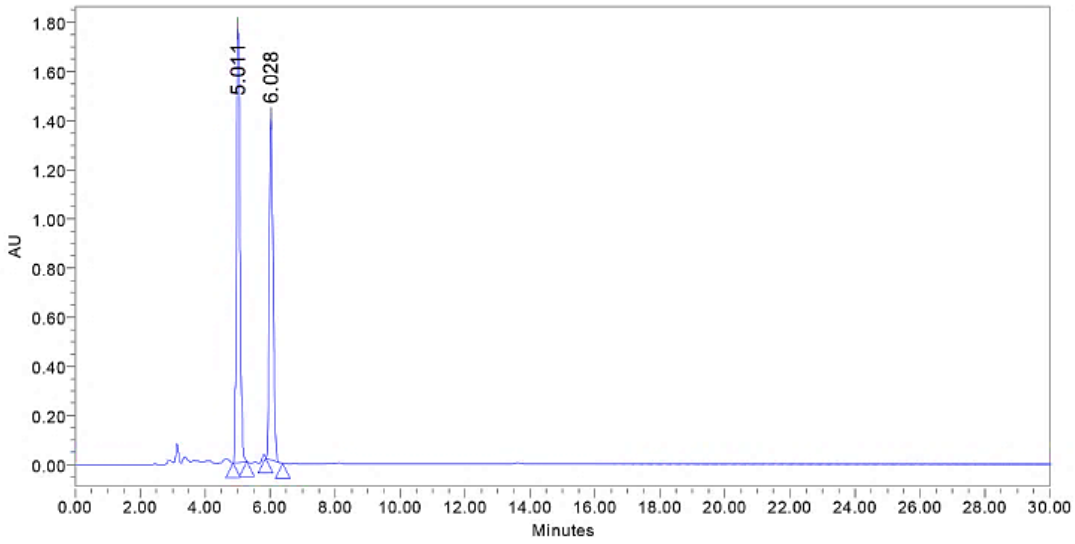
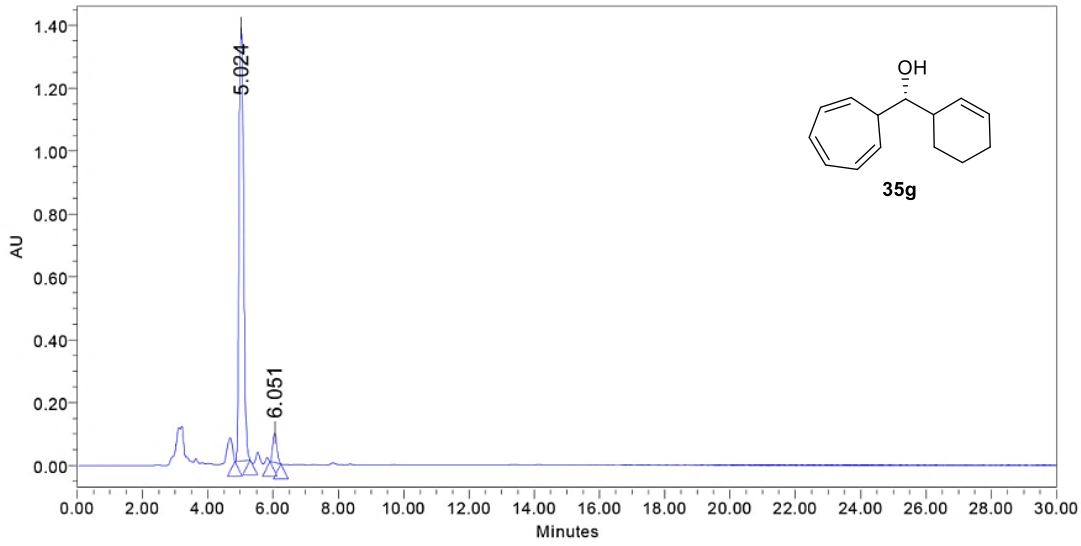


Figure SI-195. HPLC traces for racemic and compound **35f**.





Peak Results

	RT	Area	Height	% Area
1	5.024	13588061	1376413	94.30
2	6.051	821115	94747	5.70

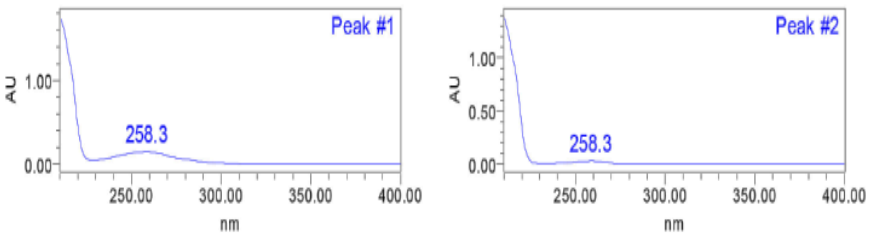
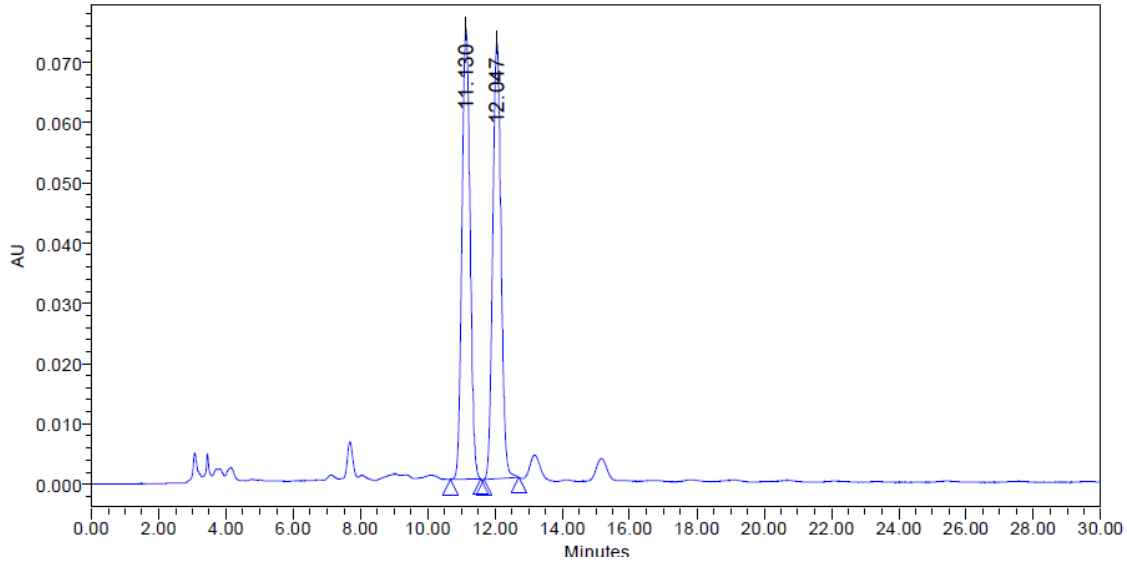
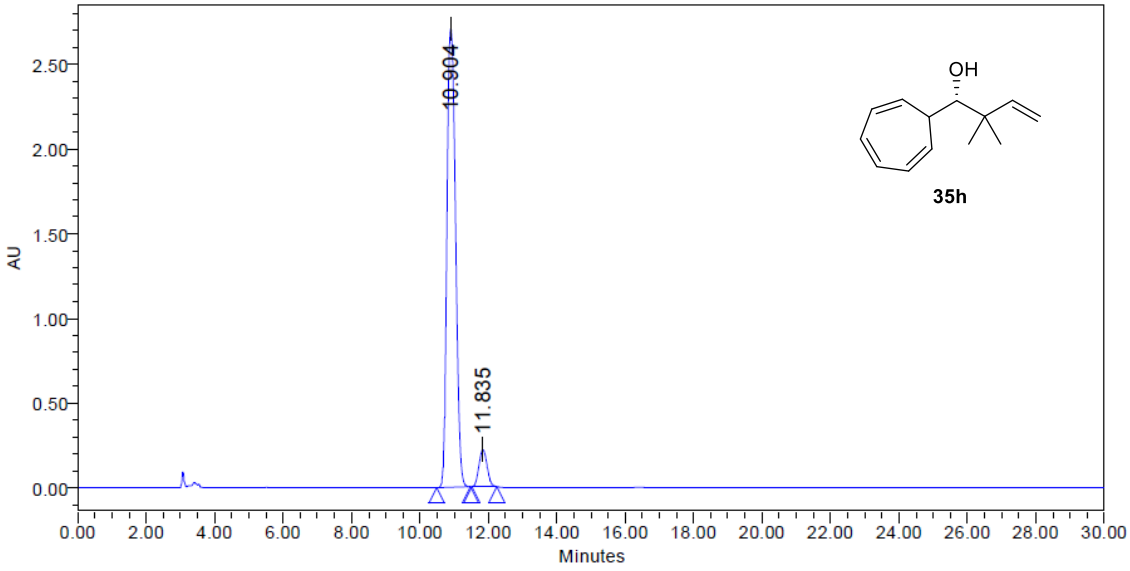


Figure SI-196. HPLC traces for racemic and compound **35g**.





Peak Results

	RT	Area	Height	% Area
1	10.904	46731399	2708959	92.79
2	11.835	3631371	218407	7.21

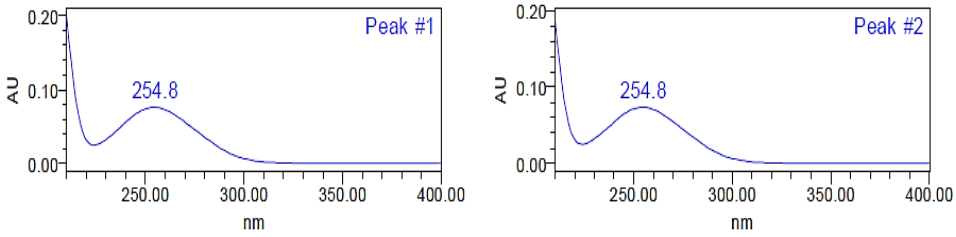


Figure SI-197. HPLC traces for racemic and compound **35h**.

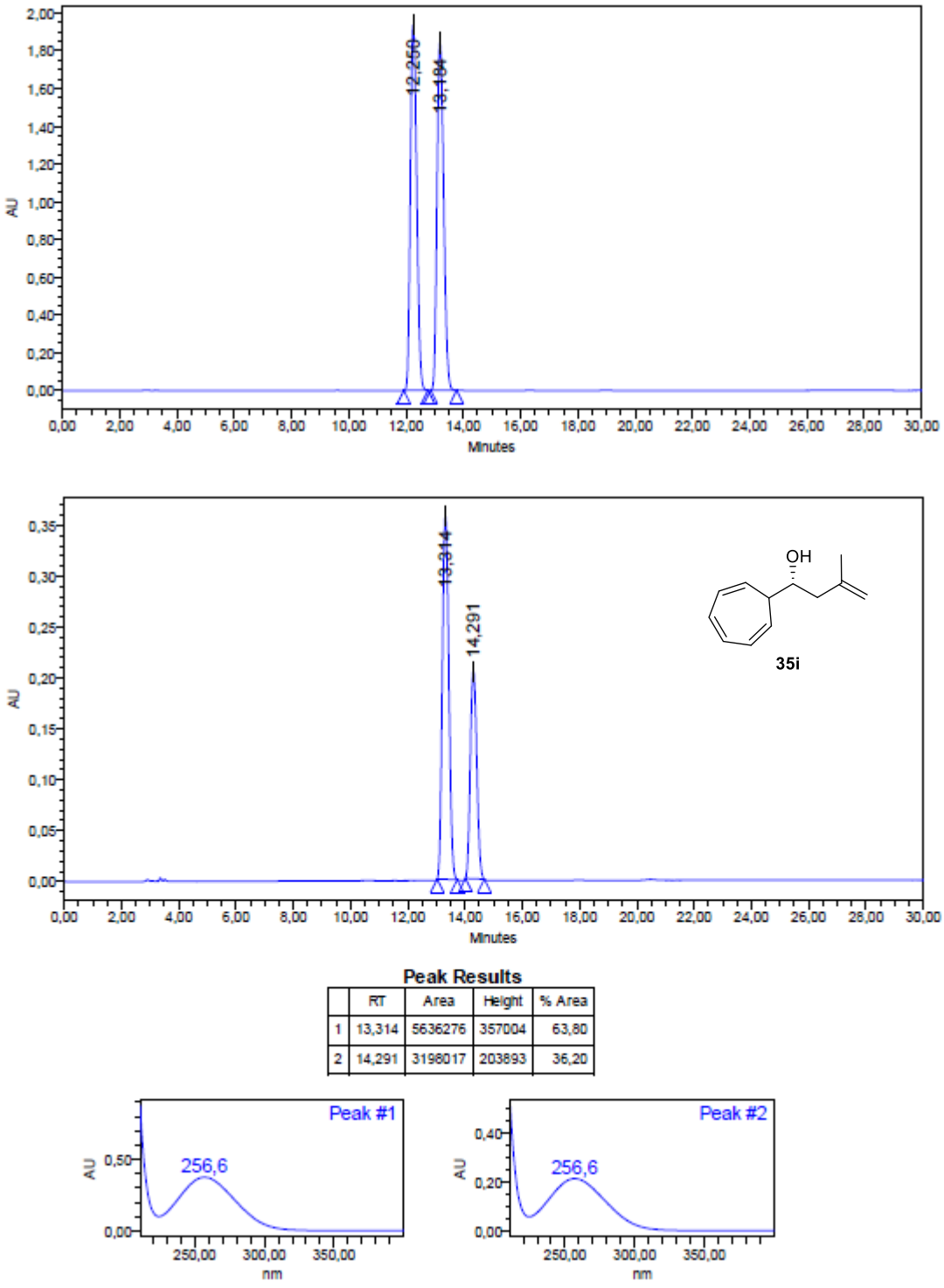
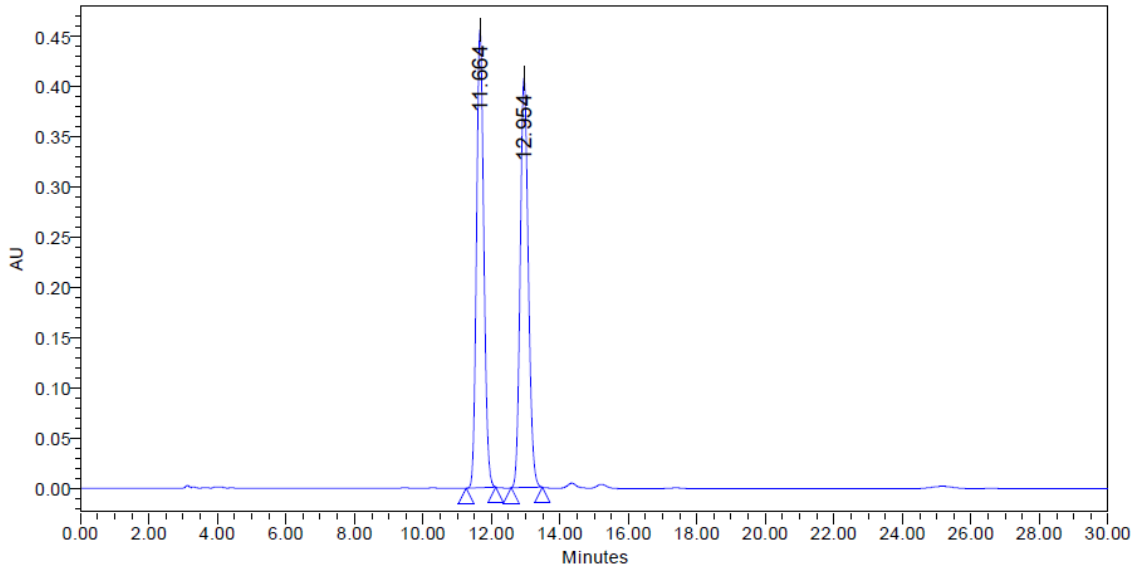
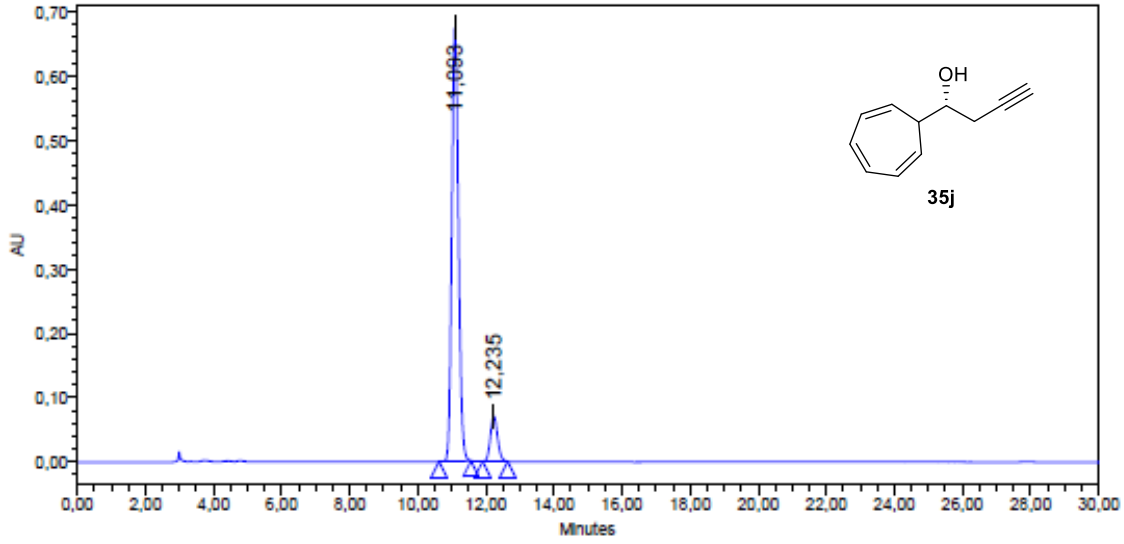


Figure SI-198. HPLC traces for racemic and compound **35i**.





Peak Results

	RT	Area	Height	% Area
1	11,093	9124291	673950	89,90
2	12,235	1024603	69936	10,10

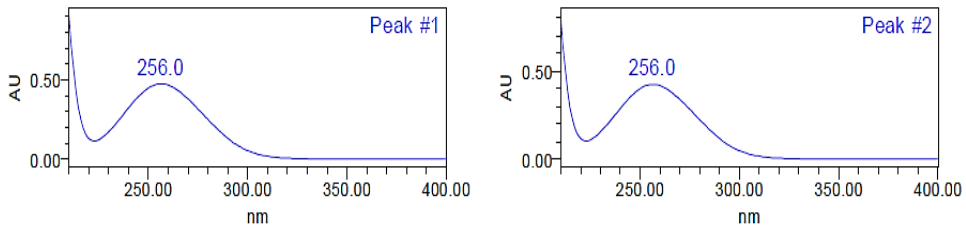


Figure SI-199. HPLC traces for racemic and compound **35j**.