Supporting Information

Asymmetric Synthesis of *gem*-Difluoromethylenated Dihydroxypyrrolizidines and Indolizidines

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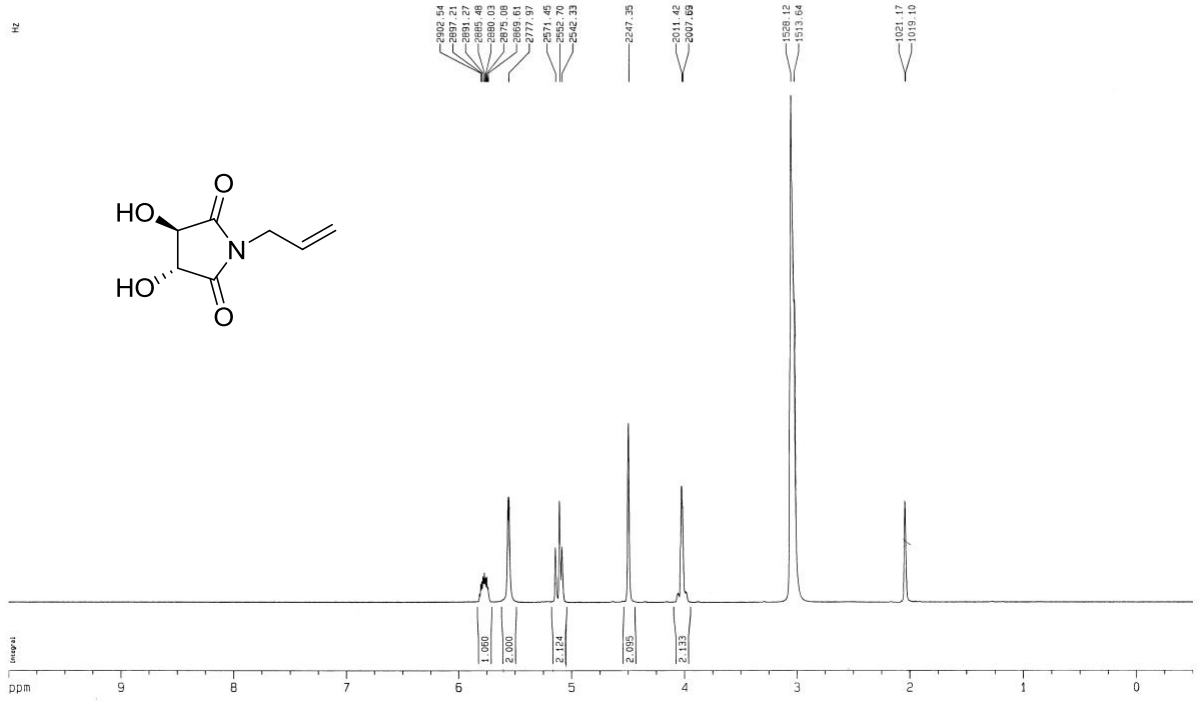
Content

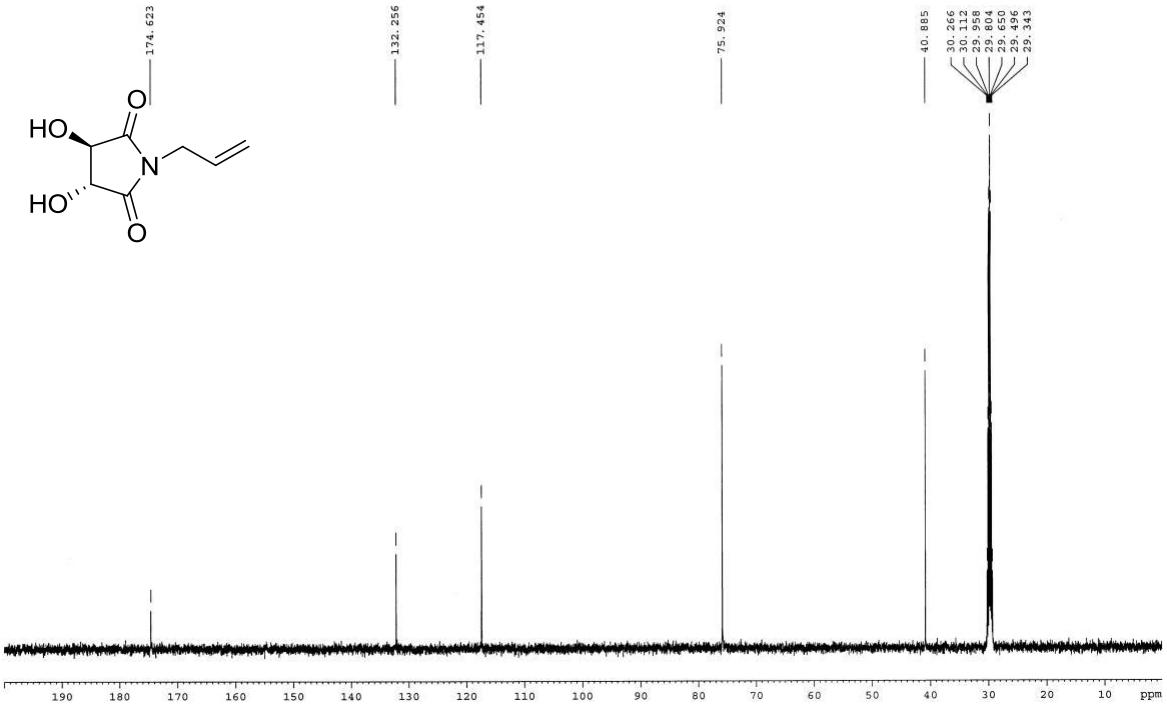
^{1}H NMR Spectrum of (3*R*,4*R*)-1-allyl-3,4-dihydroxypyrrolidine-2,5-dione

(500 MHz, acetone-d_6)

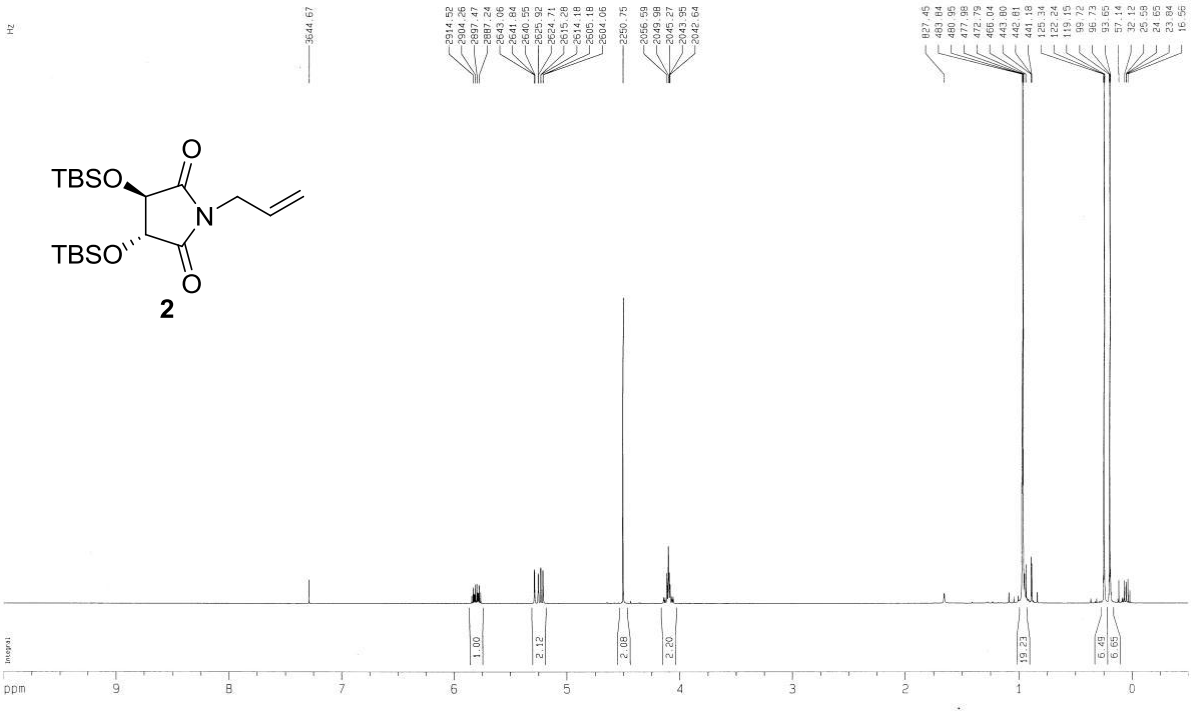


^{13}C NMR Spectrum of (3*R*,4*R*)-1-allyl-3,4-dihydroxypyrrolidine-2,5-dione

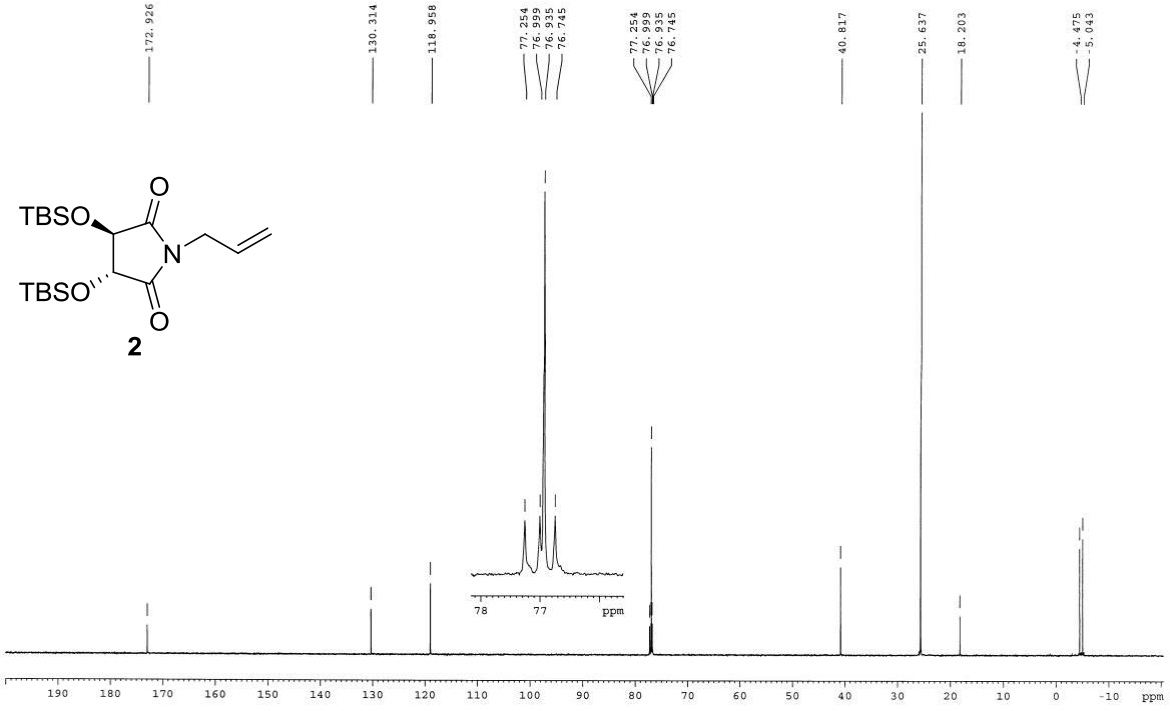
(125 MHz, acetone-d_6)



^{1}H NMR Spectrum of **2** (500 MHz, $CDCl_3$)

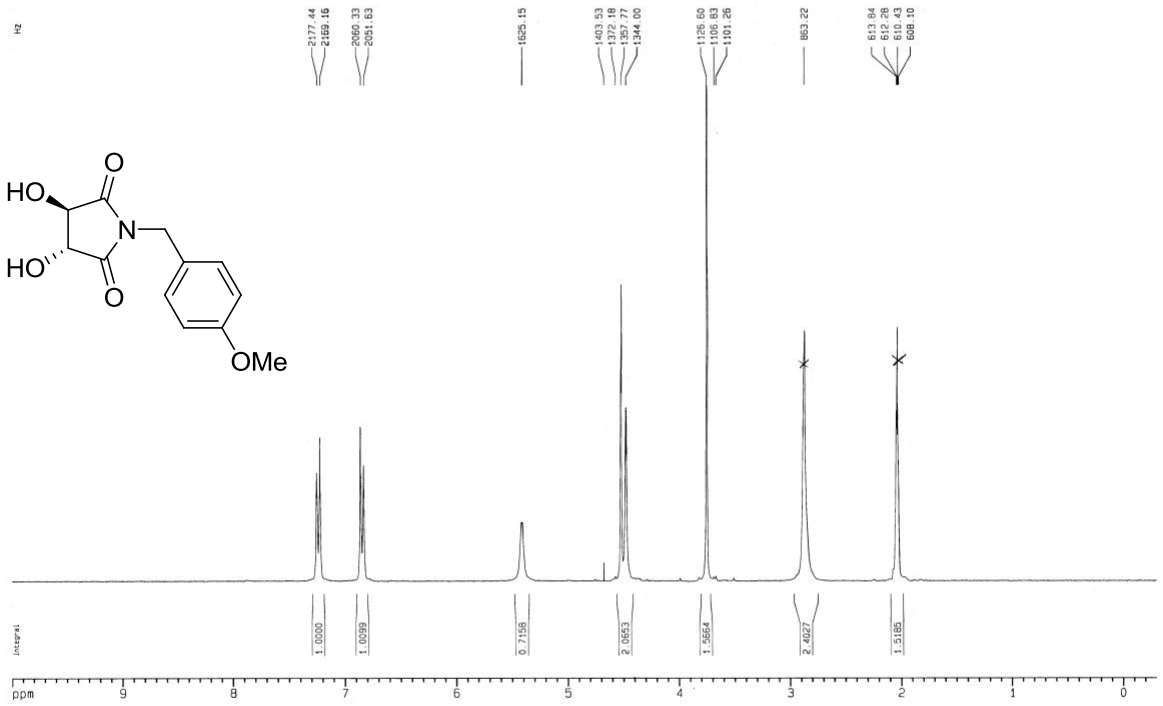


^{13}C NMR Spectrum of **2** (125 MHz, $CDCl_3$)



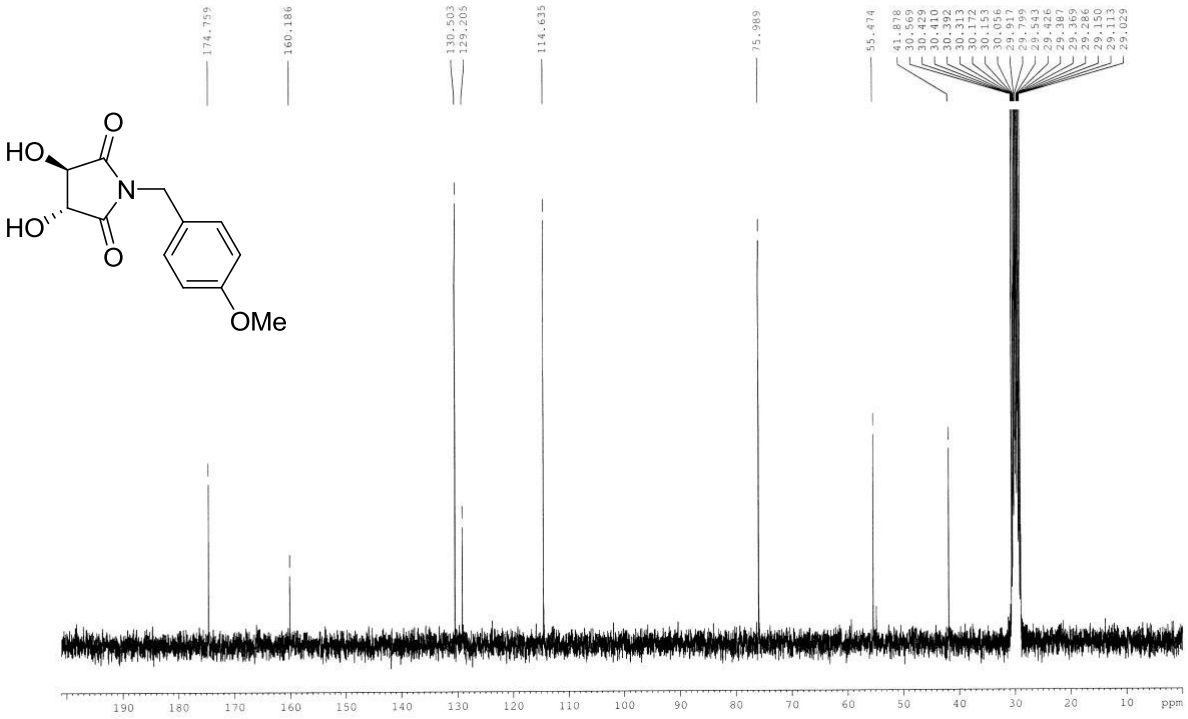
^{1}H NMR Spectrum of (3*R*,4*R*)-3,4-dihydroxy-1-(4-methoxybenzyl)pyrrolidine-2,5-dione

(300 MHz, acetone-d_6)

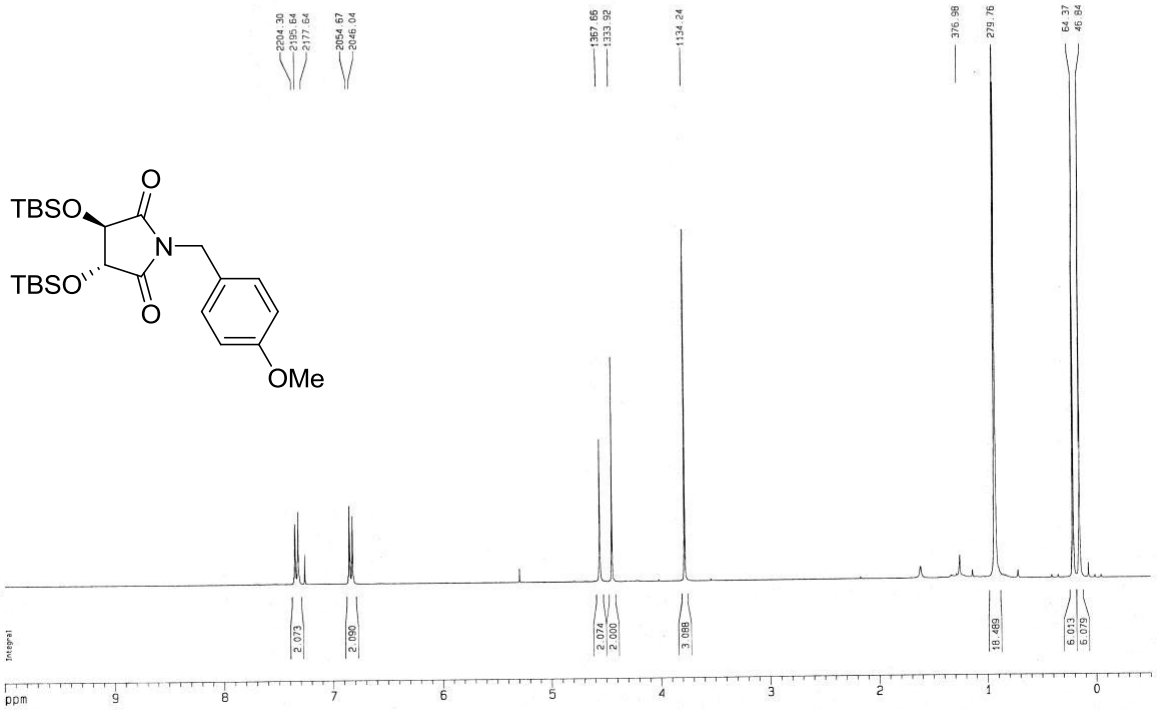


^{13}C NMR Spectrum of (3*R*,4*R*)-3,4-dihydroxy-1-(4-methoxybenzyl)pyrrolidine-2,5-dione

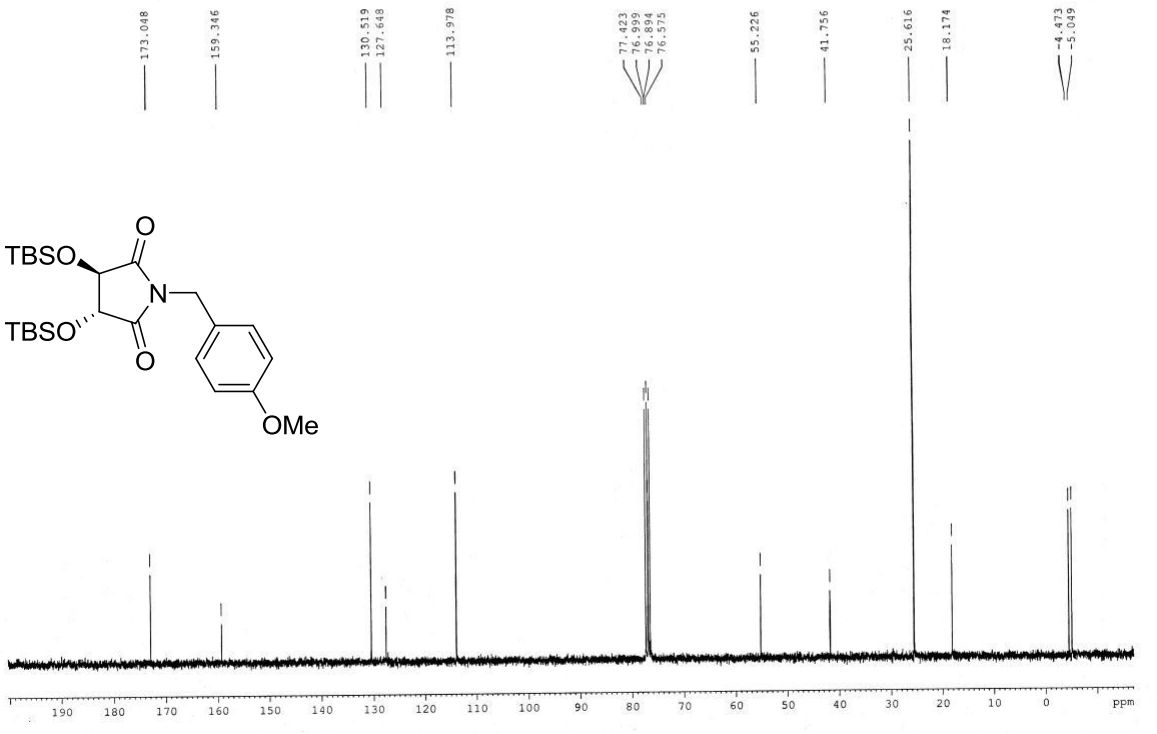
(75 MHz, acetone-d_6)



^{1}H NMR Spectrum of (3*R*,4*R*)-3,4-bis(*tert*-butyldimethylsilyloxy)-1-(4-methoxybenzyl) pyrrolidine-2,5-dione (300 MHz, $CDCl_3$)

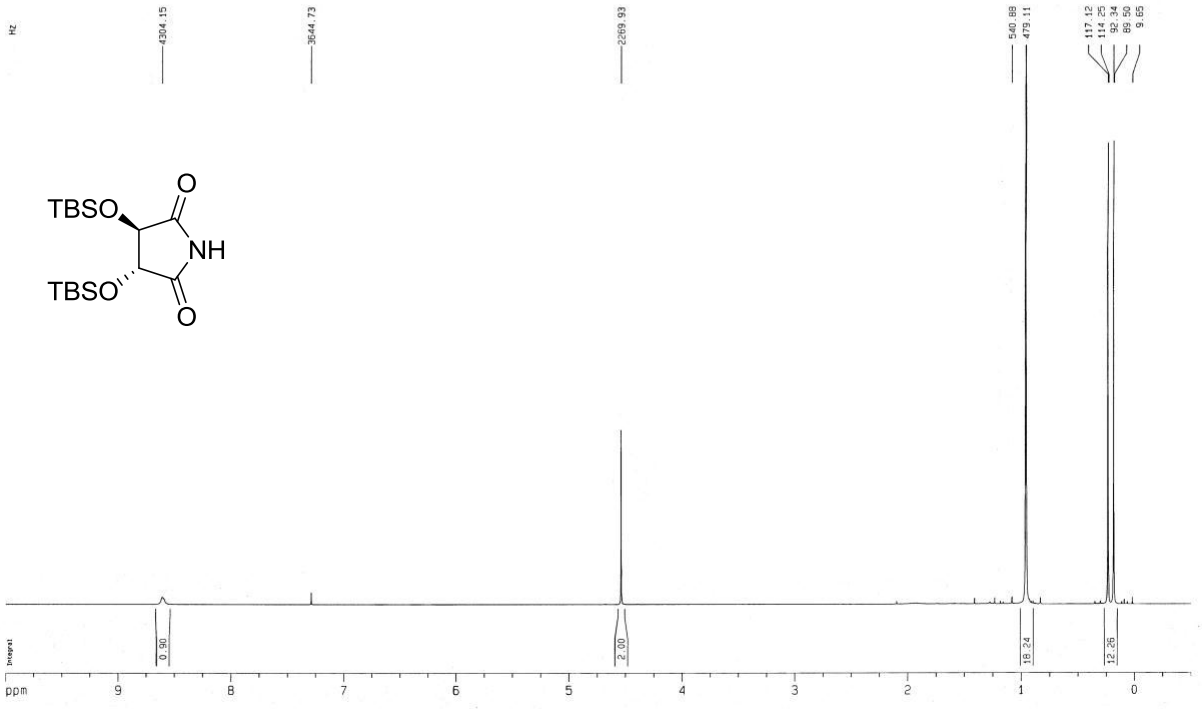


^{13}C NMR Spectrum of (3*R*,4*R*)-3,4-bis(*tert*-butyldimethylsilyloxy)-1-(4-methoxybenzyl) pyrrolidine-2,5-dione (75 MHz, $CDCl_3$)



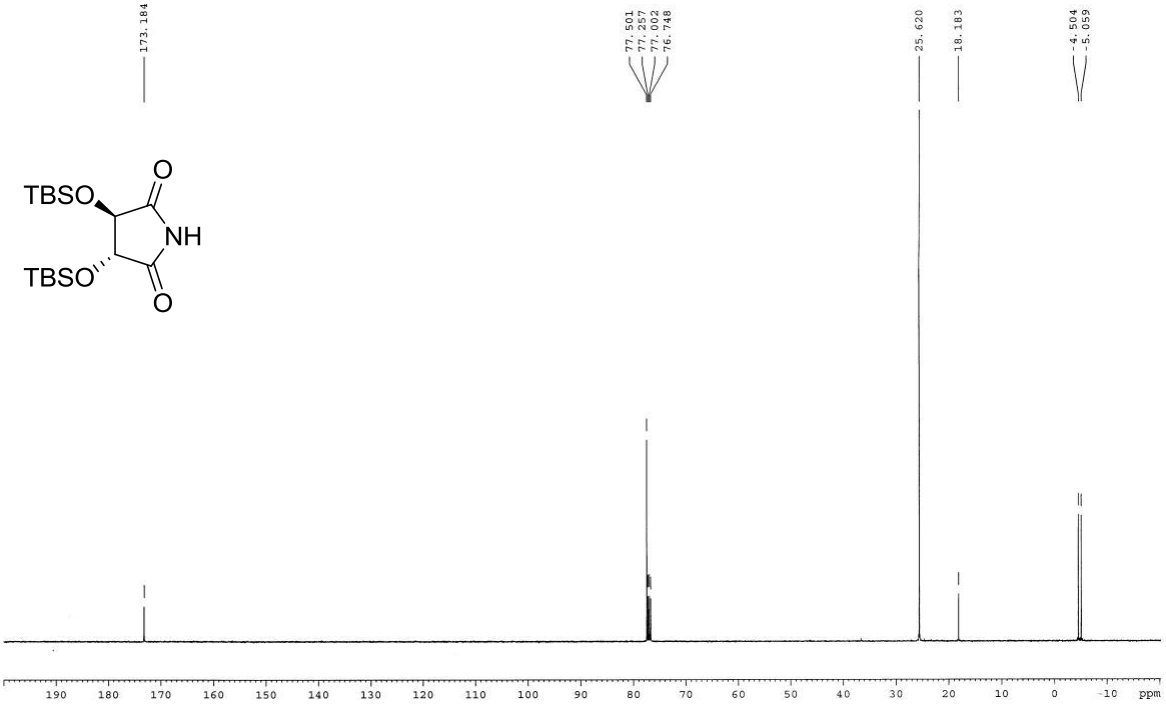
^{1}H NMR Spectrum of (3*R*,4*R*)-3,4-bis(*tert*-butyldimethylsilyloxy)pyrrolidine-2,5-dione

(500 MHz, $CDCl_3$)

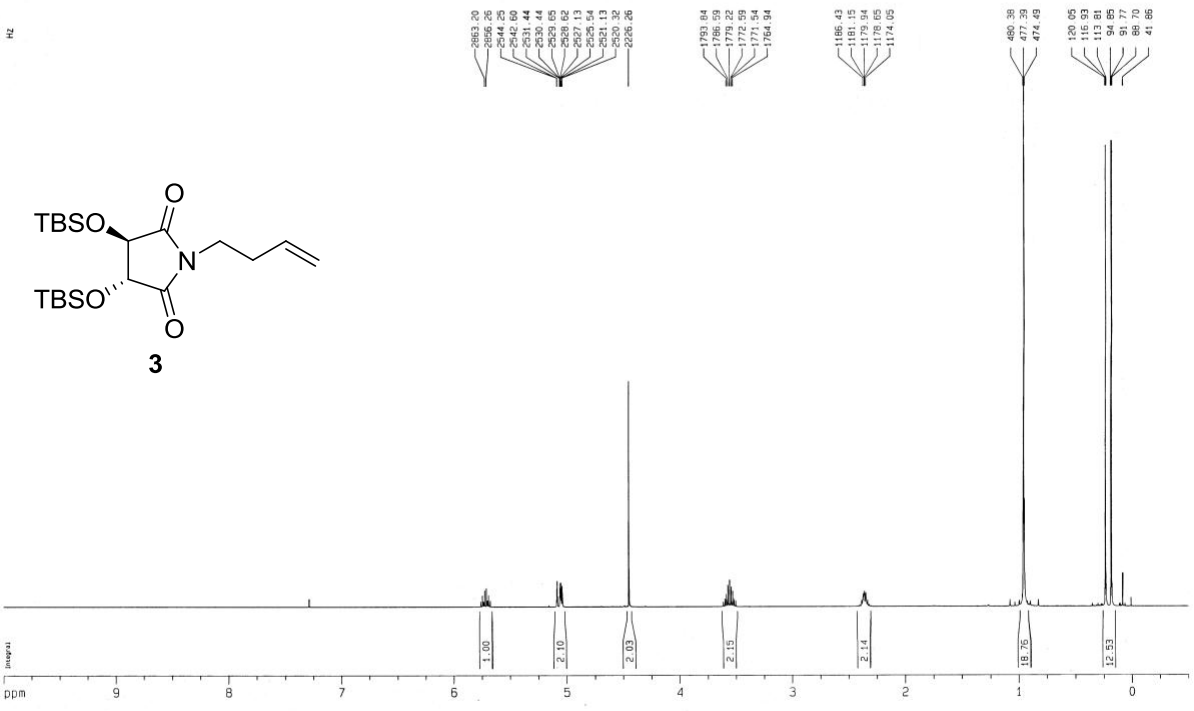


^{13}C NMR Spectrum of (3*R*,4*R*)-3,4-bis(*tert*-butyldimethylsilyloxy)pyrrolidine-2,5-dione

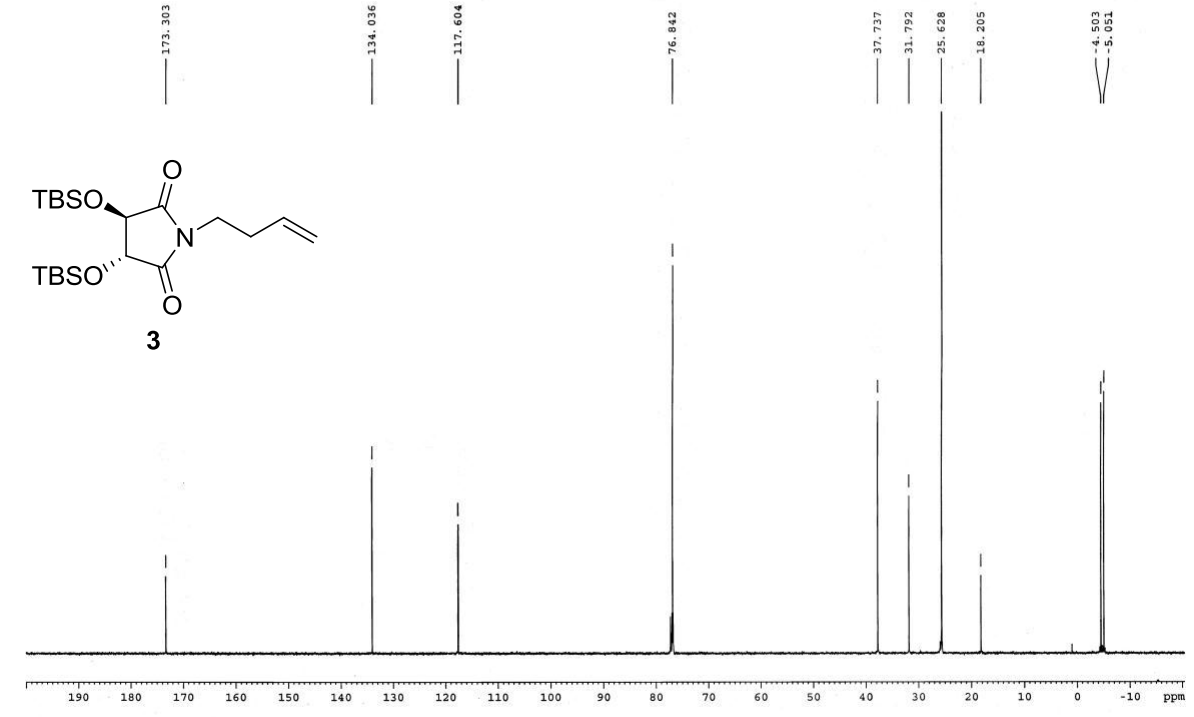
(125 MHz, $CDCl_3$)



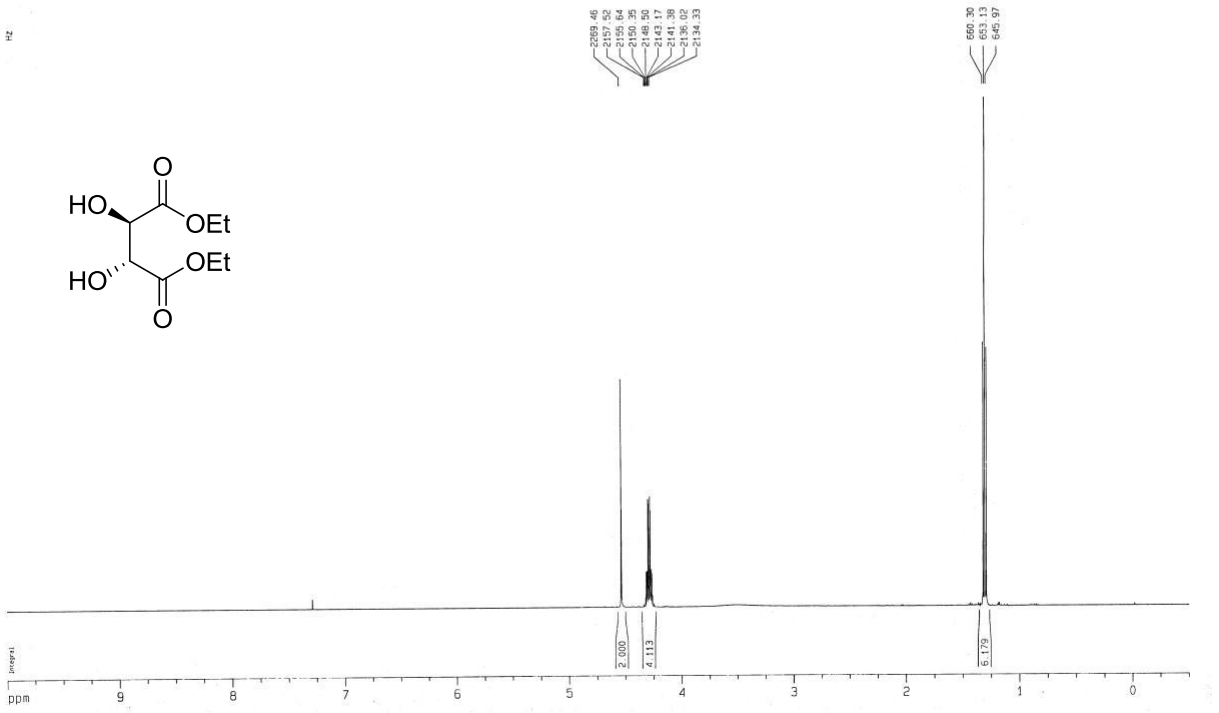
^{1}H NMR Spectrum of **3** (500 MHz, $CDCl_3$)



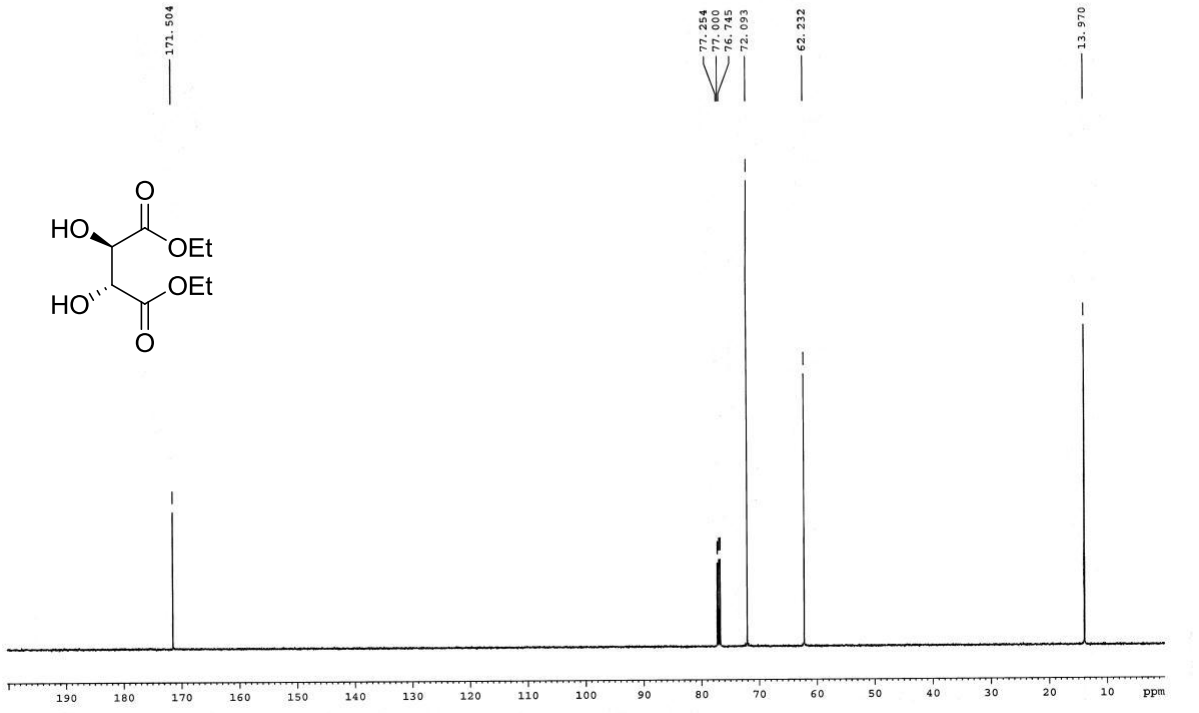
^{1}H NMR Spectrum of **3** (125 MHz, $CDCl_3$)



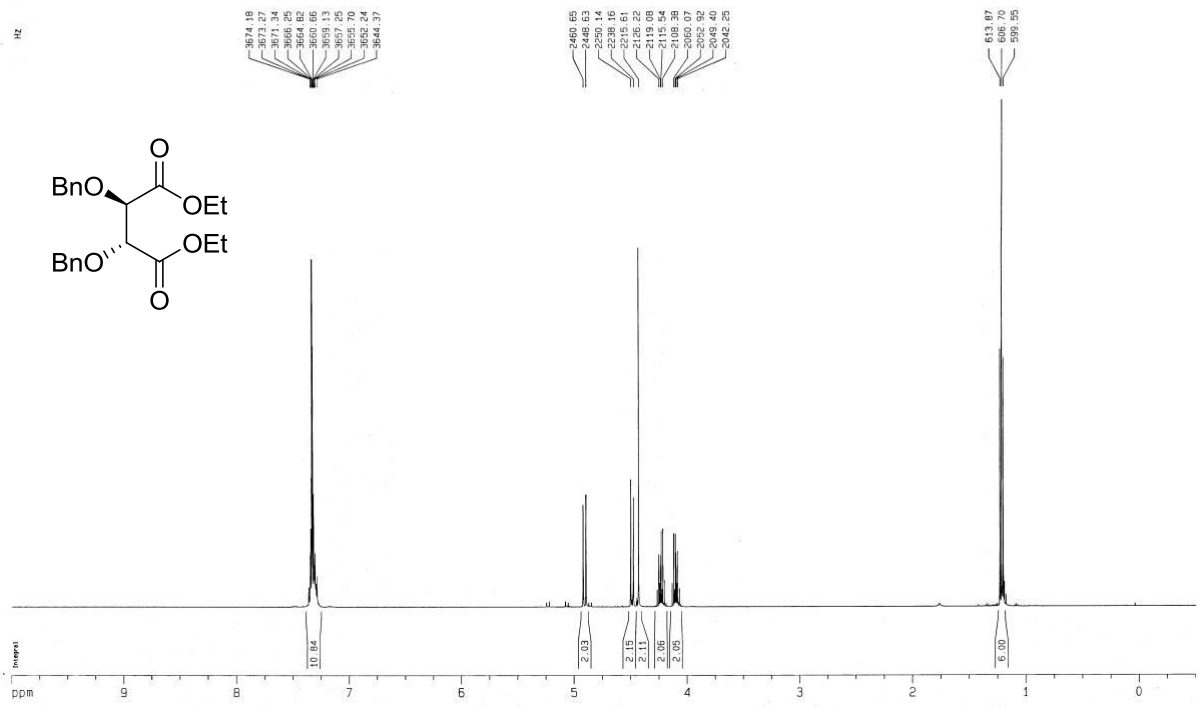
^{1}H NMR Spectrum of (2*R*,3*R*)-diethyl 2,3-dihydroxysuccinate (500 MHz, $CDCl_3$)



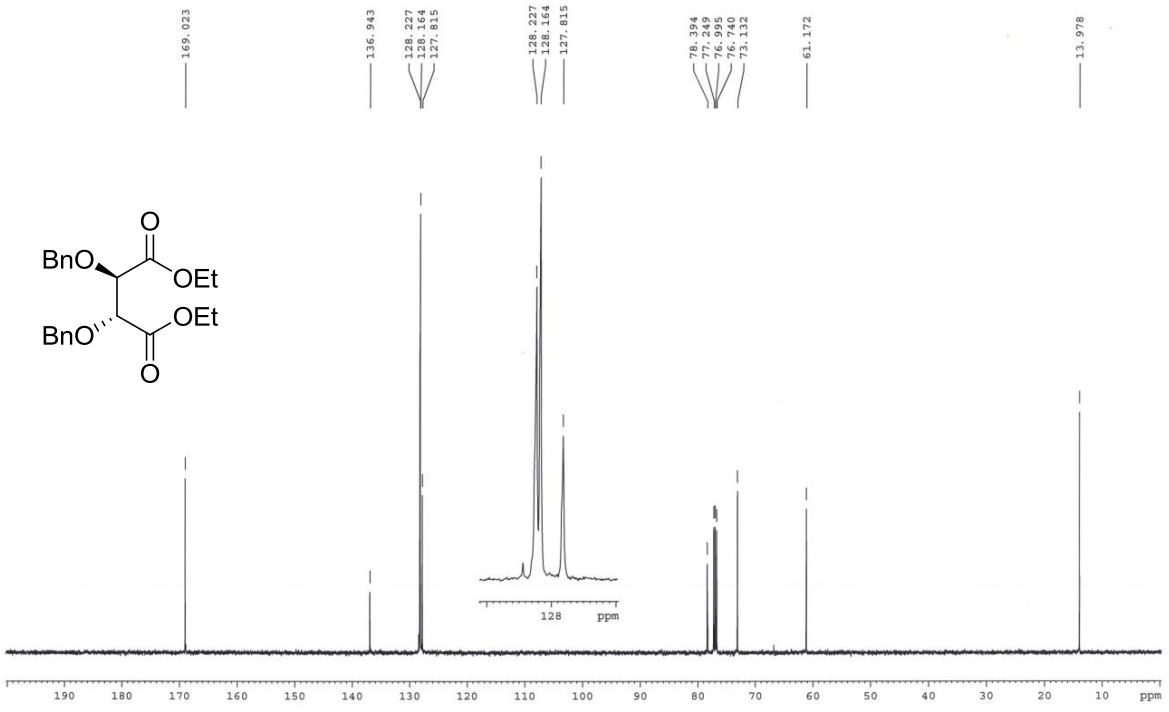
^{13}C NMR Spectrum of (2*R*,3*R*)-diethyl 2,3-dihydroxysuccinate (125 MHz, $CDCl_3$)



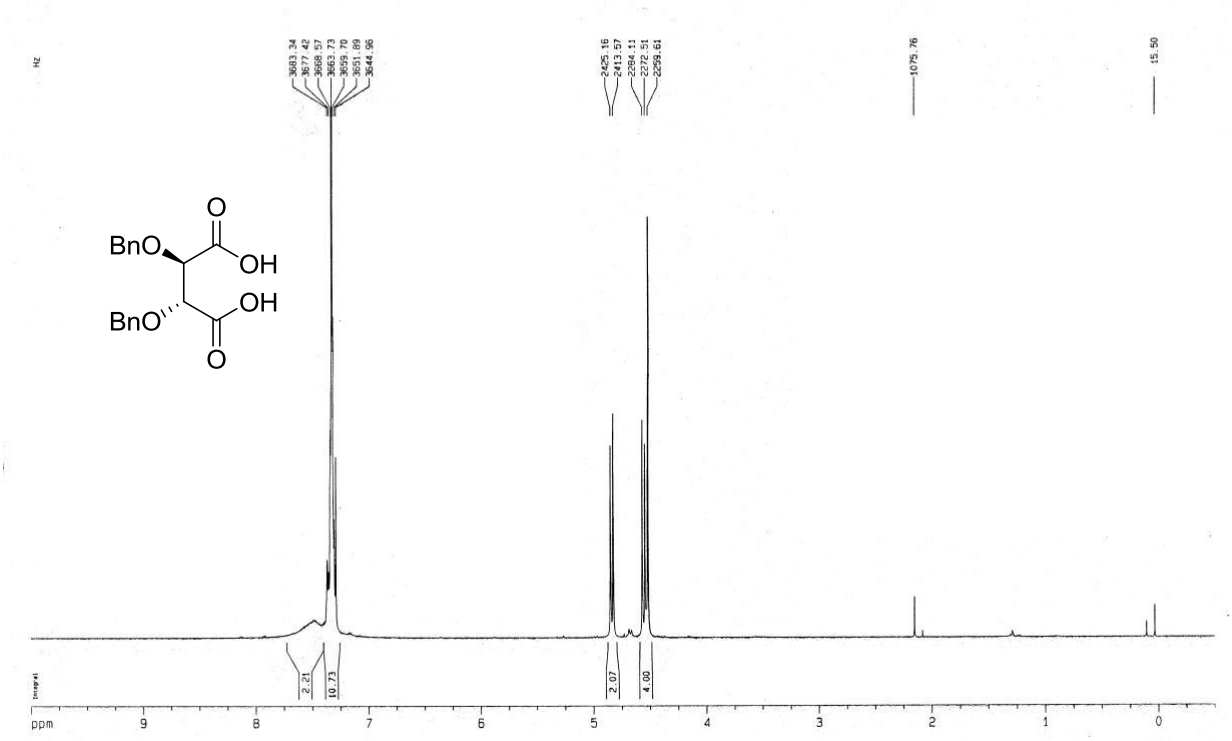
^{1}H NMR Spectrum of (2*R*,3*R*)-diethyl 2,3-bis(benzyloxy)succinate (500 MHz, $CDCl_3$)



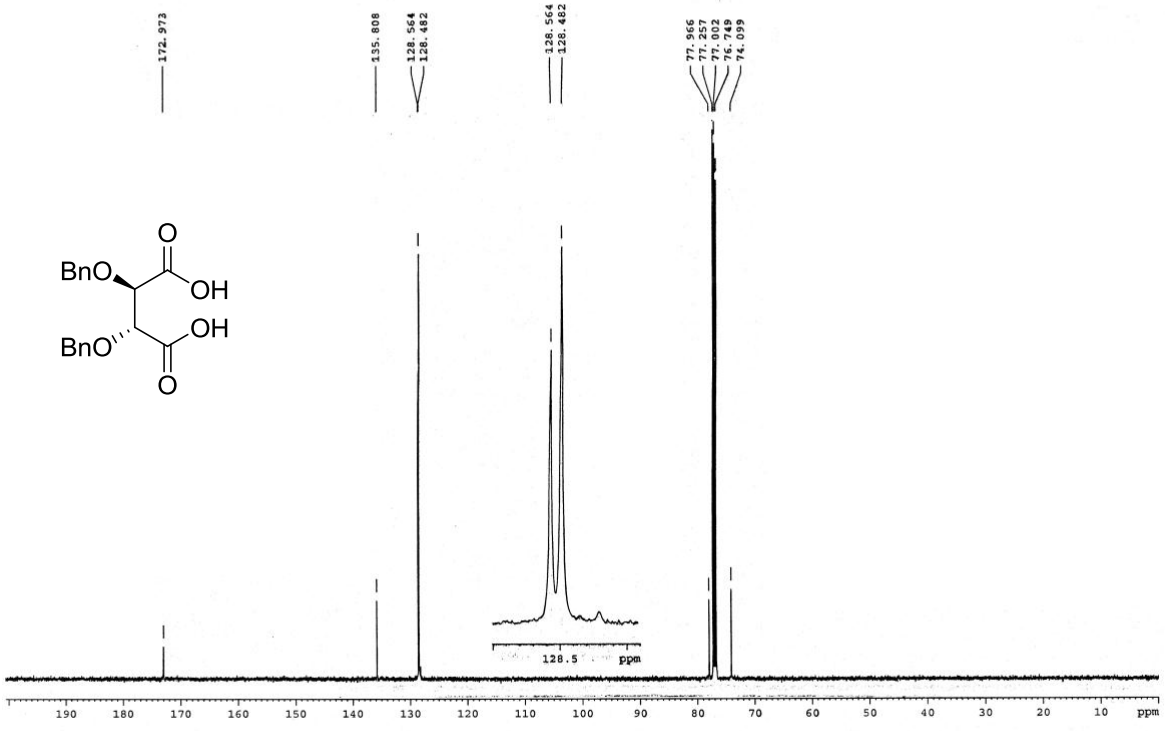
^{13}C NMR Spectrum of (2*R*,3*R*)-diethyl 2,3-bis(benzyloxy)succinate (125 MHz, $CDCl_3$)



^{1}H NMR Spectrum of (2*R*,3*R*)-2,3-bis(benzyloxy)succinic acid (500 MHz, $CDCl_3$)

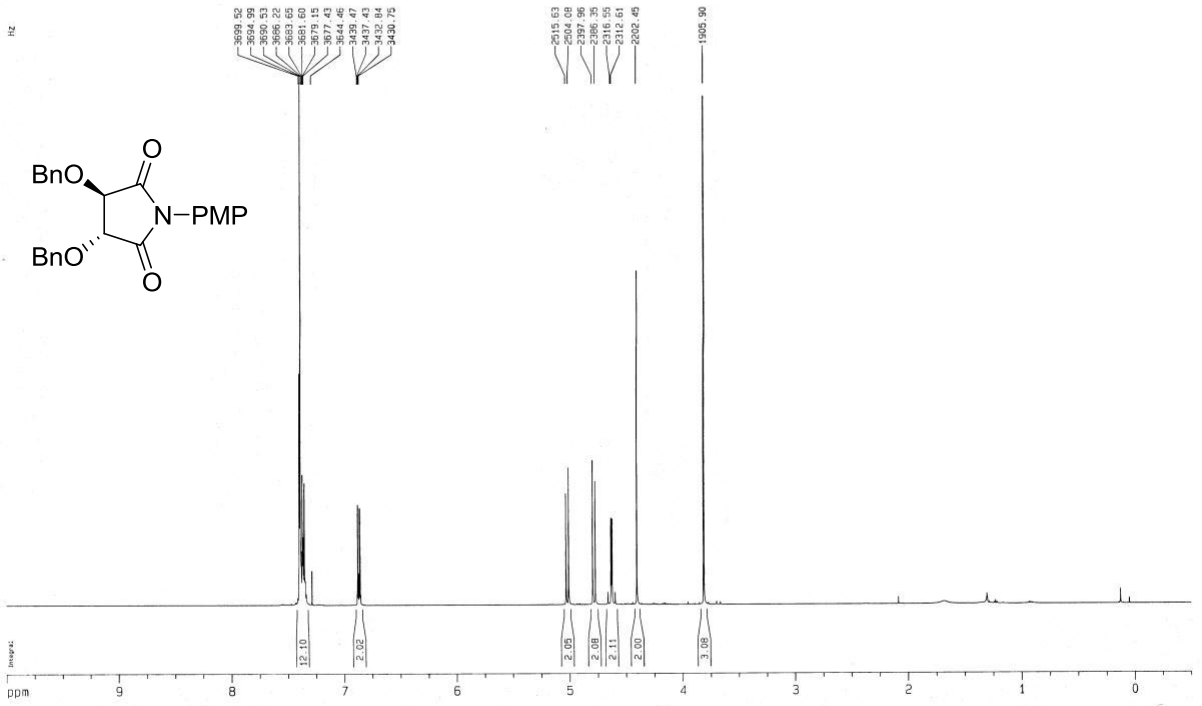


^{13}C NMR Spectrum of (2*R*,3*R*)-2,3-bis(benzyloxy)succinic acid (125 MHz, $CDCl_3$)



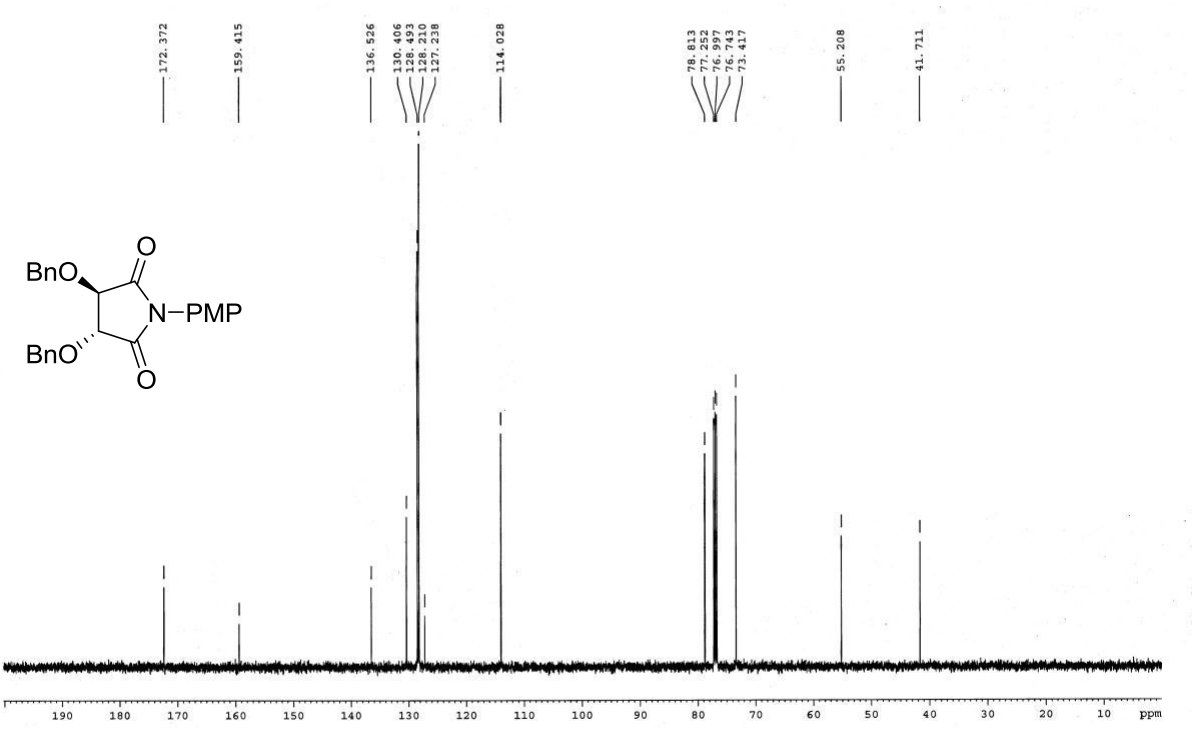
^{1}H NMR Spectrum of (3*R*,4*R*)-3,4-bis(benzyloxy)-1-(4-methoxybenzyl)pyrrolidine-2,5-dione

(500 MHz, $CDCl_3$)

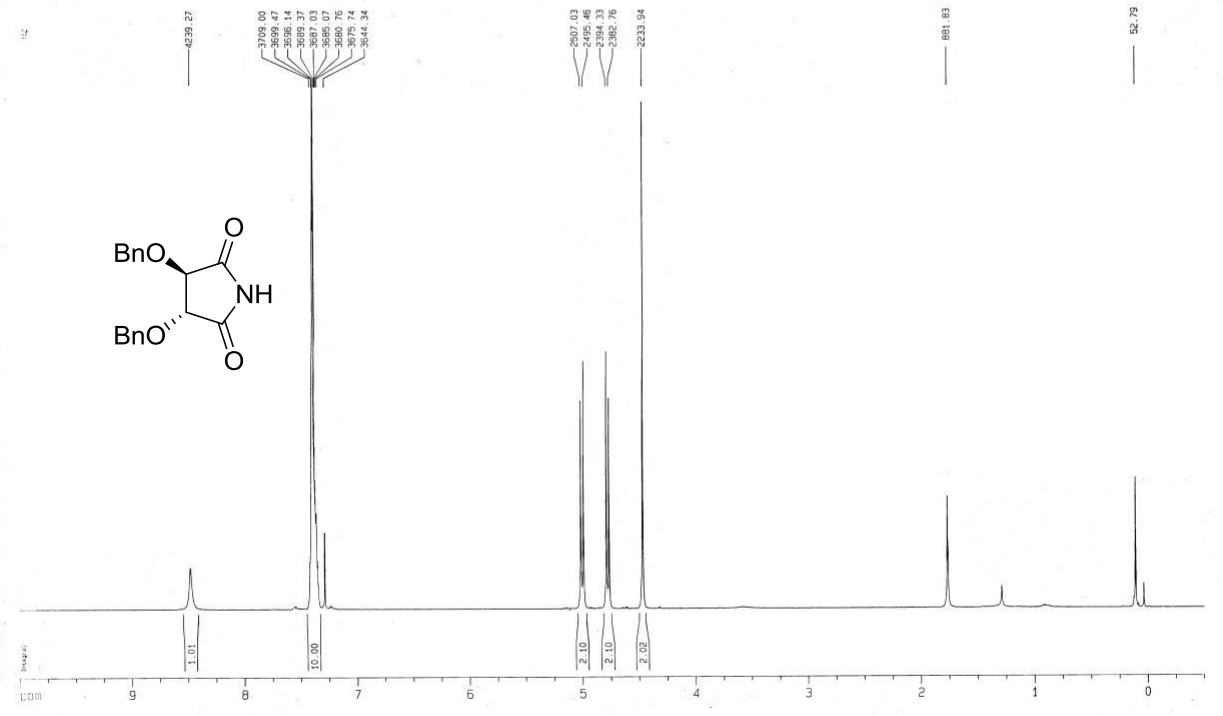


. ^{13}C NMR Spectrum of (3*R*,4*R*)-3,4-bis(benzyloxy)-1-(4-methoxybenzyl)pyrrolidine-2,5-dione

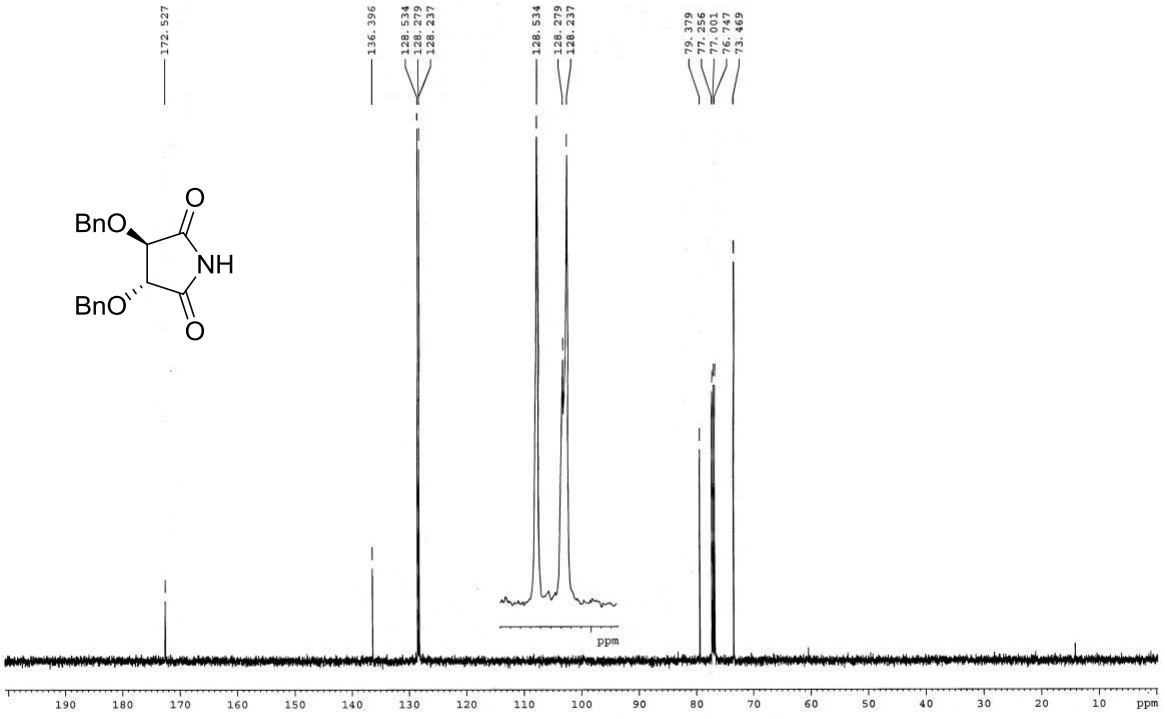
(125 MHz, $CDCl_3$)



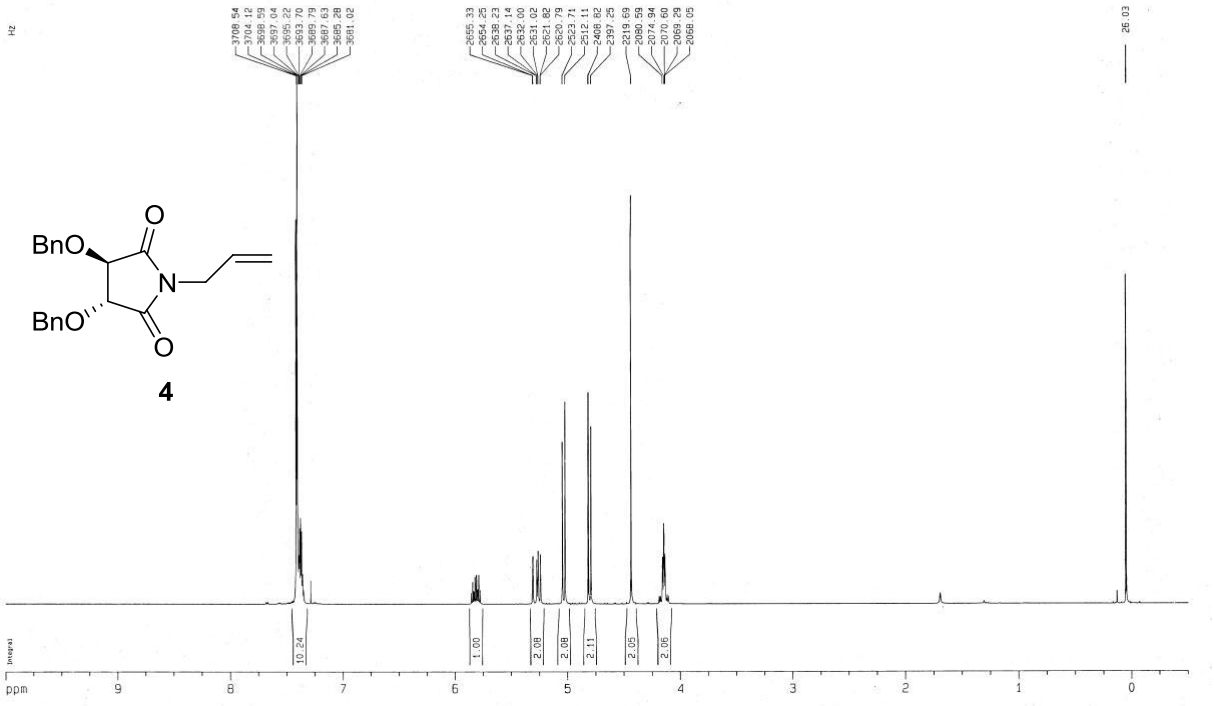
^{1}H NMR Spectrum of (3*R*,4*R*)-3,4-bis(benzyloxy)pyrrolidine-2,5-dione (500 MHz, $CDCl_3$)



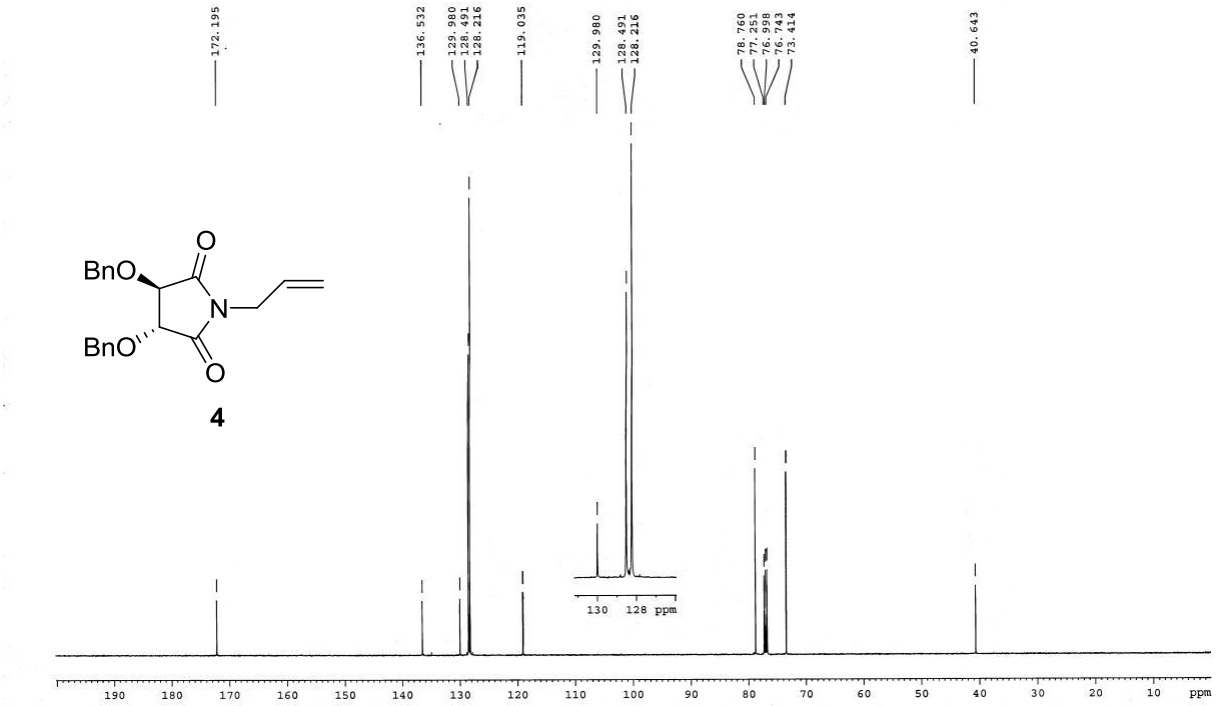
^{13}C NMR Spectrum of (3*R*,4*R*)-3,4-bis(benzyloxy)pyrrolidine-2,5-dione (125 MHz, $CDCl_3$)



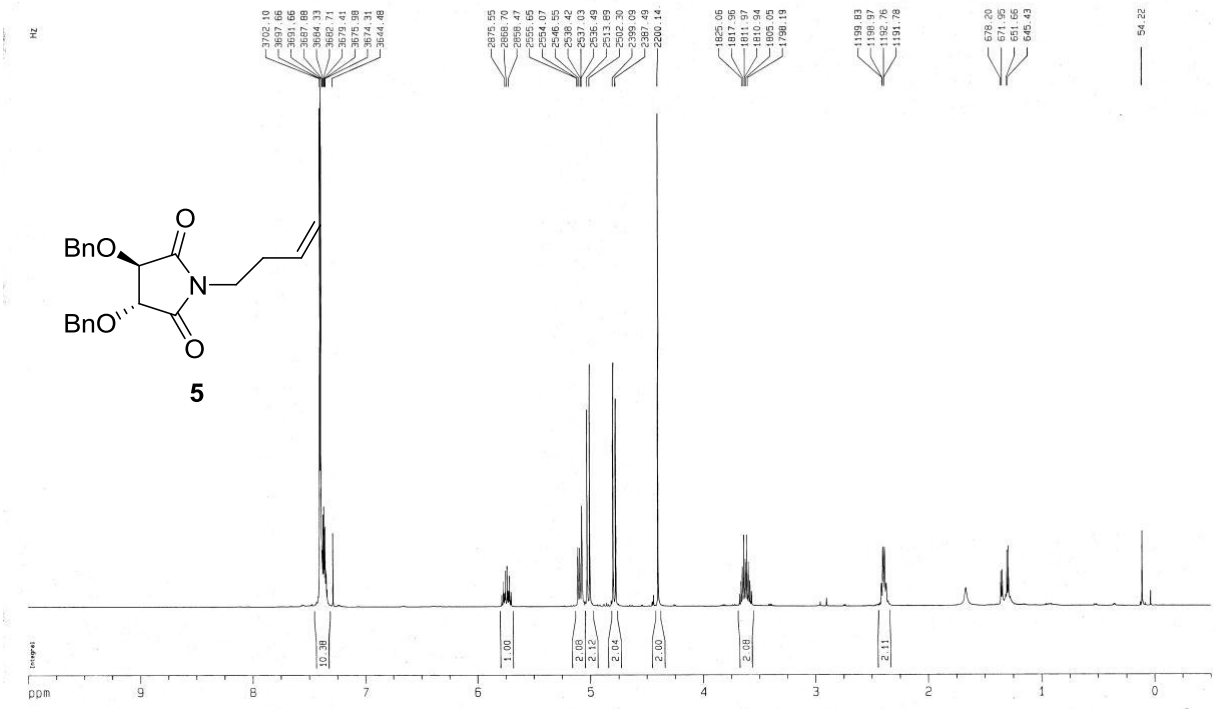
^{1}H NMR Spectrum of **4** (500 MHz, $CDCl_3$)



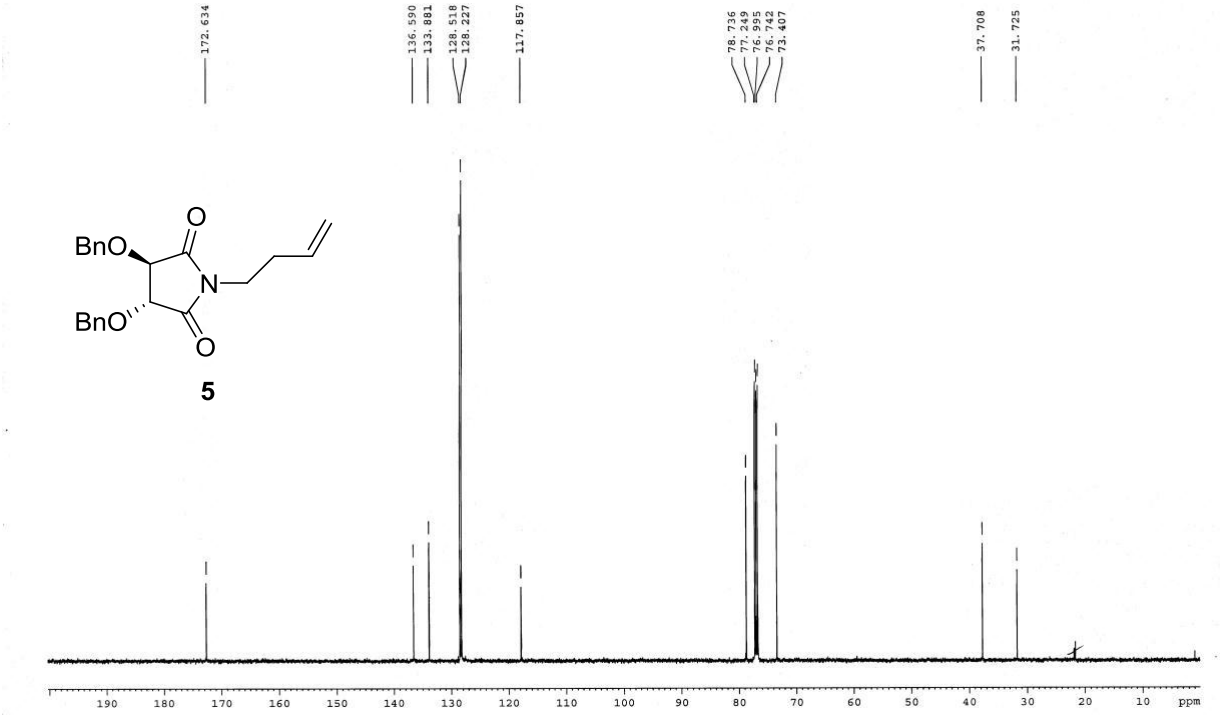
^{13}C NMR Spectrum of **4** (125 MHz, $CDCl_3$)



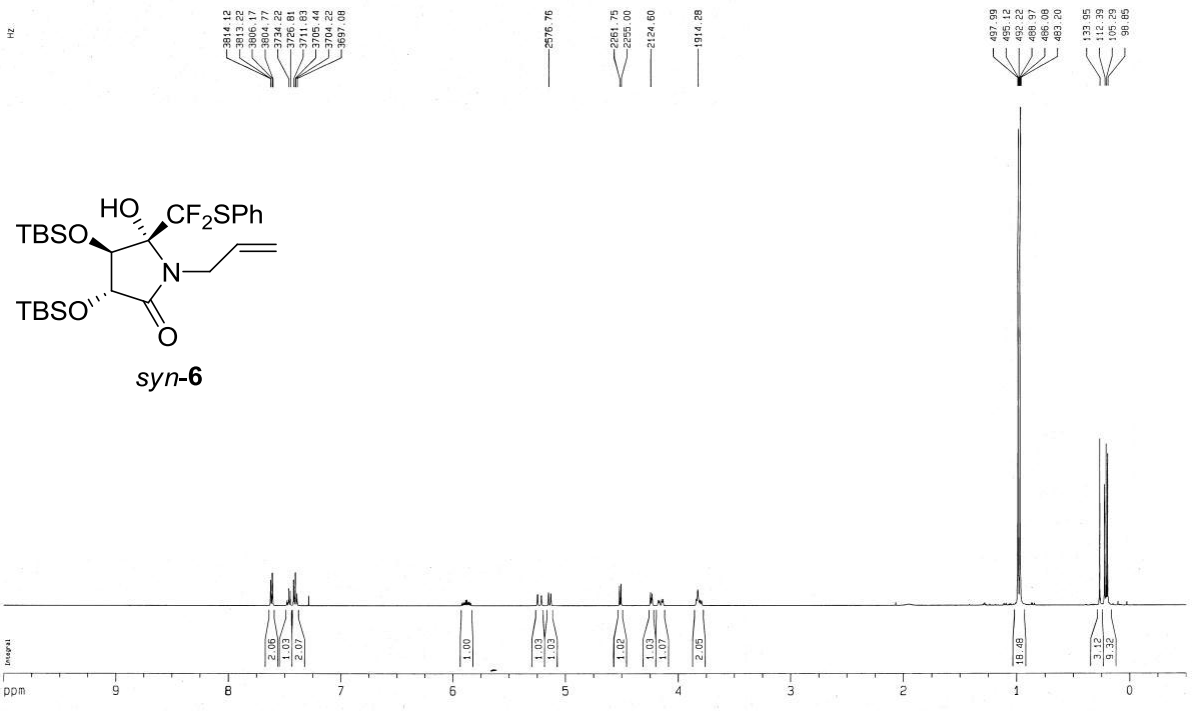
^{1}H NMR Spectrum of **5** (500 MHz, $CDCl_3$)



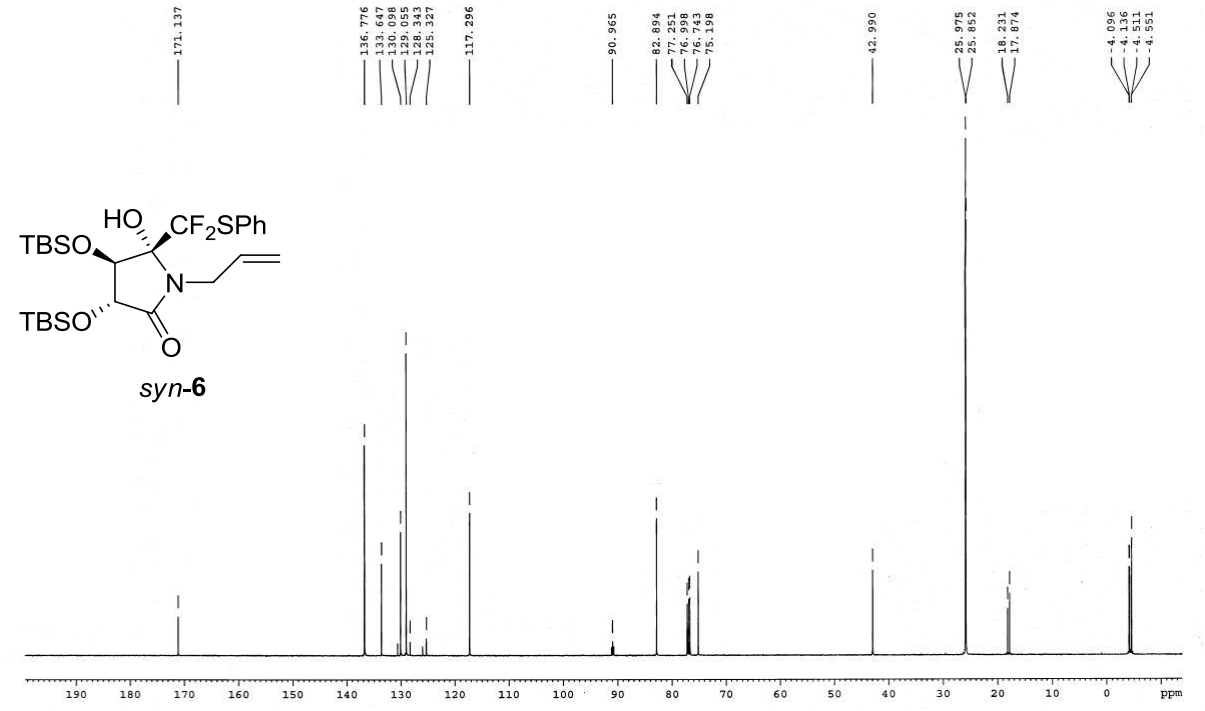
^{13}C NMR Spectrum of **5** (125 MHz, $CDCl_3$)



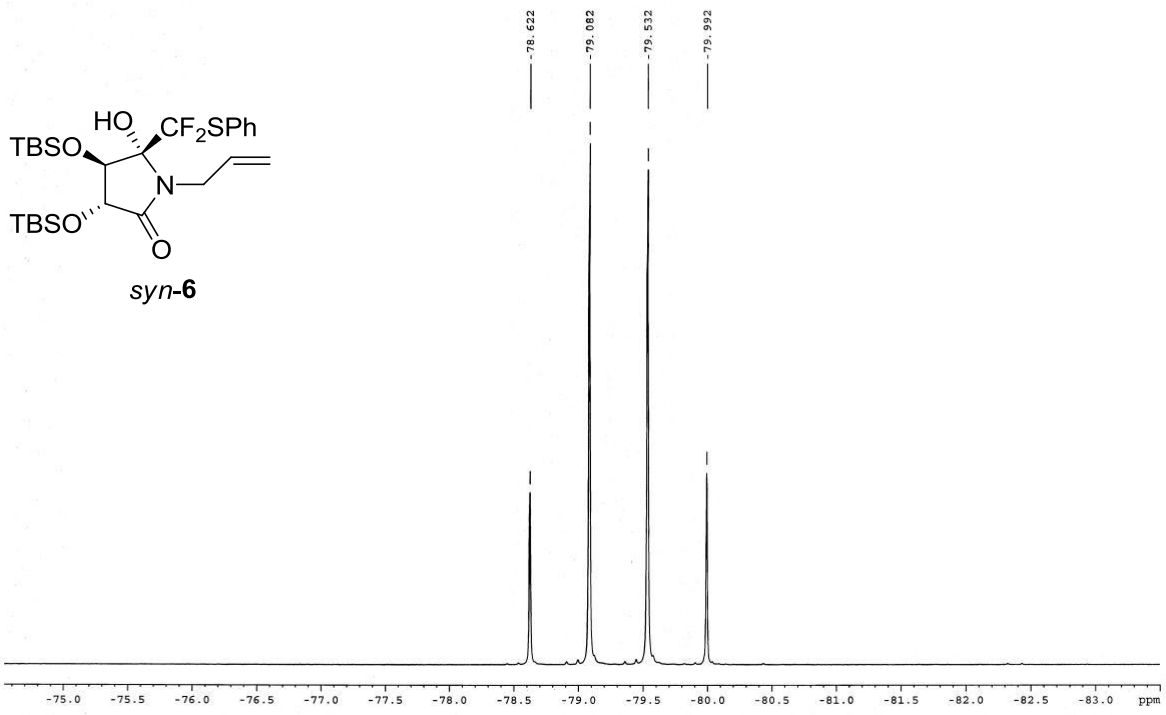
^{1}H NMR Spectrum of *syn*-**6** (500 MHz, $CDCl_3$)



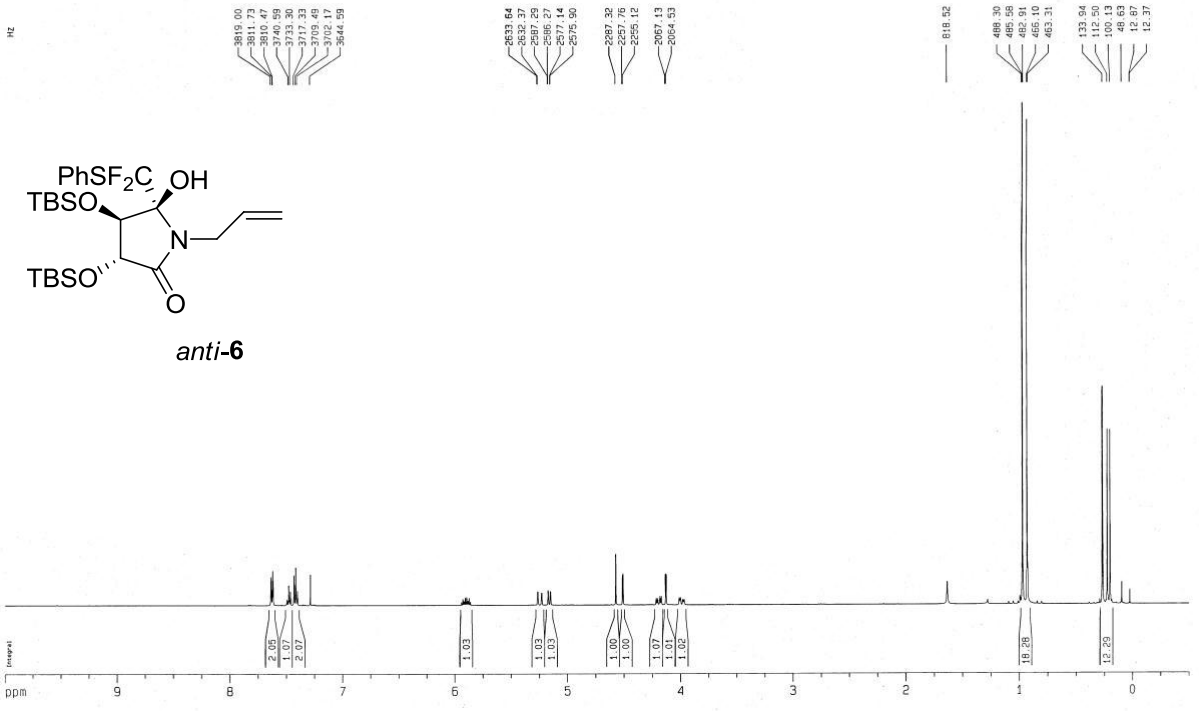
^{13}C NMR Spectrum of *syn*-**6** (125 MHz, $CDCl_3$)



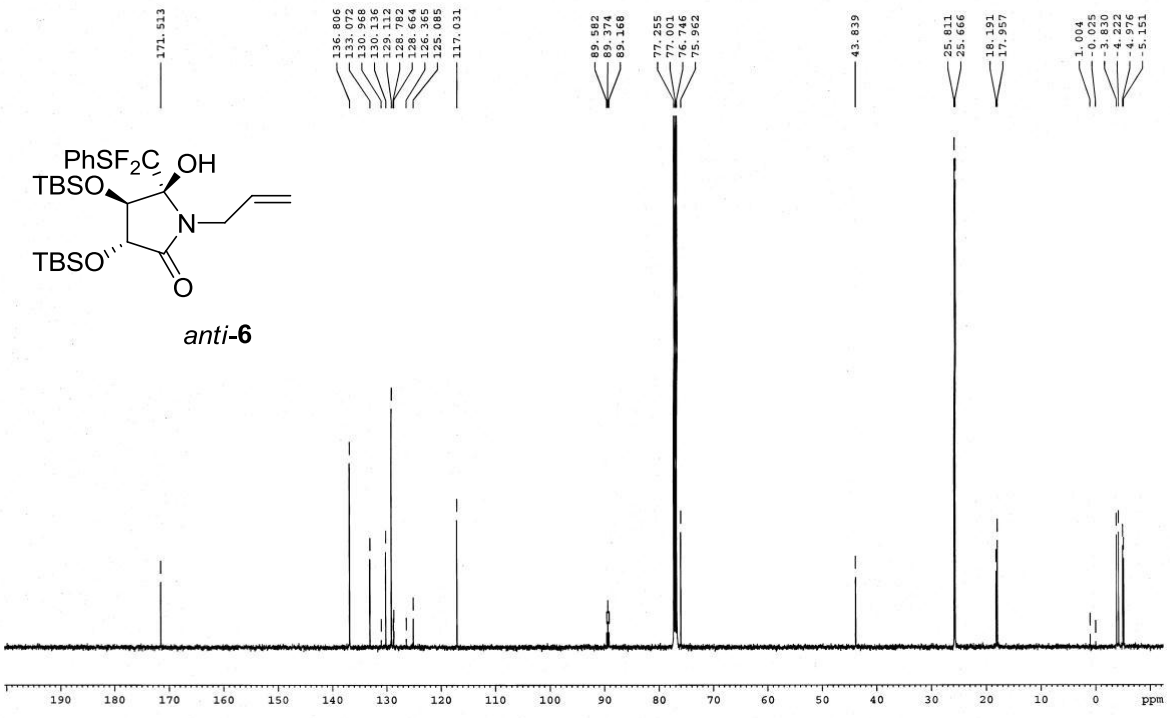
^{19}F NMR Spectrum of *syn*-**6** (470 MHz, $CDCl_3$)



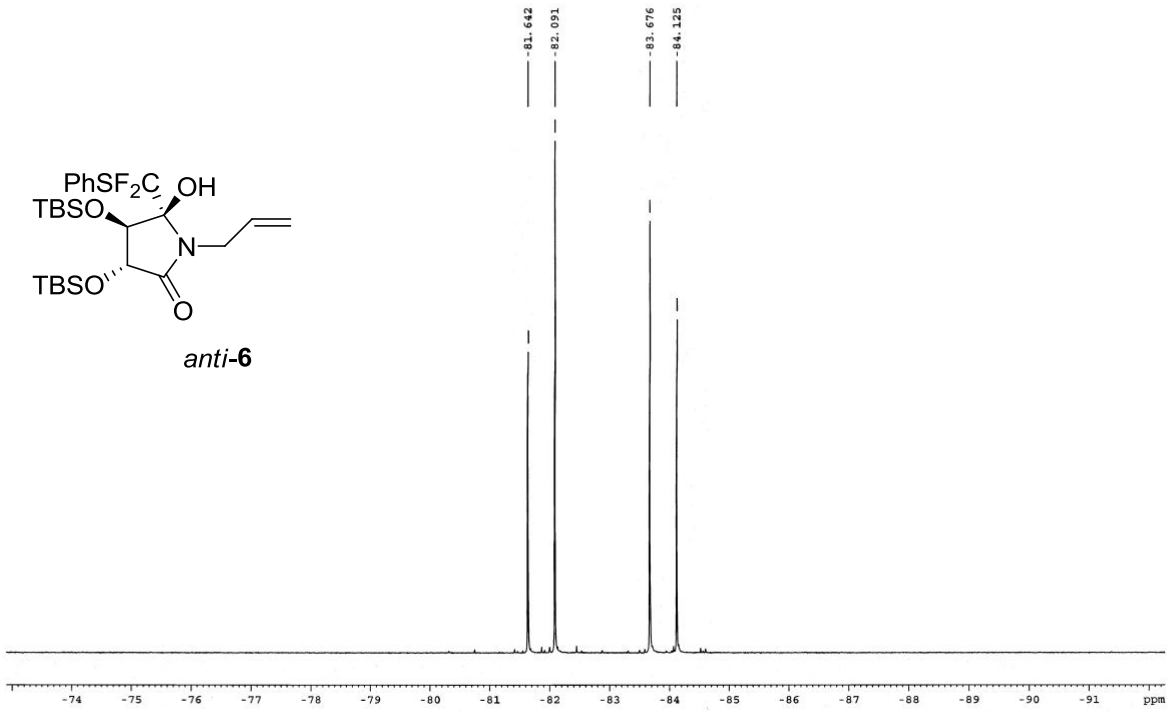
^{1}H NMR Spectrum of *anti*-**6** (500 MHz, $CDCl_3$)



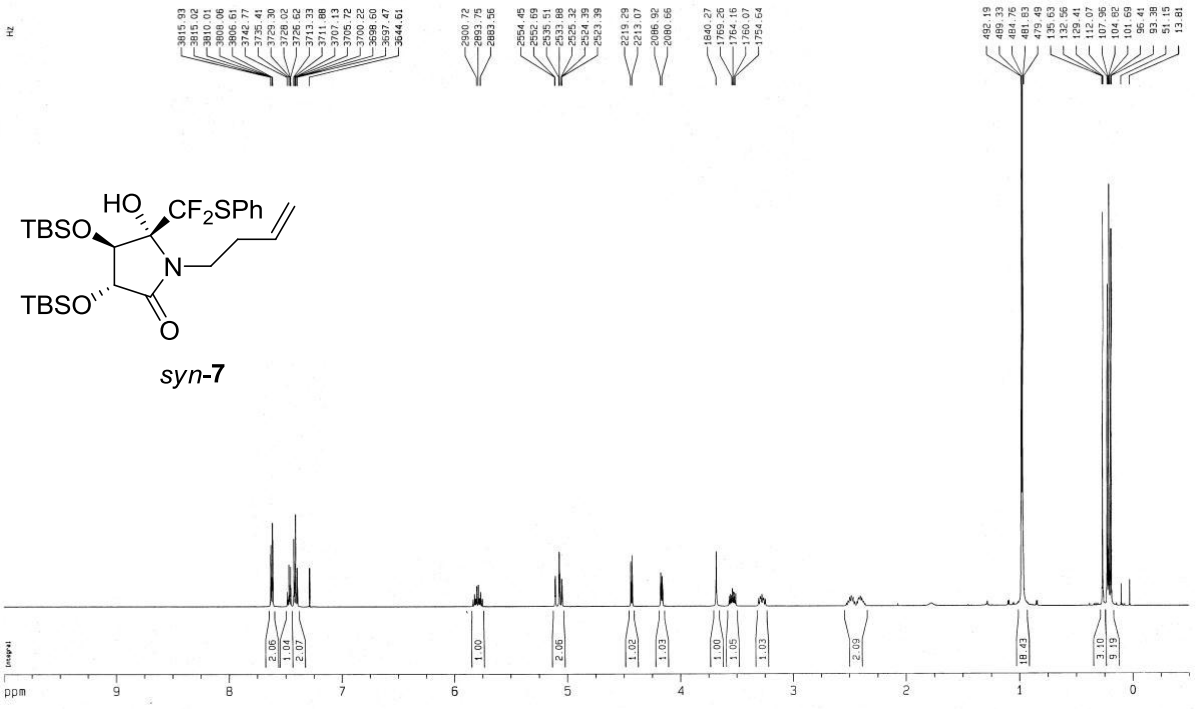
^{13}C NMR Spectrum of *anti*-**6** (125 MHz, $CDCl_3$)



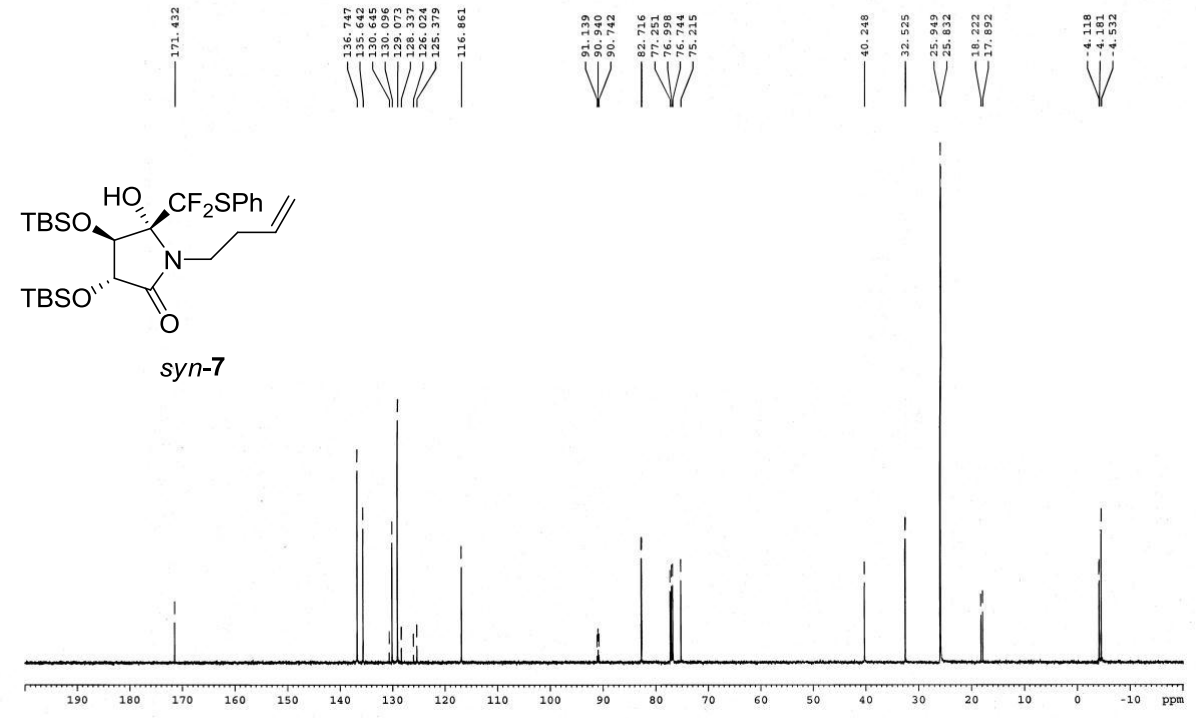
^{9}F NMR Spectrum of *anti*-**6** (470 MHz, $CDCl_3$)



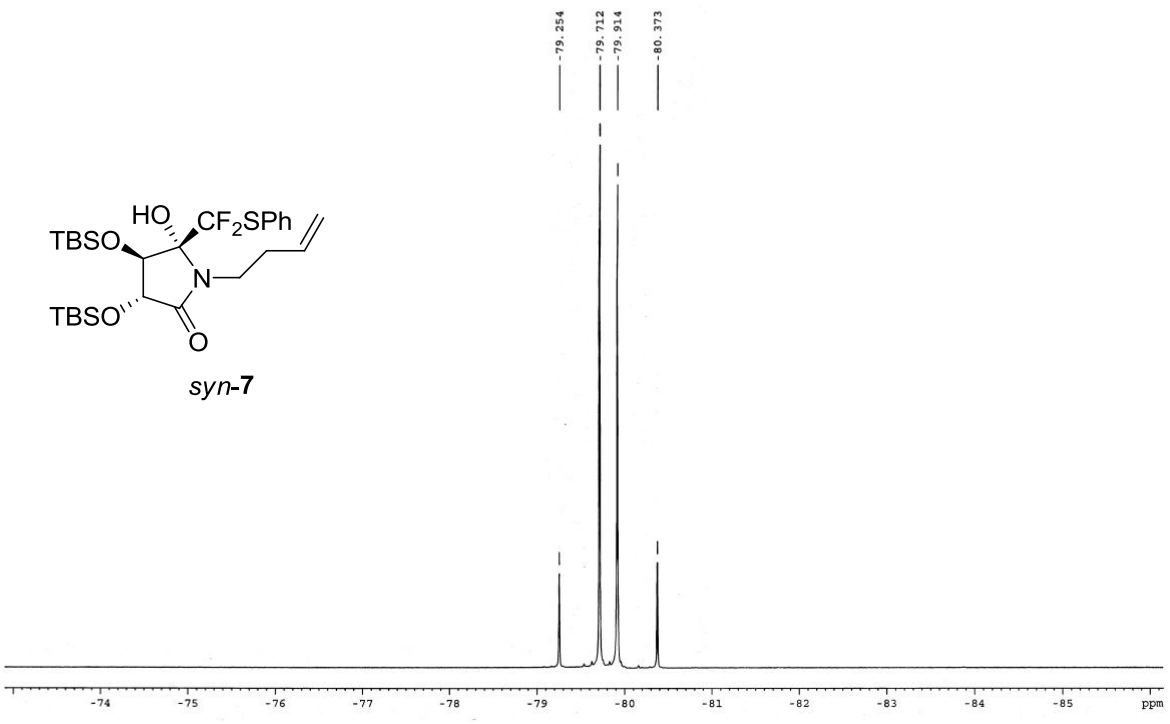
^{1}H NMR Spectrum of *syn*-**7** (500 MHz, $CDCl_3$)



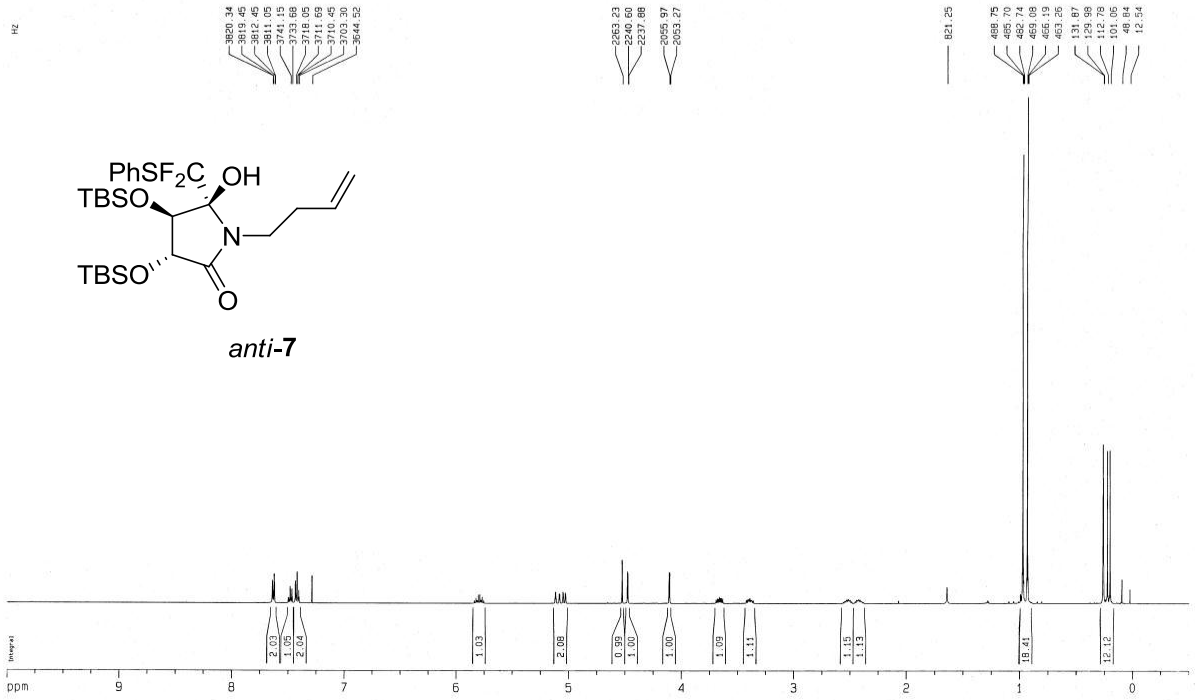
^{13}C NMR Spectrum of *syn*-**7** (125 MHz, $CDCl_3$)



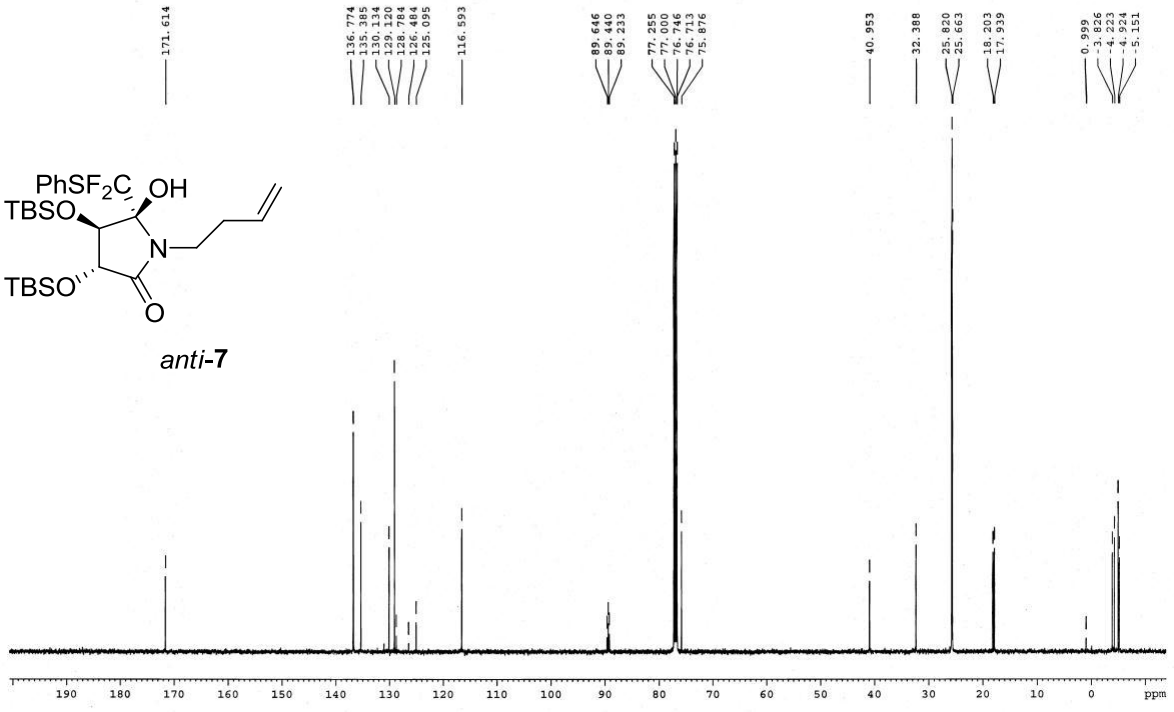
^{19}F NMR Spectrum of *syn*-**7** (470 MHz, $CDCl_3$)



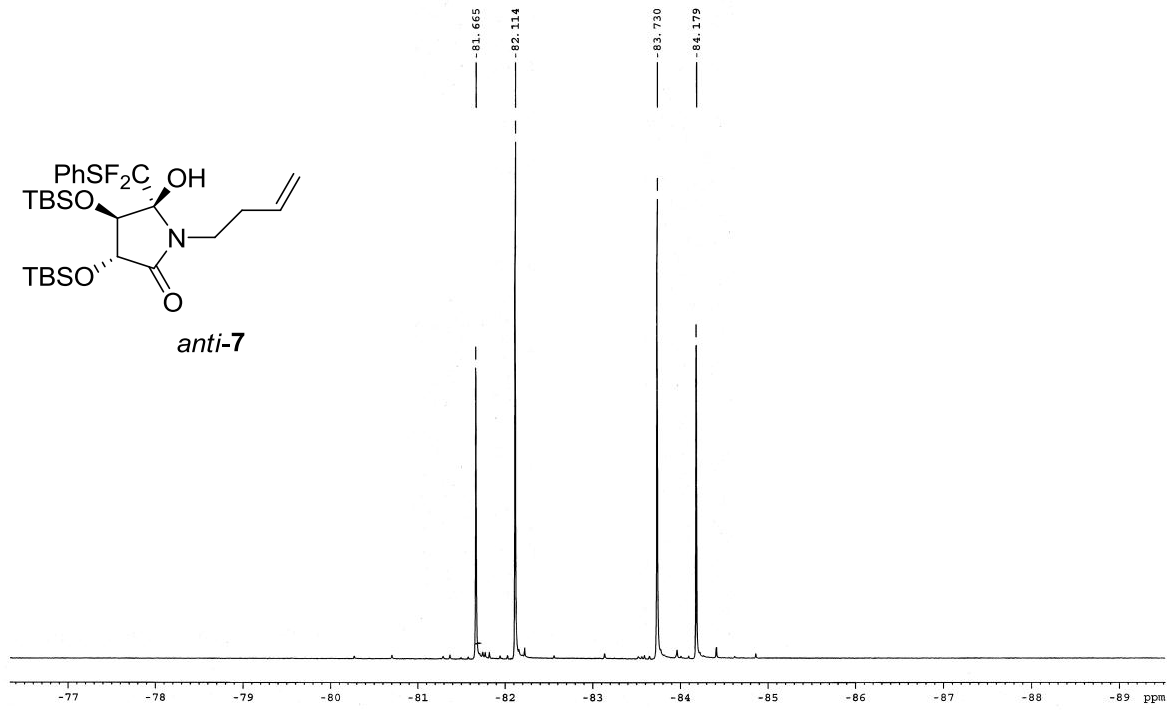
^{1}H NMR Spectrum of *anti*-**7** (500 MHz, $CDCl_3$)



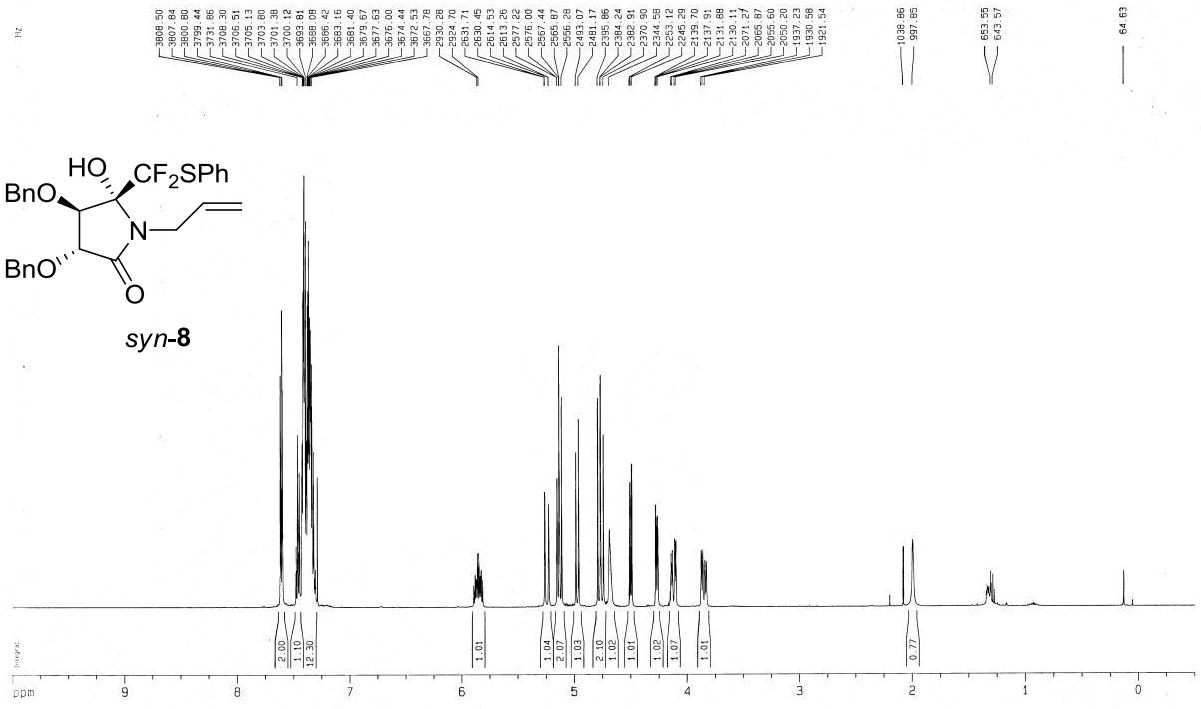
^{13}C NMR Spectrum of *anti*-**7** (125 MHz, $CDCl_3$)



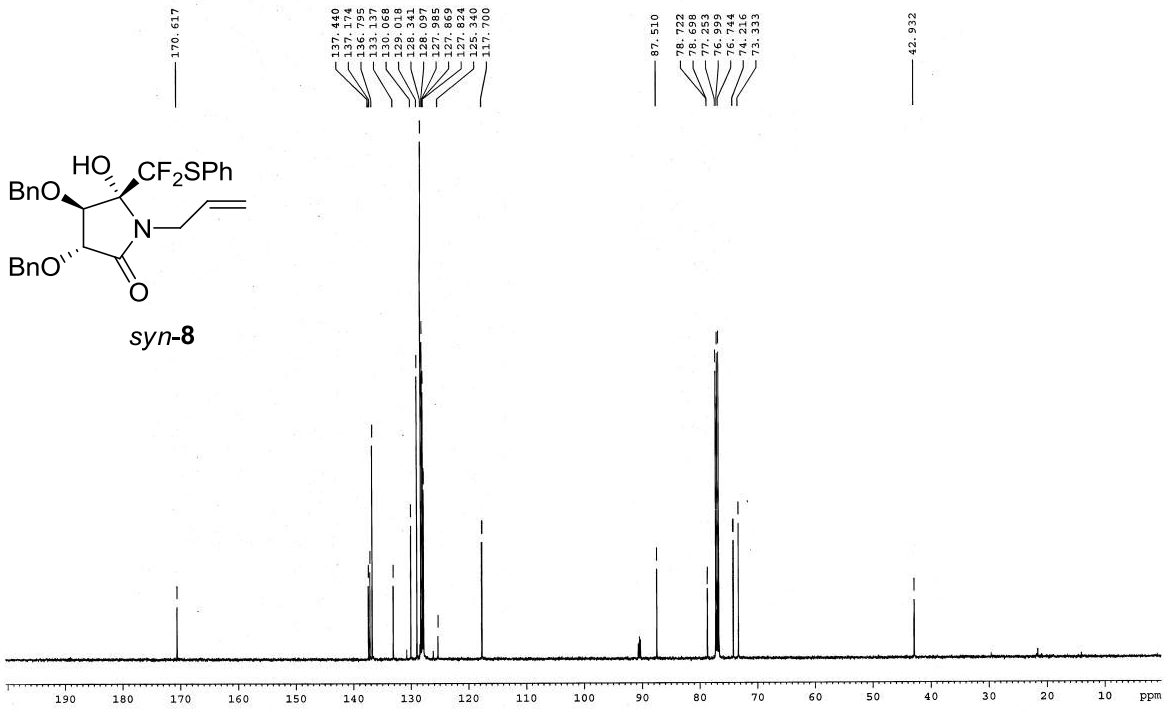
^{19}F NMR Spectrum of *anti*-**7** (470 MHz, $CDCl_3$)



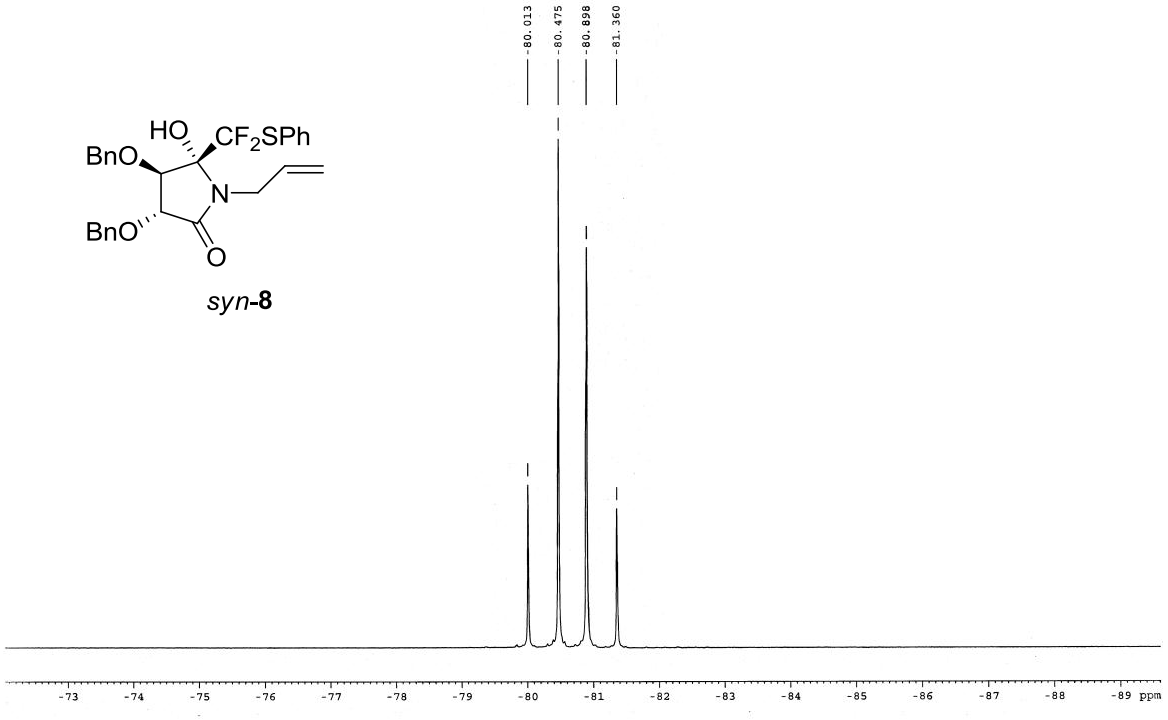
^{1}H NMR Spectrum of *syn*-**8** (500 MHz, $CDCl_3$)



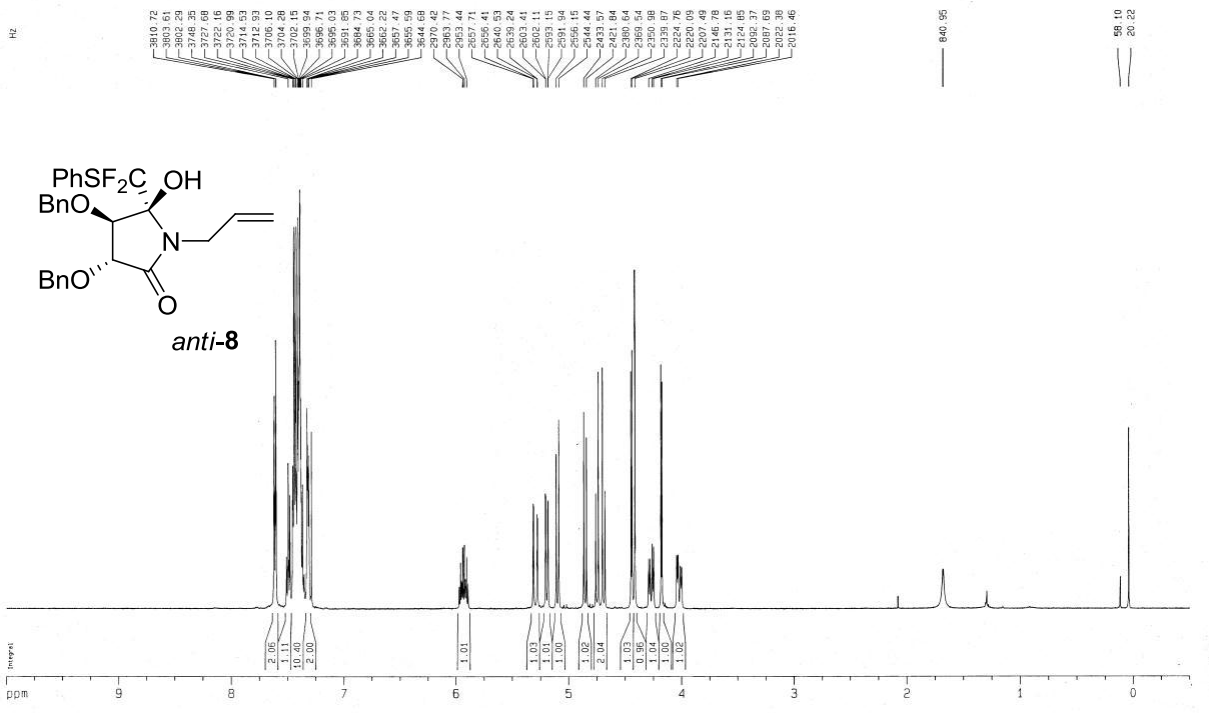
^{13}C NMR Spectrum of *syn*-**8** (125 MHz, $CDCl_3$)



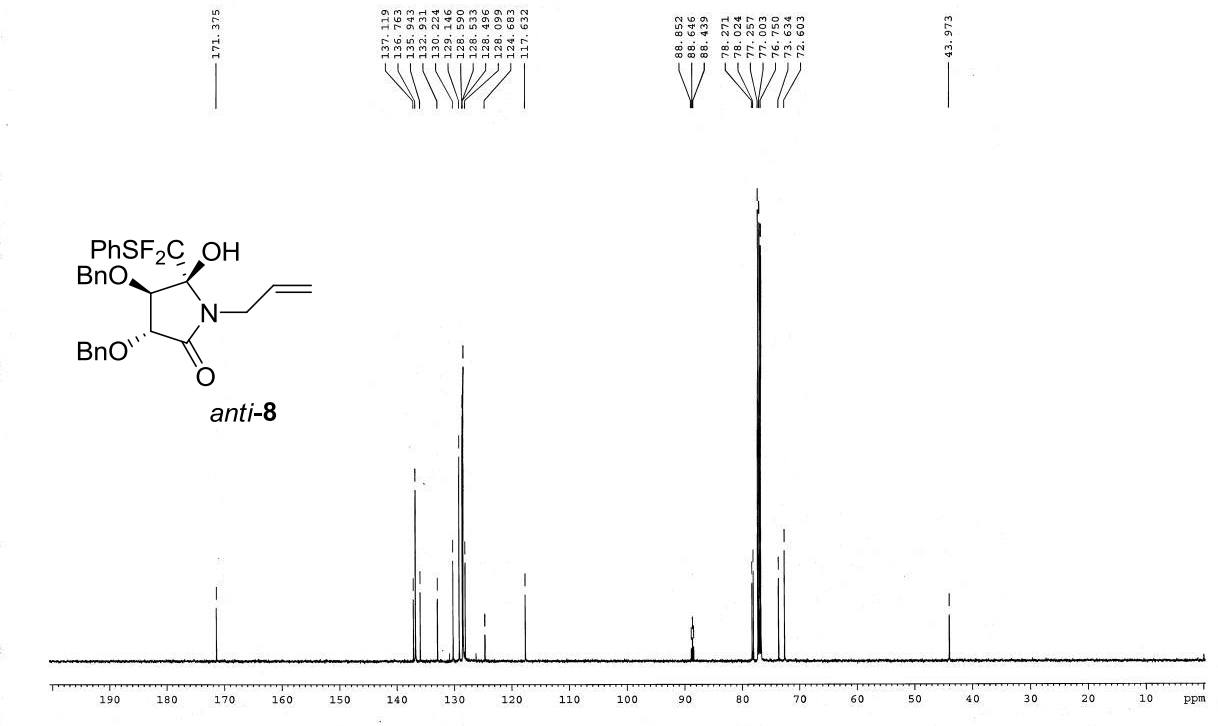
^{19}F NMR Spectrum of *syn*-**8** (470 MHz, $CDCl_3$)



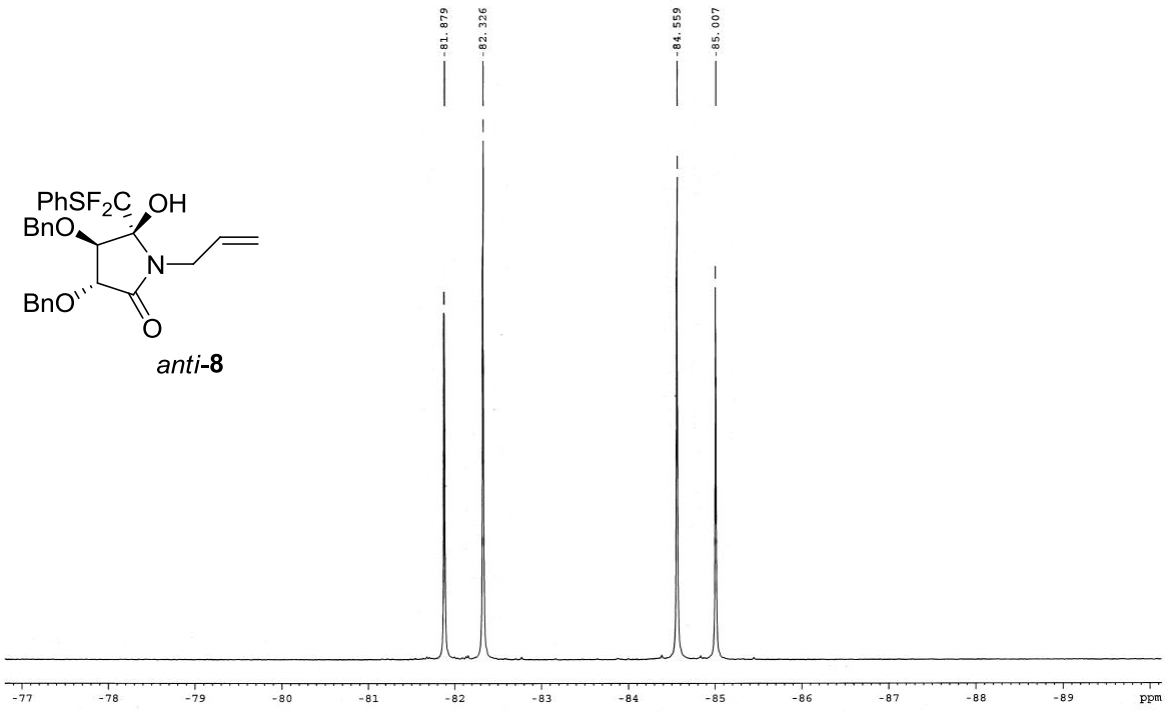
^{1}H NMR Spectrum of *anti*-**8** (500 MHz, $CDCl_3$)



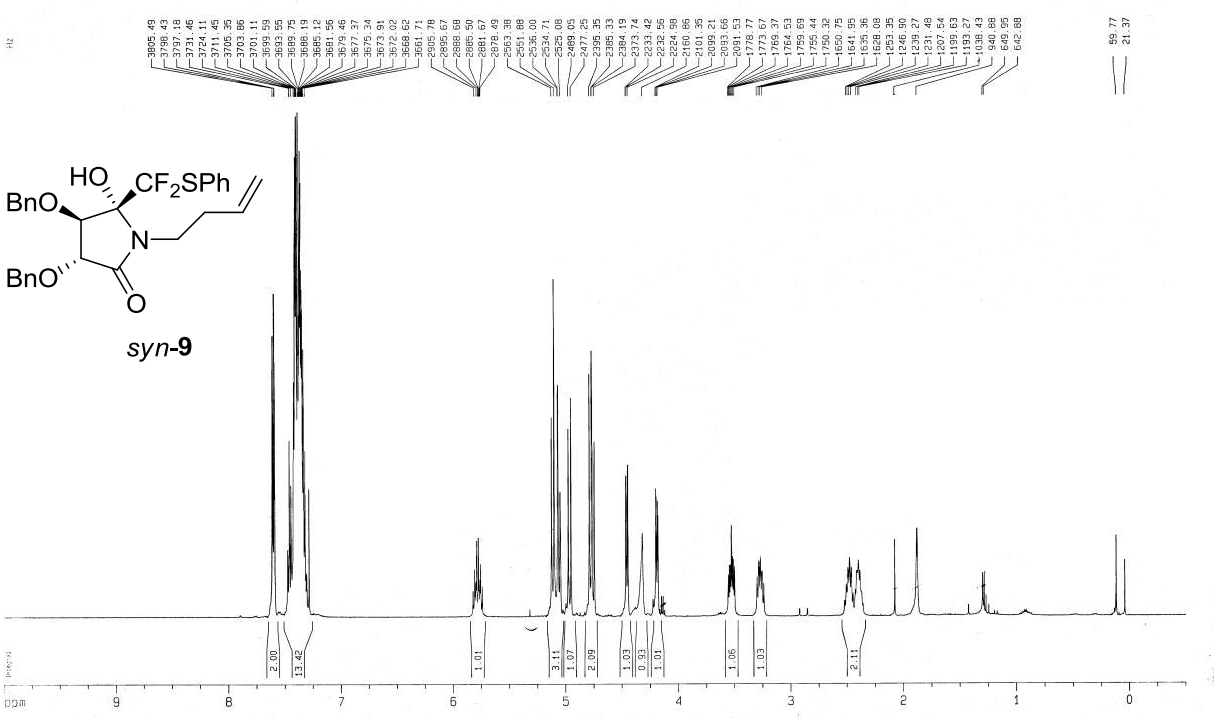
^{13}C NMR Spectrum of *anti*-**8** (125 MHz, $CDCl_3$)



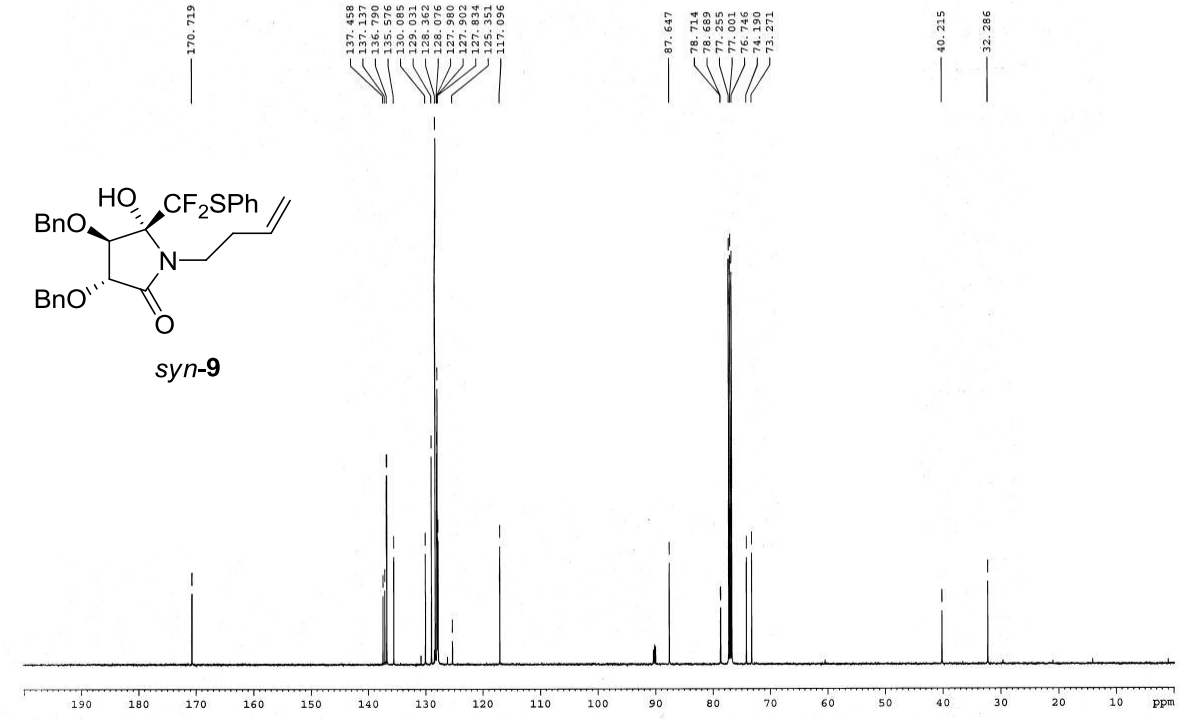
^{19}F NMR Spectrum of *anti*-**8** (470 MHz, $CDCl_3$)



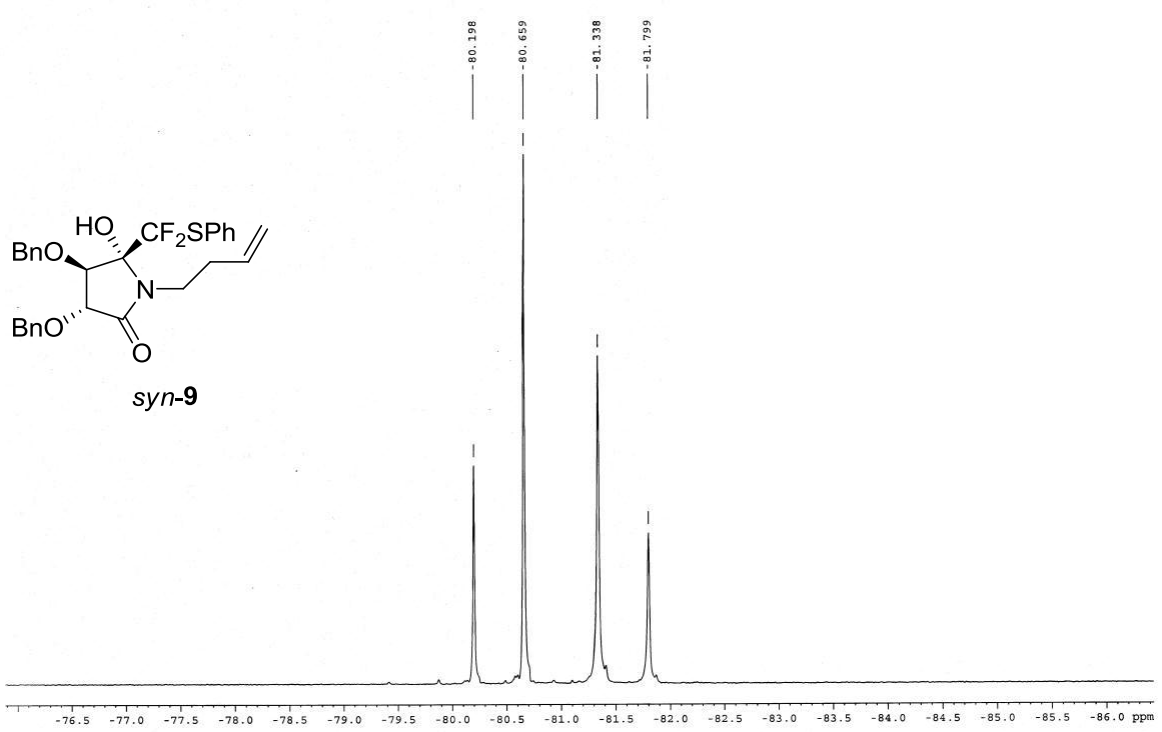
^{1}H NMR Spectrum of *syn*-**9** (500 MHz, $CDCl_3$)



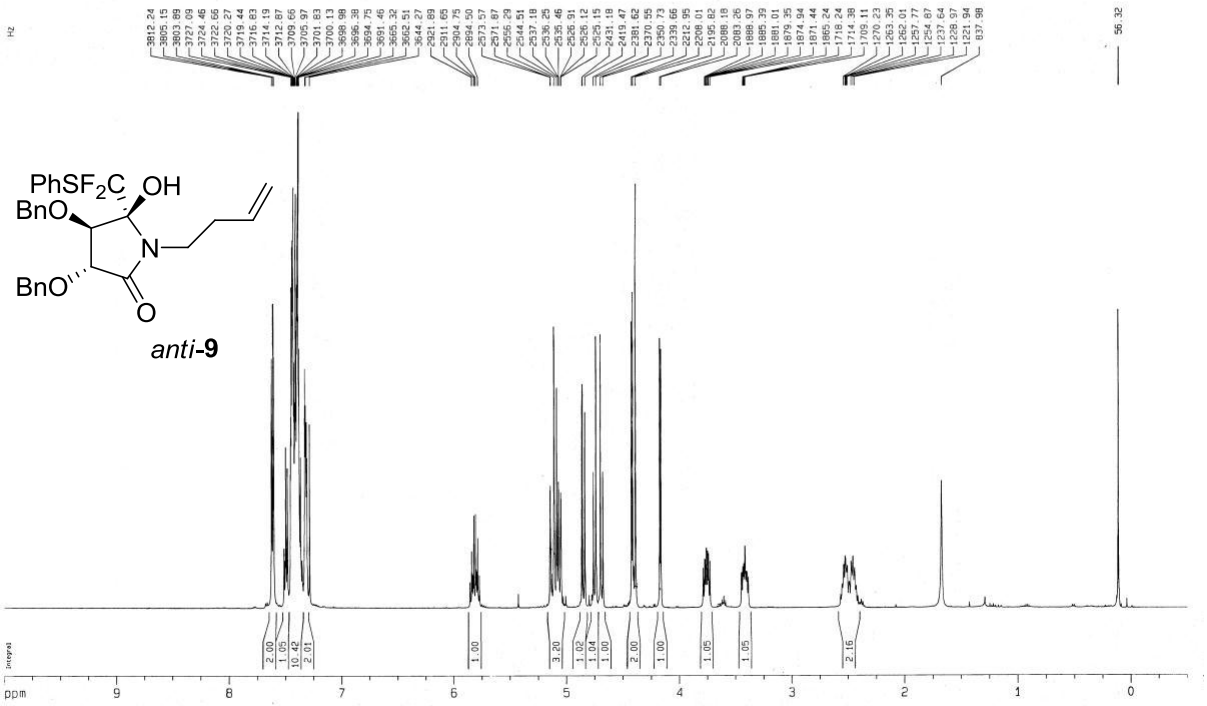
^{13}C NMR Spectrum of *syn*-**9** (125 MHz, $CDCl_3$)



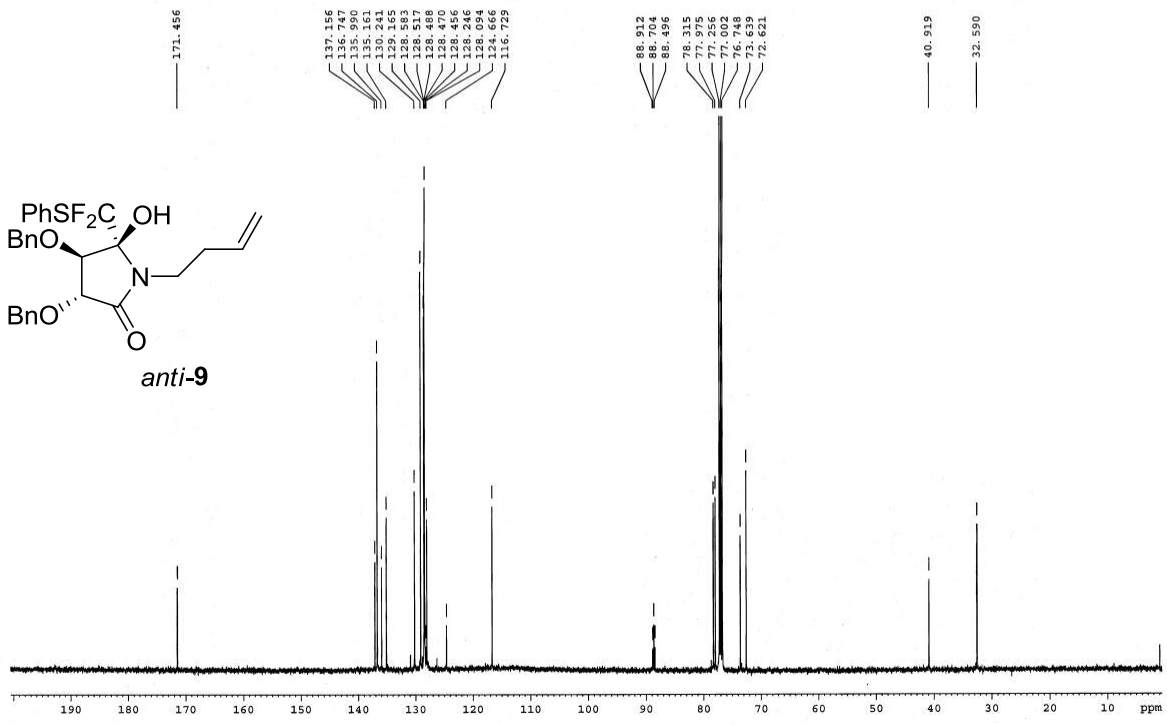
^{19}F NMR Spectrum of *syn*-**9** (470 MHz, $CDCl_3$)



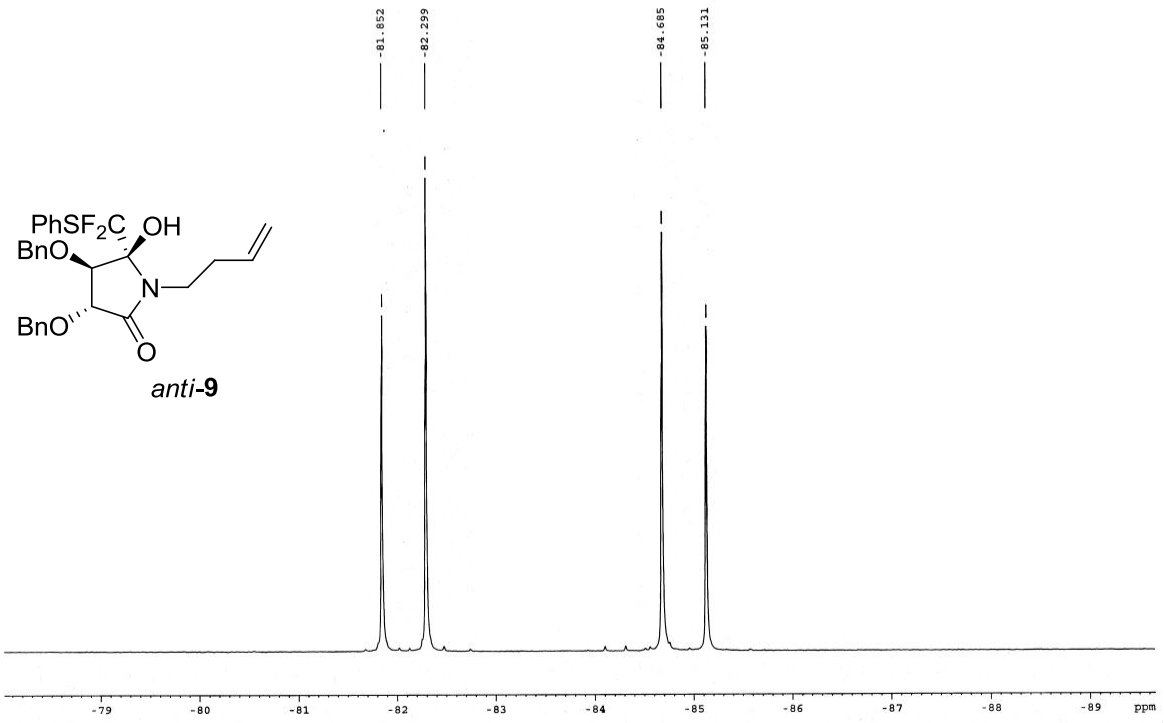
^{1}H NMR Spectrum of *anti*-**9** (500 MHz, $CDCl_3$)



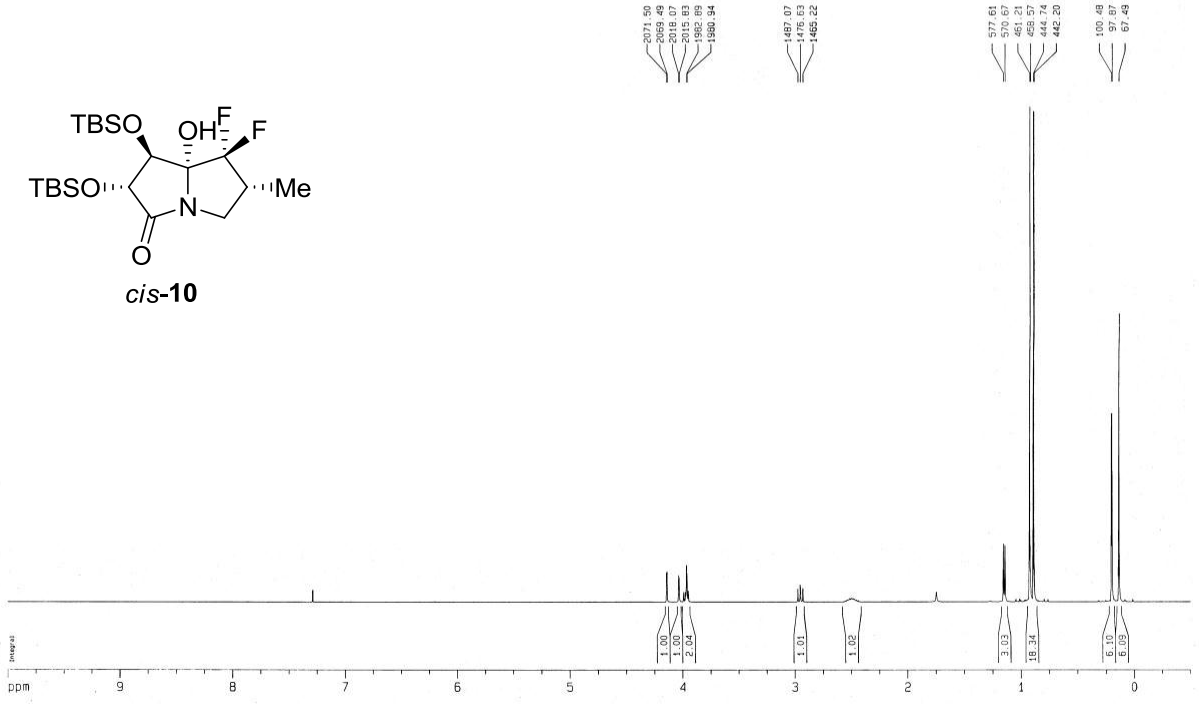
^{13}C NMR Spectrum of *anti*-**9** (125 MHz, $CDCl_3$)



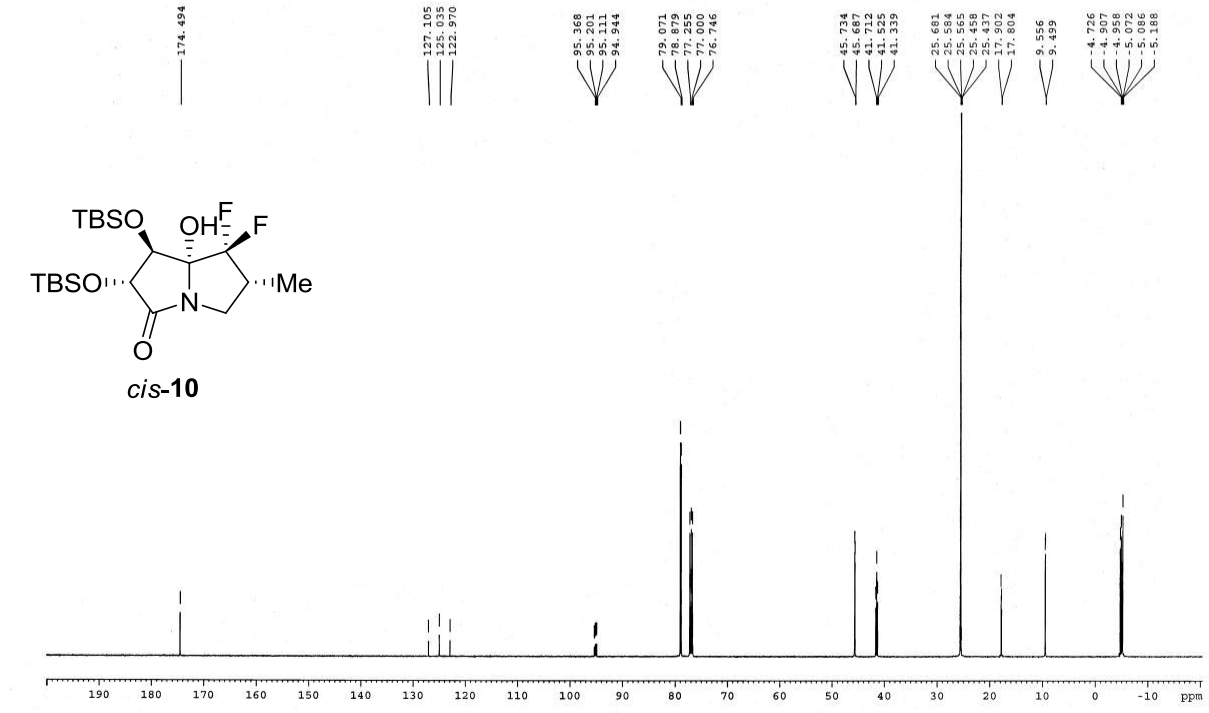
^{19}F NMR Spectrum of *anti*-**9** (470 MHz, $CDCl_3$)



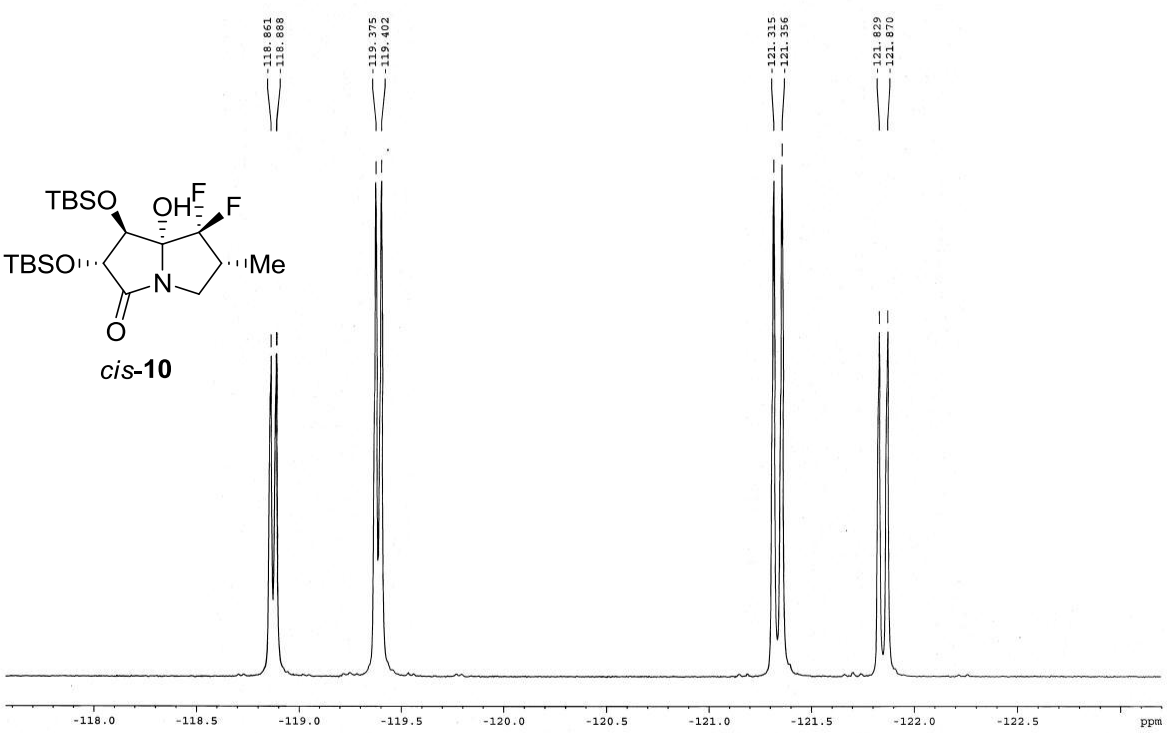
^{1}H NMR Spectrum of *cis*-**10** (500 MHz, $CDCl_3$)



^{13}C NMR Spectrum of *cis*-**10** (125 MHz, $CDCl_3$)

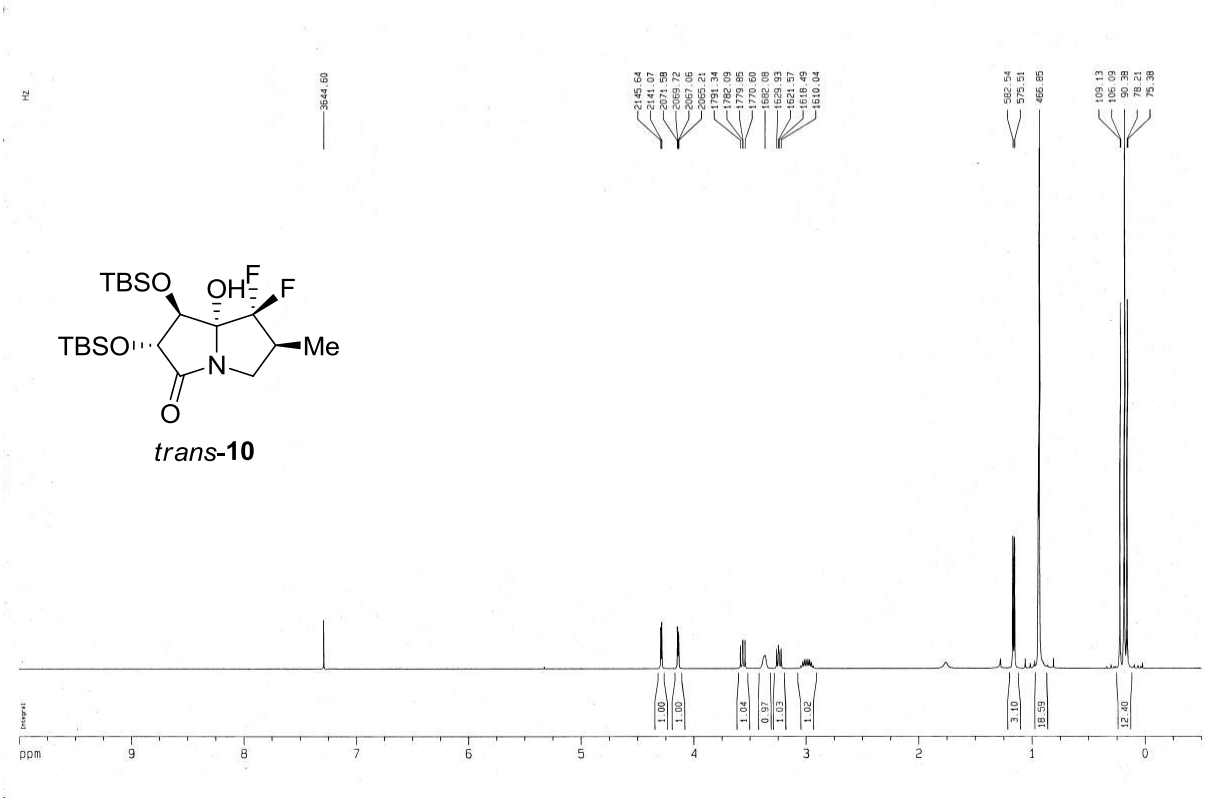


^{19}F NMR Spectrum of *cis*-**10** (470 MHz, $CDCl_3$)



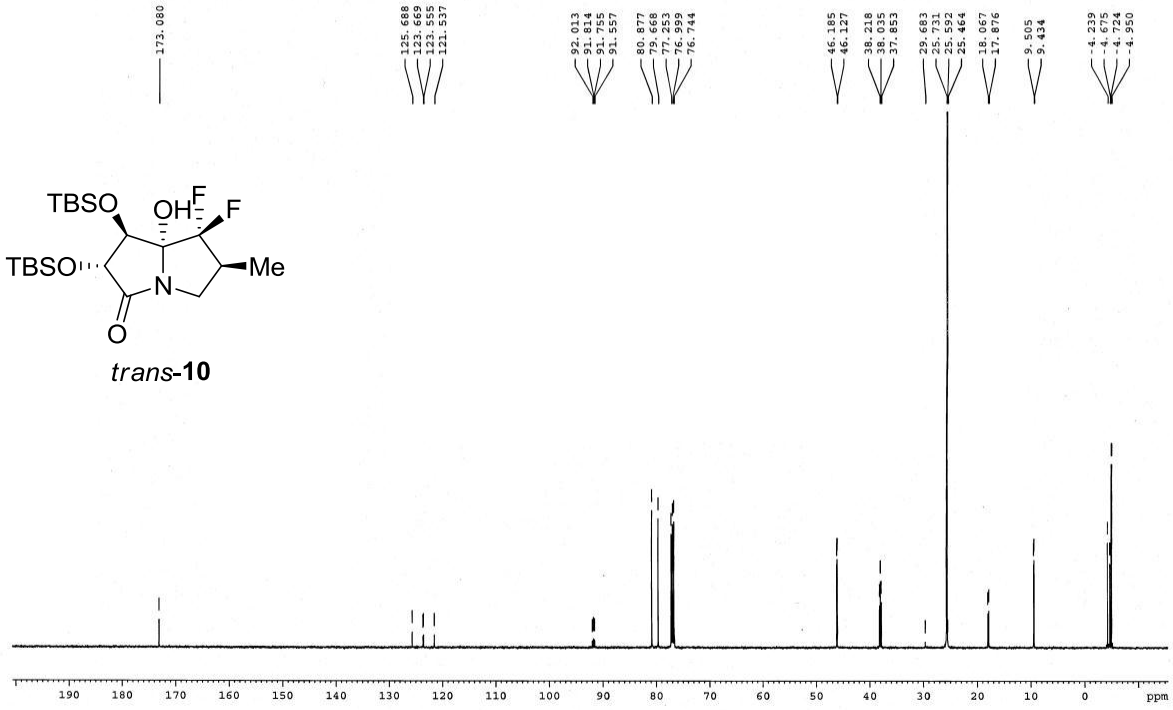
cis-**10**

^{1}H NMR Spectrum of *trans*-**10** (500 MHz, $CDCl_3$)

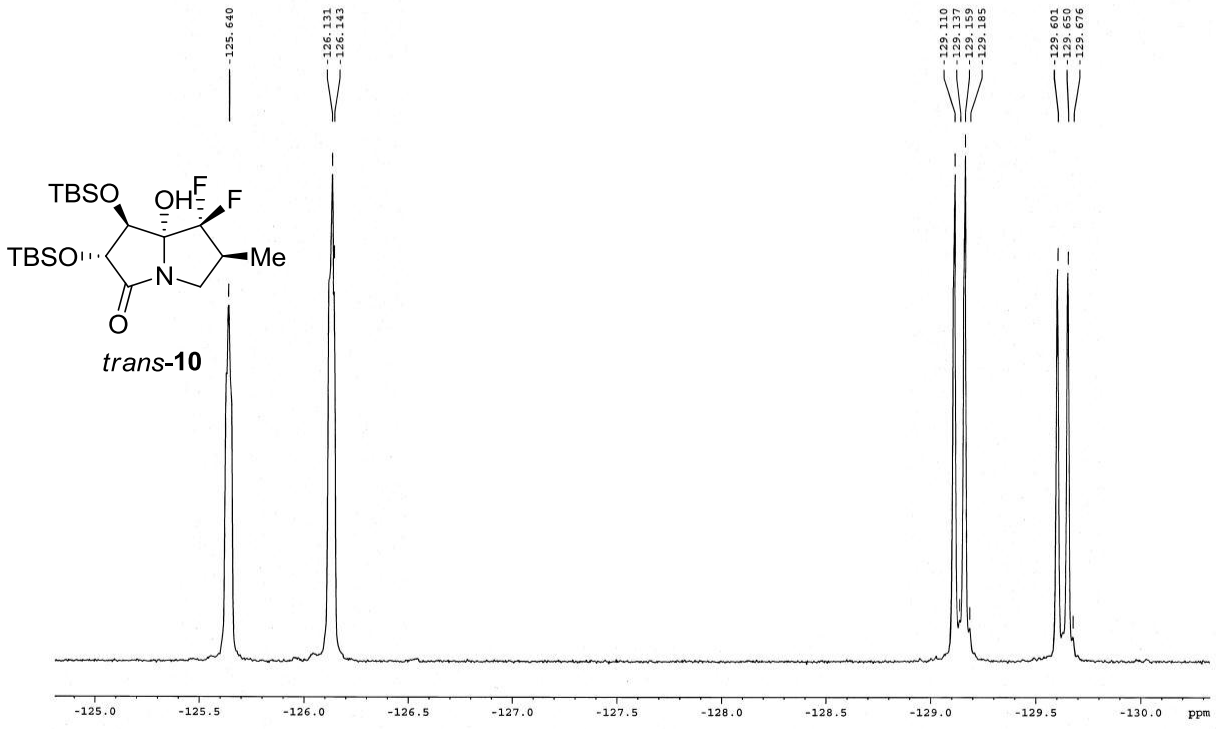


trans-**10**

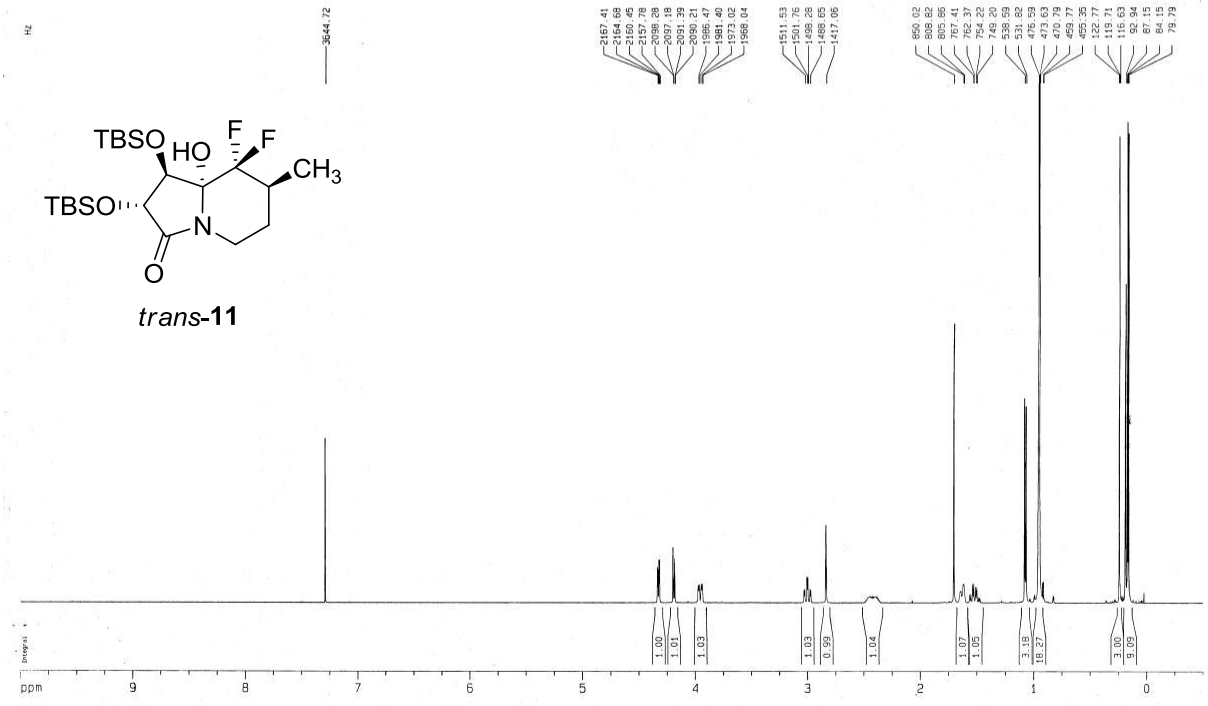
^{13}C NMR Spectrum of *trans*-**10** (125 MHz, $CDCl_3$)



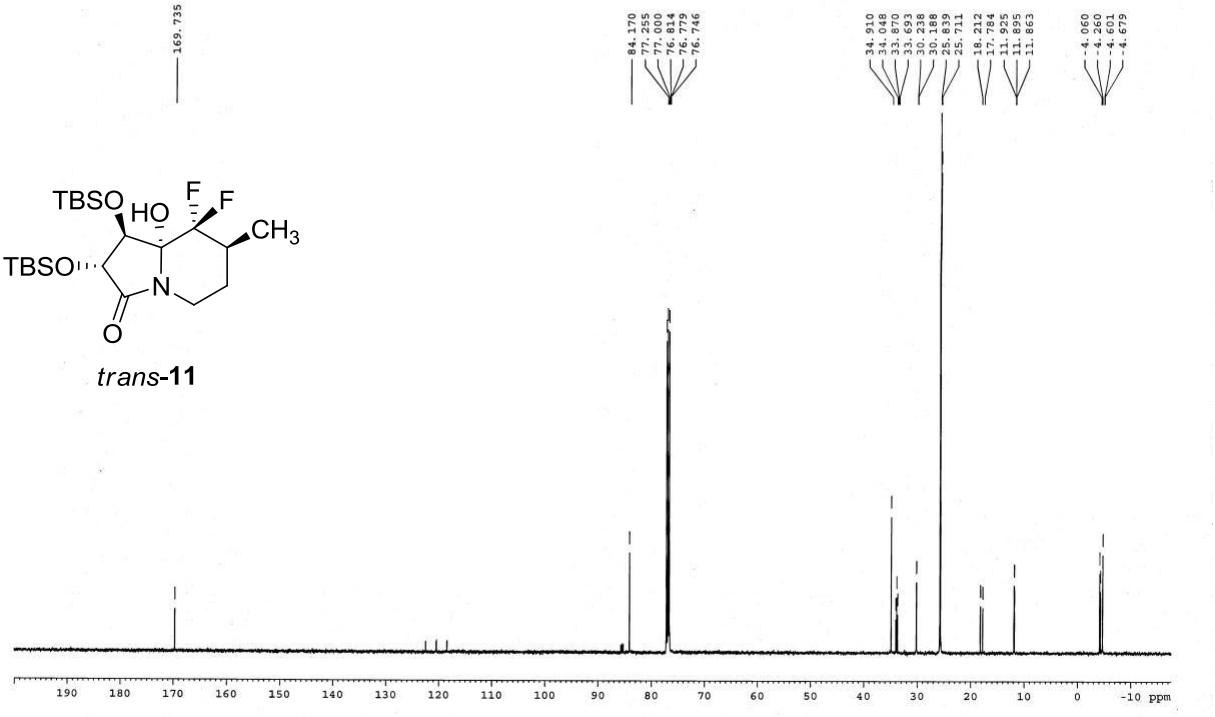
^{19}F NMR Spectrum of *trans*-**10** (470 MHz, $CDCl_3$)



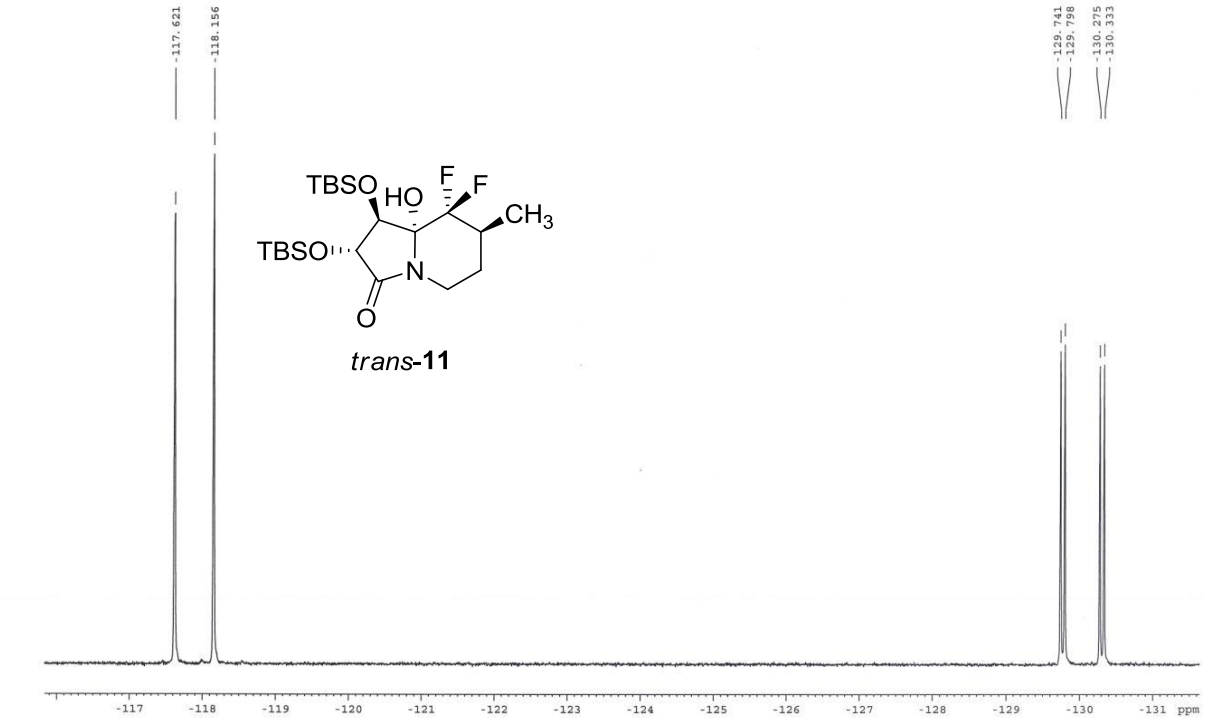
^{1}H NMR Spectrum of *trans*-**11** (500 MHz, $CDCl_3$)



^{13}C NMR Spectrum of *trans*-**11** (125 MHz, $CDCl_3$)

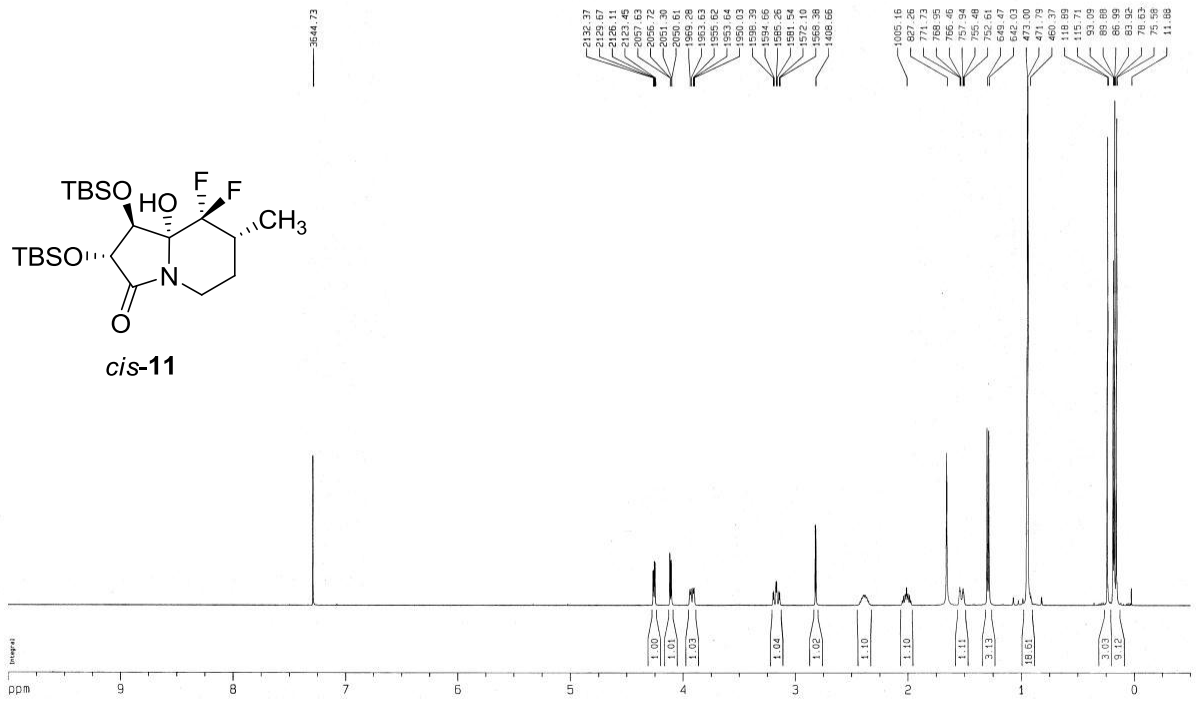


^{19}F NMR Spectrum of *trans*-**11** (470 MHz, $CDCl_3$)



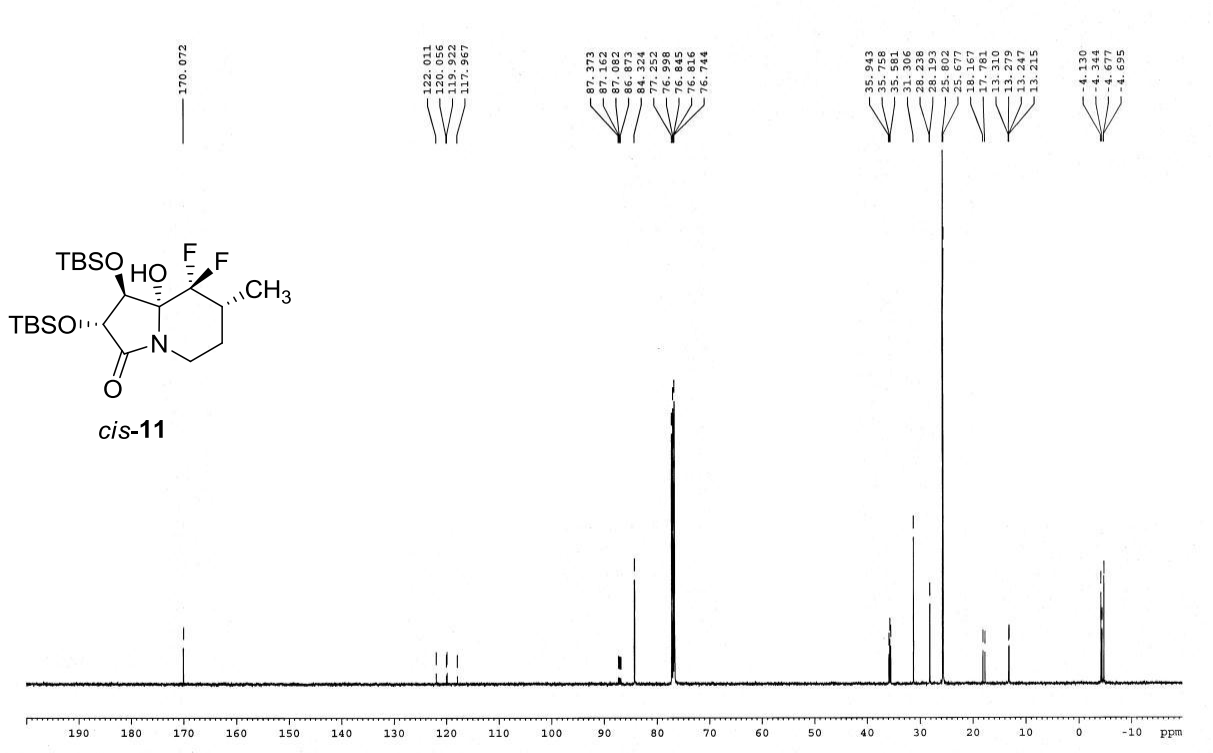
trans-**11**

^{1}H NMR Spectrum of *cis*-**11** (500 MHz, $CDCl_3$)

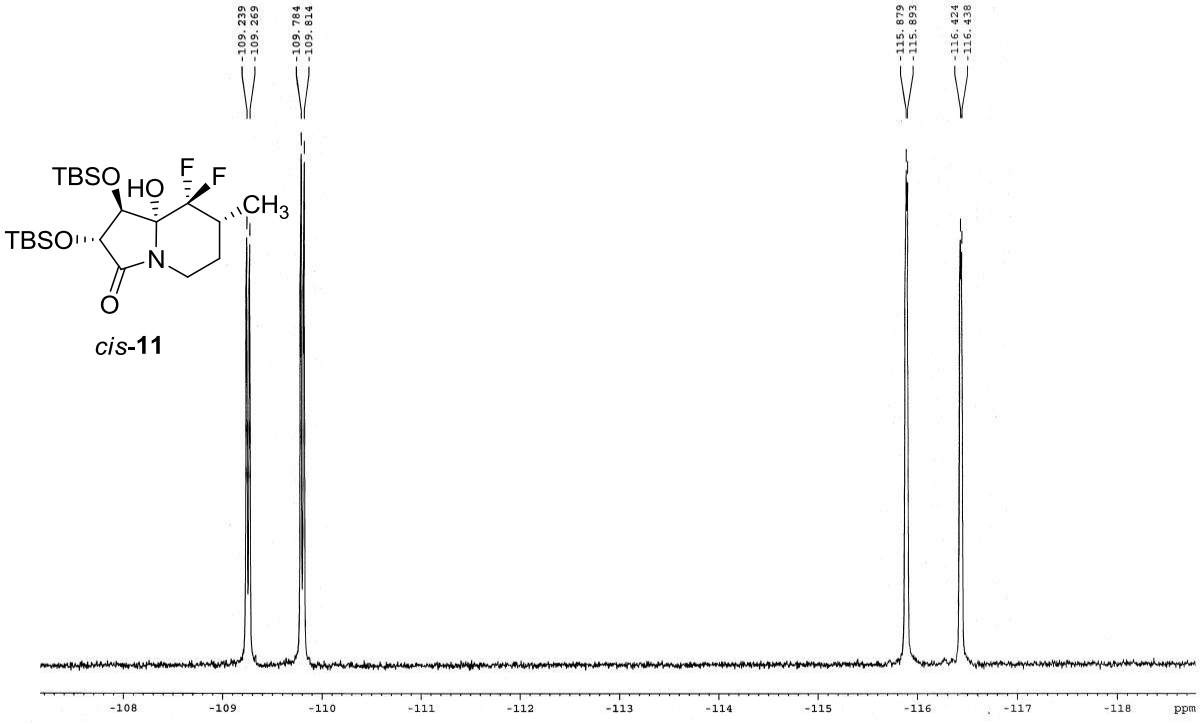


cis-**11**

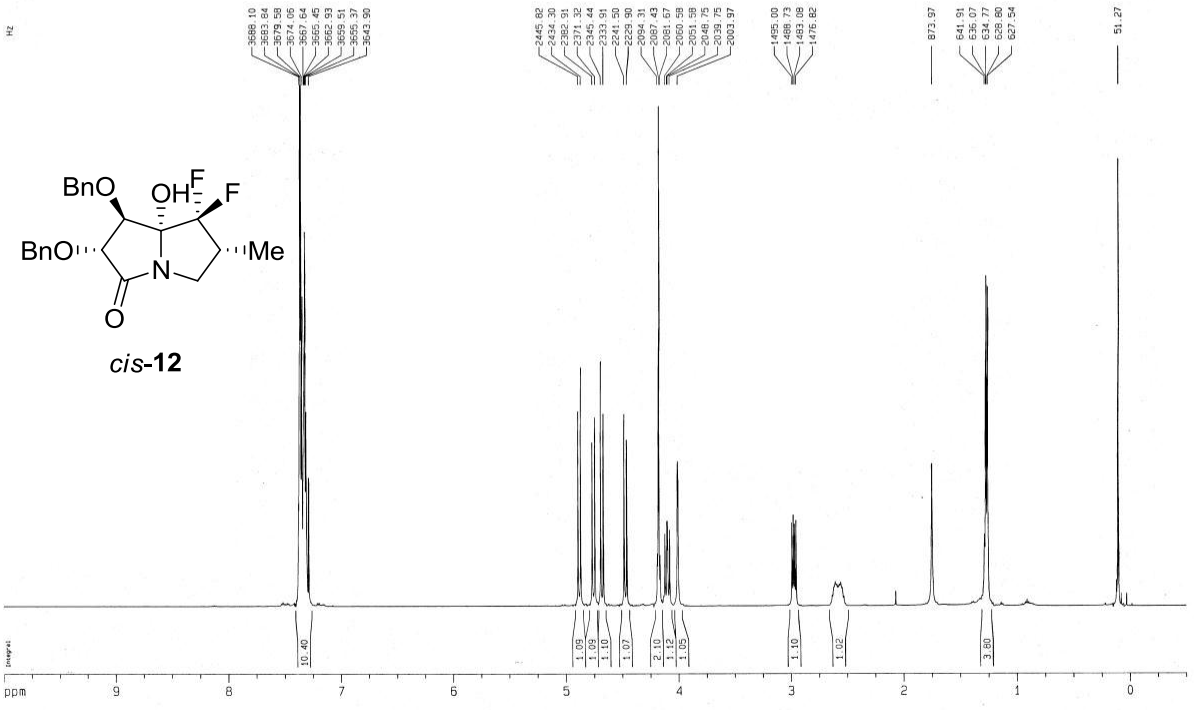
^{13}C NMR Spectrum of *cis*-**11** (125 MHz, $CDCl_3$)



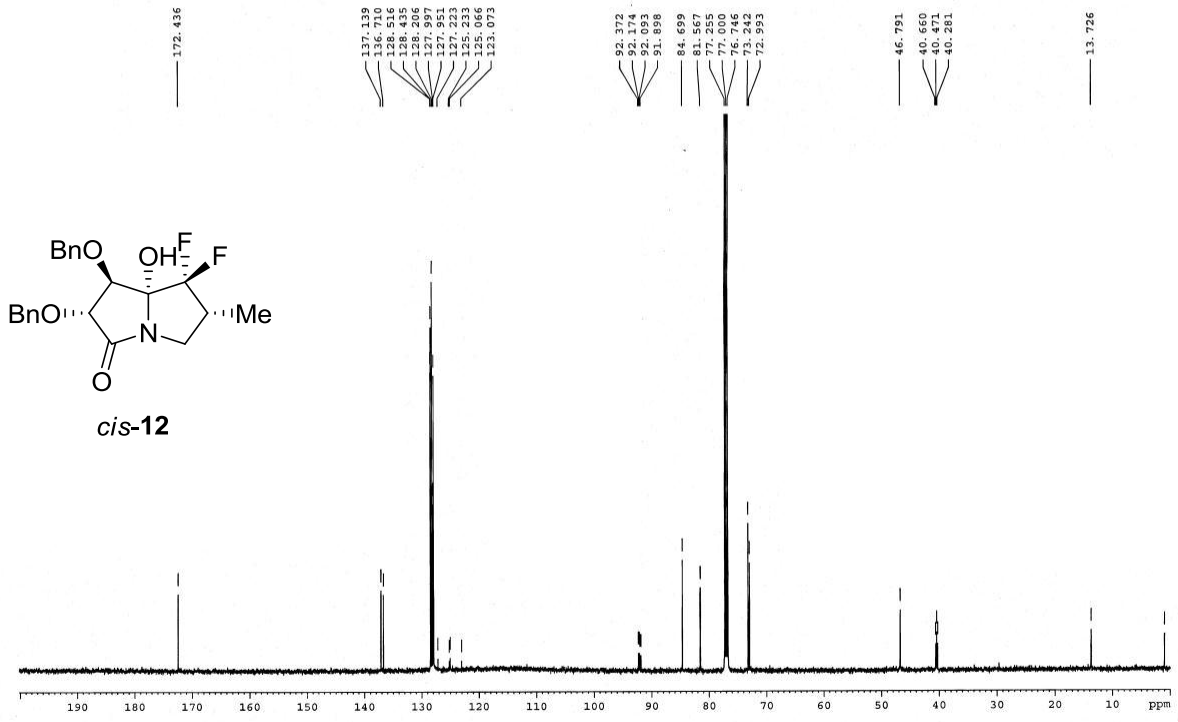
^{19}F NMR Spectrum of *cis*-**11** (470 MHz, $CDCl_3$)



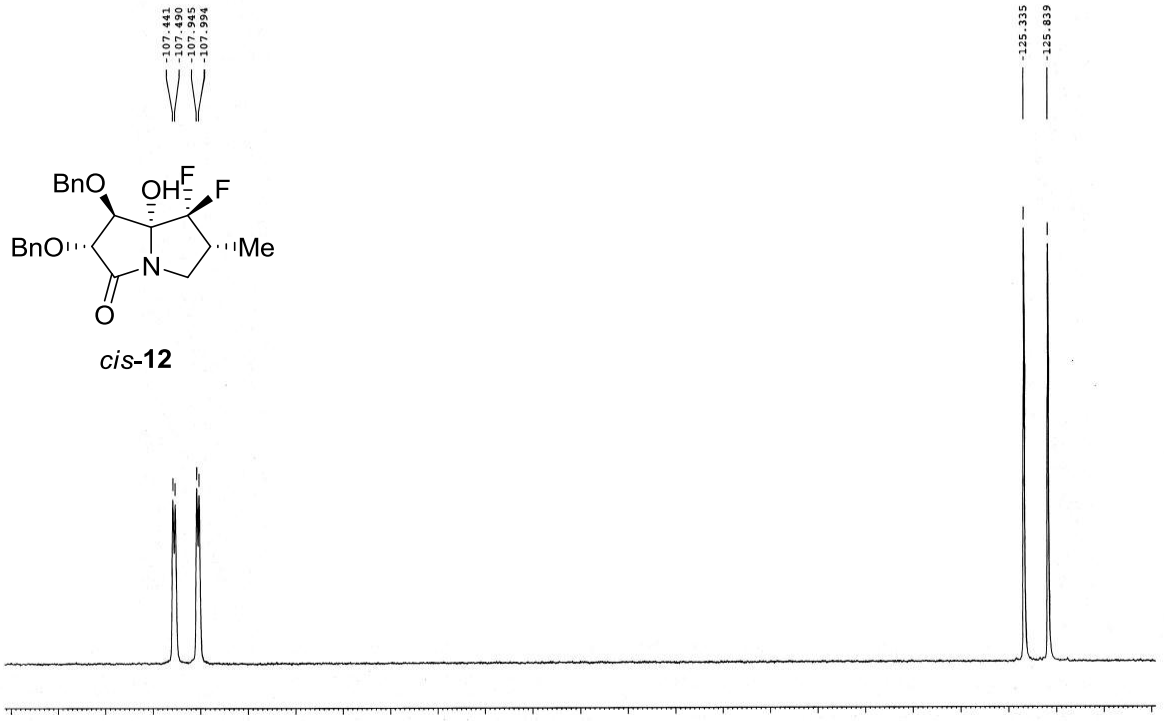
^{1}H NMR Spectrum of *cis*-**12** (500 MHz, $CDCl_3$)



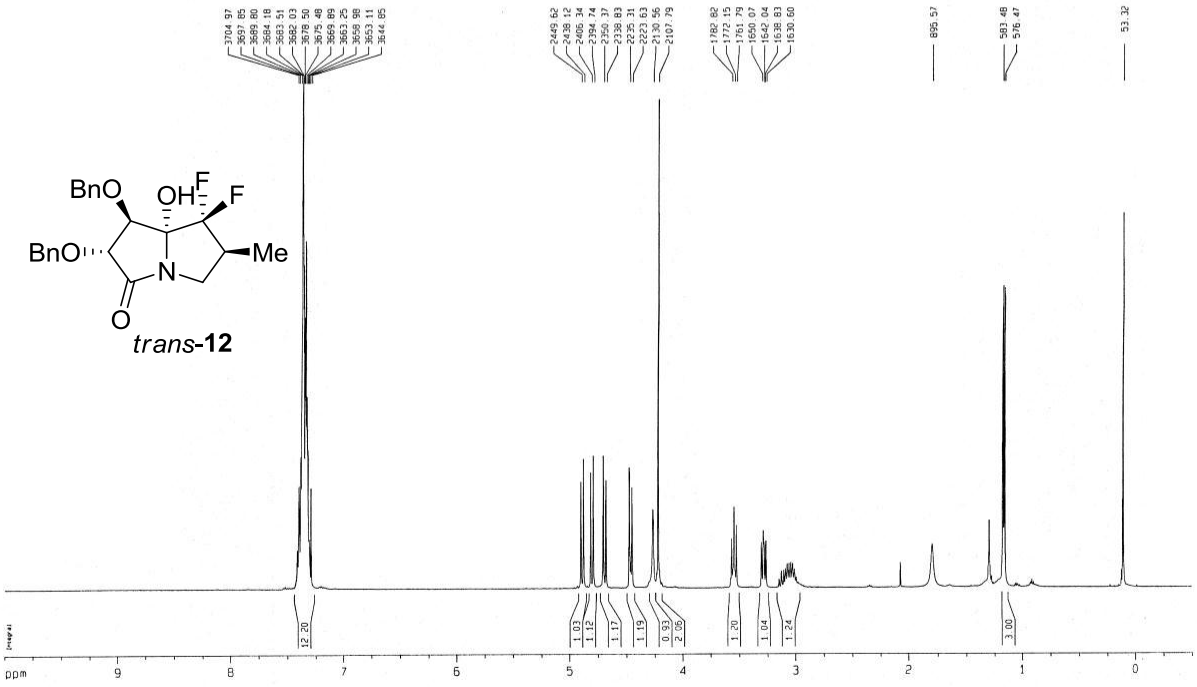
^{13}C NMR Spectrum of *cis*-**12** (125 MHz, $CDCl_3$)



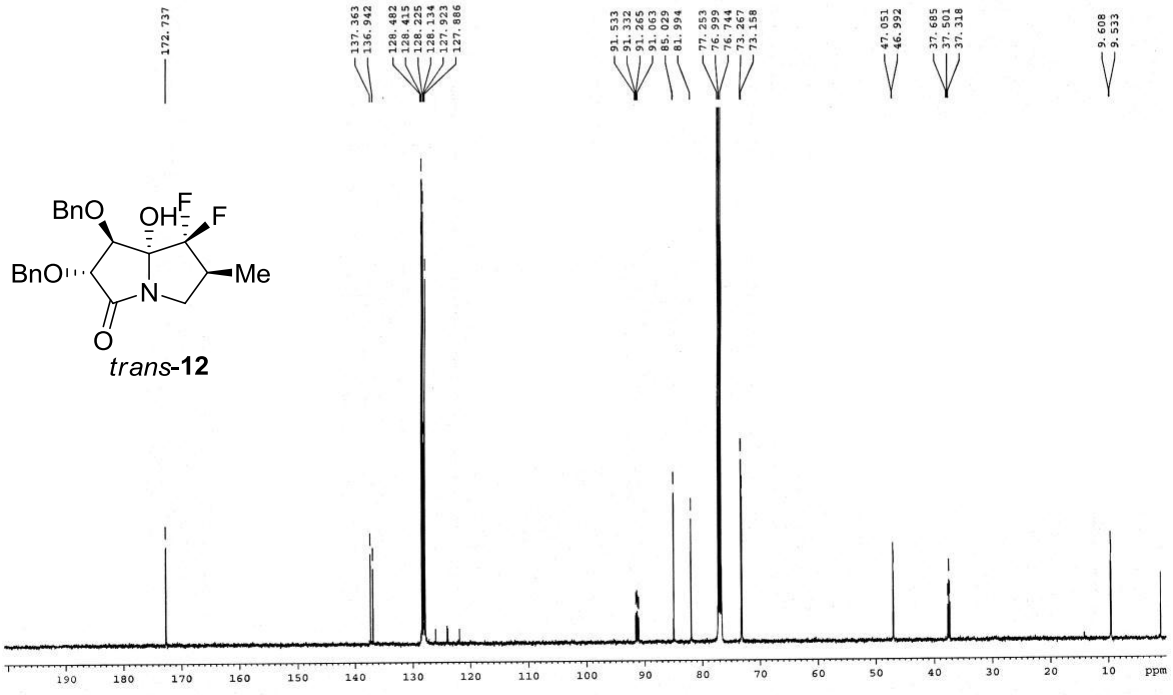
^{19}F NMR Spectrum of *cis*-**12** (470 MHz, $CDCl_3$)



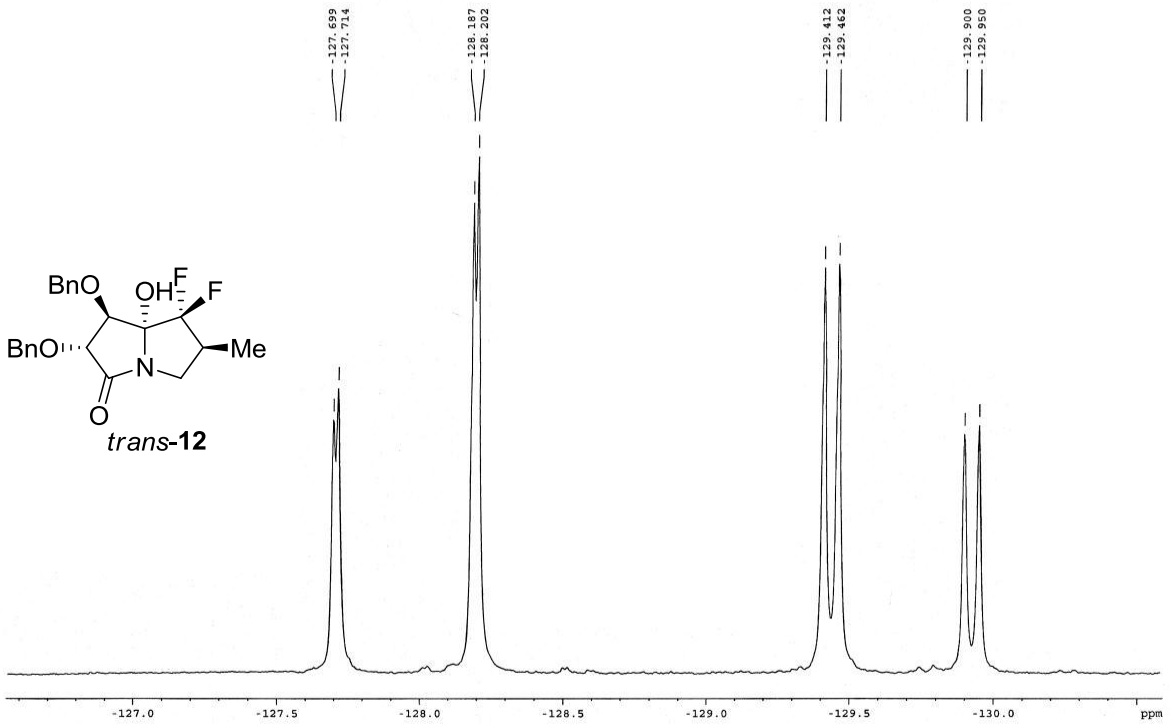
^{1}H NMR Spectrum of *trans*-**12** (500 MHz, $CDCl_3$)



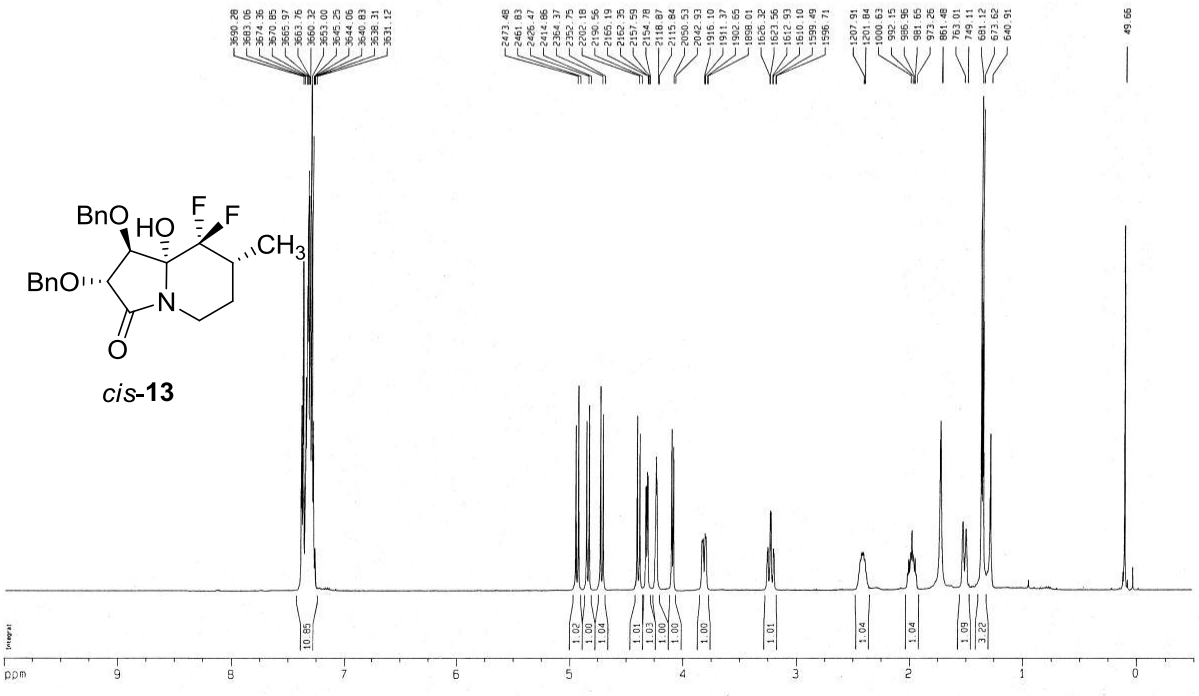
^{13}C NMR Spectrum of *trans*-**12** (125 MHz, $CDCl_3$)



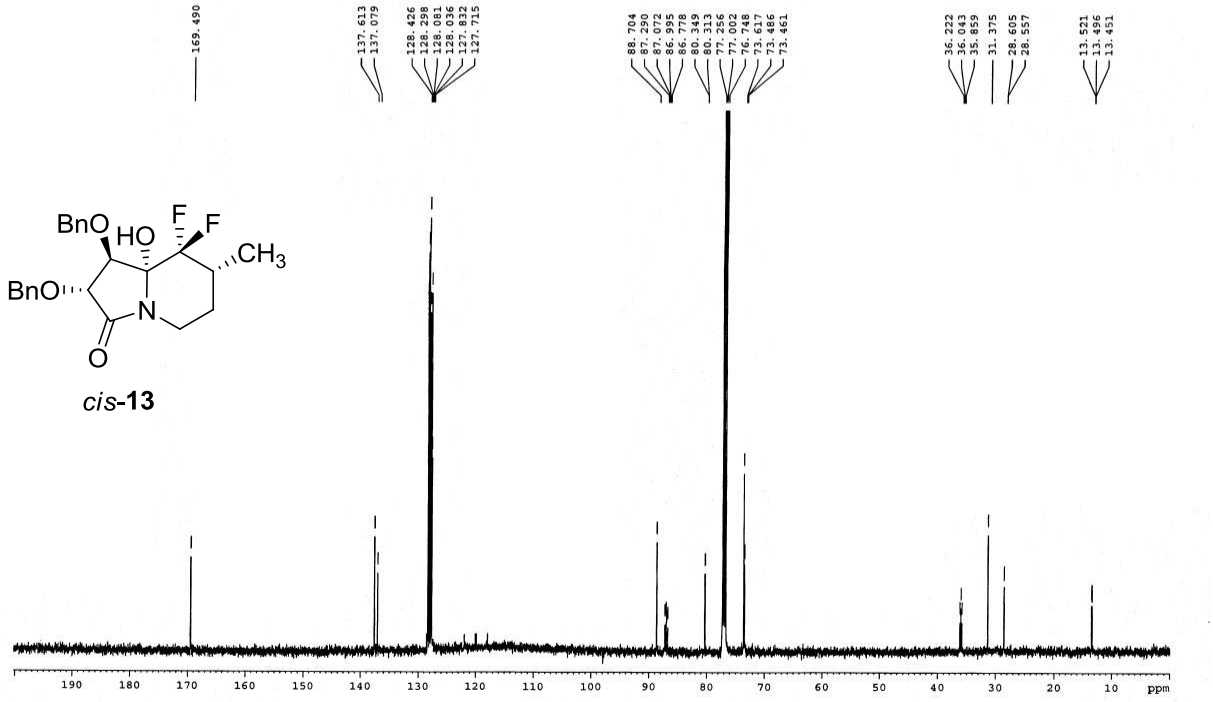
^{19}F NMR Spectrum of *trans*-**12** (470 MHz, $CDCl_3$)



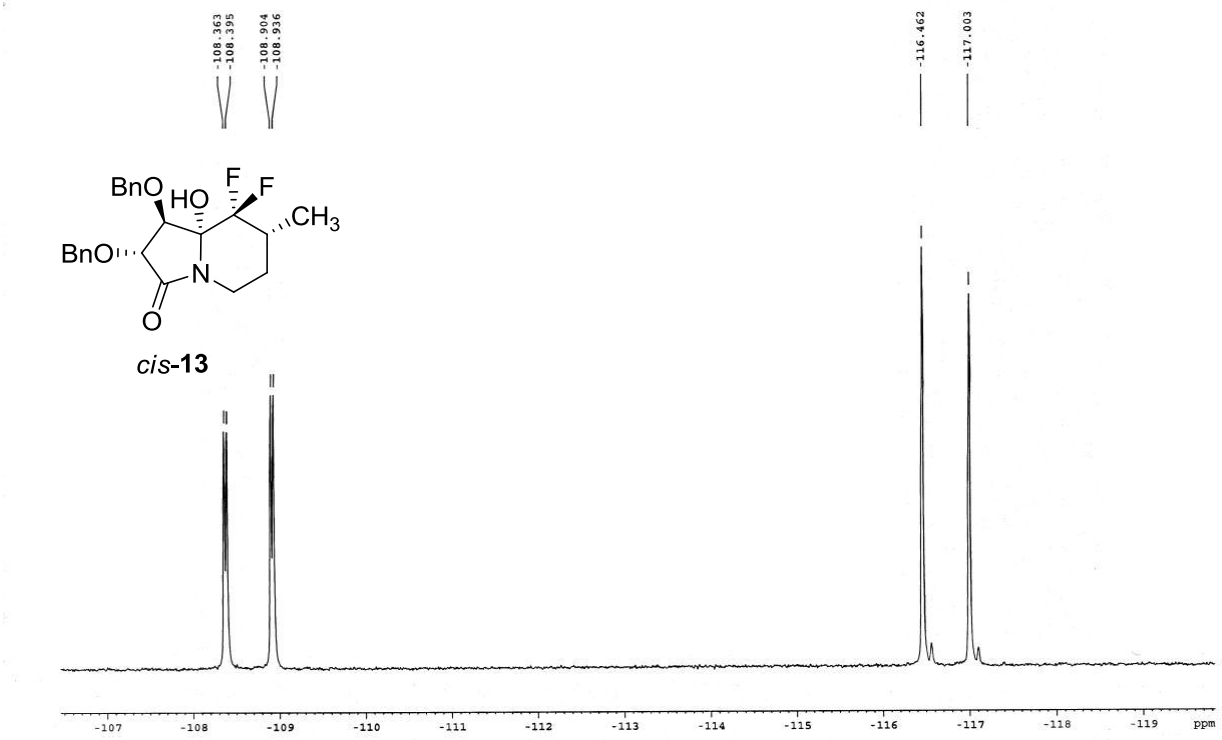
^{1}H NMR Spectrum of *cis*-**13** (500 MHz, $CDCl_3$)



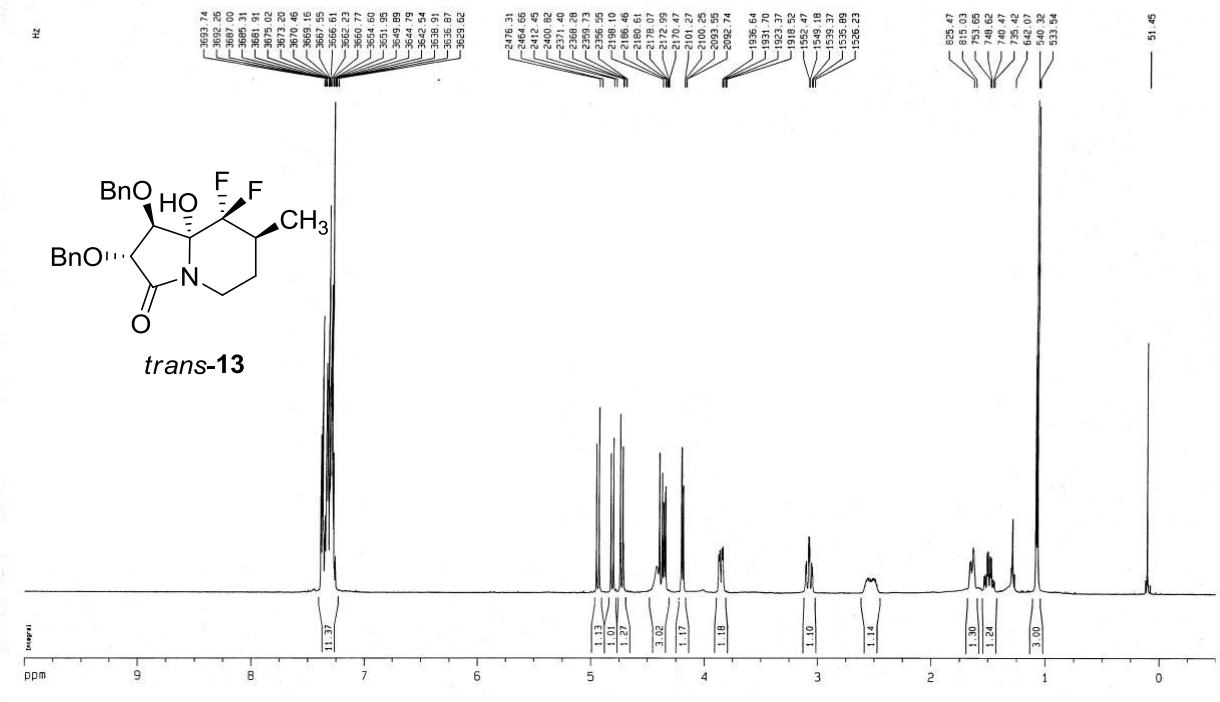
^{13}C NMR Spectrum of *cis*-**13** (125 MHz, $CDCl_3$)



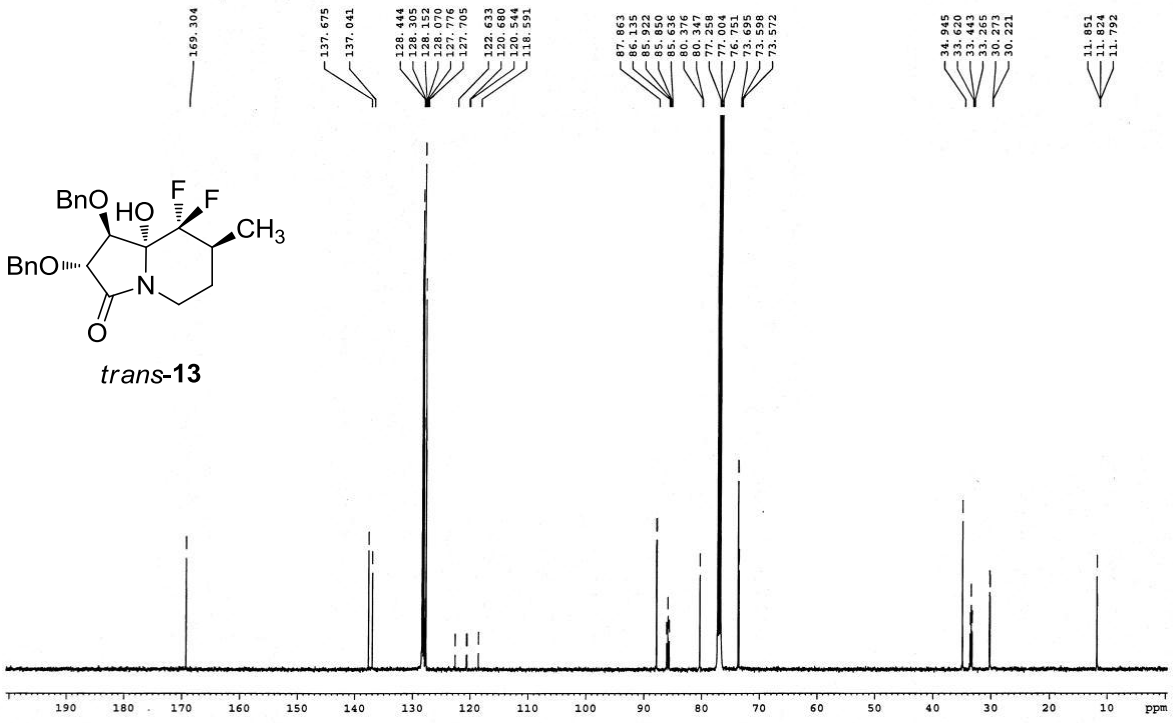
^{19}F NMR Spectrum of *cis*-**13** (470 MHz, $CDCl_3$)



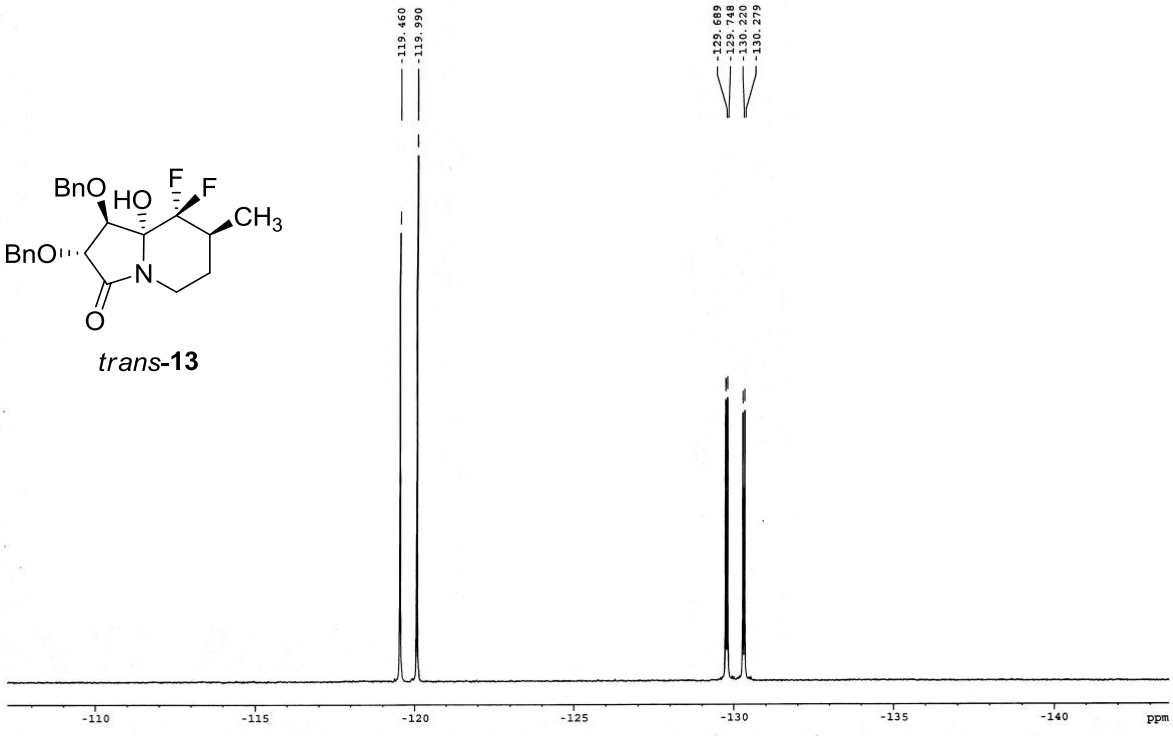
^{1}H NMR Spectrum of *trans*-**13** (500 MHz, $CDCl_3$)



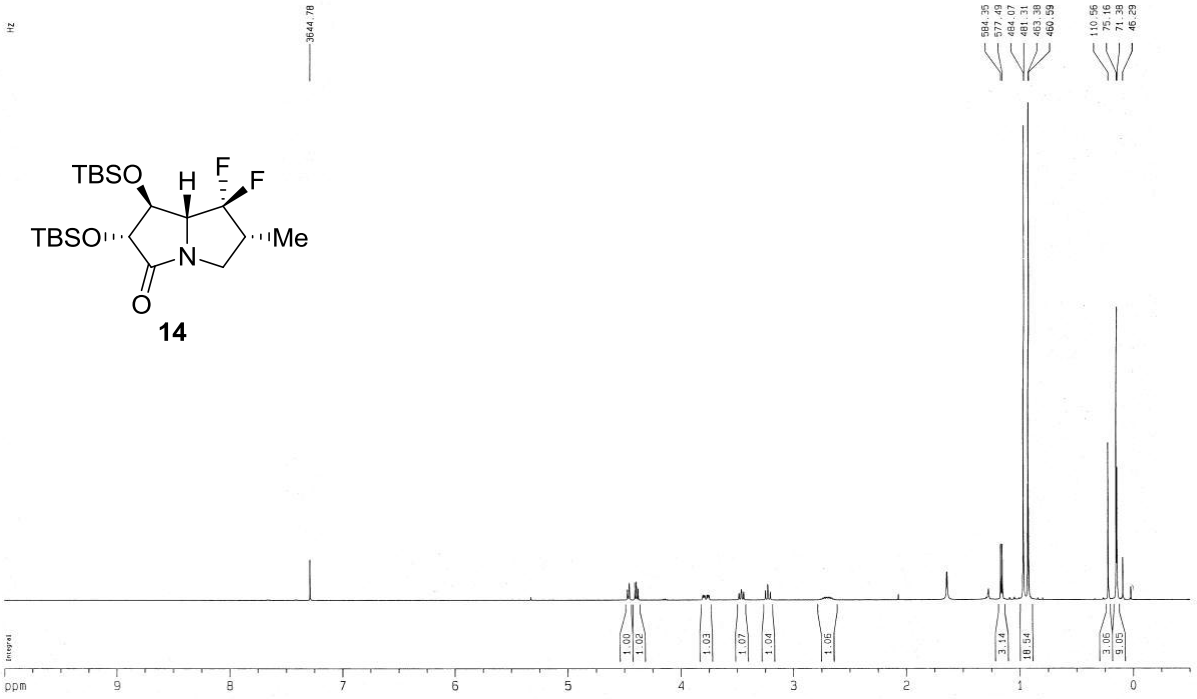
^{13}C NMR Spectrum of *trans*-**13** (125 MHz, $CDCl_3$)



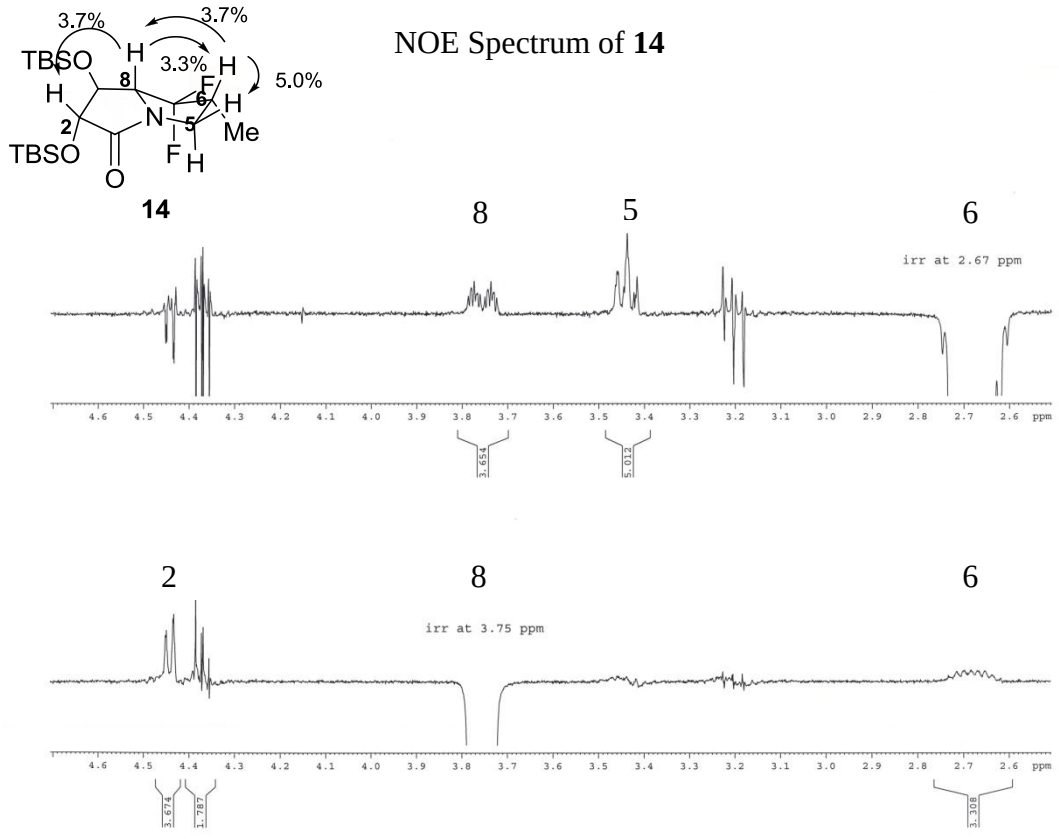
^{19}F NMR Spectrum of *trans*-**13** (470 MHz, $CDCl_3$)



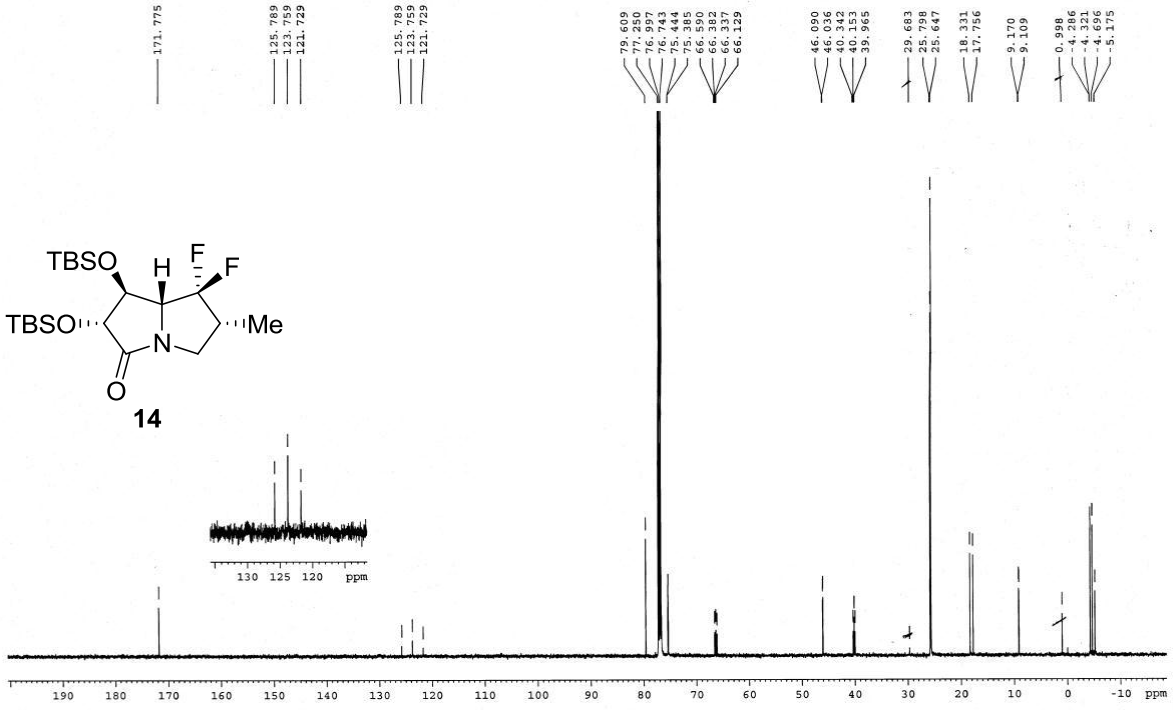
^{1}H NMR Spectrum of **14** (500 MHz, $CDCl_3$)



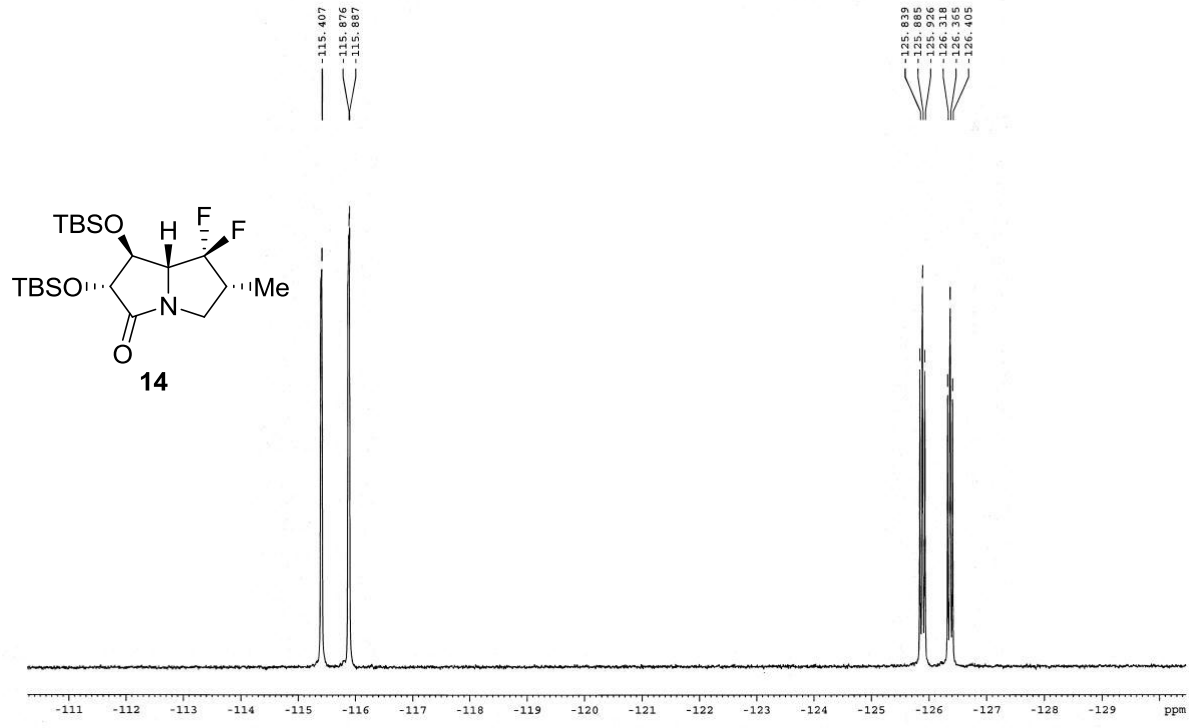
NOE Spectrum of **14**



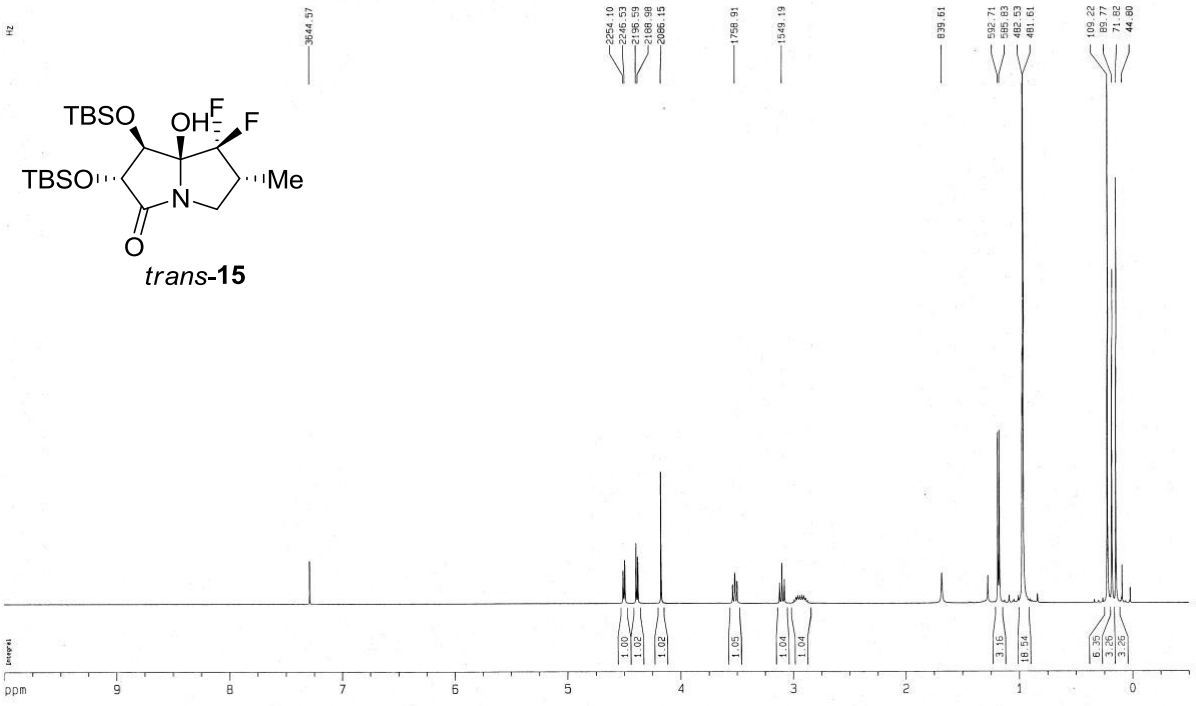
^{13}C NMR Spectrum of **14** (125 MHz, $CDCl_3$)



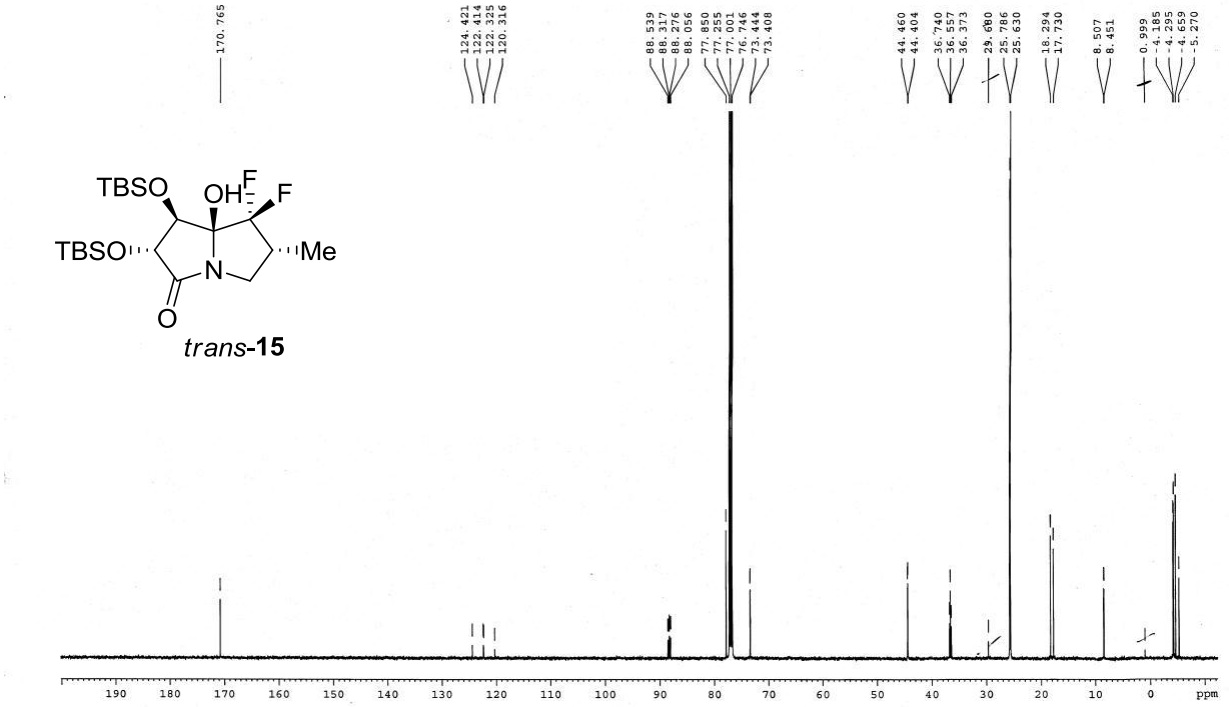
^{19}F NMR Spectrum of **14** (470MHz, $CDCl_3$)



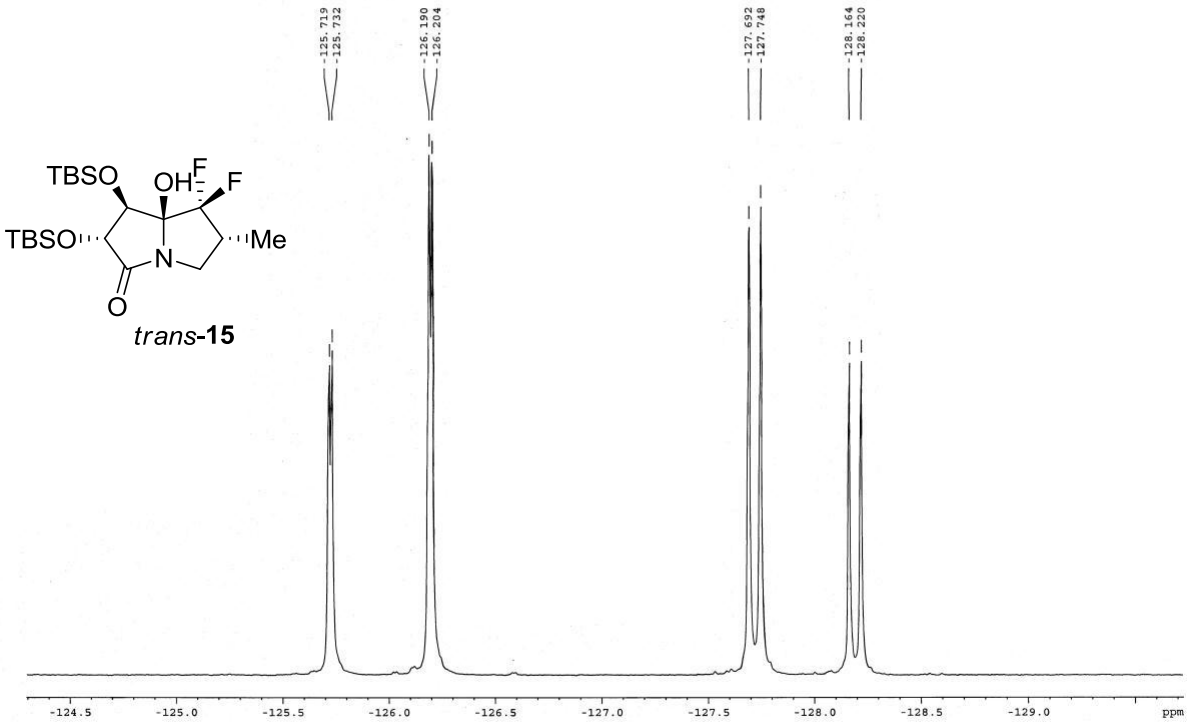
^{1}H NMR Spectrum of *trans*-**15** (500 MHz, $CDCl_3$)



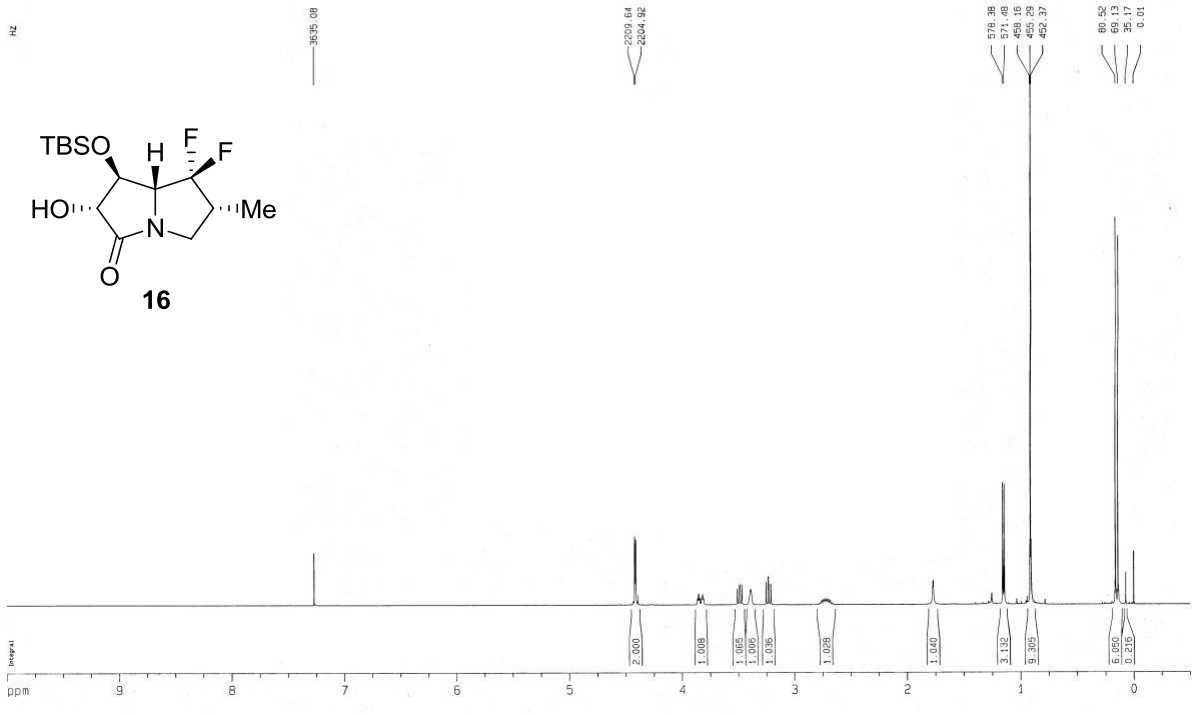
^{13}C NMR Spectrum of *trans*-**15** (125 MHz, $CDCl_3$)



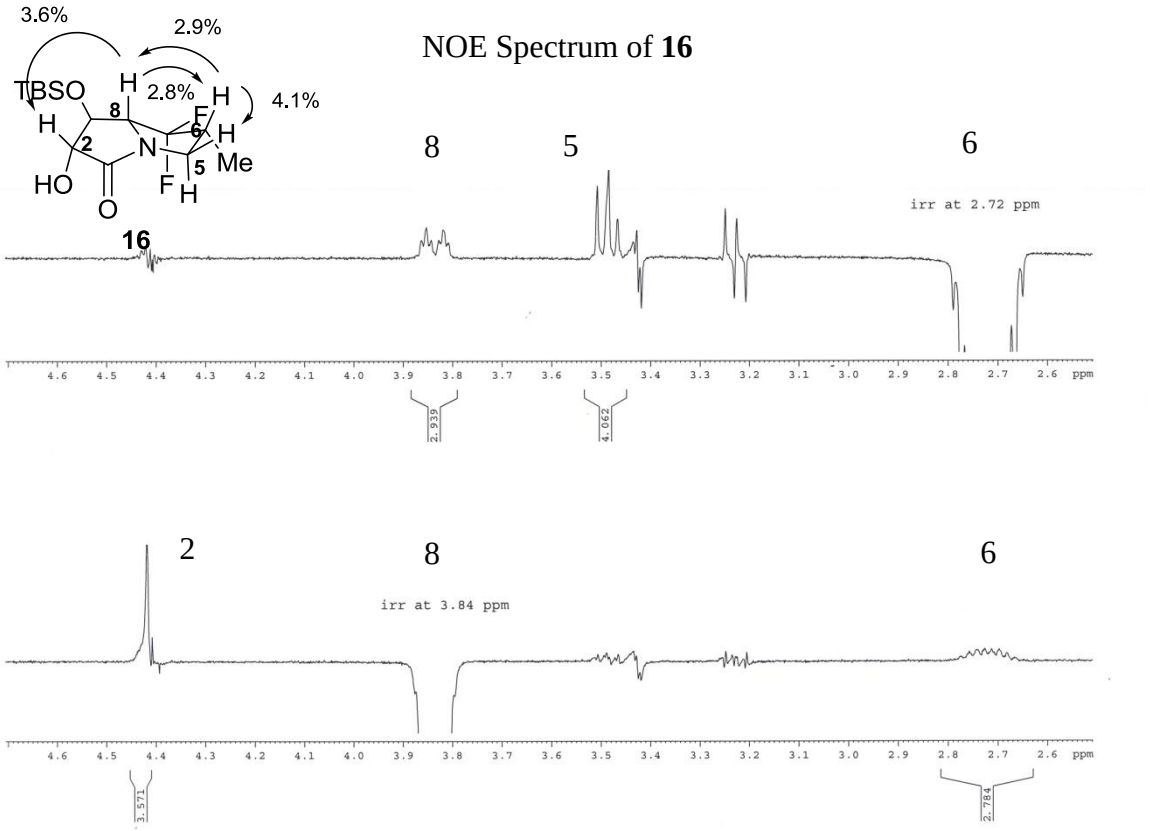
^{19}F NMR Spectrum of *trans*-**15** (470 MHz, $CDCl_3$)



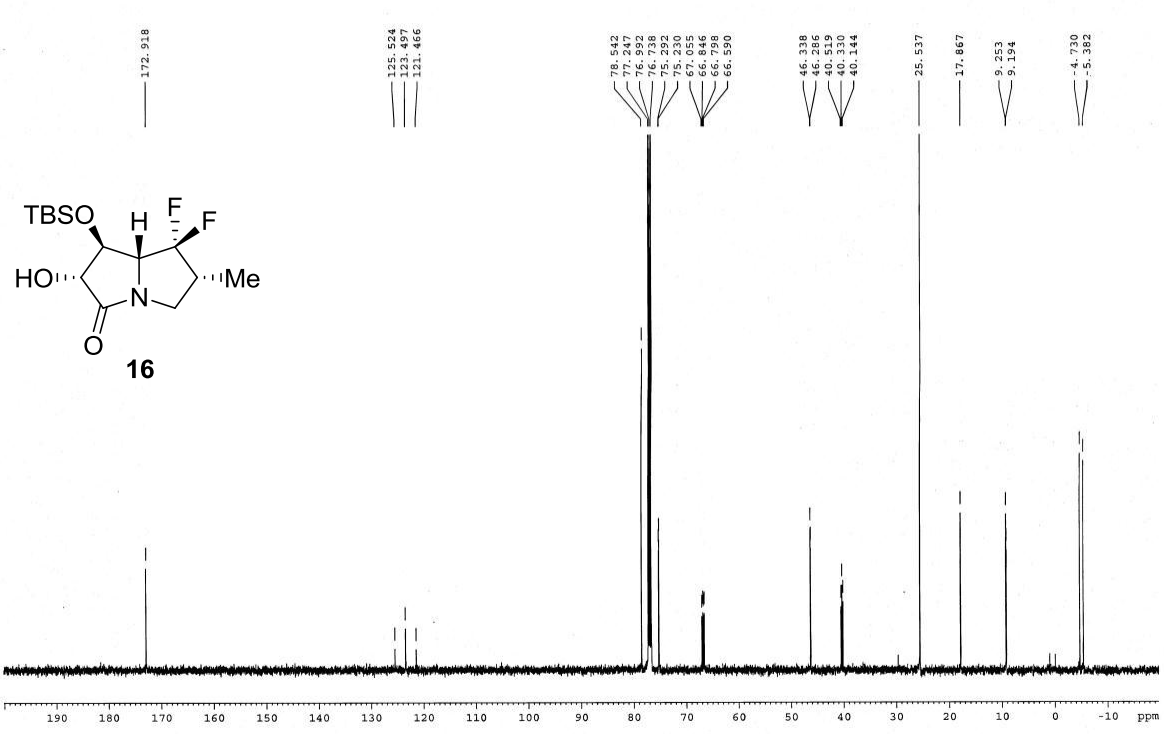
^{1}H NMR Spectrum of **16** (500 MHz, $CDCl_3$)



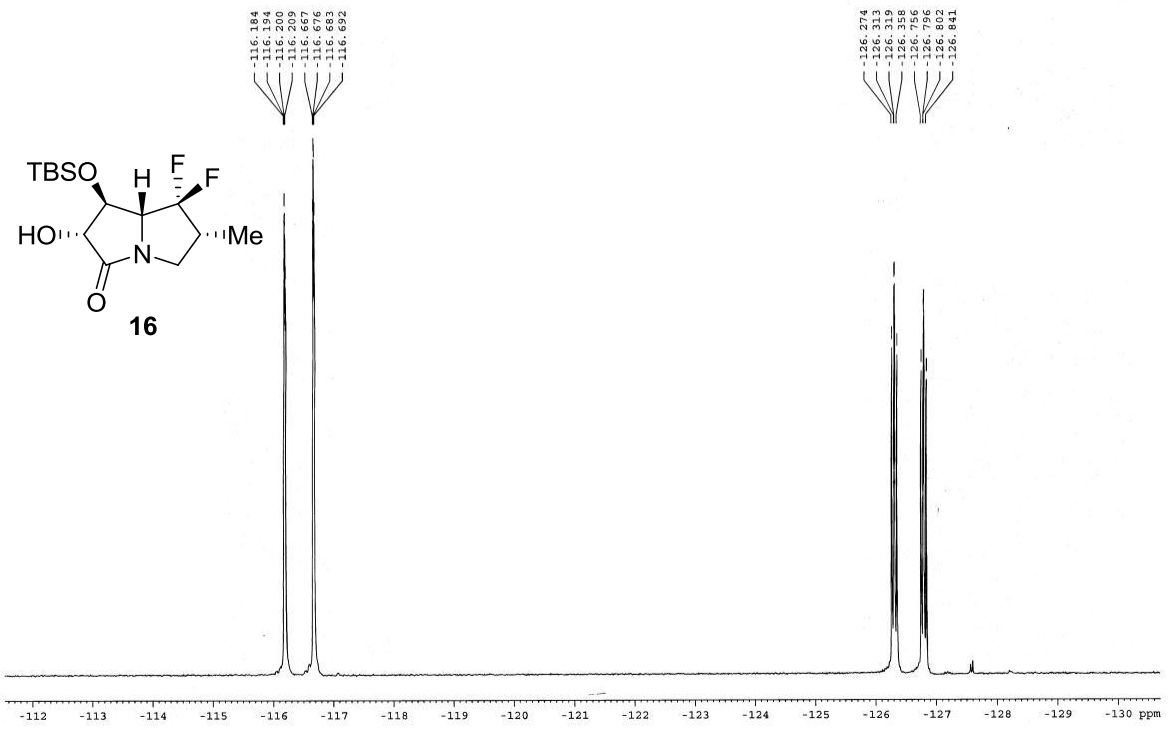
NOE Spectrum of **16**



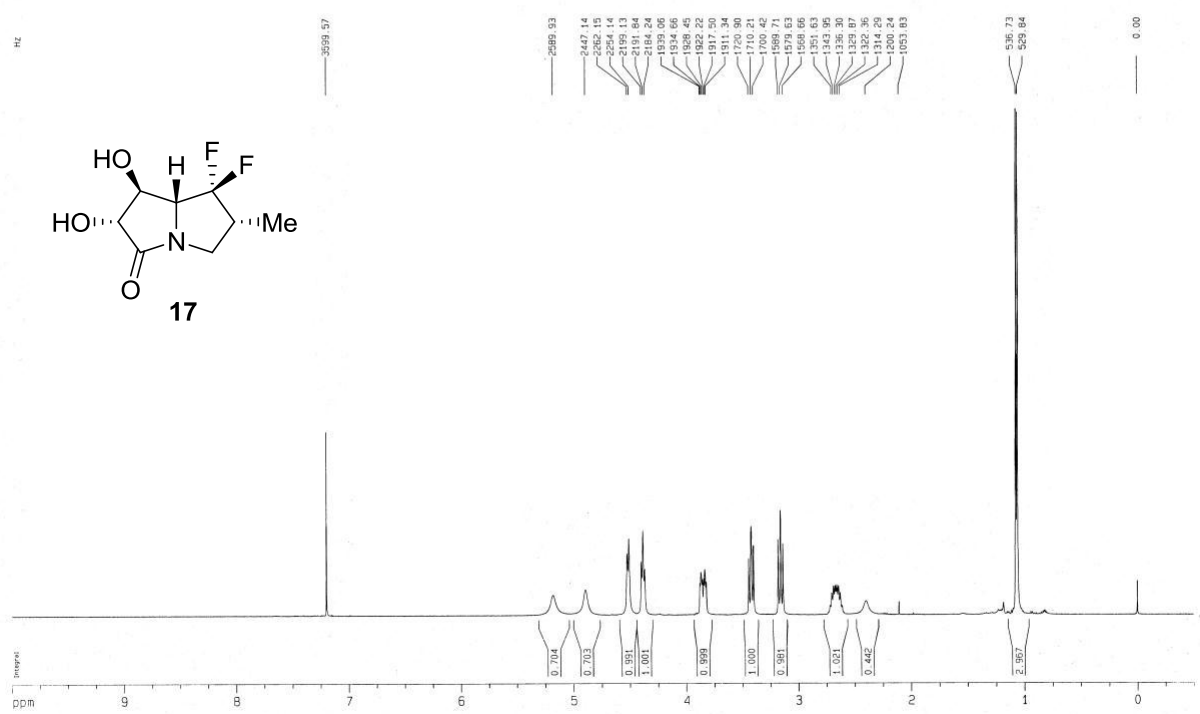
^{13}C NMR Spectrum of **16** (125 MHz, $CDCl_3$)



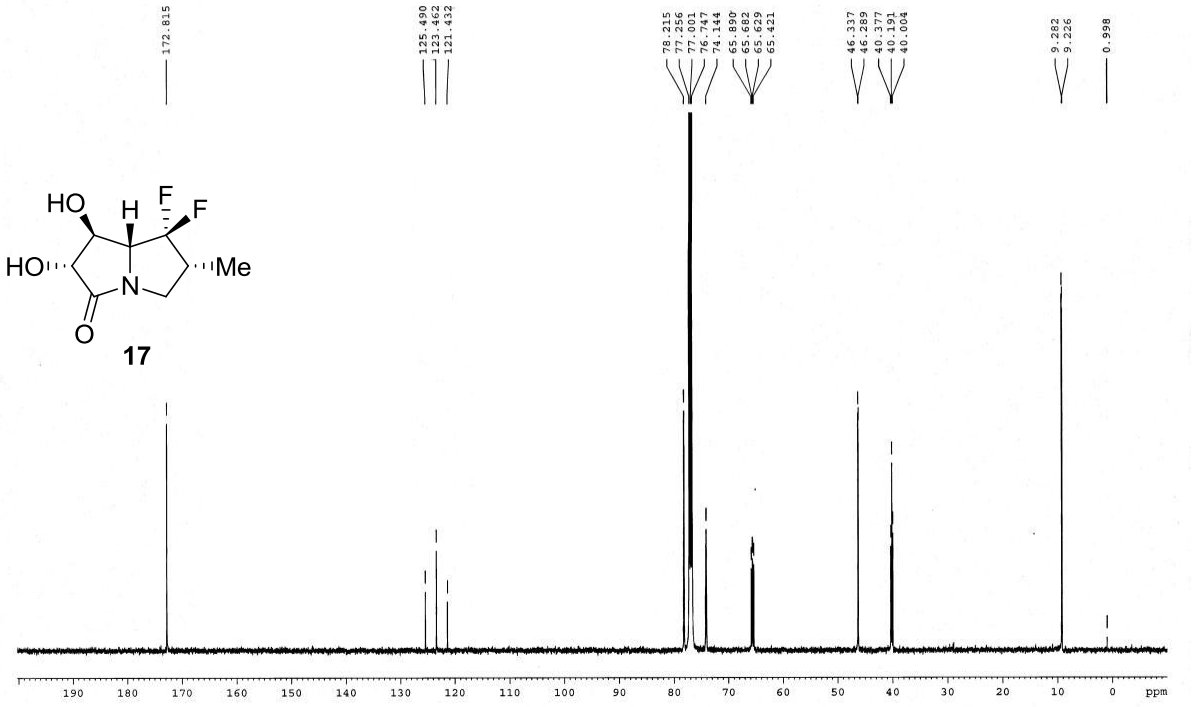
^{19}F NMR Spectrum of **16** (470 MHz, $CDCl_3$)



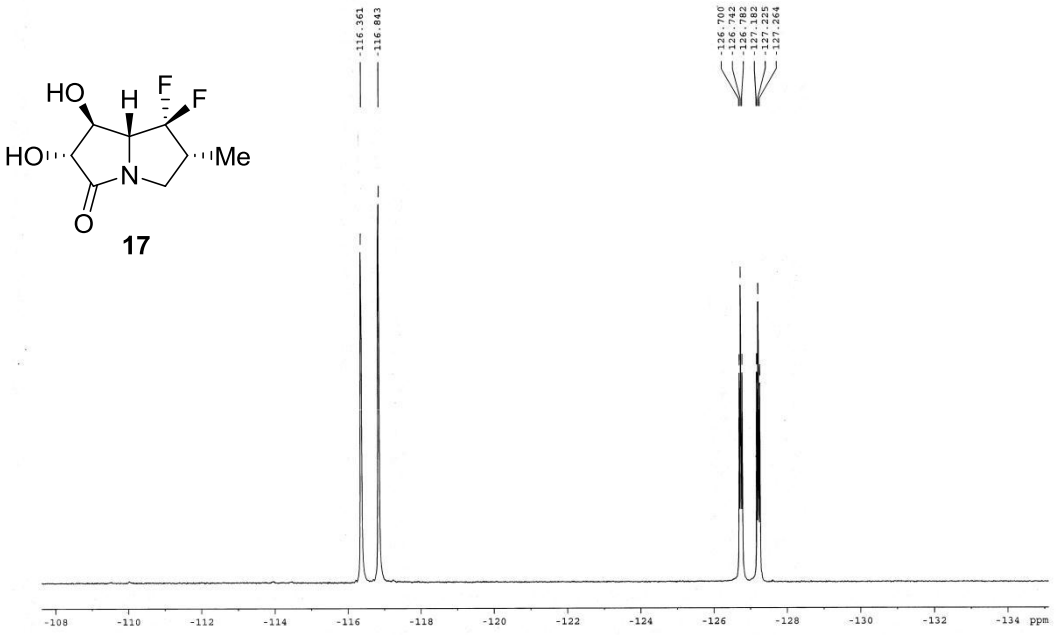
^{1}H NMR Spectrum of **17** (500 MHz, CD_3OD)



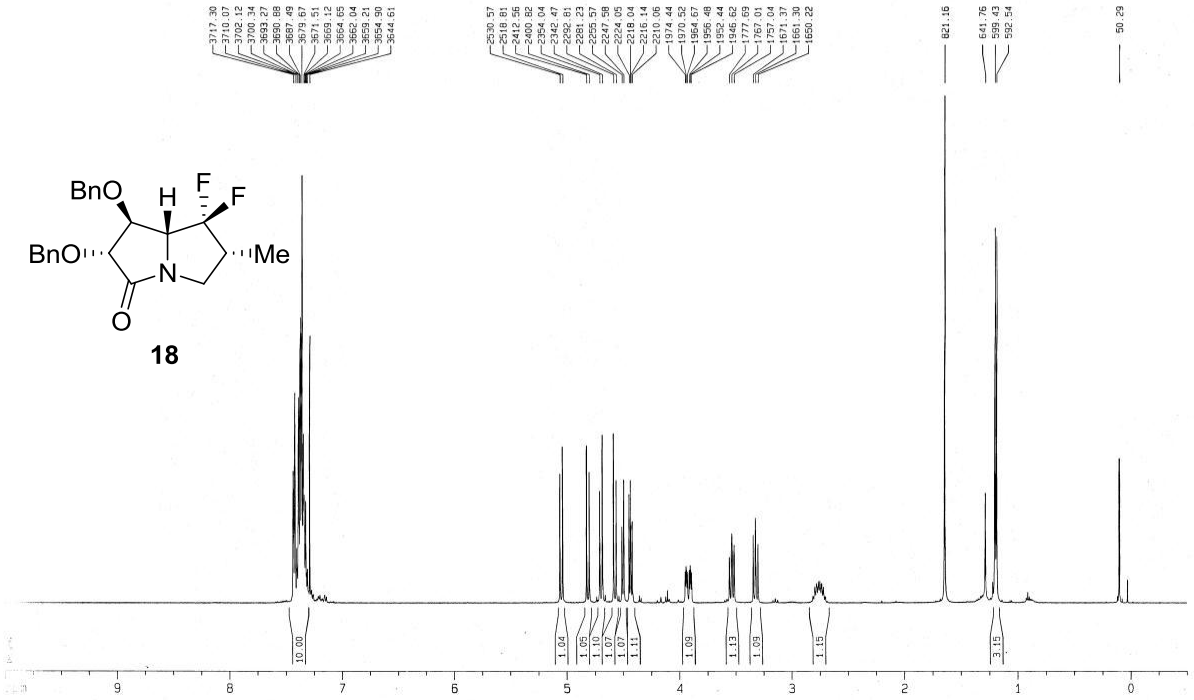
^{13}C NMR Spectrum of **17** (125 MHz, CD_3OD)



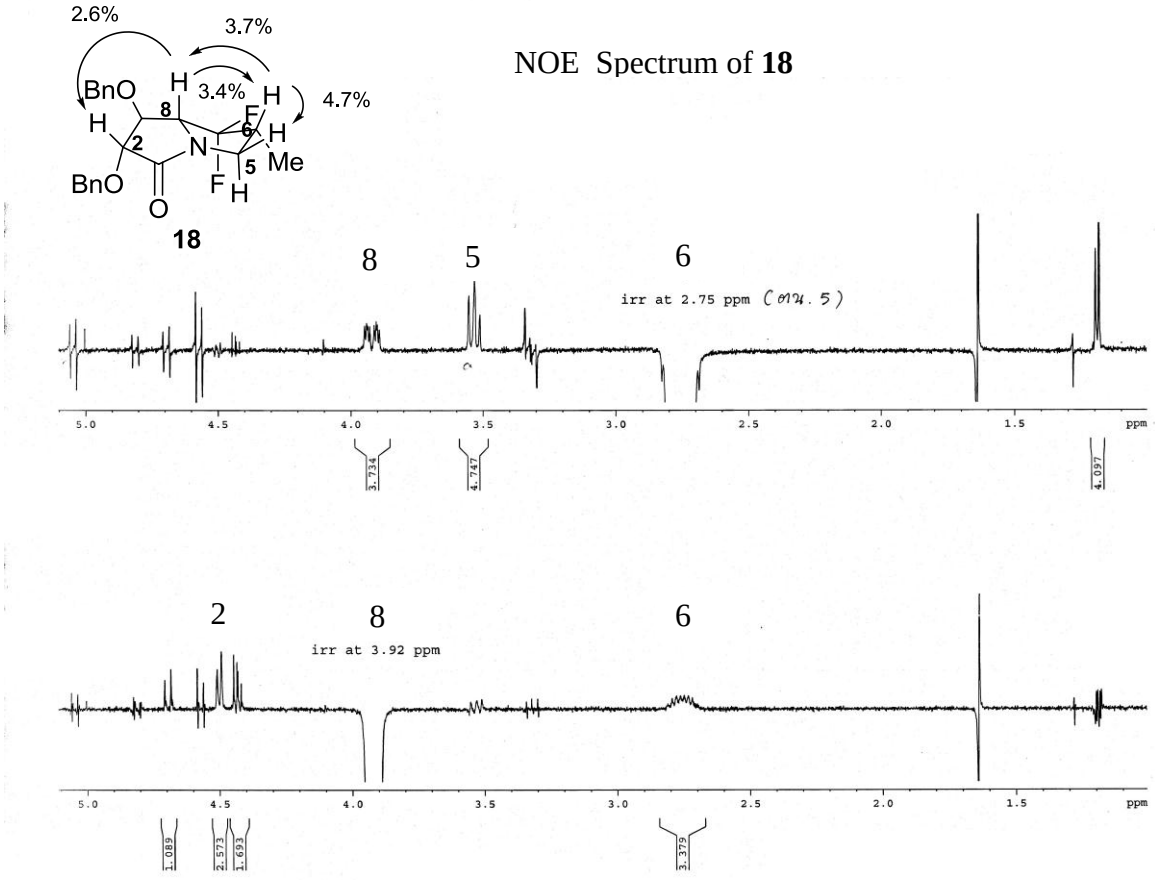
^{19}F NMR Spectrum of **17** (470 MHz CD_3OD)



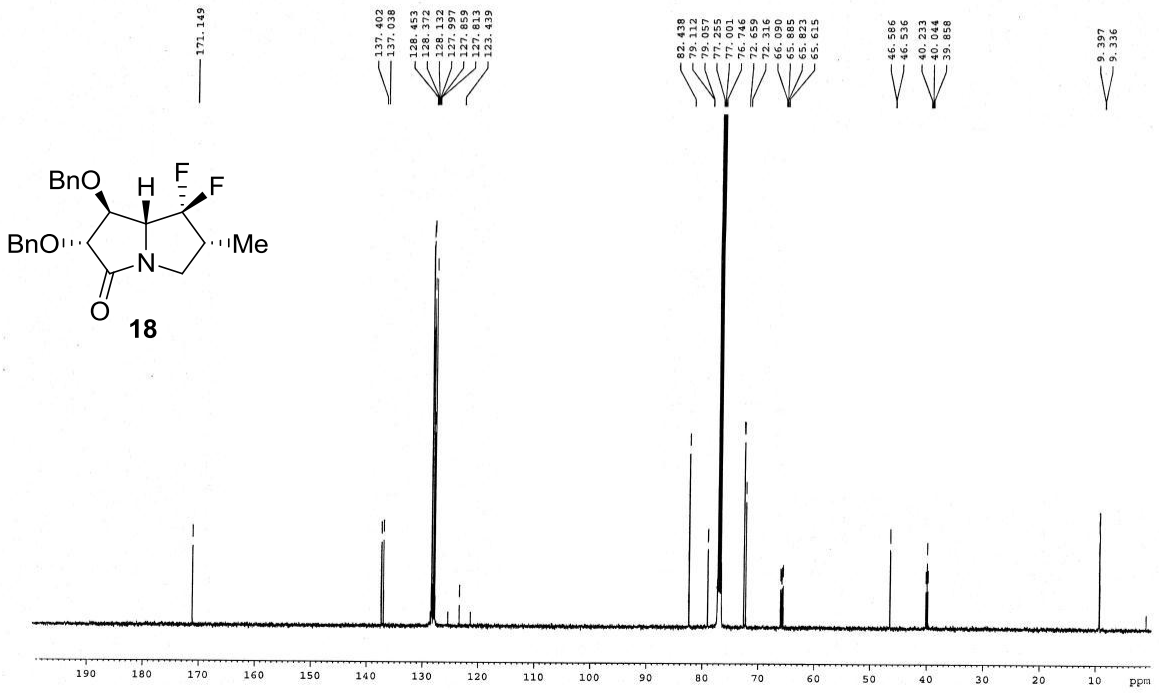
^{1}H NMR Spectrum of **18** (500 MHz, $CDCl_3$)



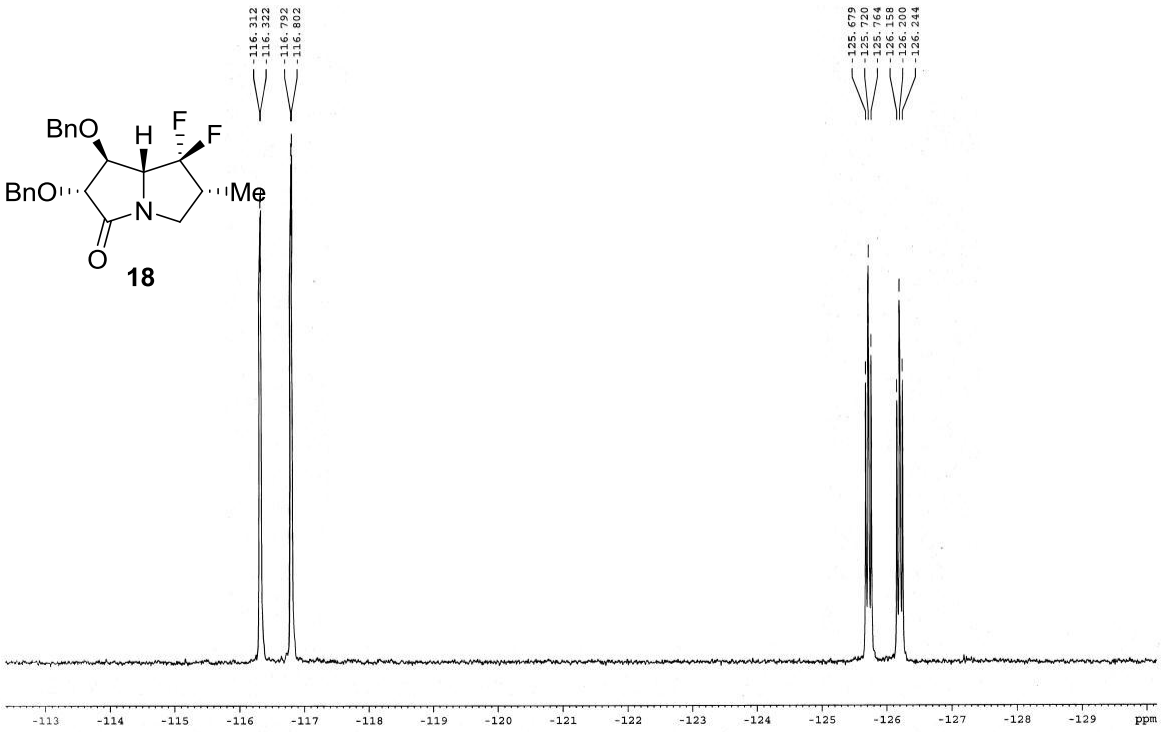
NOE Spectrum of **18**



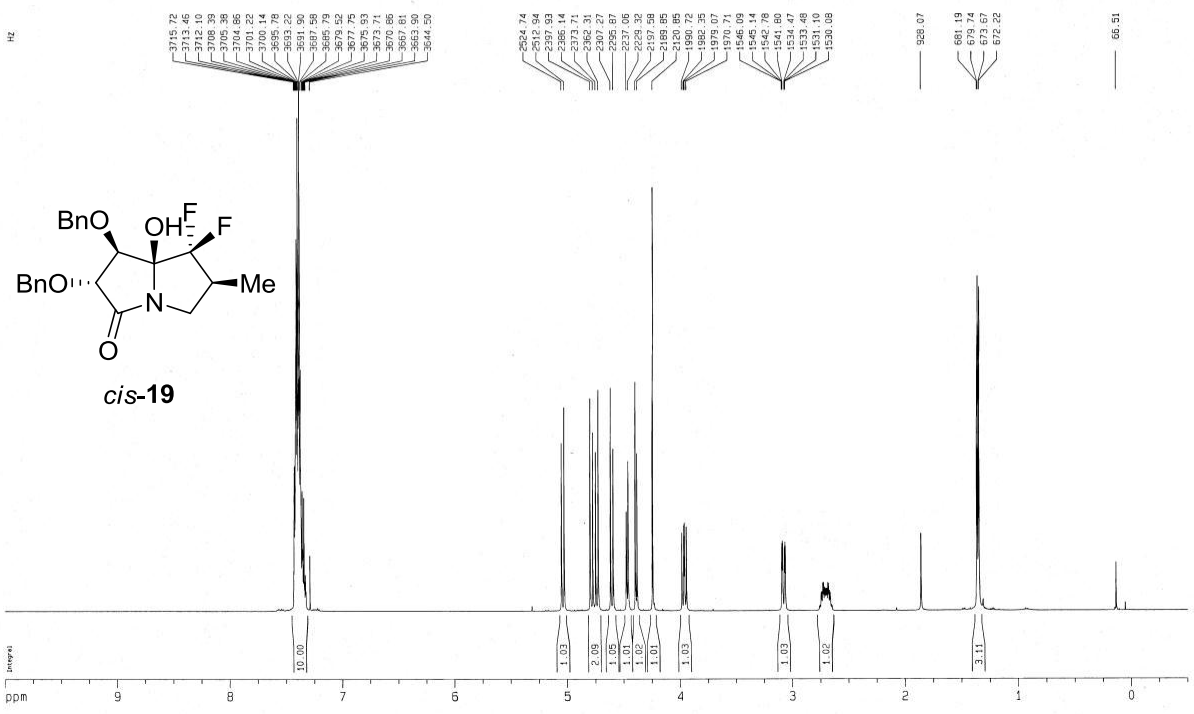
^{13}C NMR Spectrum of **18** (125 MHz, $CDCl_3$)



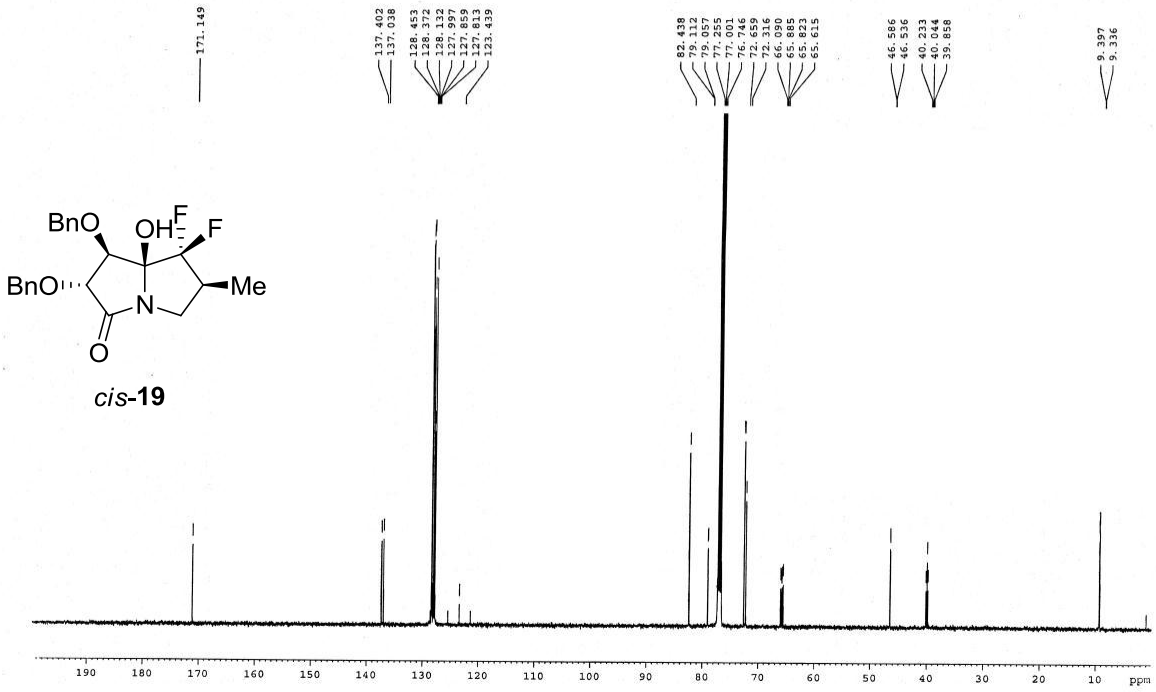
^{19}F NMR Spectrum of **18** (470 MHz, $CDCl_3$)



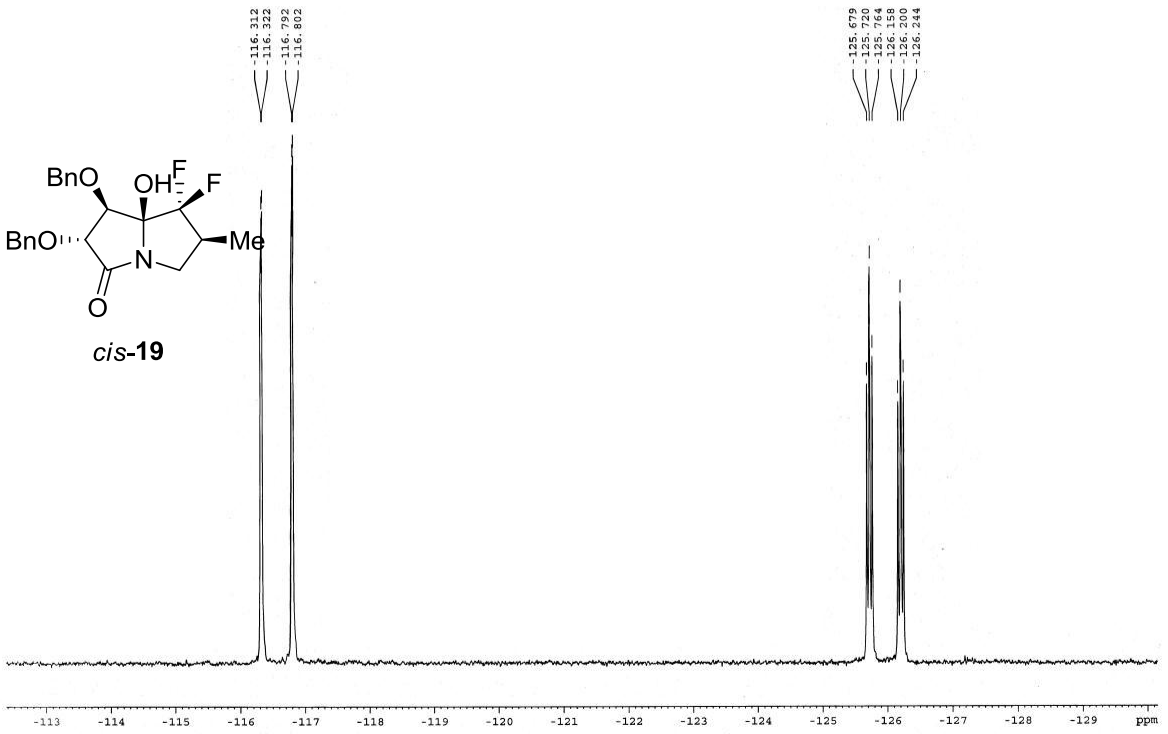
^{1}H NMR Spectrum of *cis*-**19** (500 MHz, $CDCl_3$)



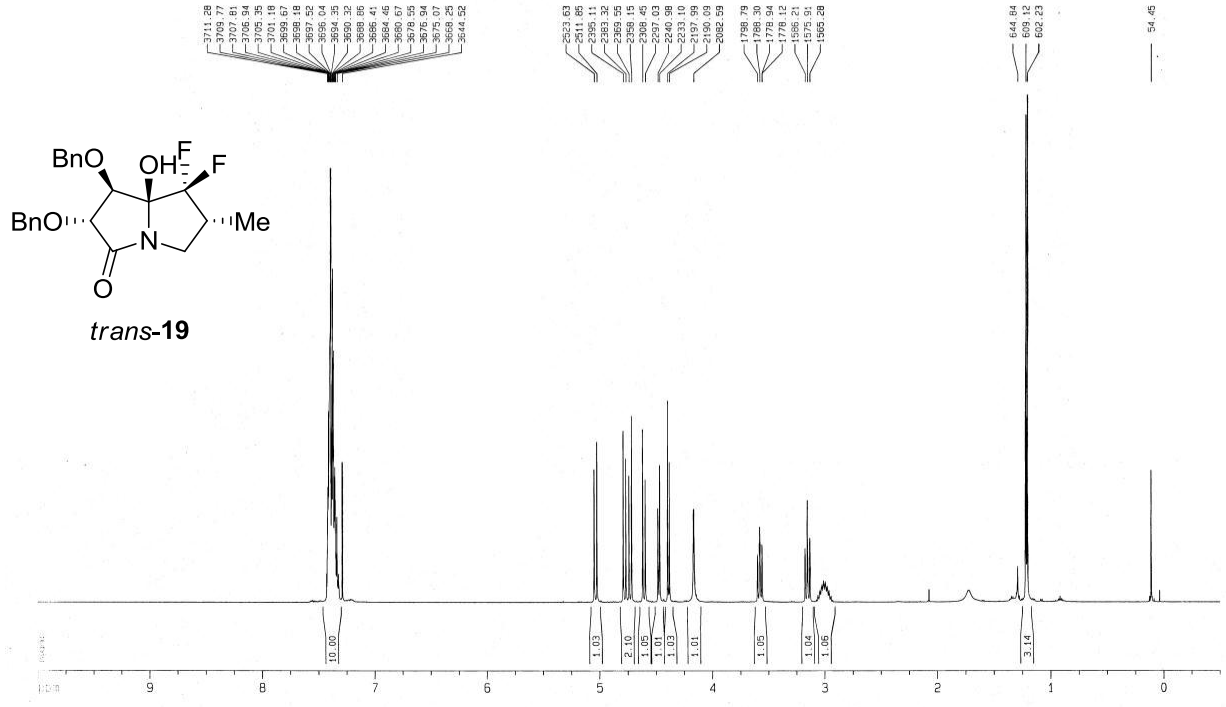
^{13}C NMR Spectrum of *cis*-**19** (125 MHz, $CDCl_3$)



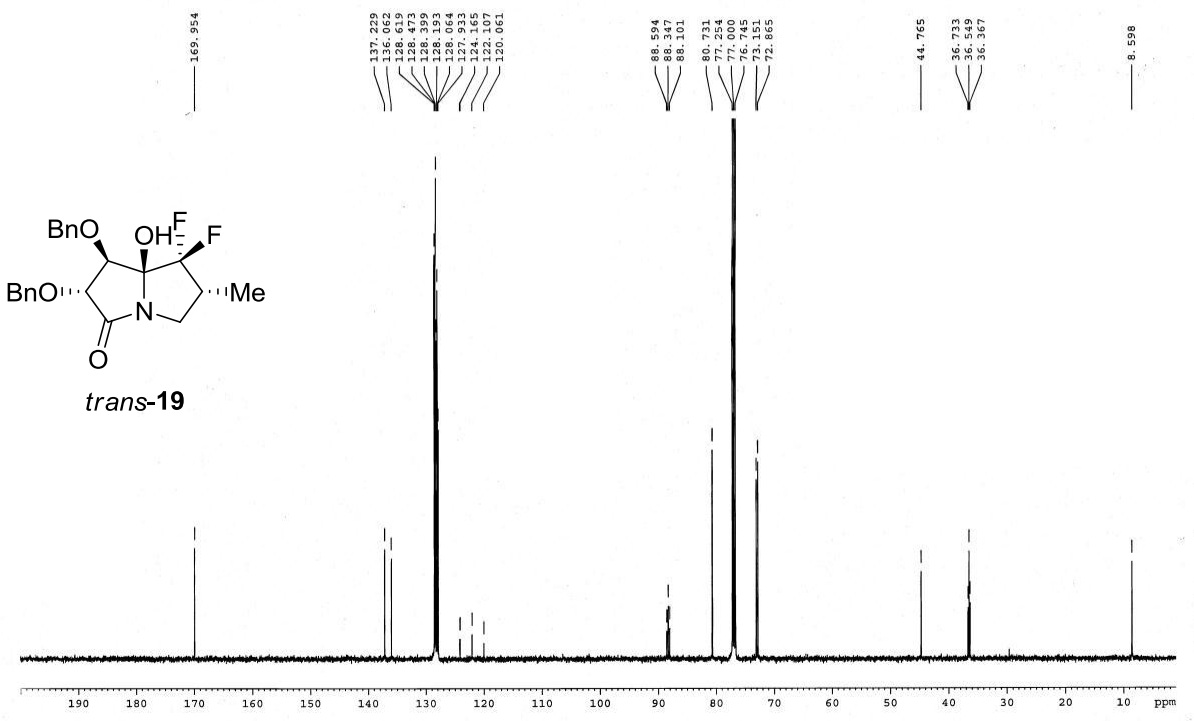
^{19}F NMR Spectrum of *cis*-**19** (470 MHz, $CDCl_3$)



^{1}H NMR Spectrum of *trans*-**19** (500 MHz, $CDCl_3$)

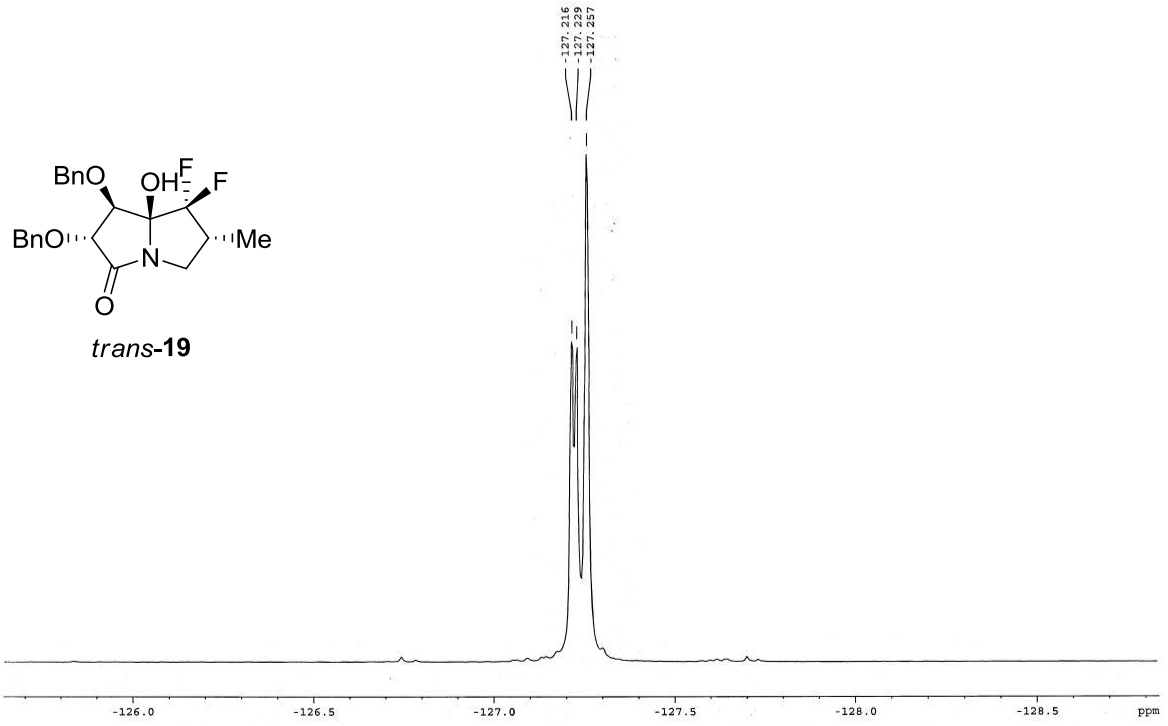


^{13}C NMR Spectrum of *trans*-**19** (125 MHz, $CDCl_3$)



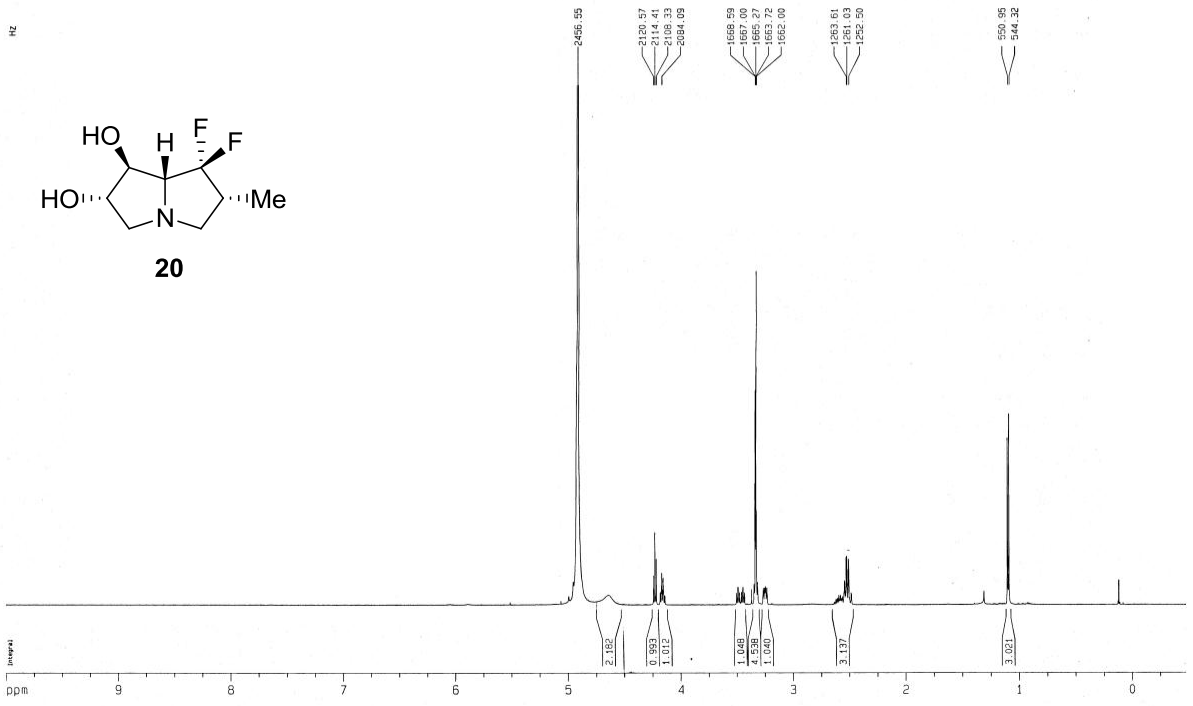
trans-**19**

^{19}F NMR Spectrum of *trans*-**19** (470 MHz, $CDCl_3$)

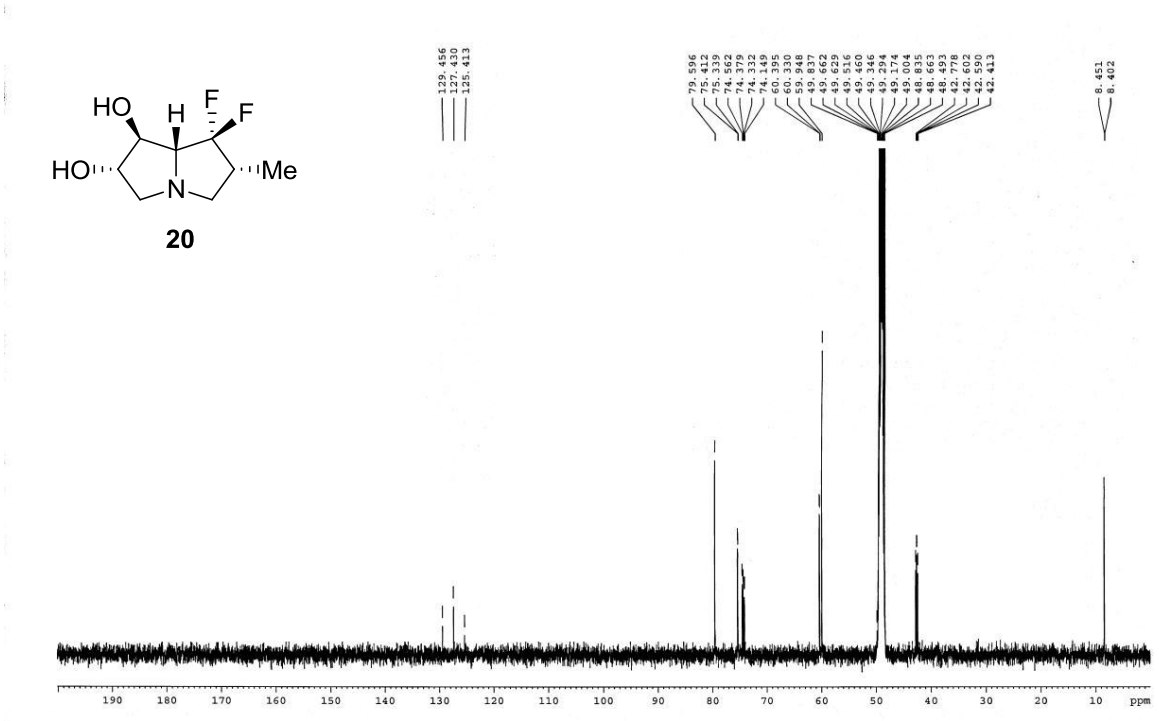


trans-**19**

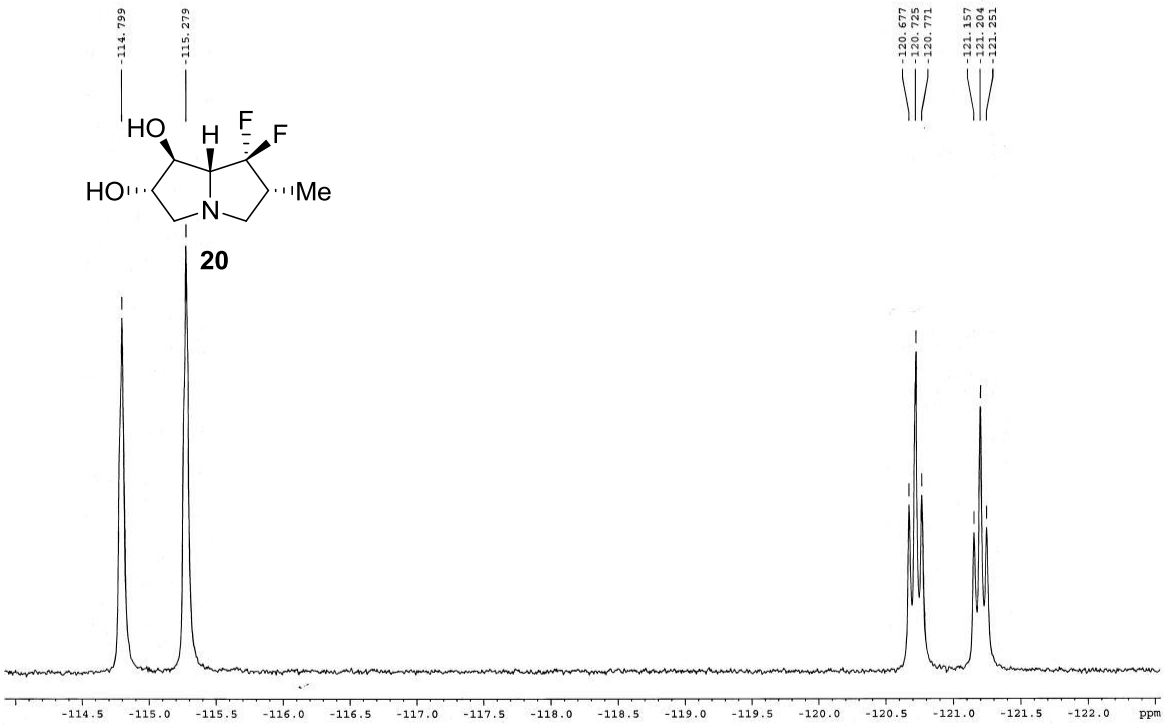
^{1}H NMR Spectrum of **20** (500 MHz, CD_3OD)



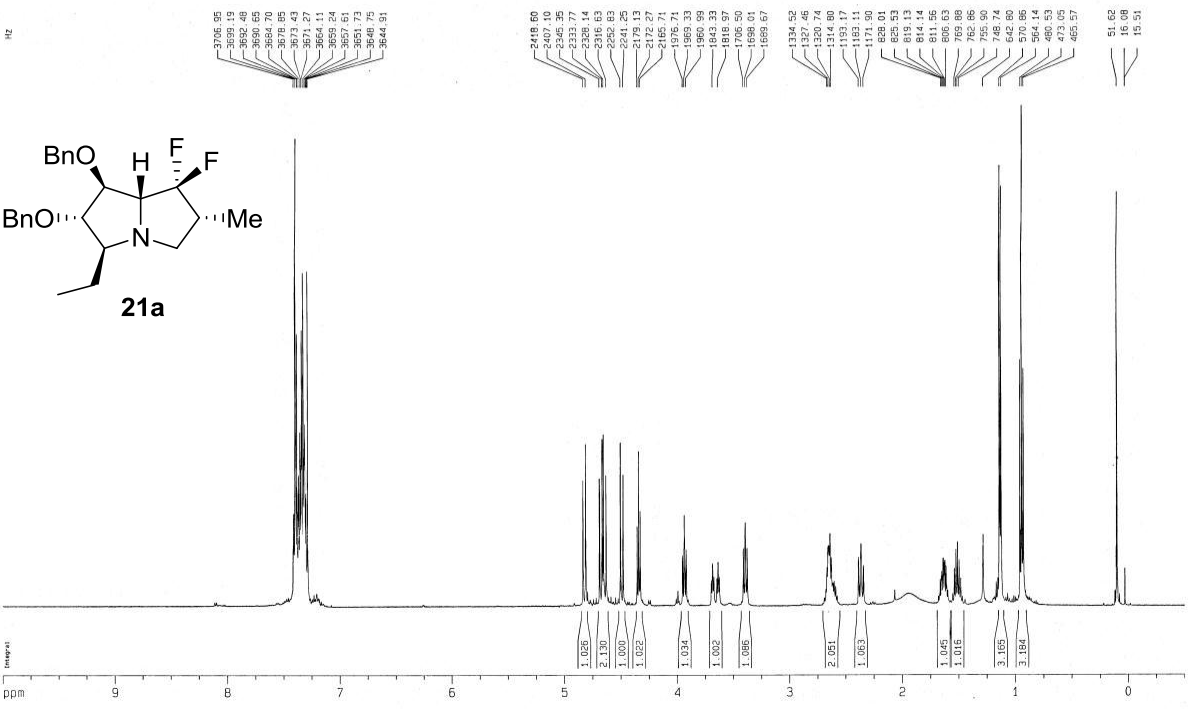
^{13}C NMR Spectrum of **20** (125 MHz, CD_3OD)



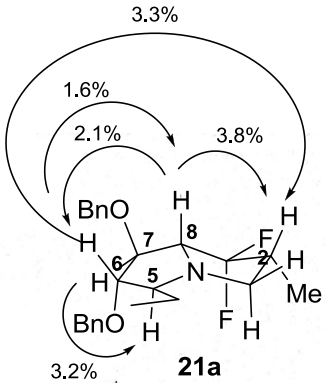
^{19}F NMR Spectrum of **20** (470 MHz, CD_3OD)

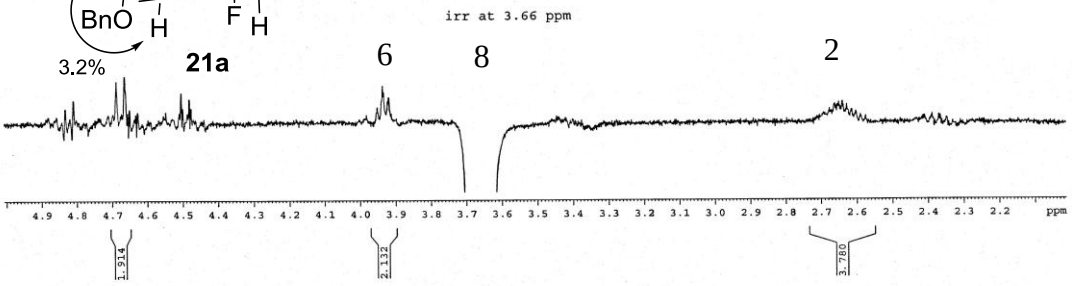


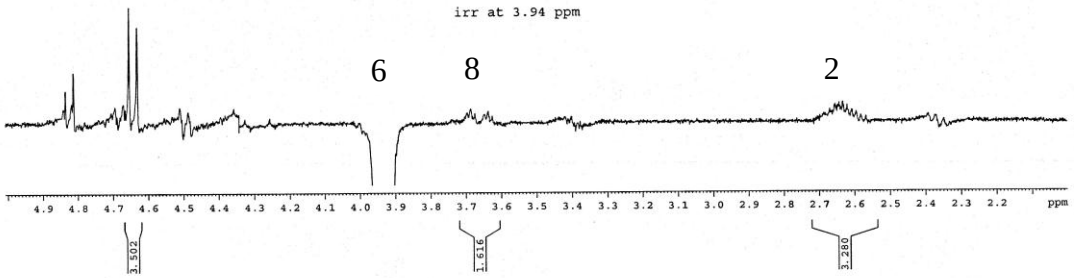
^{1}H NMR Spectrum of 2**1a** (500 MHz, $CDCl_3$)

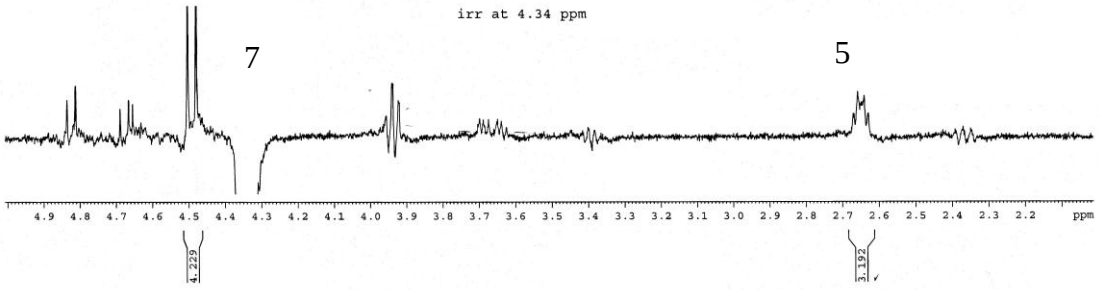


NOE Spectrum of **21a**

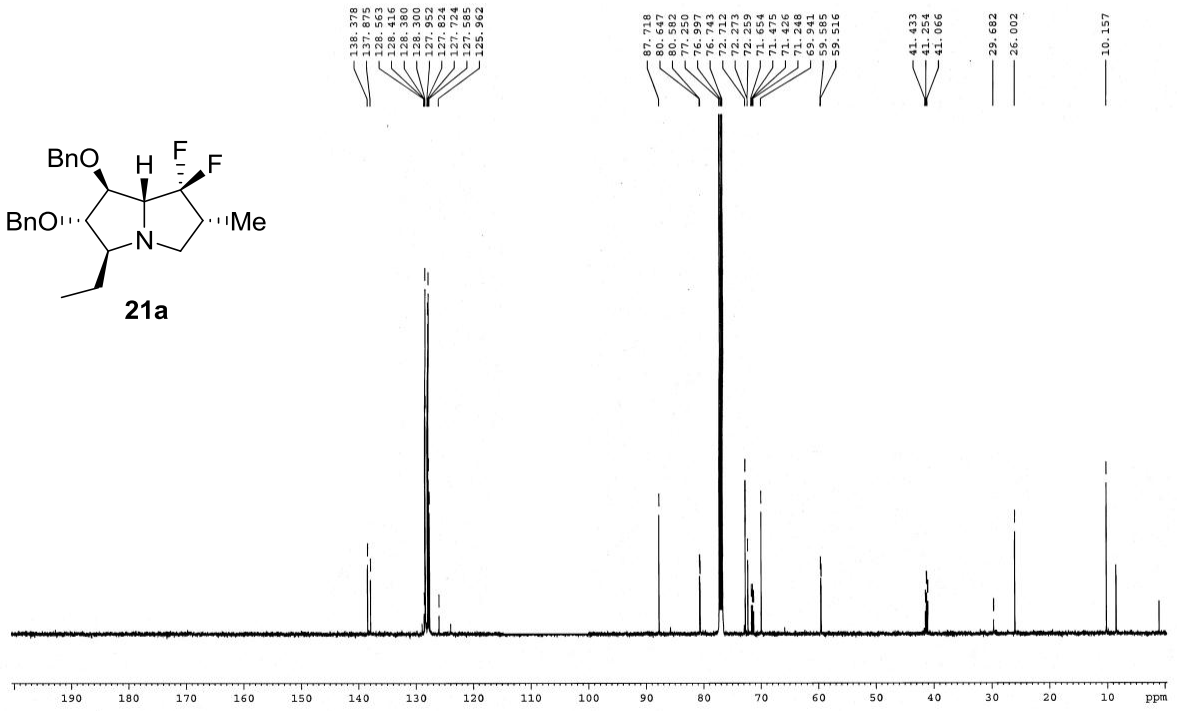




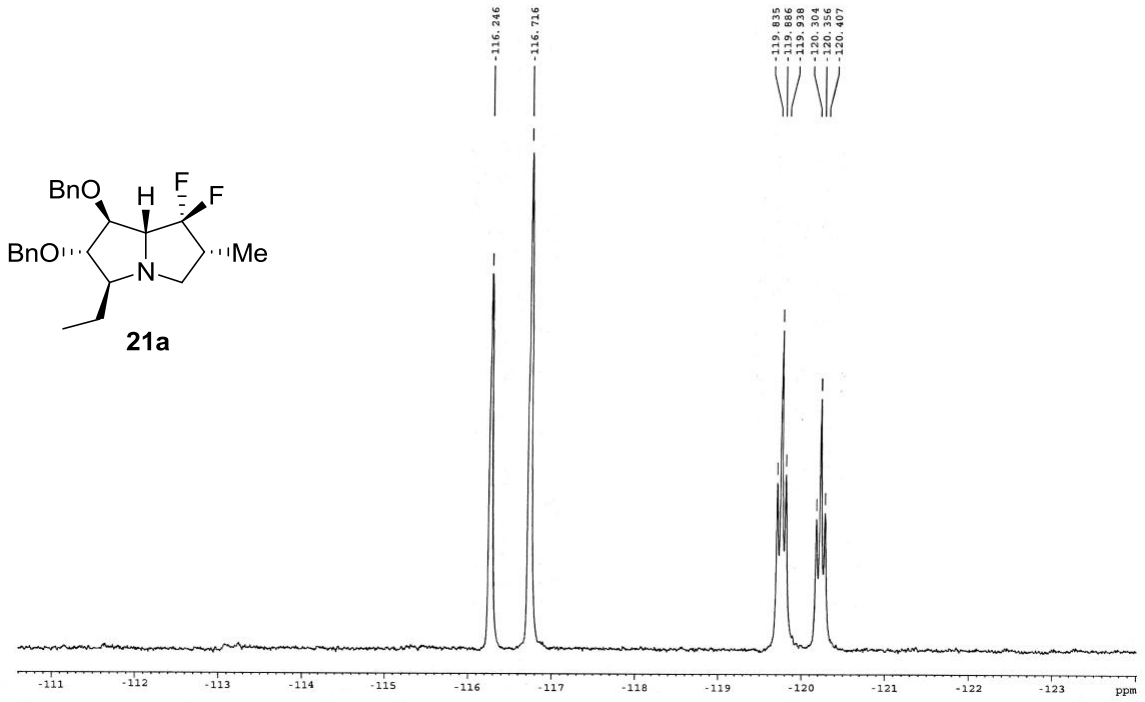




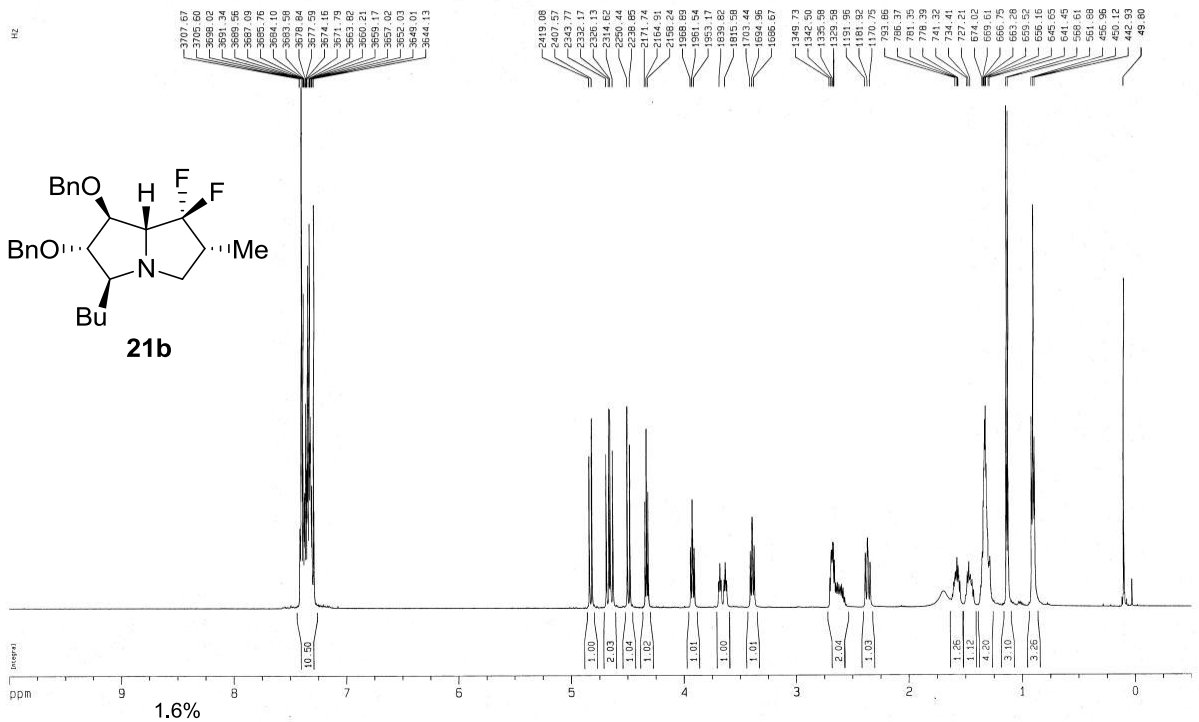
^{13}C NMR Spectrum of **21a** (125 MHz, $CDCl_3$)



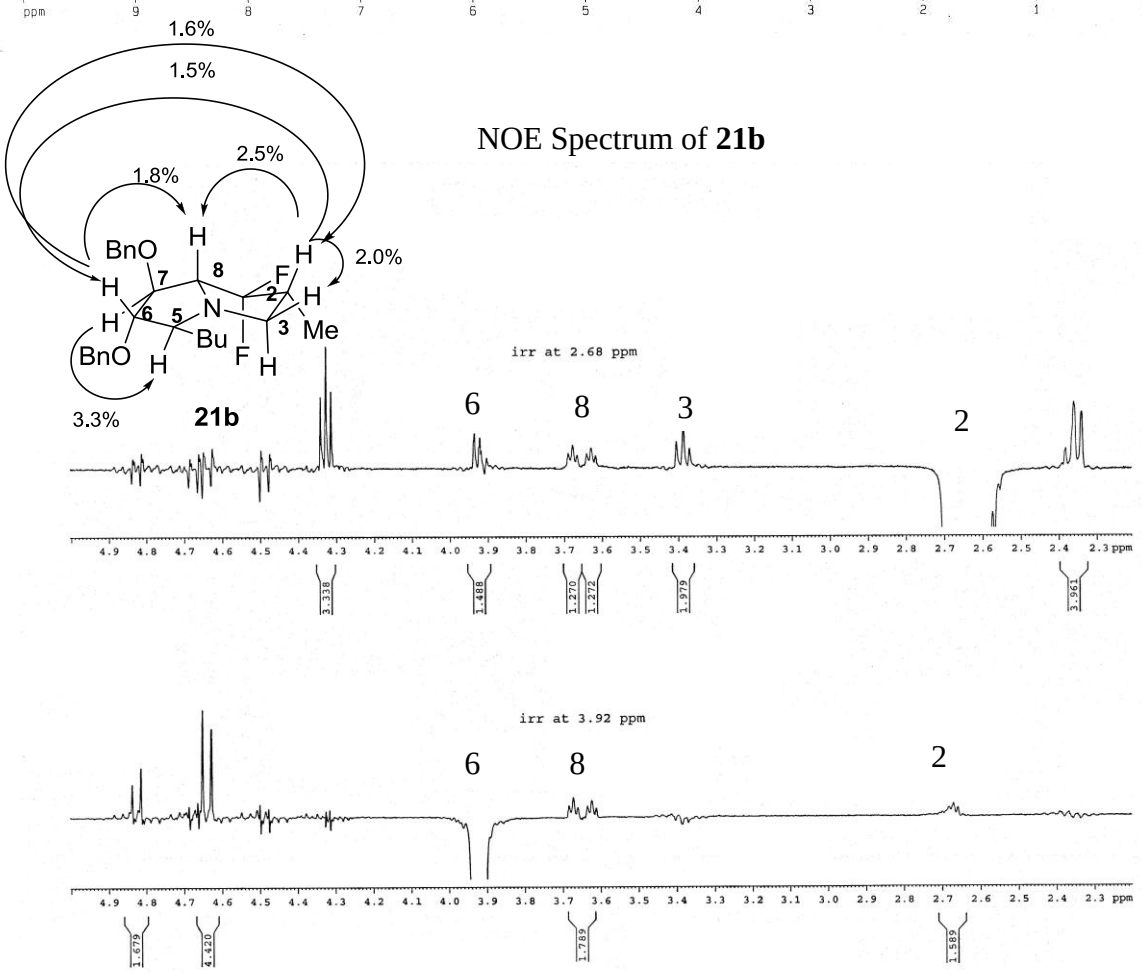
^{19}F NMR Spectrum of **21a** (470 MHz, $CDCl_3$)



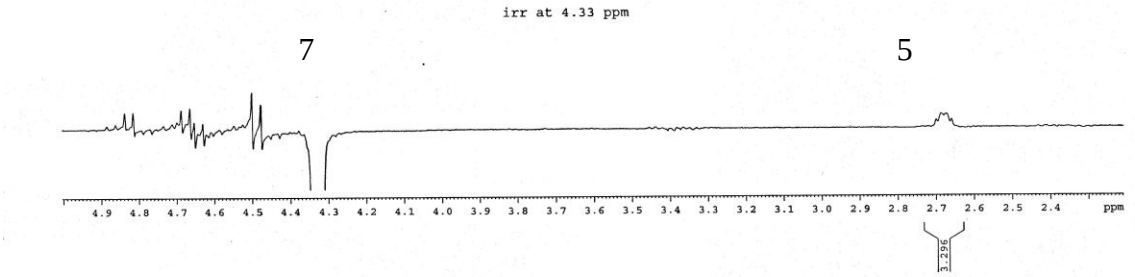
^{1}H NMR Spectrum of 2**1b** (500 MHz, $CDCl_3$)



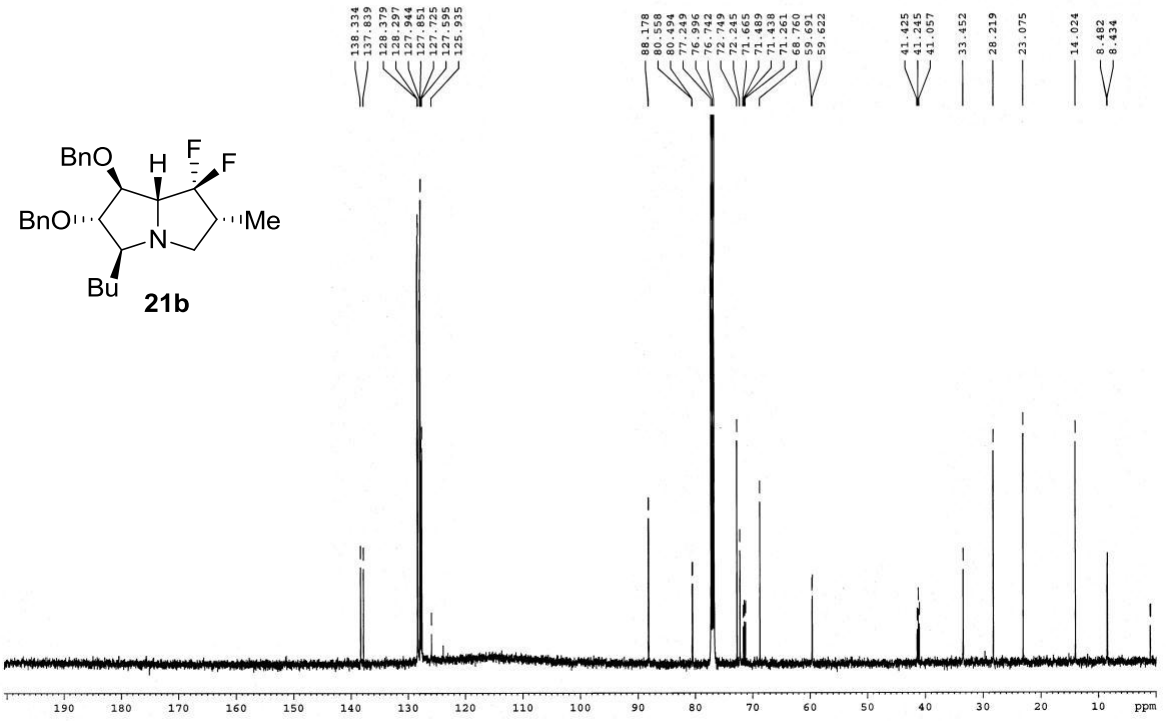
NOE Spectrum of **21b**



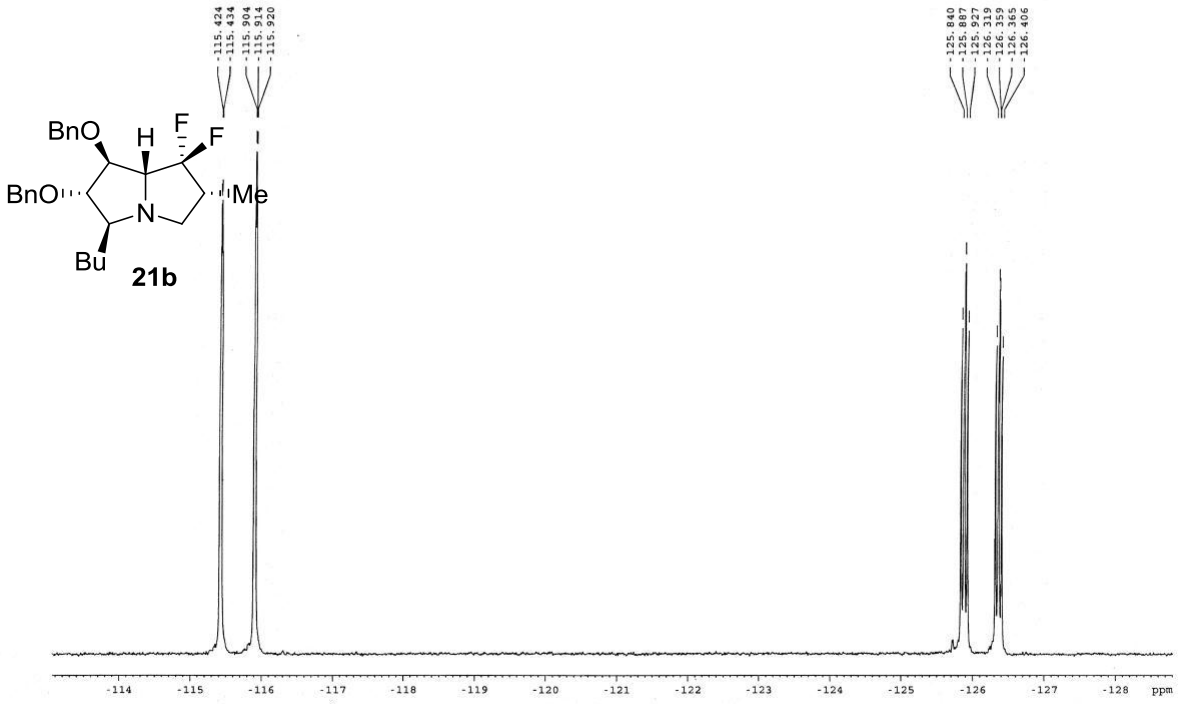
NOE Spectrum of **21b**



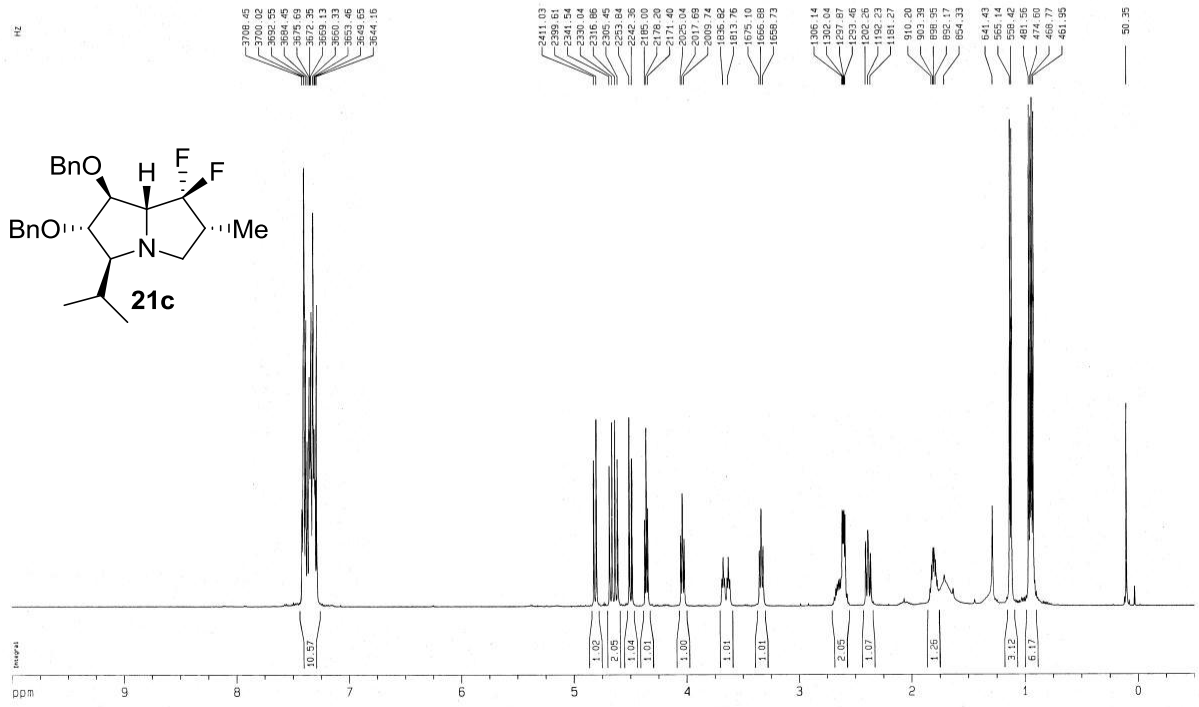
^{13}C NMR Spectrum of **21b** (125 MHz, $CDCl_3$)



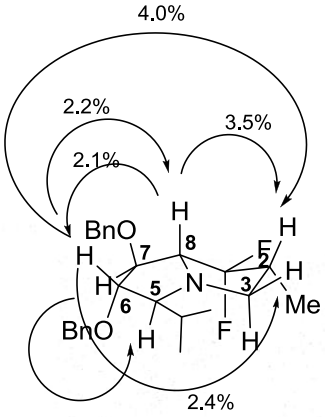
^{19}F NMR Spectrum of **21b** (470 MHz, $CDCl_3$)



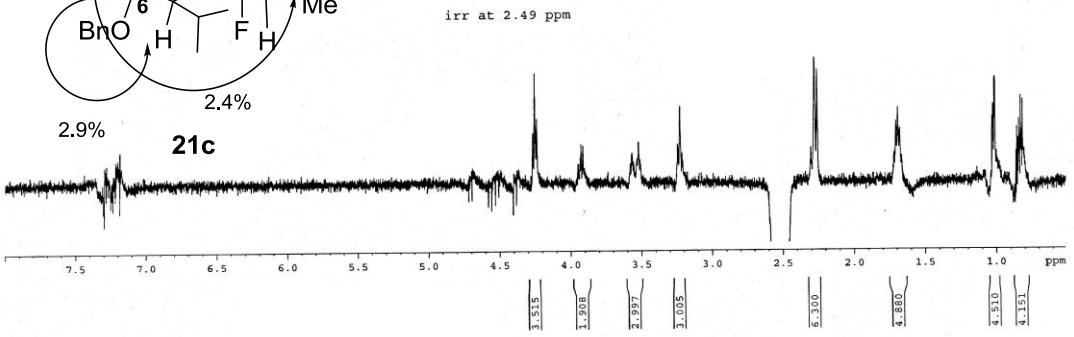
^{1}H NMR Spectrum of 2**1c** (500 MHz, $CDCl_3$)

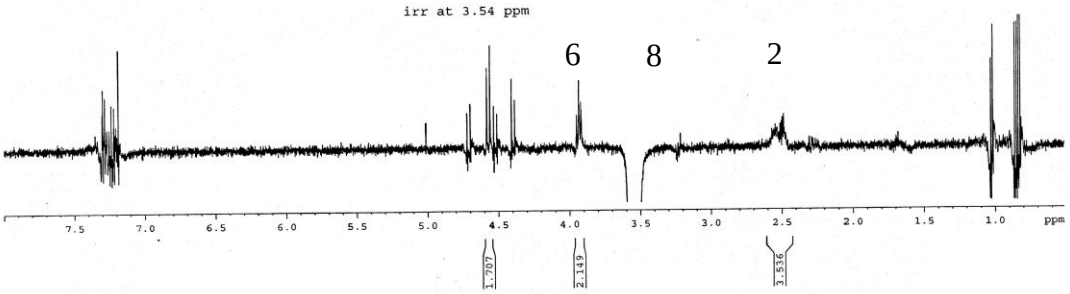


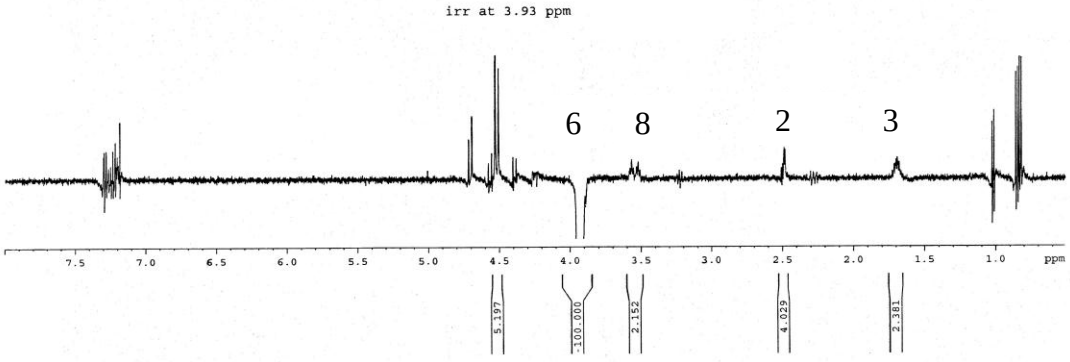
NOE Spectrum of **21c**

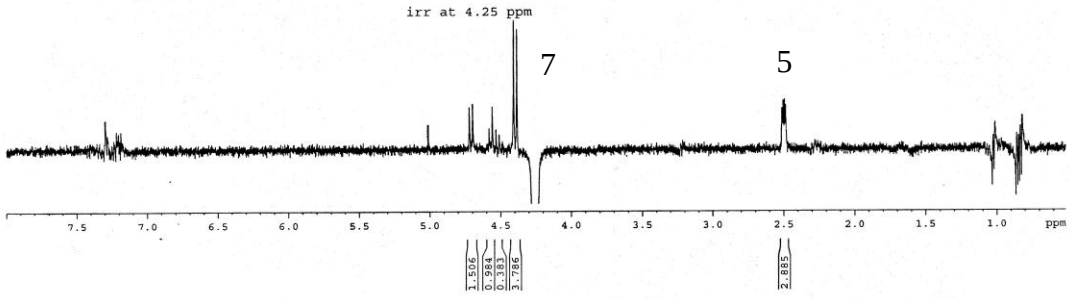


21c

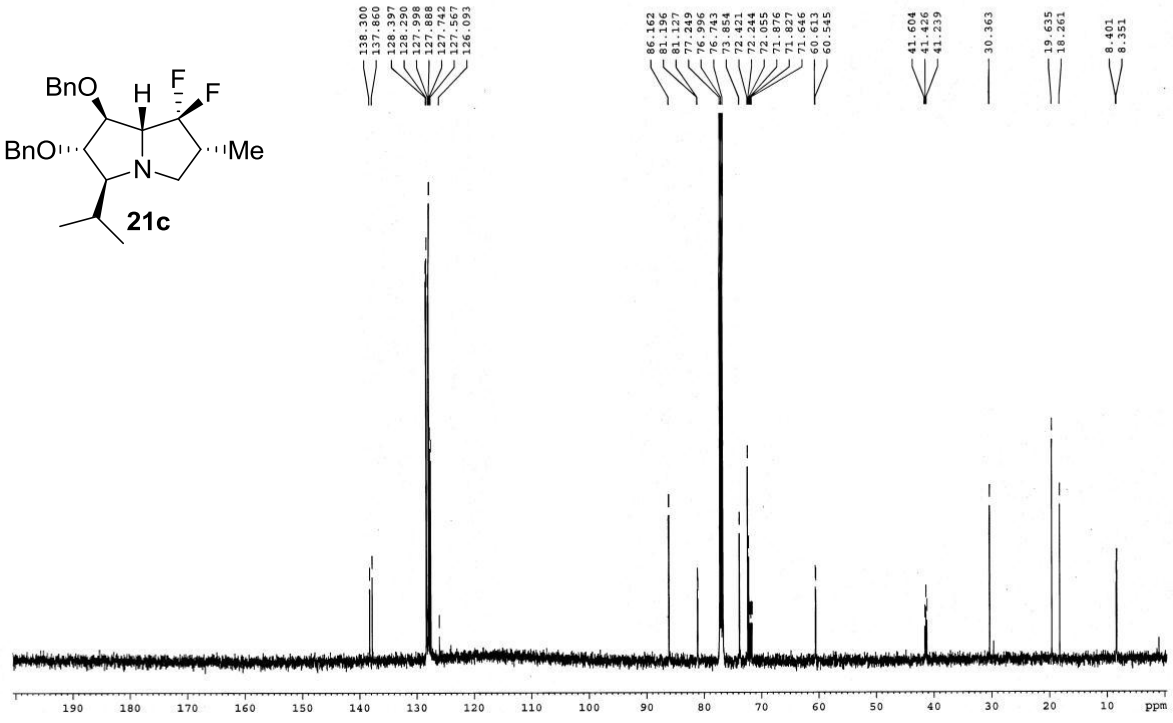




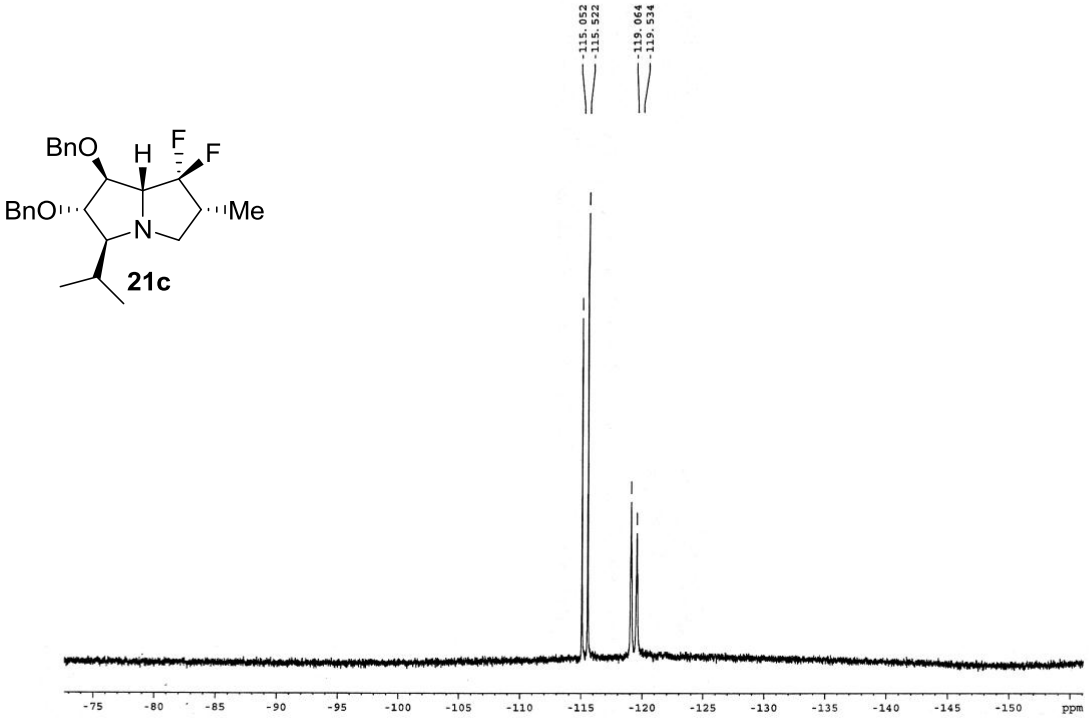




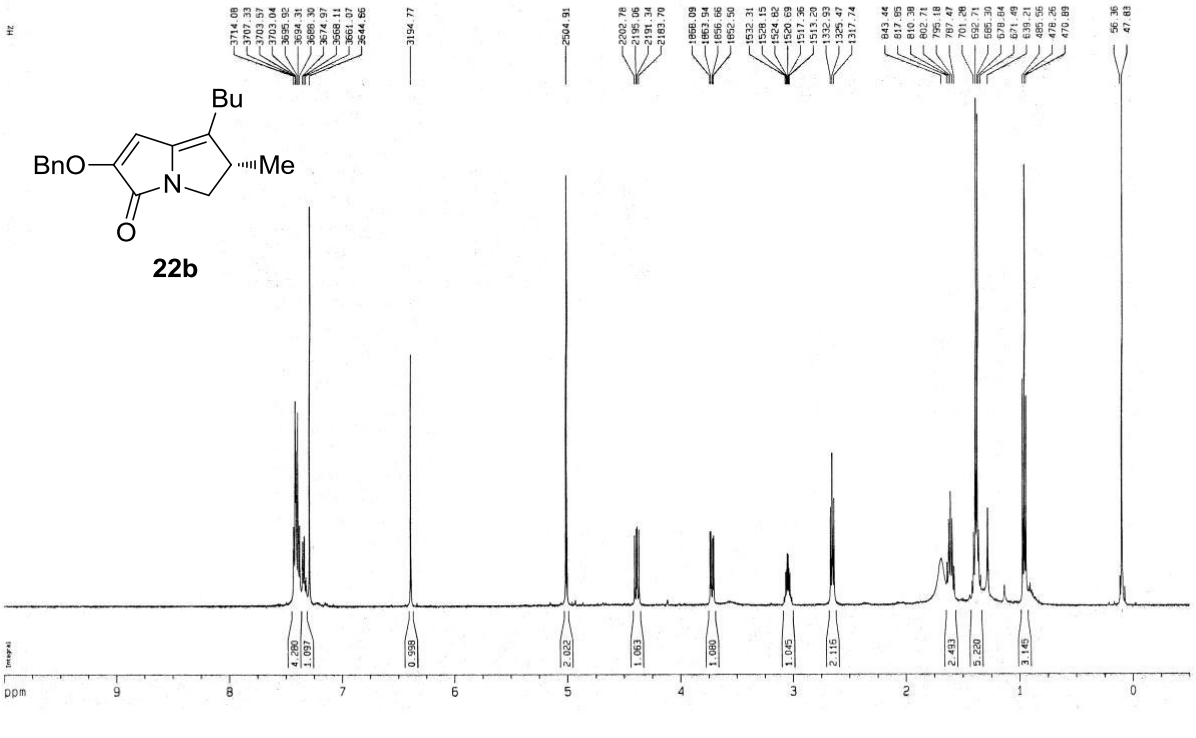
^{13}C NMR Spectrum of **21c** (125 MHz, $CDCl_3$)



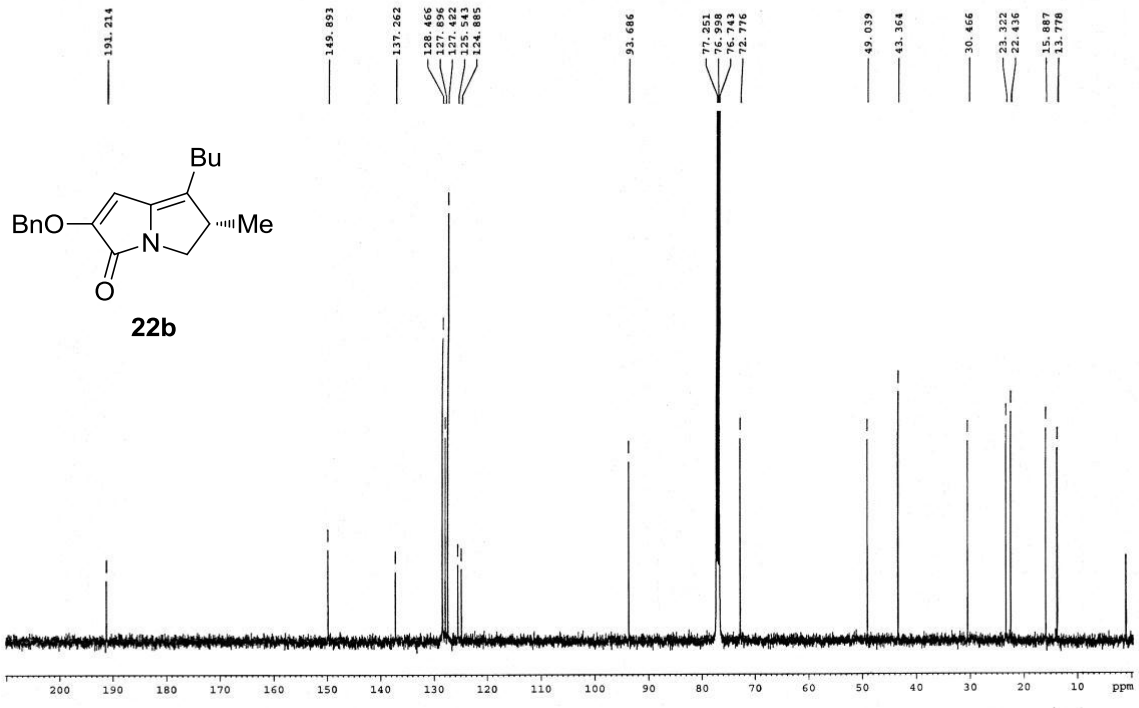
^{19}F NMR Spectrum of **21c** (470 MHz, $CDCl_3$)



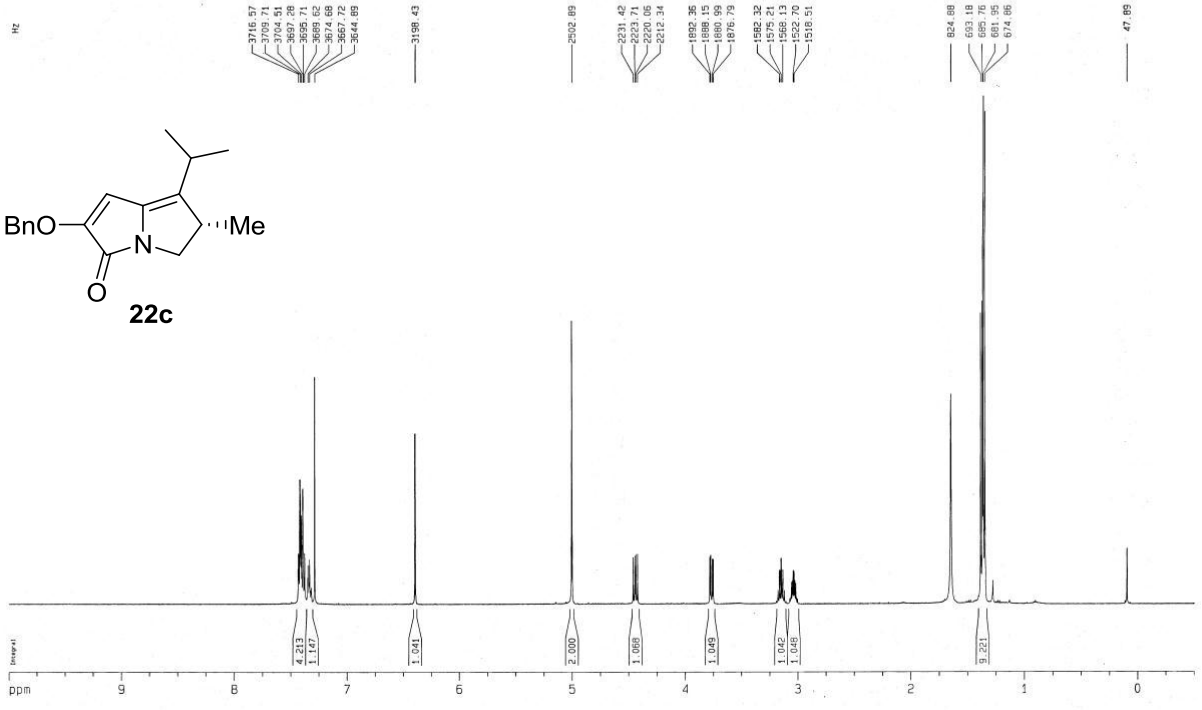
^{1}H NMR Spectrum of 2**2b** (500 MHz, $CDCl_3$)



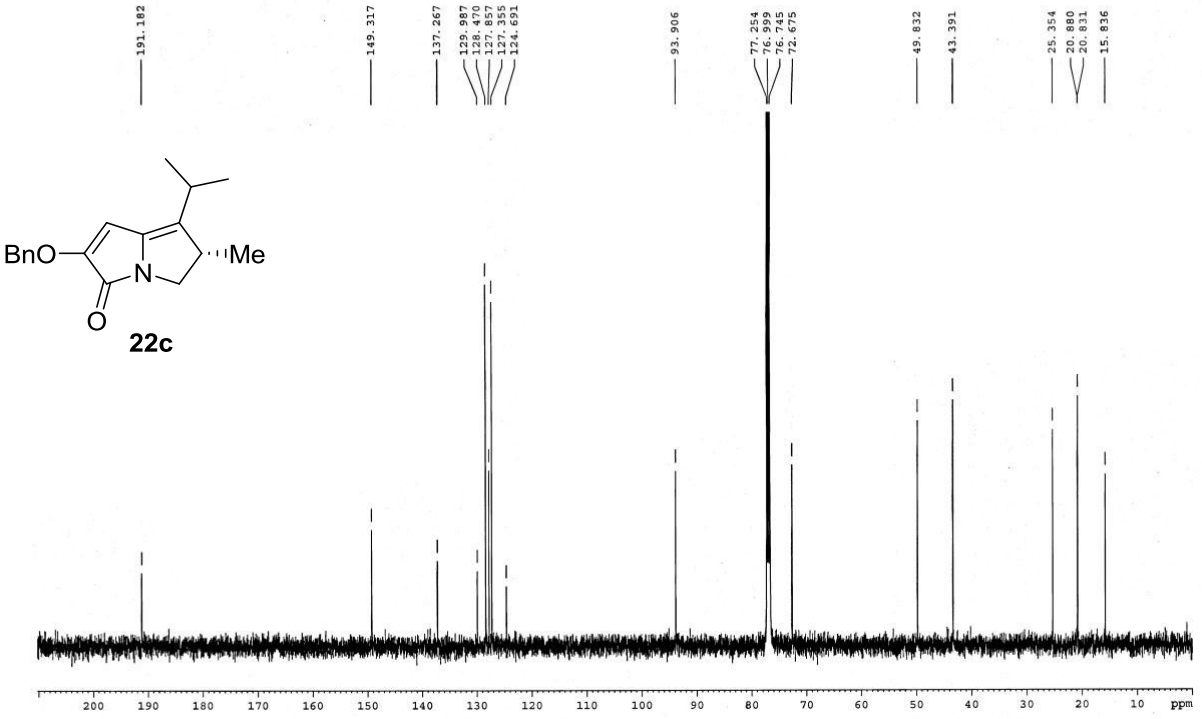
^{13}C NMR Spectrum of **22b** (125 MHz, $CDCl_3$)



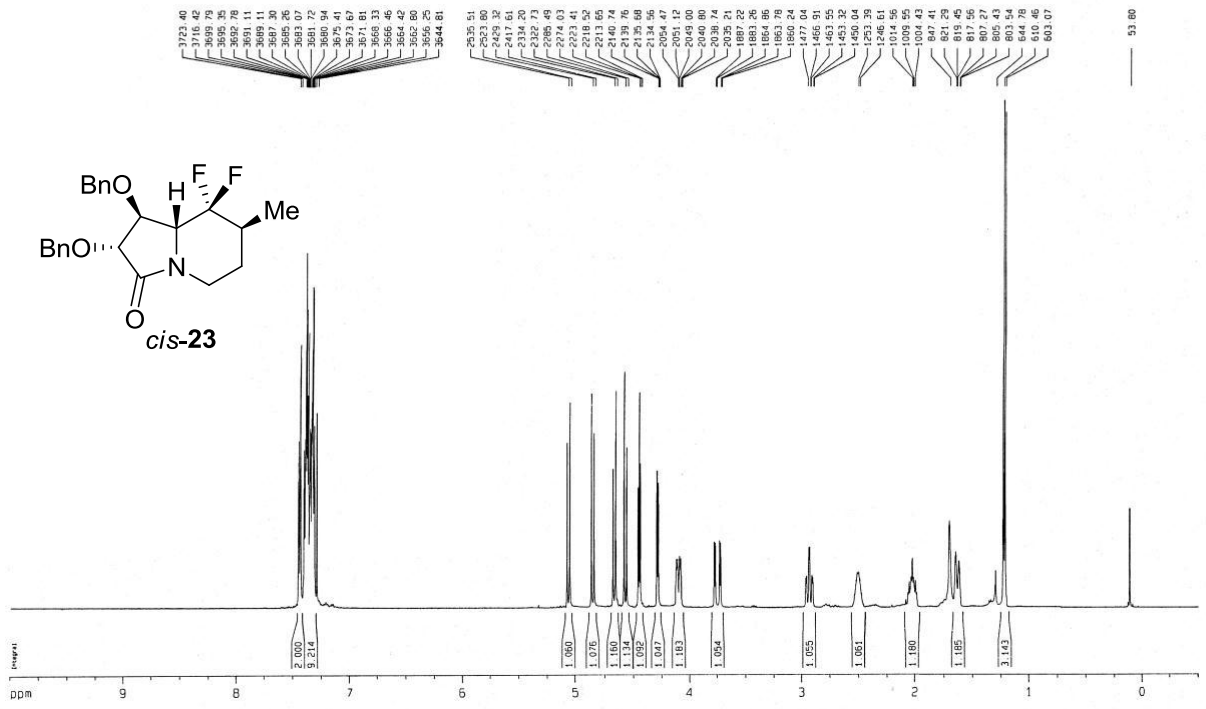
^{1}H NMR Spectrum of 2**2c** (500 MHz, $CDCl_3$)



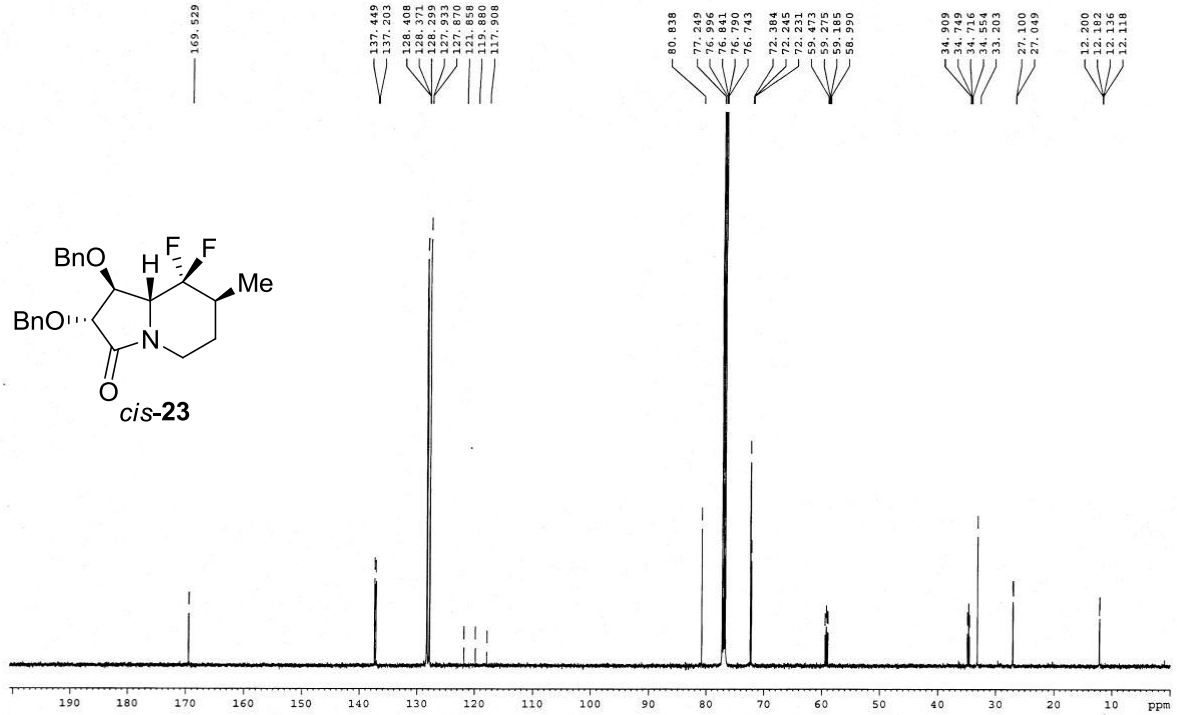
^{13}C NMR Spectrum of **22c** (125 MHz, $CDCl_3$)



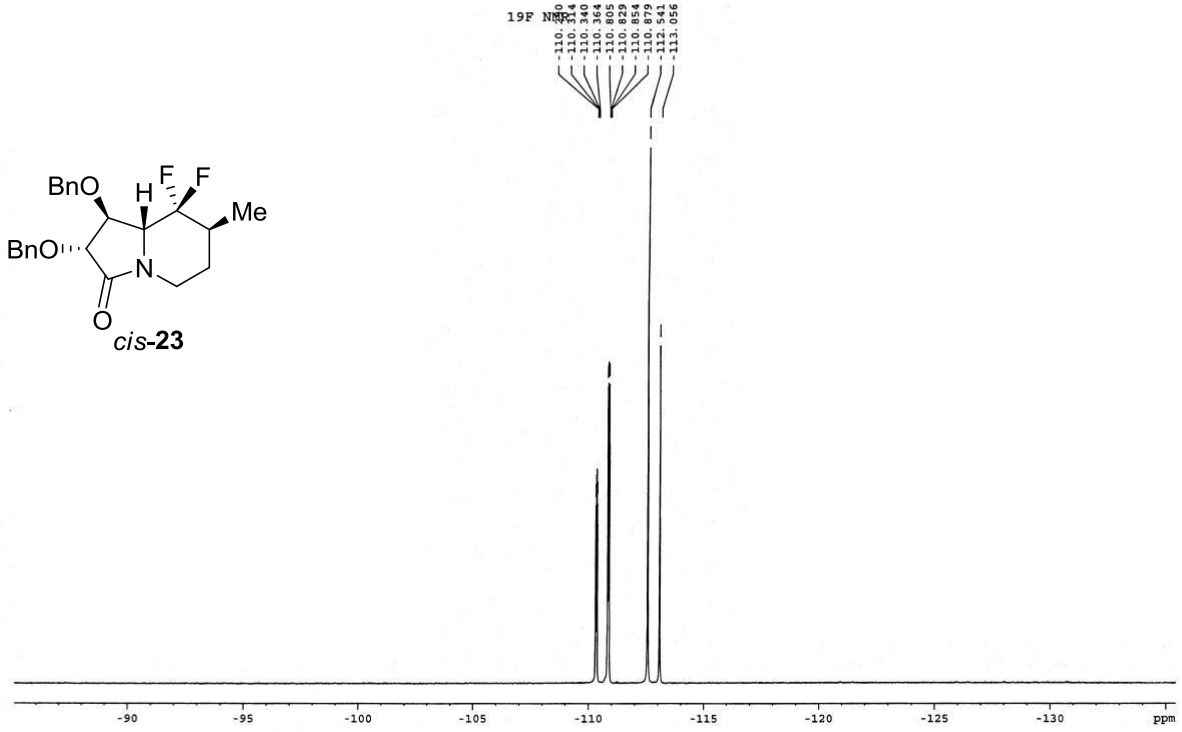
^{1}H NMR Spectrum of *cis*-2**3** (500 MHz, $CDCl_3$)



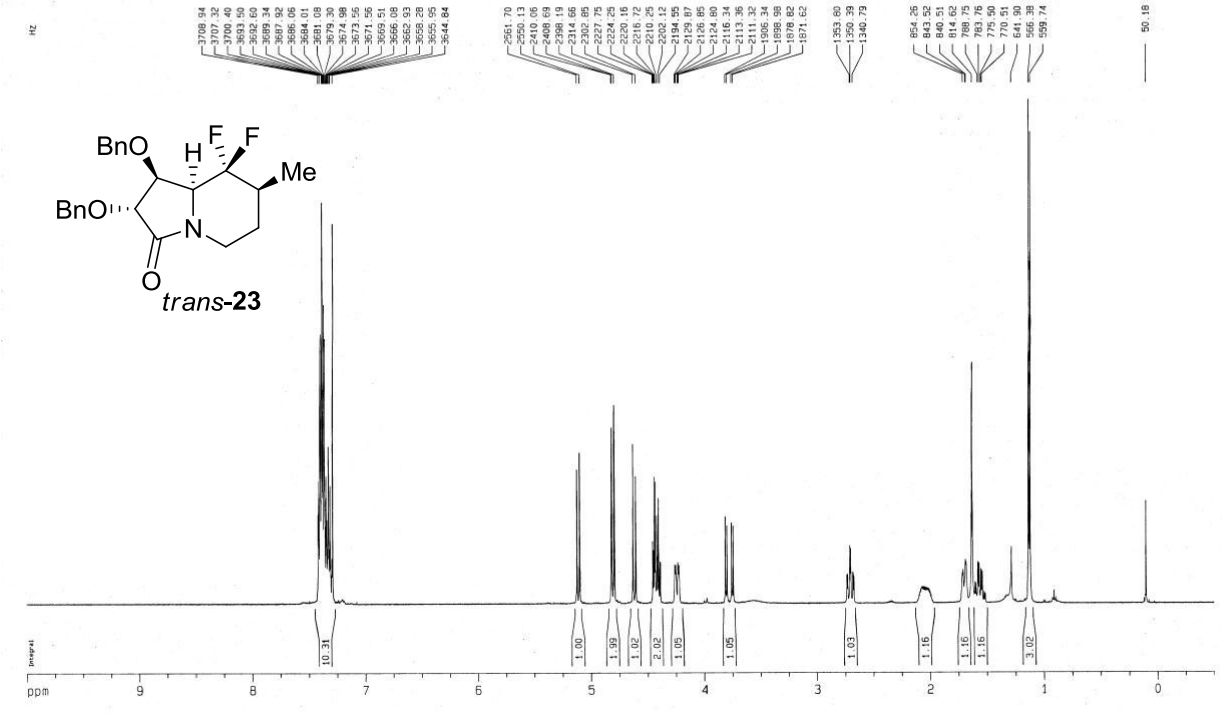
^{13}C NMR Spectrum of *cis*-2**3** (125 MHz, $CDCl_3$)



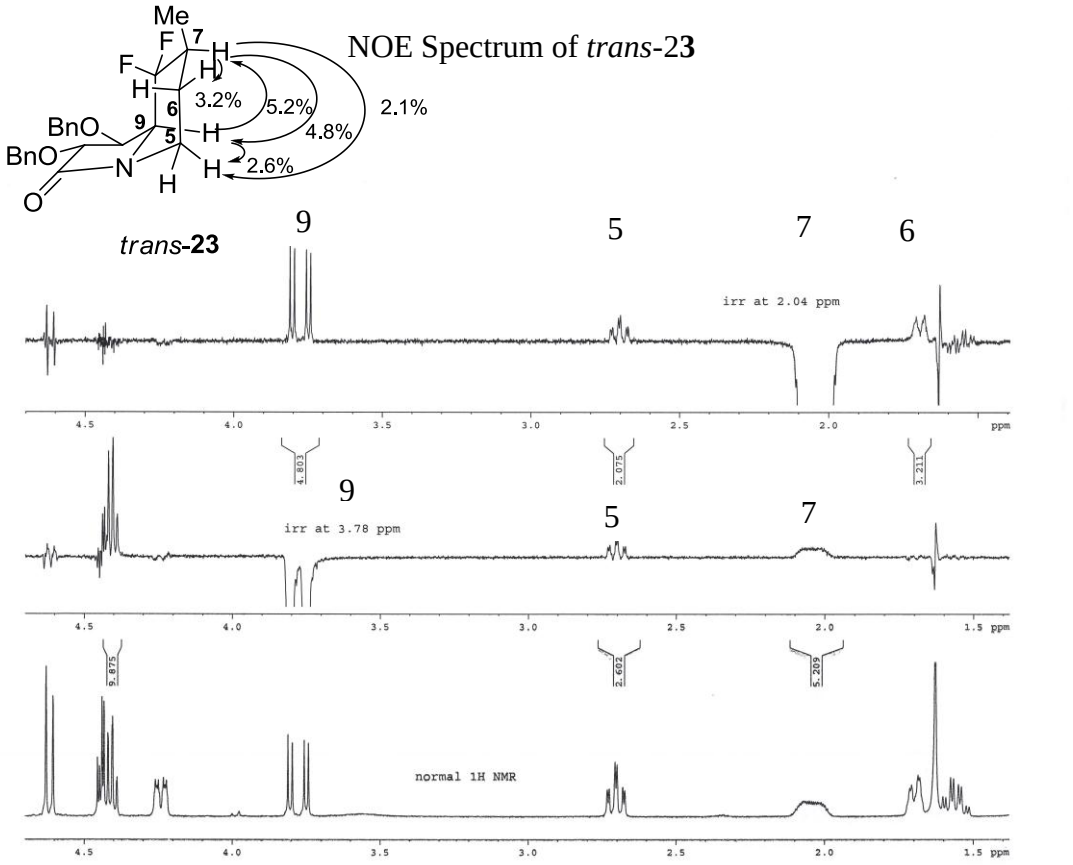
^{19}F NMR Spectrum of *cis*-2**3** (470 MHz, $CDCl_3$)



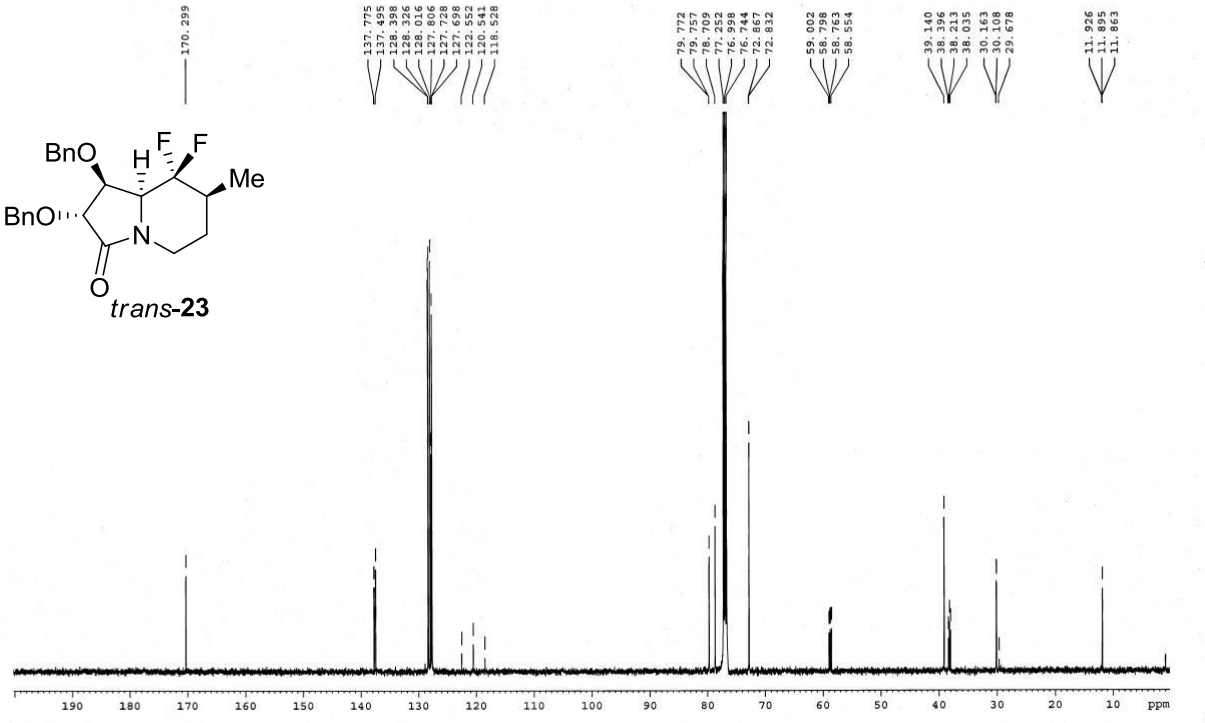
^{1}H NMR Spectrum of *trans*-2**3** (500 MHz, $CDCl_3$)



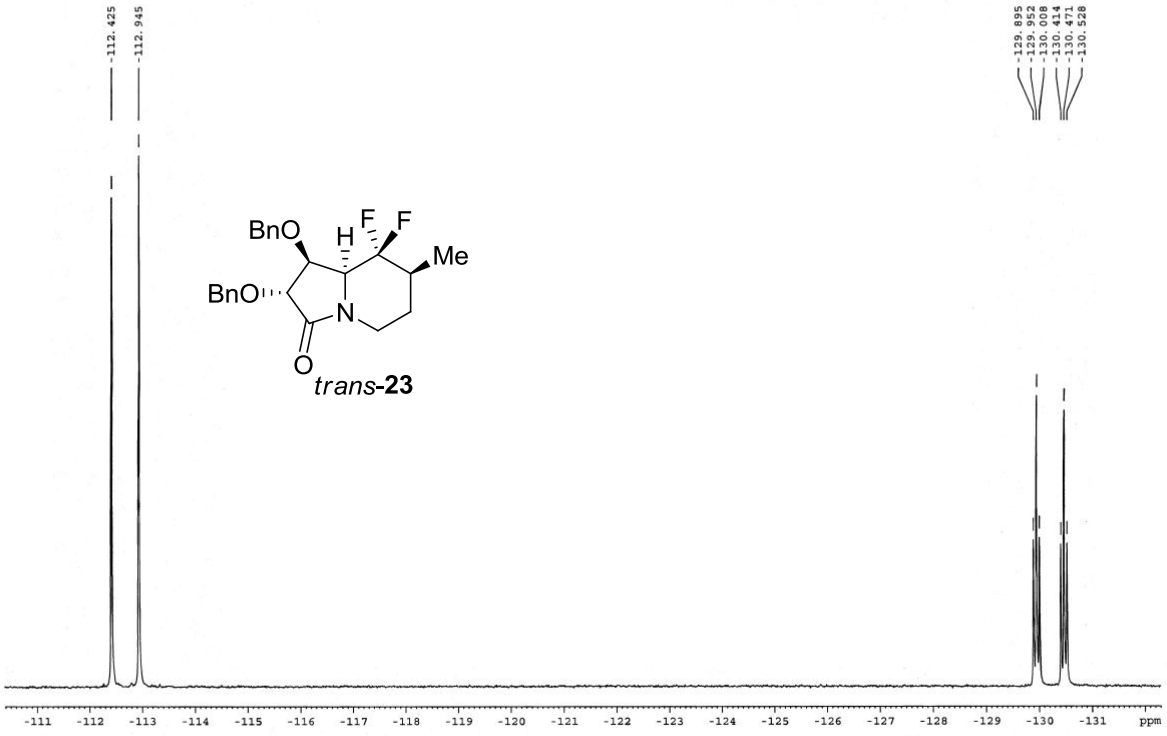
NOE Spectrum of *trans*-2**3**



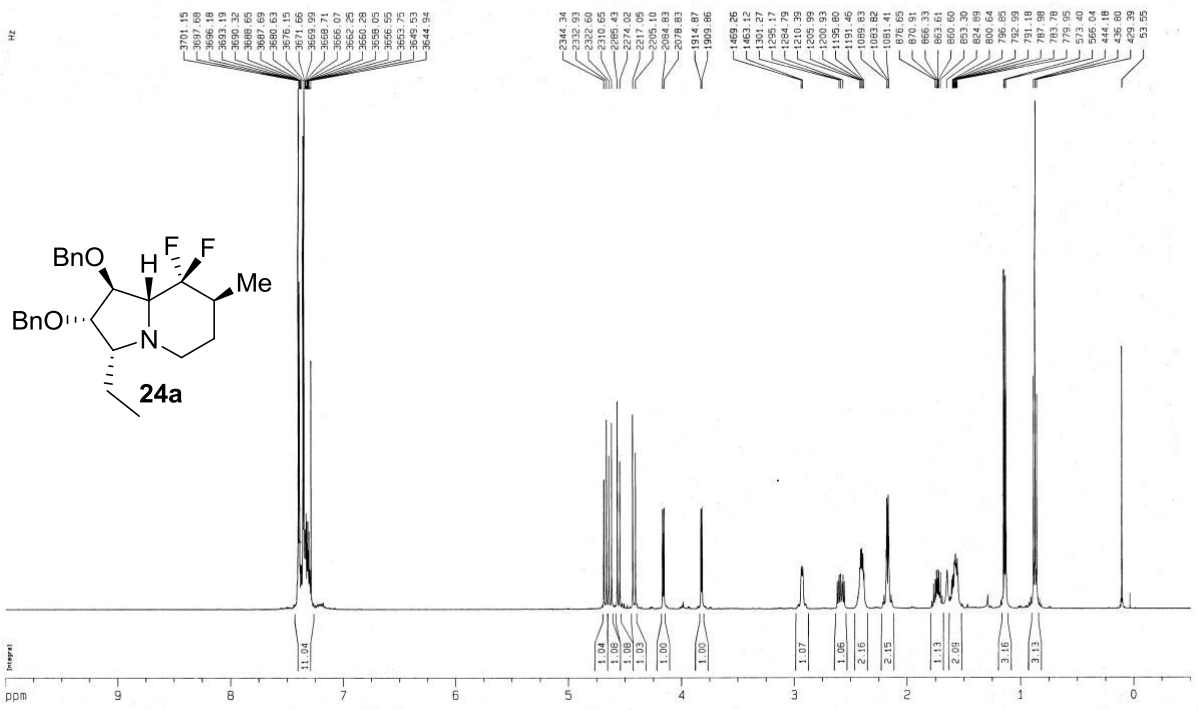
^{13}C NMR Spectrum of *trans*-2**3** (125 MHz, $CDCl_3$)



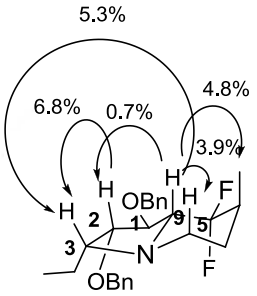
^{19}F NMR Spectrum of *trans*-2**3** (470 MHz, $CDCl_3$)



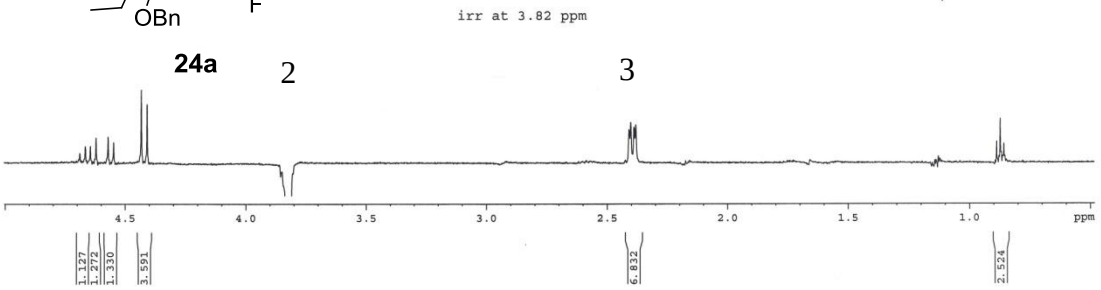
^{1}H NMR Spectrum of 2**4a** (500 MHz, $CDCl_3$)

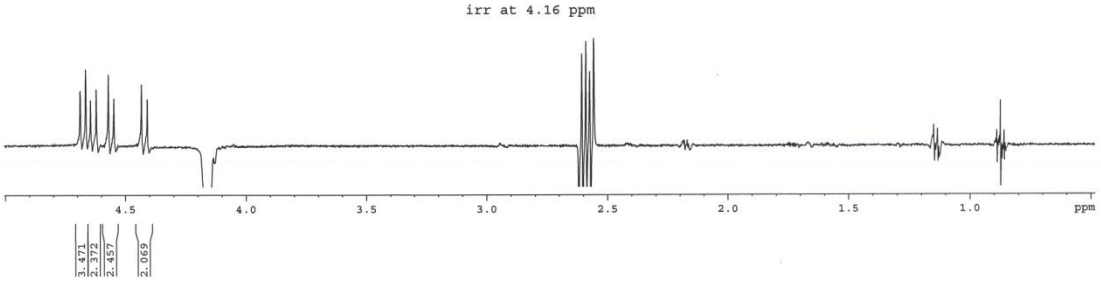


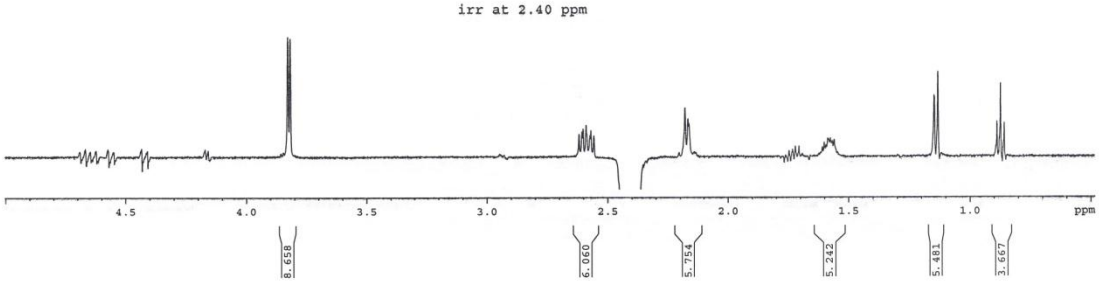
NOE Spectrum of **24a**

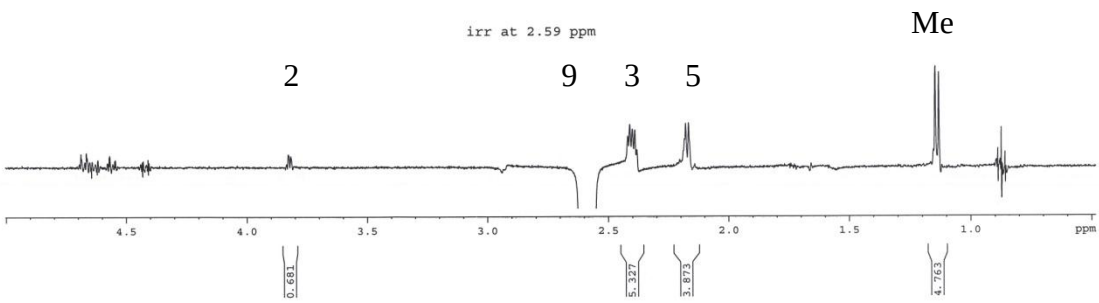


24a

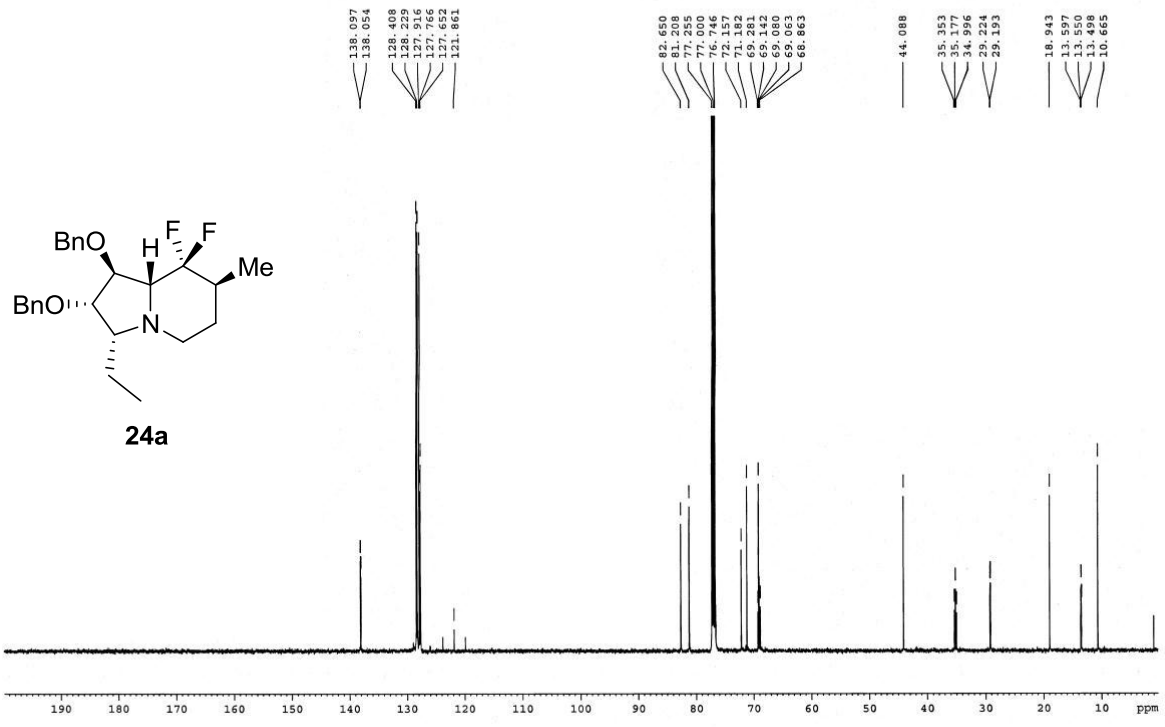






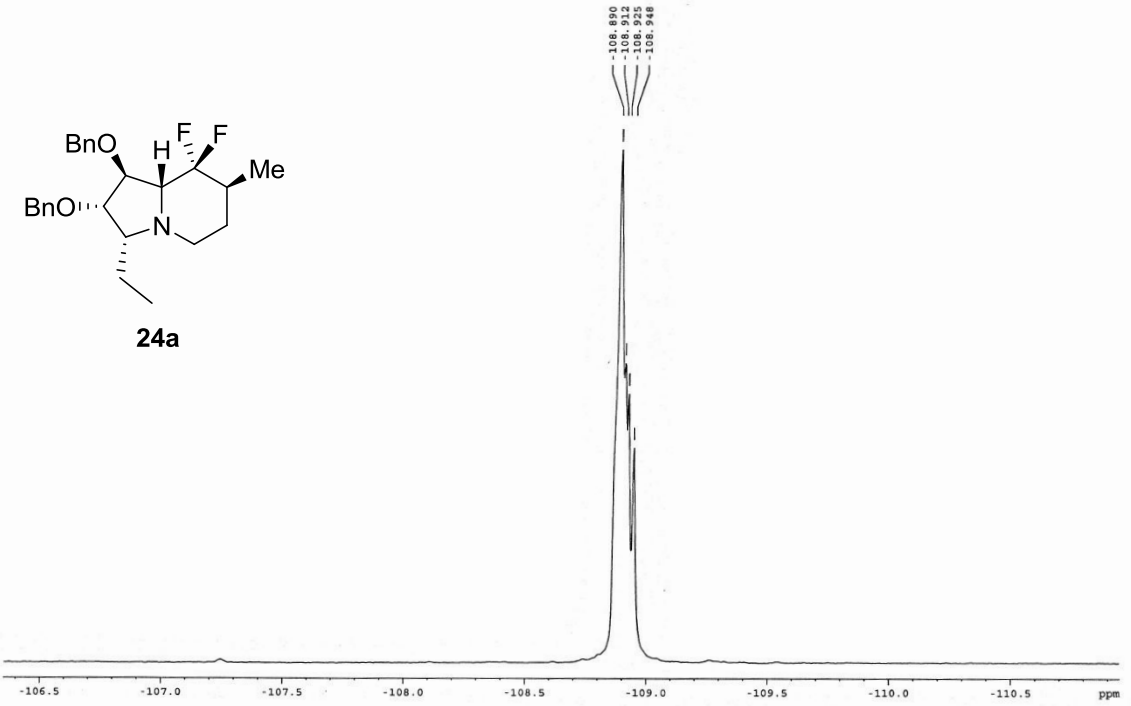


^{3}C NMR Spectrum of **24a** (125 MHz, $CDCl_3$)



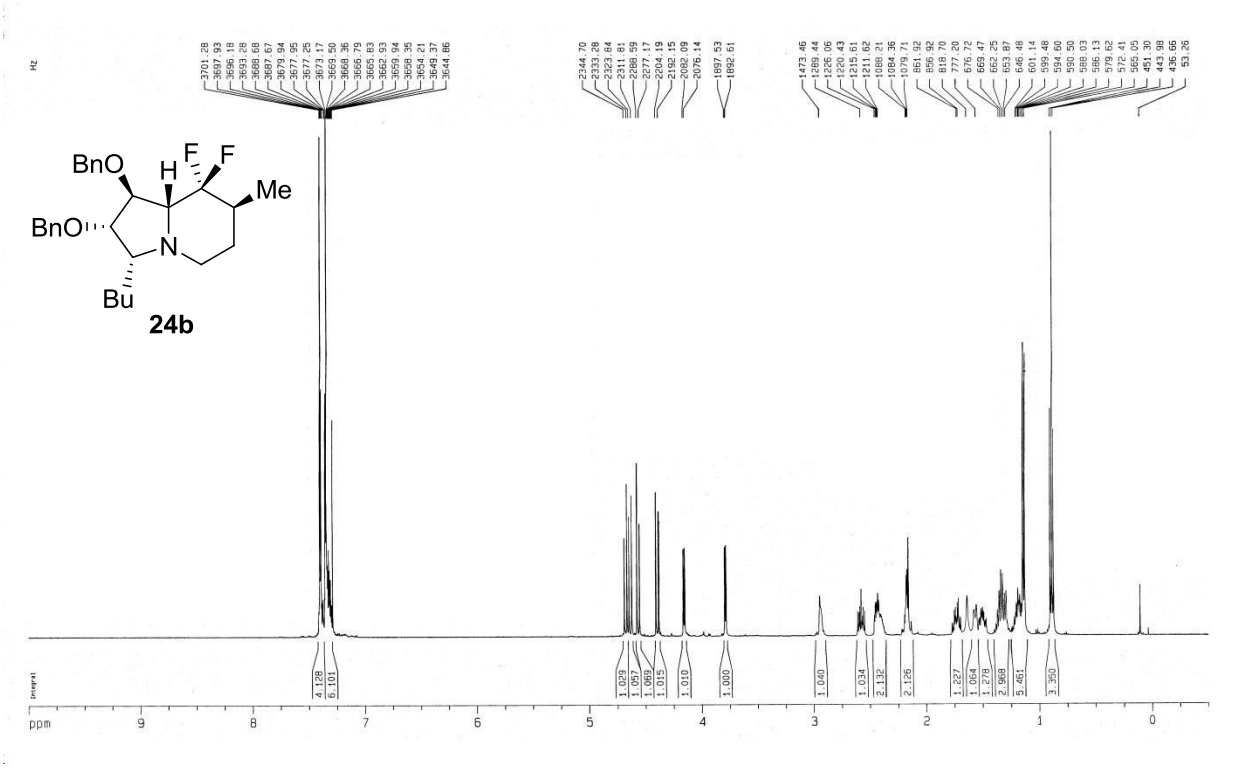
24a

^{19}F NMR Spectrum of **24a** (470 MHz, $CDCl_3$)

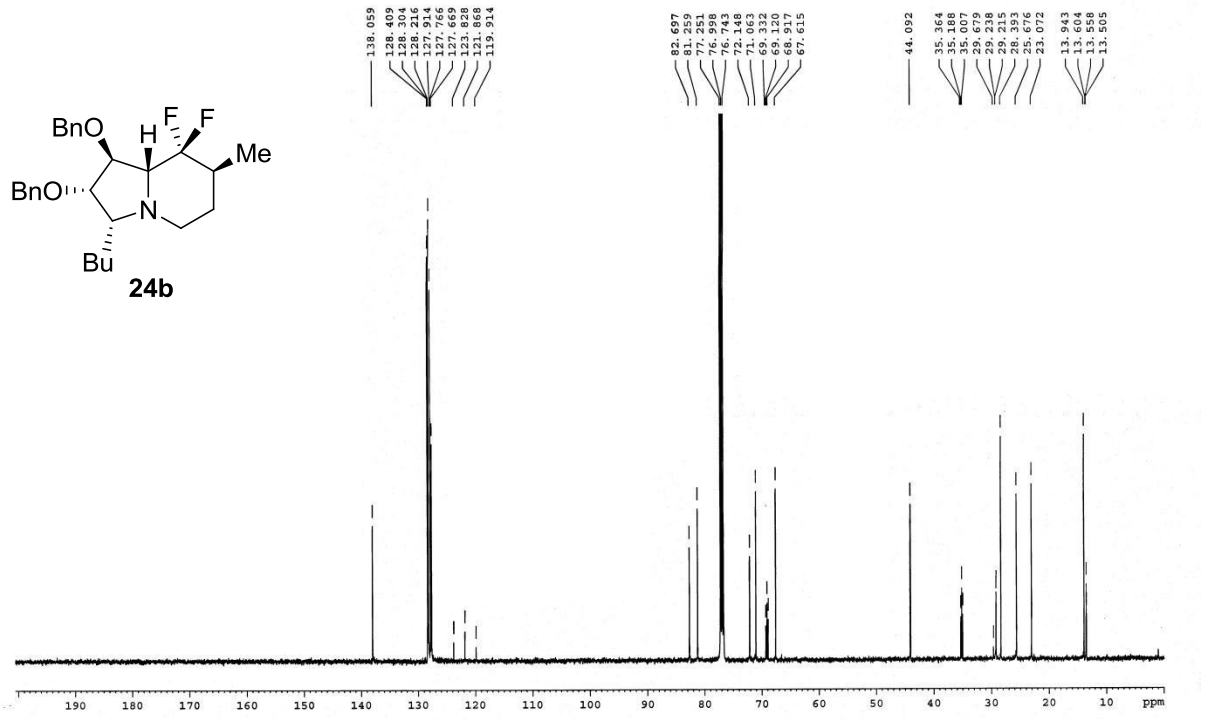


24a

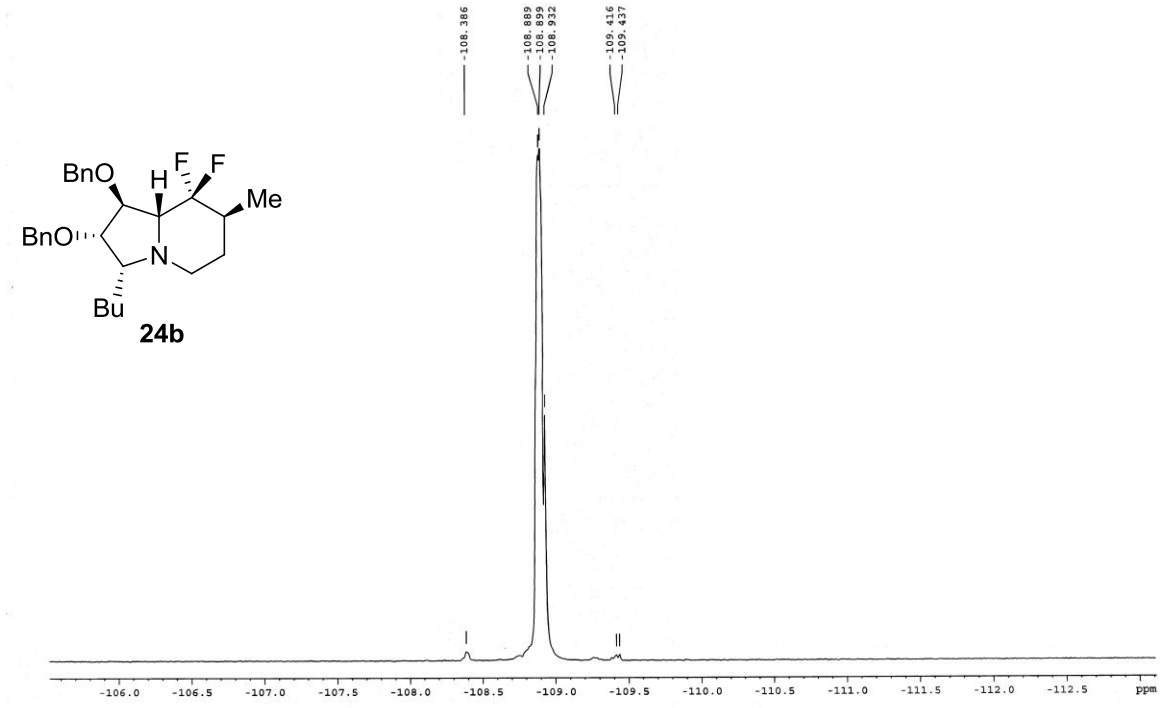
^{1}H NMR Spectrum of **24b** (500 MHz, $CDCl_3$)



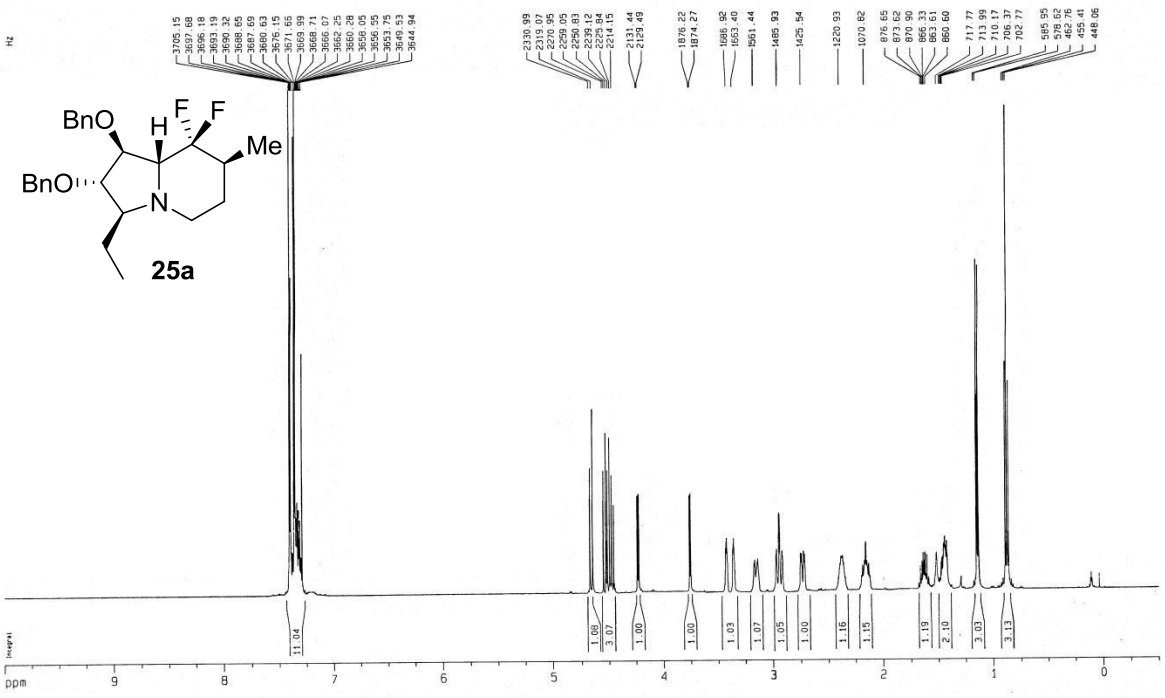
^{13}C NMR Spectrum of **24b** (125 MHz, $CDCl_3$)



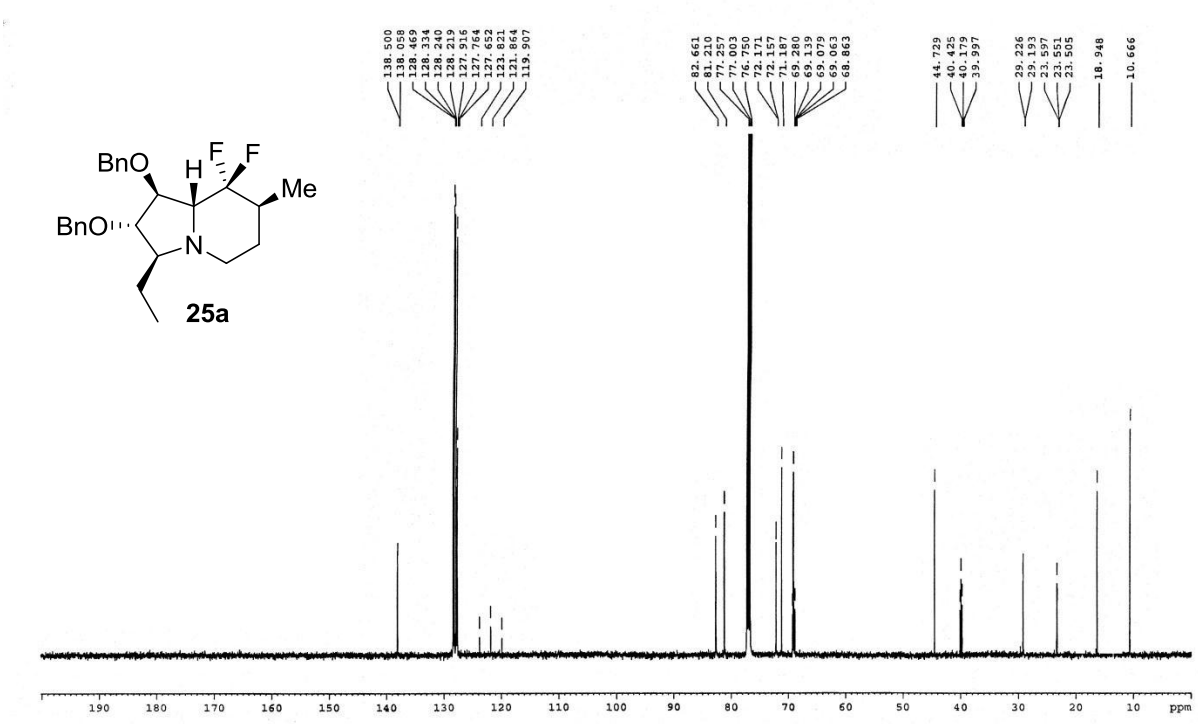
^{19}F NMR Spectrum of **24b** (470 MHz, $CDCl_3$)



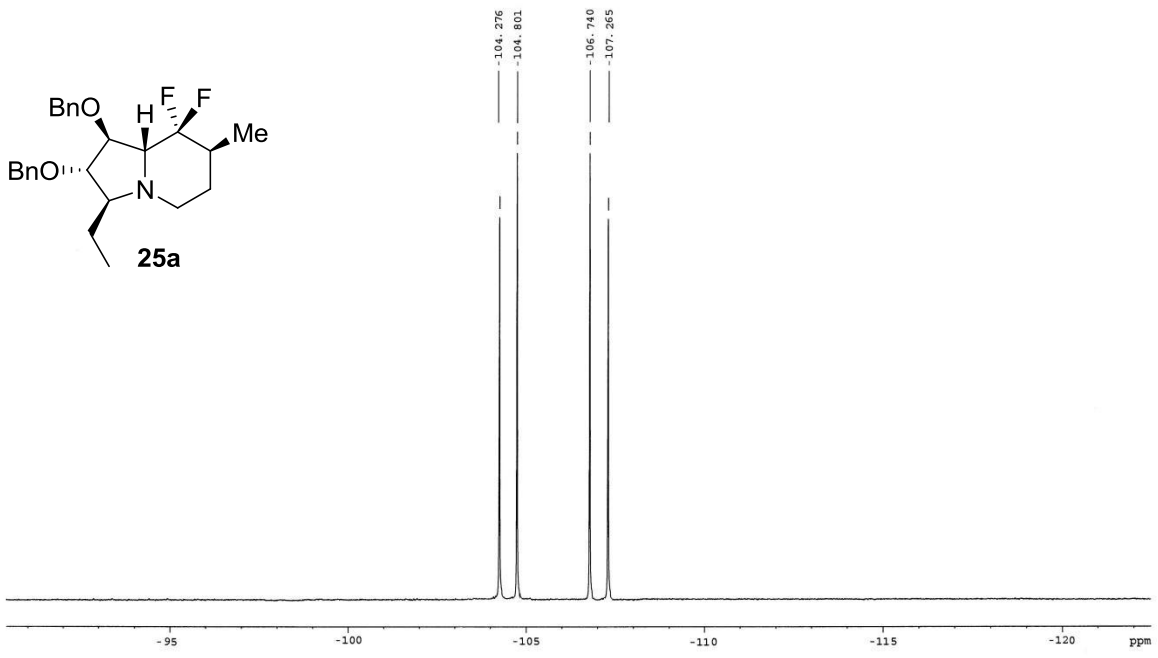
^{1}H NMR Spectrum of **25a** (500 MHz, $CDCl_3$)



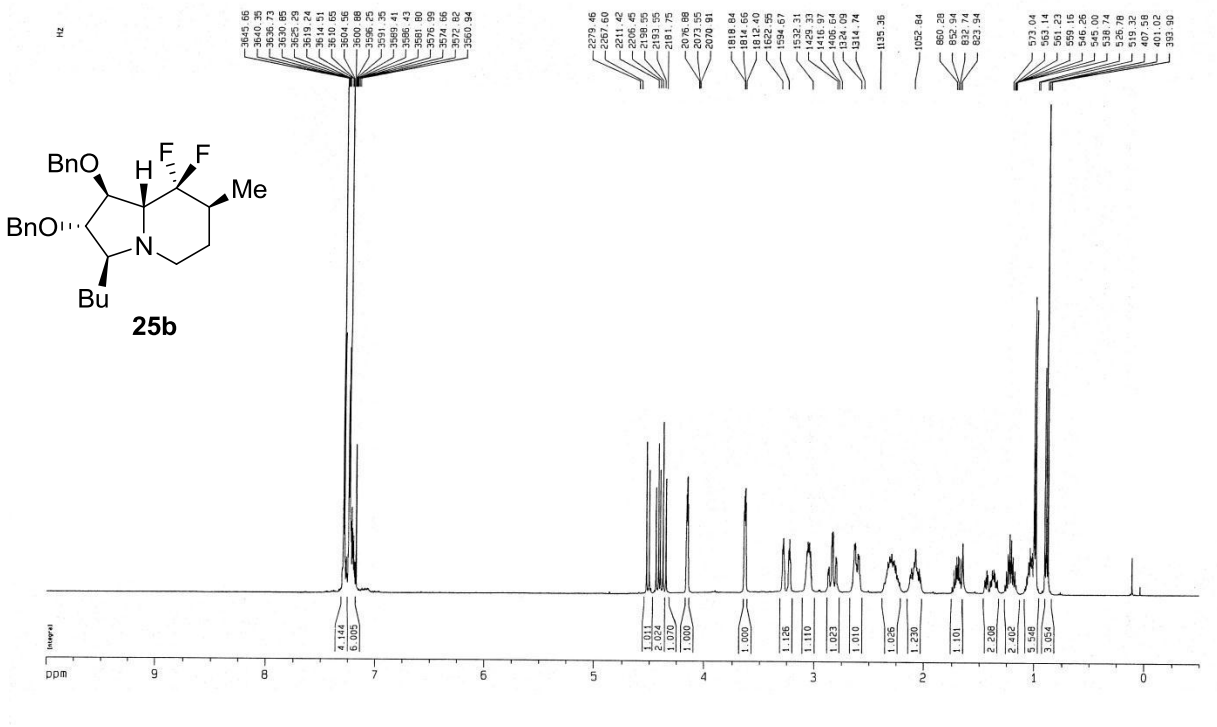
^{13}C NMR Spectrum of **25a** (125 MHz, $CDCl_3$)



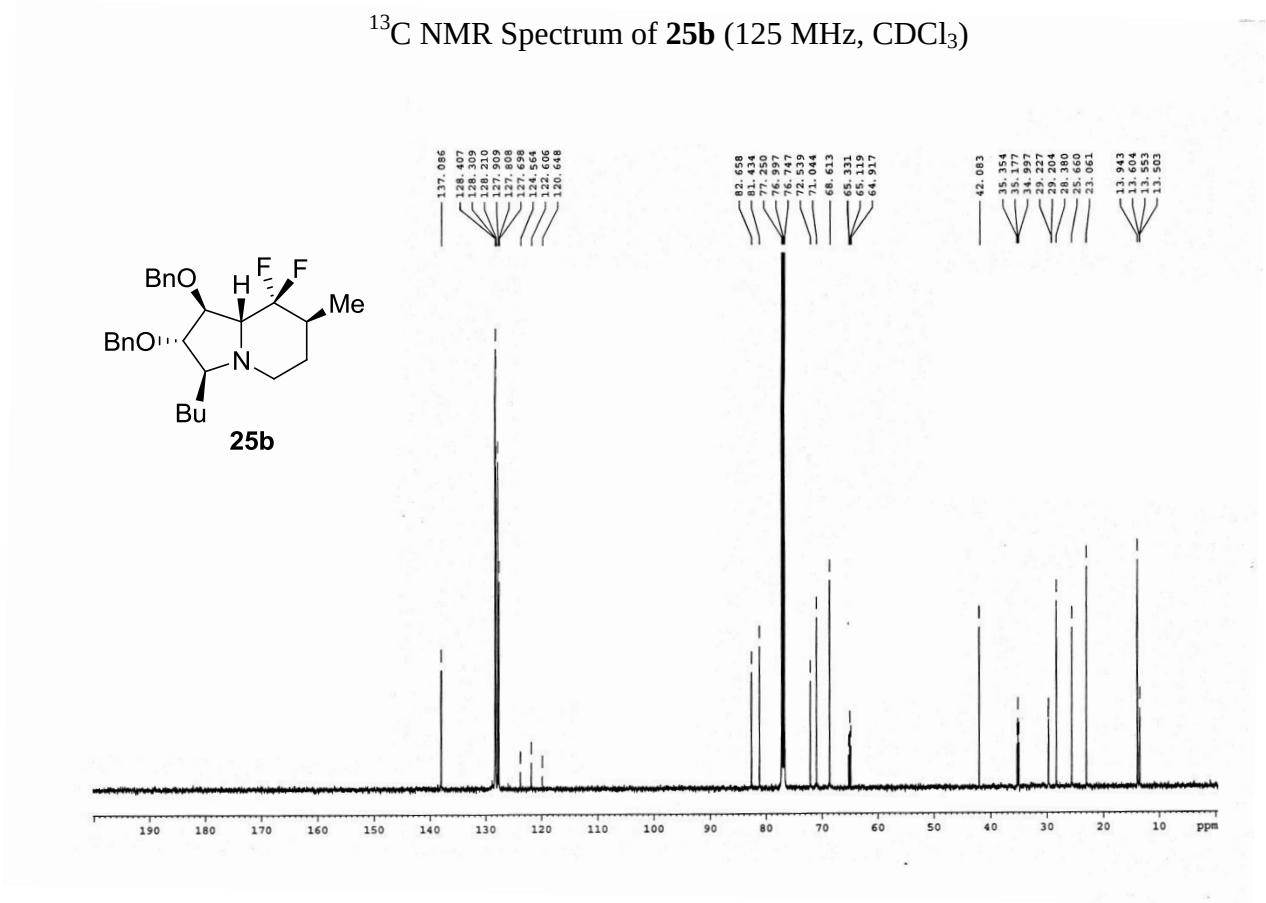
^{19}F NMR Spectrum of **25a** (470 MHz, $CDCl_3$)



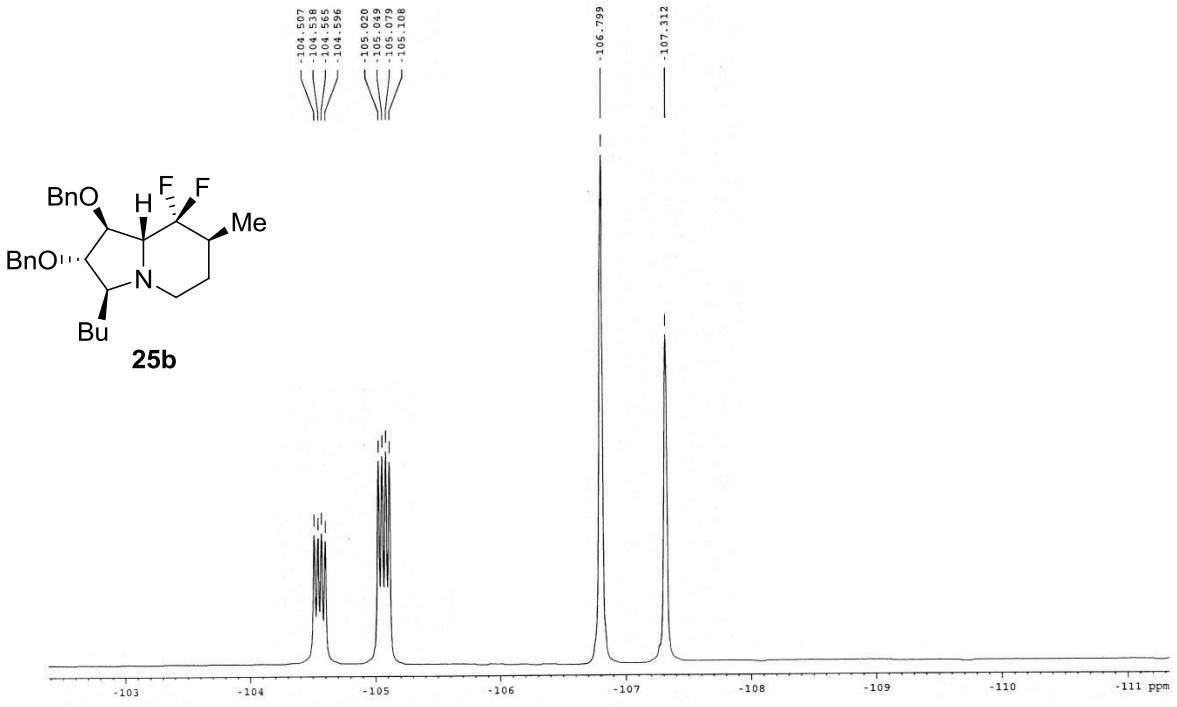
^{1}H NMR Spectrum of **25b** (500 MHz, $CDCl_3$)



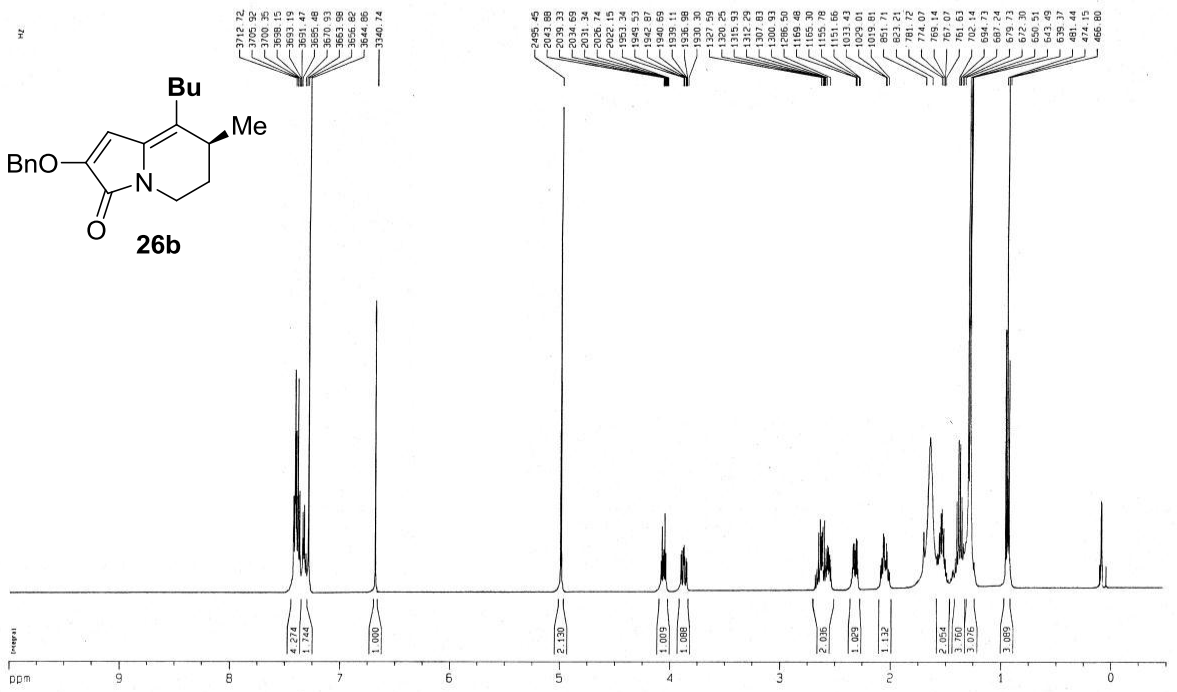
^{13}C NMR Spectrum of **25b** (125 MHz, $CDCl_3$)



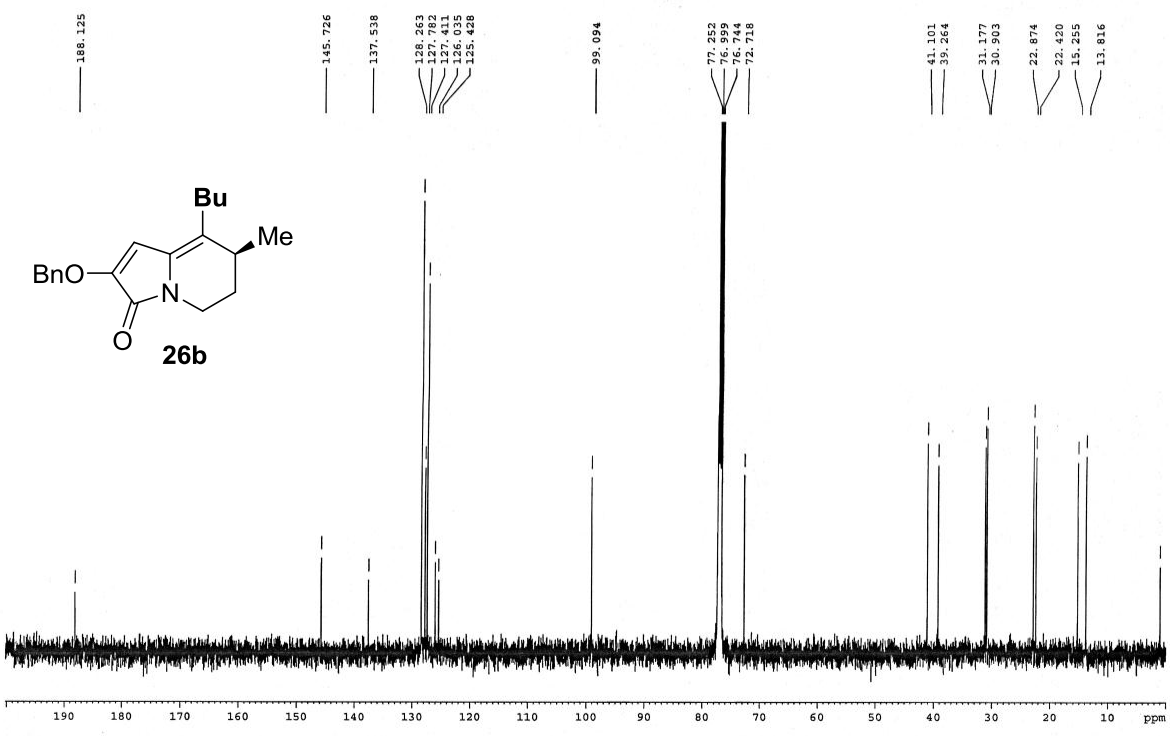
^{19}F NMR Spectrum of **25b** (470 MHz, $CDCl_3$)



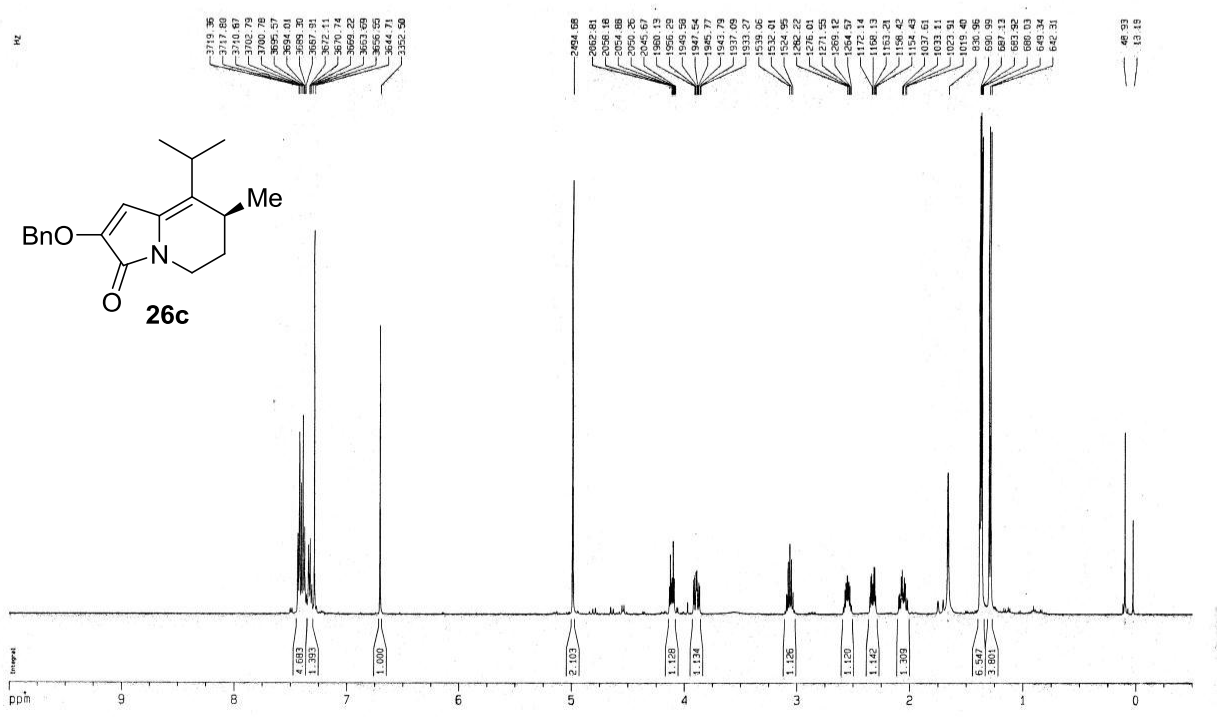
^{1}H NMR Spectrum of **26b** (500 MHz, $CDCl_3$)



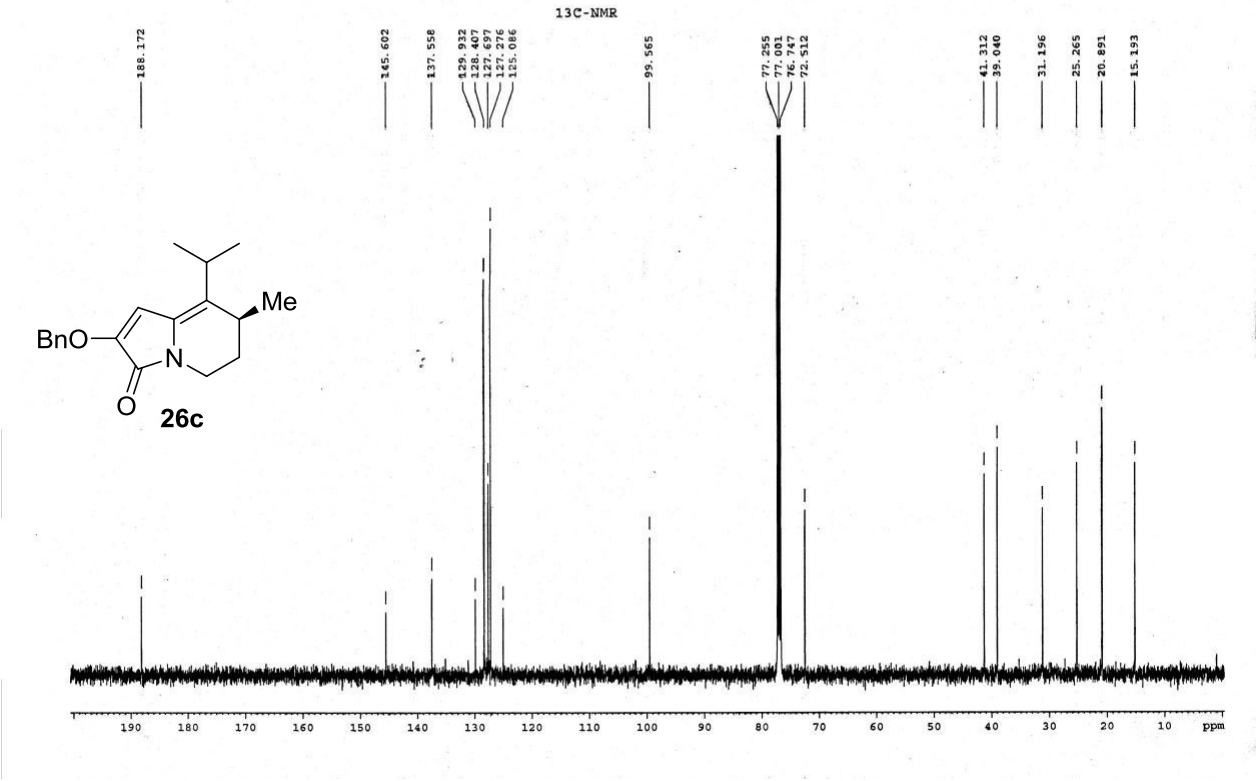
^{13}C NMR Spectrum of **26b** (125 MHz, $CDCl_3$)



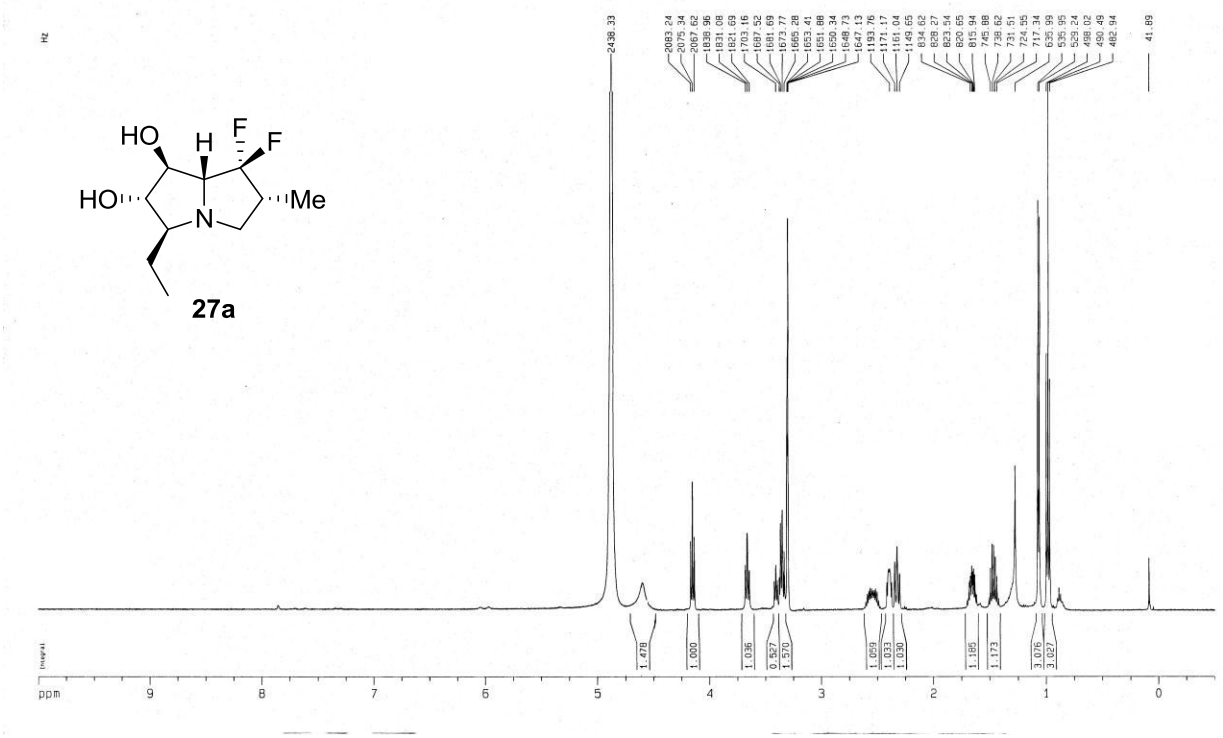
^{1}H NMR Spectrum of **26c** (500 MHz, $CDCl_3$)



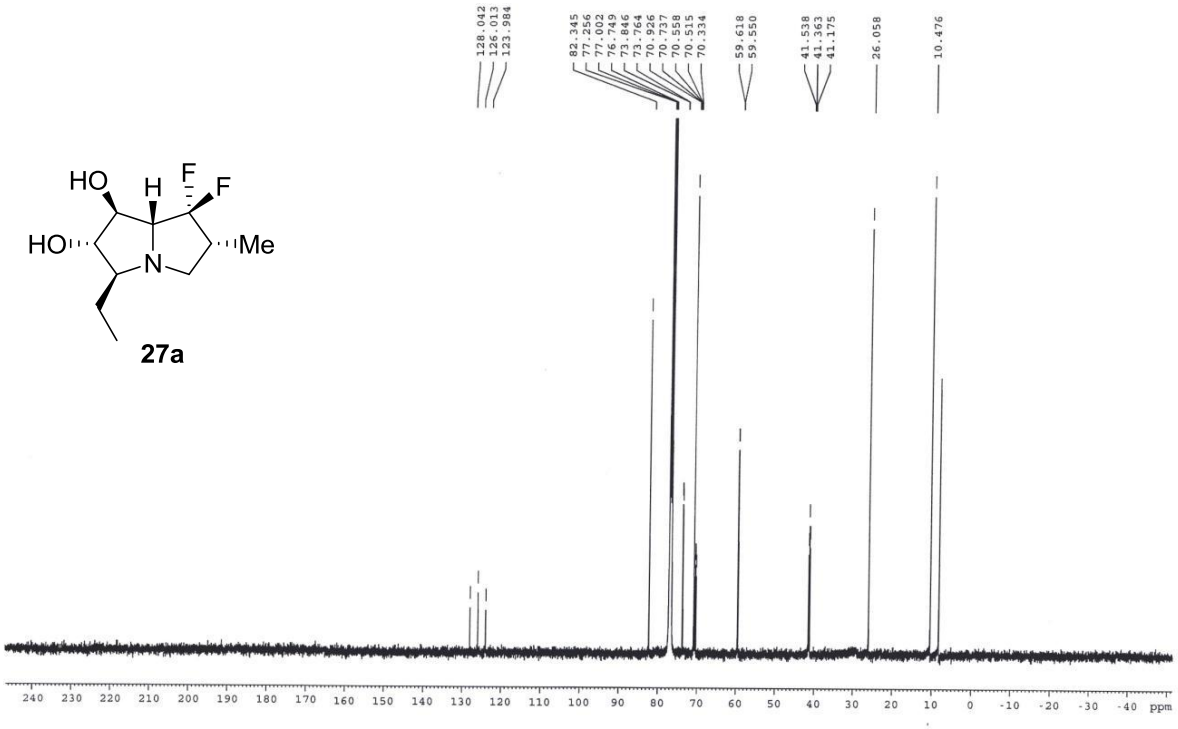
^{13}C NMR Spectrum of **26c** (125 MHz, $CDCl_3$)



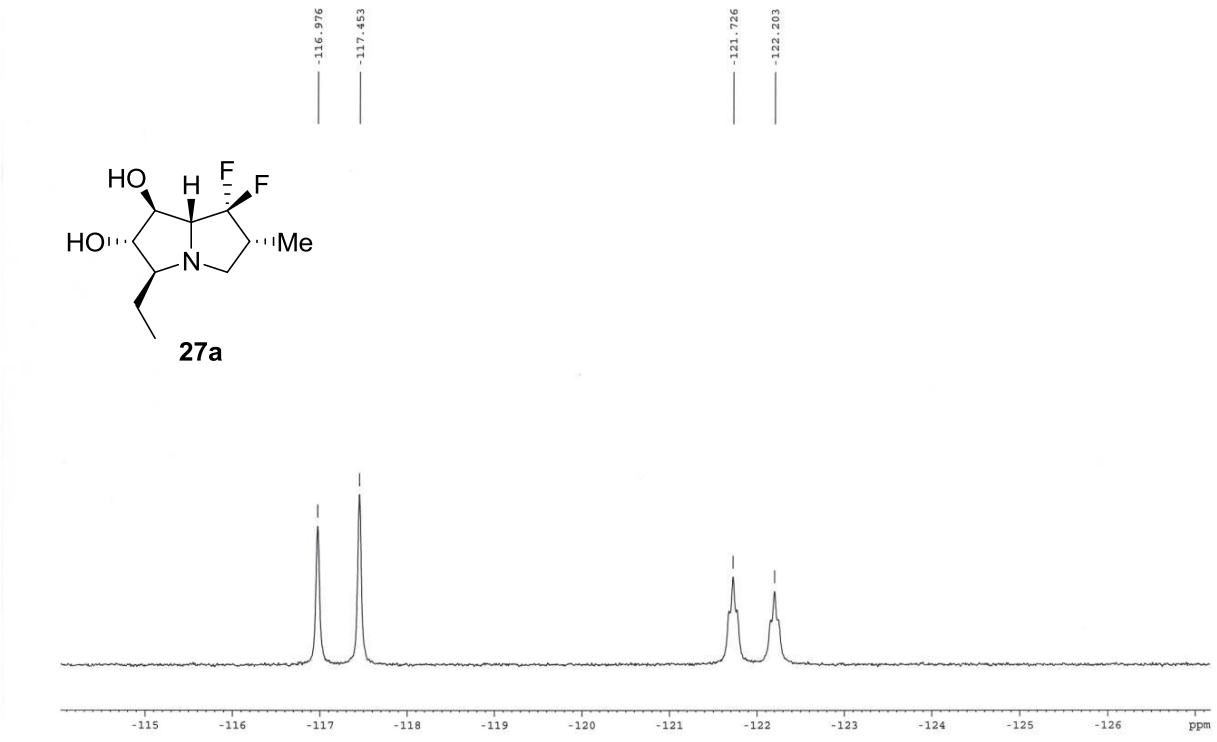
^{1}H NMR Spectrum of **27a** (500 MHz, CD_3OD)



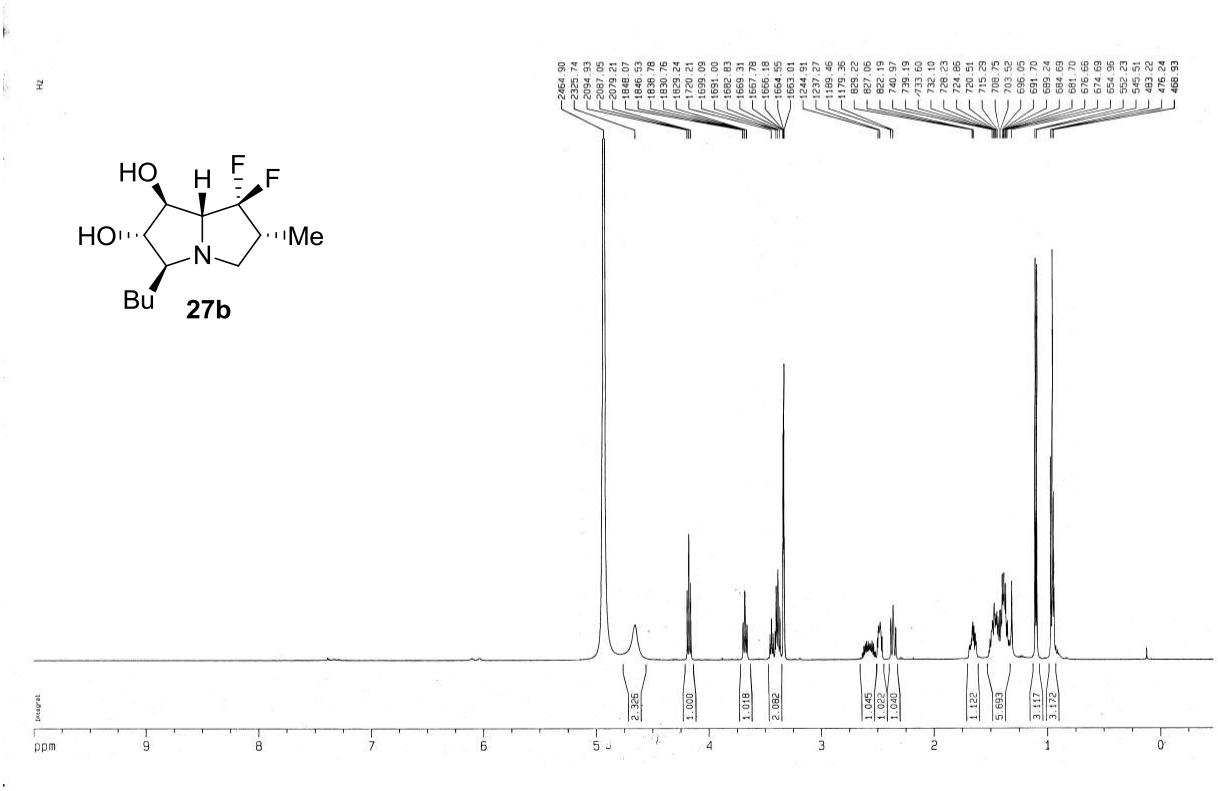
^{13}C NMR Spectrum of **27a** (125 MHz, $CDCl_3$)



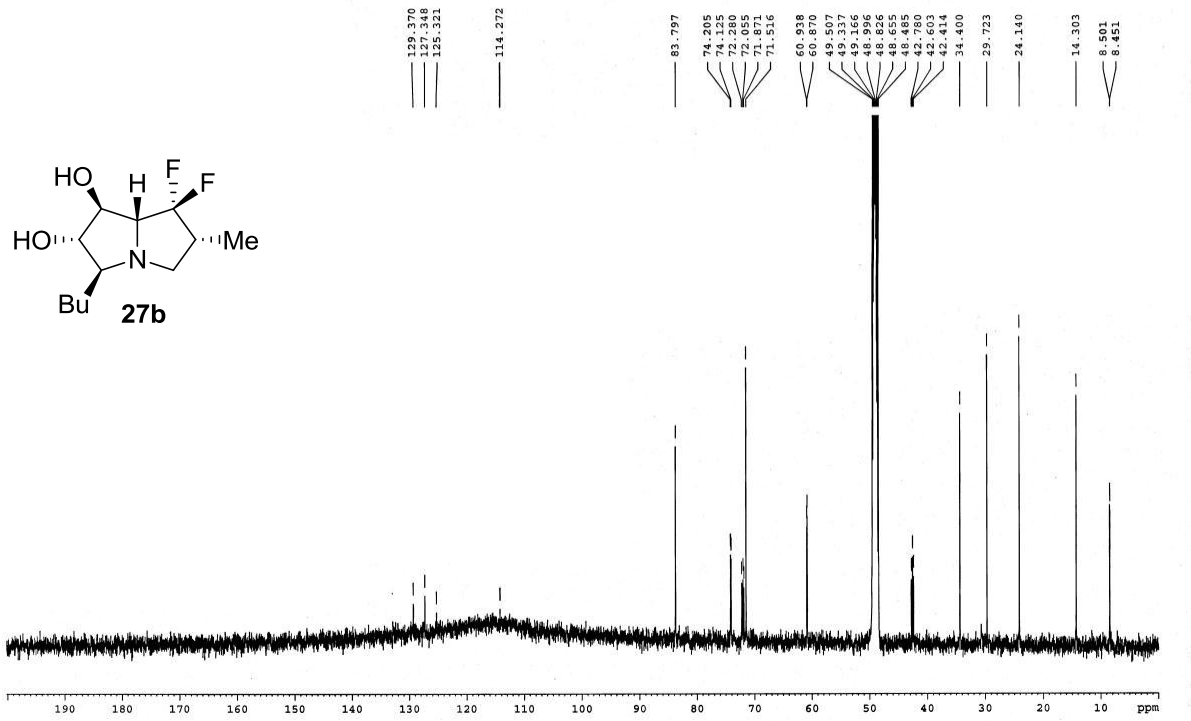
^{19}F NMR Spectrum of **27a** (470 MHz, CD_3OD)



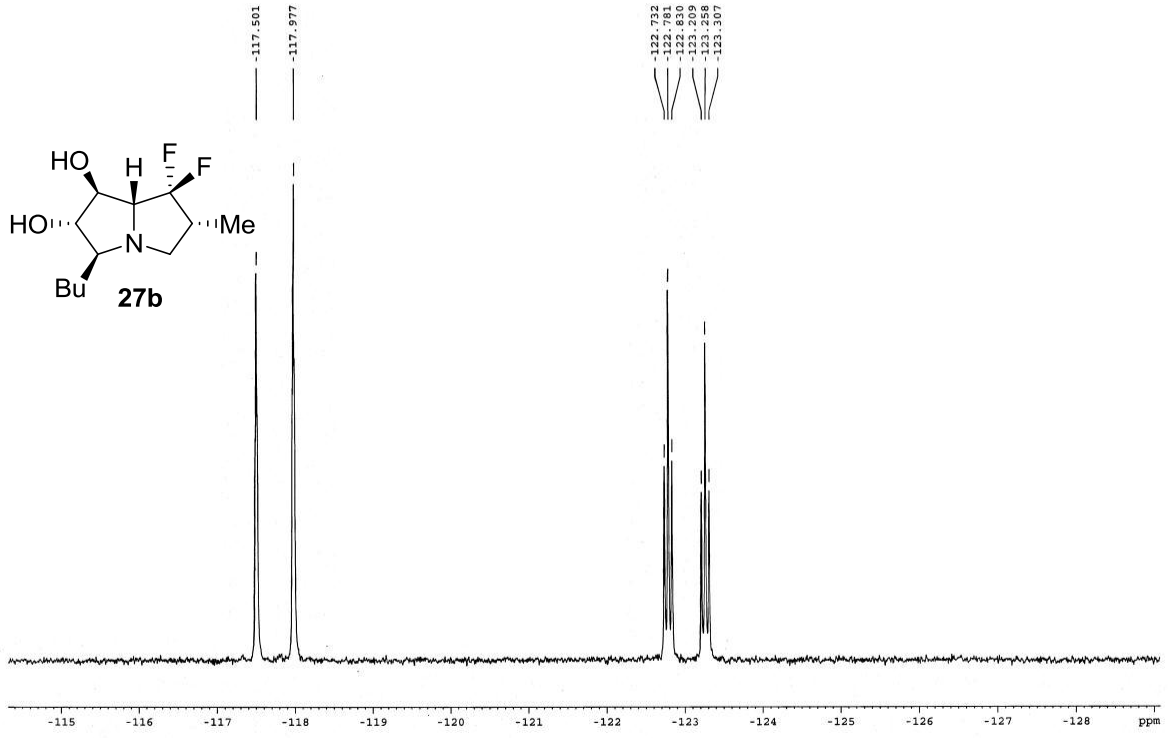
^{1}H NMR Spectrum of **27b** (500 MHz, CD_3OD)



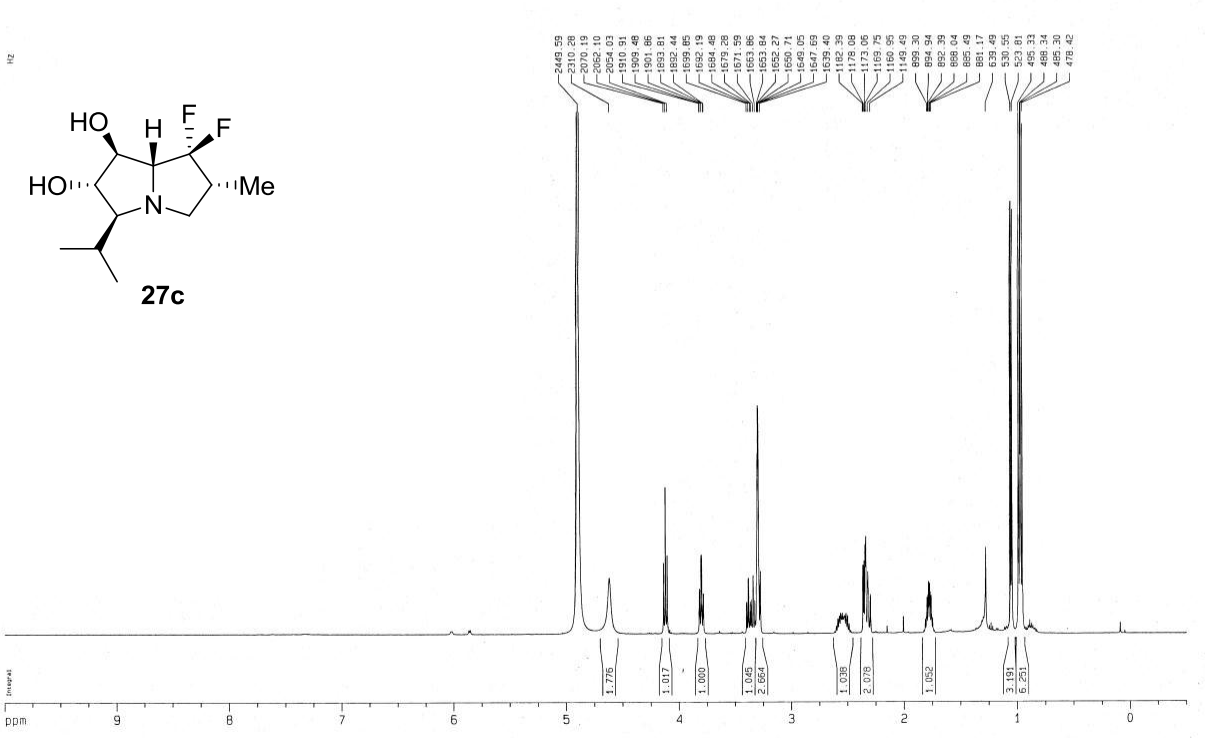
^{13}C NMR Spectrum of **27b** (125 MHz, CD_3OD)



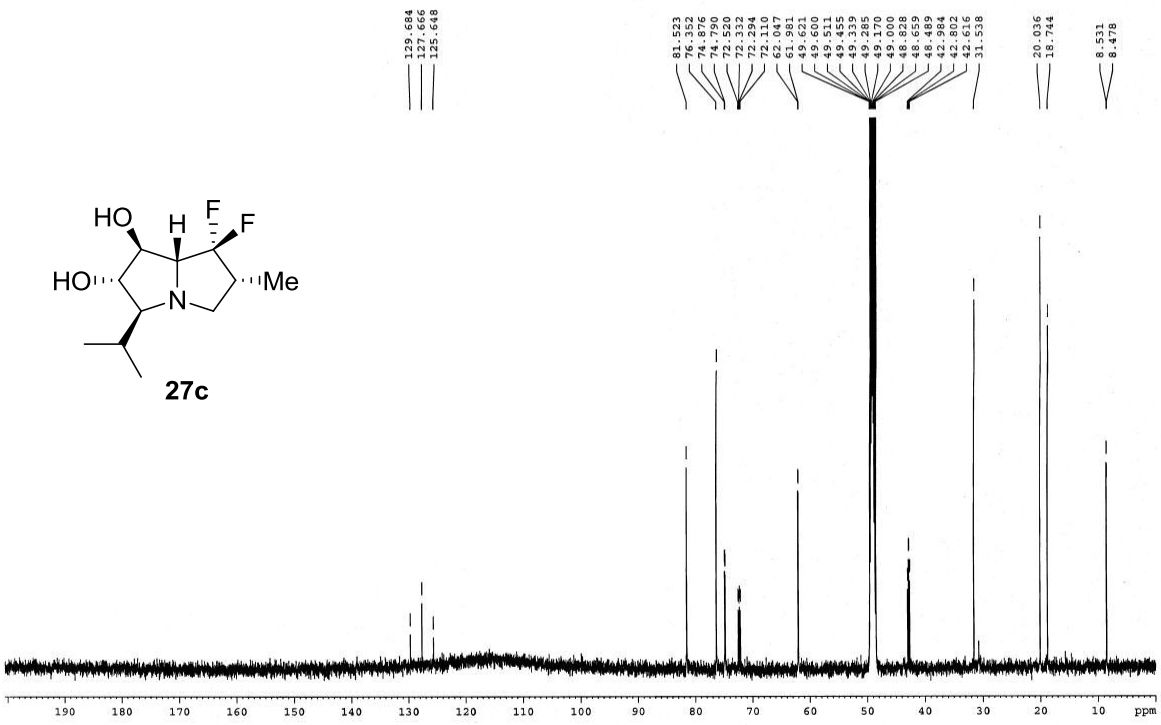
^{19}F NMR Spectrum of **27b** (470 MHz, CD_3OD)



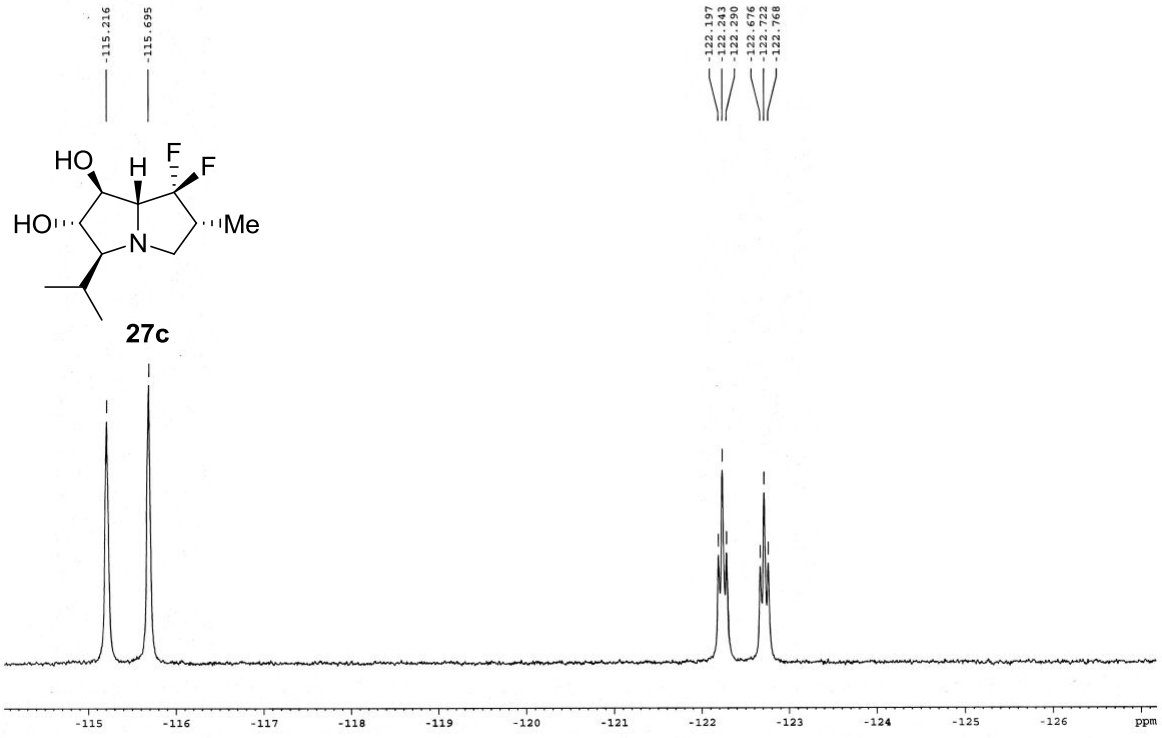
^{1}H NMR Spectrum of **27c** (500 MHz, CD_3OD)



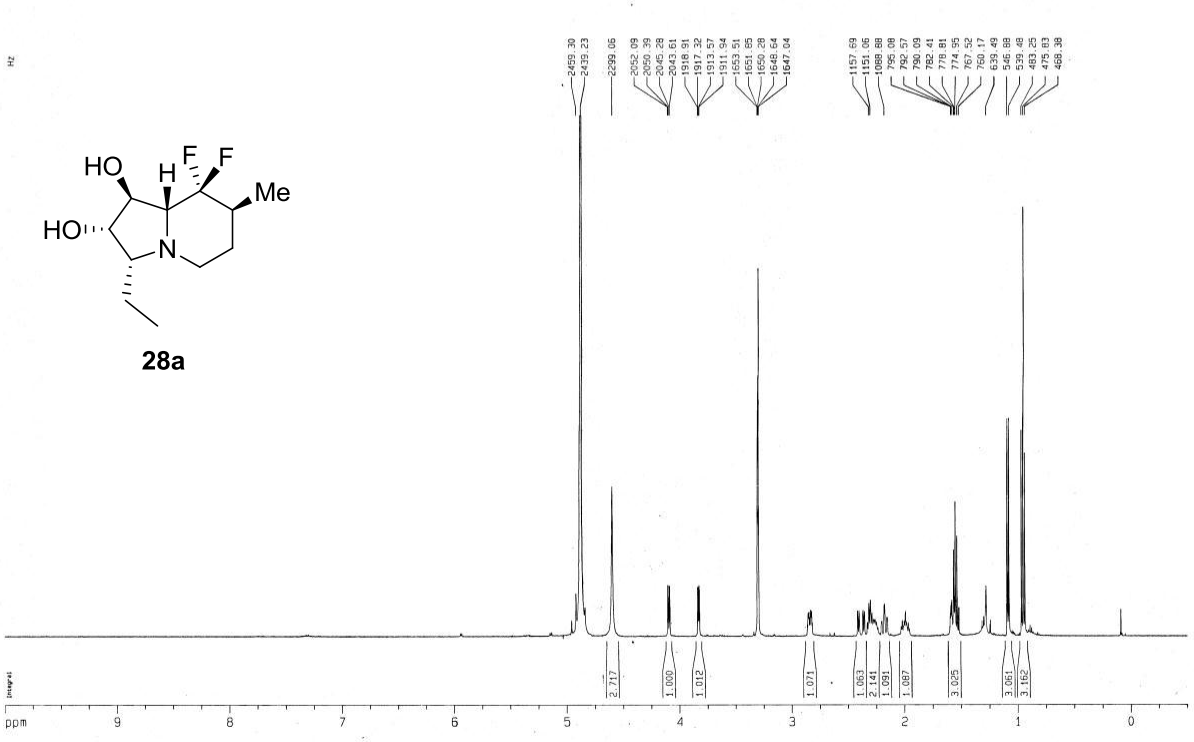
^{13}C NMR Spectrum of **27c** (125 MHz, CD_3OD)



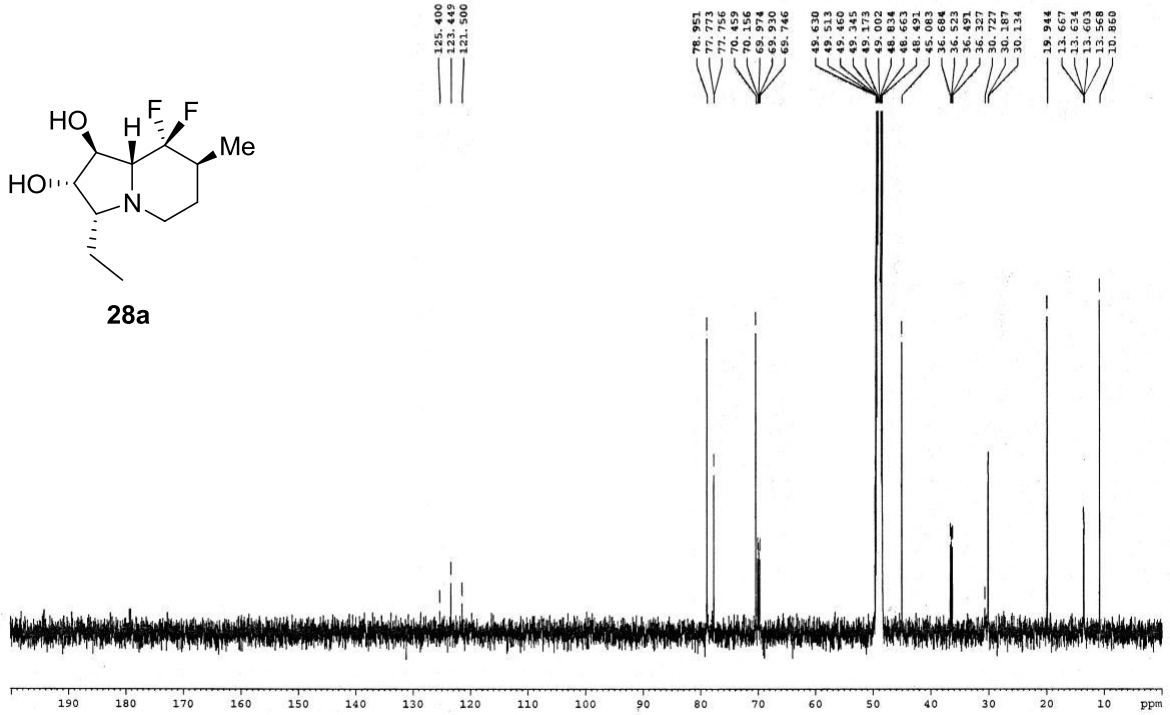
^{19}F NMR Spectrum of **27c** (470 MHz, CD_3OD)



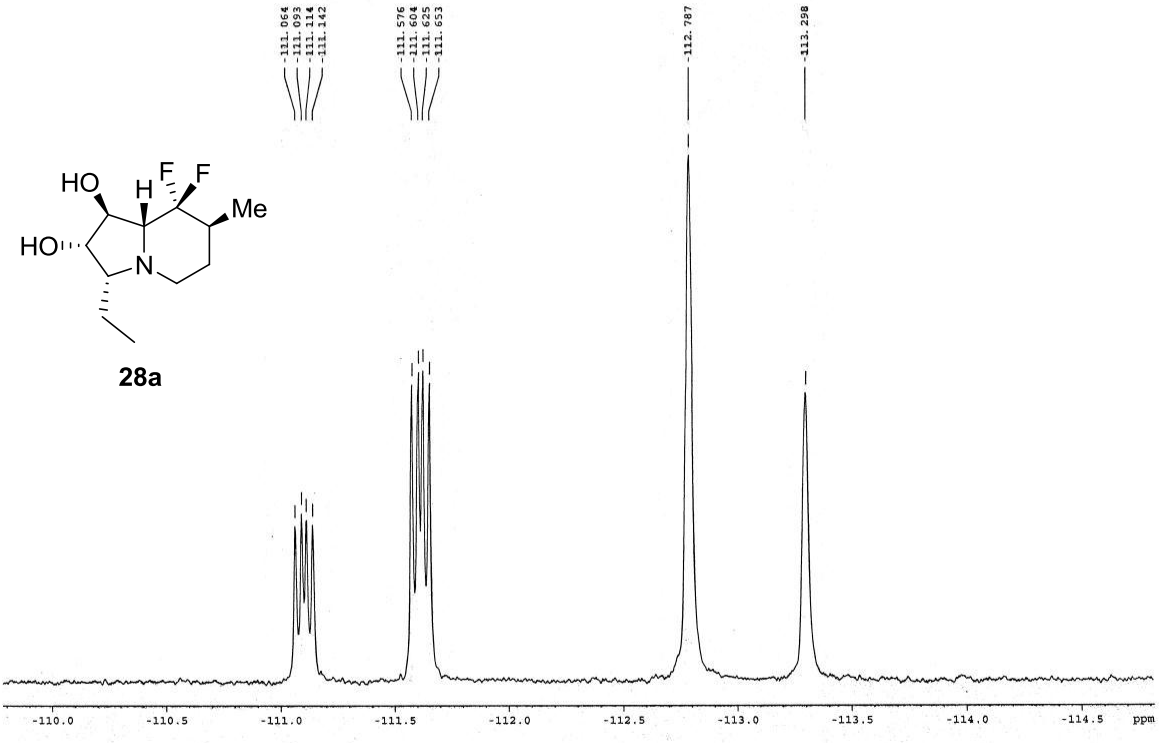
^{1}H NMR Spectrum **28a** (500 MHz, CD_3OD)



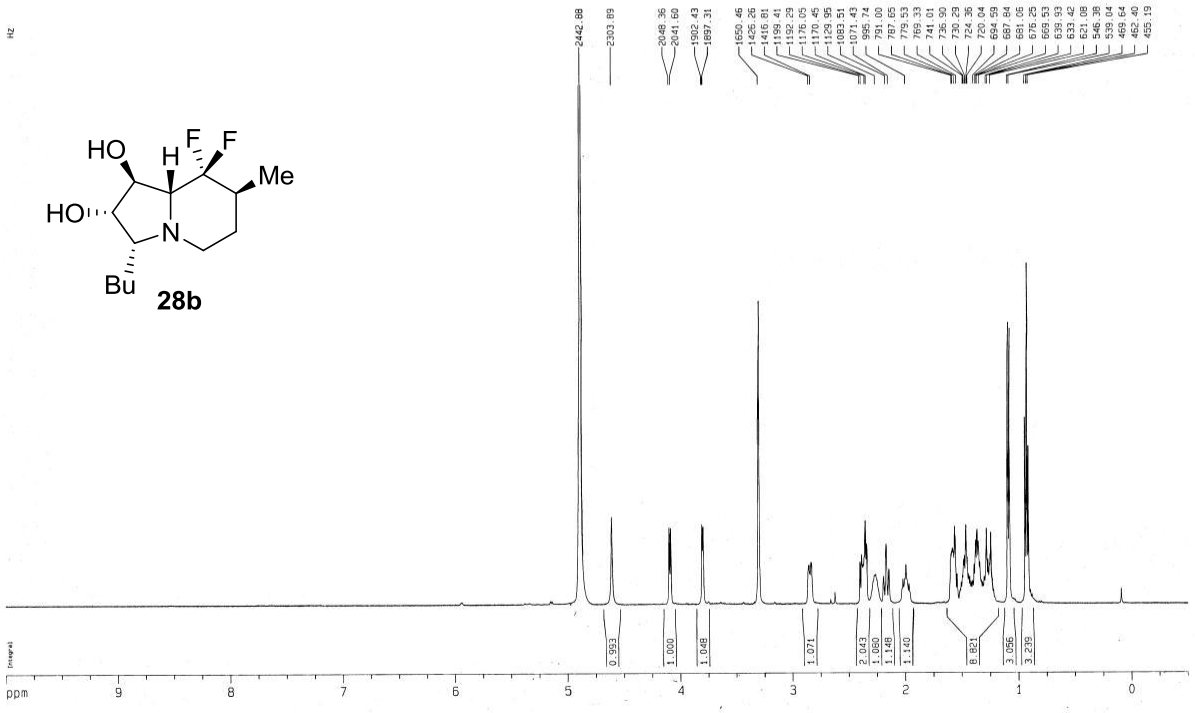
^{13}C NMR Spectrum of **28a** (125 MHz, CD_3OD)



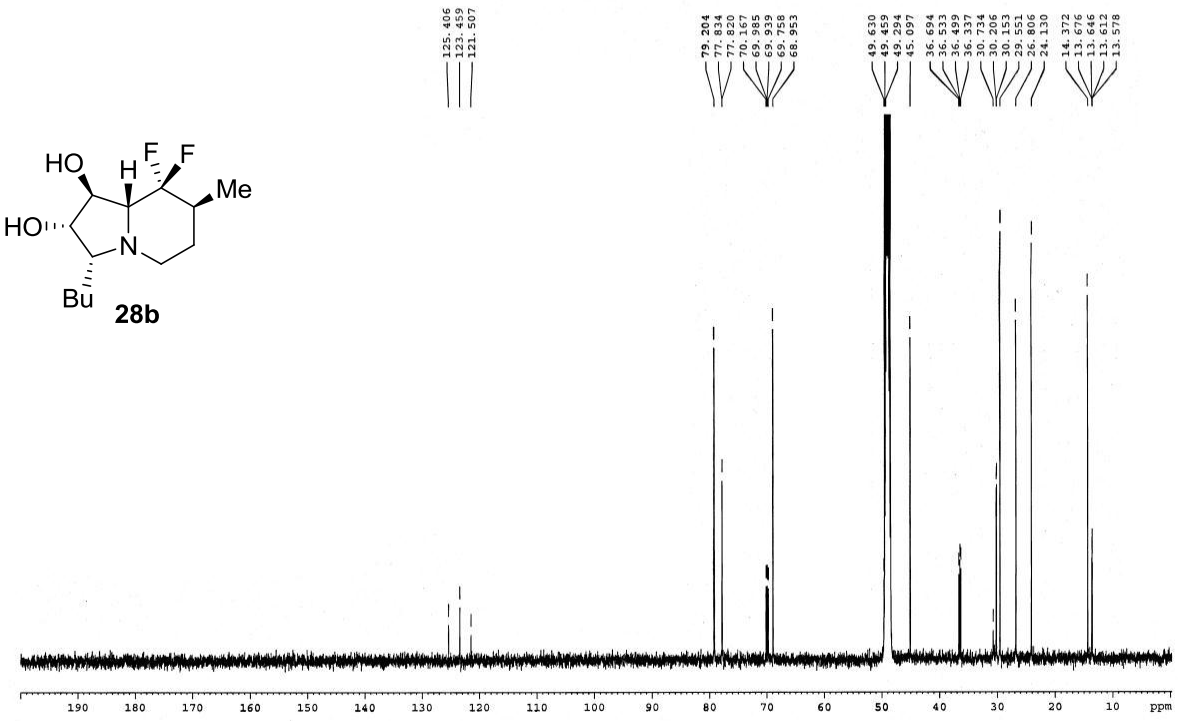
^{19}F NMR Spectrum of **28a** (470 MHz, CD_3OD)



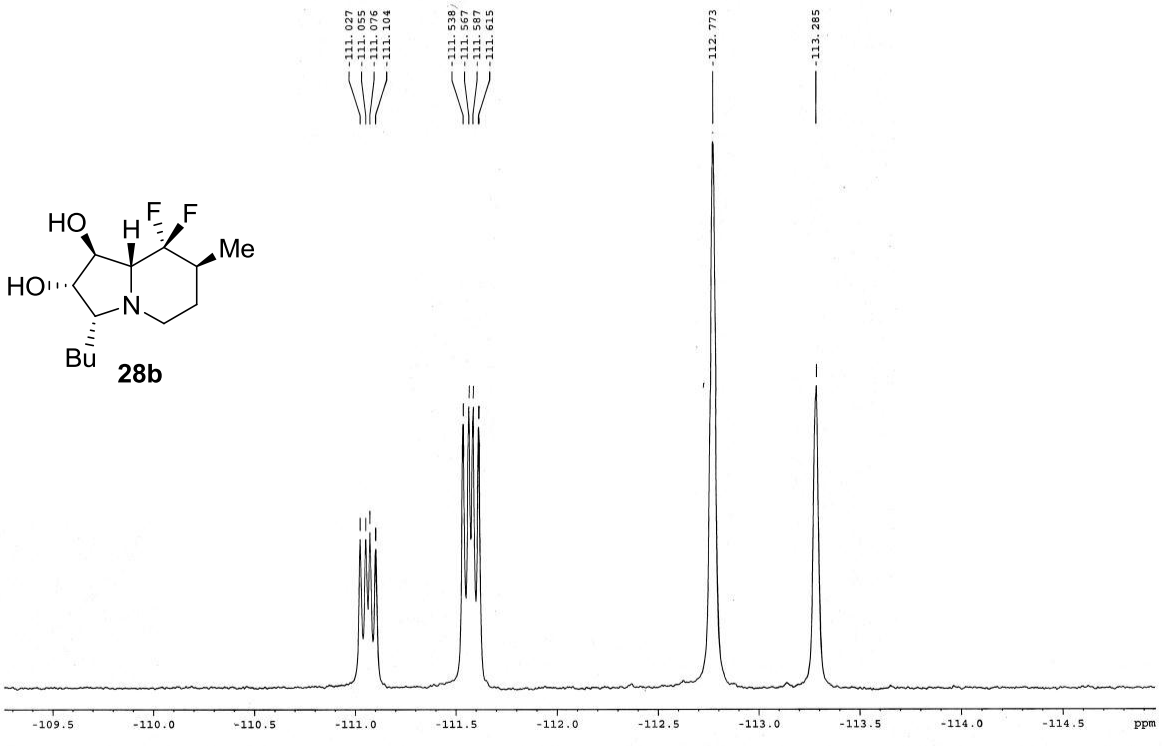
^{1}H NMR Spectrum **28b** (500 MHz, CD_3OD)



^{13}C NMR Spectrum of **28b** (125 MHz, CD_3OD)



^{19}F NMR Spectrum of **28b** (470 MHz, CD_3OD)



X-ray crystallographic analyses

X-ray diffraction data were measured on a Bruker-Nonius kappaCCD diffractometer with graphite monochromated MoKα radiation (λ = 0.71073 Å) at 298(2) K. The structures were solved by direct methods by SIR97,[1] and refined with full-matrix least-squares calculations on F^2 using SHELXL-97.[2] Crystallographic data have been deposited at the Cambridge Crystallographic Data Centre under the reference numbers CCDC 887892 – 887896. Copies of the data can be obtained, free of charge, on application to the Director, CCDC, 12 Union Road, Cambridge, CB2 1EZ, UK (e-mail: deposit@ccdc.cam.ac.uk).

*X-ray data of cis-**10***

$C_{20}H_{39}F_2NO_4Si_2$, MW= 451.703, orthorhombic, dimensions: 0.25 × 0.20 × 0.10 mm^3, D = 1.141 g/cm^3, space group $P2_12_12_1$, Z = 4, a = 8.6065(2), b = 14.1372(6), c = 21.6104(9) Å, V = 2629.38(17) Å^3, reflections collected/unique: 11,829/5160, number of observations [>2 σ (I)] 4436, final R indices [$I > 2\ \sigma\ (I)$]: R_1 = 0.0888, wR_2 = 0.2518.

*X-ray data of trans-**11***

$C_{21}H_{41}F_2NO_4Si_2$, MW= 451.703, orthorhombic, dimensions: 0.20 × 0.15 × 0.10 mm^3, D = 1.183 g/cm^3, space group $P2_12_12_1$, Z = 4, a = 9.9430(2), b = 12.3857(4), c = 21.2265(7) Å, V = 2614.06(13) Å^3, reflections collected/unique: 17503/7443, number of observations [>2 σ (I)] 5888, final R indices [$I > 2\ \sigma\ (I)$]: R_1 = 0.0482, wR_2 = 0.1164.

*X-ray data of cis-**13***

$C_{23}H_{25}F_2NO_4$, MW= 417.452, monoclinic, dimensions: 0.30 × 0.15 × 0.10 mm^3, D = 1.267g/cm^3, space group $P2_1$, Z = 2, a = 11.8980(16), b = 8.1310(6), c = 12.4120(17) Å, β = 114.293(4)°, V =

1410.14(7) Å^3, reflections collected/unique: 4898/3388, number of observations [>2 σ (I)] 2255, final R indices [$I > 2\ \sigma\ (I)$]: $R_1 = 0.0553$, $wR_2 = 0.1508$.

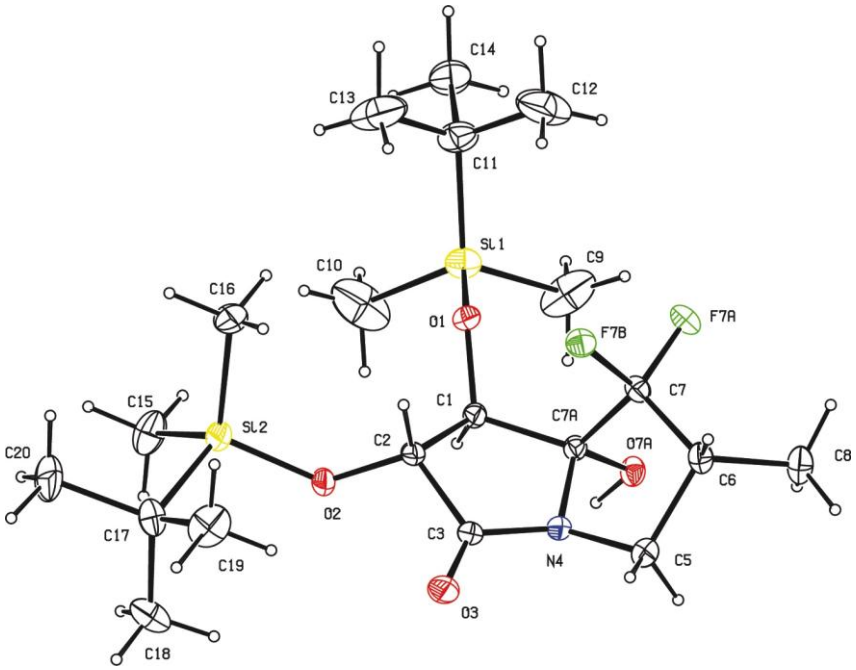
*X-ray data of cis-**19***

$C_{22}H_{23}F_2NO_4$, MW= 403.425, orthorhombic, dimensions: 0.15 × 0.15 × 0.10 mm^3, D = 1.362 g/cm^3, space group $P2_12_12_1$, Z = 4, a = 6.1397(1), b = 10.0767(3), c = 31.8096(1) Å, V = 1967.99(10) Å^3, reflections collected/unique: 8496/4359, number of observations [>2 σ (I)] 3626, final R indices [$I > 2\ \sigma\ (I)$]: $R_1 = 0.0530$, $wR_2 = 0.1410$.

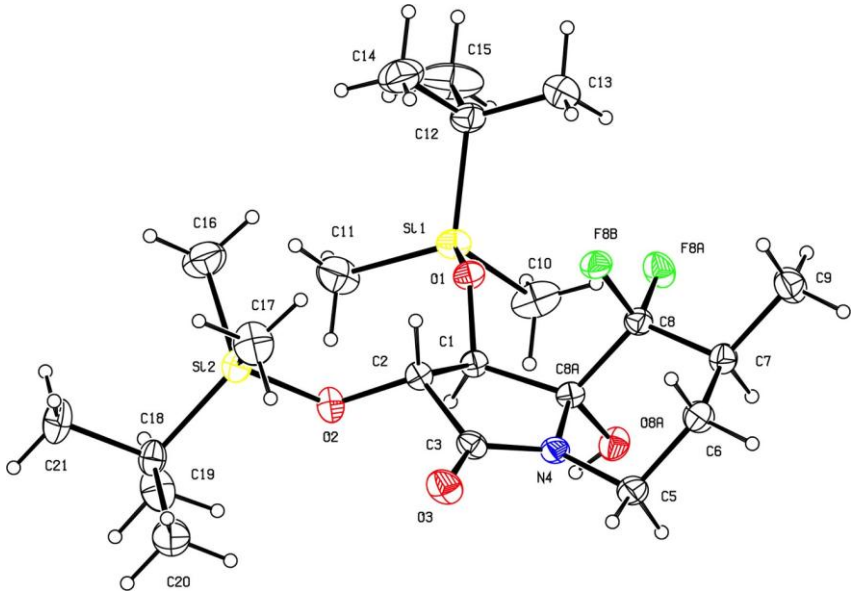
*X-ray data of **28b***

$C_{13}H_{23}F_2NO_2$, MW= 263.328, orthorhombic, dimensions: 0.20 × 0.10 × 0.10 mm^3, D = 1.240 g/cm^3, space group $P2_12_12_1$, Z = 4, a = 6.4369(2), b = 10.2183(2), c = 21.4391(7) Å, V = 1410.14(7) Å^3, reflections collected/unique: 12913/2764, number of observations [>2 σ (I)] 2510, final R indices [$I > 2\ \sigma\ (I)$]: $R_1 = 0.0449$, $wR_2 = 0.1292$.

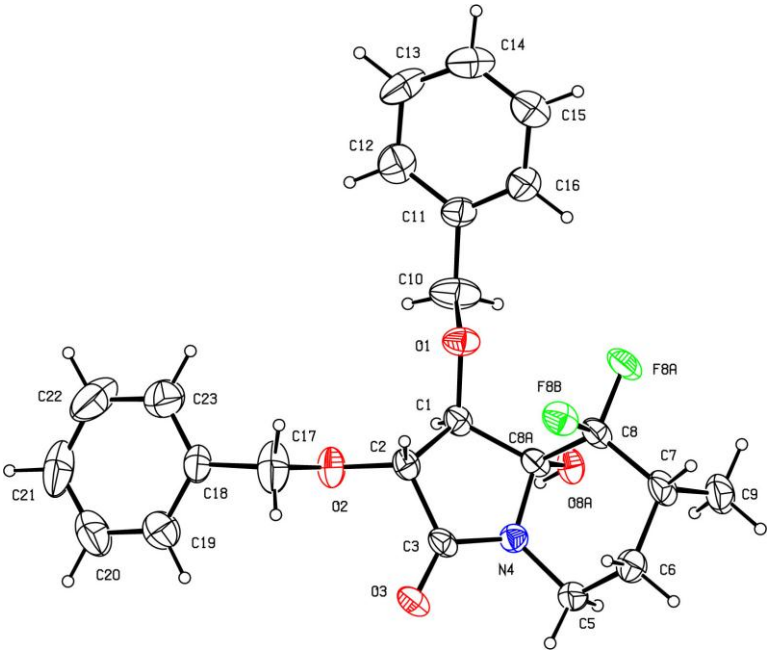
ORTEP plot of *cis*-**10**



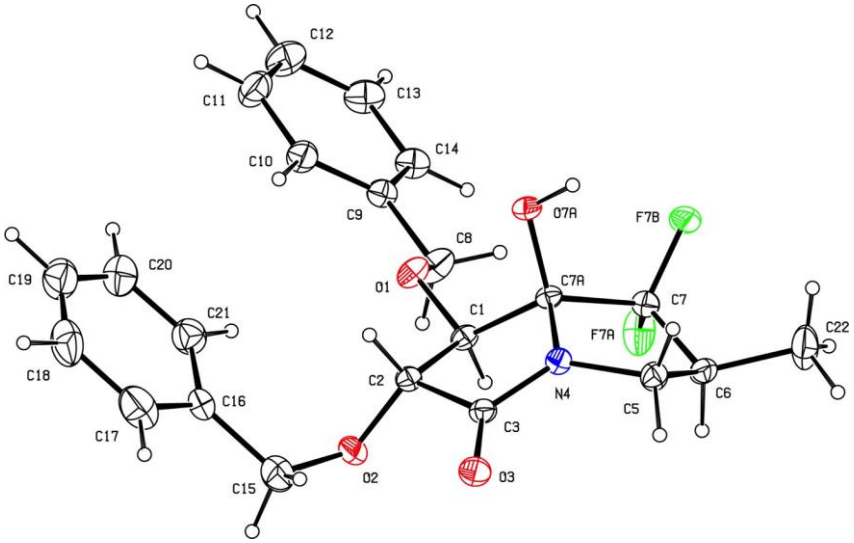
ORTEP plot of *trans*-**11**



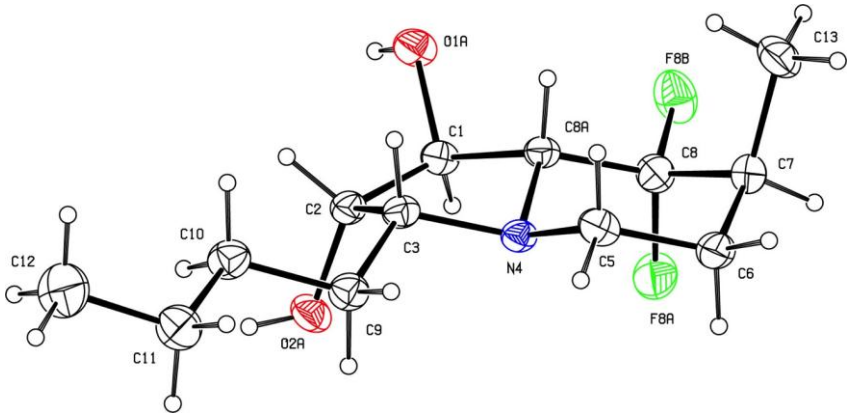
ORTEP plot of *cis*-**13**



ORTEP plot of *cis*-**19**



ORTEP plot of **28b**



References

1. Altomare, A.; Burla, M. C.; Camalli, M.; Cascarano, G. L.; Giacovazzo, C.; Guagliardi, A.; Moliterni, A.G.G.; Polidori, G.; Spagna, R. *J. Appl. Cryst.* **1999**, *32*, 115.

2. Sheldrick, G.M. *Acta Cryst.*, **2008**, A64, 112.