Supplementary Material (ESI) for Chemical Communications

Supporting Information

for

Silver(I)-Mediated Highly Enantioselective Synthesis of Axially Chiral Allenes under Thermal and Microwave-Assisted Conditions

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General Experimental Section: Reagents were obtained commercially and used without further purification unless indicated otherwise. Solvent was removed under reduced pressure and the residue obtained was chromatographed on a silica gel column (230-400 mesh) using a gradient solvent system (EtOAc / *n*-hexane as eluant unless specified otherwise). ^{1}H and ^{13}C NMR spectra were measured on either Bruker DPX-500, DPX-400 or DPX-300 spectrometer. Chemical shifts (δ ppm) were determined with tetramethylsilane (TMS) as internal reference. Mass spectra were determined on a Finnigan MAT 95 mass spectrometer. IR spectra were recorded on a Bio-RAD PTS-165 spectrometer. Chiral HPLC spectra were measured on an Agilent 1100 series using Chiralcel-OD column.

General Procedure for Synthesis of Propargylamines

A mixture of Au(Salen)PF_6 (0.01 mmol), aldehyde (1.0 mmol), amine (1.1 mmol) and alkyne (1.5 mmol) in water (1 mL) was stirred at 40 ^{o}C for 24 h in the absence of light under N_2 atmosphere. The reaction mixture was extracted with diethyl ether. The combined organic layers were dried over anhydrous $MgSO_4$, filtered, and concentrated under reduced pressure. The product was purified by flash column chromatography on silica gel using ethyl acetate-hexane as eluent. [V. K.-Y. Lo; Y. Liu; M.-K. Wong and C.-M. Che, *Org. Lett.*, 2006, **8**, 1529.]

The preparation of propargylamine **1n** and **1s** was the same as the others, despite the reactions were performed under reflux condition.

General Procedure for Silver-Mediated Synthesis of Axially Chiral Allenes from Optically Active Propargylamines under Thermal Condition

A mixture of propargylamine (0.1 mmol) and $AgNO_3$ (0.05 mmol) in CH_3CN (2 mL) was stirred at 40 ^{o}C for 24 h in the absence of light. Solvent was removed under reduced pressure. The

product was purified by flash column chromatography on silica gel using ethyl acetate-hexane as eluent. The % ee value was determined by HPLC using Chiralcel OD column with IPA-hexane as eluent.

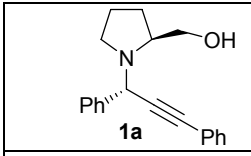
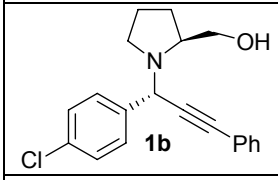
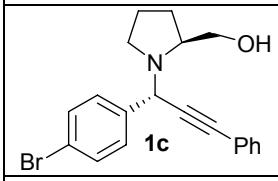
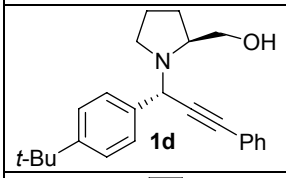
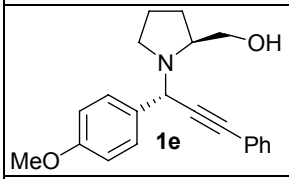
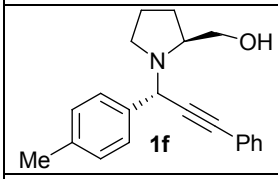
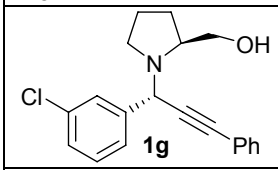
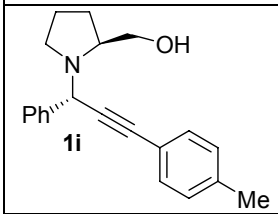
General Procedure for Silver-Mediated Synthesis of Axially Chiral Allenes from Optically Active Propargylamines under Microwave-Assisted Condition

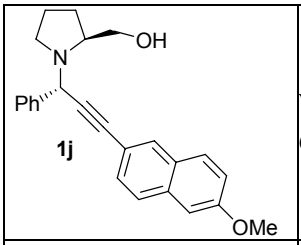
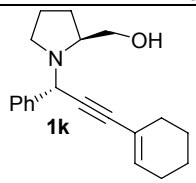
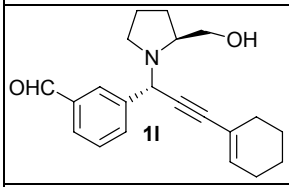
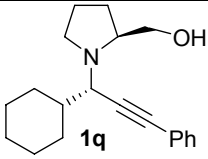
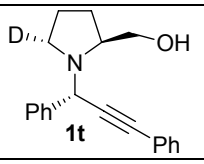
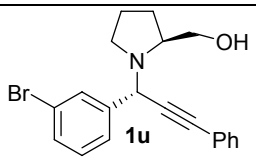
A mixture of propargylamine (0.1 mmol) and $AgNO_3$ (0.05 mmol) in CH_3CN (1 mL) was stirred for 20 min at 70 ^oC under microwave irradiation (60 W). After cooling to room temperature, solvent was removed under reduced pressure. The product was purified by flash column chromatography on alumina using ethyl acetate-hexane as eluent. The % ee value was determined by HPLC using Chiralcel OD column with IPA-hexane as eluent, or by GC using Cyclodex-β column.

General Procedure for Preparation of Racemic Allenes

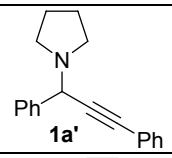
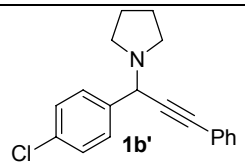
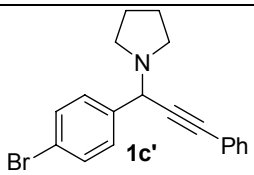
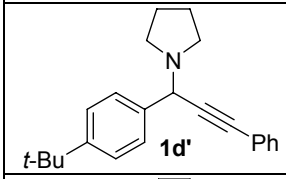
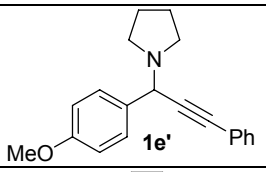
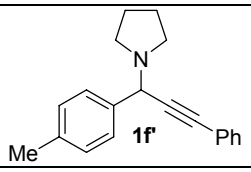
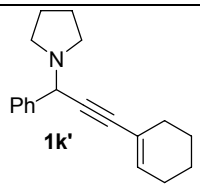
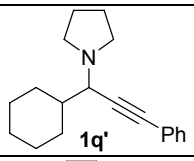
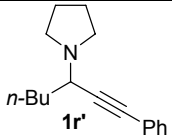
Racemic propargylamines **1a'-1h', 1j'-1s'** were synthesized as described above, despite using pyrrolidine as the amine component. The racemic propargylamines then were transformed into racemic allenes using procedures described above.

Literature References of Chiral Propargylamines

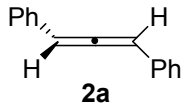
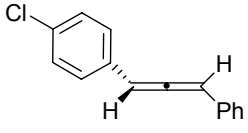
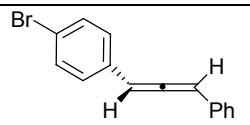
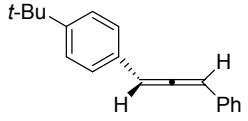
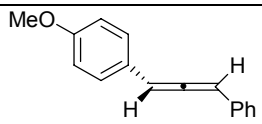
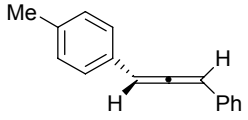
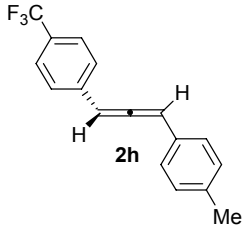
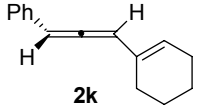
	V. K.-Y. Lo, Y. Liu, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2006, **8**, 1529.
	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
	V. K.-Y. Lo, K. K.-Y. Kung, M.-K. Wong and C.-M. Che, *J. Organomet. Chem.*, 2009, **694**, 583.
	V. K.-Y. Lo, K. K.-Y. Kung, M.-K. Wong and C.-M. Che, *J. Organomet. Chem.*, 2009, **694**, 583.
	Lo, V. K.-Y., Kung, K. K.-Y., Wong, M.-K.; Che, C.-M. *J. Organomet. Chem.* **2009**, *694*, 583-591.1`
	V. K.-Y. Lo, K. K.-Y. Kung, M.-K. Wong and C.-M. Che, *J. Organomet. Chem.*, 2009, **694**, 583.

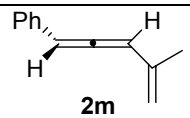
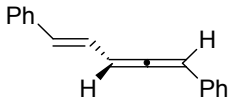
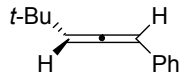
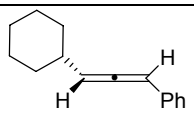
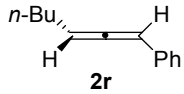
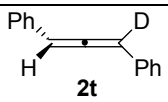
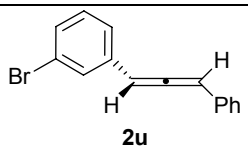
	V. K.-Y. Lo, K. K.-Y. Kung, M.-K. Wong and C.-M. Che, *J. Organomet. Chem.*, 2009, **694**, 583.
	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
	V. K.-Y. Lo, K. K.-Y. Kung, M.-K. Wong and C.-M. Che, *J. Organomet. Chem.*, 2009, **694**, 583.
	V. K.-Y. Lo, Y. Liu, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2006, **8**, 1529.
	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.

Literature References of Achiral Propargylamines

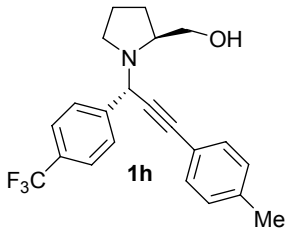
 **1a'**	1. M. Kidwai, V. Bansal, A. Kumar and S. Mozumdar, *Green Chem.*, 2007, **9**, 742. 2. C. Wei, Z. Li and C.-J. Li, *Org. Lett.*, 2003, **5**, 4473.
 **1b'**	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
 **1c'**	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
 **1d'**	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
 **1e'**	E. Ramu, R. Varala, N. Sreelatha and S. R. Adapa, *Tetrahedron Lett.*, 2007, **48**, 7184.
 **1f'**	1. E. Ramu, R. Varala, N. Sreelatha and S. R. Adapa, *Tetrahedron Lett.*, 2007, **48**, 7184. 2. M. Kidwai, V. Bansal, A. Kumar and S. Mozumdar, *Green Chem.*, 2007, **9**, 742.
 **1k'**	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
 **1q'**	1. V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517. 2. C. Wei, Z. Li and C.-J. Li, *Org. Lett.*, 2003, **5**, 4473.
 **1r'**	E. Ramu, R. Varala, N. Sreelatha and S. R. Adapa, *Tetrahedron Lett.*, 2007, **48**, 7184.

Literature References of Allenes

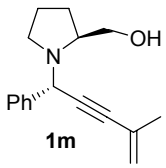
 **2a**	1. M. Yoshida, T. Okada and K. Shishido, *Tetrahedron*, 2007, **63**, 6996. 2. P. Warner and R. Sutherland, *J. Org. Chem.*, 1992, **57**, 6294.
 **2b**	1.P. Warner and R. Sutherland, *J. Org. Chem.*, 1992, **57**, 6294. 2.W. M. Jones and D. L. Krause, *J. Am. Chem. Soc.*, 1971, **93**, 551.
 **2c**	M Oku, S. Arai, K. Katayama and T. Shioiri, *Synlett*, 2000, **5**, 493.
 **2d**	V. K.-Y. Lo; M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
 **2e**	M. Yoshida, T. Okada and K. Shishido, *Tetrahedron*, 2007, **63**, 6996.
 **2f**	1. M. Yoshida, T. Okada and K. Shishido, *Tetrahedron*, 2007, **63**, 6996. 2. P. Warner and R. Sutherland, *J. Org. Chem.*, 1992, **57**, 6294.
 **2h**	P. Warner and R. Sutherland, *J. Org. Chem.*, 1992, **57**, 6294.
 **2k**	1. V. K.-Y. Lo; M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517. 2. D. Regás, J. M. Ruiz, M. M. Afonso and J. A. Palenzuela, *J. Org. Chem.*, 2006, **71**, 9153.

 **2m**	E. S. Krijnen, H. zuilhof and G. Lodder, *J. Org. Chem.*, 1994, **59**, 8139.
 **2n**	1. T. Satoh; N. Hanaki; Y. Kuramochi; Y. Inoue; K. Hosoya and K. Sakai, *Tetrahedron*, 2002, **58**, 2533. 2. J. Klein and S. Brenner, *Tetrahedron*, 1970, **26**, 5807.
 **2p**	1. H. Inoue, H. Tsubouchi, Y. Nagaoka and K. Tomioka, *Tetrahedron*, 2002, **58**, 83. 2. C. J. Elserier and P. Vermeer, *J. Org. Chem.*, 1989, **54**, 3726.
 **2q**	1. M. A. Tius and S. K. Pal, *Tetrahedron Lett.*, 2001, **42**, 2605. 2. A. G. Myers and B. Zheng, *J. Am. Chem. Soc.*, 1996, **118**, 4492.
 **2r**	1. Ramu, E.; Varala, R.; Sreelatha. N.; Adapa, S. R. *Tetrahedron Lett.* **2007**, *48*, 7184-7190. 2. C. J. Elserier and P. Vermeer, *J. Org. Chem.*, 1989, **54**, 3726.
 **2t**	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.
 **2u**	V. K.-Y. Lo, M.-K. Wong and C.-M. Che, *Org. Lett.*, 2008, **10**, 517.

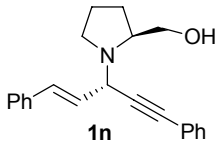
Characterization Data of Optically Active Propargylamines



Yellow oil; analytical TLC (silica gel 60) (30 % EtOAc in hexane) R_f = 0.37; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.75-7.73 (d, *J* = 8.2 Hz, 2H), 7.62-7.59 (d, *J* = 8.2 Hz, 2H), 7.43-7.40 (d, *J* = 8.0 Hz, 2H), 7.15-7.12 (d, *J* = 8.0 Hz, 2H), 5.17 (s, 1H), 3.80 (dd, *J* = 11.0, 3.7 Hz, 1H), 3.57 (dd, *J* = 11.0, 2.7 Hz, 1H), 3.32-3.25 (m, 1H), 2.83-2.75 (m, 1H), 2.59-2.53 (m, 1H), 2.35 (s, 3H), 2.01-1.61 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 143.35, 138.60, 131.64, 129.67 (q, *J* = 32 Hz), 129.07, 128.38, 125.14 (q, *J* = 4Hz), 124.11 (q, *J* = 270 Hz), 119.46, 88.44, 83.60, 62.31, 61.88, 56.11, 47.78, 27.82, 23.45, 21.32; IR (NaCl, neat, cm^{-1}) 3400, 2361, 2216, 1619; EIMS *m/z* 342 (M^+-CH_2OH); HRMS (EI) for $C_{21}H_{19}F_3N$, calcd 342.1469, found 342.1463.

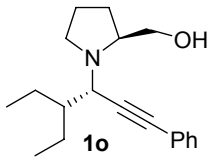


Yellow oil; analytical TLC (silica gel 60) (30% EtOAc in hexane) R_f = 0.30; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54-7.52 (m, 2H), 7.36-7.33 (m, 2H), 7.29-7.25 (m, 1H), 5.36 (s, 1H), 5.27 (t, *J* = 1.6 Hz, 1H), 5.00 (s, 1H), 3.78 (dd, *J* = 10.9, 3.6 Hz, 1H), 3.51 (dd, *J* = 10.9, 2.3 Hz, 1H), 3.21-3.16 (m, 1H), 3.18 (td, *J* = 5.9, 3.0 Hz, 1H), 2.74-2.68 (m, 1H), 1.96 (s, 3H), 1.95-1.90 (m, 1H), 1.86-1.83 (m, 1H), 1.72-1.58 (m, 2H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 139.15, 128.24, 128.01, 127.51, 126.50, 121.80, 89.00, 84.30, 61.81, 61.62, 56.06, 47.74, 27.98, 23.82, 23.53; IR (NaCl, neat, cm^{-1}) 3400, 2361, 1616; EIMS *m/z* 224 (M^+-CH_2OH); HRMS (EI) for $C_{16}H_{18}N$, calcd 224.1434, found 224.1430.



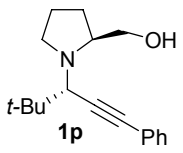
1n

Yellow oil; analytical TLC (silica gel 60) (50% EtOAc in hexane) R = 0.26; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.61-7.60 (m, 2H), 7.52-7.50 (m, 2H), 7.39-7.28 (m, 8H), 5.13 (s, 1H), 3.83 (dd, *J* = 11.0, 3.5 Hz, 1H), 3.54 (dd, *J* = 11.0, 2.5 Hz, 1H), 3.32-3.27 (m, 1H), 2.82 (td, *J* = 9.3, 7.3 Hz, 1H), 2.66-2.61 (m, 1H), 2.01-1.61 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 139.06, 131.87, 128.39, 128.36, 128.14, 127.68, 122.97, 87.89, 85.31, 61.86, 56.37, 47.95, 29.72, 28.04, 23.62; IR (NaCl, neat, cm^{-1}) 3429, 2361, 1653; EIMS *m/z* 317 (M^+); HRMS (EI) for $C_{22}H_{23}NO$, calcd 317.1774, found 317.1767.



1o

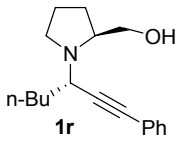
Yellow oil; analytical TLC (silica gel 60) (10 % EtOAc in hexane) R_f = 0.23; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.43-7.38 (m, 2H), 7.27-7.22 (m, 3H), 3.51-3.48 (d, *J* = 7.4 Hz, 1H), 2.76-2.61 (m, 4H), 1.79-1.75 (m, 5H), 1.61-1.45 (m, 4H), 0.95-0.88 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 131.61, 128.09, 127.56, 123.70, 88.03, 85.40, 58.33, 50.20, 43.76, 23.54, 22.33, 21.79, 10.89, 10.75; IR (NaCl, neat, cm^{-1}) 3430, 2362; EIMS *m/z* 254 (M^+-CH_2OH); HRMS (EI) for $C_{18}H_{24}N$, calcd 254.1909, found 254.1909.



1p

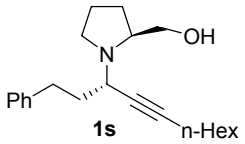
Yellow oil, analytical TLC (silica gel 60) (10 % EtOAc in hexane) R_f = 0.11; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.43-7.40 (m, 2H), 7.31-7.24 (m, 3H), 3.63-3.59 (m, 1H) 3.43-3.40 (m, 1H), 3.41 (s, 1H), 3.07-3.02 (m, 2H), 2.97-2.92 (m, 1H), 1.87-1.70 (m, 4H), 1.08 (s, 9H); ^{13}C NMR (100 MHz,

$CDCl_3$) δ 131.51, 128.14, 127.74, 123.36, 86.55, 86.51, 64.81, 63.86, 61.56, 49.49, 35.75, 27.76, 27.22, 25.00; IR (NaCl, neat, cm^{-1}) 3436, 2360; EIMS *m/z* 256 (M^+-CH_3); HRMS (EI) for $C_{17}H_{22}NO$, calcd 256.1701, found 256.1701.



1r

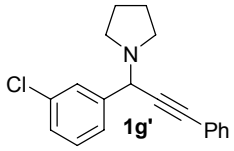
Yellow oil; analytical TLC (silica gel 60) (30 % EtOAc in hexane) R_f = 0.31; ^1H NMR (400 MHz, $CDCl_3$) δ 7.42-7.38 (m, 2H), 7.30-7.25 (m, 3H), 3.75 (t, *J* = 7.7 Hz, 1H), 3.63 (dd, *J* = 10.8, 4.0 Hz, 1H), 3.44-3.41 (m, 2H), 3.10-3.06 (m, 1H), 2.96-2.91 (m, 1H), 2.85-2.78 (m, 1H), 1.91-1.86 (m, 1H), 1.80-1.69 (m, 4H), 1.50-1.34 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 131.49, 128.01, 127.69, 123.09, 87.83, 85.01, 61.79, 61.74, 52.55, 47.13, 34.69, 28.74, 27.62, 23.49, 22.22, 13.83; IR (NaCl, neat, cm^{-1}) 3435, 2361, 2335; EIMS *m/z* 240 (M^+-CH_2OH); HRMS (EI) for $C_{17}H_{22}N$, calcd 240.1752, found 240.1754.



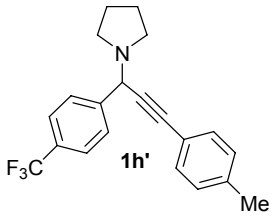
1s

Yellow oil; analytical TLC (silica gel 60) (50% EtOAc in hexane) R_f = 0.16; ^1H NMR (400 MHz, $CDCl_3$) δ 7.28-7.23 (m, 2H), 7.19-7.14 (m, 3H), 3.54-3.49 (m, 2H), 3.34 (dd, *J* = 10.8, 2.3 Hz, 1H), 2.99-2.95 (m, 1H), 2.90-2.85 (m, 1H), 2.77-2.68 (m, 3H), 2.22-2.18 (m, 2H), 1.92 (q, *J* = 7.8 Hz, 2H), 1.87-1.71 (m, 4H), 1.53-1.46 (m, 2H), 1.44-1.38 (m, 2H), 1.34-1.28 (m, 5H), 0.90-0.87 (m, 3H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 141.61, 129.26, 128.75, 83.48, 77.63, 61.65, 61.58, 51.50, 47.03, 37.03, 32.83, 31.22, 28.95, 28.39, 27.72, 23.66, 22.50, 18.52, 13.95; IR (NaCl, neat, cm^{-1}) 3429, 2364; EIMS *m/z* 296 (M^+-CH_2OH); HRMS (EI) for $C_{21}H_{30}N$, calcd 296.2373, found 296.2374.

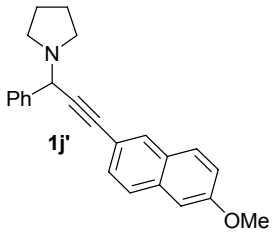
Characterization Data of Racemic Propargylamines



Pale yellow oil; analytical TLC (silica gel 60) (10% EtOAc in hexane) R_f = 0.25; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.62 (s, 1H), 7.50-7.47 (m, 3H), 7.32-7.30 (m, 3H), 7.26-7.25 (m, 2H), 4.87 (s, 1H), 2.67-2.65 (m, 4H), 1.79-1.77 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 141.70, 134.13, 131.79, 129.45, 128.28, 128.23, 127.69, 126.35, 122.93, 87.40, 85.73, 58.46, 50.09, 23.50; IR (KBr, neat, cm^{-1}) 2362; EIMS *m/z* 295 (M^+); HRMS (EI) for $C_{19}H_{18}NCl$, calcd 295.1127, found 295.1122.

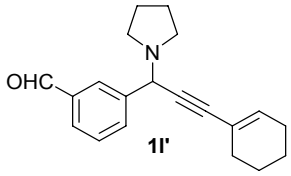


Yellow oil; analytical TLC (silica gel 60) (30 % EtOAc in hexane) R_f = 0.58; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.74 (d, *J* = 8.2 Hz, 2H), 7.59 (d, *J* = 8.2 Hz, 2H), 7.38 (d, *J* = 8.1 Hz, 2H), 7.10 (d, *J* = 8.0 Hz, 2H), 4.92 (s, 1H), 2.68-2.64 (m, 4H), 2.32 (s, 3H), 1.79-1.76 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 143.78, 138.38, 131.65, 129.66 (q, *J* = 32 Hz), 129.03, 128.49, 125.11 (q, *J* = 4 Hz), 124.22 (q, *J* = 270 Hz), 119.78, 87.74, 84.73, 58.54, 50.04, 23.48, 21.32; IR (NaCl, neat, cm^{-1}) 2361, 2224, 1619; EIMS *m/z* 343 (M^+); HRMS (EI) for $C_{21}H_{30}NF_3$, calcd 343.1548, found 343.1540.



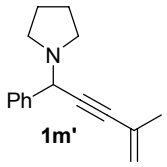
1j'

Pale yellow solid; analytical TLC (silica gel 60) (10 % EtOAc in hexane) R_f = 0.18; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.65-7.61 (m, 4H), 7.49 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.38-7.33 (m, 2H), 7.30-7.24 (m, 1H), 7.12 (dd, *J* = 9.0, 2.5 Hz, 1H), 7.05 (d, *J* = 2.4 Hz, 1H), 4.91 (s, 1H), 3.84 (s, 3H), 2.74-2.69 (m, 4H), 1.81-1.79 (m, 4H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 158.16, 139.62, 133.99, 131.23, 129.23, 129.12, 128.43, 128.24, 128.20, 127.49, 126.67, 119.30, 118.09, 105.72, 87.35, 86.22, 59.18, 55.15, 50.25, 23.47, 14.07; IR (NaCl, neat, cm^{-1}) 2352; EIMS *m/z* 341 (M^+); HRMS (EI) for $C_{24}H_{23}NO$, calcd 341.1779, found 341.1774.



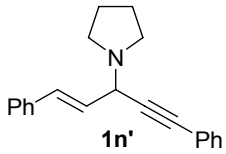
1l'

Yellow oil; analytical TLC (silica gel 60) (30% EtOAc in hexane) R_f = 0.27; ^{1}H NMR (300 MHz, $CDCl_3$) δ 10.03 (s, 1H), 8.06 (s, 1H), 7.85-7.79 (m, 2H), 7.52-7.47 (m, 1H), 6.18-6.15 (m, 1H), 4.87 (s, 1H), 2.65-2.57 (m, 4H), 2.20-2.11 (m, 4H), 1.82-1.76 (m, 4H), 1.70-1.59 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 192.21, 141.23, 126.37, 134.76, 134.19, 129.72, 128.77, 128.38, 120.25, 89.49, 82.45, 58.32, 49.89, 29.45, 25.51, 23.41, 22.21, 21.40; IR (NaCl, neat, cm^{-1}) 2361, 1699, 1653; EIMS *m/z* 293 (M^+); HRMS (EI) for $C_{20}H_{23}NO$, calcd 293.1774, found 293.1776.



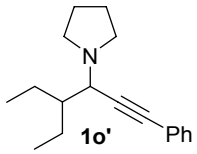
1m'

Yellow oil; analytical TLC (silica gel 60) (10% EtOAc in hexane) R_f = 0.31; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.54-7.52 (m, 2H), 7.35-7.31 (m, 2H), 7.28-7.23 (m, 1H), 5.32 (s, 1H), 5.22-5.21 (t, *J* = 1.7 Hz, 1H), 4.75 (s, 1H), 2.62-2.59 (m, 4H), 1.93 (s, 3H), 1.80-1.73 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 139.54, 128.10, 127.44, 126.68, 121.43, 88.03, 85.68, 58.96, 50.17, 23.76, 23.41; IR (NaCl, neat, cm^{-1}) 2361, 1615; EIMS *m/z* 225 (M^+); HRMS for $C_{16}H_{19}N$, calcd 224.1434, found 224.1437.



1n'

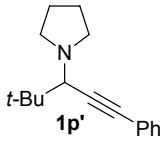
Yellow oil; analytical TLC (silica gel 60) (30% EtOAc in hexane) R_f = 0.33; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.61-7.59 (m, 2H), 7.49-7.47 (m, 2H), 7.36-7.33 (m, 3H), 7.30-.27 (m, 5H), 4.87 (s, 1H), 2.70-2.67 (m, 4H), 1.82-1.74 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 139.47, 131.75, 128.45, 128.22, 128.04, 127.54, 123.20, 86.88, 86.68, 59.11, 50.25, 23.45; IR (NaCl , neat, cm^{-1}) 2362; EIMS *m/z* 232 (M^+-C_4H_7); HRMS (EI) for $C_{17}H_{14}N$, calcd 232.1121, found 232.1120.



1o'

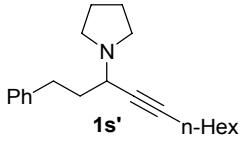
Yellow oil; analytical TLC (silica gel 60) (10 % EtOAc in hexane) R_f = 0.37; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.43-7.39 (m, 2H), 7.29-7.24 (m, 3H), 3.49 (d, *J* = 7.4 Hz, 1H), 2.75-2.61 (m, 4H), 1.79-1.75 (m, 5H), 1.61-1.42 (m, 4H), 0.95-0.88 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 131.61, 128.08, 127.56, 123.71, 88.03, 85.40, 58.33, 50.19, 43.77, 23.55, 22.34, 21.80, 10.89, 10.75; IR

(NaCl, neat, cm^{-1}) 2362; EIMS *m/z* 255 (M^+); HRMS (EI) for $C_{18}H_{25}N$, calcd 255.1987, found 255.1994.



1p'

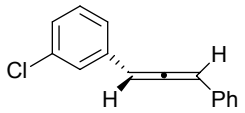
Yellow oil; analytical TLC (silica gel 60) (10 % EtOAc in hexane) R_f = 0.39; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44-7.40 (m, 2H), 7.28-7.23 (m, 3H), 3.46 (s, 1H), 2.82-2.73 (m, 4H), 1.77-1.68 (m, 4H), 1.06 (s, 9H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 131.65, 128.13, 128.58, 123.84, 86.95, 65.14, 51.69, 36.11, 27.72, 24.19; IR (NaCl, neat, cm^{-1}) 2361; EIMS *m/z* 241 (M^+); HRMS (EI) for $C_{17}H_{23}N$, calcd 241.1831, found 241.1847.



1s'

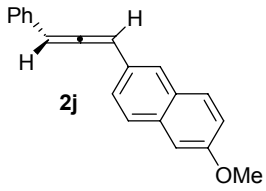
Yellow oil; analytical TLC (silica gel 60) (50% EtOAc in hexane) R_f = 0.28; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.28-7.15 (m, 5H), 3.44-3.38 (m, 1H), 2.75-2.57 (m, 6H), 2.25-2.20 (m, 2H), 2.00-1.80 (m, 2H), 1.76-1.74 (m, 4H), 1.54-1.39 (m, 4H), 1.32-1.26 (m, 4H), 0.89 (t, *J* = 6.8 Hz, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 141.96, 128.45, 128.19, 128.65, 85.61, 77.87, 53.91, 49.46, 36.95, 32.81, 31.28, 29.02, 28.46, 23.41, 22.54, 18.61, 13.98; IR (NaCl, neat, cm^{-1}) 2364; EIMS *m/z* 297 (M^+); HRMS (EI) for $C_{21}H_{31}N$, calcd 297.2457, found 297.2446.

Characterization Data of Allenes



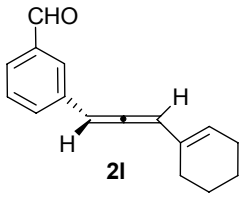
2g

Light yellow solid; analytical TLC (silica gel 60) (10% EtOAc in hexane) R_f = 0.66; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35-7.30 (m, 5H), 7.26-7.18 (m, 4H), 6.62 (d, *J* = 6.5Hz, 1H), 6.53 (d, *J* = 6.5 Hz, 1H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 208.05, 135.70, 134.71, 133.09, 129.92, 128.83, 127.59, 127.35, 126.83, 125.16, 98.91, 97.55; IR (NaCl, neat, cm^{-1}) 1937; EIMS *m/z* 226 (M^+); HRMS (EI) for $C_{15}H_{11}Cl$, calcd 226.0549, found 226.0546.



2j

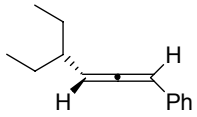
Light yellow solid; analytical TLC (silica gel 60) (10 % EtOAc in hexane) R_f = 0.47; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.70-7.64 (m, 3H), 7.48 (dd, *J* = 8.6, 1.1 Hz, 1H), 7.43-7.29 (m, 4H), 7.25-7.20 (m, 1H), 7.10 (s, 2H), 6.74 (d, *J* = 6.5 Hz, 1H), 6.64 (d, *J* = 6.5 Hz, 1H), 3.91 (s, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 208.08, 157.75, 134.03, 133.84, 129.29, 129.20, 128.78, 127.33, 127.29, 127.07, 125.81, 125.37, 119.01, 106.02, 98.78, 98.61, 78.16, 55.33; IR (NaCl, neat, cm^{-1}) 2359, 1633; EIMS *m/z* 272 (M^+); HRMS (EI) for $C_{20}H_{16}O$, calcd 272.1201, found 272.1200.



2l

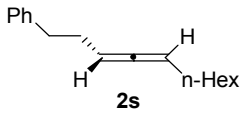
Yellow solid; analytical TLC (silica gel 60) (10% EtOAc in hexane) R_f = 0.66; ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.01 (s, 1H), 7.79 (m, 1H), 7.72-7.70 (m, 1H), 7.57-7.55 (m, 1H), 7.49-7.45 (m,

1H), 6.46-6.45 (m, 1H), 6.32 (d, *J* = 6.3 Hz, 1H), 5.82-5.79 (m, 1H), 2.17-1.97 (m, 4H), 1.68-1.58 (m, 4H); ^{13}C NMR (100 MHz, $CDCl_3$) δ 206.99, 192.34, 136.87, 136.14, 132.50, 131.30, 129.27, 128.16, 127.97, 127.74, 102.25, 96.69, 25.97, 25.84, 22.43, 22.31; IR (NaCl, neat, cm^{-1}) 1931, 1699, 1601; EIMS *m/z* 224 (M^+); HRMS (EI) for $C_{16}H_{16}O$, calcd 224.1196, found 224.1196.



2o

Yellow oil; analytical TLC (silica gel 60) (10% EtOAc in hexane) R_f = 0.74; ^{1}H NMR (300 MHz, $CDCl_3$) δ 7.30-7.26 (m, 4H), 7.20-7.14 (m, 1H), 6.14 (dd, *J* = 6.4, 2.0 Hz, 1H), 5.41-5.37 (m, 1H), 2.01-1.98 (m, 1H), 1.60-1.33 (m, 4H), 0.99-0.91 (m, 6H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 204.83, 135.27, 128.54, 126.55, 98.91, 94.55, 43.11, 29.72, 27.71, 27.47, 11.87, 11.67; IR (NaCl, neat, cm^{-1}) 1963; EIMS *m/z* 186 (M^+); HRMS (EI) for $C_{14}H_{18}$, calcd 186.1403, found 186.1401.



2s

Yellow oil; analytical TLC (silica gel 60) (10% EtOAc in hexane) R_f = 0.71; ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.29-7.26 (m, 2H), 7.20-7.16 (m, 3H), 5.13-5.07 (m, 2H), 2.72 (t, *J* = 7.8 Hz, 2H), 2.33-2.26 (m, 2H), 1.96-1.91 (m, 2H), 1.37-1.25 (m, 8H), 0.90-0.87 (m, 3H); ^{13}C NMR (75 MHz, $CDCl_3$) δ 204.01, 141.98, 128.51, 128.53, 125.78, 91.56, 90.22, 35.52, 31.72, 30.73, 29.72, 29.17, 28.93, 28.80, 22.67, 14.11; IR (NaCl, neat, cm^{-1}) 1948; EIMS *m/z* 228 (M^+); HRMS (EI) for $C_{17}H_{24}$, calcd 228.1873, found 228.1871.

ESI-MS Spectrum of 1a-Ag Adduct

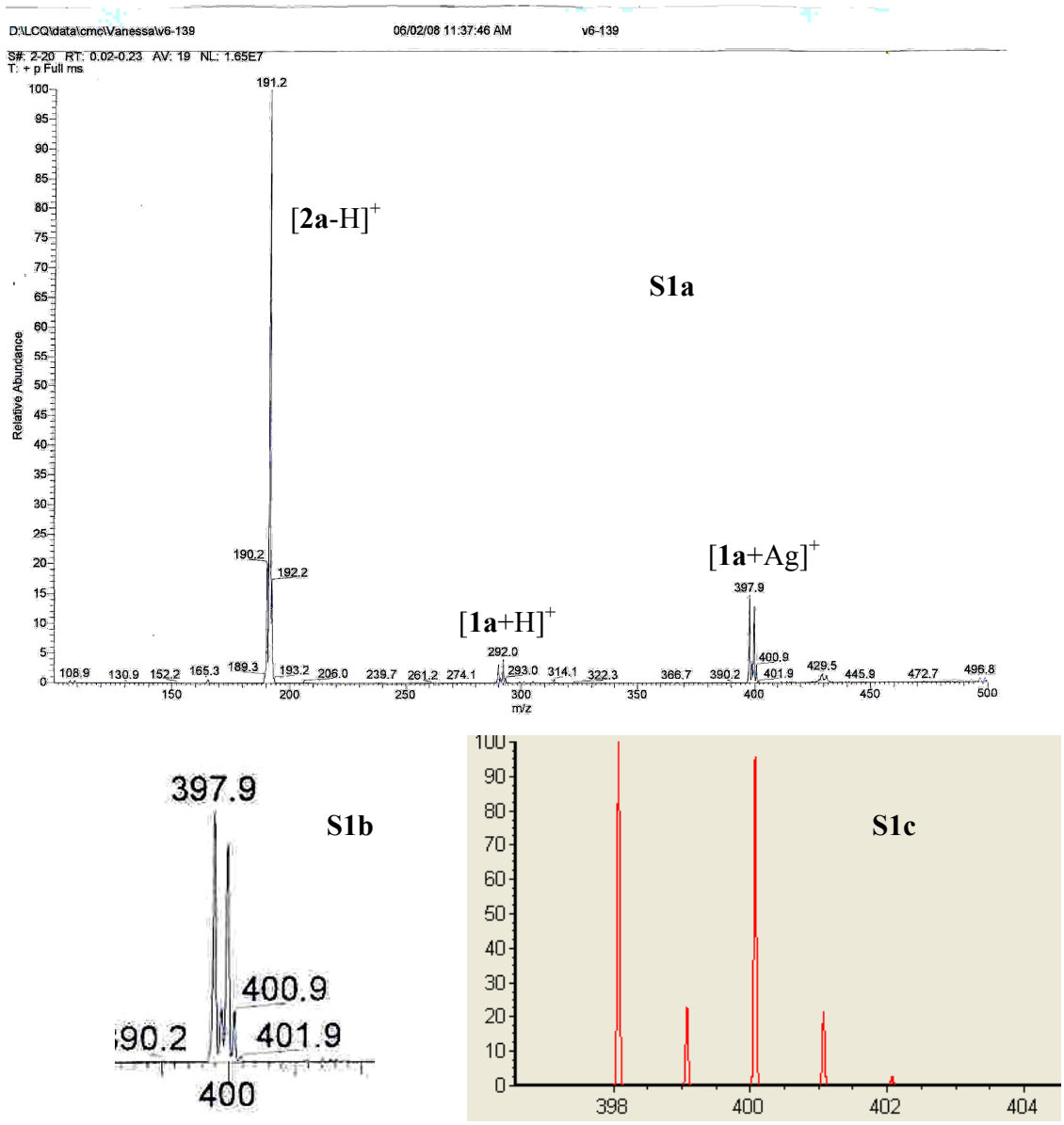


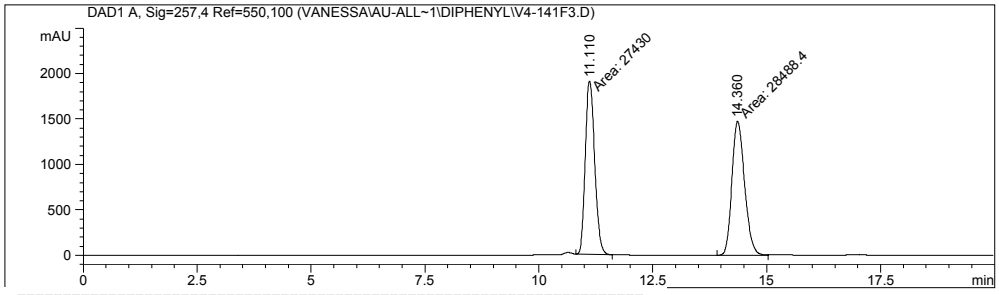
Figure **S1a**. ESI-MS spectrum of adduct of **1a** and silver(I) (peak at *m/z* = 398).

Figure **S1b**. Peak at *m/z* 398. Figure **S1c**. Simulated isotopic pattern of $C_{20}H_{21}NOAg$ (**1a** + Ag^+).

HPLC Spectra of 2a-o, 2q-s

2a (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic

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=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

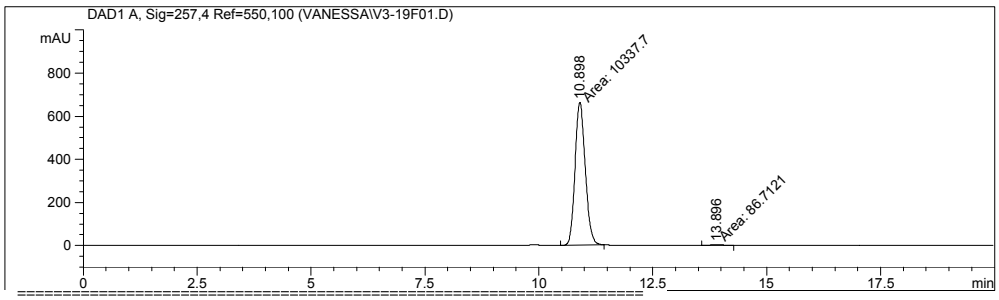

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|-------|
   1  11.110 MM    0.2393 2.74300e4  1910.52502  49.0536
   2  14.360 MM    0.3220 2.84884e4  1474.55090  50.9464

Totals :                  5.59185e4  3385.07593

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 1

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                      Area Percent Report
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Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|-------|
   1  10.898 MM    0.2598 1.03377e4   663.09436  99.1682
   2  13.896 MM    0.3557   86.71213    4.06312   0.8318

Totals :                  1.04244e4   667.15748

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
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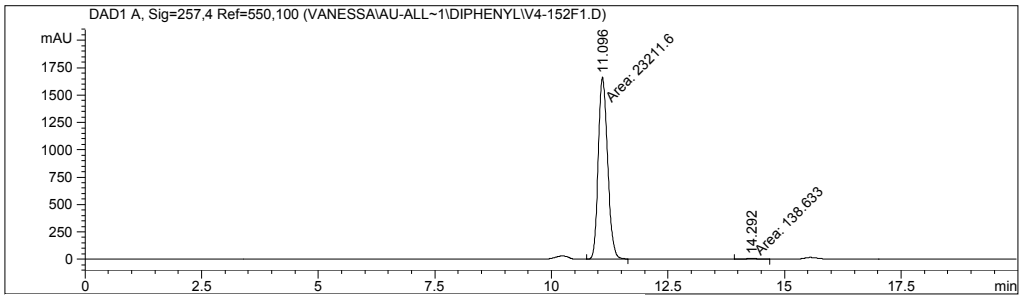
(*R*)-**2a**, for Table 1, entry 2

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                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

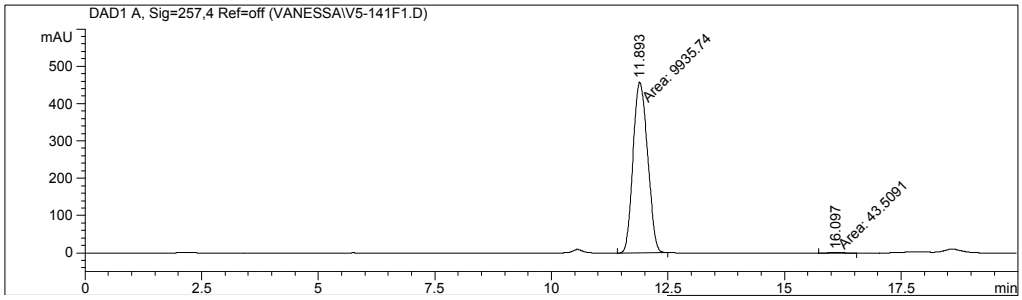

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.096 MM    0.2329 2.32116e4  1661.40918  99.4063
   2  14.292 MM    0.3362  138.63345    6.87207   0.5937

Totals :                  2.33502e4  1668.28124

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 3

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                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

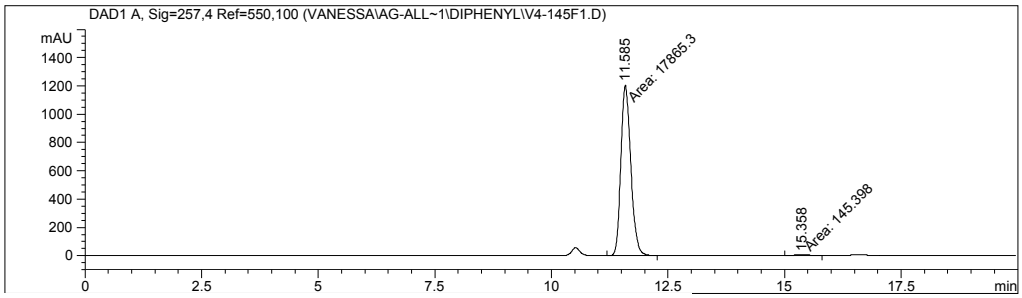

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.893 MM    0.3617 9935.74414  457.84518  99.5640
   2  16.097 MM    0.3565   43.50912    2.03386   0.4360

Totals :                  9979.25326  459.87904

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 4

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================================================================================
                            Area Percent Report
================================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

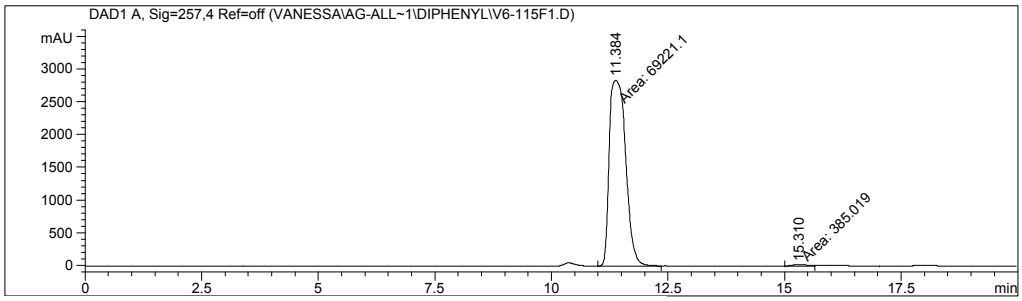

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.585 MM    0.2472 1.78653e4  1204.53699  99.1927
   2  15.358 MM    0.3327  145.39821    7.28467   0.8073

Totals :                  1.80107e4  1211.82166

 Results obtained with enhanced integrator!
================================================================================
                            *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 5




```
================================================================================
                            Area Percent Report
================================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

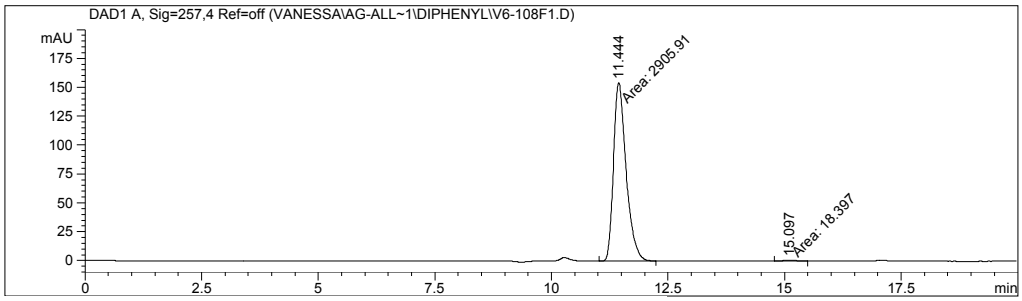

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.384 MM    0.4076 6.92211e4  2830.23437  99.4469
   2  15.310 MM    0.3132  385.01904   20.48774   0.5531

Totals :                  6.96061e4  2850.72211

 Results obtained with enhanced integrator!
================================================================================
                            *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 6

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=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

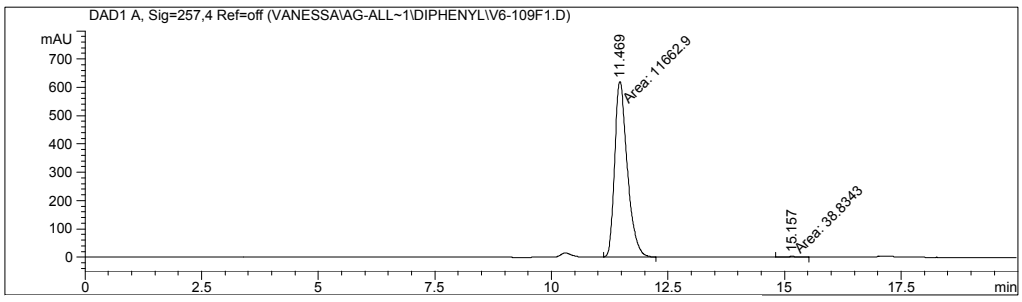

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.444 MM    0.3139 2905.91235  154.31493  99.3709
   2  15.097 MM    0.3340   18.39700 9.18011e-1   0.6291

Totals :                  2924.30936  155.23294

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 7




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

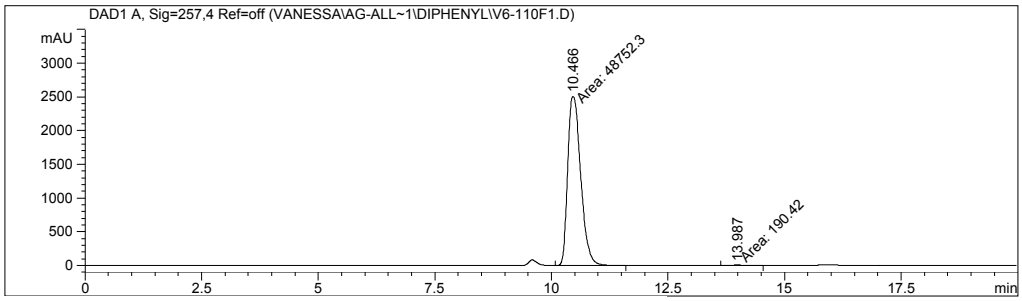

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.469 MM    0.3135 1.16629e4   620.10187  99.6681
   2  15.157 MM    0.3057   38.83427    2.11751   0.3319

Totals :                  1.17017e4   622.21938

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 8

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=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

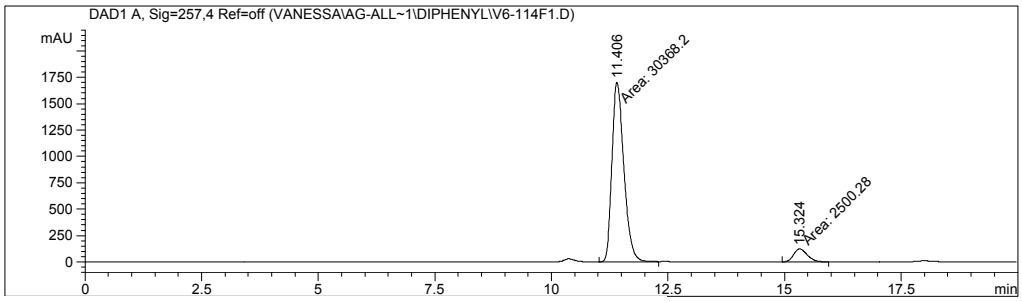

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|-------|
   1  10.466 MM    0.3237 4.87523e4  2510.38623  99.6109
   2  13.987 MM    0.4216  190.42012    7.52723   0.3891

Totals :                  4.89427e4  2517.91346

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2a**, for Table 1, entry 9




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

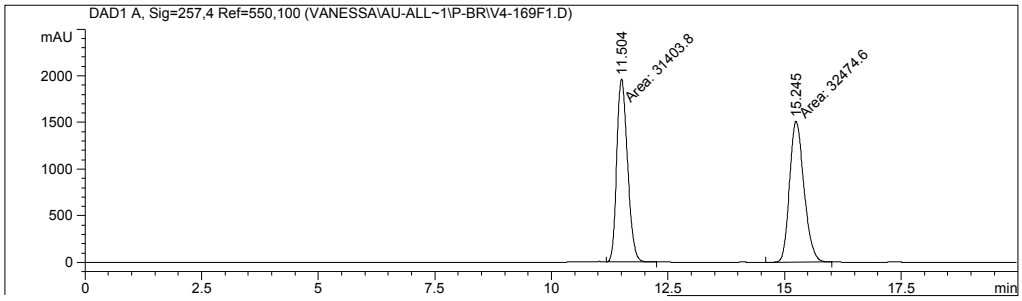
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|-------|
   1  11.406 MM    0.2979 3.03682e4  1698.99072  92.3931
   2  15.324 MM    0.3393 2500.27686  122.82414   7.6069

Totals :                  3.28685e4  1821.81487

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2c (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic

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=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

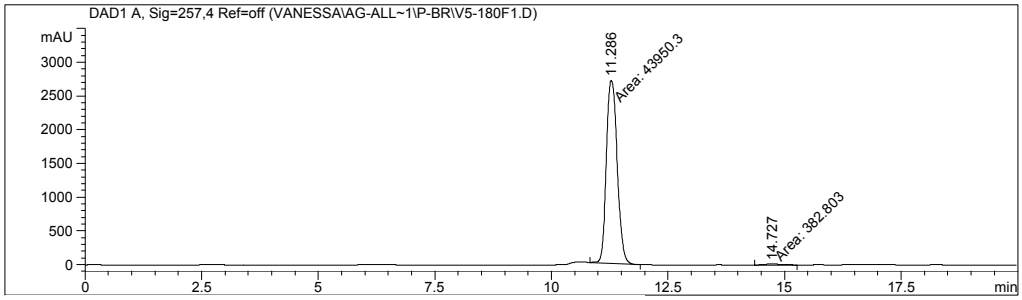

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.504 MM    0.2672 3.14038e4  1958.84766  49.1618
   2  15.245 MM    0.3586 3.24746e4  1509.51111  50.8382

Totals :                  6.38784e4  3468.35876

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2c**, for Table 2, entry 2




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

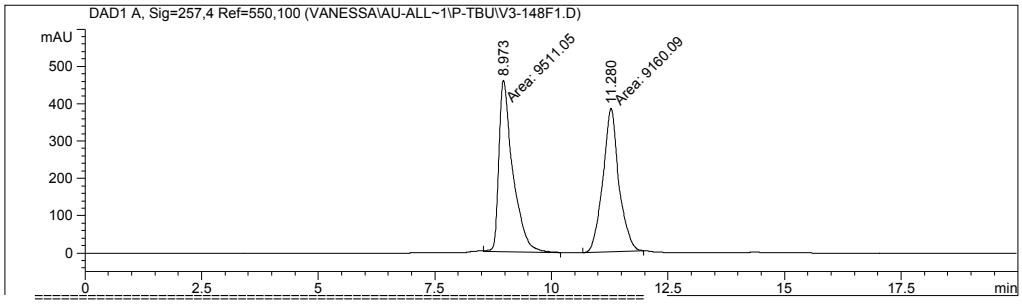
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.286 MM    0.2699 4.39503e4  2714.42432  99.1365
   2  14.727 MM    0.4275  382.80276   14.92292   0.8635

Totals :                  4.43331e4  2729.34724

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2d (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

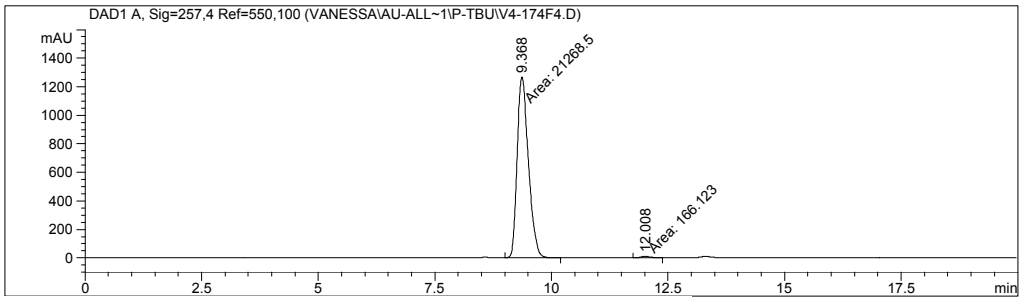

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   8.973 MM    0.3459 9511.05469  458.26010  50.9399
   2  11.280 MM    0.3966 9160.08887  384.93011  49.0601

Totals :                  1.86711e4   843.19022

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

(*R*)-**2d**, for Table 2, entry 3




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=550,100

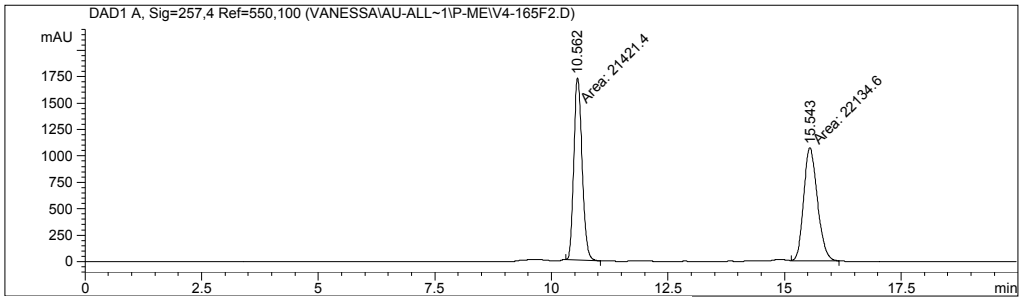
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   9.368 MM    0.2800 2.12685e4  1266.19507  99.2250
   2  12.008 MM    0.2652  166.12308   10.43981   0.7750

Totals :                  2.14346e4  1276.63487

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

2f (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

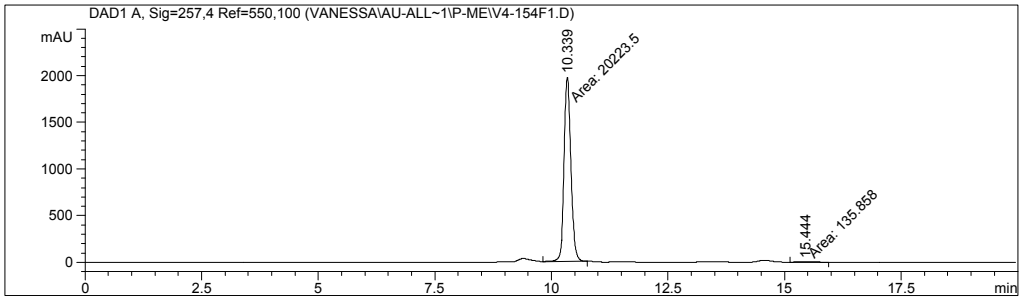

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.562 MM    0.2070 2.14214e4  1725.16504  49.1813
   2  15.543 MM    0.3435 2.21346e4  1073.94116  50.8187

Totals :                  4.35561e4  2799.10620

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

(*R*)-**2f**, for Table 2, entry 4




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=550,100

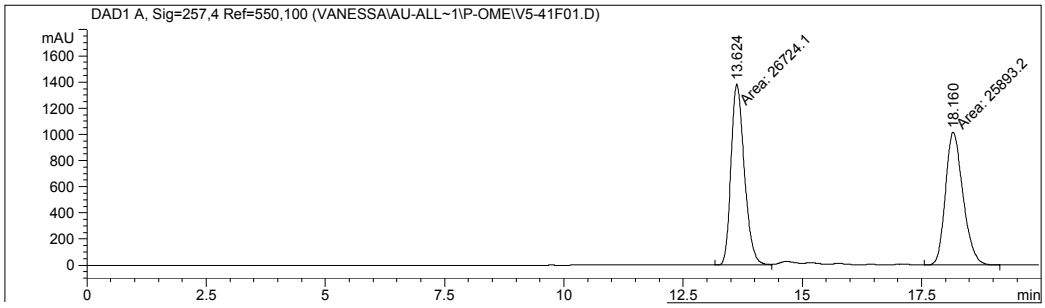
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.339 MM    0.1708 2.02235e4  1973.66675  99.3327
   2  15.444 MM    0.4708  135.85802    4.80931   0.6673

Totals :                  2.03593e4  1978.47606

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

2e (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

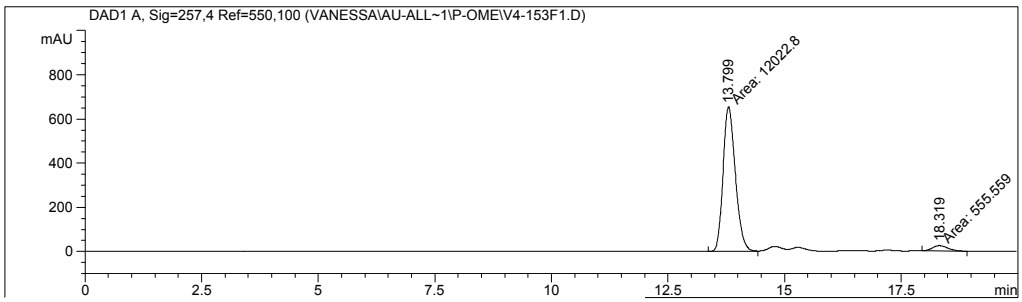

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  13.624 MM    0.3222 2.67241e4  1382.20557  50.7896
   2  18.160 MM    0.4257 2.58932e4  1013.79645  49.2104

Totals :                  5.26173e4  2396.00201

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2e**, for Table 2, entry 5




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=550,100

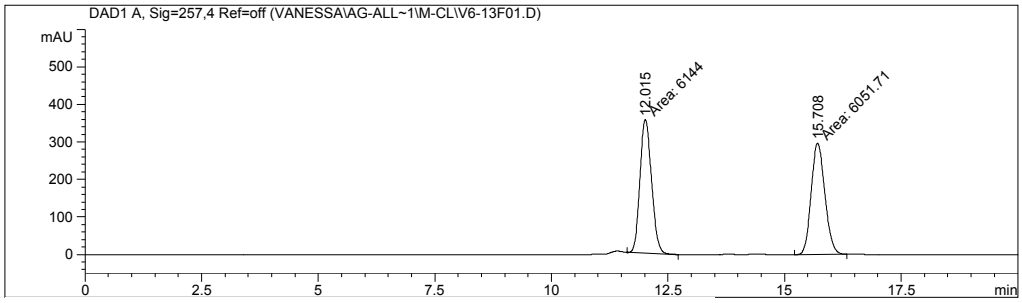
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  13.799 MM    0.3056 1.20228e4   655.71954  95.5832
   2  18.319 MM    0.3879  555.55908   23.87112   4.4168

Totals :                  1.25783e4   679.59067

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2g (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

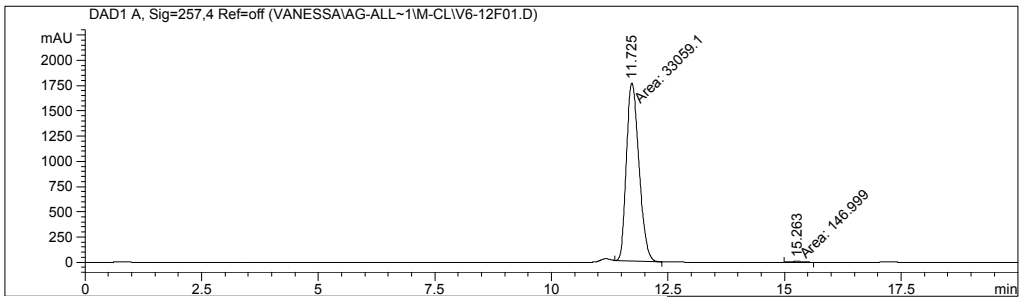

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  12.015 MM    0.2877 6143.99707  355.96976  50.3783
   2  15.708 MM    0.3403 6051.71338  296.36731  49.6217

Totals :                  1.21957e4   652.33707

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2g**, for Table 2, entry 6




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

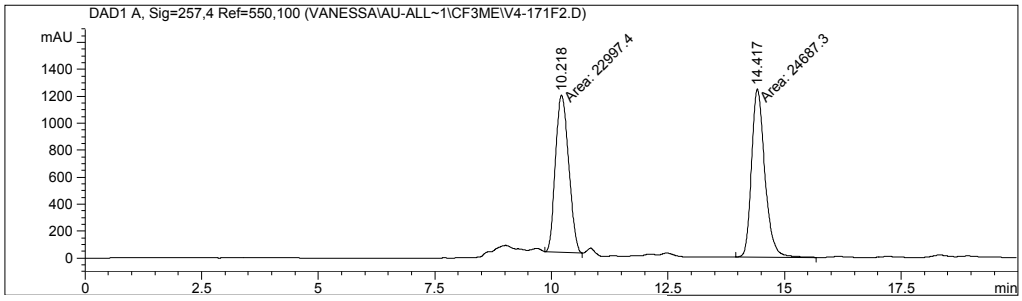
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.725 MM    0.3128 3.30591e4  1761.43079  99.5573
   2  15.263 MM    0.2982  146.99875    8.21570   0.4427

Totals :                  3.32061e4  1769.64649

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2h (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

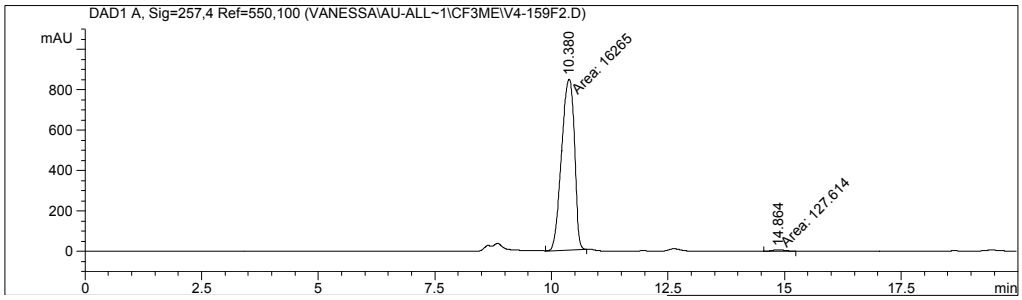

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.218 MM    0.3288 2.29974e4  1165.76416  48.2280
   2  14.417 MM    0.3293 2.46873e4  1249.48645  51.7720

Totals :                  4.76848e4  2415.25061

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2h**, for Table 2, entry 7




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

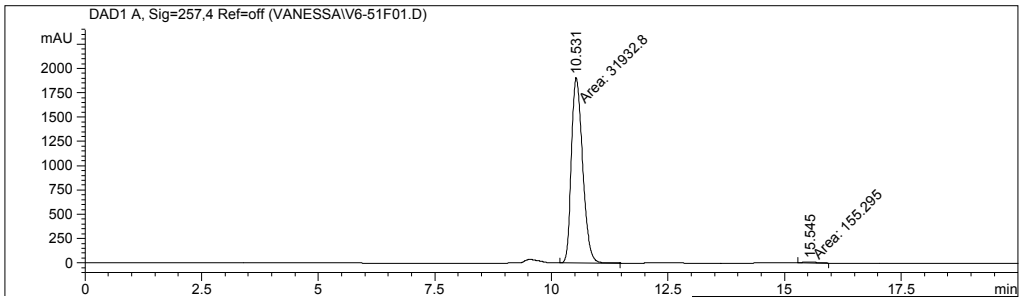

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.380 MM    0.3206 1.62650e4   845.51544  99.2215
   2  14.864 MM    0.2966  127.61410    7.17139   0.7785

Totals :                  1.63926e4   852.68683

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2f**, for Table 2, entry 8




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

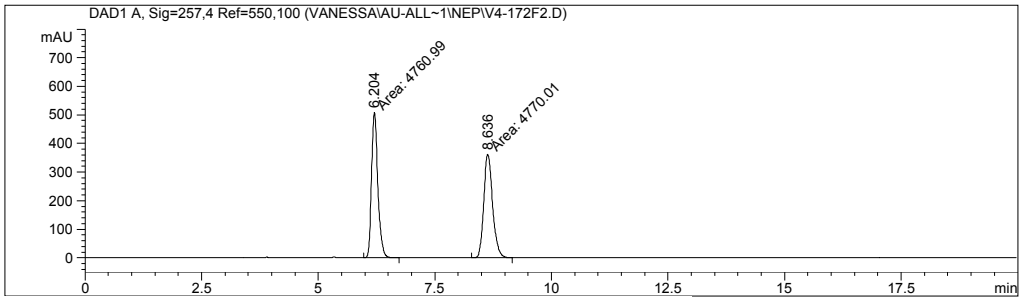
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  10.531 MM    0.2791 3.19328e4  1907.22900  99.5160
   2  15.545 MM    0.3233  155.29472    8.00552   0.4840

Totals :                  3.20881e4  1915.23452

 Results obtained with enhanced integrator!
=====================================================================
                          *** End of Report ***
```

2j (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 1 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

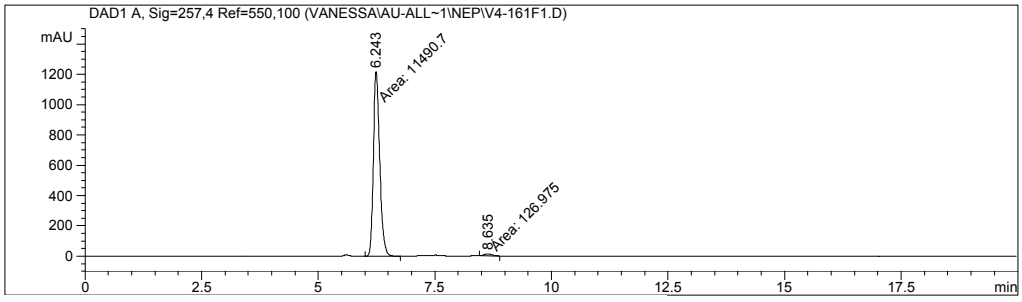

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   6.204 MM    0.1563 4760.98682  507.65067  49.9527
   2   8.636 MM    0.2197 4770.00928  361.88269  50.0473

Totals :                  9530.99609  869.53336

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2j**, for Table 2, entry 9




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=550,100

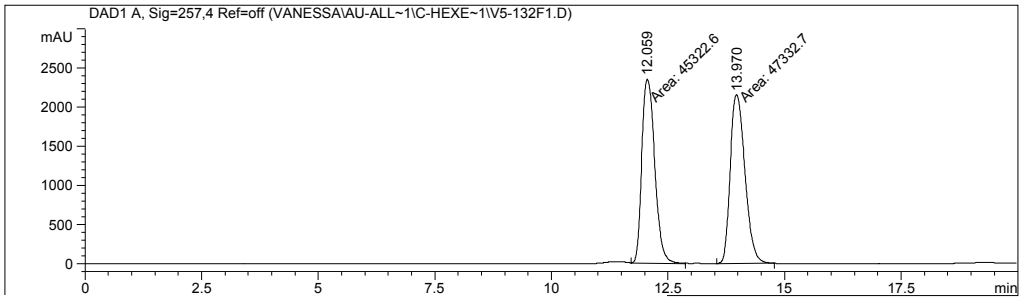
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   6.243 MM    0.1570 1.14907e4  1219.46289  98.9070
   2   8.635 MM    0.1913  126.97549   11.06229   1.0930

Totals :                  1.16177e4  1230.52518

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2k (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

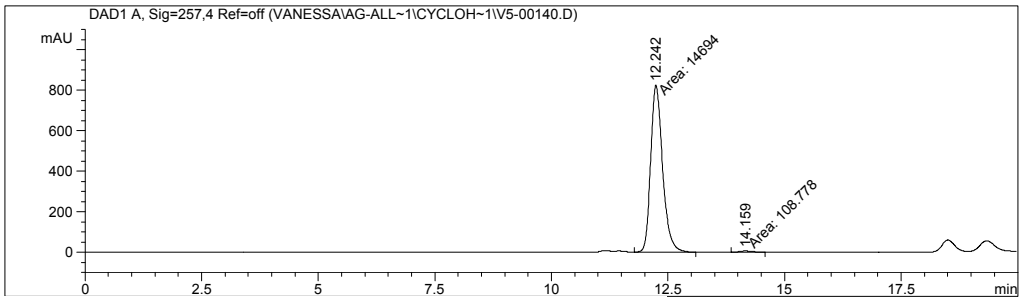

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  12.059 MM    0.3215 4.53226e4  2349.75806  48.9153
   2  13.970 MM    0.3653 4.73327e4  2159.40161  51.0847

Totals :                  9.26553e4  4509.15967

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

(*R*)-**2k**, for Table 2, entry 10




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

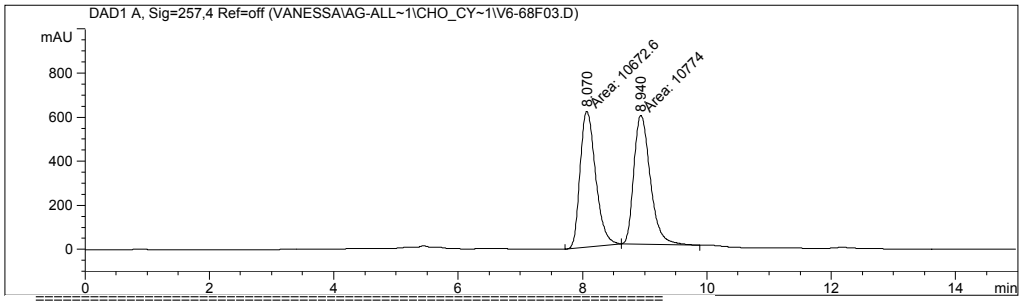
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  12.242 MM    0.2964 1.46940e4   826.31610  99.2652
   2  14.159 MM    0.3204  108.77821    5.65860   0.7348

Totals :                  1.48028e4   831.97470

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

2l (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 1 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

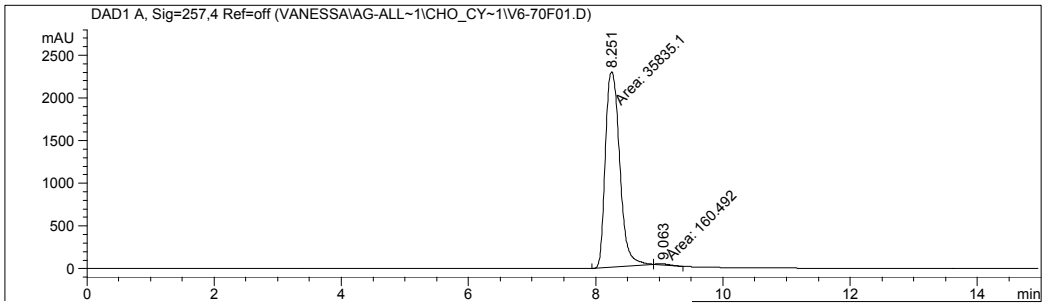

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   8.070 MM    0.2884 1.06726e4   616.72876  49.7636
   2   8.940 MM    0.3069 1.07740e4   585.10077  50.2364

Totals :                  2.14466e4  1201.82953

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2l**, for Table 2, entry 11




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

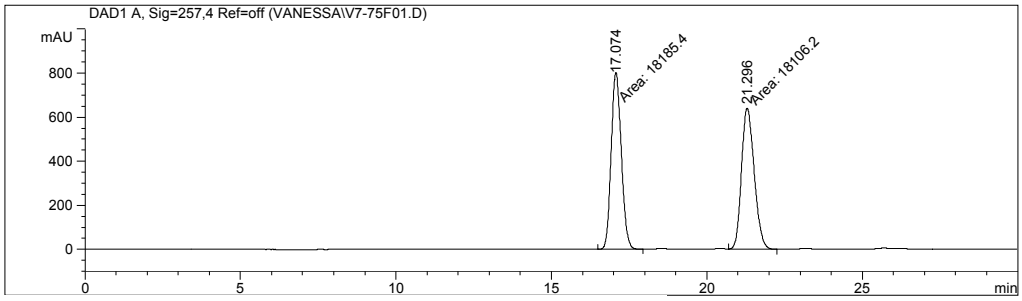
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1   8.251 MM    0.2611 3.58351e4  2287.30005  99.5541
   2   9.063 MM    0.2061  160.49194   12.98017   0.4459

Totals :                  3.59956e4  2300.28022

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2m (Chiralcel-OD column 0.46 cm x 25 cm, 100% hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

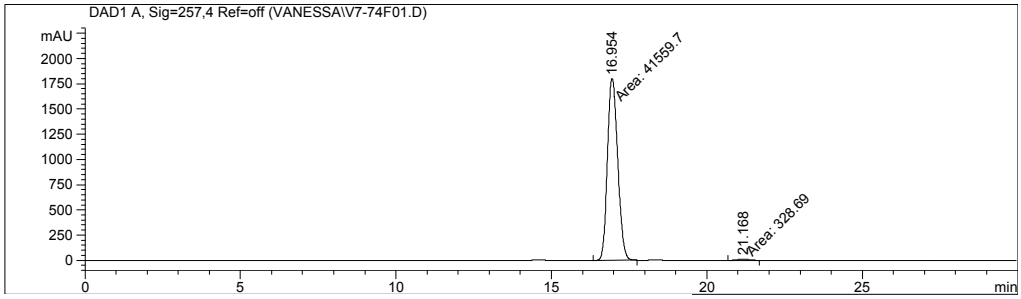

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  17.074 MM    0.3777 1.81854e4   802.36658  50.1090
   2  21.296 MM    0.4721 1.81062e4   639.23706  49.8910

Totals :                  3.62916e4  1441.60364

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2m**, for Table 2, entry 12




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

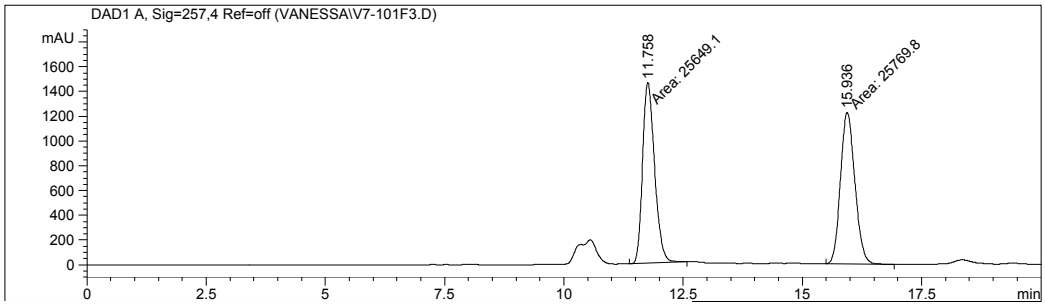
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  16.954 MM    0.3846 4.15597e4  1800.87134  99.2153
   2  21.168 MM    0.4443  328.69006   12.32942   0.7847

Totals :                  4.18884e4  1813.20076

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2n (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

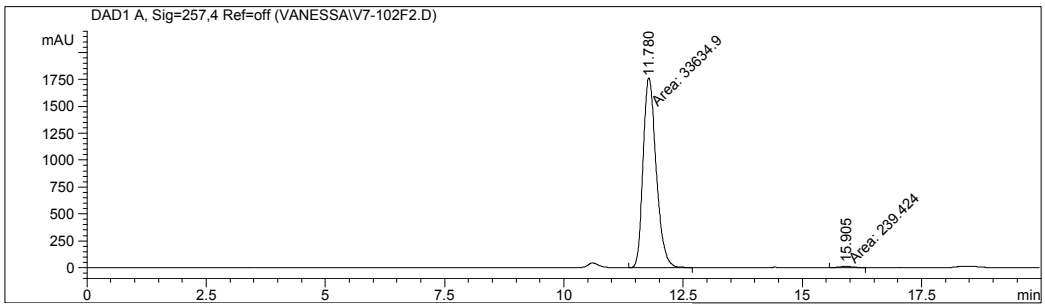

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.758 MM    0.2928 2.56491e4  1459.79529  49.8826
   2  15.936 MM    0.3510 2.57698e4  1223.72180  50.1174

Totals :                  5.14189e4  2683.51709

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2n**, for Table 2, entry 13




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

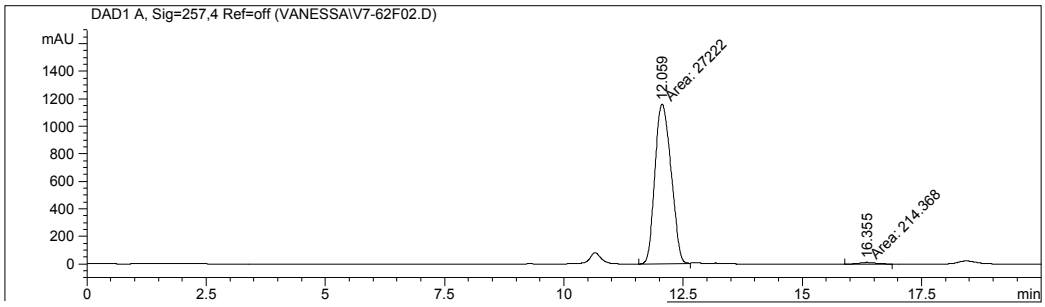

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  11.780 MM    0.3179 3.36349e4  1763.34546  99.2932
   2  15.905 MM    0.3397  239.42395   11.74685   0.7068

Totals :                  3.38744e4  1775.09231

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2a**, for Table 3, entry 1




```
=====================================================================
                        Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

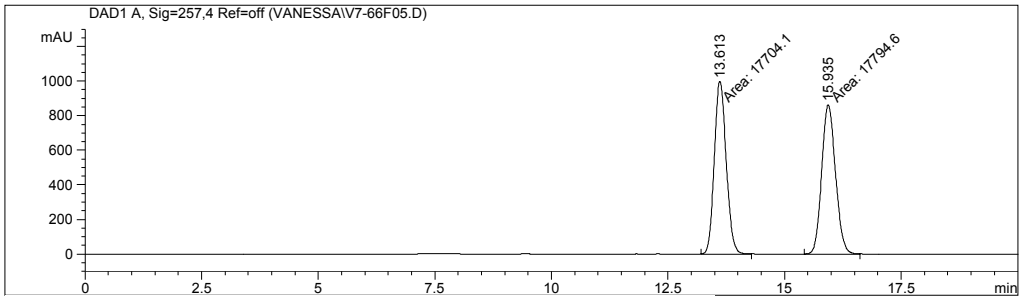
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  12.059 MM    0.3909 2.72220e4  1160.78308  99.2187
   2  16.355 MM    0.3494  214.36774   10.22633   0.7813

Totals :                  2.74363e4  1171.00941

 Results obtained with enhanced integrator!
=====================================================================
                        *** End of Report ***
```

2o (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.7 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

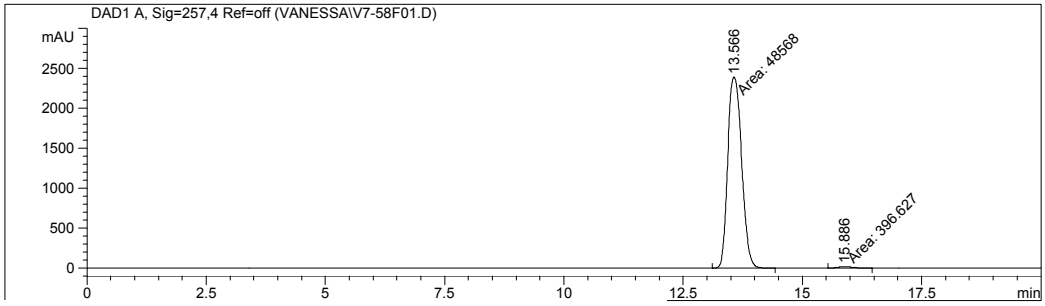

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  13.613 MM    0.2955 1.77041e4   998.44647  49.8726
   2  15.935 MM    0.3443 1.77946e4   861.34949  50.1274

Totals :                  3.54986e4  1859.79596

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2o**, for Table 3, entry 2




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

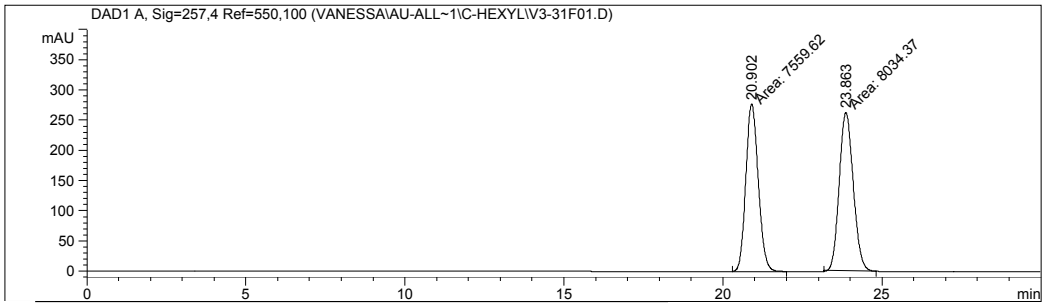
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  13.566 MM    0.3379 4.85680e4  2395.44678  99.1900
   2  15.886 MM    0.3436  396.62671   19.23931   0.8100

Totals :                  4.89646e4  2414.68609

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2q (Chiralcel-OD column 0.46 cm x 25 cm, 1% IPA in hexane, 0.3 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

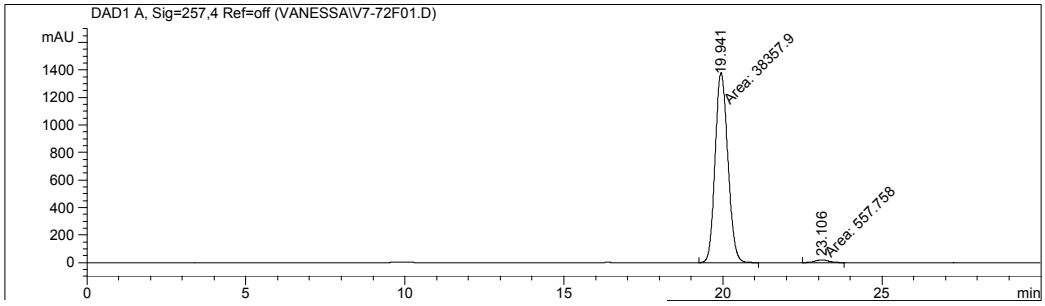

Signal 1: DAD1 A, Sig=257,4 Ref=550,100

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  20.902 MM    0.4537 7559.62402  277.70425  48.4778
   2  23.863 MM    0.5101 8034.37256  262.51013  51.5222

Totals :                  1.55940e4   540.21439

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2q**, for Table 3, entry 4




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

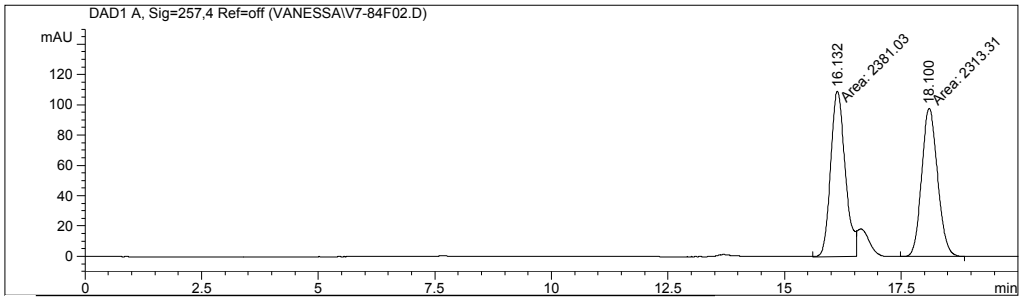
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  19.941 MM    0.4627 3.83579e4  1381.62561  98.5668
   2  23.106 MM    0.5144  557.75836   18.07164   1.4332

Totals :                  3.89157e4  1399.69725

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2r (Chiralcel-OD column 0.46 cm x 25 cm, 0.1% IPA in hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

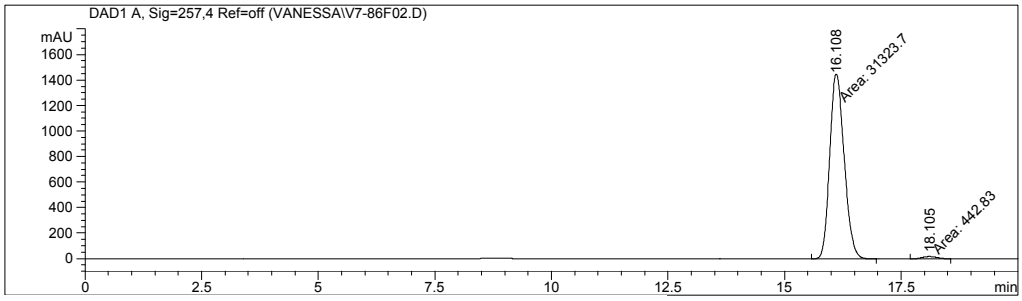

Signal 1: DAD1 A, Sig=257,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  16.132 MM    0.3634 2381.02954  109.19737  50.7213
   2  18.100 MM    0.3946 2313.31274   97.71927  49.2787

Totals :                  4694.34229  206.91664

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2r**, for Table 3, entry 5




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 A, Sig=257,4 Ref=off

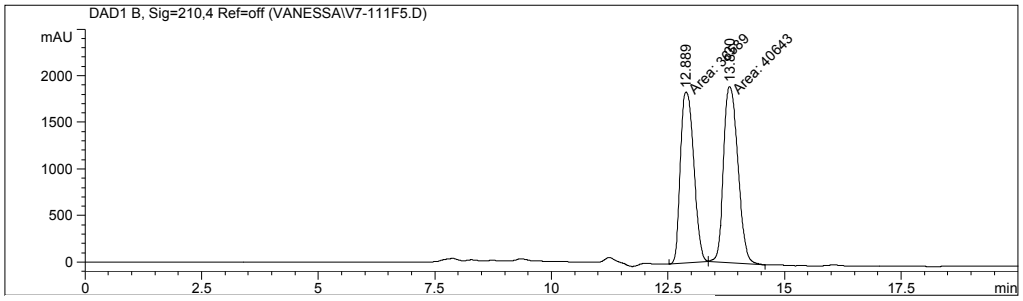
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  16.108 MM    0.3603 3.13237e4  1449.06079  98.6060
   2  18.105 MM    0.3846  442.82986   19.19112   1.3940

Totals :                  3.17666e4  1468.25191

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

2s (Chiralcel-OD column 0.46 cm x 25 cm, 100% hexane, 0.4 mL / min)

Racemic




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs

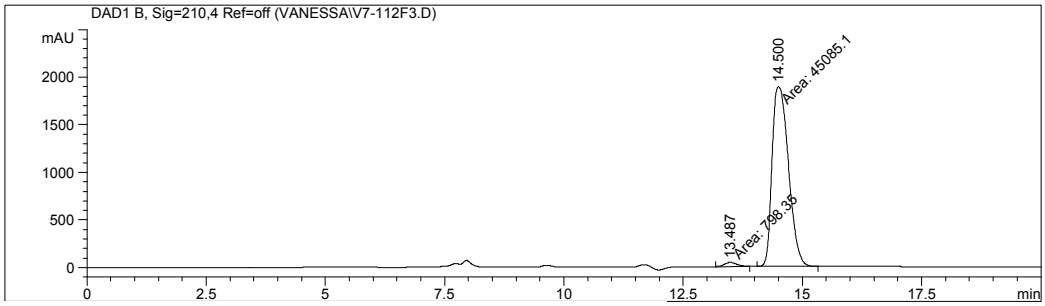

Signal 1: DAD1 B, Sig=210,4 Ref=off

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  12.889 MM    0.3323 3.65890e4  1835.34363  47.3755
   2  13.820 MM    0.3581 4.06430e4  1891.66699  52.6245

Totals :                  7.72320e4  3727.01062

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

(*R*)-**2s**, for Table 3, entry 6




```
=====================================================================
                      Area Percent Report
=====================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: DAD1 B, Sig=210,4 Ref=off

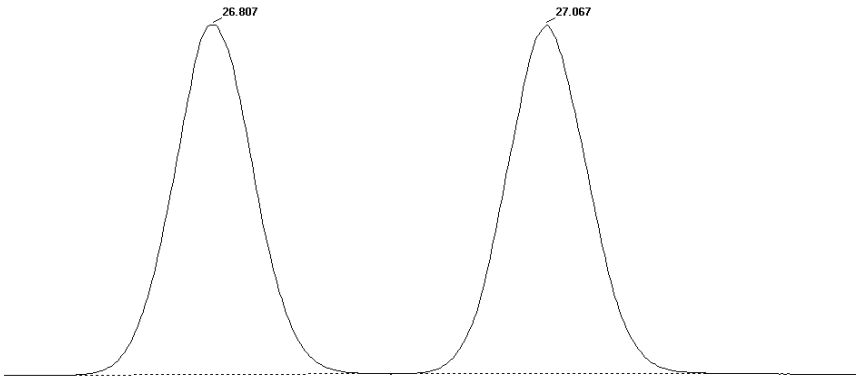
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [mAU*s]     [mAU]       %
----|-------|----|-------|----------|----------|--------|
   1  13.487 MM    0.3002  798.35040   44.32085   1.7400
   2  14.500 MM    0.3980 4.50851e4  1888.13806  98.2600

Totals :                  4.58835e4  1932.45891

 Results obtained with enhanced integrator!
=====================================================================
                      *** End of Report ***
```

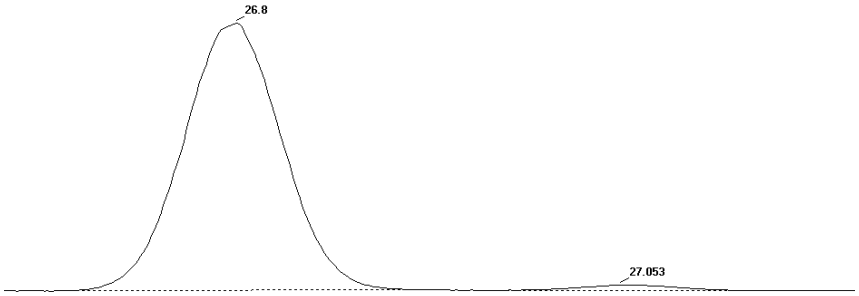
GC Spectra of 2p

Racemic (Cyclodex-β column, He as carrier gas, 1 mL/min)



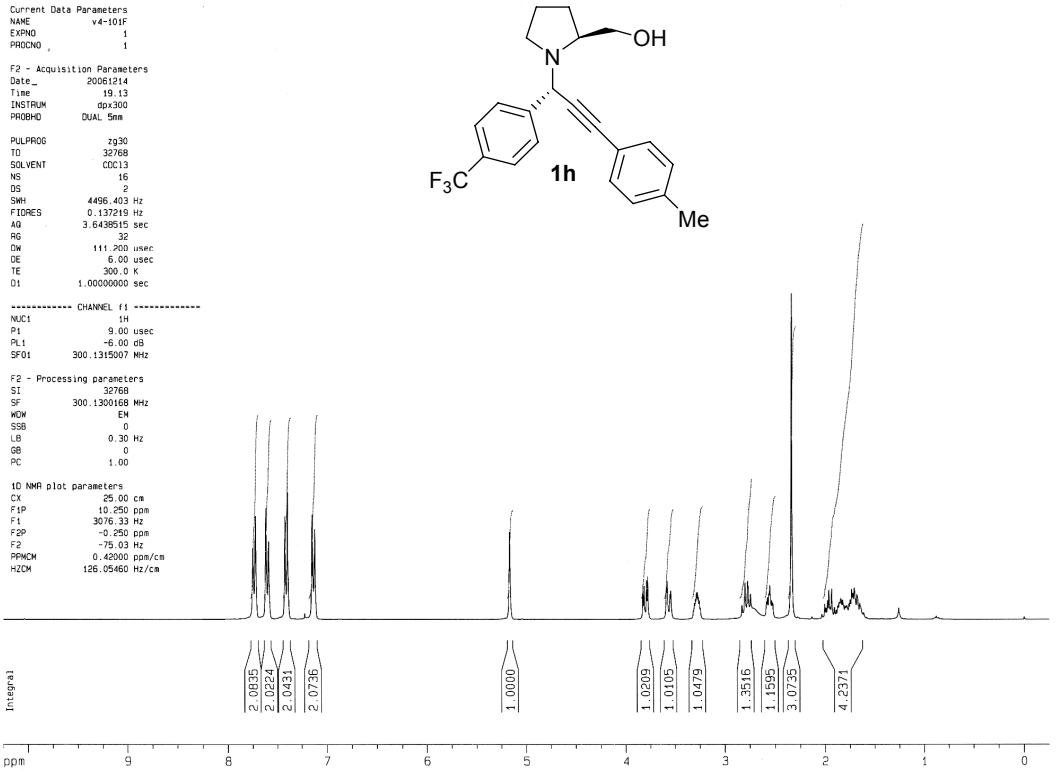
Peak # : 31	Peak area :935763	Width at 50% : 0.0700
Peak points # : 162	Name :	Width at 10% : 0.1300
Peak ret.time :26.8067	Concentr. : .4385625	Theor. plates : 812455.1
Peak start :26.6767	Asymm. at 10% : 1.0526	
Peak end :26.9467	Asymm. at 5% : 1.0698	
Peak height :20813	USP Tailing factor : 1.0349	
Peak # : 32	Peak area :933463	Width at 50% : 0.0717
Peak points # : 154	Name :	Width at 10% : 0.1300
Peak ret.time :27.0667	Concentr. : .4374846	Theor. plates : 790214.3
Peak start :26.9550	Asymm. at 10% : 1.0526	
Peak end :27.2117	Asymm. at 5% : 1.0698	
Peak height :20739	USP Tailing factor : 1.0349	

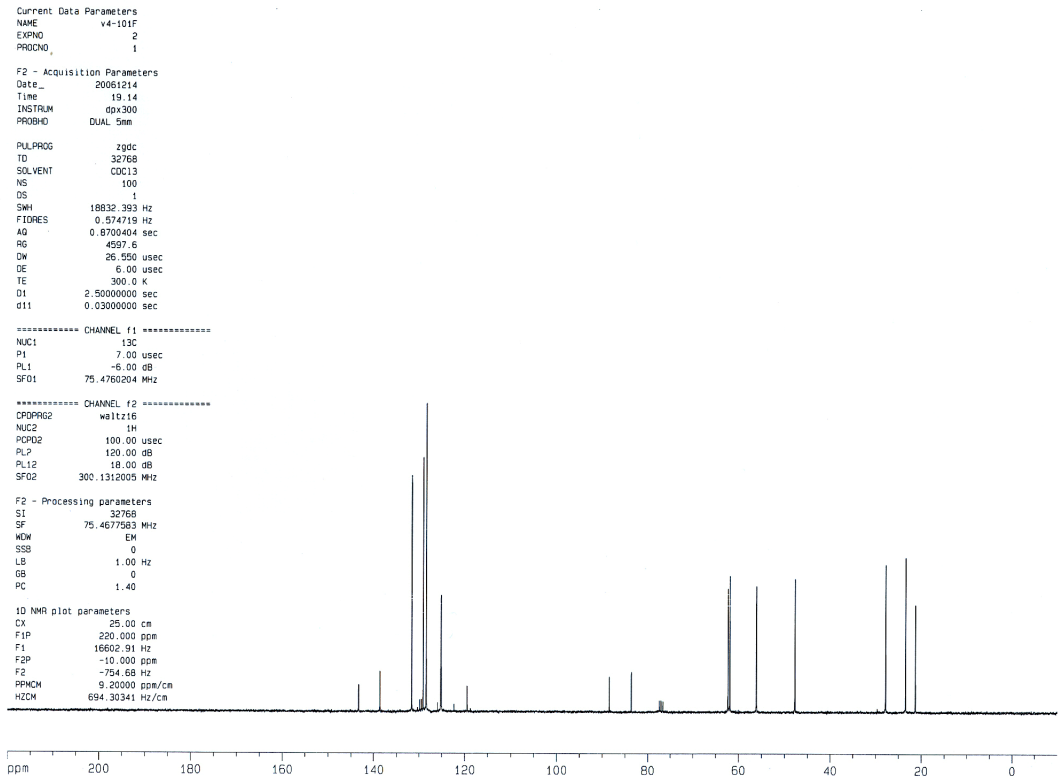
(*R*)-**2p**, for Table 3, entry 3

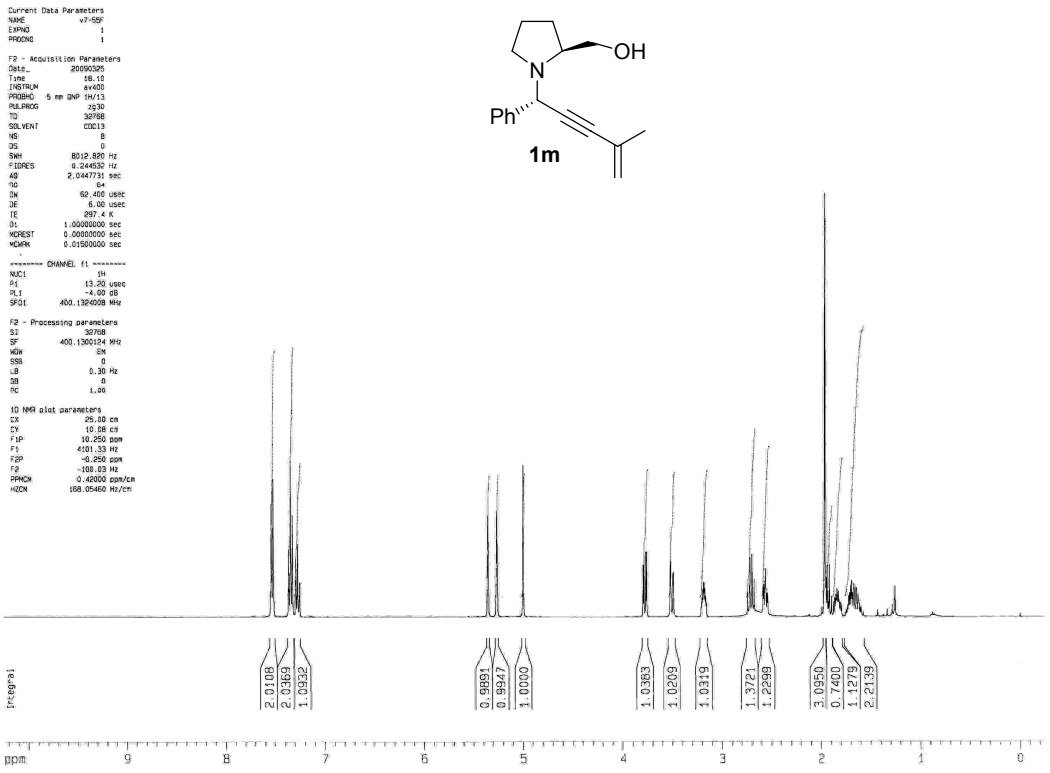


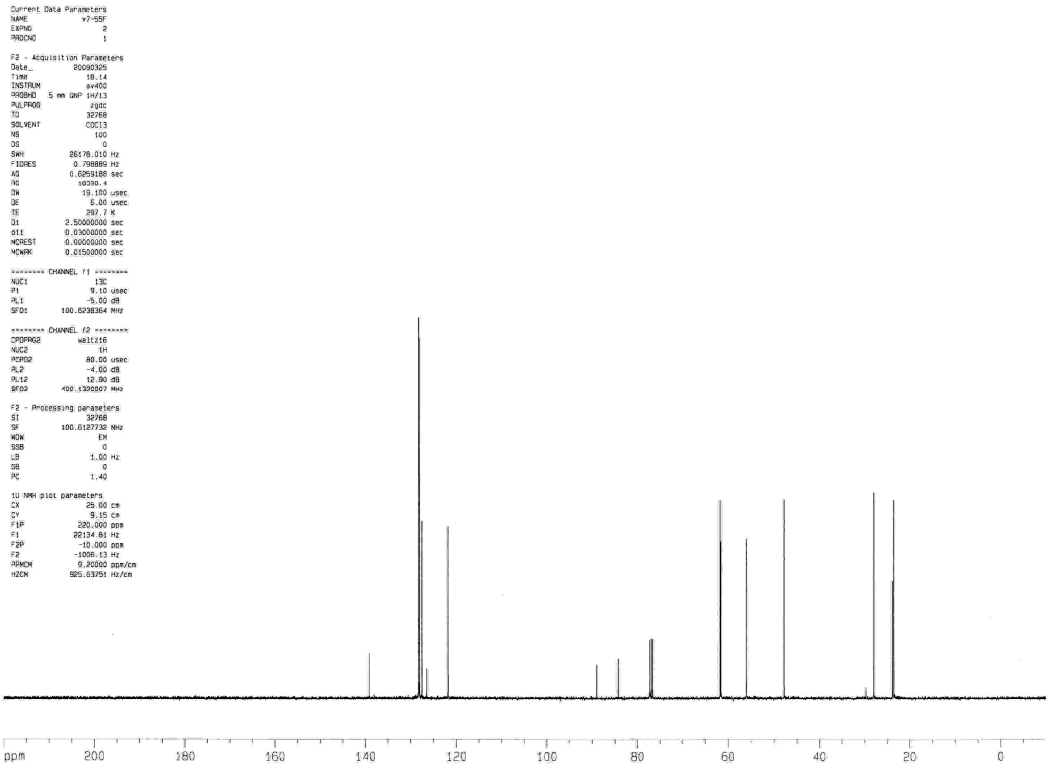
Peak # : 38	Peak area :509280	Width at 50% : 0.0700
Peak points # : 156	Name :	Width at 10% : 0.1300
Peak ret.time :26.8000	Concentr. : .2472914	Theor. plates : 812051
Peak start :26.6800	Asymm. at 10% : 0.95	
Peak end :26.9400	Asymm. at 5% : 0.9778	
Peak height :11150	USP Tailing factor : 0.9889	
Peak # : 39	Peak area :9883	Width at 50% : 0.0700
Peak points # : 121	Name :	Width at 10% : 0.1250
Peak ret.time :27.0533	Concentr. : 0	Theor. plates : 827475.8
Peak start :26.9567	Asymm. at 10% : 1.3438	
Peak end :27.1583	Asymm. at 5% : 1.4118	
Peak height :225	USP Tailing factor : 1.2059	

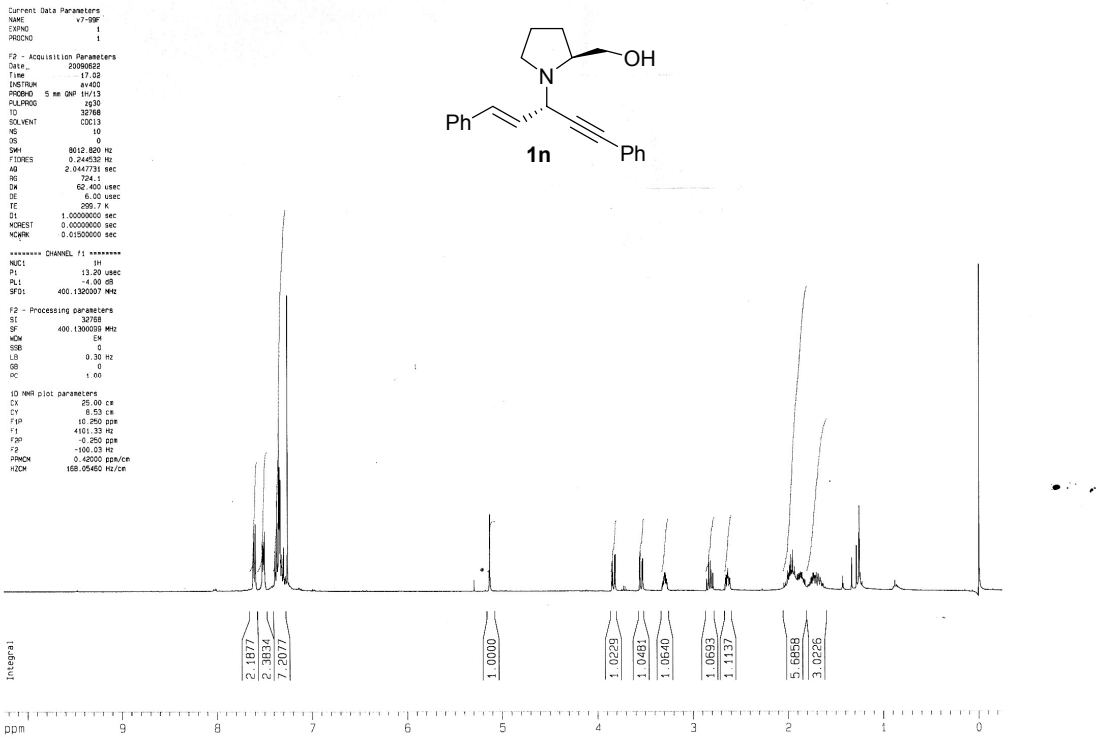
^{1}H and ^{13}C NMR Spectra

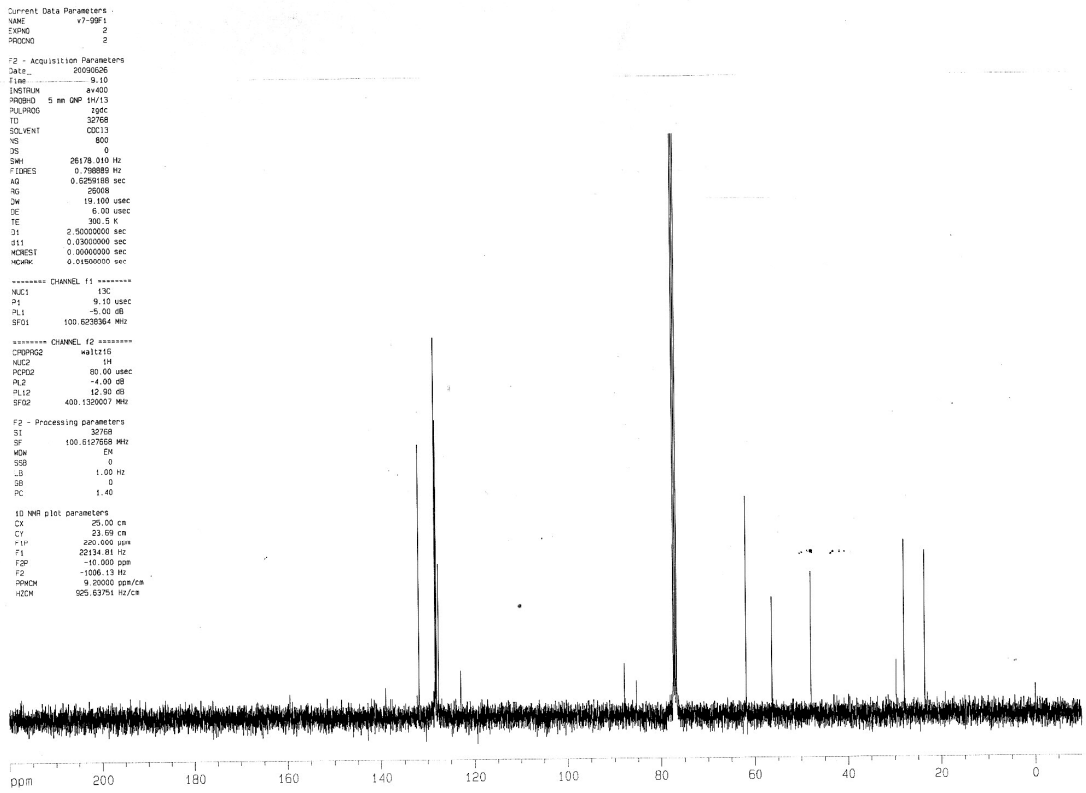


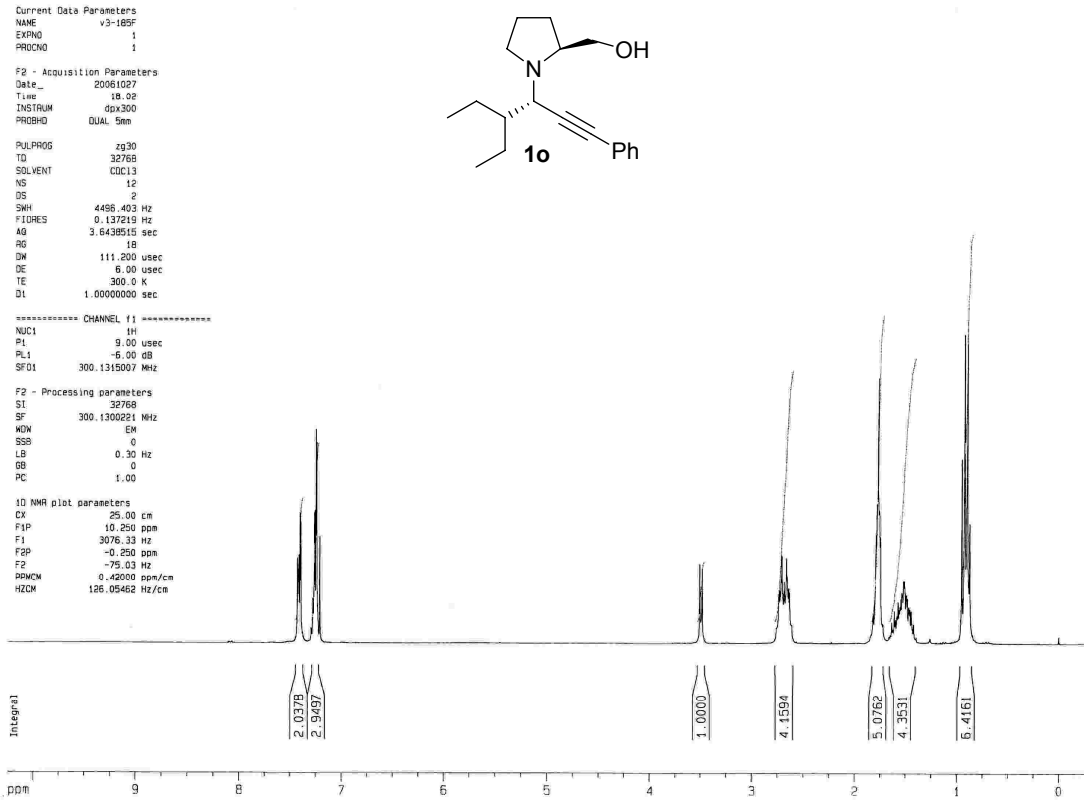


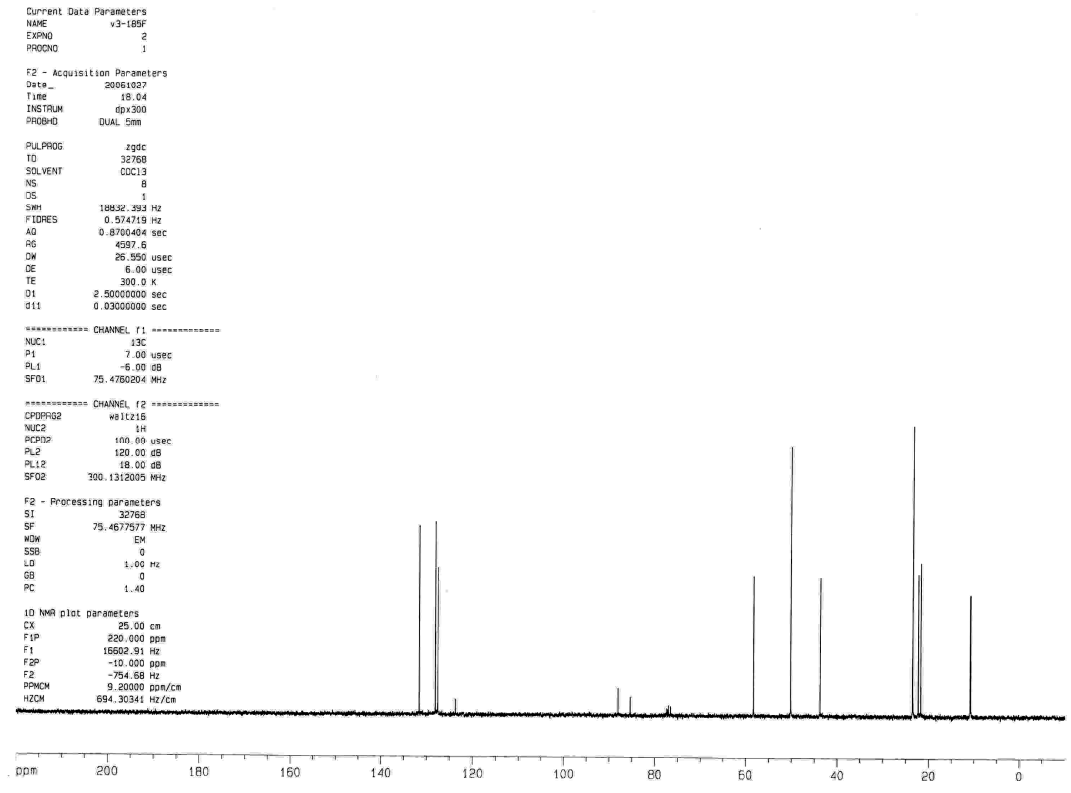

Current Data Parameters
NAME v7-55F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090325
Time 18.10
INSTRUM av400
PROBHD 5 mm BNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 8
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 64
DW 62.400 usec
DE 6.00 usec
TE 297.4 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300124 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 10.08 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -108.03 Hz
PPMCM 0.40000 ppm/cm
HZCM 158.05460 Hz/cm
OH
N
Ph
1m
Integral
2.0108
2.0369
1.0932
0.9891
0.9947
1.0000
1.0363
1.0209
1.0319
1.3721
1.2299
3.0950
0.7400
1.1279
2.2139
ppm
9
8
7
6
5
4
3
2
1
0

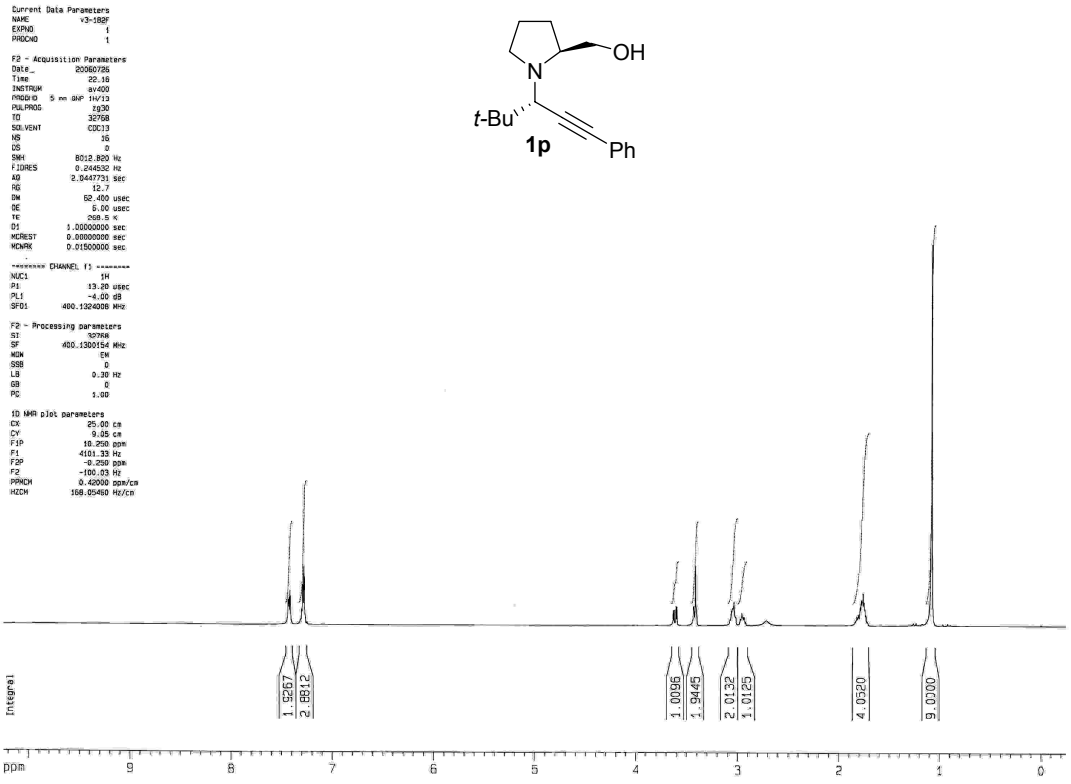

Current Data Parameters
NAME v7-55F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090325
Time 18.14
INSTRUM av400
PROBHD 5 mm BNP 1H/13
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 100
DS 0
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 16384.4
DW 19.100 usec
DE 6.00 usec
TE 297.7 K
D1 2.50000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.80 dB
SFO2 400.1320867 MHz
F2 - Processing parameters
SI 32768
SF 100.6127732 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 9.15 cm
F1P 220.000 ppm
F1 22134.84 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63751 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

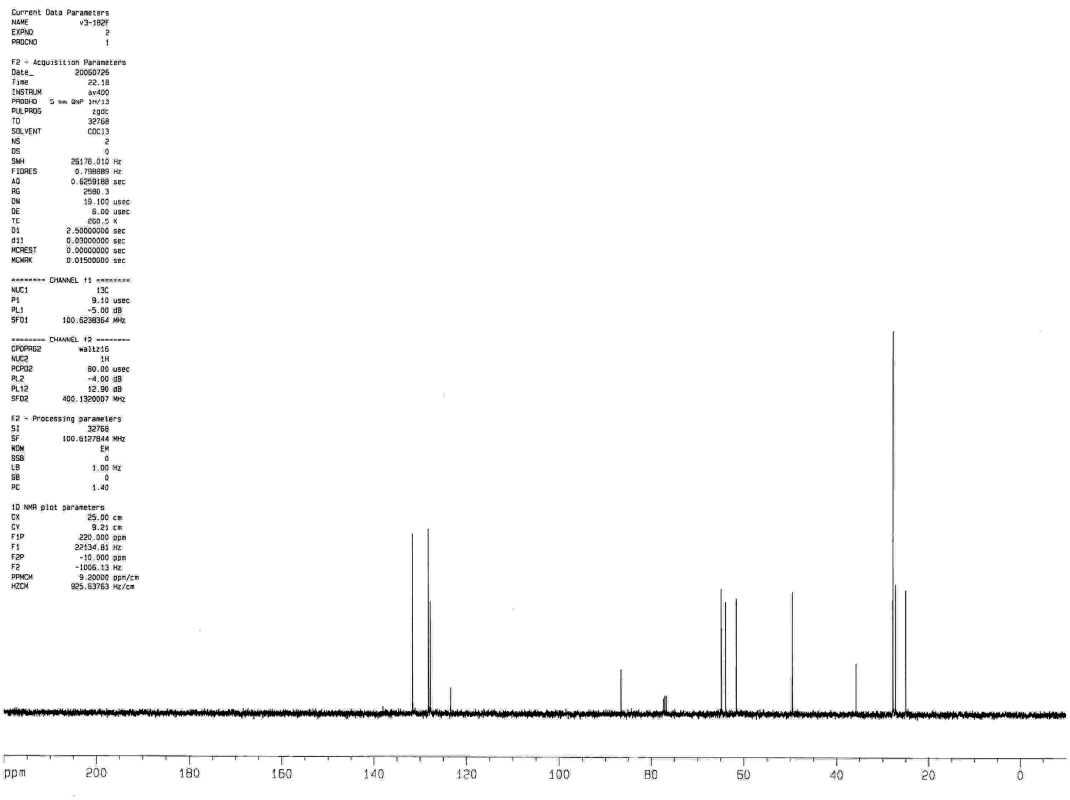

Current Data Parameters
NAME v7-99F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090622
Time 17.02
INSTRUM av400
PROBHD 5 mm GNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 10
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 724.1
DW 62.400 usec
DE 6.00 usec
TE 299.7 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 400.1300099 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 8.53 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05460 Hz/cm
OH
N
Ph
Ph
1n
Integral
2.1877
2.3834
7.2077
1.0000
1.0229
1.0481
1.0640
1.0693
1.1137
5.6859
3.0226
ppm
9
8
7
6
5
4
3
2
1
0

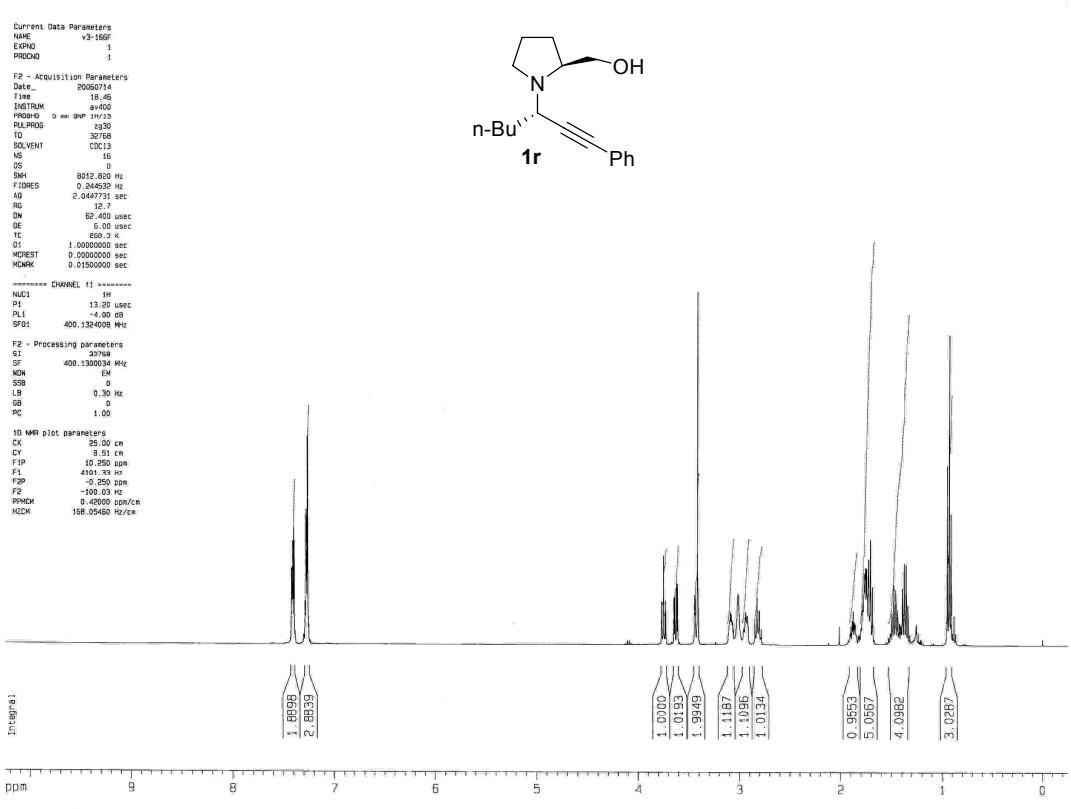

Current Data Parameters
NAME v7-99F1
EXPNO 2
PROCNO 2
F2 - Acquisition Parameters
Date_ 20090626
Time 9.10
INSTRUM av400
PROBHD 5 mm GNP 1H/13
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 800
DS 0
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6254188 sec
RG 26008
DW 19.100 usec
DE 6.00 usec
TE 300.5 K
D1 2.50000000 sec
D11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127658 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 23.69 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63751 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

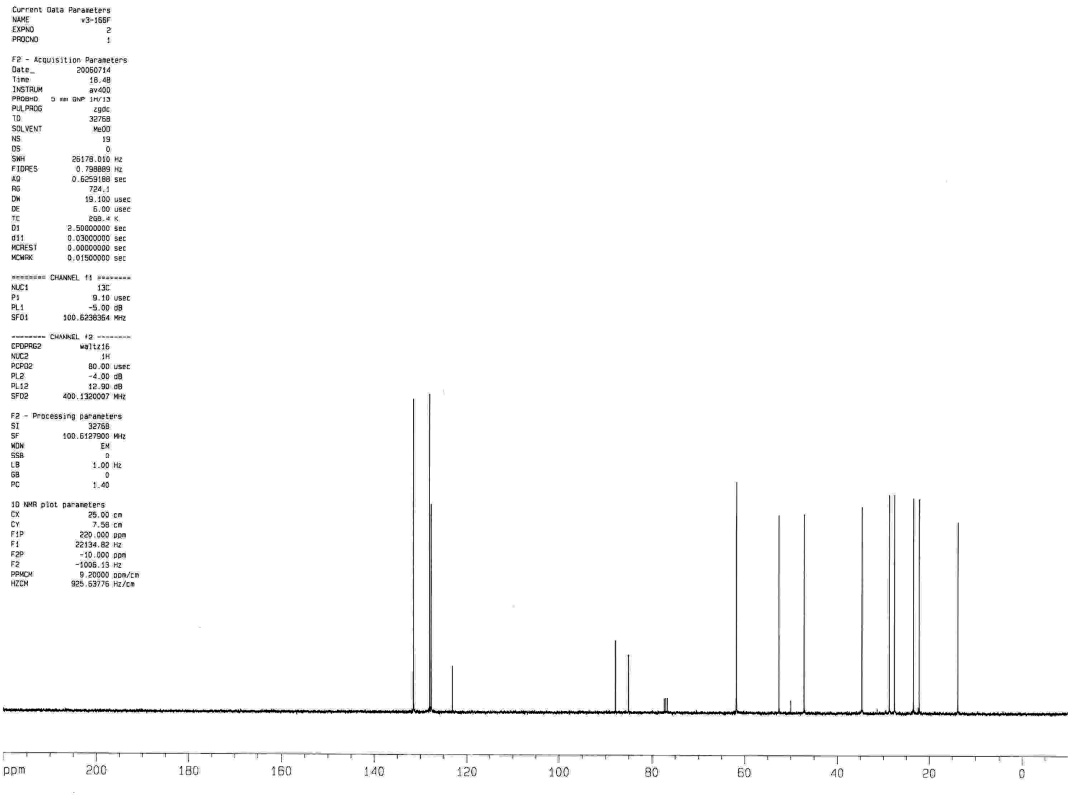

Current Data Parameters
NAME v3-185F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20061027
Time 18.02
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 12
DS 2
SWH 4496.403 Hz
FIDRES 0.137219 Hz
AQ 3.6438515 sec
RG 18
DW 111.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 9.00 usec
PL1 -6.00 dB
SFO1 300.1315007 MHz
F2 - Processing parameters
SI 32768
SF 300.1300221 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
F1P 10.250 ppm
F1 3076.33 Hz
F2P -0.250 ppm
F2 -75.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 126.05462 Hz/cm
OH
N
1o
Ph
Integral
2.037B
2.9497
1.0000
4.1594
5.0762
4.3531
6.4161
ppm
9
8
7
6
5
4
3
2
1
0

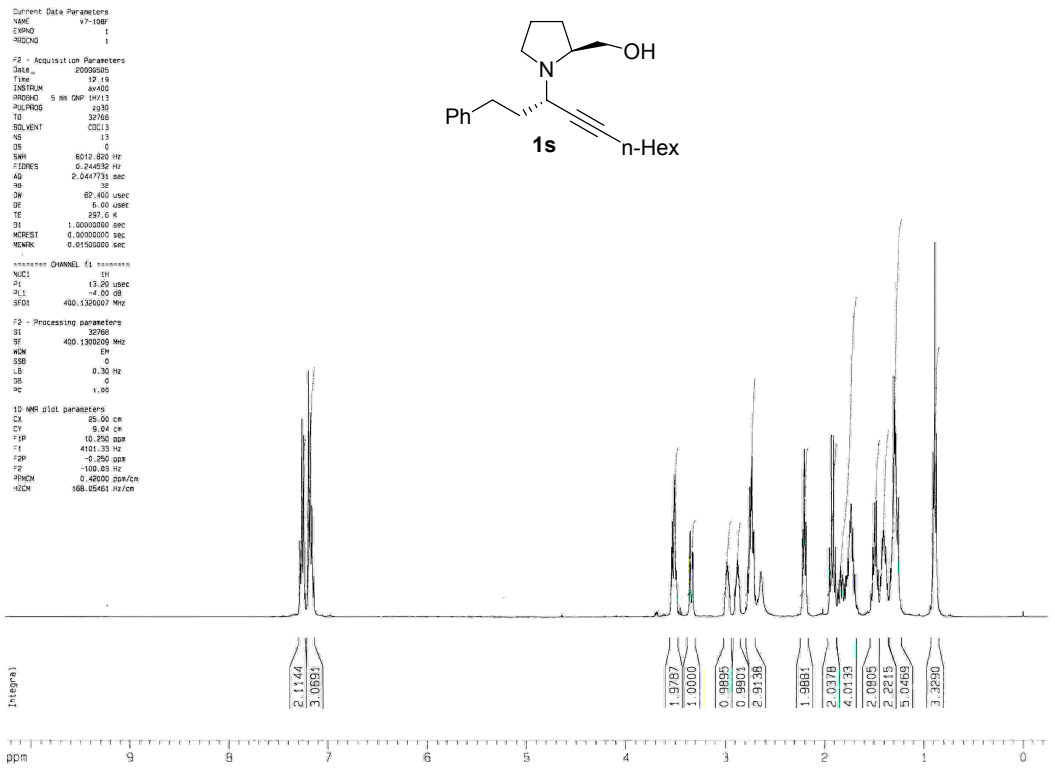

Current Data Parameters
NAME v3-185F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20061027
Time 18.04
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 8
DS 1
SWH 18832.393 Hz
FIDRES 0.574719 Hz
AQ 0.8700404 sec
RG 4597.6
DW 26.550 usec
DE 6.00 usec
TE 300.0 K
D1 2.50000000 sec
d11 0.03000000 sec
========== CHANNEL f1 ==========
NUC1 13C
P1 7.00 usec
PL1 -6.00 dB
SFO1 75.4760204 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677577 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
F1P 220.000 ppm
F1 16602.91 Hz
F2P -10.000 ppm
F2 -754.68 Hz
PPMCM 9.20000 ppm/cm
HZCM 694.30341 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

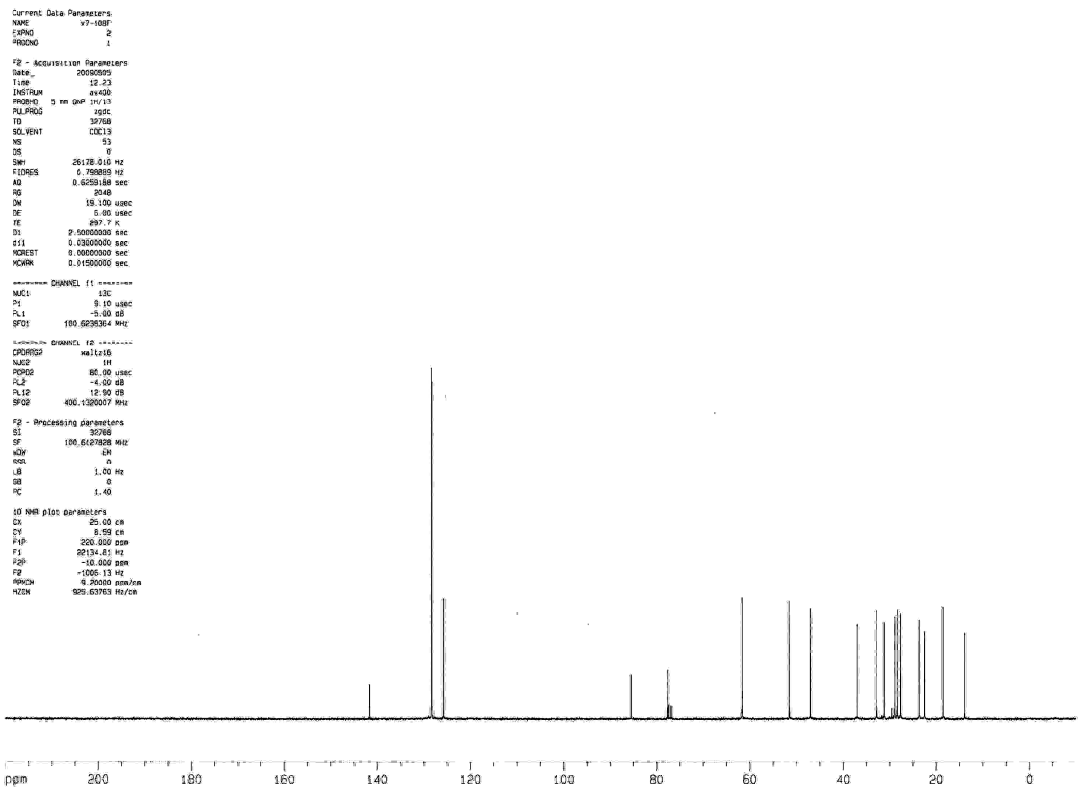

Current Data Parameters
NAME v3-182F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060726
Time 22.18
INSTRUM av400
PROBHD 5 mm BNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 12.7
DW 62.400 usec
DE 6.00 usec
TE 298.5 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300154 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 9.05 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05460 Hz/cm
OH
N
t-Bu
1p
Ph
Integral
1.9267
2.8812
1.0096
1.9445
2.0132
1.0125
4.0520
9.0000
ppm
9
8
7
6
5
4
3
2
1
0

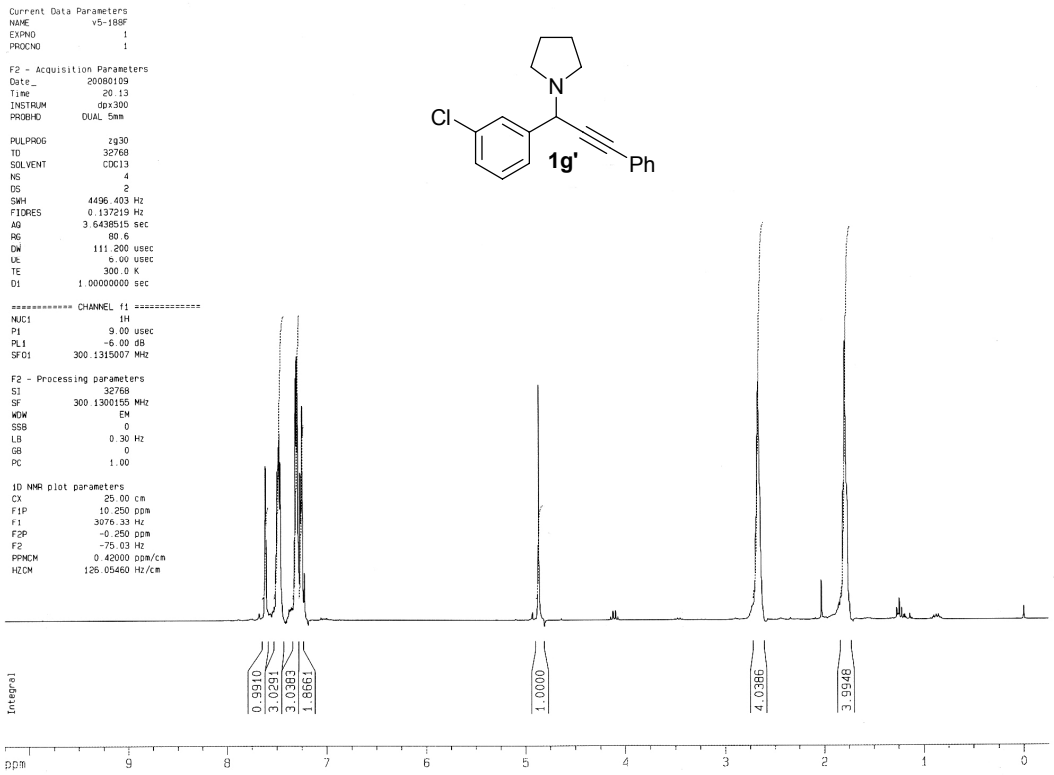

Current Data Parameters
NAME v3-182F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060726
Time 22.18
INSTRUM av400
PROBHD 5 mm BNP 1H/13
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 2
DS 0
SWH 25178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 2580.3
DW 19.100 usec
DE 6.00 usec
TE 298.5 K
D1 2.50000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1300097 MHz
F2 - Processing parameters
SI 32768
SF 100.6187844 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 9.21 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63763 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0


Current Data Parameters
NAME v3-166F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060714
Time 18.46
INSTRUM av400
PROBHD 5 mm BNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 12.7
DW 62.400 usec
DE 6.00 usec
TE 298.3 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300034 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 9.51 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05460 Hz/cm
OH
N
n-Bu
Ph
1r
Integral
1.8898
2.8839
1.0000
1.0193
1.9949
1.1187
1.1096
1.0134
0.9553
5.0567
4.0982
3.0267
ppm
9
8
7
6
5
4
3
2
1
0

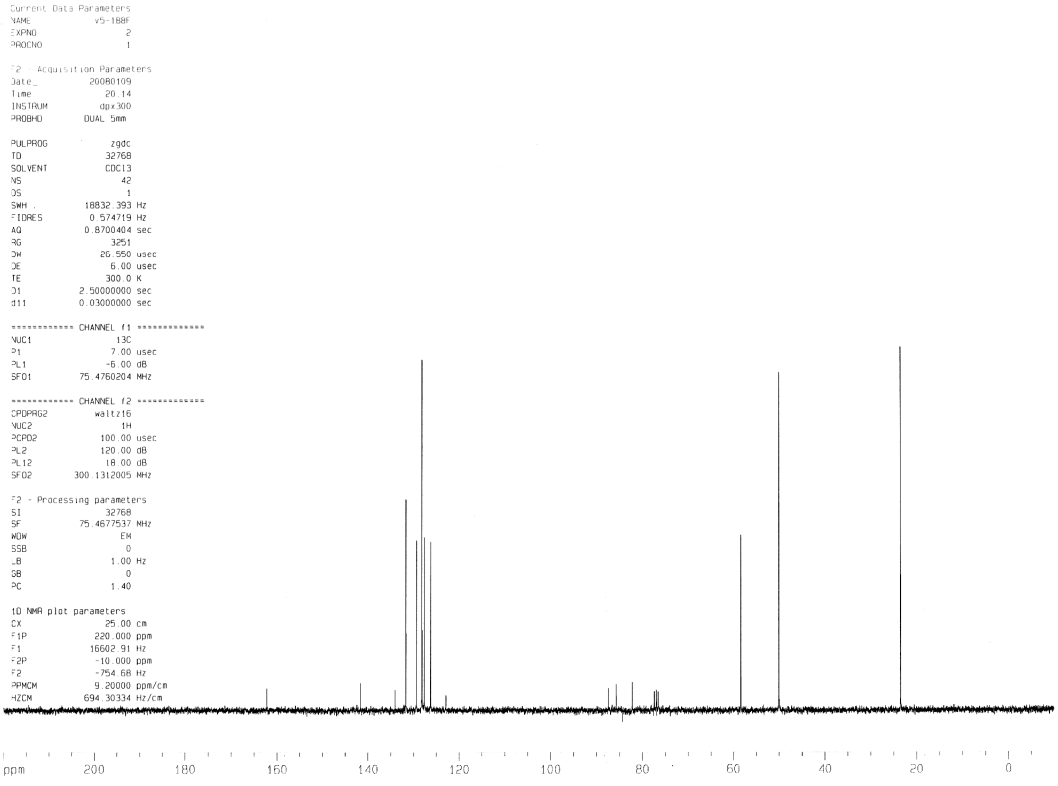

Current Data Parameters
NAME v3-166F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060714
Time 18.48
INSTRUM av400
PROBHD 5 mm BNP 1H/13
PULPROG zgdc
TD 32768
SOLVENT MeOD
NS 19
DS 0
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 724.1
DW 19.100 usec
DE 6.00 usec
TE 298.4 K
D1 2.50000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127900 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 7.56 cm
F1P 229.000 ppm
F1 22134.82 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.53776 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

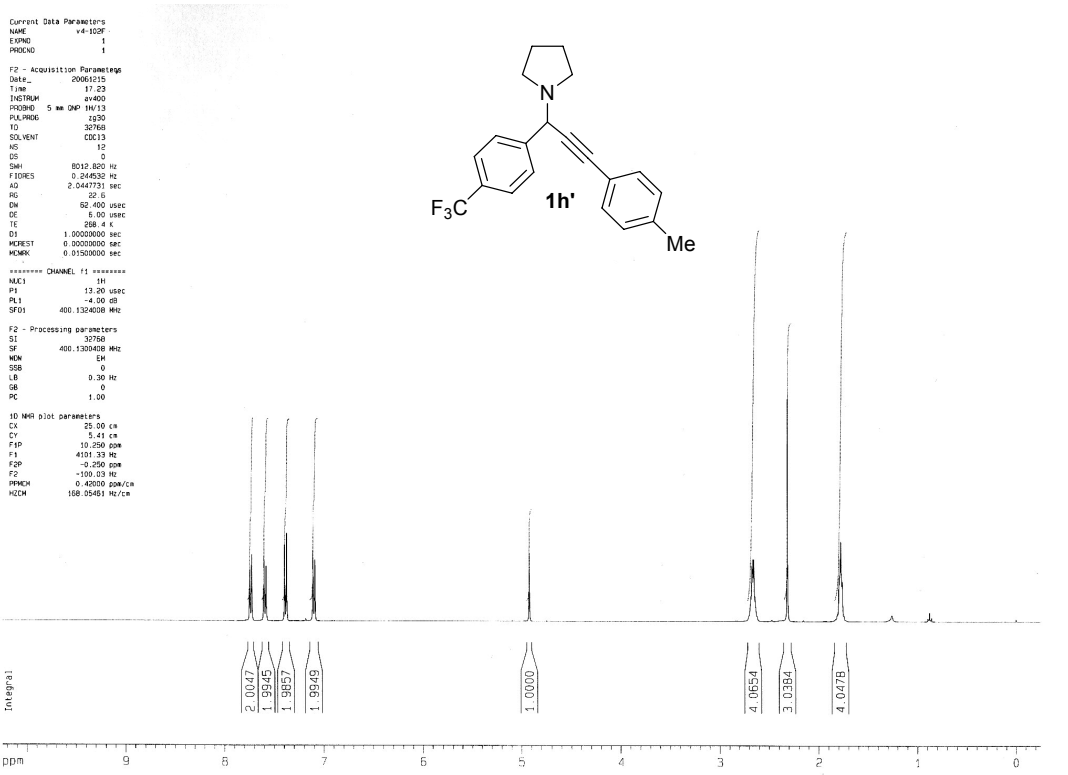

OH
N
Ph
1s
n-Hex
ppm

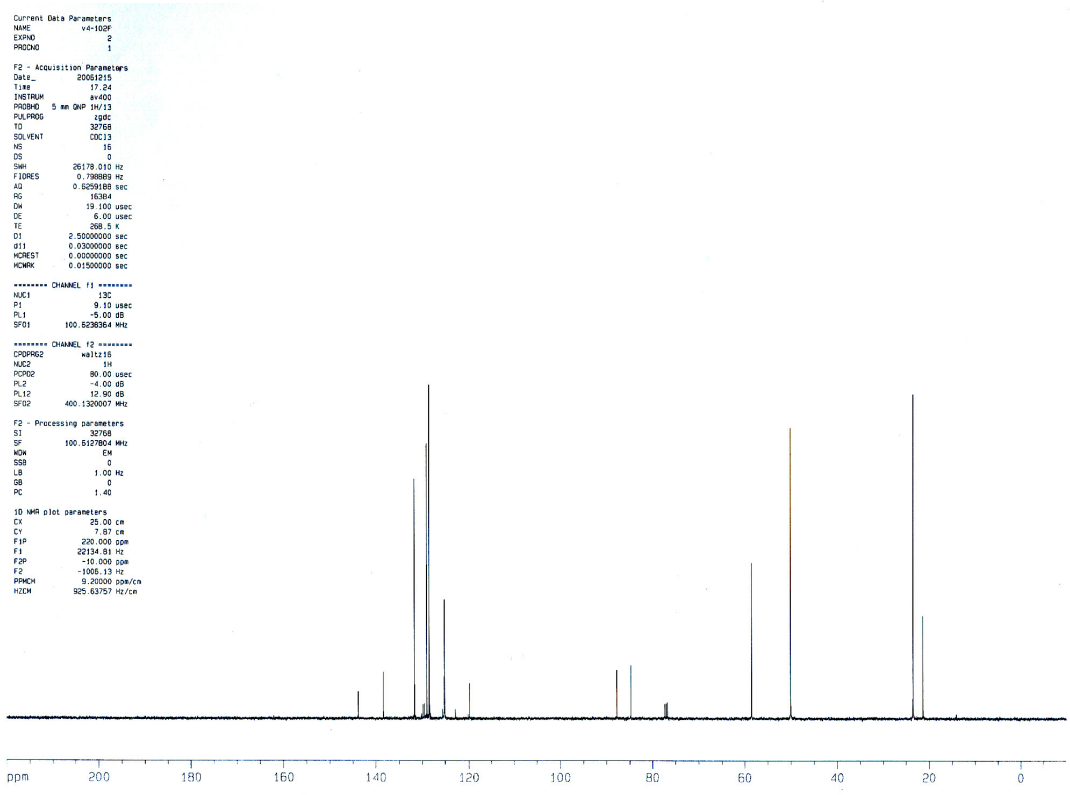

ppm

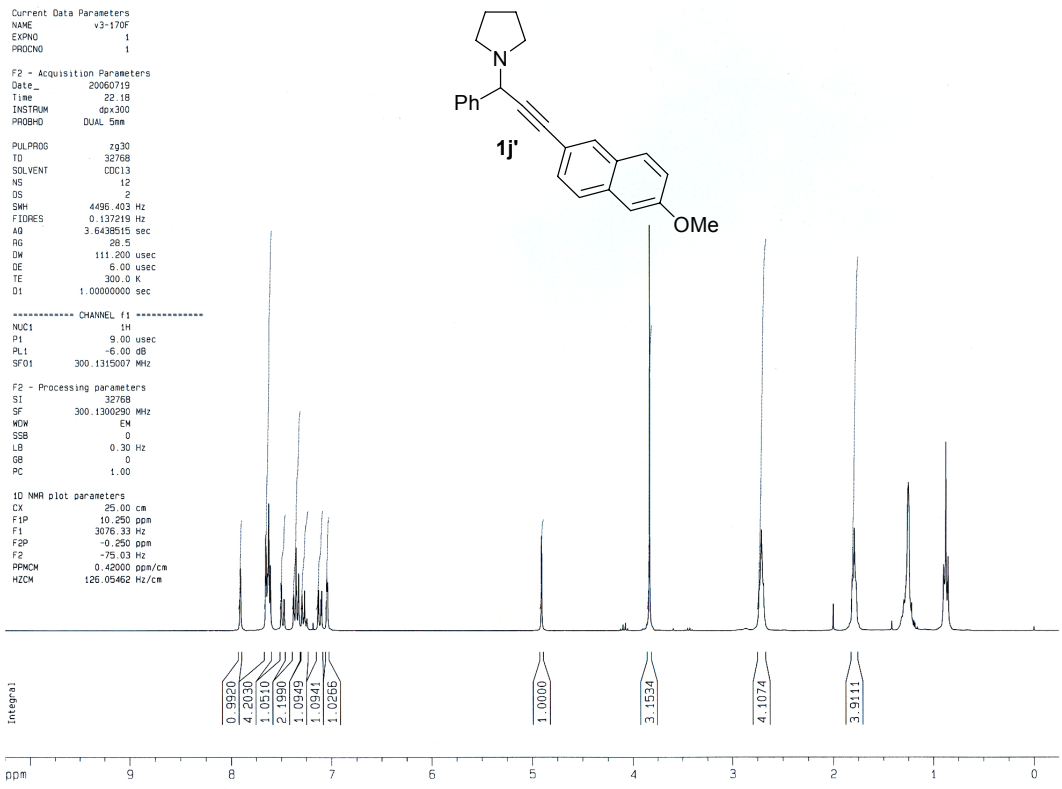

Current Data Parameters
NAME v5-188F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080109
Time 20.13
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 2
SWH 4496.403 Hz
FIDRES 0.137219 Hz
AQ 3.6438515 sec
RG 80.6
DW 111.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 9.00 usec
PL1 -6.00 dB
SFO1 300.1315007 MHz
F2 - Processing parameters
SI 32768
SF 300.1300155 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
F1P 10.250 ppm
F1 3076.33 Hz
F2P -0.250 ppm
F2 -75.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 126.05460 Hz/cm
Integral
0.9910
3.0291
3.0383
1.8661
1.0000
4.0386
3.9948
ppm
9
8
7
6
5
4
3
2
1
0

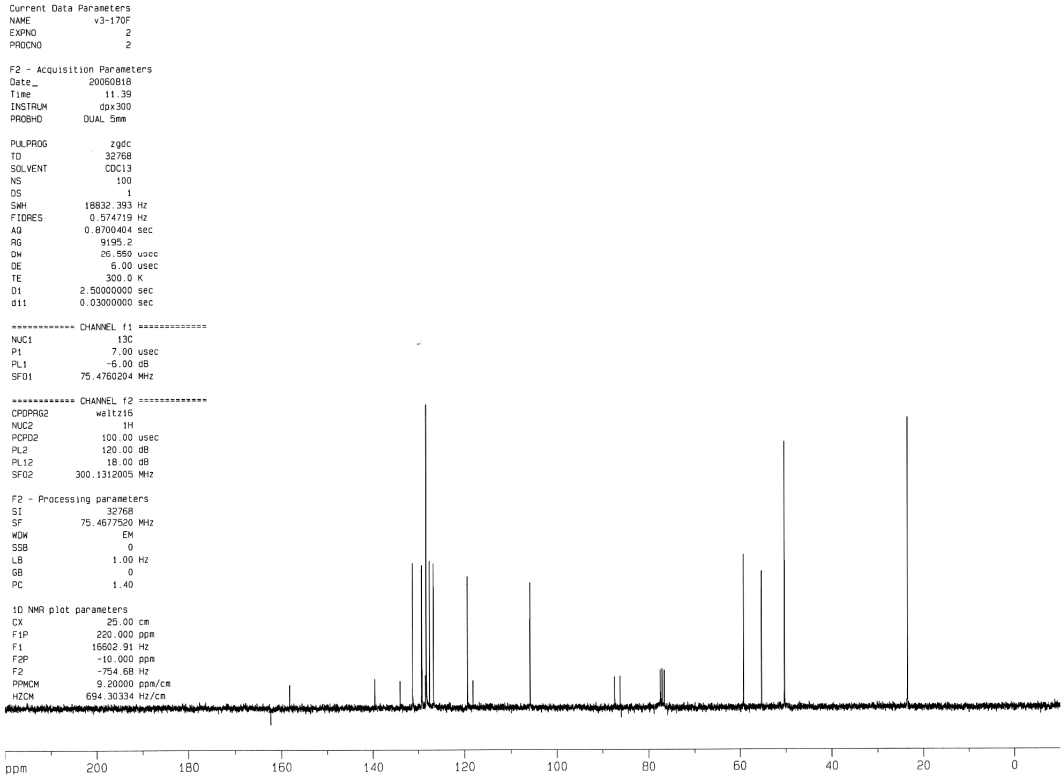
N
Cl
1g'
Ph

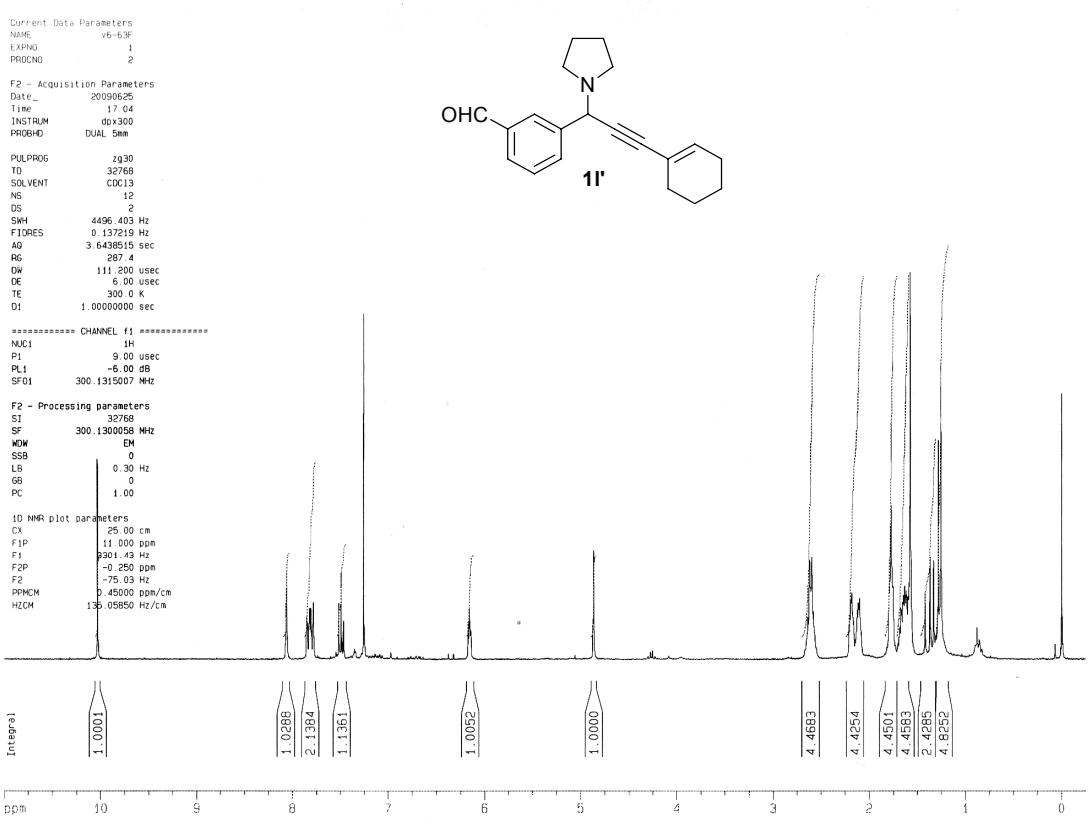

Current Data Parameters
NAME v5-188F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20080109
Time 20.14
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 42
DS 1
SWH 18832.393 Hz
FIDRES 0.574719 Hz
AQ 0.8700404 sec
RG 3251
DW 26.550 usec
DE 6.00 usec
TE 300.0 K
D1 2.50000000 sec
D11 0.03000000 sec
========== CHANNEL f1 ==========
NUC1 13C
P1 7.00 usec
PL1 -6.00 dB
SFO1 75.4760204 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677537 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
F1P 220.000 ppm
F1 16602.91 Hz
F2P -10.000 ppm
F2 -754.68 Hz
PPMCM 9.20000 ppm/cm
HZCM 694.30334 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

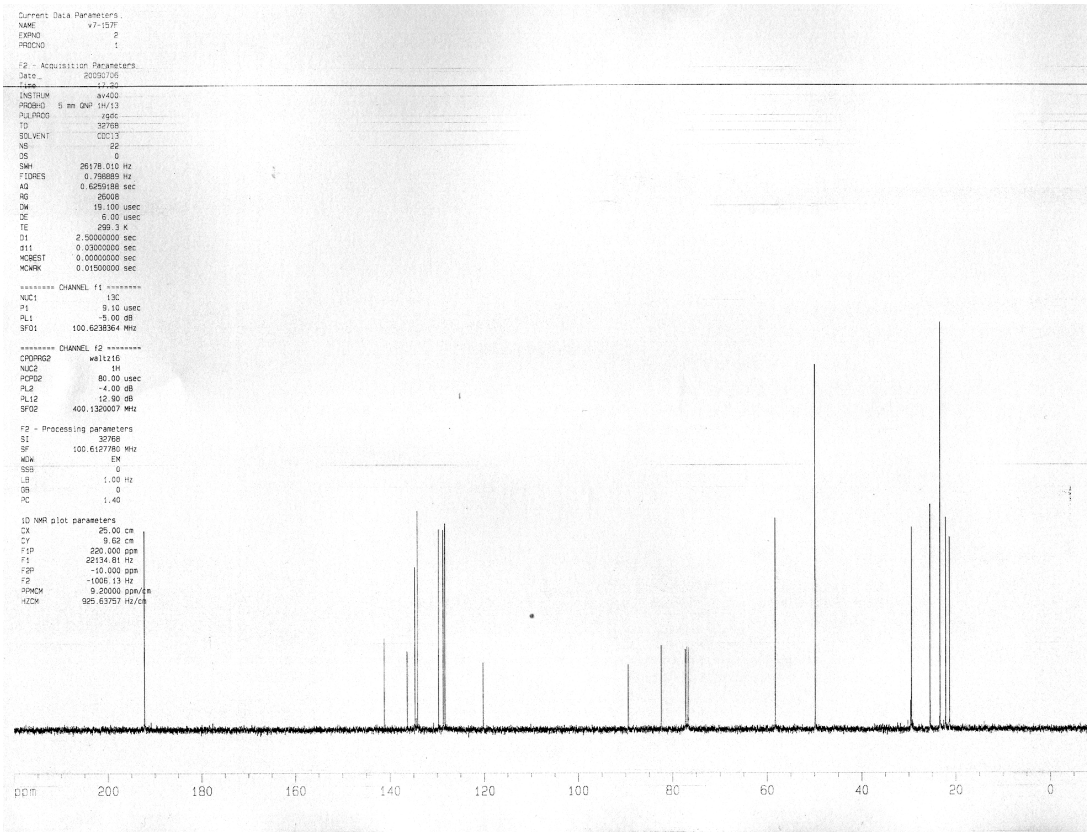

Current Data Parameters
NAME v4-102F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20061215
Time 17.23
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 12
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 22.6
DW 62.400 usec
DE 6.00 usec
TE 298.4 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300408 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 5.41 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05461 Hz/cm
N
F3C
1h'
Me
Integral
2.0047
1.9945
1.9857
1.9949
1.0000
4.0654
3.0384
4.0478
ppm
9
8
7
6
5
4
3
2
1
0

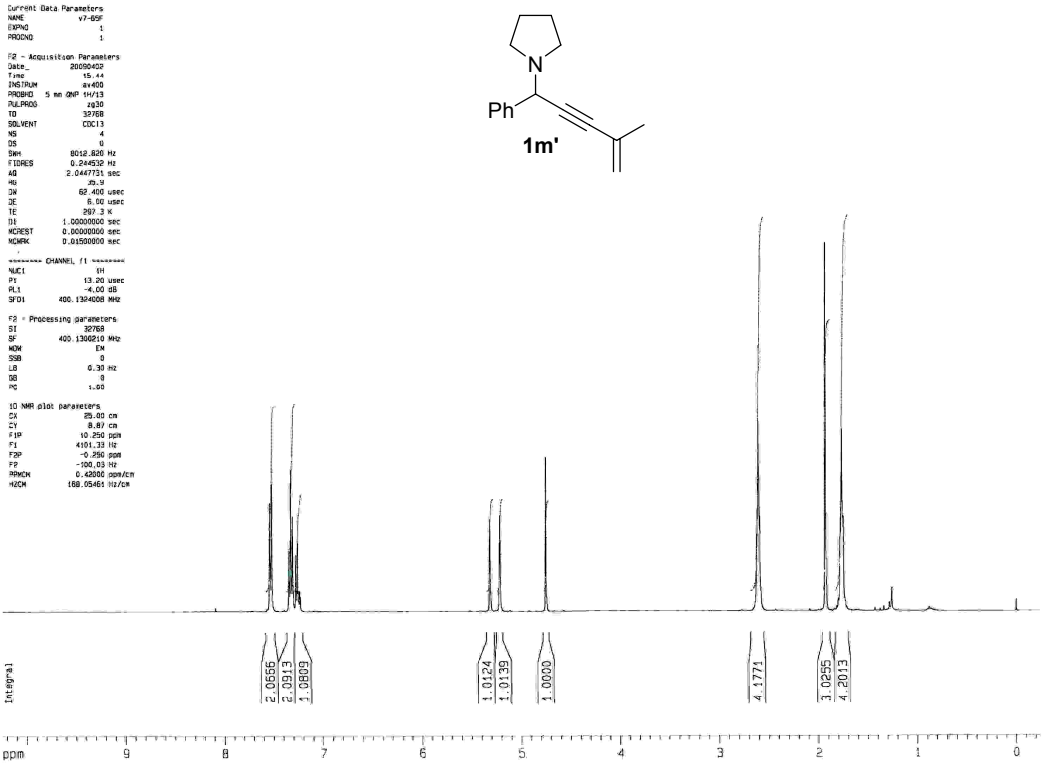

Current Data Parameters
NAME v4-102F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20061215
Time 17.24
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 25179.010 Hz
FIDRES 0.768869 Hz
AQ 0.6259188 sec
RG 16384
DW 19.100 usec
DE 6.00 usec
TE 298.5 K
D1 2.50000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127804 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 7.87 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63757 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

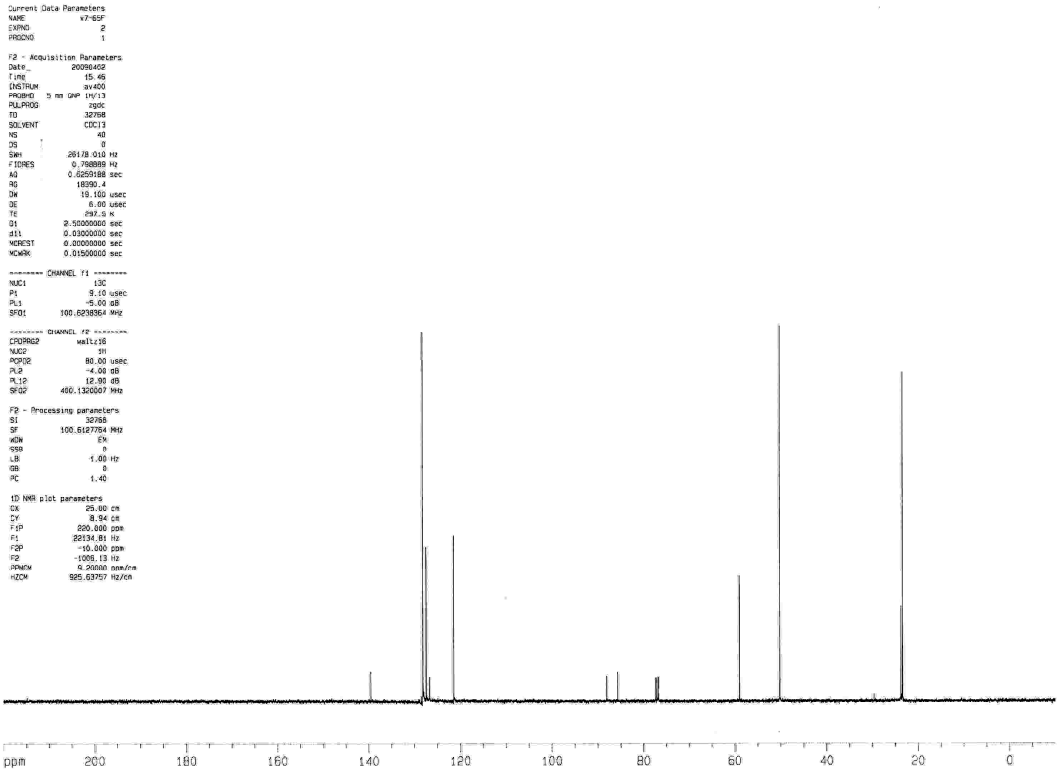

Current Data Parameters
NAME v3-170F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060719
Time 22.18
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 12
DS 2
SWH 4496.403 Hz
FIDRES 0.137219 Hz
AQ 3.6438515 sec
RG 28.5
DW 111.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
============ CHANNEL f1 ============
NUC1 1H
P1 9.00 usec
PL1 -6.00 dB
SFO1 300.1315007 MHz
F2 - Processing parameters
SI 32768
SF 300.1300290 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
F1P 10.250 ppm
F1 3076.33 Hz
F2P -0.250 ppm
F2 -75.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 126.05462 Hz/cm
N
Ph
1j'
OMe
Integral
0.9920
4.2030
1.0510
2.1990
1.0949
1.0941
1.0266
1.0000
3.1534
4.1074
3.9111
ppm
9
8
7
6
5
4
3
2
1
0

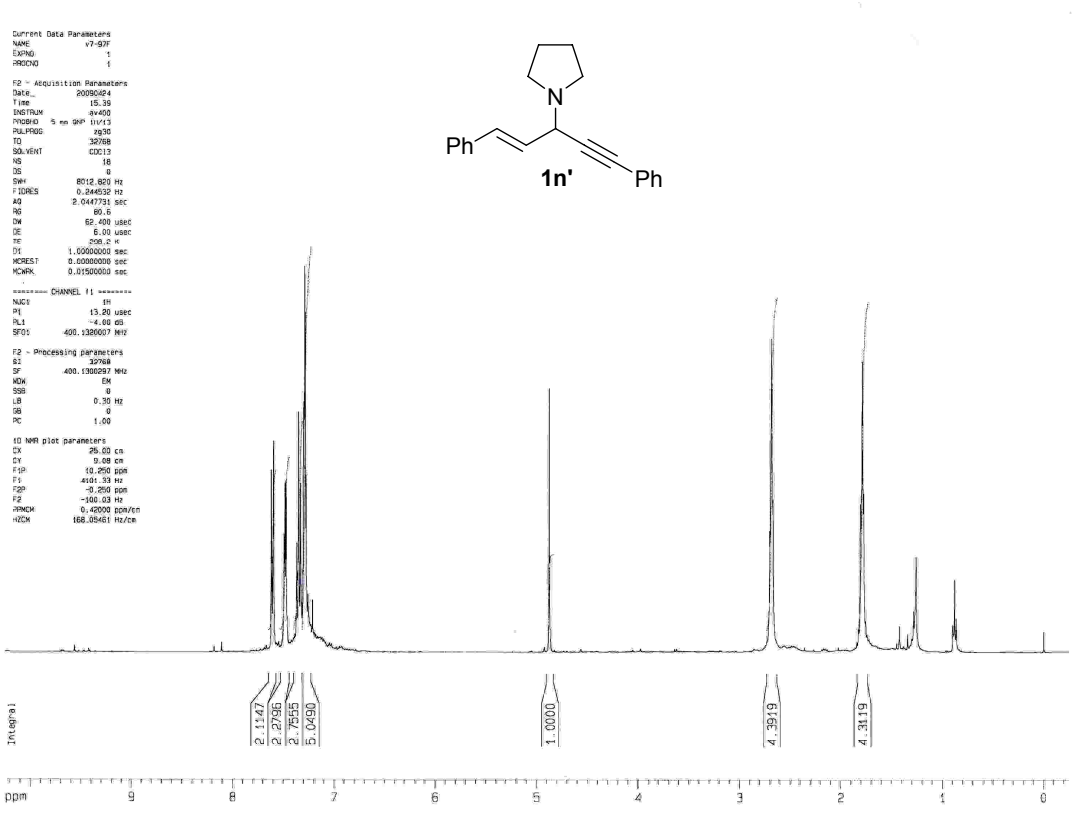

Current Data Parameters
NAME v3-170F
EXPNO 2
PROCNO 2
F2 - Acquisition Parameters
Date_ 20060818
Time 11.39
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 100
DS 1
SWH 18832.393 Hz
FIDRES 0.574719 Hz
AQ 0.8700404 sec
RG 9195.2
DW 26.559 usec
DE 6.00 usec
TE 300.0 K
D1 2.50000000 sec
d11 0.03000000 sec
============ CHANNEL f1 ============
NUC1 13C
P1 7.00 usec
PL1 -6.00 dB
SFO1 75.4760204 MHz
============ CHANNEL f2 ============
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677520 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
F1P 220.000 ppm
F1 16602.91 Hz
F2P -10.000 ppm
F2 -754.68 Hz
PPMCM 9.20000 ppm/cm
HZCM 694.30334 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

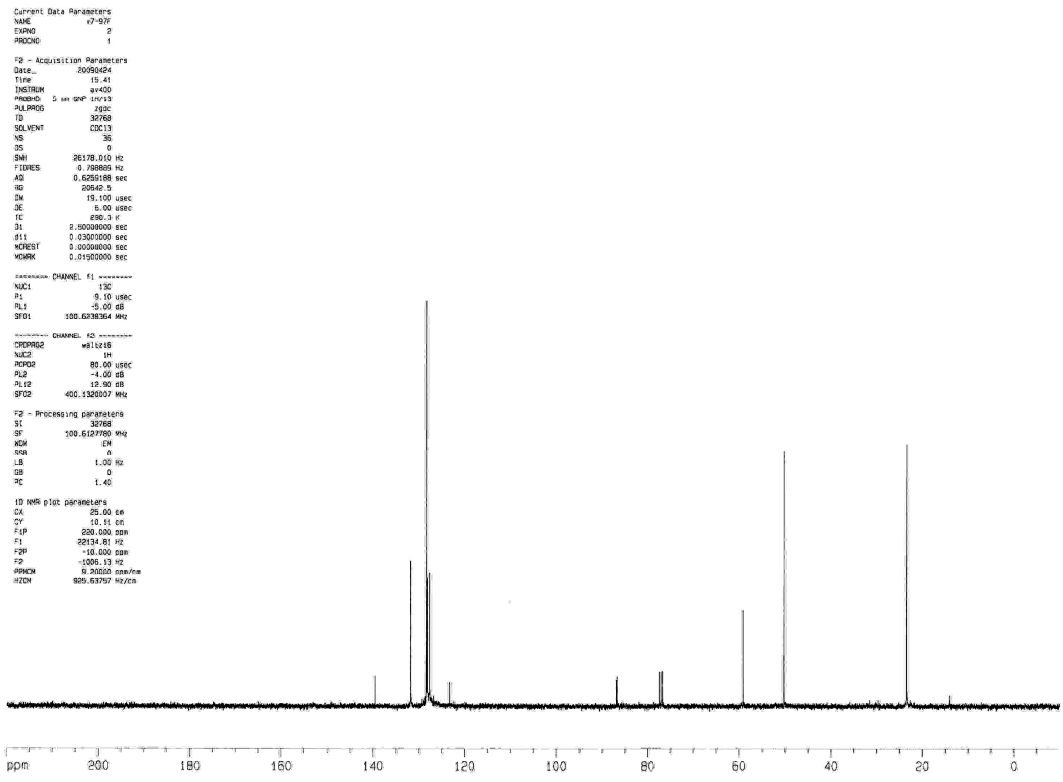

Current Data Parameters
NAME v6-63F
EXPNO 1
PROCNO 2
F2 - Acquisition Parameters
Date_ 20090625
Time 17.04
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 12
DS 2
SWH 4496.403 Hz
FIDRES 0.137219 Hz
AQ 3.6438515 sec
RG 287.4
DW 111.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
============ CHANNEL f1 ============
NUC1 1H
P1 9.00 usec
PL1 -6.00 dB
SFO1 300.1315007 MHz
F2 - Processing parameters
SI 32768
SF 300.1300058 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
F1P 11.000 ppm
F1 3301.43 Hz
F2P -0.250 ppm
F2 -75.03 Hz
PPMCM 0.45000 ppm/cm
HZCM 135.05850 Hz/cm
OHC
N
1l'
Integral
1.0001
1.0288
2.1384
1.1361
1.0052
1.0000
4.4683
4.4254
4.4501
4.4563
2.4285
4.8252
ppm
10
9
8
7
6
5
4
3
2
1
0

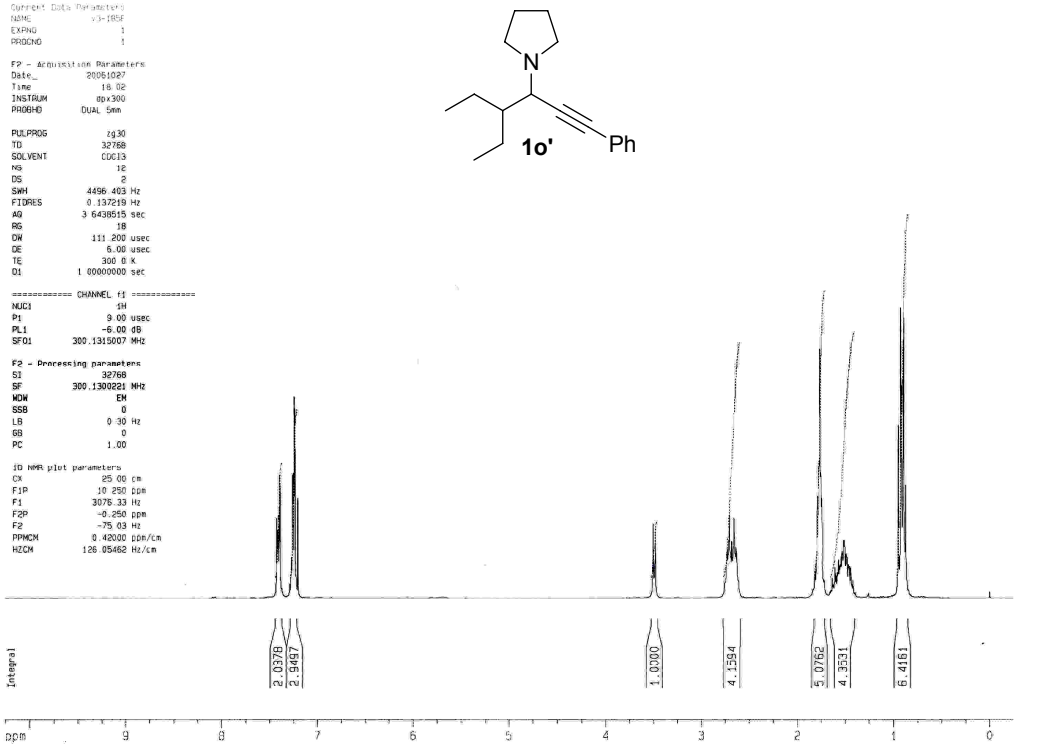

Current Data Parameters
NAME v7-157F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090706
Time 17.00
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 22
DS 0
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 26008
DW 19.100 usec
DE 6.00 usec
TE 299.3 K
D1 2.50000000 sec
d11 0.03000000 sec
MCBEST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127780 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 9.62 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63757 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

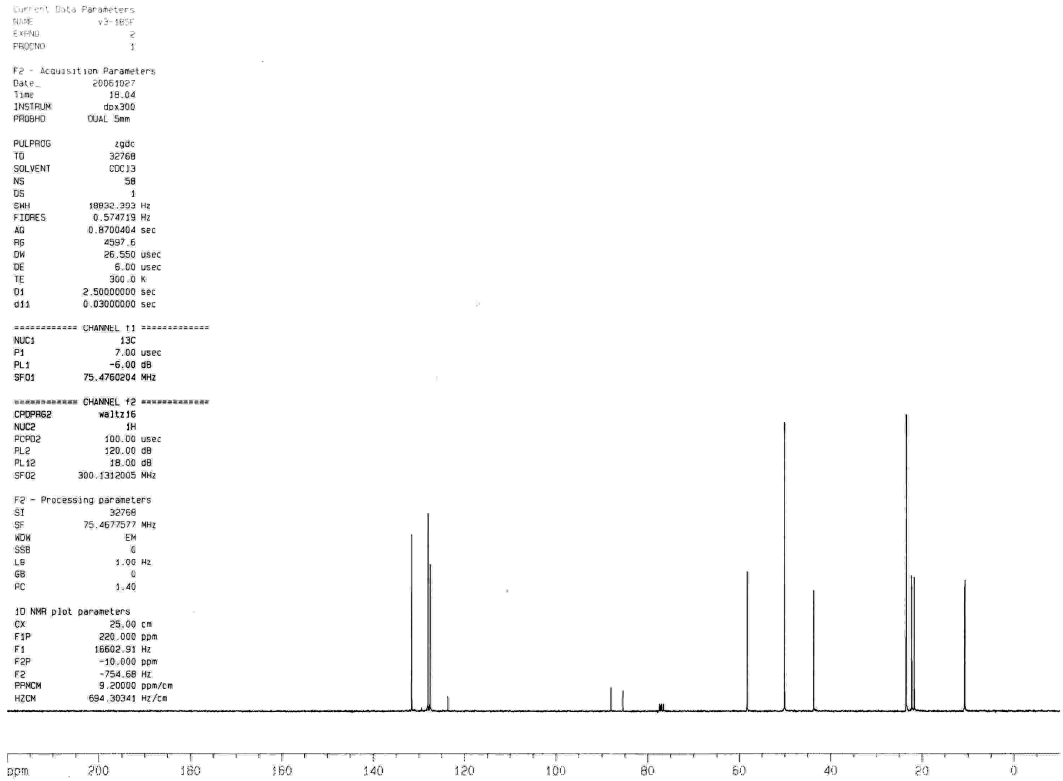

Current Data Parameters
NAME v7-65F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090402
Time 15.44
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 4
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 20.1
DW 62.400 usec
DE 6.00 usec
TE 297.3 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300210 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 8.87 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.43000 ppm/cm
HZCM 168.05461 Hz/cm
N
Ph
1m'
Integral
2.0656
2.0913
1.0809
1.0124
1.0139
1.0000
4.1771
3.0295
4.2013
ppm
9
8
7
6
5
4
3
2
1
0

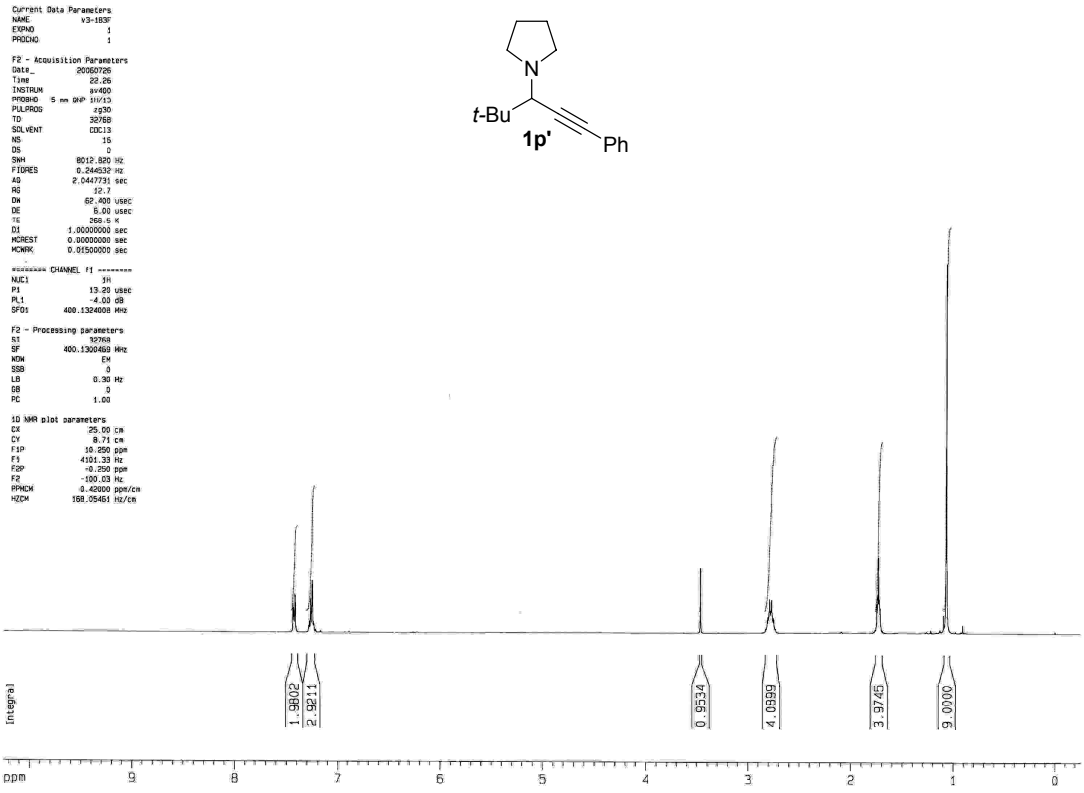

Current Data Parameters
NAME v7-65F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090402
Time 15.46
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 40
DS 0
SWH 26178.010 Hz
FIDRES 0.798899 Hz
AQ 0.6259188 sec
RG 18990.4
DW 19.100 usec
DE 6.00 usec
TE 297.3 K
D1 2.00000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127754 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 8.94 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1005.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63757 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

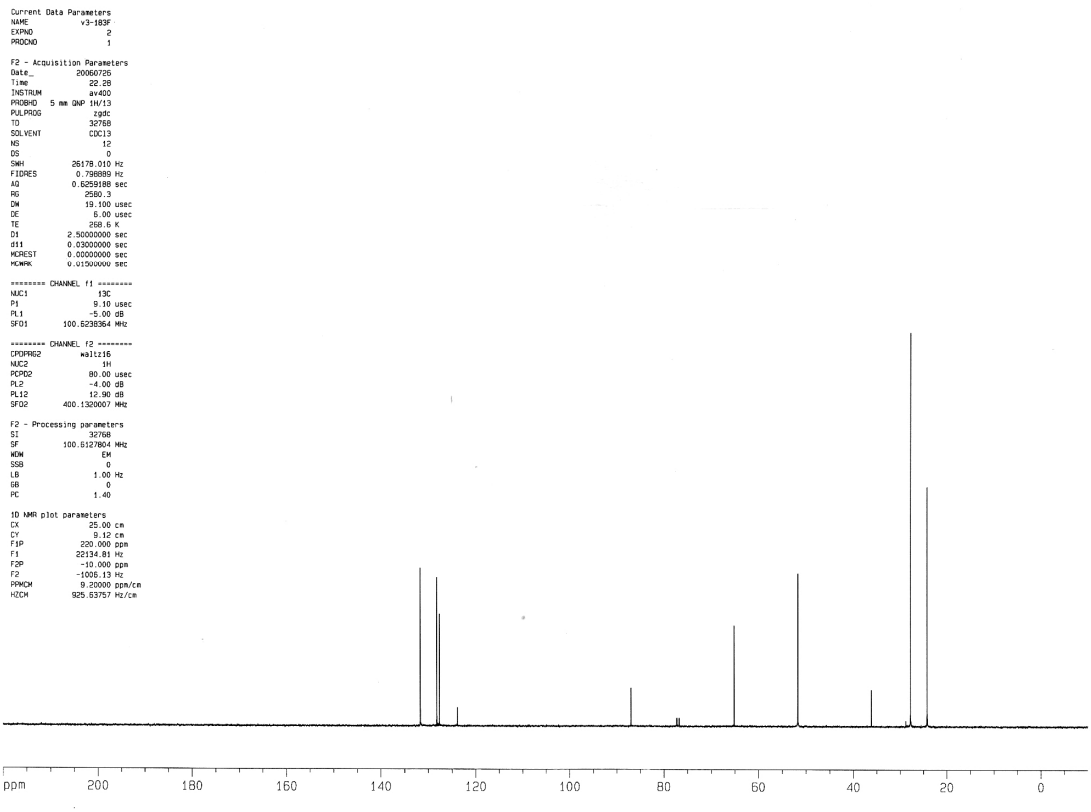

Current Data Parameters
NAME v7-97F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090424
Time 15.39
INSTRUM av400
PROBHD 5 mm BBF in/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 80.6
DW 62.400 usec
DE 6.00 usec
TE 298.2 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 400.1300297 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 9.08 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05461 Hz/cm
Ph
N
Ph
1n'
Ph
Integral
2.1547
2.2795
2.7555
5.0490
1.0000
4.3919
4.3119
ppm
9
8
7
6
5
4
3
2
1
0

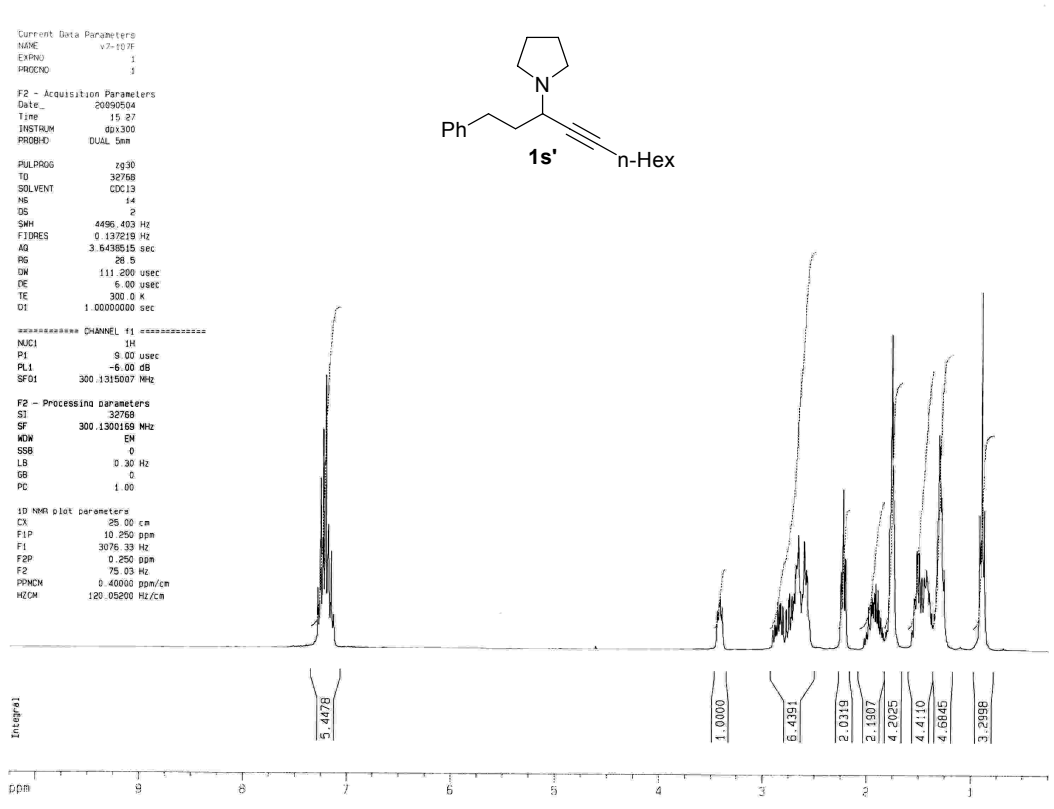

Current Data Parameters
NAME v7-97F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090424
Time 15.41
INSTRUM av400
PROBHD 5 mm BBF in/13
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 36
DS 0
SWH 26178.010 Hz
FIDRES 0.798809 Hz
AQ 0.6259168 sec
RG 20642.5
DW 19.100 usec
DE 6.00 usec
TE 298.3 K
D1 2.00000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127690 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 19.11 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63797 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

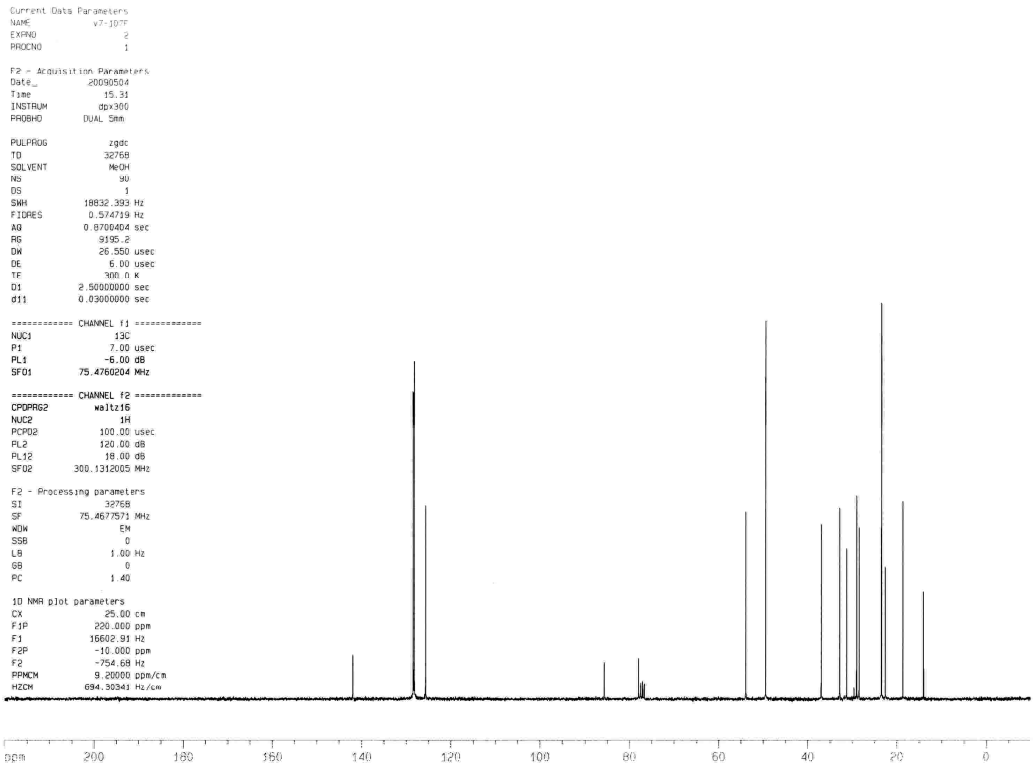

Current Data Parameters
NAME v3-185F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20061027
Time 18.02
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 12
DS 2
SWH 4496.403 Hz
FIDRES 0.137219 Hz
AQ 3.6436515 sec
RG 18
DW 111.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 9.00 usec
PL1 -6.00 dB
SFO1 300.1315007 MHz
F2 - Processing parameters
SI 32768
SF 300.1300021 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
F1P 10.250 ppm
F1 3076.33 Hz
F2P -0.250 ppm
F2 -75.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 126.05462 Hz/cm
1o'
Ph
Integral
2.0378
2.9497
1.0000
4.1594
5.0762
4.3531
6.4161
ppm
9
8
7
6
5
4
3
2
1
0

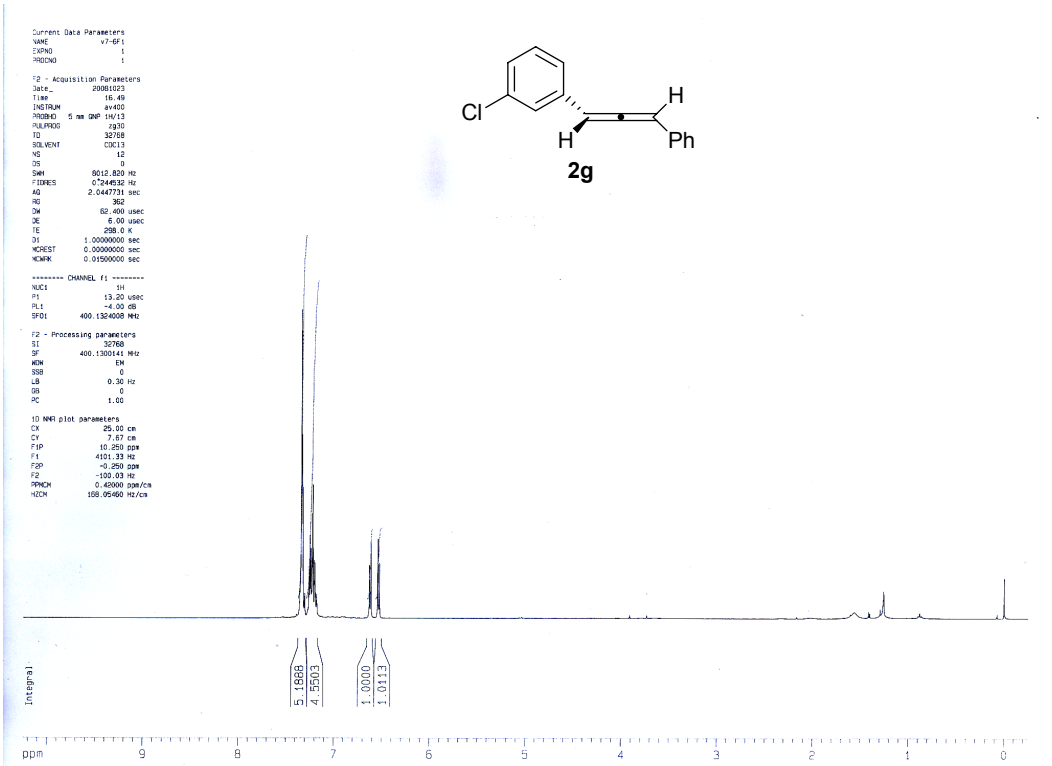

Current Data Parameters
NAME v3-185F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20061027
Time 18.04
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zgdc
TD 32768
SOLVENT CDCl3
NS 58
DS 1
SWH 18832.393 Hz
FIDRES 0.574719 Hz
AQ 0.8700404 sec
RG 4597.6
DW 26.550 usec
DE 6.00 usec
TE 300.0 K
D1 2.50000000 sec
d11 0.03000000 sec
========== CHANNEL f1 ==========
NUC1 13C
P1 7.00 usec
PL1 -6.00 dB
SFO1 75.4760204 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677577 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
F1P 220.000 ppm
F1 16602.91 Hz
F2P -10.000 ppm
F2 -754.68 Hz
PPMCM 9.20000 ppm/cm
HZCM 694.30341 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

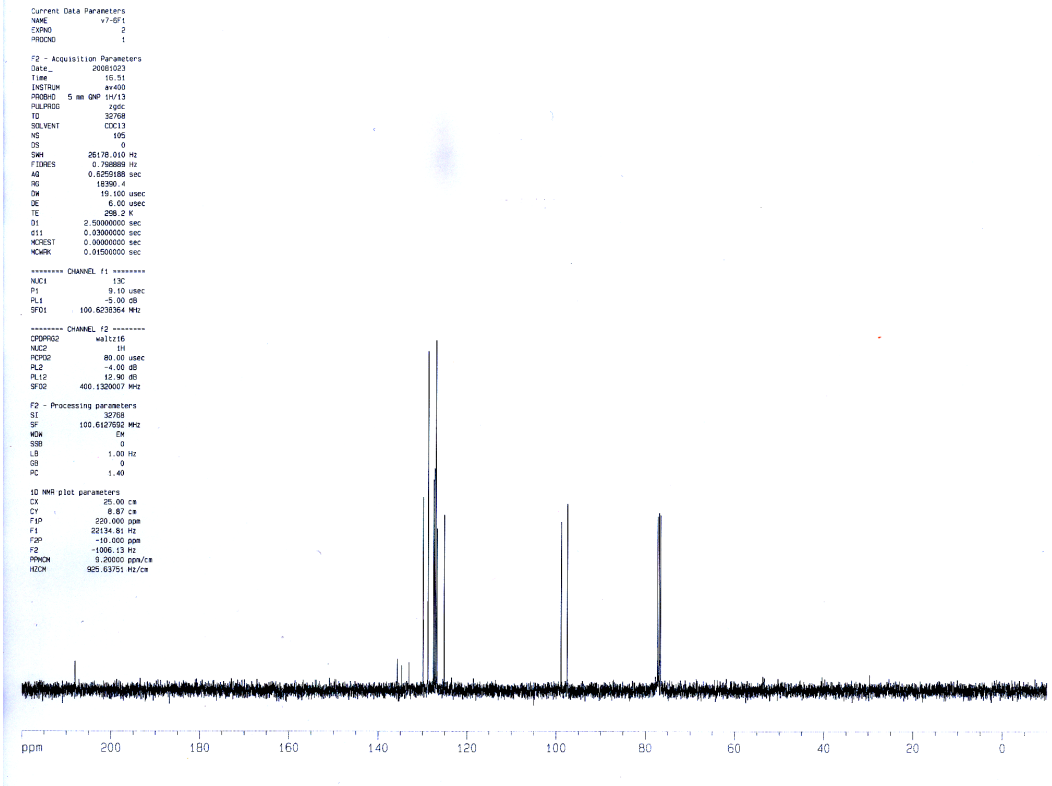

Current Data Parameters
NAME v3-183F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060726
Time 22.26
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 12.7
DW 62.400 usec
DE 6.00 usec
TE 268.6 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300469 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 8.71 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05461 Hz/cm
t-Bu
1p'
Ph
Integral
1.9802
2.9211
0.9534
4.0999
3.9745
9.0000
ppm
9
8
7
6
5
4
3
2
1
0

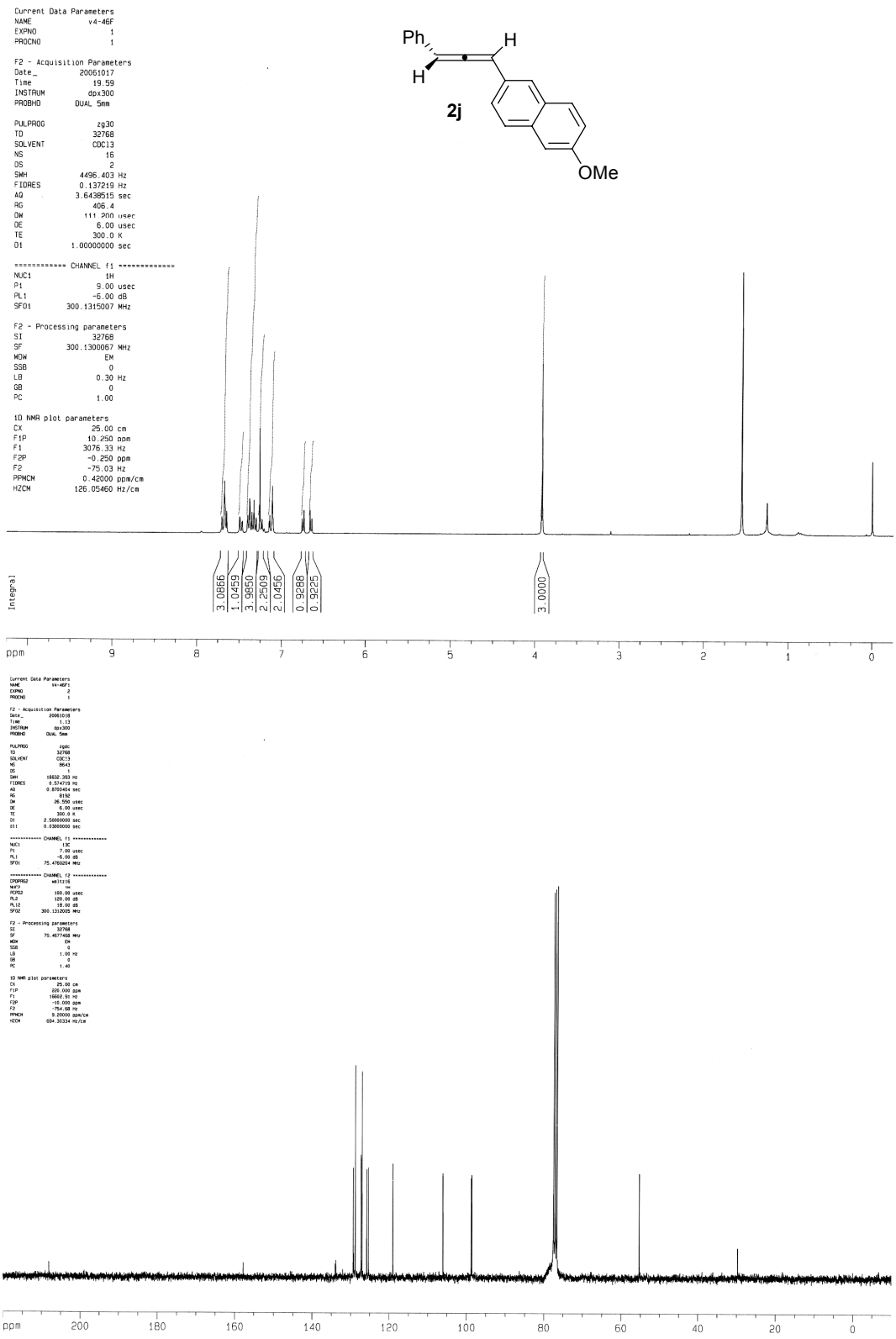

Current Data Parameters
NAME v3-183F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20060726
Time 22.28
INSTRUM av400
PROBHD 5 mm QNP 1H/13
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 12
DS 0
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 2580.3
DW 19.100 usec
DE 6.00 usec
TE 268.6 K
D1 2.50000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127804 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 9.12 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63757 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

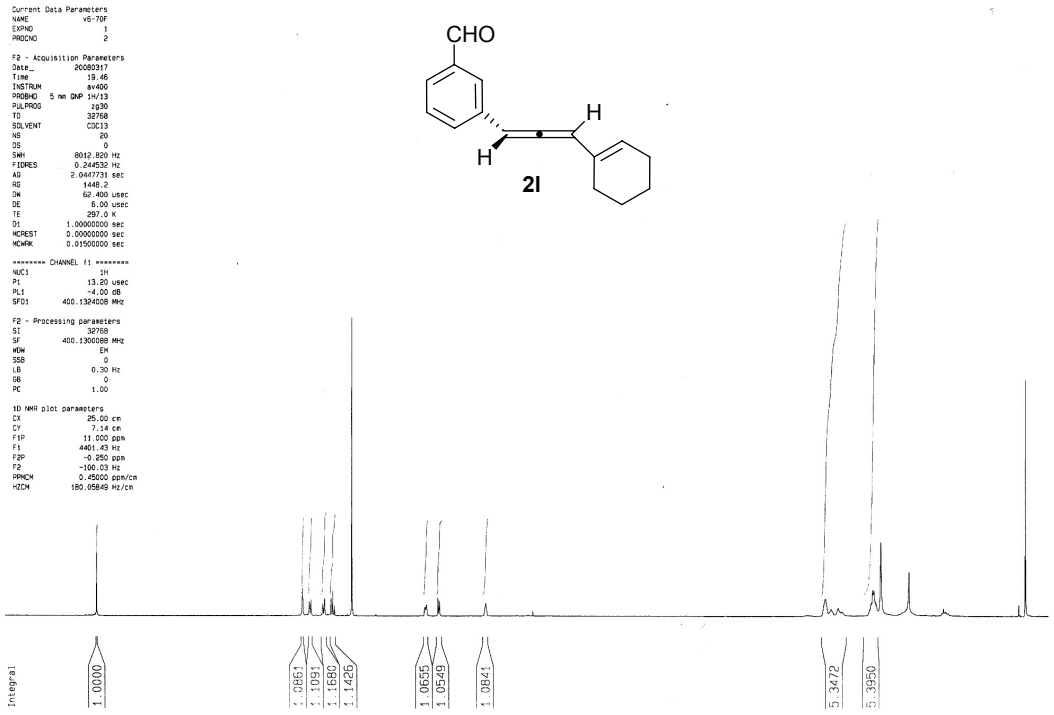

Current Data Parameters
NAME v7-107F
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090504
Time 15.27
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 14
DS 2
SWH 4496.403 Hz
FIDRES 0.137219 Hz
AQ 3.6438515 sec
RG 28.5
DW 111.200 usec
DE 6.00 usec
TE 300.0 K
D1 1.00000000 sec
========== CHANNEL f1 ==========
NUC1 1H
P1 9.00 usec
PL1 -6.00 dB
SFO1 300.1315007 MHz
F2 - Processing parameters
SI 32768
SF 300.1300168 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
F1P 10.250 ppm
F1 3076.33 Hz
F2P 0.250 ppm
F2 75.03 Hz
PPMCM 0.40000 ppm/cm
HZCM 120.05200 Hz/cm
Ph
N
1s'
n-Hex
Integral
5.4478
1.0000
6.4391
2.0319
2.1907
4.2025
4.4110
4.6845
3.2998
ppm


Current Data Parameters
NAME v7-107F
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20090504
Time 15.31
INSTRUM dpx300
PROBHD DUAL 5mm
PULPROG zgdc
TD 32768
SOLVENT MeOH
NS 90
DS 1
SWH 18832.393 Hz
FIDRES 0.574719 Hz
AQ 0.8700404 sec
RG 9195.2
DW 26.550 usec
DE 6.00 usec
TF 300.0 K
D1 2.50000000 sec
d11 0.03000000 sec
========== CHANNEL f1 ==========
NUC1 13C
P1 7.00 usec
PL1 -6.00 dB
SFO1 75.4760204 MHz
========== CHANNEL f2 ==========
CPDPRG2 waltz16
NUC2 1H
PCPD2 100.00 usec
PL2 120.00 dB
PL12 18.00 dB
SFO2 300.1312005 MHz
F2 - Processing parameters
SI 32768
SF 75.4677571 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
F1P 220.000 ppm
F1 16602.91 Hz
F2P -10.000 ppm
F2 -754.68 Hz
PPMCM 9.20000 ppm/cm
HZCM 694.30341 Hz/cm
ppm

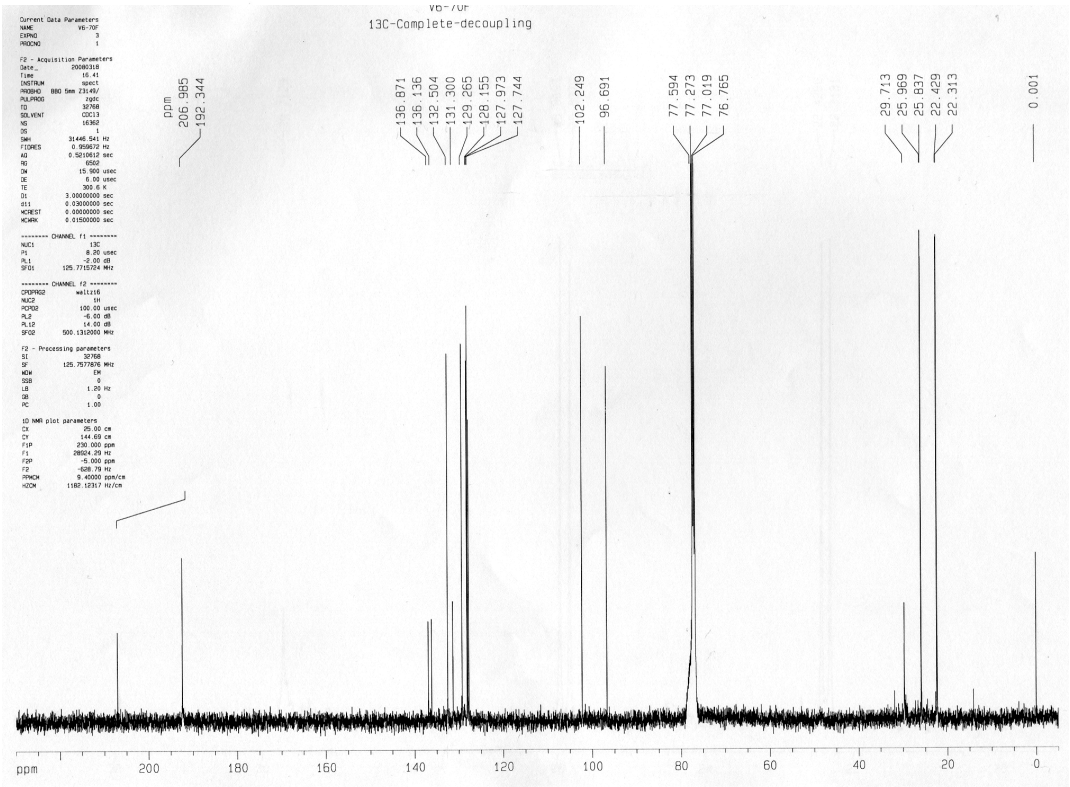

Current Data Parameters
NAME v7-6f1
EXPNO 1
PROCNO 1
F2 - Acquisition Parameters
Date_ 20081023
Time 16.49
INSTRUM av400
PROBHD 5 mm GNP 1H/13
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 12
DS 0
SWH 8012.820 Hz
FIDRES 0.244532 Hz
AQ 2.0447731 sec
RG 362
DW 62.400 usec
DE 6.00 usec
TE 298.0 K
D1 1.00000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 1H
P1 13.20 usec
PL1 -4.00 dB
SFO1 400.1324008 MHz
F2 - Processing parameters
SI 32768
SF 400.1300141 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
1D NMR plot parameters
CX 25.00 cm
CY 7.67 cm
F1P 10.250 ppm
F1 4101.33 Hz
F2P -0.250 ppm
F2 -100.03 Hz
PPMCM 0.42000 ppm/cm
HZCM 168.05460 Hz/cm
Cl
H
H
Ph
2g
Integral
5.1888
4.5503
1.0000
1.0113
ppm
9
8
7
6
5
4
3
2
1
0

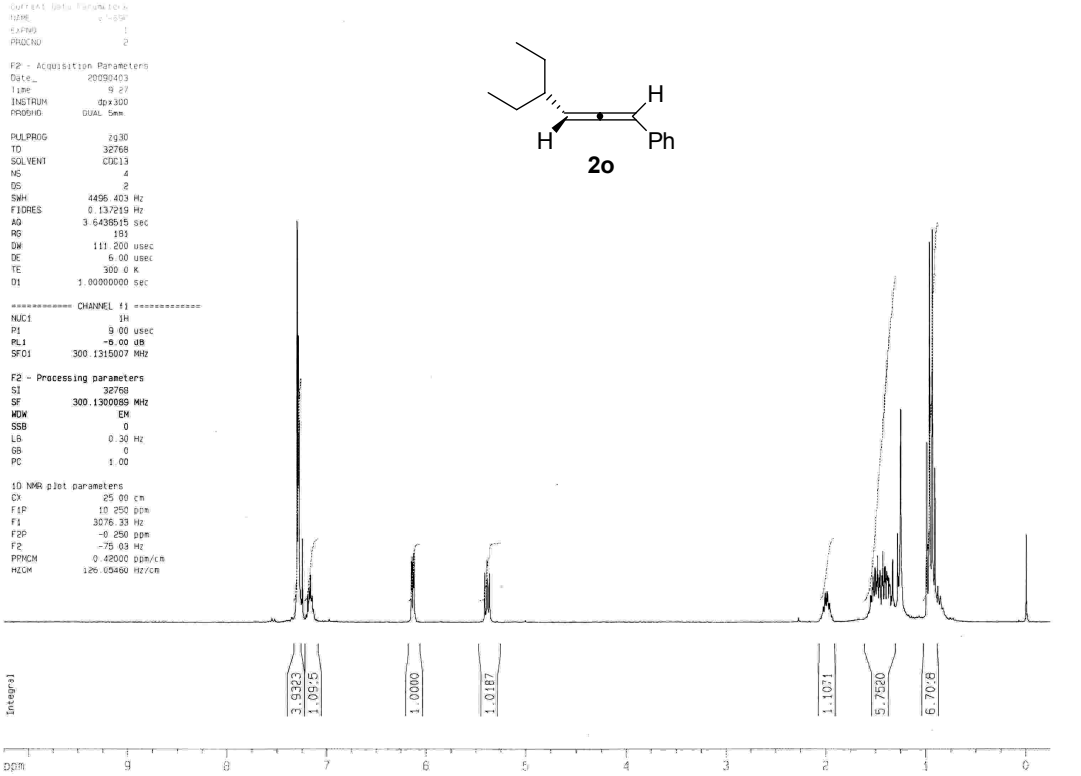

Current Data Parameters
NAME v7-6f1
EXPNO 2
PROCNO 1
F2 - Acquisition Parameters
Date_ 20081023
Time 16.51
INSTRUM av400
PROBHD 5 mm GNP 1H/13
PULPROG zgpg
TD 32768
SOLVENT CDCl3
NS 105
DS 0
SWH 26178.010 Hz
FIDRES 0.798889 Hz
AQ 0.6259188 sec
RG 18390.4
DW 19.100 usec
DE 6.00 usec
TE 298.2 K
D1 2.50000000 sec
d11 0.03000000 sec
MCREST 0.00000000 sec
MCWRK 0.01500000 sec
======== CHANNEL f1 ========
NUC1 13C
P1 9.10 usec
PL1 -5.00 dB
SFO1 100.6238364 MHz
======== CHANNEL f2 ========
CPDPRG2 waltz16
NUC2 1H
PCPD2 80.00 usec
PL2 -4.00 dB
PL12 12.90 dB
SFO2 400.1320007 MHz
F2 - Processing parameters
SI 32768
SF 100.6127692 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
1D NMR plot parameters
CX 25.00 cm
CY 8.87 cm
F1P 220.000 ppm
F1 22134.81 Hz
F2P -10.000 ppm
F2 -1006.13 Hz
PPMCM 9.20000 ppm/cm
HZCM 925.63751 Hz/cm
ppm
200
180
160
140
120
100
80
60
40
20
0

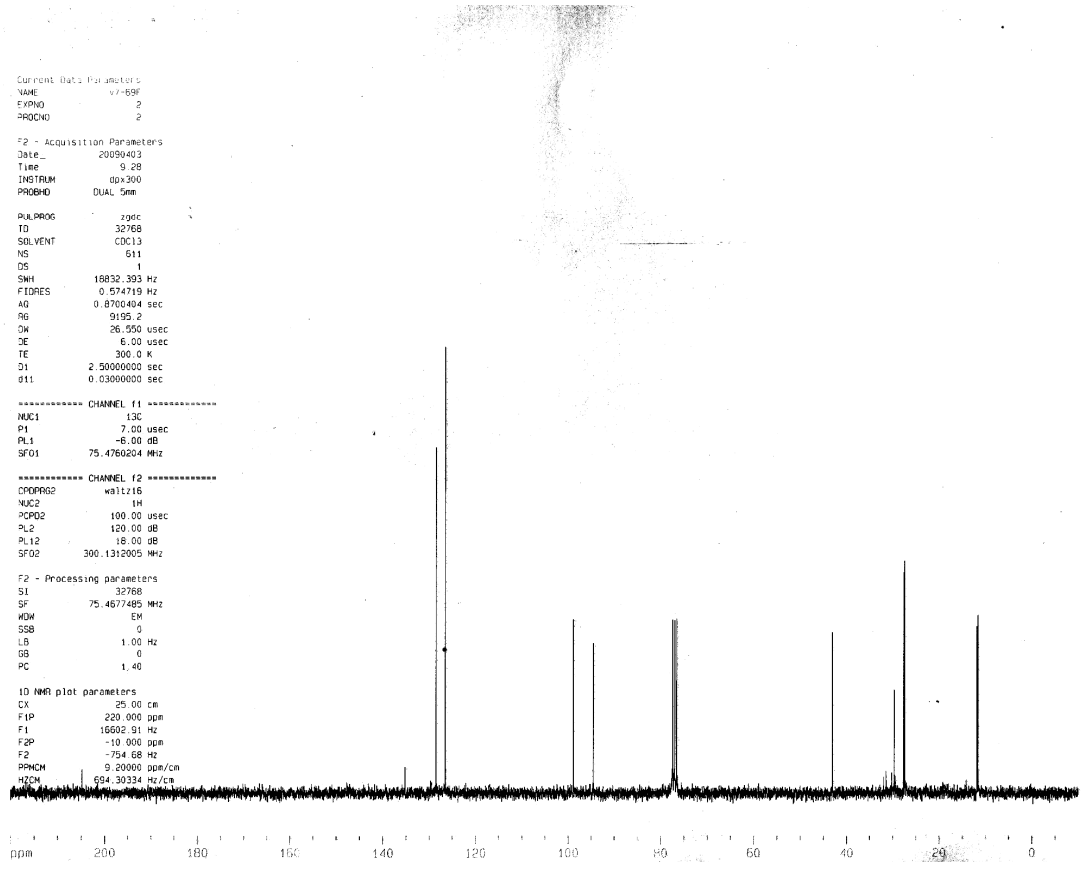

Ph
H
H
2j
OMe
Integral
3.0866
1.0459
3.9850
2.2509
2.0456
0.9288
0.9225
3.0000
ppm

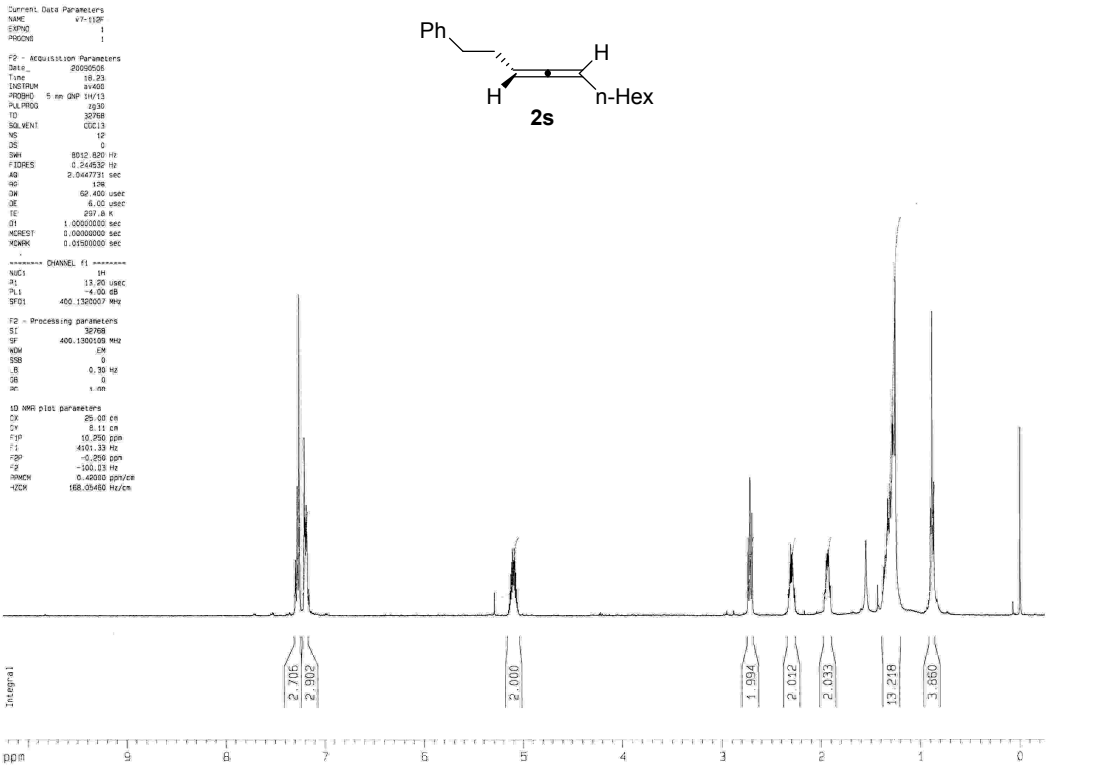

CHO
H
H
2l

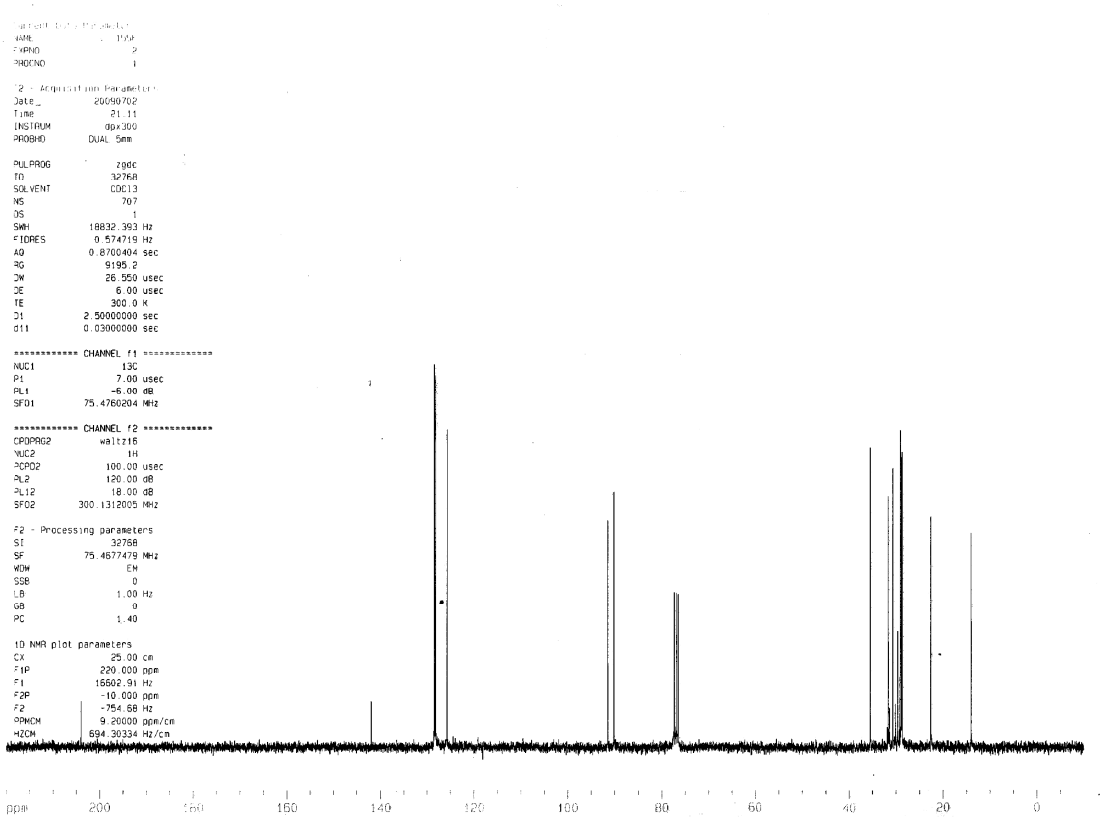
Integral
1.0000
1.0861
1.1091
1.1680
1.1426
1.0655
1.0549
1.0841
5.3472
5.3950
ppm


13C-Complete-decoupling
ppm
206.985
192.344
136.871
136.136
132.504
131.300
129.265
128.155
127.973
127.744
102.249
96.691
77.594
77.273
77.019
76.765
29.713
25.969
25.837
22.429
22.313
0.001


H
H
Ph
2o
Integral
3.9323
1.0915
1.0000
1.0187
1.1071
5.7520
6.7018
ppm


ppm


Ph
H
H
n-Hex
2s
2.705
2.902
2.000
1.994
2.012
2.033
13.218
3.660
Integral
ppm


ppm