Electronic Supplementary Information

Lewis acid-mediated radical cyclization: Stereocontrol in cascade radical addition-cyclization-trapping reactions

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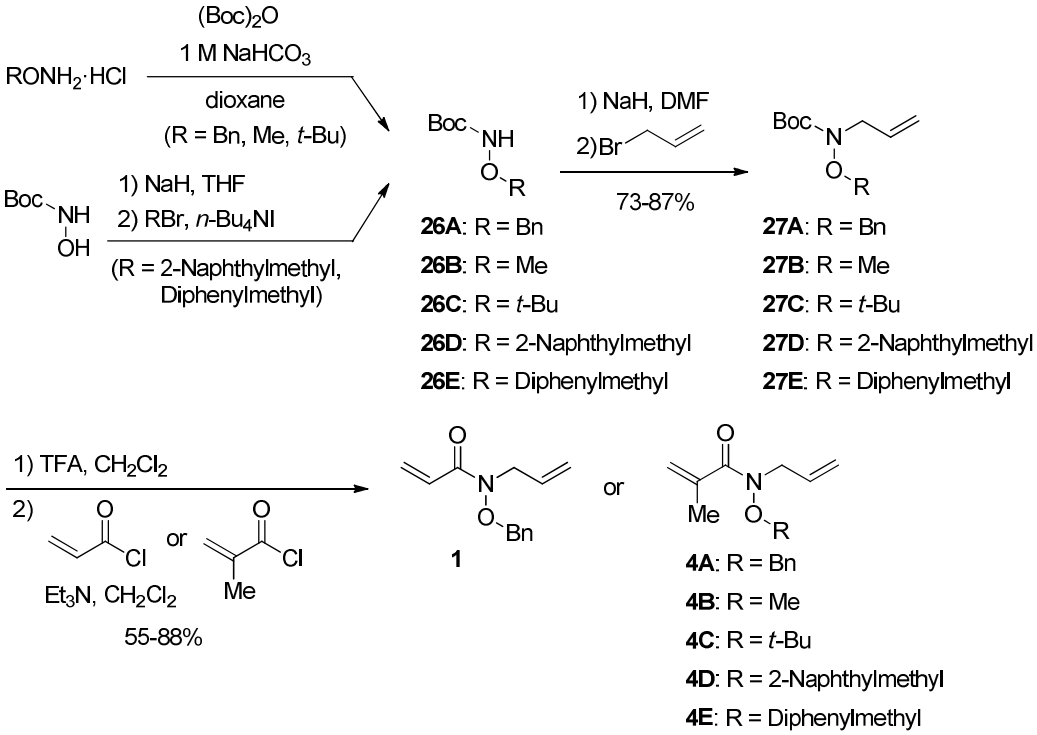


Scheme 1

Preparation of 26A-E. Following the reported procedure,[1] **26A-C** were obtained. Following the procedure modified from the reported method,[2] **26D** and **26E** were obtained.

26A. A colorless oil. IR ($CHCl_3$) 1743 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.40-7.30 (5H, m), 7.12 (1H, br s), 4.86 (2H, s), 1.48 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.8, 135.8, 129.2, 128.5 (2C), 81.7, 78.4, 28.1. MS (EI^+) *m/z* 223 (M^+, 7), 92 (100). HRMS (EI^+) calcd for $C_{12}H_{17}NO_3$ (M^+) 223.1208, found 223.1214.

26B. A colorless oil. IR ($CHCl_3$) 1700 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.28 (1H, br s), 3.67 (3H, s), 1.45 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.9, 81.6, 64.3, 28.1. MS (CI^+) *m/z* 148 ($M+H^+$, 11), 92 (100). HRMS (CI^+) calcd for $C_6H_{14}NO_3$ ($M+H^+$) 148.0974, found 148.0969.

26C. A colorless crystal. Mp 80-71 °C (AcOEt/hexane). IR ($CHCl_3$) 1748 cm^{-1}. ^1H NMR ($CDCl_3$) δ 6.75 (1H, br s), 1.45 (9H, s), 1.21 (9H, s). ^{13}C NMR ($CDCl_3$) δ 157.6, 81.0, 80.2, 28.1, 26.1. MS (CI^+) *m/z* 190 ($M+H^+$, 10), 134 (100). HRMS (CI^+) calcd for $C_9H_{20}NO_3$ ($M+H^+$) 190.1443, found 190.1450.

26D. A colorless crystal. Mp 70-71 °C (AcOEt/hexane). IR ($CHCl_3$) 1742 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.90-7.81 (4H, m), 7.55-7.47 (3H, m), 7.10 (1H, br s), 5.02 (2H, s), 1.48 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.7, 133.2, 132.7, 128.5, 128.1, 128.0, 127.7, 127.0, 126.2, 126.1, 118.1, 81.5, 53.0, 28.2. MS (EI^+) *m/z* 273 (M^+, 10), 128 (100). HRMS (EI^+) calcd for $C_{16}H_{19}NO_3$ (M^+) 273.1365, found 273.1363. Anal. calcd for $C_{16}H_{19}NO_3$: C, 70.31; H, 7.01; N, 5.12%. Found: C, 70.12; H, 6.83; N, 5.08%.

26E. A colorless oil. IR ($CHCl_3$) 1741 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.40-7.27 (10H, m), 7.07 (1H, br s), 5.90 (1H, s), 1.47 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.5, 139.4, 128.5, 128.2, 127.9, 88.9, 81.8, 28.2. MS (FAB^-) *m/z* 298 ($M-H^+$,

40), 153 (100). HRMS (FAB^-) calcd for $C_{18}H_{20}NO_3$ ($M-H^+$) 298.1443, found 298.1436.

Preparation of 27A-E. After NaH (60% oil suspension, 440 mg 11 mmol) was washed with hexanes three times under argon atmosphere, DMF (40 mL) was added. To this stirred suspension was added a solution of **26A-E** (10 mmol) in DMF (10 mL) at 0 °C. After being stirred at same temperature for 20 min, allyl bromide (0.92 mL, 11 mmol) was added to the reaction mixture. After being stirred at the room temperature for 1 h, the reaction mixture was diluted with water and then extracted with AcOEt. The organic phase was dried over $MgSO_4$ and concentrated under reduced pressure. Purification of the residue by flash silica gel column chromatography (AcOEt:hexane = 1:10–1:5) afforded the products **27A-E**.

27A. A colorless oil. IR ($CHCl_3$) 1699 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.41-7.30 (5H, m), 5.87 (1H, m), 5.22 (1H, dd, *J*=17.1, 1.6 Hz), 5.17 (1H, dd, *J*=10.4, 1.6 Hz), 4.83 (2H, s), 4.00 (2H, br d, *J*=6.1 Hz), 1.49 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.6, 135.6, 132.7, 129.3, 128.4, 128.3, 118.0, 81.3, 77.1, 52.7, 28.1. MS (EI^+) *m/z* 263 (M^+, 0.2), 91 (100). HRMS (EI^+) calcd for $C_{15}H_{21}NO_3$ (M^+) 263.1521, found 263.1519.

27B. A colorless oil. IR ($CHCl_3$) 1700 cm^{-1}. ^1H NMR ($CDCl_3$) δ 5.85 (1H, m), 5.21 (1H, dd, *J*=17.1, 1.6 Hz), 5.16 (1H, dd, *J*=10.4, 1.6 Hz), 4.00 (2H, br d, *J*=5.8 Hz), 3.65 (3H, s), 1.47 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.4, 132.7, 117.9, 81.4, 62.5, 52.1, 28.2. MS (EI^+) *m/z* 187 (M^+, 0.4), 56 (100). HRMS (EI^+) calcd for $C_9H_{17}NO_3$ (M^+) 187.1208, found 187.1211.

27C. A colorless oil. IR ($CHCl_3$) 1726, 1692 cm^{-1}. ^1H NMR ($CDCl_3$) δ 5.88 (1H, m), 5.17 (1H, dd, *J*=17.1, 1.6 Hz), 5.14 (1H, dd, *J*=10.1, 1.6 Hz), 4.23 (1H, br m), 3.74 (1H, br m), 1.45 (9H, s), 1.23 (9H, s). ^{13}C NMR ($CDCl_3$) δ 158.8, 132.8, 117.7, 81.5, 81.2, 56.2, 28.1, 27.1. MS (CI^+) *m/z* 230 ($M+H^+$, 8), 174 (100). HRMS (CI^+) calcd for $C_{12}H_{24}NO_3$ ($M+H^+$) 230.1757, found 230.1755.

27D. A colorless oil. IR ($CHCl_3$) 1697 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.86-7.81 (4H, m), 7.54 (1H, d, *J*=9.8 Hz), 7.51-7.46 (2H, m), 5.89 (1H, m), 5.24 (1H, dd, *J*=17.0, 1.6 Hz), 5.18 (1H, br d, *J*=9.7 Hz), 5.01 (2H, s), 4.00 (2H, br d, *J*=6.1 Hz), 1.51 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.7, 133.3, 133.2 (2C), 132.8, 128.5, 128.1, 128.0, 127.7, 127.0, 126.2, 126.1, 118.1, 81.5, 77.4, 53.0, 28.2. MS (FAB^+) *m/z* 314 ($M+H^+$, 4), 141 (100). HRMS (FAB^+) calcd for $C_{19}H_{24}NO_3$ ($M+H^+$) 314.1756, found 314.1762.

27E. A colorless oil. IR ($CHCl_3$) 1698 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.42-7.27 (10H, m), 5.89 (1H, s), 5.71 (1H, m), 5.10 (1H, dd, *J*=17.4, 1.5 Hz), 5.08 (1H, dd, *J*=10.4, 1.5 Hz), 3.76 (2H, br d, *J*=5.5 Hz), 1.47 (9H, s). ^{13}C NMR ($CDCl_3$) δ 157.1, 140.1, 132.6, 130.1, 128.3, 128.2, 117.6, 87.8, 81.7, 53.5, 28.2. MS (FAB^+) *m/z* 340 ($M+H^+$, 4), 167 (100). HRMS (FAB^+) calcd for $C_{21}H_{26}NO_3$ ($M+H^+$) 340.1912, found 340.1904.

Preparation of 1 and 4A-E. To a solution of **27A-E** (3.0 mmol) in CH_2Cl_2 (15 mL) was added TFA (2.3 mL, 30 mmol) under argon atmosphere at 0 °C. After being stirred at room temperature for 5 h, the reaction mixture was neutralized with saturated aqueous $NaHCO_3$ and then extracted with CH_2Cl_2. The organic phase was dried over $MgSO_4$ and concentrated under reduced pressure to give crude amine. To a solution of crude amine and Et_3N (1.25 mL, 9.0 mmol) in CH_2Cl_2 (15 mL) was added acid chloride (3.3 mmol) under argon atmosphere at the room temperature. After being stirred at the same temperature for 3 h, the reaction mixture was diluted with water and then extracted with AcOEt. Purification of the residue by flash silica gel column chromatography (AcOEt:hexane = 1:6–1:3) afforded the products **1** and **4A-E**.

1. A colorless oil. IR ($CHCl_3$) 1653, 1618 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.42-7.32 (5H, m), 6.74 (1H, dd, *J*=17.1, 10.4 Hz), 6.42 (1H, dd, *J*=17.1, 1.8 Hz), 5.90 (1H, m), 5.73 (1H, dd, *J*=10.4, 1.8 Hz), 5.28 (1H, dd, *J*=17.1, 1.2 Hz), 5.23 (1H, dd, *J*=10.4, 1.2 Hz), 4.86 (2H, s), 4.31 (2H, d, *J*=6.1 Hz). ^{13}C NMR ($CDCl_3$) δ 166.9, 134.3, 132.1, 129.4, 129.2, 129.0, 128.7, 126.3, 118.6, 77.5, 49.4. MS (EI^+) *m/z* 217 (M^+, 4), 91 (100). HRMS (EI^+) calcd for $C_{13}H_{15}NO_2$ (M^+) 217.1103, found 217.1098.

4A. A colorless oil. IR ($CHCl_3$) 1655, 1631 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.45-7.30 (5H, m), 5.88 (1H, m), 5.34 (1H, s), 5.29 (1H, dd, *J*=17.1, 1.3 Hz), 5.28 (1H, s), 5.23 (1H, br d, *J*=10.1 Hz), 4.84 (2H, s), 4.23 (2H, d, *J*=6.1 Hz), 1.98 (3H, s). ^{13}C NMR ($CDCl_3$) δ 171.9, 140.6, 134.8, 132.3, 129.4, 128.9, 128.6, 118.5, 117.5, 77.4, 50.7, 19.9. MS (EI^+) *m/z* 231 (M^+, 45), 159 (100). HRMS (EI^+) calcd for $C_{14}H_{17}NO_2$ (M^+) 231.1259, found 231.1252.

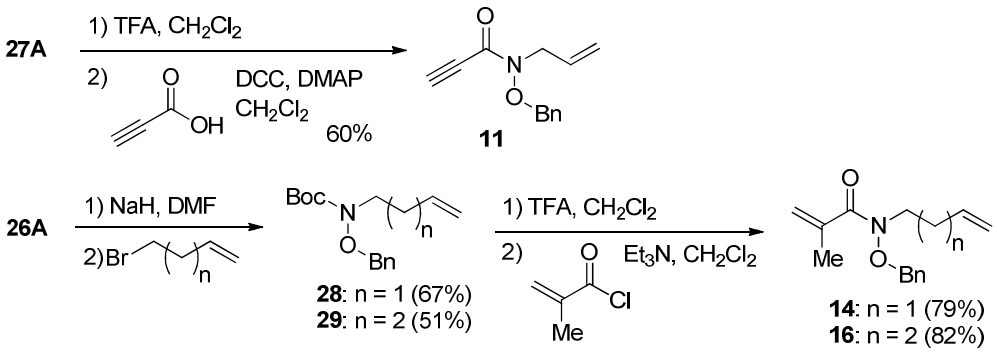
4B. A colorless oil. IR ($CHCl_3$) 1656, 1631 cm^{-1}. ^1H NMR ($CDCl_3$) δ 5.88 (1H, m), 5.33 (1H, s), 5.29 (1H, dd, *J*=18.6, 1.5 Hz), 5.25 (1H, s), 5.24 (1H, dd, *J*=13.2, 1.5 Hz), 4.25 (2H, d, *J*=5.8 Hz), 3.68 (3H, s), 2.00 (3H, s). ^{13}C NMR ($CDCl_3$) δ 171.5, 140.3, 132.2, 118.3, 117.4, 62.1, 49.5, 19.8. MS (EI^+) *m/z* 155 (M^+, 23), 69 (100). HRMS (EI^+) calcd for $C_8H_{13}NO_2$ (M^+) 155.0946, found 155.0939.

4C. A colorless oil. IR ($CHCl_3$) 1668, 1631 cm^{-1}. ^1H NMR ($CDCl_3$) δ 5.80 (1H, m), 5.31 (1H, s), 5.28 (1H, s), 5.18-5.13 (2H, m), 3.30 (2H, br s), 1.84 (3H, s), 1.19 (9H, s). ^{13}C NMR ($CDCl_3$) δ 174.9, 140.6, 132.8, 118.9, 118.0, 82.9, 55.4, 27.3, 19.7. MS (EI^+) *m/z* 197 (M^+, 8), 71 (100). HRMS (EI^+) calcd for $C_{11}H_{19}NO_2$ (M^+) 197.1416, found 197.1412.

4D. A colorless oil. IR ($CHCl_3$) 1657, 1630 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.86-7.78 (4H, m), 7.52-7.43 (3H, m), 5.88 (1H, m), 5.36 (1H, s), 5.29 (1H, dd, *J*=17.1, 1.6 Hz), 5.29 (1H, s), 5.23 (1H, dd, *J*=10.0, 1.6 Hz), 5.00 (2H, s), 4.24 (2H, d, *J*=5.8 Hz), 1.99 (3H, s). ^{13}C NMR ($CDCl_3$) δ 171.8, 140.4, 133.3, 133.1, 132.2, 132.1, 128.6, 128.3, 128.0, 127.7, 126.6, 126.5, 126.3, 118.4, 117.5, 77.0, 50.8, 19.8. MS (EI^+) *m/z* 281 (M^+, 0.1), 141 (100). HRMS (EI^+) calcd for $C_{18}H_{19}NO_2$ (M^+) 281.1416, found 281.1425.

4E. A colorless oil. IR ($CHCl_3$) 1657, 1631 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.42-7.29 (10H, m), 5.94 (1H, s), 5.73 (1H, m), 5.17 (1H, s), 5.17-5.14 (2H, m), 5.12 (1H, dd, *J*=8.9, 1.6 Hz), 3.90 (2H, d, *J*=5.8 Hz), 1.87 (3H, s). ^{13}C NMR ($CDCl_3$) δ 172.2, 140.2, 139.5, 132.3, 128.3, 128.2, 128.1, 118.0, 117.7, 87.4, 52.3, 19.7. MS (CI^+) *m/z* 308 ($M+H^+$, 1.6), 167 (100). HRMS (CI^+) calcd for $C_{20}H_{22}NO_2$ ($M+H^+$) 308.1650, found 308.1652.

1-2. Preparation of substrates 11, 14 and 16 (Scheme 2)



Scheme 2

Preparation of substrate 11. To a solution of **27A** (789 mg, 3.0 mmol) in CH_2Cl_2 (15 mL) was added TFA (2.3 mL, 30 mmol) under argon atmosphere at 0 °C. After being stirred at room temperature for 5 h, the reaction mixture was neutralized with saturated aqueous $NaHCO_3$ and then extracted with CH_2Cl_2. The organic phase was dried over $MgSO_4$ and concentrated under reduced pressure to give crude amine. To a solution of crude amine, DCC (744 mg, 3.6 mmol) and DMAP (44 mg, 0.36 mmol) in CH_2Cl_2 (15 mL) was added acid (0.20 mL, 3.3 mmol) under argon atmosphere at the room temperature. After being stirred at the same temperature for 3 h, the reaction mixture was filtered through a pad of Celite. The filtrate was concentrated under reduced pressure. Purification of the residue by flash silica gel column chromatography (AcOEt:hexane = 1:5–1:3) afforded **11** (387 mg, 60%).

11. A colorless oil. IR ($CHCl_3$) 1641 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.42-7.30 (5H, m), 5.82 (1H, m), 5.26 (1H, dd, *J*=17.1, 1.5 Hz), 5.23 (1H, dd, *J*=11.0, 1.5 Hz), 4.96 (2H, s), 4.21 (2H, d, *J*=5.8 Hz), 1.31 (1H, s). ^{13}C NMR ($CDCl_3$) δ 153.8, 134.1, 131.0, 129.4, 129.0, 128.6, 119.3, 79.1, 78.1, 75.4, 49.5. MS (EI^+) *m/z* 215 (M^+, 29), 129 (100). HRMS (EI^+) calcd for $C_{13}H_{13}NO_2$ (M^+) 215.0946, found 215.0939.

Preparation of substrates 14 and 16. Following the same procedure as for **1** or **4A-E**, the synthetic intermediates **28** and **29** and the substrates **14** and **16** were obtained.

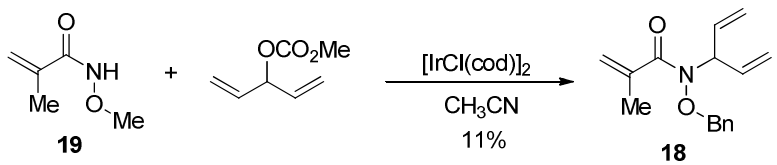
28. A colorless oil. IR ($CHCl_3$) 1699 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.42-7.31 (5H, m), 5.77 (1H, m), 5.09 (1H, dd, *J*=17.1, 1.5 Hz), 5.03 (1H, dd, *J*=10.4, 1.5 Hz), 4.84 (2H, s), 3.47 (2H, t, *J*=7.0 Hz), 2.36 (2H, m), 1.50 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.6, 135.7, 135.3, 129.4, 128.5, 128.4, 116.7, 81.2, 76.9, 49.2, 31.4, 28.2. MS (FAB^+) *m/z* 278 ($M+H^+$, 16), 91 (100). HRMS (FAB^+) calcd for $C_{16}H_{24}NO_3$ ($M+H^+$) 278.1756, found 278.1762.

29. A colorless oil. IR ($CHCl_3$) 1699 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.43-7.30 (5H, m), 5.79 (1H, m), 5.01 (1H, br d, *J*=17.0 Hz), 4.96 (1H, dd, *J*=10.0, 1.2 Hz), 4.83 (2H, s), 3.42 (2H, t, *J*=7.3 Hz), 2.08 (2H, m), 1.70 (2H, m), 1.50 (9H, s). ^{13}C NMR ($CDCl_3$) δ 156.6, 137.9, 135.7, 129.4, 128.5, 128.4, 115.0, 81.2, 76.9, 49.1, 30.8, 28.3, 26.1. MS (FAB^+) *m/z* 292 ($M+H^+$, 15), 91 (100). HRMS (FAB^+) calcd for $C_{17}H_{26}NO_3$ ($M+H^+$) 292.1913, found 292.1907.

14. A colorless oil. IR ($CHCl_3$) 1650 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.40-7.31 (5H, m), 5.76 (1H, m), 5.29 (1H, s), 5.24 (1H, s), 5.09 (1H, dd, *J*=17.1, 1.8 Hz), 5.05 (1H, dd, *J*=10.1, 1.8 Hz), 4.81 (2H, s), 3.67 (2H, t, *J*=7.0 Hz), 2.40 (2H, m), 1.96 (3H, s). ^{13}C NMR ($CDCl_3$) δ 171.7, 140.6, 134.6, 134.5, 129.1, 128.7, 128.4, 117.1, 117.0, 76.4, 46.4, 31.3, 19.8. MS (EI^+) *m/z* 245 (M^+, 1.3), 91 (100). HRMS (EI^+) calcd for $C_{15}H_{19}NO_2$ (M^+) 245.1416, found 245.1405.

16. A colorless oil. IR ($CHCl_3$) 1631 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.38-7.30 (5H, m), 5.77 (1H, m), 5.29 (1H, s), 5.23 (1H, s), 5.01 (1H, dd, *J*=17.1, 1.8 Hz), 4.97 (1H, dd, *J*=10.1, 1.8 Hz), 4.79 (2H, s), 3.61 (2H, t, *J*=7.3 Hz), 2.05 (2H, m), 1.99 (3H, s), 1.74 (2H, m). ^{13}C NMR ($CDCl_3$) δ 171.2, 140.4, 137.1, 134.4, 128.9, 128.4, 128.2, 116.7, 114.9, 76.1, 46.1, 30.3, 25.8, 19.5. MS (EI^+) *m/z* 259 (M^+, 0.5), 91 (100). HRMS (EI^+) calcd for $C_{16}H_{21}NO_2$ (M^+) 259.1572, found 259.1581.

1-3. Preparation of substrate 18 (Scheme 3)



Scheme 3

Preparation of substrate 18. To a solution of amide **19** (1.15 g, 10 mmol) in CH_3CN (40 mL) was added a solution of carbonate (1.42 g, 12 mmol) and $[IrCl(cod)]_2$ (536 mg, 0.80 mmol) in CH_3CN (20 mL) under argon atmosphere at the room temperature. After being stirred at the same temperature for 3 h, the reaction mixture was diluted with H_2O and then extracted with AcOEt. The organic phase was dried over $MgSO_4$ and concentrated under reduced pressure. Purification of the residue by flash silica gel column chromatography (AcOEt:hexane = 1:10−1:5) afforded the product **18** (283 mg, 11%).

18. A colorless oil. IR ($CHCl_3$) 1656 cm^{-1}. ^1H NMR ($CDCl_3$) δ 7.40-7.32 (5H, m), 6.05 (2H, m), 5.37-5.26 (7H, m), 4.88 (2H, s), 1.99 (3H, s). ^{13}C NMR ($CDCl_3$) δ 172.5, 140.9, 134.8, 134.5, 129.2, 128.7, 128.5, 118.5, 117.3, 78.6, 63.7, 19.7. MS (FAB^+) *m/z* 258 ($M+H^+$, 100). HRMS (FAB^+) calcd for $C_{16}H_{20}NO_2$ ($M+H^+$) 258.1494, found 258.1492.

2. NOESY of chiral products

The NOESY studies of *trans*-**2a**, *cis*-**2a**, *cis*-**21** and *trans*-**22** are shown in Figures 1 and 2.

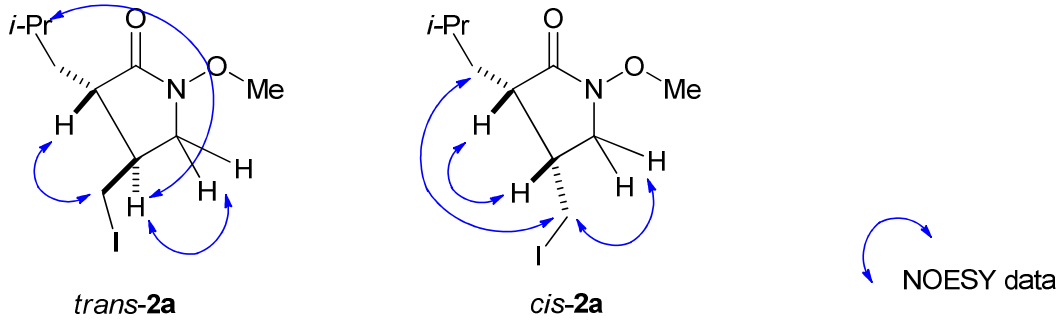


Fig. 1 NOESY study of *trans*-**2a** and *cis*-**2a**.

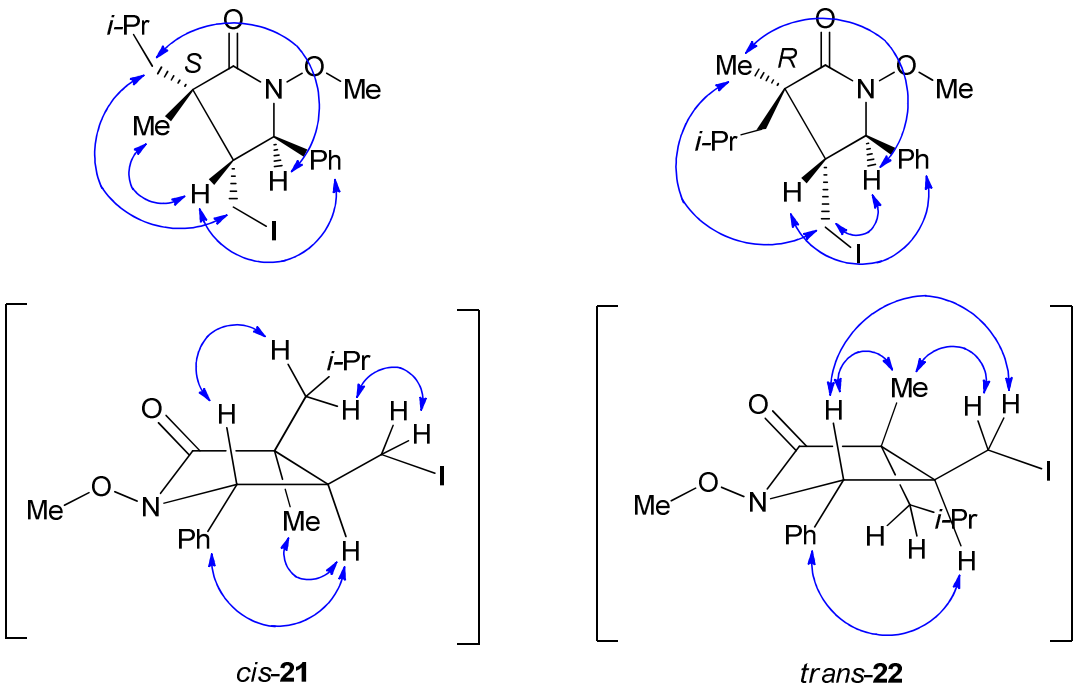
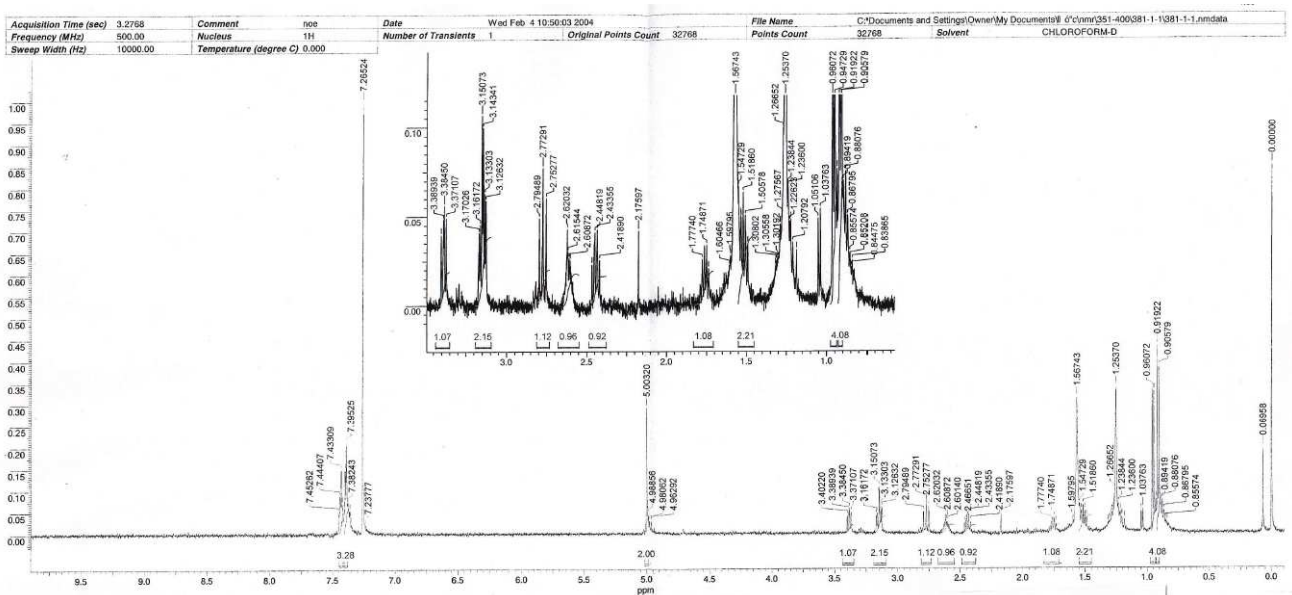


Fig. 2 NOESY study of *cis*-**21** and *trans*-**22**.

3. ^{1}H NMR of all obtained products

cis-**2a**



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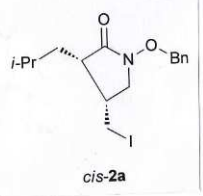
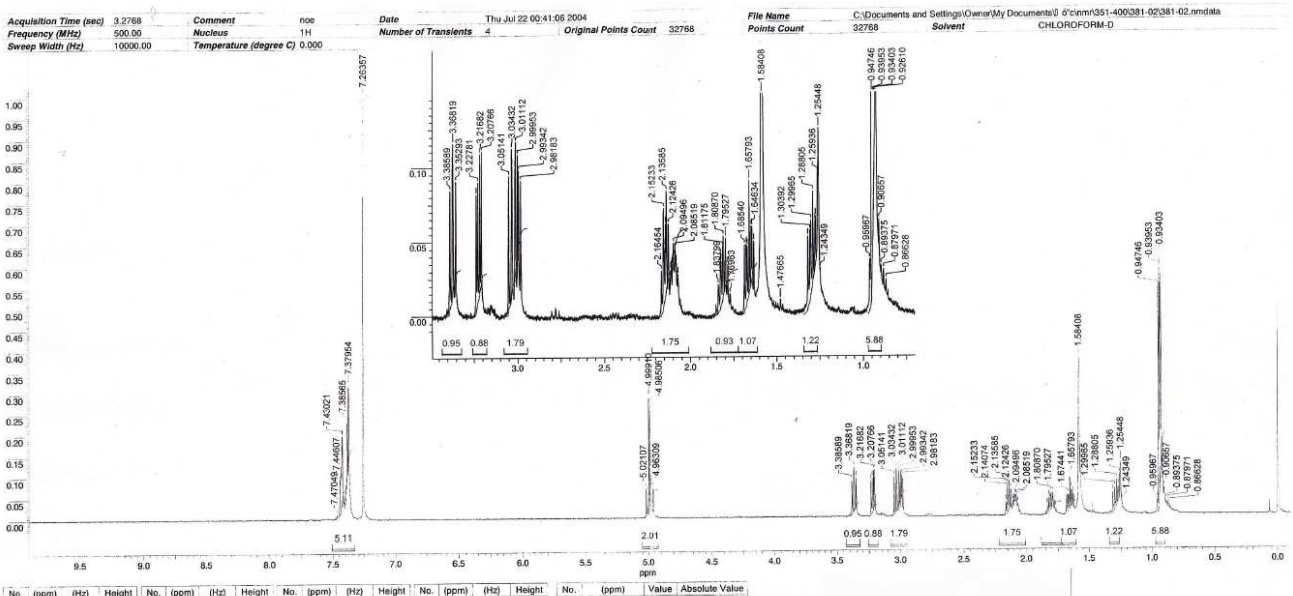
1	-0.00	-0.0	0.8497	24	1.24	619.2	0.0682	47	1.78	888.7	0.0259	70	4.96	2481.5	0.0284
2	0.01	3.4	0.0393	25	1.25	626.9	0.3371	48	2.18	1088.0	0.0419	71	4.98	2490.3	0.0285
3	0.07	34.8	0.1948	26	1.27	633.3	0.0995	49	2.42	1209.4	0.0255	72	4.99	2494.3	0.0453
4	0.84	419.3	0.0252	27	1.28	637.8	0.0517	50	2.43	1216.8	0.0425	73	5.00	2501.6	0.2923
5	0.84	422.4	0.0215	28	1.29	643.0	0.0457	51	2.45	1224.1	0.0412	74	7.24	3618.9	0.0216
6	0.85	426.0	0.0270	29	1.29	644.9	0.0382	52	2.47	1233.3	0.0230	75	7.27	3632.6	1.0000
7	0.86	427.9	0.0299	30	1.30	651.0	0.0273	53	2.60	1300.7	0.0254	76	7.35	3677.5	0.0226
8	0.87	434.0	0.0505	31	1.31	652.8	0.0265	54	2.61	1304.4	0.0265	77	7.36	3681.8	0.0511
9	0.87	437.0	0.0358	32	1.31	654.0	0.0255	55	2.62	1307.7	0.0301	78	7.37	3683.0	0.0537
10	0.88	440.4	0.0752	33	1.31	656.5	0.0249	56	2.62	1310.2	0.0428	79	7.38	3687.6	0.0619
11	0.89	447.1	0.0700	34	1.32	658.6	0.0222	57	2.75	1376.4	0.0604	80	7.38	3689.4	0.0573
12	0.91	452.9	0.3835	35	1.49	744.7	0.0343	58	2.77	1386.5	0.0771	81	7.38	3691.2	0.0726
13	0.92	459.6	0.4319	36	1.51	752.9	0.0503	59	2.79	1397.4	0.0491	82	7.39	3695.5	0.1794
14	0.93	466.0	0.0765	37	1.52	759.3	0.0634	60	3.13	1563.2	0.0590	83	7.40	3697.6	0.2115
15	0.95	473.6	0.3281	38	1.53	765.7	0.0484	61	3.13	1566.5	0.0629	84	7.40	3700.7	0.1481
16	0.96	480.4	0.3345	39	1.53	766.9	0.0505	62	3.14	1571.7	0.0997	85	7.41	3702.5	0.1480
17	1.04	518.8	0.0543	40	1.54	769.4	0.0383	63	3.15	1575.4	0.1068	86	7.41	3706.2	0.0583

No.	(ppm)	Value	Absolute Value
1	[0.90 .. 0.93]	4.078	1.21069e+3
2	[0.94 .. 0.97]	3.396	1.00821e+3
3	[1.45 .. 1.55]	2.205	6.54763e+2
4	[1.71 .. 1.83]	1.078	3.20114e+2
5	[2.38 .. 2.49]	0.918	2.72565e+2
6	[2.55 .. 2.68]	0.960	2.85124e+2
7	[2.73 .. 2.81]	1.124	3.33755e+2
8	[3.09 .. 3.19]	2.155	6.39752e+2
9	[3.35 .. 3.44]	1.056	3.16379e+2
10	[4.99 .. 5.02]	2.000	5.93815e+2
11	[7.38 .. 7.41]	3.276	9.72761e+2
12	[7.42 .. 7.45]	1.015	5.98299e+2



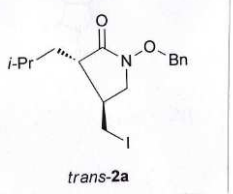
cis-**2a**

trans-**2a**



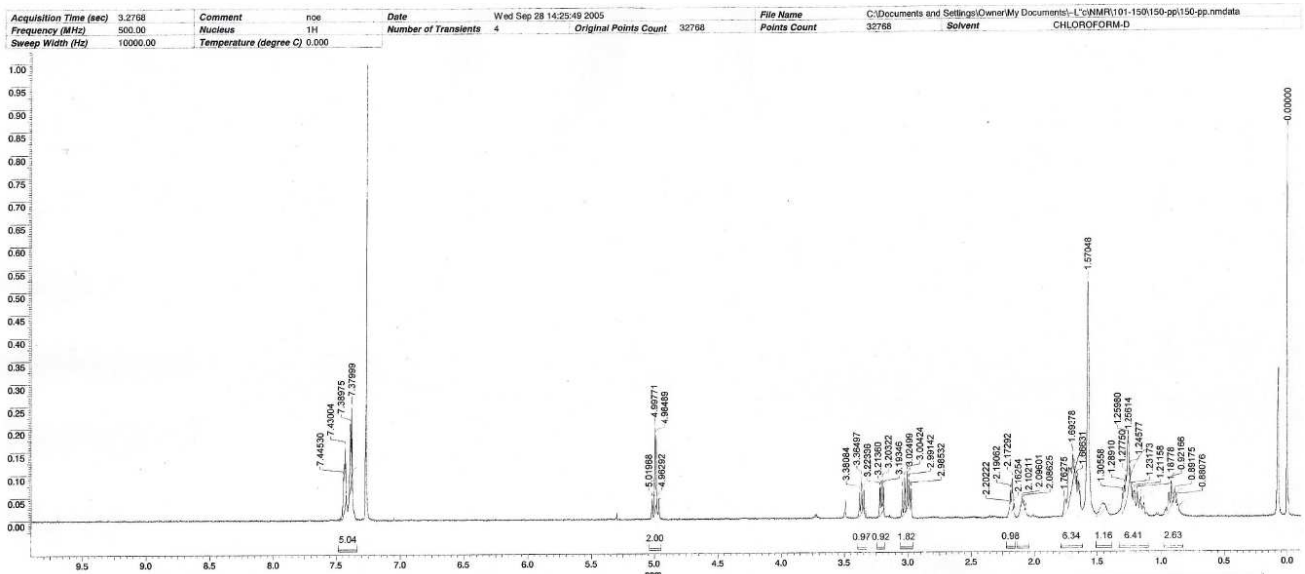
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	0.87	433.1	0.0238	21	1.63	814.9	0.0496	41	2.10	1050.8	0.0342	61	3.24	1618.5	0.0818
2	0.88	439.9	0.0307	22	1.64	820.7	0.0595	42	2.11	1053.3	0.0320	62	3.35	1676.5	0.0907
3	0.89	446.9	0.0334	23	1.65	823.2	0.0601	43	2.11	1055.4	0.0309	63	3.37	1684.1	0.1159
4	0.91	453.3	0.0640	24	1.66	829.0	0.0904	44	2.12	1062.1	0.0615	64	3.39	1692.9	0.0845
5	0.93	463.0	0.5755	25	1.67	834.5	0.0463	45	2.14	1067.9	0.0835	65	4.96	2481.5	0.0735
6	0.93	467.0	0.6125	26	1.67	837.2	0.0477	46	2.14	1070.4	0.0614	66	4.99	2492.5	0.2717
7	0.94	469.8	0.5876	27	1.69	842.7	0.0472	47	2.15	1074.0	0.0461	67	5.00	2499.6	0.2888
8	0.95	473.7	0.5415	28	1.77	884.8	0.0146	48	2.15	1076.2	0.0721	68	5.02	2510.5	0.0692
9	0.96	479.8	0.0372	29	1.78	891.2	0.0343	49	2.16	1082.3	0.0303	69	7.26	3631.8	1.0000
10	1.24	621.7	0.0317	30	1.80	897.6	0.0521	50	2.98	1490.9	0.0909	70	7.38	3687.9	0.3001
11	1.25	627.2	0.1253	31	1.81	904.3	0.0533	51	2.99	1496.7	0.0976	71	7.38	3689.8	0.3206
12	1.26	629.7	0.0955	32	1.81	905.9	0.0461	52	3.00	1499.8	0.1082	72	7.39	3692.8	0.2300
13	1.27	636.1	0.0664	33	1.82	910.8	0.0365	53	3.01	1505.6	0.1168	73	7.39	3695.0	0.2284
14	1.28	637.9	0.0631	34	1.82	912.3	0.0398	54	3.01	1507.1	0.0994	74	7.40	3698.6	0.0836
15	1.29	644.0	0.0831	35	1.84	919.0	0.0207	55	3.03	1515.6	0.1009	75	7.41	3704.1	0.0417
16	1.30	649.8	0.0638	36	2.07	1034.7	0.0275	56	3.03	1517.2	0.1125	76	7.43	3713.3	0.1964
17	1.30	652.0	0.0570	37	2.07	1036.8	0.0253	57	3.05	1525.7	0.0940	77	7.43	3715.1	0.1975

No.	(ppm)	Value	Absolute Value
1	[0.90 .. 0.97]	5.876	3.55281e+3
2	[1.26 .. 1.34]	1.215	7.34873e+2
3	[1.61 .. 1.72]	1.070	6.47142e+2
4	[1.72 .. 1.88]	0.926	5.60135e+2
5	[2.01 .. 2.22]	1.750	1.05785e+3
6	[2.94 .. 3.08]	1.786	1.08017e+3
7	[3.18 .. 3.26]	0.875	5.29208e+2
8	[3.32 .. 3.43]	0.948	5.73405e+2
9	[4.92 .. 5.05]	2.012	1.21664e+3
10	[7.33 .. 7.51]	5.108	3.08876e+3



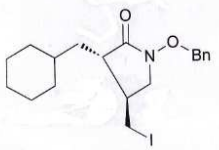
trans-**2a**

trans-**2b**



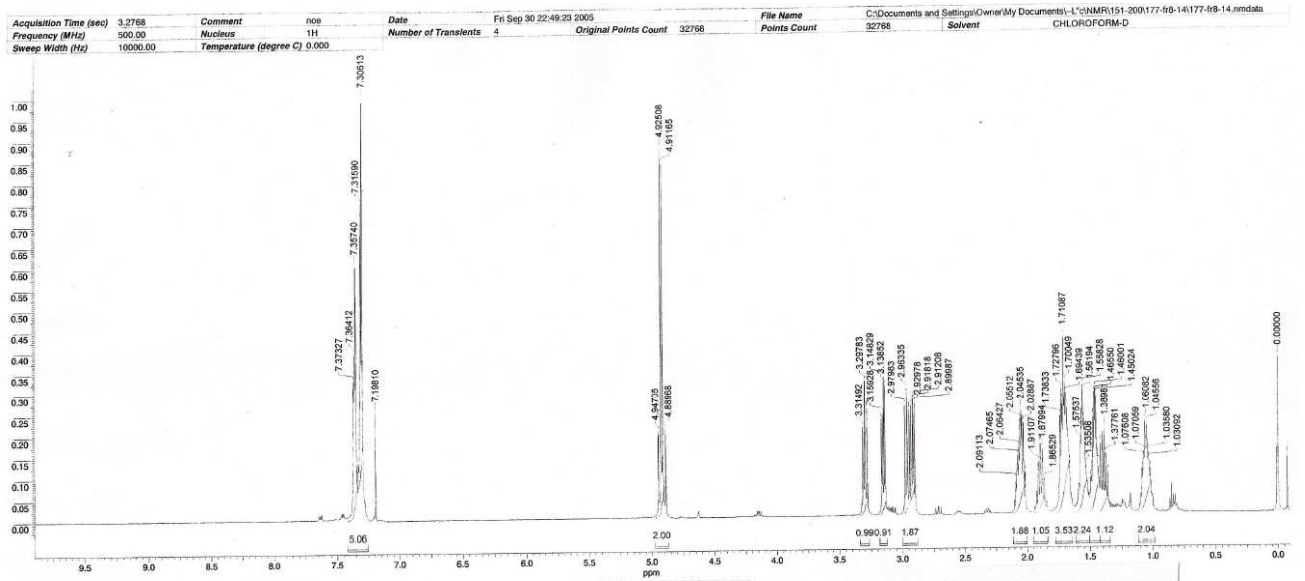
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.8395	18	1.29	646.4	0.0679	35	2.17	1086.5	0.0862	52	3.36	1682.5	0.0905
2	0.88	440.4	0.0383	19	1.31	652.8	0.0509	36	2.18	1089.5	0.0588	53	3.38	1690.4	0.0579
3	0.89	445.9	0.0539	20	1.57	785.2	0.5153	37	2.19	1092.9	0.0402	54	4.96	2481.5	0.0464
4	0.92	460.8	0.0768	21	1.64	819.4	0.0580	38	2.19	1095.3	0.0591	55	4.98	2492.4	0.1843
5	1.14	570.1	0.0315	22	1.65	825.2	0.0783	39	2.20	1101.1	0.0246	56	5.00	2498.9	0.2000
6	1.16	582.3	0.0445	23	1.65	827.4	0.0805	40	2.97	1486.9	0.0629	57	5.02	2509.8	0.0458
7	1.19	593.9	0.0544	24	1.67	833.2	0.0895	41	2.99	1492.7	0.0655	58	7.38	3687.9	0.1941
8	1.19	596.0	0.0502	25	1.68	839.3	0.1008	42	2.99	1495.7	0.0843	59	7.38	3690.0	0.2486
9	1.21	605.8	0.0576	26	1.68	841.4	0.1110	43	3.00	1502.1	0.1010	60	7.39	3693.0	0.1984
10	1.22	608.8	0.0566	27	1.69	846.9	0.1368	44	3.02	1511.0	0.0640	61	7.39	3694.9	0.2110
11	1.23	615.9	0.0632	28	1.76	881.4	0.0348	45	3.02	1512.5	0.0878	62	7.43	3713.2	0.1279
12	1.25	622.9	0.1096	29	2.07	1034.9	0.0182	46	3.04	1521.0	0.0627	63	7.43	3715.0	0.1613
13	1.25	624.7	0.0941	30	2.08	1039.8	0.0263	47	3.19	1596.7	0.0700	64	7.44	3718.7	0.1246
14	1.26	628.1	0.1646	31	2.09	1043.1	0.0370	48	3.20	1601.6	0.0843	65	7.45	3722.6	0.0957
15	1.26	629.9	0.1757	32	2.10	1048.0	0.0402	49	3.21	1606.8	0.0694				
16	1.28	638.8	0.0921	33	2.10	1051.1	0.0334	50	3.22	1611.7	0.0656				
17	1.29	644.6	0.0695	34	2.16	1081.3	0.0307	51	3.35	1673.6	0.0624				

No.	(ppm)	Value	Absolute Value
1	[0.83 .. 0.98]	2.631	1.09552e+3
2	[1.10 .. 1.33]	6.406	2.66754e+3
3	[1.39 .. 1.51]	1.155	4.80980e+2
4	[1.62 .. 1.79]	6.343	2.64113e+3
5	[2.04 .. 2.14]	0.900	3.74667e+2
6	[2.15 .. 2.22]	0.981	4.08404e+2
7	[2.96 .. 3.06]	1.819	7.57534e+2
8	[3.18 .. 3.25]	0.915	3.81107e+2
9	[3.33 .. 3.40]	0.969	4.03366e+2
10	[4.95 .. 5.04]	2.000	8.32808e+2
11	[7.33 .. 7.48]	5.043	2.09999e+3



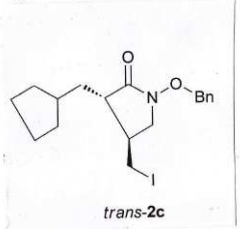
trans-**2b**

trans-**2c**



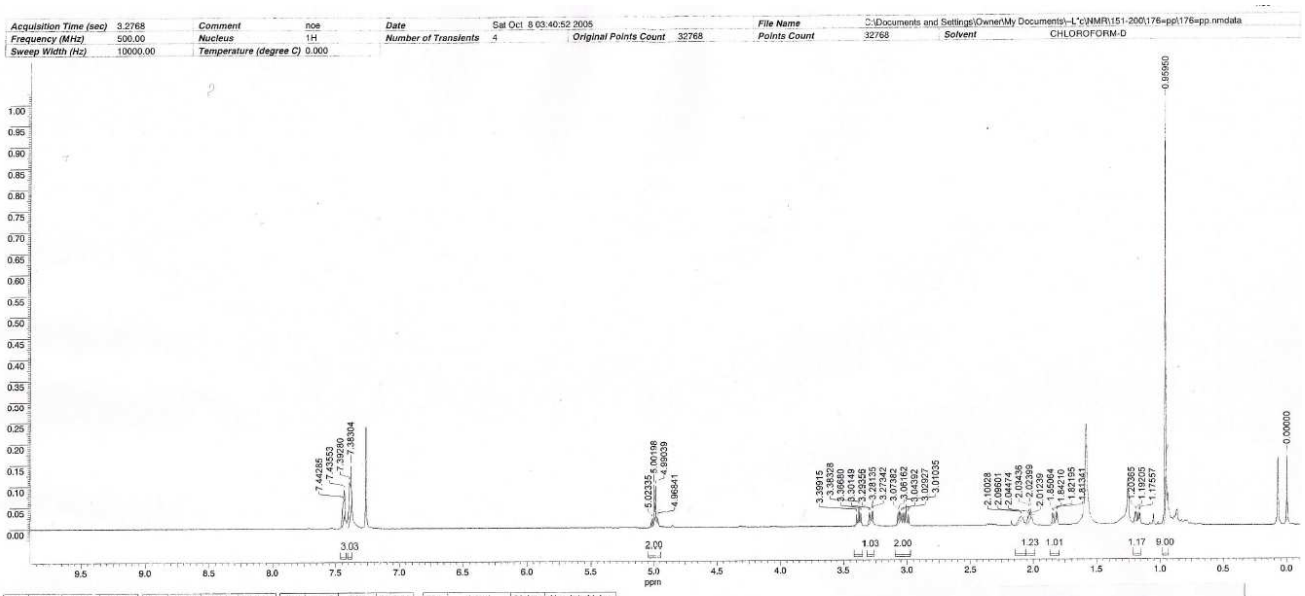
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.3672	23	1.48	740.4	0.1349	45	2.02	1008.6	0.0992	67	3.28	1641.0	0.2530
2	1.02	510.0	0.1053	24	1.49	745.0	0.0907	46	2.03	1014.4	0.2165	68	3.30	1648.9	0.3206
3	1.03	515.5	0.1260	25	1.50	748.3	0.0845	47	2.03	1016.0	0.1311	69	3.31	1657.5	0.2085
4	1.04	517.9	0.1449	26	1.53	766.0	0.1065	48	2.04	1019.9	0.2349	70	4.89	2444.8	0.2118
5	1.05	522.8	0.2129	27	1.54	767.5	0.1130	49	2.05	1022.7	0.2447	71	4.91	2455.8	0.8422
6	1.05	526.7	0.1534	28	1.54	772.1	0.2125	50	2.06	1027.6	0.2234	72	4.93	2462.5	0.8767
7	1.06	530.4	0.2189	29	1.55	775.2	0.2231	51	2.06	1032.1	0.1591	73	4.95	2473.5	0.2048
8	1.07	535.3	0.1457	30	1.56	779.1	0.3078	52	2.07	1034.9	0.1122	74	7.29	3599.0	0.2554
9	1.08	538.0	0.1306	31	1.56	781.0	0.2916	53	2.07	1037.3	0.1374	75	7.30	3651.2	0.7994
10	1.09	542.9	0.1073	32	1.57	783.4	0.2487	54	2.09	1045.6	0.0830	76	7.31	3653.1	1.0000
11	1.36	680.9	0.1002	33	1.58	787.7	0.1724	55	2.90	1449.9	0.2686	77	7.31	3658.1	0.7046
12	1.38	687.6	0.1406	34	1.68	842.0	0.2516	56	2.91	1456.0	0.2816	78	7.32	3657.9	0.7517
13	1.38	688.9	0.1418	35	1.69	847.2	0.2874	57	2.92	1459.1	0.2719	79	7.32	3662.2	0.2955
14	1.39	694.9	0.2039	36	1.70	850.2	0.3150	58	2.93	1464.9	0.2597	80	7.33	3667.4	0.1333
15	1.40	701.3	0.1754	37	1.71	855.4	0.4199	59	2.94	1471.6	0.2489	81	7.35	3673.6	0.1210
16	1.41	702.5	0.1699	38	1.72	860.8	0.2668	60	2.96	1479.8	0.2816	82	7.35	3676.9	0.5337
17	1.42	709.3	0.1669	39	1.73	864.0	0.2977	61	2.96	1481.7	0.3008	83	7.36	3678.7	0.6052

No.	(ppm)	Value	Absolute Value
1	[0.99 .. 1.12]	2.043	1.65383e+3
2	[1.35 .. 1.43]	1.121	9.07390e+2
3	[1.43 .. 1.51]	2.012	1.62871e+3
4	[1.51 .. 1.62]	2.236	1.81011e+3
5	[1.64 .. 1.78]	3.530	2.85687e+3
6	[1.84 .. 1.95]	1.055	8.53546e+2
7	[2.01 .. 2.11]	1.881	1.52254e+3
8	[2.88 .. 3.00]	1.868	1.51199e+3
9	[3.13 .. 3.18]	0.912	7.38392e+2
10	[3.27 .. 3.34]	0.986	7.98225e+2
11	[4.87 .. 4.98]	2.000	1.61880e+3
12	[7.25 .. 7.42]	5.062	4.09710e+3

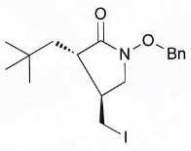


trans-**2c**

trans-**2d**

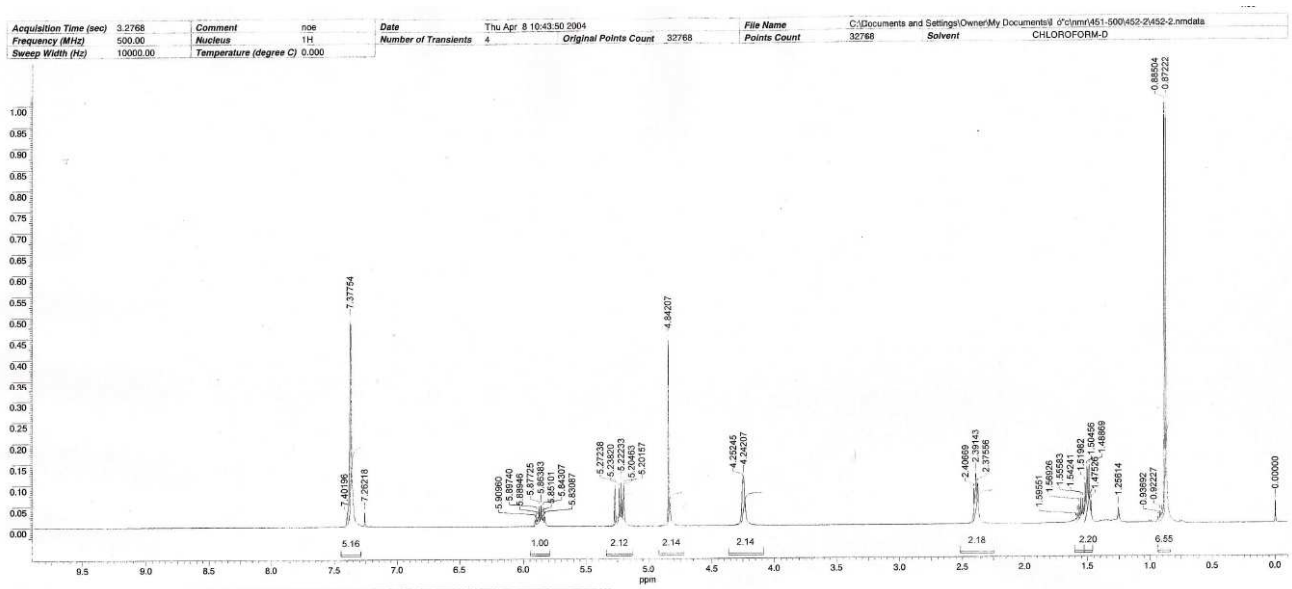


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	-0.00	-0.0	0.1615	15	2.09	1045.6	0.0198	29	3.29	1646.8	0.0315	1	[0.94 .. 0.98]	8.968	4.01646e+3
2	0.96	479.8	1.0000	16	2.10	1048.0	0.0210	30	3.30	1650.7	0.0319	2	[1.15 .. 1.22]	1.175	5.24334e+2
3	1.16	582.0	0.0286	17	2.10	1050.1	0.0213	31	3.37	1683.4	0.0318	3	[1.80 .. 1.87]	1.014	4.52438e+2
4	1.16	587.8	0.0301	18	2.10	1051.7	0.0202	32	3.38	1691.6	0.0462	4	[1.99 .. 2.06]	1.229	5.48594e+2
5	1.19	596.0	0.0322	19	2.11	1053.2	0.0197	33	3.40	1699.6	0.0282	5	[2.06 .. 2.15]	1.014	4.52548e+2
6	1.20	601.8	0.0329	20	2.99	1495.4	0.0284	34	4.97	2484.2	0.0228	6	[2.97 .. 3.09]	1.995	8.90615e+2
7	1.81	906.7	0.0313	21	3.01	1505.2	0.0510	35	4.99	2495.2	0.0982	7	[3.26 .. 3.32]	1.033	4.61064e+2
8	1.82	911.0	0.0330	22	3.03	1514.6	0.0320	36	5.00	2501.0	0.1007	8	[3.35 .. 3.42]	0.995	4.44033e+2
9	1.84	921.0	0.0279	23	3.04	1522.0	0.0306	37	5.02	2511.7	0.0198	9	[4.95 .. 5.05]	2.000	8.92669e+2
10	1.85	925.3	0.0296	24	3.06	1528.1	0.0333	38	7.38	3691.5	0.1477	10	[7.37 .. 7.40]	3.026	1.35086e+3
11	2.01	1006.2	0.0186	25	3.06	1530.8	0.0369	39	7.39	3694.6	0.1055	11	[7.42 .. 7.45]	1.997	8.91575e+2
12	2.02	1012.0	0.0391	26	3.07	1536.9	0.0325	40	7.39	3696.4	0.1096				
13	2.03	1017.2	0.0383	27	3.27	1636.7	0.0352	41	7.44	3717.8	0.0900				
14	2.04	1022.4	0.0214	28	3.28	1640.7	0.0358	42	7.44	3721.4	0.0630				

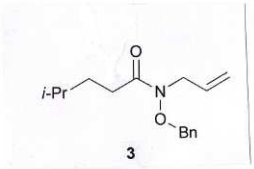


trans-**2d**

3

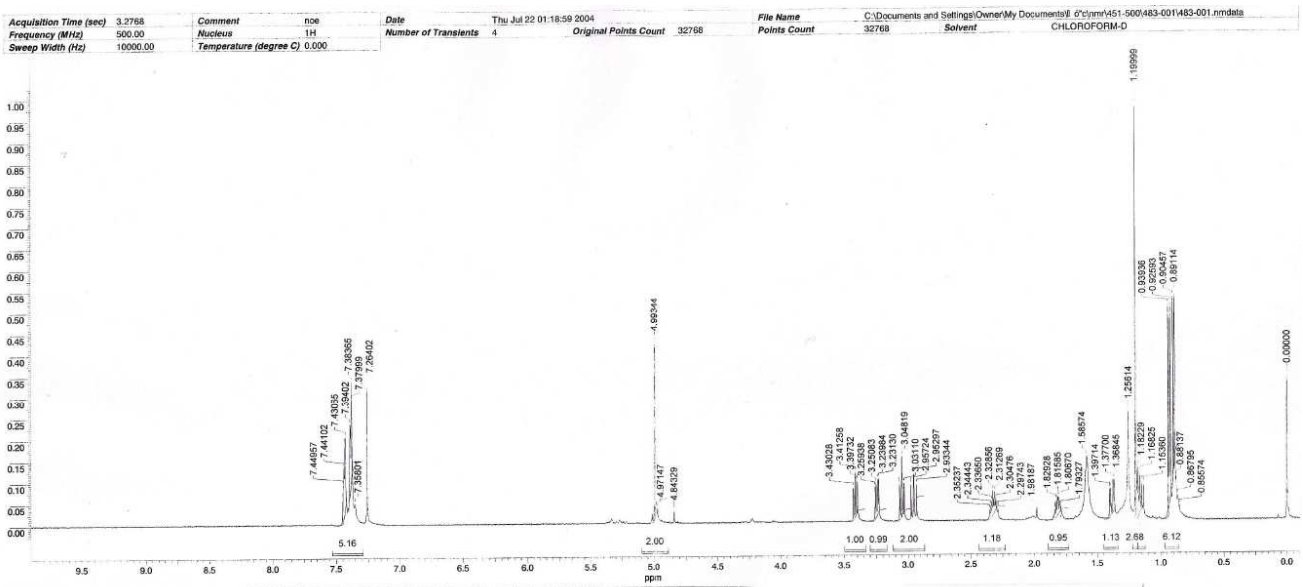


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	-0.00	-0.0	0.0530	17	1.60	797.8	0.0121	33	5.84	2921.5	0.0455	1	[0.84 .. 0.94]	6.546	5.21336e+3
2	0.87	436.1	1.0000	18	2.38	1187.8	0.0963	34	5.85	2925.5	0.0287	2	[1.46 .. 1.53]	2.196	1.74904e+3
3	0.89	442.5	0.9977	19	2.39	1195.7	0.1200	35	5.86	2927.6	0.0282	3	[1.53 .. 1.60]	1.010	8.04250e+2
4	0.91	453.8	0.0248	20	2.41	1203.3	0.0840	36	5.86	2931.9	0.0520	4	[2.25 .. 2.52]	2.179	1.73537e+3
5	0.92	461.1	0.0284	21	4.24	2121.0	0.1184	37	5.88	2938.6	0.0478	5	[4.09 .. 4.37]	2.137	1.70178e+3
6	0.94	468.5	0.0157	22	4.25	2126.2	0.1112	38	5.89	2942.9	0.0243	6	[4.72 .. 4.92]	2.142	1.70562e+3
7	1.26	628.1	0.0388	23	4.84	2421.0	0.4445	39	5.89	2944.7	0.0236	7	[5.13 .. 5.34]	2.116	1.68489e+3
8	1.48	737.5	0.0546	24	5.20	2600.8	0.0958	40	5.90	2948.7	0.0349	8	[5.79 .. 5.95]	1.000	7.96401e+2
9	1.49	744.3	0.1385	25	5.20	2602.3	0.0892	41	5.91	2954.8	0.0163	9	[7.29 .. 7.45]	5.161	4.11022e+3
10	1.50	752.3	0.1350	26	5.22	2611.2	0.1050	42	7.26	3631.1	0.0357				
11	1.52	759.9	0.0967	27	5.22	2612.4	0.0985	43	7.37	3686.0	0.4850				
12	1.53	765.1	0.0454	28	5.24	2619.1	0.0916	44	7.38	3688.8	0.4941				
13	1.54	771.2	0.0600	29	5.24	2620.6	0.0797	45	7.40	3701.0	0.0245				



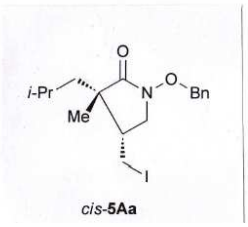
3

5Aa



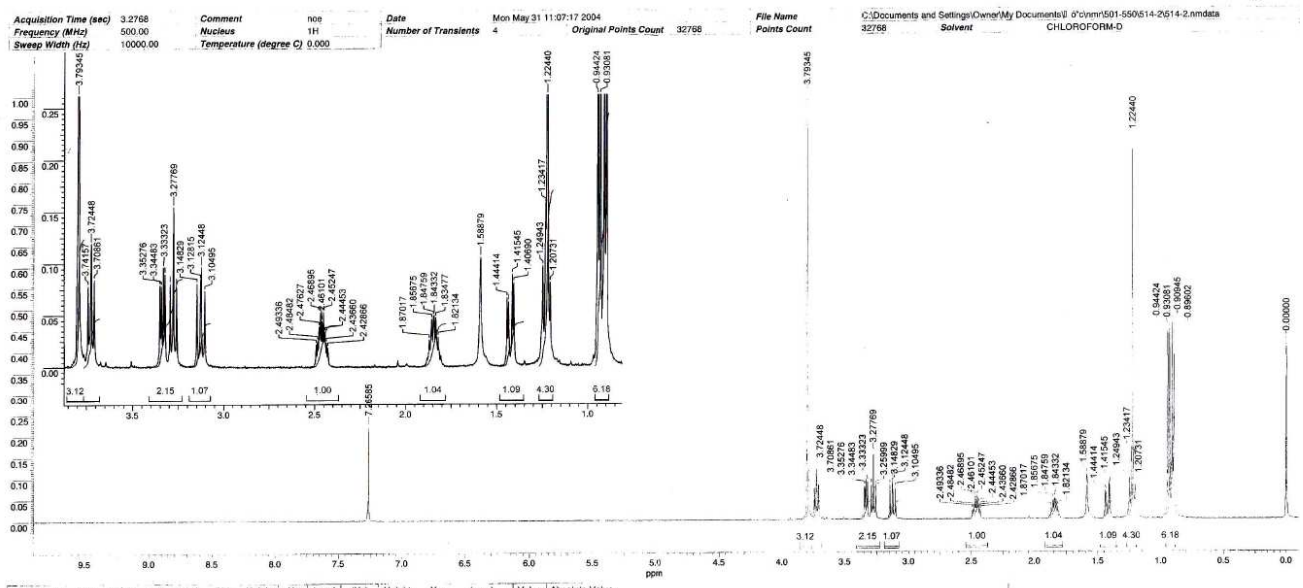
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	0.00	0.0	0.3390	17	1.40	698.6	0.0731	33	2.34	1168.2	0.0449	49	3.42	1707.5	0.1075
2	0.86	427.9	0.0341	18	1.41	702.8	0.0719	34	2.34	1172.2	0.0343	50	3.43	1716.1	0.0788
3	0.87	434.0	0.0574	19	1.59	792.9	0.1495	35	2.35	1176.2	0.0248	51	4.84	2421.6	0.0281
4	0.88	440.7	0.1005	20	1.79	896.6	0.0326	36	2.93	1466.7	0.0863	52	4.97	2485.7	0.0350
5	0.89	445.6	0.5305	21	1.81	903.3	0.0531	37	2.95	1476.5	0.1111	53	4.99	2496.7	0.4269
6	0.90	452.3	0.5281	22	1.82	907.9	0.0549	38	2.96	1478.6	0.0916	54	7.26	3632.0	0.3329
7	0.93	463.0	0.5106	23	1.82	910.1	0.0533	39	2.98	1488.4	0.0864	55	7.35	3676.0	0.0431
8	0.94	469.7	0.5052	24	1.83	914.6	0.0469	40	3.03	1515.5	0.0893	56	7.36	3679.0	0.0503
9	1.14	569.8	0.0831	25	1.84	921.0	0.0247	41	3.05	1524.1	0.1527	57	7.38	3690.0	0.2944
10	1.15	576.8	0.0888	26	1.98	990.9	0.0291	42	3.07	1532.9	0.0869	58	7.38	3691.8	0.3373
11	1.17	584.1	0.1121	27	2.29	1144.4	0.0263	43	3.23	1615.6	0.1014	59	7.39	3694.9	0.2286
12	1.18	591.1	0.1231	28	2.30	1148.7	0.0321	44	3.24	1619.9	0.0992	60	7.39	3697.0	0.2356
13	1.20	600.0	1.0000	29	2.30	1152.4	0.0474	45	3.25	1625.4	0.0894	61	7.43	3715.3	0.2065
14	1.26	628.1	0.2573	30	2.31	1156.3	0.0675	46	3.26	1629.7	0.0811	62	7.43	3717.2	0.2033
15	1.37	684.2	0.0955	31	2.32	1160.3	0.0520	47	3.40	1698.7	0.0952	63	7.44	3720.5	0.1334

No.	(ppm)	Value	Absolute Value
1	[0.86 .. 0.97]	6.120	3.44331e+3
2	[1.19 .. 1.19]	1.330	7.48450e+2
3	[1.19 .. 1.22]	2.685	1.51039e+3
4	[1.34 .. 1.45]	1.135	6.38374e+2
5	[1.73 .. 1.89]	0.946	5.31980e+2
6	[2.23 .. 2.44]	1.180	6.64017e+2
7	[2.87 .. 3.11]	2.001	1.12584e+3
8	[3.17 .. 3.30]	0.994	5.59026e+2
9	[3.34 .. 3.50]	0.996	5.60353e+2
10	[4.89 .. 5.10]	2.000	1.12516e+3
11	[7.29 .. 7.53]	5.157	2.90125e+3

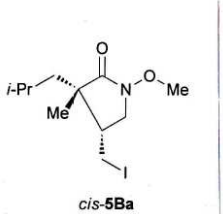


cis-**5Aa**

5Ba

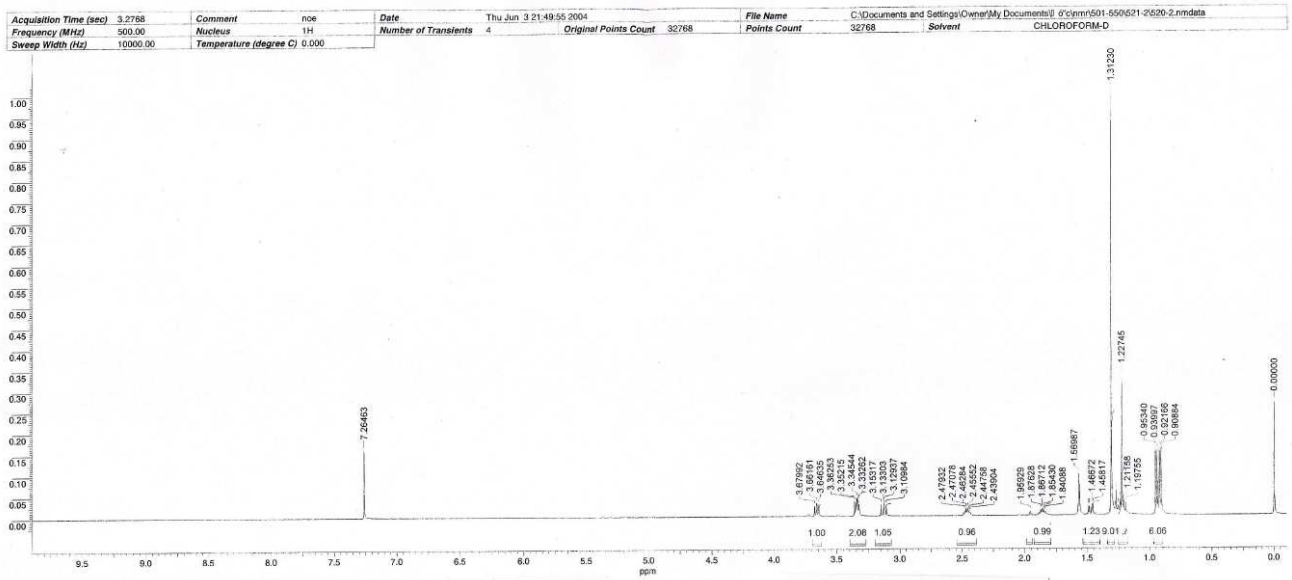


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	-0.00	-0.0	0.4147	16	1.83	917.4	0.0471	31	3.12	1562.2	0.0965	1	[0.89 .. 0.96]	6.175	4.38360e+3
2	0.90	448.0	0.4464	17	1.84	921.7	0.0496	32	3.13	1564.1	0.0844	2	[1.19 .. 1.27]	4.299	3.05147e+3
3	0.91	454.7	0.4651	18	1.85	923.8	0.0484	33	3.15	1574.1	0.0805	3	[1.35 .. 1.48]	1.086	7.71053e+2
4	0.93	465.4	0.4475	19	1.86	928.4	0.0455	34	3.26	1630.0	0.0782	4	[1.78 .. 1.92]	1.038	7.36574e+2
5	0.94	472.1	0.4514	20	1.87	935.1	0.0258	35	3.28	1638.8	0.1546	5	[2.37 .. 2.54]	1.000	7.09887e+2
6	1.21	603.7	0.0813	21	2.43	1214.3	0.0185	36	3.30	1647.7	0.0506	6	[3.07 .. 3.19]	1.073	7.61567e+2
7	1.22	612.2	0.8905	22	2.44	1218.3	0.0227	37	3.32	1658.2	0.0697	7	[3.23 .. 3.41]	2.153	1.52843e+3
8	1.23	617.1	0.1579	23	2.44	1222.3	0.0333	38	3.33	1666.6	0.0961	8	[3.68 .. 3.76]	1.190	8.44516e+2
9	1.25	624.7	0.0971	24	2.45	1226.2	0.0526	39	3.34	1672.4	0.0781	9	[3.77 .. 3.85]	3.122	2.21591e+3
10	1.41	703.5	0.0809	25	2.46	1230.5	0.0438	40	3.35	1676.4	0.0791				
11	1.42	707.7	0.0892	26	2.47	1234.5	0.0521	41	3.71	1854.3	0.0643				
12	1.44	717.8	0.0625	27	2.48	1238.1	0.0384	42	3.72	1862.2	0.1194				
13	1.44	722.1	0.0668	28	2.48	1242.4	0.0247	43	3.74	1870.6	0.0783				
14	1.58	784.4	0.1055	29	2.49	1246.7	0.0214	44	3.78	1886.3	0.6000				
15	1.82	910.7	0.0286	30	3.10	1552.5	0.0734	45	7.27	3632.8	0.2220				



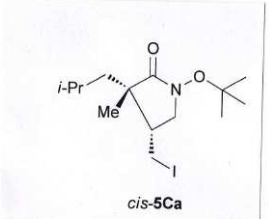
cis-**5Ba**

5Ca



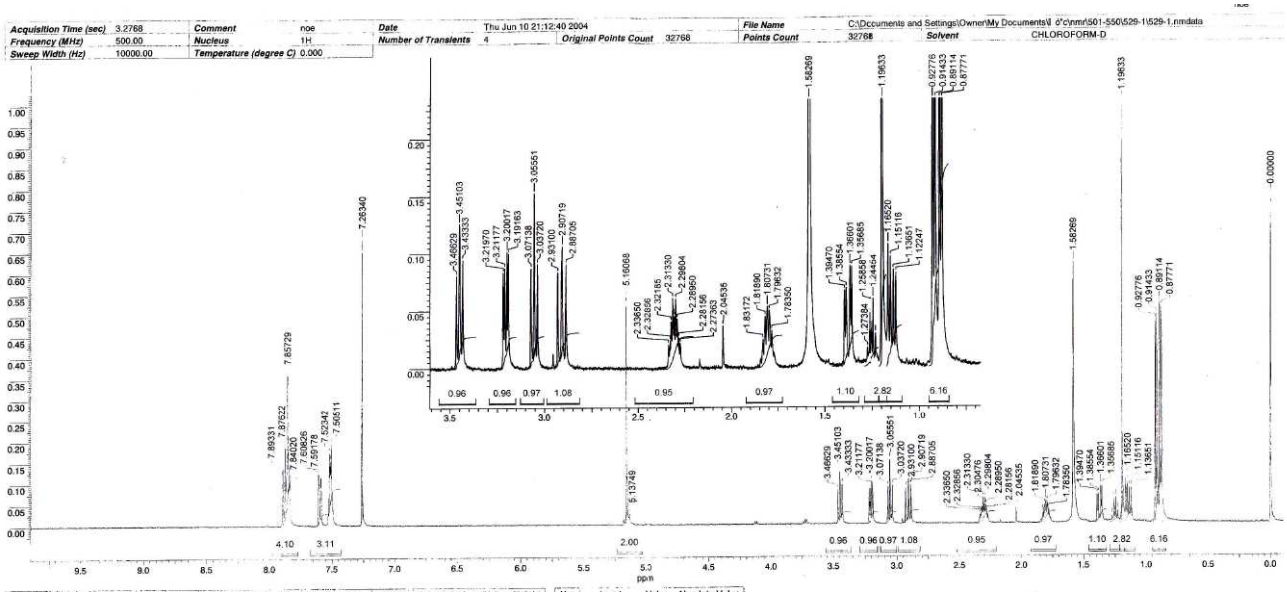
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.2656	17	1.49	743.1	0.0216	33	3.13	1564.7	0.0332
2	0.91	454.4	0.1585	18	1.50	747.7	0.0221	34	3.13	1566.5	0.0272
3	0.92	460.8	0.1597	19	1.57	784.9	0.0983	35	3.15	1576.6	0.0274
4	0.94	470.0	0.1551	20	1.84	920.4	0.0093	36	3.33	1663.9	0.0280
5	0.95	476.7	0.1590	21	1.85	927.2	0.0152	37	3.33	1666.3	0.0375
6	1.20	598.8	0.0301	22	1.86	931.4	0.0148	38	3.34	1670.3	0.0403
7	1.21	605.8	0.0351	23	1.87	933.6	0.0154	39	3.35	1672.7	0.0438
8	1.23	613.7	0.3330	24	1.88	938.1	0.0136	40	3.35	1676.1	0.0312
9	1.24	619.8	0.0385	25	1.96	979.6	0.0097	41	3.36	1681.3	0.0353
10	1.25	622.6	0.0302	26	2.44	1219.5	0.0075	42	3.65	1823.2	0.0288
11	1.26	629.6	0.0238	27	2.45	1223.8	0.0115	43	3.66	1830.8	0.0319
12	1.27	636.2	0.0598	28	2.46	1227.8	0.0174	44	3.67	1832.6	0.0306
13	1.28	641.5	0.0165	29	2.46	1231.4	0.0137	45	3.68	1840.0	0.0246
14	1.31	656.1	1.0000	30	2.47	1235.4	0.0170	46	7.26	3632.3	0.1609
15	1.46	729.1	0.0267	31	2.48	1239.7	0.0108				

No.	(ppm)	Value	Absolute Value
1	[0.90 .. 0.97]	6.056	2.82868e+3
2	[1.18 .. 1.25]	4.794	2.23942e+3
3	[1.29 .. 1.34]	9.015	4.21085e+3
4	[1.40 .. 1.54]	1.228	5.73543e+2
5	[1.79 .. 1.93]	0.994	4.64365e+2
6	[1.94 .. 1.99]	0.124	5.78351e+1
7	[2.38 .. 2.54]	0.962	4.49566e+2
8	[3.07 .. 3.20]	1.048	4.89342e+2
9	[3.27 .. 3.40]	2.083	9.73093e+2
10	[3.63 .. 3.69]	1.000	4.67098e+2



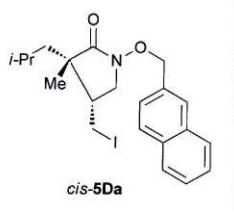
cis-**5Ca**

5Da



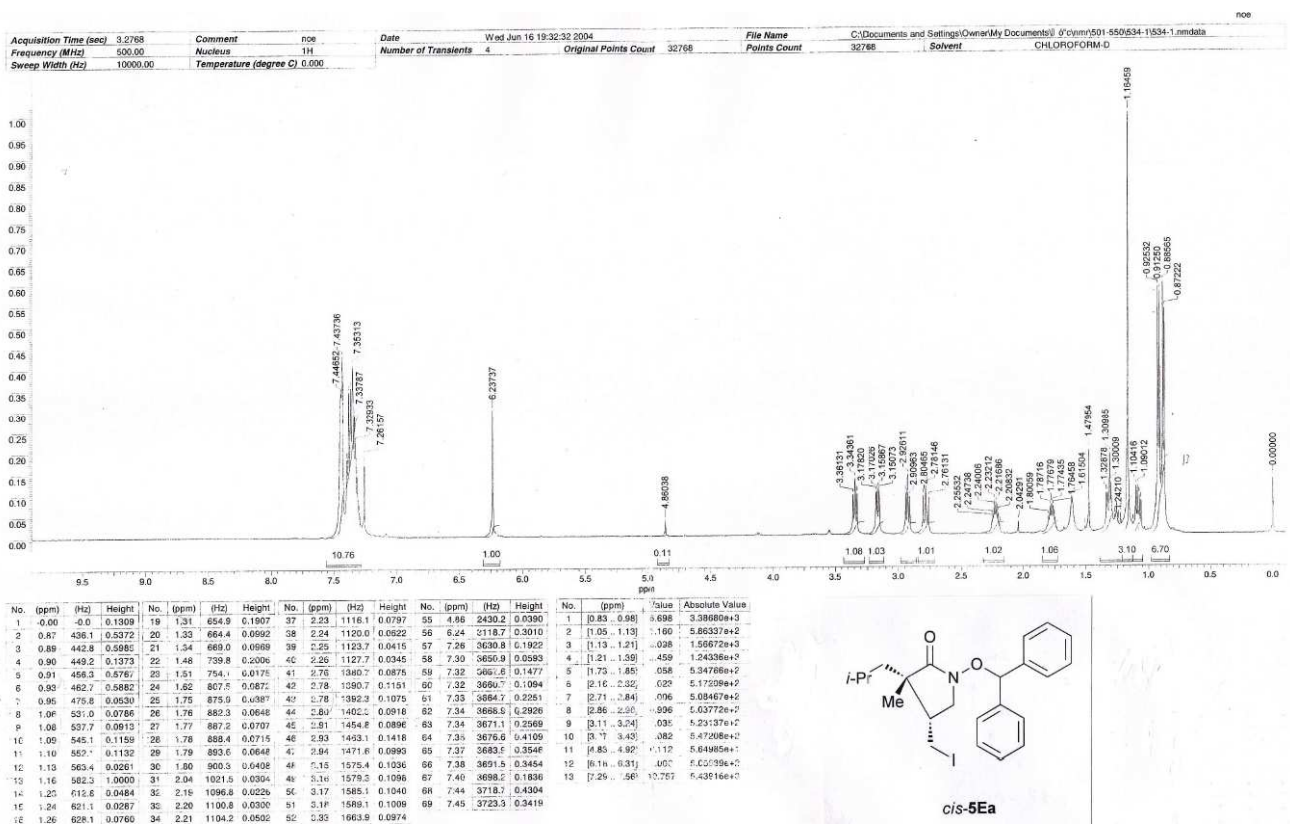
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.7761	17	1.37	683.0	0.0888	33	2.32	1160.9	0.0402	49	5.14	2568.7	0.0262
2	0.00	1.2	0.5112	18	1.39	692.8	0.0893	34	2.33	1164.3	0.0237	50	5.16	2580.3	0.5440
3	0.88	436.5	0.5151	19	1.39	697.3	0.0670	35	2.34	1168.2	0.0201	51	7.26	3631.7	0.8820
4	0.89	445.6	0.5248	20	1.58	791.3	0.6206	36	2.89	1443.5	0.0908	52	7.51	3752.6	0.1948
5	0.91	457.2	0.4963	21	1.78	891.6	0.0323	37	2.91	1453.6	0.1065	53	7.51	3756.2	0.1545
6	0.93	463.9	0.4826	22	1.80	896.2	0.0500	38	2.93	1465.5	0.0836	54	7.52	3757.7	0.1431
7	1.12	561.2	0.0824	23	1.81	903.7	0.0535	39	3.04	1518.6	0.0909	55	7.52	3759.3	0.1437
8	1.14	568.3	0.0848	24	1.82	908.5	0.0446	40	3.06	1527.6	0.1529	56	7.52	3761.7	0.1738
9	1.15	575.6	0.0965	25	1.83	915.9	0.0243	41	3.07	1535.7	0.0871	57	7.53	3766.3	0.0300
10	1.17	582.6	0.1074	26	2.05	1022.7	0.0265	42	3.19	1595.8	0.1001	58	7.54	3795.9	0.1162
11	1.20	598.2	1.0000	27	2.21	1136.6	0.0214	43	3.20	1600.1	0.1019	59	7.61	3804.1	0.1237
12	1.23	615.3	0.0294	28	2.28	1140.8	0.0262	44	3.21	1605.9	0.0875	60	7.84	3920.1	0.1095
13	1.24	622.3	0.0599	29	2.29	1144.7	0.0427	45	3.22	1609.9	0.0837	61	7.86	3928.6	0.3605
14	1.26	629.3	0.0553	30	2.30	1149.0	0.0602	46	3.43	1716.7	0.0945	62	7.86	3938.1	0.1864
15	1.27	636.9	0.0171	31	2.30	1152.4	0.0450	47	3.45	1725.5	0.1260	63	7.89	3946.7	0.1369
16	1.36	678.4	0.0881	32	2.31	1156.7	0.0609	48	3.47	1733.1	0.0807				

No.	(ppm)	Value	Absolute Value
1	[0.84 .. 0.95]	6.161	3.33140e+3
2	[1.09 .. 1.17]	4.261	2.30451e+3
3	[1.17 .. 1.21]	2.817	1.52294e+3
4	[1.22 .. 1.29]	1.976	1.06864e+3
5	[1.32 .. 1.46]	1.096	5.92477e+2
6	[1.73 .. 1.92]	0.975	5.27039e+2
7	[2.20 .. 2.52]	0.951	5.13984e+2
8	[2.82 .. 2.99]	1.376	7.43923e+2
9	[3.00 .. 3.13]	0.971	5.24959e+2
10	[3.15 .. 3.29]	0.951	5.17923e+2
11	[3.36 .. 3.56]	0.951	5.16561e+2
12	[5.03 .. 5.24]	2.000	1.08139e+3
13	[7.43 .. 7.67]	1.110	6.00148e+2
14	[7.77 .. 7.98]	2.103	1.13684e+3



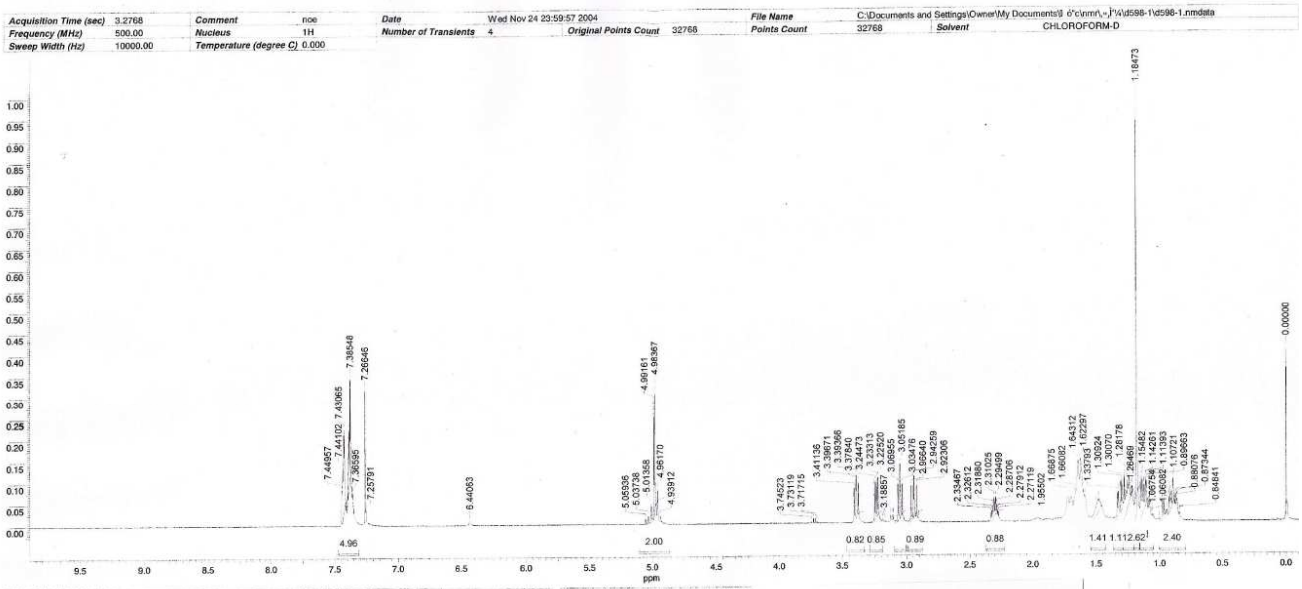
cis-**5Da**

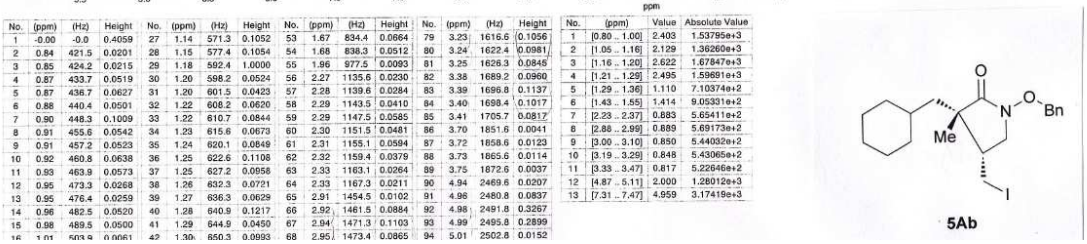
5Ea



cis-**5Ea**

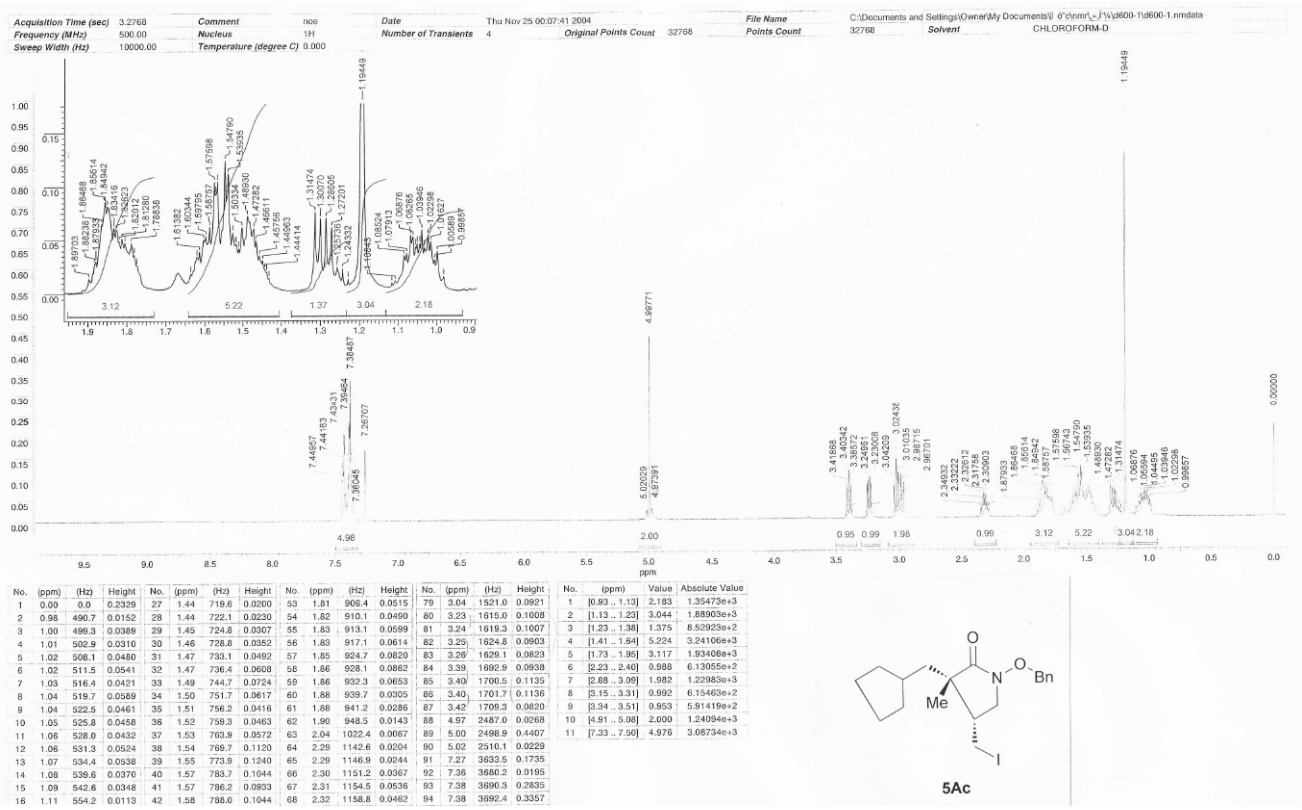
5Ab





5Ab

5Ac



No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	0.00	0.0	0.2329	27	1.44	719.6	0.0200	53	1.81	906.4	0.0515	79	3.04	1521.0	0.0921	1	[0.93 .. 1.13]	2.183	1.35473e+3
2	0.98	490.7	0.0152	28	1.44	722.1	0.0230	54	1.82	910.1	0.0490	80	3.23	1615.0	0.1008	2	[1.13 .. 1.23]	3.044	1.88903e+3
3	1.00	499.3	0.0389	29	1.45	724.8	0.0307	55	1.83	913.1	0.0599	81	3.24	1619.3	0.1007	3	[1.23 .. 1.38]	1.375	8.52923e+2
4	1.01	502.9	0.0310	30	1.46	728.8	0.0352	56	1.83	917.1	0.0614	82	3.25	1624.8	0.0903	4	[1.41 .. 1.84]	5.224	3.24106e+3
5	1.02	508.1	0.0480	31	1.47	733.1	0.0492	57	1.85	924.7	0.0820	83	3.26	1629.1	0.0823	5	[1.73 .. 1.95]	3.117	1.93406e+3
6	1.02	511.5	0.0541	32	1.47	736.4	0.0608	58	1.86	928.1	0.0862	84	3.39	1692.9	0.0938	6	[2.23 .. 2.40]	0.988	6.13055e+2
7	1.03	516.4	0.0421	33	1.49	744.7	0.0724	59	1.86	932.3	0.0653	85	3.40	1700.5	0.1135	7	[2.88 .. 3.09]	1.982	1.22983e+3
8	1.04	519.7	0.0589	34	1.50	751.7	0.0617	60	1.88	939.7	0.0305	86	3.40	1701.7	0.1136	8	[3.15 .. 3.31]	0.992	6.15463e+2
9	1.04	522.5	0.0461	35	1.51	756.2	0.0416	61	1.88	941.2	0.0286	87	3.42	1709.3	0.0820	9	[3.34 .. 3.51]	0.953	5.91419e+2
10	1.05	525.8	0.0458	36	1.52	759.3	0.0463	62	1.90	948.5	0.0143	88	4.97	2487.0	0.0268	10	[4.91 .. 5.08]	2.000	1.24094e+3
11	1.06	528.0	0.0432	37	1.53	763.9	0.0572	63	2.04	1022.4	0.0067	89	5.00	2498.9	0.4407	11	[7.33 .. 7.56]	4.976	3.08734e+3
12	1.06	531.3	0.0524	38	1.54	769.7	0.1120	64	2.29	1142.6	0.0204	90	5.02	2510.1	0.0229				
13	1.07	534.4	0.0538	39	1.55	773.9	0.1240	65	2.29	1146.9	0.0244	91	7.27	3633.5	0.1735				
14	1.08	539.6	0.0370	40	1.57	783.7	0.1044	66	2.30	1151.2	0.0367	92	7.36	3680.2	0.0195				
15	1.09	542.6	0.0348	41	1.57	786.2	0.0933	67	2.31	1154.5	0.0536	93	7.38	3690.3	0.2835				
16	1.11	554.2	0.0113	42	1.58	788.0	0.1044	68	2.32	1158.8	0.0462	94	7.38	3692.4	0.3357				

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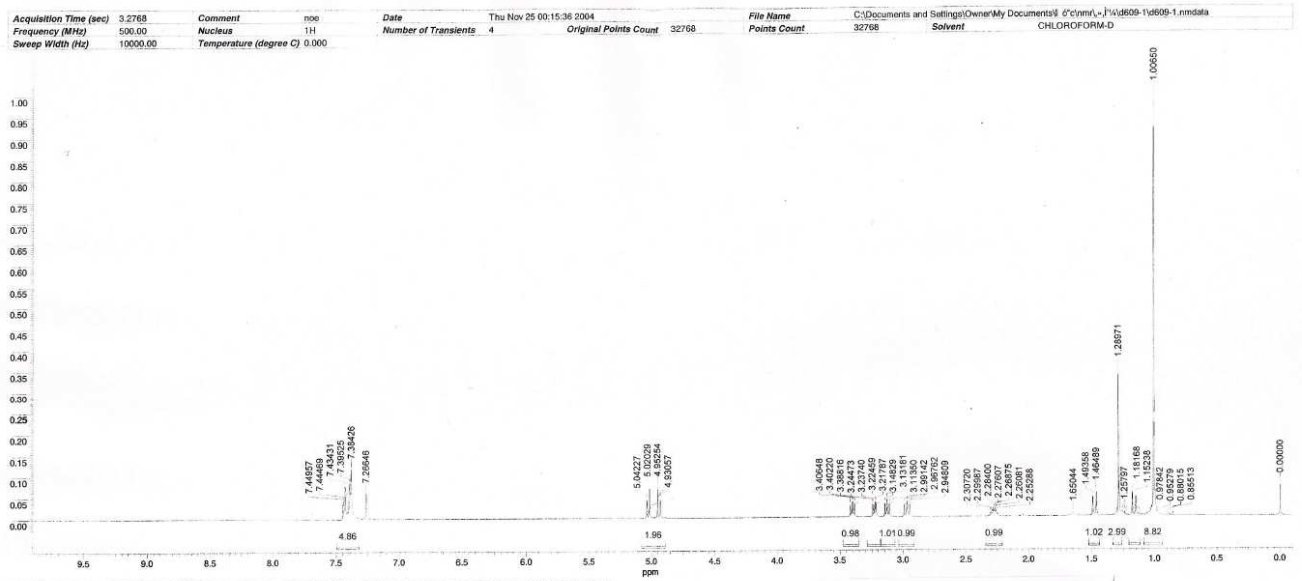
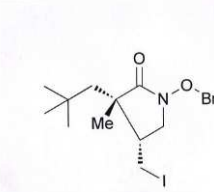


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	-0.00	-0.0	0.0726	20	2.26	1130.4	0.0143	39	3.40	1701.1	0.0372	1	[0.94 .. 1.09]	8.816	5.14122e+3
2	0.86	427.6	0.0087	21	2.27	1134.4	0.0201	40	3.41	1703.2	0.0361	2	[1.12 .. 1.21]	1.146	6.68042e+2
3	0.88	440.1	0.0060	22	2.28	1136.0	0.0163	41	3.42	1710.6	0.0288	3	[1.26 .. 1.33]	2.989	1.74320e+3
4	0.95	476.4	0.0064	23	2.28	1142.0	0.0206	42	4.93	2465.3	0.0470	4	[1.44 .. 1.53]	1.023	5.96862e+2
5	0.98	489.2	0.0102	24	2.29	1146.0	0.0158	43	4.95	2476.3	0.0739	5	[2.21 .. 2.34]	0.987	5.75470e+2
6	1.01	503.3	1.0000	25	2.30	1149.9	0.0100	44	5.02	2510.1	0.0724	6	[2.91 .. 3.03]	0.988	5.75973e+2
7	1.05	525.2	0.0076	26	2.31	1153.6	0.0087	45	5.04	2521.1	0.0451	7	[3.07 .. 3.16]	1.013	5.90835e+2
8	1.13	564.9	0.0067	27	2.95	1474.0	0.0289	46	7.27	3633.2	0.0606	8	[3.18 .. 3.29]	0.997	5.81278e+2
9	1.15	576.2	0.0497	28	2.97	1483.8	0.0374	47	7.38	3690.3	0.1024	9	[3.36 .. 3.48]	0.981	5.71881e+2
10	1.18	590.8	0.0589	29	2.97	1485.9	0.0342	48	7.38	3692.1	0.1175	10	[4.89 .. 5.08]	1.956	1.14088e+3
11	1.23	614.6	0.0054	30	2.99	1495.7	0.0309	49	7.39	3694.6	0.0628	11	[7.32 .. 7.49]	4.859	2.83381e+3
12	1.24	621.7	0.0101	31	3.11	1556.7	0.0308	50	7.40	3697.6	0.0842				
13	1.26	629.0	0.0120	32	3.13	1565.9	0.0437	51	7.41	3702.5	0.0283				
14	1.29	644.9	0.3491	33	3.15	1574.1	0.0326	52	7.41	3706.5	0.0176				
15	1.46	732.4	0.0569	34	3.22	1608.9	0.0348	53	7.43	3715.6	0.0737				



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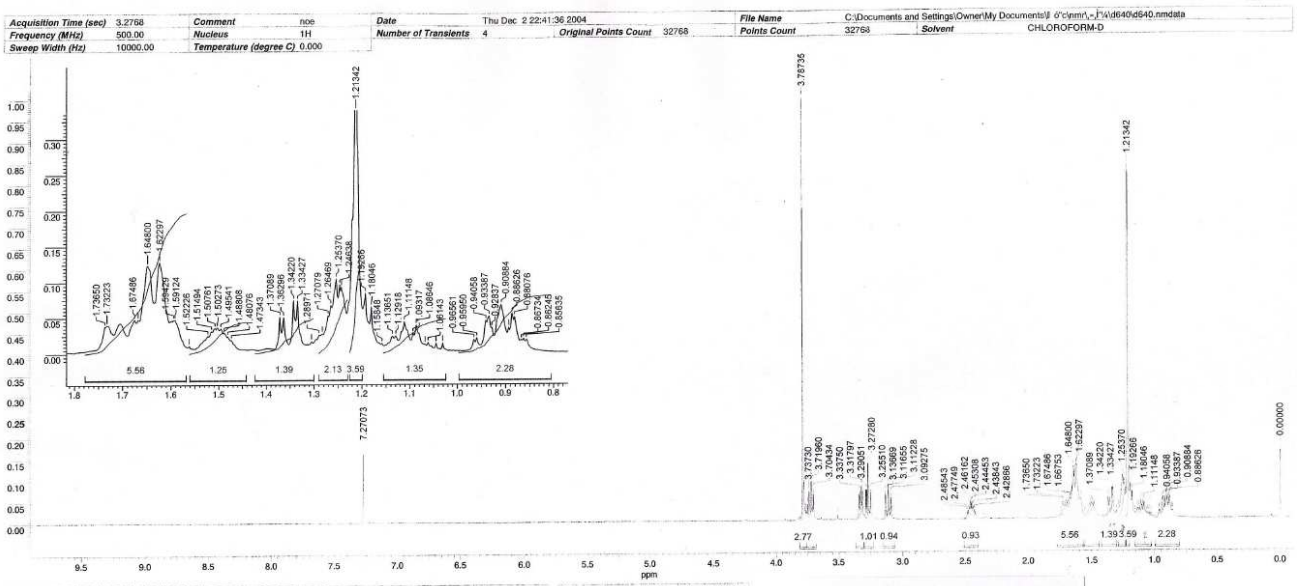
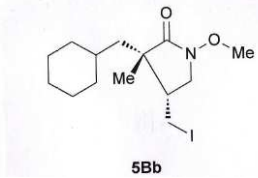


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	0.00	0.0	0.1640	23	1.16	579.2	0.0138	45	1.51	757.5	0.0313	67	3.12	1558.3	0.0695
2	0.86	428.2	0.0182	24	1.18	590.2	0.0648	46	1.52	761.1	0.0246	68	3.14	1568.3	0.0672
3	0.86	431.2	0.0198	25	1.19	596.3	0.0844	47	1.56	781.0	0.0112	69	3.26	1627.6	0.0723
4	0.87	433.7	0.0181	26	1.21	606.7	0.8353	48	1.59	795.6	0.0479	70	3.27	1636.4	0.1377
5	0.88	440.4	0.0506	27	1.24	621.1	0.0928	49	1.59	797.1	0.0472	71	3.29	1645.3	0.0720
6	0.89	443.1	0.0555	28	1.25	623.2	0.0963	50	1.62	811.5	0.1288	72	3.32	1659.0	0.0833
7	0.89	446.5	0.0354	29	1.25	626.9	0.1047	51	1.65	824.0	0.1241	73	3.33	1663.0	0.0787
8	0.91	454.4	0.0673	30	1.26	632.3	0.0673	52	1.67	833.8	0.0476	74	3.34	1668.8	0.0693
9	0.93	464.2	0.0355	31	1.27	635.4	0.0525	53	1.67	837.4	0.0482	75	3.35	1673.0	0.0625
10	0.93	466.9	0.0513	32	1.28	641.5	0.0276	54	1.73	866.1	0.0405	76	3.51	1754.8	0.0113
11	0.94	470.3	0.0453	33	1.29	644.9	0.0255	55	1.74	868.3	0.0382	77	3.70	1852.2	0.0746
12	0.96	479.8	0.0209	34	1.31	652.8	0.0168	56	2.42	1210.4	0.0172	78	3.72	1859.8	0.0925
13	0.97	482.8	0.0189	35	1.33	667.1	0.0742	57	2.43	1214.3	0.0212	79	3.72	1861.0	0.0898

No.	(ppm)	Value	Absolute Value
1	[0.81 .. 1.00]	2.278	1.52913e+3
2	[1.02 .. 1.16]	1.350	9.05834e+2
3	[1.20 .. 1.23]	3.588	2.40819e+3
4	[1.23 .. 1.29]	2.132	1.43058e+3
5	[1.30 .. 1.42]	1.389	9.32168e+2
6	[1.44 .. 1.56]	1.253	8.40617e+2
7	[1.57 .. 1.78]	5.564	3.73411e+3
8	[2.40 .. 2.51]	0.931	6.24588e+2
9	[3.06 .. 3.15]	0.944	6.33662e+2
10	[3.23 .. 3.30]	1.006	6.75114e+2
11	[3.30 .. 3.37]	0.922	6.18722e+2
12	[3.68 .. 3.75]	1.165	7.81885e+2
13	[3.76 .. 3.81]	2.772	1.86024e+3



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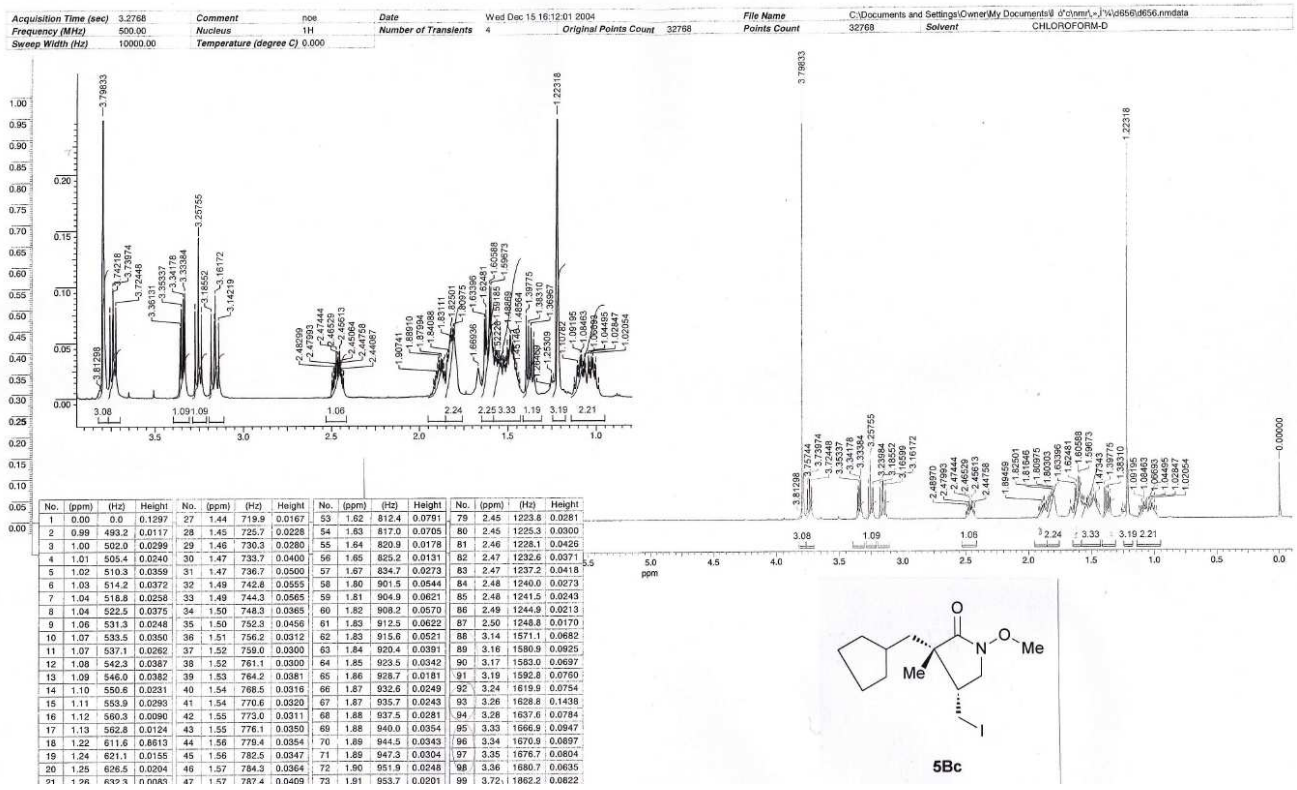

No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	0.00	0.0	0.1297	27	1.44	719.9	0.0167	53	1.62	812.4	0.0791	79	2.45	1223.8	0.0281
2	0.99	493.2	0.0117	28	1.45	725.7	0.0228	54	1.63	817.0	0.0705	80	2.45	1225.3	0.0300
3	1.00	502.0	0.0299	29	1.46	730.3	0.0280	55	1.64	820.9	0.0178	81	2.46	1228.1	0.0426
4	1.01	505.4	0.0240	30	1.47	733.7	0.0400	56	1.65	825.2	0.0131	82	2.47	1232.6	0.0371
5	1.02	510.3	0.0359	31	1.47	736.7	0.0500	57	1.67	834.7	0.0273	83	2.47	1237.2	0.0418
6	1.03	514.2	0.0372	32	1.49	742.8	0.0555	58	1.80	901.5	0.0544	84	2.48	1240.0	0.0273
7	1.04	518.8	0.0258	33	1.49	744.3	0.0565	59	1.81	904.9	0.0621	85	2.48	1241.5	0.0243
8	1.04	522.5	0.0375	34	1.50	748.3	0.0365	60	1.82	908.2	0.0570	86	2.49	1244.9	0.0213
9	1.06	531.3	0.0248	35	1.50	752.3	0.0456	61	1.83	912.5	0.0622	87	2.50	1248.8	0.0170
10	1.07	533.5	0.0350	36	1.51	756.2	0.0312	62	1.83	915.6	0.0521	88	3.14	1571.1	0.0682
11	1.07	537.1	0.0262	37	1.52	759.0	0.0300	63	1.84	920.4	0.0391	89	3.16	1580.9	0.0925
12	1.08	542.3	0.0387	38	1.52	761.1	0.0300	64	1.85	923.5	0.0342	90	3.17	1583.0	0.0697
13	1.09	546.0	0.0382	39	1.53	764.2	0.0381	65	1.86	928.7	0.0181	91	3.19	1592.8	0.0760
14	1.10	550.6	0.0231	40	1.54	768.5	0.0316	66	1.87	932.6	0.0249	92	3.24	1619.9	0.0754
15	1.11	553.9	0.0293	41	1.54	770.6	0.0320	67	1.87	935.7	0.0243	93	3.26	1628.8	0.1438
16	1.12	560.3	0.0090	42	1.55	773.0	0.0311	68	1.88	937.5	0.0281	94	3.28	1637.6	0.0784
17	1.13	562.8	0.0124	43	1.55	776.1	0.0350	69	1.88	940.0	0.0354	95	3.33	1666.9	0.0947
18	1.22	611.6	0.8613	44	1.56	779.4	0.0354	70	1.89	944.5	0.0343	96	3.34	1670.9	0.0897
19	1.24	621.1	0.0155	45	1.56	782.5	0.0347	71	1.89	947.3	0.0304	97	3.35	1676.7	0.0804
20	1.25	626.5	0.0204	46	1.57	784.3	0.0364	72	1.90	951.9	0.0248	98	3.36	1680.7	0.0635
21	1.26	632.3	0.0083	47	1.57	787.4	0.0409	73	1.91	953.7	0.0201	99	3.72	1862.2	0.0822

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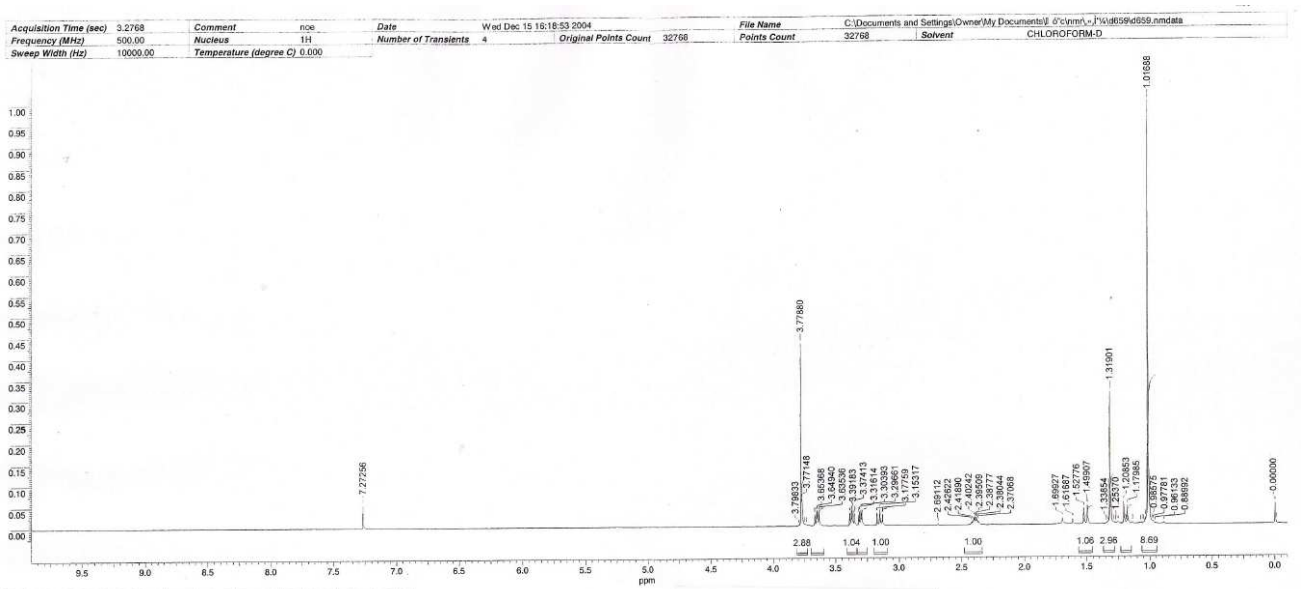
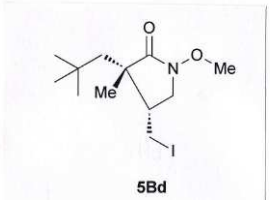


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.01	-3.7	0.0070	20	1.35	673.8	0.0035	39	3.30	1648.3	0.0389
2	0.00	0.0	0.0485	21	1.50	749.5	0.0458	40	3.30	1652.0	0.0375
3	0.89	445.0	0.0047	22	1.53	763.9	0.0388	41	3.32	1658.1	0.0329
4	0.96	480.7	0.0033	23	1.62	808.4	0.0136	42	3.32	1661.7	0.0275
5	0.98	488.9	0.0073	24	1.70	849.6	0.0159	43	3.36	1677.9	0.0297
6	0.99	492.9	0.0101	25	2.36	1181.7	0.0082	44	3.37	1687.1	0.0472
7	1.02	508.4	1.0000	26	2.37	1185.3	0.0097	45	3.38	1689.8	0.0190
8	1.04	517.6	0.0159	27	2.38	1190.2	0.0130	46	3.39	1695.9	0.0307
9	1.05	526.7	0.0049	28	2.39	1193.9	0.0162	47	3.64	1817.7	0.0334
10	1.08	538.3	0.0035	29	2.40	1197.5	0.0166	48	3.65	1824.7	0.0371
11	1.14	569.8	0.0055	30	2.40	1201.2	0.0183	49	3.65	1826.8	0.0332
12	1.18	589.9	0.0449	31	2.41	1204.6	0.0116	50	3.67	1834.2	0.0269
13	1.19	594.8	0.0051	32	2.42	1209.4	0.0086	51	3.73	1867.4	0.0043



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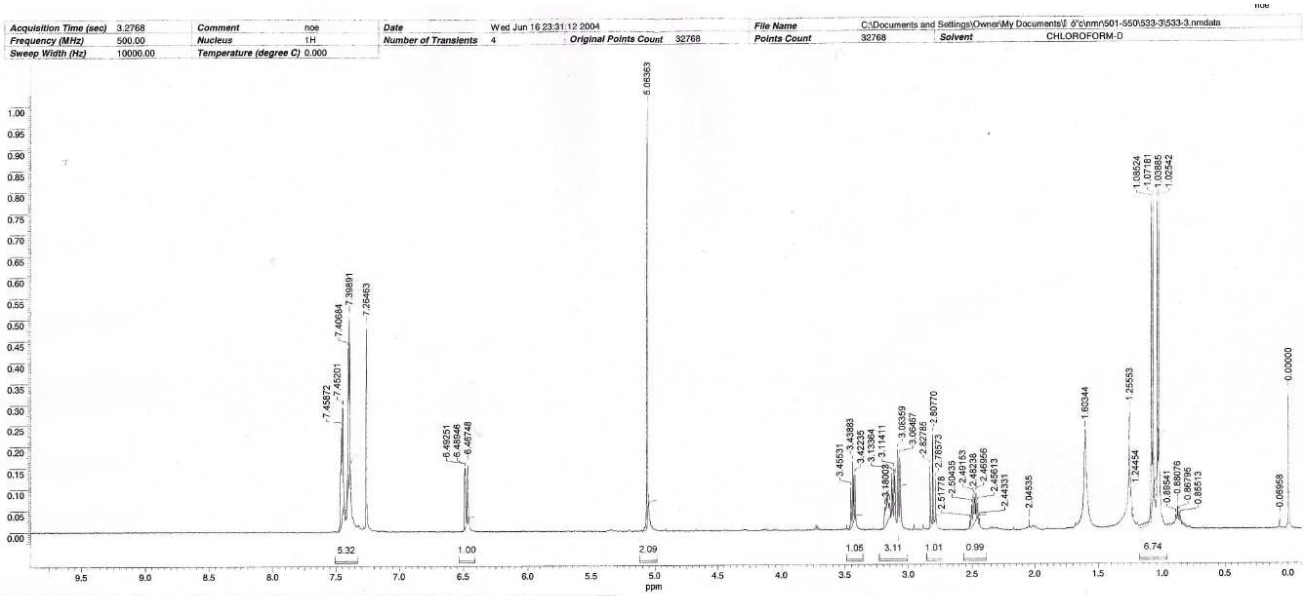
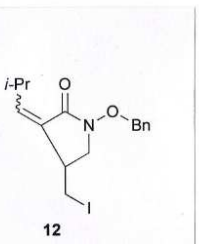


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	0.00	0.0	0.3206	20	2.48	1241.2	0.0739	39	3.42	1711.2	0.1296
2	0.07	34.8	0.0219	21	2.49	1245.8	0.0823	40	3.44	1719.4	0.1610
3	0.86	427.6	0.0300	22	2.50	1252.2	0.0572	41	3.46	1727.7	0.0997
4	0.87	434.0	0.0392	23	2.52	1258.9	0.0214	42	5.06	2531.8	1.0000
5	0.88	440.4	0.0644	24	2.79	1392.9	0.1191	43	6.47	3233.7	0.1555
6	0.90	447.7	0.0328	25	2.81	1403.9	0.2235	44	6.47	3235.6	0.1522
7	1.03	512.7	0.7752	26	2.83	1413.9	0.1503	45	6.49	3244.7	0.1491
8	1.04	519.4	0.7745	27	3.06	1532.3	0.1732	46	6.49	3246.3	0.1486
9	1.07	535.9	0.7781	28	3.08	1541.8	0.1886	47	7.26	3632.3	0.4835
10	1.09	542.6	0.7732	29	3.11	1553.7	0.1274	48	7.39	3697.0	0.4491
11	1.23	615.3	0.0342	30	3.11	1557.1	0.1434	49	7.40	3699.5	0.5081
12	1.24	622.3	0.0801	31	3.13	1563.8	0.0999	50	7.41	3703.4	0.4344
13	1.26	627.8	0.2752	32	3.13	1566.8	0.1330	51	7.42	3712.0	0.0360
14	1.60	801.7	0.2317	33	3.15	1573.8	0.0632	52	7.45	3723.9	0.2948
15	2.05	1022.7	0.0216	34	3.17	1582.7	0.0870	53	7.45	3726.0	0.2960
16	2.44	1221.7	0.0264	35	3.17	1584.5	0.0912	54	7.46	3729.4	0.2443
17	2.46	1228.1	0.0617	36	3.18	1590.0	0.0502	55	7.47	3733.3	0.1415

No.	(ppm)	Value	Absolute Value
1	[0.96 .. 1.18]	6.737	4.12450e+3
2	[2.39 .. 2.56]	0.995	6.08878e+2
3	[2.74 .. 2.86]	1.013	6.20397e+2
4	[3.01 .. 3.23]	3.109	1.90339e+3
5	[3.36 .. 3.49]	1.054	6.45482e+2
6	[4.99 .. 5.12]	2.091	1.27993e+3
7	[6.41 .. 6.54]	1.000	6.12203e+2
8	[7.33 .. 7.51]	5.319	3.25600e+3



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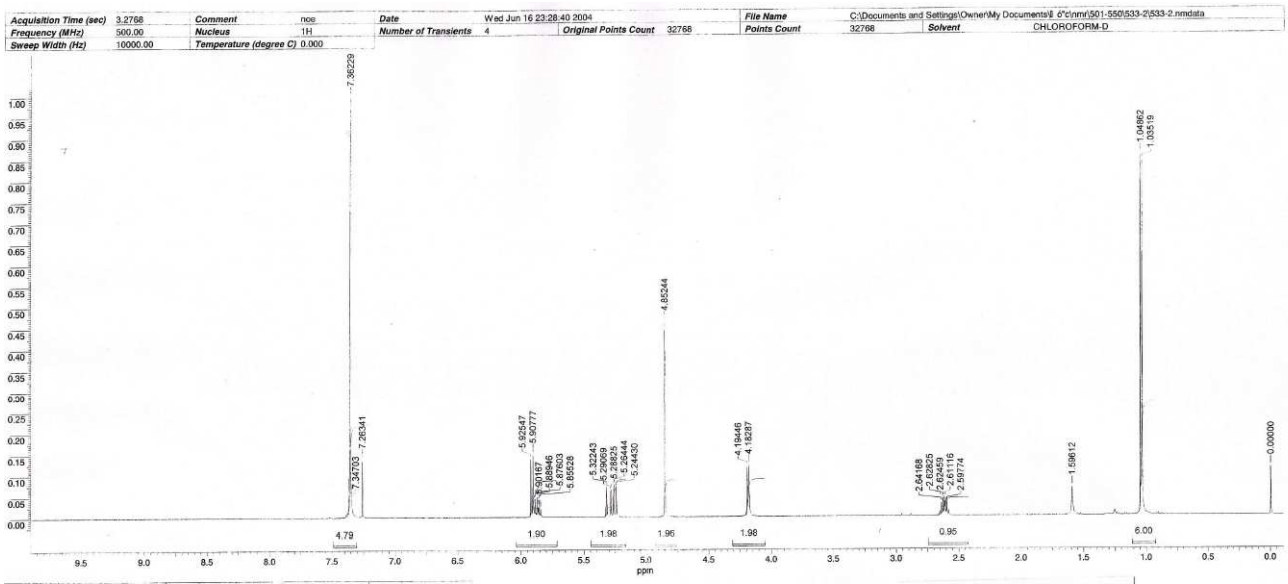
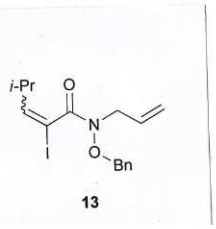


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.1145	19	5.29	2644.1	0.0647
2	1.04	517.6	0.8433	20	5.29	2645.3	0.0609
3	1.05	524.3	0.8561	21	5.32	2661.2	0.0727
4	1.60	798.1	0.0675	22	5.32	2662.4	0.0663
5	2.60	1298.9	0.0320	23	5.84	2921.6	0.0203
6	2.60	1300.7	0.0166	24	5.86	2927.6	0.0420
7	2.61	1305.6	0.0427	25	5.86	2931.9	0.0239
8	2.61	1307.4	0.0344	26	5.87	2933.7	0.0234
9	2.62	1312.2	0.0333	27	5.86	2938.0	0.0477
10	2.63	1314.1	0.0422	28	5.85	2944.7	0.0433
11	2.64	1320.4	0.0296	29	5.90	2949.0	0.0246
12	4.18	2091.4	0.1214	30	5.90	2950.8	0.0283
13	4.19	2097.2	0.1179	31	5.91	2953.9	0.1485
14	4.86	2426.2	0.4639	32	5.93	2962.7	0.1382
15	5.24	2622.2	0.0711	33	7.26	3631.7	0.1386

No.	(ppm)	Value	Absolute Value
1	[0.92 .. 1.11]	6.000	5.80692e+3
2	[2.42 .. 2.75]	0.951	9.20475e+2
3	[4.05 .. 4.31]	1.976	1.91208e+3
4	[4.76 .. 4.92]	1.956	1.89312e+3
5	[5.16 .. 5.45]	1.977	1.91312e+3
6	[5.71 .. 6.04]	1.905	1.84146e+3
7	[7.31 .. 7.49]	4.786	4.63185e+3



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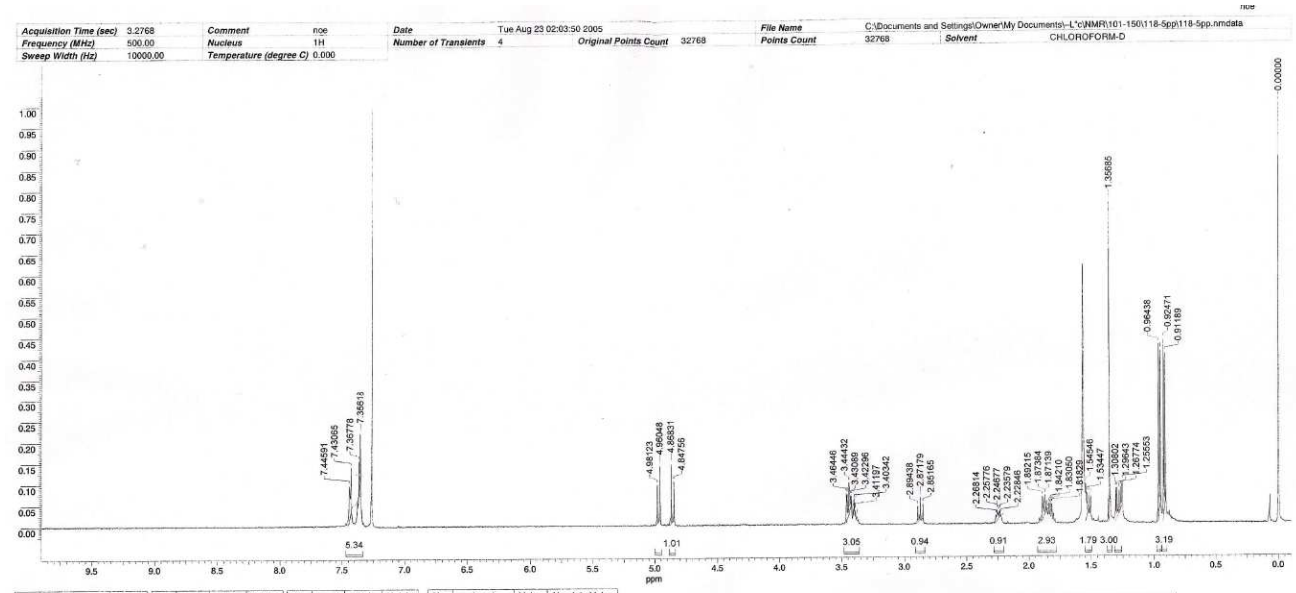
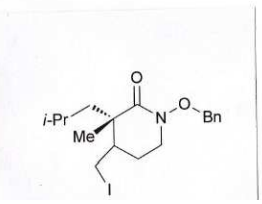
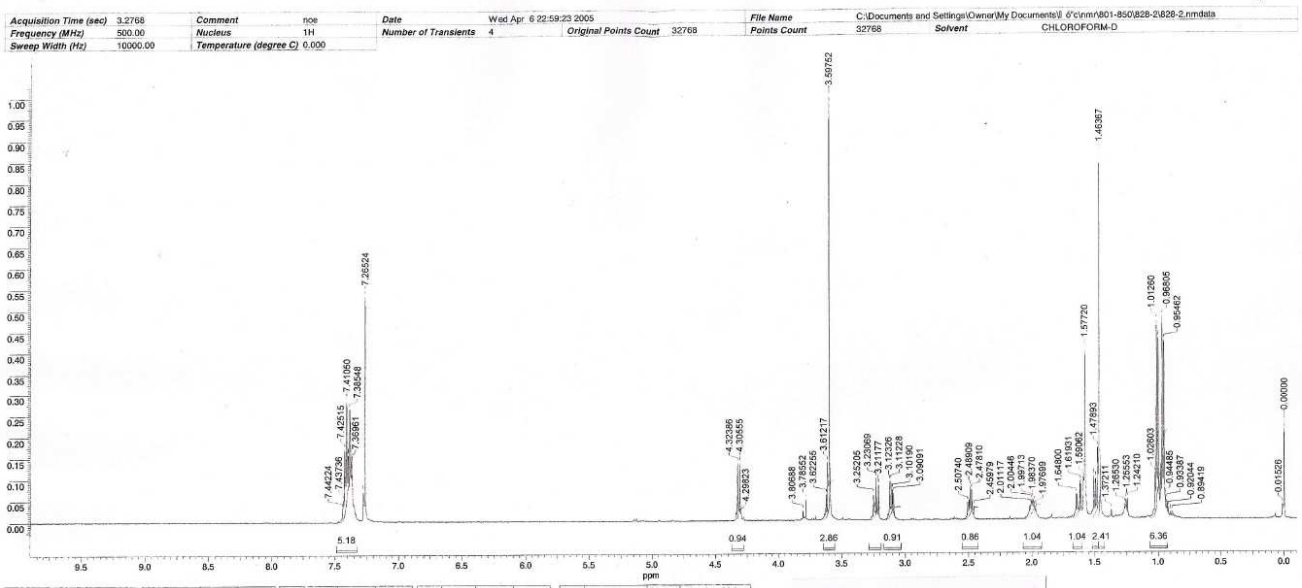


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.9983	21	1.87	936.8	0.0679	41	3.43	1715.4	0.0675
2	0.91	455.9	0.4059	22	1.89	943.3	0.0405	42	3.44	1717.6	0.0523
3	0.92	462.4	0.4387	23	1.89	946.1	0.0630	43	3.44	1719.7	0.0889
4	0.95	475.5	0.4112	24	2.23	1114.2	0.0222	44	3.44	1722.2	0.1001
5	0.96	482.2	0.4269	25	2.24	1117.9	0.0320	45	3.45	1726.4	0.0387
6	1.26	627.8	0.1003	26	2.24	1119.7	0.0278	46	3.46	1729.8	0.0709
7	1.27	633.9	0.0862	27	2.25	1123.4	0.0287	47	3.46	1732.2	0.0728
8	1.28	640.0	0.0779	28	2.25	1127.0	0.0253	48	4.85	2423.8	0.1053
9	1.30	648.2	0.0840	29	2.26	1128.9	0.0330	49	4.87	2434.2	0.1469
10	1.31	654.0	0.0834	30	2.26	1130.1	0.0317	50	4.96	2480.2	0.1427
11	1.36	678.4	0.7690	31	2.27	1134.1	0.0194	51	4.98	2490.6	0.0977
12	1.51	753.2	0.0638	32	2.85	1425.8	0.0480	52	7.35	3676.9	0.1860
13	1.52	758.4	0.0702	33	2.87	1435.9	0.0635	53	7.36	3678.1	0.2204
14	1.53	767.2	0.0730	34	2.87	1437.1	0.0625	54	7.37	3683.9	0.1557

No.	(ppm)	Value	Absolute Value
1	[0.90 .. 0.94]	3.191	1.32199e+3
2	[0.94 .. 0.98]	3.000	1.24291e+3
3	[1.26 .. 1.32]	1.780	7.37288e+2
4	[1.34 .. 1.38]	2.995	1.24091e+3
5	[1.50 .. 1.55]	1.794	7.43243e+2
6	[1.78 .. 1.93]	2.930	1.21410e+3
7	[2.21 .. 2.28]	0.914	3.78567e+2
8	[2.84 .. 2.91]	0.944	3.91225e+2
9	[3.36 .. 3.48]	3.047	1.26230e+3
10	[4.84 .. 4.89]	1.006	4.16730e+2
11	[4.95 .. 5.00]	0.982	4.07039e+2
12	[7.33 .. 7.47]	5.338	2.21152e+3



cis-**21**



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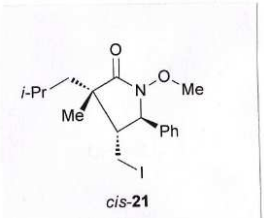
Frequency (MHz)	500.00	Nucleus	1H	Number of Transients	4	Original Points Count	32768	Points Count	32768	Solvent	CHLOROFORM-D
Sweep Width (Hz)	10000.00	Temperature (degree C)	0.000								

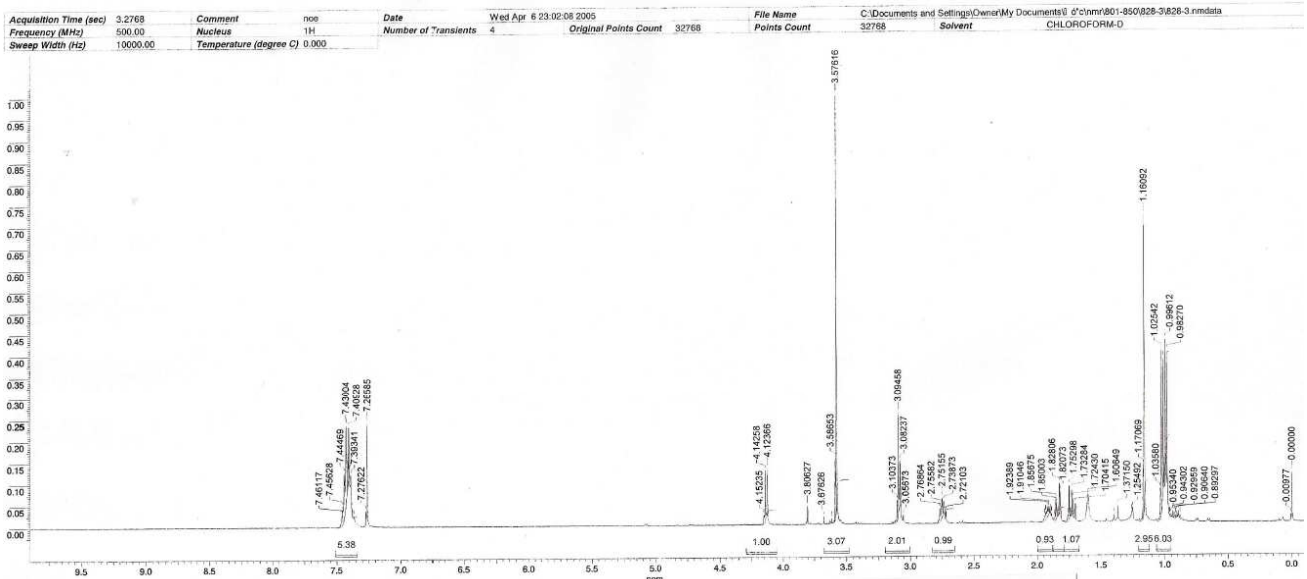
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.2272	18	1.46	731.8	0.8626	35	2.02	1008.9	0.0308	52	3.62	1811.3	0.0603
2	0.02	7.5	0.0332	19	1.48	739.5	0.1691	36	2.46	1229.9	0.0312	53	3.63	1814.0	0.0294
3	0.89	447.1	0.0177	20	1.49	746.8	0.0959	37	2.47	1235.4	0.0416	54	3.79	1892.8	0.0495
4	0.91	453.5	0.0168	21	1.51	754.1	0.1010	38	2.48	1239.1	0.0702	55	3.81	1903.4	0.0233
5	0.92	460.2	0.0273	22	1.58	788.6	0.4022	39	2.49	1244.5	0.0767	56	4.30	2149.1	0.0194
6	0.93	466.9	0.0450	23	1.59	795.3	0.0996	40	2.50	1248.2	0.0464	57	4.31	2152.8	0.1362
7	0.94	472.4	0.0551	24	1.61	806.0	0.0837	41	2.51	1253.7	0.0412	58	4.32	2161.9	0.1362
8	0.95	477.3	0.4225	25	1.62	809.7	0.0906	42	3.09	1545.5	0.0639	59	7.27	3632.6	0.5343
9	0.97	484.0	0.4795	26	1.64	820.3	0.0585	43	3.10	1551.0	0.0712	60	7.28	3639.9	0.0700
10	0.98	491.3	0.1127	27	1.65	824.0	0.0600	44	3.11	1556.1	0.0932	61	7.37	3684.8	0.1464
11	1.00	499.9	0.4276	28	1.97	985.1	0.0251	45	3.12	1561.6	0.0913	62	7.38	3690.6	0.2358
12	1.01	506.3	0.4705	29	1.98	988.5	0.0311	46	3.21	1605.9	0.0821	63	7.39	3692.7	0.2664
13	1.03	513.0	0.1081	30	1.98	991.9	0.0426	47	3.23	1615.3	0.0989	64	7.40	3698.2	0.1575
14	1.24	621.1	0.0483	31	1.99	995.5	0.0464	48	3.25	1622.7	0.0236	65	7.41	3705.3	0.2834

No.	(ppm)	Value	Absolute Value
1	[0.93 .. 1.07]	6.364	3.39503e+3
2	[1.42 .. 1.47]	2.409	1.28519e+3
3	[1.48 .. 1.52]	1.178	6.28203e+2
4	[1.60 .. 1.67]	1.038	5.53828e+2
5	[1.92 .. 2.07]	1.044	5.57201e+2
6	[2.43 .. 2.55]	0.855	4.56230e+2
7	[3.03 .. 3.17]	0.913	4.87231e+2
8	[3.19 .. 3.29]	0.862	4.59610e+2
9	[3.56 .. 3.65]	2.860	1.52605e+3
10	[4.27 .. 4.37]	0.938	5.00423e+2
11	[7.33 .. 7.49]	5.182	2.76455e+3



cis-**21**

trans-**22**



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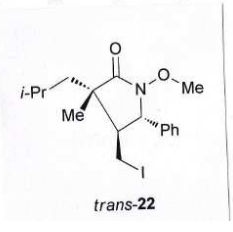
Frequency (MHz)	500.00	Nucleus	1H	Number of Transients	4	Original Points Count	32768	Points Count	32768	Solvent	CHLOROFORM-D
Sweep Width (Hz)	10000.00	Temperature (degree C)	0.000								

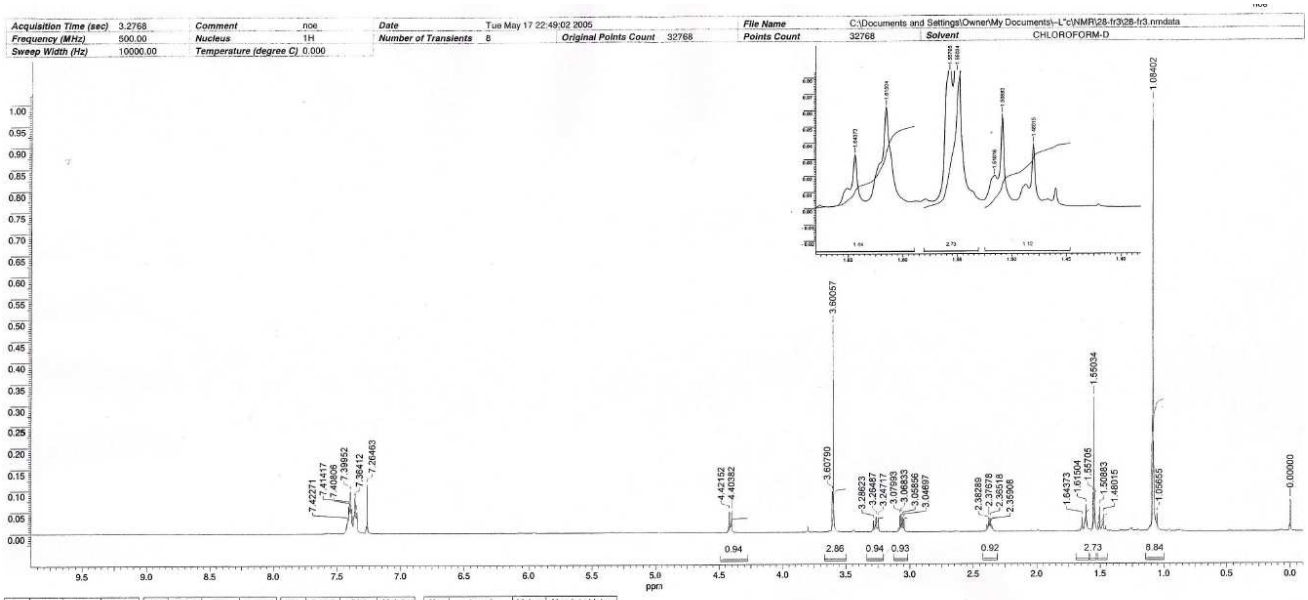
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.1151	22	1.37	685.8	0.0393	43	1.92	961.9	0.0374	64	4.13	2066.7	0.0297
2	0.01	4.9	0.0177	23	1.40	701.3	0.0188	44	1.93	965.3	0.0271	65	4.14	2071.3	0.1267
3	0.88	441.9	0.0164	24	1.61	803.2	0.0665	45	1.94	968.4	0.0235	66	4.15	2076.2	0.0229
4	0.89	446.5	0.0266	25	1.70	852.1	0.0441	46	1.94	972.0	0.0157	67	7.27	3632.9	0.2436
5	0.91	453.2	0.0253	26	1.71	857.3	0.0128	47	2.72	1360.5	0.0284	68	7.28	3638.1	0.0381
6	0.92	458.1	0.0158	27	1.72	862.1	0.0557	48	2.73	1366.9	0.0412	69	7.36	3678.1	0.0146
7	0.93	464.8	0.0228	28	1.73	866.4	0.0767	49	2.74	1369.4	0.0515	70	7.37	3684.8	0.0253
8	0.94	471.5	0.0254	29	1.74	871.6	0.0181	50	2.75	1375.8	0.0598	71	7.38	3692.4	0.0446
9	0.95	476.7	0.0189	30	1.75	876.5	0.0868	51	2.76	1377.9	0.0416	72	7.39	3696.7	0.1206
10	0.96	481.6	0.0159	31	1.76	881.4	0.0170	52	2.77	1384.3	0.0349	73	7.40	3699.1	0.0986
11	0.97	483.7	0.0187	32	1.82	910.4	0.0726	53	3.06	1528.4	0.0198	74	7.41	3702.5	0.1926
12	0.98	491.3	0.4008	33	1.83	914.0	0.0919	54	3.08	1538.7	0.1418	75	7.41	3704.6	0.2316
13	1.00	498.1	0.4272	34	1.84	918.9	0.0200	55	3.08	1541.2	0.1467	76	7.41	3707.1	0.1548
14	1.01	503.3	0.1155	35	1.85	925.0	0.0456	56	3.09	1547.3	0.2575	77	7.42	3711.4	0.1422

No.	(ppm)	Value	Absolute Value
1	[0.96 .. 1.07]	6.030	4.66177e+3
2	[1.12 .. 1.21]	2.945	2.27698e+3
3	[1.68 .. 1.79]	1.072	8.29073e+2
4	[1.79 .. 1.88]	1.066	8.24290e+2
5	[1.88 .. 2.00]	0.932	7.20596e+2
6	[2.65 .. 2.83]	0.989	7.64406e+2
7	[3.01 .. 3.20]	2.011	1.55446e+3
8	[3.48 .. 3.67]	3.068	2.37206e+3
9	[4.05 .. 4.29]	1.005	7.76782e+2
10	[7.34 .. 7.51]	5.380	4.15882e+3



trans-**22**

cis-**23**



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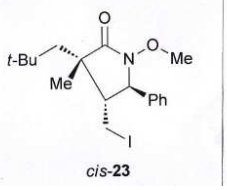
Frequency (MHz)	500.00	Nucleus	1H	Number of Transients	8	Original Points Count	32768	Points Count	32768	Solvent	CHLOROFORM-D
Sweep Width (Hz)	10000.00	Temperature (degree C)	0.000								

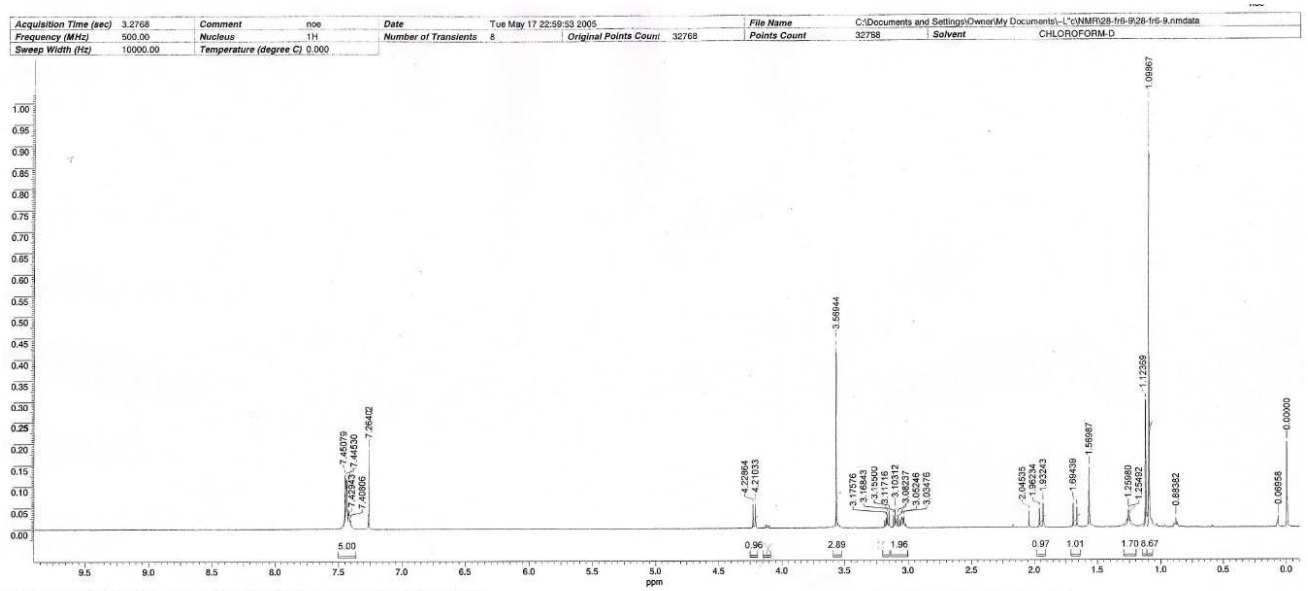
No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height
1	-0.00	-0.0	0.0731	16	3.05	1523.5	0.0301	31	7.35	3672.6	0.0399
2	1.06	528.3	0.0416	17	3.06	1529.3	0.0338	32	7.35	3674.1	0.0502
3	1.08	542.0	1.0000	18	3.07	1534.2	0.0426	33	7.35	3676.0	0.0387
4	1.09	545.7	0.2699	19	3.08	1540.0	0.0384	34	7.36	3677.8	0.0419
5	1.48	740.1	0.0396	20	3.25	1623.6	0.0341	35	7.36	3679.9	0.0762
6	1.51	754.4	0.0578	21	3.26	1632.4	0.0361	36	7.36	3682.1	0.0833
7	1.52	758.1	0.0200	22	3.27	1634.3	0.0343	37	7.37	3684.8	0.0424
8	1.55	775.2	0.0152	23	3.29	1643.1	0.0269	38	7.39	3692.7	0.0416
9	1.56	778.5	0.0907	24	3.60	1800.3	0.4847	39	7.39	3696.7	0.0585
10	1.62	807.5	0.0624	25	3.61	1803.9	0.0956	40	7.40	3699.8	0.0988
11	1.64	821.9	0.0333	26	4.40	2201.9	0.0507	41	7.41	3704.0	0.0592
12	2.36	1179.5	0.0179	27	4.41	2205.6	0.0166	42	7.41	3707.1	0.0634
13	2.37	1182.6	0.0309	28	4.42	2210.8	0.0498	43	7.42	3711.4	0.0254
14	2.38	1188.4	0.0323	29	7.26	3632.3	0.1155	44	7.43	3712.9	0.0233
15	2.38	1191.4	0.0221	30	7.27	3636.0	0.0185				

No.	(ppm)	Value	Absolute Value
1	[1.00 .. 1.14]	8.836	7.09296e+3
2	[1.45 .. 1.52]	1.123	9.01226e+2
3	[1.53 .. 1.58]	2.727	2.18939e+3
4	[1.59 .. 1.69]	1.439	1.15530e+3
5	[2.31 .. 2.42]	0.920	7.38824e+2
6	[3.02 .. 3.13]	0.930	7.46293e+2
7	[3.21 .. 3.34]	0.941	7.55362e+2
8	[3.50 .. 3.67]	2.864	2.29916e+3
9	[4.28 .. 4.49]	0.936	7.51604e+2



cis-**23**

trans-**24**



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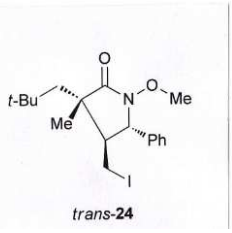
Frequency (MHz)	500.00	Nucleus	1H	Number of Transients	8	Original Points Count	32768	Points Count	32768	Solvent	CHLOROFORM-D
Sweep Width (Hz)	10000.00	Temperature (degree C)	0.000								

No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	-0.00	-0.0	0.1991	18	3.10	1551.6	0.0447	1	[1.06 .. 1.11]	8.673	4.26334e+3
2	0.07	34.8	0.0264	19	3.12	1558.6	0.0298	2	[1.11 .. 1.14]	3.010	1.47936e+3
3	0.88	441.9	0.0231	20	3.16	1577.5	0.0408	3	[1.20 .. 1.29]	1.701	8.35924e+2
4	1.10	549.3	1.0000	21	3.17	1584.2	0.0334	4	[1.64 .. 1.71]	1.013	4.97769e+2
5	1.12	561.8	0.3014	22	3.18	1587.9	0.0248	5	[1.91 .. 1.98]	0.974	4.78521e+2
6	1.25	627.5	0.0370	23	3.57	1784.7	0.4422	6	[3.00 .. 3.13]	1.964	9.65253e+2
7	1.26	629.9	0.0414	24	4.21	2105.2	0.0581	7	[3.15 .. 3.20]	0.948	4.66142e+2
8	1.57	784.9	0.1418	25	4.23	2114.3	0.0565	8	[3.53 .. 3.59]	2.891	1.42109e+3
9	1.66	832.2	0.0477	26	7.26	3632.0	0.1871	9	[4.09 .. 4.15]	0.179	8.77539e+1
10	1.69	847.2	0.0578	27	7.41	3704.0	0.0216	10	[4.19 .. 4.25]	0.962	4.73053e+2
11	1.93	966.2	0.0568	28	7.42	3710.1	0.0374	11	[7.36 .. 7.50]	5.000	2.45771e+3
12	1.96	981.2	0.0453	29	7.43	3712.9	0.0449				
13	2.05	1022.7	0.0393	30	7.43	3714.7	0.0262				
14	3.03	1517.4	0.0270	31	7.44	3719.9	0.1169				
15	3.05	1524.1	0.0232	32	7.45	3722.6	0.1194				
16	3.05	1526.2	0.0259	33	7.45	3725.4	0.1264				



trans-**24**

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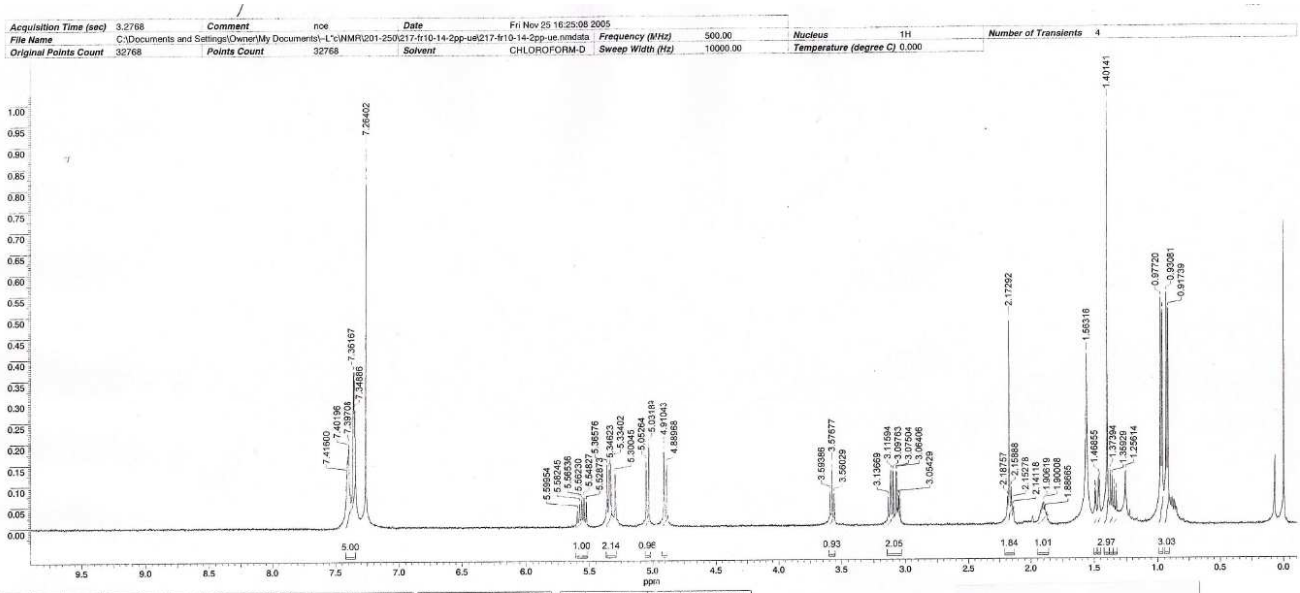
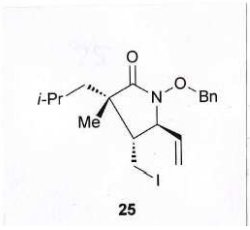


No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	(Hz)	Height	No.	(ppm)	Value	Absolute Value
1	0.92	458.7	0.5092	16	1.89	943.3	0.0344	31	3.12	1559.2	0.1194	46	5.55	2774.1	0.0699	1	[0.91 .. 0.94]	3.028	1.15628e+3
2	0.93	465.4	0.5478	17	1.89	946.7	0.0490	32	3.14	1568.3	0.0670	47	5.56	2781.2	0.0588	2	[0.96 .. 0.99]	3.002	1.14635e+3
3	0.96	482.2	0.5055	18	1.90	950.0	0.0529	33	3.56	1780.1	0.0755	48	5.57	2782.7	0.0653	3	[1.32 .. 1.35]	0.824	2.38143e+2
4	0.98	488.6	0.5353	19	1.91	953.1	0.0525	34	3.58	1788.4	0.1476	49	5.58	2789.7	0.0547	4	[1.36 .. 1.38]	0.833	3.18173e+2
5	1.26	628.1	0.1264	20	2.14	1070.6	0.0432	35	3.59	1796.9	0.0812	50	5.58	2791.2	0.0562	5	[1.39 .. 1.43]	2.974	1.13564e+3
6	1.33	665.3	0.0784	21	2.15	1076.4	0.0544	36	4.89	2444.8	0.1463	51	5.60	2799.8	0.0383	6	[1.45 .. 1.48]	0.687	2.62272e+2
7	1.35	672.9	0.0885	22	2.16	1079.4	0.0880	37	4.91	2455.2	0.1907	52	7.26	3632.0	0.9018	7	[1.48 .. 1.51]	0.515	1.96802e+2
8	1.36	679.6	0.1150	23	2.17	1086.5	0.4897	38	5.03	2515.9	0.1966	53	7.35	3674.4	0.2804	8	[1.86 .. 1.95]	1.006	3.83973e+2
9	1.37	687.0	0.1283	24	2.19	1093.8	0.0662	39	5.05	2526.3	0.1545	54	7.35	3677.5	0.3536	9	[2.13 .. 2.21]	1.840	7.02676e+2
10	1.40	700.7	1.0000	25	3.04	1521.3	0.0625	40	5.30	2650.2	0.1260	55	7.36	3680.8	0.3706	10	[3.03 .. 3.15]	2.051	7.82917e+2
11	1.46	730.6	0.1057	26	3.05	1527.1	0.0695	41	5.33	2667.0	0.1590	56	7.40	3698.5	0.1978	11	[3.55 .. 3.60]	0.928	3.54241e+2
12	1.47	734.3	0.1167	27	3.06	1532.0	0.1268	42	5.35	2673.1	0.1366	57	7.40	3701.0	0.1866	12	[4.88 .. 4.92]	0.958	3.65710e+2
13	1.49	745.0	0.0800	28	3.08	1537.5	0.1275	43	5.37	2682.9	0.1472	58	7.41	3702.5	0.1700	13	[5.02 .. 5.06]	0.958	3.65955e+2
14	1.50	748.6	0.0847	29	3.10	1548.8	0.1285	44	5.53	2764.4	0.0601	59	7.41	3704.0	0.1616	14	[5.29 .. 5.37]	2.143	8.18363e+2
15	1.56	781.6	0.4052	30	3.12	1558.0	0.1298	45	5.55	2772.9	0.0686	60	7.42	3708.0	0.1262	15	[5.52 .. 5.61]	1.000	3.81790e+2



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