Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.


# Synthesis and glycosidase inhibition of *N*-substituted derivatives of 1,4-dideoxy-1,4-imino-D-mannitol (DIM)

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# Supplementary Information

**Experimental data for**
**compound 13b-i, 14b-i, 16b-g, 17b-g, 19b-h, 20b-h, 28b-g and 29b-g**
*and*
**NMR spectra and Infrared spectra for**
**compound 2, 7-11, 13a-i, 14a-i, 16a-g and 17a-g**

# 1. Experimental data for compounds

***N*-Ethyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13b)**

According to the general reductive amination procedures, product **13b** (99.5 mg, 89% yield) was obtained from **10** (0.10 g, 0.41 mmol) and 40% aq. acetaldehyde (142.6 µL, 1.23 mmol) as a light yellow syrup. $[\alpha]_D^{27}$-41.0 (*c* 1.80 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 2985 s, 2933 s, 2800 w, 1704 w, 1455 w, 1380 s, 1267 m, 1208 vs, 1157 s, 1103 m, 1058 s, 991 w, 931 w, 860 m, 844 m, 514 w; $\delta_H$ (500 MHz; $CDCl_3$) 4.60-4.56 (2H, m), 4.46 (1H, td, *J*= 7.5 Hz, 2.0 Hz), 4.19 (1H, t, *J* = 7.8 Hz), 3.99 (1H, t, *J* = 7.5 Hz), 3.26 (1H, d, *J* = 11.1 Hz), 3.11 (1H, dq, *J*= 12.4 Hz, 7.5 Hz) 2.62 (1H, d, *J* = 2.3 Hz), 2.15-2.08 (2H, m), 1.45 (3H, s), 1.43 (3H, s), 1.33 (3H, s), 1.28 (3H, s), 1.04 (3H, t, *J* = 7.5 Hz); $\delta_C$ (125 MHz; $CDCl_3$) 110.9, 107.1, 81.2, 77.6, 75.2, 67.6, 65.8, 58.5, 47.8, 26.2, 25.8, 24.7, 24.0, 12.5; HRMS(ESI) calcd for $C_{14}H_{26}NO_4^+$ $[M+H]^+$ 272.18563, found 272.18515.

***N*-Ethyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14b)**

According to the general deprotection procedures, product **14b** (16.7 mg, 100% yield) was obtained from **13b** (20.0 mg, 0.07 mmol) as a white solid. M.p. 142-143 °C; $[\alpha]_D^{27}$ -36.8 (*c* 0.35 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3420 vs, 2926 vw, 1653 w, 1132 w, 1098 w, 1044 m, 625 vw; $\delta_H$ (500 MHz; $D_2O$) 4.57-4.51 (2H, m), 4.22 (1H, dd, *J*= 11.0 Hz, 5.0 Hz), 3.83 (2H, m), 3.65 (1H, t, *J* = 4.1Hz), 3.59 (3H, m) 3.19-3.12 (1H, m) 1.35 (3H, t, *J* = 7.3 Hz); $\delta_C$ (125 MHz; $D_2O$) 70.8, 68.5, 68.1, 67.3, 62.5, 54.6, 49.3, 9.3; HRMS(ESI) calcd for $C_8H_{18}NO_4^+$ $[M+H]^+$ 192.12303, found 192.12280.

***N*-Propyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13c)**

According to the general reductive amination procedures, product **13c** (45.2 mg, 77% yield) was obtained from **10** (50.0 mg, 0.21 mmol) and propanal (45.7 µL, 0.63 mmol) as a light yellow syrup. $[\alpha]_D^{28}$ -57.1 (*c* 1.90 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 2985 s, 2934 s, 2874 m, 2783 w, 1709 w, 1456 m, 1380 s, 1267 m, 1208 vs, 1157 s, 1098 m, 1059 s, 990 w, 935 w, 860 s, 842 m, 514 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.59-4.54 (2H, m), 4.46 (1H, td, *J*= 7.2 Hz, 1.6 Hz), 4.21 (1H, t, *J* = 8.0 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.25 (1H, d, *J* = 10.8 Hz), 3.05-2.98 (1H, m) 2.61 (1H, d, *J* = 2.8 Hz), 2.07-1.99 (2H, m), 1.51-1.42 (8H, m), 1.32 (3H, s), 1.27 (3H, s), 0.89 (3H, t, *J* = 7.4 Hz); $\delta_C$ (100 MHz; $CDCl_3$) 110.0, 107.1, 81.1, 77.7, 75.3, 67.9, 65.7, 59.1, 56.0, 26.2, 25.9, 24.9, 24.0, 20.9, 11.8; HRMS(ESI) calcd for $C_{15}H_{28}NO_4^+$ $[M+H]^+$ 286.20168, found 286.20103.

***N*-Propyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14c)**

According to the general deprotection procedures, product **14c** (25.3 mg, 100% yield) was obtained from **13c** (30.0 mg, 0.10 mmol) as a light yellow syrup. $[\alpha]_D^{27}$-36.1 (*c* 0.85 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3392 vs, 2927 m, 2856 w, 1653 w, 1405 w, 1108 w,1044 m, 560 w; $\delta_H$ (400 MHz; $D_2O$) 4.55-4.51 (2H, m), 4.23-4.22 (1H, m), 3.88-3.80 (2H, m), 3.67 (1H, s), 3.56 (2H, d, *J* = 7.3 Hz) 3.40-3.33 (1H, m), 3.10-3.03 (1H, m), 1.77-1.75 (2H, m), 0.98 (3H, t, *J* = 7.2 Hz); $\delta_C$ (100 MHz; $D_2O$) 70.7, 68.8, 68.6, 67.3, 62.6, 55.0, 55.4, 18.1, 10.1; HRMS(ESI) calcd for $C_9H_{20}NO_4^+$ $[M+H]^+$ 203.13868, found 206.13845.

***N*-Butyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13d)**

According to the general reductive amination procedures, product **13d** (51.1 mg, 87% yield) was obtained from **10** (48.7 mg, 0.20 mmol) and n-butanal (54.1 µL, 0.60 mmol) as a colorless syrup. $[\alpha]_D^{24}$-46.8 (*c* 1.12 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3032 w, 2985 m, 2959 m, 2933 s, 2873 w, 2783 w, 1707 w, 1457 w, 1370 s, 1266 m, 1208 vs, 1156 s, 1089 m, 1058 m, 860 m, 844 m, 514 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.59-4.54 (2H, m), 4.46 (1H, t, *J*= 7.2 Hz), 4.20 (1H, t, *J* = 7.6 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.11-3.04 (1H, m), 2.59 (1H, d, *J* = 2.0 Hz), 2.06-1.98 (2H, m), 1.43-1.27 (16H, m), 0.90 (3H, t, *J* = 7.2 Hz); $\delta_C$ (100 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.1, 65.7, 59.1, 54.0, 30.0, 26.3, 25.9, 24.9, 24.0, 20.6, 14.1; HRMS(ESI) calcd for $C_{16}H_{30}NO_4^+$ $[M+H]^+$ 300.21693, found 300.21697.

***N*-Butyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14d)**

According to the general deprotection procedures, product **14d** (13.6 mg, 99% yield) was obtained from **13d** (16.0 mg, 0.05 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -41.4 (*c* 0.35 in $CH_3OH$); $\nu_{max}$/cm$^{-1}$ 3347 s, 2961 m, 2937 w, 2873 w, 1111 m, 1034 m; $\delta_H$ (400 MHz; $CDCl_3$) 4.58-4.50 (2H, m), 4.22 (1H, q, *J* = 5.1 Hz), 3.88-3.80 (2H, m), 3.67 (1H, t, *J* = 4.1 Hz), 3.56 (2H, d, *J* = 7.4 Hz), 3.44-3.37 (1H, m), 1.81-1.66 (2H, m), 1.46-1.33 (2H, m), 0.94 (3H, t, *J* = 7.3 Hz); $\delta_C$ (100 MHz; $CDCl_3$) 70.7, 68.8, 68.6, 67.3, 62.6, 55.4, 54.4, 26.4, 19.2, 12.7;[1] HRMS(ESI) calcd for $C_{10}H_{22}NO_4^+$ $[M+H]^+$ 220.15433, found 220.15401.

**N-Pentyl-1,4-dideoxy-2,3:5,6-di-O-isopropylidene-1,4-imino-d-mannitol (13e)**

According to the general reductive amination procedures, product **13e** (108.2 mg, 84% yield) was obtained from **10** (100.0 mg, 0.41 mmol) and n-pentanal (137.8 µL, 1.23 mmol) as a colorless syrup. $[\alpha]_D^{24}$-34.0 (*c* 1.97 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 2990 m, 2956 m, 2927 vs, 2858 m, 2790 w, 1684 m,1458 m, 1379 s, 1208 s, 1155 m, 1094 m, 1044 m, 861 m, 419 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.59-4.54 (2H, m), 4.46 (1H, td, *J*= 7.2 Hz, 1.6 Hz), 4.19 (1H, t, *J* = 7.6 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.09-3.01 (1H, m), 2.59 (1H, d, *J* = 2.7 Hz), 2.06-1.97 (2H, m), 1.46-1.21 (18H, m), 0.88 (3H, t, *J* = 7.2 Hz); $\delta_C$ (100 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.2, 29.6, 27.4, 26.3, 25.9, 24.9, 24.0, 22.6, 14.1; HRMS(ESI) calcd for $C_{17}H_{32}NO_4^+$ $[M+H]^+$ 314.23258, found 314.23238.

***N*-Pentyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14e)**

According to the general deprotection procedures, product **14e** (13.6 mg, 99% yield) was obtained from **13e** (16.0 mg, 0.05 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -41.9 (*c* 0.53 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3362 s, 2958 m, 2937 m, 2873 w, 1653 m, 1458 w, 1113 m, 1050 m, 517 w; $\delta_H$ (400 MHz; $D_2O$) 4.53-4.47 (2H, m), 4.18 (1H, q, *J* = 5.2 Hz), 3.86-3.78 (2H, m), 3.53 (1H, s), 3.45-3.44 (2H, d, *J*= 6.8 Hz), 3.32-3.24 (1H, m), 3.02-2.95 (1H, m), 1.72-1.67 (2H, m), 1.36-1.31 (4H, m), 0.89 (3H, t, *J* = 7.2 Hz); $\delta_C$ (100 MHz; $D_2O$) 71.0, 68.8, 68.4, 67.8, 62.7, 55.4, 54.8, 28.0, 24.4, 21.5, 13.0; HRMS(ESI) calcd for $C_{11}H_{24}NO_4^+$ $[M+H]^+$ 234.16998, found 234.16964.

***N*-Hexyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13f)**

According to the general reductive amination procedures, product **13f** (66.7 mg, 84% yield) was obtained from **10** (59.0 mg, 0.24 mmol) and n-hexanal (88.4 μL, 0.72 mmol) as a colorless syrup. $[\alpha]_D^{24}$ -54.6 (*c* 1.86 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2984 m, 2956 m, 2928 s, 2859 m, 2782 w, 1456 w,1369 s, 1265 m, 1206 vs, 1154 s, 1092 m, 1047s, 989 w, 860 m, 843 m, 419 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.60-4.55 (2H, m), 4.46 (1H, td, *J*= 7.3 Hz, 1.6 Hz), 4.20 (1H, t, *J* = 7.6 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.26 (1H, d, *J* = 11.0 Hz), 3.09-3.02 (1H, m), 2.59 (1H, d, *J* = 2.6 Hz), 2.07-1.98 (2H, m), 1.44-1.27 (20H, m), 0.88 (3H, t, *J* = 6.4 Hz); $\delta_C$ (100 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.8, 59.1, 54.2, 31.8, 27.7, 27.0, 26.3, 25.9, 24.9, 24.0, 22.6, 14.0; HRMS(ESI) calcd for $C_{18}H_{34}NO_4^+$ $[M+H]^+$ 328.24824, found 328.24786.

***N*-Hexyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14f)**

According to the general deprotection procedures, product **14f** (23.4 mg, 100% yield) was obtained from **13f** (27.0 mg, 0.08 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -46.9 (*c* 1.05 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3348 vs, 2956 m, 2930 m, 2859 w, 1457 w, 1115 m, 1034 w; $\delta_H$ (500 MHz; $D_2O$) 4.57-4.51 (2H, m), 4.22 (1H, q, *J*= 4.5 Hz), 3.84 (2H, qd, *J*= 11.9 Hz, 6.2Hz), 3.66 (1H, s), 3.55 (2H, d, *J*= 7.4 Hz), 3.42-3.35 (1H, m), 3.12-3.07 (1H, m), 1.78-1.69 (2H, m), 1.39-1.32 (6H, m), 0.87 (3H, t, *J* = 5.5 Hz); $\delta_C$ (125 MHz; $D_2O$) 70.7, 68.7, 68.6, 67.2, 62.5, 55.3, 54.5, 30.3, 25.3, 24.2, 21.6, 13.1; HRMS(ESI) calcd for $C_{12}H_{26}NO_4^+$ $[M+H]^+$ 248.18563, found 248.18526.

***N*-Heptyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13g)**

According to the general reductive amination procedures, product **13g** (106.7 mg, 76% yield) was obtained from **10** (100 mg, 0.41 mmol) and n-heptanal (165.2 μL, 1.23 mmol) as a colorless syrup. $[\alpha]_D^{27}$ -45.6 (*c* 1.49 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2985 m, 2956 m, 2928 vs, 2858 m, 2783 w, 1457 w, 1379 s, 1267 m, 1208 vs, 1156 s, 1094 m, 1049 s, 990 w, 931 s, 860 m, 844 m, 514 w; $\delta_H$ (500 MHz; $CDCl_3$) 4.58-4.54 (2H, m), 4.46 (1H, t, *J*= 7.5 Hz), 4.18 (1H, t, *J* = 7.5 Hz), 3.98 (1H, t, *J* = 7.5Hz, H1), 3.25 (1H, d, *J* = 11.0 Hz), 3.08-3.02 (1H, m), 2.59 (1H, d, *J* = 3.5 Hz), 2.06-1.98 (2H, m), 1.43-1.27 (22H, m), 0.87 (3H, t, *J* = 6.3 Hz); $\delta_C$(125 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.8, 59.1, 54.3, 31.9, 29.3, 27.7, 27.4, 26,3, 25.9, 24.9, 24.0, 22.7, 14.1; HRMS(ESI) calcd for $C_{19}H_{36}NO_4^+$ $[M+H]^+$ 342.26389, found 342.26332.

***N*-Heptyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14g)**

According to the general deprotection procedures, product **14g** (30.5mg, 100% yield) was obtained from **13g** (35.0 mg, 0.10 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -28.7 (*c* 0.28 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3349 s, 2956 m, 2929 s, 2859 w, 1684 w, 1458 w, 1117 w, 1041 m; $\delta_H$ (400 MHz; $D_2O$) 4.59-4.51 (2H, m), 4.23 (1H, q, *J*= 5.1 Hz), 3.90-3.81 (2H, m), 3.67 (1H, t, *J*= 4.0 Hz), 3.56 (2H, d, *J*= 7.6 Hz), 3.44-3.37 (1H, m), 3.15-3.07 (1H, m), 1.76-1.71 (2H, m), 1.37-1.30 (8H, m), 0.88 (3H, t, *J* = 7.2 Hz); $\delta_C$(100 MHz; $D_2O$) 70.7, 68.8, 68.6, 67.3, 62.6, 55.4, 54.6, 30.7, 27.8, 24.3, 21.8, 13.3; HRMS(ESI) calcd for $C_{13}H_{28}NO_4^+$ $[M+H]^+$ 262.20128, found 262.20098.

***N*-Octyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13h)**

According to the general reductive amination procedures, product **13h** (57.0 mg, 78% yield) was obtained from **10** (50.0 mg, 0.21 mmol) and n-octanal (98.4 μL, 0.63 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -38.1 (*c* 0.53 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2986 m, 2956 m, 2927 vs, 2856 m, 2790 w, 1684 m, 1460 m, 1380 s, 1267 m, 1208 s, 1157 m, 1095 m, 1052 m, 860 m, 844 w, 511 w; $\delta_H$ (500 MHz; $CDCl_3$) 4.59-4.55 (2H, m), 4.46 (1H, td, *J*= 7.5 Hz, 1.5 Hz), 4.19 (1H, t, *J* = 7.5 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.08-3.02 (1H, m), 2.59 (1H, d, *J* = 3.0 Hz), 2.06-1.98 (2H, m), 1.47-1.27 (24H, m), 0.87 (3H, t, *J* = 6.5 Hz); $\delta_C$ (125 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.71, 75.3, 68.0, 65.8, 59.1, 54.3, 31.9, 29.6, 29.3, 27.8, 27.4, 26.3, 25.87, 24.9, 24.1, 22.7, 14.1; HRMS(ESI) calcd for $C_{20}H_{38}NO_4^+$ $[M+H]^+$ 356.27954, found 356.27921.

***N*-Octyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14h)**

According to the general deprotection procedures, product **14h** (21.9 mg, 100% yield) was obtained from **13h** (25.0 mg, 0.07 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -39.2 (*c* 0.39 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3377 vs, 2956 m, 2926 s, 2856 m, 1647 w, 1456 w, 1119 m, 1041 w, 517 w; $\delta_H$ (400 MHz; $D_2O$) 4.58-4.50 (2H, m), 4.22 (1H, q, *J*= 5.1 Hz), 3.88-3.80 (2H, m), 3.66 (1H, t, *J*= 4.2 Hz), 3.56 (2H, d, *J*= 7.4 Hz), 3.43-3.36 (1H, m), 3.13-3.06 (1H, m), 1.79-1.67 (2H, m), 1.36-1.28 (10H, m), 0.86 (3H, t, *J* = 6.4 Hz); $\delta_C$ (100 MHz; $D_2O$) 70.7, 68.7, 68.6, 67.3, 62.5, 55.3, 54.6, 30.9, 28.11, 28.08, 25.7, 24.3, 21.9, 13.4; HRMS(ESI) calcd for $C_{14}H_{30}NO_4^+$ $[M+H]^+$ 276.21693, found 276.21684.

***N*-Nonyl-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (13i)**

According to the general reductive amination procedures, product **13i** (64.7 mg, 71% yield) was obtained from **10** (60.0 mg, 0.25 mmol) and n-nonanal (128.9 μL, 0.75 mmol) as a colorless syrup. $[\alpha]_D^{29}$ -45.4 (*c* 0.55 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2984 w, 2925 vs, 2855 m, 2783 w, 1457 w, 1369 m, 1266 w, 1027 s, 1155 m, 1050 m, 1105 vs, 860 w, 843 w; $\delta_H$ (500 MHz; $CDCl_3$)

4.59-4.55 (2H, m), 4.46 (1H, t, *J* = 7.0 Hz), 4.19 (1H, t, *J* = 7.5 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.25 (1H, d, *J* = 11.5 Hz), 3.08-3.02 (1H, m), 2.59 (1H, d, *J* = 3.0 Hz), 2.06-1.98 (2H, m), 1.43 (8H, s), 1.33-1.25 (18H, m), 0.87 (3H, t, *J* = 6.5 Hz); $\delta_C$ (125 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.3, 31.9, 29.6, 29.3, 27.7, 27.4, 26.3, 25.9, 24.9, 24.1, 22.7, 14.1; HRMS(ESI) calcd for $C_{21}H_{40}NO_4^+$ $[M+H]^+$ 370.29519, found 370.29464.

***N*-Nonyl-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (14i)**

According to the general deprotection procedures, product **14i** (26.4 mg, 100% yield) was obtained from **13i** (30.1 mg, 0.08 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -32.1 (*c* 0.86 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3308 s, 2925 vs, 2855 m, 1116 m, 1044 w, 419 m; $\delta_H$ (400 MHz; $D_2O$) 4.53-4.50 (2H, m), 4.20 (1H, m), 3.82 (2H, s), 3.64 (1H, s), 3.53 (2H, d, *J* = 6.7 Hz), 3.38-3.34 (1H, m), 3.11-3.07 (1H, m), 1.73 (2H, s), 1.32-1.26 (12H, m), 0.84 (3H, s); $\delta_C$ (100 MHz; $D_2O$) 70.7, 68.7, 68.5, 67.2, 62.5, 55.3, 54.5, 31.0, 28.3, 28.2, 28.1, 25.6, 24.2, 21.9, 13.3; HRMS(ESI) calcd for $C_{15}H_{32}NO_4^+$ $[M+H]^+$ 290.23258, found 290.23267.

***N*-(But-3-en-1-yl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (16b)**

According to the general nucleophilic substitution procedures, product **16b** (63.1 mg, 86% yield) was obtained from **10** (60.0 mg, 0.25 mmol) and 1-bromo-4-butene (38.3 μL, 0.38 mmol) as a colorless syrup. $[\alpha]_D^{26}$ -53.1 (*c* 0.36 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2984 m, 2934 m, 2797 w, 1370 s, 1267 w, 1207 vs, 1155 m, 1098 m, 1047 s, 990 w, 912 w, 860 m, 844 w; $\delta_H$ (400 MHz; $CDCl_3$) 5.81 (1H, ddt, *J* = 17.0 Hz, 10.3 Hz, 6.5 Hz), 5.06-4.95 (2H, m), 4.60-4.55 (2H, m), 4.46 (1H, td, *J*= 6.4 Hz, 1.6 Hz), 4.21 (1H, t, *J* = 8.0 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.27 (1H, d, *J* = 10.8 Hz), 3.20-3.13 (1H, m), 2.67 (1H, dd, *J*= 4.3 Hz, 1.1 Hz), 2.24-2.11 (4H, m), 1.43 (6H, s), 1.32 (3H, s), 1.27 (3H, s); $\delta_C$ (100 MHz; $CDCl_3$) 136.7, 115.3, 111.1, 107.1, 81.0, 77.7, 75.3, 67.6, 65.7, 59.1, 53.3, 31.9, 26.2, 25.8, 24.8, 24.0; HRMS(ESI) calcd for$C_{16}H_{28}NO_4^+$ $[M+H]^+$ 298.20128, found 298.20101.

***N*-(But-3-en-1-yl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (17b)**

According to the general deprotection procedures, product **17b** (34.1mg, 100% yield) was obtained from **16b** (40.0mg, 0.13 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -30.6 (*c* 0.60 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3356 vs, 2926 w, 2379 w, 2320 w, 1732 w, 1510 w, 1458 w, 1338 w, 1127 m, 1033 w, 1002 w, 933 w; $\delta_H$ (400 MHz; $D_2O$) 5.83 (1H, ddt, *J* = 17.1 Hz, 10.3 Hz, 6.7 Hz), 5.30-5.21 (2H, m), 4.59-4.52 (2H, m), 4.24 (1H, q, *J* = 5.0 Hz), 3.90 (1H, dd, *J* = 11.9 Hz, 5.9 Hz), 3.83 (1H, dd, *J* = 11.8 Hz, 4.8 Hz), 3.72 (1H, t, *J* = 4.3 Hz), 3.59-3.51 (3H, m), 3.25-3.18 (1H, m), 2.61-2.49 (2H, m); $\delta_C$ (100 MHz; $D_2O$) 132.4, 118.8, 70.6, 69.3, 68.6, 67.1, 62.6, 55.4, 53.6, 28.9; HRMS(ESI) calcd for $C_{10}H_{20}NO_4^+$ $[M+H]^+$ 218.13868, found 218.13830.

***N*-(Pent-4-en-1-yl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (16c)**

According to the general nucleophilic substitution procedures, product **16c** (908.7mg, 71% yield) was obtained from **10** (1.0 g, 4.11 mmol) and 1-bromo-5-pentene (0.73 mL, 6.17 mmol) as a colorless syrup. $[\alpha]_D^{24}$ -26.1 (*c* 1.72 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 3392 w, 3081 w, 2986 s, 2935 s, 2801 w, 1698 s, 1642 m, 1458 w, 1381 s, 1268 m, 1209 vs, 1157 m, 1097 m, 1056 s, 991 w, 916 s, 860 m, 517 w; $\delta_H$ (400 MHz; $CDCl_3$) 5.88-5.78 (1H, m), 5.03-5.02 (1H, m), 4.95-4.92 (1H, m) 4.60-4.55 (2H, m), 4.46 (1H, td, *J*= 7.8 Hz, 1.7 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.26 (1H, d, *J* = 11.0 Hz), 3.08 (1H, dt, *J* = 12.2 Hz, 8.5 Hz), 2.60 (1H, d, *J* = 2.7 Hz), 2.17-1.99 (4H, m), 1.60-1.51 (2H, m), 1.43 (6H, s), 1.32 (3H, s), 1.27 (3H, s); $\delta_C$ (100 MHz; $CDCl_3$) 138.8, 114.4, 111.0, 107.1, 81.1, 77.7, 75.3, 68.1, 65.7, 59.1, 53.7, 31.5, 27.1, 26.3, 25.9, 24.8, 24.0; HRMS(ESI) calcd for $C_{17}H_{30}NO_4^+$ $[M+H]^+$ 312.21693, found 312.21667.

***N*-(Pent-4-en-1-yl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (17c)**

According to the general deprotection procedures, product **17c** (85.0 mg, 99% yield) was obtained from **16c** (100.0 mg, 0.32 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -16.8 (*c* 0.75 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3420 vs, 2973 w, 1684 w, 1559 w, 1402 m, 1127 w, 1038 w, 594 w; $\delta_H$ (400 MHz; $D_2O$) 5.89-5.82 (1H, m), 5.14-5.06 (2H, m), 4.53-4.50 (2H, m), 4.20 (1H, s), 3.86-3.82 (2H, m), 3.68-3.62 (1H, m), 3.56-3.54 (2H, m), 3.40-3.36 (1H, m), 3.13-3.09 (1H, m), 2.16-2.15 (2H, m), 1.95-1.78 (2H, m); $\delta_C$ (100 MHz; $D_2O$) 137.0, 116.0, 70.7, 68.8, 68.6, 67.2, 62.5, 55.4, 53.9, 29.8, 23.5; HRMS(ESI) calcd for $C_{11}H_{22}NO_4^+$ $[M+H]^+$ 232.15433, found 232.15405.

***N*-(Hex-5-en-1-yl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (16d)**

According to the general nucleophilic substitution procedures, product **16d** (40.0 mg, 56% yield) was obtained from **10** (54.0 mg, 0.22 mmol) and 1-bromo-6-hexene (44.5 μL, 0.33 mmol) as a colorless syrup. $[\alpha]_D^{26}$ -51.1 (*c* 1.17 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2984 m, 2930 s, 2859 w, 2783 w, 1456 w, 1370 m, 1266 w, 1207 vs, 1155 m, 1051 s, 990 w, 910 w, 860 m, 844 w; $\delta_H$ (400 MHz; $CDCl_3$) 5.85-5.75 (1H, m), 5.02-4.92 (2H, m), 4.59-4.55 (2H, m), 4.47 (1H, t, *J* = 7.2 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.11-3.04 (1H, dt, *J* = 12.0 Hz, 8.0 Hz), 2.60 (1H, d, *J* = 2.7 Hz), 2.07-2.00 (4H, m), 1.47-1.35 (10H, m), 1.33 (3H, s), 1.27 (3H, s); $\delta_C$ (100 MHz; $CDCl_3$) 139.0, 114.3, 111.0, 107.1, 81.1, 77.7, 75.3, 68.1, 65.7, 59.1, 54.0, 33.7, 27.2, 26.7, 26.3, 25.9, 24.8, 23.9; HRMS(ESI) calcd for $C_{18}H_{32}NO_4^+$ $[M+H]^+$ 326.23258, found 326.23225.

***N*-(Hex-5-en-1-yl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (17d)**

According to the general deprotection procedures, product **17d** (25.9 mg, 100% yield) was obtained from **16d** (30.0 mg, 0.09 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -40.9 (*c* 0.44 in $CH_3OH$); $\nu_{max}/cm^{-1}$ 3362 vs, 2943 m, 2836 w, 1640 m, 1447 m, 1126 m, 1024 s, 918 w, 556 m; $\delta_H$ (400 MHz; $D_2O$) 5.88 (1H, ddt, *J* = 17.1 Hz, 10.3 Hz, 6.7 Hz), 5.11-5.03 (2H, m), 4.57-4.50 (2H, m), 4.22 (1H, q, *J* = 5.0 Hz), 3.88-3.79 (2H, m), 3.66 (1H, t, *J* = 4.1 Hz), 3.56-3.54 (2H, m), 3.45-3.35 (1H, m), 3.15-3.07 (1H,

m), 2.12 (2H, q, *J* = 6.9 Hz), 1.78-1.75 (2H, m), 1.51-1.47 (2H, m); $\delta_C$ (100 MHz; $D_2O$) 138.6, 115.0, 70.6, 68.7, 68.5, 67.2, 62.5, 55.3, 54.17, 32.2, 24.8, 23.6; HRMS(ESI) calcd for $C_{12}H_{24}NO_4^+$ $[M+H]^+$ 246.16998, found 246.16957.

***N*-(Hept-6-en-1-yl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (16e)**

According to the general nucleophilic substitution procedures, product **16e** (398 mg, 87% yield) was obtained from **10** (328.0 mg, 1.35 mmol) and 1-bromo-7-heptene (358.6 mg, 2.03 mmol) as a colorless syrup. $[\alpha]_D^{26}$-51.5 (*c* 1.13 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 2985 m, 2930 s, 2859 w, 2783 w, 1643 vw, 1458 w, 1380 s, 1267 m, 1208 vs, 1156 s, 1102 m, 1051 s, 991 m, 910 w, 860 m, 844 m, 514 vw; $\delta_H$ (400 MHz; $CDCl_3$) 5.85-5.75 (1H, m), 5.00-4.90 (2H, m), 4.59-4.54 (2H, m), 4.46(1H, t, *J* = 7.3 Hz), 4.18 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.20-3.13 (1H, dt, *J*= 12.0 Hz, 8.1 Hz), 2.59 (1H, d, *J* =2.4 Hz), 2.06-1.98 (4H, m), 1.51-1.27 (18H, m); $\delta_C$ (100 MHz; $CDCl_3$) 139.0, 114.2, 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.1, 33.8, 28.8, 27.6, 26.87, 26.28, 25.86, 24.9, 24.0; HRMS(ESI) calcd for $C_{19}H_{34}NO_4^+$ $[M+H]^+$ 340.24824, found 340.24800.

***N*-(Hept-6-en-1-yl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (17e)**

According to the general deprotection procedures, product **17e** (20.0 mg, 100% yield) was obtained from **16e** (22.0 mg, 0.06 mmol) as a light yellow syrup. $[\alpha]_D^{26}$-40.5 (*c* 0.77 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3349 vs, 2935 m, 2859 w, 1640 w, 1417 m, 1126 m, 1043 m, 998 w, 911 w, 554 w; $\delta_H$ (400 MHz; $D_2O$) 5.93 (1H, ddt, *J* = 17.1 Hz, 10.3 Hz, 6.7 Hz), 5.11-5.01 (2H, m), 4.60-4.53 (2H, m), 4.24 (1H, q, *J* = 5.0 Hz), 3.91-3.82 (2H, m), 3.68 (1H, t, *J* = 4.1 Hz), 3.58 (2H, d, *J* = 7.4 Hz,), 3.46-3.39 (1H, m), 3.16-3.09 (1H, m), 2.11 (2H, q, *J* = 6.5 Hz), 1.80-1.74 (2H, m), 1.53-1.39 (4H, m); $\delta_C$ (100 MHz; $D_2O$) 139.6, 114.5, 70.7, 68.8, 68.6, 67.3, 62.6, 55.4, 54.5, 32.7, 24.4, 25.2, 24.2; HRMS(ESI) calcd for $C_{13}H_{26}NO_4^+$ $[M+H]^+$ 260.18563, found 260.18520.

***N*-(Oct-7-en-1-yl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (16f)**

According to the general nucleophilic substitution procedures, product **16f** (134.8 mg, 64% yield) was obtained from **10** (145.0 mg, 0.60 mmol) and 1-bromo-8-octene (172.0 mg, 0.90 mmol) as a colorless syrup. $[\alpha]_D^{24}$-36.2 (*c* 0.31 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 2984 m, 2928 vs, 2657 m, 2783 w, 1456 w, 1369 m, 1267 m, 1207 s, 1156 m, 1103 w, 1050 m, 990 w, 910 w, 860 m, 843 w; $\delta_H$ (400 MHz; $CDCl_3$) 5.79 (1H, ddt, *J* = 17.0 Hz, 10.2 Hz, 6.6 Hz), 5.00-4.90 (2H, m), 4.59-4.54 (2H, m), 4.45 (1H, td, *J* = 7.3 Hz, 1.6 Hz), 4.19 (1H, t, *J* = 7.7 Hz), 3.97 (1H, t, *J* = 7.5 Hz), 3.24 (1H, d, *J* = 11.0 Hz), 3.20-3.13 (1H, dt, *J* = 11.8 Hz, 8.1 Hz), 2.59 (1H, d, *J* =2.8 Hz), 2.06-1.98 (4H, m), 1.48-1.24 (20H, m); $\delta_C$(100 MHz; $CDCl_3$) 139.2, 114.1, 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.2, 33.8, 29.1, 28.9, 27.7, 27.2, 26.3, 25.9, 24.9, 24.0; HRMS(ESI) calcd for $C_{20}H_{36}NO_4^+$ $[M+H]^+$ 354.26389, found 354.26343.

***N*-(Oct-7-en-1-yl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (17f)**

According to the general deprotection procedures, product **17f** (43.3 mg, 99% yield) was obtained from **16f** (50.0 mg, 0.14 mmol) as a light yellow syrup. $[\alpha]_D^{26}$-36.9 (*c* 0.96 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3368 vs, 2928 s, 2859 m, 1640 w, 1458 w, 1126 m, 1044 w, 913 w; $\delta_H$ (400 MHz; $D_2O$) 5.93 (1H, ddt, *J* = 17.2 Hz, 10.3 Hz, 6.7 Hz), 5.11-5.00 (2H, m), 4.59-4.52 (2H, m), 4.23 (1H, q, *J* = 5.1 Hz), 3.90-3.81 (2H, m), 3.66 (1H, t, *J* = 4.2 Hz), 3.56-3.54 (2H, m), 3.43-3.36 (1H, m), 3.14-3.06 (1H, m), 2.11 (2H, dd, *J* = 12.4 Hz, 7.8 Hz), 1.82-1.71 (2H, m), 1.47-1.40 (6H, m); $\delta_C$ (100 MHz; $D_2O$) 140.1, 114.2, 70.8, 68.7, 68.6, 67.4, 62.6, 55.4, 54.6, 32.9, 27.7, 27.6, 25.5, 24.3; HRMS(ESI) calcd for $C_{14}H_{28}NO_4^+$ $[M+H]^+$ 274.20128, found 274.20118.

***N*-(Non-8-en-1-yl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (16g)**

According to the general nucleophilic substitution procedures, product **16g** (66.7 mg, 69% yield) was obtained from **10** (64.0 mg, 0.26 mmol) and 1-bromo-9-nonene (61.6 mg, 0.30 mmol) as a colorless syrup. $[\alpha]_D^{24}$-23.4 (*c* 0.57 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 2985 m, 2928 vs, 2856 m, 2784 vw, 1704 w, 1456 w, 1380 m, 1266 w, 1209 s, 1158 m, 1093 w, 1054 m, 910 w, 860 m; $\delta_H$ (400 MHz; $CDCl_3$) 5.79 (1H, ddt, *J* = 17.0 Hz, 10.2 Hz, 6.7 Hz), 5.00-4.90 (2H, m), 4.58-4.54 (2H, m), 4.45 (1H, td, *J*= 7.3 Hz, 1.6 Hz), 4.18 (1H, t, *J* = 7.8 Hz), 3.97 (1H, t, *J* = 7.5 Hz), 3.24 (1H, d, *J* = 11.0 Hz), 3.05 (1H, dt, *J* = 12.1 Hz, 8.0 Hz), 2.58 (1H, d, *J* = 2.4 Hz), 2.06-1.97 (4H, m), 1.43-1.26 (22H, m); $\delta_C$ (100 MHz; $CDCl_3$) 139.2, 114.1, 111.0, 107.1, 81.1, 77.7, 75.3, 68.1, 65.8, 59.1, 54.2, 33.8, 29.4, 29.1, 28.9, 27.7, 27.3, 26.3, 25.9, 24.8, 24.0; HRMS(ESI) calcd for $C_{21}H_{38}NO_4^+$ $[M+H]^+$ 368.27954, found 368.27932.

***N*-(Non-8-en-1-yl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (17g)**

According to the general deprotection procedures, product **17g** (22.6 mg, 99% yield) was obtained from **16g** (26.0 mg, 0.07 mmol) as a light yellow syrup. $[\alpha]_D^{26}$-29.4 (*c* 0.98 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3367 vs, 2928 s, 2854 m, 1653 w, 1458 m, 1125 m, 1041 w, 910 w, 726 w, 628 w; $\delta_H$ (400 MHz; $D_2O$) 5.95 (1H, ddt, *J* = 17.1 Hz, 10.3 Hz, 6.7 Hz), 5.11-5.00 (2H, m), 4.61-4.54 (2H, m), 4.25 (1H, q, *J* = 5.1 Hz), 3.92-3.83 (2H, m), 3.69 (1H, t, *J* = 4.2 Hz), 3.59-3.58 (2H, m), 3.46-3.39 (1H, m), 3.17-3.10 (1H, m), 2.10 (2H, q, *J* = 6.5 Hz), 1.83-1.73 (2H, m), 1.54-1.29 (8H, m); $\delta_C$ (100 MHz; $D_2O$) 140.4, 114.1, 70.8, 68.8, 68.6, 67.3, 62.6, 55.4, 54.6, 33.0, 28.0, 25.6, 24.3; HRMS(ESI) calcd for $C_{15}H_{30}NO_4^+$ $[M+H]^+$ 288.21693, found 288.21672.

***N*-(Phenethyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (19b)**

According to the general nucleophilic substitution procedures, product **19b** (116.1 mg, 74% yield) was obtained from **10** (110.0 mg, 0.45 mmol) and 2-phenyl-1-bromoethane (125.8 mg, 0.68 mmol) as a white solid. M.p. 86-87 °C; $[\alpha]_D^{24}$-38.3 (*c* 0.42 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 2985 m, 2922 vs, 2853 m, 2809 w, 2373 w, 1685 w, 1455 w, 1369 m, 1272 w, 1207 s, 1154 m, 1099 m, 1044 s, 991 w, 930 w, 859 w, 755 w, 700 m, 522 m; $\delta_H$ (400 MHz; $CDCl_3$) 7.30-7.26 (2H, m), 7.23-7.17 (3H, m),

4.64-4.57 (2H, m), 4.47 (1H, td, *J* = 7.3 Hz, 1.4 Hz), 4.06 (1H, t, *J* = 7.8 Hz), 3.93 (1H, t, *J* = 7.5 Hz), 3.41-3.34 (2H, m), 2.80-2.77 (2H, m), 2.73 (1H, d, *J* =3.8 Hz), 2.40-2.34 (1H, m), 2.23 (1H, dd, *J* =10.9 Hz, 4.6 Hz), 1.42 (3H, s), 1.41 (3H, s), 1.33 (3H, s), 1.29 (3H, s); $\delta_C$ (100 MHz; $CDCl_3$) 140.6, 128.8, 128.2, 125.9, 111.1, 107.1, 81.0, 77.7, 75.2, 67.4, 65.6, 59.2, 55.5, 34.1, 26.3, 25.9, 24.8, 23.9; HRMS(ESI) calcd for $C_{20}H_{30}NO_4^+$ [M+H]$^+$ 348.21693, found 348.21667.

***N*-(Phenethyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20b)**

According to the general deprotection procedures, product **20b** (17.5 mg, 100% yield) was obtained from **19b** (20.0 mg, 0.06 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -34.1 (*c* 0.38 in $CH_3OH$); $\nu_{max}$/cm$^{-1}$ 3361 vs, 2923 w, 1651 w, 1460 w, 1419 w, 1127 m, 1033 w, 753 w, 703w, 503 w; $\delta_H$ (500 MHz; $D_2O$) 7.44-7.41 (2H, m), 7.37-7.36 (3H, m), 4.59-4.55 (1H, m), 4.53-4.52 (1H, m), 4.22-4.21 (1H, m), 3.86 (1H, dd, *J* = 11.8 Hz, 6.8 Hz), 3.79 (1H, dd, *J* = 11.8 Hz, 4.6 Hz), 3.72-3.58 (4H, m), 3.41-3.55 (1H, m), 3.18-3.07 (2H, m); $\delta_C$ (125 MHz; $D_2O$) 136.0, 129.1, 128.8, 127.4, 70.5, 69.3, 68.6, 67.0, 62.5, 55.4, 55.3, 30.7; HRMS(ESI) calcd for $C_{14}H_{22}NO_4^+$ [M+H]$^+$ 268.15433, found 268.15397.

***N*-(Phenylproyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (19c)**

According to the general nucleophilic substitution procedures, product **19c** (117.7 mg, 72% yield) was obtained from **10** (110.0 mg, 0.45 mmol) and 3-phenyl-1-bromopropane (135.4 mg, 0.68 mmol) as a colorless syrup. $[\alpha]_D^{26}$ -42.8 (*c* 2.1 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3062 w, 3026 w, 2985 s, 2931 vs, 2855 m, 2785 m, 1706m, 1603 w, 1497 w, 1454 m, 1340 s, 1268 m,1208 vs, 1157 m, 1100 m, 1049 s, 990 w, 931 w, 860 m, 842 m, 747 m, 699 m, 514 w; $\delta_H$ (400 MHz; $CDCl_3$) 7.28-7.25 (2H, m), 7.19-7.14 (3H, m), 4.60-4.56 (2H, m), 4.45 (2H, td, *J* = 7.3 Hz, 1.9 Hz), 4.16 (1H, t, *J* = 7.8 Hz), 3.95 (1H, t, *J* = 7.5 Hz), 3.29 (1H, d, *J* = 10.9 Hz), 3.11 (1H, dt, *J* = 12.2 Hz, 8.4 Hz), 2.75-2.68 (1H, m), 2.62-2.54 (2H, m), 2.13-2.06 (2H, m), 1.85-1.73 (2H, m), 1.45 (3H, s), 1.36 (3H, s), 1.32 (3H, s), 1.28 (3H, s); $\delta_C$ (100 MHz; $CDCl_3$) 142.4, 128.4, 128.3, 125.7, 111.0, 107.1, 81.1, 77.7, 75.3, 68.1, 65.8, 59.1, 53.8, 33.6, 29.5, 26.2, 25.9, 24.9, 24.0; HRMS(ESI) calcd for $C_{21}H_{32}NO_4^+$ [M+H]$^+$ 362.223258, found 362.23229.

***N*-(Phenylproyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20c)**

According to the general deprotection procedures, product **20c** (26.3 mg, 100% yield) was obtained from **19c** (30.0 mg, 0.08 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -36.1 (*c* 0.19 in $CH_3OH$); $\nu_{max}$/cm$^{-1}$ 3361 vs, 2922 m, 2854 w, 1653 w, 1455 m, 1419 w, 1130 m, 755 m, 701 m; $\delta_H$ (400 MHz; $D_2O$) 7.43-7.39 (2H, m), 7.34-7.32 (3H, m), 4.52-4.49 (2H, m), 4.17-4.14 (1H, m), 3.84-3.76 (2H, m), 3.65-3.58 (1H, m), 3.57-3.48 (2H, m), 3.45-3.38 (1H, m), 3.13-3.05 (1H, m), 2.82-2.69 (2H, m), 2.14-2.06 (2H, m); $\delta_C$ (100 MHz; $D_2O$) 140.5, 128.9, 128.5, 126.6, 70.7, 68.8, 68.6, 67.2, 62.5, 55.4, 53.7, 31.7, 26.0; HRMS(ESI) calcd for $C_{15}H_{24}NO_4^+$ [M+H]$^+$ 282.16998, found 282.16991.

***N*-(Phenylbutyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (19d)**

According to the general nucleophilic substitution procedures, product **19d** (225.8 mg, 77% yield) was obtained from **10** (190.0 mg, 0.78 mmol) and 4-phenyl-1-bromobutane (249.3 mg, 1.17 mmol) as a colorless syrup. $[\alpha]_D^{26}$ -43.5 (*c* 0.96 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 2985 m, 2934 m, 2784 w, 1705 w, 1497 vw, 1454 w, 1370 m, 1267 w, 1207 vs, 1155 m, 1050 s, 860 m, 746 w, 699 m, 514 vw; $\delta_H$ (400 MHz; $CDCl_3$) 7.29-7.25 (2H, m), 7.19-7.15 (3H, m), 4.59-4.55 (2H, m), 4.48 (1H, td, *J* = 7.2 Hz, 1.3 Hz), 4.22 (1H, t, *J* = 7.7 Hz), 3.99 (1H, t, *J* = 7.6 Hz), 3.25 (1H, d, *J* =11.0 Hz), 3.12 (1H, dt, *J* = 12.2 Hz, 8.4 Hz), 2.69-2.58 (3H, m), 2.08-2.02 (2H, m), 1.77-1.47 (4H, m), 1.45-1.44 (6H, m), 1.33 (3H, s), 1.28 (3H, s); $\delta_C$ (100 MHz; $CDCl_3$) 142.7, 128.4, 128.3, 125.6, 111.0, 107.1, 81.1, 77.7, 75.3, 68.1, 65.7, 59.1, 54.0, 35.8, 29.1, 27.4, 26.3, 25.9, 24.8, 23.9; HRMS(ESI) calcdfor $C_{22}H_{34}NO_4^+$ [M+H]$^+$ 376.24824, found 376.24770.

***N*-(Phenylbutyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20d)**

According to the general deprotection procedures, product **20d** (44.1 mg, 99% yield) was obtained from **19d** (50.0 mg, 0.13 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -36.0 (*c* 0.53 in $CH_3OH$); $\nu_{max}$/cm$^{-1}$ 3355 vs, 2940 m, 1647 w, 1496 w, 1455 m, 1341 w, 1130 m, 1056 w, 1044 w, 748 w, 700 m, 502 w; $\delta_H$ (400 MHz; $D_2O$) 7.40-7.36 (2H, m), 7.31-7.26 (3H, m), 4.48-4.40 (2H, m), 4.12-4.11 (1H, m), 3.78 (2H, d, *J* = 5.2 Hz), 3.46-3.39 (1H, m), 3.38-3.27 (2H, m), 3.22-3.20 (1H, m), 2.99-2.92 (1H, m), 2.73-7.63 (2H, m), 1.75-1.61 (4H, m); $\delta_C$ (100 MHz; $D_2O$) 142.3, 128.7, 128.6, 126.1, 71.1, 68.9, 68.3, 68.1, 62.7, 55.4, 54.7, 34.4, 27.7, 24.4; HRMS(ESI) calcd for $C_{16}H_{26}NO_4^+$ [M+H]$^+$ 296.18563, found 296.18530.

***N*-(Phenylpentyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (19e)**

According to the general nucleophilic substitution procedures, product **19e** (169.5 mg, 73% yield) was obtained from **10** (145.0 mg, 0.60 mmol) and 5-phenyl-1-bromopentane (204.4 mg, 0.90 mmol) as a colorless syrup. $[\alpha]_D^{24}$ -42.5 (*c* 1.88 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3026 vw, 2985 m, 2932 vs, 2858 m, 2783 w, 1496 w, 1454 w, 1379 s, 1367 m, 1207 vs, 1156 m, 1102 m, 1053 s, 860 m, 843 w, 699 m, 514 vw; $\delta_H$ (400 MHz; $CDCl_3$) 7.28-7.24 (2H, m), 7.17-7.14 (3H, m), 4.59-4.54 (2H, m), 4.46 (1H, td, *J* = 7.3 Hz, 1.6 Hz), 4.19 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.07 (1H, dt, *J* = 11.7 Hz, 8.1 Hz), 2.62-2.58 (3H, m), 2.06-1.99 (2H, m), 1.68-1.58 (2H, m), 1.54-1.27 (16H, m); $\delta_C$ (100 MHz; $CDCl_3$) 142.8, 128.4, 128.2, 125.6, 111.0, 107.1, 81.1, 77.7, 75.2, 68.0, 65.7, 59.1, 54.1, 36.0, 31.5, 27.6, 27.1, 26.3, 25.9, 24.8, 24.0; HRMS(ESI) calcd for $C_{23}H_{36}NO_4^+$ [M+H]$^+$ 390.26389, found 390.26359.

***N*-(Phenylpentyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20e)**

According to the general deprotection procedures, product **20e** (35.5 mg, 100% yield) was obtained from **19e** (40 mg, 0.10 mmol) as a light yellow syrup. $[\alpha]_D^{26}$-34.9 (*c* 0.57 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3347 vs, 3025 w, 2934 s, 2857 w, 1653 w, 1452 m, 1128 m, 1042 m, 748 w, 700 m, 576 w; $\delta_H$ (500 MHz; $D_2O$) 7.39-7.36 (2H, m), 7.31-7.26 (3H, m), 4.54-4.49 (2H, m), 4.19 (1H, q, *J* = 5.0 Hz), 3.83 (2H, dq, *J* = 21.0 Hz, 6.1 Hz), 3.62 (1H, t, *J* = 4.1 Hz), 3.55-3.47 (2H, m), 3.39-3.33 (1H, m), 3.08-3.02 (1H, m), 2.67 (2H, t, *J* = 7.5 Hz), 1.81-1.72 (2H, m), 1.71-1.65 (2H, m), 1.45-1.33 (2H, m); $\delta_C$ (125 MHz; $D_2O$) 142.9, 128.6, 125.9, 70.7, 68.7, 68.6, 67.2, 62.5, 55.3, 54.4, 34.7, 30.0, 25.2, 24.2; HRMS(ESI) calcd for $C_{17}H_{28}NO_4^+$ $[M+H]^+$ 310.20128, found 310.20107.

***N*-(Phenylhexyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (19f)**

According to the general nucleophilic substitution procedures, product **19f** (147.8 mg, 81% yield) was obtained from **10** (110.0 mg, 0.45 mmol) and 6-phenyl-1-bromohexane (162.8 mg, 0.68 mmol) as a colorless syrup. $[\alpha]_D^{26}$-36.5 (*c* 1.59 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 2986 m, 2932 s, 2859 w, 2784 vw, 1705 vw, 1603 vw, 1497 vw, 1454 w, 1380 s, 1267 m, 1207 vs, 1157 m, 1102 m, 1053 s, 860 m, 747 w, 699 m, 517 vm; $\delta_H$ (500 MHz; $CDCl_3$) 7.28-7.25 (2H, m), 7.18-7.15 (3H, m), 4.59-4.55 (2H, m), 4.46 (1H, td, *J* = 7.3 Hz, 1.3 Hz), 4.19 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.07 (1H, dt, *J* = 11.9 Hz, 8.2 Hz), 2.61-2.58 (3H, m), 2.06-1.99 (2H, m), 1.64-1.56 (2H, m), 1.48-1.27 (18H, m); $\delta_C$ (125 MHz; $CDCl_3$) 142.9, 128.4, 128.2, 125.5, 112.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.2, 35.94, 31.5, 29.3, 27.7, 27.3, 26.3, 25.9, 24.8, 24.0; HRMS(ESI) calcd for $C_{24}H_{38}NO_4^+$ $[M+H]^+$ 404.27954, found 404.27899.

***N*-(Phenylhexyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20f)**

According to the general deprotection procedures, product **20f** (44.5 mg, 100% yield) was obtained from **19f** (50.0 mg, 0.12 mmol) as a light yellow syrup. $[\alpha]_D^{26}$-32.9 (*c* 1.01 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3332 vs, 3025 w, 2931 s, 2857 w, 1724 w, 1495 w, 1453 m, 1339 w, 1288 w, 1127 m, 1089 w, 1041 w, 748 w, 699 m, 492 w; $\delta_H$ (500 MHz; $D_2O$) 7.39-7.36 (2H, m), 7.31-7.25 (3H, m), 4.55-4.50 (2H, m), 4.20 (1H, q, *J* = 5.0 Hz), 3.87-3.80 (2H, m), 3.66 (1H, t, *J* = 4.2 Hz), 3.56-3.49 (2H, m), 3.39-3.34 (1H, m), 3.08-3.03 (1H, m), 2.67 (2H, t, *J* = 7.5 Hz), 1.76-1.71 (2H, m), 1.67-1.61 (2H, m), 1.45-1.33 (4H, m); $\delta_C$ (125 MHz; $D_2O$) 143.3, 128.6, 128.5, 125.8, 70.7, 68.7, 68.6, 67.2, 62.5, 55.3, 54.4, 34.8, 30.3, 27.6, 25.5, 24.2; HRMS(ESI) calcd for $C_{18}H_{30}NO_4^+$ $[M+H]^+$ 324.21693, found 324.21586.

***N*-(Phenylheptyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (19g)**

According to the general nucleophilic substitution procedures, product **19g** (177.6 mg, 69% yield) was obtained from **10** (150.0 mg, 0.62 mmol) and 7-phenyl-1-bromoheptane (237.3 mg, 0.93 mmol) as a colorless syrup. $[\alpha]_D^{26}$-34.3 (*c* 1.90 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 2986 m, 2930 vs, 2856 m, 2787 w, 1710 m, 1458 w, 1379 m, 1267 w, 1208 s, 1157 m, 1103 m, 1058 m, 860 m, 699 m, 511 w; $\delta_H$ (400 MHz; $CDCl_3$) 7.29-7.25 (2H, m), 7.18-7.15 (3H, m), 4.59-4.55 (2H, m), 4.46 (1H, td, *J* = 7.2 Hz, 1.2 Hz), 4.20 (1H, t, *J* = 7.7 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.06 (1H, dt, *J* = 11.9 Hz, 8.0 Hz), 2.61-2.57 (3H, m), 2.06-1.97 (2H, m), 1.66-1.57 (2H, m), 1.44-1.27 (20H, m); $\delta_C$ (100 MHz; $CDCl_3$) 142.9, 128.4, 128.2, 125.5, 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.2, 36.0, 31.5, 29.5, 29.3, 27.7, 27.3, 26.3, 25.9, 24.9, 24.0; HRMS(ESI) calcd for $C_{25}H_{40}NO_4^+$ $[M+H]^+$ 418.29519, found 418.29492.

***N*-(Phenylheptyl))-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20g)**

According to the general deprotection procedures, product **20g** (41.1 mg, 100% yield) was obtained from **19g** (46.0 mg, 0.11 mmol) as a light yellow syrup. $[\alpha]_D^{26}$-30.4 (*c* 1.45 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3420 vs, 2926 m, 2854 w, 1655 w, 1559 w, 1460 w, 1127 w, 1047 w, 747 w, 700 w; $\delta_H$ (500 MHz; $D_2O$) 7.37-7.34 (2H, m), 7.30-7.23 (3H, m), 4.53-4.50 (2H, m), 4.20 (1H, d, *J* = 4.9 Hz), 3.87-3.80 (2H, m), 3.62-3.61 (1H, m), 3.54-3.46 (2H, m), 3.38-3.32 (1H, m), 3.07-3.01 (1H, m), 2.63 (2H, t, *J* = 7.4 Hz), 1.76-1.66 (2H, m), 1.65-1.59 (2H, m), 1.35-1.33 (6H, m); $\delta_C$ (125 MHz; $D_2O$) 143.4, 128.6, 128.5, 125.8, 70.7, 68.7, 68.6, 67.3, 62.6, 55.3, 54.5, 34.9, 30.5, 27.9, 25.6, 24.3; HRMS(ESI) calcd for $C_{19}H_{32}NO_4^+$ $[M+H]^+$ 338.23258, found 338.23227.

**N-(Phenyloctyl)-1,4-dideoxy-2,3:5,6-di-O-isopropylidene-1,4-imino-d-mannitol (19h)**

According to the general nucleophilic substitution procedures, product **19h** (140.7 mg, 61% yield) was obtained from **10** (130.0 mg, 0.53 mmol) and 8-phenyl-1-bromooctane (201.9 mg, 0.75 mmol) as a colorless syrup. $[\alpha]_D^{26}$-32.7 (*c* 1.35 in $CH_2Cl_2$); $\nu_{max}$/$cm^{-1}$ 3026 vw, 2985 m, 2928 vs, 2783 vw, 1705 w, 1454 w, 1379 m, 1267 w, 1208 s, 1157 m, 1047 m, 860 w, 699 w, 514 vw; $\delta_H$ (500 MHz; $CDCl_3$) 7.28-7.25 (2H, m), 7.18-7.15 (3H, m), 4.59-4.55 (2H, m), 4.46 (1H, td, *J* = 7.3 Hz, 1.6 Hz), 4.19 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.25 (1H, d, *J* =11.0 Hz), 3.05 (1H, dt, *J* = 12.3 Hz, 8.4 Hz), 2.61-2.58 (3H, m), 2.06-1.98 (2H, m), 1.62-1.56 (2H, m), 1.45-1.27 (22H, m); $\delta_C$ (125 MHz; $CDCl_3$) 142.9, 128.4, 128.2, 125.5, 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 59.1, 54.2, 36.0, 31.5, 29.5, 29.5, 29.3, 27.7, 27.4, 26.3, 25.9, 24.9, 24.0; HRMS(ESI) calcd for $C_{26}H_{42}NO_4^+$ $[M+H]^+$ 432.31084, found 432.30954.

***N*-(Phenyloctyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (20h)**

According to the general deprotection procedures, product **20h** (54.7 mg, 100% yield) was obtained from **19h** (61.0 mg, 0.14 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -34.5 (*c* 0.44 in $CH_3OH$); $\nu_{max}$/$cm^{-1}$ 3342 vs, 3025 w, 2931 s, 2856 m, 1653 w, 1453 m, 1129 m, 1044 w, 749 w, 699 m, 576 w; $\delta_H$ (500 MHz; $D_2O$) 7.22-7.18 (2H, m), 7.13-7.08 (3H, m), 4.53-4.51 (2H, m), 4.18 (1H, q, *J* = 4.8 Hz), 3.89-3.81 (2H, m), 3.59 (1H, s), 3.52-3.49 (1H, m), 3.41-3.37 (1H, m), 3.32-3.37 (1H, m), 2.98-2.93 (1H, m), 2.51 (2H, t, *J* = 7.5 Hz), 1.64-1.63 (2H, m), 1.52 (2H, s), 1.23 (8H, m); $\delta_C$ (125 MHz; $D_2O$) 143.0, 128.4, 128.3, 125.6, 70.6,

69.0, 68.6, 67.3, 62.6, 55.3, 54.4, 35.4, 31.1, 28.8, 28.6, 28.5, 26.0, 24.5; HRMS(ESI) calcd for $C_{20}H_{34}NO_4^+$ $[M+H]^+$ 352.24824, found 352.24780.

***N*-(3-((*tert*-Butyldimethylsilyl)oxy)propyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (28b)**

According to the general nucleophilic substitution procedures, product **28b** (204.5 mg, 57% yield) was obtained from **10** (200.0 mg, 0.82 mmol) and 3-((*tert*-butyldimethylsilyl)oxy)-1-bromopropane (311.5 mg, 1.23 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -29.1 (*c* 0.93 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3392 m, 2986 s, 2935 s, 2805 w, 1688 m, 1456 w,1373 s, 1381 m, 1211 vs, 1156 s, 1059 vs, 990 w, 858 m, 842 m, 777 w, 514 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.59-4.55 (2H, m), 4.43 (1H, td, *J* = 7.3 Hz, 1.9 Hz), 4.13 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.4 Hz), 3.73-3.60 (2H, m), 3.24 (1H, d, *J* = 11.0 Hz), 3.13 (1H, dt, *J* = 12.3 Hz, 8.2 Hz), 2.59-2.58 (1H, m), 2.11-2.05 (2H, m), 1.71-1.65 (2H, m), 1.42 (6H, s), 1.32 (3H, s), 1.27 (3H, s), 0.88 (9H, s), 0.04 (6H, s); $\delta_C$ (100 MHz; $CDCl_3$) 110.0, 107.1, 81.2, 77.6, 75.3, 68.1, 65.9, 61.6, 59.3, 50.8, 31.0, 26.4, 26.0, 25.87, 24.9, 24.1, 18.4, -5.3;HRMS(ESI) calcd for $C_{21}H_{42}NO_5Si^+$ $[M+H]^+$ 416.28268, found 416.28230.

***N*-(3-Hydroxypropyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (29b)**

According to the general deprotection procedures, product **29b** (37.1 mg, 99% yield) was obtained from **28b** (60.0 mg, 0.14 mmol) as a light yellow solid. M. p. 78-80 °C; $[\alpha]_D^{26}$ -26.1 (*c* 1.00 in $CH_3OH$); $\nu_{max}$/cm$^{-1}$ 3397 vs, 2964 w, 1647 w, 1405 w, 1126 w, 1050 w, 561 w; $\delta_H$ (400 MHz; $D_2O$) 4.63-4.55 (2H, m), 4.26 (1H, q, *J* = 5.0 Hz), 3.93-3.84 (2H, m), 3.82-3.71 (3H, m), 3.63-3.54 (3H, m), 3.30-3.23 (1H, m), 2.12-1.96 (2H, m); $\delta_C$ (100 MHz; $D_2O$) 70.8, 69.1, 68.65, 67.3, 62.6, 56.2, 55.6, 52.6, 26.9; HRMS(ESI) calcd for $C_9H_{20}NO_5^+$ $[M+H]^+$ 222.13360, found 222.13360.

***N*-(4-((*tert*-Butyldimethylsilyl)oxy)butyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (28c)**

According to the general nucleophilic substitution procedures, product **28c** (108.8 mg, 77% yield) was obtained from **10** (80.0 mg, 0.33 mmol) and 4-((*tert*-butyldimethylsilyl)oxy)-1-bromobutane (132.3 mg, 0.50 mmol) as a light yellow syrup. $[\alpha]_D^{28}$ -32.3 (*c* 1.50 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 2986 w, 2934 s, 2858 vw, 1705 w, 1463 w, 1380 m, 1256 m, 1208 s, 1157 m, 1100 vs, 1058 m, 837 s, 776 m, 515 vw; $\delta_H$ (400 MHz; $CDCl_3$) 4.59-4.54 (2H, m), 4.45 (1H, td, *J* = 7.2Hz, 1.2 Hz), 4.18 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.6 Hz), 3.61 (2H, t, *J* = 5.2 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.06 (1H, dt, *J* = 12.1 Hz, 7.4 Hz), 2.60 (1H, d, *J* = 2.4 Hz), 2.08-2.02 (2H, m), 1.61-1.46 (4H, m), 1.43 (6H, s), 1.32 (3H, s), 1.27 (3H, s), 0.88 (9H, s), 0.04 (6H, s); $\delta_C$ (100 MHz; $CDCl_3$) 110.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 63.2, 59.1, 54.1, 30.7, 26.3, 26.0, 25.9, 24.9, 24.1, 24.0, 18.4, -5.2, -5.3; HRMS(ESI) calcd for $C_{22}H_{44}NO_5Si^+$ $[M+H]^+$ 430.29833, found 430.29768.

***N*-(4-Hydroxybutyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (29c)**

According to the general deprotection procedures, product **29c** (11.4 mg, 100% yield) was obtained from **35c** (18.0 mg, 0.04 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -29.3 (*c* 0.28 in $CH_3OH$); $\nu_{max}$/cm$^{-1}$ 3359 w, 2921 m, 2854 w, 2373 w, 2326 w, 1647 w, 1458 w, 1130 w, 1022 w, 417 w; $\delta_H$ (400 MHz; $D_2O$) 4.57-4.50 (2H, m), 4.22 (1H, q, *J* =5.1 Hz), 3.89-3.79 (2H, m), 3.68-3.60 (3H, m), 3.56 (2H, d, *J* = 7.4 Hz), 3.47-3.40 (1H, m), 3.17-3.10 (1H, m), 1.88-1.74 (2H, m), 1.66-1.59 (2H, m); $\delta_C$ (100 MHz; $D_2O$) 70.7, 68.8, 68.6, 67.2, 62.5, 60.8, 55.3, 54.2, 28.4, 21.4; HRMS(ESI) calcd for $C_{10}H_{22}NO_5^+$ $[M+H]^+$ 236.14925, found 236.14906.

***N*-(5-((*tert*-Butyldimethylsilyl)oxy)pentyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (28d)**

According to the general nucleophilic substitution procedures, product **35d** (240.6 mg, 66% yield) was obtained from **10** (200.0 mg, 0.82 mmol) and 5-((*tert*-butyldimethylsilyl)oxy)-1-bromopentane (346.0 mg, 1.23 mmol) as a light yellow syrup. $[\alpha]_D^{20}$ -16.6 (*c* 0.56 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3447 w, 2931 vs, 2858 m, 2801 w, 1729 m, 1684 m, 1458 w, 1380 m, 1257 m, 1208 s, 1156 m, 1098 s, 1073 m, 990 w, 932 w, 860 m, 836 s, 776 m, 512 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.59-4.54 (2H, m), 4.45 (1H, td, *J* = 7.3 Hz, 1.4 Hz), 4.18 (1H, t, *J* = 7.7 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.59 (2H, t, *J* = 6.5 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.06 (1H, dt, *J* = 11.8 Hz, 8.1 Hz), 2.59 (1H, d, *J* = 2.7 Hz), 2.07-1.99 (2H, m), 1.56-1.27 (18H, m), 0.88 (9H, s), 0.03 (6H, s); $\delta_C$ (100 MHz; $CDCl_3$) 111.1, 107.1, 81.1, 77.7, 75.3, 68.0, 65.8, 63.2, 54.3, 32.9, 27.6, 26.3, 26.0, 25.9, 24.9, 24.0, 23.8, 18.3, -5.3; HRMS(ESI) calcd for $C_{23}H_{46}NO_5Si^+$ $[M+H]^+$ 444.3140, found 444.3137.

***N*-(5-Hydroxypentyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (29d)**

According to the general deprotection procedures, product **29d** (38.6 mg, 100% yield) was obtained from **28d** (60.0 mg, 0.14mmol) as a light yellow syrup. $[\alpha]_D^{20}$ -41.4 (*c* 0.76 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 3365 vs, 2942 m, 1647 w, 1418 m, 1130 m, 1046 m, 560 w; $\delta_H$ (500 MHz; $D_2O$) 4.56-4.52 (1H, m), 4.50 (1H, t, *J*= 4.0 Hz), 4.21 (1H, q, *J* = 5.0 Hz), 3.87-3.79 (2H, m), 3.66 (1H, t, *J* = 4.0 Hz), 3.60 (2H, t, *J* = 6.5 Hz), 3.55 (2H, d, *J* = 7.5 Hz), 3.44-3.38 (1H, m), 3.13-3.08 (1H, m), 1.84-1.71 (2H, m), 1.61-1.56 (2H, m), 1.48-1.35 (2H, m); $\delta_C$ (125 MHz; $D_2O$) 70.7, 68.8, 68.6, 67.2, 62.5, 61.2, 55.3, 54.3, 30.6, 24.1, 22.2; HRMS(ESI) calcd for $C_{11}H_{24}NO_5^+$ $[M+H]^+$ 250.1649, found 250.1649.

***N*-(6-((*tert*-Butyldimethylsilyl)oxy)hexyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (28e)**

According to the general nucleophilic substitution procedures, product **28e** (259.5 mg, 69% yield) was obtained from **10** (200.0 mg, 0.82 mmol) and 6-((*tert*-butyldimethylsilyl)oxy)-1-bromohexane (363.3 mg, 1.23 mmol) as a light yellow syrup. $[\alpha]_D^{25}$ -40.8 (*c* 1.82 in $CH_2Cl_2$); $\nu_{max}$/cm$^{-1}$ 2986 m, 2931 vs, 2858 s, 2783 w, 1463 w, 1380 m, 1256 m, 1208 s, 1156 m, 1101 s, 1048 m, 860 m, 837 s, 775 m, 514 w; $\delta_H$ (500 MHz; $CDCl_3$); 4.59-4.54 (2H, m), 4.45 (1H, td, *J* = 7.3 Hz, 1.4 Hz), 4.18 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.58 (2H, t, *J* = 6.7 Hz), 3.25 (1H, d, *J* = 11.0 Hz), 3.05 (1H, dt, *J* = 12.0 Hz, 8.1 Hz), 2.59 (1H, d,

*J* = 2.8 Hz), 2.06-1.99 (2H, m), 1.53-1.48 (2H, m), 1.43-1.27 (18H, m), 0.89 (9H, s), 0.04 (6H, s); $\delta_C$ (125 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 63.3, 59.1, 54.2, 32.9, 27.7, 26.3, 26.3, 26.0, 25.9, 25.8, 24.8, 24.0, 18.4, -5.3; HRMS(ESI) calcd for $C_{24}H_{48}NO_5Si^+$ $[M+H]^+$ 458.32963, found 458.32918.

***N*-(6-Hydroxyhexyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (29e)**

According to the general deprotection procedures, product **29e** (39.2 mg, quantitative yield) was obtained from **28e** (60 mg, 0.13 mmol) as a light yellow syrup. $[\alpha]_D^{26}$ -40.2 (*c* 0.60 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 3365 vs, 2937 m, 2865 w, 1647 w, 1458 m, 1130 m, 1046 m, 550 w; $\delta_H$ (500 MHz; $D_2O$) 4.57-4.50 (2H, m), 4.22 (1H, q, *J* = 5.0 Hz), 3.88-3.80 (2H, m), 3.67 (1H, t, *J* = 4.0 Hz), 3.60 (2H, t, *J* = 6.5 Hz), 3.56 (2H, d, *J* = 7.5 Hz), 3.44-3.38 (1H, m), 3.14-3.08 (1H, m), 1.84-1.71 (2H, m), 1.57-1.55 (2H, m), 1.41-1.40 (4H, m); $\delta_C$ (125 MHz; $D_2O$) 70.7, 68.7, 68.6, 67.2, 62.5, 61.5, 55.3, 54.4, 30.9, 24.4, 24.5, 24.2; HRMS(ESI) calcd for $C_{12}H_{26}NO_5^+$ $[M+H]^+$ 264.180555, found 264.18035.

***N*-(7-((*tert*-Butyldimethylsilyl)oxy)heptyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (28f)**

According to the general nucleophilic substitution procedures, product **28f** (143.6 mg, 57% yield) was obtained from **10** (130.0 mg, 0.53 mmol) and 7-((*tert*-butyldimethylsilyl)oxy)-1-bromoheptane (245.9 mg, 0.80 mmol) as a pale yellow syrup. $[\alpha]_D^{26}$ -33.1 (*c*1.57 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 3514 w, 2986 m, 2931 vs, 2857 m, 2784 w, 1707 w, 1463 w, 1380 m, 1256 m, 1208 s, 1156 m, 1099 s, 1050 m, 990 w, 932 w, 860 w, 837 m, 775 m, 514 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.58-4.53 (2H, m), 4.45 (1H, td, *J* = 7.2 Hz, 1.5 Hz), 4.18 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.58 (2H, t, *J* = 6.6 Hz), 3.24 (1H, d, *J* = 11.0 Hz), 3.04 (1H, td, *J* = 12.1 Hz, 8.1 Hz), 2.58 (1H, d, *J* = 2.6 Hz), 2.05-1.98 (2H, m), 1.50-1.42 (10H, m), 1.34-1.23 (12H, m), 0.88 (9H, s), 0.04 (6H, s); $\delta_C$(100 MHz; $CDCl_3$)111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.7, 63.3, 59.1, 54.2,32.9, 29.4, 27.7, 27.4,26.3, 26.0, 25.9, 25.8, 24.9, 24.0, 18.4, -5.3; HRMS(ESI) calcd for $C_{25}H_{50}NO_5Si^+$ $[M+H]^+$ 472.34528, found 472.34512.

***N*-(7-Hydroxyheptyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (29f)**

According to the general deprotection procedures, product **29f** (46.5 mg, 100% yield) was obtained from **28f** (70.0 mg, 0.15 mmol) as a pale yellow syrup. $[\alpha]_D^{28}$ -26.7 (*c* 1.64 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 3419 vs, 2935 m, 2931 vs, 2862 w, 1647 m, 1458 w, 1133 w, 1026 w, 597 w; $\delta_H$ (400 MHz; $CDCl_3$) 4.57-4.50 (2H, m), 4.21 (1H, q, *J* = 5.0 Hz), 3.87-3.79 (2H, m), 3.66 (1H, t, *J* = 3.8 Hz), 3.60-3.54 (4H, m), 3.43-3.35 (1H, m), 3.13-3.06 (1H, m), 1.80-1.68 (2H, m), 1.55-1.52 (2H, m), 1.42-1.30 (6H, m); $\delta_C$ (100 MHz; $CDCl_3$) 70.7, 68.8, 68.6, 67.3, 62.6, 61.7, 55.4, 54.5, 31.1. 27.9, 25.6, 24.7, 24.3; HRMS(ESI) calcd for $C_{13}H_{28}NO_5^+$ $[M+H]^+$ 278.19620, found 278.19604.

***N*-(8-((*tert*-Butyldimethylsilyl)oxy)octyl)-1,4-dideoxy-2,3:5,6-di-*O*-isopropylidene-1,4-imino-D-mannitol (28g)**

According to the general nucleophilic substitution procedures, product **28g** (133.7 mg, 67% yield) was obtained from **10** (100.0 mg, 0.41 mmol) and 8-((*tert*-butyldimethylsilyl)oxy)-1-bromooctane (198.9 mg, 0.62 mmol) as a light yellow syrup. $[\alpha]_D^{28}$ -33.1 (*c* 1.57 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 2986 m, 2933 s, 2859 w, 2784 w, 1705 w, 1455 w, 1380 s, 1267 m, 1208 vs, 1157 m, 1053 s, 860 m, 843 w, 699 m, 517 w; $\delta_H$ (500 MHz; $CDCl_3$) 4.59-4.54 (2H, m), 4.45 (1H, td, *J* = 7.3 Hz, 1.5 Hz), 4.18 (1H, t, *J* = 7.8 Hz), 3.98 (1H, t, *J* = 7.5 Hz), 3.58 (2H, t, *J* = 6.7 Hz), 3.24 (1H, d, *J* = 11.1 Hz), 3.05 (1H, dt, *J* = 12.2 Hz, 8.3 Hz), 2.59 (1H, d, *J* = 2.8 Hz), 2.06-1.98 (2H, m), 1.51-1.43 (10H, m), 1.32-1.27 (14H, m), 0.88 (9H, s), 0.04 (6H, s); $\delta_C$ (125 MHz; $CDCl_3$) 111.0, 107.1, 81.1, 77.7, 75.3, 68.0, 65.8, 63.3, 59.1, 54.3, 32.9, 29.6, 29.5, 27.7, 27.4, 26.3, 26.0, 25.9, 25.8, 24.9, 24.0, 18.4, -5.2; HRMS(ESI) calcd for $C_{26}H_{52}NO_5Si^+$ $[M+H]^+$ 486.36093, found 486.36082.

***N*-(8-Hydroxyoctyl)-1,4-dideoxy-1,4-imino-D-mannitol hydrochloride (29g)**

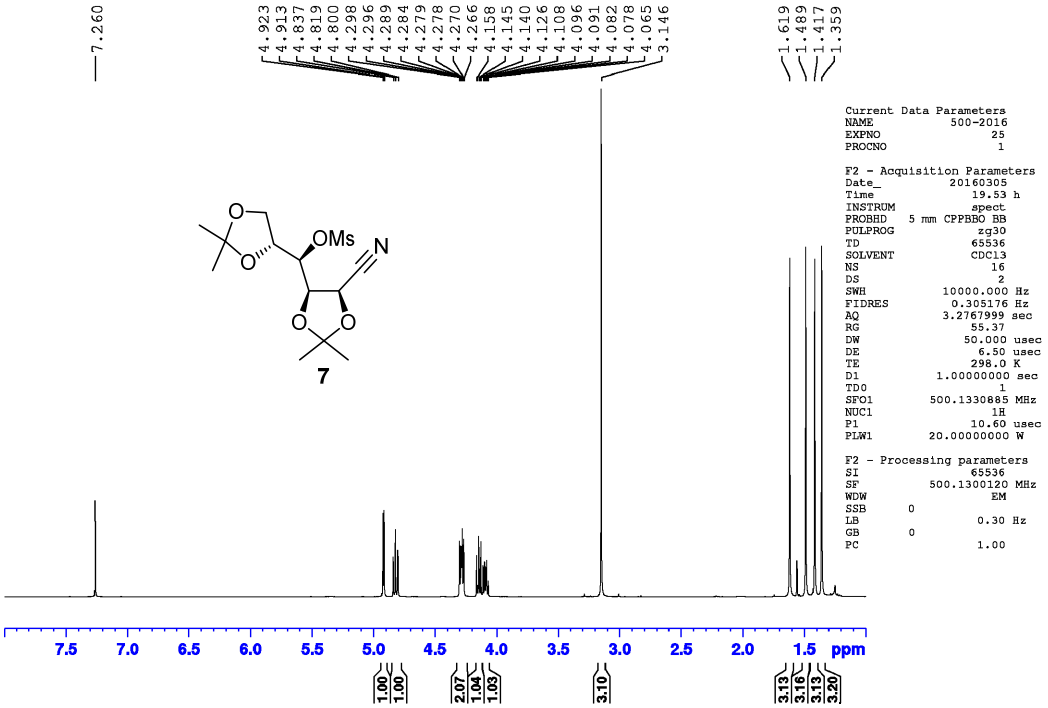
According to the general deprotection procedures, product **29g** (33.7 mg, 100% yield) was obtained from **28g** (50.0 mg, 0.10 mmol) as a pale yellow syrup. $[\alpha]_D^{26}$ -35.2 (*c* 0.77 in $CH_2Cl_2$); $\nu_{max}/cm^{-1}$ 3336 vs, 2933 s, 2856 m, 1716 w, 1404 s, 1277 w, 1128 m, 1046 m, 714 w, 517 w; $\delta_H$ (500 MHz; $CDCl_3$) 4.57-4.50 (2H, m), 4.22 (1H, q, *J* = 5.0 Hz), 3.88-3.80 (2H, m), 3.66 (1H, t, *J* = 4.2 Hz), 3.59 (2H, t, *J* = 6.7 Hz), 3.55 (2H, d, *J* = 7.6 Hz), 3.43-3.35 (1H, m), 3.13-3.07 (1H, m), 1.79-1.69 (2H, m), 1.55-1.53 (2H, m), 1.36-1.33 (8H, m); $\delta_C$ (125 MHz; $CDCl_3$) 70.7, 68.7, 68.6, 67.3, 62.5, 61.8, 55.3, 54.5, 31.1, 28.1, 28.0, 25.6, 24.8, 24.5; HRMS(ESI) calcd for $C_{14}H_{30}NO_5^+$ $[M+H]^+$ 292.21185, found 292.21140.

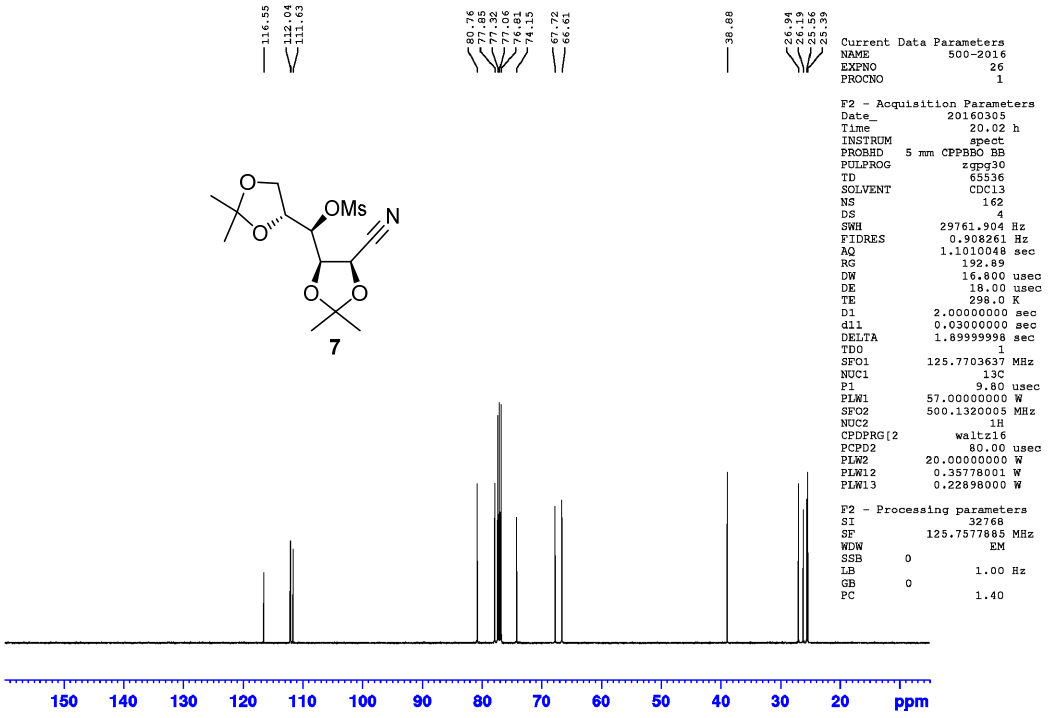
## References

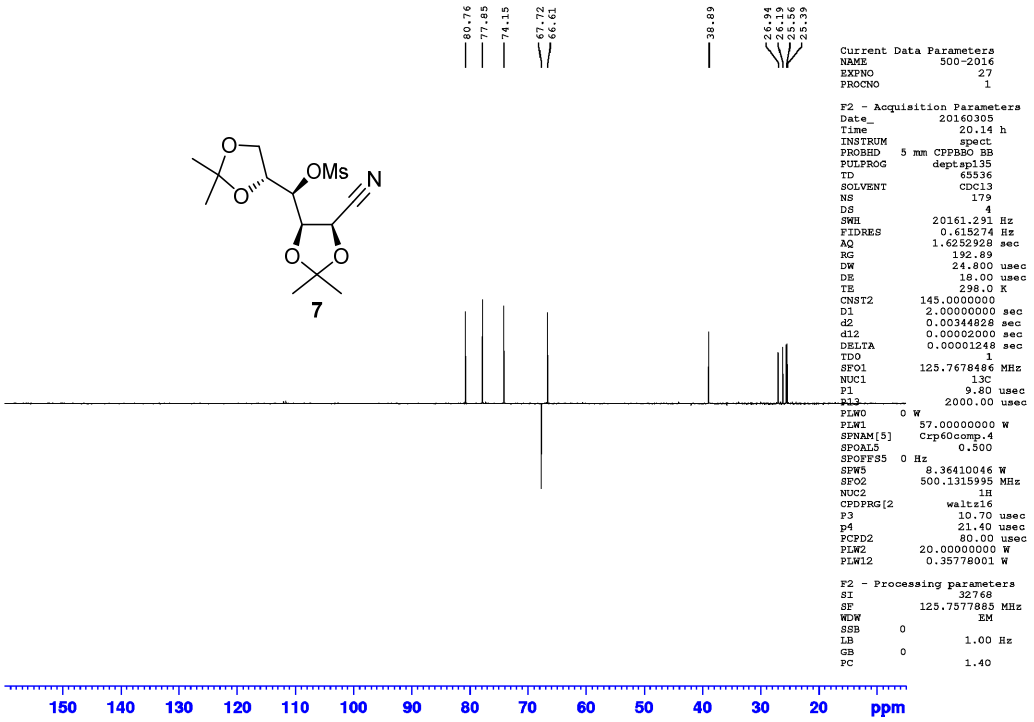
1 G. W. J. Fleet, B. Winchester, N. M. Carpenter, US4996329A, 1991.

## 2. NMR spectra and Infrared spectra for compounds

**Compound 7**:

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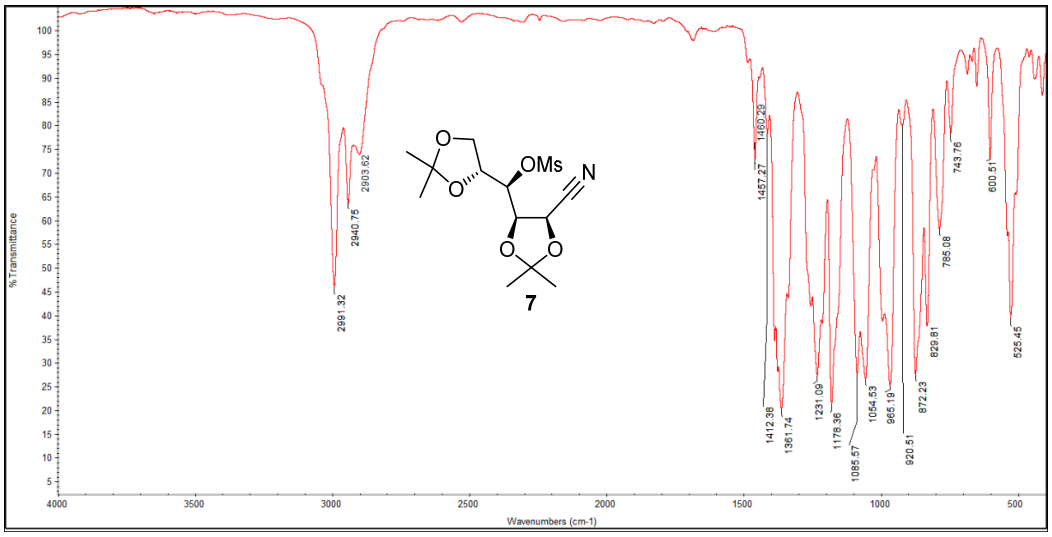
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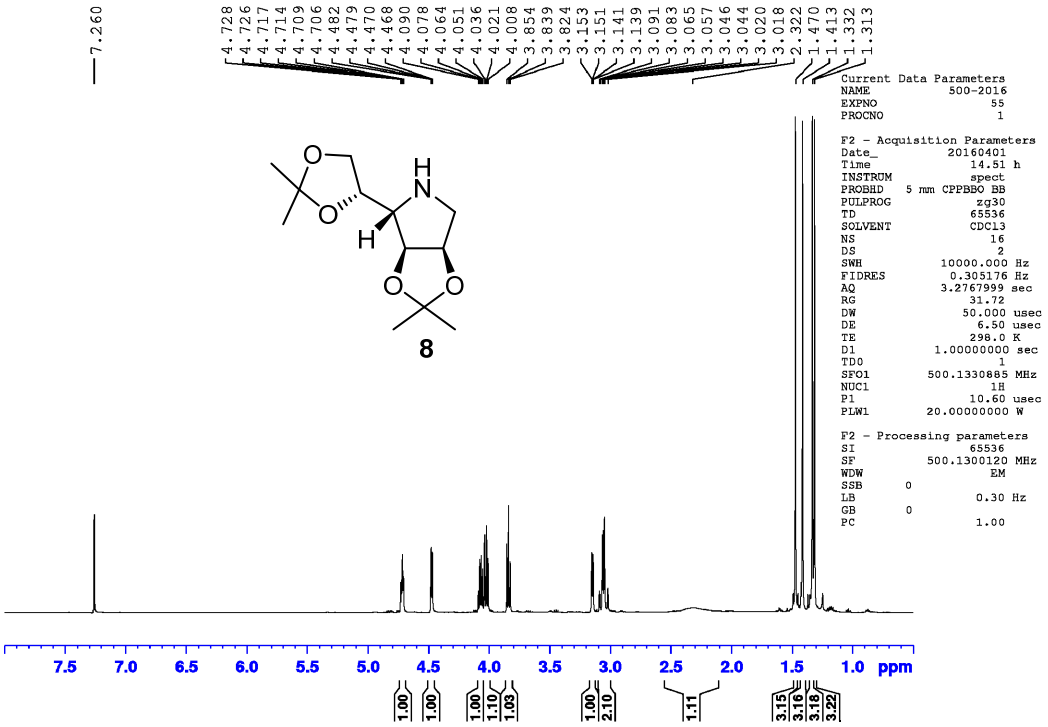
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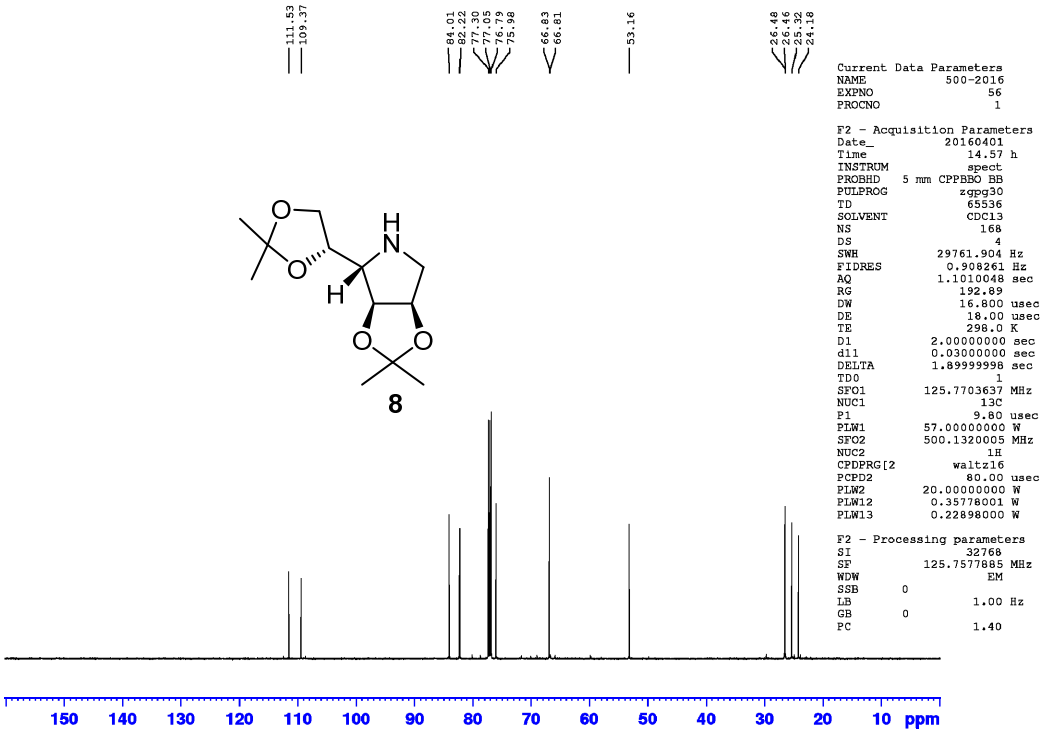
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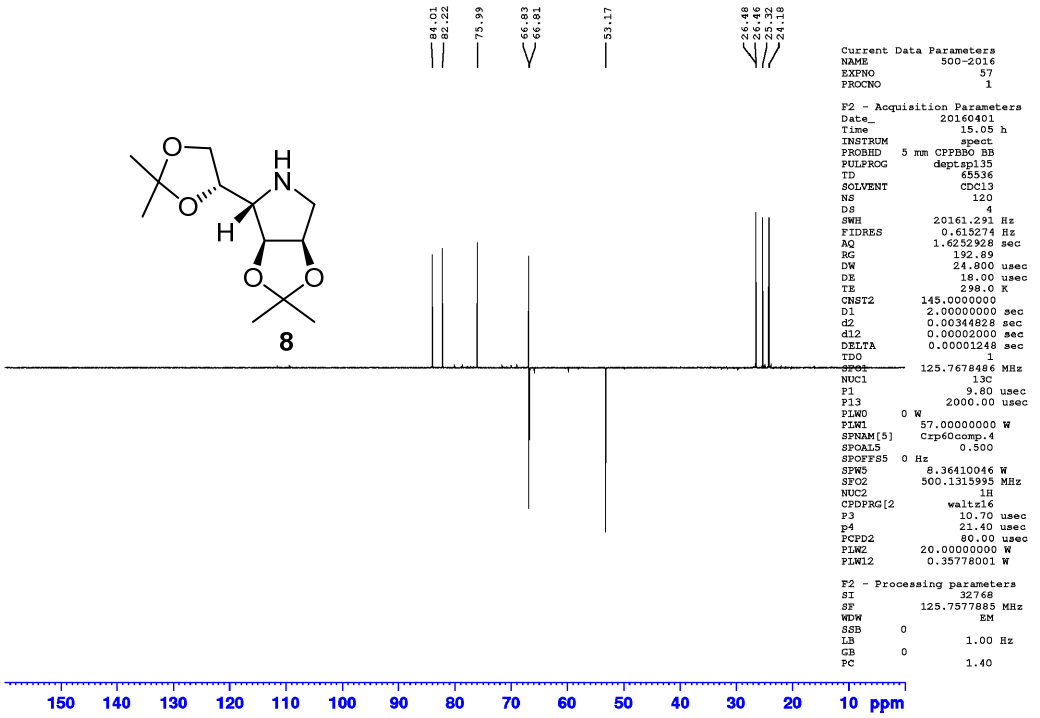
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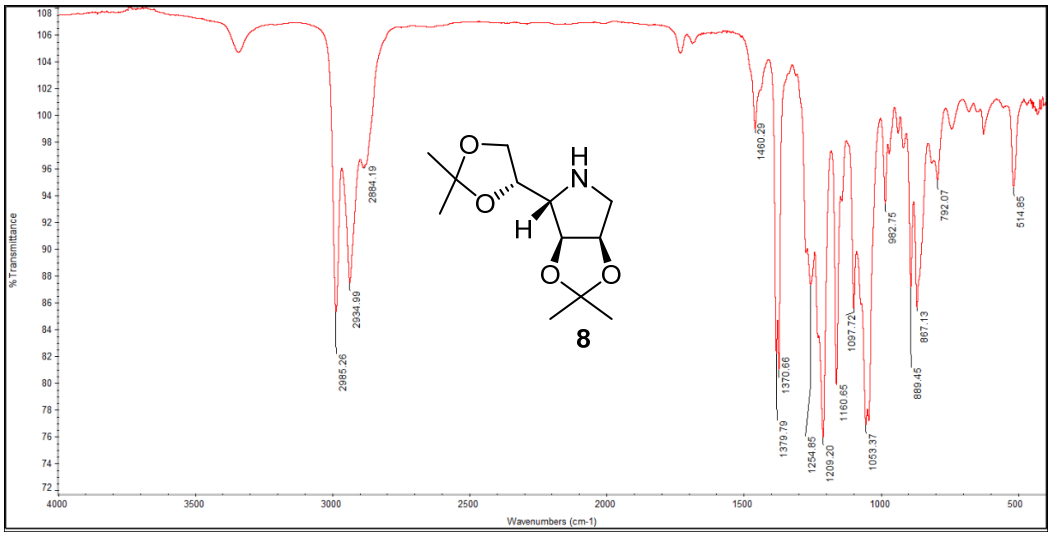
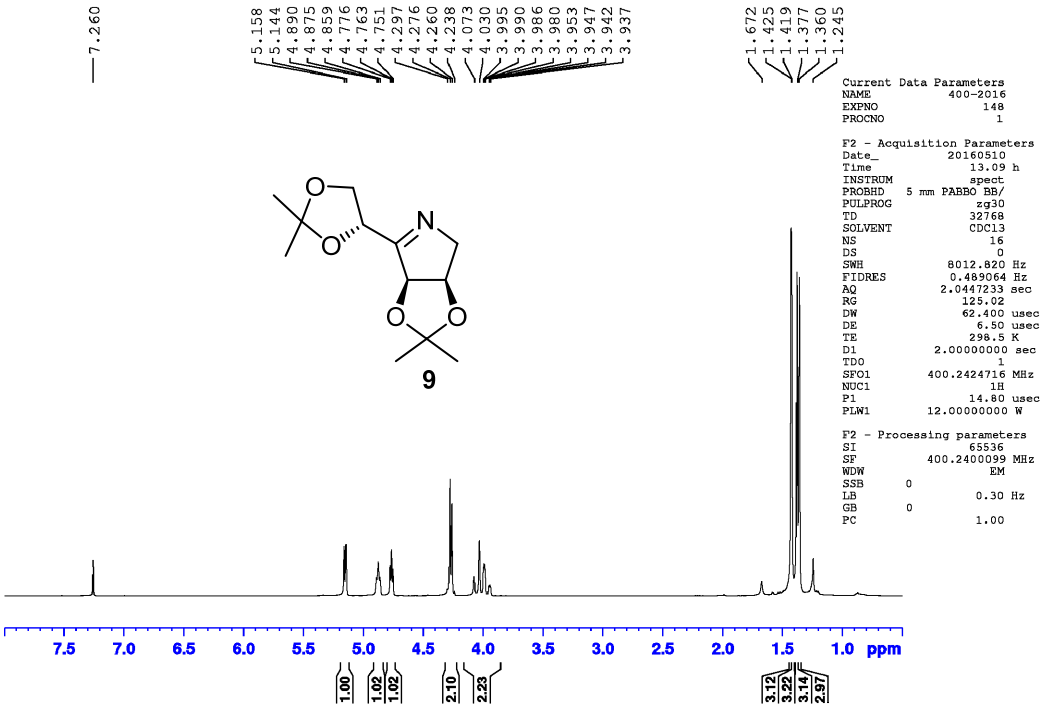
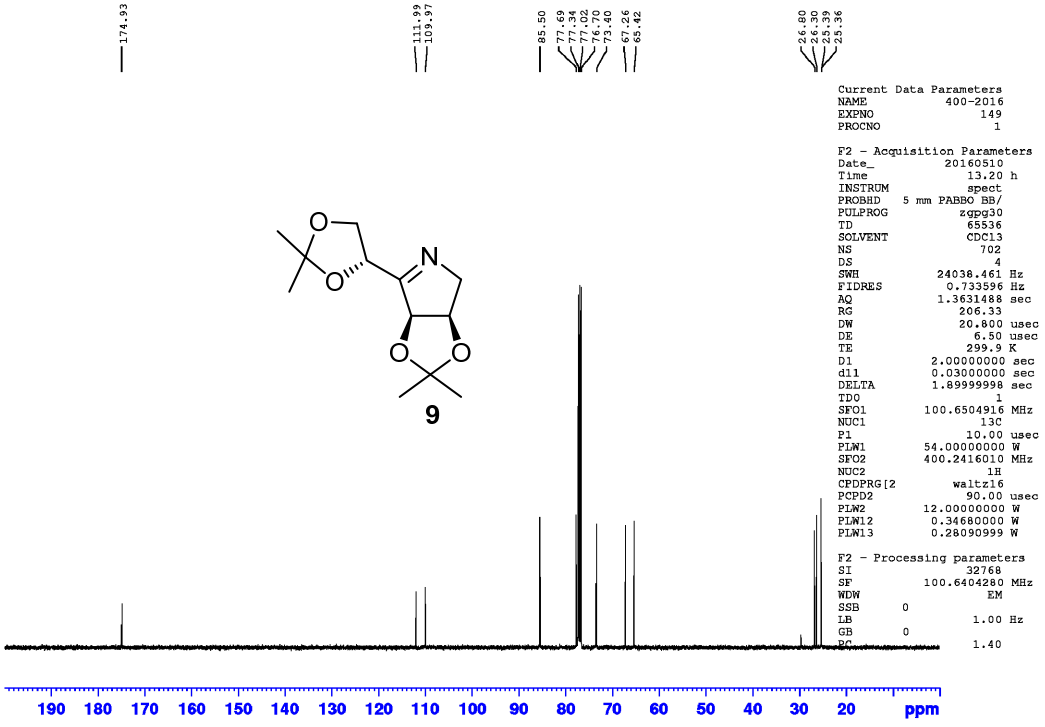
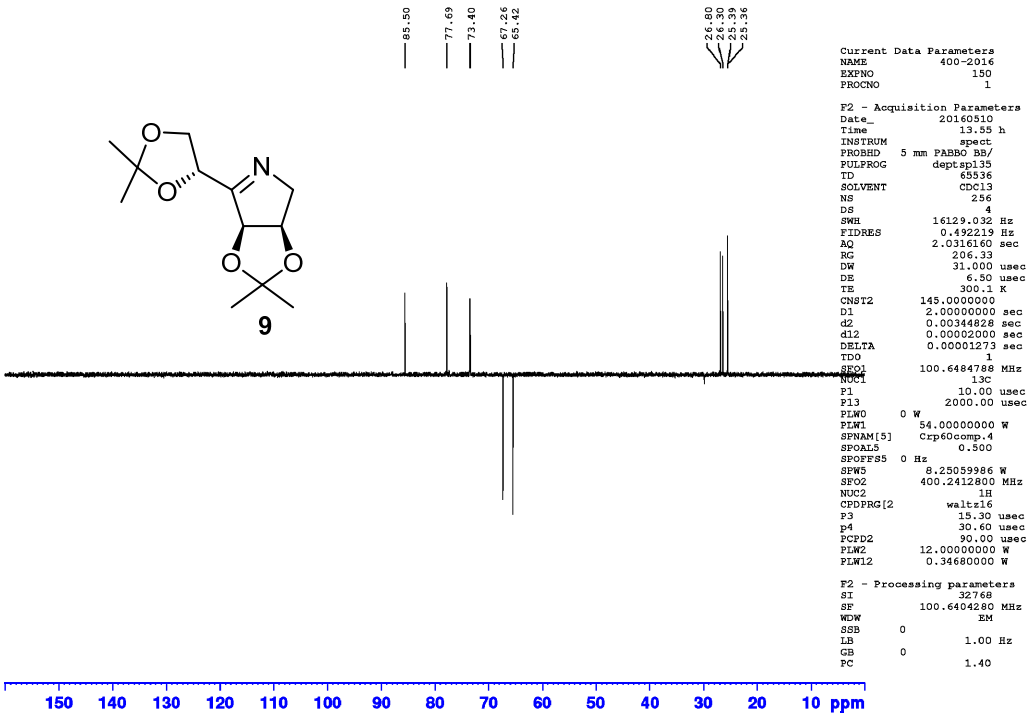
p4 21.40 usec
PCPD2 80.00 usec
PLW2 20.00000000 W
PLW12 0.35778001 W
F2 - Processing parameters
SI 32768
SF 125.7577885 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

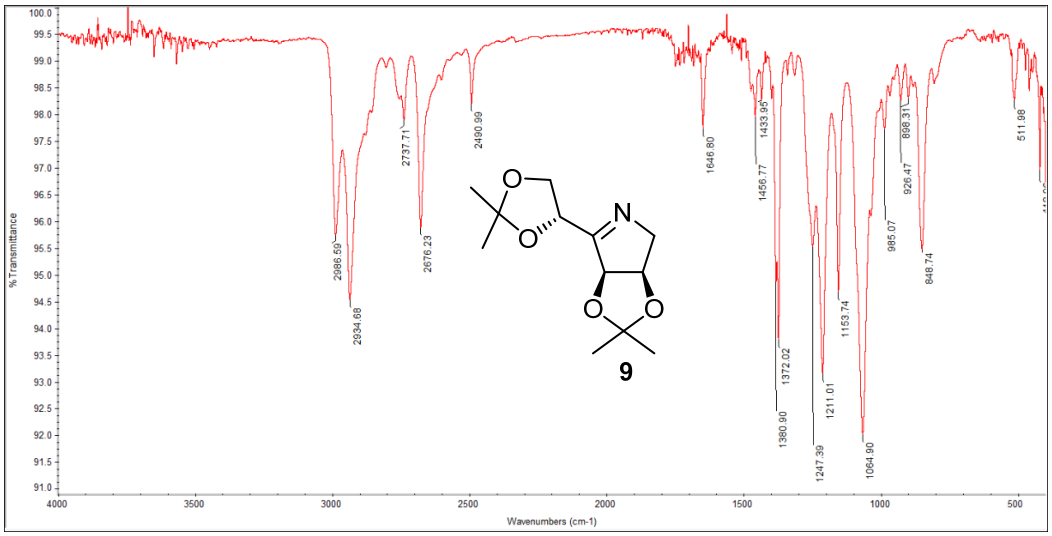

% Transmittance
Wavenumbers (cm-1)
2985.26
2934.99
2884.19
1460.29
1379.79
1370.66
1254.85
1209.20
1160.65
1097.72
1053.37
962.76
889.45
867.13
792.07
514.95
8

Compound **9:**

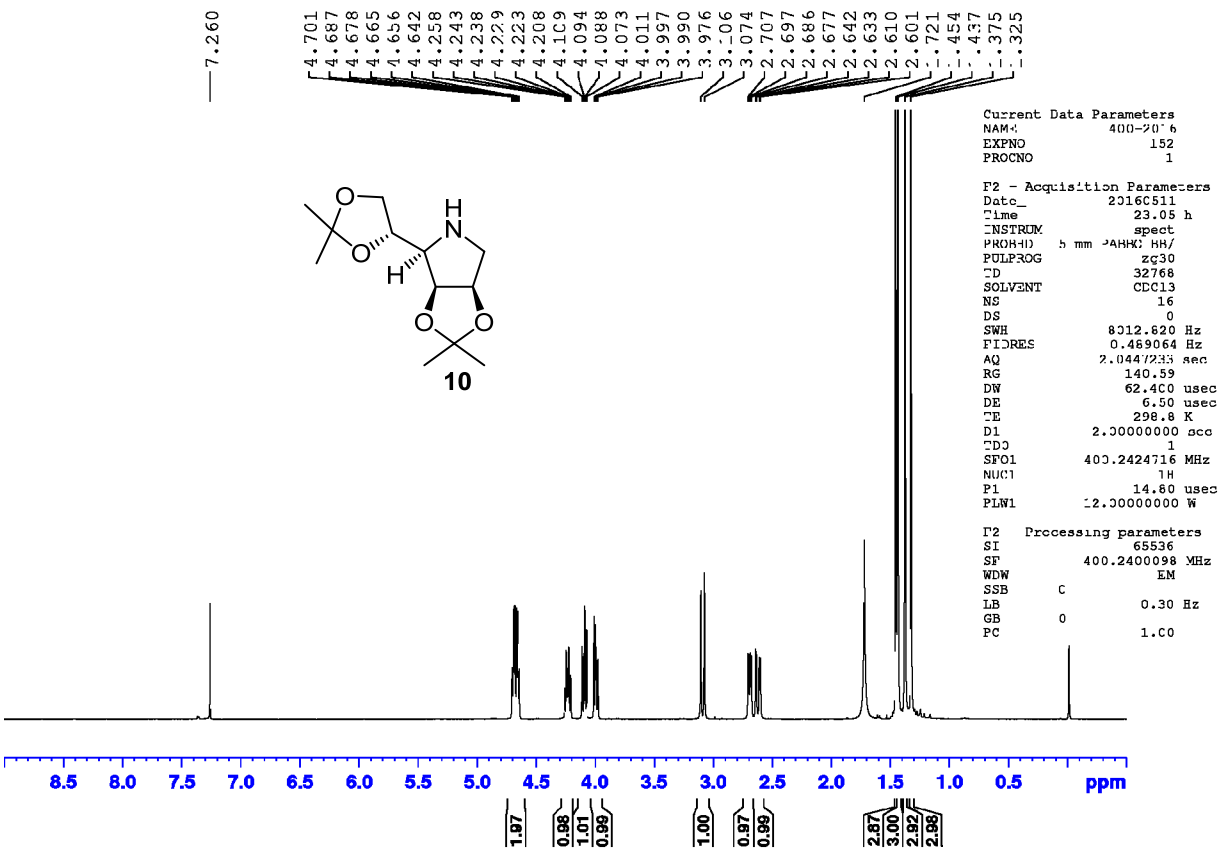

7.260
5.158
5.144
4.890
4.875
4.859
4.776
4.763
4.751
4.297
4.276
4.260
4.238
4.073
4.030
3.995
3.990
3.986
3.980
3.953
3.947
3.942
3.937
1.672
1.425
1.419
1.377
1.360
1.245
9
Current Data Parameters
NAME 400-2016
EXPNO 148
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160510
Time 13.09 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.489064 Hz
AQ 2.0447233 sec
RG 125.02
DW 62.400 usec
DE 6.50 usec
TE 298.5 K
D1 2.00000000 sec
TD0 1
SFO1 400.2424716 MHz
NUC1 1H
P1 14.80 usec
PLW1 12.00000000 W
F2 - Processing parameters
SI 65536
SF 400.2400099 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 ppm
1.00 1.02 1.02 2.10 2.23 3.12 3.22 3.14 2.97

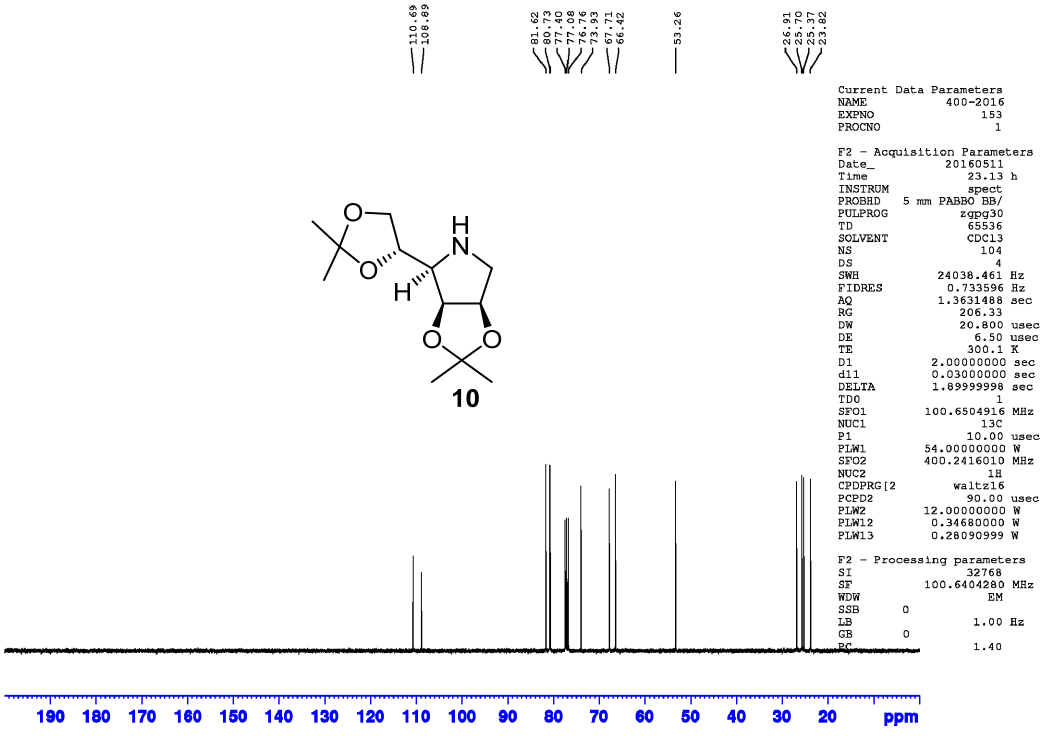

174.93
111.99
109.97
85.50
77.69
77.34
77.02
76.70
73.40
67.26
65.42
26.80
26.30
25.39
25.36
9
Current Data Parameters
NAME 400-2016
EXPNO 149
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160510
Time 13.20 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 702
DS 4
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 1.3631488 sec
RG 206.33
DW 20.800 usec
DE 6.50 usec
TE 299.9 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
SFO1 100.6504916 MHz
NUC1 13C
P1 10.00 usec
PLW1 54.00000000 W
SFO2 400.2416010 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W
PLW13 0.28090999 W
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

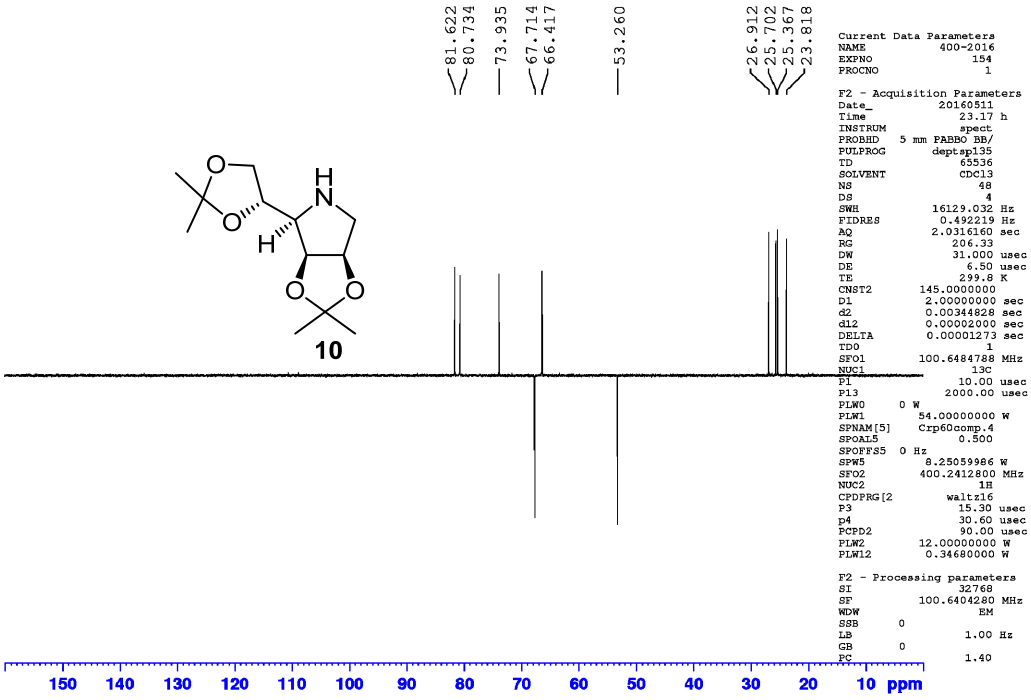

85.50
77.69
73.40
67.26
65.42
26.80
26.30
25.39
25.36
9
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm
Current Data Parameters
NAME 400-2016
EXPNO 150
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160510
Time 13.55 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG deptsp135
TD 65536
SOLVENT CDCl3
NS 256
DS 4
SWH 16129.032 Hz
FIDRES 0.492219 Hz
AQ 2.0316160 sec
RG 206.33
DW 31.000 usec
DE 6.50 usec
TE 300.1 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001273 sec
TDO 1
SFO1 100.6484788 MHz
NUC1 13C
P1 10.00 usec
P13 2000.00 usec
PLW0 0 W
PLW1 54.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 8.25059986 W
SFO2 400.2412800 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 15.30 usec
p4 30.60 usec
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40


% Transmittance
Wavenumbers (cm-1)
2986.59
2934.68
2737.71
2676.23
2490.99
1646.80
1456.77
1433.95
1372.02
1360.90
1247.39
1211.01
1153.74
1064.90
985.07
926.47
898.31
848.74
511.98
9

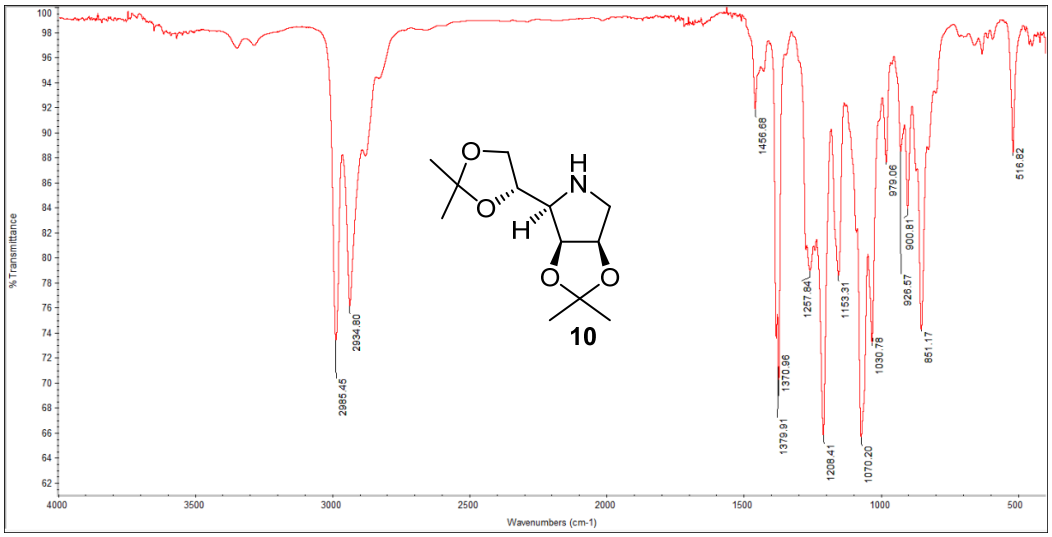
Compound **10:**


7.260
4.701
4.687
4.678
4.665
4.656
4.642
4.258
4.243
4.238
4.229
4.223
4.208
4.109
4.094
4.088
4.073
4.011
3.997
3.990
3.976
3.074
2.707
2.697
2.686
2.677
2.642
2.633
2.610
2.601
10
Current Data Parameters
EXPNO 152
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160511
Time 23.05 h
INSTRUM spect
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.469064 Hz
AQ 2.0447233 sec
RG 140.59
DW 62.400 usec
DE 6.50 usec
TE 298.8 K
D1 2.00000000 sec
TD0 1
SFO1 400.2424716 MHz
NUC1 1H
P1 14.80 usec
PLW1 12.00000000 W
F2 - Processing parameters
SI 65536
SF 400.2400098 MHz
WDW EM
LB 0.30 Hz
GB 0
PC 1.00
8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 ppm
1.97 0.98 1.01 0.99 1.00 0.97 0.99 2.87 3.00 2.92 2.98

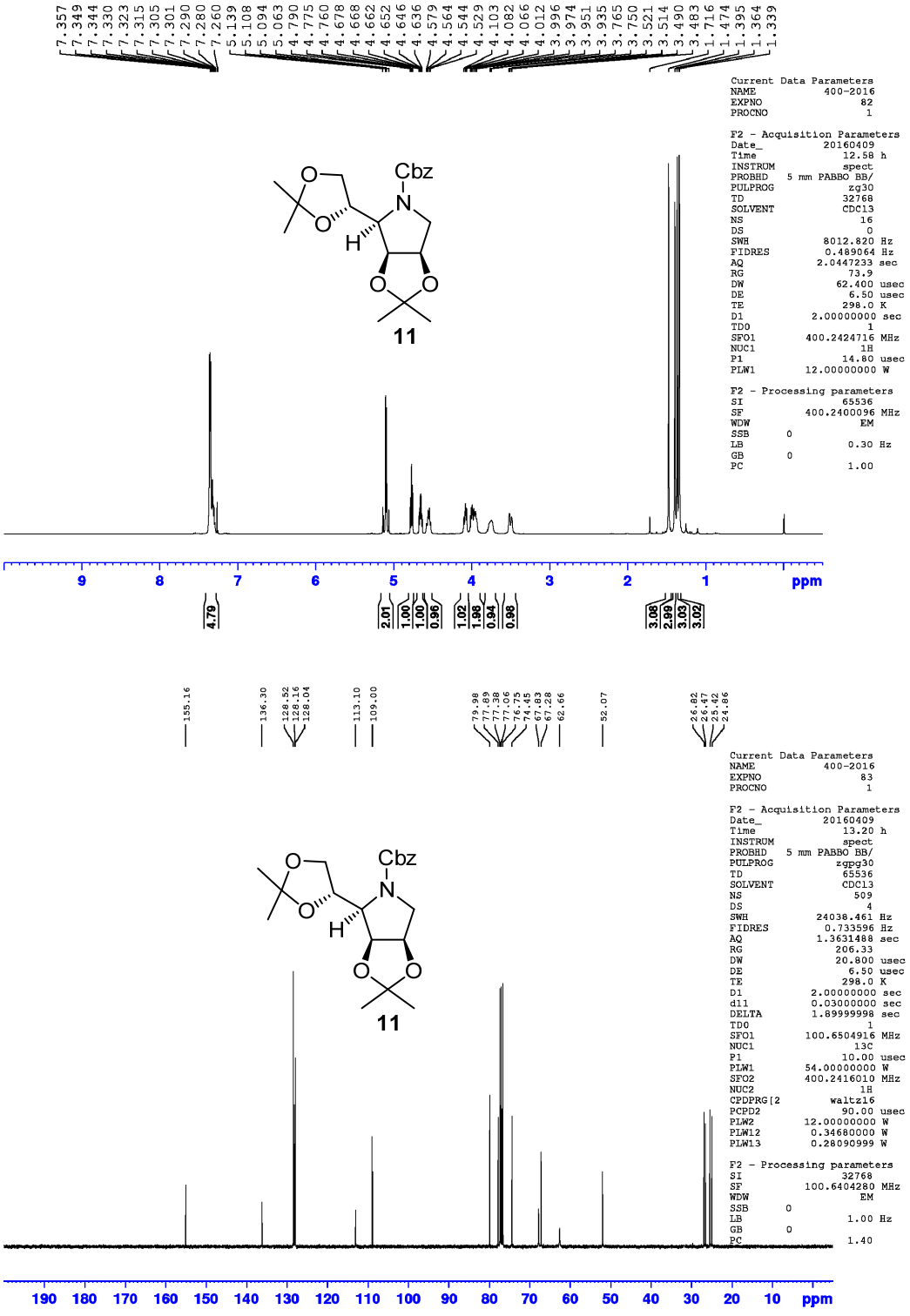

110.69
108.89
81.62
80.73
77.40
77.08
76.76
73.93
67.71
66.42
53.26
26.91
25.70
25.37
23.82
10
Current Data Parameters
NAME 400-2016
EXPNO 153
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160511
Time 23.13 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 104
DS 4
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 1.3631488 sec
RG 206.33
DW 20.800 usec
DE 6.50 usec
TE 300.1 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
SFO1 100.6504916 MHz
NUC1 13C
P1 10.00 usec
PLW1 54.00000000 W
SFO2 400.2416010 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W
PLW13 0.28090999 W
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 ppm

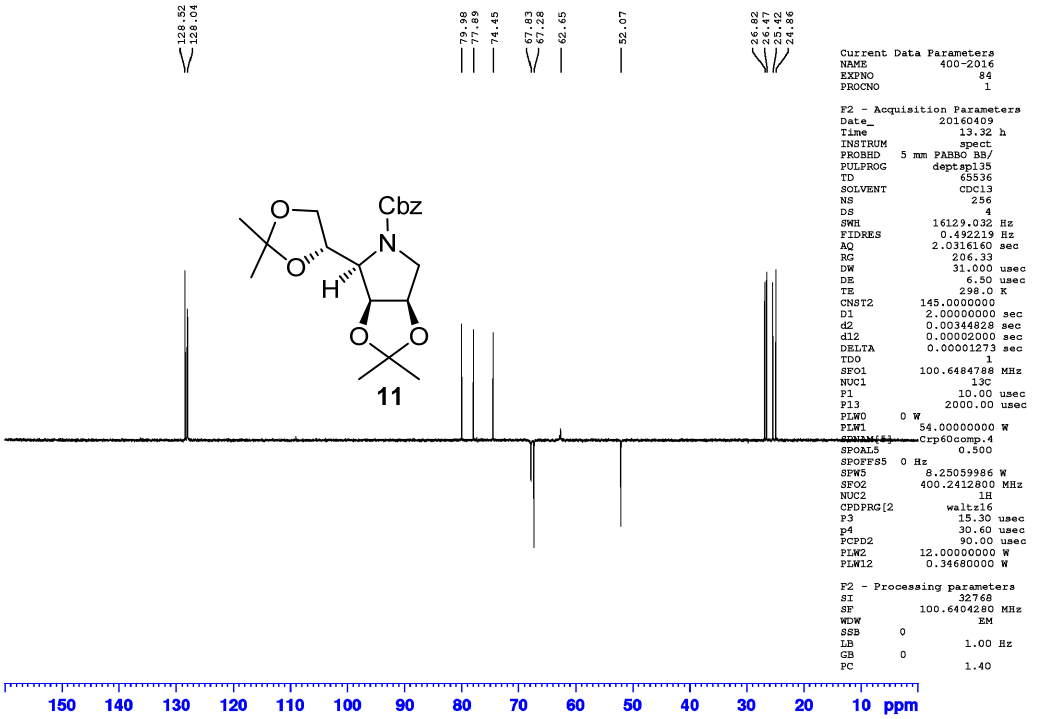



```
Current Data Parameters
NAME                  400-2016
EXPNO                      154
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160511
Time                     23.17 h
INSTRUM                   spect
PROBHD    5 mm PABBO BB/
PULPROG            deptsp135
TD                       65536
SOLVENT                  CDCl3
NS                          48
DS                           4
SWH                  16129.032 Hz
FIDRES                0.492219 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                       31.000 usec
DE                        6.50 usec
TE                       299.8 K
CNST2                145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                 100.6484788 MHz
NUC1                        13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0          0 W
PLW1           54.00000000 W
SPNAM[5]       Crp60comp.4
SPOAL5                   0.500
SPOFFS5       0 Hz
SPW5            8.25059986 W
SFO2               400.2412800 MHz
NUC2                        1H
CPDPRG[2               waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2           12.00000000 W
PLW12           0.34680000 W

F2 - Processing parameters
SI                       32768
SF                 100.6404280 MHz
WDW                         EM
SSB           0
LB                        1.00 Hz
GB            0
PC                        1.40
```

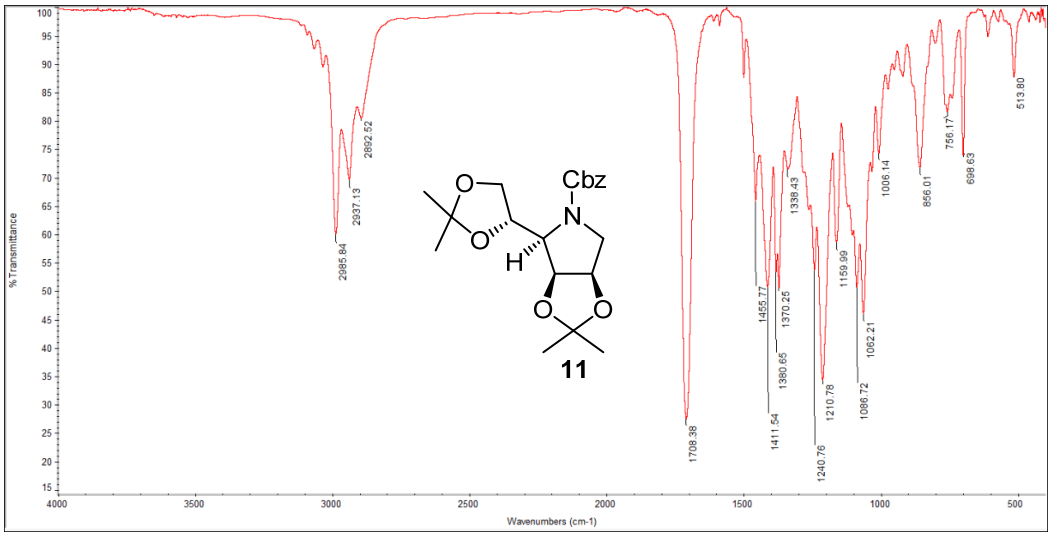


Compound **11:**

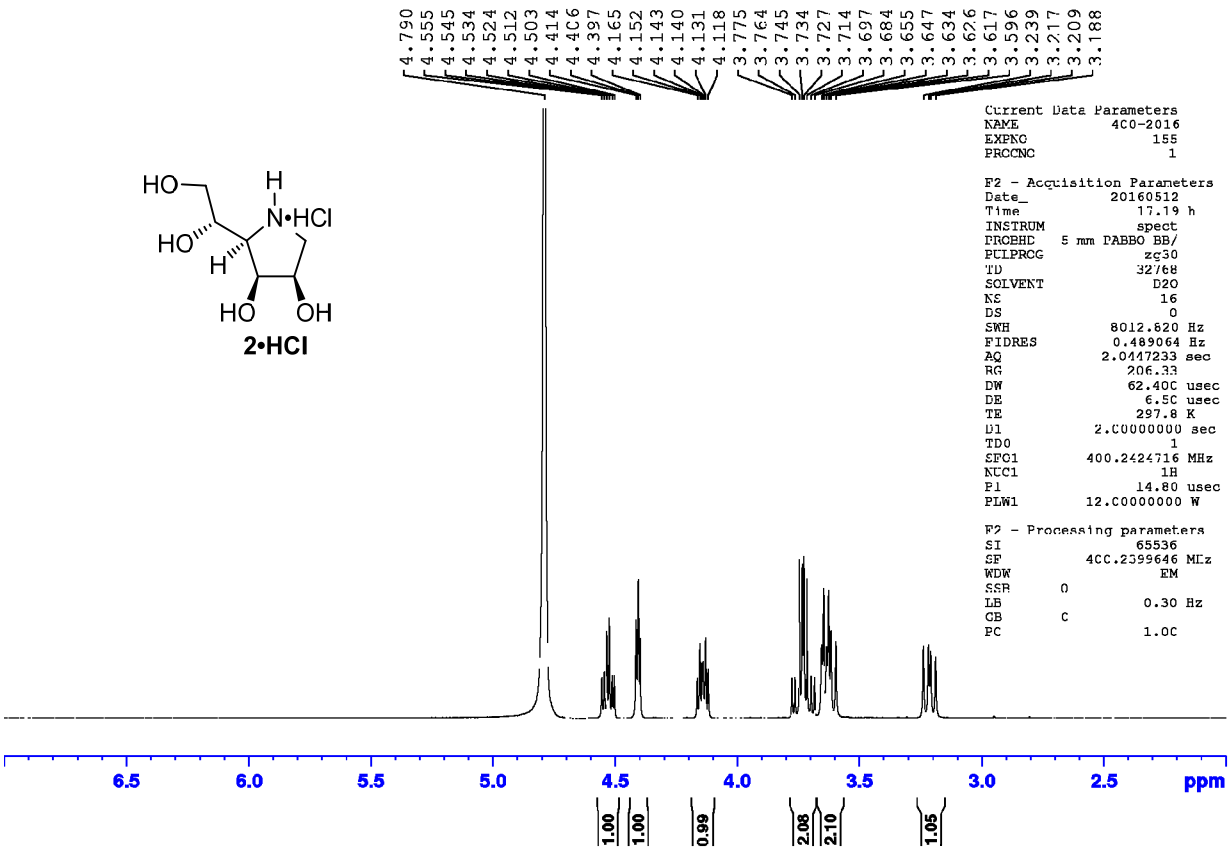

7.357
7.349
7.344
7.330
7.323
7.315
7.305
7.301
7.290
7.280
7.260
5.139
5.108
5.094
5.063
4.790
4.775
4.760
4.678
4.668
4.662
4.652
4.646
4.636
4.579
4.564
4.544
4.529
4.103
4.082
4.066
4.012
3.996
3.974
3.951
3.935
3.765
3.750
3.521
3.514
3.490
3.483
1.716
1.474
1.395
1.364
1.339
Cbz
N
O
O
H
O
O
11
Current Data Parameters
NAME 400-2016
EXPNO 82
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160409
Time 12.58 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zg30
TD 32768
SOLVENT CDCl3
NS 16
DS 0
SWH 8012.820 Hz
FIDRES 0.489064 Hz
AQ 2.0447233 sec
RG 73.9
DW 62.400 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
TD0 1
SFO1 400.2424716 MHz
NUC1 1H
P1 14.80 usec
PLW1 12.00000000 W
F2 - Processing parameters
SI 65536
SF 400.2400096 MHz
WDW EM
SSB 0
LB 0.30 Hz
GB 0
PC 1.00
9 8 7 6 5 4 3 2 1 ppm
4.79 2.01 1.00 1.00 0.96 1.02 1.98 0.94 0.98 3.08 2.89 3.03 3.02
155.16
136.30
128.52
128.16
128.04
113.10
109.00
79.98
77.89
77.58
77.06
76.75
74.45
67.83
67.28
62.66
52.07
26.82
26.47
25.42
24.86
Cbz
N
O
O
H
O
O
11
Current Data Parameters
NAME 400-2016
EXPNO 83
PROCNO 1
F2 - Acquisition Parameters
Date_ 20160409
Time 13.20 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG zgpg30
TD 65536
SOLVENT CDCl3
NS 509
DS 4
SWH 24038.461 Hz
FIDRES 0.733596 Hz
AQ 1.3631488 sec
RG 206.33
DW 20.800 usec
DE 6.50 usec
TE 298.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
SFO1 100.6504916 MHz
NUC1 13C
P1 10.00 usec
PLW1 54.00000000 W
SFO2 400.2416010 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W
PLW13 0.28090999 W
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40
190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

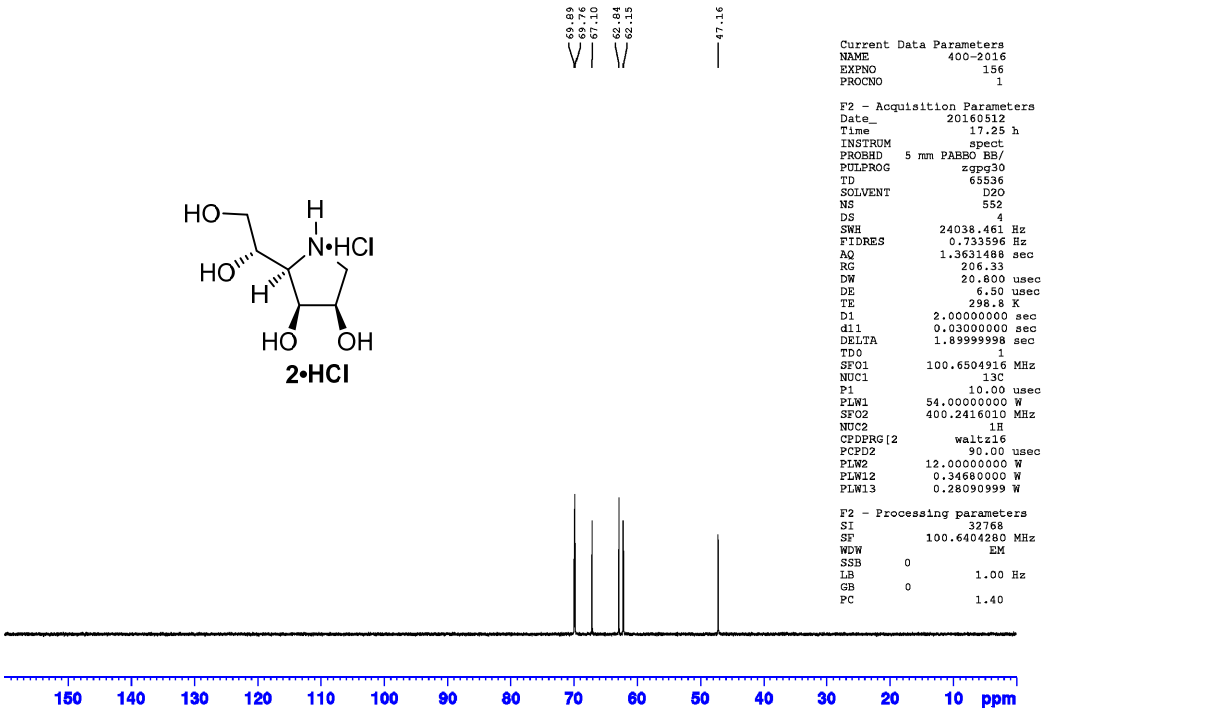


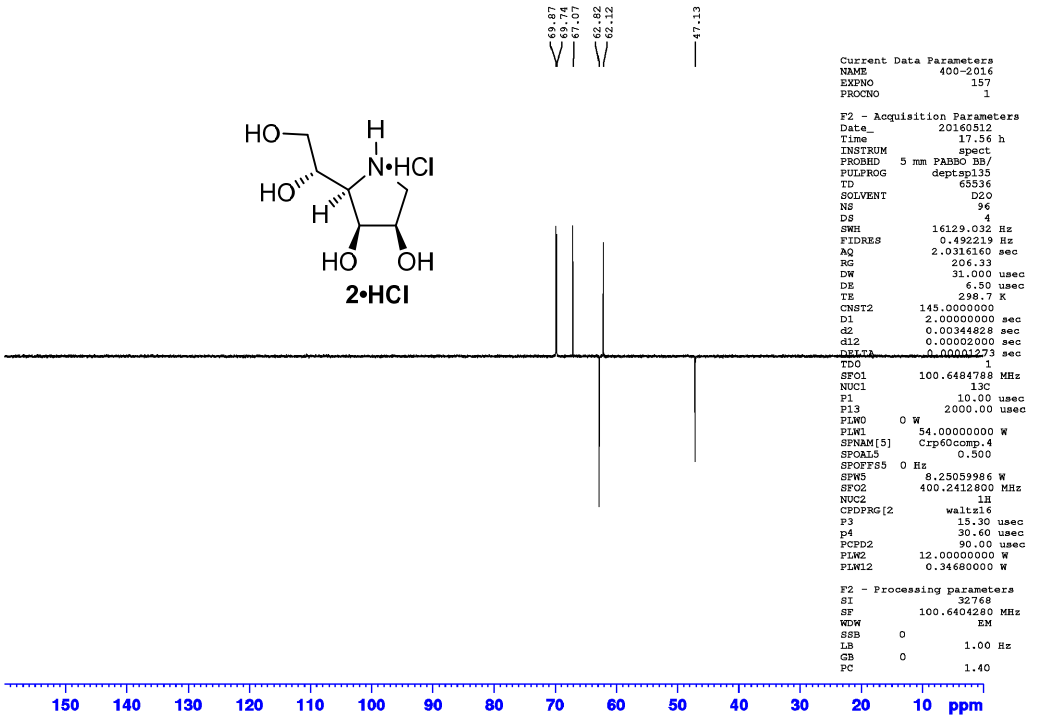

```
Current Data Parameters
NAME                  400-2016
EXPNO                       84
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160409
Time                    13.32 h
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                 CDCl3
NS                        256
DS                          4
SWH                 16129.032 Hz
FIDRES                0.492219 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                      31.000 usec
DE                       6.50 usec
TE                      298.0 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                 54.00000000 W
SPNAM[5]          Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                  8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                        32768
SF                  100.6404280 MHz
WDW                          EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



Compound **2 • HCl:**



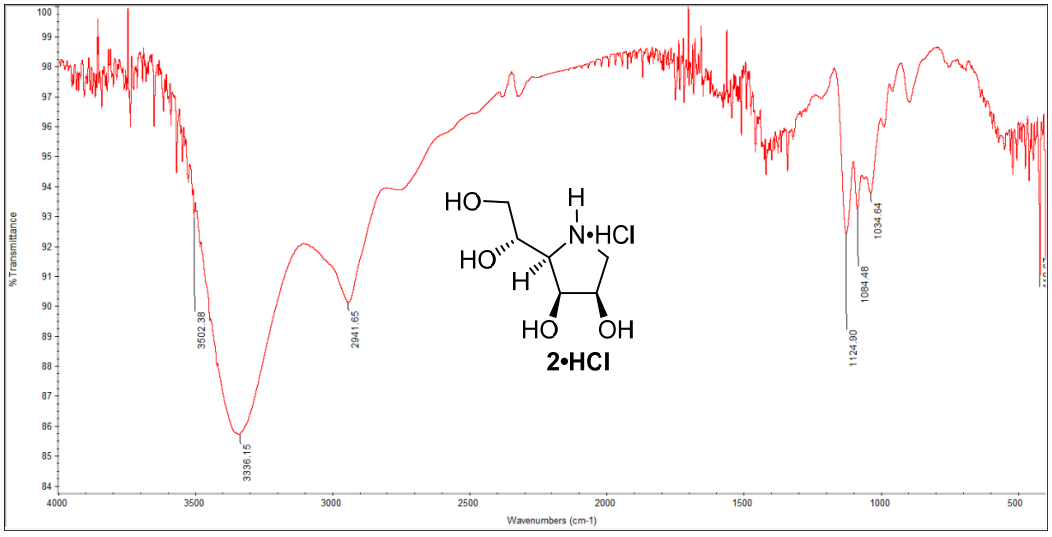





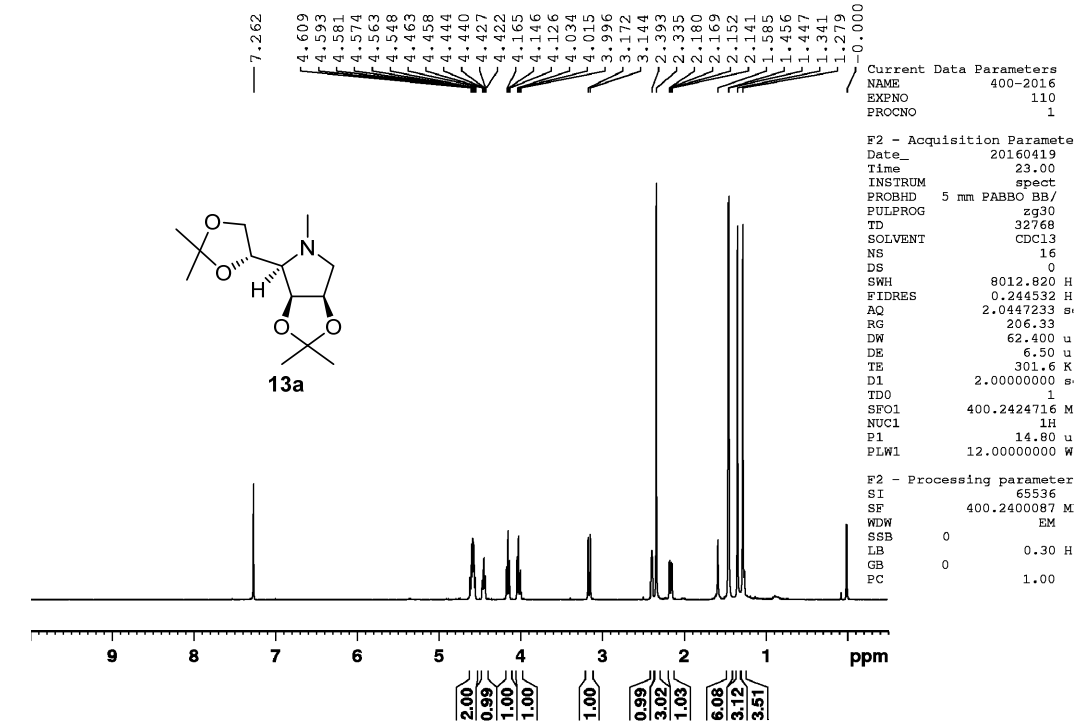

Current Data Parameters
NAME 400-2016
EXPNO 157
PROCNO 1

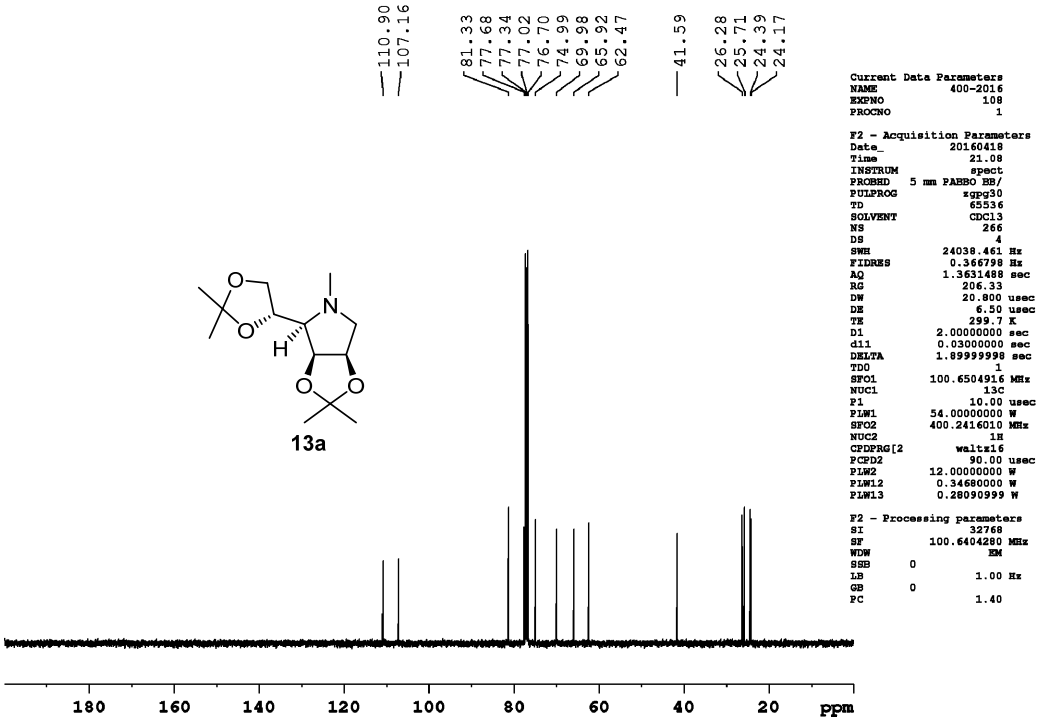
F2 - Acquisition Parameters
Date_ 20160512
Time 17.56 h
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG deptsp135
TD 65536
SOLVENT D2O
NS 96
DS 4
SWH 16129.032 Hz
FIDRES 0.492219 Hz
AQ 2.0316160 sec
RG 206.33
DW 31.000 usec
DE 6.50 usec
TE 298.7 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001273 sec
TD0 1
SFO1 100.6484788 MHz
NUC1 13C
P1 10.00 usec
P13 2000.00 usec
PLW0 0 W
PLW1 54.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 8.25059986 W
SFO2 400.2412800 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 15.30 usec
p4 30.60 usec
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W

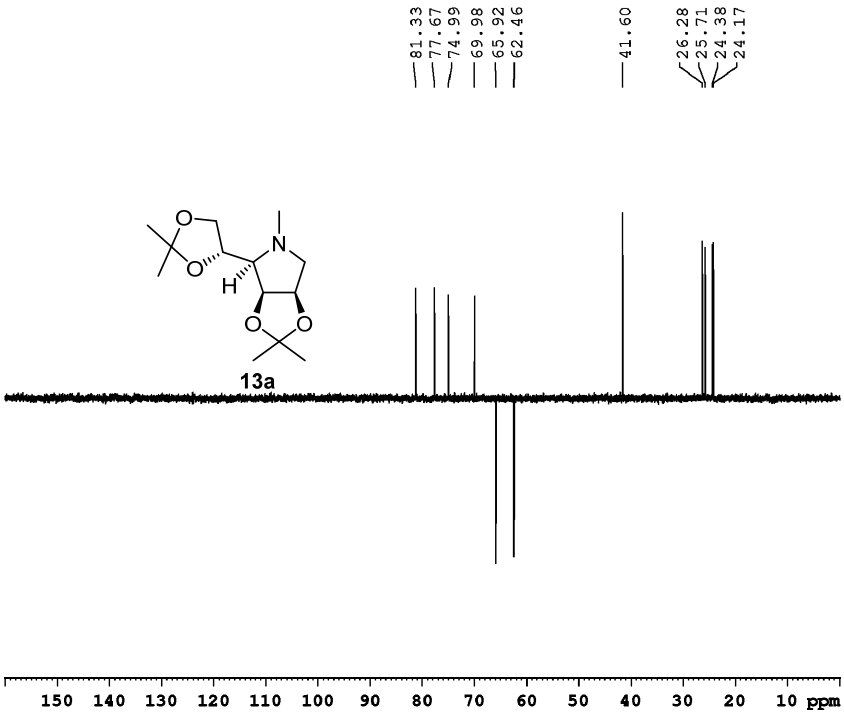
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40



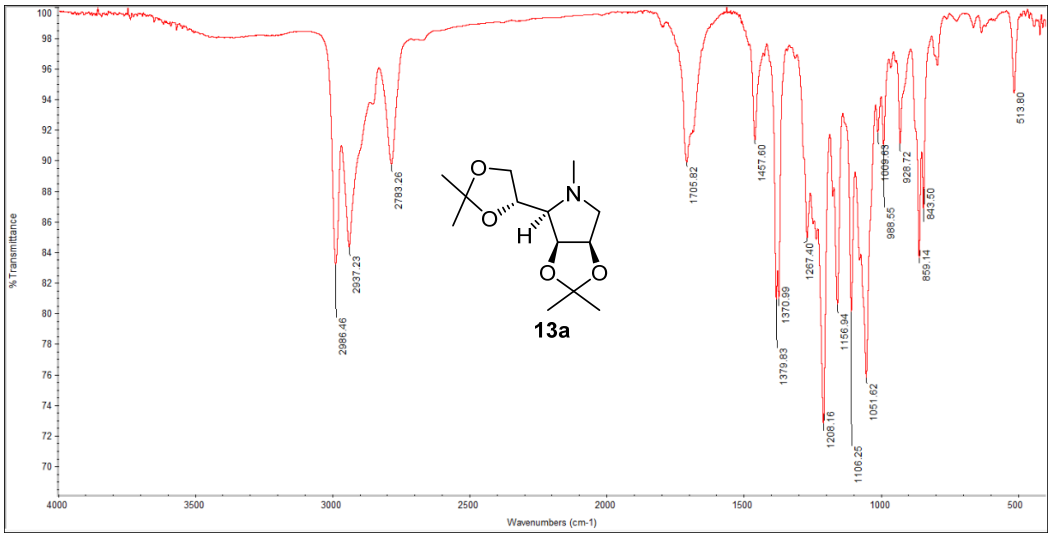
Compound **13a:**



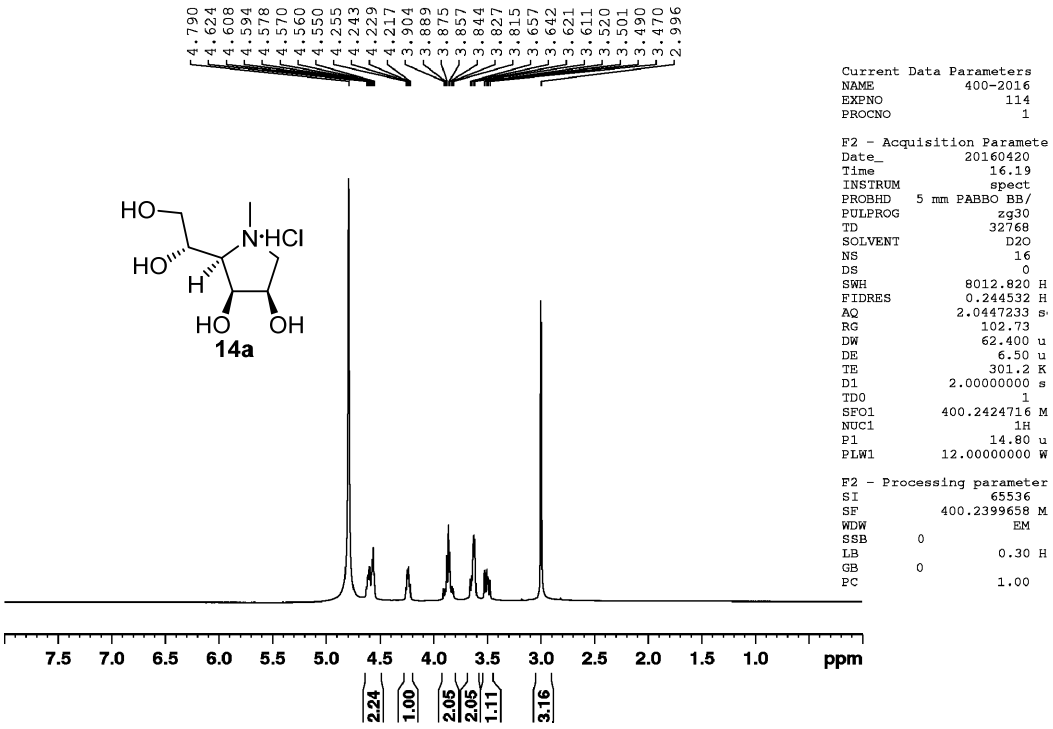





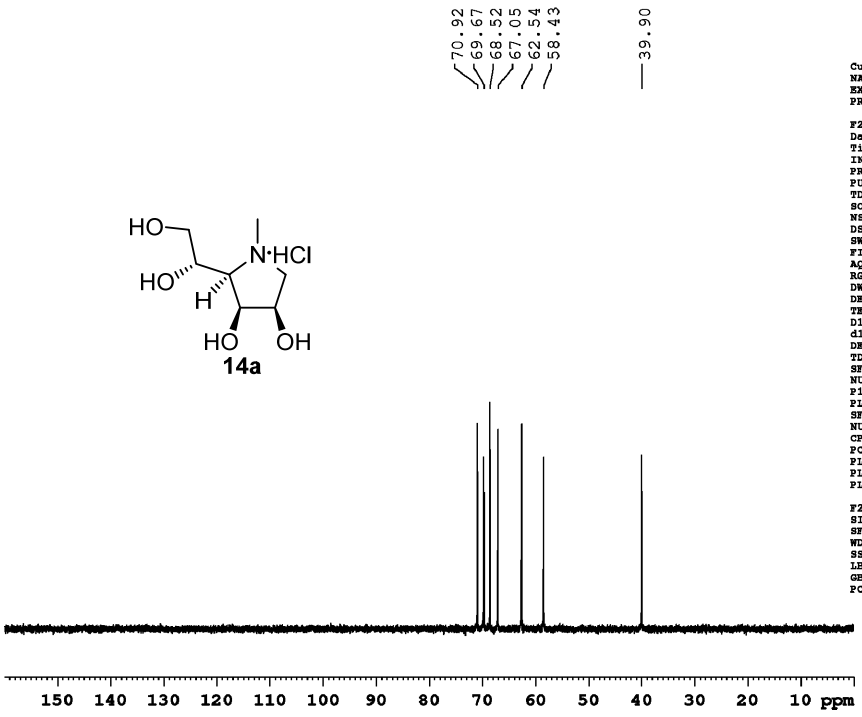

```
Current Data Parameters
NAME                  400-2016
EXPNO                      109
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160418
Time                    21.19
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             dept-sp135
TD                       65536
SOLVENT                  CDCl3
NS                          81
DS                           4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                  2.0316160 sec
RG                        206.33
DW                        31.000 usec
DE                         6.50 usec
TE                       299.2 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                        13C
P1                        10.00 usec
P13                     2000.00 usec
PLW0        0 W
PLW1                 54.00000000 W
SPNAM[5]             Crp60comp.4
SPOAL5                    0.500
SPOFFS5     0 Hz
SPW5                  8.25059986 W
SFO2                400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                        15.30 usec
p4                        30.60 usec
PCPD2                     90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



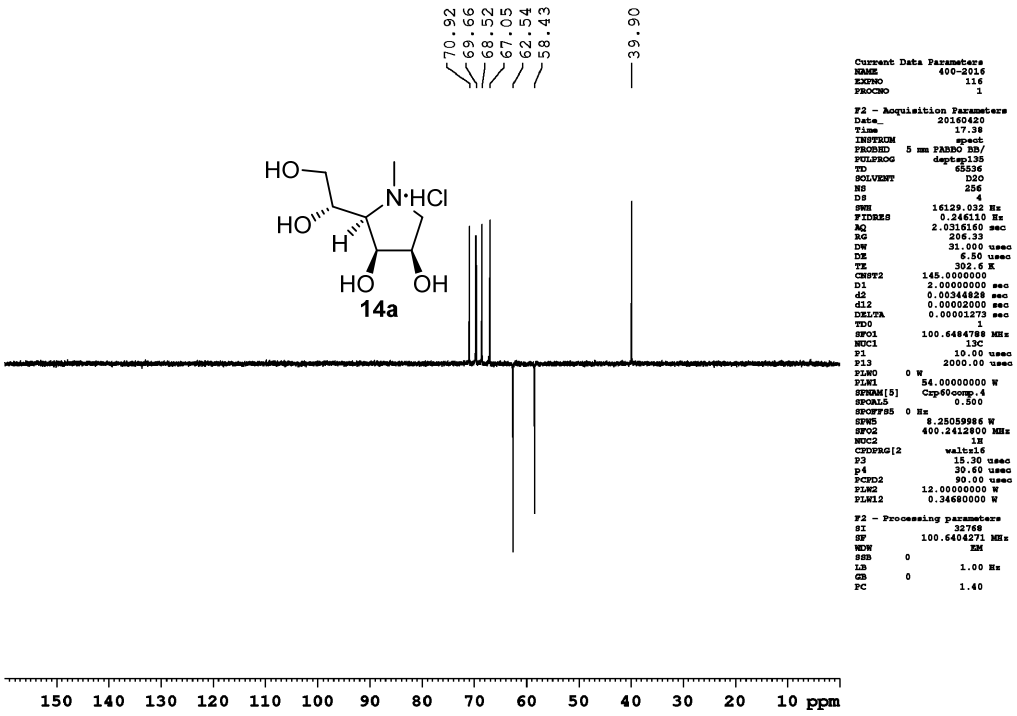
Compound **14a:**



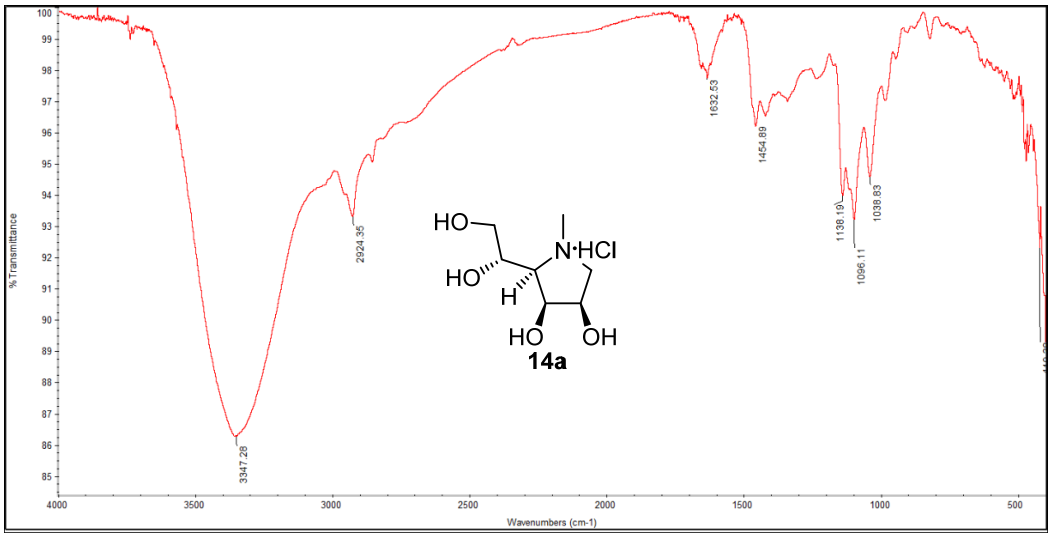

```
Current Data Parameters
NAME              400-2016
EXPNO                  114
PROCNO                   1

F2 - Acquisition Paramete
Date_              20160420
Time                 16.19
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT                D2O
NS                      16
DS                       0
SWH               8012.820 H
FIDRES               0.244532 H
AQ                2.0447233 s
RG                   102.73
DW                   62.400 u
DE                    6.50 u
TE                   301.2 K
D1                2.00000000 s
TD0                      1
SFO1            400.2424716 M
NUC1                    1H
P1                   14.80 u
PLW1           12.00000000 W

F2 - Processing parameter
SI                    65536
SF              400.2399658 M
WDW                     EM
SSB       0
LB                    0.30 H
GB        0
PC                    1.00
```



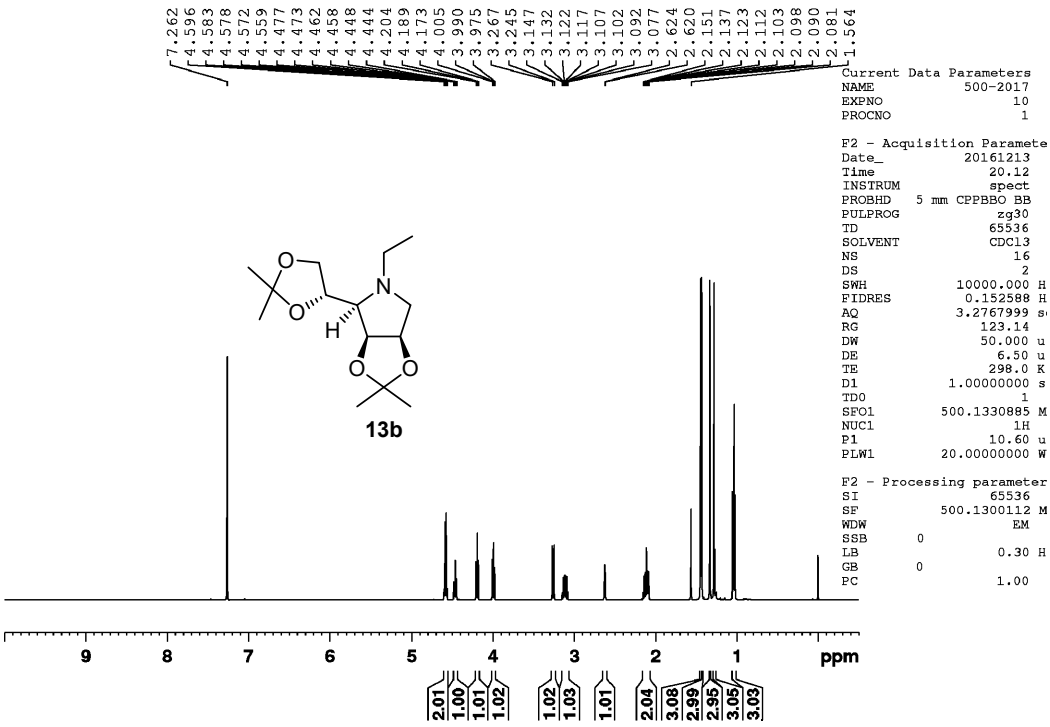

```
Current Data Parameters
NAME              400-2016
EXPNO                  115
PROCNO                   1

F2 - Acquisition Parameters
Date_              20160420
Time                 17.19
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG            zgpg30
TD                   65536
SOLVENT                D2O
NS                    1024
DS                       4
SWH              24038.461 Hz
FIDRES               0.366798 Hz
AQ                1.3631488 sec
RG                   206.33
DW                   20.800 usec
DE                    6.50 usec
TE                   303.0 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                      1
SFO1           100.6504916 MHz
NUC1                    13C
P1                   10.00 usec
PLW1           54.00000000 W
SFO2           400.2416010 MHz
NUC2                    1H
CPDPRG[2             waltz16
PCPD2                90.00 usec
PLW2           12.00000000 W
PLW12           0.34680000 W
PLW13           0.28090999 W

F2 - Processing parameters
SI                    32768
SF             100.6404280 MHz
WDW                     EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```



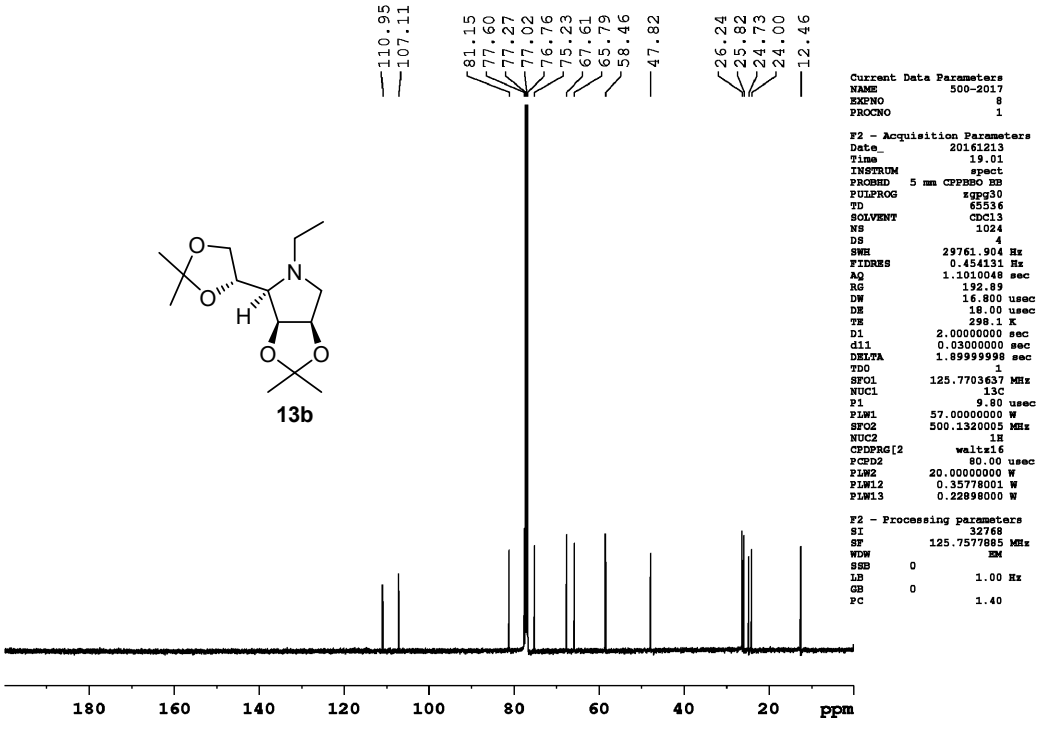

```
Current Data Parameters
NAME                  400-2016
EXPNO                      116
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160420
Time                    17.38
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG             dept-sp135
TD                       65536
SOLVENT                    D2O
NS                         256
DS                           4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                       31.000 usec
DE                        6.50 usec
TE                      302.6 K
CNST2                 145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                 54.00000000 W
SPNAM[5]             Crp60comp.4
SPOAL5                    0.500
SPOFFS5     0 Hz
SPW5                  8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
P4                       30.60 usec
PCPD2                    90.00 usec
PLW2                 12.00000000 W
PLW12                 0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404271 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



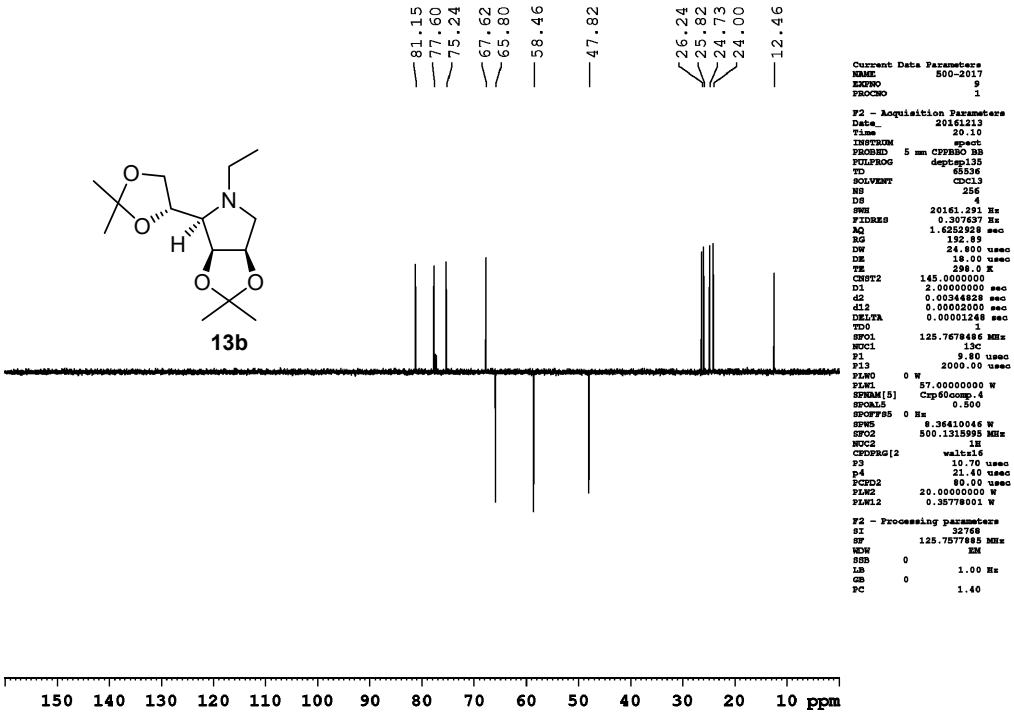
Compound **13b:**




```
Current Data Parameters
NAME                  500-2017
EXPNO                       10
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20161213
Time                     20.12
INSTRUM                  spect
PROBHD    5 mm CPPBBO BB
PULPROG                  zg30
TD                      65536
SOLVENT                 CDCl3
NS                         16
DS                          2
SWH                10000.000 H
FIDRES                 0.152588 H
AQ                 3.2767999 s
RG                       123.14
DW                       50.000 u
DE                        6.50 u
TE                       298.0 K
D1                 1.00000000 s
TD0                          1
SFO1               500.1330885 M
NUC1                        1H
P1                       10.60 u
PLW1              20.00000000 W

F2 - Processing parameter
SI                       65536
SF                 500.1300112 M
WDW                         EM
SSB          0
LB                        0.30 H
GB           0
PC                       1.00
```




```
Current Data Parameters
NAME                  500-2017
EXPNO                        8
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20161213
Time                     19.01
INSTRUM                  spect
PROBHD    5 mm CPPBBO BB
PULPROG                 zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                        1024
DS                           4
SWH                29761.904 Hz
FIDRES                 0.454131 Hz
AQ                 1.1010048 sec
RG                       192.89
DW                     16.800 usec
DE                     18.00 usec
TE                       298.1 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                          1
SFO1              125.7703637 MHz
NUC1                        13C
P1                      9.80 usec
PLW1               57.00000000 W
SFO2              500.1320005 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                  80.00 usec
PLW2              20.00000000 W
PLW12              0.35778001 W
PLW13              0.22898000 W

F2 - Processing parameters
SI                       32768
SF                125.7577885 MHz
WDW                         EM
SSB          0
LB                     1.00 Hz
GB           0
PC                       1.40
```

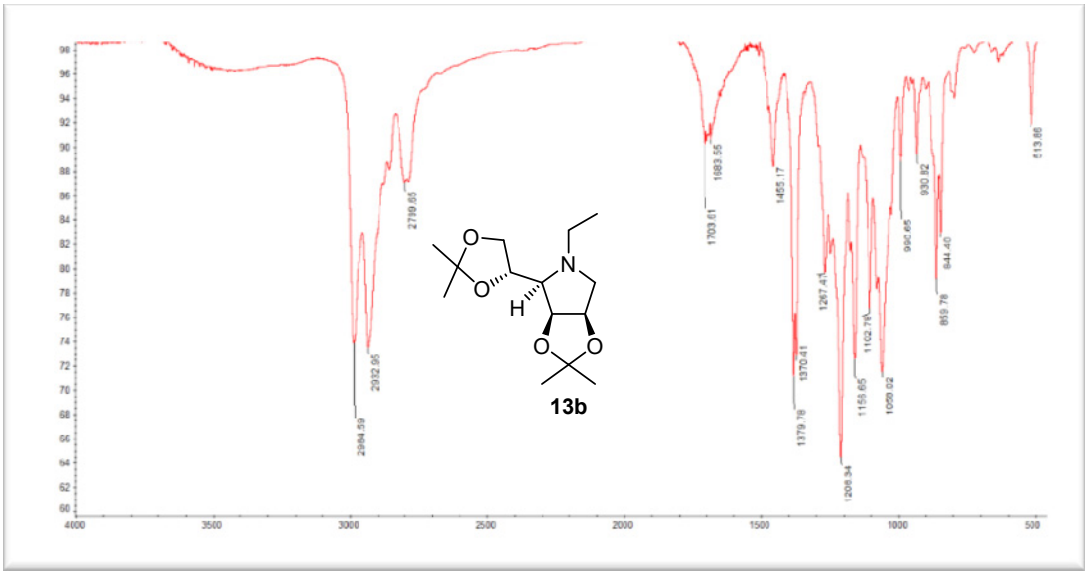




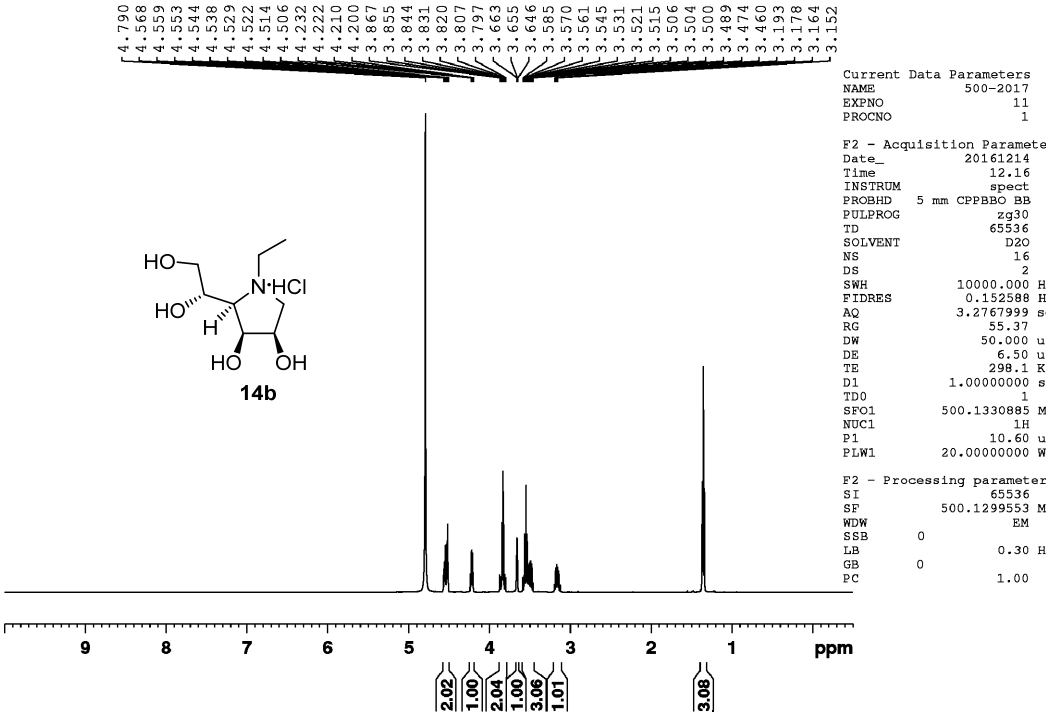
Current Data Parameters
NAME 500-2017
EXPNO 9
PROCNO 1

F2 - Acquisition Parameters
Date_ 20161213
Time 20.10
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG deptsp135
TD 65536
SOLVENT CDCl3
NS 256
DS 4
SWH 20161.291 Hz
FIDRES 0.307637 Hz
AQ 1.6252928 sec
RG 192.89
DW 24.800 usec
DE 18.00 usec
TE 298.0 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001248 sec
TD0 1
SFO1 125.7678496 MHz
NUC1 13C
P1 9.80 usec
P13 2000.00 usec
PLW0 0 W
PLW1 57.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 0.36410046 W
SFO2 500.1315995 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 10.70 usec
p4 21.40 usec
PCPD2 80.00 usec
PLW2 20.00000000 W
PLW12 0.35778001 W

F2 - Processing parameters
SI 32768
SF 125.7577885 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

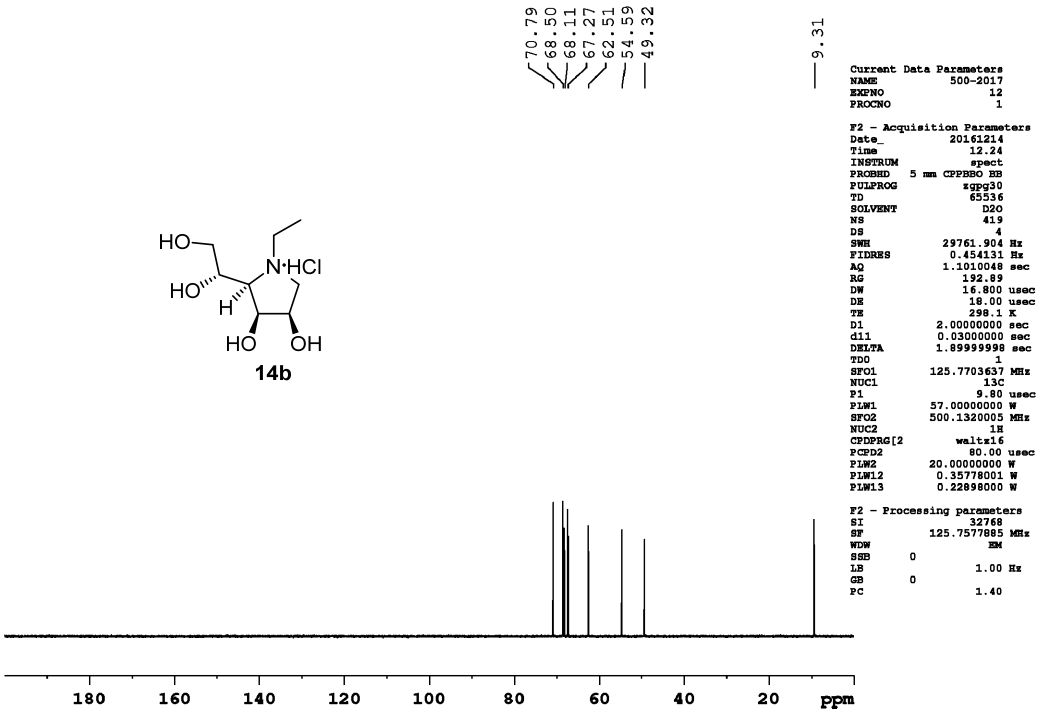
Compound **14b:**




Current Data Parameters
NAME 500-2017
EXPNO 11
PROCNO 1

F2 - Acquisition Paramete
Date_ 20161214
Time 12.16
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG zg30
TD 65536
SOLVENT D2O
NS 16
DS 2
SWH 10000.000 H
FIDRES 0.152588 H
AQ 3.2767999 s
RG 55.37
DW 50.000 u
DE 6.50 u
TE 298.1 K
D1 1.00000000 s
TD0 1
SFO1 500.1330885 M
NUC1 1H
P1 10.60 u
PLW1 20.00000000 W

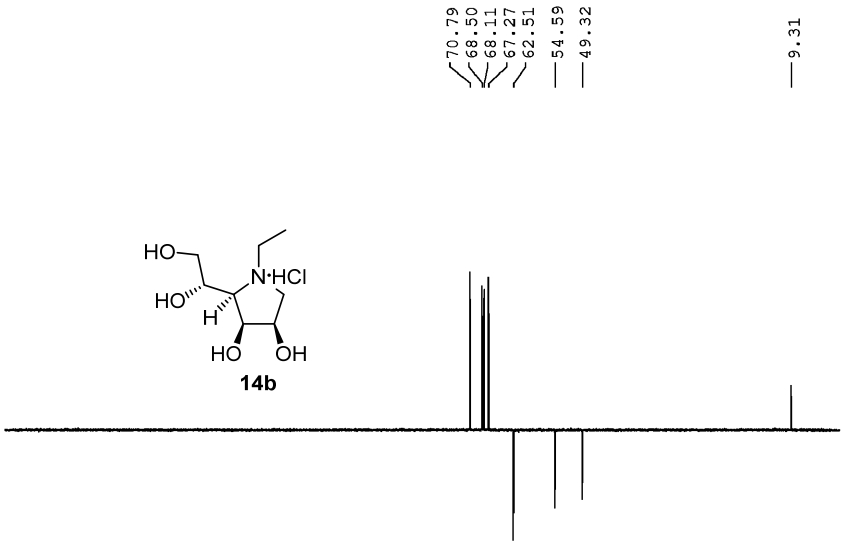
F2 - Processing parameter
SI 65536
SF 500.1299553 M
WDW EM
SSB 0
LB 0.30 H
GB 0
PC 1.00



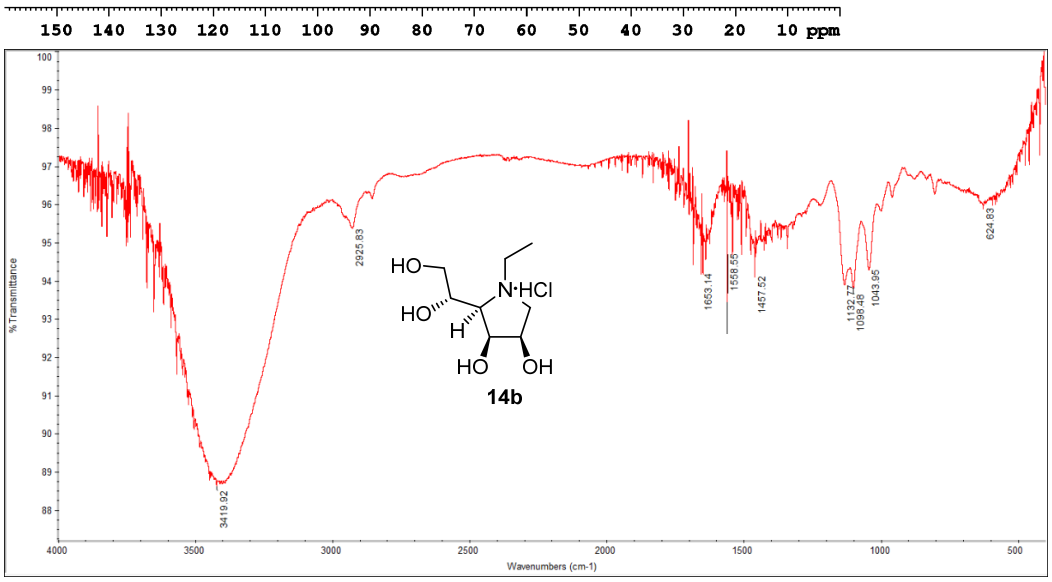

Current Data Parameters
NAME 500-2017
EXPNO 12
PROCNO 1

F2 - Acquisition Parameters
Date_ 20161214
Time 12.24
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG zgpg30
TD 65536
SOLVENT D2O
NS 419
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010048 sec
RG 192.89
DW 16.800 usec
DE 18.00 usec
TE 298.1 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
SFO1 125.7703637 MHz
NUC1 13C
P1 9.80 usec
PLW1 57.00000000 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 20.00000000 W
PLW12 0.35778001 W
PLW13 0.22898000 W

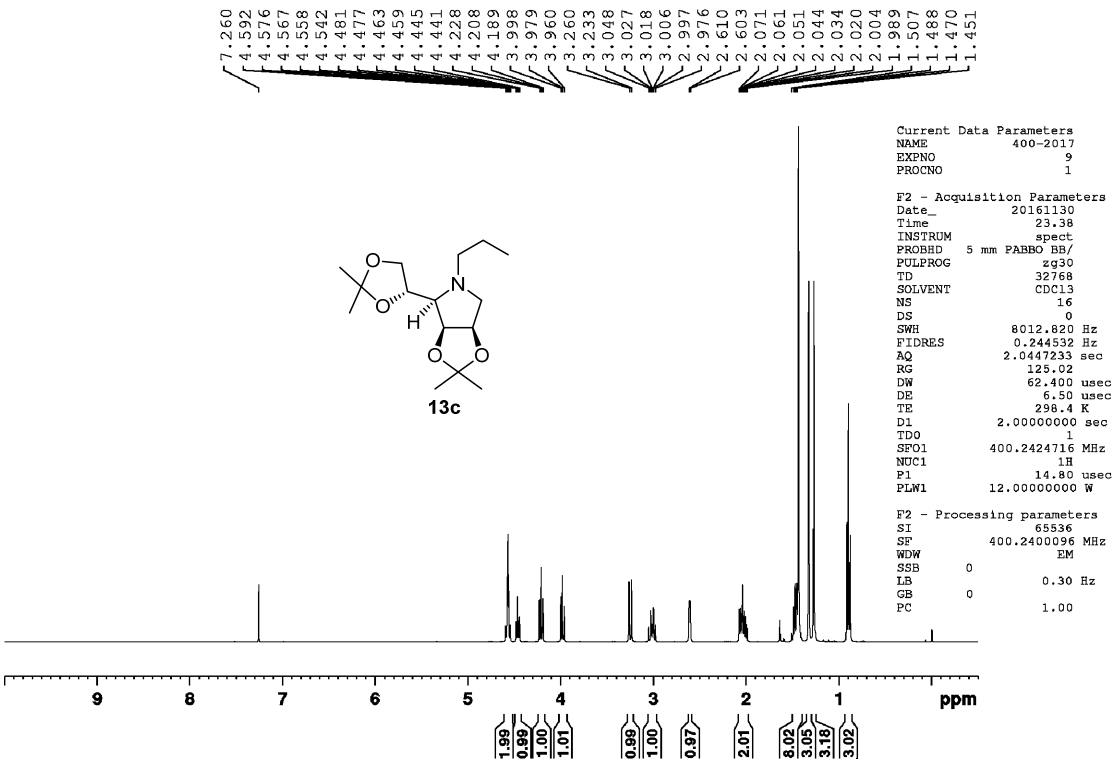
F2 - Processing parameters
SI 32768
SF 125.7577885 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

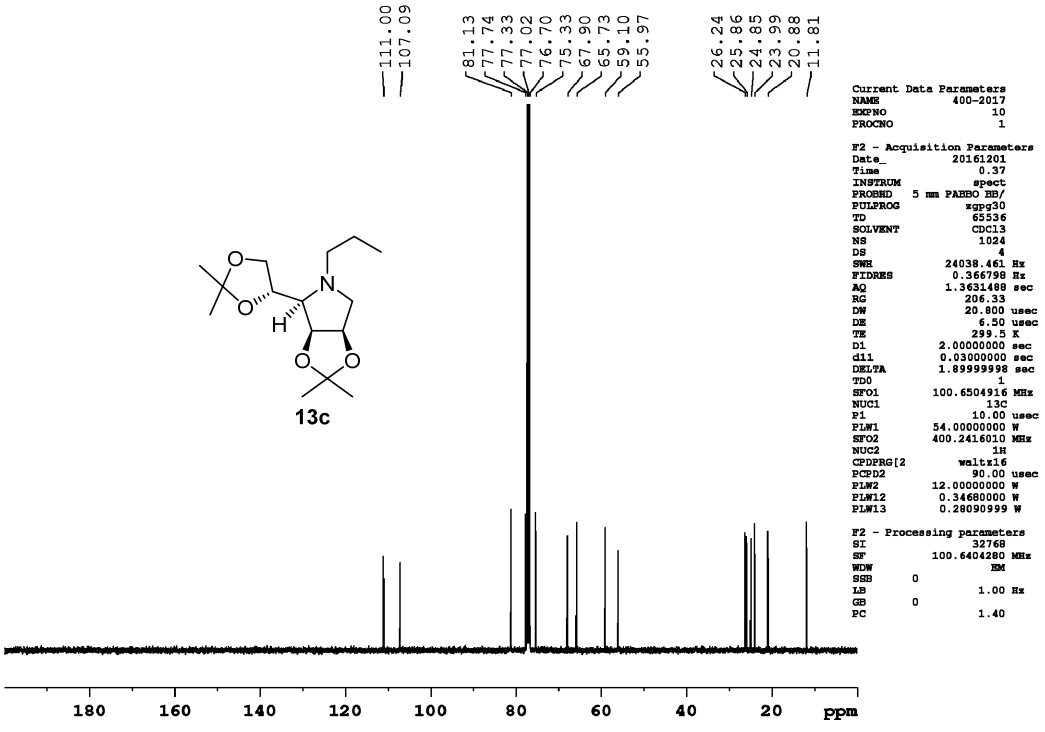


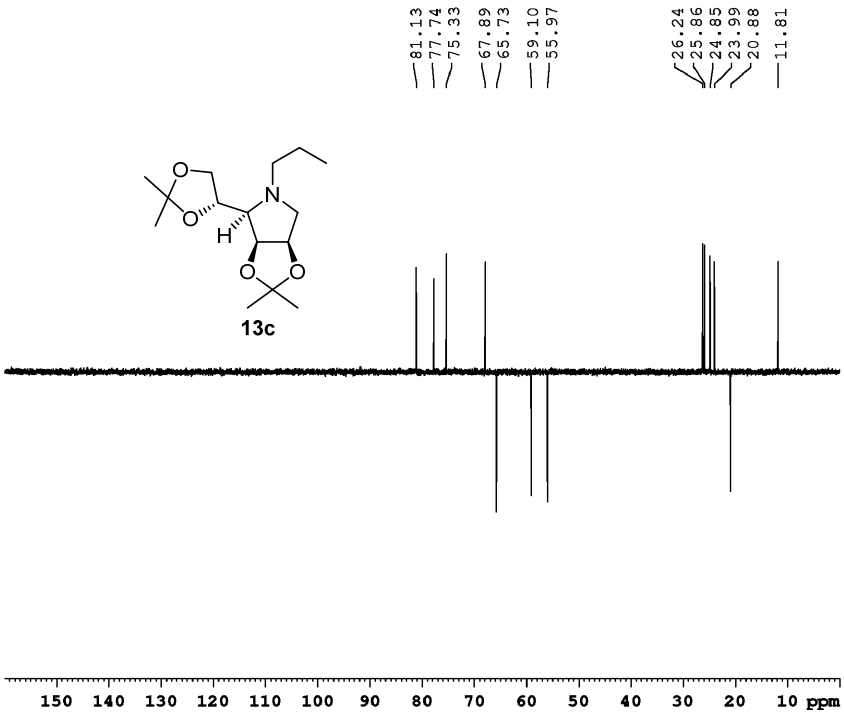

```
Current Data Parameters
NAME                  500-2017
EXPNO                       13
PROCNO                       1

F2 - Acquisition Parameters
Date_               20161214
Time                    12.44
INSTRUM                 spect
PROBHD     5 mm CPPBBO BB
PULPROG             dept-sp135
TD                       65536
SOLVENT                    D2O
NS                          98
DS                           4
SWH                 20161.291 Hz
FIDRES                0.307637 Hz
AQ                    1.6252928 sec
RG                       192.89
DW                       24.800 usec
DE                       19.00 usec
TE                       298.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001249 sec
TD0                             1
SFO1                 125.7678486 MHz
NUC1                         13C
P1                          9.80 usec
P13                      2000.00 usec
PLW0        0 W
PLW1                  57.00000000 W
SPNAM[5]              Crp60comp.4
SPOAL5                      0.500
SPOFFS5     0 Hz
SPW5                   8.36410046 W
SFO2                 500.1315995 MHz
NUC2                         1H
CPDPRG[2                waltz16
P3                         10.70 usec
p4                         21.40 usec
PCPD2                      80.00 usec
PLW2                 20.00000000 W
PLW12                 0.35778001 W

F2 - Processing parameters
SI                          32768
SF                   125.7577885 MHz
WDW                            EM
SSB         0
LB                          1.00 Hz
GB          0
PC                          1.40
```



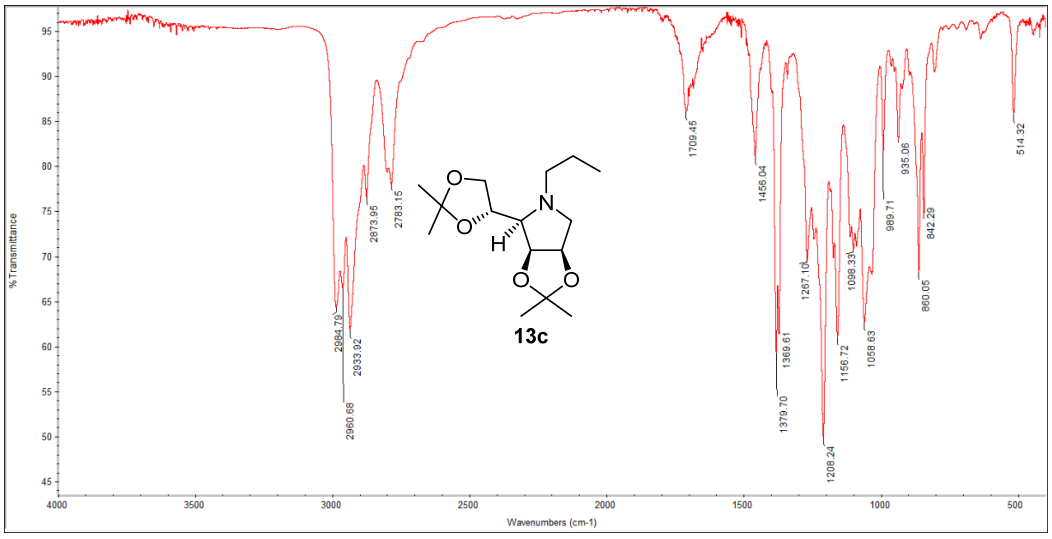
Compound **13c:**



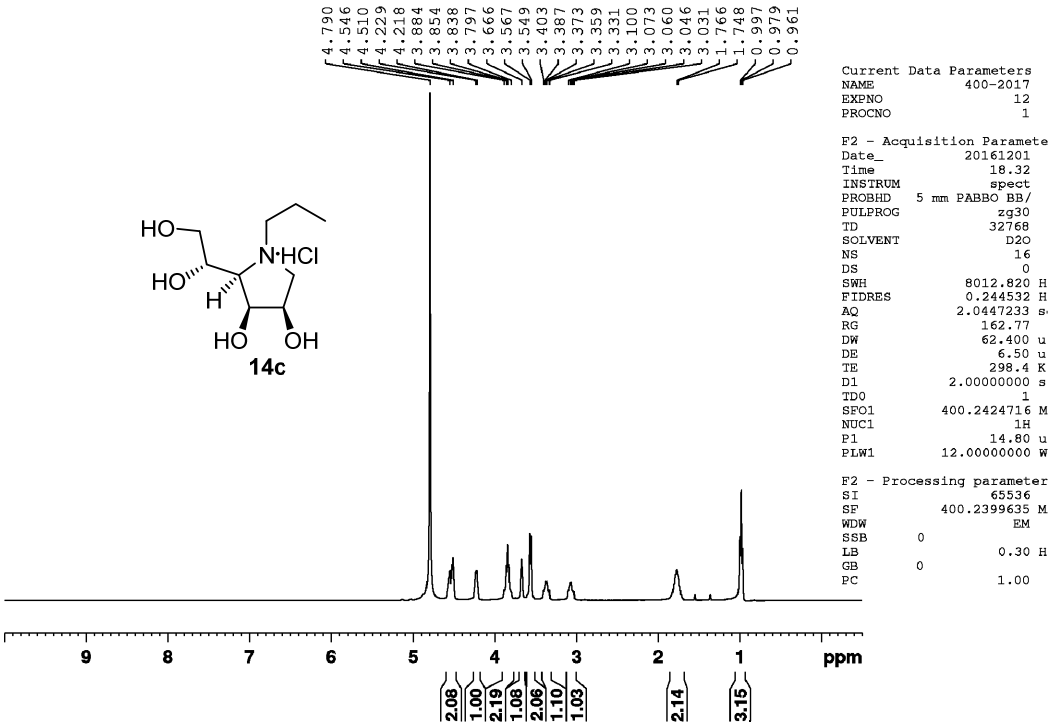





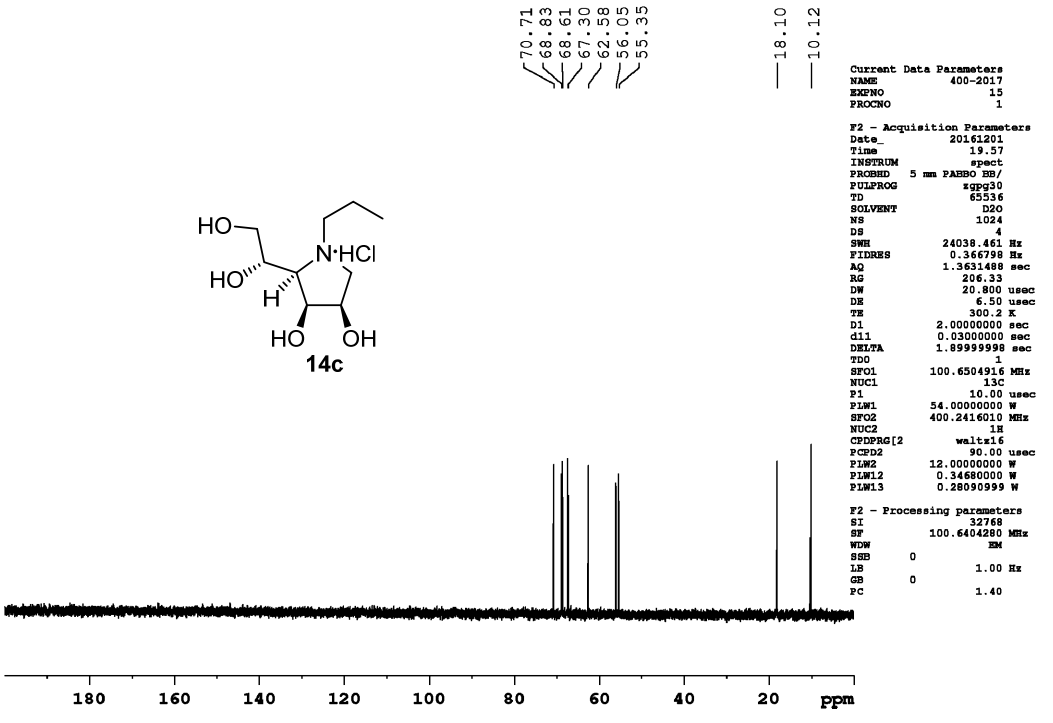

```
Current Data Parameters
NAME                  400-2017
EXPNO                       11
PROCNO                       1

F2 - Acquisition Parameters
Date_               20161201
Time                    0.55
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             dept-sp135
TD                       65536
SOLVENT                  CDCl3
NS                         256
DS                           4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     299.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                             1
SFO1                 100.6484788 MHz
NUC1                        13C
P1                          10.00 usec
P13                       2000.00 usec
PLW0        0 W
PLW1                  54.00000000 W
SPNAM[5]              Crp60comp.4
SPOAL5                     0.500
SPOFFS5     0 Hz
SPW5                  8.25059986 W
SFO2                400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                          15.30 usec
P4                          30.60 usec
PCPD2                       90.00 usec
PLW2                  12.00000000 W
PLW12                  0.34680000 W

F2 - Processing parameters
SI                          32768
SF                  100.6404280 MHz
WDW                            EM
SSB         0
LB                          1.00 Hz
GB          0
PC                          1.40
```



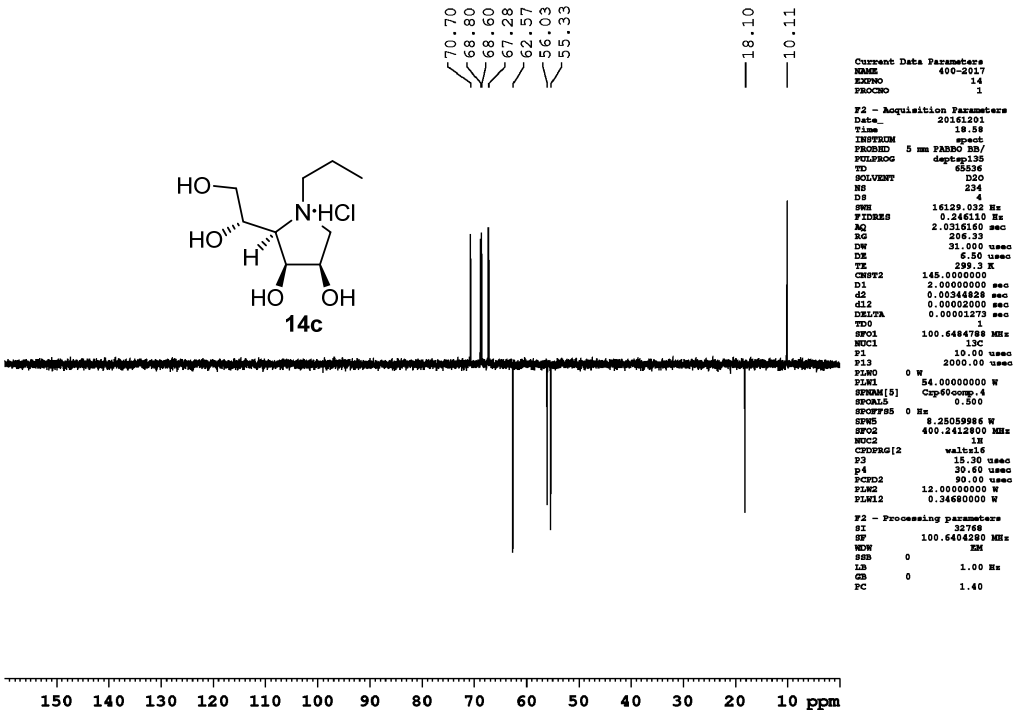
Compound **14c:**



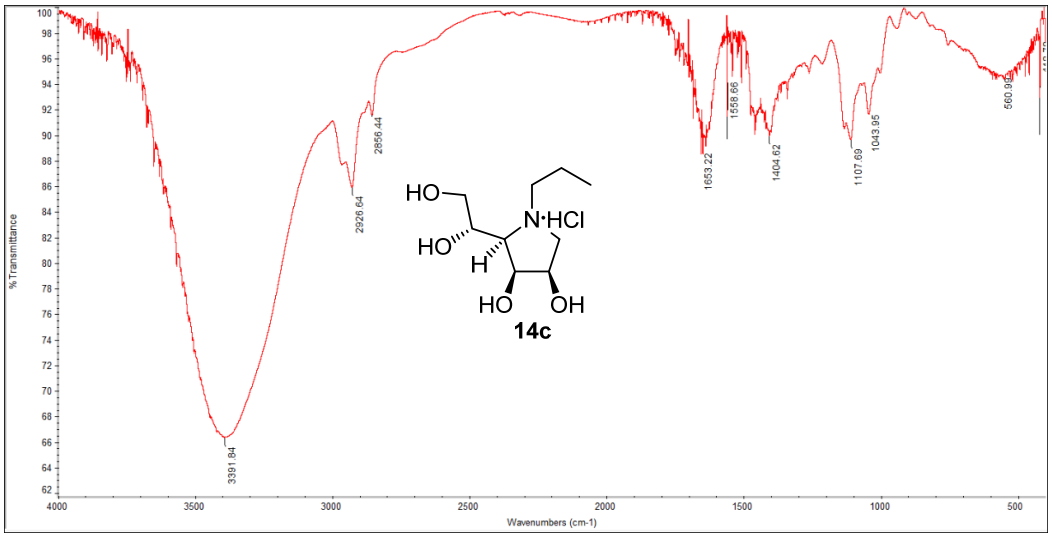

```
Current Data Parameters
NAME                  400-2017
EXPNO                       12
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20161201
Time                     18.32
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                  2.0447233 s
RG                     162.77
DW                     62.400 u
DE                      6.50 u
TE                     298.4 K
D1                 2.00000000 s
TD0                         1
SFO1               400.2424716 M
NUC1                       1H
P1                      14.80 u
PLW1               12.00000000 W

F2 - Processing parameter
SI                      65536
SF                 400.2399635 M
WDW                        EM
SSB          0
LB                      0.30 H
GB           0
PC                      1.00
```



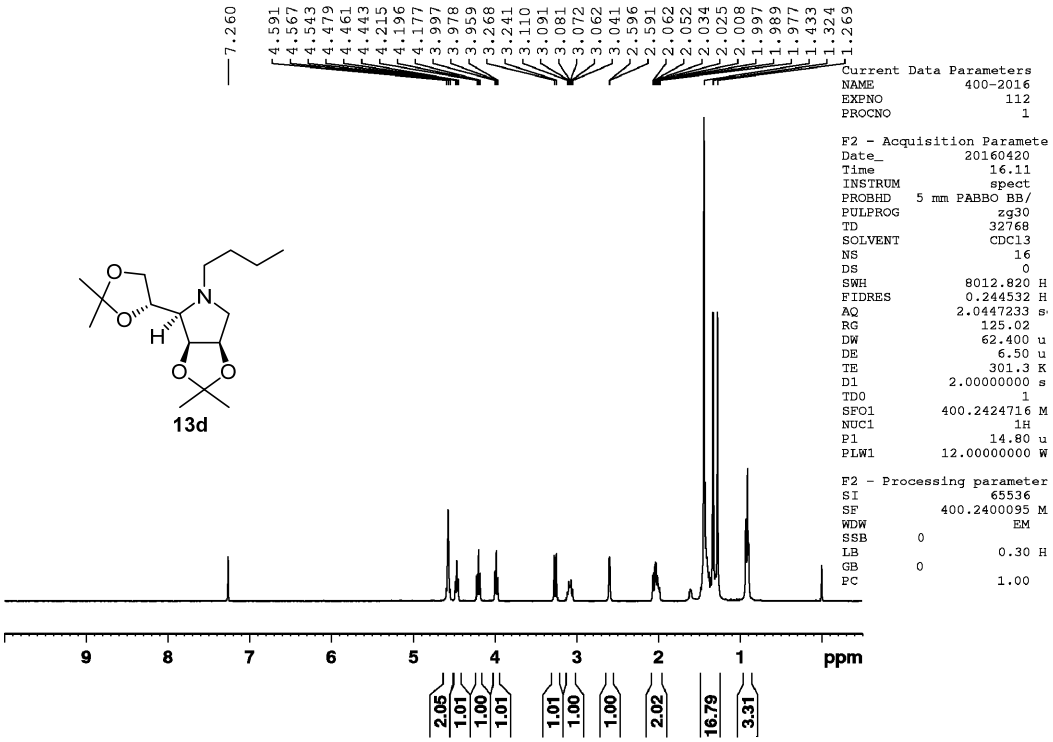

```
Current Data Parameters
NAME                  400-2017
EXPNO                       15
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20161201
Time                     19.57
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                 zgpg30
TD                      65536
SOLVENT                   D2O
NS                         1024
DS                            4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                  1.3631488 sec
RG                     206.33
DW                    20.800 usec
DE                     6.50 usec
TE                     300.2 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1
SFO1              100.6504916 MHz
NUC1                       13C
P1                    10.00 usec
PLW1               54.00000000 W
SFO2              400.2416010 MHz
NUC2                       1H
CPDPRG[2                waltz16
PCPD2                 90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                      32768
SF                100.6404280 MHz
WDW                        EM
SSB          0
LB                    1.00 Hz
GB           0
PC                      1.40
```



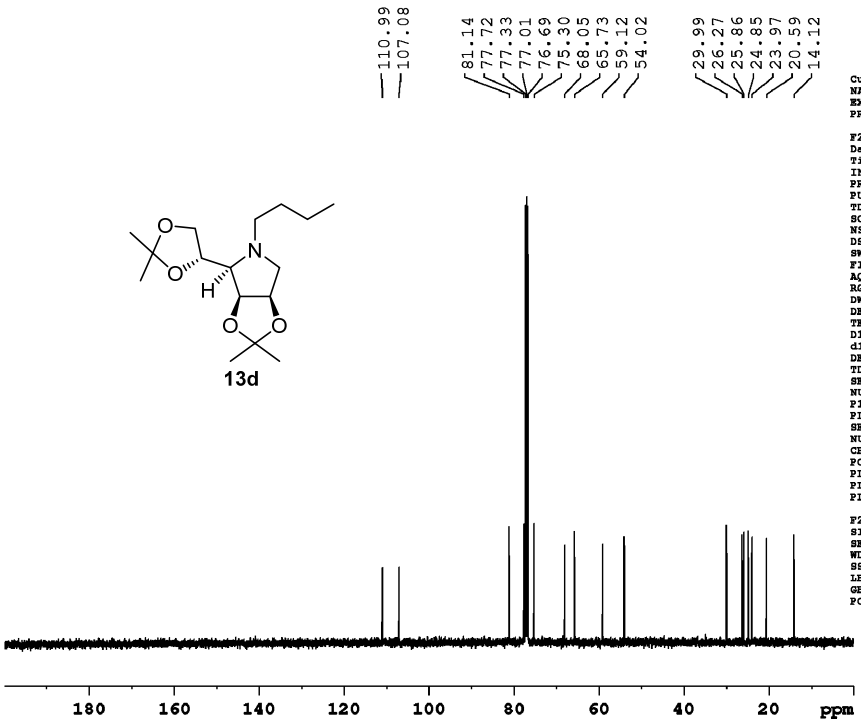

```
Current Data Parameters
NAME                  400-2017
EXPNO                       14
PROCNO                       1

F2 - Acquisition Parameters
Date_               20161201
Time                    18.58
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             dept-sp135
TD                       65536
SOLVENT                    D2O
NS                         234
DS                           4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     299.3 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                        13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1               54.00000000 W
SPNAM[5]           Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                8.25059986 W
SFO2                400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



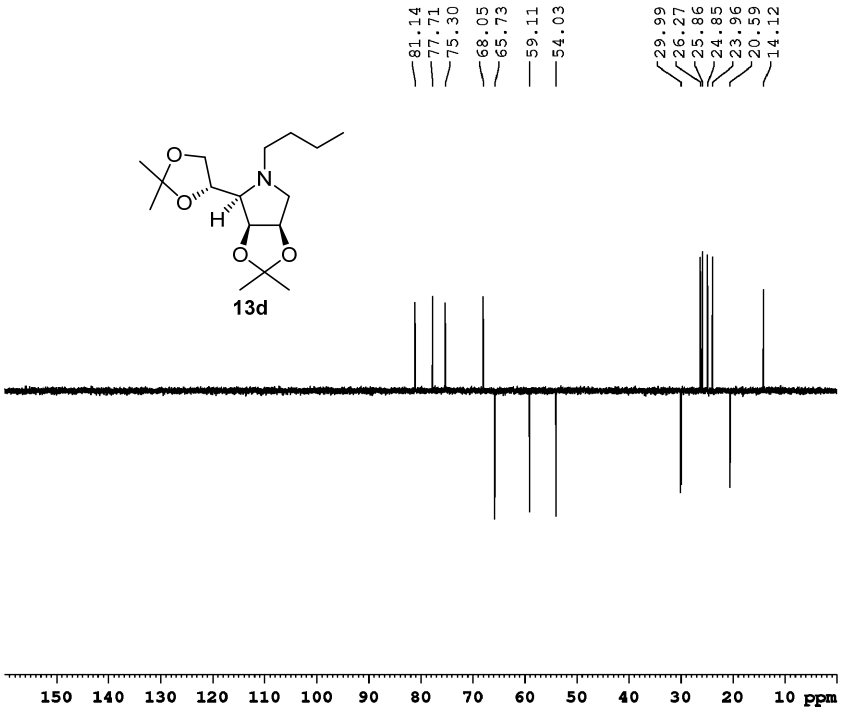
Compound **13d:**



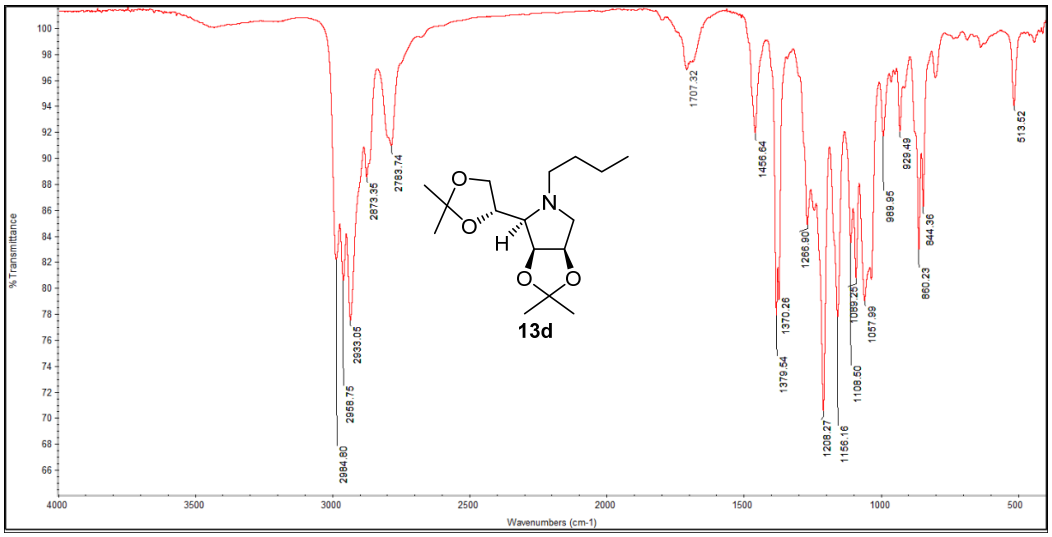

```
Current Data Parameters
NAME                  400-2016
EXPNO                      112
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20160420
Time                     16.11
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                 CDCl3
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                   2.0447233 s
RG                      125.02
DW                      62.400 u
DE                       6.50 u
TE                      301.3 K
D1                 2.00000000 s
TD0                         1
SFO1               400.2424716 M
NUC1                       1H
P1                      14.80 u
PLW1               12.00000000 W

F2 - Processing parameter
SI                      65536
SF                 400.2400095 M
WDW                        EM
SSB          0
LB                       0.30 H
GB           0
PC                       1.00
```



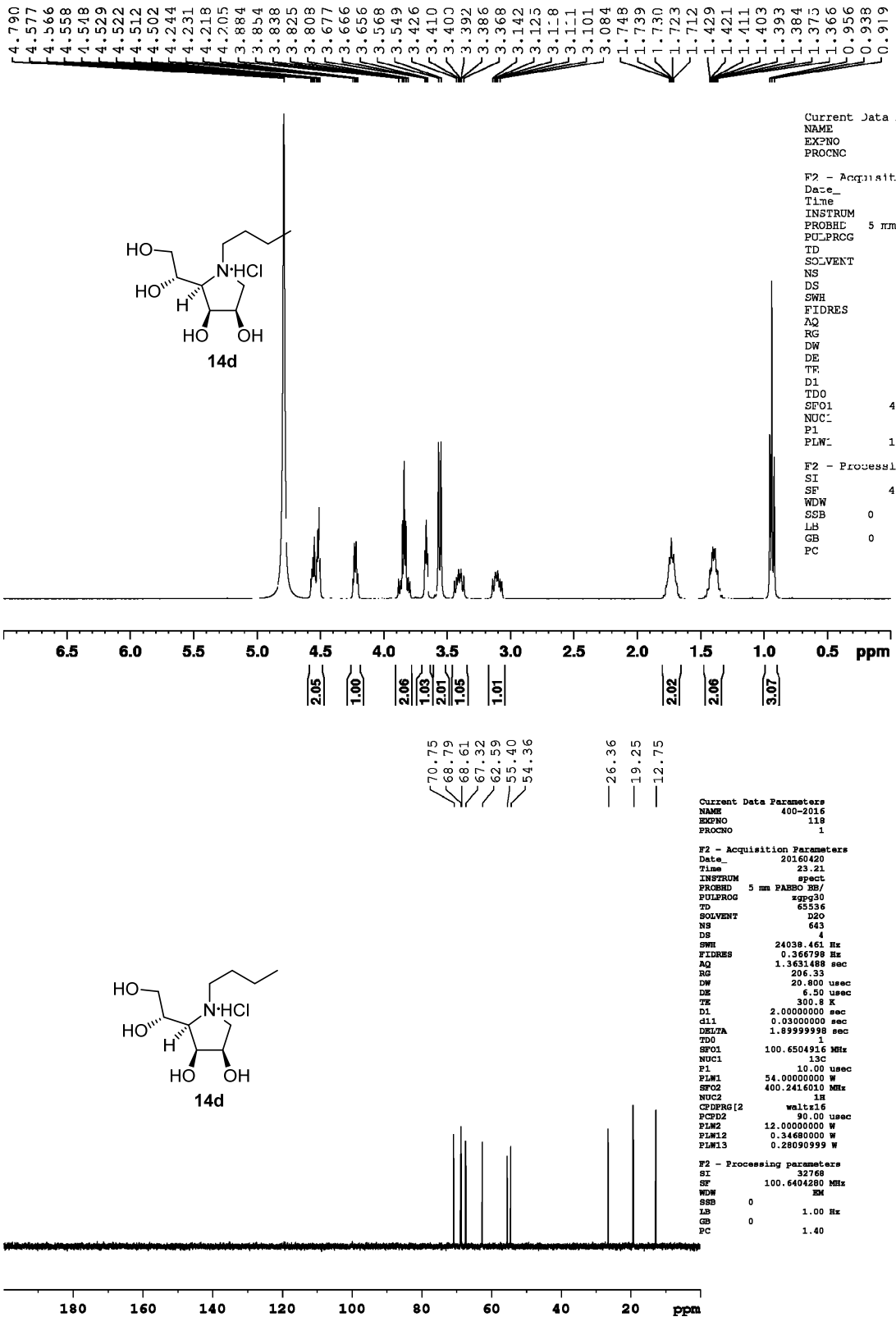

```
Current Data Parameters
NAME                  400-2016
EXPNO                      103
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160418
Time                     14.14
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                         458
DS                           4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631488 sec
RG                      206.33
DW                      20.800 usec
DE                       6.50 usec
TE                      300.7 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1
SFO1               100.6504916 MHz
NUC1                       13C
P1                      10.00 usec
PLW1               54.00000000 W
SFO2               400.2416010 MHz
NUC2                       1H
CPDPRG[2                waltz16
PCPD2                   90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                      32768
SF                 100.6404280 MHz
WDW                        EM
SSB          0
LB                       1.00 Hz
GB           0
PC                       1.40
```

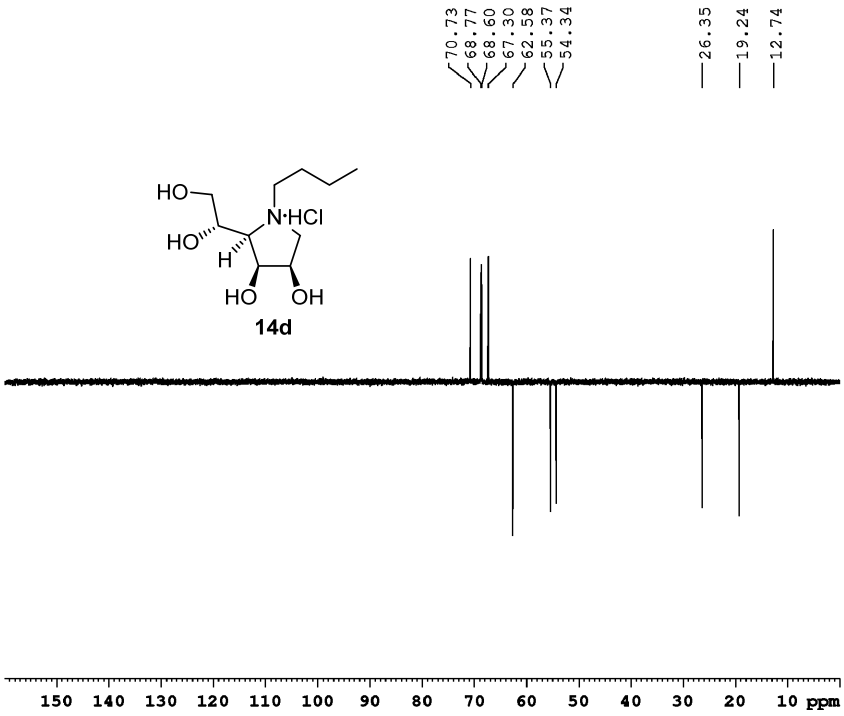



```
Current Data Parameters
NAME                  400-2016
EXPNO                      105
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160418
Time                    16.24
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                 CDCl3
NS                        162
DS                          4
SWH                 16129.032 Hz
FIDRES              0.246110 Hz
AQ                  2.0316160 sec
RG                      206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     299.6 K
CNST2               145.0000000
D1                  2.00000000 sec
d2                  0.00344828 sec
d12                 0.00002000 sec
DELTA               0.00001273 sec
TD0                          1
SFO1               100.6484788 MHz
NUC1                       13C
P1                      10.00 usec
P13                   2000.00 usec
PLW0          0 W
PLW1           54.00000000 W
SPNAM[5]         Crp60comp.4
SPOAL5                 0.500
SPOFFS5       0 Hz
SPW5            8.25059986 W
SFO2               400.2412800 MHz
NUC2                       1H
CPDPRG[2              waltz16
P3                     15.30 usec
p4                     30.60 usec
PCPD2                  90.00 usec
PLW2           12.00000000 W
PLW12           0.34690000 W

F2 - Processing parameters
SI                        32768
SF                 100.6404280 MHz
WDW                          EM
SSB           0
LB                      1.00 Hz
GB            0
PC                      1.40
```

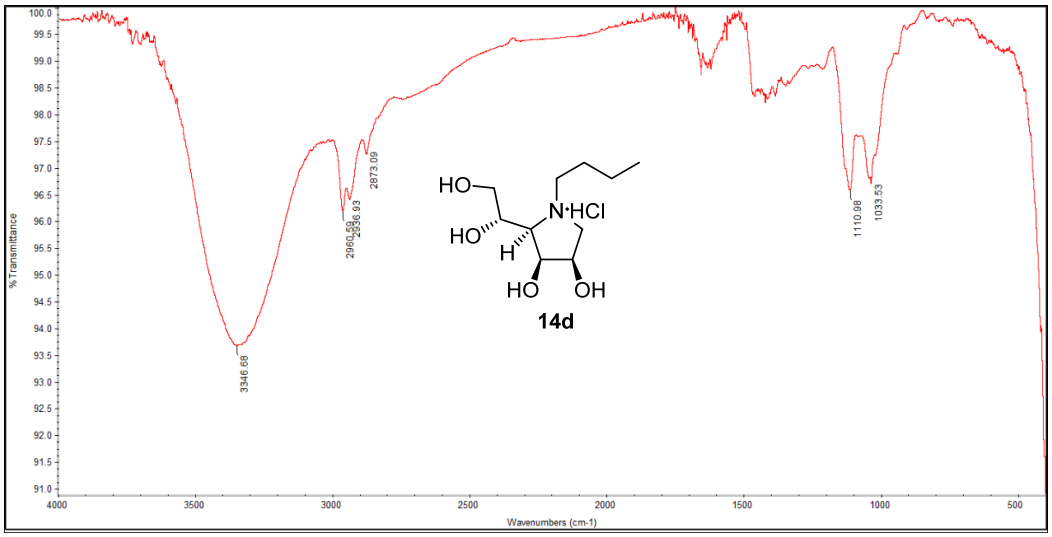


Compound **14d:**

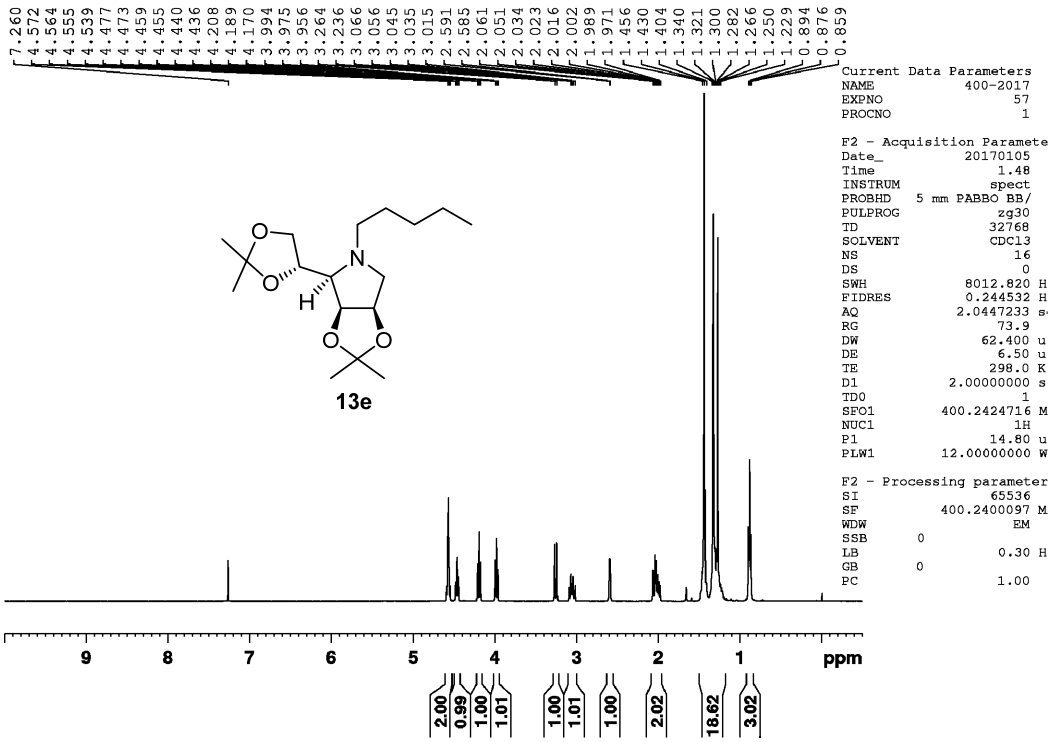


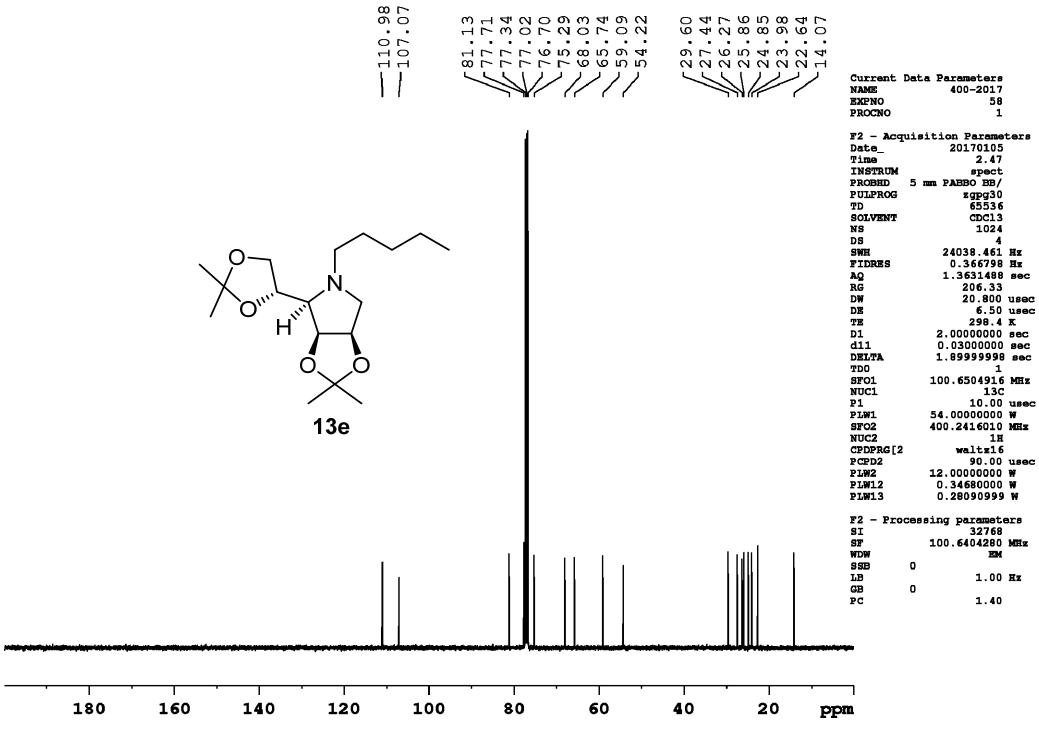


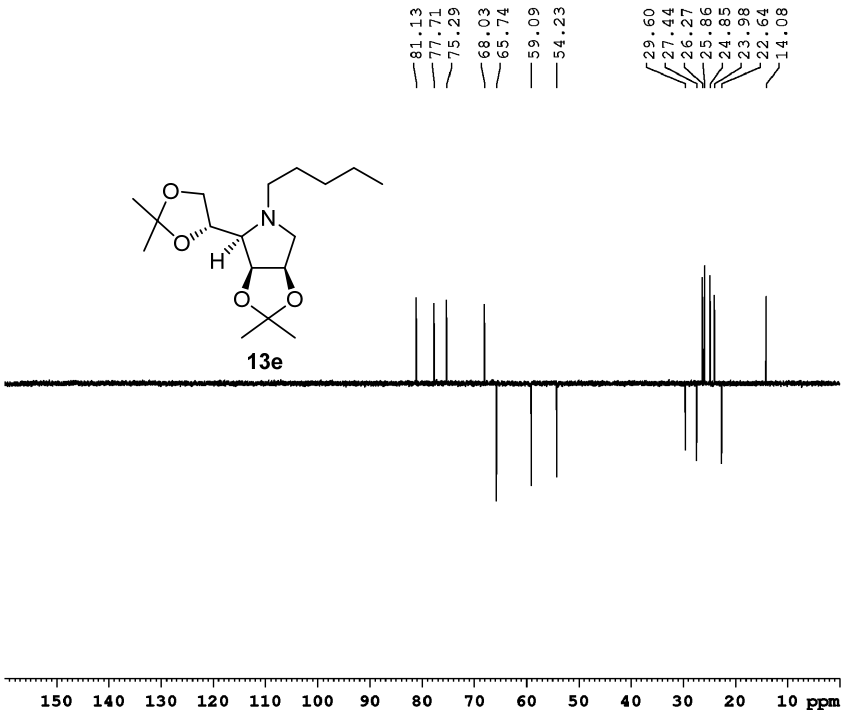

```
Current Data Parameters
NAME                  400-2016
EXPNO                      119
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160420
Time                   23.24
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        147
DS                          4
SWH                16129.032 Hz
FIDRES                 0.246110 Hz
AQ                 2.0316160 sec
RG                       206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     300.3 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                           1
SFO1               100.6484788 MHz
NUC1                        13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                 8.25059986 W
SFO2               400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                        32768
SF                 100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



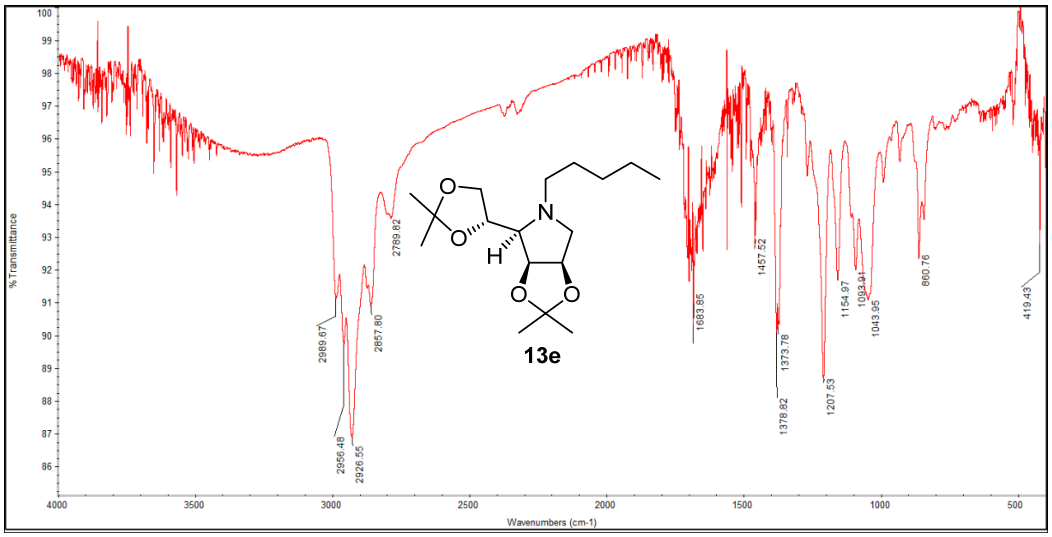
Compound **13e:**



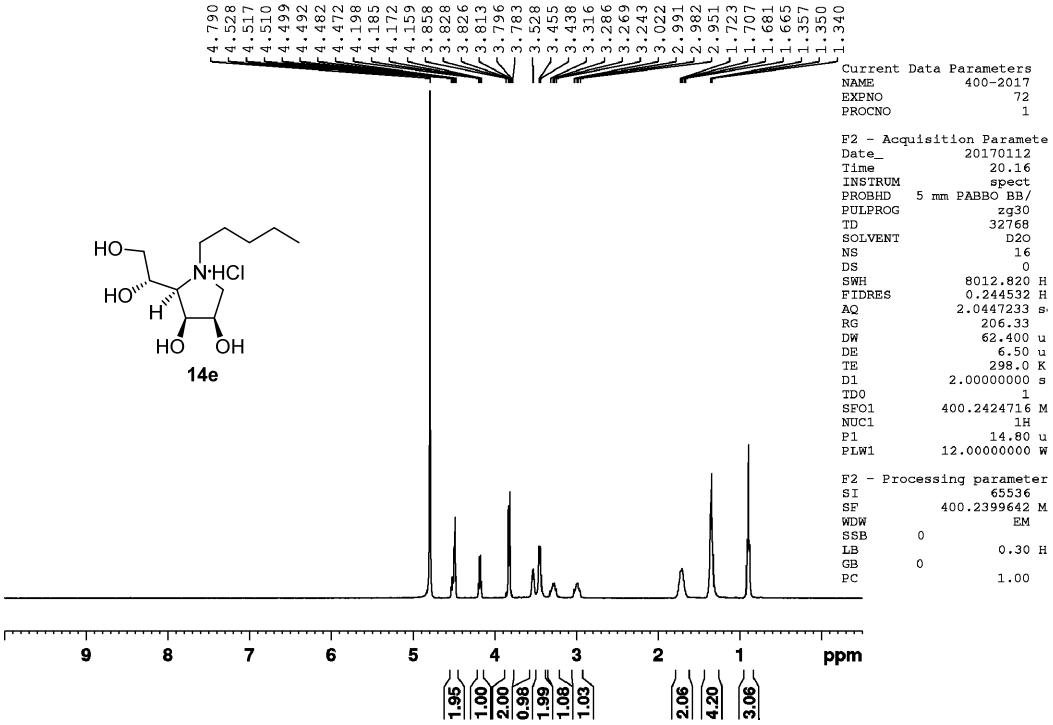



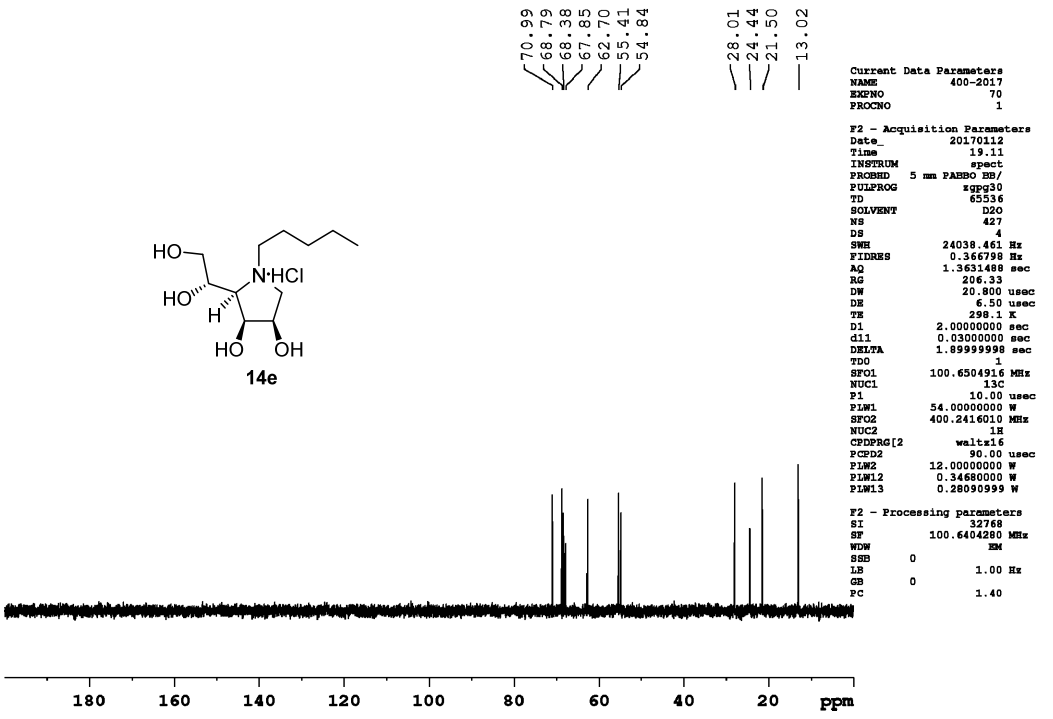


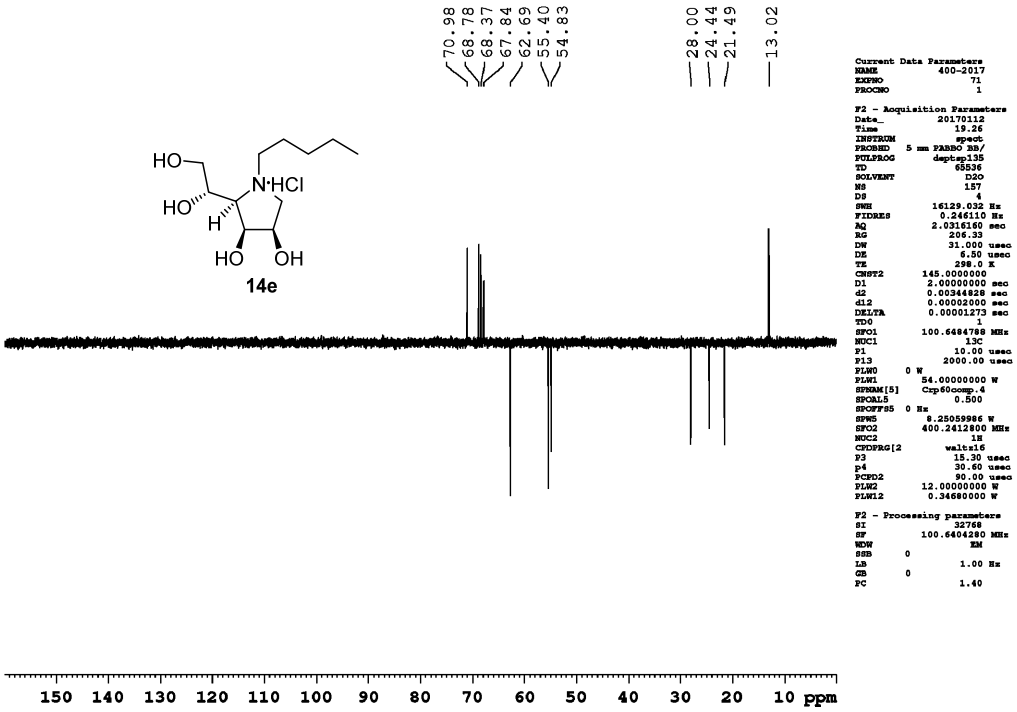

```
Current Data Parameters
NAME                  400-2017
EXPNO                       59
PROCNO                       1

F2 - Acquisition Parameters
Date_               20170105
Time                    9.05
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             dept-sp135
TD                       65536
SOLVENT                  CDCl3
NS                         256
DS                           4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                      206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     298.0 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                       13C
P1                      10.00 usec
P13                   2000.00 usec
PLW0        0 W
PLW1                54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                 8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                      15.30 usec
p4                      30.60 usec
PCPD2                   90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404280 MHz
WDW                         EM
SSB         0
LB                       1.00 Hz
GB          0
PC                       1.40
```



Compound **14e:**

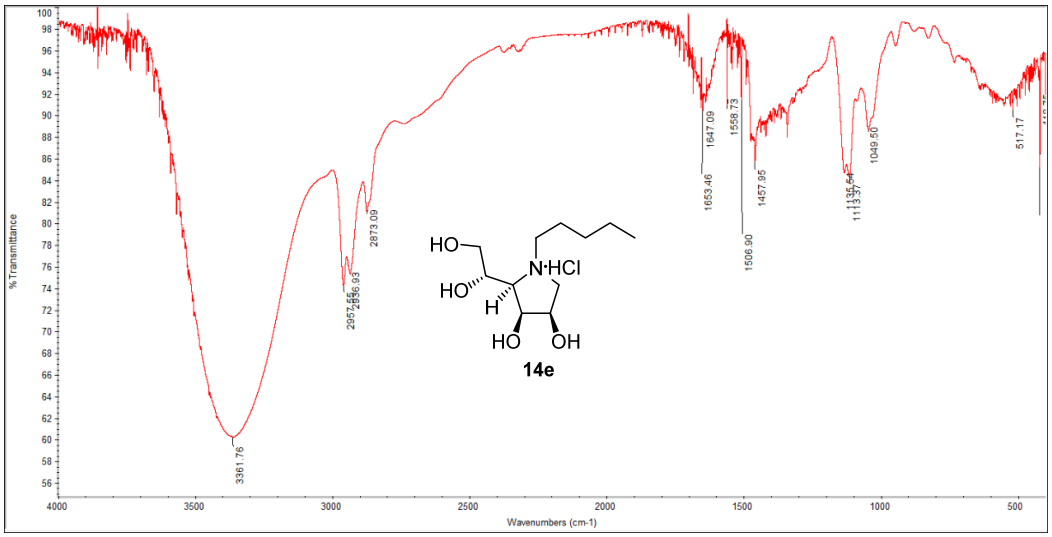


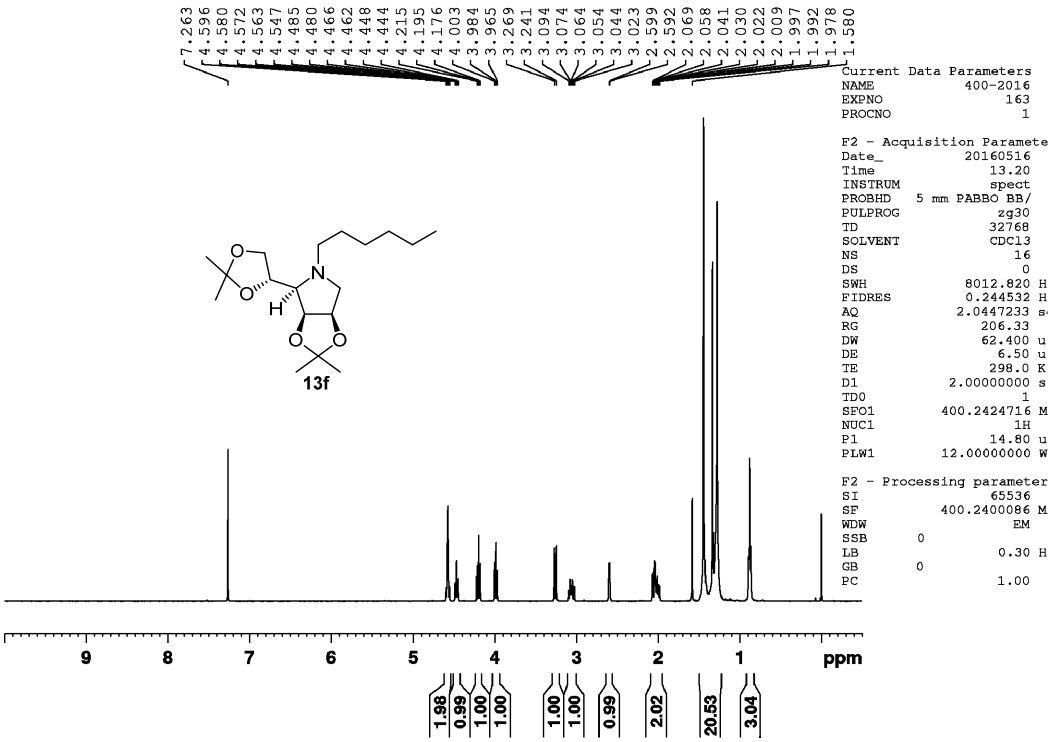


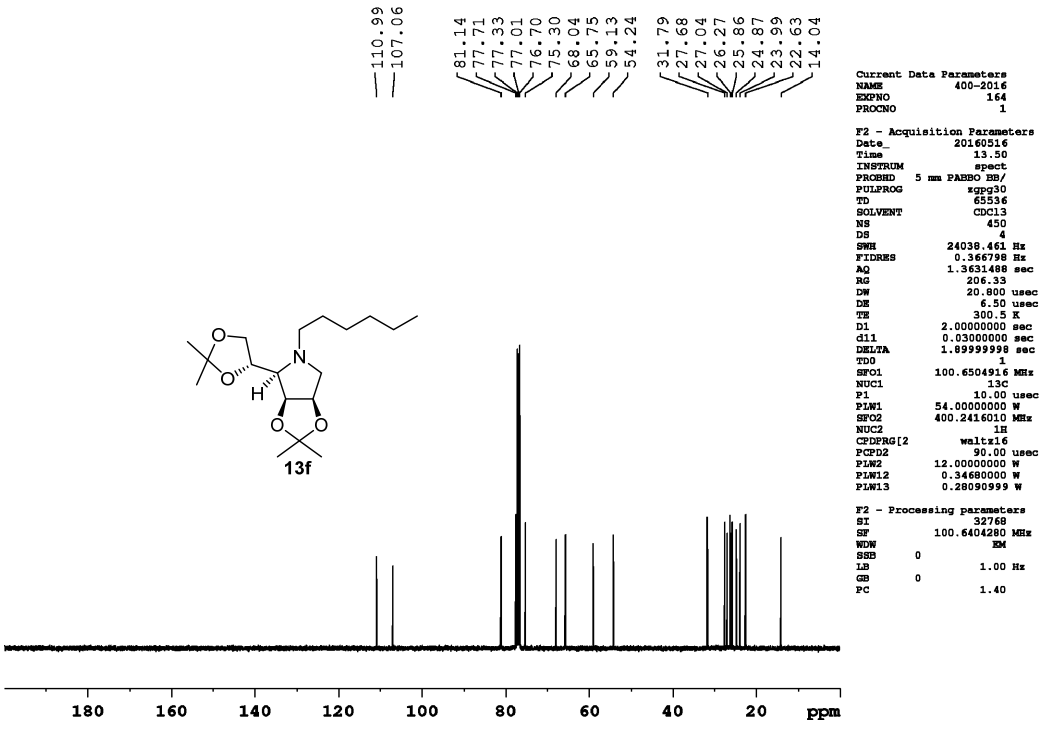


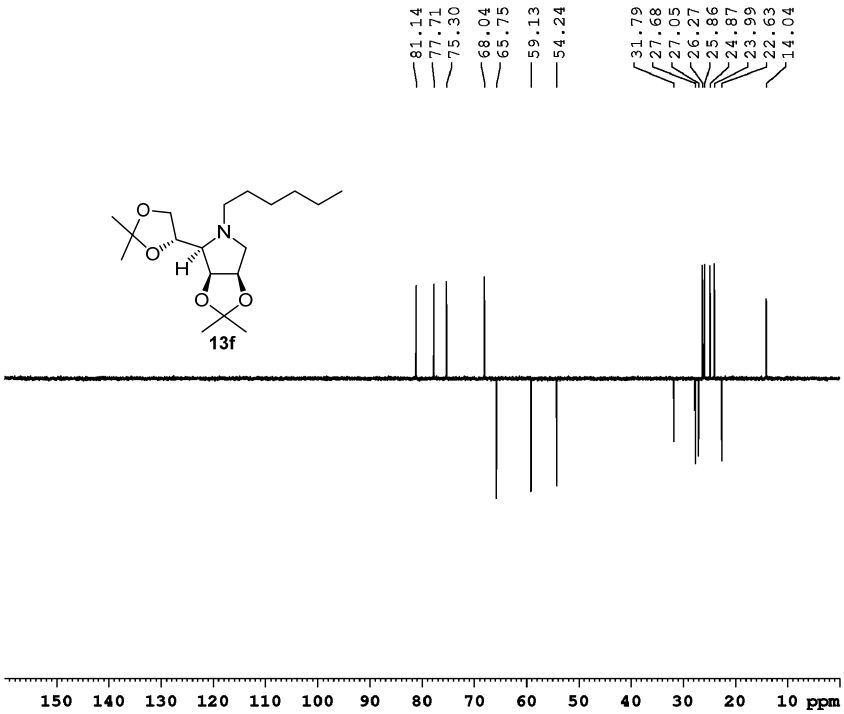
```
Current Data Parameters
NAME                  400-2017
EXPNO                       71
PROCNO                       1

F2 - Acquisition Parameters
Date_               20170112
Time                   19.26
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        157
DS                          4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     298.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                             1
SFO1                100.6484788 MHz
NUC1                        13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                  54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                     0.500
SPOFFS5     0 Hz
SPW5                  8.25059986 W
SFO2                400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                          32768
SF                  100.6404280 MHz
WDW                            EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```

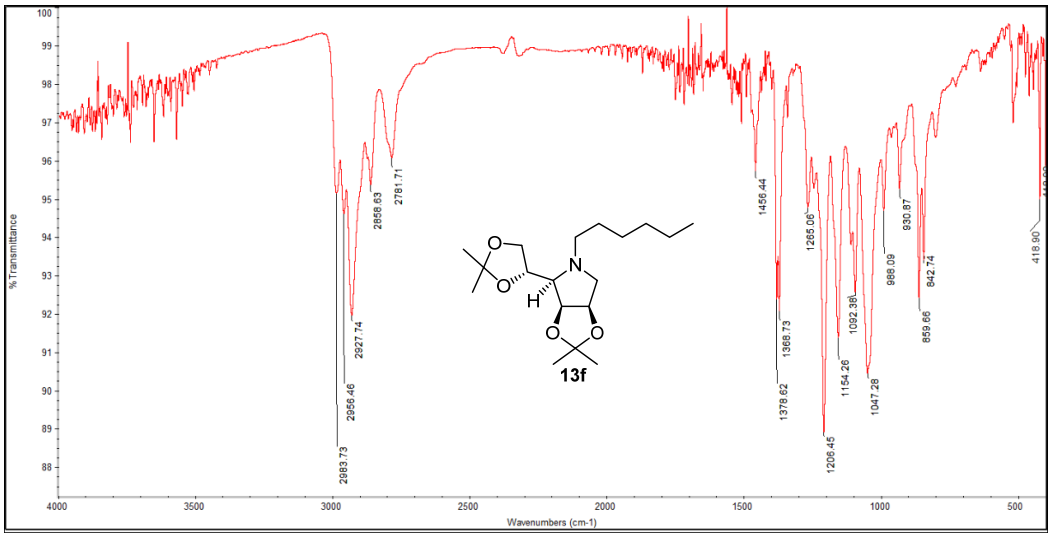
Compound **13f:**



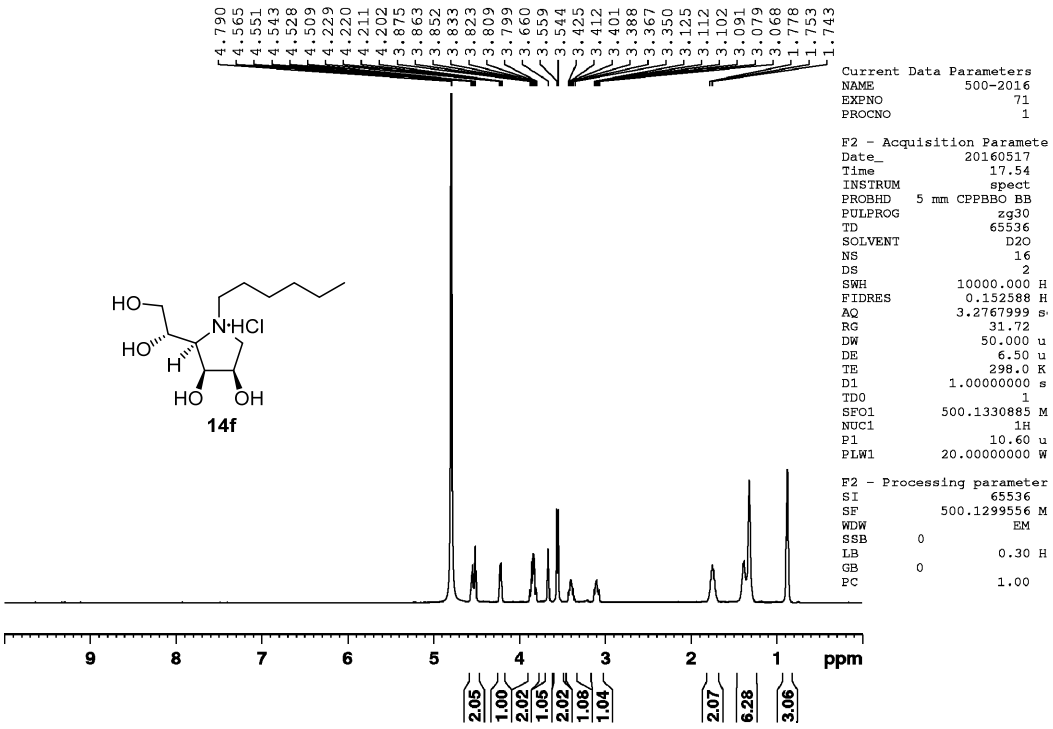






```
Current Data Parameters
NAME                  400-2016
EXPNO                      165
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160516
Time                    14.01
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             dept.cp135
TD                       65536
SOLVENT                  CDCl3
NS                         150
DS                           4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                       31.000 usec
DE                        6.50 usec
TE                      300.3 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                 54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                    0.500
SPOFFS5     0 Hz
SPW5                  8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
P4                       30.60 usec
PCPD2                    90.00 usec
PLW2                 12.00000000 W
PLW12                 0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



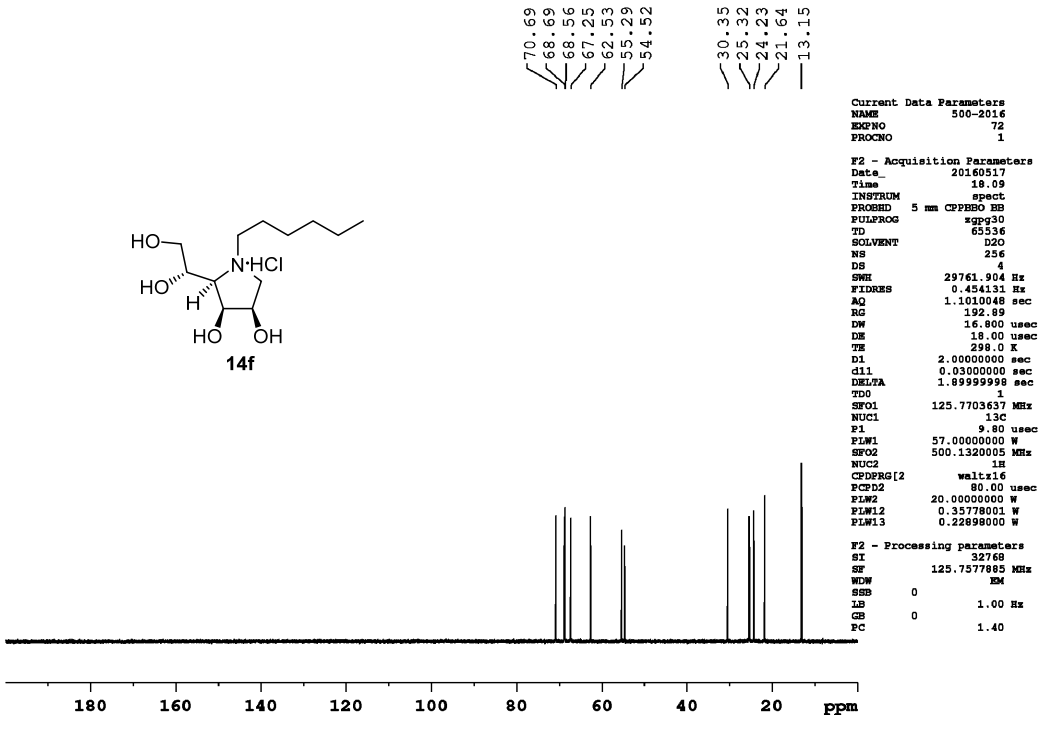
Compound **14f:**




Current Data Parameters
NAME 500-2016
EXPNO 71
PROCNO 1

F2 - Acquisition Paramete
Date_ 20160517
Time 17.54
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG zg30
TD 65536
SOLVENT D2O
NS 16
DS 2
SWH 10000.000 H
FIDRES 0.152588 H
AQ 3.2767999 s
RG 31.72
DW 50.000 u
DE 6.50 u
TE 298.0 K
D1 1.00000000 s
TD0 1
SFO1 500.1330885 M
NUC1 1H
P1 10.60 u
PLW1 20.00000000 W

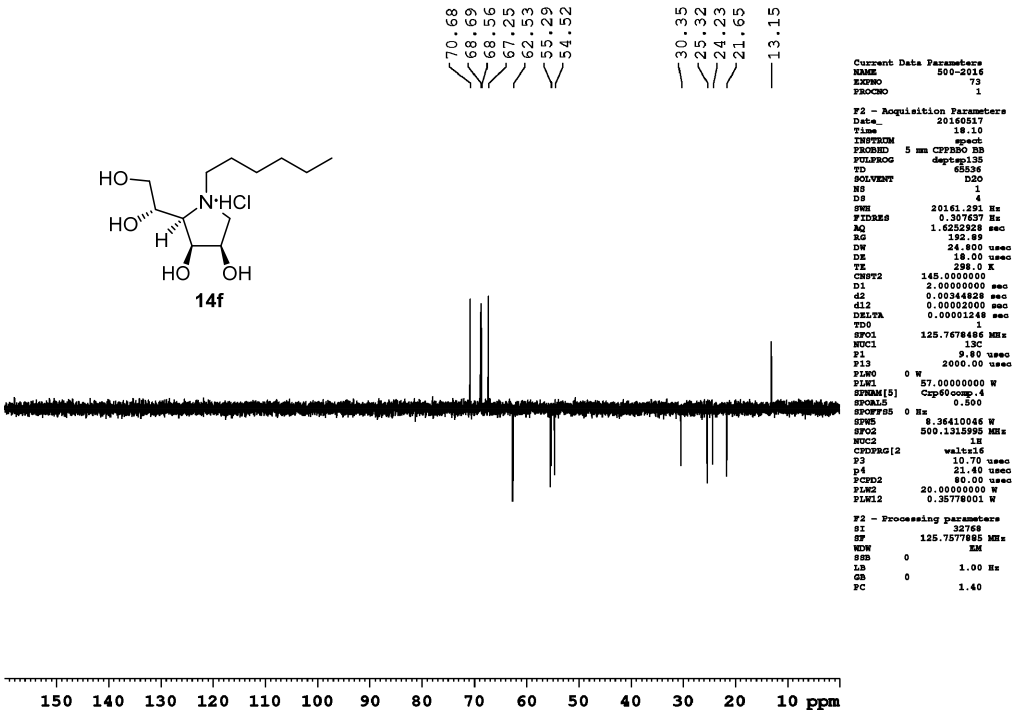
F2 - Processing parameter
SI 65536
SF 500.1299556 M
WDW EM
SSB 0
LB 0.30 H
GB 0
PC 1.00



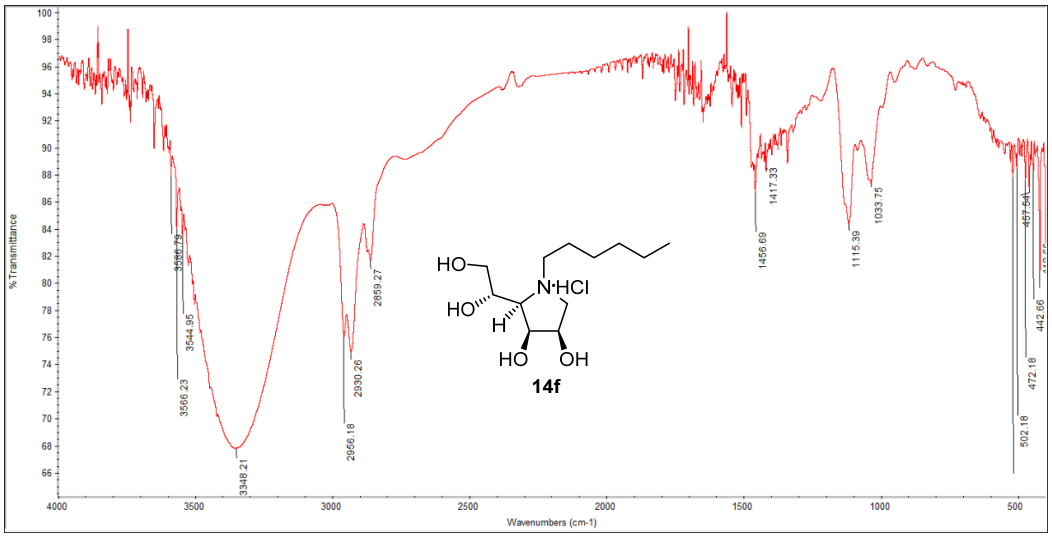

Current Data Parameters
NAME 500-2016
EXPNO 72
PROCNO 1

F2 - Acquisition Parameters
Date_ 20160517
Time 18.09
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG zgpg30
TD 65536
SOLVENT D2O
NS 256
DS 4
SWH 29761.904 Hz
FIDRES 0.454131 Hz
AQ 1.1010048 sec
RG 192.89
DW 16.800 usec
DE 18.00 usec
TE 298.0 K
D1 2.00000000 sec
d11 0.03000000 sec
DELTA 1.89999998 sec
TD0 1
SFO1 125.7703637 MHz
NUC1 13C
P1 9.80 usec
PLW1 57.00000000 W
SFO2 500.1320005 MHz
NUC2 1H
CPDPRG[2 waltz16
PCPD2 80.00 usec
PLW2 20.00000000 W
PLW12 0.35778001 W
PLW13 0.22898000 W

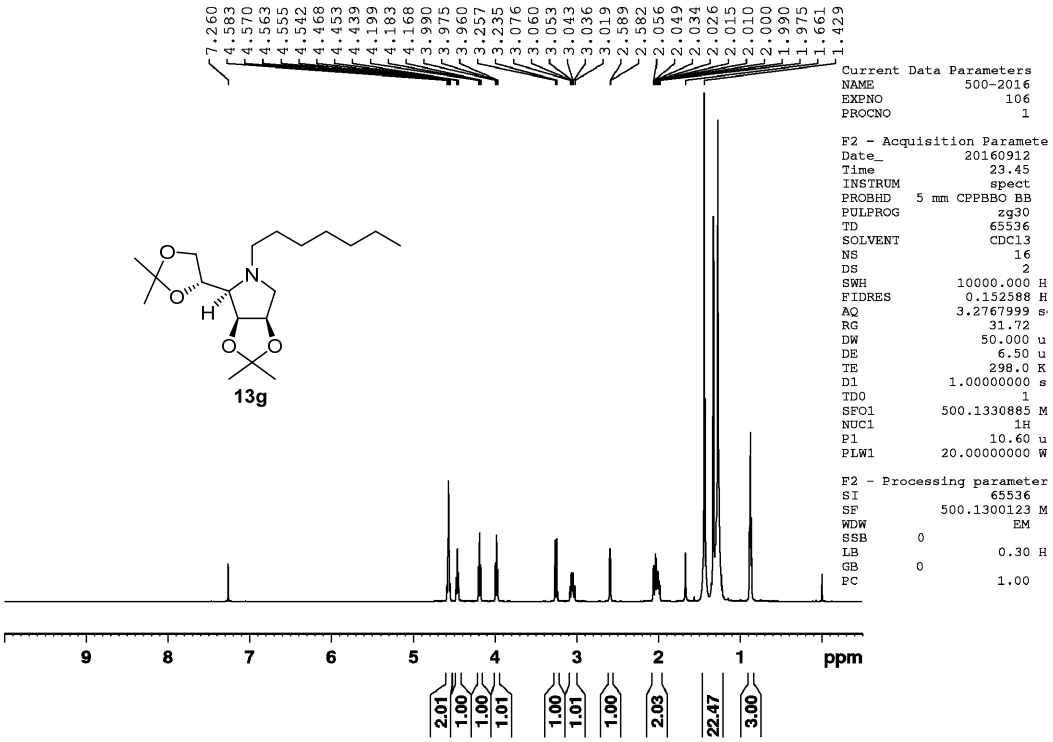
F2 - Processing parameters
SI 32768
SF 125.7577885 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

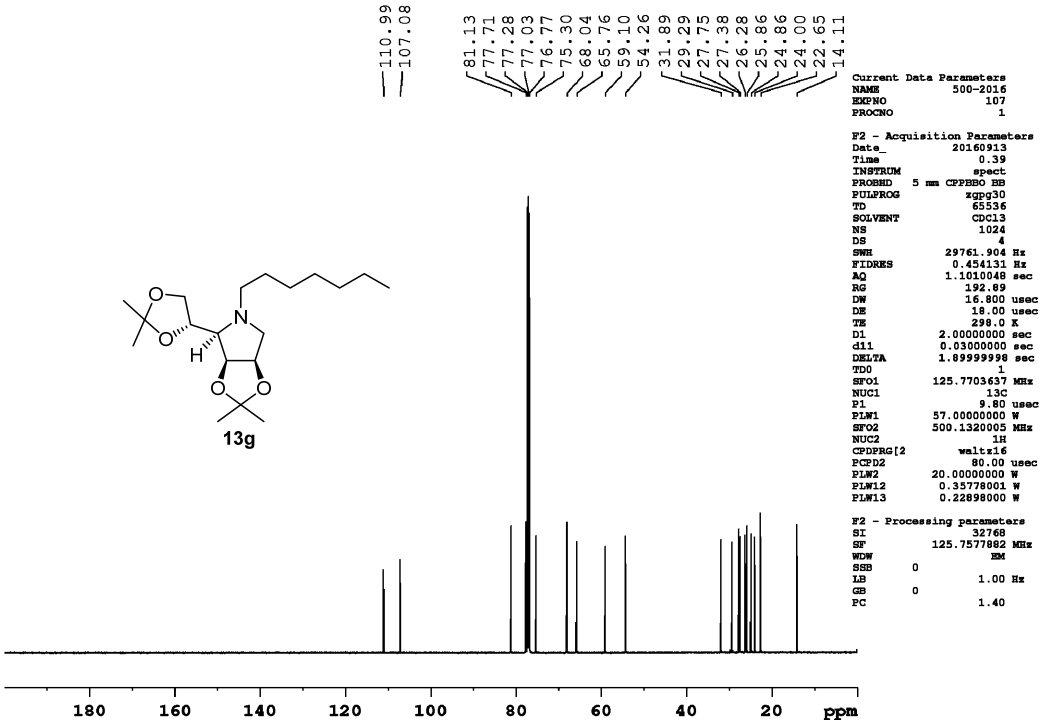


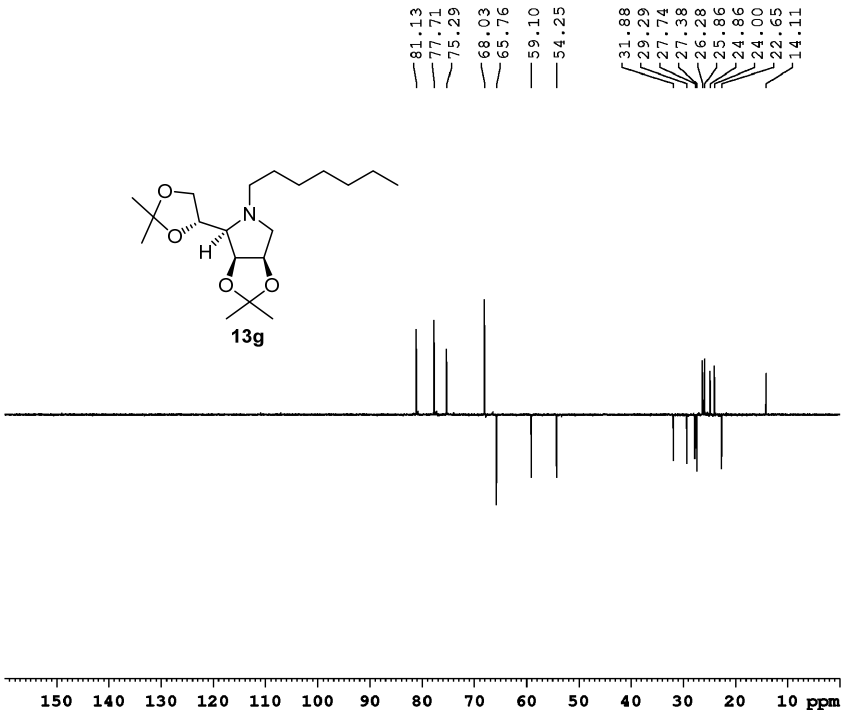

```
Current Data Parameters
NAME                  500-2016
EXPNO                       73
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160517
Time                    18.10
INSTRUM                 spect
PROBHD    5 mm CPPBBO BB
PULPROG             dept-sp135
TD                       65536
SOLVENT                    D2O
NS                           1
DS                           4
SWH                 20161.291 Hz
FIDRES                0.307637 Hz
AQ                    1.6252928 sec
RG                        192.89
DW                        24.800 usec
DE                        18.00 usec
TE                       298.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001248 sec
TD0                          1
SFO1                 125.7678486 MHz
NUC1                        13C
P1                         9.80 usec
P13                     2000.00 usec
PLW0          0 W
PLW1                  57.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                    0.500
SPOFFS5       0 Hz
SPW5                   8.36410046 W
SFO2                 500.1315995 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                        10.70 usec
p4                        21.40 usec
PCPD2                     80.00 usec
PLW2                 20.00000000 W
PLW12                 0.35778001 W

F2 - Processing parameters
SI                       32768
SF                   125.7577895 MHz
WDW                         EM
SSB           0
LB                        1.00 Hz
GB            0
PC                        1.40
```



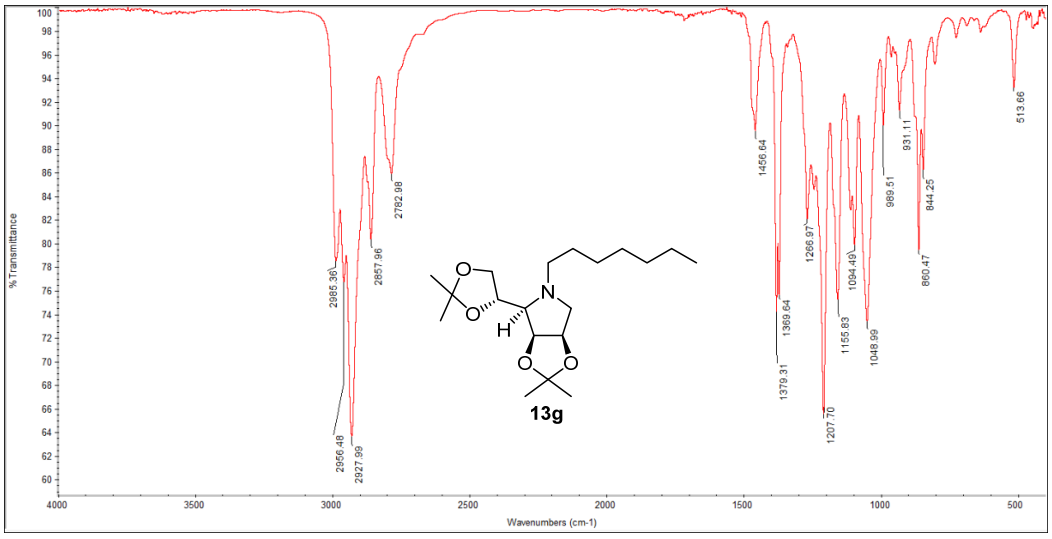
Compound **13g:**



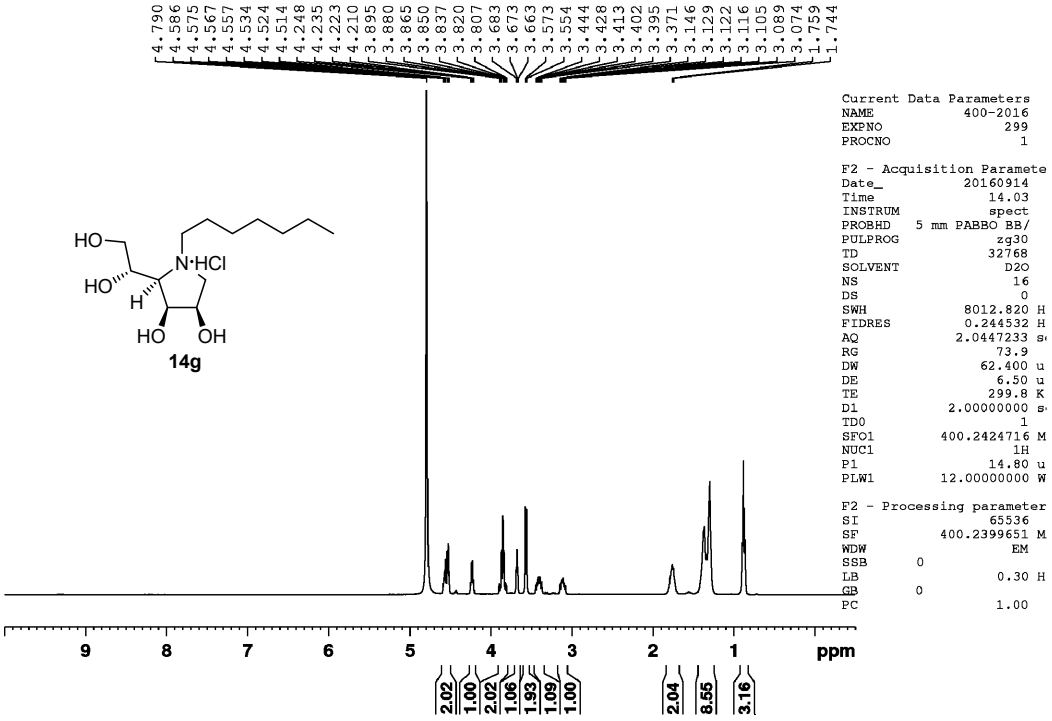





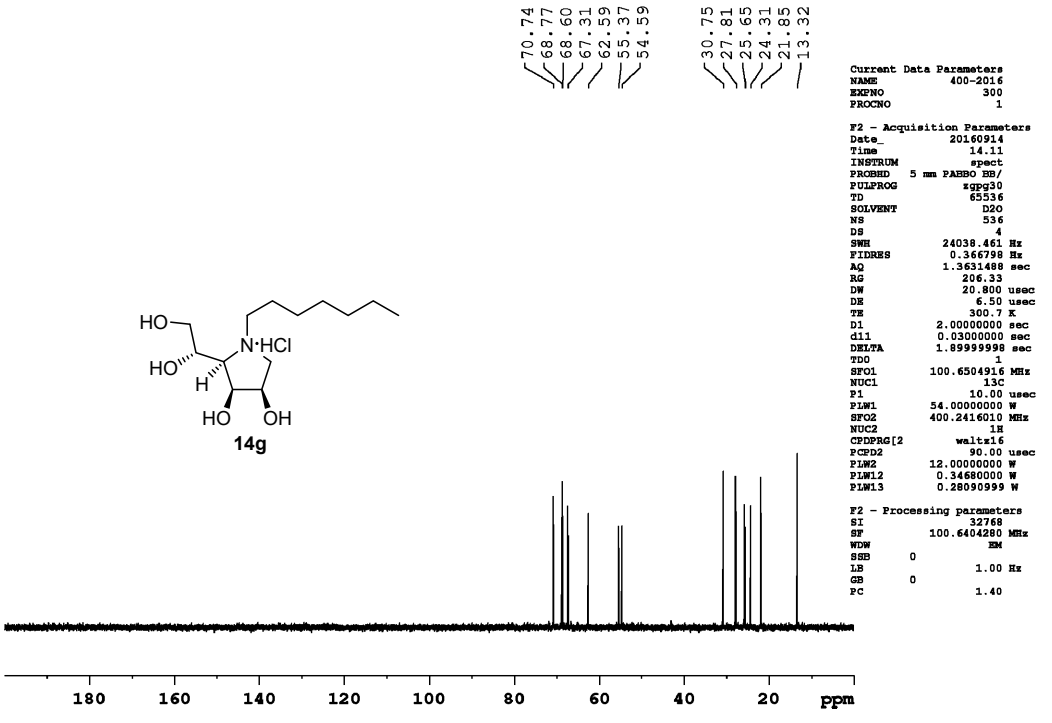

```
Current Data Parameters
NAME                  500-2016
EXPNO                      105
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160908
Time                    16.49
INSTRUM                 spect
PROBHD     5 mm CPPBBO BB
PULPROG             dept-sp135
TD                       65536
SOLVENT                  CDCl3
NS                         150
DS                           4
SWH                 20161.291 Hz
FIDRES                0.307637 Hz
AQ                    1.6252928 sec
RG                        192.89
DW                        24.800 usec
DE                        18.00 usec
TE                       298.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001248 sec
TD0                             1
SFO1                 125.7678486 MHz
NUC1                         13C
P1                          9.80 usec
P13                      2000.00 usec
PLW0        0 W
PLW1                  57.00000000 W
SPNAM[5]             Crp60comp.4
SPOAL5                     0.500
SPOFFS5     0 Hz
SPW5                   8.36410046 W
SFO2                 500.1315995 MHz
NUC2                         1H
CPDPRG[2                waltz16
P3                         10.70 usec
P4                         21.40 usec
PCPD2                      80.00 usec
PLW2                 20.00000000 W
PLW12                 0.35778001 W

F2 - Processing parameters
SI                          32768
SF                   125.7577885 MHz
WDW                            EM
SSB         0
LB                          1.00 Hz
GB          0
PC                          1.40
```



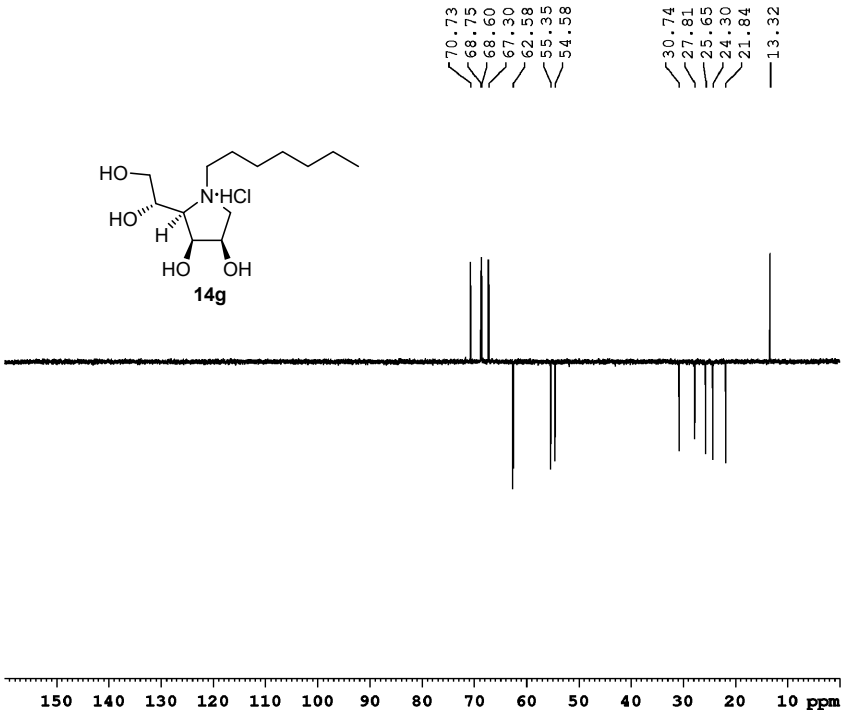
Compound **14g:**



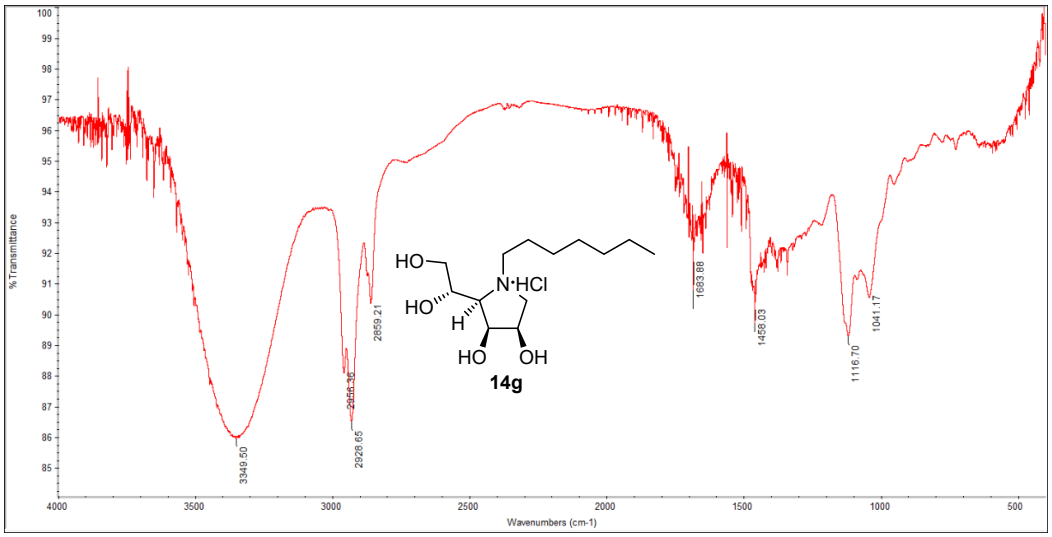

```
Current Data Parameters
NAME                  400-2016
EXPNO                      299
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20160914
Time                     14.03
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                   2.0447233 s
RG                        73.9
DW                      62.400 u
DE                       6.50 u
TE                      299.8 K
D1                 2.00000000 s
TD0                         1
SFO1               400.2424716 M
NUC1                       1H
P1                      14.80 u
PLW1               12.00000000 W

F2 - Processing parameter
SI                        65536
SF                   400.2399651 M
WDW                          EM
SSB          0
LB                       0.30 H
GB           0
PC                       1.00
```



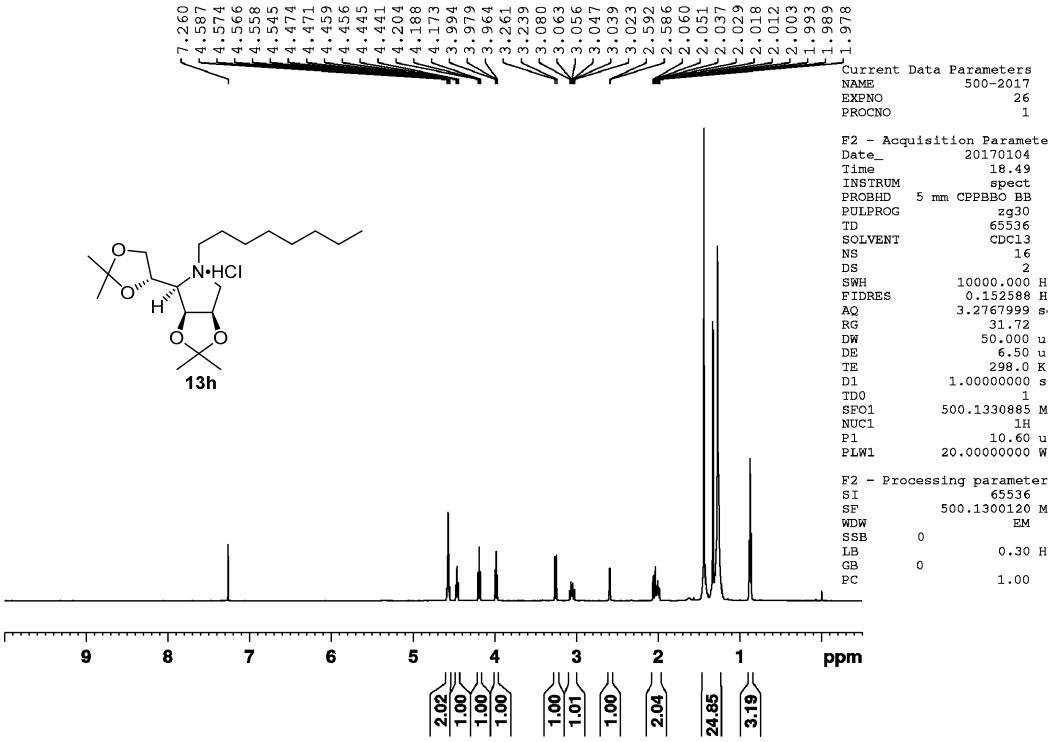

```
Current Data Parameters
NAME                  400-2016
EXPNO                      300
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160914
Time                     14.11
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                zgpg30
TD                      65536
SOLVENT                   D2O
NS                         536
DS                           4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631488 sec
RG                      206.33
DW                    20.800 usec
DE                     6.50 usec
TE                     300.7 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1
SFO1              100.6504916 MHz
NUC1                       13C
P1                    10.00 usec
PLW1               54.00000000 W
SFO2              400.2416010 MHz
NUC2                       1H
CPDPRG[2                waltz16
PCPD2                 90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                        32768
SF                100.6404280 MHz
WDW                          EM
SSB          0
LB                    1.00 Hz
GB           0
PC                       1.40
```

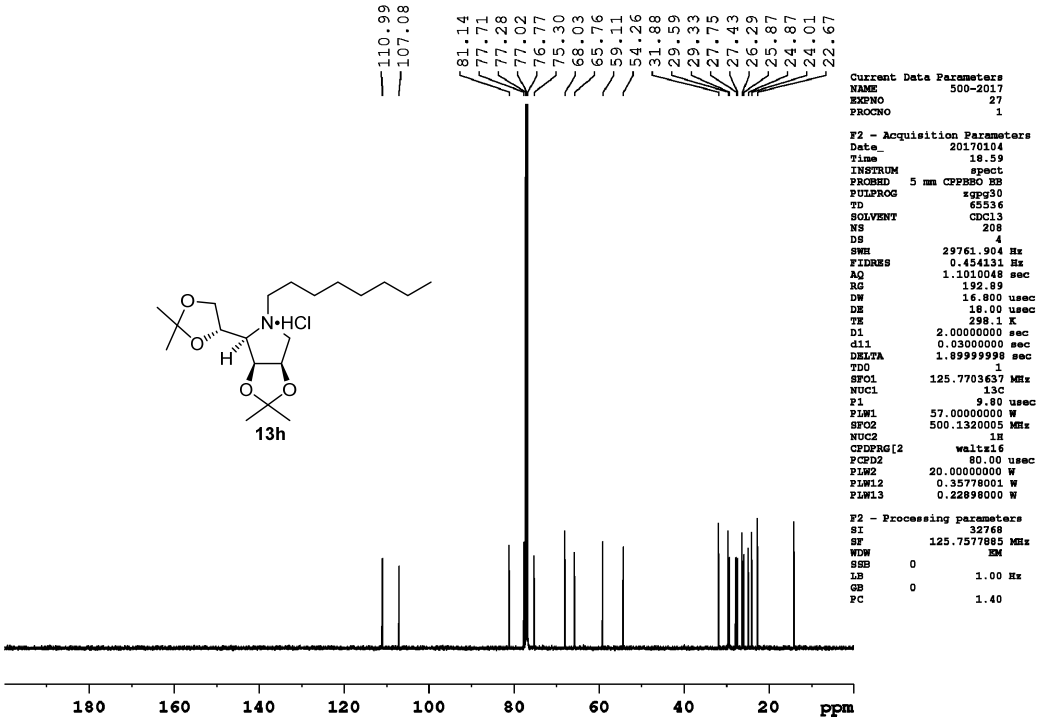


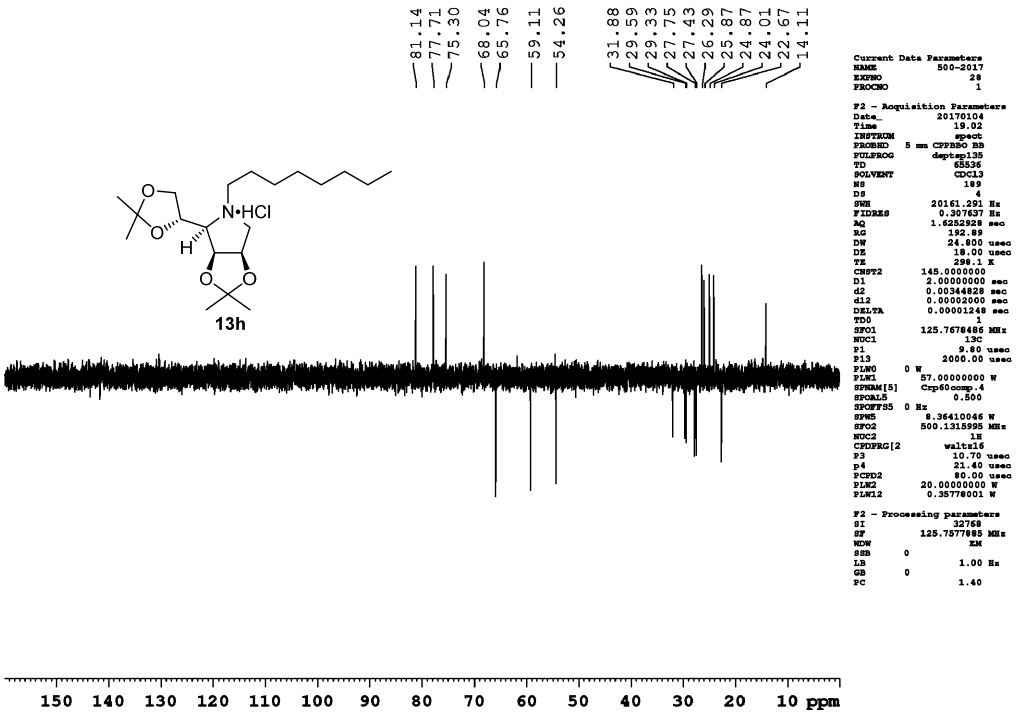

```
Current Data Parameters
NAME                  400-2016
EXPNO                      301
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160914
Time                    14.41
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        173
DS                          4
SWH                16129.032 Hz
FIDRES                 0.246110 Hz
AQ                     2.0316160 sec
RG                       206.33
DW                      31.000 usec
DE                       6.50 usec
TE                       300.3 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                             1
SFO1               100.6404788 MHz
NUC1                         13C
P1                         10.00 usec
P13                      2000.00 usec
PLW0       0 W
PLW1                54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                    0.500
SPOFFS5    0 Hz
SPW5                 8.25059986 W
SFO2               400.2412800 MHz
NUC2                         1H
CPDPRG[2                waltz16
P3                         15.30 usec
p4                         30.60 usec
PCPD2                      90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                          32768
SF                 100.6404280 MHz
WDW                            EM
SSB        0
LB                          1.00 Hz
GB         0
PC                          1.40
```



Compound **13h:**



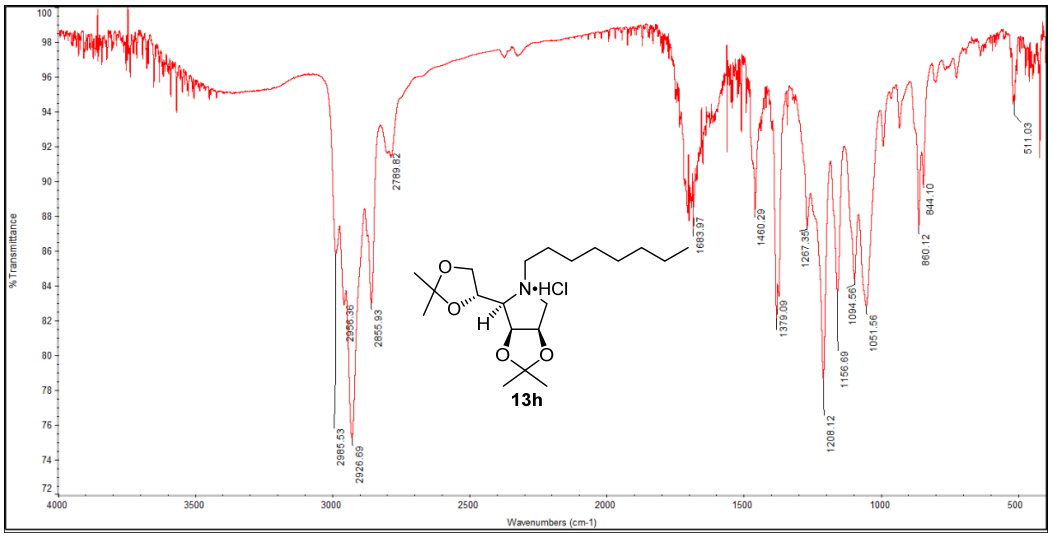




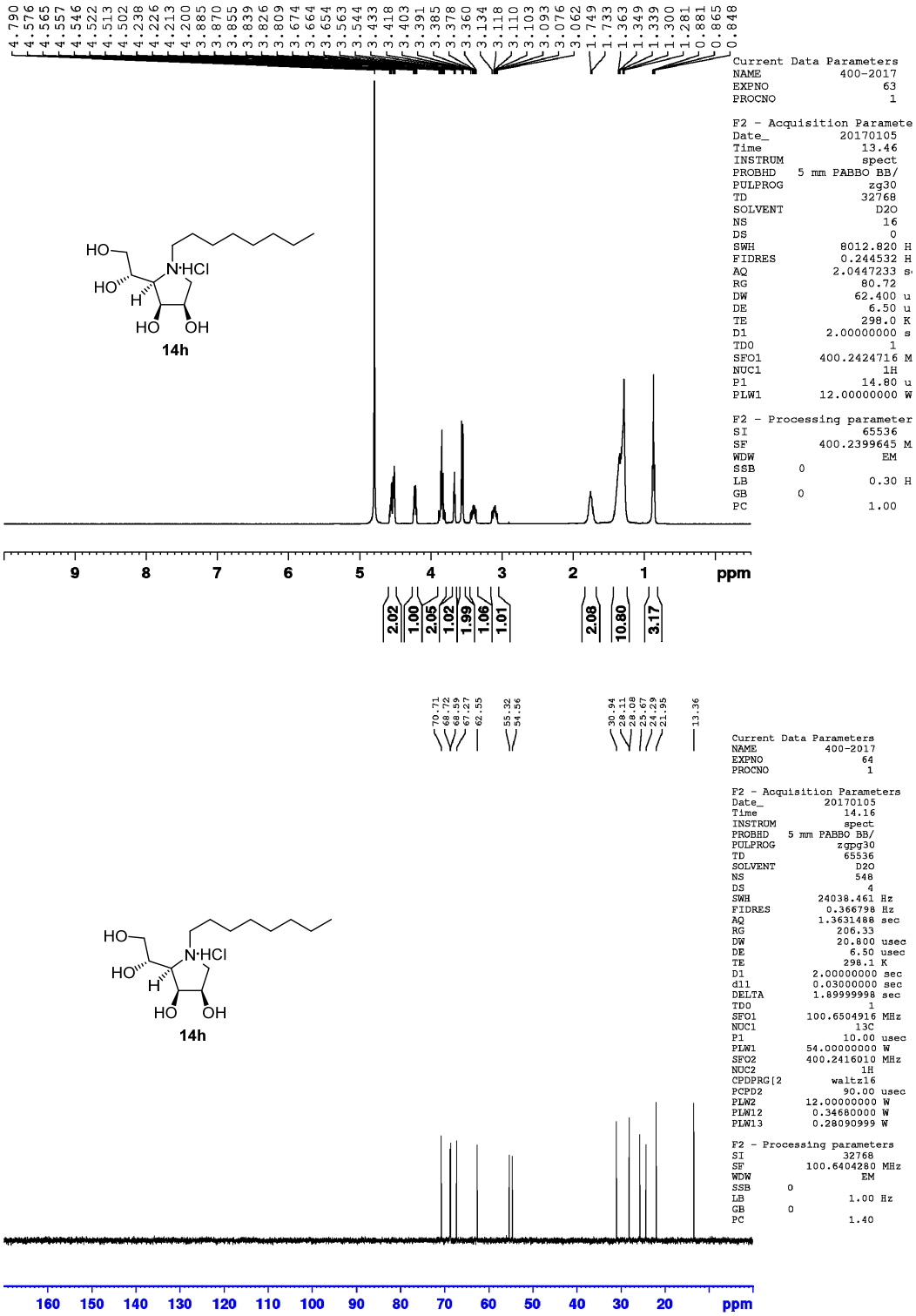
Current Data Parameters
NAME 500-2017
EXPNO 29
PROCNO 1

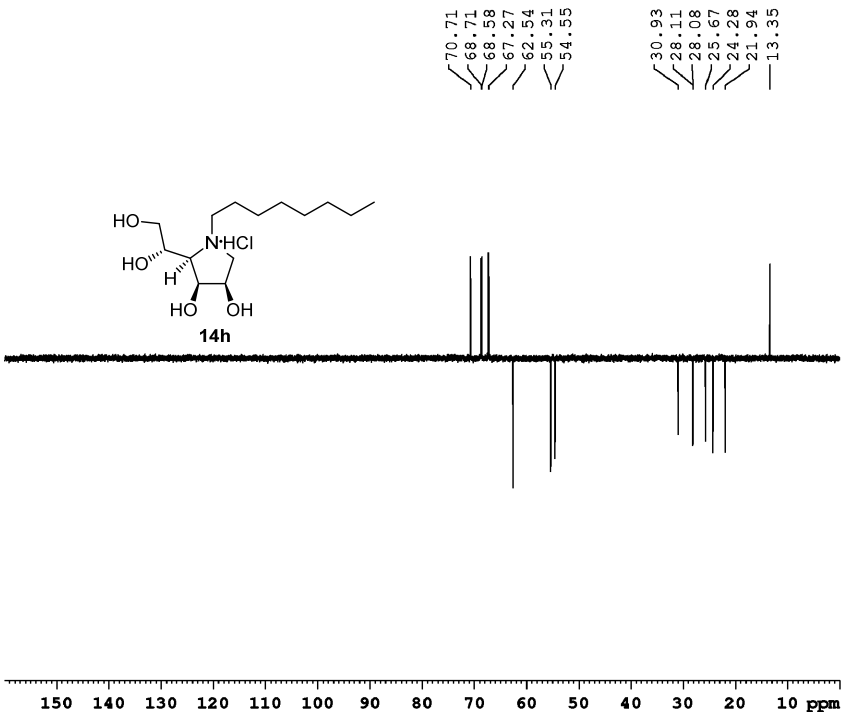
F2 - Acquisition Parameters
Date_ 20170104
Time 19.02
INSTRUM spect
PROBHD 5 mm CPPBBO BB
PULPROG deptsp135
TD 65536
SOLVENT CDCl3
NS 189
DS 4
SWH 20161.291 Hz
FIDRES 0.307637 Hz
AQ 1.6252928 sec
RG 192.89
DW 24.800 usec
DE 18.00 usec
TE 298.1 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001248 sec
TD0 1
SFO1 125.7678486 MHz
NUC1 13C
P1 9.80 usec
P13 2000.00 usec
PLW0 0 W
PLW1 57.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 8.36410046 W
SFO2 500.1315995 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 10.70 usec
p4 21.40 usec
PCPD2 80.00 usec
PLW2 20.00000000 W
PLW12 0.35778001 W

F2 - Processing parameters
SI 32768
SF 125.7577895 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

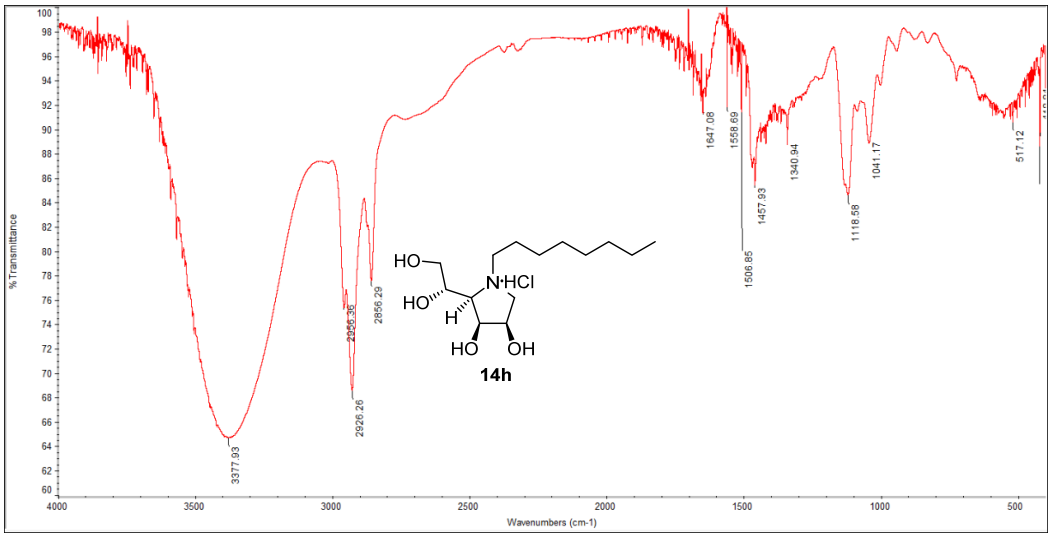



Compound **14h:**

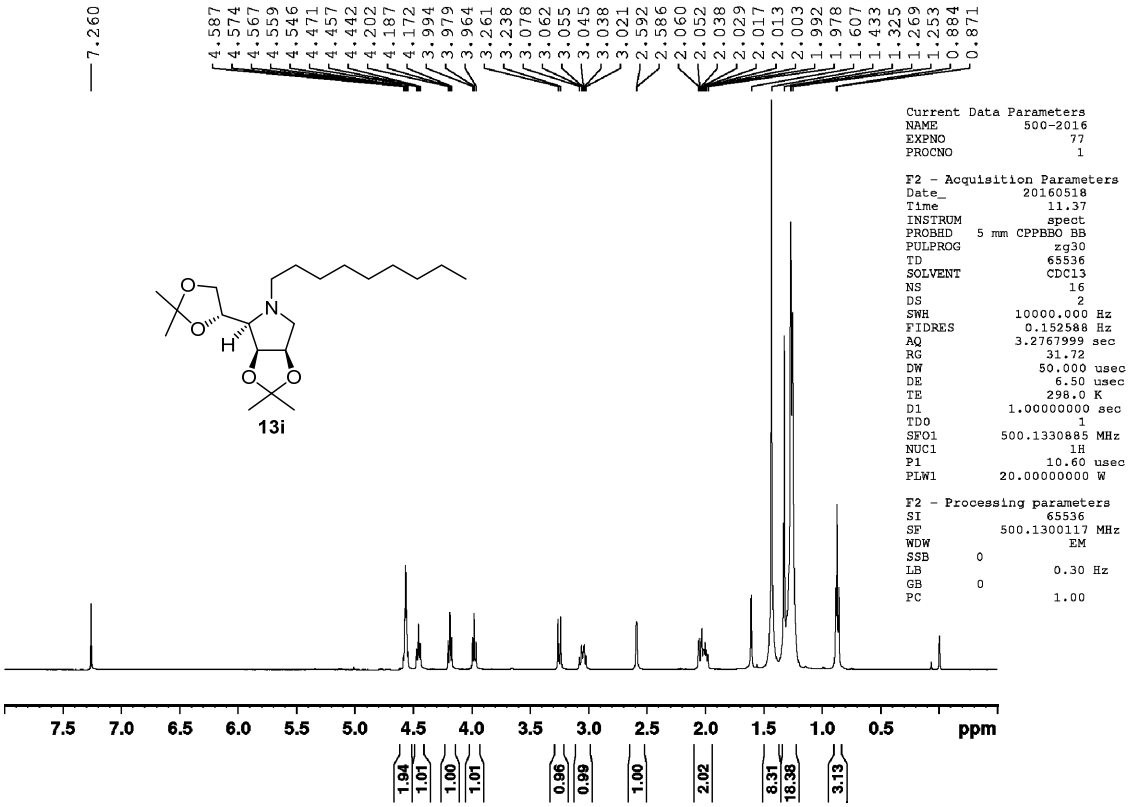


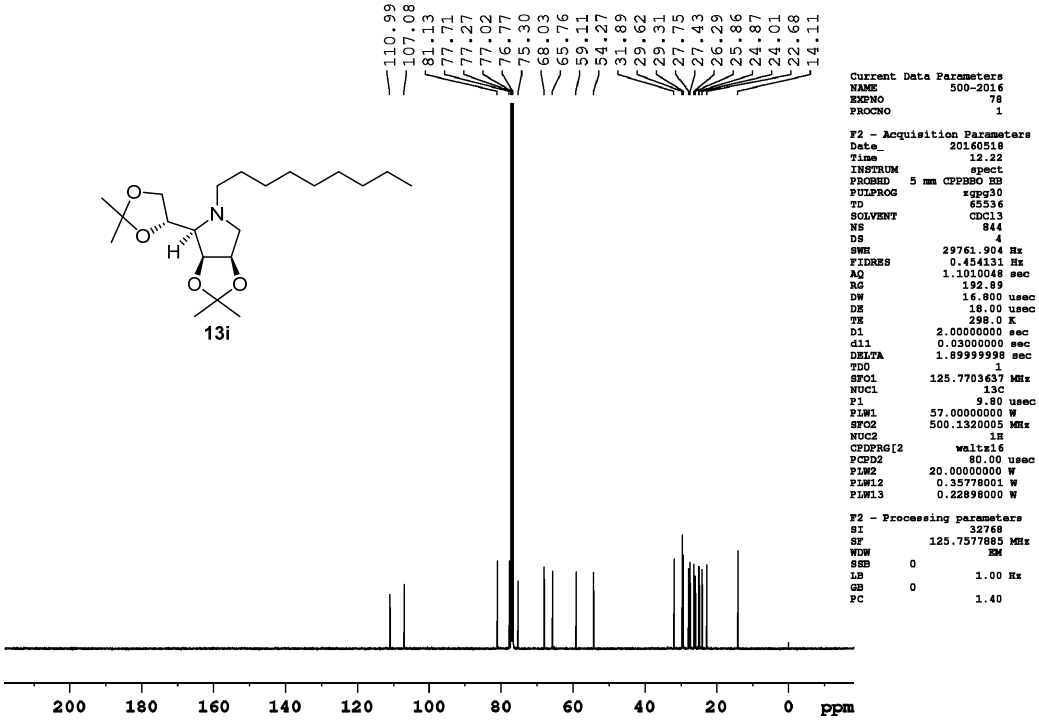


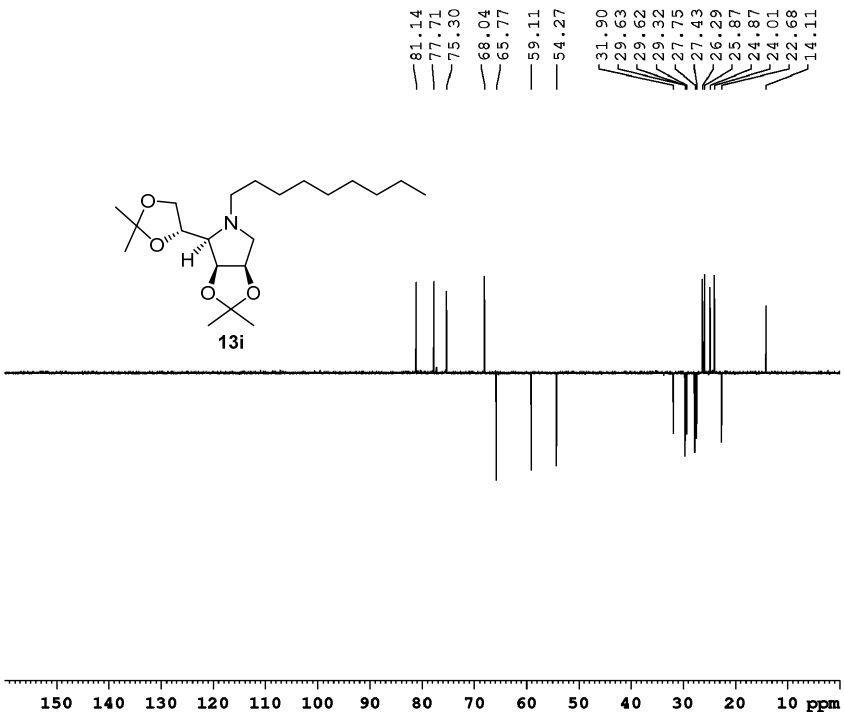

```
Current Data Parameters
NAME                  400-2017
EXPNO                       65
PROCNO                       1

F2 - Acquisition Parameters
Date_               20170105
Time                    14.23
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             dept-sp135
TD                       65536
SOLVENT                    D2O
NS                         148
DS                           4
SWH                 16129.032 Hz
FIDRES                  0.246110 Hz
AQ                  2.0316160 sec
RG                        206.33
DW                      31.000 usec
DE                       6.50 usec
TE                       298.0 K
CNST2               145.0000000
D1                  2.00000000 sec
d2                  0.00344828 sec
d12                 0.00002000 sec
DELTA               0.00001273 sec
TD0                          1
SFO1               100.6484788 MHz
NUC1                        13C
P1                        10.00 usec
P13                     2000.00 usec
PLW0        0 W
PLW1              54.00000000 W
SPNAM[5]          Crp60comp.4
SPOAL5                  0.500
SPOFFS5     0 Hz
SPW5               8.25059986 W
SFO2               400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                        15.30 usec
P4                        30.60 usec
PCPD2                     90.00 usec
PLW2              12.00000000 W
PLW12              0.34680000 W

F2 - Processing parameters
SI                       32768
SF                 100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



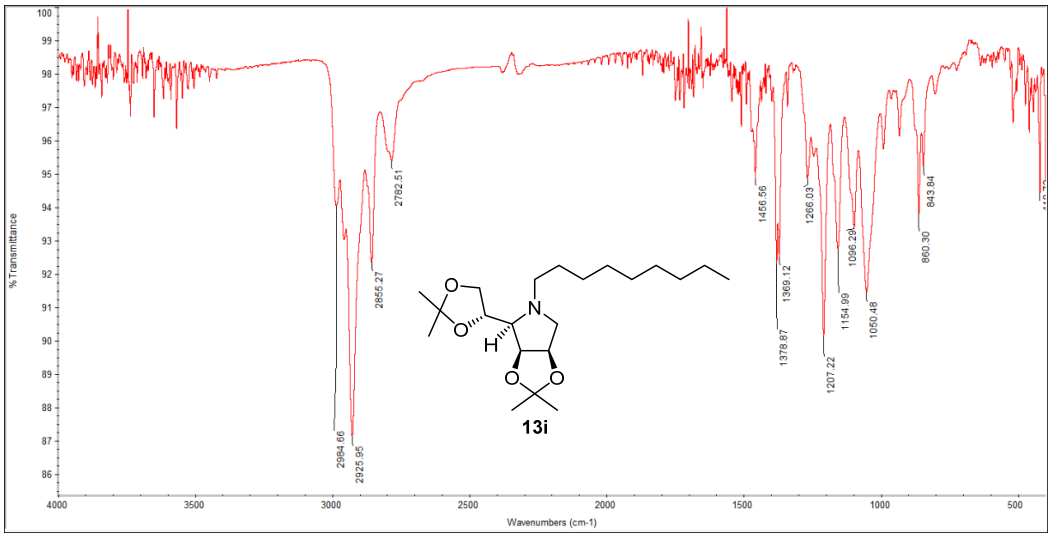
Compound **13i:**



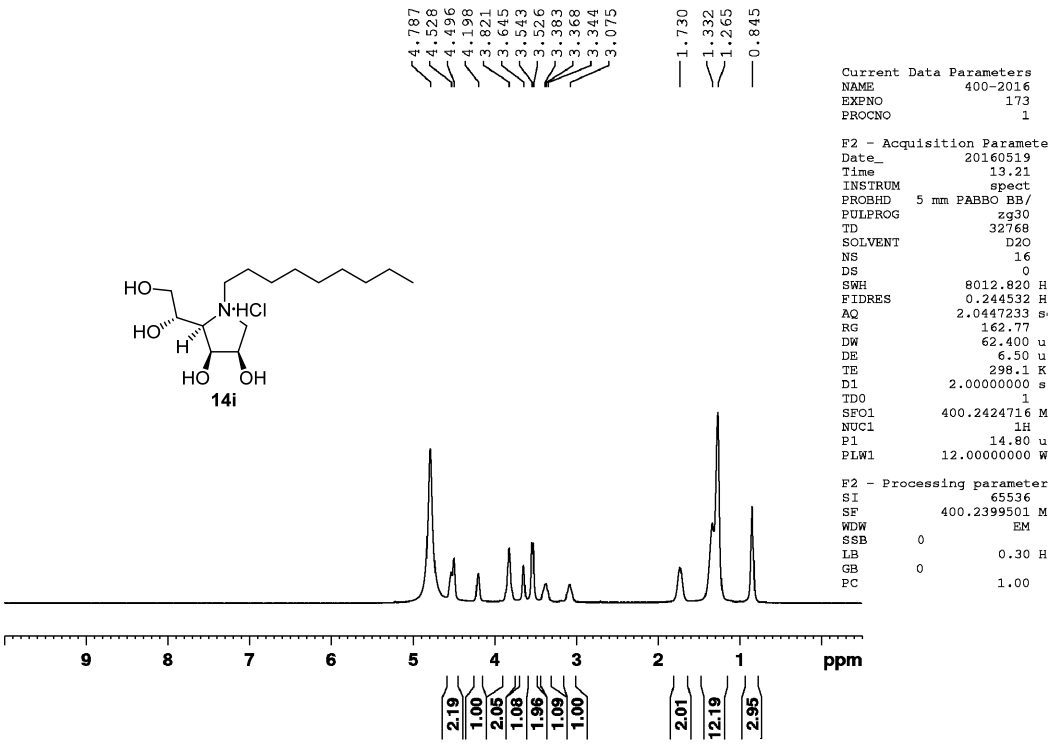





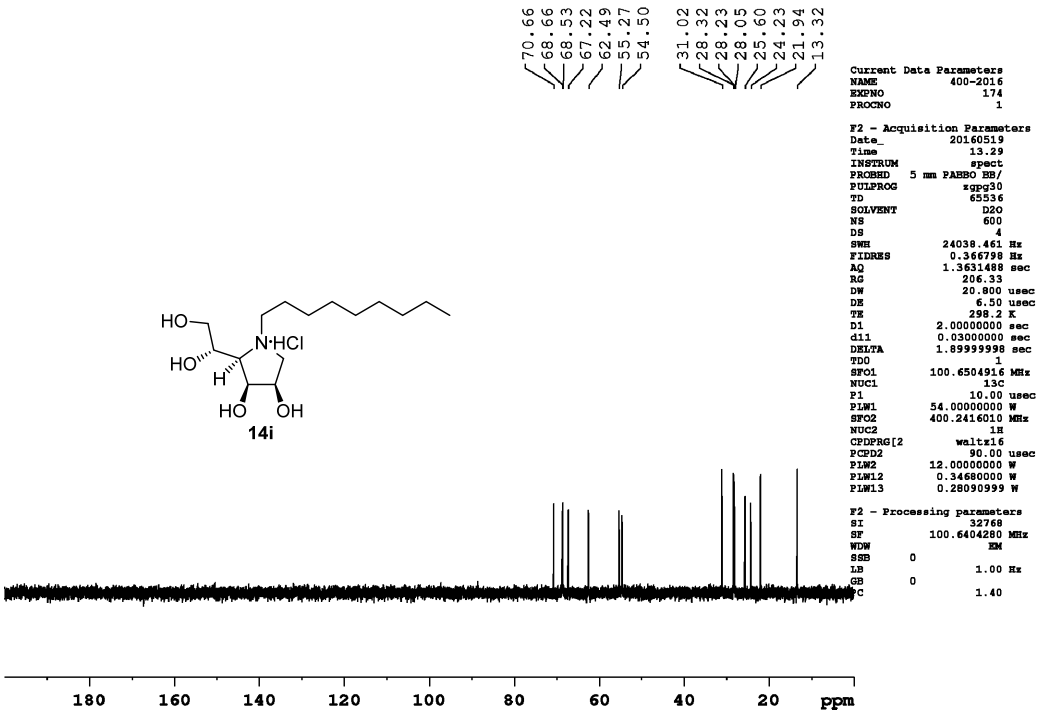

```
Current Data Parameters
NAME                  500-2016
EXPNO                       79
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160518
Time                    12.38
INSTRUM                 spect
PROBHD     5 mm CPFBBO BB
PULPROG             dept-sp135
TD                       65536
SOLVENT                  CDCl3
NS                         256
DS                           4
SWH                 20161.291 Hz
FIDRES                0.307697 Hz
AQ                    1.6252928 sec
RG                       192.89
DW                      24.800 usec
DE                      18.00 usec
TE                      298.0 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001248 sec
TD0                          1
SFO1                125.7678486 MHz
NUC1                       13C
P1                        9.80 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                57.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                 8.36410046 W
SFO2                500.1315995 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                       10.70 usec
p4                       21.40 usec
PCPD2                    80.00 usec
PLW2                20.00000000 W
PLW12                0.35778001 W

F2 - Processing parameters
SI                       32768
SF                  125.7577885 MHz
WDW                         EM
SSB         0
LB                       1.00 Hz
GB          0
PC                       1.40
```



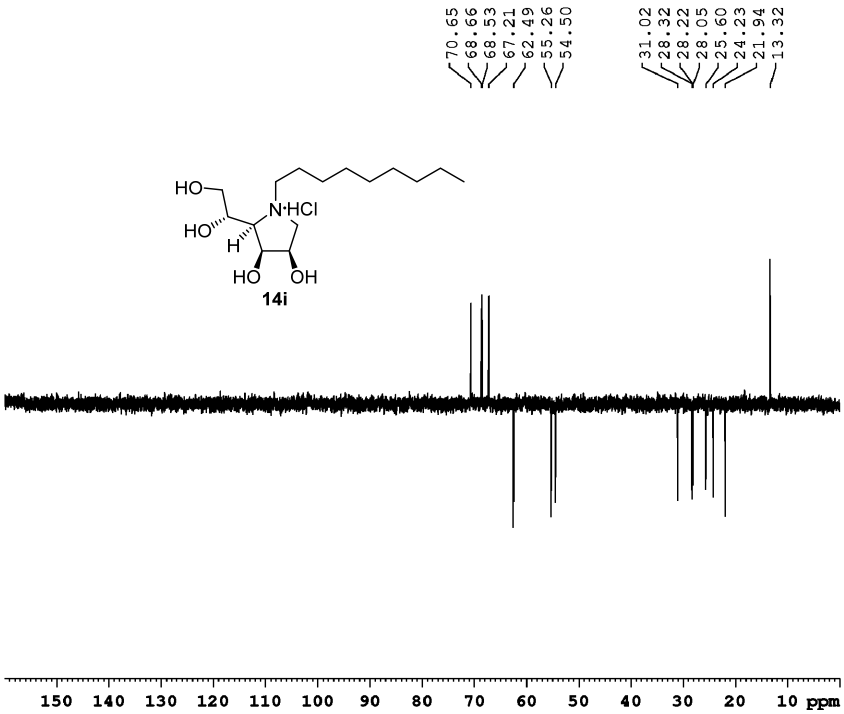
Compound **14i:**



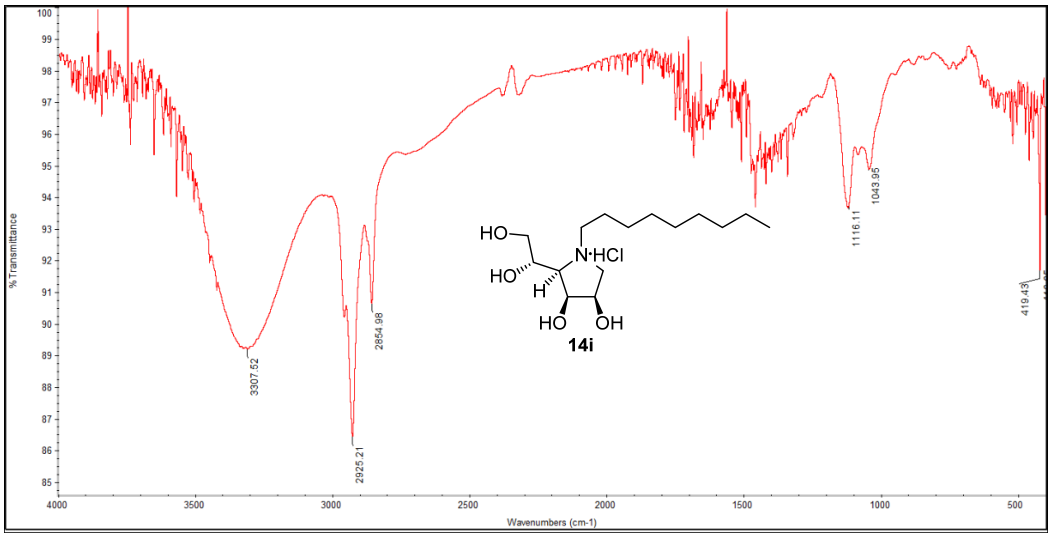

```
Current Data Parameters
NAME                  400-2016
EXPNO                      173
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160519
Time                     13.21
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                  8012.820 Hz
FIDRES               0.244532 Hz
AQ                   2.0447233 sec
RG                      162.77
DW                      62.400 usec
DE                       6.50 usec
TE                      298.1 K
D1                   2.00000000 sec
TD0                          1
SFO1               400.2424716 MHz
NUC1                        1H
P1                       14.80 usec
PLW1                12.00000000 W

F2 - Processing parameters
SI                       65536
SF                 400.2399501 MHz
WDW                         EM
SSB          0
LB                       0.30 Hz
GB           0
PC                       1.00
```



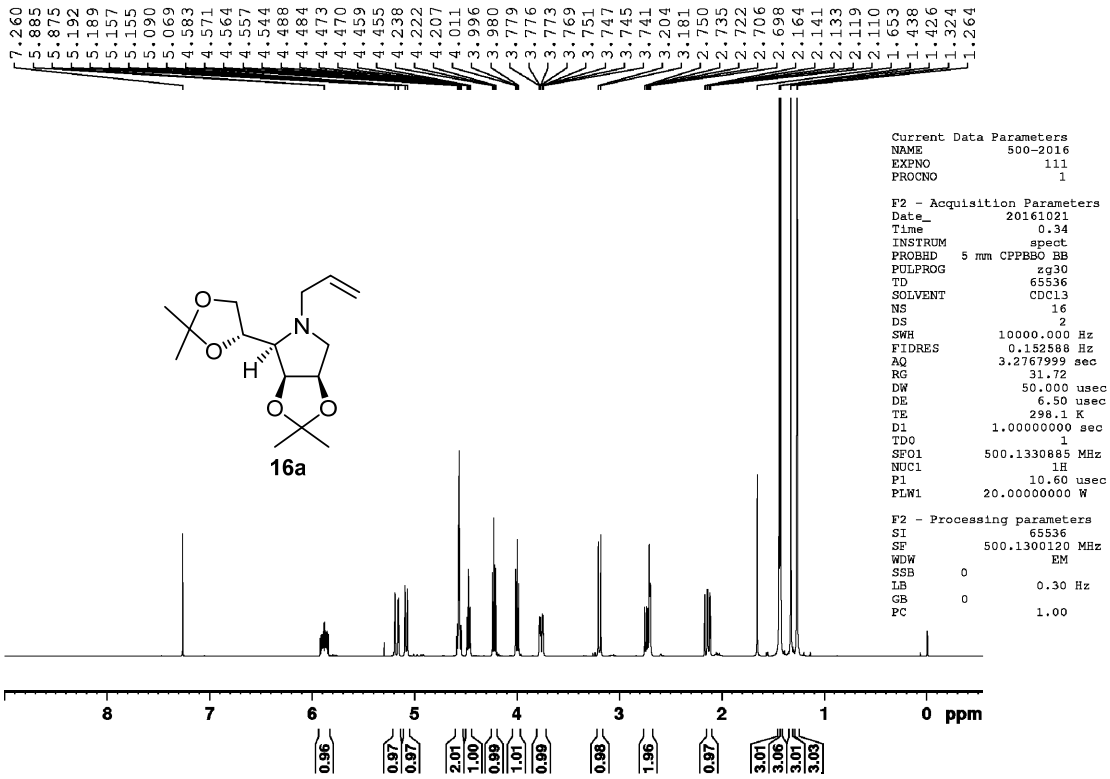

```
Current Data Parameters
NAME                  400-2016
EXPNO                      174
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160519
Time                     13.29
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                zgpg30
TD                      65536
SOLVENT                   D2O
NS                        600
DS                          4
SWH                24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631488 sec
RG                      206.33
DW                      20.800 usec
DE                       6.50 usec
TE                      298.2 K
D1                   2.00000000 sec
d11                  0.03000000 sec
DELTA                1.89999998 sec
TD0                          1
SFO1               100.6504916 MHz
NUC1                        13C
P1                       10.00 usec
PLW1                54.00000000 W
SFO2               400.2416010 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                    90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W
PLW13                0.28090999 W

F2 - Processing parameters
SI                       32768
SF                 100.6404280 MHz
WDW                         EM
SSB          0
LB                       1.00 Hz
GB           0
PC                       1.40
```

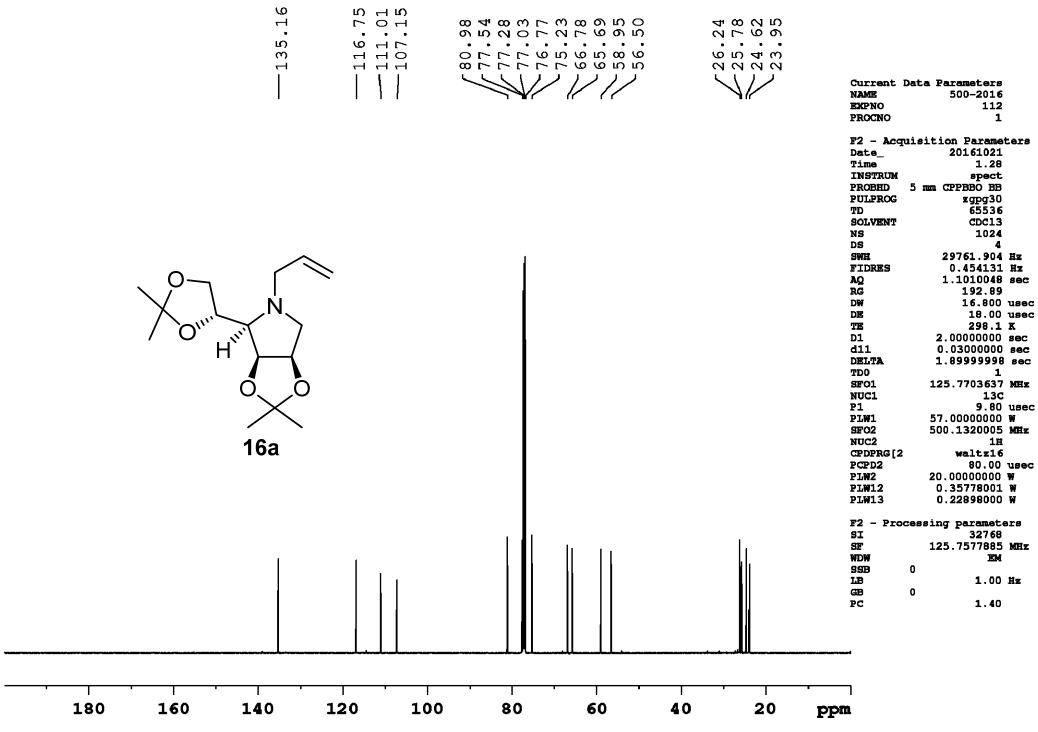


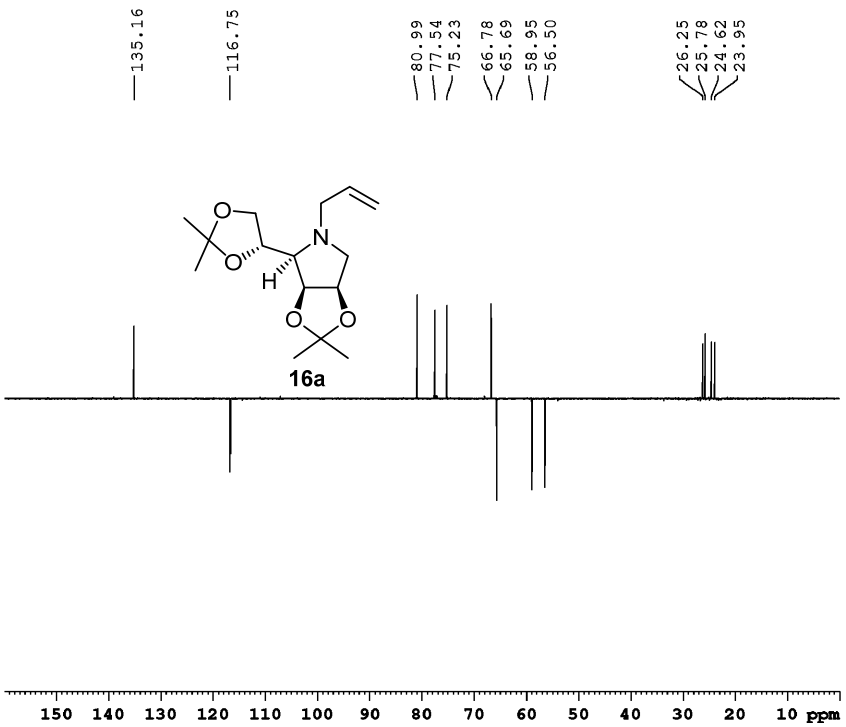

```
Current Data Parameters
NAME                  400-2016
EXPNO                      175
PROCNO                       1

F2 - Acquisition Parameters
Date_              20160519
Time                   14.08
INSTRUM                spect
PROBHD     5 mm PABBO BB/
PULPROG            dept-sp135
TD                      65536
SOLVENT                   D2O
NS                        150
DS                          4
SWH                16129.032 Hz
FIDRES                 0.246110 Hz
AQ                     2.0316160 sec
RG                        206.33
DW                     31.000 usec
DE                      6.50 usec
TE                      298.3 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                             1
SFO1                100.6484788 MHz
NUC1                         13C
P1                          10.00 usec
P13                       2000.00 usec
PLW0          0 W
PLW1                54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                     0.500
SPOFFS5       0 Hz
SPW5                 8.25059986 W
SFO2                400.2412800 MHz
NUC2                         1H
CPDPRG[2                waltz16
P3                          15.30 usec
p4                          30.60 usec
PCPD2                       90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                         32768
SF                  100.6404280 MHz
WDW                            EM
SSB           0
LB                          1.00 Hz
GB            0
PC                          1.40
```



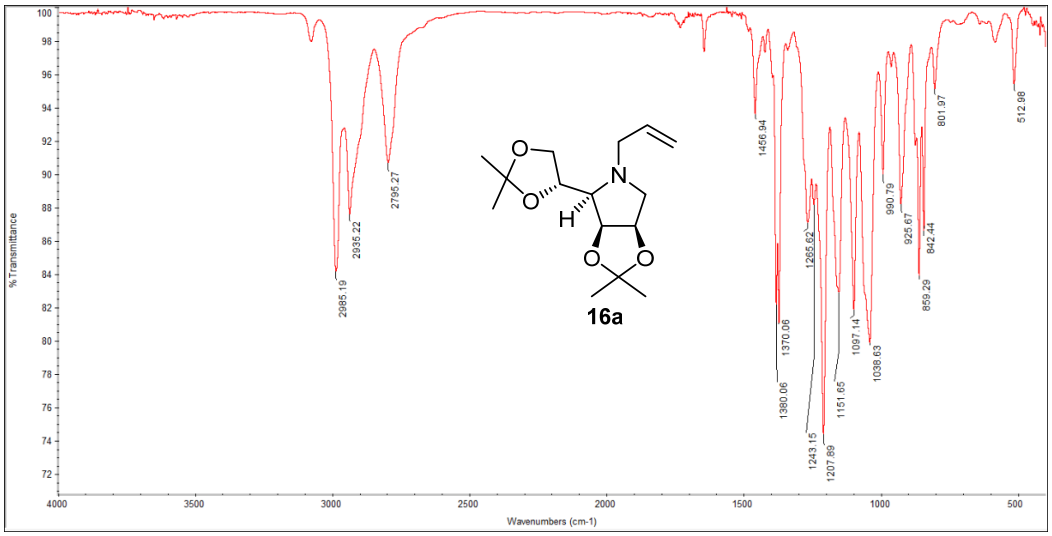
Compound **16a:**



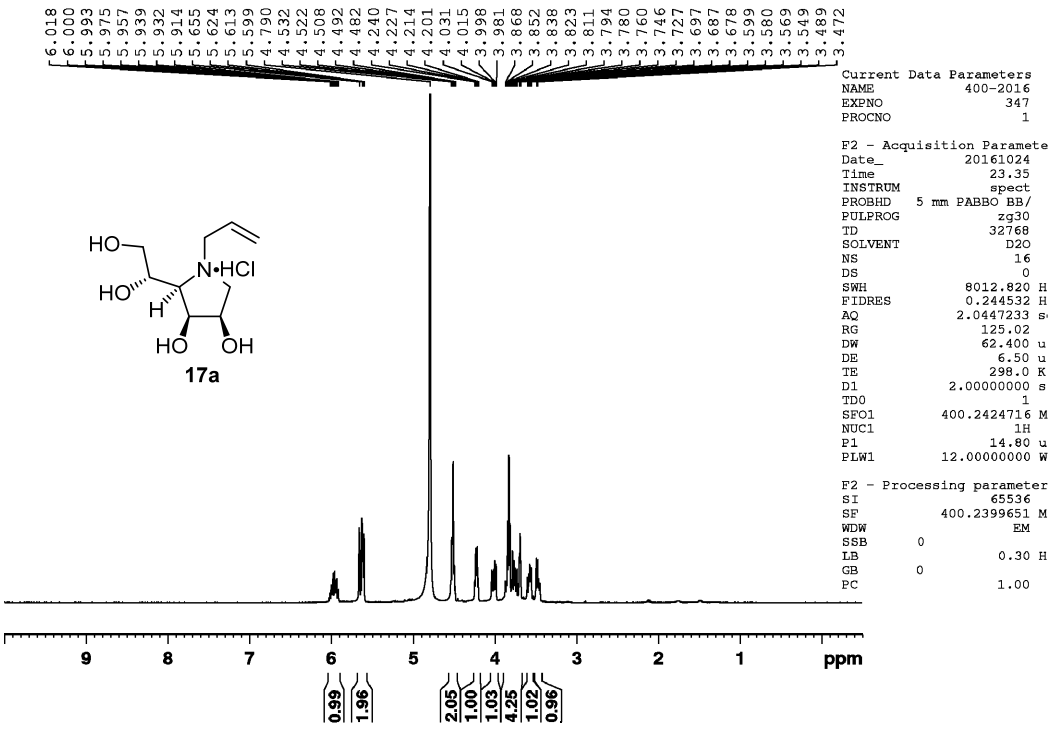



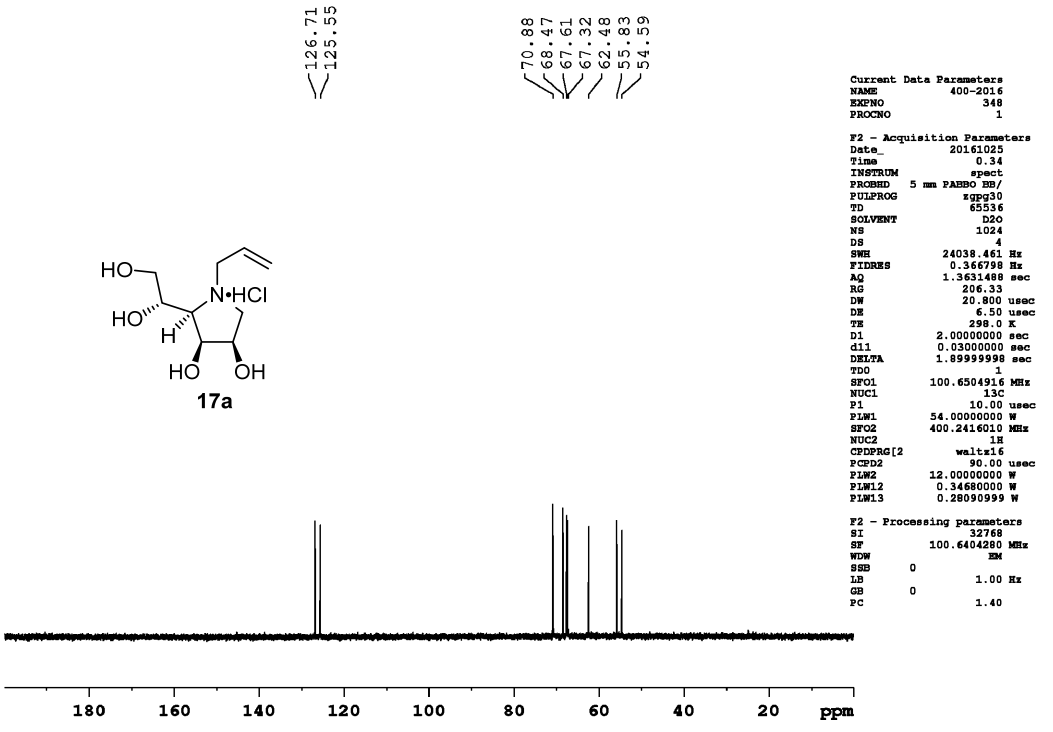


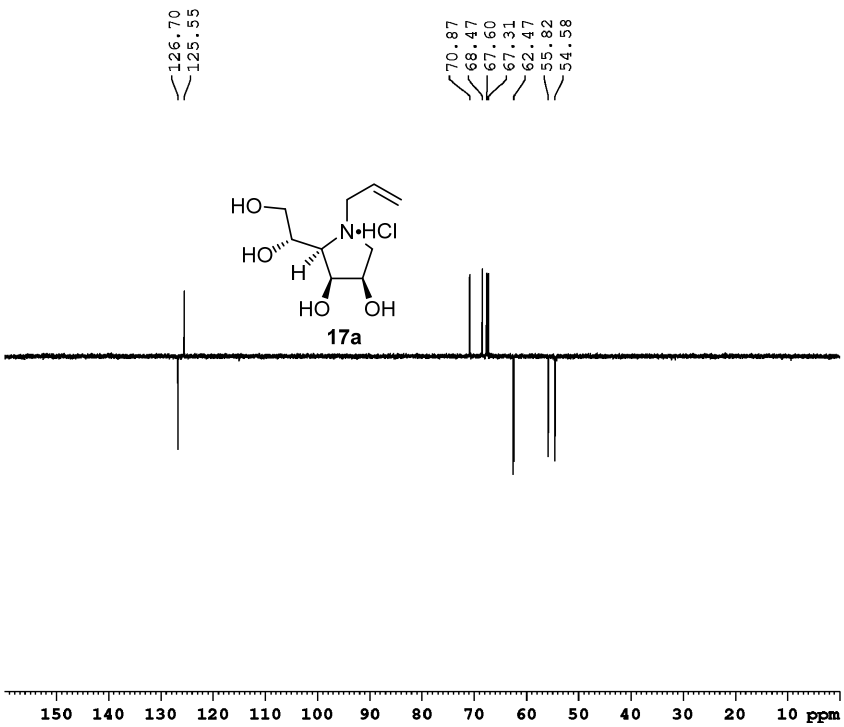

```
Current Data Parameters
NAME                  500-2016
EXPNO                      113
PROCNO                       1

F2 - Acquisition Parameters
Date_               20161021
Time                     1.44
INSTRUM                  spect
PROBHD     5 mm CPPBBO BB
PULPROG                  deptsp135
TD                       65536
SOLVENT                  CDCl3
NS                         256
DS                           4
SWH                  20161.291 Hz
FIDRES               0.307637 Hz
AQ                   1.6252928 sec
RG                       192.89
DW                      24.800 usec
DE                      18.00 usec
TE                      298.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001248 sec
TD0                          1
SFO1                 125.7678486 MHz
NUC1                      13C
P1                        9.80 usec
P13                    2000.00 usec
PLW0       0 W
PLW1                57.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                    0.500
SPOFFS5    0 Hz
SPW5                 8.36410046 W
SFO2                 500.1315995 MHz
NUC2                      1H
CPDPRG[2                waltz16
P3                       10.70 usec
p4                       21.40 usec
PCPD2                    80.00 usec
PLW2                20.00000000 W
PLW12                0.35778001 W

F2 - Processing parameters
SI                       32768
SF                   125.7577885 MHz
WDW                         EM
SSB        0
LB                       1.00 Hz
GB         0
PC                       1.40
```



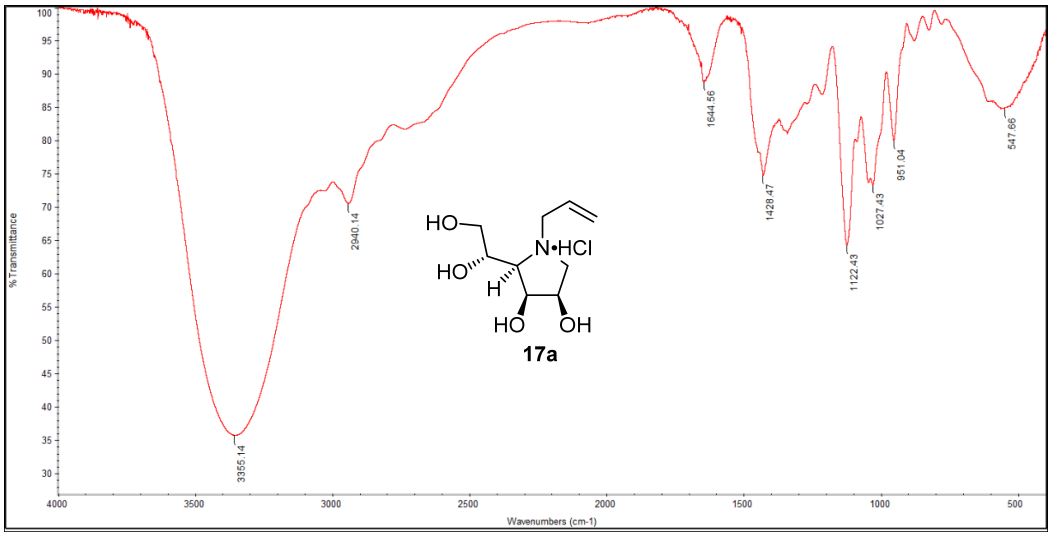
Compound **17a:**



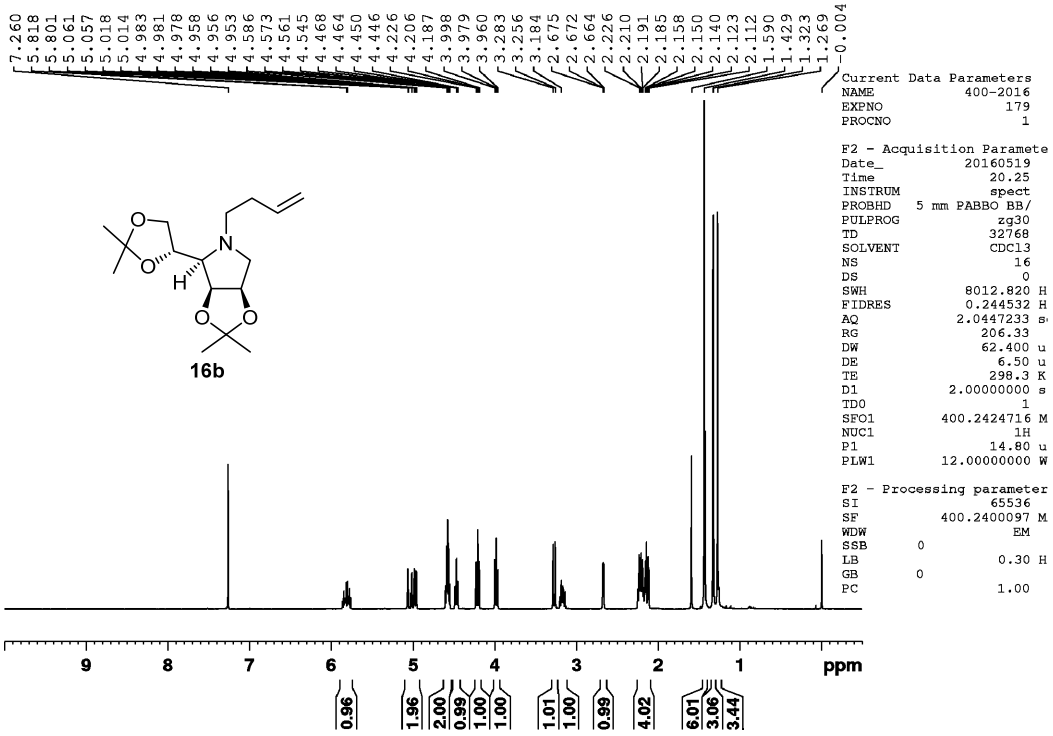



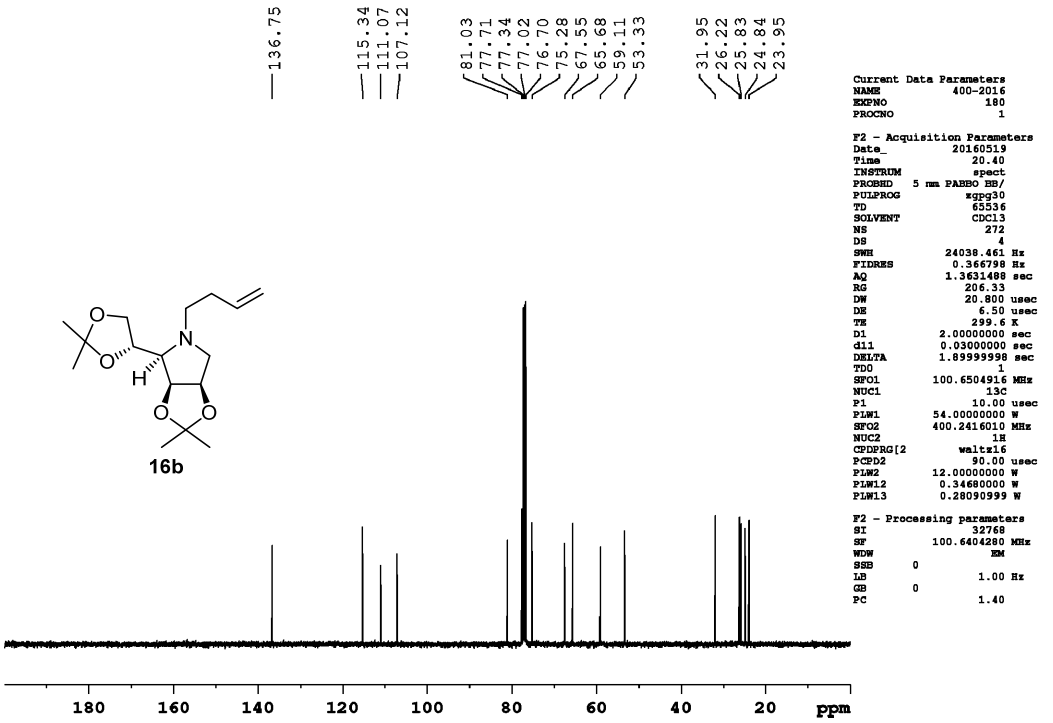


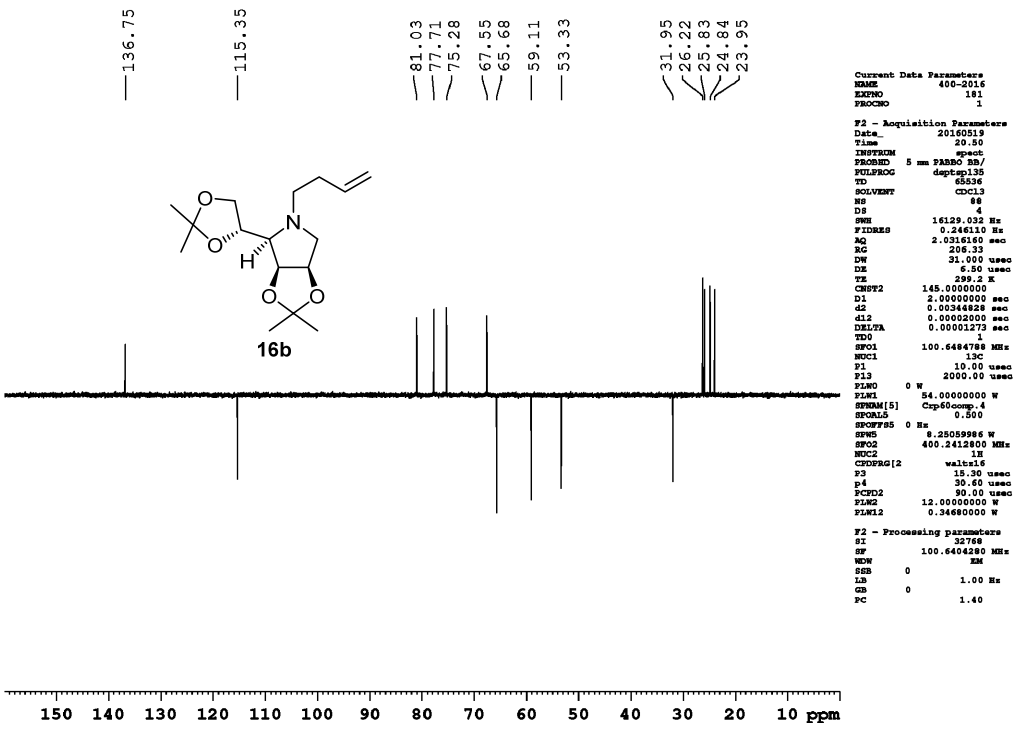

```
Current Data Parameters
NAME                  400-2016
EXPNO                      349
PROCNO                       1

F2 - Acquisition Parameters
Date_               20161025
Time                     0.52
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        256
DS                          4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                       31.000 usec
DE                        6.50 usec
TE                      298.0 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1               54.00000000 W
SPNAM[5]           Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



Compound **16b:**



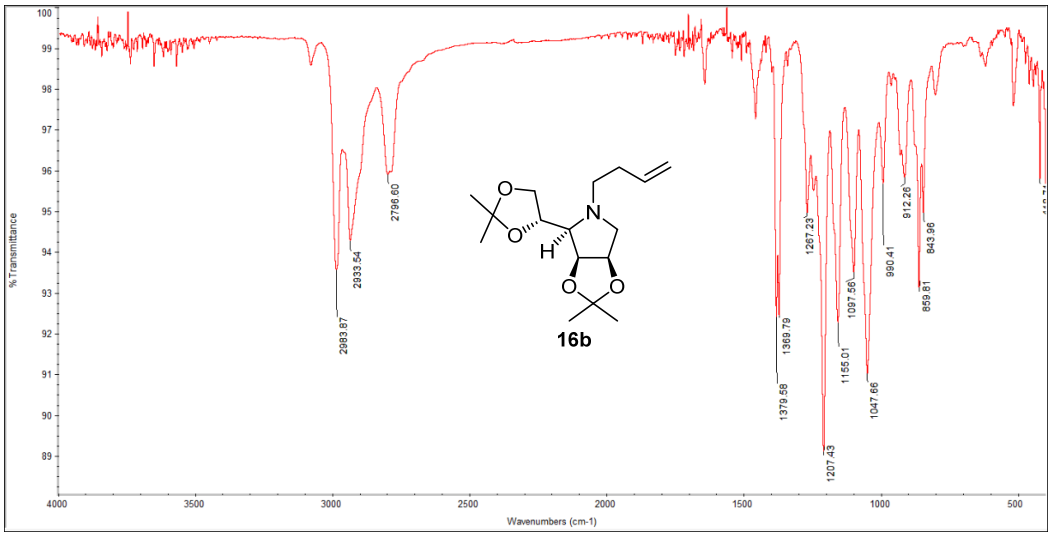




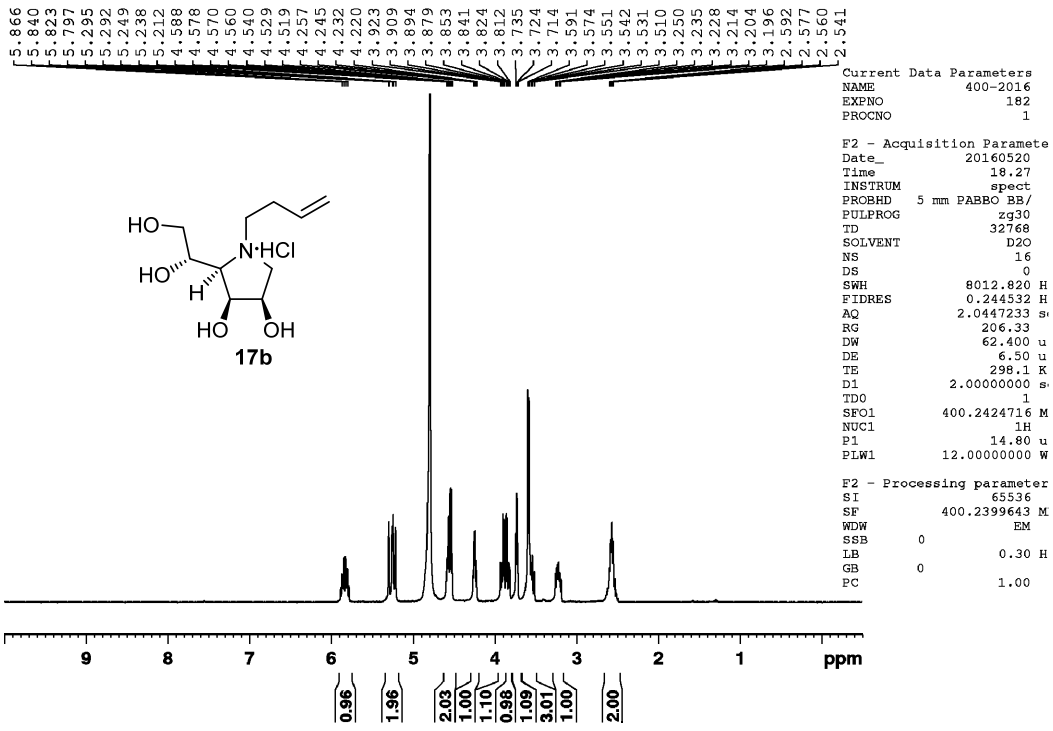
Current Data Parameters
NAME 400-2016
EXPNO 181
PROCNO 1

F2 - Acquisition Parameters
Date_ 20160519
Time 20.50
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG dept-sp135
TD 65536
SOLVENT CDCl3
NS 88
DS 4
SWH 16129.032 Hz
FIDRES 0.246110 Hz
AQ 2.0316160 sec
RG 206.33
DW 31.000 usec
DE 6.50 usec
TE 299.2 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001273 sec
TD0 1
SFO1 100.6484788 MHz
NUC1 13C
P1 10.00 usec
P13 2000.00 usec
PLW0 0 W
PLW1 54.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 8.25059986 W
SFO2 400.2412800 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 15.30 usec
p4 30.60 usec
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W

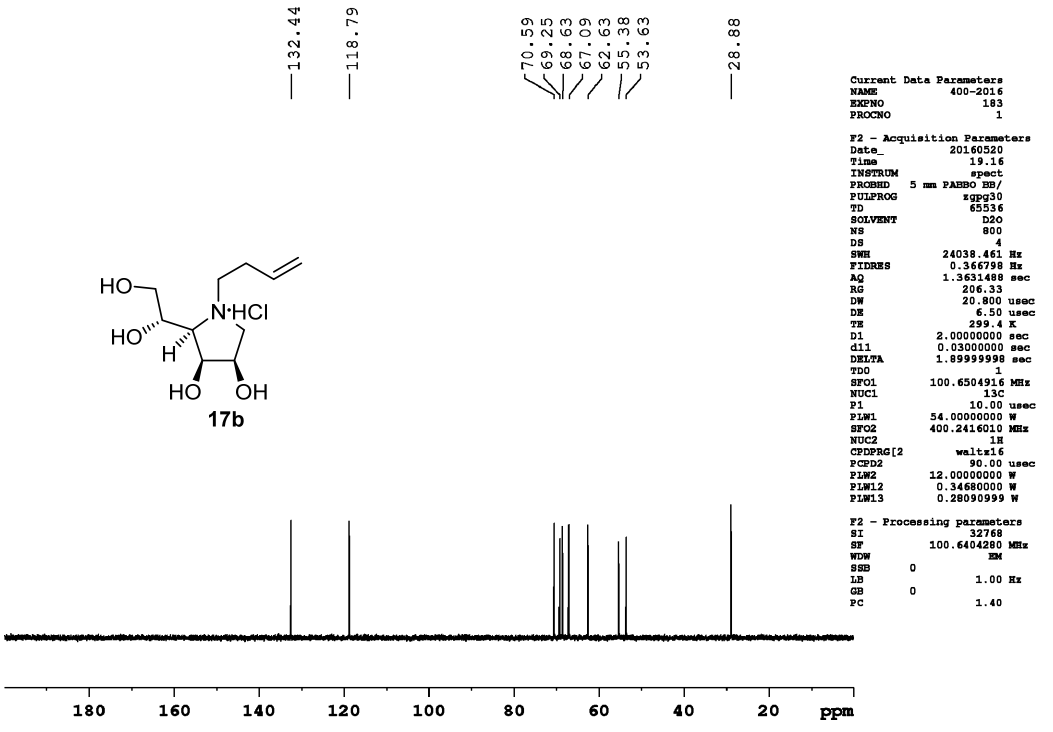
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

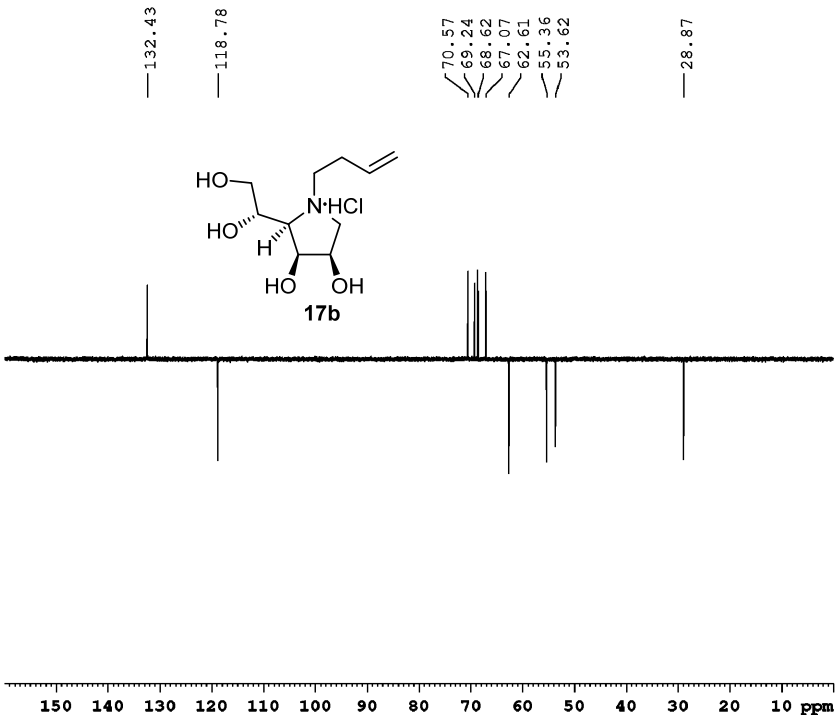
Compound **17b:**



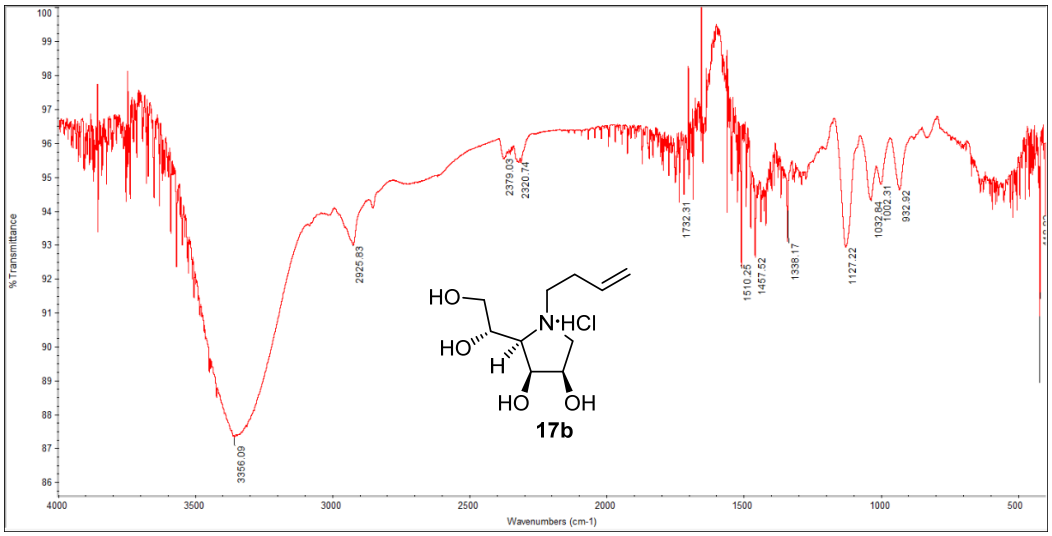

```
Current Data Parameters
NAME                  400-2016
EXPNO                      182
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20160520
Time                     18.27
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                  2.0447233 s
RG                      206.33
DW                      62.400 u
DE                        6.50 u
TE                      298.1 K
D1                 2.00000000 s
TD0                         1
SFO1               400.2424716 M
NUC1                       1H
P1                      14.80 u
PLW1               12.00000000 W

F2 - Processing parameter
SI                        65536
SF                 400.2399643 M
WDW                          EM
SSB          0
LB                       0.30 H
GB           0
PC                       1.00
```



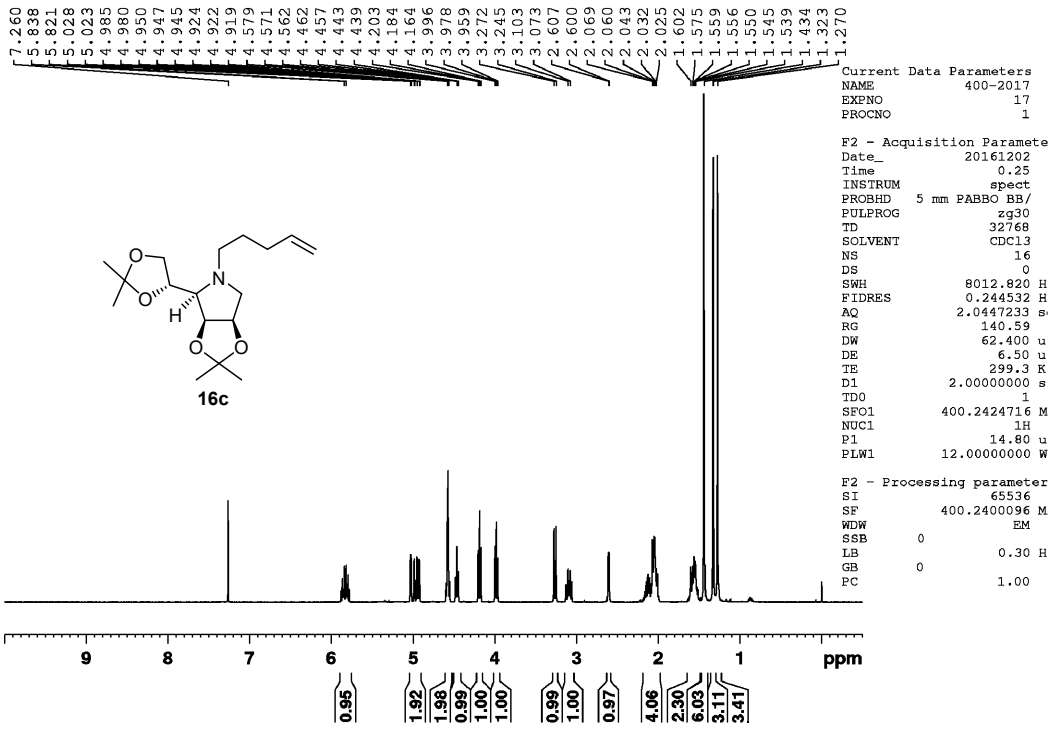

```
Current Data Parameters
NAME                  400-2016
EXPNO                      183
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160520
Time                     19.16
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                zgpg30
TD                      65536
SOLVENT                   D2O
NS                         800
DS                           4
SWH                24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631488 sec
RG                      206.33
DW                      20.800 usec
DE                        6.50 usec
TE                      299.4 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1
SFO1               100.6504916 MHz
NUC1                       13C
P1                       10.00 usec
PLW1               54.00000000 W
SFO2               400.2416010 MHz
NUC2                       1H
CPDPRG[2                waltz16
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                        32768
SF                 100.6404280 MHz
WDW                          EM
SSB          0
LB                       1.00 Hz
GB           0
PC                       1.40
```



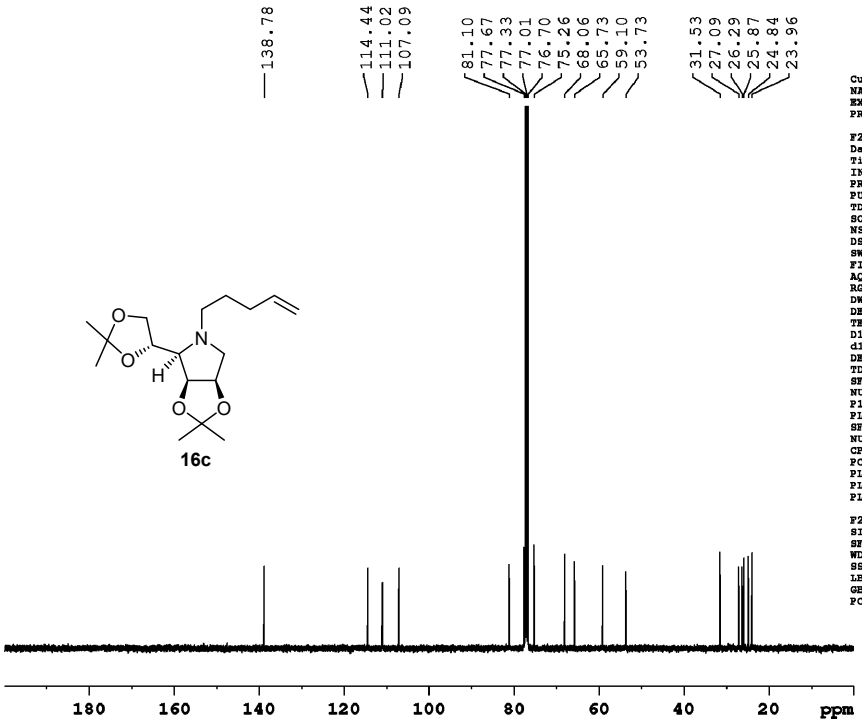

```
Current Data Parameters
NAME                  400-2016
EXPNO                      184
PROCNO                       1

F2 - Acquisition Parameters
Date_              20160520
Time                   19.29
INSTRUM                spect
PROBHD    5 mm PABBO BB/
PULPROG          deptsp135
TD                     65536
SOLVENT                  D2O
NS                       180
DS                         4
SWH               16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     298.9 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                            1
SFO1              100.6484788 MHz
NUC1                         13C
P1                        10.00 usec
P13                     2000.00 usec
PLW0        0 W
PLW1              54.00000000 W
SPNAM[5]          Crp60comp.4
SPOAL5                    0.500
SPOFFS5     0 Hz
SPW5               8.25059986 W
SFO2              400.2412800 MHz
NUC2                         1H
CPDPRG[2                waltz16
P3                        15.30 usec
p4                        30.60 usec
PCPD2                     90.00 usec
PLW2              12.00000000 W
PLW12              0.34680000 W

F2 - Processing parameters
SI                         32768
SF                100.6404280 MHz
WDW                           EM
SSB         0
LB                         1.00 Hz
GB          0
PC                         1.40
```



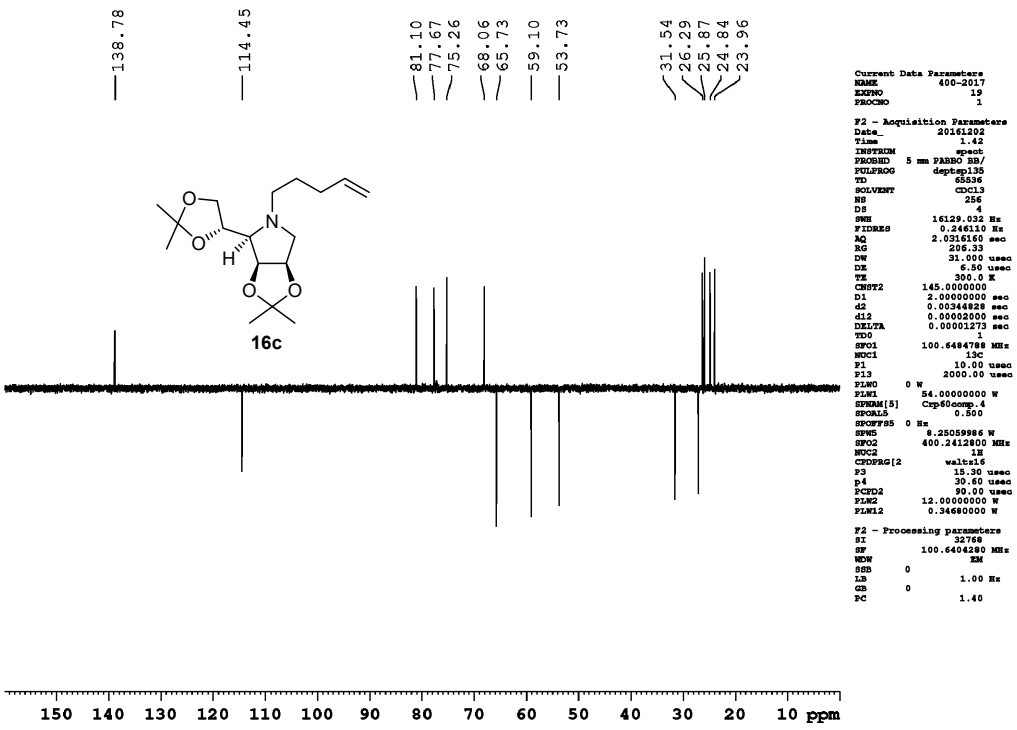
Compound **16c:**



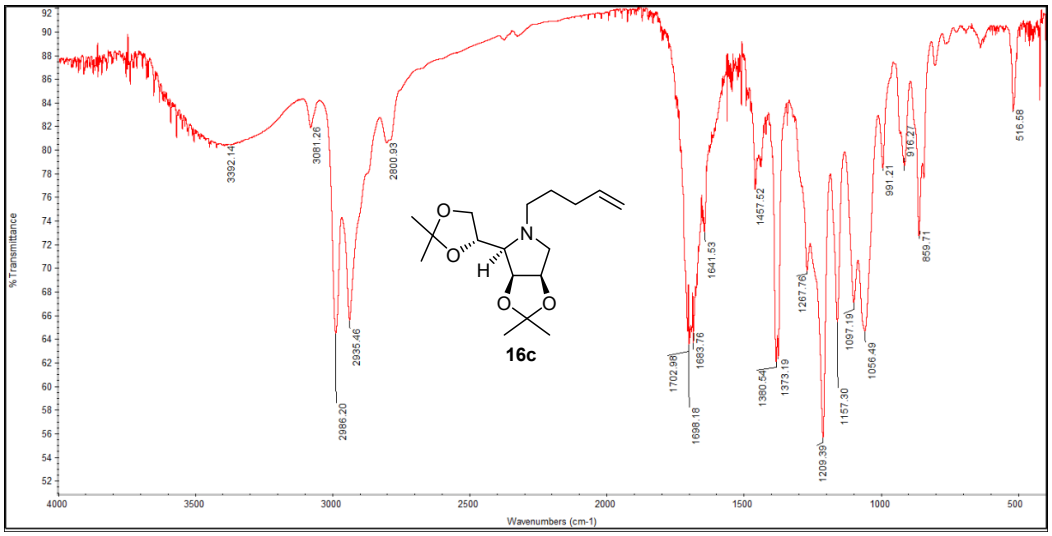

```
Current Data Parameters
NAME                  400-2017
EXPNO                       17
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20161202
Time                      0.25
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                 CDCl3
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                   2.0447233 s
RG                      140.59
DW                      62.400 u
DE                       6.50 u
TE                      299.3 K
D1                 2.00000000 s
TD0                         1
SFO1               400.2424716 M
NUC1                       1H
P1                      14.80 u
PLW1              12.00000000 W

F2 - Processing parameter
SI                      65536
SF                 400.2400096 M
WDW                        EM
SSB          0
LB                      0.30 H
GB           0
PC                      1.00
```



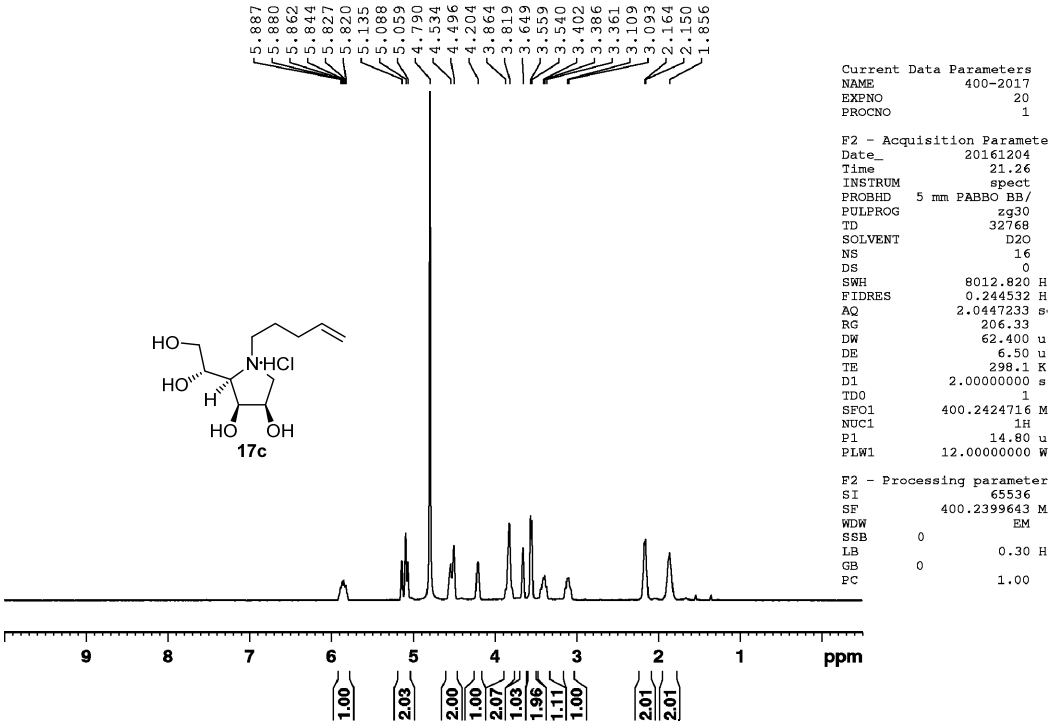

```
Current Data Parameters
NAME                  400-2017
EXPNO                       18
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20161202
Time                      1.24
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                 zgpg30
TD                      65536
SOLVENT                 CDCl3
NS                       1024
DS                          4
SWH                 24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631488 sec
RG                      206.33
DW                      20.800 usec
DE                       6.50 usec
TE                      300.5 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1
SFO1               100.6504916 MHz
NUC1                       13C
P1                      10.00 usec
PLW1               54.00000000 W
SFO2               400.2416010 MHz
NUC2                       1H
CPDPRG[2                waltz16
PCPD2                   90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                      32768
SF                 100.6404280 MHz
WDW                        EM
SSB          0
LB                      1.00 Hz
GB           0
PC                      1.40
```



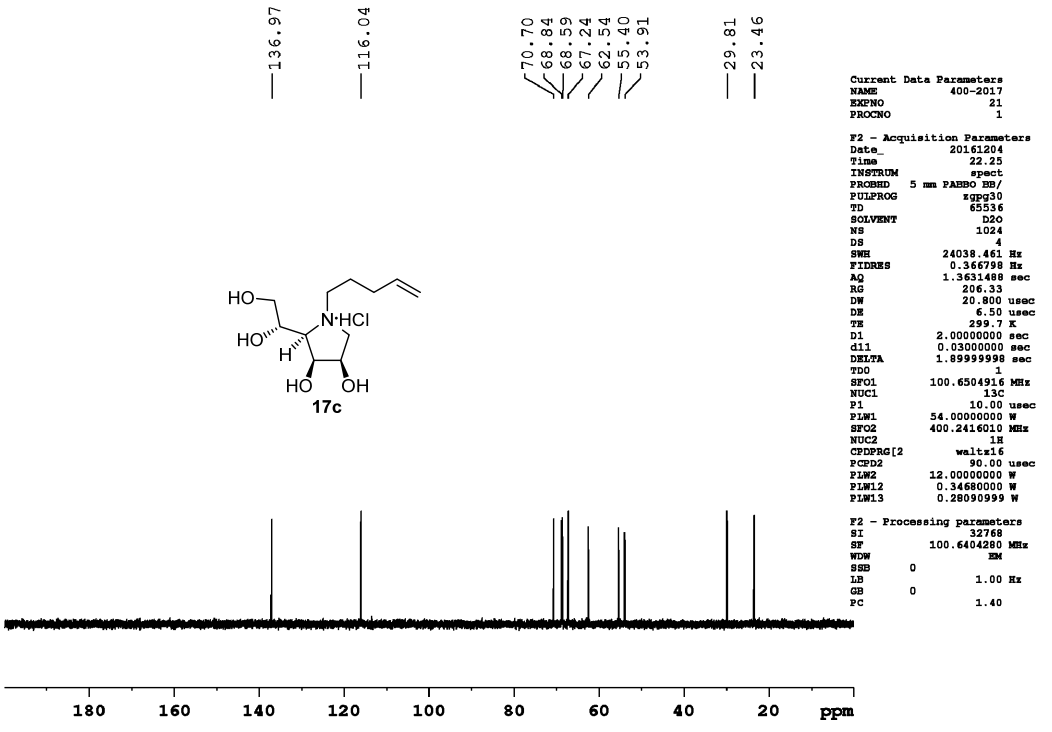

```
Current Data Parameters
NAME                  400-2017
EXPNO                       19
PROCNO                       1

F2 - Acquisition Parameters
Date_               20161202
Time                     1.42
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG                 deptsp135
TD                         65536
SOLVENT                  CDCl3
NS                         256
DS                           4
SWH                  16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                       31.000 usec
DE                        6.50 usec
TE                      300.0 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                          1
SFO1                 100.6484788 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0       0 W
PLW1                54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                   0.500
SPOFFS5    0 Hz
SPW5                 8.25059986 W
SFO2                 400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       39.60 usec
PCPD2                    90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                       32768
SF                   100.6404280 MHz
WDW                        EM
SSB        0
LB                       1.00 Hz
GB         0
PC                       1.40
```



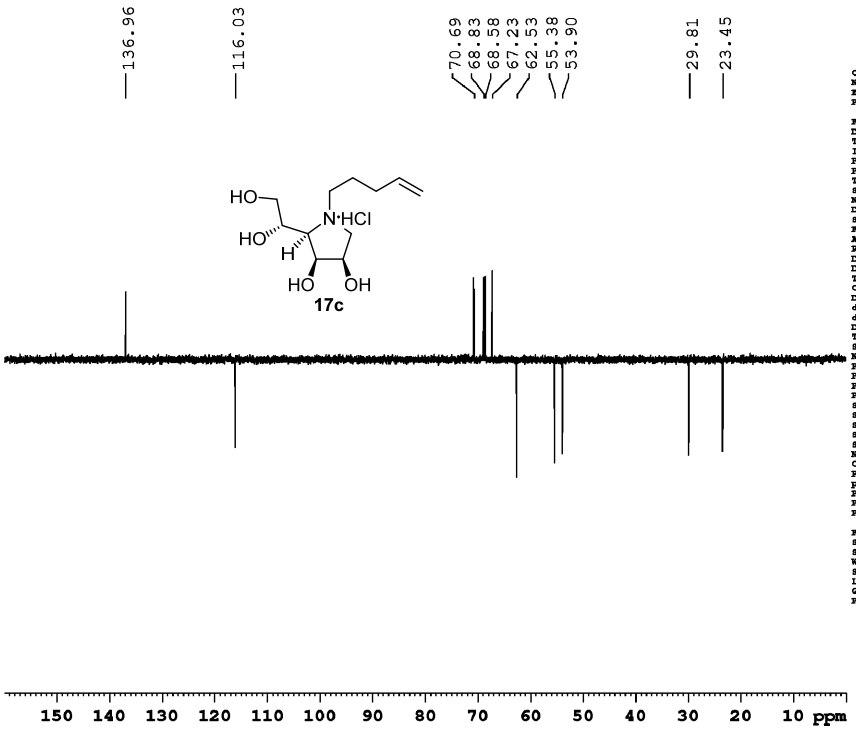
Compound **17c:**




```
Current Data Parameters
NAME              400-2017
EXPNO                   20
PROCNO                   1

F2 - Acquisition Paramete
Date_             20161204
Time                 21.26
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG               zg30
TD                   32768
SOLVENT                D2O
NS                      16
DS                       0
SWH               8012.820 H
FIDRES               0.244532 H
AQ                2.0447233 s
RG                   206.33
DW                   62.400 u
DE                     6.50 u
TE                   298.1 K
D1                2.00000000 s
TD0                      1
SFO1            400.2424716 M
NUC1                    1H
P1                   14.80 u
PLW1             12.00000000 W

F2 - Processing parameter
SI                       65536
SF               400.2399643 M
WDW                         EM
SSB       0
LB                    0.30 H
GB        0
PC                    1.00
```

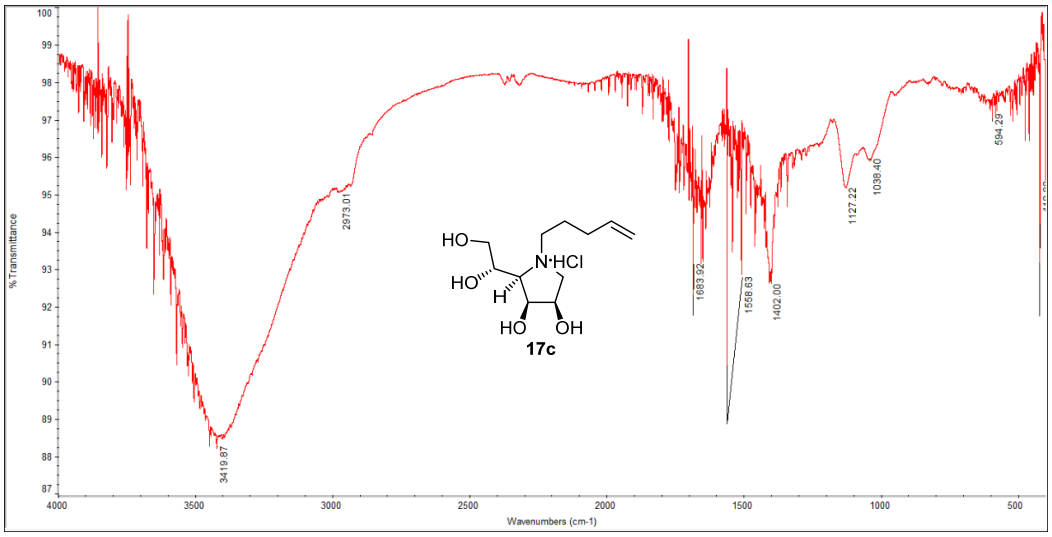



```
Current Data Parameters
NAME              400-2017
EXPNO                   21
PROCNO                   1

F2 - Acquisition Parameters
Date_             20161204
Time                 22.25
INSTRUM              spect
PROBHD   5 mm PABBO BB/
PULPROG             zgpg30
TD                   65536
SOLVENT                D2O
NS                    1024
DS                       4
SWH              24038.461 Hz
FIDRES               0.366798 Hz
AQ                1.3631488 sec
RG                   206.33
DW                   20.800 usec
DE                     6.50 usec
TE                   299.7 K
D1                2.00000000 sec
d11               0.03000000 sec
DELTA             1.89999998 sec
TD0                      1
SFO1            100.6504916 MHz
NUC1                    13C
P1                   10.00 usec
PLW1             54.00000000 W
SFO2            400.2416010 MHz
NUC2                    1H
CPDPRG[2            waltz16
PCPD2                90.00 usec
PLW2             12.00000000 W
PLW12             0.34680000 W
PLW13             0.28090999 W

F2 - Processing parameters
SI                       32768
SF              100.6404280 MHz
WDW                         EM
SSB       0
LB                    1.00 Hz
GB        0
PC                    1.40
```

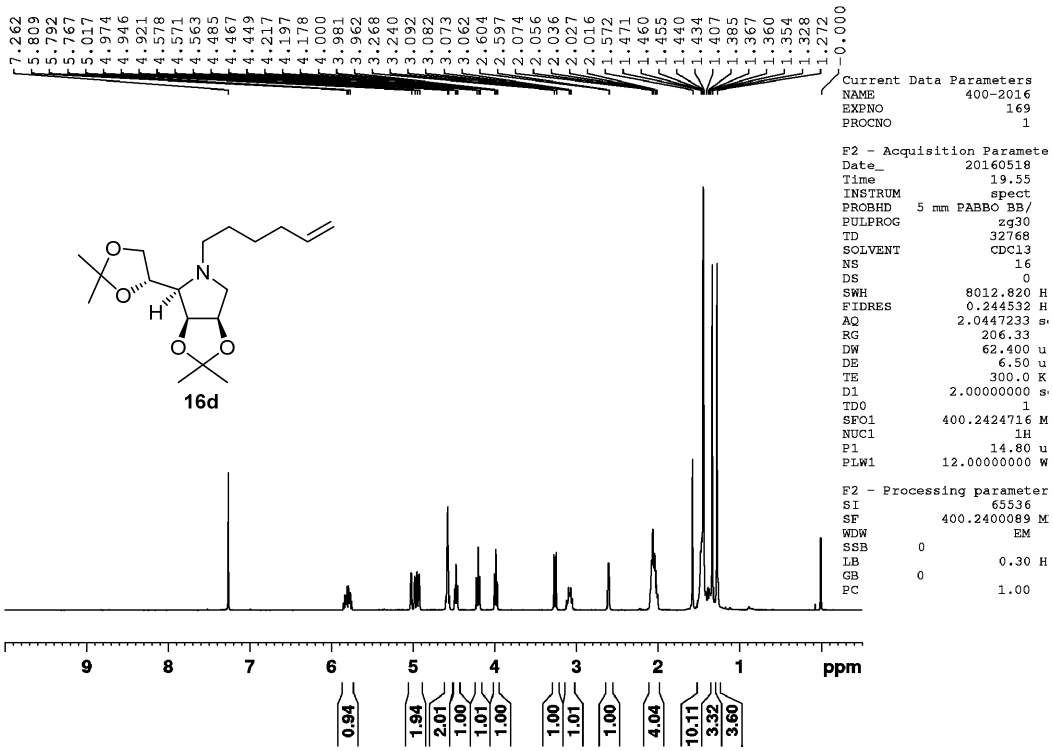


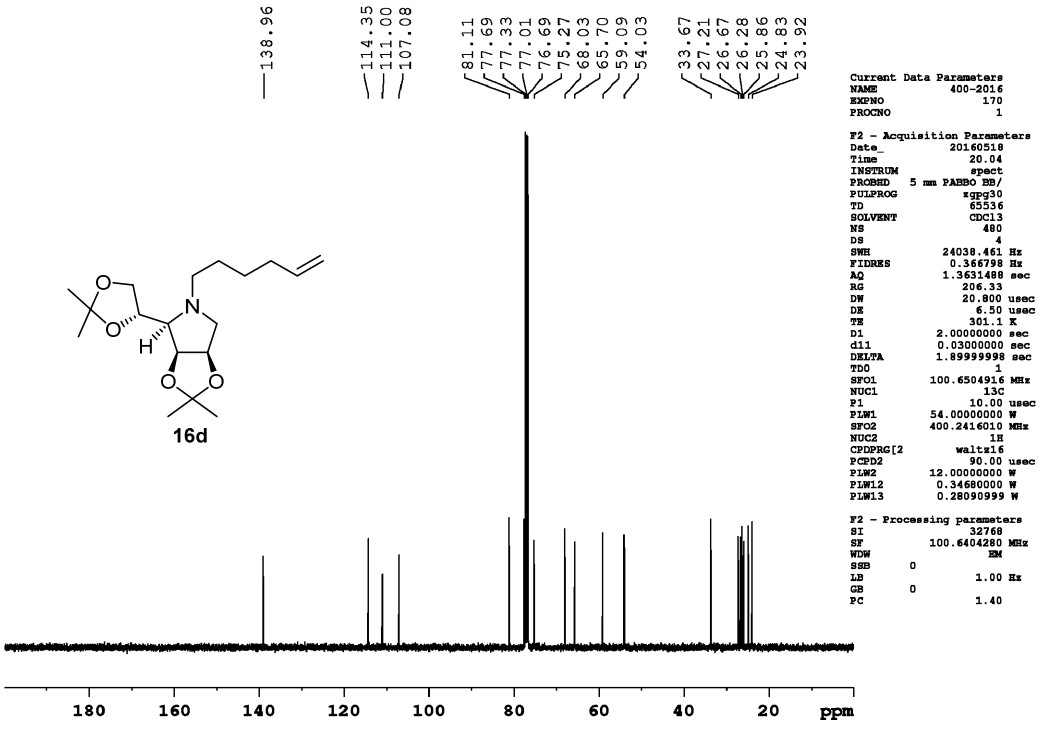


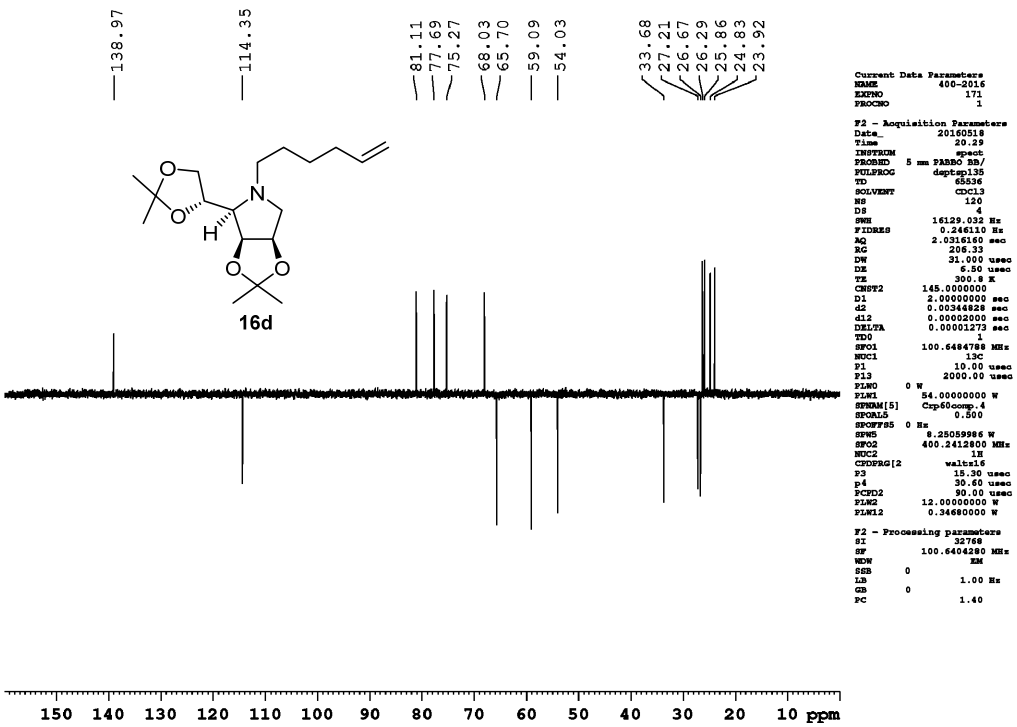
```
Current Data Parameters
NAME                  400-2017
EXPNO                       22
PROCNO                       1

F2 - Acquisition Parameters
Date_              20161204
Time                    22.43
INSTRUM                 spect
PROBHD    5 mm PABBO BB/
PULPROG              deptsp135
TD                       65536
SOLVENT                    D2O
NS                         256
DS                           4
SWH                16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     299.2 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1               100.6484789 MHz
NUC1                        13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1              54.00000000 W
SPNAM[5]          Crp60comp.4
SPOAL5                  0.500
SPOFFS5     0 Hz
SPW5               8.25059986 W
SFO2               400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2              12.00000000 W
PLW12              0.34680000 W

F2 - Processing parameters
SI                       32768
SF                 100.6404280 MHz
WDW                         EM
SSB         0
LB                       1.00 Hz
GB          0
PC                       1.40
```

Compound **16d:**



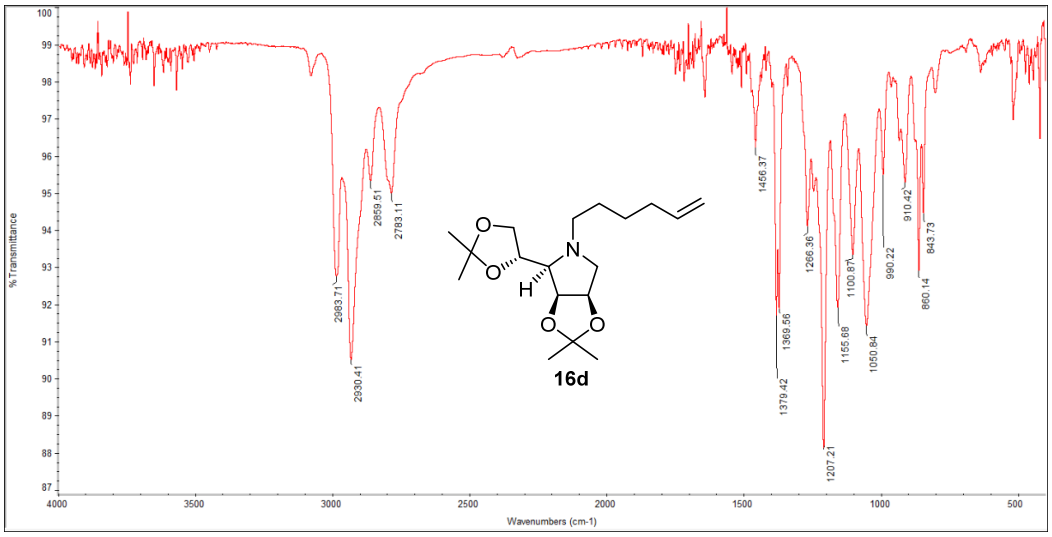




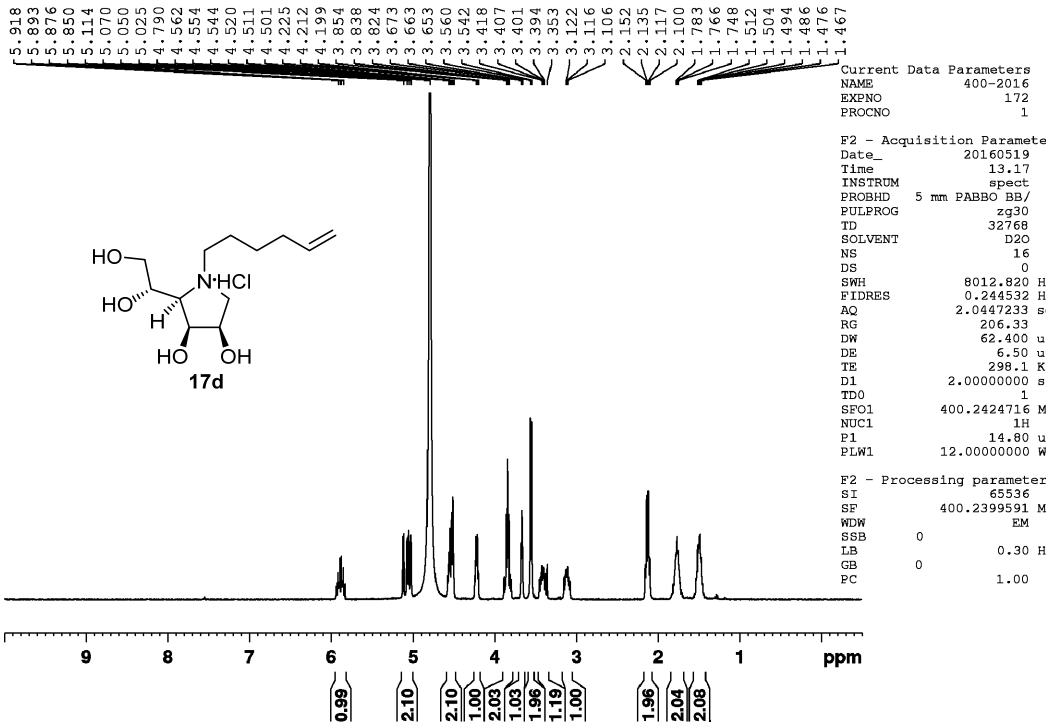
Current Data Parameters
NAME 400-2016
EXPNO 171
PROCNO 1

F2 - Acquisition Parameters
Date_ 20160518
Time 20.29
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG deptsp135
TD 65536
SOLVENT CDCl3
NS 120
DS 4
SWH 16129.032 Hz
FIDRES 0.246110 Hz
AQ 2.0316160 sec
RG 206.33
DW 31.000 usec
DE 6.50 usec
TE 300.8 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001273 sec
TD0 1
SFO1 100.6484788 MHz
NUC1 13C
P1 10.00 usec
P13 2000.00 usec
PLW0 0 W
PLW1 54.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 8.25059986 W
SFO2 400.2412800 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 15.30 usec
p4 30.60 usec
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W

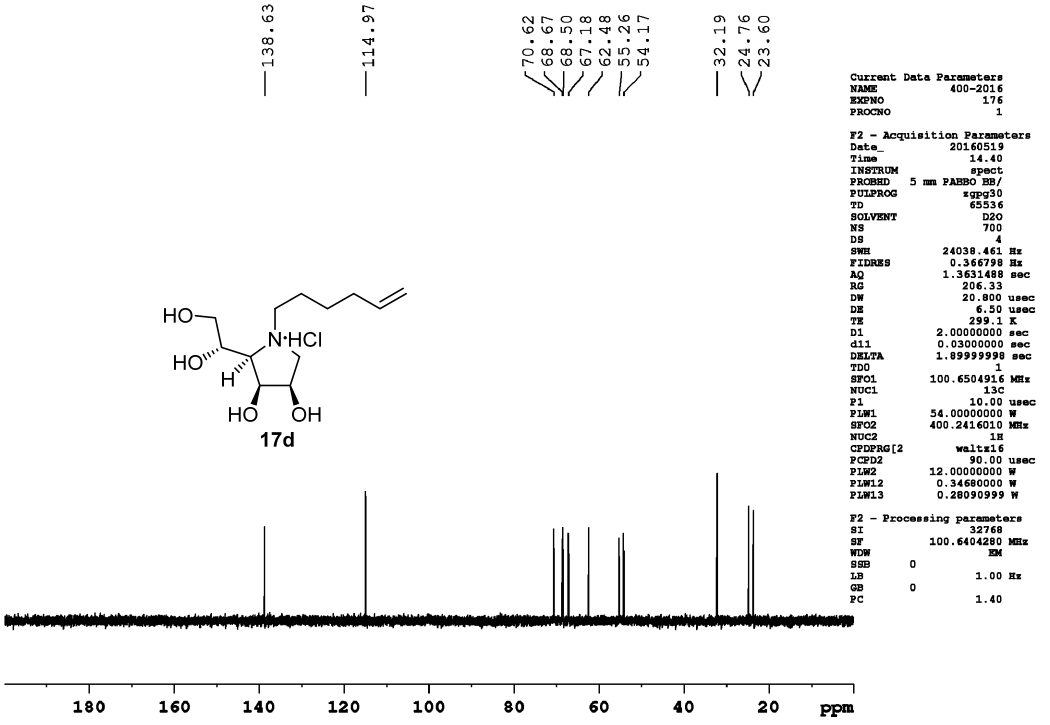
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

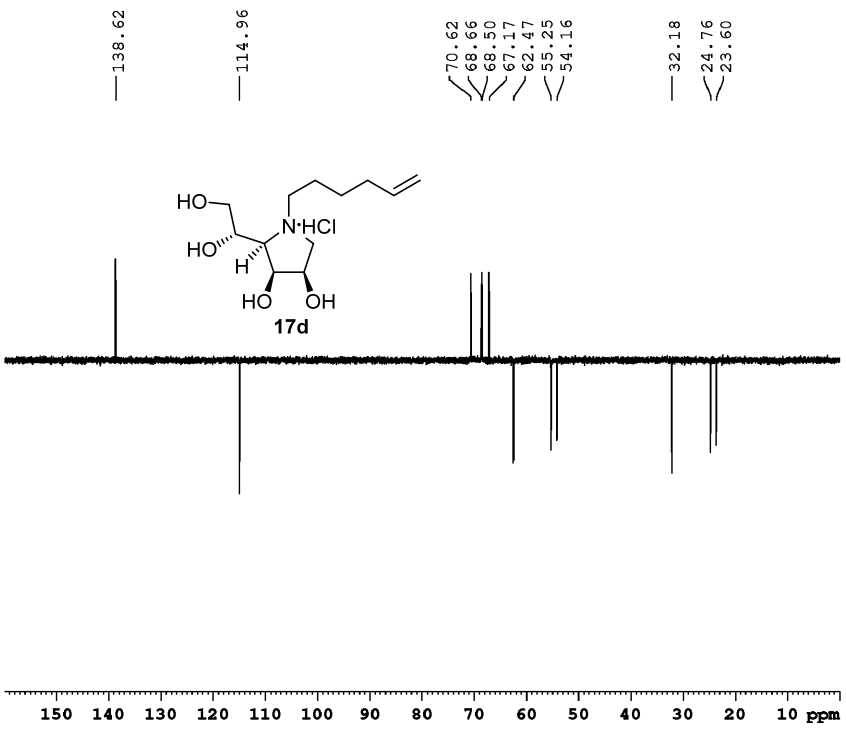
Compound **17d:**



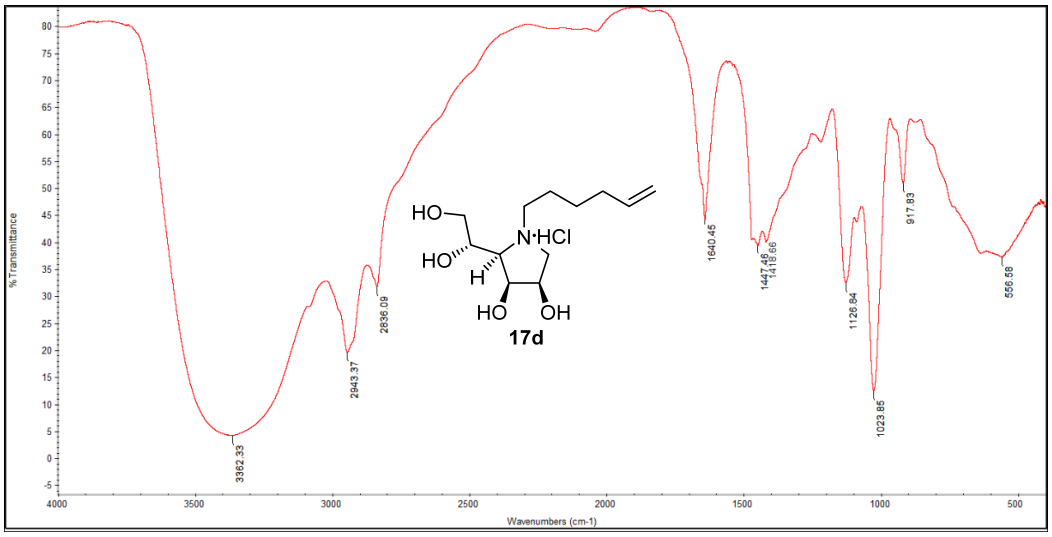

```
Current Data Parameters
NAME                  400-2016
EXPNO                      172
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20160519
Time                     13.17
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                   8012.820 H
FIDRES                0.244532 H
AQ                    2.0447233 s
RG                       206.33
DW                       62.400 u
DE                        6.50 u
TE                       298.1 K
D1                 2.00000000 s
TD0                          1
SFO1               400.2424716 M
NUC1                        1H
P1                       14.80 u
PLW1              12.00000000 W

F2 - Processing parameter
SI                       65536
SF                 400.2399591 M
WDW                         EM
SSB          0
LB                        0.30 H
GB           0
PC                       1.00
```



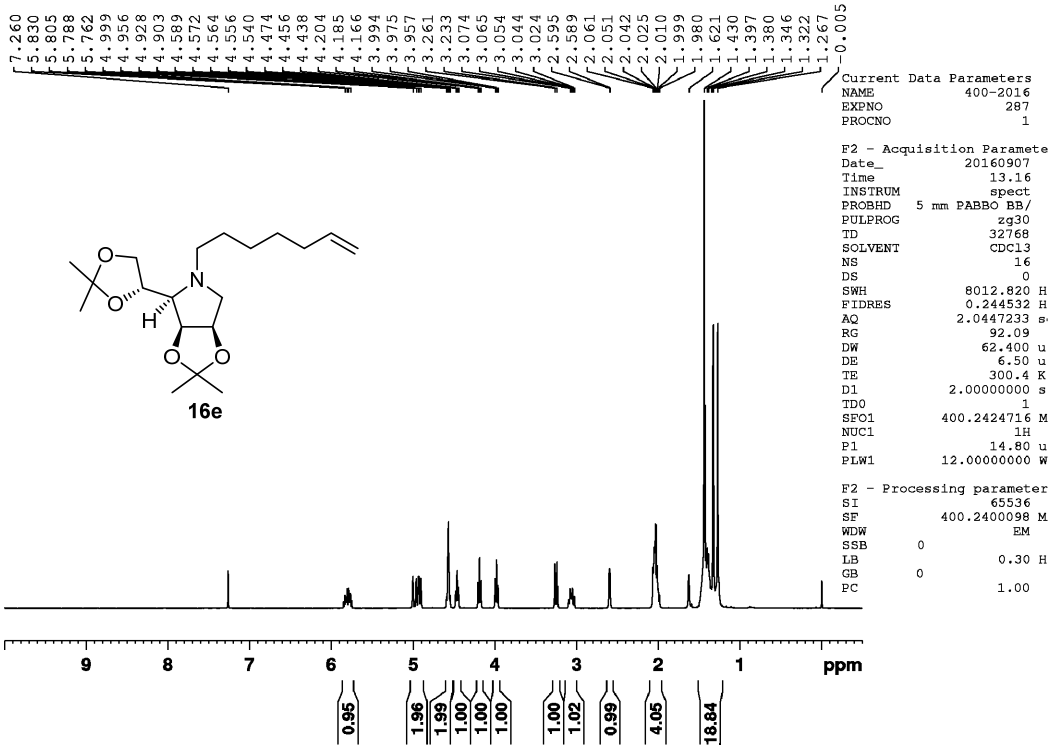

```
Current Data Parameters
NAME                  400-2016
EXPNO                      176
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160519
Time                     14.40
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                 zgpg30
TD                      65536
SOLVENT                   D2O
NS                         700
DS                           4
SWH                24038.461 Hz
FIDRES                0.366798 Hz
AQ                    1.3631488 sec
RG                       206.33
DW                       20.800 usec
DE                        6.50 usec
TE                       299.1 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                          1
SFO1              100.6504916 MHz
NUC1                        13C
P1                       10.00 usec
PLW1               54.00000000 W
SFO2              400.2416010 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                       32768
SF                100.6404280 MHz
WDW                         EM
SSB          0
LB                        1.00 Hz
GB           0
PC                       1.40
```

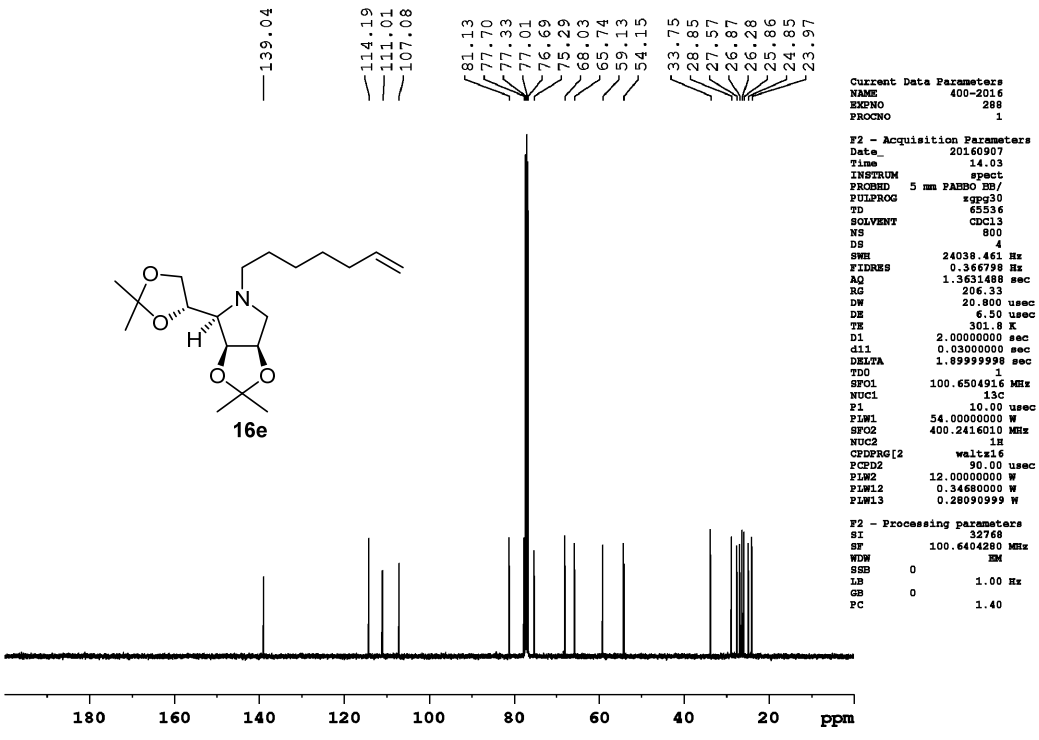


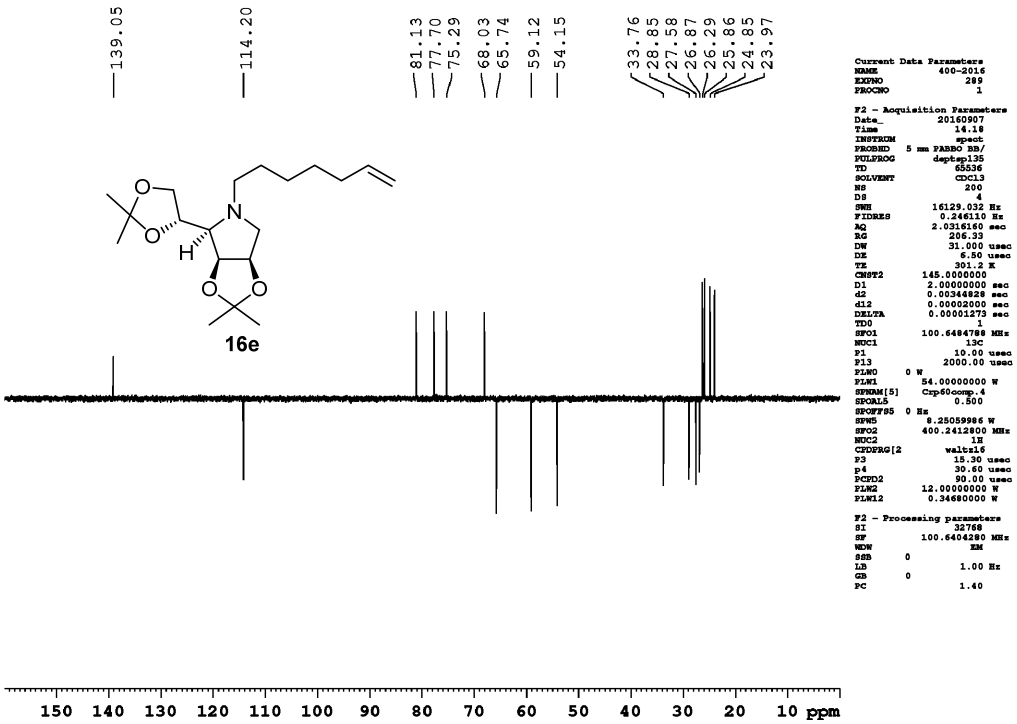

```
Current Data Parameters
NAME                  400-2016
EXPNO                      177
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160519
Time                    15.06
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        200
DS                          4
SWH                16129.032 Hz
FIDRES                 0.246110 Hz
AQ                     2.0316160 sec
RG                        206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     298.9 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                           1
SFO1                100.6484788 MHz
NUC1                        13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1                54.00000000 W
SPNAM[5]            Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                 8.25059986 W
SFO2                400.2412800 MHz
NUC2                        1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2                12.00000000 W
PLW12                0.34680000 W

F2 - Processing parameters
SI                        32768
SF                  100.6404280 MHz
WDW                          EM
SSB         0
LB                       1.00 Hz
GB          0
PC                       1.40
```



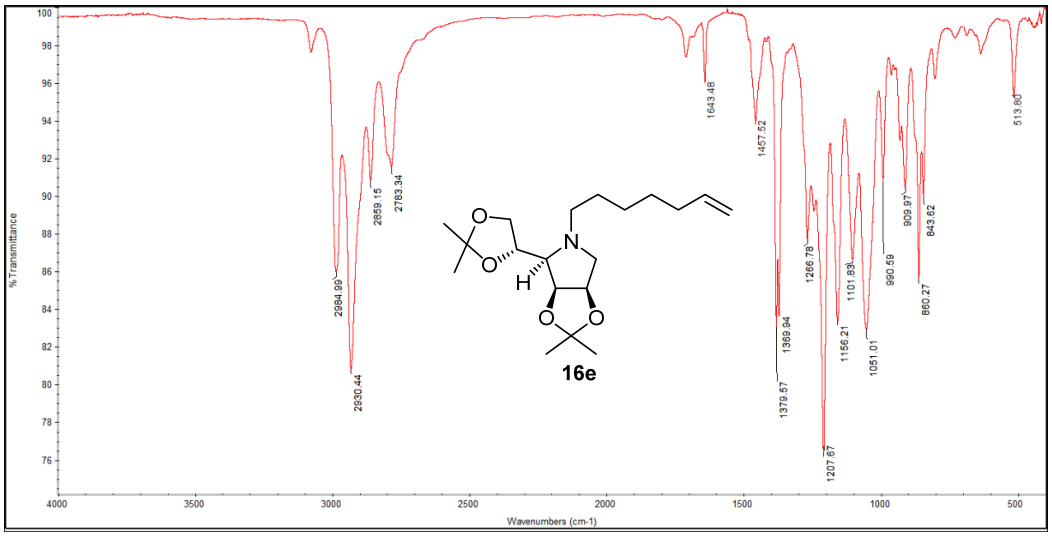
Compound **16e:**



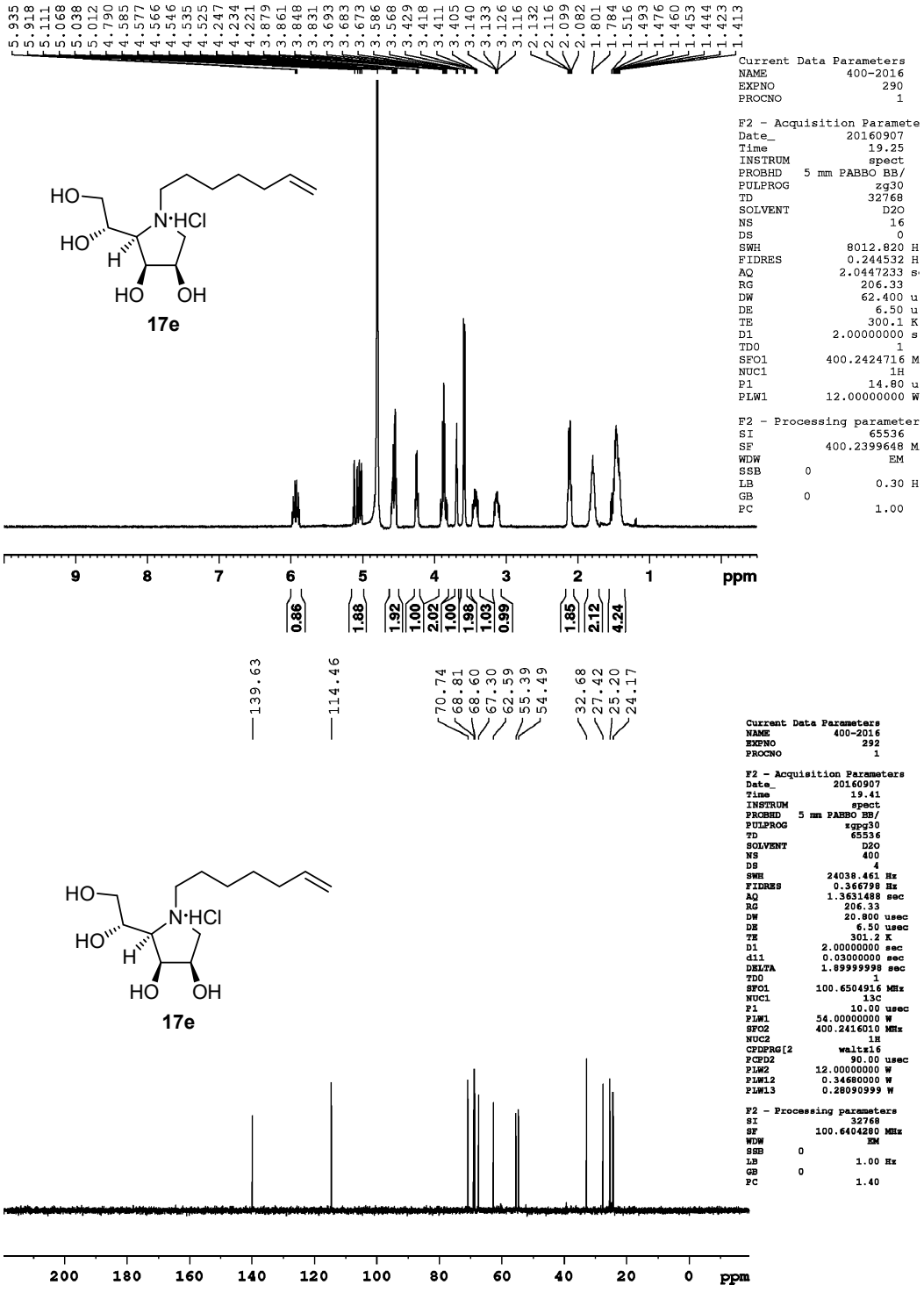



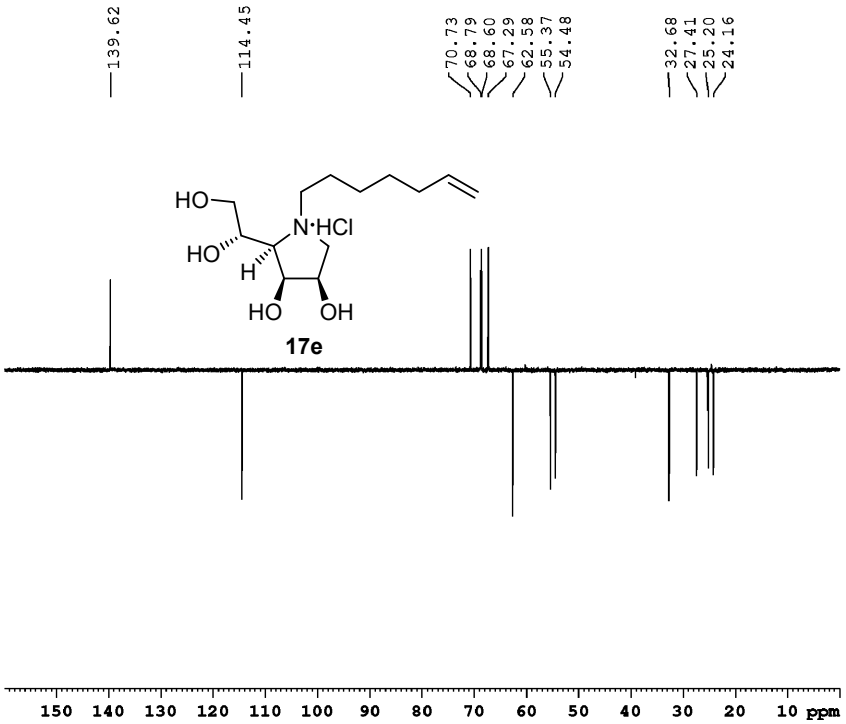



```
Current Data Parameters
NAME                  400-2016
EXPNO                      289
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160907
Time                     14.18
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                       65536
SOLVENT                  CDCl3
NS                         200
DS                           4
SWH                  16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                       31.000 usec
DE                        6.50 usec
TE                      301.2 K
CNST2                145.0000000
D1                     2.00000000 sec
d2                     0.00344828 sec
d12                    0.00002000 sec
DELTA                  0.00001273 sec
TD0                             1
SFO1                 100.6484788 MHz
NUC1                         13C
P1                           10.00 usec
P13                        2000.00 usec
PLW0          0 W
PLW1                  54.00000000 W
SPNAM[5]              Crp60comp.4
SPOAL5                      0.500
SPOFFS5       0 Hz
SPW5                   0.25059986 W
SFO2                 400.2412800 MHz
NUC2                         1H
CPDPRG[2                 waltz16
P3                           15.30 usec
p4                           30.60 usec
PCPD2                        90.00 usec
PLW2                  12.00000000 W
PLW12                  0.34680000 W

F2 - Processing parameters
SI                           32768
SF                   100.6404280 MHz
WDW                             EM
SSB           0
LB                            1.00 Hz
GB            0
PC                            1.40
```

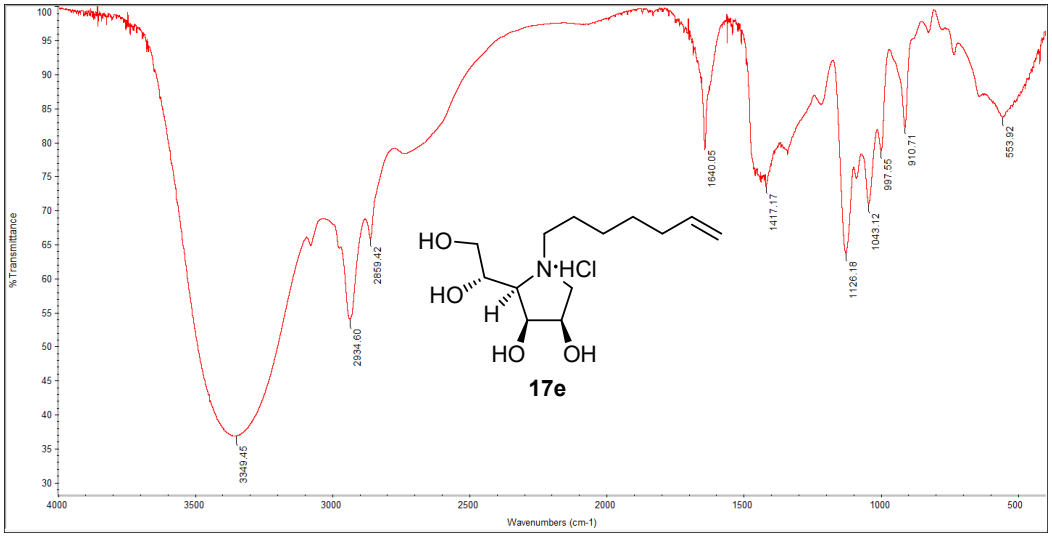


Compound **17e:**

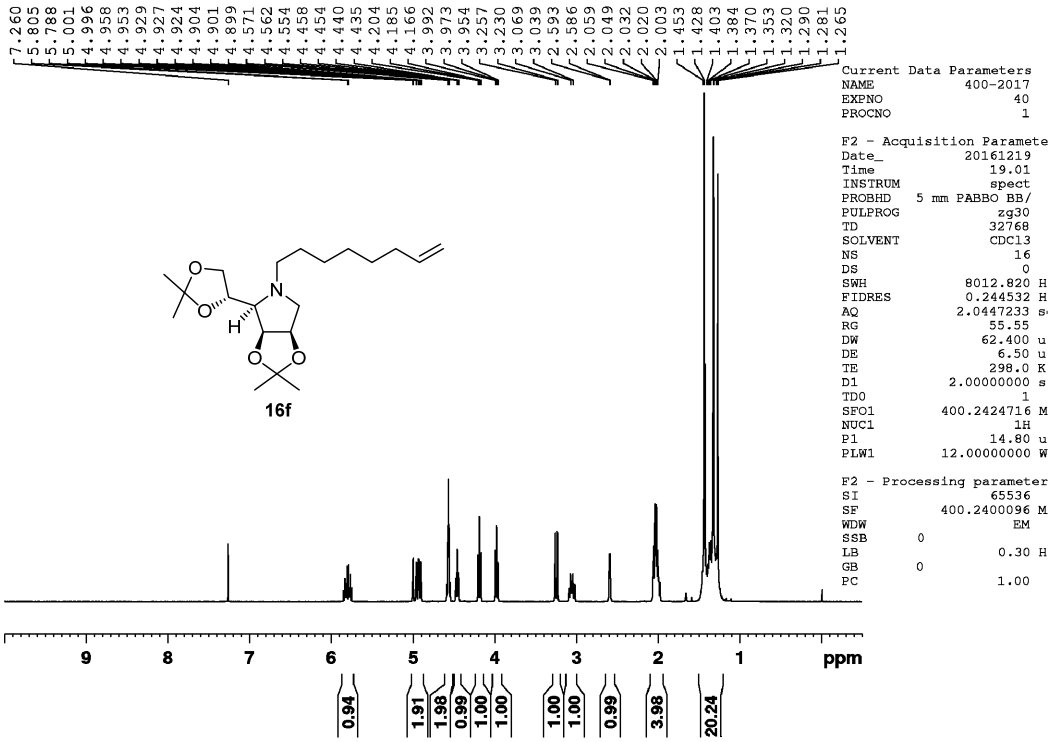


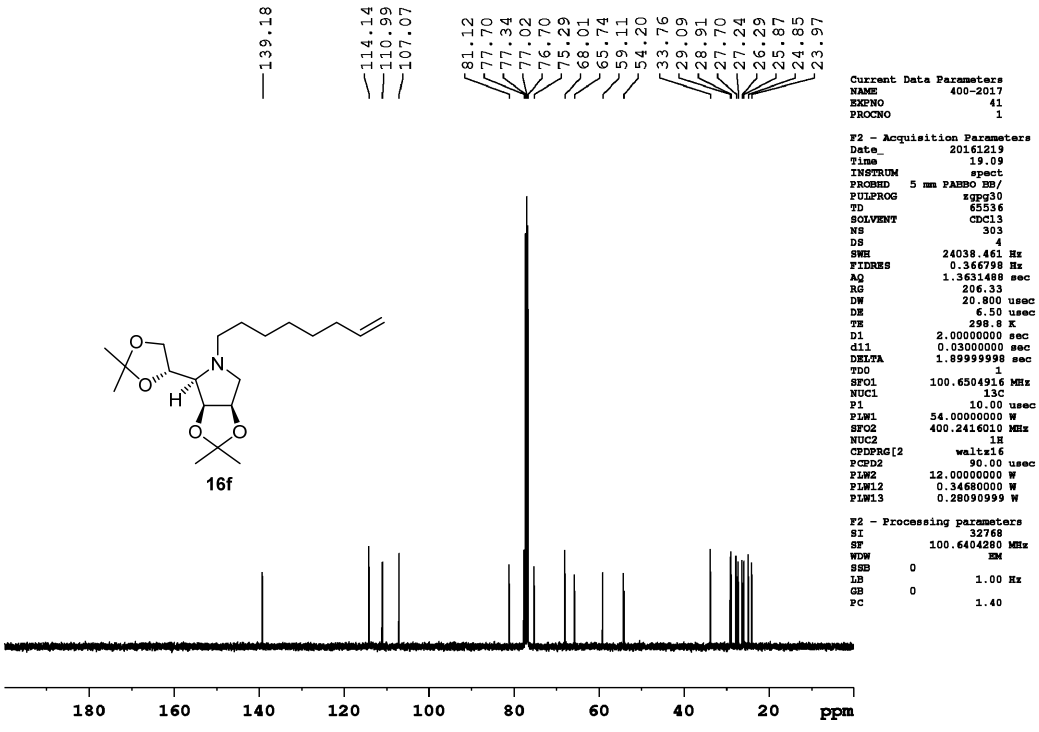


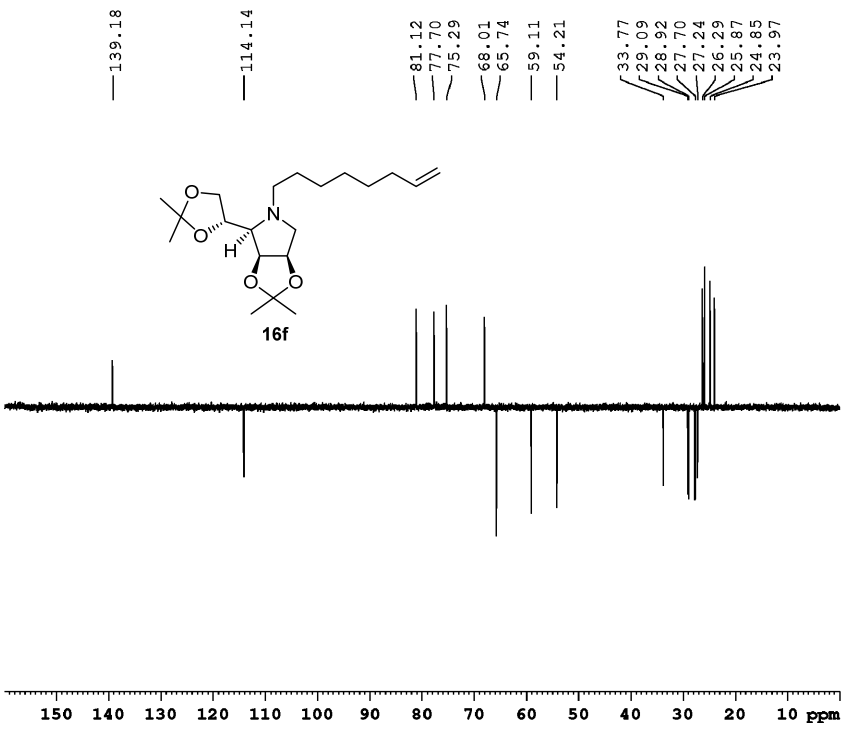

```
Current Data Parameters
NAME                  400-2016
EXPNO                      293
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160907
Time                     19.54
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        256
DS                          4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                    2.0316160 sec
RG                       206.33
DW                      31.000 usec
DE                       6.50 usec
TE                     300.9 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                          1
SFO1                100.6484788 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW0        0 W
PLW1               54.00000000 W
SPNAM[5]           Crp60comp.4
SPOAL5                   0.500
SPOFFS5     0 Hz
SPW5                8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                       32768
SF                  100.6404280 MHz
WDW                         EM
SSB         0
LB                        1.00 Hz
GB          0
PC                        1.40
```



Compound **16f**



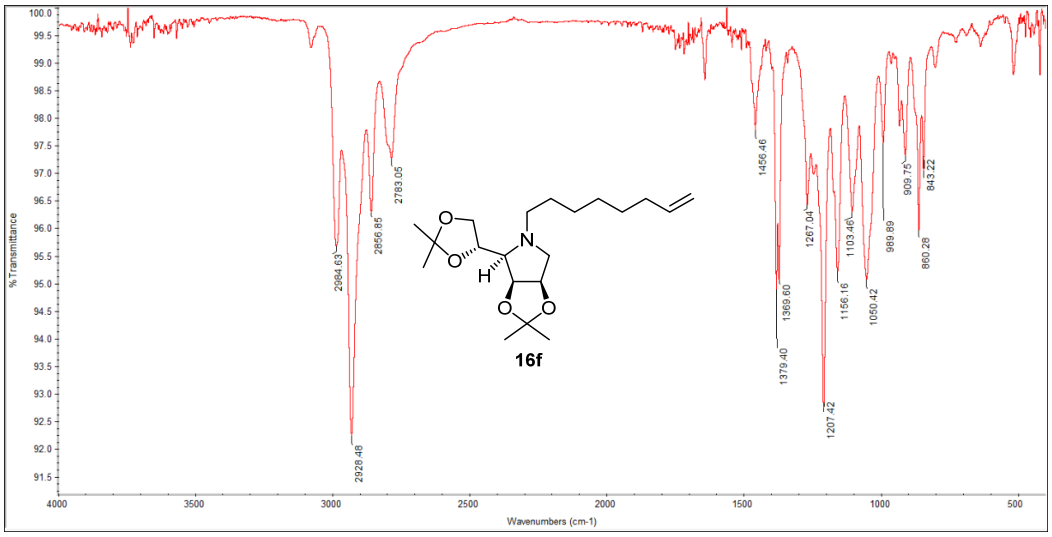




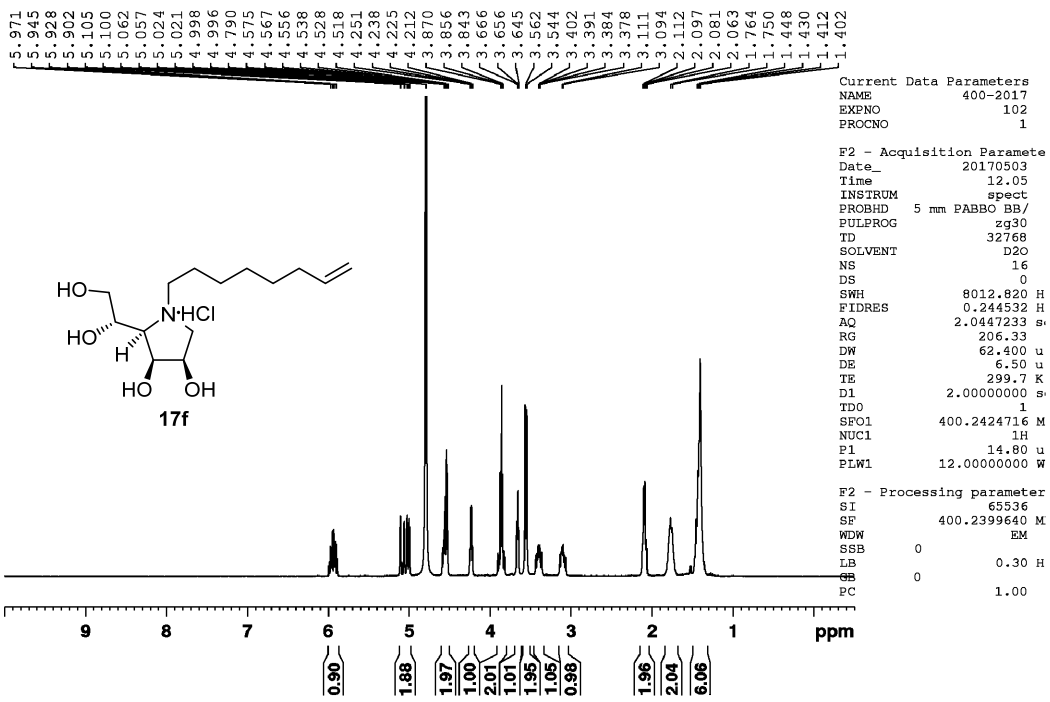
Current Data Parameters
NAME 400-2017
EXPNO 42
PROCNO 1

F2 - Acquisition Parameters
Date_ 20161219
Time 19.22
INSTRUM spect
PROBHD 5 mm PABBO BB/
PULPROG deptsp135
TD 65536
SOLVENT CDCl3
NS 116
DS 4
SWH 16129.032 Hz
FIDRES 0.246110 Hz
AQ 2.0316160 sec
RG 206.33
DW 31.000 usec
DE 6.50 usec
TE 298.3 K
CNST2 145.0000000
D1 2.00000000 sec
d2 0.00344828 sec
d12 0.00002000 sec
DELTA 0.00001273 sec
TD0 1
SFO1 100.6484788 MHz
NUC1 13C
P1 10.00 usec
P13 2000.00 usec
PLW0 0 W
PLW1 54.00000000 W
SPNAM[5] Crp60comp.4
SPOAL5 0.500
SPOFFS5 0 Hz
SPW5 8.25059986 W
SFO2 400.2412800 MHz
NUC2 1H
CPDPRG[2 waltz16
P3 15.30 usec
p4 30.60 usec
PCPD2 90.00 usec
PLW2 12.00000000 W
PLW12 0.34680000 W

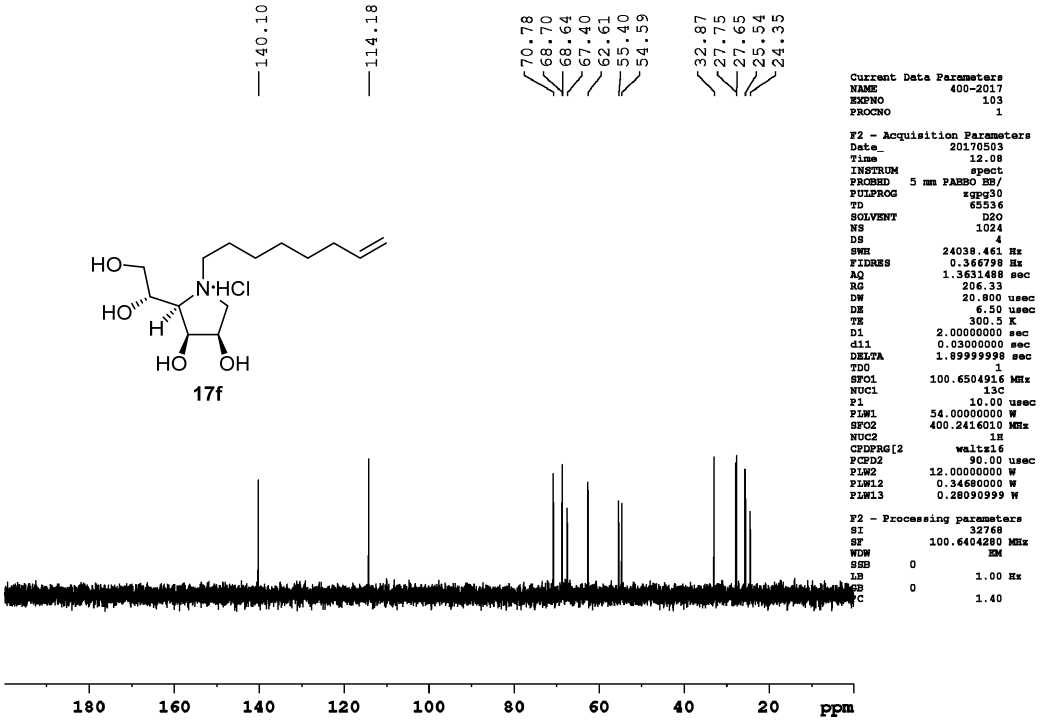
F2 - Processing parameters
SI 32768
SF 100.6404280 MHz
WDW EM
SSB 0
LB 1.00 Hz
GB 0
PC 1.40

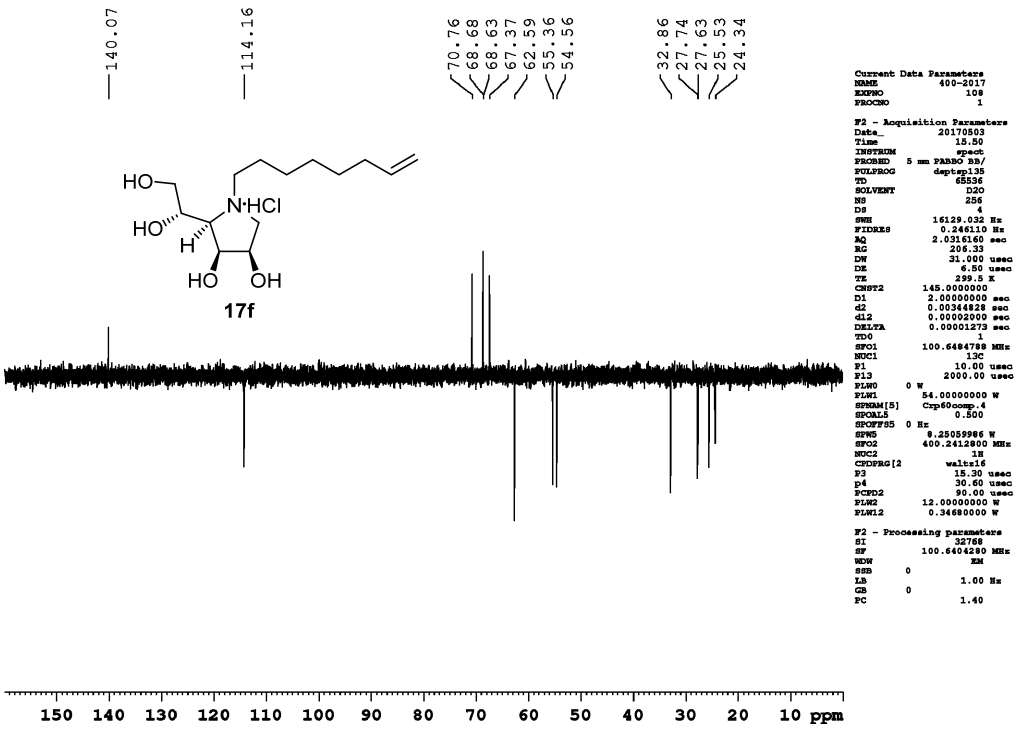
Compound **17f:**



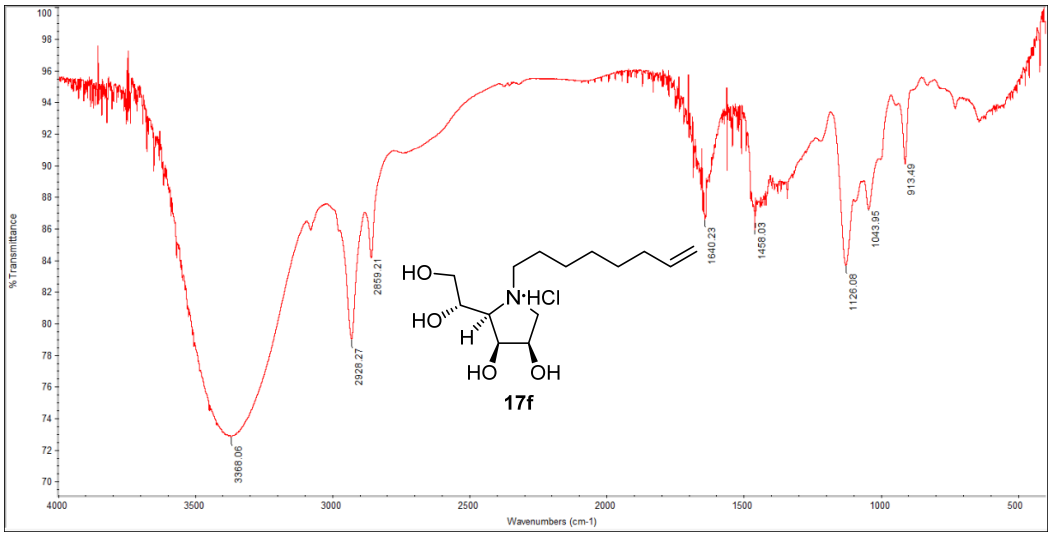

```
Current Data Parameters
NAME                  400-2017
EXPNO                      102
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20170503
Time                     12.05
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                   2.0447233 s
RG                      206.33
DW                      62.400 u
DE                        6.50 u
TE                      299.7 K
D1                   2.00000000 s
TD0                          1
SFO1               400.2424716 M
NUC1                        1H
P1                       14.80 u
PLW1              12.00000000 W

F2 - Processing parameter
SI                       65536
SF                 400.2399640 M
WDW                         EM
SSB          0
LB                       0.30 H
GB           0
PC                       1.00
```



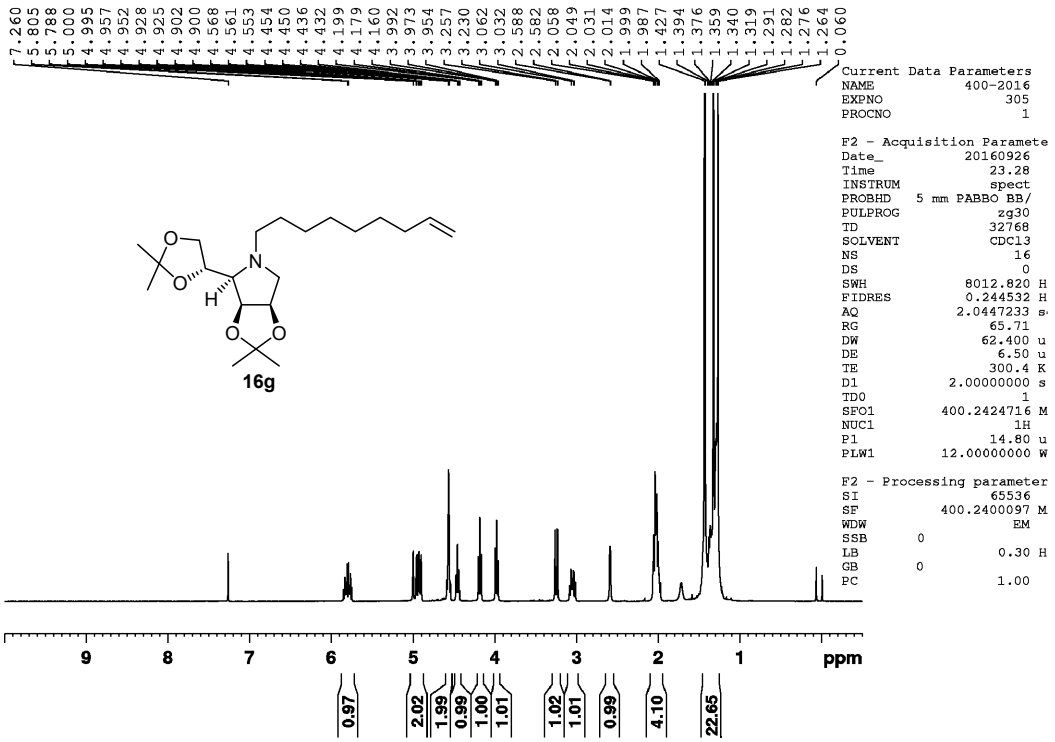

```
Current Data Parameters
NAME                  400-2017
EXPNO                      103
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20170503
Time                     12.08
INSTRUM                  spect
PROBHD     5 mm PABBO BB/
PULPROG                 zgpg30
TD                      65536
SOLVENT                   D2O
NS                         1024
DS                            4
SWH                  24038.461 Hz
FIDRES               0.366798 Hz
AQ                   1.3631488 sec
RG                      206.33
DW                      20.800 usec
DE                        6.50 usec
TE                      300.5 K
D1                   2.00000000 sec
d11                  0.03000000 sec
DELTA                1.89999998 sec
TD0                          1
SFO1               100.6504916 MHz
NUC1                        13C
P1                       10.00 usec
PLW1              54.00000000 W
SFO2               400.2416010 MHz
NUC2                        1H
CPDPRG[2                waltz16
PCPD2                    90.00 usec
PLW2              12.00000000 W
PLW12              0.34680000 W
PLW13              0.28090999 W

F2 - Processing parameters
SI                       32768
SF                 100.6404280 MHz
WDW                         EM
SSB          0
LB                       1.00 Hz
GB           0
PC                       1.40
```

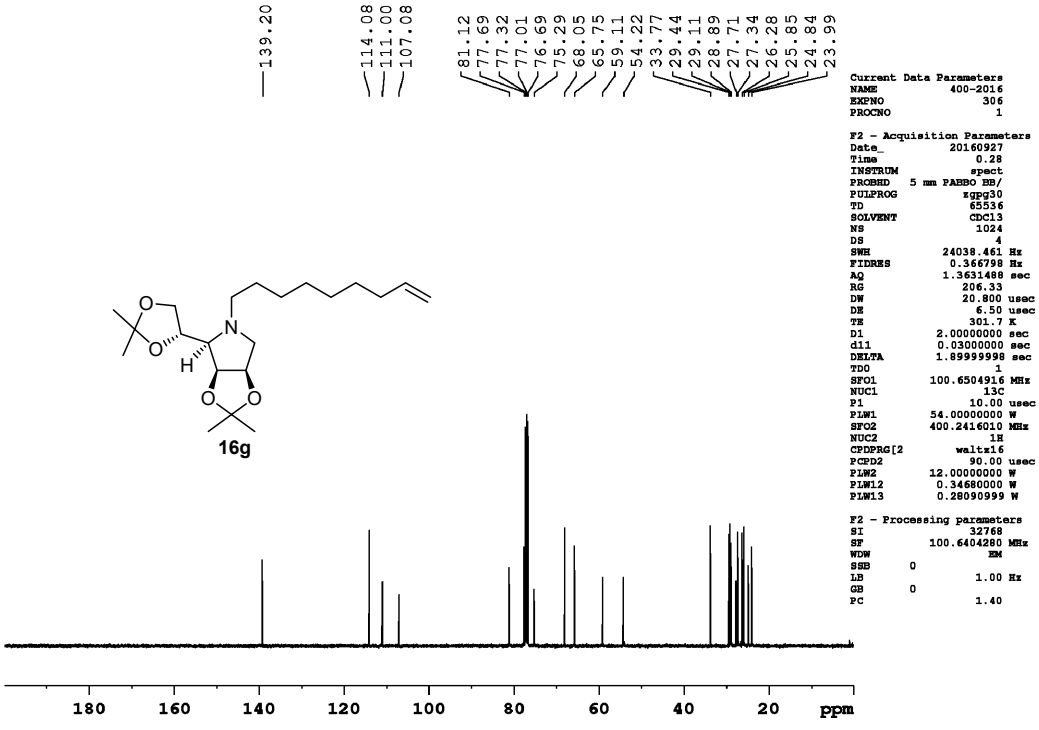


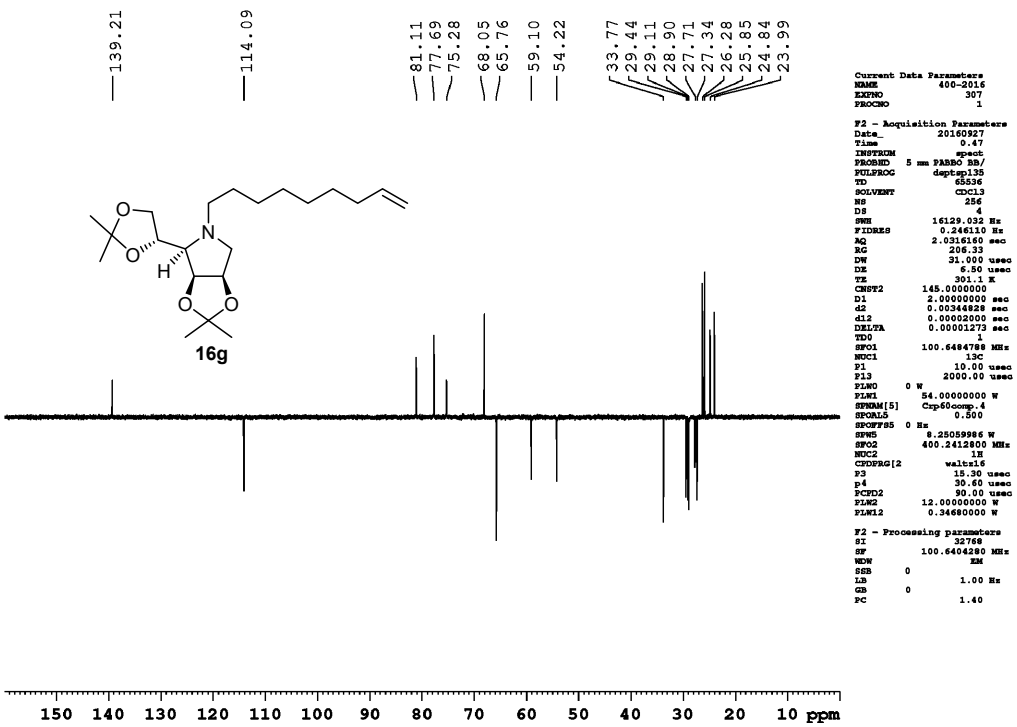

```
Current Data Parameters
NAME                  400-2017
EXPNO                      108
PROCNO                       1

F2 - Acquisition Parameters
Date_              20170503
Time                   15.50
INSTRUM                spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                     65536
SOLVENT                  D2O
NS                       256
DS                         4
SWH                16129.032 Hz
FIDRES                 0.246110 Hz
AQ                 2.0316160 sec
RG                      206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     299.5 K
CNST2                145.0000000
D1                   2.00000000 sec
d2                   0.00344828 sec
d12                  0.00002000 sec
DELTA                0.00001273 sec
TD0                          1
SFO1               100.6404788 MHz
NUC1                       13C
P1                      10.00 usec
P13                   2000.00 usec
PLW0        0 W
PLW1              54.00000000 W
SPNAM[5]          Crp60comp.4
SPOAL5                 0.500
SPOFFS5     0 Hz
SPW5               9.25059986 W
SFO2               400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                      15.30 usec
p4                      30.60 usec
PCPD2                   90.00 usec
PLW2              12.00000000 W
PLW12              0.34680000 W

F2 - Processing parameters
SI                       32768
SF                 100.6404290 MHz
WDW                        EM
SSB         0
LB                      1.00 Hz
GB          0
PC                      1.40
```



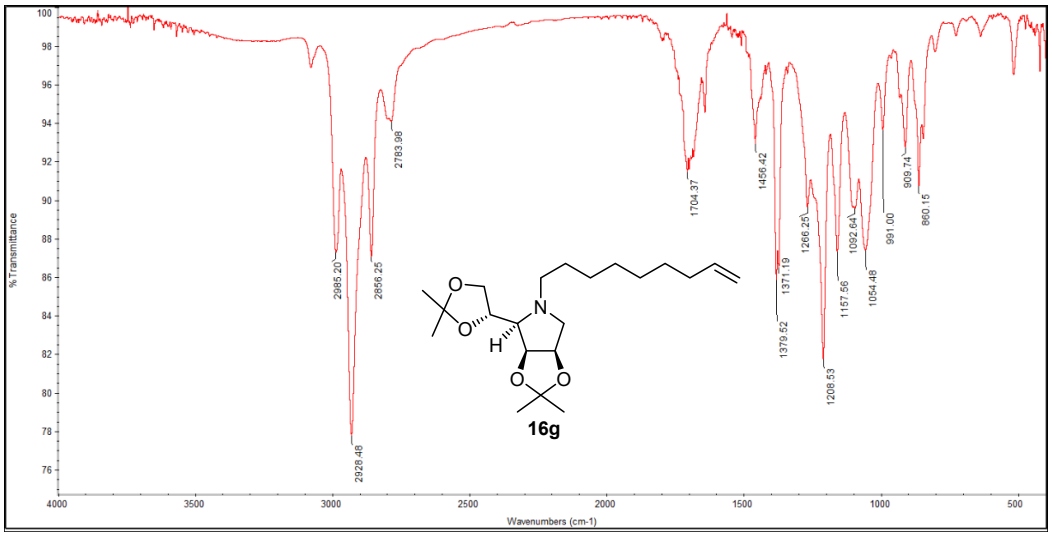
Compound **16g:**



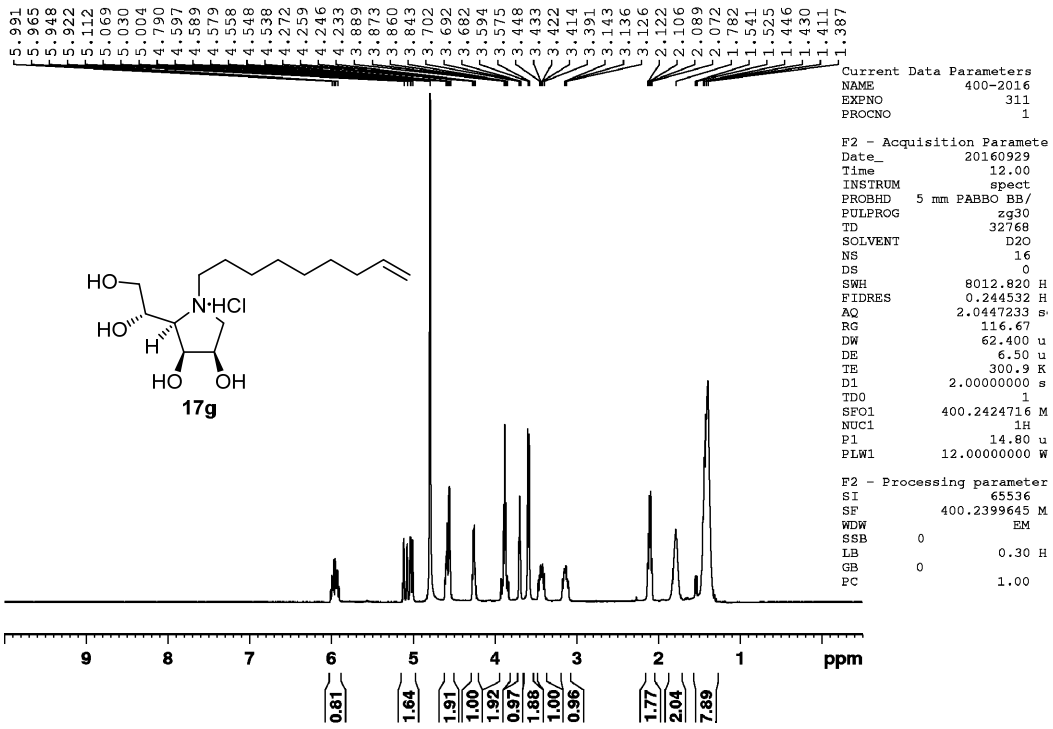





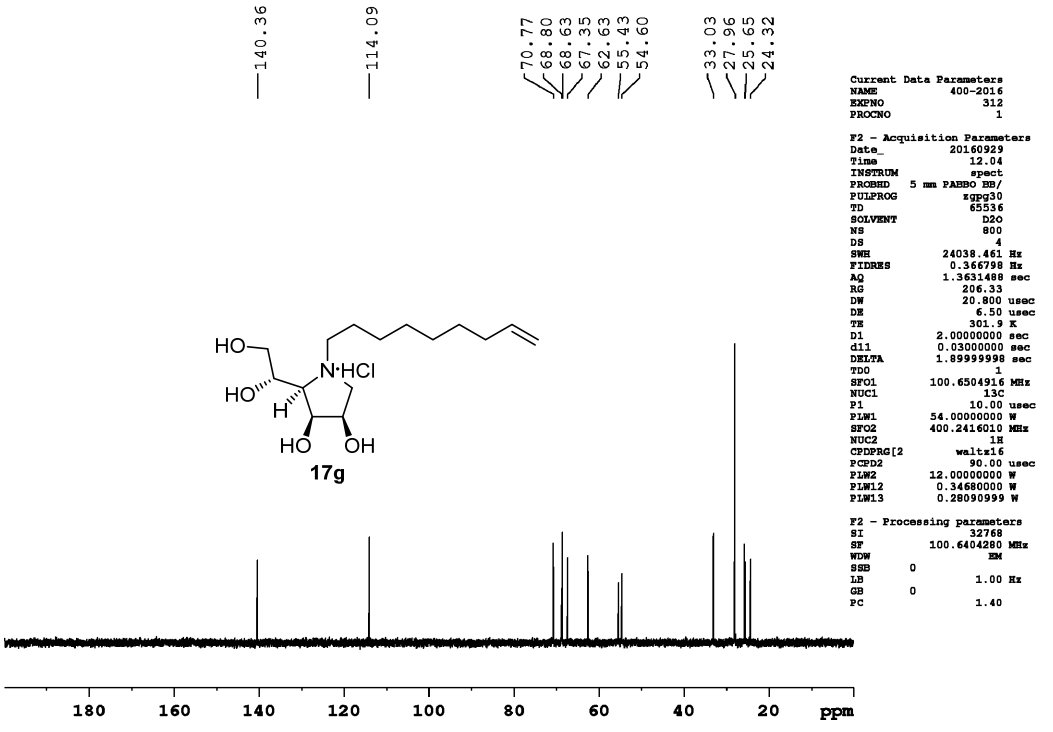

```
Current Data Parameters
NAME                  400-2016
EXPNO                      307
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160927
Time                    0.47
INSTRUM                spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                 CDCl3
NS                        256
DS                          4
SWH                 16129.032 Hz
FIDRES                0.246110 Hz
AQ                  2.0316160 sec
RG                     206.33
DW                     31.000 usec
DE                      6.50 usec
TE                     301.1 K
CNST2               145.0000000
D1                    2.00000000 sec
d2                    0.00344828 sec
d12                   0.00002000 sec
DELTA                 0.00001273 sec
TD0                         1
SFO1                100.6404789 MHz
NUC1                       13C
P1                       10.00 usec
P13                    2000.00 usec
PLW1        0 W
PLW1               54.00000000 W
SPNAM[5]           Crp60comp.4
SPOAL5                  0.500
SPOFFS5     0 Hz
SPW5                 8.25059986 W
SFO2                400.2412800 MHz
NUC2                       1H
CPDPRG[2                waltz16
P3                       15.30 usec
p4                       30.60 usec
PCPD2                    90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                      32768
SF                  100.6404280 MHz
WDW                        EM
SSB         0
LB                       1.00 Hz
GB          0
PC                       1.40
```



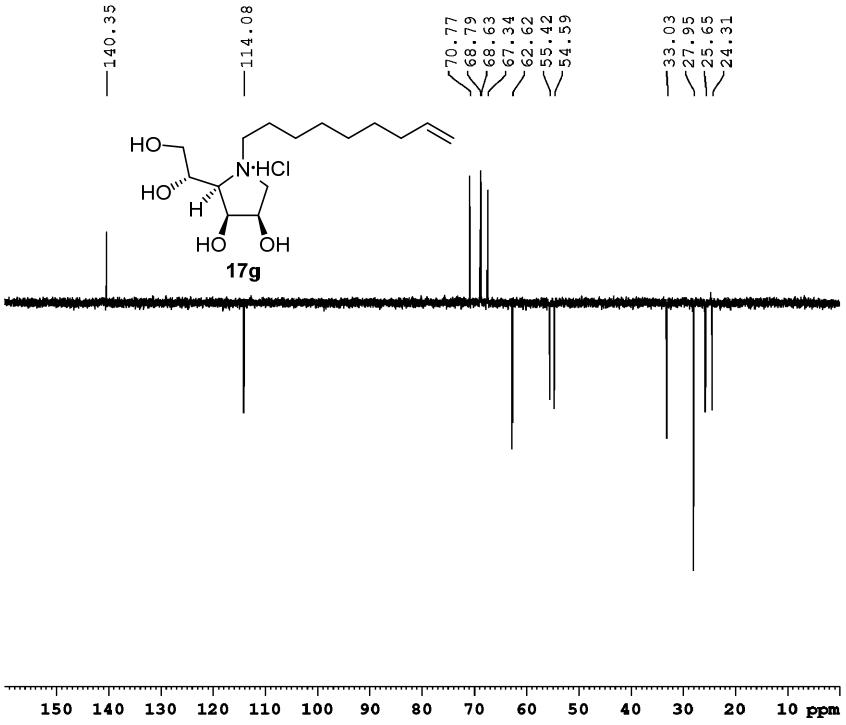
Compound **17g:**




```
Current Data Parameters
NAME                  400-2016
EXPNO                      311
PROCNO                       1

F2 - Acquisition Paramete
Date_                 20160929
Time                     12.00
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                  zg30
TD                      32768
SOLVENT                   D2O
NS                         16
DS                          0
SWH                  8012.820 H
FIDRES               0.244532 H
AQ                  2.0447233 s
RG                      116.67
DW                      62.400 u
DE                        6.50 u
TE                       300.9 K
D1                 2.00000000 s
TD0                         1
SFO1               400.2424716 M
NUC1                       1H
P1                      14.80 u
PLW1               12.00000000 W

F2 - Processing parameter
SI                        65536
SF                 400.2399645 M
WDW                          EM
SSB          0
LB                        0.30 H
GB           0
PC                        1.00
```




```
Current Data Parameters
NAME                  400-2016
EXPNO                      312
PROCNO                       1

F2 - Acquisition Parameters
Date_                 20160929
Time                     12.04
INSTRUM                  spect
PROBHD    5 mm PABBO BB/
PULPROG                zgpg30
TD                      65536
SOLVENT                   D2O
NS                         800
DS                           4
SWH                24038.461 Hz
FIDRES              0.366798 Hz
AQ                  1.3631488 sec
RG                      206.33
DW                    20.800 usec
DE                     6.50 usec
TE                       301.9 K
D1                 2.00000000 sec
d11                0.03000000 sec
DELTA              1.89999998 sec
TD0                         1
SFO1               100.6504916 MHz
NUC1                       13C
P1                     10.00 usec
PLW1               54.00000000 W
SFO2               400.2416010 MHz
NUC2                       1H
CPDPRG[2                waltz16
PCPD2                  90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W
PLW13               0.28090999 W

F2 - Processing parameters
SI                        32768
SF                 100.6404280 MHz
WDW                          EM
SSB          0
LB                     1.00 Hz
GB           0
PC                        1.40
```




```
Current Data Parameters
NAME                  400-2016
EXPNO                      313
PROCNO                       1

F2 - Acquisition Parameters
Date_               20160929
Time                    13.02
INSTRUM                 spect
PROBHD     5 mm PABBO BB/
PULPROG             deptsp135
TD                      65536
SOLVENT                   D2O
NS                        200
DS                          4
SWH                 16129.032 Hz
FIDRES              0.246110 Hz
AQ                  2.0316160 sec
RG                      206.33
DW                    31.000 usec
DE                     6.50 usec
TE                     302.2 K
CNST2               145.0000000
D1                  2.00000000 sec
d2                  0.00344828 sec
d12                 0.00002000 sec
DELTA               0.00001273 sec
TD0                         1
SFO1               100.6404788 MHz
NUC1                      13C
P1                      10.00 usec
P13                   2000.00 usec
PLW0        0 W
PLW1               54.00000000 W
SPNAM[5]           Crp60comp.4
SPOAL5                  0.500
SPOFFS5     0 Hz
SPW5                8.25059986 W
SFO2               400.2412800 MHz
NUC2                      1H
CPDPRG[2                waltz16
P3                      15.30 usec
P4                      30.60 usec
PCPD2                   90.00 usec
PLW2               12.00000000 W
PLW12               0.34680000 W

F2 - Processing parameters
SI                        32768
SF                 100.6404280 MHz
WDW                         EM
SSB         0
LB                      1.00 Hz
GB          0
PC                      1.40
```