Supplementary Material for

Stereoselective Synthesis of 2-Acetamido-1,2-dideoxynojirimycin (DNJNAc) and Ureido-DNJNAc Derivatives as New Hexosaminidase Inhibitors

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1.- Experimental part.

1.- Synthesis of 3-acetamido-1,3-dideoxyaltronojirimycin (29)

3-Azido-2,4-di-*O*-benzyl-5*N*,6*O*-(cyclic carbamate)-1,3-dideoxyaltronojirimycin (26)

A solution of **20** (278 mg, 0.91 mmol) in DMF (5 mL) was added via cannula to a suspension of NaH (51 mg, 2.01 mmol) in DMF (5 mL) cooled at 0ºC. After 10 min, benzyl bromide (0.17 mL, 1.37 mmol) was added dropwise, and the reaction was allowed to stir at r.t. until no starting material was observed by TLC. H_2O (5 mL) was then added and the crude was extracted with CH_2Cl_2 (3x 5 mL), dried over $MgSO_4$, and purified by chromatography on silica gel using hexane/EtOAc to give **26** (306 mg, 84%) as a colorless oil. $[\alpha]^{20}_D$ = +31.4 (c=0.64, $CHCl_3$). ^{1}H-NMR (400 MHz, $CDCl_3$, δ/ppm): 7.40 – 7.27 (m, 10H), 4.73 (d, *J*=12.0 Hz, 1H), 4.65 (d, *J*=11.5 Hz, 1H), 4.48 (d, *J* = 11.5 Hz, 1H), 4.36 (d, *J* = 12.0 Hz, 1H), 4.32 (m, 1H), 4.11 (m, 1H), 4.07 – 4.00 (m, 1H), 3.94 (d, *J* = 15.0 Hz, 1H), 3.88 (m, 2H), 3.63 (m, 1H), 3.06 (dd, *J* = 15.0, 1.5 Hz, 1H). ^{13}C-NMR (100 MHz, $CDCl_3$, δ/ppm): 157.7 (CO), 137.1 (C), 136.7 (s), 128.7 (s), 128.4 (CH), 128.4 (CH), 128.2 (CH), 128.0 (CH), 127.9 (CH), 75.0 (CH), 73.6 (CH), 71.9 (CH_2), 70.9 (CH_2), 65.4 (CH_2), 59.3 (CH), 52.9 (CH), 38.0 (CH_2). IR (film, ν_{max} / cm^{-1}): 3031, 2912, 2107, 1755, 1454, 1418, 1235, 1070. HRMS (ES): calcd. for $C_{21}H_{23}N_4O_4$: 395.17138, found 395.17222

3-Acetamido-2,4-di-*O*-benzyl-5*N*,6*O*-(cyclic carbamate)-1,3-dideoxyaltronojirimycin (27)

Pd/C (49 mg, 0.05 mmol) was added to a solution of **26** (305 mg, 0.77 mmol) in EtOAc (7 mL) and the reaction was charged with H_2 (5 barg) and stirred at r.t. for 4h. Palladium was filtered over Celite and solvents were removed under low pressure. The colorless oil obtained was dissolved in pyridine (2 mL) and Ac_2O (122 µL, 1.16 mmol) was added. The reaction was stirred at r.t. for 16h. H_2O (5 mL) was then added and the crude was extracted with CH_2Cl_2 (3x 5 mL), dried over $MgSO_4$, and purified by chromatography on silica gel using hexane/EtOAc to give **27** (258 mg, 81%) as a white foam. $[\alpha]^{20}_D$ = +19.5 (c=0.2, $CHCl_3$). Mp: 70-72 ºC. ^{1}H-NMR (400 MHz, $CDCl_3$, δ/ppm): 7.38-7.22 (m, 10H), 5.86 (d, *J* = 5.5 Hz, 1H), 4.72 (d, *J* = 11.5 Hz, 1H), 4.61 (q, *J* = 4.5 Hz, 1H), 4.57 (d, *J* = 11.5, 1H), 4.45 (d, *J* = 11.5 Hz, 1H), 4.37 (d, *J* = 8.0 Hz, 1H), 4.35 (d, *J* = 11.5 Hz, 1H), 4.05 (m, 2H), 3.95 (d, *J* = 14.5 Hz, 1H), 3.90 (dd, *J* = 10.0, 4.5 Hz, 1H), 3.67 (ddd, *J* = 10.0, 8.0, 4.5 Hz, 1H), 3.06 (dd, *J* = 14.5, 1.5 Hz, 1H), 2.00 (s, 3H). ^{13}C-NMR (100 MHz, $CDCl_3$, δ/ppm): 171.1 (CO), 157.7 (CO), 137.5 (C), 136.7 (C), 128.7 (CH), 128.4 (CH), 128.4 (CH), 128.2 (CH), 127.9 (CH), 127.8 (CH), 73.0 (CH), 72.5 (CH), 71.3 (CH_2), 70.7 (CH_2), 66.2 (CH_2), 52.9 (CH), 48.0 (CH), 38.7 (CH_2), 23.3 (CH_3). IR (film, ν_{max} / cm^{-1}): 3325, 2918, 1758, 1658, 1547, 1104, 1071. HRMS (ES): calcd. for $C_{23}H_{27}N_2O_5$: 411.19145, found 411.19126

3-Acetamido-2,4-di-*O*-benzyl-1,3-dideoxyaltronojirimycin (28)

NaOH 6M (0.25 mL, 1.53 mmol) was added to a solution of **27** (63 mg, 0.15 mmol) in MeOH : H_2O 9:1 (5 mL) and the reaction was stirred at reflux for 4 h. H_2O (5 mL) was then added and the crude was extracted with EtOAc (3x 5 mL), dried over $MgSO_4$ and purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **28** (56 mg, 94%) as a colorless oil. $[\alpha]^{20}_D$ = -5.4 (c=0.55, CH_3OH). ^{1}H-NMR (400 MHz, CD_3OD, δ/ppm): 7.40 – 7.25 (m, 10H), 4.65 (m, 3H), 4.54 (d, *J* = 11.5 Hz, 1H), 4.44 (d, *J* = 11.5 Hz, 1H), 3.93 (m, *J* = 6.5 Hz, 3H), 3.74 (dd, *J* = 11.5, 6.5 Hz, 1H), 3.41 (m, 1H), 3.27 (dd, *J* = 13.5, 2.0 Hz, 1H), 3.17 (d, *J* = 13.5 Hz, 1H), 1.99 (s, 3H). ^{13}C-NMR (100 MHz, CD_3OD, δ/ppm): 173.8 (CO), 138.9 (C), 138.5 (CH), 129.5 (CH), 129.4 (CH), 129.2 (CH), 129.1 (CH), 129.0 (CH), 73.7 (CH), 73.0 (CH_2), 72.0 (CH_2), 70.6 (CH), 59.6 (CH_2), 57.0 (CH), 47.5 (CH), 43.9 (CH_2), 22.6 (CH_3). IR (film, ν_{max} / cm^{-1}): 3641, 3212, 3065, 1653, 1454, 1247, 1169, 1030. HRMS (ES): calcd. for $C_{22}H_{29}N_2O_4$: 385.2122, found 385.2111

3-Acetamido-1,3-dideoxyaltronojirimycin (29)

Pd/C (44 mg, 0.04 mmol) was added to a solution of **28** (200 mg, 0.52 mmol) in previously degassed MeOH (10 mL) was added Pd/C (44 mg, 0.04 mmol). The reaction was charged with H_2 (20 barg) and stirred at 60ºC for 20h. Palladium was then filtered through Celite and the crude was purified by chromatography on silica gel using CH_2Cl_2/MeOH/NH_3 72.5:25:2.5 to give **29** (82 mg, 77%) as a slightly yellow sticky foam. $[\alpha]^{20}_D$ = -16.5 (c=0.42, MeOH). ^{1}H-NMR (400 MHz, D_2O, δ/ppm): 4.13 (dd, *J* = 6.0, 4.0 Hz, 1H), 4.00 (dd, *J* = 7.5, 4.0 Hz, 1H), 3.88 (td, *J* = 6.0, 3.0 Hz, 1H), 3.82 – 3.74 (m, 2H), 3.04 – 2.89 (m, 2H), 2.78 (dd, *J* = 14.0, 6.0 Hz, 1H), 2.06 (s, 3H). ^{13}C-NMR (100 MHz, D_2O, δ/ppm, d^6-DMSO internal reference): 176.1 (CO), 68.6 (CH), 66.8 (CH), 61.4 (CH_2), 58.7 (CH), 54.5 (CH), 46.4 (CH_2), 23.6 (CH_3). IR (film, ν_{max} / cm^{-1}): 3311, 2930, 1650, 1549, 1376, 1299, 1068. HRMS (ES): calcd. for $C_8H_{17}N_2O_4$: 205.11828, found 205.11806

2.- Preparation of compounds 32b-d.

2-Acetamido-3,4-6-tri-*O*-acetyl-1,2-dideoxy-5-*N*-(*N'*-octylaminocarbonyl)nojirimycin (32b)

TFA (0.53 mL, 6.92 mmol) was added to a solution of **31** (99 mg, 0.23 mmol) in CH_2Cl_2 (8 mL) and the reaction was stirred at r.t. until no starting material was observed by TLC. Solvent was removed under low pressure and the resulting oil was dissolved in CH_2Cl_2 (8 mL). TEA (0.25 mL, 1.79 mmol) and octyl isocyanate (122 µl, 0.69 mmol) were added and the reaction was heated at reflux for 4h. H_2O (5 mL) was then added and the reaction was extracted with CH_2Cl_2 (3x 5 mL), dried over $MgSO_4$, and purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **32b** (71 mg, 85%) as a colorless oil. $[\alpha]^{20}_D$ = -57.2 (c=2.01, $CHCl_3$). ^{1}H-NMR (400 MHz, $CDCl_3$, δ/ppm): 6.52 (d, *J* = 7.5 Hz, 1H), 5.10 – 4.98 (m, 2H), 4.91 (m, 1H), 4.47 (dd, *J* = 11.0, 7.5 Hz, 1H), 4.26 (td, *J* = 7.0, 2.0 Hz, 1H), 4.20 – 4.11 (m, 1H), 4.07 (m, 1H), 3.98 (d, *J* = 14.0 Hz, 1H), 3.30 (dd, *J* = 14.5, 3.0 Hz, 1H), 3.22 (m, 2H), 2.12 (s, 3H), 2.10 (s, 3H), 2.07 (s, 3H), 1.98 (s, 3H), 1.50 (t, *J* = 7.0 Hz, 2H), 1.29 (m, 10H), 0.88 (t, *J* = 6.5 Hz, 3H). ^{13}C-NMR (100 MHz, $CDCl_3$, δ/ppm): 171.0 (CO), 169.6 (CO), 168.8 (CO), 168.7 (CO), 159.1 (CO), 68.1 (CH) , 67.0 (CH), 61.0 (CH_2), 53.9 (CH), 46.6 (CH), 41.1 (CH_2), 39.1 (CH_2), 31.7 (CH_2), 30.0 (CH_2), 29.2 (CH_2), 29.19 (CH_2), 26.8 (CH_2), 23.2 (CH_3), 22.5 (CH_2), 20.8 (CH_3), 20.8 (CH_3), 20.7 (CH_3), 14.0 (CH_3). IR (film, ν_{max} / cm^{-1}): 3359, 2936, 2846, 1758, 1649, 1521, 1373, 1213, 1040. HRMS (ES): calcd. for $C_{23}H_{40}N_3O_8$: 486.28099, found 486.28081

2-Acetamido-3,4-6-tri-*O*-acetyl-1,2-dideoxy-5-*N*-(*N'*-phenylaminocarbonyl)nojirimycin (32c)

TFA (0.41 mL, 5.18 mmol) was added to a solution of **31** (75 mg, 0.17 mmol) in CH_2Cl_2 (8 mL) and the reaction was stirred at r.t. until no starting material was observed by TLC. Solvent was removed under reduced pressure and the resulting oil was dissolved in CH_2Cl_2 (8 mL). TEA (0.19 mL, 1.35 mmol) and phenyl isocyanate (56 µl, 0.52 mmol) were added and the reaction was heated at reflux for 4h. H_2O (5 mL) was then added and the reaction was extracted with CH_2Cl_2 (3x 5 mL), dried over $MgSO_4$, and purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **32c** (63 mg, 80%) as a white solid. $[\alpha]^{20}_D$ = -73.0 (c=0.24, $CHCl_3$). Mp: 79-82 ºC. ^{1}H-NMR (400 MHz, $CDCl_3$, δ/ppm): 7.44 (m, 2H), 7.30 (m, 3H), 7.07 (tt, *J* =7.0, 1.0 Hz, 1H), 6.46 (d, *J* = 7.5 Hz, 1H), 5.07 (t, *J* = 3.5 Hz, 1H), 4.97 (m, 1H), 4.54 (dd, *J* = 11.5, 7.0 Hz, 1H), 4.42 (t, *J* = 7.5 Hz, 1H), 4.24 (dd, *J* = 11.5, 7.5 Hz, 1H),4.17 (dt, *J*=14.5, 1.5 Hz,1H) 4.12 (q, *J* = 3.5 Hz, 1H), 3.37 (dd, *J* = 14.5, 3.0 Hz, 1H), 2.15 (s, 6H), 2.07 (s, 3H), 1.98 (s, 3H). ^{13}C-NMR (100 MHz, $CDCl_3$, δ/ppm): 171.7 (CO), 170.0 (CO), 169.0 (CO), 168.8 (CO), 156.4 (CO), 138.9 (C), 129.1 (CH), 123.6 (CH), 119.7 (CH), 68.2 (CH), 67.3 (CH), 61.5 (CH_2), 54.1 (CH), 46.8 (CH), 39.4 (CH_2), 23.5 (CH_3), 21.1 (CH_3), 21.0 (CH_3), 20.9 (CH_3). IR (film, ν_{max} / cm^{-1}): 3333, 3013, 2928, 1746, 1662, 1537, 1444, 1370, 1232. HRMS (ES): calcd. for $C_{21}H_{28}N_3O_8$: 450.18709, found 450.18715

2-Acetamido-3,4-6-tri-*O*-acetyl-5-*N*-(*N'*-benzylaminocarbonyl)-1,2-dideoxynojirimycin (32d)

TFA (0.39 mL, 5.15 mmol) was added to a solution of **31** (74 mg, 0.17 mmol) in CH_2Cl_2 (8 mL) and the reaction was stirred at r.t. until no starting material was observed by TLC. Solvent was removed under

low pressure and the resulting oil was dissolved in CH_2Cl_2 (8 mL). TEA (0.19 mL, 1.33 mmol) and benzyl isocyanate (63 µl, 0.52 mmol) were added and the reaction was heated at reflux for 4h. H_2O (5 mL) was then added and the reaction was extracted with CH_2Cl_2 (3x 5 mL), dried over $MgSO_4$, and purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **32d** (56 mg, 70%) as a colorless oil. $[\alpha]^{20}_D$ = -55.0 (c=1.30, $CHCl_3$). ^{1}H-NMR (400 MHz, $CDCl_3$, δ/ppm): 7.36 – 7.25 (m, 5H), 6.46 (d, *J* = 7.5 Hz, 1H), 5.40 (t, *J* = 5.5 Hz, 1H), 5.01 (t, *J* = 3.5 Hz, 1H), 4.90 (m, 1H), 4.50 – 4.42 (m, 2H), 4.36 (dd, *J* = 15.0 ,5.0 Hz, 2H), 4.14 (dd, *J* = 11.5, 6.5 Hz, 1H), 4.06 (dd, *J* = 7.0, 3.5 Hz, 1H), 4.00 (d, *J* = 15.0 Hz, 1H), 3.33 (dd, *J* = 15.0, 3.5 Hz, 1H), 2.11 (s, 3H), 2.03 (s, 3H), 1.96 (s, 3H), 1.91 (s, 3H). ^{13}C-NMR (100 MHz, $CDCl_3$, δ/ppm): 170.0 (CO), 168.8 (CO), 168.0 (CO), 168.0 (CO), 159.0 (CO), 138.3 (C), 127.7 (CH), 126.7 (CH), 126.5 (CH), 67.2 (CH), 66.2 (CH), 60.0 (CH_2), 53.2 (CH), 45.7 (CH), 44.1 (CH_2), 38.4 (CH_2), 22.3 (CH_3), 19.9 (CH_3), 19.9 (CH_3), 19.7 (CH_3). IR (film, ν_{max} / cm^{-1}): 3359, 2927, 1746, 1651, 1532, 1370, 1225, 1043. HRMS (ES): calcd. for $C_{22}H_{30}N_3O_8$: 464.20270, found 464.20274.

3.- Preparation of compounds 10b-d.

2-Acetamido-1,2-dideoxy-5-*N*-(*N'*-octylaminocarbonyl)nojirimycin (10b).

32b (71 mg, 0.20 mmol) was dissolved in a NH_3 saturated MeOH solution (4 mL) and the reaction was stirred at r.t. for 18h. Solvent was removed under low pressure, and the crude was purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **10b** (47 mg, 75%) as a slightly yellow solid. $[\alpha]^{20}_D$ = +26.9 (c=2.0, CH_3OH). Mp: 57-59 ºC. ^{1}H-NMR (400 MHz, CD_3OD, δ/ppm): 3.95 (m, 1H), 3.92 – 3.80 (m, 3H), 3.79 – 3.70 (m, 2H), 3.61 (t, *J* = 4.5 Hz, 1H), 3.35 (dd, *J* = 14.0, 3.0 Hz, 1H), 3.21 – 3.05 (m, 2H), 1.95 (s, 3H), 1.49 (m, 2H), 1.35 – 1.27 (m, 10H), 0.90 (t, *J* = 7.0 Hz, 3H). ^{13}C-NMR (100 MHz, CD_3OD, δ/ppm): 172.6 (CO), 161.7 (CO), 71.6 (CH), 70.2 (CH), 61.9 (CH), 61.7 (CH_2), 51.6 (CH), 41.8 (CH_2), 40.9 (CH_2), 33.0 (CH_2), 31.1 (CH_2), 30.5 (CH_2), 30.4 (CH_2), 28.0 (CH_2), 23.7 (CH_3), 22.9 (CH_2), 14.4 (CH_3). IR (film, ν_{max} / cm^{-1}): 3333, 2917, 2853, 1623, 1533, 1373. HRMS (ES): calcd. for $C_{17}H_{34}N_3O_5$: 360.24930, found 360.24925

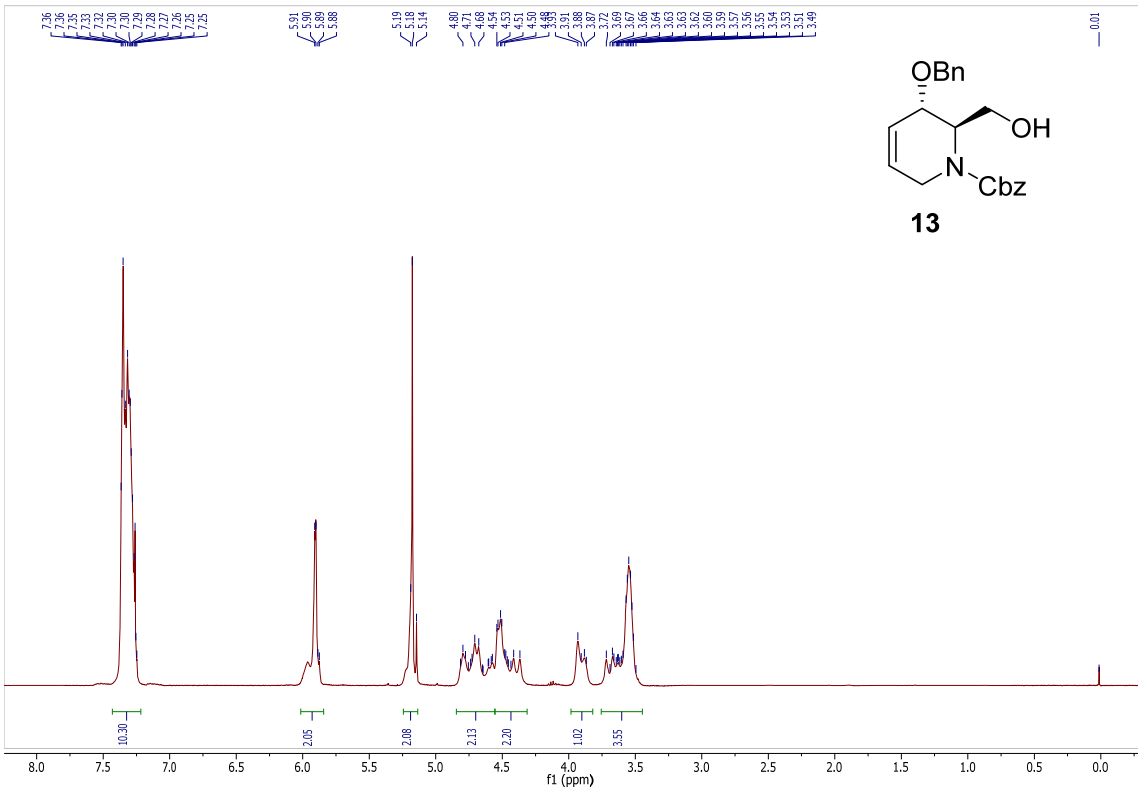
2-Acetamido-1,2-dideoxy-5-*N*-(*N'*-phenylaminocarbonyl)nojirimycin (10c)

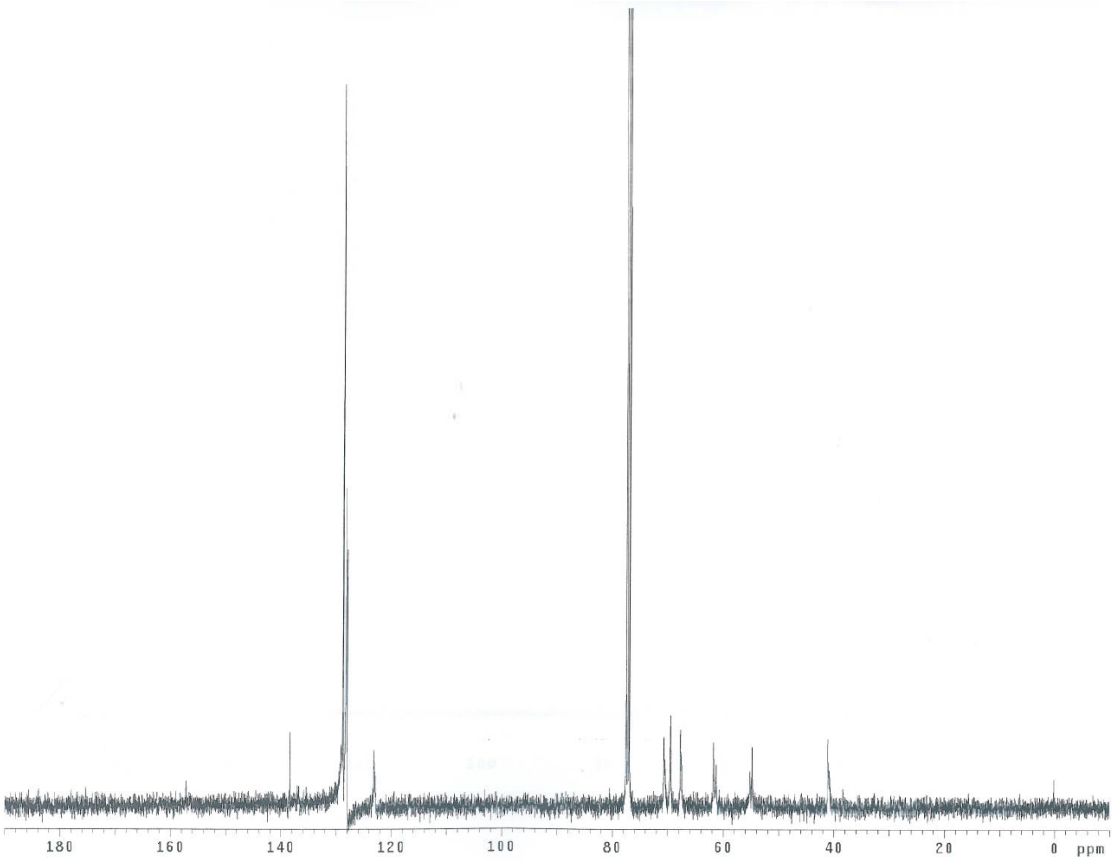
32c (60 mg, 0.13 mmol) was dissolved in a NH_3 saturated MeOH solution (4 mL) and the reaction was stirred at r.t. for 18h. Solvent was removed under low pressure, and the crude was purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **10c** (25 mg, 58%) as a slightly yellow solid. $[\alpha]^{20}_D$ = +21.5 (c=1.2, CH_3OH). Mp: 61-63 ºC. ^{1}H-NMR (400 MHz, CD_3OD, δ/ppm): 7.33 – 7.22 (m, 4H), 7.02 – 6.96 (m, 1H), 4.13 (m, 1H), 4.04 – 3.97 (m, 2H), 3.92 (q, *J* = 3.5 Hz, 1H), 3.82 (dd, *J* = 11.5, 3.5 Hz, 1H), 3.73 (t, *J* = 5.0Hz, 1H), 3.66 (t, *J* = 5.0 Hz, 1H), 3.42 (dd, *J* = 14.0, 3.5 Hz, 1H), 1.97 (s, 3H). ^{13}C-NMR (100 MHz, CD_3OD, δ/ppm): 172.87 (CO), 159.6 (CO), 140.9 (C), 129.6 (CH), 123.8 (CH), 121.4 (CH), 71.5 (CH), 70.4 (CH), 62.5 (CH), 61.9 (CH_2), 51.7 (CH), 40.8 (CH_2), 22.9(CH_3). IR (film, ν_{max} / cm^{-1}): 3227, 2923, 1636, 1533, 1444. HRMS (ES): calcd. for $C_{15}H_{22}N_3O_5$: 324.15540, found 324.15551

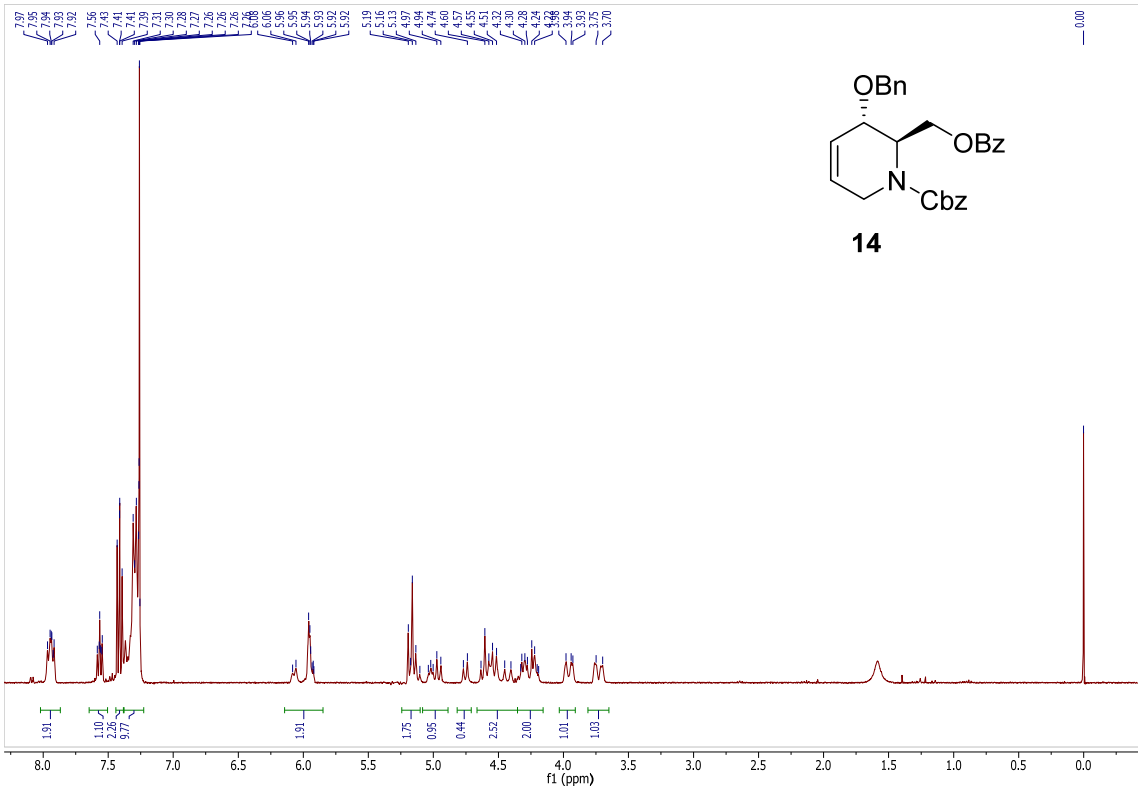
2-Acetamido-5-*N*-(*N'*-benzylaminocarbonyl)-1,2-dideoxynojirimycin (10d)

32d (56 mg, 0.12 mmol) was dissolved in a NH_3 saturated MeOH solution (4 mL) and the reaction was stirred at r.t. for 18h. Solvent was removed under low pressure, and the crude was purified by chromatography on silica gel using CH_2Cl_2/MeOH to give **10d** (31 mg, 76%) as a slightly yellow solid. $[\alpha]^{20}_D$ = +39.5 (c=1.4, CH_3OH). Mp: 56-58 ºC. ^{1}H-NMR (400 MHz, CD_3OD, δ/ppm): 7.35 – 7.26 (m, 4H), 7.21 (m, 1H), 4.35 (dd, *J* = 15.0 Hz, 2H), 4.08 – 4.03 (m, 1H), 3.94 – 3.85 (m, 3H), 3.80 – 3.71 (m, 2H), 3.63 (t, *J* = 4.5 Hz, 1H), 3.40 (dd, *J* = 15.0, 4.0 Hz, 1H), 1.89 (s, 3H). ^{13}C-NMR (100 MHz, CD_3OD, δ/ppm): 172.6 (CO), 161.6 (CO), 141.3(C), 129.3 (CH), 128.1 (CH), 127.8 (CH), 71.4 (CH), 70.2 (CH), 61.8 (CH), 61.6 (CH_2), 51.5 (CH), 45.3 (CH_2), 40.8 (CH_2), 22.9 (CH_3). IR (film, ν_{max} / cm^{-1}): 3353, 2917, 1617, 1533, 1450, 1264, 1059. HRMS (ES): calcd. for $C_{16}H_{24}N_3O_5$: 338.17105, found 338.17116.

4.- NMR spectra



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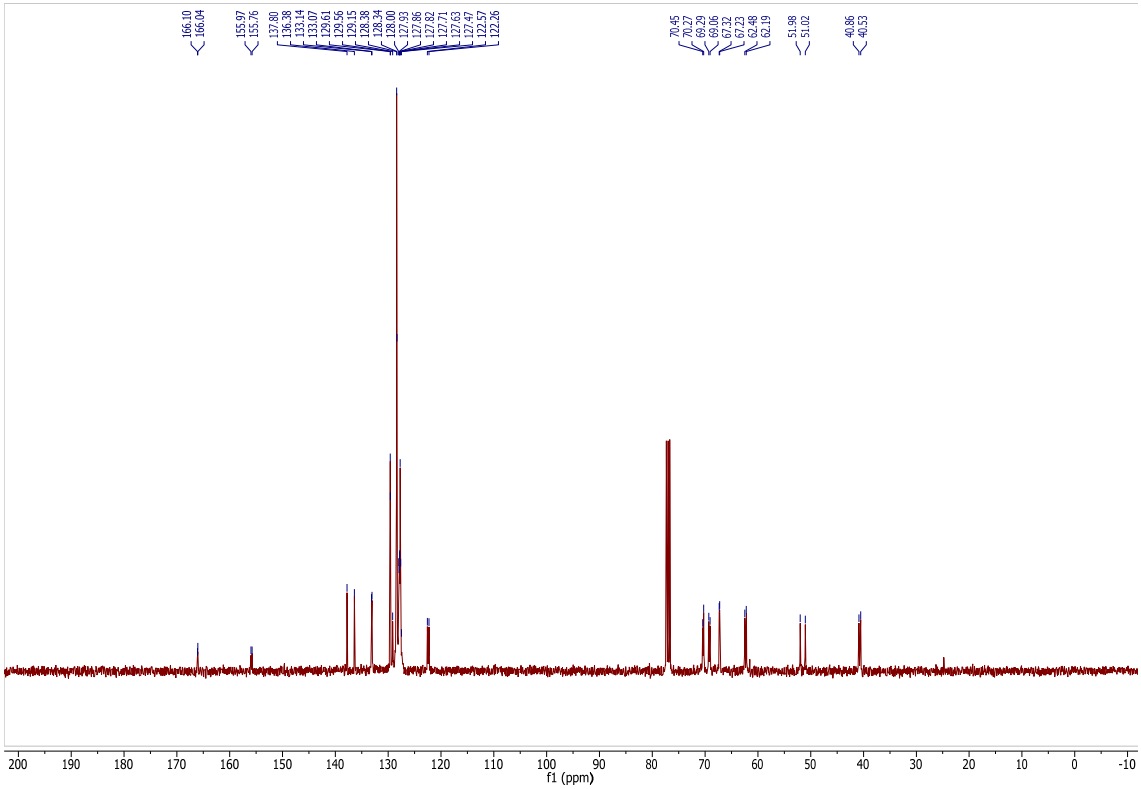
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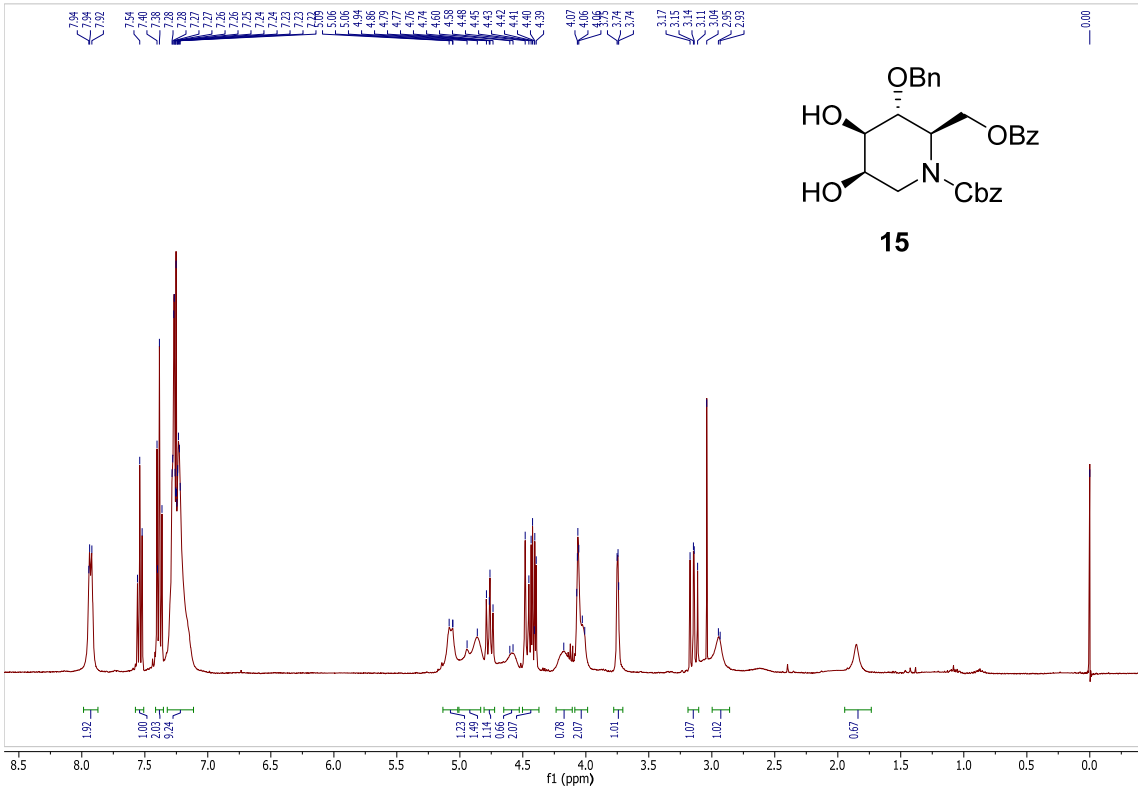
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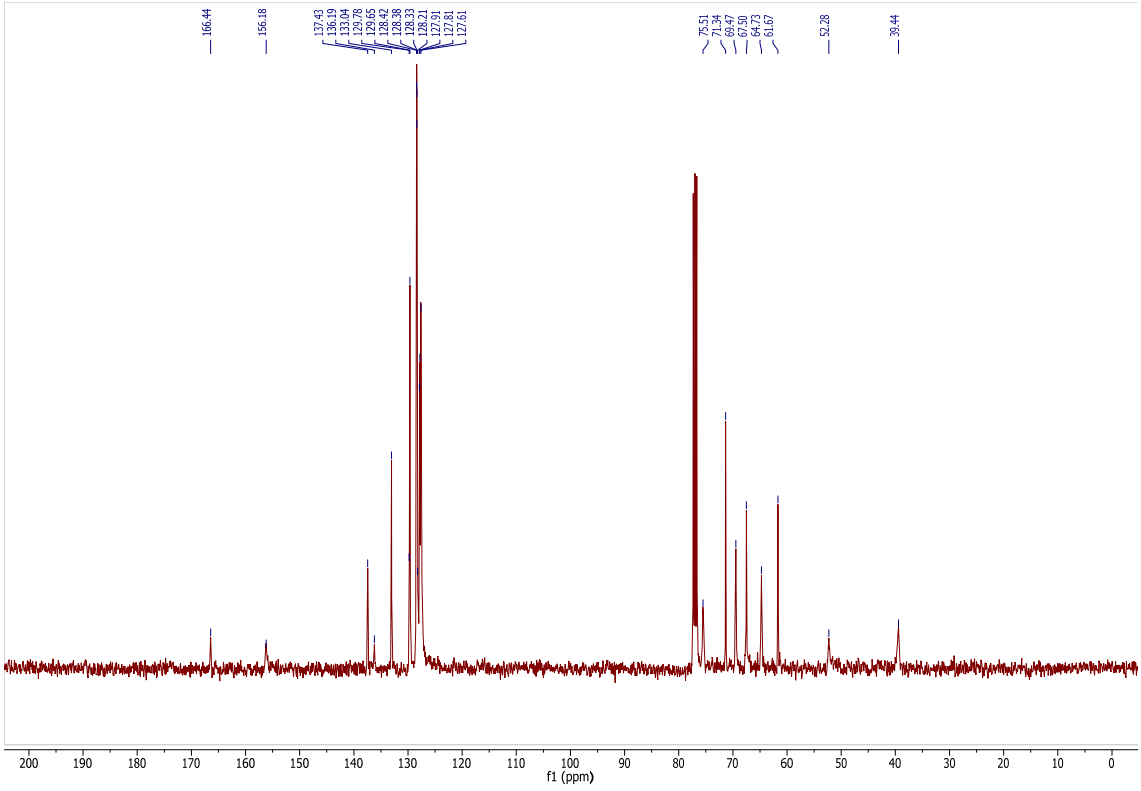
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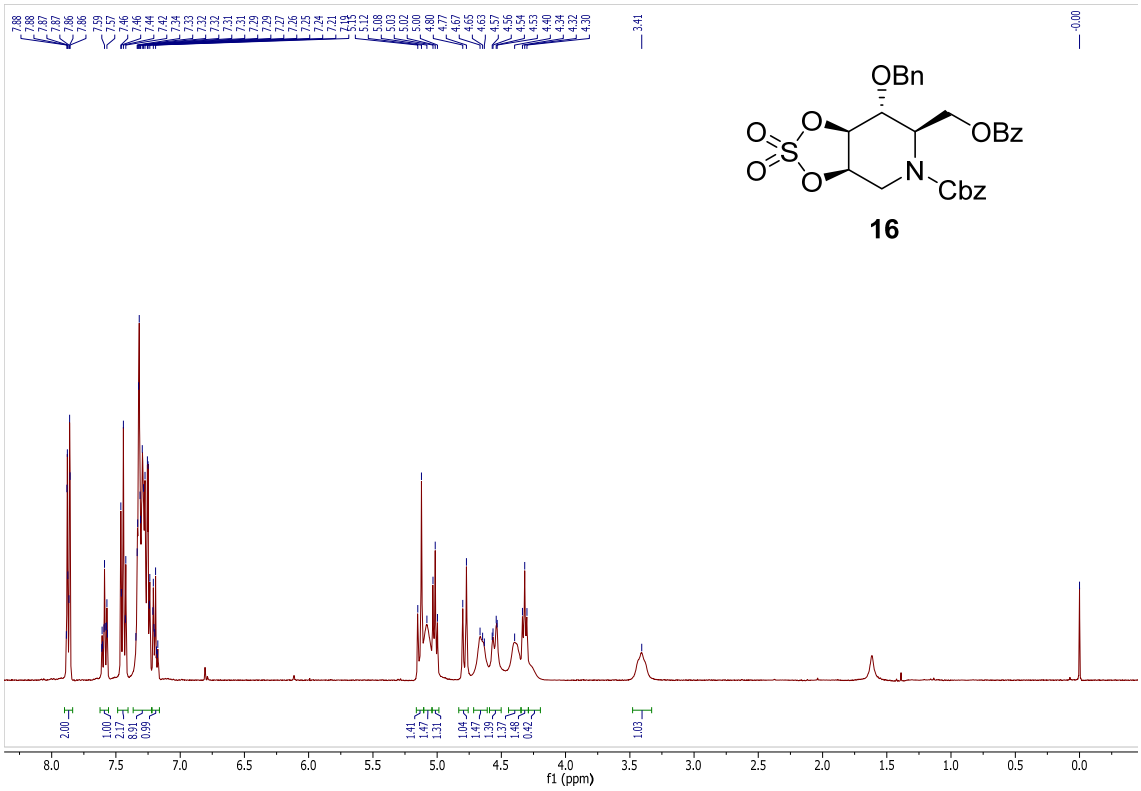
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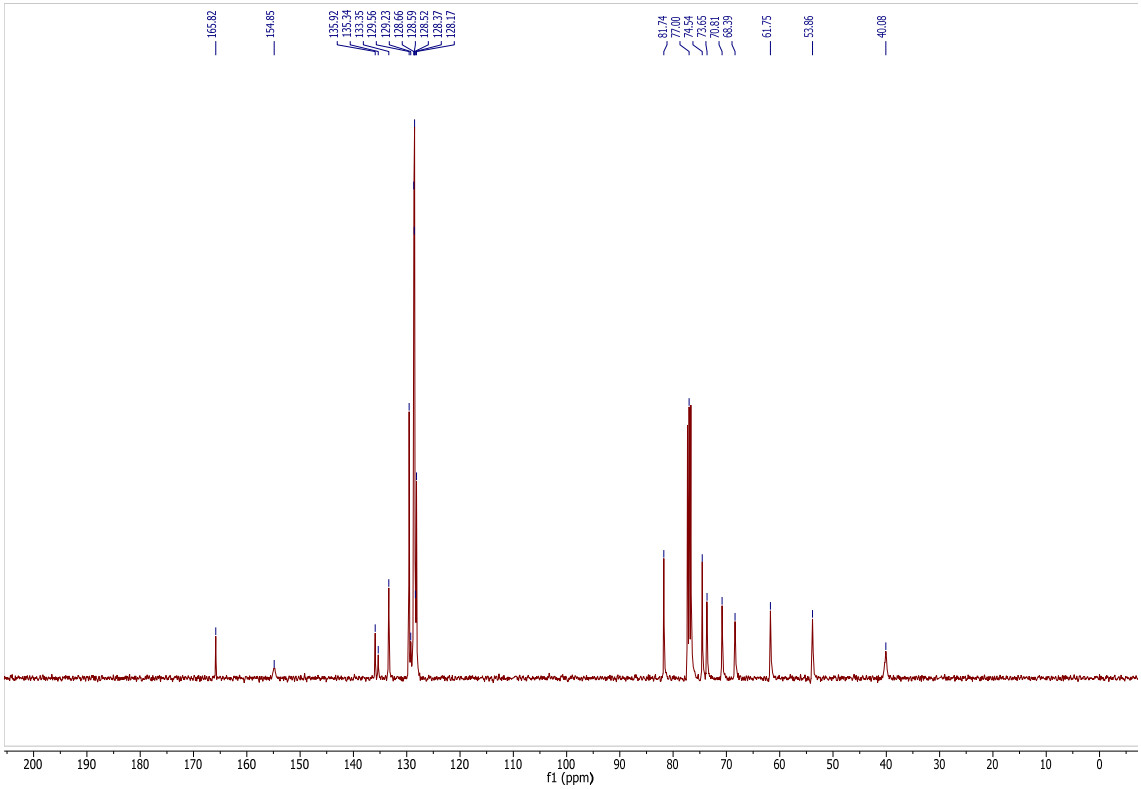
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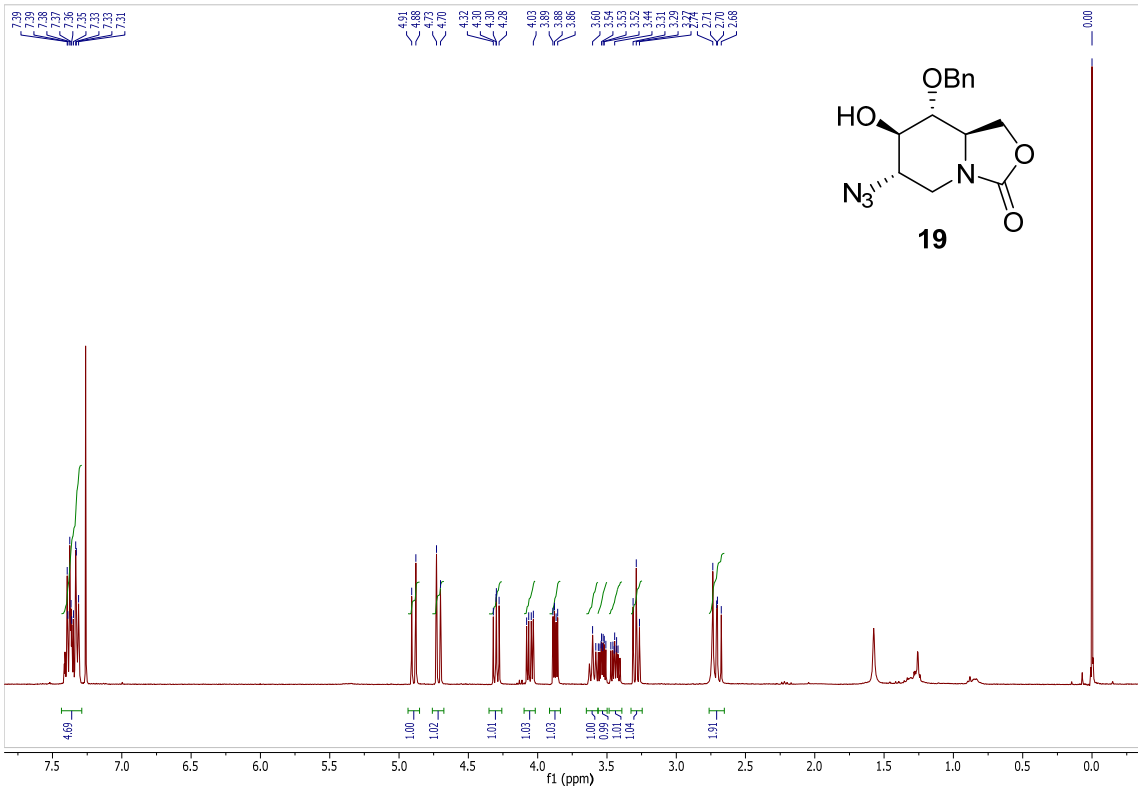
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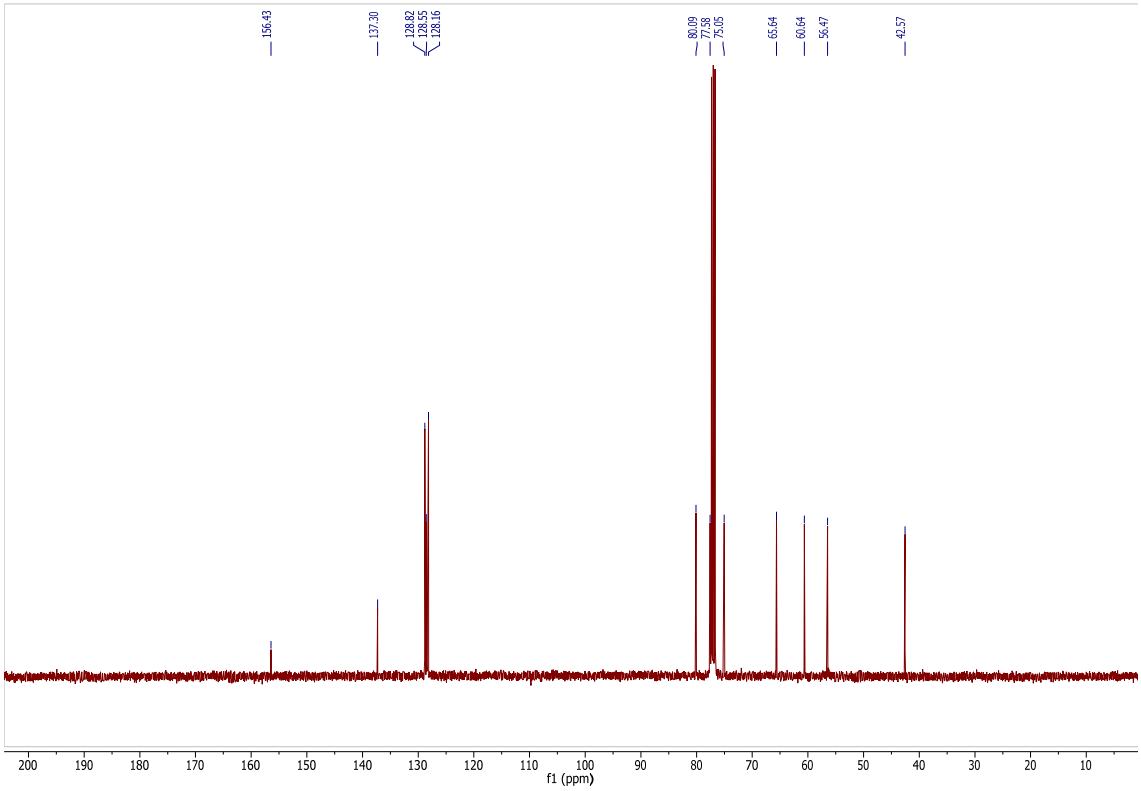
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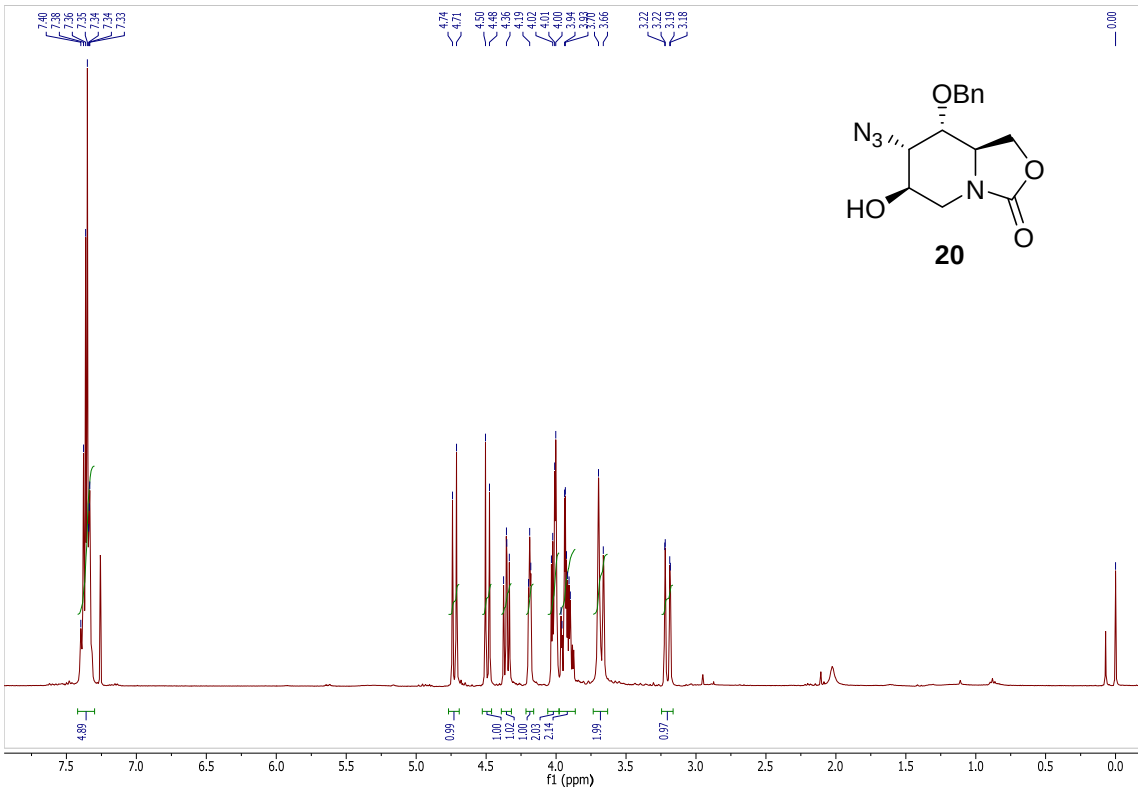
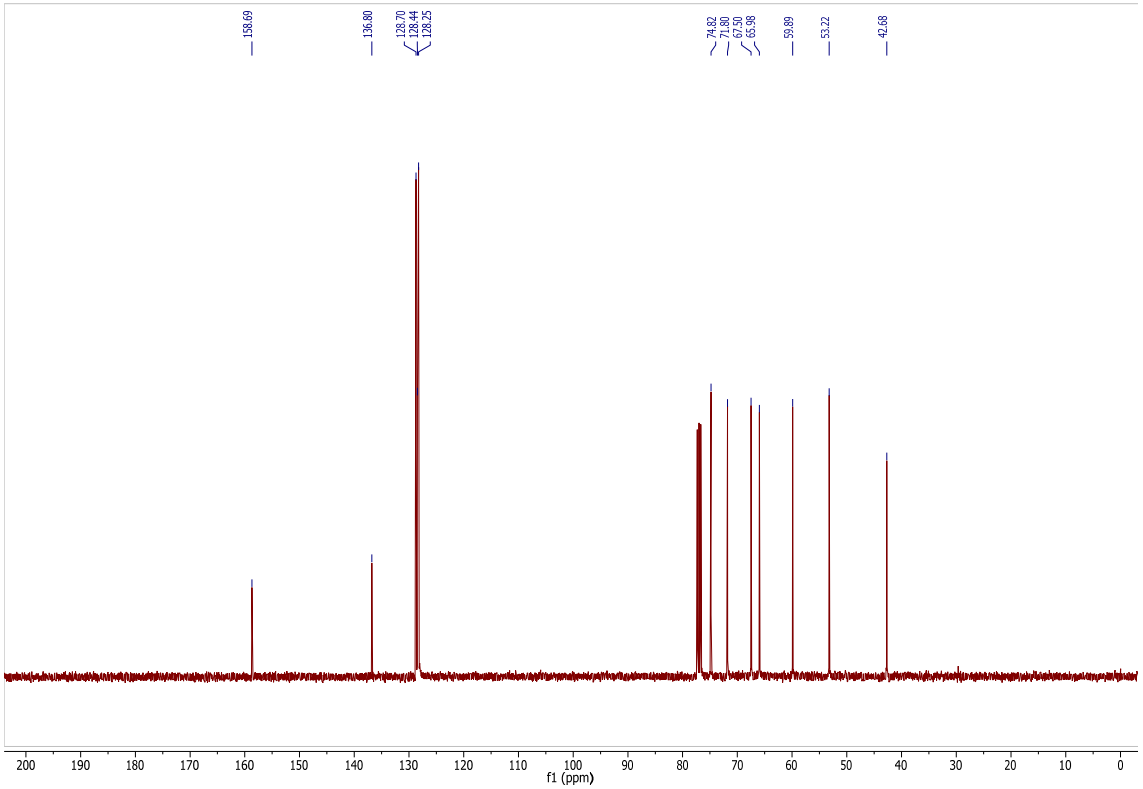
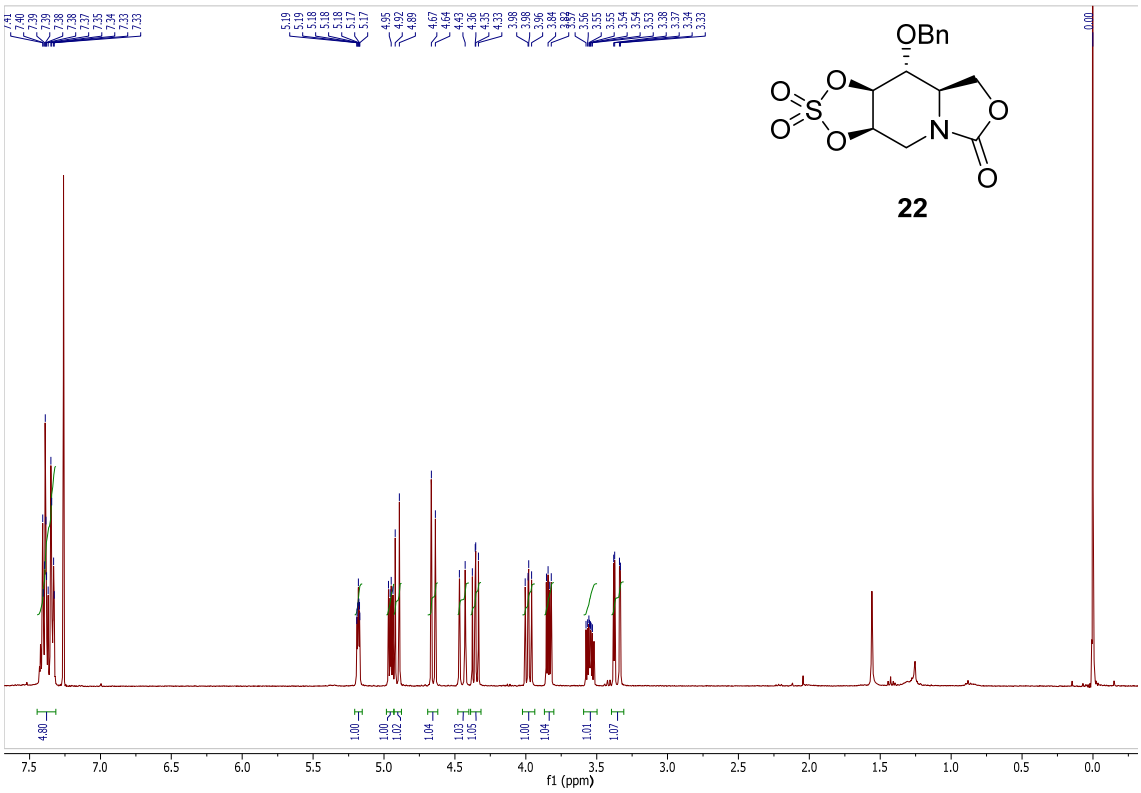
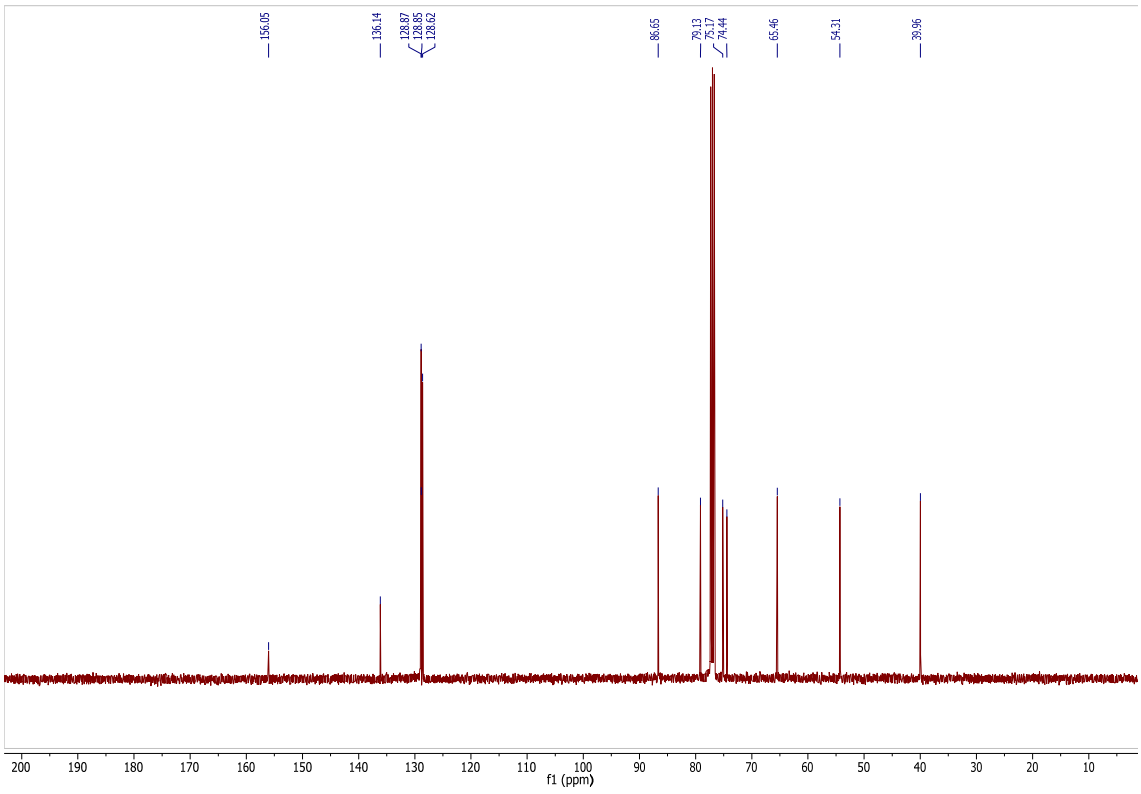
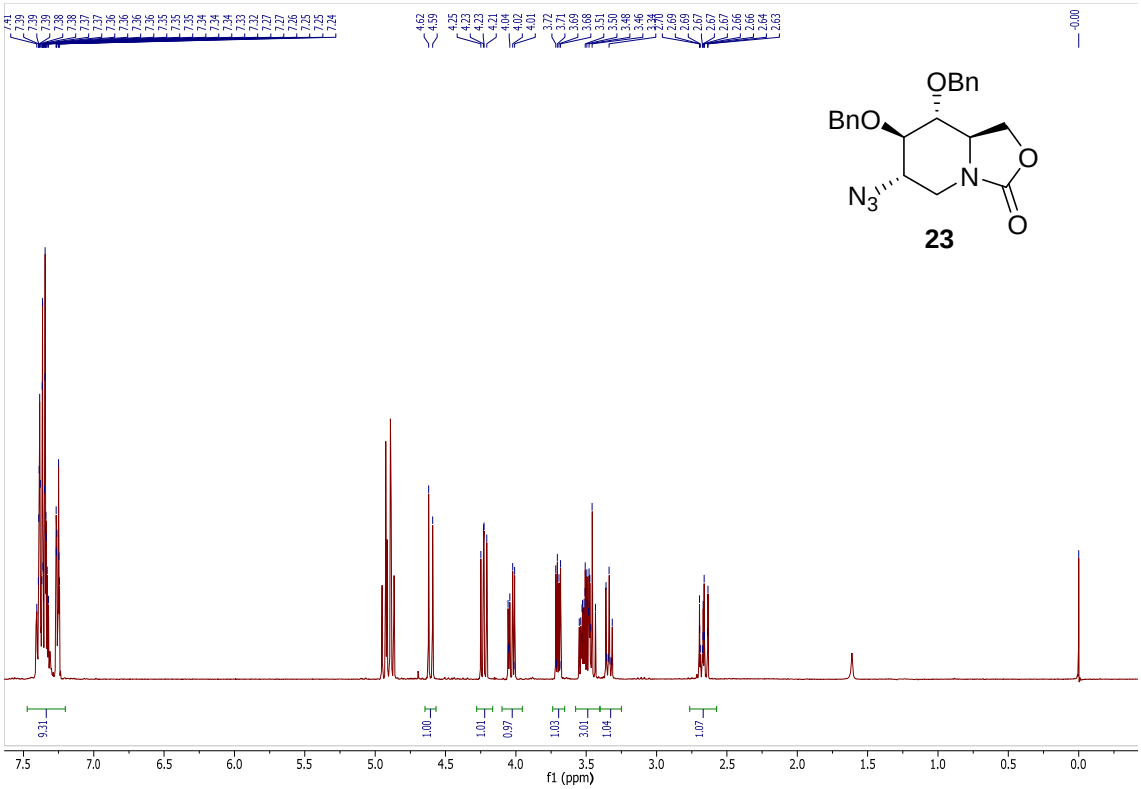
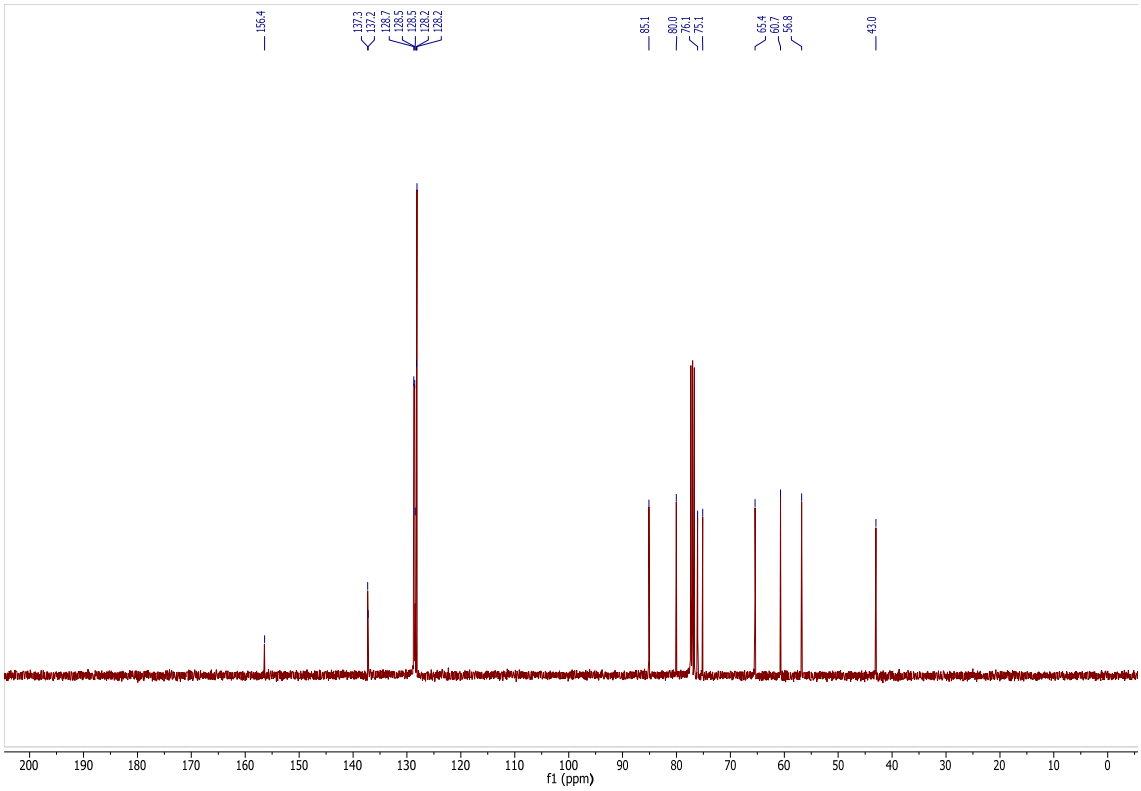

OBn
N3
HO
O
N
O
20
f1 (ppm)

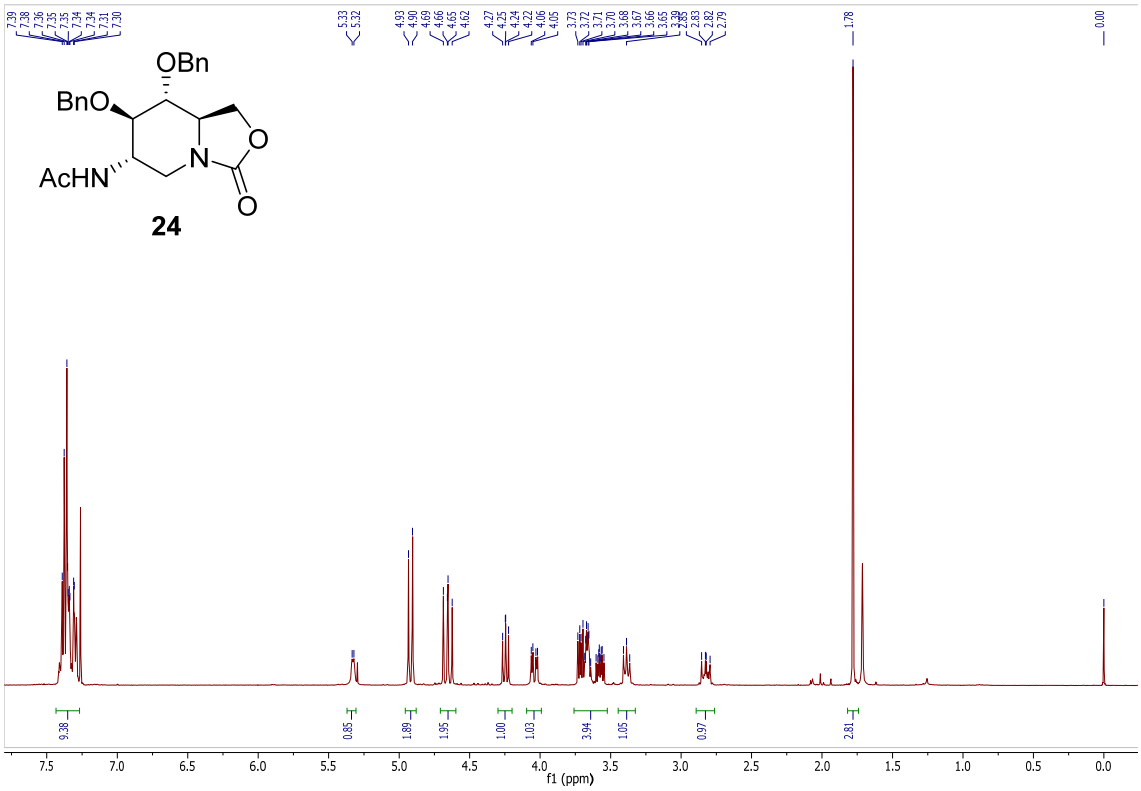

f1 (ppm)

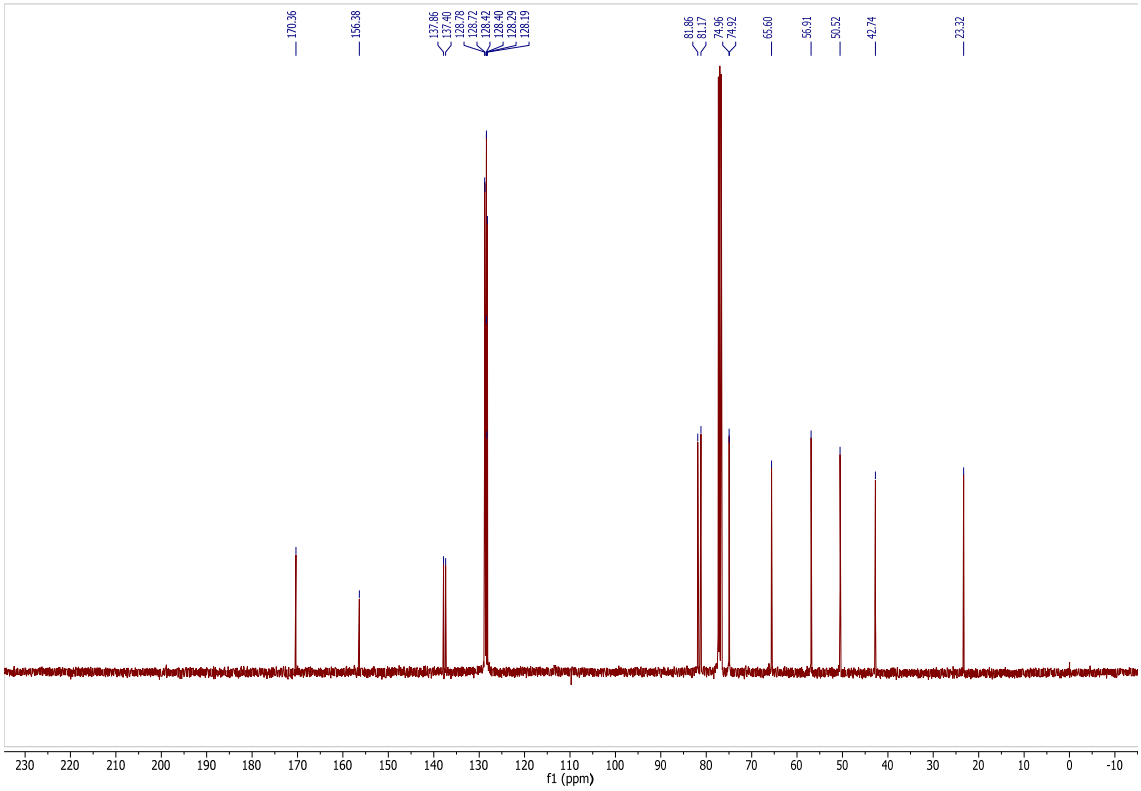

OBn
O
S
O
O
O
N
O
O
22
f1 (ppm)

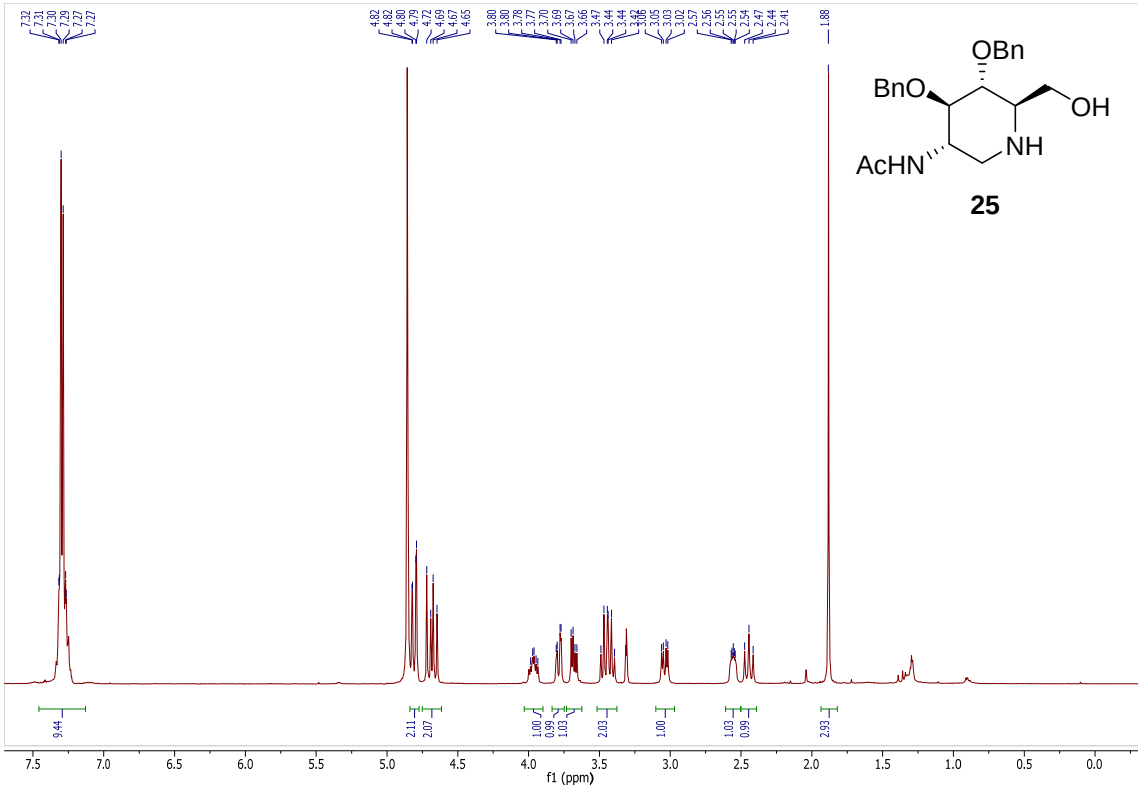

156.05
136.14
128.87
128.85
128.62
86.65
79.13
75.17
74.44
65.46
54.31
39.96
f1 (ppm)

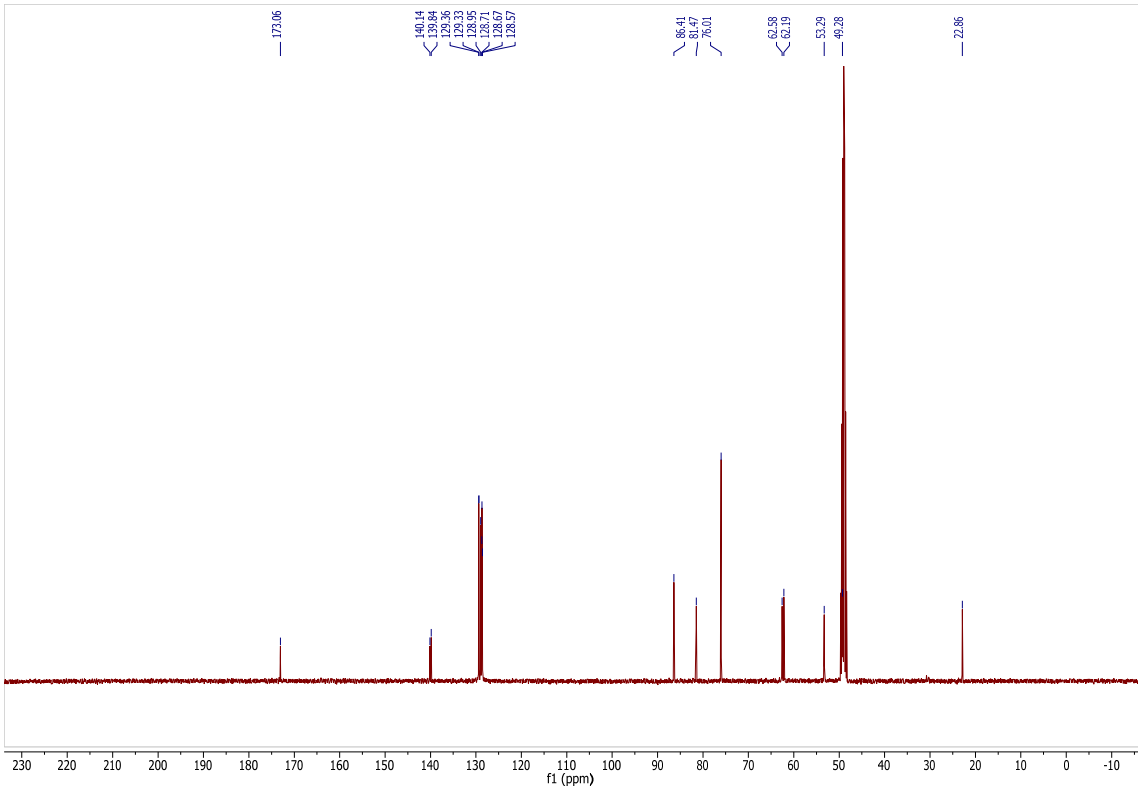

OBn
BnO
N3
N
O
O
23
f1 (ppm)

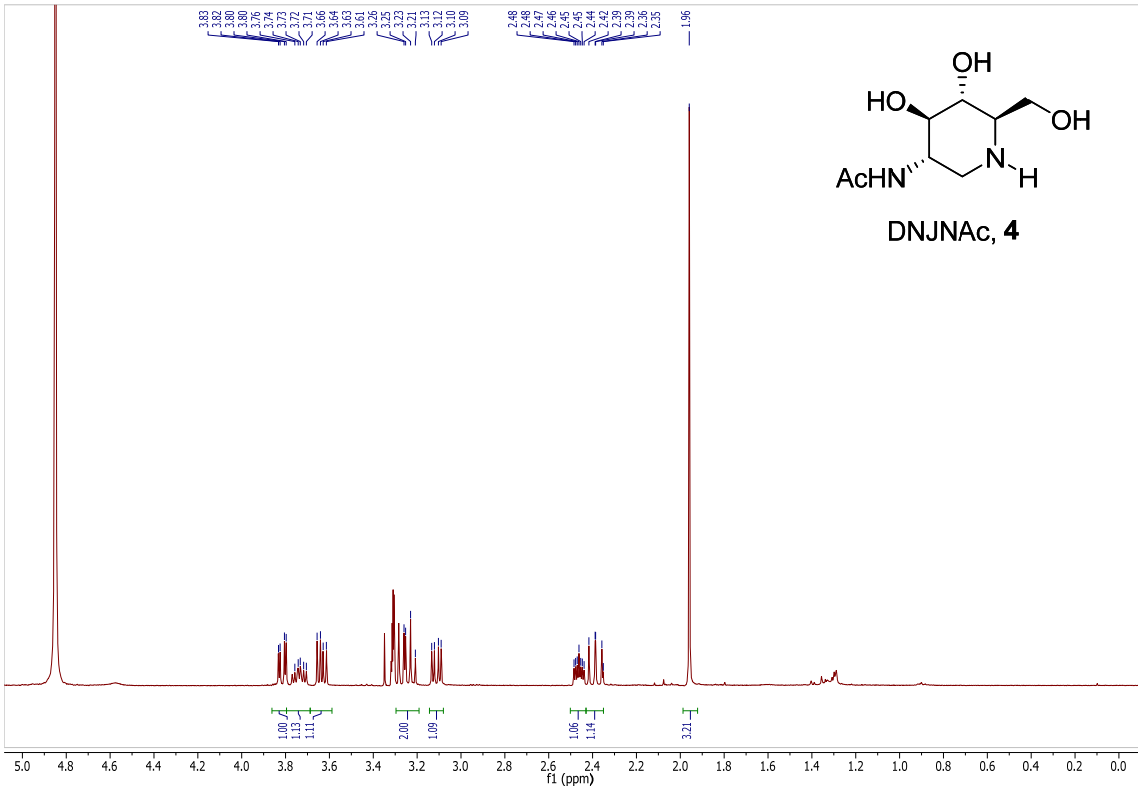

f1 (ppm)

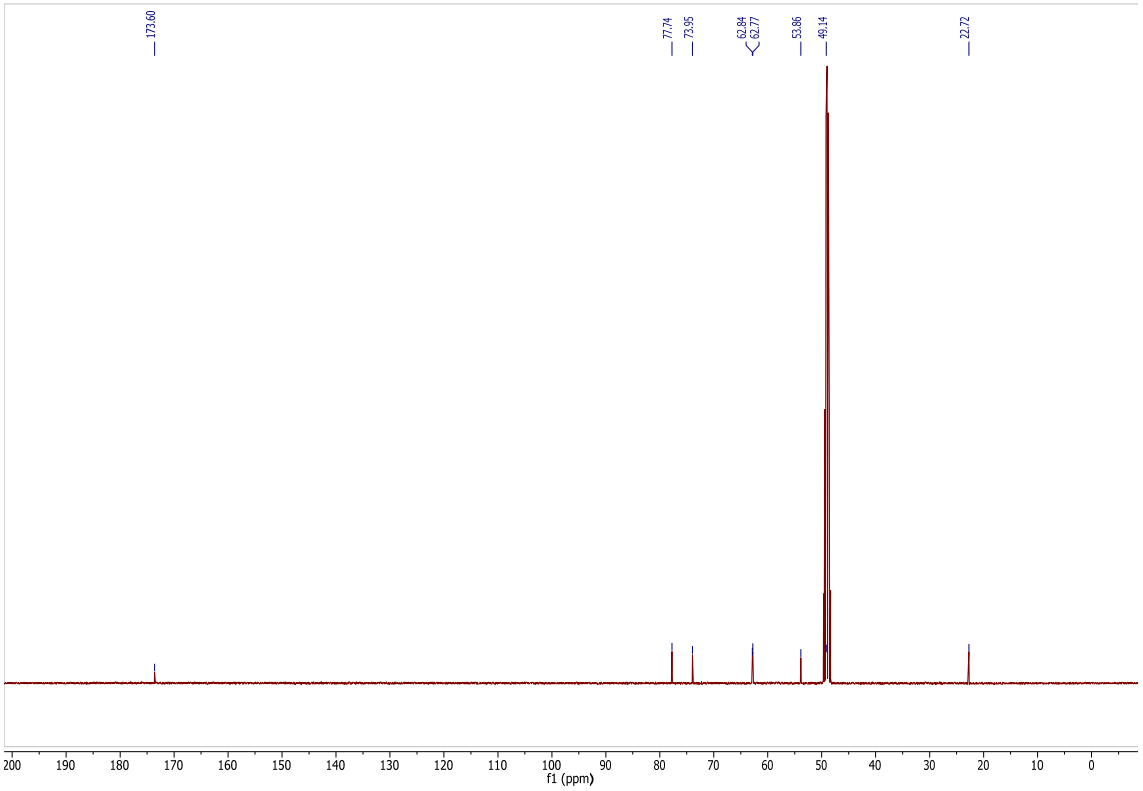

OBn
BnO
AcHN
N
O
O
24
f1 (ppm)

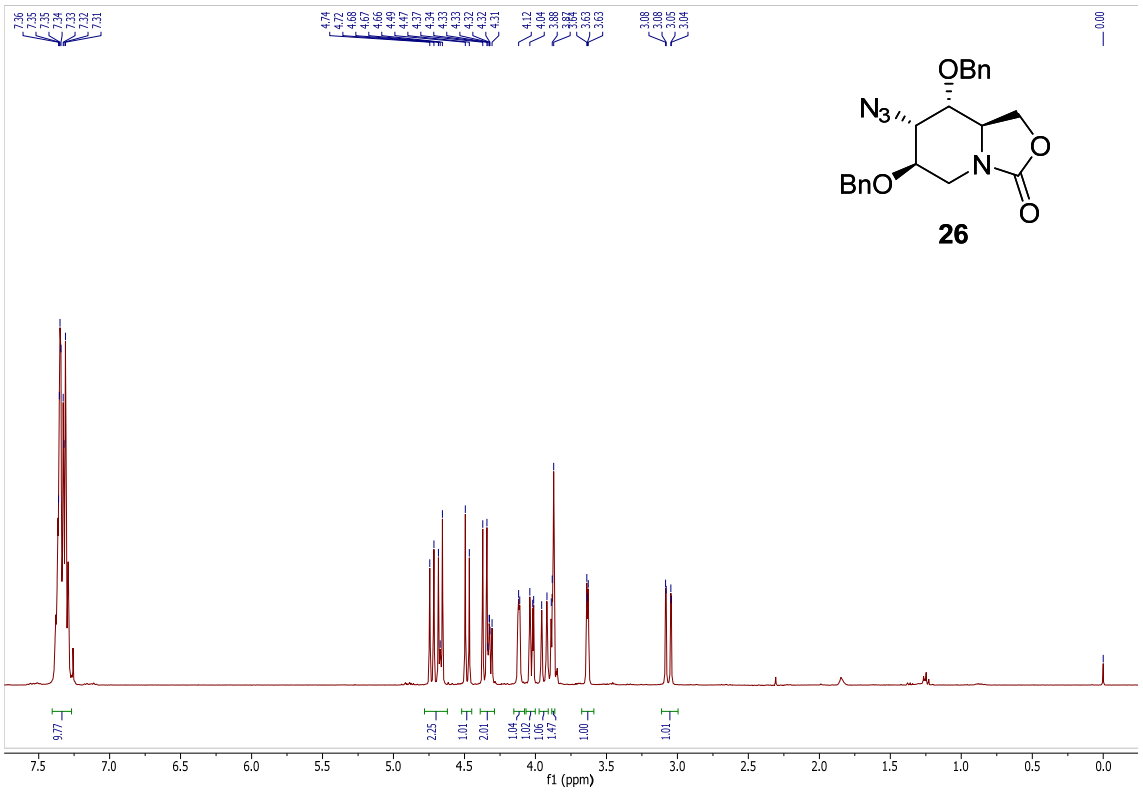

f1 (ppm)

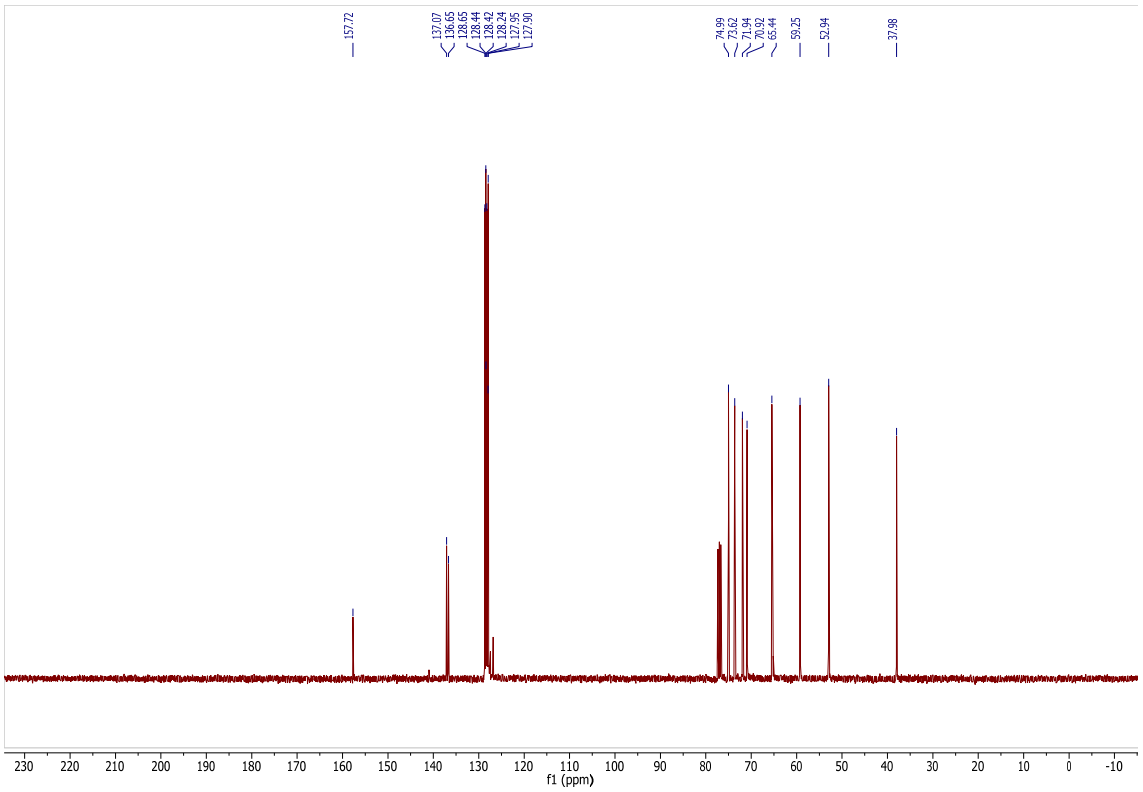

OBn
BnO
OH
NH
AcHN
25
f1 (ppm)

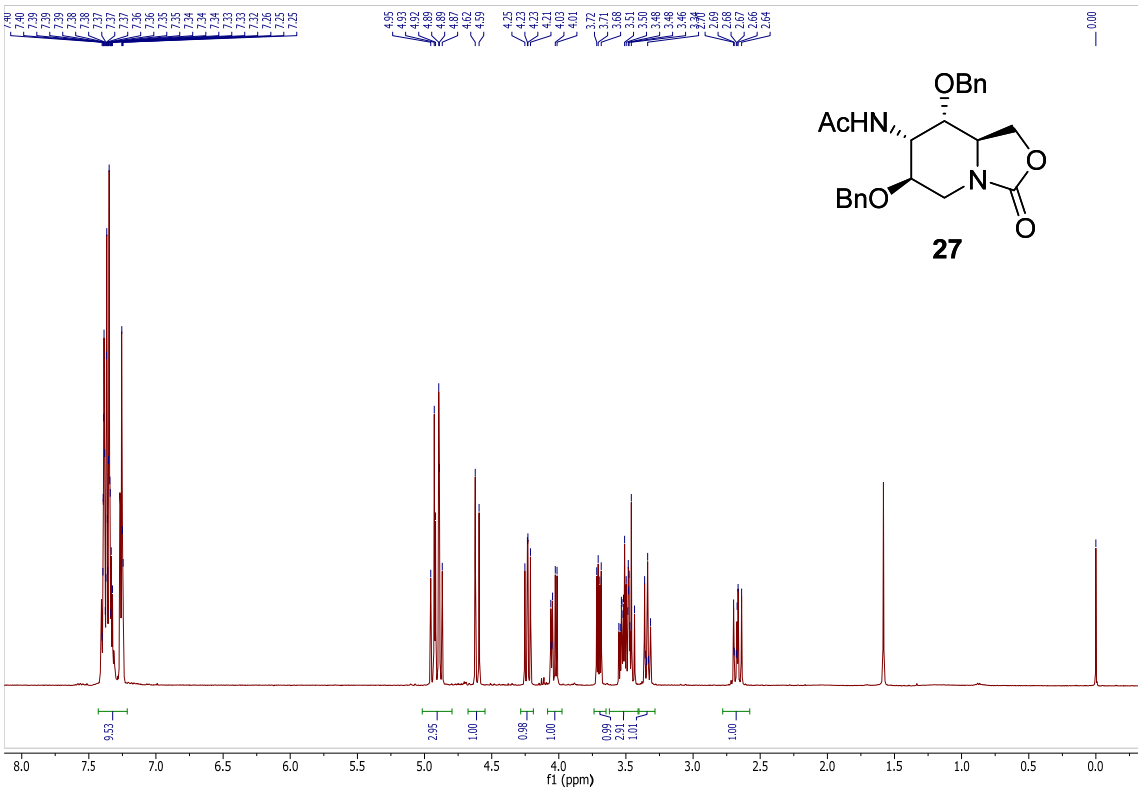

f1 (ppm)

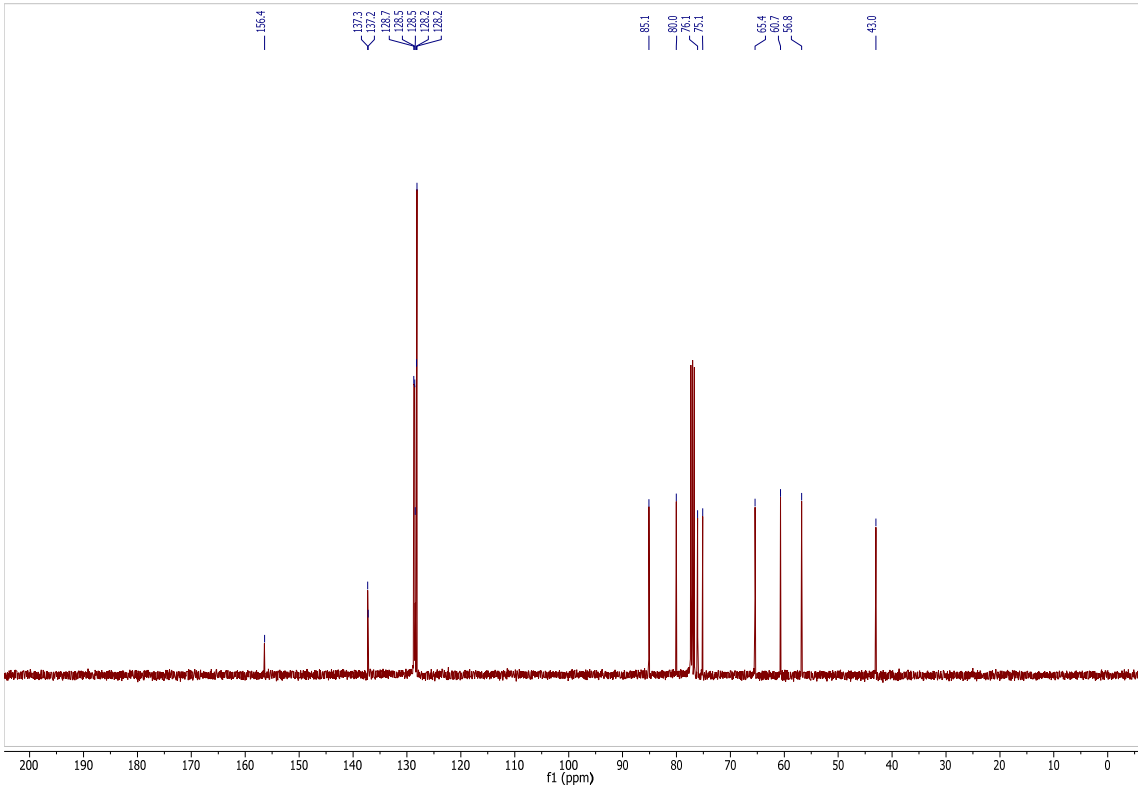

OH
HO
OH
AcHN
N
H
DNJNAc, 4
f1 (ppm)

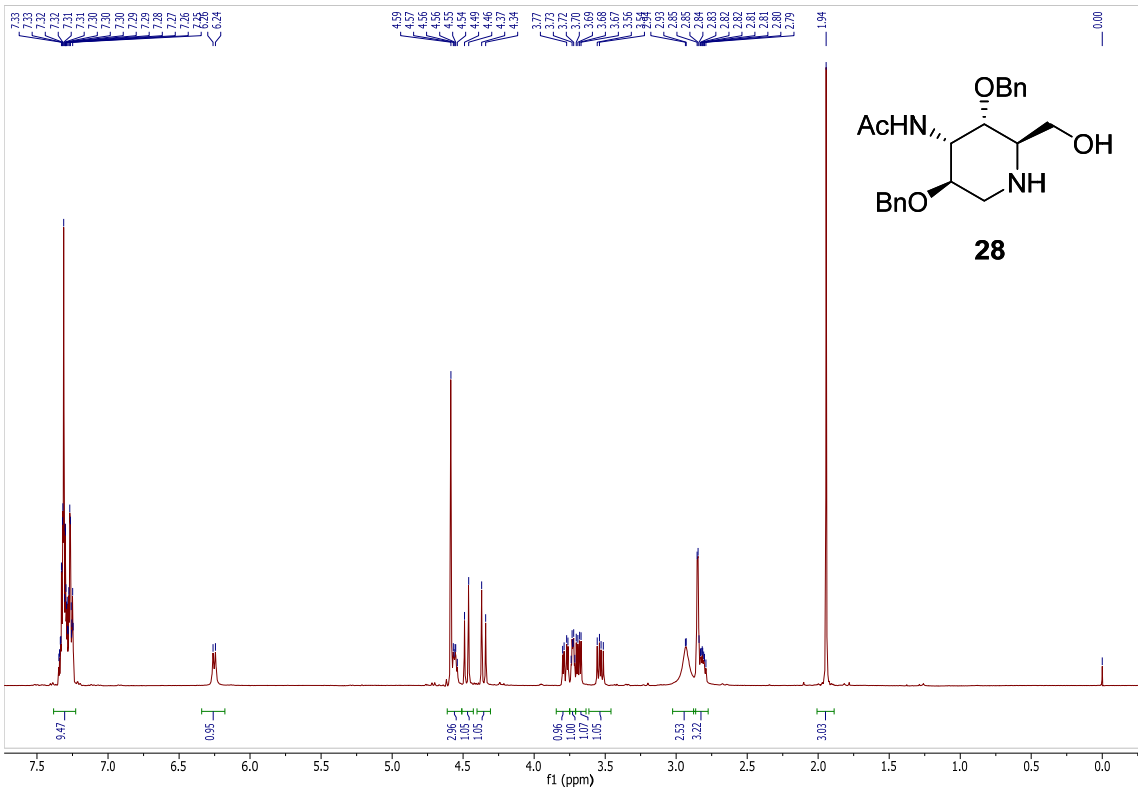

f1 (ppm)

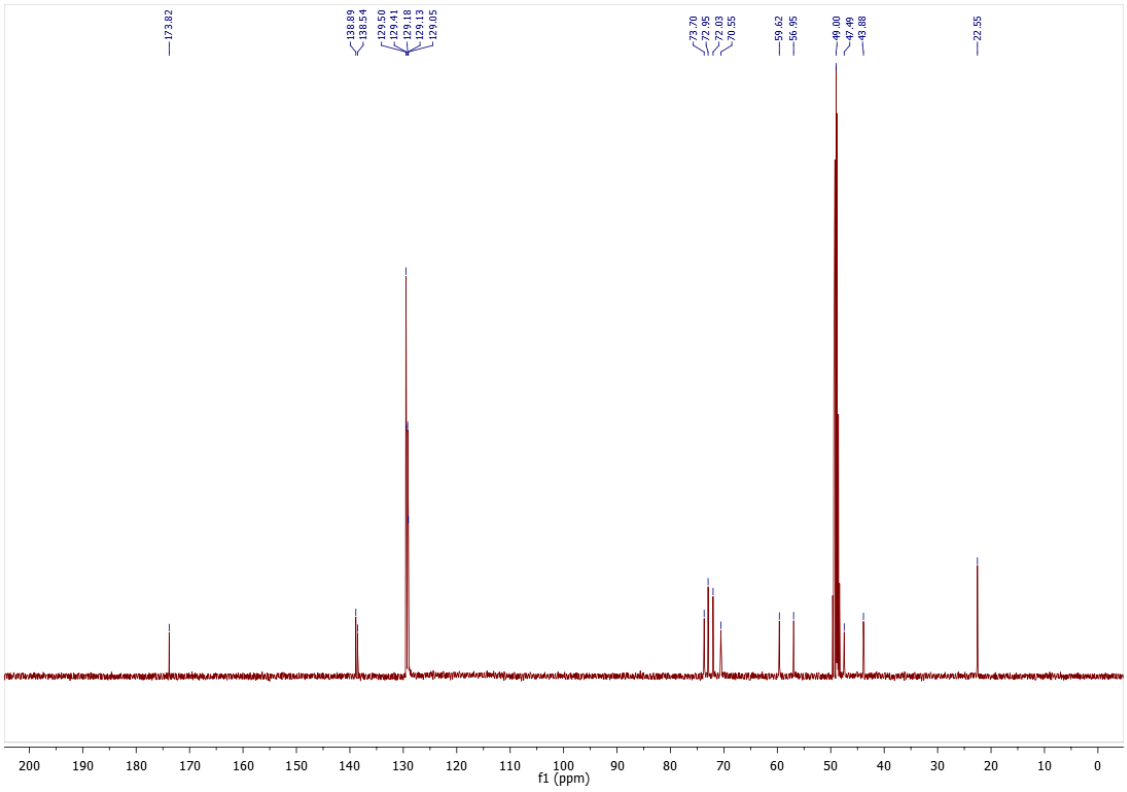

OBn
N3
BnO
O
N
O
O
26
f1 (ppm)

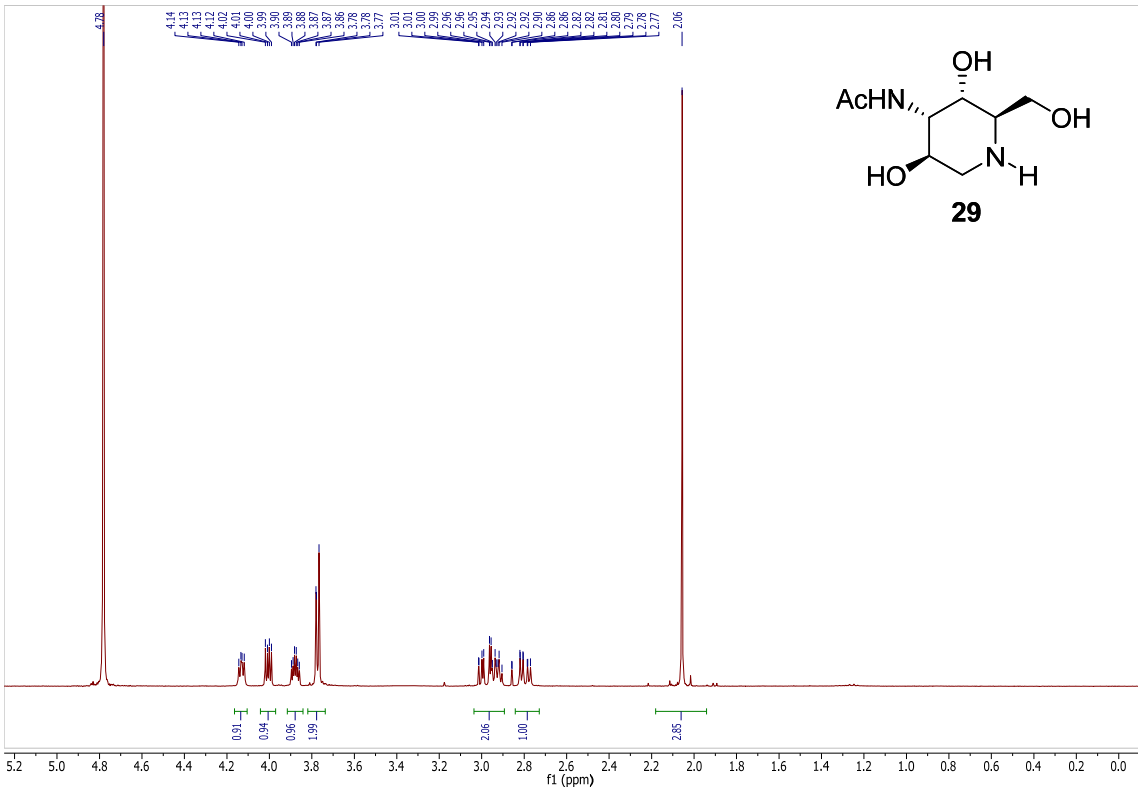

f1 (ppm)

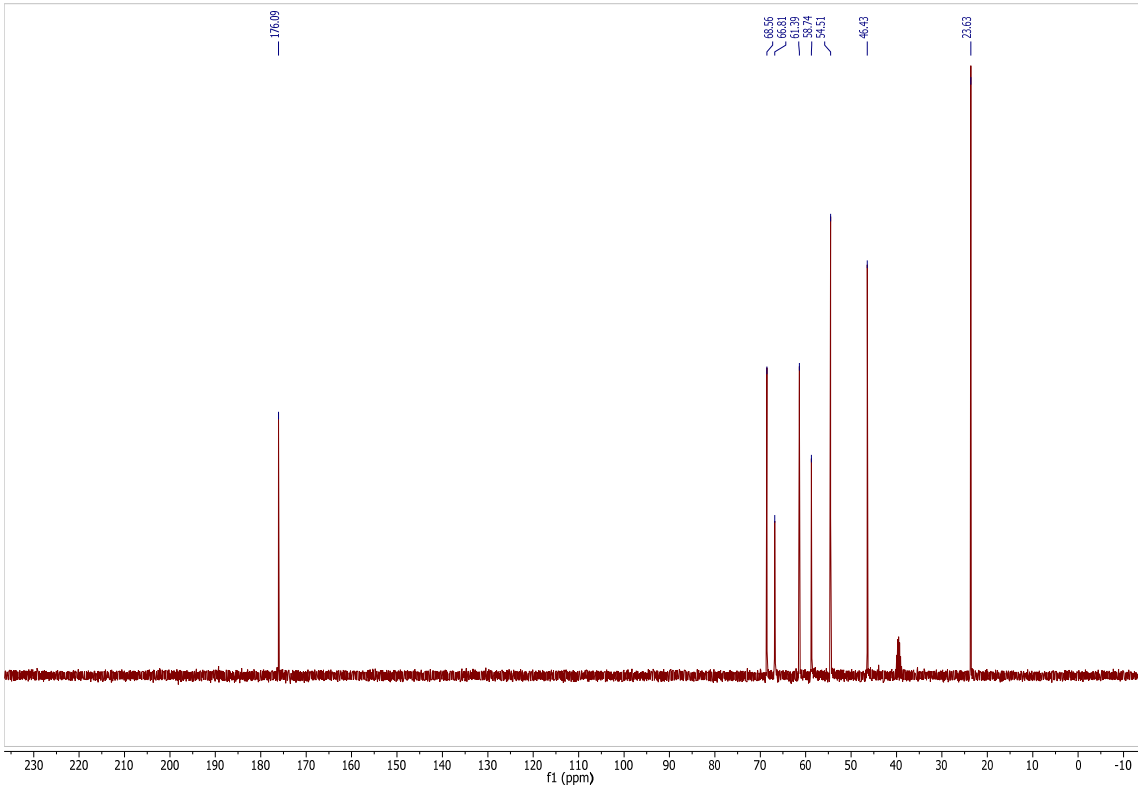

OBn
AcHN
BnO
O
N
O
O
27
f1 (ppm)

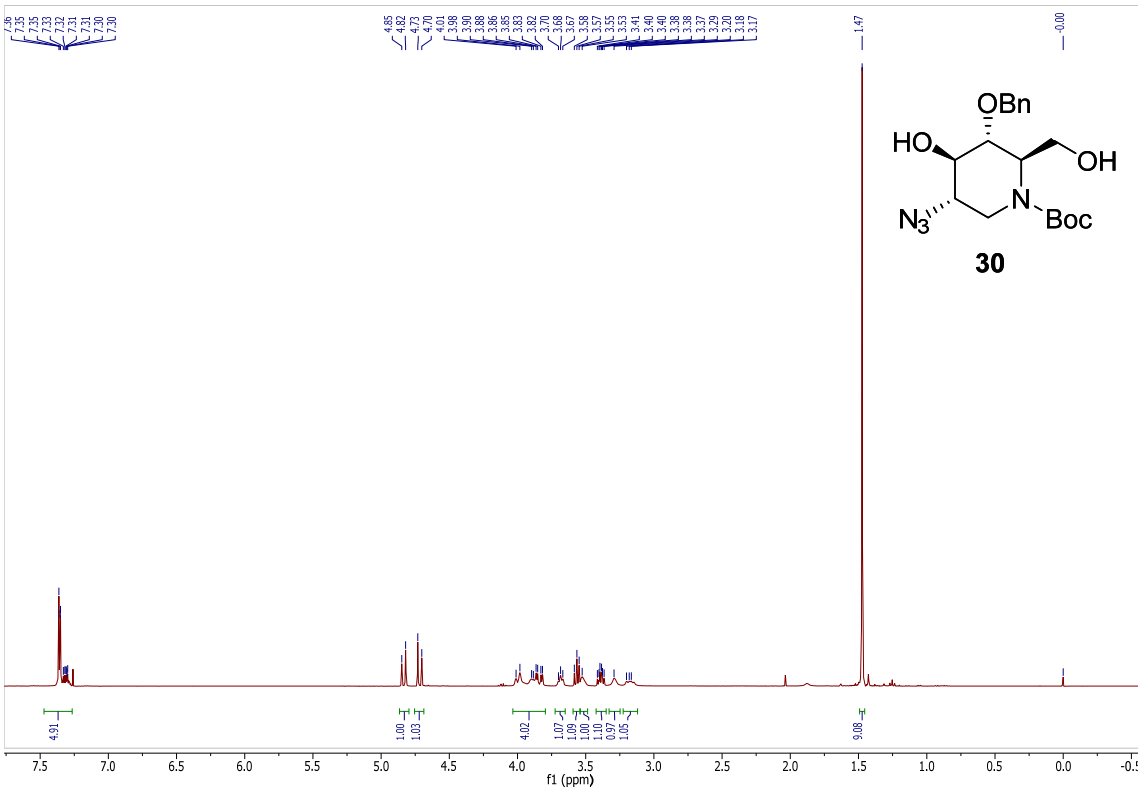

f1 (ppm)

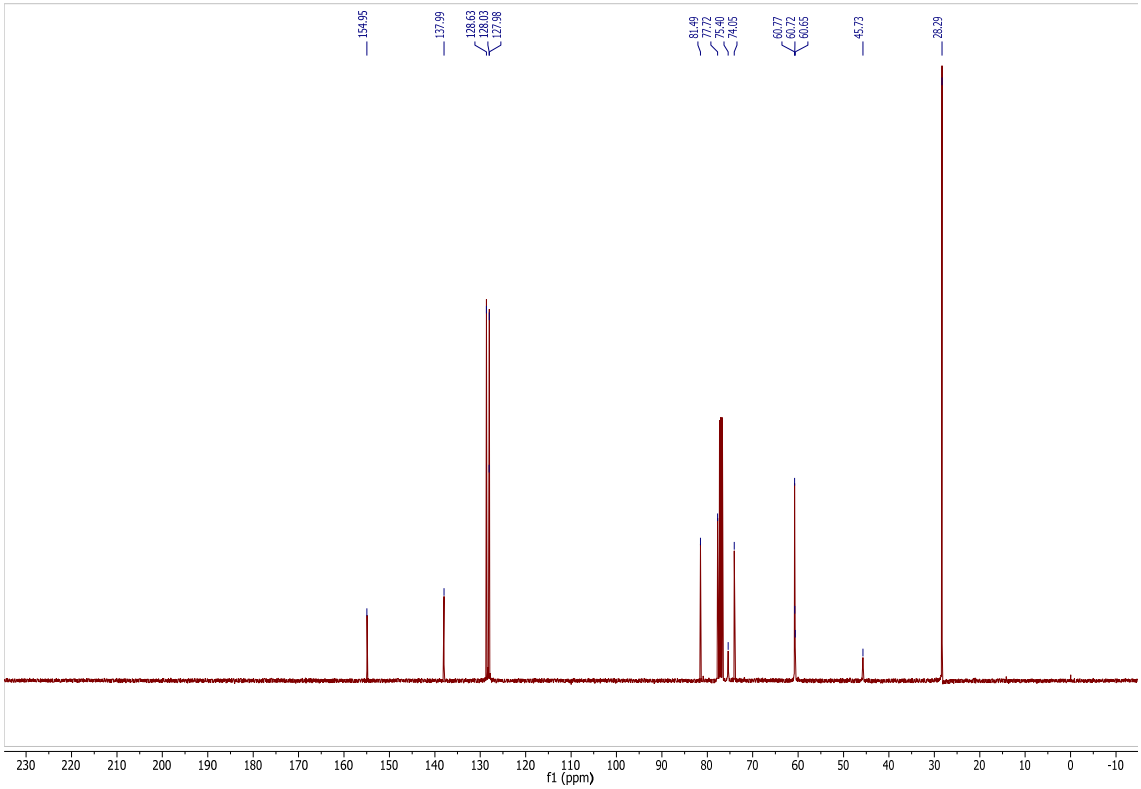

OBn
AcHN
OH
NH
BnO
28
f1 (ppm)

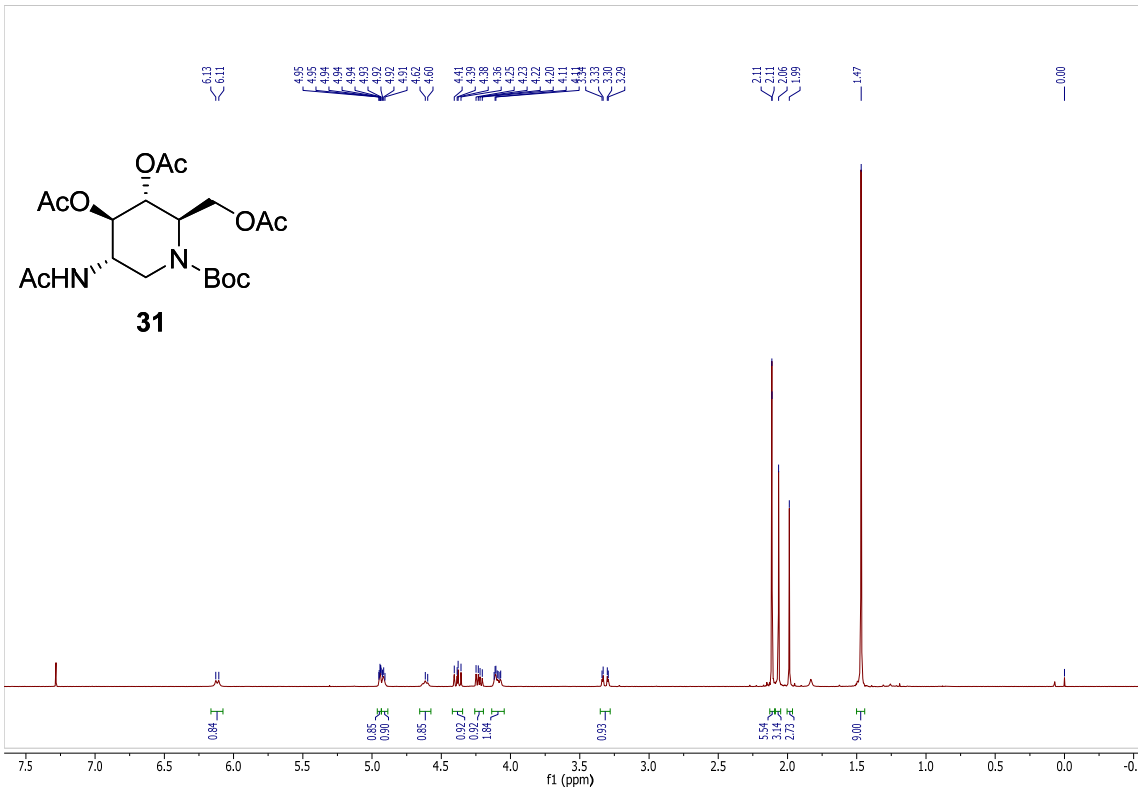

f1 (ppm)

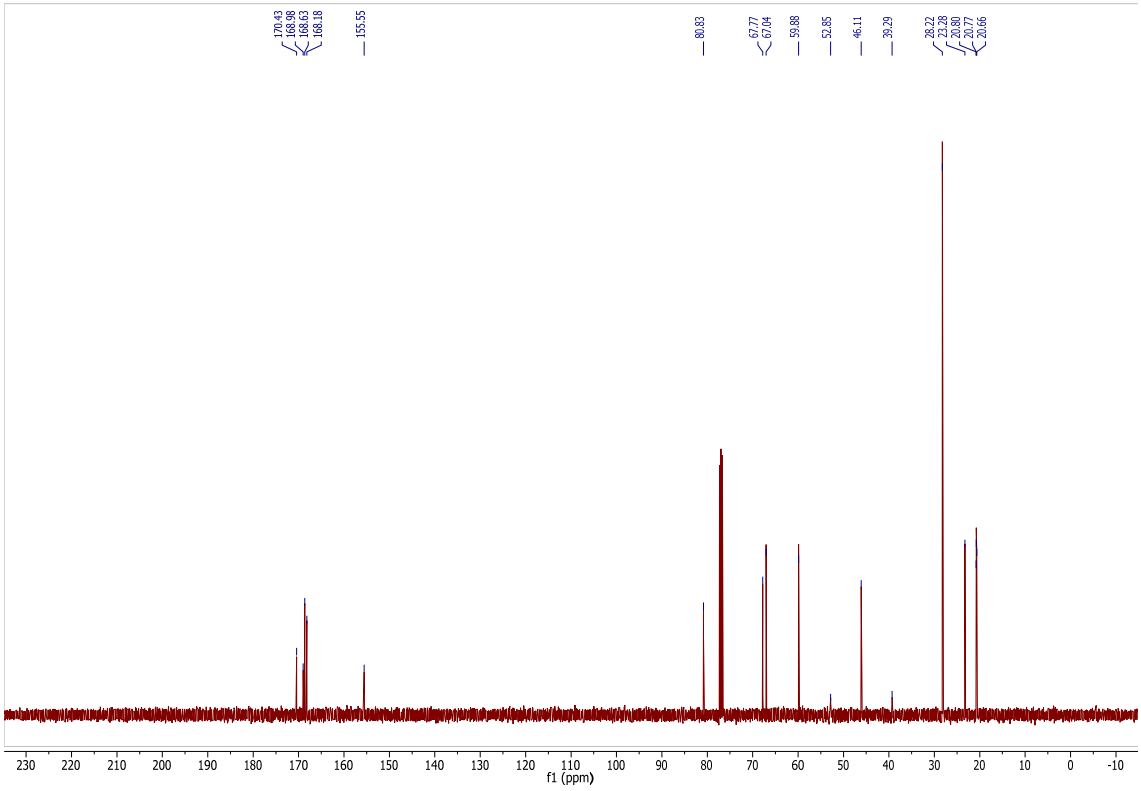

OH
AcHN
OH
HO
N
H
29
f1 (ppm)

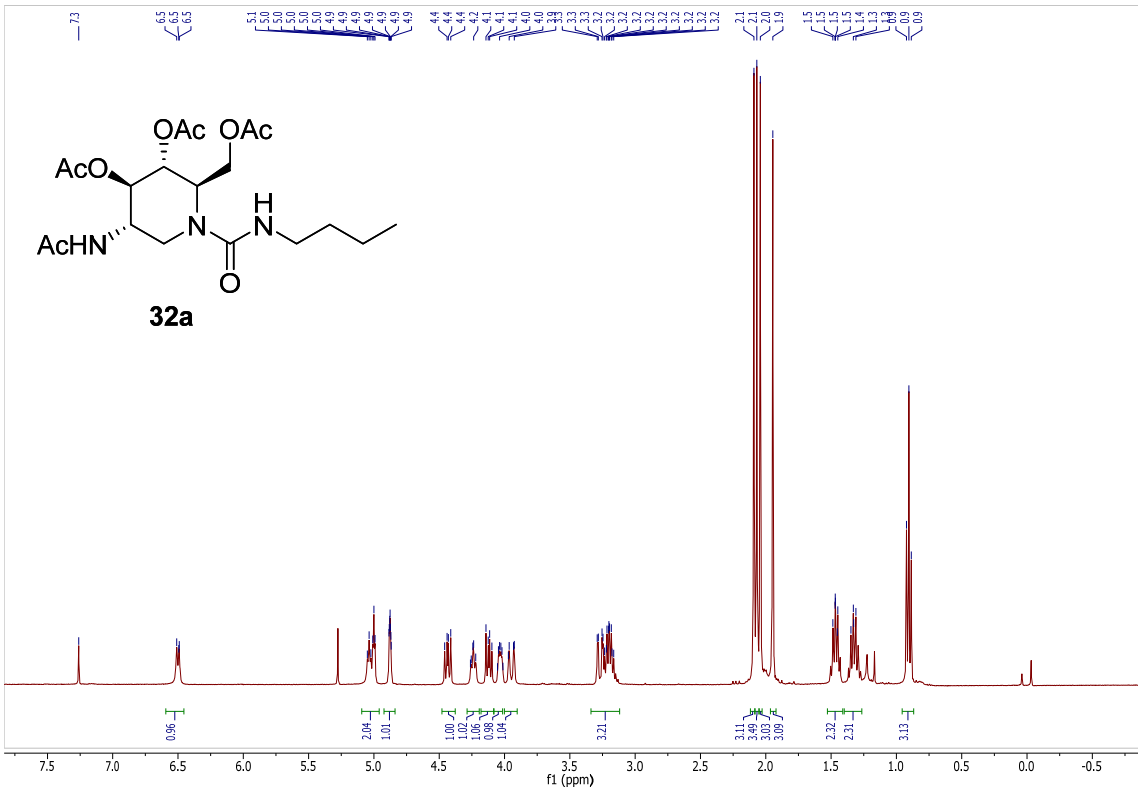

f1 (ppm)

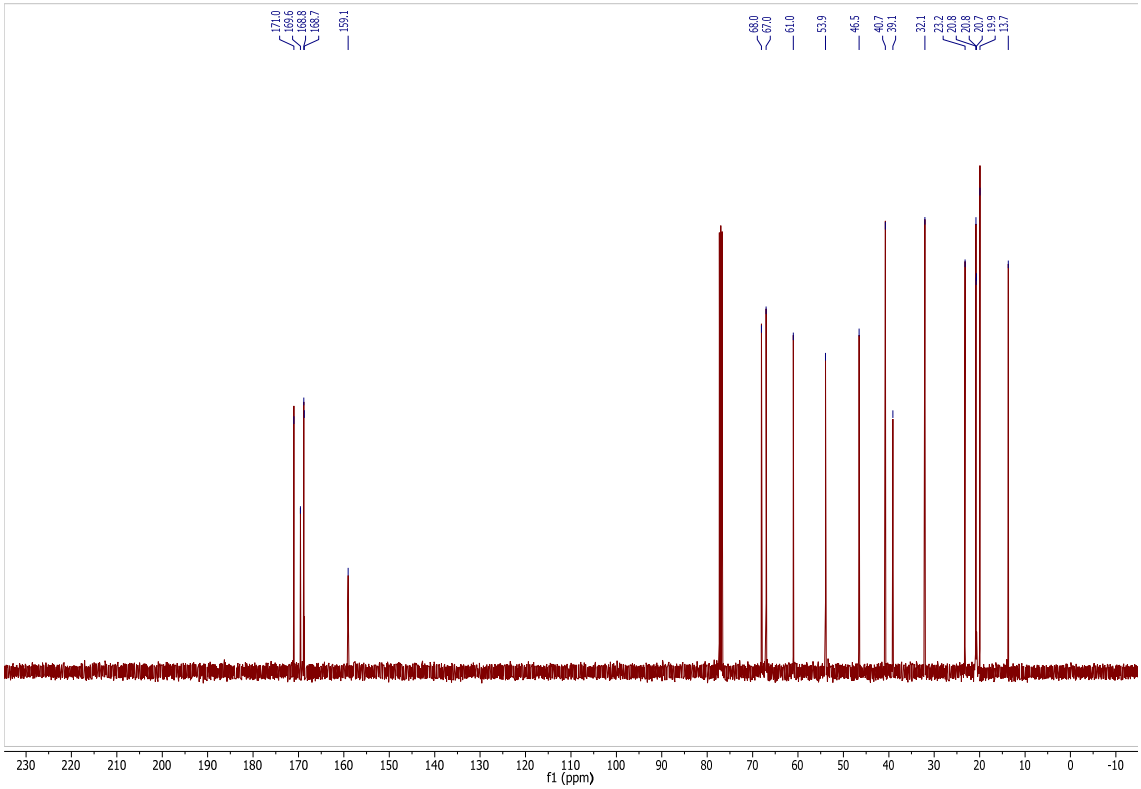

OBn
HO
OH
N
Boc
N3
30
f1 (ppm)

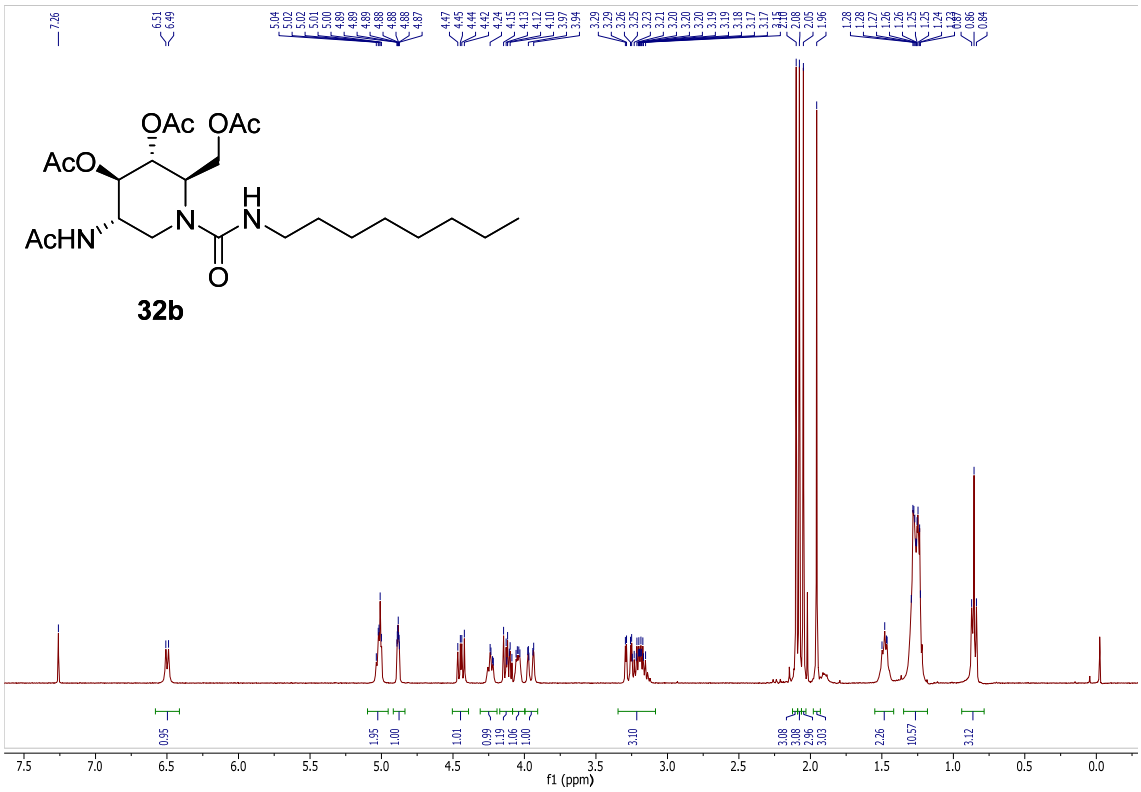

f1 (ppm)

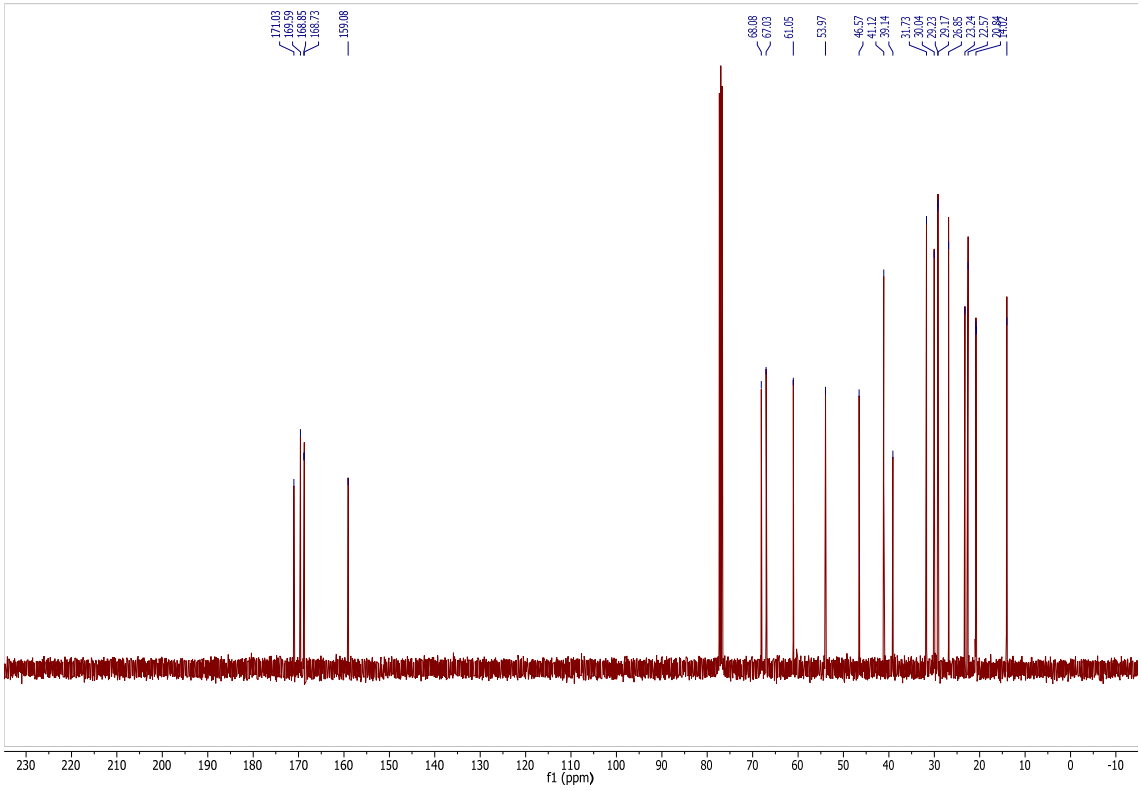

OAc
AcO
OAc
AcHN
N
Boc
31
f1 (ppm)

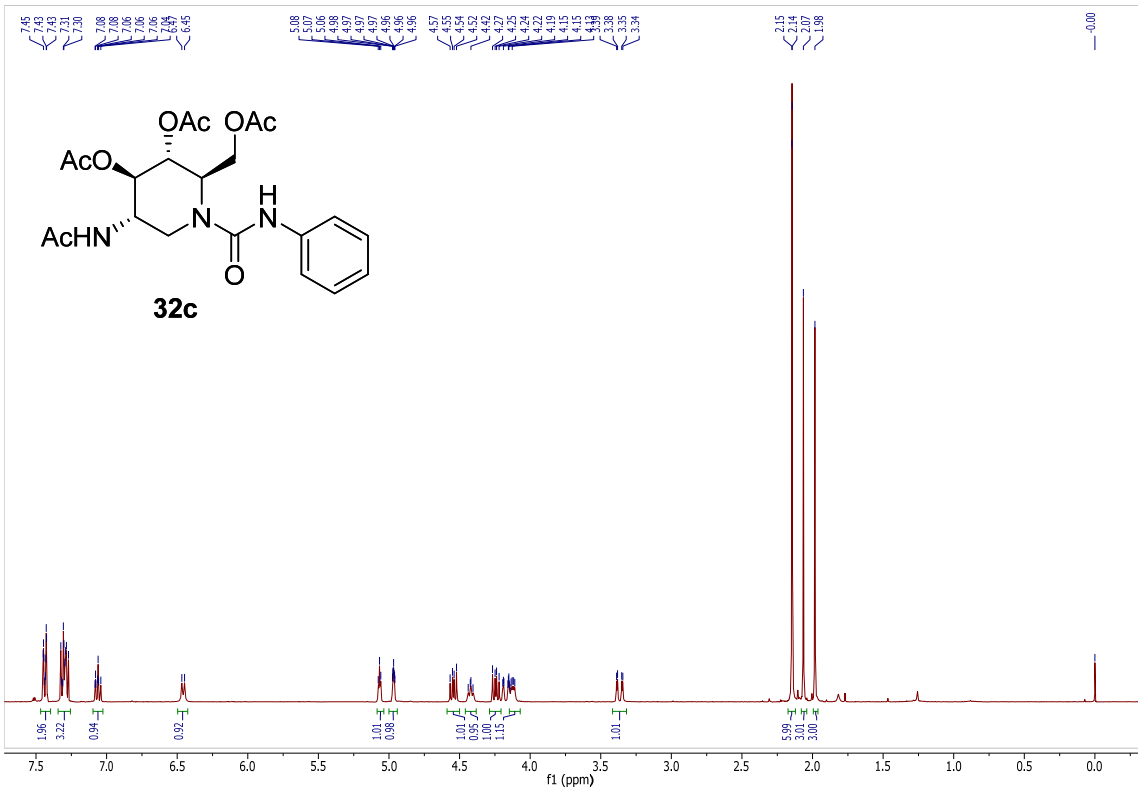

f1 (ppm)

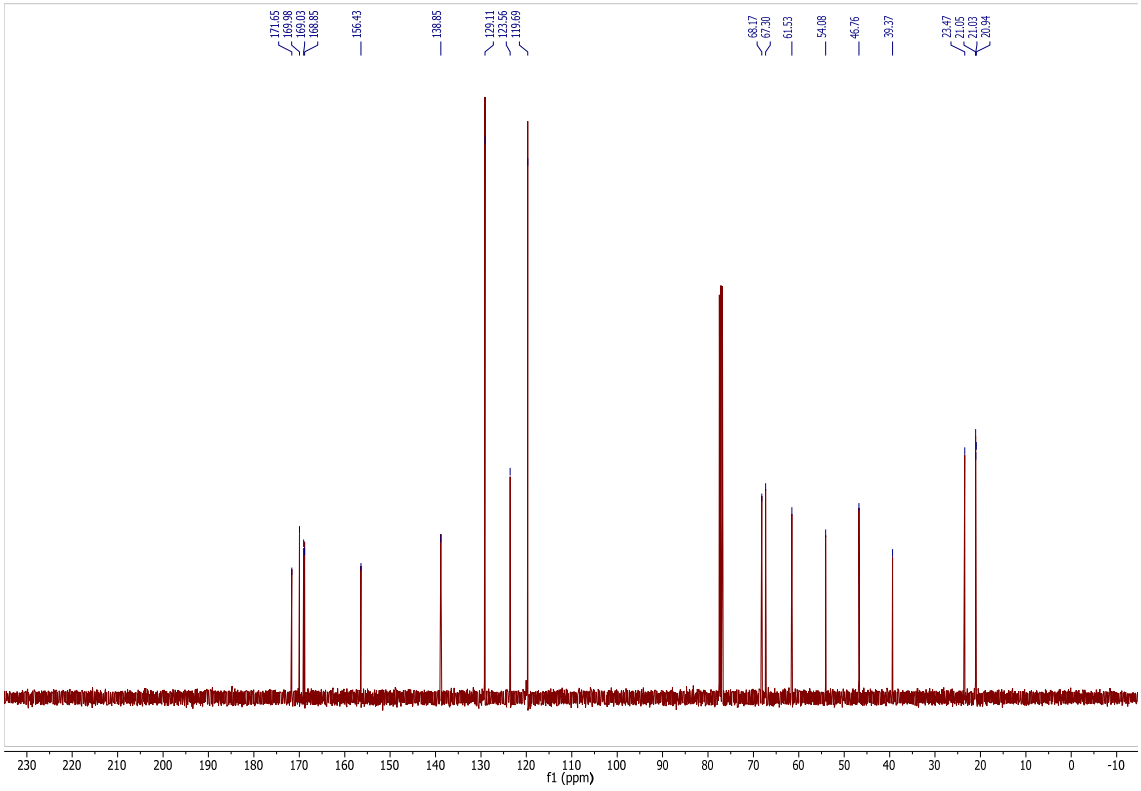

OAc OAc
AcO
AcHN
N
H
N
O
32a
f1 (ppm)

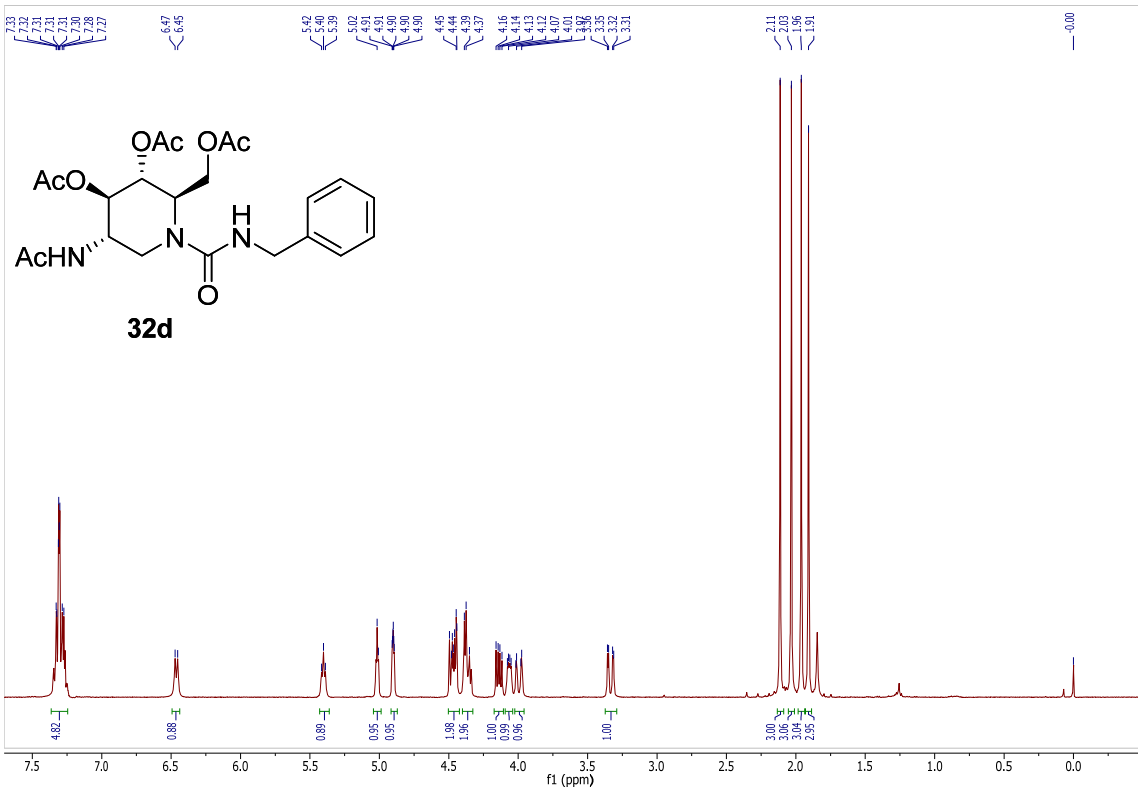

f1 (ppm)

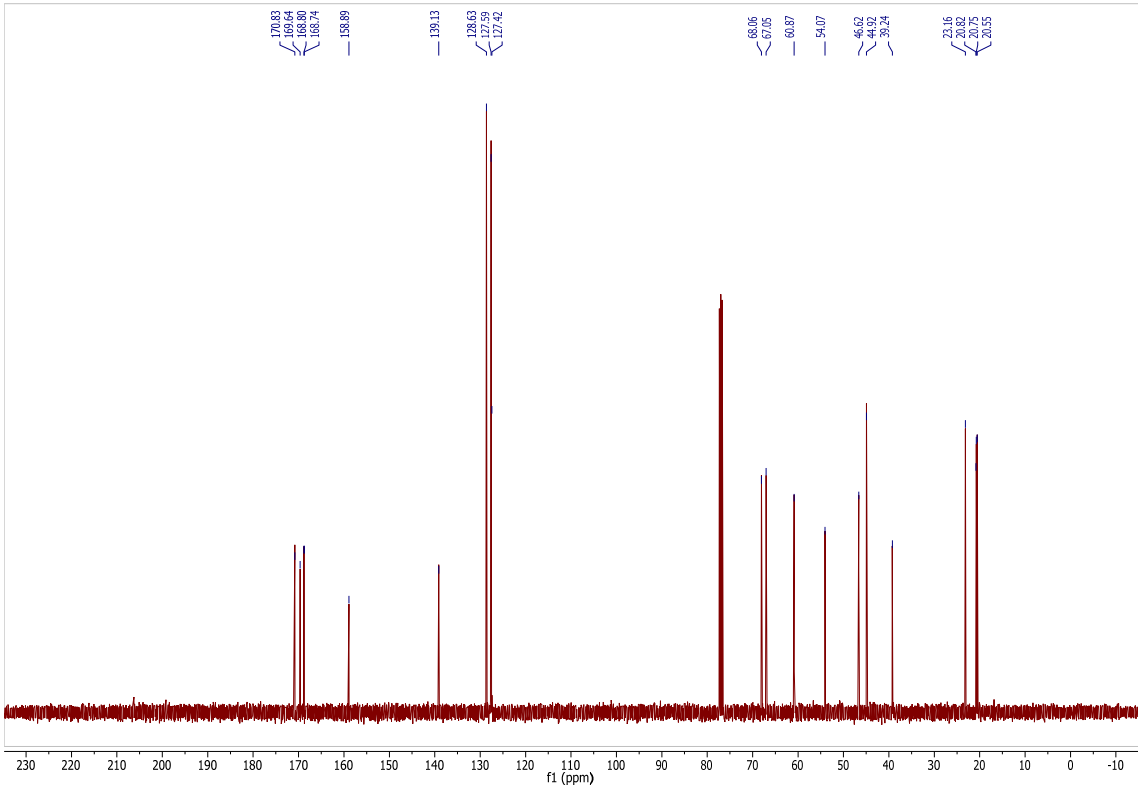

OAc OAc
AcO
AcHN
N
H
N
O
32b
f1 (ppm)

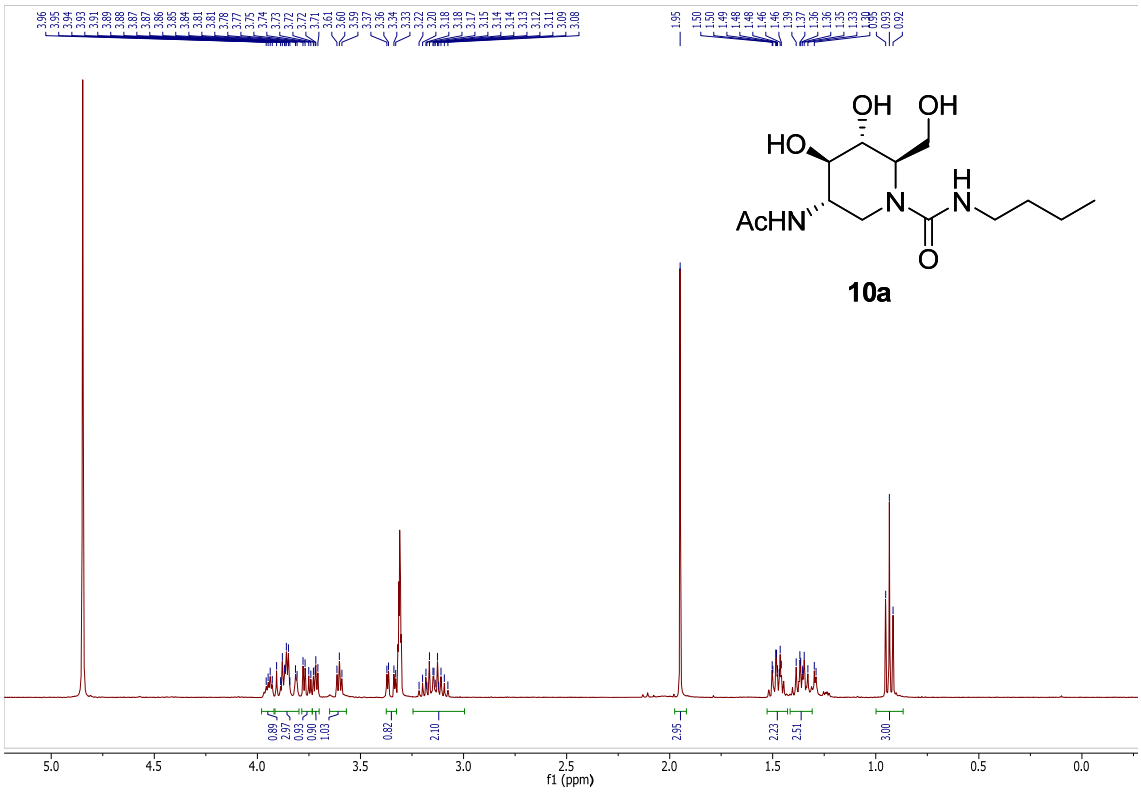

f1 (ppm)

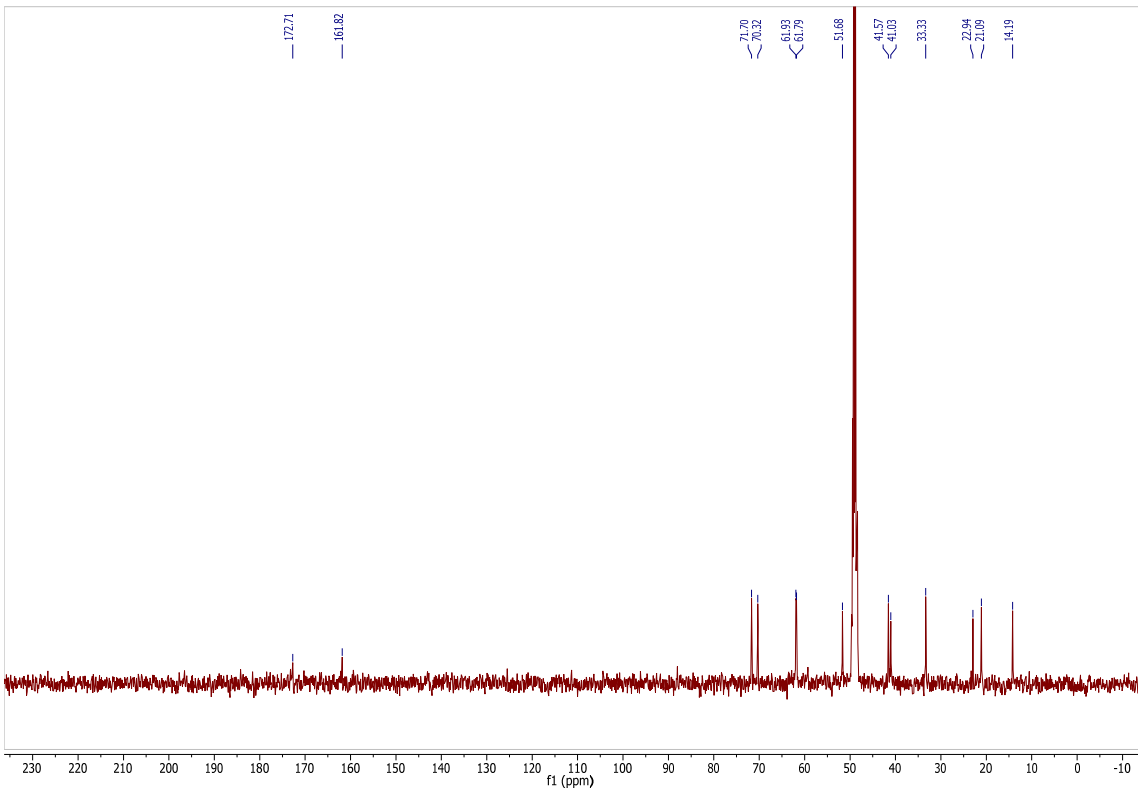

OAc
OAc
AcO
AcHN
N
H
N
O
32c
f1 (ppm)

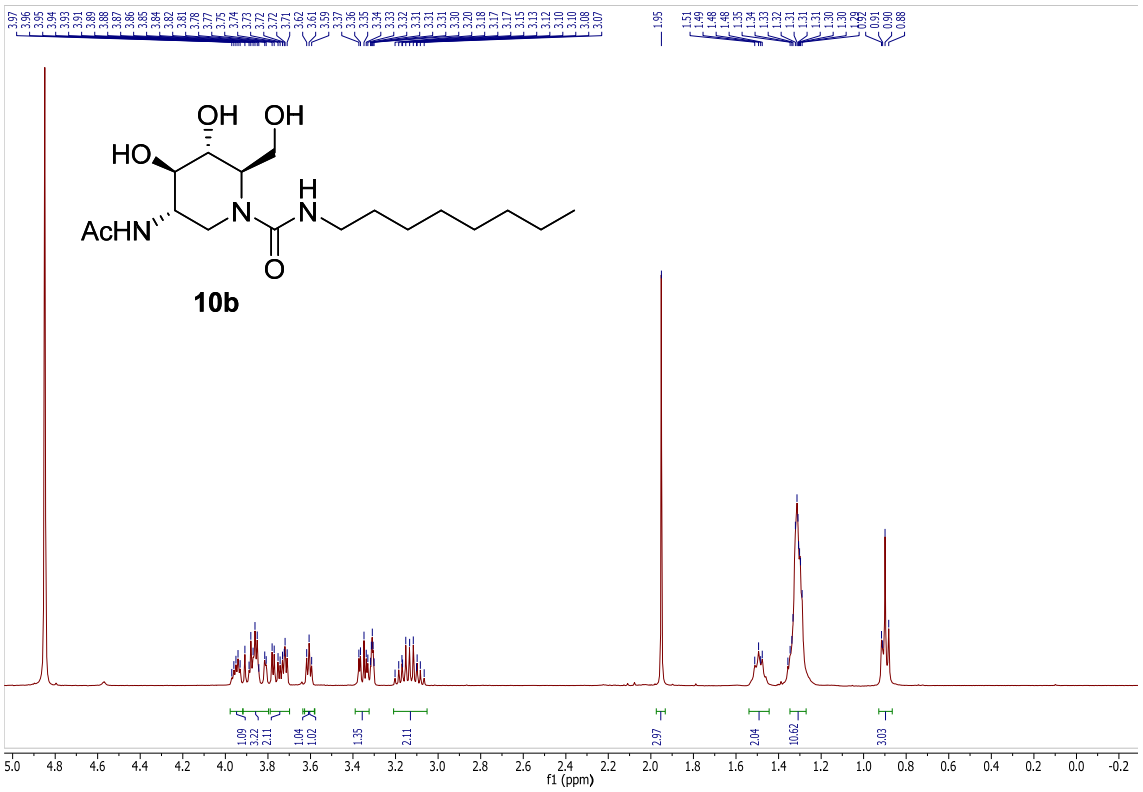

f1 (ppm)

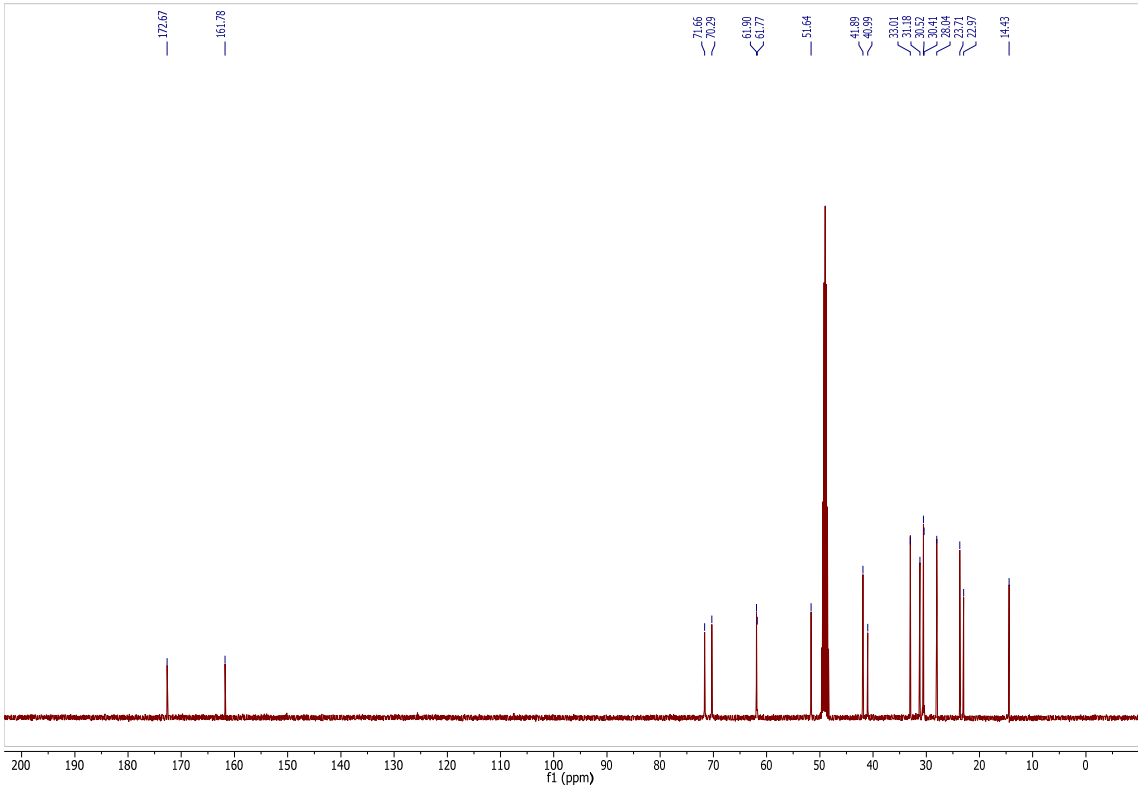

OAc
OAc
AcO
AcHN
N
H
N
O
32d
f1 (ppm)

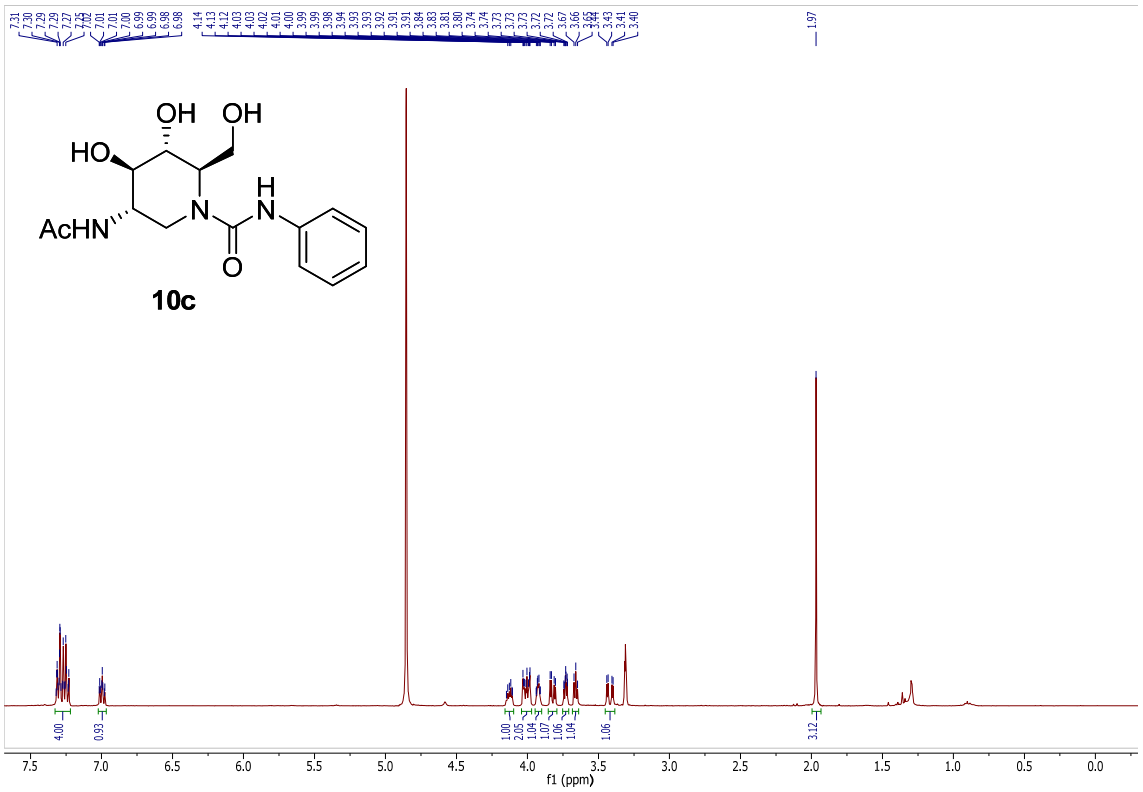

f1 (ppm)

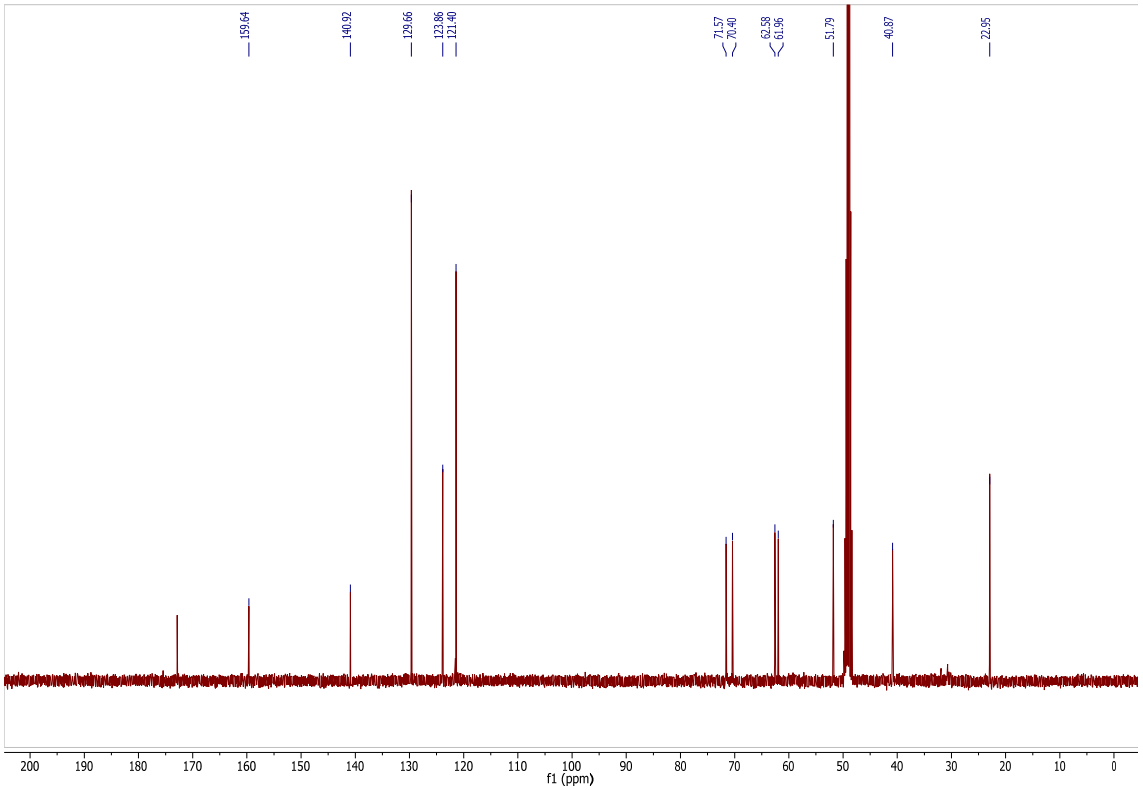

OH
OH
HO
H
N
N
AcHN
O
10a
f1 (ppm)

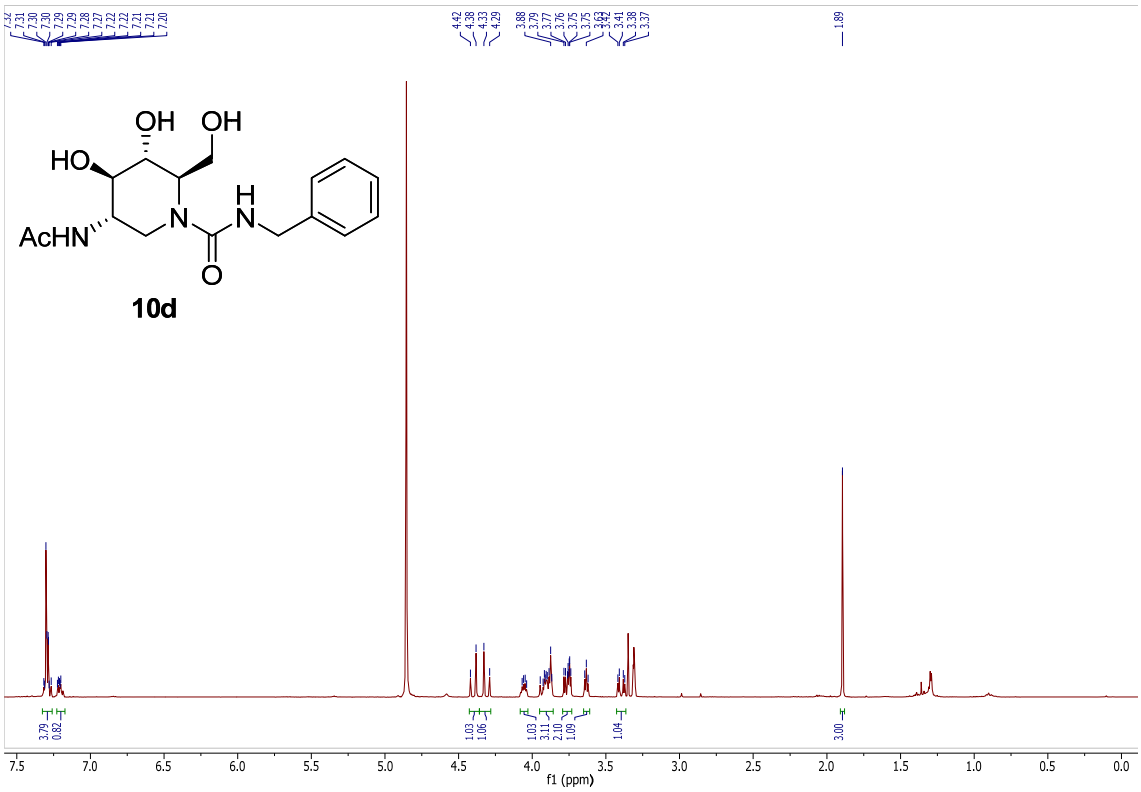

f1 (ppm)

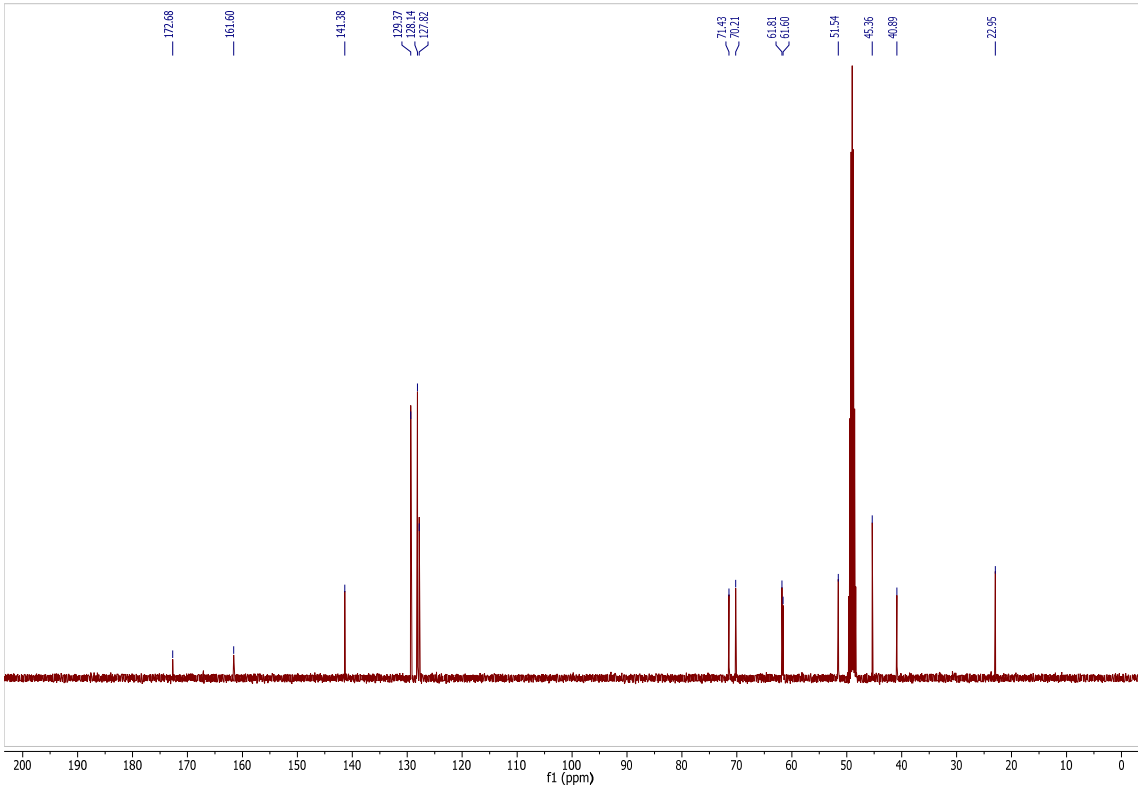

OH
OH
HO
H
N
N
AcHN
O
10b
f1 (ppm)


172.67
161.78
71.66
70.29
61.90
61.77
51.64
41.89
40.99
33.01
31.18
30.52
30.41
28.04
23.71
22.97
14.43
f1 (ppm)

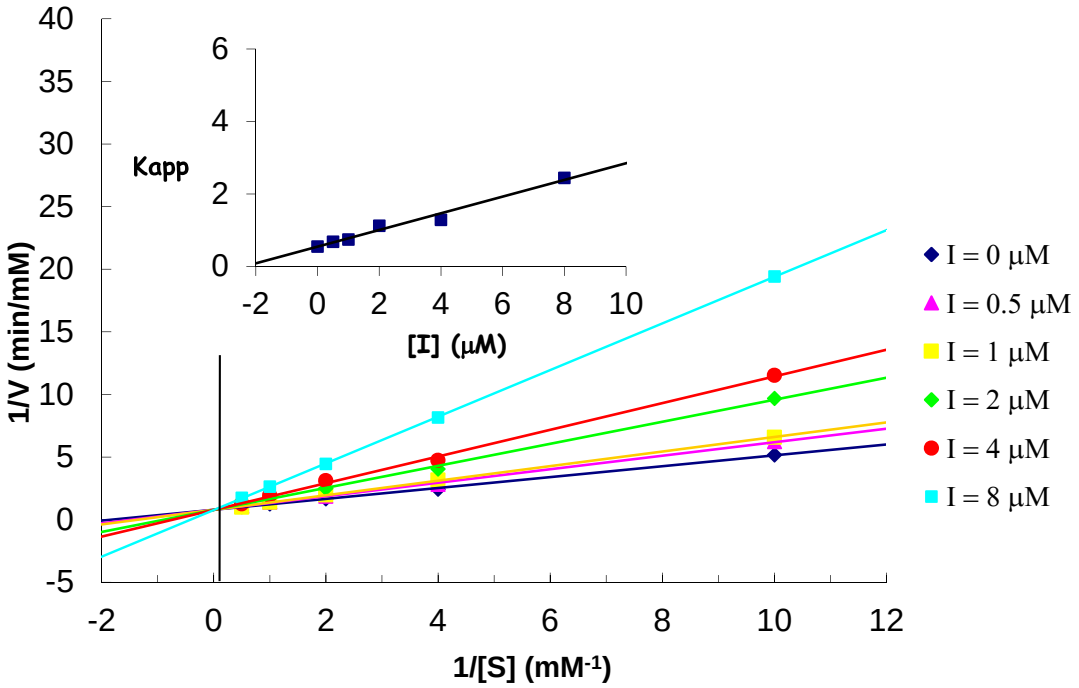

OH
OH
HO
AcHN
N
H
N
O
10c
f1 (ppm)

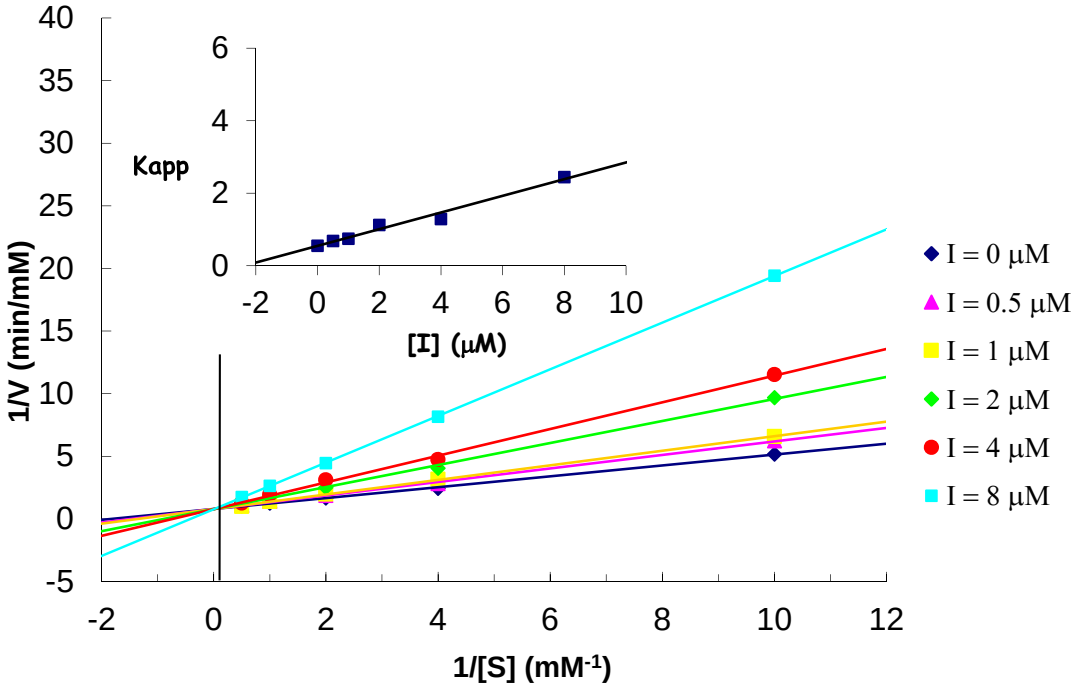

159.64
140.92
129.66
123.86
121.40
71.57
70.40
62.58
61.96
51.79
40.87
22.95
f1 (ppm)


OH
OH
HO
AcHN
N
H
N
O
10d
f1 (ppm)

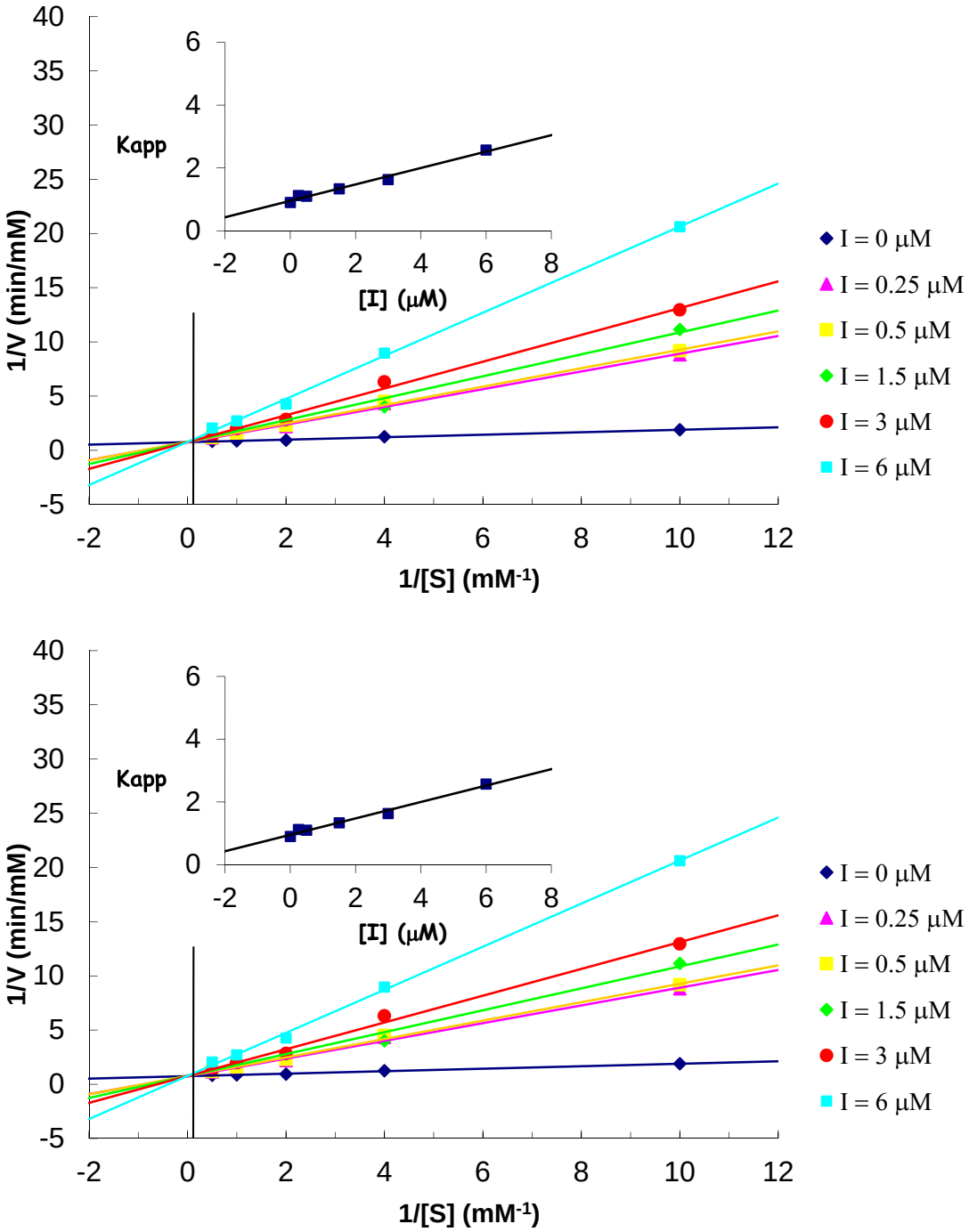

172.68
161.60
141.38
129.37
128.14
127.82
71.43
70.21
61.81
61.60
51.54
45.36
40.89
22.95
f1 (ppm)

5.- Lineweaver-Burk Plot against β-*N-Acetylglucosaminidase* of 10c

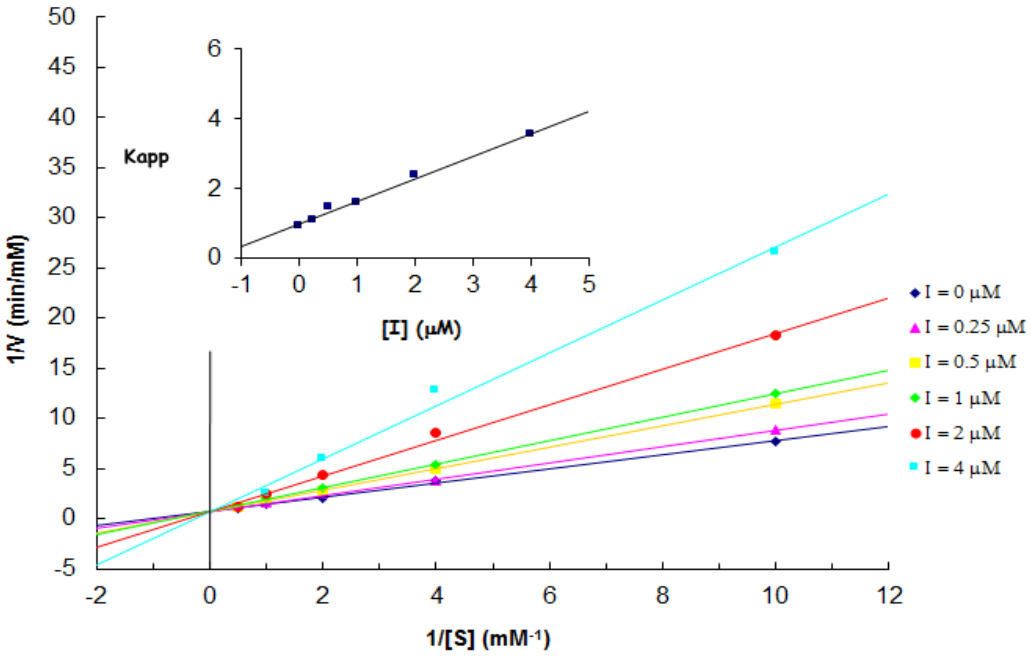




Lineweaver-Burk Plot for K_i determination (2.1 μM) of **10c** against *β*-N-*acetylglucosaminidase* (human placenta, pH 5.5).



Lineweaver-Burk Plot for K_i determination (4.1 µM) of **10c** against *β*-N-*acetylglucosaminidase* (bovine kidney, pH 5.5).



Lineweaver-Burk Plot for K_i determination (1.5 µM) of **10c** against *β*-N-*acetylglucosaminidase* (Jack bean, pH 5.5).