

Supporting Information

A Simple, Cost-Effective Method for the Regioselective Deuteration of Anilines

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General Information

The following includes general experimental procedures, specific details for representative reactions, isolation, and spectroscopic data for new compounds. All of the reactions listed in the main publication were performed in capped 2–5 mL or 0.5–2 mL microwave reaction vials from Biotage unless otherwise noted. Reactions were heated in a commercial Biotage Initiator Sixty microwave synthesis apparatus. Melting points were recorded using a Fisher-Johns melting point apparatus and are uncorrected. ^1H , ^2H , ^{13}C , and ^{19}F NMR spectra were obtained using either Varian Mercury 300 MHz or Varian Unity 400 MHz spectrometers. ^1H spectra were referenced to tetramethylsilane (TMS, 0 ppm) or solvent carbons and ^{13}C spectra were referenced to solvent carbons (77.23 ppm for CDCl_3). ^2H spectra were referenced to deuterated methylene chloride (5.23 ppm for CD_2Cl_2), and ^{19}F spectra were unreferenced. IR spectra were obtained using a Perkin Elmer Spectrum 1000 FT-IR spectrometer on NaCl plates. High-resolution mass spectra were obtained using a VG 70-250S (double focusing) mass spectrometer at 70 eV for electron impact ionization or a Sciex QStar operating at a spray voltage of 5500 V for electrospray ionization. D_2O (99.9 % D) was purchased from Cambridge Isotope Laboratories Inc. and used without further treatment. Concentrated HCl was purchased from ACP Chemicals, and used without further treatment. All other reagents were purchased from Sigma-Aldrich, VWR International, or Strem Chemical Company and used as received unless otherwise noted.

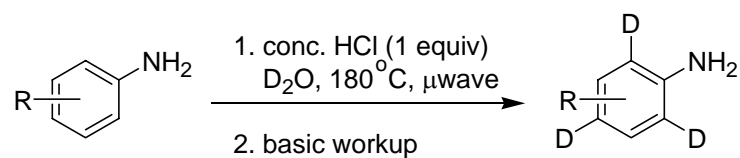
Abbreviations:

Et_2O : Diethyl Ether
h: hours
s: strong (IR)
m: moderate (IR)

RT: Room Temperature
br: broad (IR)
w: weak (IR)

General Procedure

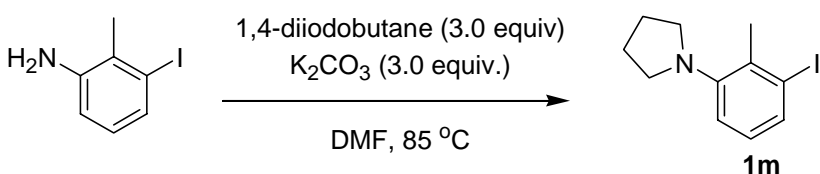
General Procedure for the deuteration of anilines:



In a microwave reaction vial with a magnetic stir bar, aniline (1 equiv, 0.4 mmol) was added, followed by 0.2 M HCl in D₂O (1 equiv, 2 mL) (Note: if the acid salt or zwitterion species was used, 2 mL D₂O was added instead of the HCl/D₂O solution). The vial was capped and sealed and heated in the microwave synthesis apparatus for 30 minutes at a temperature of 180 °C. The reaction mixture can be directly concentrated to afford the DCl salt of the aniline (or appropriate zwitterion species). Alternatively, basic aqueous workup (*via* addition of 2 mL 3 M NaOH, 1 mL brine and 2 mL Et₂O, separation of phases, and washing the organic phase with brine) can be used to afford the deuterated aniline product.

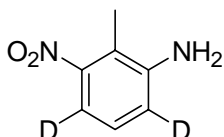
Experimental Data

1-(3-iodo-2-methylphenyl)pyrrolidine (**1m**)



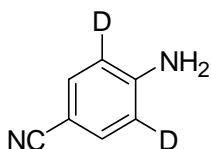
3-iodo-2-methylaniline (500 mg, 2.14 mmol), 1,4-diodobutane (849 μL , 6.44 mmol), and K_2CO_3 (890 mg, 6.44 mmol) were combined, dissolved in 5 mL dry DMF, and stirred in a capped flask for 4 days at 85 $^\circ\text{C}$. The reaction mixture was quenched with H_2O , and washed with 3 x 10 mL Et_2O . The organic phase was then washed with 2 x 10 mL H_2O , dried with Na_2SO_4 , filtered, and concentrated *in vacuo*. The crude product was purified by flash chromatography on silica gel ($R_f = 0.86$ in 30 % Et_2O /hexane) using 0 to 5 % Et_2O /hexane to afford **1m** as a clear orange oil. Isolated yield: 496 mg (81 %). ^1H NMR (300 MHz, CDCl_3) δ 1.89-1.05 (m, 4 H), 2.42 (s, 3 H), 3.06-3.12 (m, 4 H), 6.78 (t, $J=7.9$ Hz, 1 H), 6.93 (dd, $J=8.1, 1.0$ Hz, 1 H), 7.46 (dd, $J=7.8, 1.0$ Hz, 1 H); ^{13}C NMR (100 MHz, CDCl_3) δ 24.7, 25.9, 51.5, 104.2, 116.5, 127.5, 131.9, 132.9, 150.4; IR neat, ν (cm^{-1}) 662 (m), 707 (s), 768 (s), 876 (w), 952 (s), 991 (s), 1079 (m), 1121 (s), 1152 (m), 1184 (m), 1310 (s), 1353 (s), 1454 (s), 1553 (s), 1578 (s), 1904 (w), 2815 (s), 2871 (s), 2965 (s); HRMS (EI) Calc'd for $\text{C}_{11}\text{H}_{14}\text{IN}$: 287.0171 (M^+), found 287.0167.

4,6-dideutero-2-methyl-3-nitroaniline (**2a**)



Following the general procedure **2a** was obtained as a yellow solid (mp = 84-85 $^\circ\text{C}$). ^1H NMR (400 MHz, CDCl_3) δ 2.25 (s, 3H), 3.89 (br s, 2H), 7.10 (s, 1H); ^2H NMR (61 MHz, CHCl_3) δ 6.93 (s, 1D), 7.25 (s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 12.5, 113.6 (1:1:1 t, $J=25.7$ Hz), 115.8, 118.1 (1:1:1 t, $J=24.3$ Hz), 126.4, 146.2, 151.5; IR thin film, ν (cm^{-1}) 759 (w), 915 (w), 1358 (m), 1516 (s), 3411 (m); HRMS (EI) Calc'd for $\text{C}_6\text{H}_6\text{D}_2\text{N}_2\text{O}_2$: 154.0711 (M^+), found 154.0712.

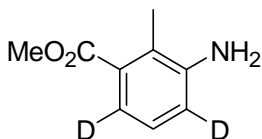
4-amino-3,5-dideuterobenzonitrile (**2b**)



Following the general procedure **2b** was obtained as an off-white solid (mp = 80-81 $^\circ\text{C}$). ^1H NMR (400 MHz, CDCl_3) δ 4.21 (br s, 2H), 7.40 (s, 2H); ^2H NMR (61 MHz, CHCl_3) δ 6.73 (s, 2D); ^{13}C NMR (100 MHz, CDCl_3) δ 100.0, 114.1 (1:1:1 t, $J=24.3$ Hz), 120.1, 133.6, 150.3; IR thin film, ν (cm^{-1}) 772 (m), 910 (m), 936 (w), 1192 (m), 1301 (m), 1475

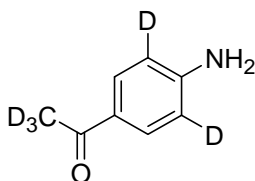
(s), 1590 (s), 1621 (s), 2215 (s), 3373 (s), 3478 (s); HRMS (ESI) Calc'd for $C_7H_5D_2N$: 121.0729 ($[M+H]^+$), found 121.0733.

methyl 3-amino-4,6-dideutero-2-methylbenzoate (**2c**)



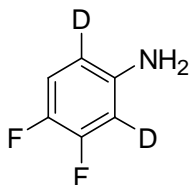
Following the general procedure **2c** was obtained as a clear, pale yellow oil, becoming an orange-red colour upon standing. 1H NMR (300 MHz, $CDCl_3$) δ 2.34 (s, 3H), 3.72 (br s, 2H), 3.87 (s, 3H), 7.04 (s, 1H); 2H NMR (61 MHz, $CHCl_3$) δ 6.90 (s, 1D), 7.30 (s, 1D); ^{13}C NMR (100 MHz, $CDCl_3$) δ 13.8, 51.9, 117.9 (1:1:1 t, $J=23.9$ Hz), 120.1 (1:1:1 t, $J=25.0$ Hz), 122.9, 125.8, 131.4, 145.3, 169.0; IR thin film, ν (cm^{-1}) 760 (w), 807 (w), 919 (w), 970 (w), 1079 (m), 1241 (s), 1281 (s), 1438 (s), 1576 (m), 1627 (m), 1716 (s), 3382 (m); HRMS (EI) Calc'd for $C_9H_9D_2NO_2$: 167.0915 (M^+), found 167.0917.

1-(4-amino-3,5-dideuterophenyl)-2,2,2-trideuteroethanone (**2d**)



Following the general procedure **2d** was obtained as a yellow solid (mp = 103-104 °C). 1H NMR (300 MHz, $CDCl_3$) δ 4.24 (br s, 2H), 7.79 (s, 2H); 2H NMR (61 MHz, $CHCl_3$) δ 2.51 (s, 3D), 6.73 (s, 2D); ^{13}C NMR (100 MHz, $CDCl_3$) δ 25.5 (m), 113.3 (1:1:1 t, $J=24.3$ Hz), 127.6, 130.6, 151.1, 196.6; IR thin film, ν (cm^{-1}) 775 (m), 814 (w), 881 (w), 1269 (s), 1306 (s), 1404 (m), 1481 (m), 1552 (m), 1578 (m), 1645 (s), 3220 (s), 3323 (s), 3394 (s); HRMS (EI) Calc'd for $C_8H_4D_5NO$: 140.0998 (M^+), found 140.1000.

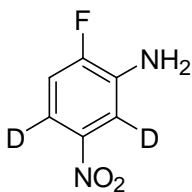
2,6-dideutero-3,4-difluoroaniline (**2e**)



Following the general procedure **2e** was obtained as a colourless oil which became dark brown upon standing. 1H NMR (400 MHz, $CDCl_3$) δ 3.61 (br s, 2H), 6.90–6.95 (m, 1H); 2H NMR (61 MHz, $CHCl_3$) δ 6.42 (s, 1D), 6.55 (br s, 1D); ^{13}C NMR (100 MHz, $CDCl_3$) δ 104.2 (1:1:1 t, $J=23.0$ Hz), 110.4 (1:1:1 t, $J=24.3$ Hz), 117.6 (dd, $J=18.0$, 1.8 Hz), 143.2 (dd, $J=8.5$, 2.6 Hz), 144.1 (dd, $J=236.0$, 11.8 Hz), 150.8 (dd, $J=245.6$, 14.0 Hz); ^{19}F NMR (376 MHz, $CDCl_3$) δ -152.3, -138.2; IR neat, ν (cm^{-1}) 723 (m), 738 (m), 760 (m), 849 (w), 891 (m), 1000 (m), 1119 (m), 1160 (m), 1219 (m), 1305 (m), 1425 (m), 1482

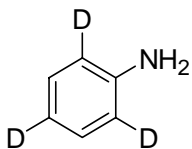
(s), 1596 (w), 2921 (w), 3375 (w); HRMS (EI) Calc'd for C₆H₃D₂F₂N: 131.0516 (M⁺), found 131.0513.

2,4-dideutero-3-nitro-6-fluoroaniline (**2f**)



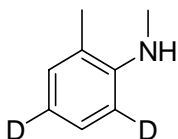
Following the general procedure **2f** was obtained as a yellow solid (mp = 95-96 °C). ¹H NMR (400 MHz, CDCl₃) δ 4.06 (br s, 2H), 7.06–7.12 (m, 1H), 7.60 (dd, *J*=8.9, 4.2 Hz, 0.5H); ²H NMR (61 MHz, CHCl₃) δ 7.67 (s, 0.5D), 7.73 (s, 1D); ¹³C NMR (100 MHz, CDCl₃) δ 111.1 (1:1:1:1:1 td, *J*=23.9, 5.9 Hz), 113.9 (d, *J*=8.8 Hz), 115.3 (d, *J*=22.1 Hz), 115.4 (d, *J*=21.3 Hz), 135.5 (d, *J*=14.0 Hz), 154.6 (dd, *J*=250.0, 1.5 Hz); ¹⁹F NMR (376 MHz, CDCl₃) δ -125.7; IR thin film, ν (cm⁻¹) 667 (m), 727 (m), 821 (w), 900 (w), 1218 (m), 1358 (s), 1522 (s), 1627 (m), 3365 (s), 3448 (s); HRMS (EI) Calc'd for C₆H₃D₂FN₂O₂: 158.0461 (M⁺), found 158.0463.

2,4,6-trideuteroaniline (**2g**)

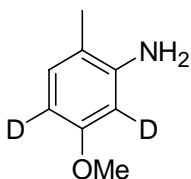


Following the general procedure **2g** was obtained as clear, colourless oil, slowly turning a pale brown colour. Spectral data matched that of previously reported data. ¹H NMR (400 MHz, CDCl₃) δ 3.60 (br s, 2H), 7.15 (s, 2h).

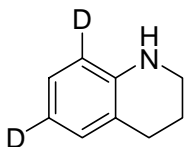
4,6-dideutero-*N*,2-dimethylaniline (**2h**)



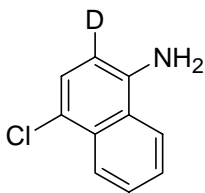
Following the general procedure, **2h** was obtained as a clear oil. ¹H NMR (300 MHz, CDCl₃) δ 2.11 (s, 3H), 2.87 (s, 3H), 3.52 (br s, 3H), 7.04 (s, 1H), 7.15 (s, 1H); ²H NMR (61 MHz, CHCl₃) δ 6.73 (s, 1D), 6.80 (s, 1D); ¹³C NMR (100 MHz, CDCl₃) δ 17.3, 30.7, 108.8 (1:1:1 t, *J*=24.3 Hz), 116.5 (1:1:1 t, *J*=25.0 Hz), 121.8, 126.9, 129.7, 147.1; IR neat, ν (cm⁻¹) 753 (m), 900 (w), 1090 (m), 1264 (m), 1310 (m), 1469 (s), 1491 (s), 1576 (s), 1596 (s), 2806 (w), 2865 (m), 2900 (m), 2929 (m), 2976 (w), 3433 (m); HRMS (EI) Calc'd for C₈H₉D₂N: 123.1017 (M⁺), found 123.1016.

2,6-dideutero-3-methoxy-6-methylaniline (**2i**)

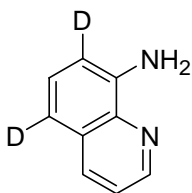
Following the general procedure **2i** was obtained as a purple oil. ^1H NMR (300 MHz, CDCl_3) δ 2.08 (s, 3H), 3.58 (br s, 2H), 3.73 (s, 3H), 6.92 (s, 1H); ^2H NMR (61 MHz, CHCl_3) δ 6.37 (br s, 2D); ^{13}C NMR (100 MHz, CDCl_3) δ 16.4, 55.1, 100.6 (1:1:1 t, $J=23.5$ Hz), 103.3 (1:1:1 t, $J=24.6$ Hz), 114.7, 130.7, 145.3, 158.8; IR neat, ν (cm^{-1}) 766 (m), 1046 (m), 1141 (m), 1241 (m), 1477 (s), 1624 (s), 2860 (w), 2931 (m), 2998 (w), 3374 (m), 3464 (m); HRMS (EI) Calc'd for $\text{C}_8\text{H}_9\text{D}_2\text{NO}$: 139.0966 (M^+), found 139.0964.

6,8-dideutero-1,2,3,4-tetrahydroquinoline (**2j**)

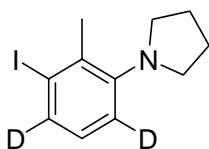
Following the general procedure **2j** was obtained as a clear, pale yellow oil which turned to a light brown colour upon standing. ^1H NMR (400 MHz, CDCl_3) δ 1.89–1.96 (m, 2H), 2.75 (t, $J=6.4$ Hz, 2H), 3.26–3.29 (m, 2H), 3.78 (br s, 1H), 6.93 (s, 1H), 6.94 (s, 1H); ^2H NMR (61 MHz, CHCl_3) δ 6.56 (s, 1D), 6.70 (s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 22.1, 26.9, 41.9, 113.8 (1:1:1 t, $J=25.5$ Hz), 116.6 (1:1:1 t, $J=24.3$ Hz), 121.4, 126.4, 129.3, 144.6; IR neat, ν (cm^{-1}) 671 (m), 754 (s), 905 (m), 1004 (w), 1060 (w), 1099 (m), 1181 (w), 1267 (m), 1300 (s), 1354 (m), 1449 (m), 1488 (s), 1597 (m), 2841 (w), 2927 (m), 3405 (w); HRMS (EI) Calc'd for $\text{C}_9\text{H}_9\text{D}_2\text{N}$: 135.1017 (M^+), found 135.1020.

1-amino-4-chloro-2-deuteronaphthalene (**2k**)

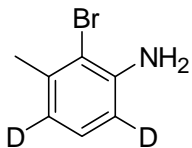
Following the general procedure **2k** was obtained as a purple solid (mp = 79–81 °C). ^1H NMR (300 MHz, CDCl_3) δ 4.10 (br s, 2H), 7.34 (s, 1H), 7.48 (ddd, $J=8.3, 6.8, 1.3$ Hz, 1H), 7.56 (ddd, $J=8.4, 7.0, 1.3$ Hz, 1H), 7.76–7.80 (m, 1H), 8.20–8.24 (m, 1H); ^2H NMR (61 MHz, CHCl_3) δ 6.77 (s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 109.3 (1:1:1 t, $J=24.3$ Hz), 120.7, 121.2, 125.1, 125.5, 126.3, 126.9, 128.5, 131.1, 141.3; IR thin film, ν (cm^{-1}) 641 (s), 706 (s), 752 (s), 895 (w), 945 (m), 1023 (w), 1198 (w), 1270 (m), 1368 (s), 1386 (s), 1424 (s), 1446 (s), 1507 (m), 1577 (m), 1620 (s), 3374 (s); HRMS (EI) Calc'd for $\text{C}_{10}\text{H}_7\text{DCIN}$: 178.0408 (M^+), found 178.0405.

8-amino-5,7-dideuteroquinoline (**2l**)

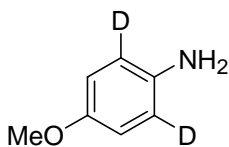
Following the general procedure **2l** was obtained as an off-white solid which turns to a dark brown colour upon standing (mp = 57-58 °C). ^1H NMR (400 MHz, CDCl_3) δ 4.98 (br s, 2H), 7.32 (s, 1H), 7.32–7.36 (m, 1H), 8.04 (dt, $J=8.2, 1.3$ Hz, 1H), 8.74–8.76 (m, 1H); ^2H NMR (61 MHz, CHCl_3) δ 7.02 (s, 1D), 7.25 (s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 109.7 (1:1:1 t, $J=23.9$ Hz), 115.7 (1:1:1 t, $J=25.0$ Hz), 121.3, 127.1, 128.7, 135.9, 138.4, 143.8, 147.4; IR thin film, ν (cm^{-1}) 653 (s), 719 (m), 795 (s), 817 (s), 1120 (w), 1370 (s), 1455 (m), 1496 (s), 1612 (m), 3353 (m), 3451 (s); HRMS (ESI) Calc'd for $\text{C}_9\text{H}_7\text{D}_2\text{N}_2$: 147.0885 ($[\text{M}+\text{H}]^+$), found 147.0891.

1-(3-iodo-4,6-dideutero-2-methylphenyl)pyrrolidine (**2m**)

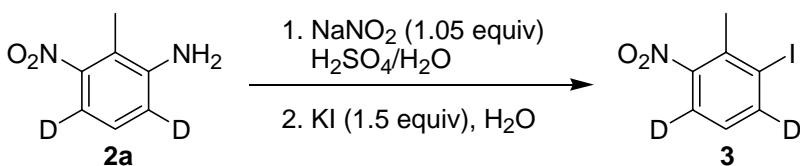
Following the general procedure **2m** was obtained as a pale yellow oil which turned green overnight. ^1H NMR (400 MHz, CDCl_3) δ 1.89–1.94 (m, 4H), 2.42 (s, 3H), 3.06–3.11 (m, 4H), 6.78 (s, 1H); ^2H NMR (61 MHz, CHCl_3) δ 7.00 (s, 1D), 7.54 (s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 24.7, 25.8, 51.4, 103.9, 116.2 (1:1:1 t, $J=24.3$ Hz), 127.2, 131.6 (1:1:1 t, $J=25.3$ Hz), 132.8, 150.3; IR neat, ν (cm^{-1}) 655 (m), 756 (s), 874 (m), 908 (m), 959 (s), 1005 (s), 1104 (m), 1138 (w), 1352 (m), 1408 (s), 1441 (m), 1541 (m), 1563 (s), 2812 (w), 2872 (w), 2963 (m); HRMS (EI) Calc'd for $\text{C}_{11}\text{H}_{12}\text{D}_2\text{NI}$: 289.0297 (M^+), found 289.0289.

2-bromo-4,6-dideutero-3-methylaniline (**2n**)

Following the general procedure **2n** was obtained as a pale yellow oil which turned light brown overnight. ^1H NMR (400 MHz, CDCl_3) δ 2.36 (s, 3H), 4.09 (br s, 2H), 6.98 (s, 1H); ^2H NMR (61 MHz, CHCl_3) δ 6.70 (br s, 1D), 6.73 (br s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 23.4, 112.1, 112.8 (1:1:1 t, $J=24.3$ Hz), 119.9 (1:1:1 t, $J=25.0$ Hz), 127.1, 138.6, 144.1; IR neat, ν (cm^{-1}) 743 (m), 911 (m), 990 (s), 1027 (s), 1107 (w), 1208 (w), 1408 (m), 1433 (s), 1451 (s), 1582 (m), 1609 (s), 3373 (m), 3469 (w); HRMS (EI) Calc'd for $\text{C}_7\text{H}_6\text{D}_2\text{NBr}$: 186.9966 (M^+), found 186.9969.

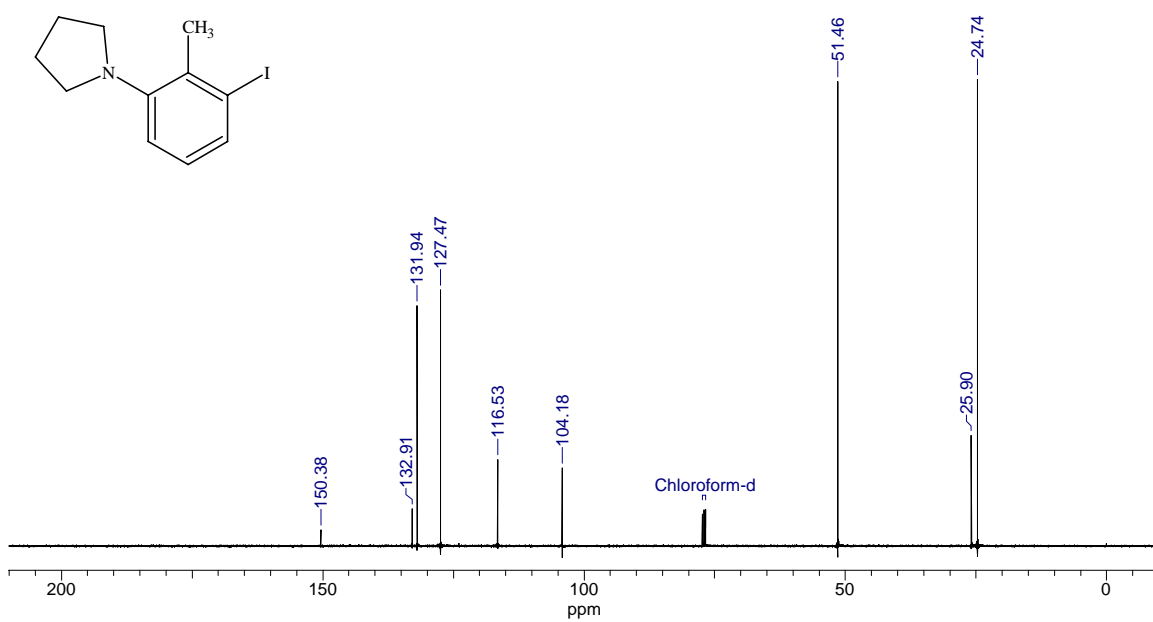
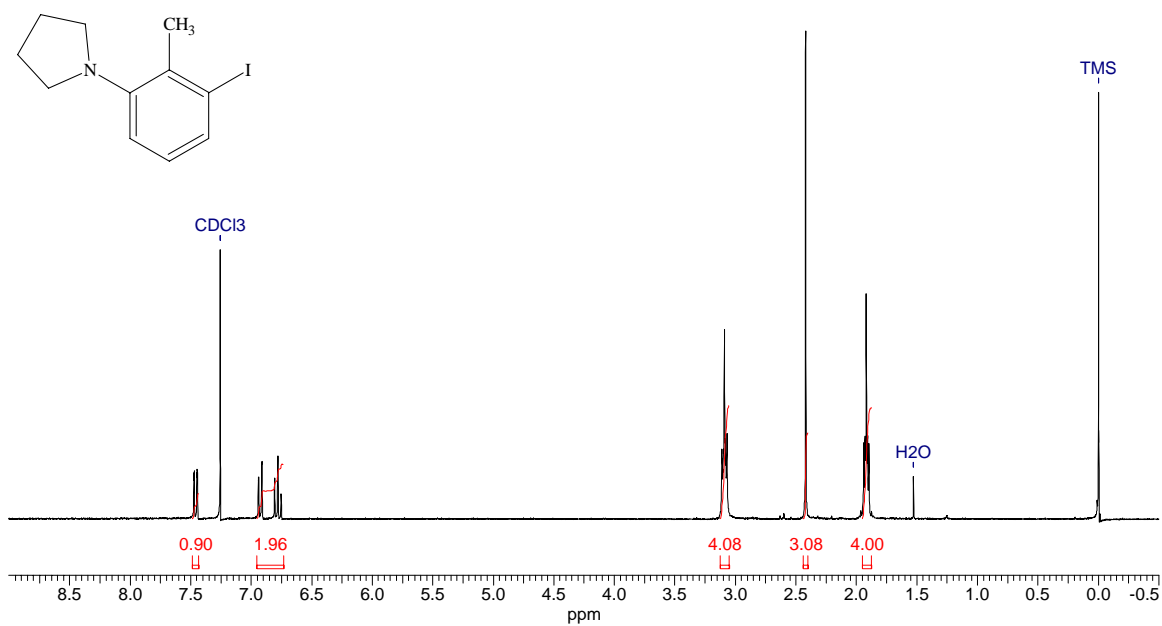
2,6-dideutero-4-methoxyaniline (**2o**)

Following the general procedure **2o** was obtained as a light brown solid (mp = 43–44 °C). ^1H NMR (300 MHz, CDCl_3) δ 3.41 (br s, 2H), 3.73 (s, 3H), 6.74 (s, 2H); ^2H NMR (61 MHz, CHCl_3) δ 6.73 (s, 2D); ^{13}C NMR (100 MHz, CDCl_3) δ 55.7, 114.6, 116.1 (1:1:1 t, $J=23.9$ Hz), 139.7, 152.8; IR thin film, ν (cm^{-1}) 702 (m), 763 (m), 872 (m), 896 (m), 1024 (s), 1056 (s), 1178 (m), 1214 (s), 1250 (m), 1438 (m), 1475 (s), 1496 (m), 1624 (w), 3221 (m), 3384 (s); HRMS (EI) Calc'd for $\text{C}_7\text{H}_7\text{D}_2\text{NO}$: 125.0810 (M^+), found 125.0814.

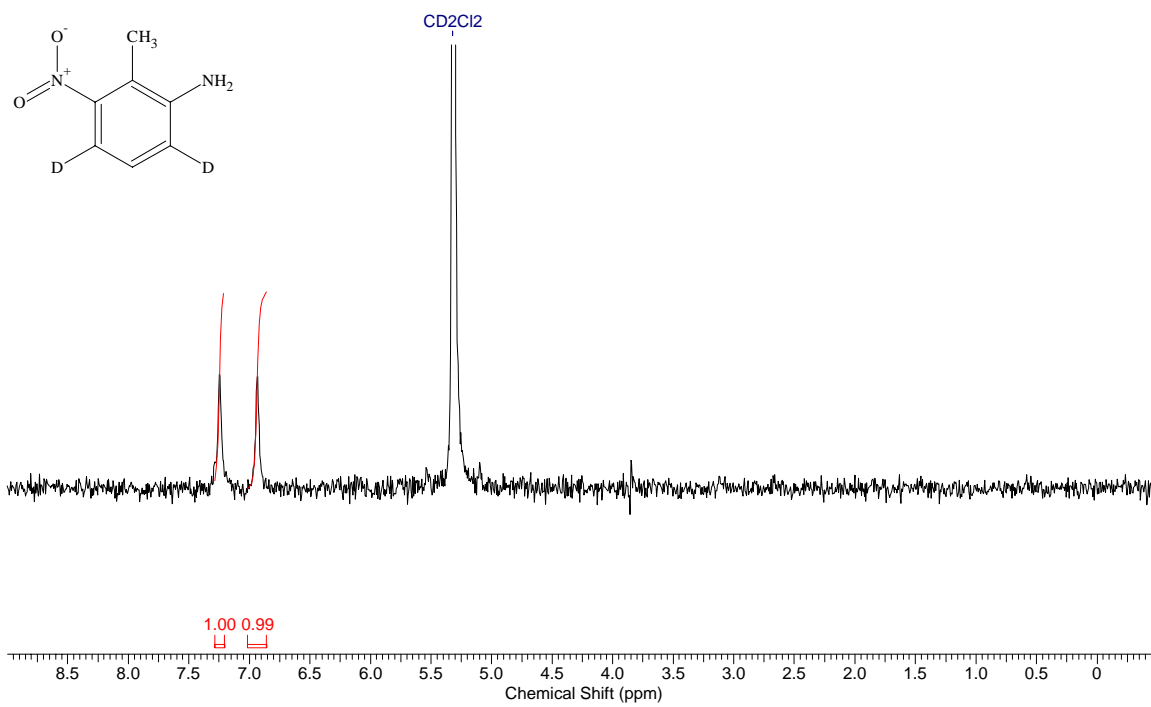
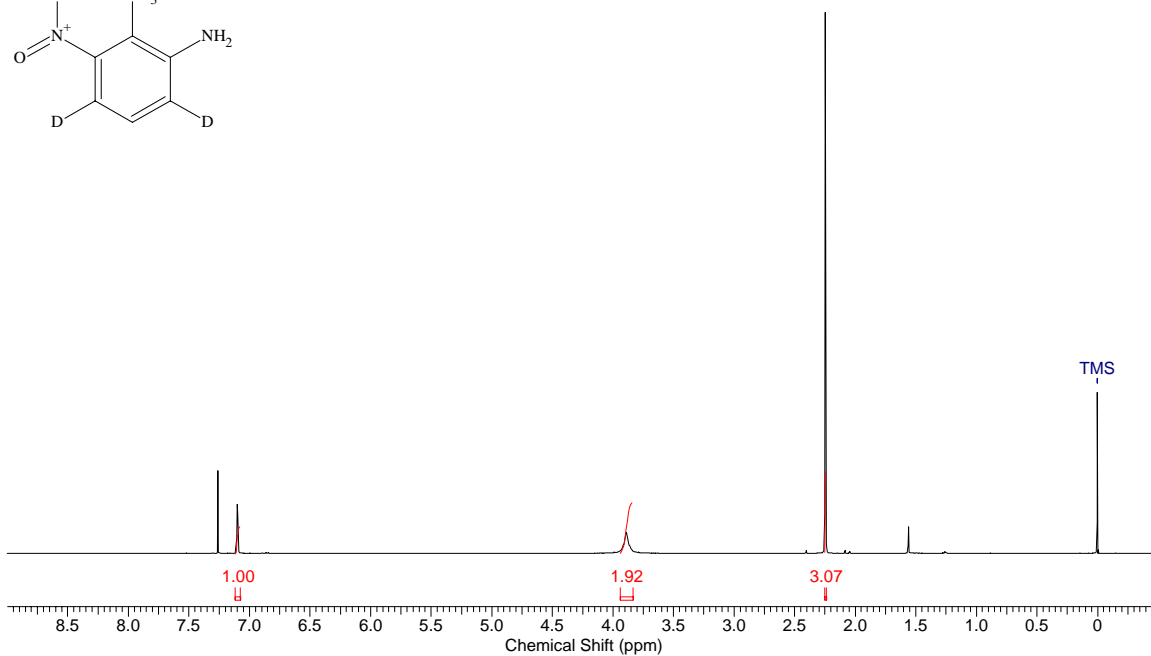
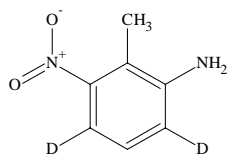
4,6-dideutero-1-iodo-2-methyl-3-nitrobenzene (**3**)

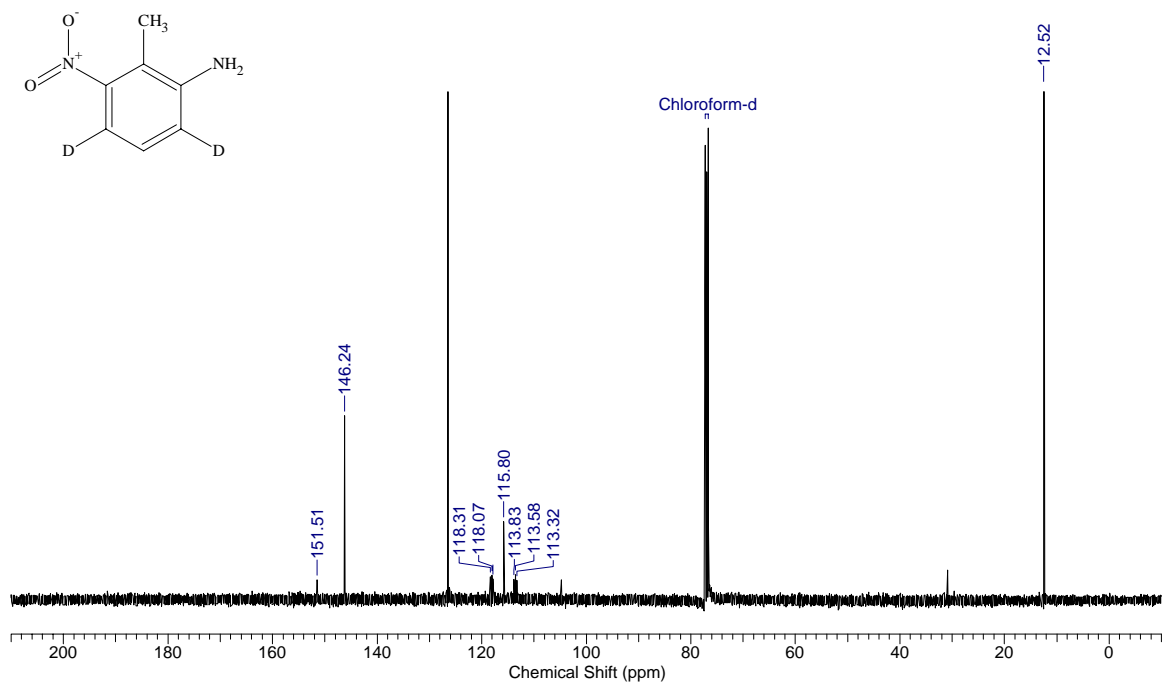
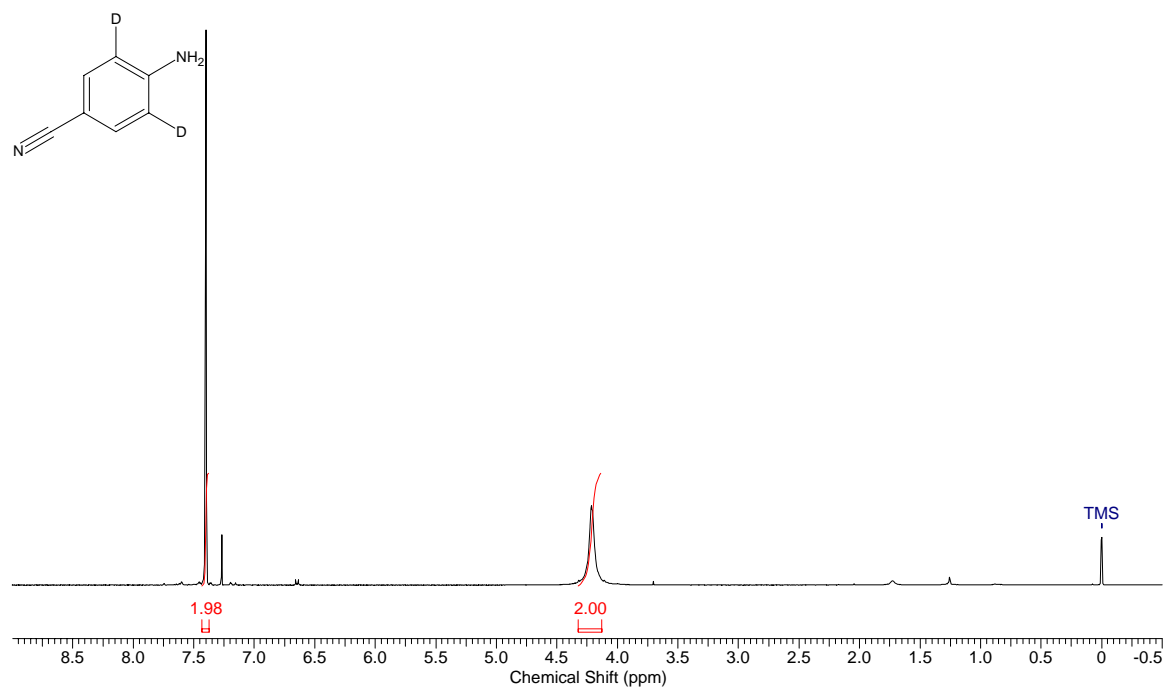
4,6-dideutero-2-methyl-3-nitroaniline **2a** (336 mg, 2.18 mmol) was suspended in 5 mL H_2O , and a mixture of 0.5 mL conc. H_2SO_4 in 5 mL H_2O was added. The mixture was cooled to 0 °C in an ice bath, and a solution of NaNO_2 (158 mg, 2.29 mmol) in 5 mL H_2O was added dropwise *via* addition funnel over 10 min, and stirred for 1 h. To this mixture was added dropwise a solution of KI (543 mg, 3.27 mmol) in 5 mL H_2O *via* addition funnel over 10 min, and the mixture allowed to warm to RT and stirred overnight. The reaction mixture was extracted with 2 x 15 mL CH_2Cl_2 , and the combined organic phases washed with 20 mL sat. Na_2SO_3 . The organic phase was then dried with Na_2SO_4 , filtered, and concentrated *in vacuo*. The crude product was then purified by flash chromatography on silica gel (R_f 0.51 in 5 % Et_2O /hexane) using 5 % Et_2O /hexane to afford **1a-d₂** as a pale yellow oil which slowly solidifies to a pale yellow solid (mp = 30–32 °C). Isolated yield: 513 mg (89 %). ^1H NMR (400 MHz, CDCl_3) δ 2.60 (s, 3H), 7.04 (br s, 1H); ^2H NMR (61 MHz, CHCl_3) δ 7.75 (s, 1D), 8.08 (s, 1D); ^{13}C NMR (100 MHz, CDCl_3) δ 24.9, 103.3, 123.7 (1:1:1 t, $J=26.5$ Hz), 127.7, 135.0, 142.8 (1:1:1 t, $J=25.7$ Hz), 150.3; IR thin film, ν (cm^{-1}) 692 (m), 857 (m), 1015 (m), 1088 (w), 1350 (s), 1519 (s), 2361 (s); HRMS (EI) Calc'd for $\text{C}_7\text{H}_4\text{D}_2\text{NO}_2$: 264.9569 (M^+), found 264.9562.

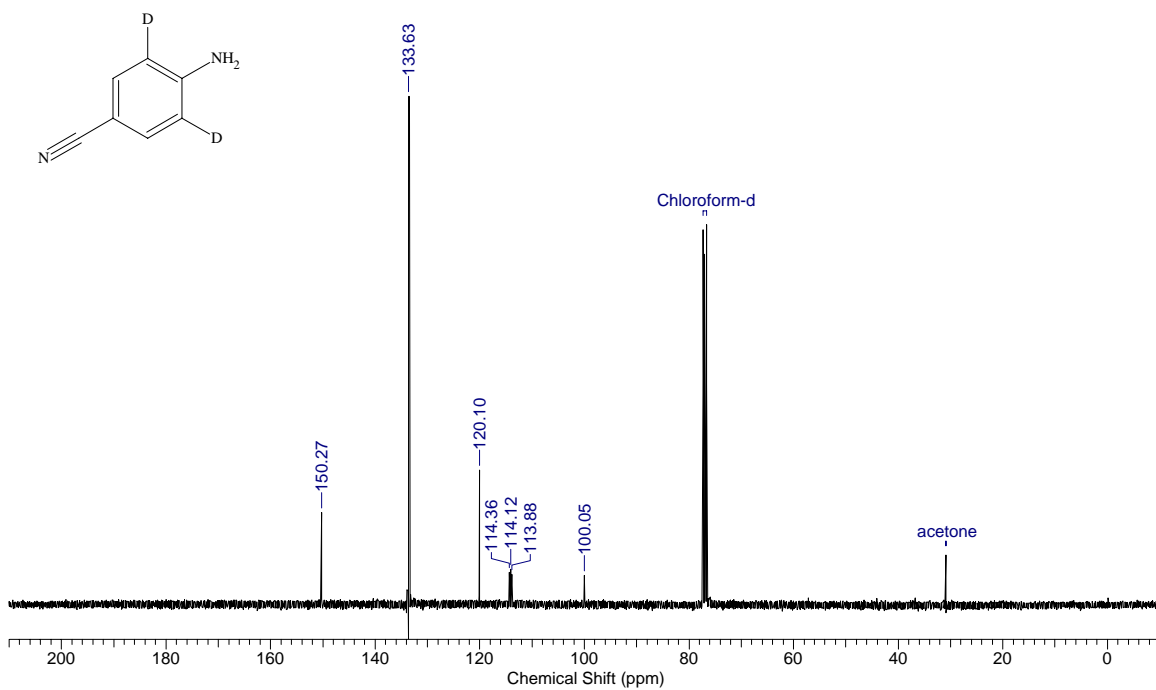
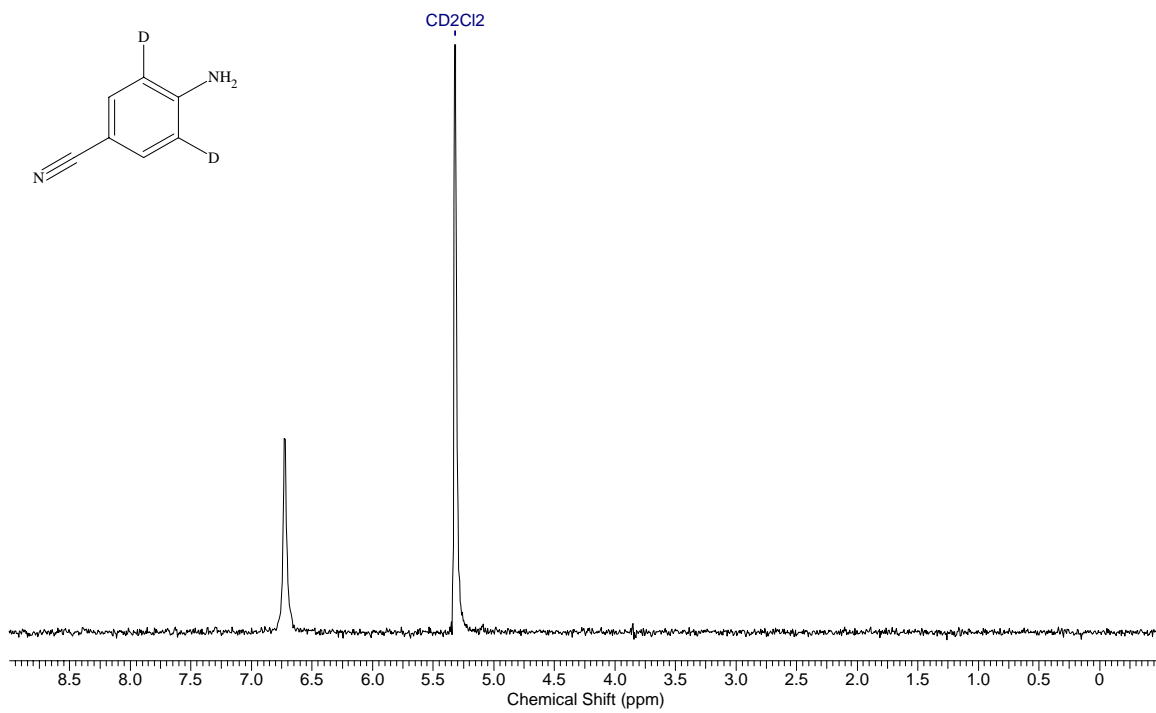
Representative Spectra (in numerical order):

Compound **1m**

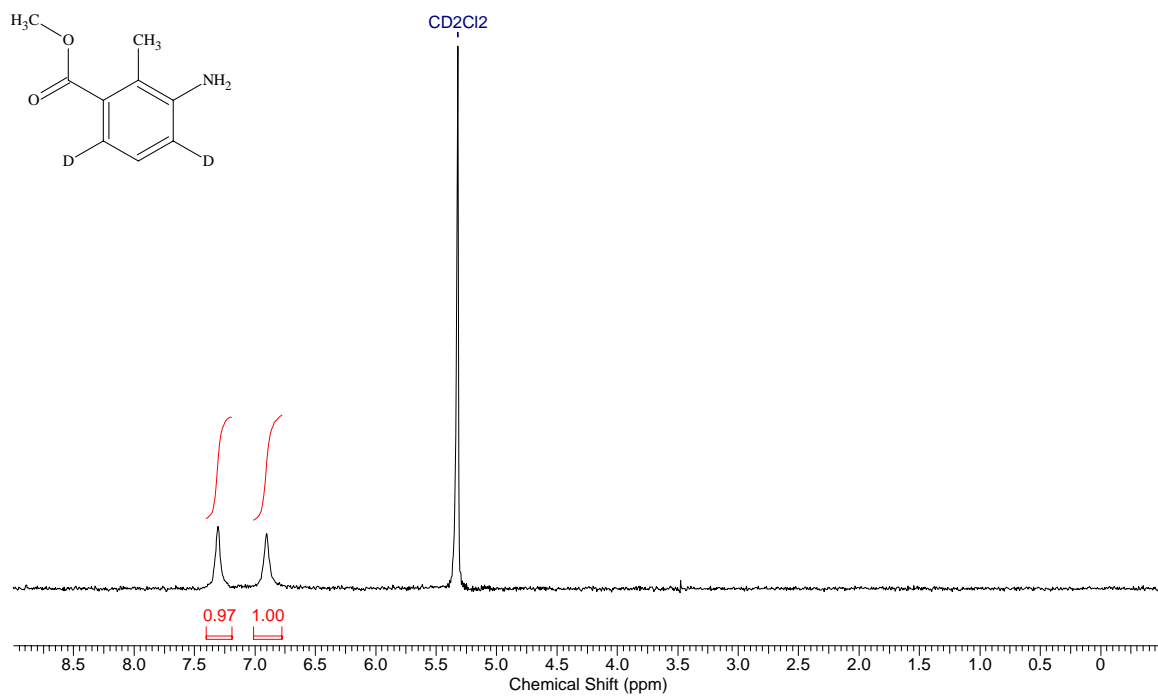
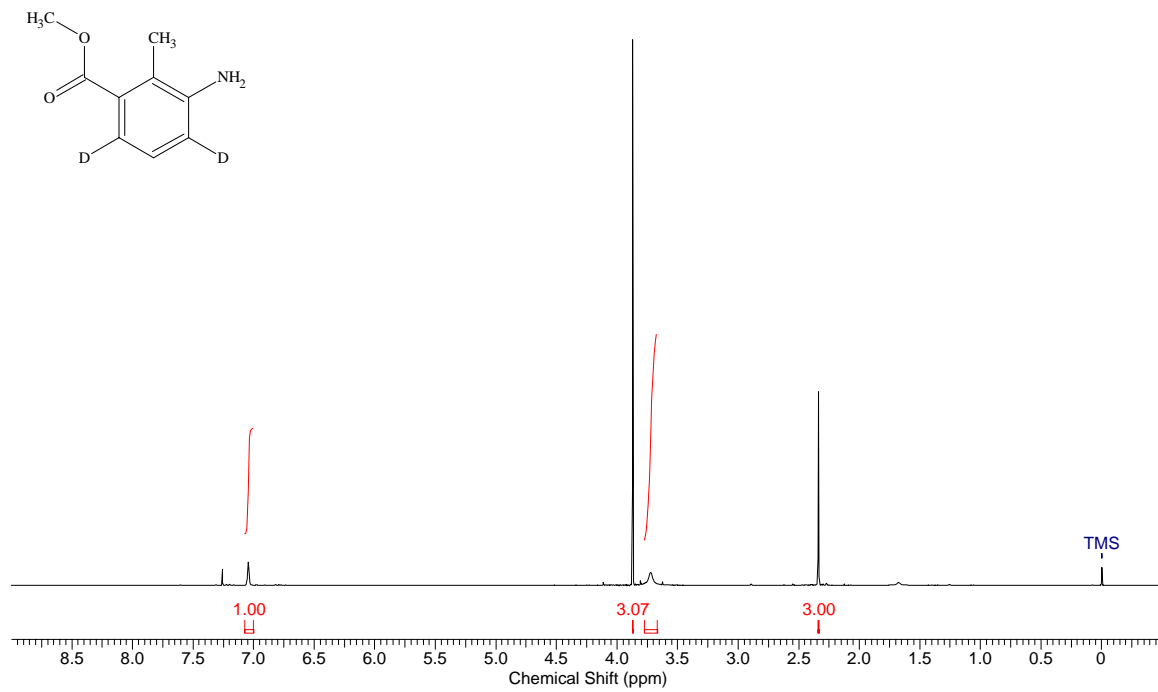
Compound 2a

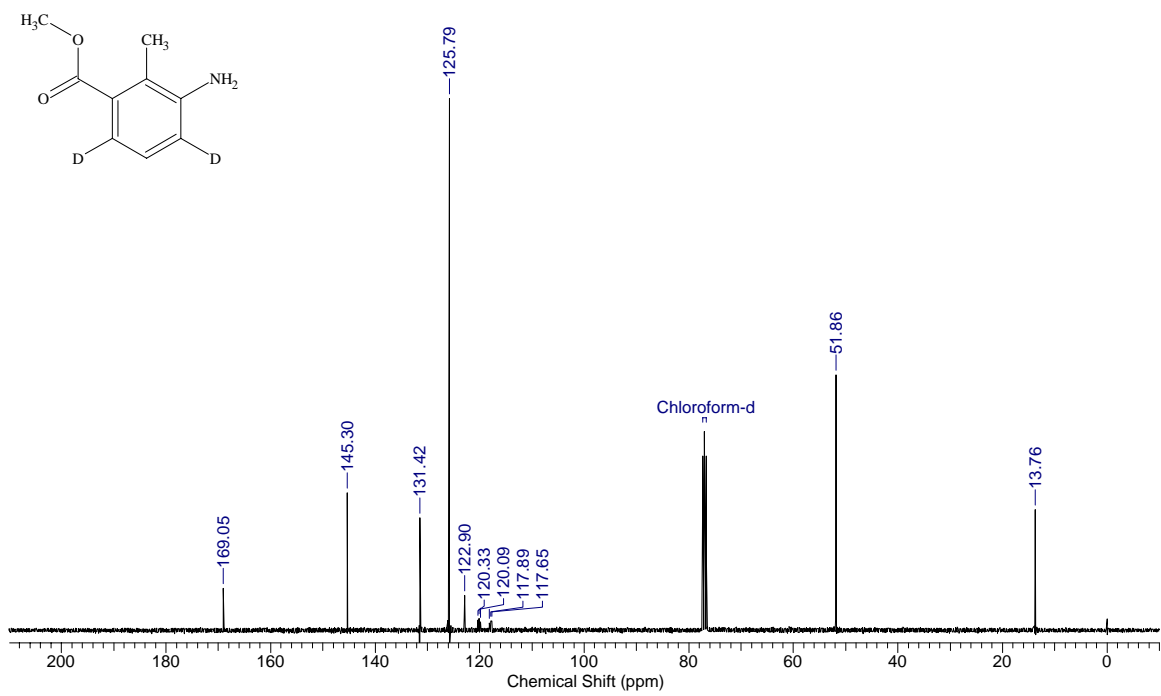
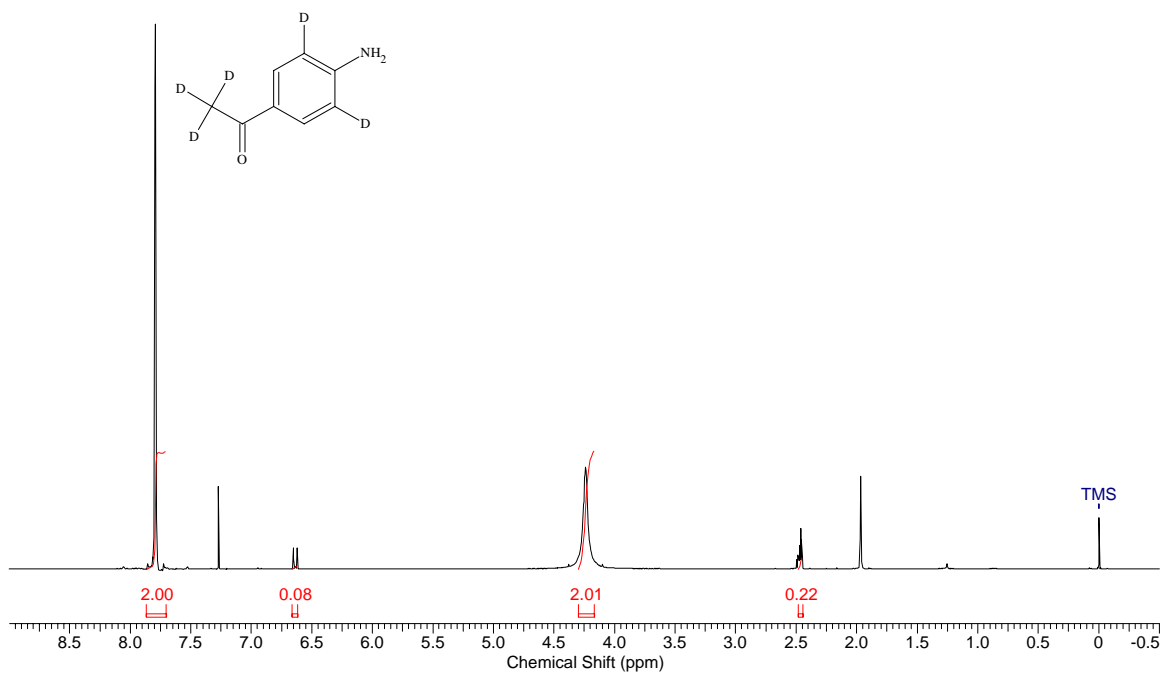


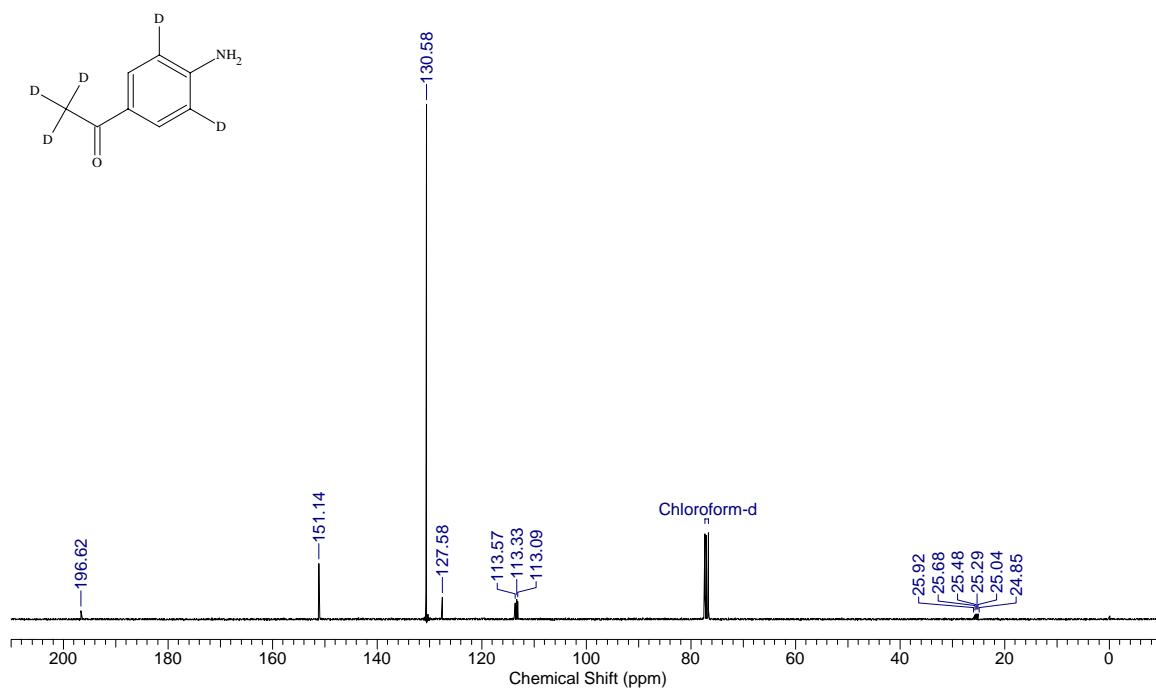
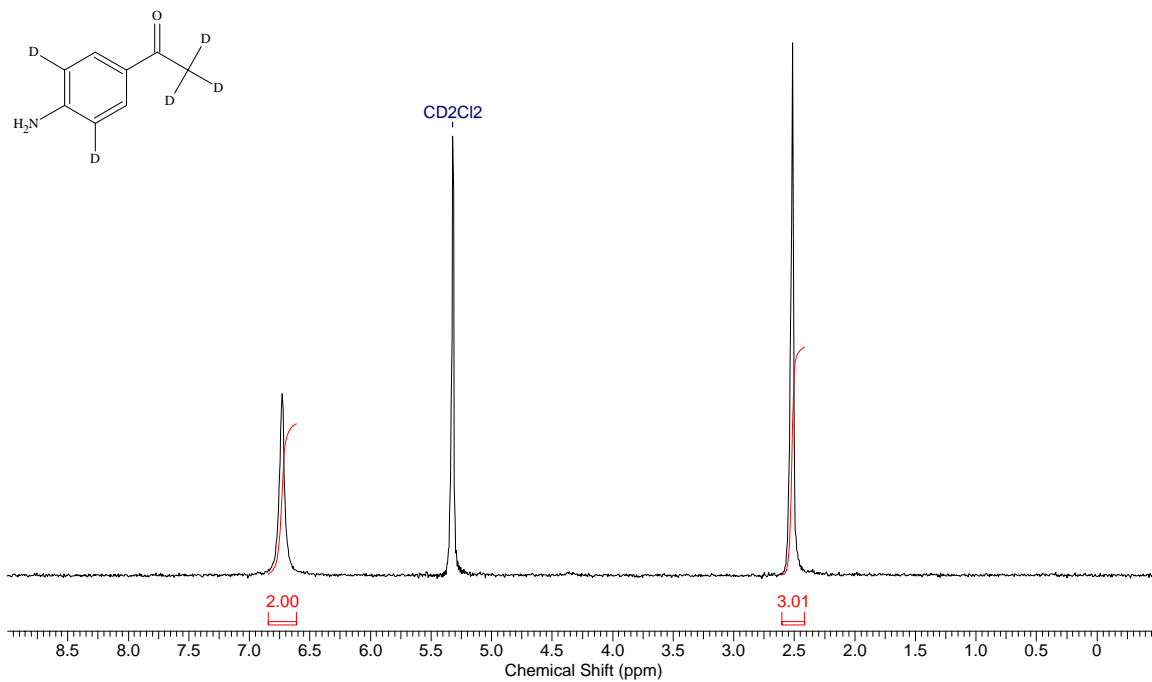
**Compound 2b**



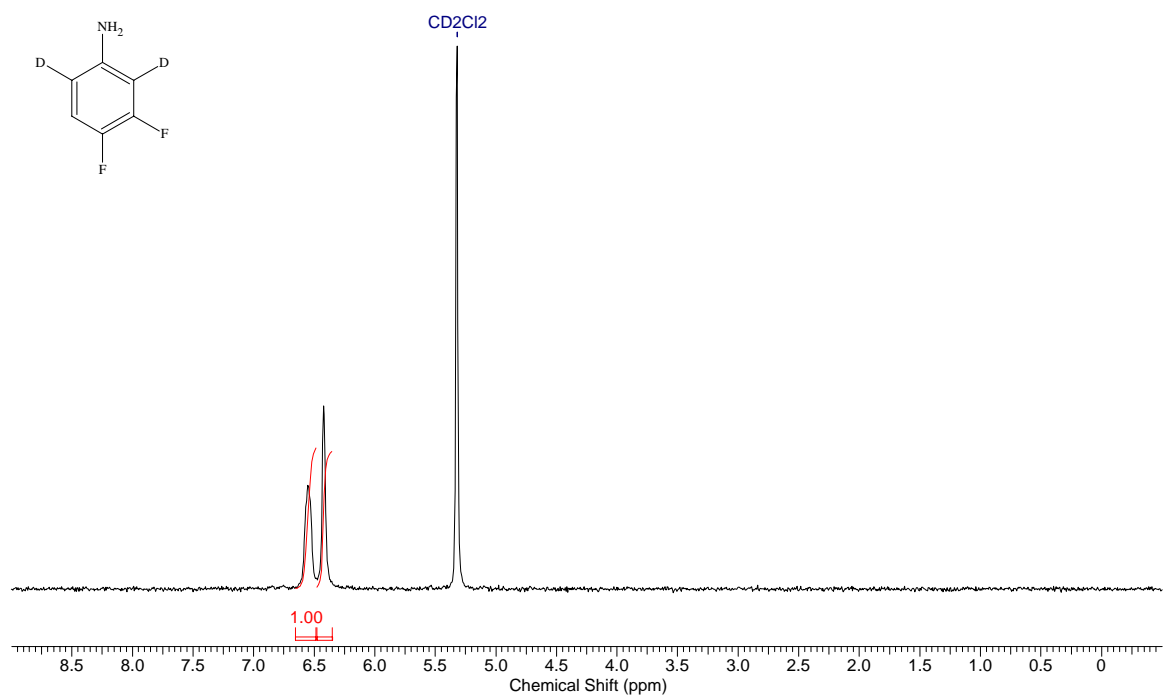
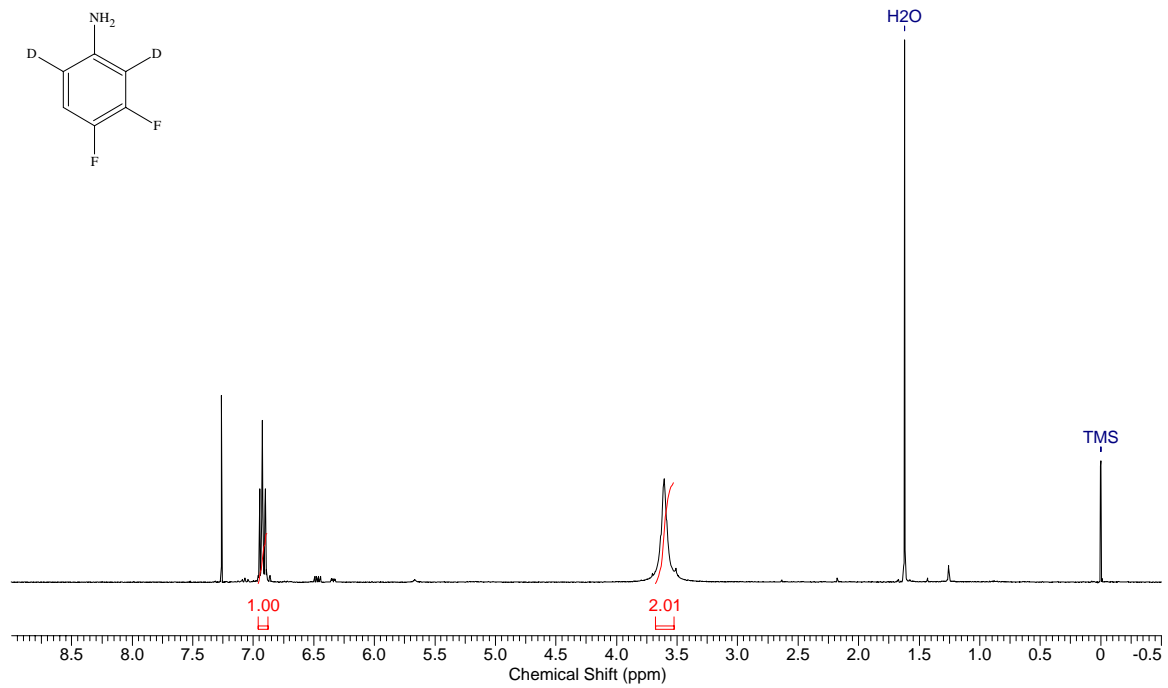
Compound 2c

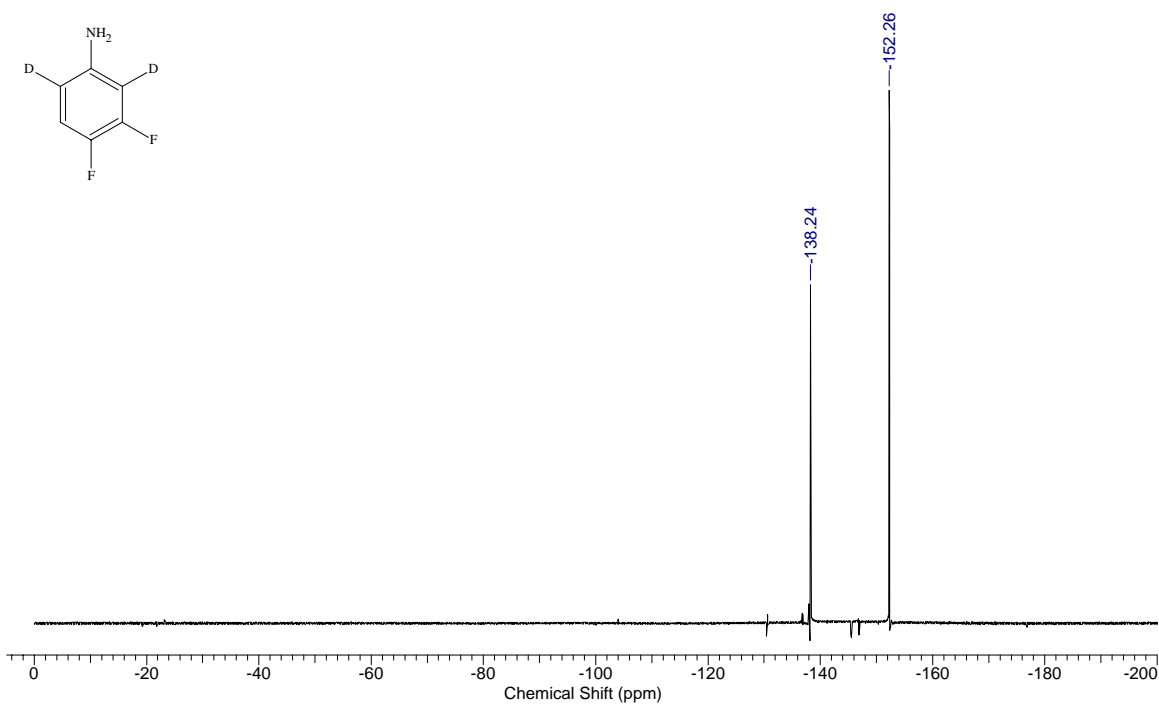
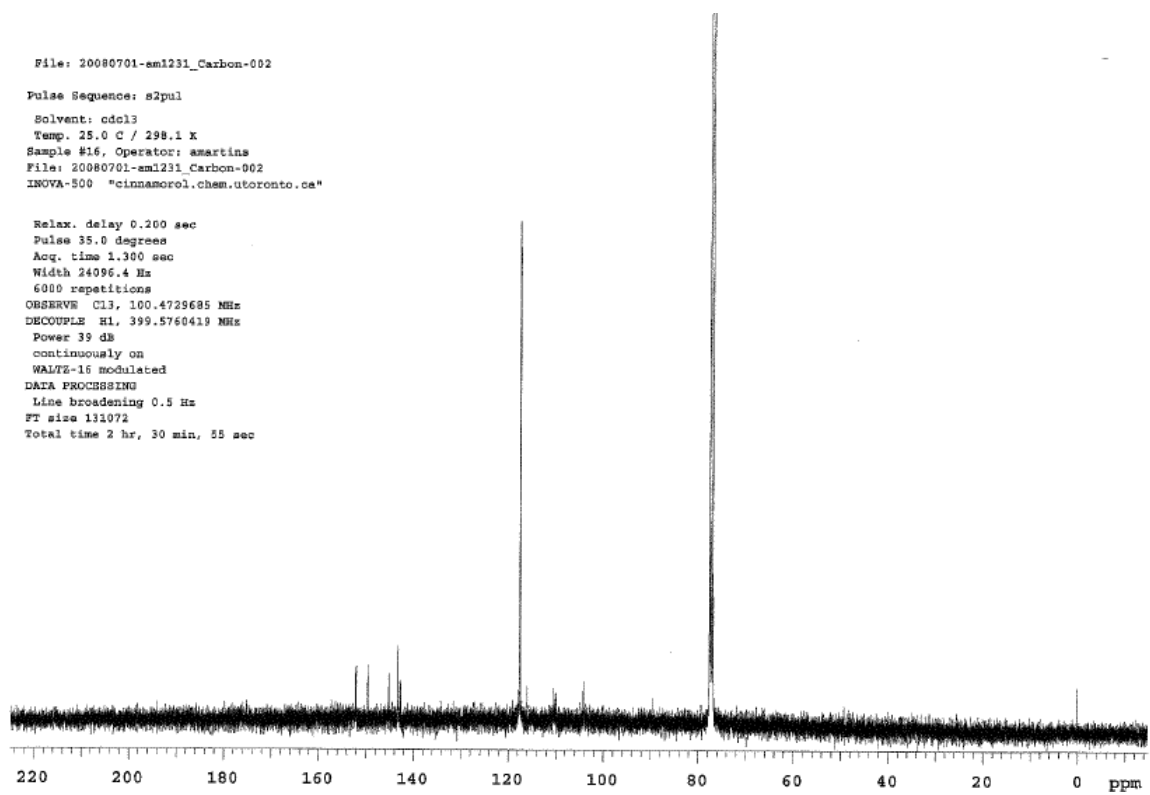


Compound **2d**

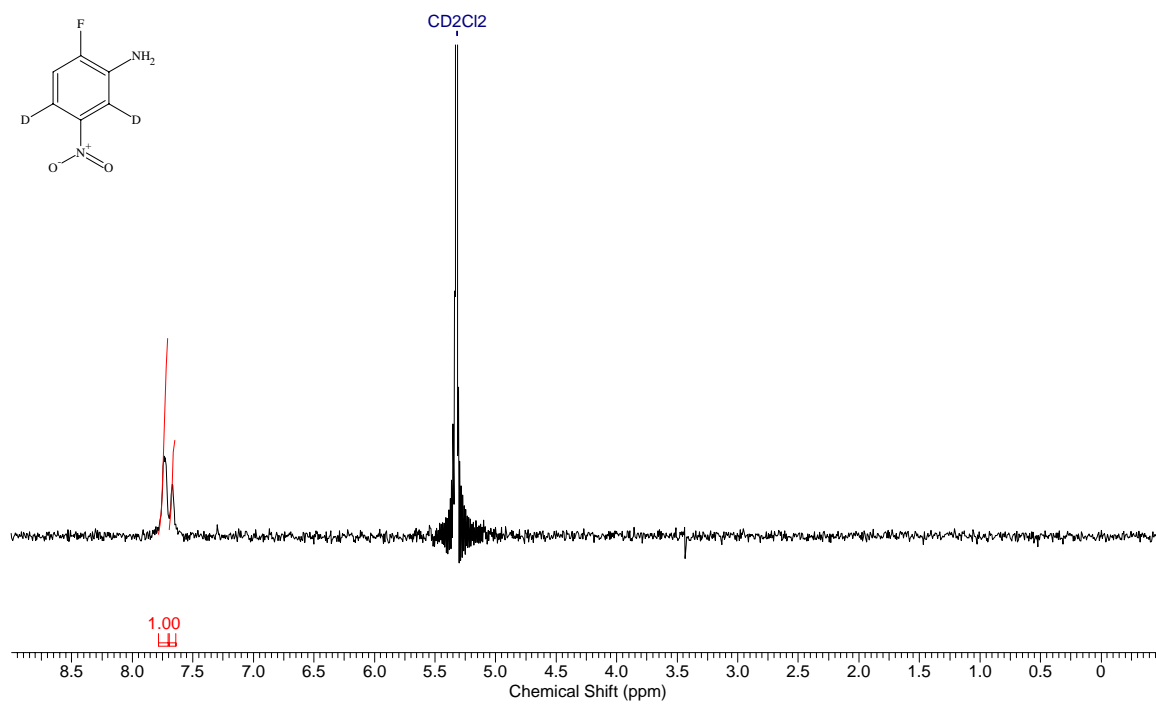
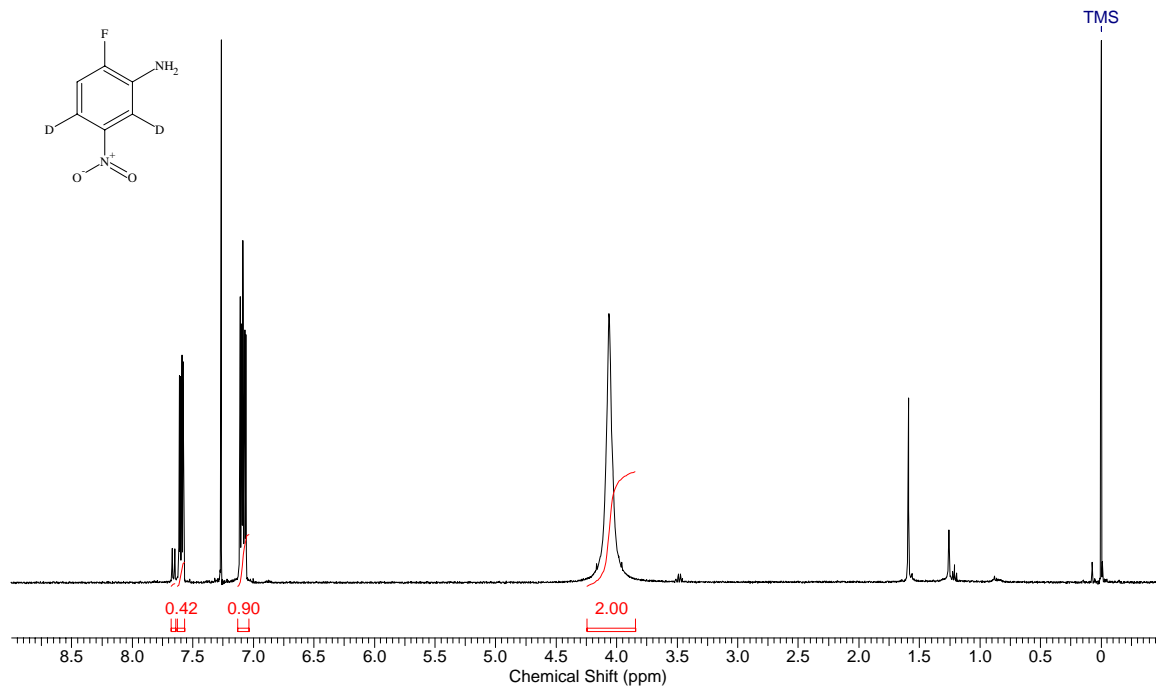


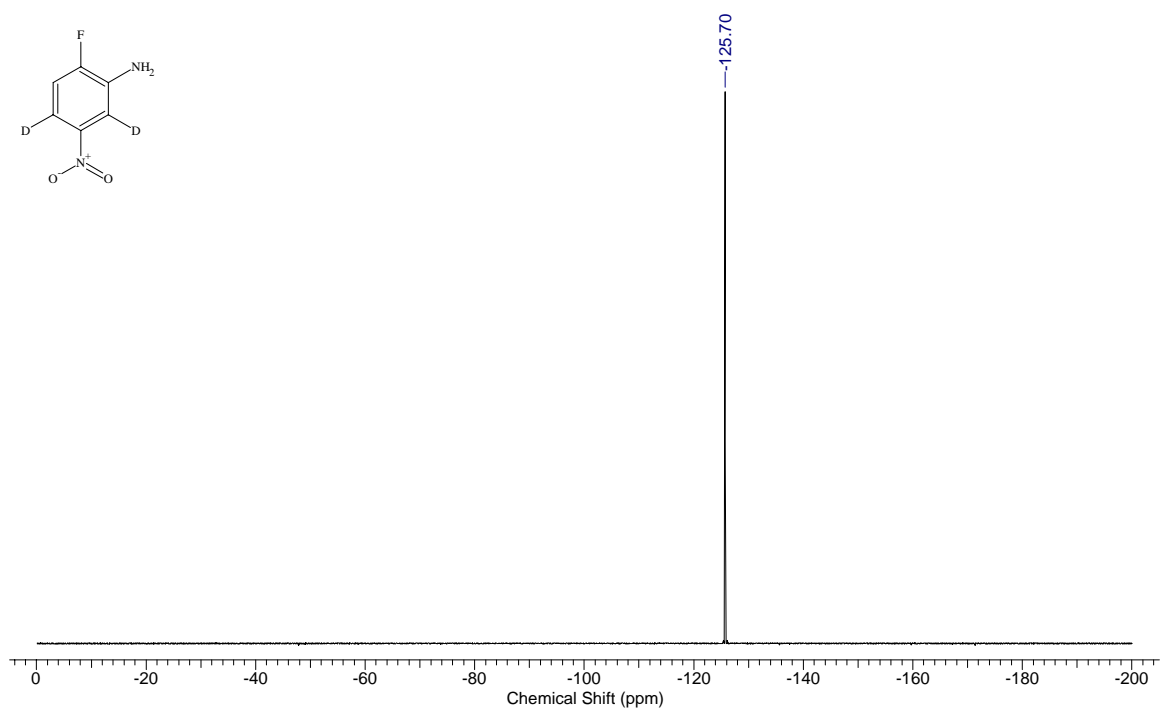
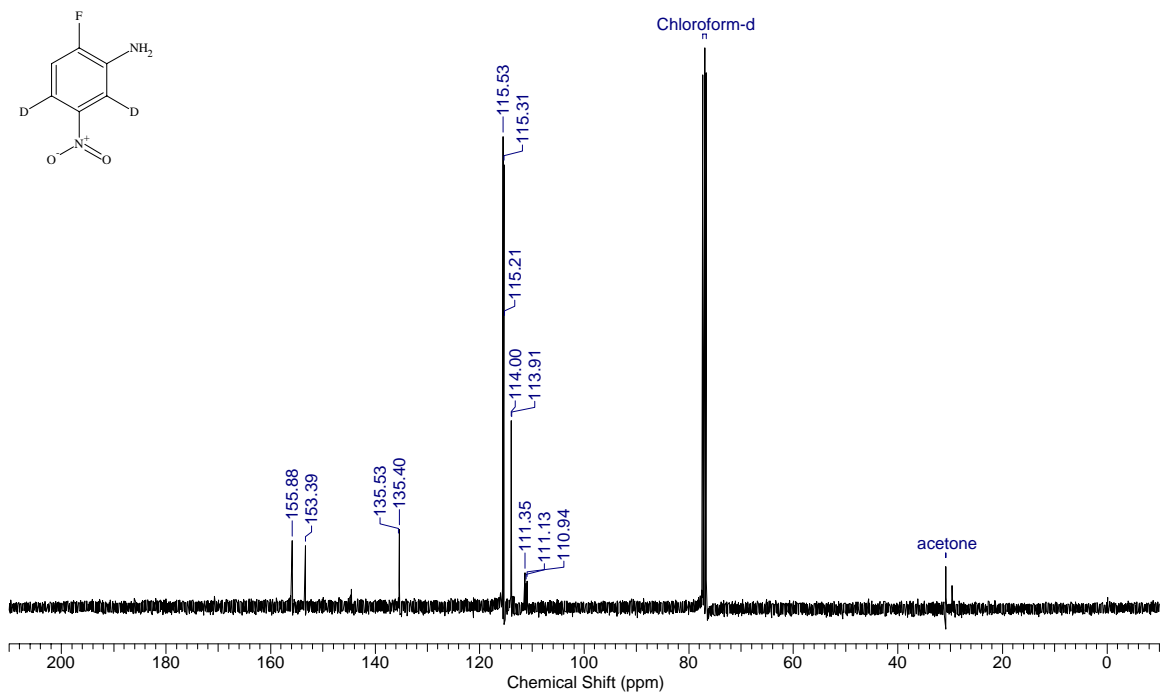
Compound 2e



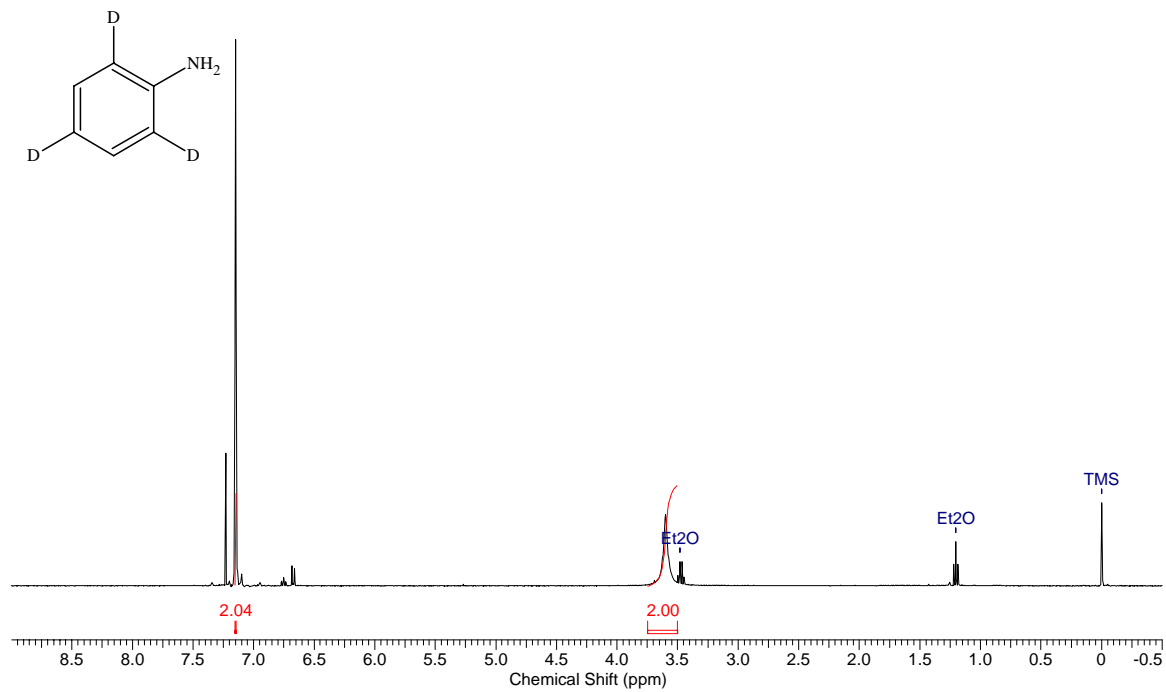


Compound 2f

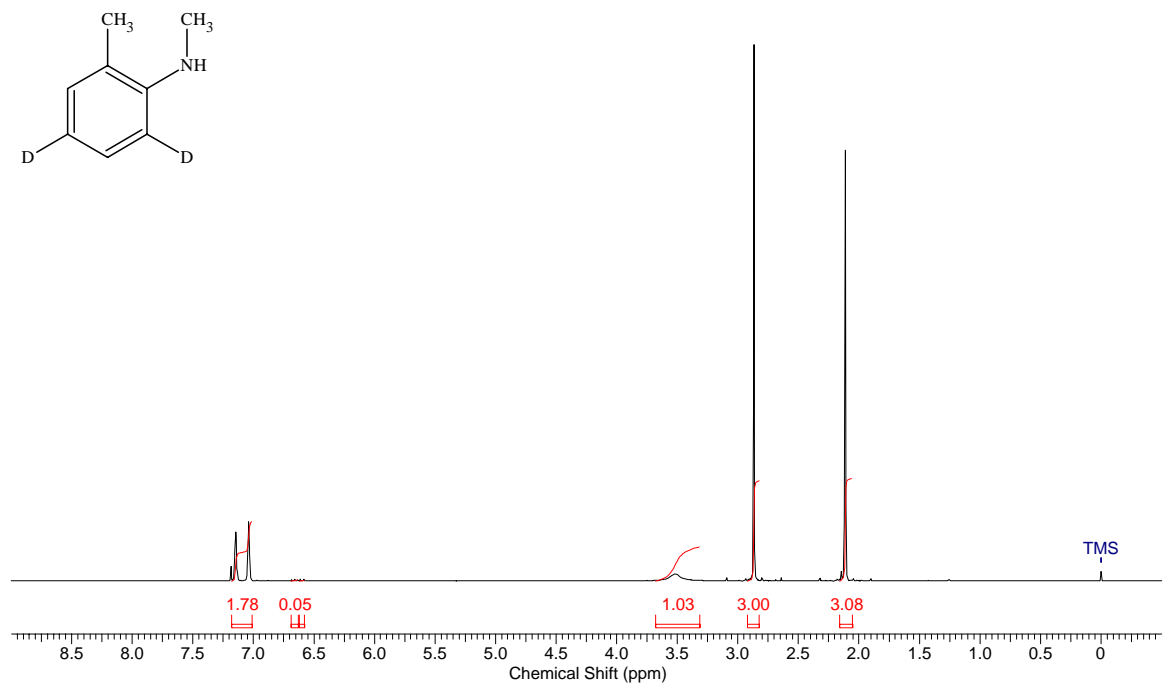


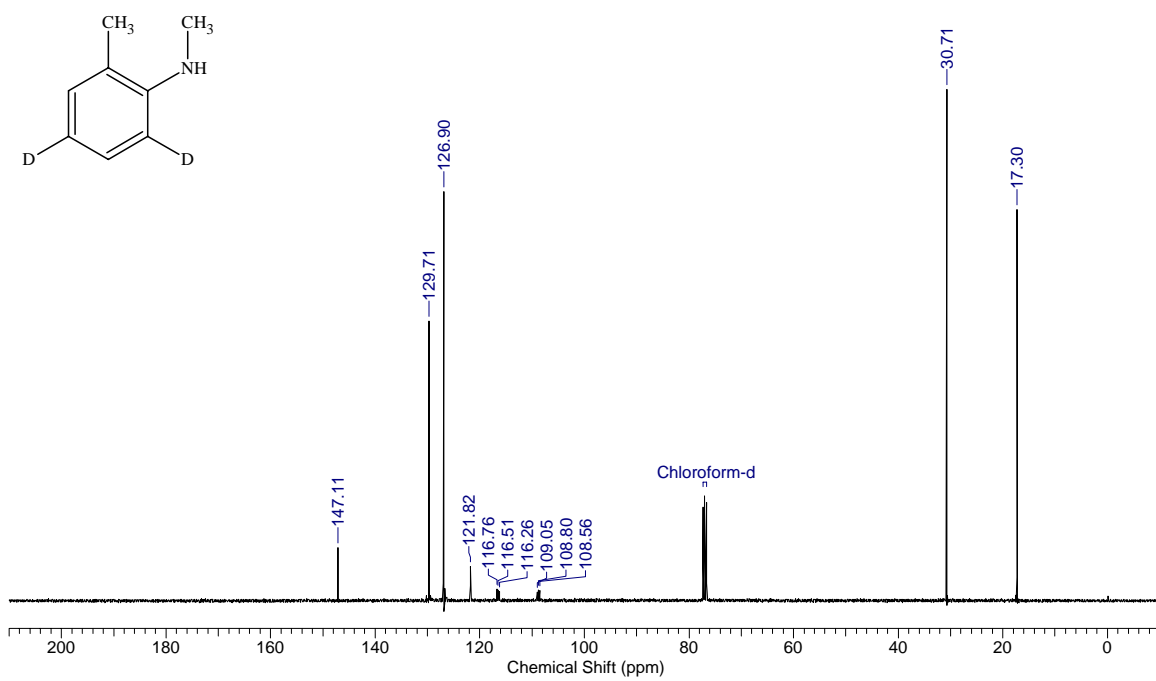
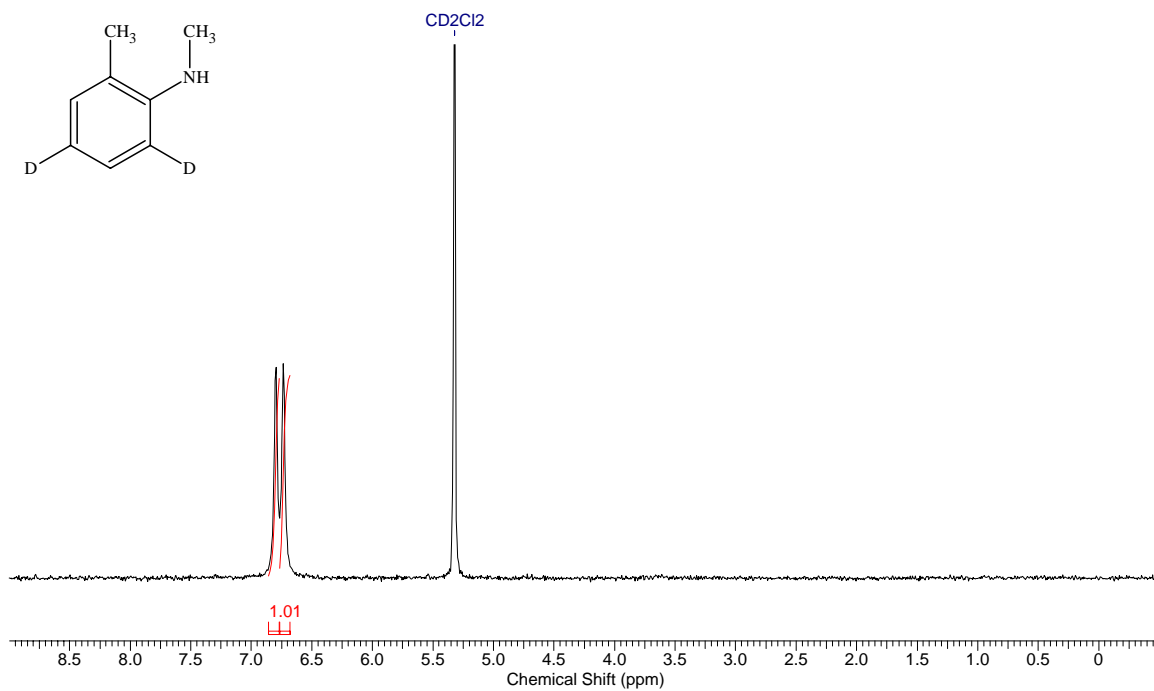


Compound 2g

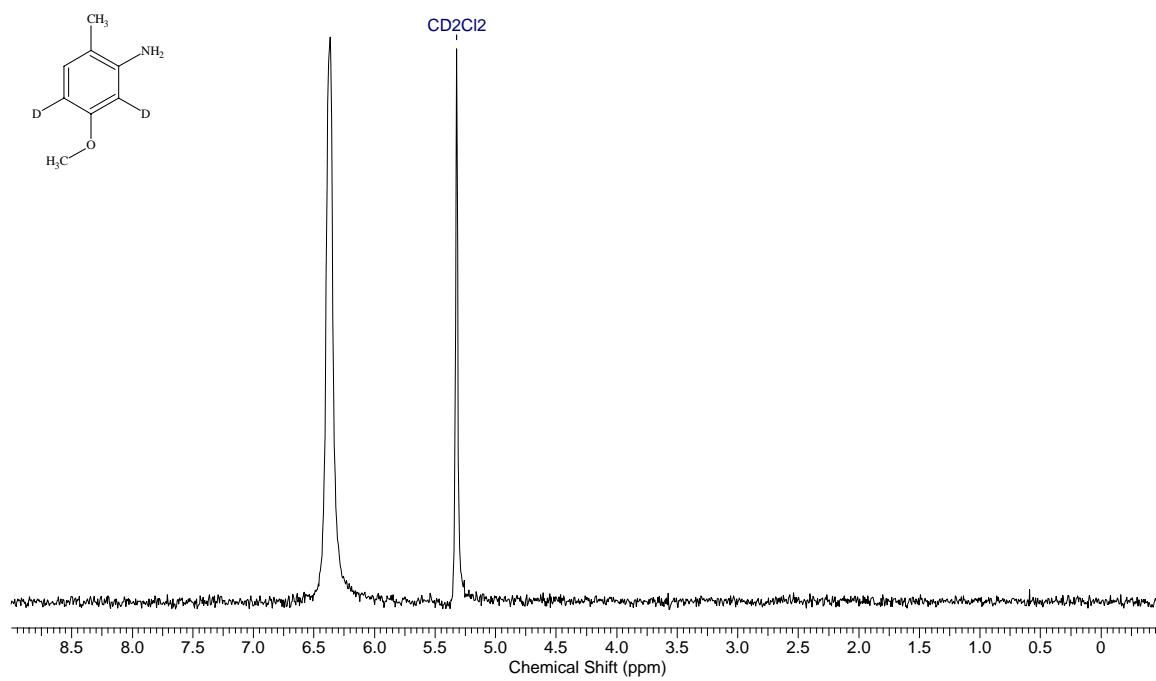
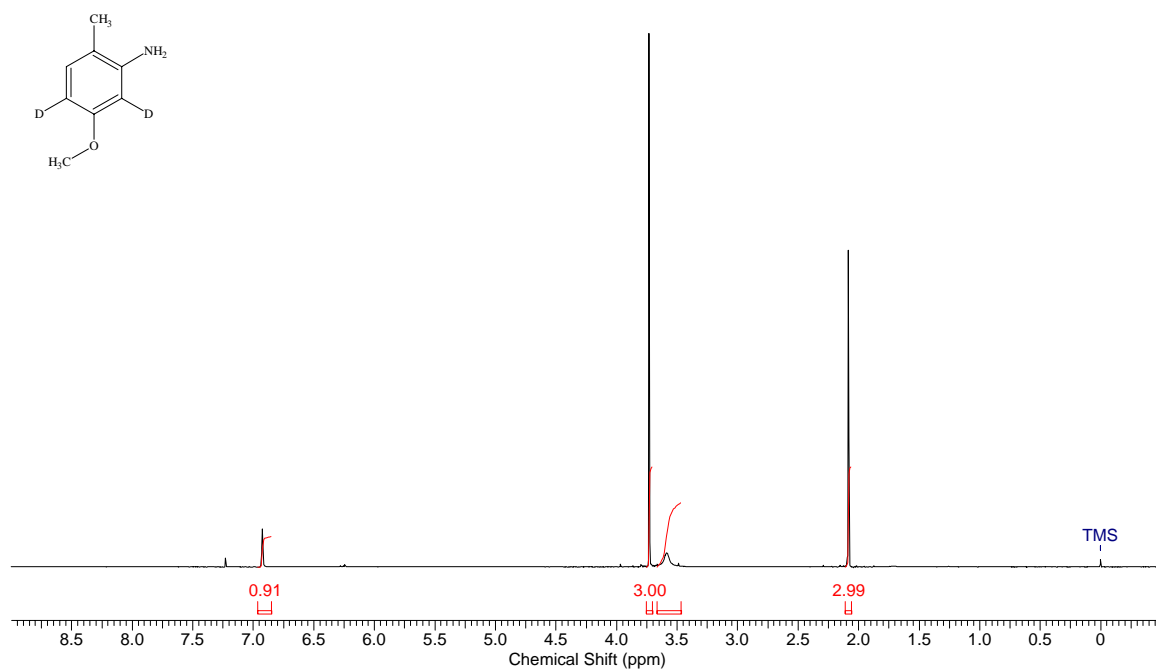


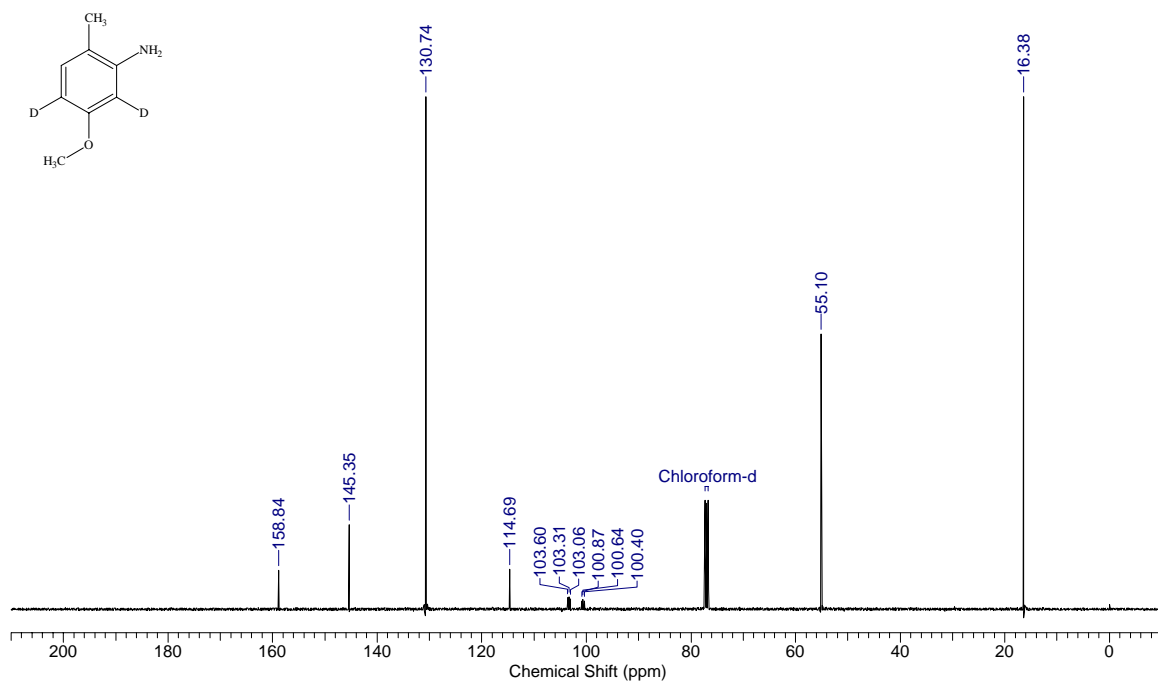
Compound 2h



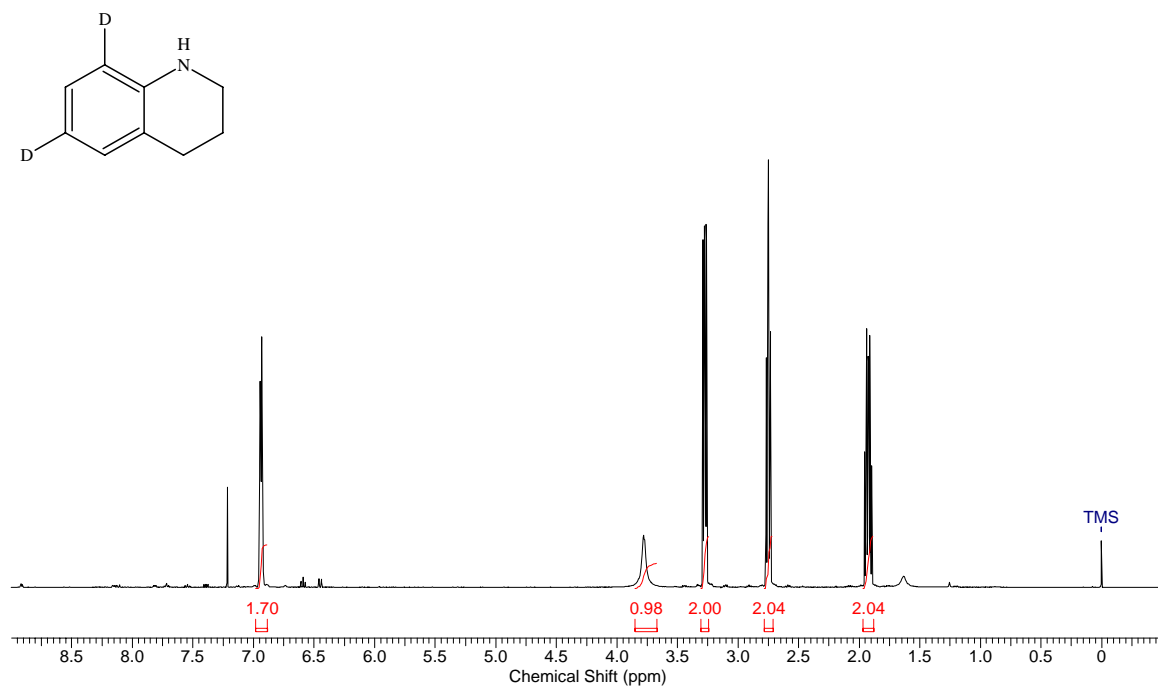


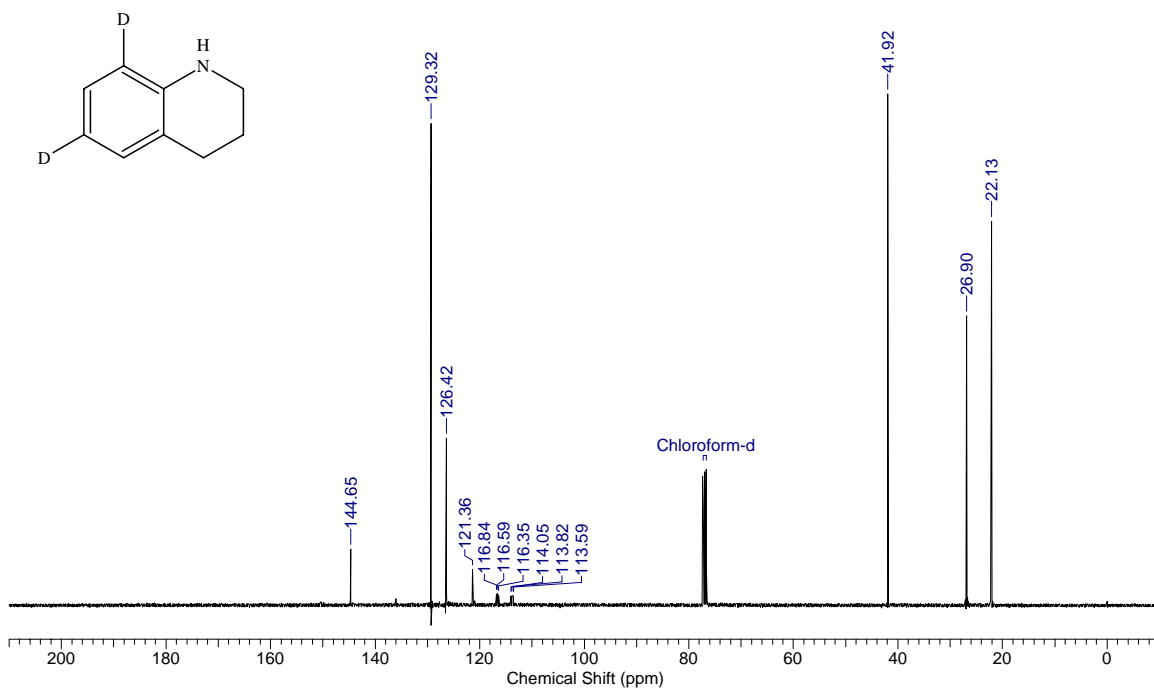
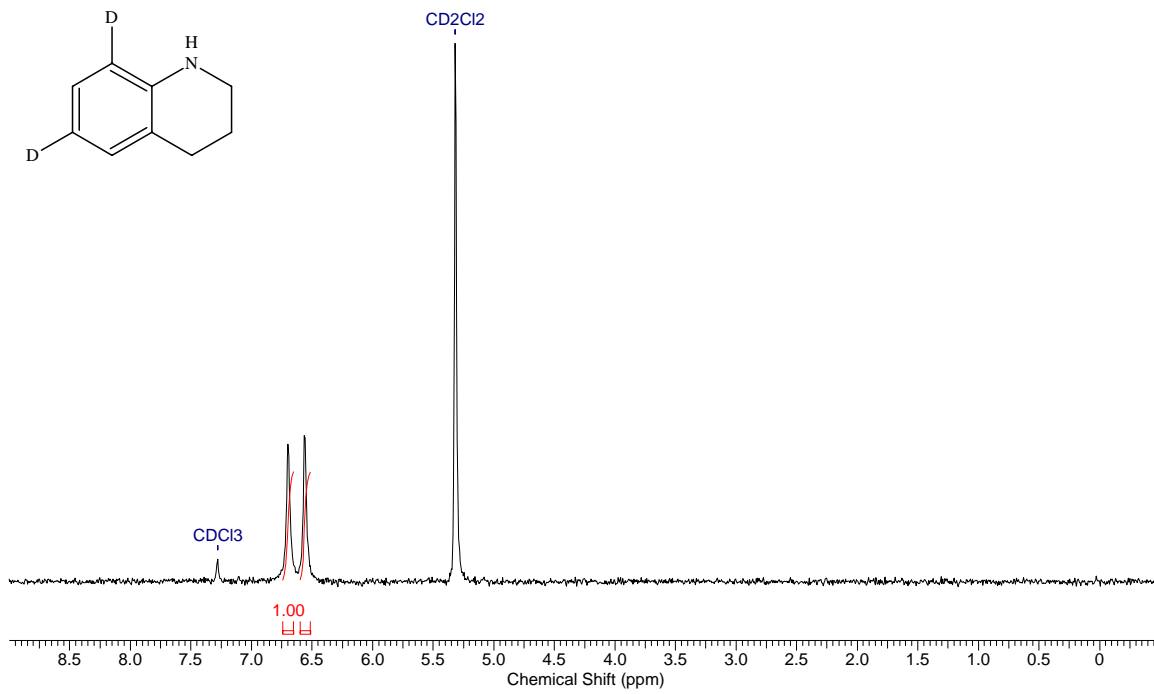
Compound 2i



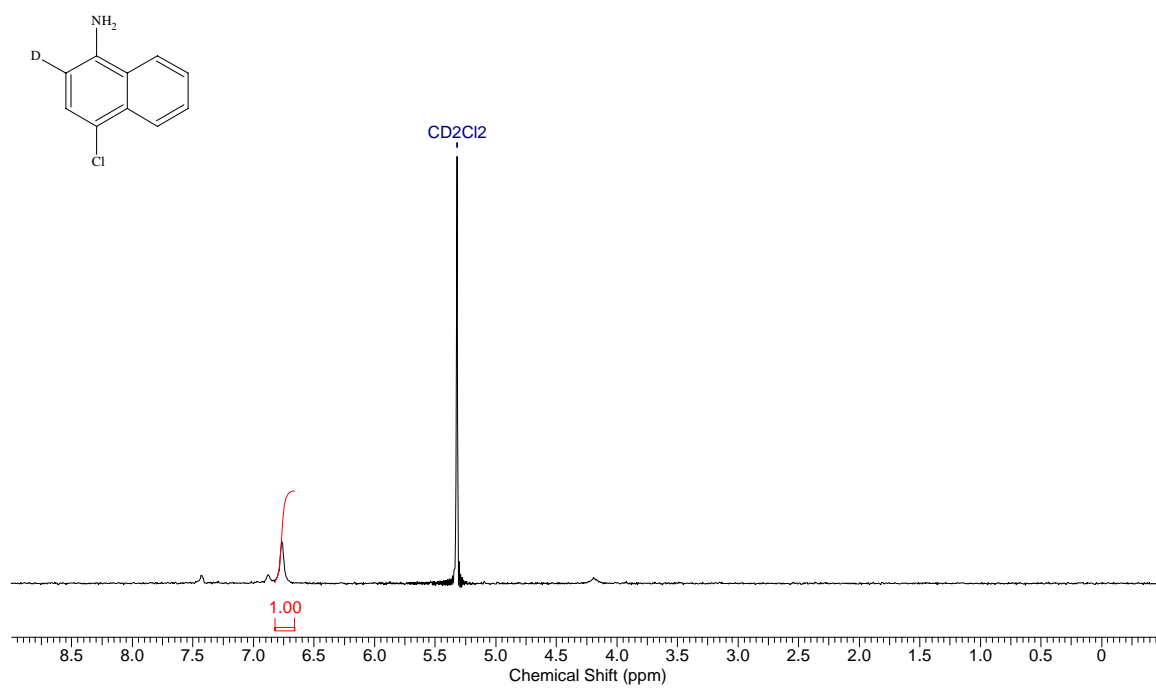
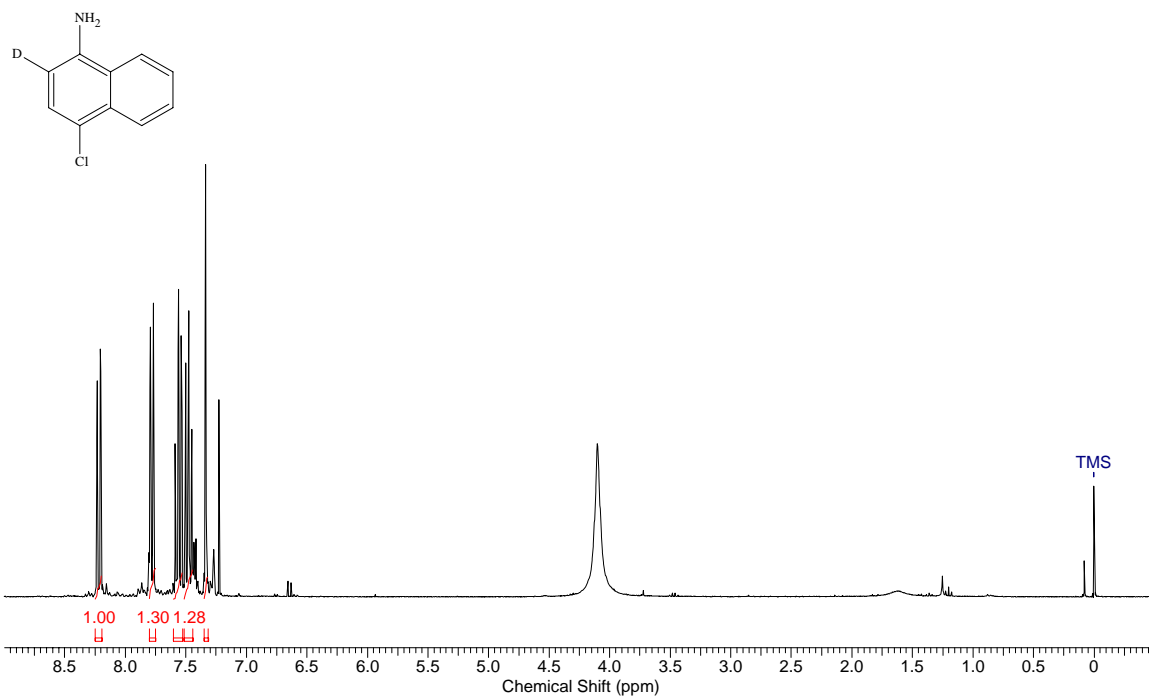


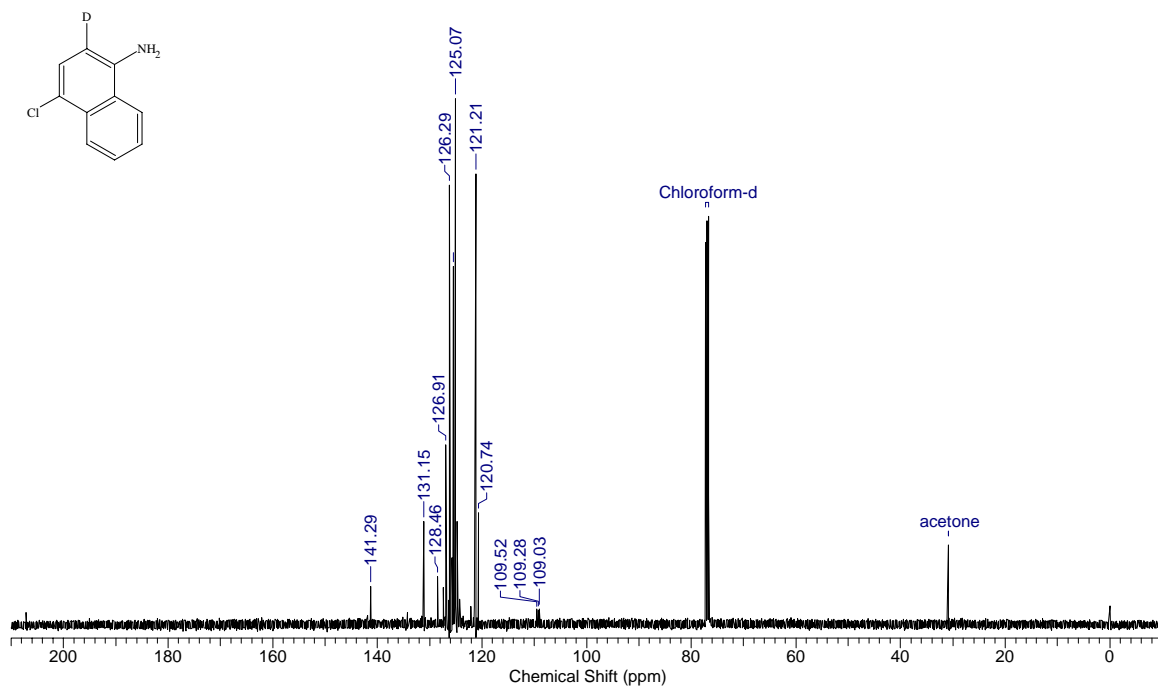
Compound 2j



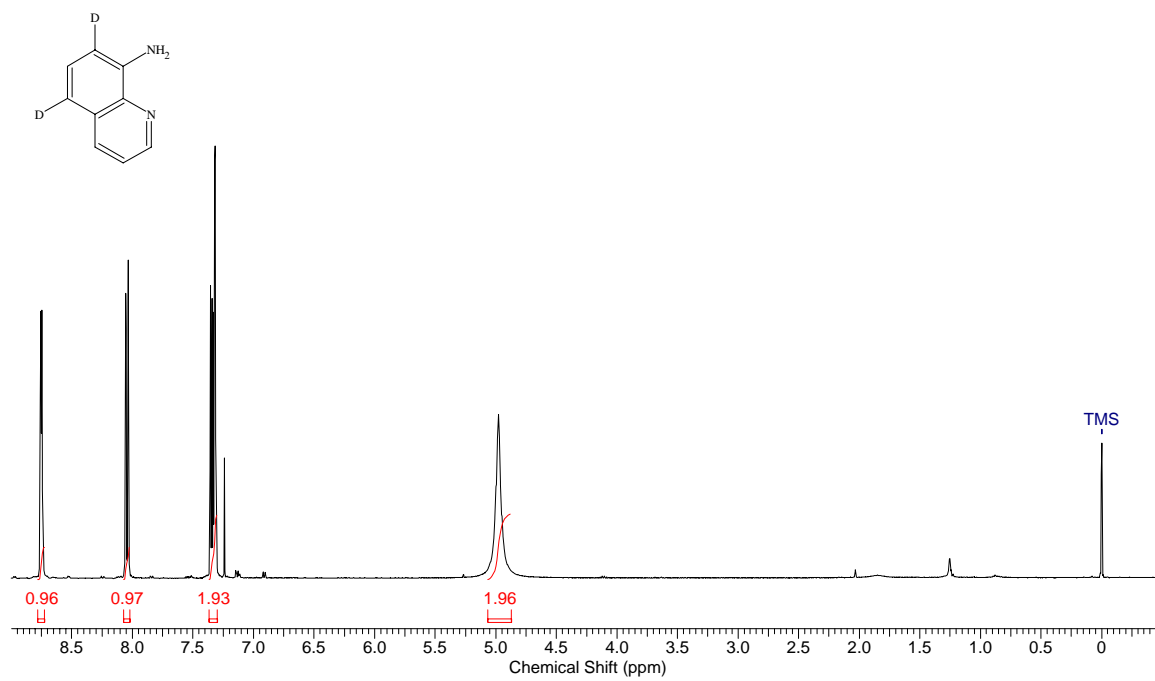


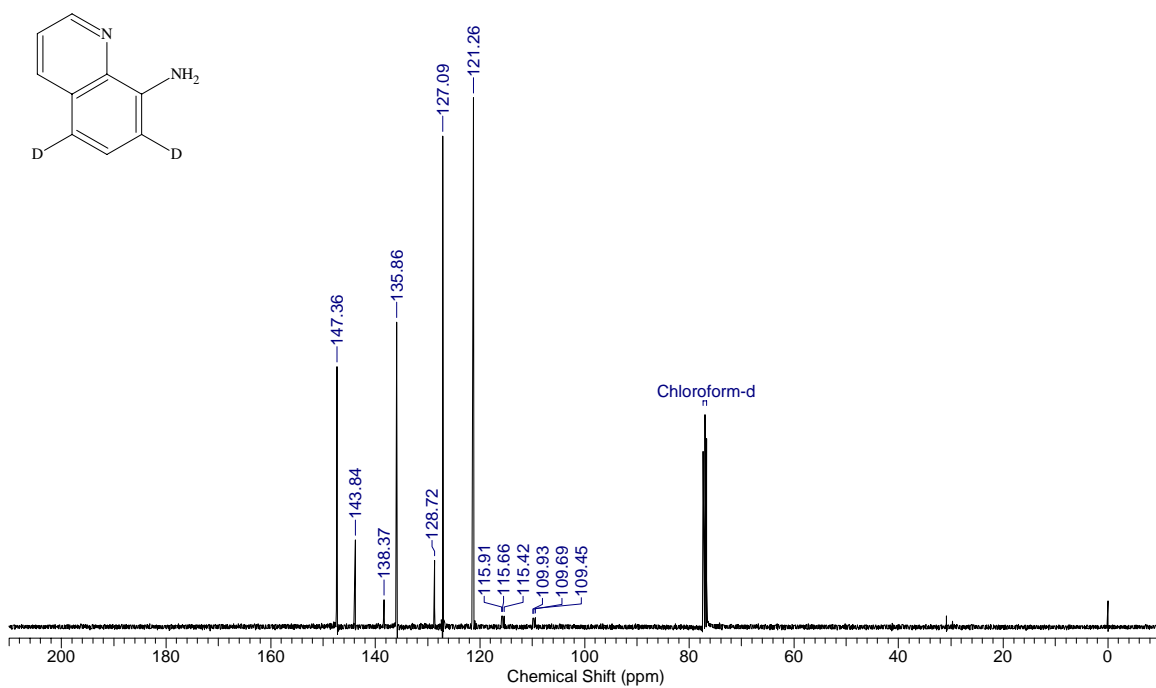
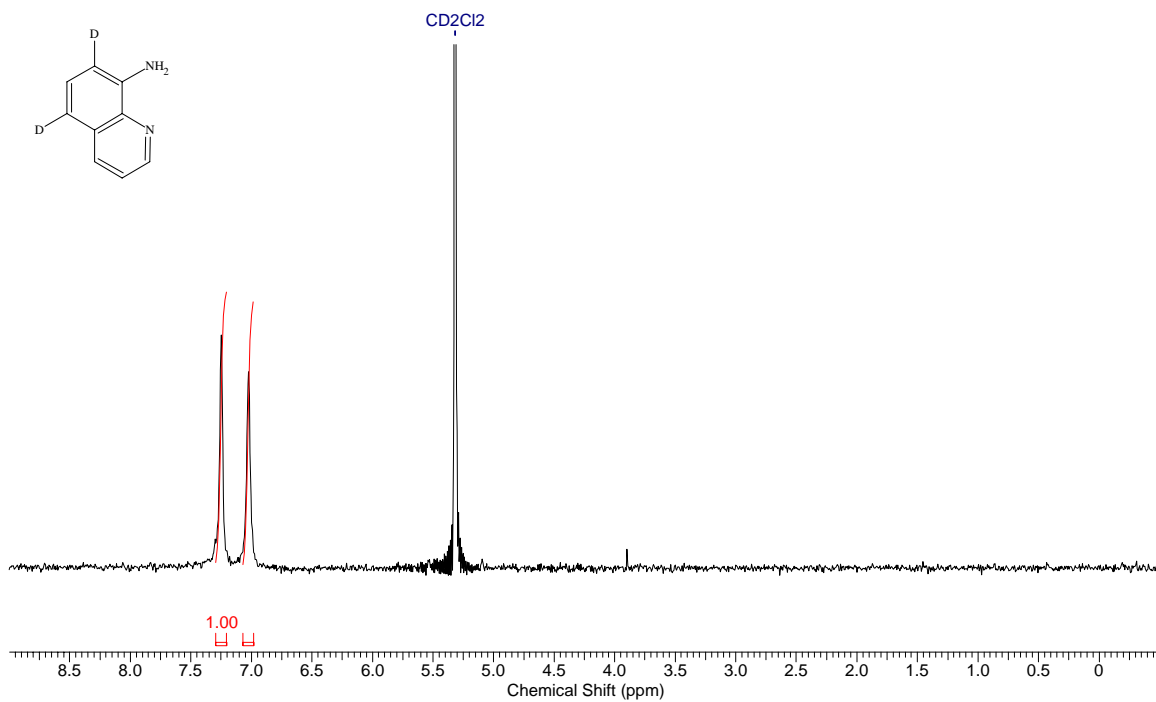
Compound 2k

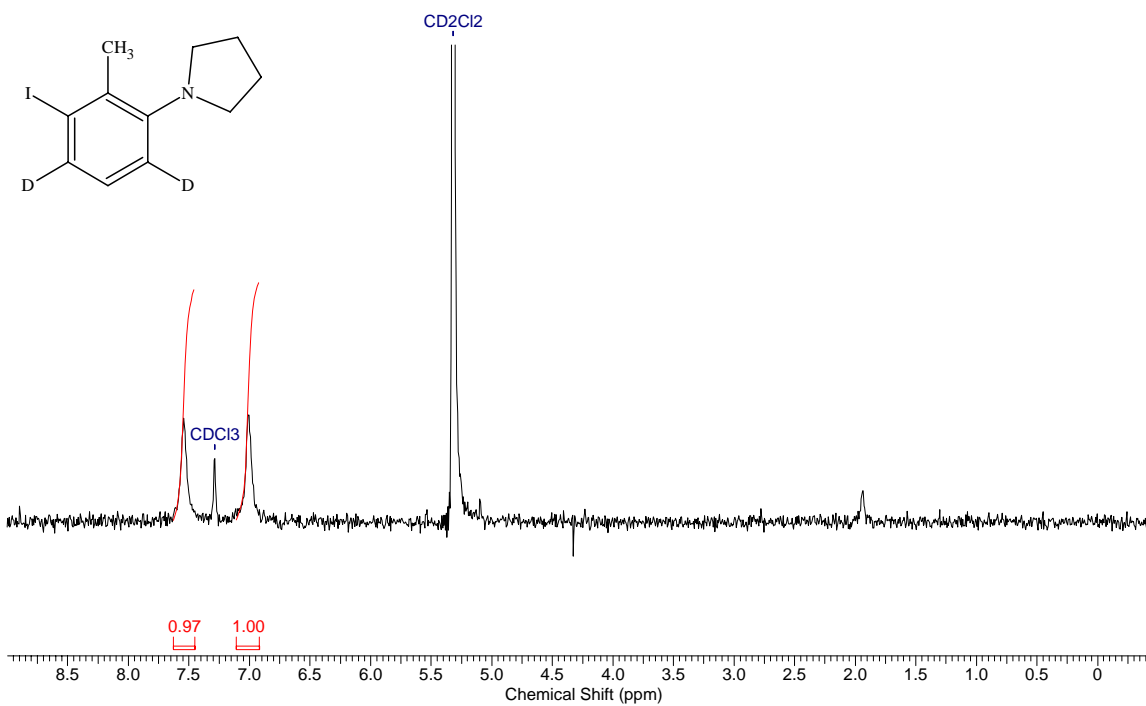
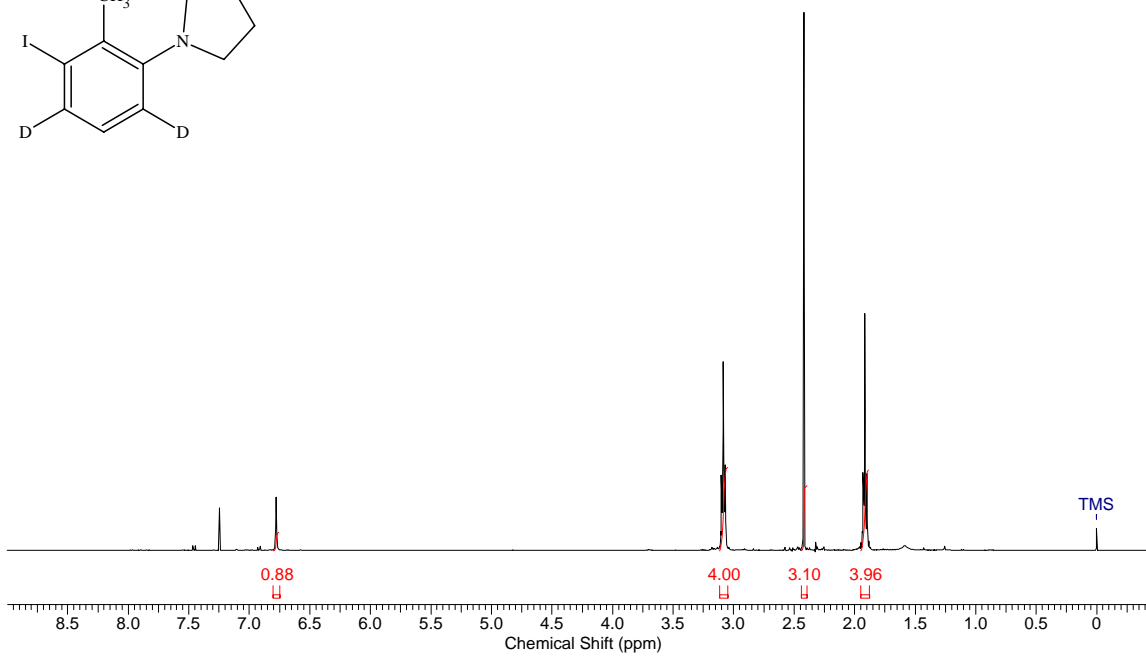
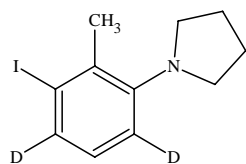


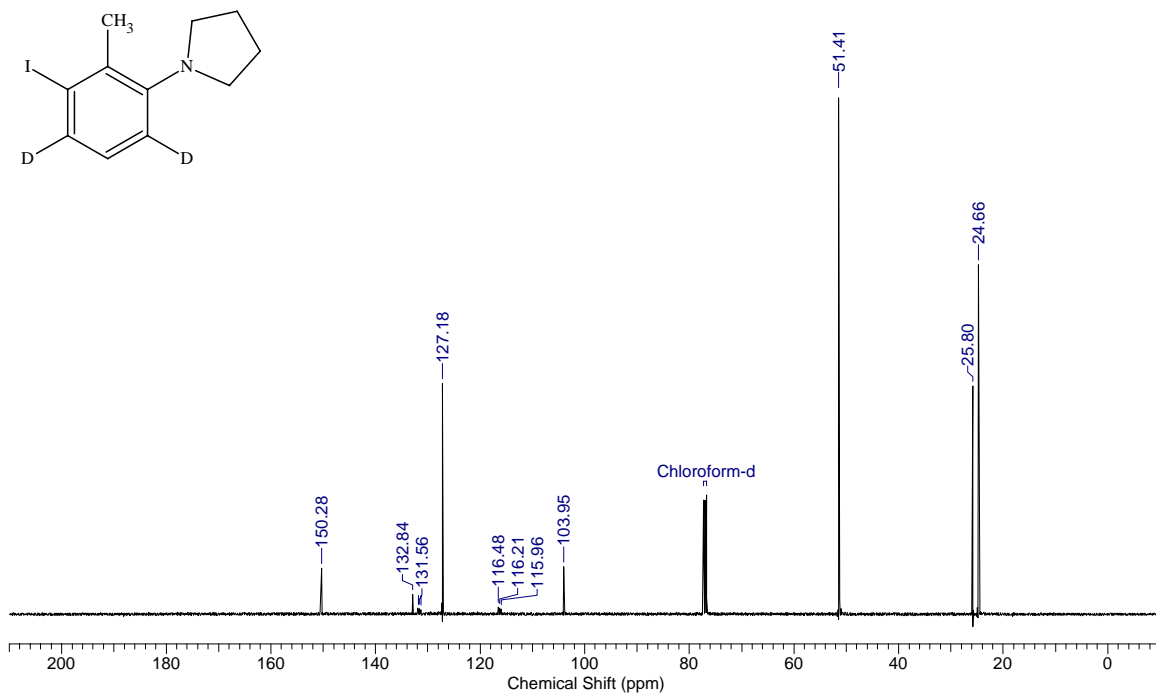


Compound 2l

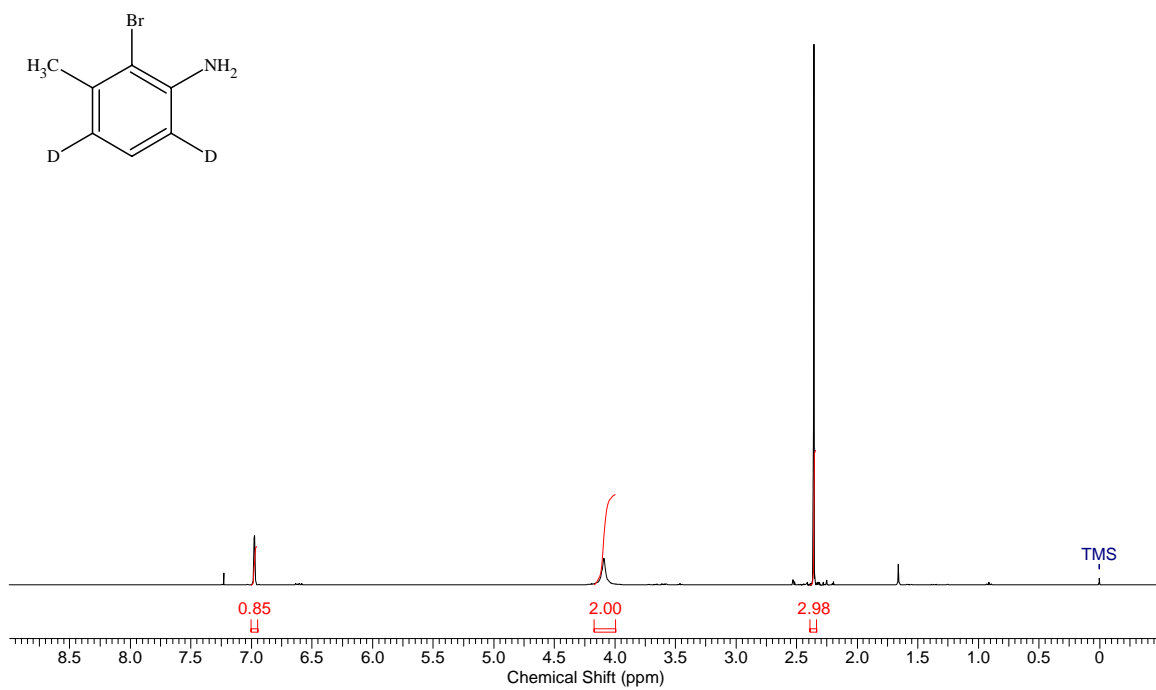


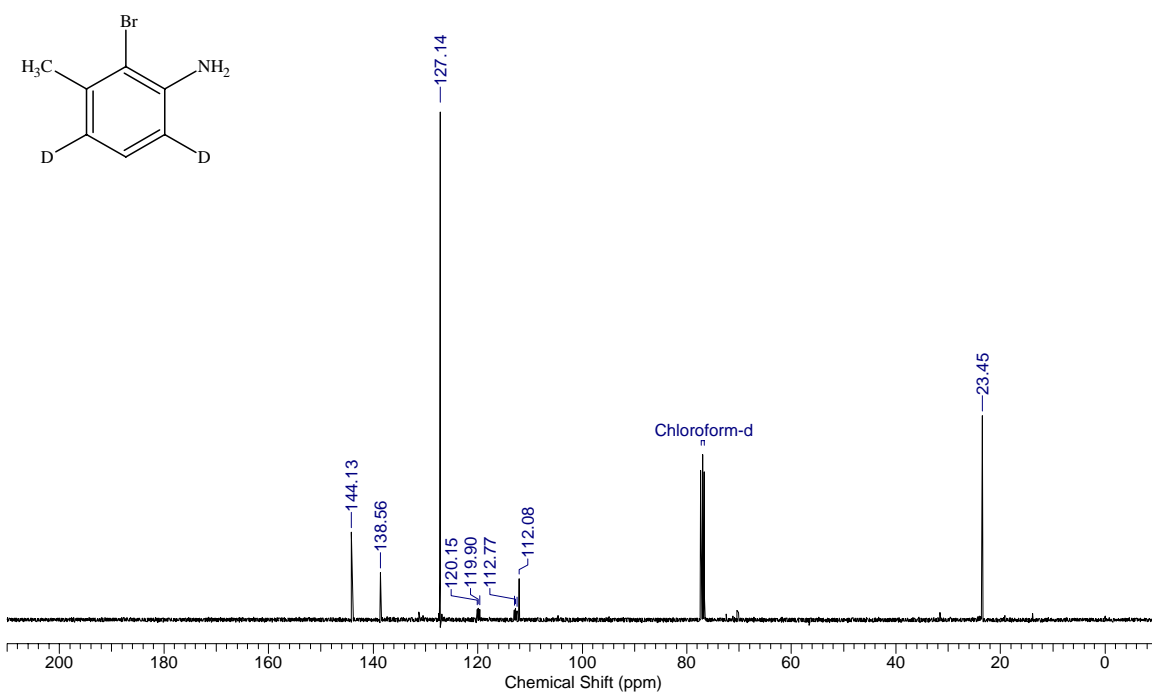
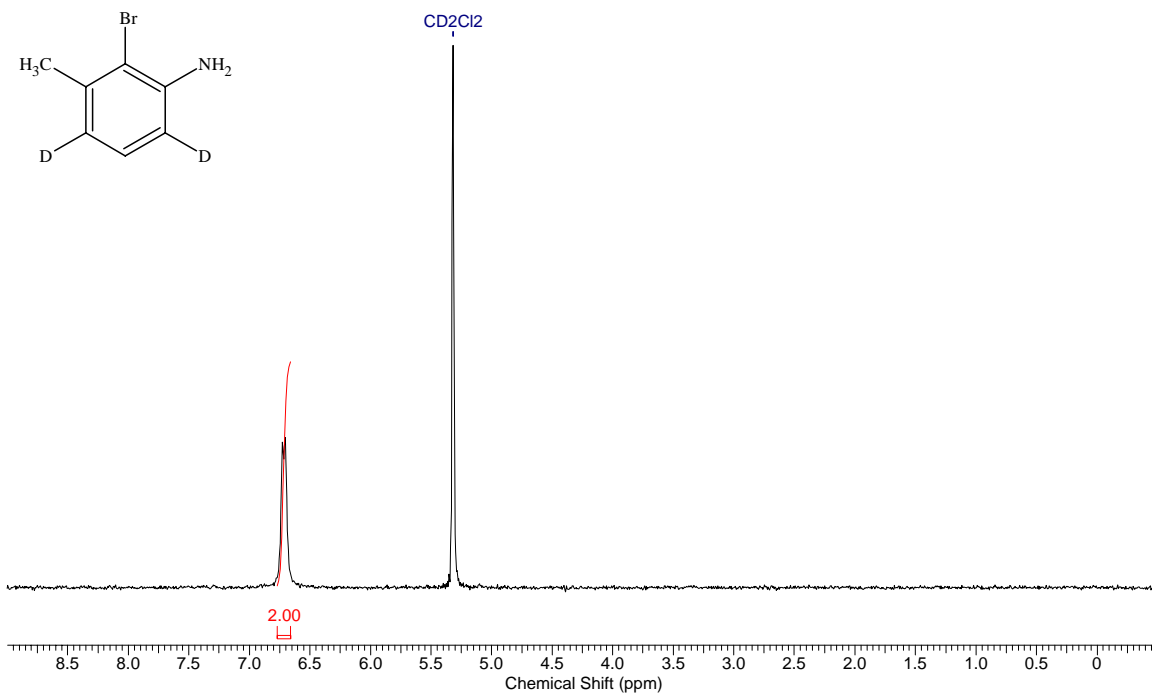


Compound **2m**

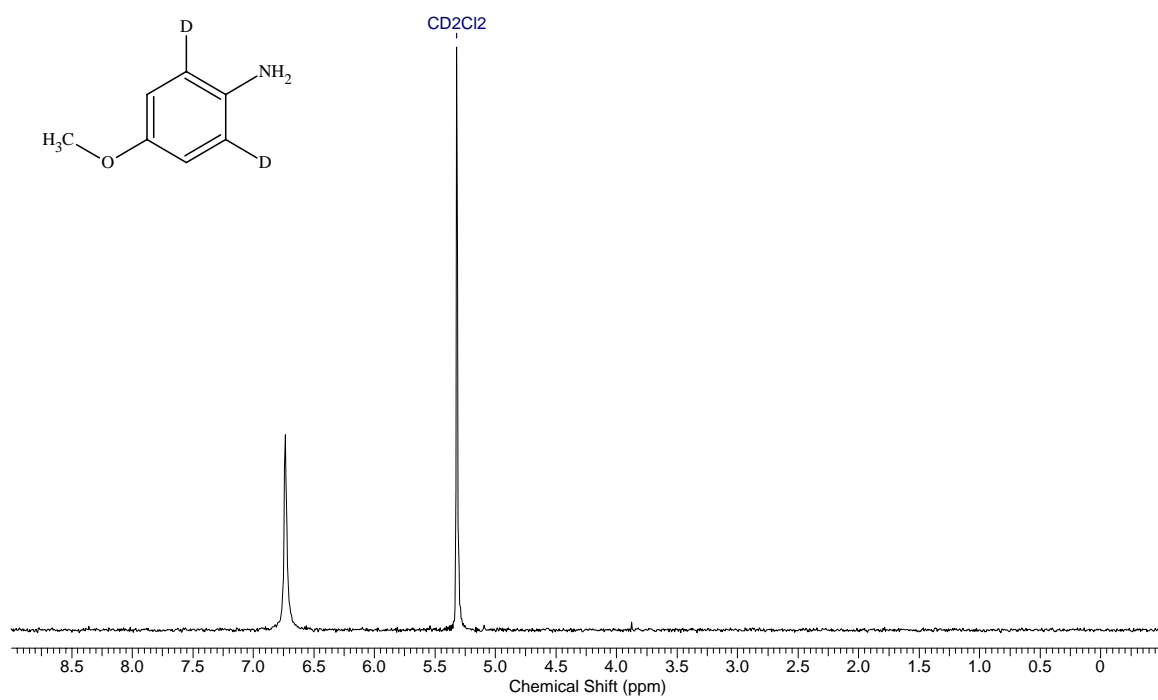
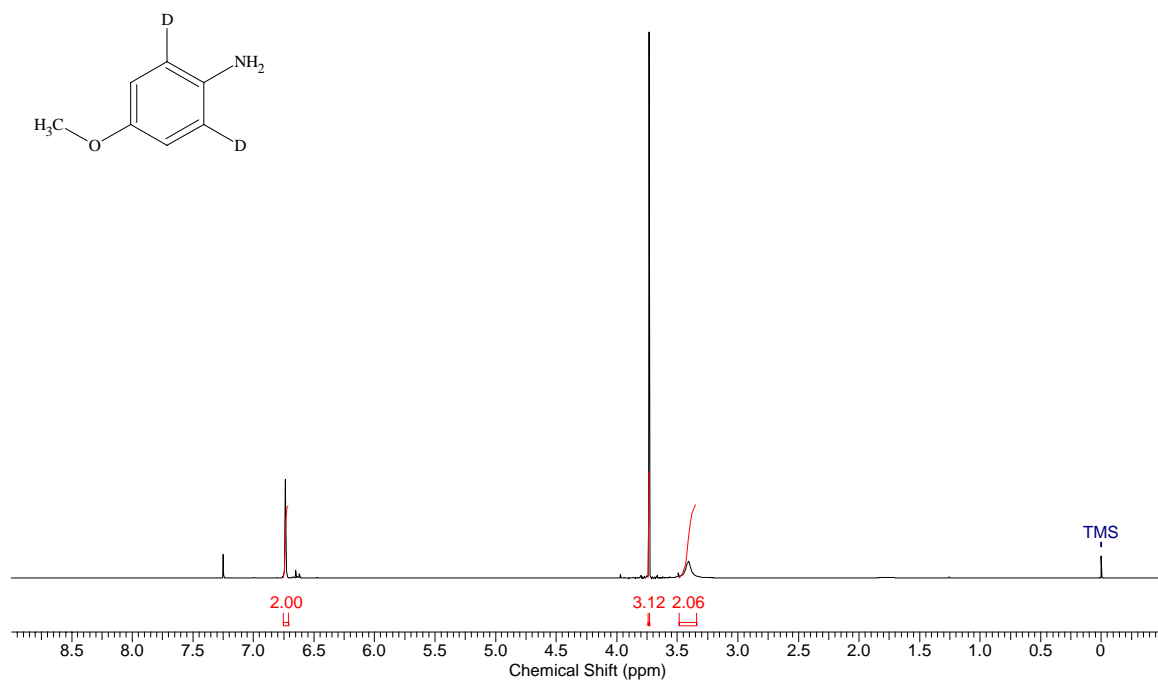


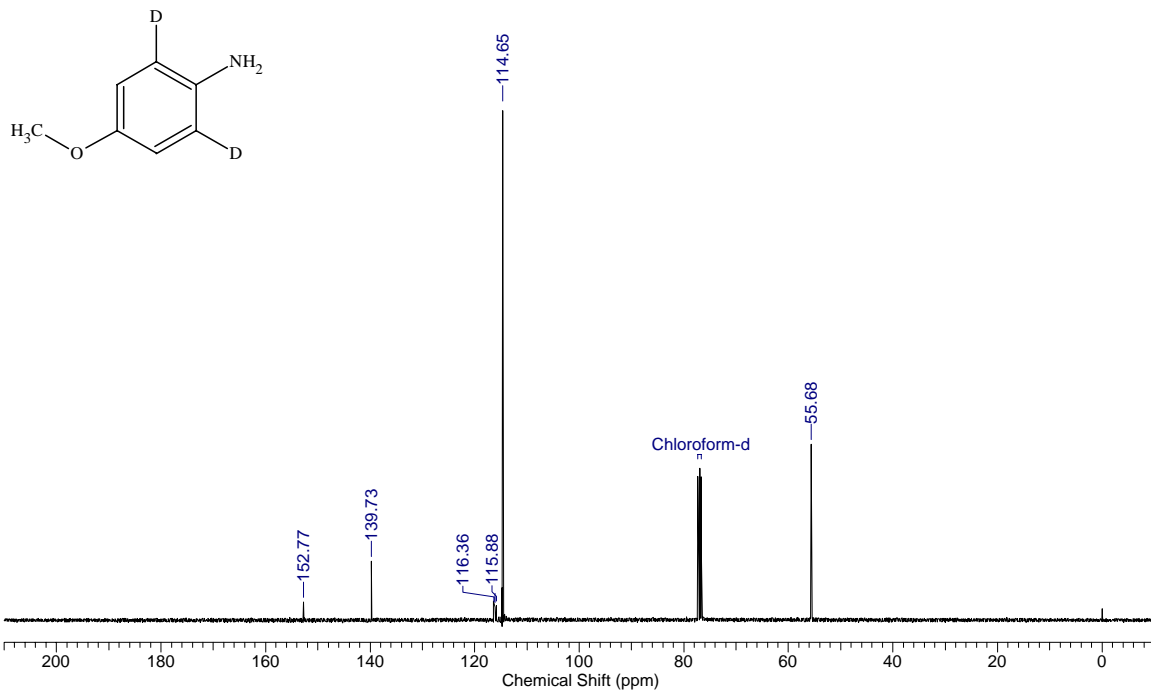
Compound 2n





Compound 2o





Compound 3

