Supporting Information

Iron-Catalysed Radical Cyclization to Synthesize Germanium-Substituted Indolo[2,1-*a*]isoquinolin-6(5*H*)-ones and Indolin-2-ones

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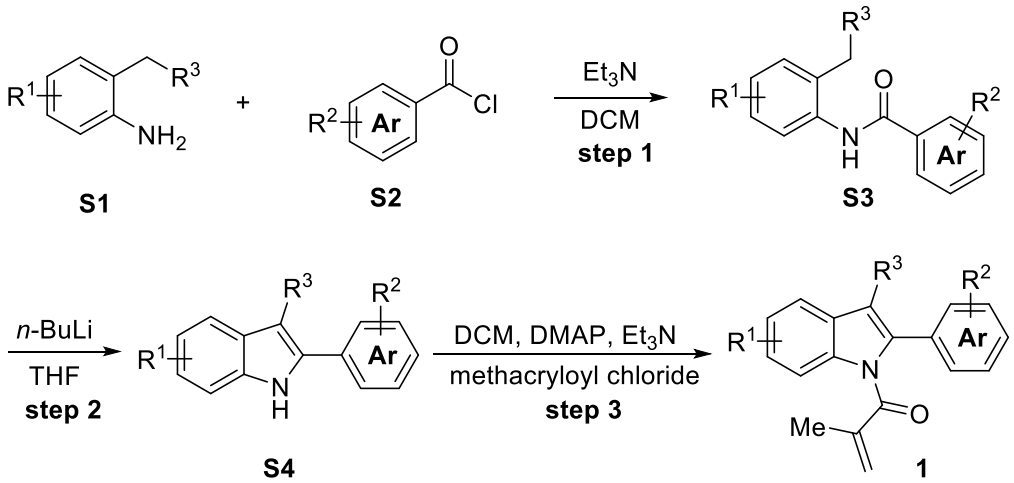
Contents

1. General information

^{1}H NMR spectra were recorded on Bruker 600 MHz spectrometer and the chemical shifts were reported in parts per million (δ) relative to internal standard TMS (0 ppm) for $CDCl_3$. The peak patterns are indicated as follows: s, singlet; d, doublet; dd, doublet of doublet; t, triplet; m, multiplet; q, quartet. The coupling constants, J, are reported in Hertz (Hz). ^{13}C NMR spectra were obtained at Bruker 150 MHz and referenced to the internal solvent signals (central peak is 77.0 ppm in $CDCl_3$). $CDCl_3$ was used as the NMR solvent. High-resolution mass spectra (HRMS) were acquired on Thermo Q-Exactive instrument (quadrupole mass analyzer) using electrospray ionization mode (ESI). Flash column chromatography was performed over silica gel 200-300. All reagents were weighed and handled in air at room temperature. All chemical reagents were purchased from Alfa, Acros, Aldrich, TCI, and J&K and used without further purification.

2. General procedures for the synthesis of substrates

General procedures for the synthesis of **1b-1n**.[1-5]



Step 1: To a solution of **S1** (10.0 mmol, 1.0 equiv) and acid chloride (11.0 mmol, 1.1 equiv) in DCM (50.0 mL) was added dropwise Et_3N (20.0 mmol, 2.0 equiv) at 0 ºC. Then the mixture was stirred at room temperature for 12 h. After completion, the mixture was washed with brine. The organic layers were dried over anhydrous Na_2SO_4. After removal of the solvent, the crude reaction mixture was purified on silica gel to afford the corresponding amide **S3**.

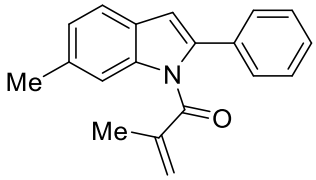
Step 2: To a solution of amide **S3** (5.0 mmol) in THF (50.0 mL) was added dropwise *n*-BuLi (15.0 mmol, 3.0 equiv) at 0 ºC under nitrogen. Then the mixture was stirred at room temperature for 12 h. After completion, the reaction mixture was quenched with HCl (1 M). The aqueous layer was extracted with ethyl acetate. The combined organic layers were dried over anhydrous Na_2SO_4. After removal of the

solvent, the crude reaction mixture was purified on silica gel to afford the corresponding indole product **S4**.

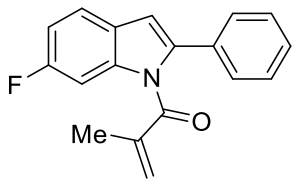
Step 3: To the solution of indole **S4** (2.5 mmol, 1.0 equiv) and DMAP (0.5 mmol, 0.2 equiv) in DCM (0.5 M) was added Et_3N (5.0 mmol, 2.0 equiv) and methacryloyl chloride (5.0 mmol, 2.0 equiv) at 0 °C under nitrogen dropwise. The solution was then warmed up to room temperature and stirred for 12 h. The resulting mixture was diluted with DCM (20.0 mL) and saturated NH_4Cl solution (20.0 mL). The aqueous layer was extracted with DCM (20.0 mL × 3). The combined organic layer was washed with brine, dried over Na_2SO_4, filtered and concentrated in vacuo to give the residue, which was purified by flash chromatography and then recrystallized from petroleum ether/ethyl acetate to afford the substrate **1**.

Then substrates (**1a**, **1p**, **1q** and **1s**) were known compounds and synthesized according to the literature.

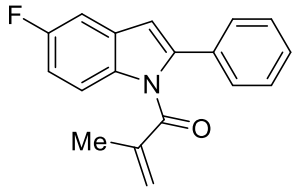
Substrates (**4a-4m**) were known compounds and synthesized according to the literature.[6]



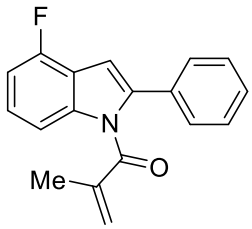
2-Methyl-1-(6-methyl-2-phenyl-1*H*-indol-1-yl)prop-2-en-1-one (1b). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.81 (s, 1H), 7.48 (d, J = 7.9 Hz, 1H), 7.37-7.34 (m, 2H), 7.30-7.27 (m, 3H), 7.09 (d, J = 7.9 Hz, 1H), 6.64 (s, 1H), 5.32 (s, 1H), 5.14 (s, 1H), 2.49 (s, 3H), 1.88 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.4, 141.3, 140.2, 138.3, 134.4, 134.3, 128.6, 127.8, 127.5, 126.7, 126.0, 124.6, 120.2, 113.9, 108.4, 21.9, 18.2; HRMS (ESI) calcd for $C_{19}H_{18}NO$ [M + H^+], 276.1383; found: 276.1380.



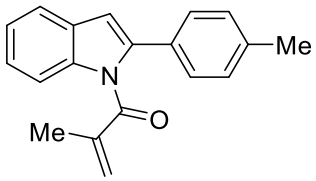
1-(6-Fluoro-2-phenyl-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1c). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.92 (dd, J = 8.9 Hz, 4.5 Hz, 1H), 7.38-7.36 (m, 2H), 7.32-7.28 (m, 3H), 7.23 (dd, J = 8.7 Hz, 2.5 Hz, 1H), 7.03 (dt, J = 9.1 Hz, 2.5 Hz, 1H), 6.60 (s, 1H), 5.32 (d, J = 1.1 Hz, 1H), 5.12 (s, 1H), 1.88 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.1, 159.4 (d, $J_{C\text{-}F}$ = 237.7 Hz), 142.3, 141.0, 134.2, 133.9, 134.0 (d, $J_{C\text{-}F}$ = 43.6 Hz), 128.6, 128.0, 127.9, 126.2, 114.8 (d, $J_{C\text{-}F}$ = 9.4 Hz), 112.0 (d, $J_{C\text{-}F}$ = 25.1 Hz), 108.1 (d, $J_{C\text{-}F}$ = 4.0 Hz), 105.8 (d, $J_{C\text{-}F}$ = 23.6 Hz), 18.2; HRMS (ESI) calcd for $C_{18}H_{15}FNO$ [M + H^+], 280.1132; found: 280.1130.



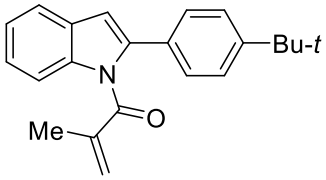
1-(5-Fluoro-2-phenyl-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1d). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.93 (dd, J = 9.0 Hz, 4.6 Hz, 1H), 7.40-7.37 (m, 2H), 7.34-7.30 (m, 3H), 7.25 (dd, J = 8.7 Hz, 2.8 Hz, 1H), 7.03 (dt, J = 9.3 Hz, 2.6 Hz, 1H), 6.65 (s, 1H), 5.34 (d, J = 1.0 Hz, 1H), 5.13 (s, 1H), 1.89 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.1, 159.5 (d, $J_{C\text{-}F}$ = 238.0 Hz), 142.3, 141.0, 134.2, 133.9, 129.7 (d, $J_{C\text{-}F}$ = 10.3 Hz), 128.7, 128.0, 127.9, 126.2, 114.9 (d, $J_{C\text{-}F}$ = 8.9 Hz), 112.1 (d, $J_{C\text{-}F}$ = 25.2 Hz), 108.2 (d, $J_{C\text{-}F}$ = 4.2 Hz), 105.9 (d, $J_{C\text{-}F}$ = 23.9 Hz), 18.3; HRMS (ESI) calcd for $C_{18}H_{15}FNO$ [M + H^+], 280.1132; found: 280.1132.



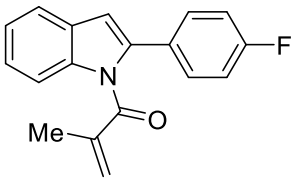
1-(4-Fluoro-2-phenyl-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1e). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.72 (d, J = 8.3 Hz, 1H), 7.40-7.38 (m, 2H), 7.34-7.32 (m, 3H), 7.25-7.22 (m, 1H), 6.95 (dd, J = 9.1 Hz, 8.4 Hz, 1H), 6.79 (s, 1H), 5.39 (d, J = 0.9 Hz, 1H), 5.19 (s, 1H), 1.90 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.3, 155.8 (d, $J_{C\text{-}F}$ = 246.4 Hz), 141.0, 140.8, 139.9 (d, $J_{C\text{-}F}$ = 9.6 Hz), 133.7, 128.7, 128.0, 127.9, 126.6, 124.8 (d, $J_{C\text{-}F}$ = 7.2 Hz), 118.0 (d, $J_{C\text{-}F}$ = 21.9 Hz), 109.7 (d, $J_{C\text{-}F}$ = 3.9 Hz), 108.1 (d, $J_{C\text{-}F}$ = 18.5 Hz), 103.6, 18.2; HRMS (ESI) calcd for $C_{18}H_{15}FNO$ [M + H^+], 280.1132; found: 280.1130.



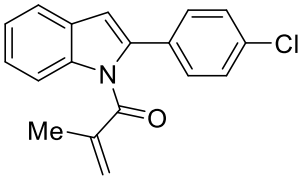
2-Methyl-1-(2-(p-tolyl)-1*H*-indol-1-yl)prop-2-en-1-one (1f). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.95 (d, J = 8.2 Hz, 1H), 7.58 (d, J = 7.6 Hz, 1H), 7.31-7.28 (m, 1H), 7.25 (t, J = 7.3 Hz, 1H), 7.21-7.17 (m, 4H), 6.65 (s, 1H), 5.37 (d, J = 0.8 Hz, 1H), 5.19 (s, 1H), 2.37 (s, 3H), 1.91 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.4, 141.2, 141.0, 137.8, 137.6, 131.3, 129.3, 129.1, 127.8, 126.1, 124.0, 123.0, 120.5, 113.7, 118.1, 21.2, 18.3; HRMS (ESI) calcd for $C_{19}H_{18}NO$ [M + H^+], 276.1383; found: 276.1381.



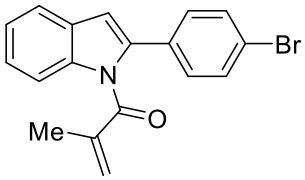
1-(2-(4-(*tert*-Butyl)phenyl)-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1g). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.94 (d, J = 8.3Hz, 1H), 7.59 (d, J = 7.7 Hz, 1H), 7.39 (d, J = 8.3Hz, 2H), 7.31-7.28 (m, 1H), 7.26-7.24 (m, 3H), 6.67 (s, 1H), 5.37 (s, 1H), 5.20 (s, 1H), 1.91 (s, 3H), 1.34 (s, 9H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.5, 150.9, 141.3, 141.0, 137.8, 131.2, 129.2, 127.7, 126.1, 125.5, 124.0, 123.0, 120.5, 113.7, 108.2, 34.7, 31.3, 18.3; HRMS (ESI) calcd for $C_{22}H_{24}NO$ [M + H^+], 318.1852; found: 318.1851.



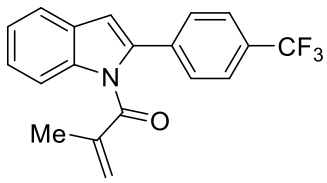
1-(2-(4-Fluorophenyl)-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1h). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.85 (d, J = 8.2 Hz, 1H), 7.51 (d, J = 7.8 Hz, 1H), 7.24-7.16 (m, 4H), 6.98 (t, J = 8.7 Hz, 2H), 6.57 (s, 1H), 5.32 (d, J = 1.1 Hz, 1H), 5.14 (s, 1H), 1.83 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.1, 162.3 (d, $J_{C\text{-}F}$ = 246.8 Hz), 141.2, 139.6, 137.7, 130.3 (d, $J_{C\text{-}F}$ = 3.3 Hz), 129.5 (d, $J_{C\text{-}F}$ = 8.0 Hz), 128.9, 126.3, 124.3, 123.1, 120.6, 115.7 (d, $J_{C\text{-}F}$ = 21.7 Hz), 113.8, 108.7, 18.3; HRMS (ESI) calcd for $C_{18}H_{15}FNO$ [M + H^+], 280.1132; found: 280.1130.



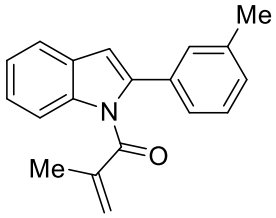
1-(2-(4-Chlorophenyl)-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1i). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.93 (d, J = 8.4 Hz, 1H), 7.58 (d, J = 7.8 Hz, 1H), 7.33-7.29 (m, 3H), 7.26-7.21 (m, 3H), 6.66 (s, 1H), 5.40 (s, 1H), 5.21 (s, 1H), 1.91 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 170.9, 141.1, 139.4, 137.8, 133.6, 132.5, 128.9, 128.8, 128.7, 126.5, 124.4, 123.1, 120.7, 113.8, 109.0, 18.2; HRMS (ESI) calcd for $C_{18}H_{15}ClNO$ [M + H^+], 296.0837; found: 296.0822.



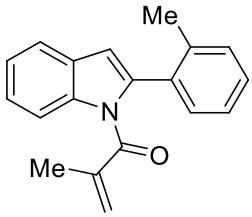
1-(2-(4-Bromophenyl)-1*H*-indol-1-yl)-2-methylprop-2-en-1-one (1j). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.97 (d, J = 8.3Hz, 1H), 7.60 (d, J = 7.7Hz, 1H), 7.39-7.36 (m, 2H), 7.32-7.30 (m, 3H), 7.28-7.25 (m, 1H), 6.70 (s, 1H), 5.35 (d, J = 1.2 Hz, 1H), 5.18 (s, 1H), 1.89 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.3, 141.2, 140.8, 137.8, 134.2, 129.0, 128.6, 127.9, 127.7, 126.1, 124.2, 123.0, 120.6, 113.8, 108.5, 18.3; HRMS (ESI) calcd for $C_{18}H_{15}BrNO$ [M + H^+], 340.0332; found: 340.0331.



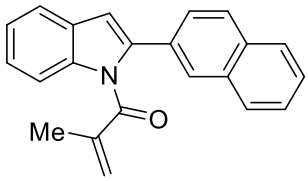
2-Methyl-1-(2-(4-(trifluoromethyl)phenyl)-1*H*-indol-1-yl)prop-2-en-1-one (1k). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.93 (d, J = 8.3 Hz, 1H), 7.63 (t, J = 7.9 Hz, 3H), 7.44 (d, J = 7.9 Hz, 2H), 7.34 (t, J = 7.8 Hz, 1H), 7.28 (t, J = 7.6 Hz, 1H), 6.78 (s, 1H), 5.48 (s, 1H), 5.31 (s, 1H), 1.95 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 170.8, 141.3, 139.2, 138.1, 137.6, 129.6 (q, J = 32.6 Hz), 128.8, 127.9, 126.8, 125.6 (q, J = 3.6 Hz), 124.9, 124.0 (q, J = 273.2 Hz), 123.3, 121.0, 113.9, 110.1, 18.3; HRMS (ESI) calcd for $C_{19}H_{15}F_3NO$ [M + H^+], 330.1100; found: 330.1102.



2-Methyl-1-(2-(m-tolyl)-1*H*-indol-1-yl)prop-2-en-1-one (1l). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.89 (d, J = 8.1 Hz, 1H), 7.48 (d, J = 7.8 Hz, 1H), 7.19 (t, J = 7.7 Hz, 1H), 7.15-7.12 (m, 2H), 7.01-6.99 (m, 3H), 6.56 (s, 1H), 5.19 (s, 1H), 5.01 (s, 1H), 2.25 (s, 3H), 1.78 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.3, 141.1, 140.9, 138.2, 137.7, 134.1, 128.9, 128.5, 128.4, 128.3, 125.7, 124.9, 124.1, 123.0, 120.5, 113.7, 108.2, 21.3, 18.2; HRMS (ESI) calcd for $C_{19}H_{18}NO$ [M + H^+], 276.1383; found: 276.1381.

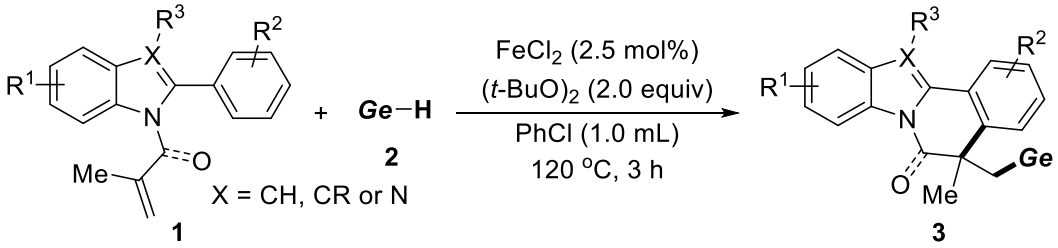


2-Methyl-1-(2-(o-tolyl)-1*H*-indol-1-yl)prop-2-en-1-one (1m). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.03 (d, J = 8.3 Hz, 1H), 7.61 (d, J = 7.7 Hz, 1H), 7.33 (t, J = 7.6Hz, 1H), 7.28 (t, J = 7.6Hz, 1H), 7.25-7.23 (m, 2H), 7.20 (t, J = 7.5 Hz, 1H), 7.15 (d, J = 7.5 Hz, 1H), 6.60 (s, 1H), 5.28 (s, 1H), 5.18 (s, 1H), 2.28 (s, 3H), 1.78 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.2, 141.2, 139.2, 137.1, 136.3, 133.7, 130.4, 130.3, 129.0, 128.2, 125.7, 124.2, 124.1, 123.1, 120.4, 114.3, 109.8, 20.3, 18.3; HRMS (ESI) calcd for $C_{19}H_{18}NO$ [M + H^+], 276.1383; found: 276.1381.



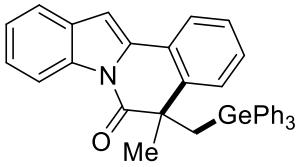
2-Methyl-1-(2-(naphthalen-2-yl)-1*H*-indol-1-yl)prop-2-en-1-one (1n). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.02-8.00 (m, 1H), 7.85-7.83 (m, 3H), 7.79 (s, 1H), 7.64-7.62 (mz, 1H), 7.53-7.48 (m, 2H), 7.45-7.43 (m, 1H), 7.35-7.33 (m, 1H), 7.30-7.27 (m, 1H), 6.81 (s, 1H), 5.28 (s, 1H), 5.21 (s, 1H), 1.86 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 171.4, 141.2, 140.8, 138.0, 133.2, 132.6, 131.7, 129.1, 128.4, 128.0, 127.8, 126.8, 126.7, 126.4, 126.1, 125.8, 124.4, 123.2, 120.7, 113.9, 109.0, 18.3; HRMS (ESI) calcd for $C_{22}H_{18}NO$ [M + H^+], 312.1383; found: 312.1381.

3. General procedure and characterization data for product 3

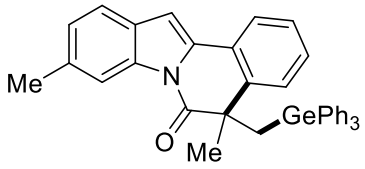


To a mixture of $FeCl_2$ (0.7 mg, 2.5% mmol), alkene **1** (0.2 mmol) and ***Ge*-H** (0.22 mmol) under nitrogen, chlorobenzene (1.0 mL) was added. Then di-*tert*-butyl peroxide (75.0 μL, 0.4 mmol) was added dropwise into the mixture. The resulting mixture was then stirred at 120 °C for 3 h. After the mixture was cooled to room temperature, the resulting solution was directly filtered through a pad of silica by ethyl acetate. The

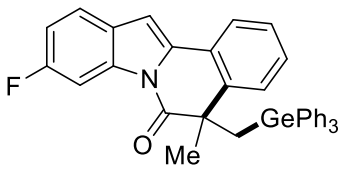
solvent was evaporated in *vacuo* to give the crude product. The residue was purified by flash column chromatography on silica gel (ethyl acetate/petroleum ether) to give the pure product **3**.



5-Methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3a). (101 mg, 90%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.37 (d, J = 7.6 Hz, 1H), 7.54 (d, J = 7.2 Hz, 1H), 7.44 (d, J = 6.55 Hz, 1H), 7.36 (d, J = 7.4 Hz, 1H), 7.24-7.23 (m, 8H), 7.19-7.16 (m, 1H), 7.08-7.04 (m, 10H), 6.65 (s, 1H), 2.90 (d, J = 14.2 Hz, 1H), 2.43 (d, J = 14.0 Hz, 1H), 1.66 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.1, 138.8, 136.3, 135.2, 135.1, 134.7, 130.3, 128.4, 127.6, 127.5, 127.0, 126.6, 124.6, 124.3, 124.0, 123.6, 120.0, 116.7, 102.5, 47.6, 35.8, 25.0; HRMS (ESI) calcd for $C_{36}H_{29}GeNNaO$ [M + Na^+], 588.1353; found: 588.1357.

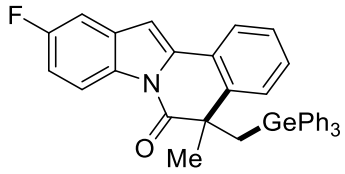


5,9-Dimethyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3b). (77 mg, 66%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.18 (s, 1H), 7.52 (d, J = 7.9 Hz, 1H), 7.58 (d, J = 7.8 Hz, 1H), 7.36 (d, J = 7.5 Hz, 1H), 7.33-7.32 (m, 1H), 7.24-7.21 (m, 6H), 7.17 (t, J = 7.5 Hz, 1H), 7.10-7.09 (m, 3H), 7.07-7.04 (m, 7H), 6.62 (s, 1H), 2.89 (d, J = 13.9 Hz, 1H), 2.47 (s, 3H), 2.42 (d, J = 14.1 Hz, 1H), 1.66 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.1, 138.6, 136.3, 135.5, 135.1, 134.8, 134.6, 128.4, 128.2, 128.0, 127.6, 127.0, 126.5, 125.4, 124.5, 123.4, 119.5, 116.9, 102.5, 47.6, 35.6, 25.2, 21.9; HRMS (ESI) calcd for $C_{37}H_{31}GeNNaO$ [M + Na^+], 602.1510; found: 602.1508.

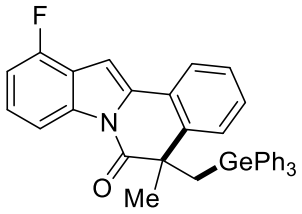


9-Fluoro-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3c). (89 mg, 76%)). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.6); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.30-8.28 (m, 1H), 7.54 (d, J = 7.7 Hz, 1H), 7.38 (d, J = 7.9 Hz, 1H), 7.22-7.19 (m, 7H), 7.10-7.09 (m, 5H), 7.07-7.04 (m, 6H), 6.96 (t, J = 8.8 Hz, 1H), 6.61(s, 1H), 2.88 (d, J = 14.1 Hz, 1H), 2.43 (d, J = 14.2 Hz, 1H), 1.67 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.9, 160.0 (d, J_{C-F} = 239.0 Hz), 139.1, 136.8, 136.2, 134.7, 131.4 (d, J_{C-F} = 9.9 Hz), 131.4, 128.8, 128.4, 127.6, 127.1, 126.7,

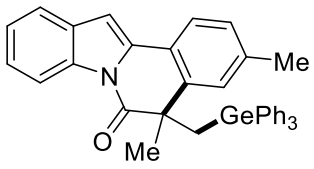
123.9, 123.7, 117.7 (d, $J_{C\text{-}F}$ = 9.0 Hz), 112.1(d, $J_{C\text{-}F}$ = 24.7 Hz), 105.5 (d, $J_{C\text{-}F}$ = 23.9 Hz), 102.0 (d, $J_{C\text{-}F}$ = 4.0 Hz), 47.5, 35.8, 25.2; HRMS (ESI) calcd for $C_{36}H_{28}FGeNNaO$ [M + Na^+], 606.1259; found: 606.1259.



10-Fluoro-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3d). (86 mg, 74%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.30-8.28 (m, 1H), 7.55 (d, J = 7.8 Hz, 1H), 7.39 (d, J = 7.9 Hz, 1H), 7.22-7.21 (m, 6H), 7.19-7.17 (m, 1H), 7.10-7.09 (m, 5H), 7.07-7.05 (m, 6H), 6.98-6.95 (m, 1H), 6.61 (s, 1H), 2.88 (d, J = 14.2 Hz, 1H), 2.43 (d, J = 14.3 Hz, 1H), 1.67 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.9, 160.0 (d, $J_{C\text{-}F}$ = 238.6 Hz), 139.0, 136.8, 136.2, 134.7, 131.4 (d, $J_{C\text{-}F}$ = 10.1 Hz), 131.4, 128.8, 128.4, 127.6, 127.1, 126.7, 123.9, 123.7, 117.7 (d, $J_{C\text{-}F}$ = 9.2 Hz), 112.0 (d, $J_{C\text{-}F}$ = 24.6 Hz), 105.5 (d, $J_{C\text{-}F}$ = 24.0 Hz), 102.0 (d, $J_{C\text{-}F}$ = 3.6 Hz), 47.5, 35.8, 25.1; HRMS (ESI) calcd for $C_{36}H_{28}FGeNNaO$ [M + Na^+], 606.1259; found: 606.1256.

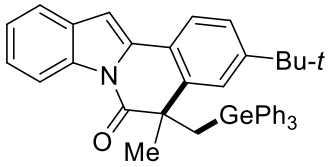


11-Fluoro-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3e). (64 mg, 55%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.30-8.28 (m, 1H), 7.55 (d, J = 7.8 Hz, 1H), 7.39 (d, J = 7.9 Hz, 1H), 7.21(d, J = 7.7 Hz, 6H), 7.19-7.17 (m, 1H), 7.10-7.09 (m, 5H), 7.07-7.05 (m, 6H), 6.94 (t, J = 8.6 Hz, 1H), 6.76 (s, 1H), 2.88 (d, J = 14.2 Hz, 1H), 2.44 (d, J = 14.1 Hz, 1H), 1.68 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.3, 155.3 (d, $J_{C\text{-}F}$ = 246.0 Hz), 138.9, 137.0 (d, $J_{C\text{-}F}$ = 9.1 Hz), 136.2, 135.3, 134.8, 128.8, 128.5, 127.7, 127.2, 126.6, 125.3 (d, $J_{C\text{-}F}$ = 7.0 Hz), 123.9, 123.7, 119.1 (d, $J_{C\text{-}F}$ = 21.5 Hz), 112.8 (d, $J_{C\text{-}F}$ = 3.3 Hz), 109.4 (d, $J_{C\text{-}F}$ = 18.3 Hz), 97.9, 47.8, 35.9, 25.1; HRMS (ESI) calcd for $C_{36}H_{28}FGeNNaO$ [M + Na^+], 606.1259; found: 606.1258.

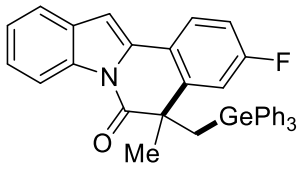


3,5-dimethyl-5-((triphenylgermyl)methyl)indolo[2,1-a]isoquinolin-6(5*H*)-one (3f). (82 mg, 71%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR

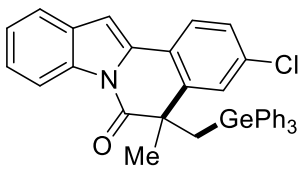
(600 MHz, $CDCl_3$) δ 8.33 (d, J = 7.3 Hz, 1H), 7.46 (d, J = 8.1 Hz, 1H), 7.43-7.42 (m, 1H), 7.24-7.23 (m, 8H), 7.15 (s, 1H), 7.08-7.06 (m, 9H), 7.01 (d, J = 8.1 Hz, 1H), 6.61 (s, 1H), 2.90 (d, J = 14.1 Hz, 1H), 2.42 (d, J = 14.2 Hz, 1H), 2.05 (s, 3H), 1.64 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.2, 138.7, 138.6, 136.3, 135.5, 135.0, 134.8, 130.4, 128.4, 128.0, 127.6, 127.4, 124.3, 123.9, 123.6, 121.8, 119.8, 116.5, 101.7, 47.7, 35.9, 24.8, 21.1; HRMS (ESI) calcd for $C_{37}H_{31}GeNNaO$ [M + Na^+], 602.1510; found: 602.1507.



3-(*tert*-Butyl)-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3g). (80 mg, 64%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.39 (d, J = 7.9 Hz, 1H), 7.47 (d, J = 8.2 Hz, 1H), 7.42 (d, J = 7.4 Hz, 1H), 7.33 (s, 1H), 7.26-7.23 (m, 9H), 7.10-7.04 (m, 9H), 6.58 (s, 1H), 2.91 (d, J = 14.1 Hz, 1H), 2.49 (d, J = 14.2 Hz, 1H), 1.66 (s, 3H), 1.08 (s, 9H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.6, 152.0, 138.7, 136.4, 135.5, 135.0, 134.9, 130.5, 128.5, 127.8, 124.6, 124.4, 124.0, 123.7, 122.4, 121.9, 119.9, 116.4, 101.8, 48.2, 36.5, 34.7, 30.9, 24.5; HRMS (ESI) calcd for $C_{40}H_{37}GeNNaO$ [M + Na^+], 644.1979; found: 644.1971.

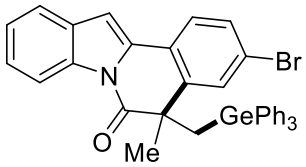


3-Fluoro-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3h). (72 mg, 63%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.33-8.32 (m, 1H), 7.52-7.50 (m, 1H), 7.45-7.44 (m, 1H), 7.25-7.24 (m, 7H), 7.20-7.16 (m, 1H), 7.12-7.06 (m, 10H), 6.91-6.88 (m, 1H), 6.59 (s, 1H), 2.89 (d, J = 14.2 Hz, 1H), 2.32 (d, J = 14.1 Hz, 1H), 1.67 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.4, 162.7 (d, $J_{C\text{-}F}$ = 247.4 Hz), 141.3 (d, $J_{C\text{-}F}$ = 7.1 Hz), 136.0, 135.0 (d, $J_{C\text{-}F}$ = 17.2 Hz), 134.7, 136.6 (d, $J_{C\text{-}F}$ = 46.7 Hz), 130.2, 128.5, 127.7, 125.6 (d, $J_{C\text{-}F}$ = 8.5 Hz), 124.7, 124.2, 120.7 (d, $J_{C\text{-}F}$ = 3.0 Hz), 119.9, 116.7, 114.8 (d, $J_{C\text{-}F}$ = 22.2 Hz), 113.5 (d, $J_{C\text{-}F}$ = 22.5 Hz), 102.3, 47.7, 35.5, 25.3; HRMS (ESI) calcd for $C_{36}H_{28}FGeNNaO$ [M + Na^+], 606.1259; found: 606.1254.

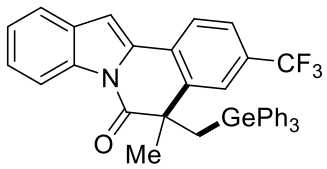


3-Chloro-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3i). (88 mg,

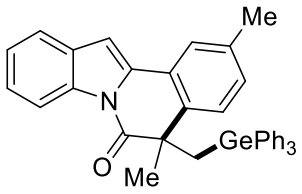
73%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.33 (d, J = 7.8 Hz, 1H), 7.47-7.45 (m, 2H), 7.38 (d, J = 1.6 Hz, 1H), 7.29-7.27 (m, J = 7.9 Hz, 1H), 7.26-7.24 (m, 7H), 7.17-7.15 (m, 1H), 7.11-7.01 (m, 9H), 6.65 (s, 1H), 2.90 (d, J = 14.3 Hz, 1H), 2.35 (d, J = 14.4 Hz, 1H), 1.67 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.4, 140.5, 136.0, 135.1, 134.7, 134.3, 134.2, 130.1, 128.5, 127.6, 127.4, 127.0, 125.0, 124.9, 124.2, 122.9, 120.1, 116.7, 103.0, 47.7, 35.6, 25.1; HRMS (ESI) calcd for $C_{36}H_{28}ClGeNNaO$ [M + Na^+], 622.0963; found: 622.0963.



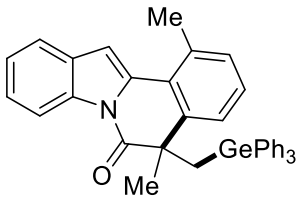
3-Bromo-5-methyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3j). (98 mg, 76%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.36 (d, J = 8.0 Hz, 1H), 7.55 (d, J = 7.6 Hz, 1H), 7.45 (d, J = 7.5 Hz, 1H), 7.37 (d, J = 7.9 Hz, 1H), 7.27-7.26 (m, 1H), 7.24-7.22 (m, 6H), 7.19 (t, J = 7.6 Hz, 1H), 7.10-7.09 (m, 1H), 7.08-7.04 (m, 9H), 6.66 (s, 1H), 2.89 (d, J = 14.3 Hz, 1H), 2.43 (d, J = 14.2 Hz, 1H), 1.67 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.1, 138.8, 136.3, 135.2, 135.1, 134.8, 130.3, 128.4, 128.3, 127.6, 127.0, 126.6, 124.6, 124.3, 124.0, 123.6, 120.0, 116.7, 102.5, 47.6, 35.8, 25.1. HRMS (ESI) calcd for $C_{36}H_{28}BrGeNNaO$ [M + Na^+], 666.0458; found: 666.0454.



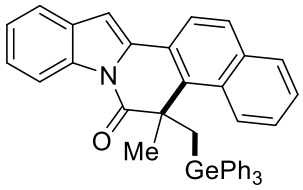
5-Methyl-3-(trifluoromethyl)-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3k). (94 mg, 75%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.38 (d, J = 8.0 Hz, 1H), 7.66 (s, 1H), 7.63 (d, J = 7.6 Hz, 1H), 7.50 (d, J = 7.6 Hz, 1H), 7.43 (d, J = 8.1 Hz, 1H), 7.34-7.32 (m, 1H), 7.29-7.27 (m, 1H), 7.24-7.22 (m, 6H), 7.11-7.05 (m, 9H), 6.77 (s, 1H), 2.94 (d, J = 14.2 Hz, 1H), 2.44 (d, J = 14.3 Hz, 1H), 1.69 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.3, 139.4, 135.8, 135.3, 134.6, 133.7, 130.0 (q, J = 32.7 Hz), 129.9, 128.6, 127.8, 127.7 (q, J = 23.4 Hz), 125.5, 124.4, 124.0, 123.9 (q, J = 3.8 Hz), 123.7 (q, J = 272.7 Hz), 123.7 (q, J = 3.9 Hz), 120.4, 116.8, 104.5, 47.8, 35.8, 24.7; HRMS (ESI) calcd for $C_{37}H_{28}F_3GeNNaO$ [M + Na^+], 656.1227; found: 656.1224.



2,5-Dimethyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3l). (109 mg, 95%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.33 (d, J = 7.1 Hz, 1H), 7.55 (d, J = 7.4 Hz, 1H), 7.36 (s, 1H), 7.26-7.22 (m, 9H), 7.11-7.09 (m, 3H), 7.07-7.04 (m, 6H), 6.89(d, J = 8.0 Hz, 1H), 6.66(s, 1H), 2.86 (d, J = 14.1 Hz, 1H), 2.41 (d, J = 14.1 Hz, 1H), 2.33 (s, 3H), 1.66 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.3, 135.5, 135.3, 135.1, 134.4, 134.1, 133.7, 129.3, 128.5, 127.3, 126.6, 125.4, 123.5, 123.0, 122.9, 122.8, 118.9, 115.7, 101.3, 46.2, 34.7, 24.5, 20.0; HRMS (ESI) calcd for $C_{37}H_{31}GeNNaO$ [M + Na^+], 602.1510; found: 602.1509.

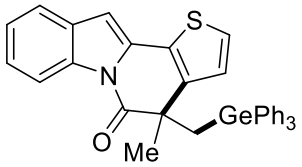


1,5-Dimethyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3m). (102 mg, 89%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.45 (d, J = 8.1 Hz, 1H), 7.49(d, J = 7.5 Hz, 1H), 7.33-7.29 (m, 2H), 7.24 (d, J = 7.1 Hz, 7H), 7.11 (d, J = 7.1 Hz, 3H), 7.07-7.05 (m, 7H), 6.99-6.96 (m, 1H), 6.75(s, 1H), 2.92 (d, J = 14.2 Hz, 1H), 2.53 (s, 3H), 2.45 (d, J = 14.1 Hz, 1H), 1.65 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.4, 140.1, 136.5, 135.1, 134.9, 134.4, 134.3, 130.6, 130.3, 128.4, 127.7, 127.5, 125.1, 124.6, 123.9, 123.8, 120.1, 116.7, 108.7, 47.8, 35.9, 25.4, 24.7; HRMS (ESI) calcd for $C_{37}H_{31}GeNNaO$ [M + Na^+], 602.1510; found: 602.1510.

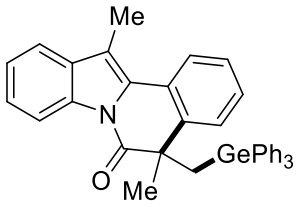


7-Methyl-7-((triphenylgermyl)methyl)benzo[f]indolo[2,1-*a*]isoquinolin-8(7*H*)-one (3n). (79 mg, 64%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.60 (d, J = 8.6 Hz, 1H), 8.32-8.30 (m, 1H), 7.73 (d, J = 7.8 Hz, 1H), 7.60 (t, J = 8.9 Hz, 2H), 7.50-7.47 (m, 1H), 7.46-7.45 (m, 1H), 7.43-7.40 (m, 1H), 7.26-7.24 (m, 2H), 6.98-6.94 (m, 9H), 6.88-6.86 (m, 6H), 6.74 (s, 1H), 3.30 (d, J = 14.2 Hz, 1H), 3.11 (d, J = 14.2 Hz, 1H), 2.19

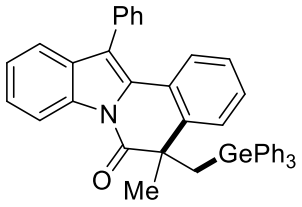
(s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.9, 135.9, 135.5, 134.9, 134.7, 134.4, 132.8, 131.2, 130.8, 129.9, 129.12, 128.1, 127.4, 126.3, 126.21, 125.5, 124.7, 124.3, 122.2, 121.4, 120.0, 117.0, 104.2, 48.4, 31.8, 26.4; HRMS (ESI) calcd for $C_{40}H_{31}GeNNaO$ [M + Na^+], 638.1510; found: 638.1505.



4-Methyl-4-((triphenylgermyl)methyl)thieno[2',3':3,4]pyrido[1,2-*a*]indol-5(4*H*)-one (3o). (69 mg, 63%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.30 (d, J = 7.6 Hz, 1H), 7.39-7.37 (m, 1H), 7.27-7.25 (m, 6H), 7.23-7.21 (m, 2H), 7.10-7.07 (m, 9H), 7.06 (d, J = 5.2 Hz, 1H), 6.87 (d, J = 5.1 Hz, 1H), 6.29 (s, 1H), 2.79 (d, J = 14.0 Hz, 1H), 2.67 (d, J = 14.1 Hz, 1H), 1.66 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 172.6, 141.1, 135.1, 133.6, 133.5, 130.7, 129.2, 127.4, 126.7, 124.8, 124.6, 124.2, 123.5, 123.0, 118.8, 115.3, 100.7, 46.1, 33.6, 24.5; HRMS (ESI) calcd for $C_{34}H_{27}GeNNaOS$ [M + Na^+], 594.0917; found: 594.0912.

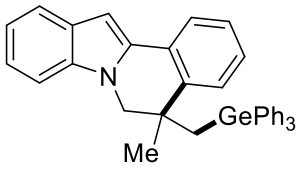


5,12-Dimethyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3p). (88 mg, 76%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.42 (d, J = 7.4 Hz, 1H), 7.68 (d, J = 7.9 Hz, 1H), 7.44-7.41 (m, 2H), 7.30-7.25 (m, 2H), 7.23-7.19 (m, 7H), 7.11-7.08 (m, 3H), 7.05-7.03 (m, 7H), 2.90 (d, J = 14.2 Hz, 1H), 2.44 (d, J = 14.1 Hz, 1H), 2.43 (s, 3H), 1.66 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.1, 139.4, 136.6, 134.9, 134.1, 132.2, 129.6, 128.4, 127.7, 127.5, 126.9, 126.8, 126.2, 125.3, 125.0, 123.8, 118.0 116.8, 113.7, 47.5, 35.6, 25.8, 11.4; HRMS (ESI) calcd for $C_{37}H_{31}GeNNaO$ [M + Na^+], 602.1510; found: 602.1508.

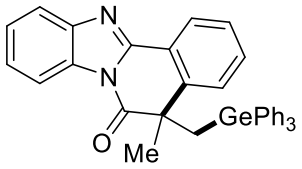


5-Methyl-12-phenyl-5-((triphenylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3q). (87 mg, 68%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.46 (d, J = 8.3 Hz, 1H), 7.51 (d, J = 6.7 Hz, 2H), 7.46-7.44 (m, 1H), 7.40-7.36 (m, 3H), 7.32-7.29 (m, 1H), 7.26-7.25 (m, 6H), 7.22-7.19 (m, 1H), 7.18-7.12 (m, 5H), 7.09-7.06 (m,

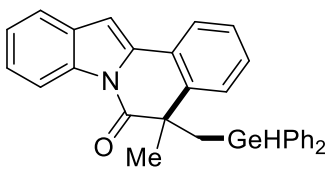
6H), 6.95 (t, J = 7.2 Hz, 1H), 6.86 (t, J = 7.7 Hz, 1H), 2.92 (d, J = 14.1 Hz, 1H), 2.46 (d, J = 13.9 Hz, 1H), 1.72 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.4, 139.5, 136.4, 134.9, 134.3, 134.0, 131.8, 130.0, 129.2, 129.1, 128.4, 128.0, 127.8, 127.6, 126.5, 126.4, 125.4, 125.2, 125.0, 124.0, 119.5, 118.9, 116.6, 47.6, 35.4, 25.5; HRMS (ESI) calcd for $C_{42}H_{33}GeNNaO$ [M + Na^+], 664.1666; found: 664.1664.



5-Methyl-5-((triphenylgermyl)methyl)-5,6-dihydroindolo[2,1-*a*]isoquinoline (3r). (64 mg, 58%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.74 (d, J = 7.6 Hz, 1H), 7.62-7.61 (m, 1H), 7.39-7.38 (m, 6H), 7.36-7.33 (m, 3H), 7.31-7.28 (m, 7H), 7.23-7.21 (m, 1H), 7.14-7.11 (m, 1H), 7.09-7.05 (m, 2H), 6.87 (s, 1H), 6.80-6.78 (m, 1H), 4.05 (d, J = 12.2 Hz, 1H), 3.77 (d, J = 12.1 Hz, 1H), 2.15 (d, J = 14.4 Hz, 1H), 2.06 (d, J = 14.4 Hz, 1H), 1.40 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 141.8, 137.4, 136.8, 135.1, 134.9, 128.9, 128.6, 128.2, 127.8, 127.5, 127.0, 124.7, 124.6, 121.4, 120.5, 119.7, 109.1, 96.3, 51.9, 38.6, 26.7, 26.4; HRMS (ESI) calcd for $C_{36}H_{31}GeNNaO$ [M + Na^+], 574.1561; found: 574.1560.

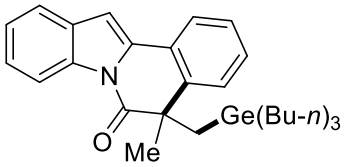


5-Methyl-5-((triphenylgermyl)methyl)benzo[4,5]imidazo[2,1-*a*]isoquinolin-6(5*H*)-one (3s). (90 mg, 80%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.21 (d, J = 7.6 Hz, 1H), 8.13 (d, J = 7.6 Hz, 1H), 7.69 (d, J = 7.7 Hz, 1H), 7.46 (d, J = 7.9 Hz, 1H), 7.37-7.35 (m, 1H), 7.33-7.30 (m, 2H), 7.27-7.25 (m, 1H), 7.21-7.20 (m, 6H), 7.09-7.04 (m, 9H), 2.90 (d, J = 14.4 Hz, 1H), 2.50 (d, J = 14.3 Hz, 1H), 1.71 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.4, 149.3, 143.6, 142.0, 135.7, 134.7, 131.3, 131.2, 128.6, 127.7, 127.5, 126.4, 125.8, 125.4, 124.9, 122.5, 119.3, 115.6, 48.2, 36.3, 24.6; HRMS (ESI) calcd for $C_{35}H_{28}GeNNaO$ [M + Na^+], 589.1306; found: 589.1303.



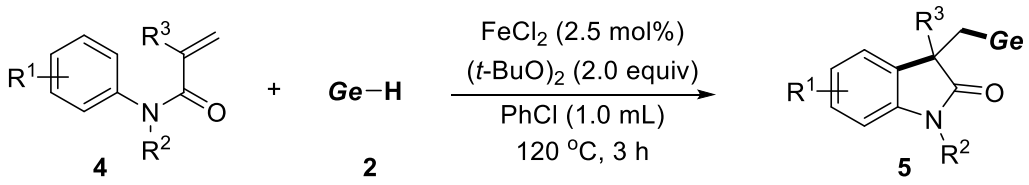
5-Benzyl-5-methylindolo[2,1-*a*]isoquinolin-6(5*H*)-one--phenyl-l2-germane (1/1) (3t). (54 mg, 55%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.36 (d, J = 7.5 Hz, 1H), 7.69 (d, J = 7.7 Hz, 1H), 7.52-7.50 (m, 1H), 7.38 (d, J =

7.6 Hz, 1H), 7.27-7.21 (m, 7H), 7.17-7.15 (m, 2H), 7.11 (d, J = 6.5 Hz, 2H), 6.95-6.92 (m, 3H), 6.85 (s, 1H), 4.55 (s, 1H), 2.54 (dd, J = 13.6 Hz, 3.4 Hz, 1H), 2.07 (dd, J = 13.8 Hz, 2.8 Hz, 1H), 1.77 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.0, 138.8, 136.1, 135.3, 135.1, 135.0, 134.4, 134.3, 130.5, 128.7, 128.6, 128.4, 127.9, 127.6, 127.2, 126.6, 124.8, 124.2, 124.1, 123.5, 120.1, 116.8, 102.7, 47.1, 32.5, 28.1; HRMS (ESI) calcd for $C_{30}H_{25}GeNNaO$ [M + Na^+], 512.1040; found: 512.1041.

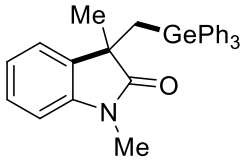


5-Methyl-5-((tributylgermyl)methyl)indolo[2,1-*a*]isoquinolin-6(5*H*)-one (3u). (76 mg, 75%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.66-8.65 (m, 1H), 7.89-7.87 (m, 1H), 7.64 (d, J = 7.5 Hz, 1H), 7.50-7.49 (m, 1H), 7.42-7.35 (m, 4H), 7.08 (s, 1H), 2.00 (dd, J = 13.7 Hz, 2.4 Hz, 1H), 1.82 (s, 3H), 1.59 (dd, J = 14.0 Hz, 1.0 Hz, 1H), 1.08-0.99 (m, 12H), 0.75-0.73 (m, 9H), 0.34-0.23(m, 6H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.6, 140.1, 135.6, 135.4, 130.6, 128.6, 127.1, 126.9, 125.1, 124.4, 123.7, 123.6, 120.3, 116.9, 102.7, 46.8, 33.2, 28.3, 26.9, 26.4, 13.5, 12.7; HRMS (ESI) calcd for $C_{30}H_{41}GeNNaO$ [M + H^+], 528.2292; found: 528.2290.

4. General procedure and characterization data for product 5

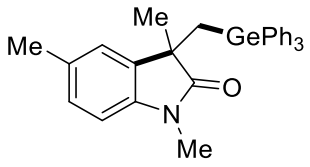


To a mixture of $FeCl_2$ (0.7 mg, 2.5% mmol), alkene **4** (0.2 mmol) and ***Ge*-H** (0.22 mmol) under nitrogen, chlorobenzene (1.0 mL) was added. Then di-*tert*-butyl peroxide (75.0 μL, 0.4 mmol) was added dropwise into the mixture. The resulting mixture was then stirred at 120 °C for 3 h. After the mixture was cooled to room temperature, the resulting solution was directly filtered through a pad of silica by ethyl acetate. The solvent was evaporated in *vacuo* to give the crude product. The residue was purified by flash column chromatography on silica gel (ethyl acetate/petroleum ether) to give the pure product **5**.

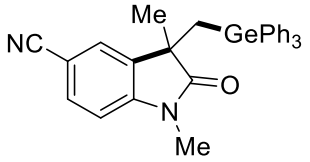


1,3-Dimethyl-3-((triphenylgermyl)methyl)indolin-2-one (5a). (54 mg, 90%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 4:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$)

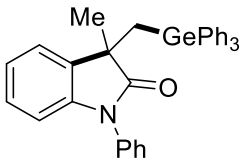
δ 7.28-7.26 (m, 3H), 7.24-7.22 (m, 12H), 7.10 (t, J = 7.6 Hz, 1H), 7.06 (d, J = 7.3 Hz, 1H), 6.83 (t, J = 7.3 Hz, 1H), 6.36 (d, J = 7.5 Hz, 1H), 2.49 (s, 3H), 2.36 (d, J = 13.6 Hz, 1H), 2.36 (d, J = 13.9 Hz, 1H), 1.45 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.4, 143.0, 136.7, 135.0, 134.5, 128.6, 127.9, 127.6, 122.8, 122.1, 108.3, 46.6, 29.9, 25.5, 22.3; HRMS (ESI) calcd for $C_{29}H_{27}GeNNaO$ [M + Na^+], 502.1197; found: 502.1195.



1,3,5-Trimethyl-3-((triphenylgermyl)methyl)indolin-2-one (5b). (91 mg, 92%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.28-7.26 (m, 3H), 7.24-7.20 (m, 12H), 6.90 (d, J = 7.6 Hz, 1H), 6.82 (s, 1H), 6.31 (d, J = 7.8 Hz, 1H), 2.46 (s, 3H), 2.35 (d, J = 14.3 Hz, 1H), 2.16 (d, J = 14.1 Hz, 1H), 2.10 (s, 3H), 1.44 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.1, 140.4, 136.6, 134.9, 134.2, 131.4, 128.5, 127.7, 124.1, 107.8, 46.4, 29.5, 25.4, 22.5, 20.8; HRMS (ESI) calcd for $C_{30}H_{29}GeNNaO$ [M + Na^+], 516.1353; found: 516.1352.

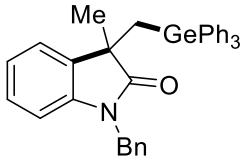


1,3-Dimethyl-2-oxo-3-((triphenylgermyl)methyl)indoline-5-carbonitrile (5c). (87 mg, 86%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 5:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.40 (dd, J = 8.1 Hz, 1.6 Hz, 1H), 7.32-7.30 (m, 3H), 7.28-7.23 (m, 13H), 6.42 (d, J = 8.0 Hz, 1H), 2.56 (s, 3H), 2.38 (d, J = 14.4 Hz, 1H), 2.17 (d, J = 14.3 Hz, 1H), 1.47 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.0, 146.6, 135.9, 135.1, 134.6, 132.9, 128.9, 127.9, 126.3, 119.0, 108.4, 104.9, 46.3, 29.4, 25.7, 21.8; HRMS (ESI) calcd for $C_{30}H_{26}GeN_2NaO$ [M + Na^+], 527.1149; found: 527.1149.

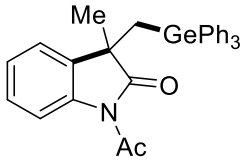


1-Methyl-3-phenyl-3-((triphenylgermyl)methyl)indolin-2-one--3-methyl-1-phenyl-3-((triphenylgermyl)methyl)indolin-2-one (1/1) (5d). (104 mg, 96%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.31-7.25 (m, 12H), 7.23-7.20 (m, 6H), 7.06-7.03 (m, 2H), 6.82 (t, J = 7.6 Hz, 1H), 6.75-6.74 (m, 2H), 6.55 (d, J = 8.3 Hz, 1H), 2.50 (dd, J = 14.2 Hz, 1.4 Hz, 1H), 2.28 (dd, J = 14.2 Hz, 1.3 Hz, 1H), 1.57 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 179.7, 142.6, 136.7, 135.0, 134.4, 134.2, 128.9, 128.6, 127.9, 127.5,

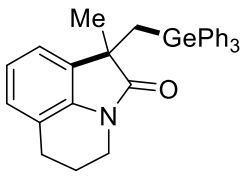
127.3, 126.2, 123.1, 122.6, 109.4, 46.8, 30.5, 23.1; HRMS (ESI) calcd for $C_{34}H_{29}GeNNaO$ [M + Na^+], 564.1353; found: 564.1357.



1-Menzyl-3-methyl-3-((triphenylgermyl)methyl)indolin-2-one (5e). (102 mg, 92%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.30-7.23 (m, 15H), 7.21-7.19 (m, 2H), 7.16-7.14 (m, 1H), 7.08-7.04 (m, 3H), 6.97 (t, J = 7.9 Hz, 1H), 6.78 (t, J = 7.5 Hz, 1H), 6.28 (d, J = 7.8 Hz, 1H), 4.73 (d, J = 15.7 Hz, 1H), 3.44 (d, J = 15.6 Hz, 1H), 2.39 (dd, J = 14.1 Hz, 1.4 Hz, 1H), 2.23 (dd, J = 14.0 Hz, 1.1 Hz, 1H), 1.51 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.4, 141.9, 136.6, 136.2, 134.9, 134.5, 128.6, 128.5, 127.8, 127.4, 127.2, 127.0, 122.7, 122.1, 109.2, 46.6, 42.8, 30.0, 22.1; HRMS (ESI) calcd for $C_{35}H_{31}GeNNaO$ [M + Na^+], 578.1510; found: 578.1515.

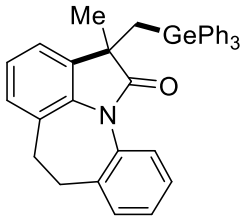


1-Acetyl-3-methyl-3-((triphenylgermyl)methyl)indolin-2-one (5f). (55 mg, 54%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.96 (d, J = 8.3 Hz, 1H), 7.32-7.29 (m, 3H), 7.26-7.22 (m, 12H), 7.18-7.15 (m, 1H), 7.07 (d, J = 7.5 Hz, 1H), 6.94 (t, J = 7.4 Hz, 1H), 2.38 (d, J = 14.3 Hz, 1H), 2.23 (d, J = 14.2 Hz, 1H), 2.22 (s, 3H), 1.50 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 181.3, 170.6, 139.2, 136.0, 134.8, 134.4, 133.2, 128.9, 127.9, 124.8, 122.6, 116.8, 47.3, 31.3, 26.4, 23.2; HRMS (ESI) calcd for $C_{30}H_{27}GeNNaO_2$ [M + Na^+], 530.1146; found: 530.1146.

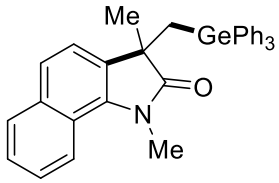


1-Methyl-1-((triphenylgermyl)methyl)-5,6-dihydro-4*H*-pyrrolo[3,2,1-*ij*]quinolin-2(1*H*)-one (5g). (83 mg, 82%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.29-7.25 (m, 3H), 7.24-7.22 (m, 12H), 6.88 (d, J = 7.4 Hz, 1H), 6.85 (d, J = 7.6 Hz, 1H), 6.75-6.72 (m, 1H), 3.49-3.45 (m, 1H), 2.53-2.49 (m, 1H), 2.43-2.37 (m, 2H), 2.33-2.29 (m, 1H), 2.22 (d, J = 14.2 Hz, 1H), 1.58-1.55 (m, 2H), 1.47(s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$)

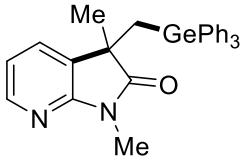
δ 179.4, 138.7, 136.8, 135.0, 132.9, 128.4, 127.7, 126.4, 121.6, 120.4, 120.0, 47.8, 37.8, 29.7, 24.0, 22.4, 20.5; HRMS (ESI) calcd for $C_{31}H_{29}GeNNaO$ [M + Na^+], 528.1353; found: 528.1356.



7-Methyl-7-((triphenylgermyl)methyl)-11,12-dihydrobenzo[6,7]azepino[3,2,1-*hi*]indol-6(7*H*)-one (5h). (85 mg, 75%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.28-7.16 (m, 16H), 7.02 (s, 3H), 6.91 (d, J = 7.2 Hz, 1H), 6.84 (d, J = 7.7 Hz, 1H), 6.75-6.73 (m, 1H), 2.80-2.72 (m, 4H), 2.53 (dd, J = 14.1 Hz, 5.7 Hz, 1H), 2.25 (dd, J = 14.0 Hz, 5.8 Hz, 1H), 1.53 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 181.0, 140.0, 136.8, 136.3, 135.9, 135.2, 135.1, 129.6, 129.2, 128.7, 128.0, 126.3, 126.1, 125.9, 125.1, 122.2, 120.6, 46.6, 33.8, 33.7, 30.6, 24.0; HRMS (ESI) calcd for $C_{36}H_{31}GeNNaO$ [M + Na^+], 590.1510; found: 590.1514.

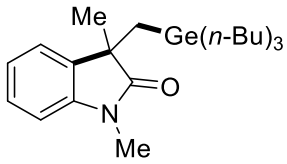


1,3-Dimethyl-3-((triphenylgermyl)methyl)-1,3-dihydro-2*H*-benzo[*g*]indol-2-one (5i). (42 mg, 40%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.57 (d, J = 7.7Hz, 1H), 7.38 (d, J = 8.1Hz, 1H), 7.35 (d, J = 7.2Hz, 1H), 7.28-7.25 (m, 1H), 7.23-7.20 (m, 1H), 7.19-7.15 (m, 9H), 7.10-7.07 (m, 6H), 7.52 (d, J = 7.6 Hz, 1H), 3.00 (s, 3H), 2.93 (d, J = 14.0 Hz, 1H), 2.45 (d, J = 13.8 Hz, 1H), 1.61 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 173.3, 138.8, 136.9, 136.7, 134.9, 133.1, 128.3, 127.5, 126.6, 126.0, 125.9, 122.6, 121.8, 119.4, 108.1, 46.5, 37.8, 29.4, 26.3; HRMS (ESI) calcd for $C_{33}H_{29}GeNNaO$ [M + Na^+], 552.1353; found: 552.1355.

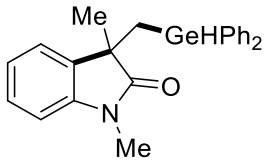


1,3-Dimethyl-3-((triphenylgermyl)methyl)-1,3-dihydro-2*H*-pyrrolo[2,3-*b*]pyridin-2-one (5j). (60 mg, 62%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 10:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.02-8.01 (m, 1H), 7.32-7.30 (m, 3H), 7.28-7.23 (m, 12H), 7.20-7.19 (m, 1H), 6.70-6.68 (m, 1H), 2.63 (s, 3H), 2.39 (d, J = 14.0 Hz, 1H), 2.18 (d, J = 14.2 Hz, 1H), 1.47(s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.1, 156.2, 146.4, 136.2, 134.7, 129.9, 128.9, 128.8, 128.0, 117.6, 46.3,

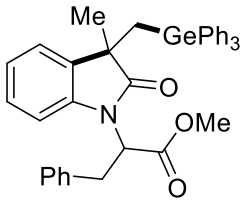
29.4, 24.7, 21.6; HRMS (ESI) calcd for $C_{28}H_{26}GeN_2NaO$ [M + Na^+], 503.1149; found: 503.1146.



1,3-Dimethyl-3-((tributylgermyl)methyl)indolin-2-one (5k). (67mg, 80%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.27-7.23 (m, 1H), 7.18 (d, J =7.2 Hz, 1H), 7.02 (t, J = 7.5 Hz, 1H), 6.81 (d, J =7.8 Hz, 1H), 3.18 (s, 3H), 1.48 (d, J = 14.0 Hz, 1H), 1.41 (s, 3H), 1.31 (d, J = 13.9 Hz, 1H), 1.21-1.15 (m, 6H), 1.12-1.06 (m, 6H), 0.82 (t, J = 7.2 Hz, 9H), 0.42-0.36 (m, 3H), 0.29-0.24 (m, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 181.1, 142.7, 135.6, 127.6, 122.7, 122.2, 107.8, 46.5, 28.3, 27.0, 26.6, 26.1, 23.0, 13.6, 12.7; HRMS (ESI) calcd for $C_{23}H_{39}GeNNaO$ [M + Na^+], 442.2134; found: 442.2139.



3-((Diphenylgermyl)methyl)-1,3-dimethylindolin-2-one (5l). (50 mg, 52%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 20:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.27-7.22 (m, 10H), 7.20-7.18 (m, 1H), 7.12 (d, J = 7.2 Hz, 1H), 6.94 (t, J = 7.2 Hz, 1H), 6.63 (d, J = 7.8 Hz, 1H), 4.59-4.58 (m, 1H), 2.80 (s, 3H), 2.05 (dd, J = 13.7 Hz, 4.0 Hz, 1H), 1.84 (dd, J = 13.8 Hz, 3.1 Hz, 1H), 1.44 (s, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.3, 142.7, 136.4, 135.7, 134.7, 134.4, 134.3, 128.7, 128.6, 128.0, 127.9, 127.8, 122.9, 122.2, 108.0, 46.4, 27.2, 25.6, 23.4; HRMS (ESI) calcd for $C_{23}H_{23}GeNNaO$ [M + Na^+], 426.0884; found: 426.0883.

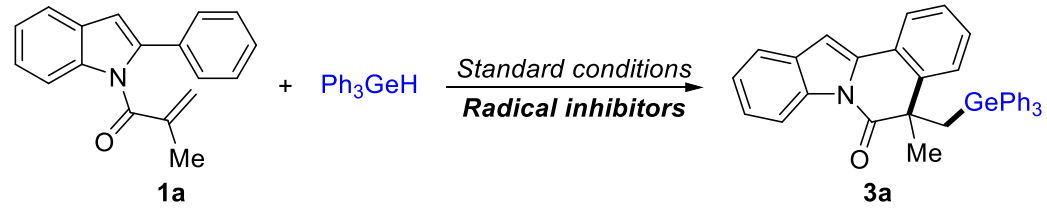


Methyl 2-(3-methyl-2-oxo-3-((triphenylgermyl)methyl)indolin-1-yl)-3-phenylpropanoate (5m). (95 mg, 76% (dr = 1:1)). Isolated by column chromatography on silica gel (petroleum ether/DCM = 1:2, R_f = 0.6); Both ^{1}H and ^{13}C NMR contain all the signals of the two diastereomers. ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.31-7.30 (m, 7H), 7.29-7.26 (m, 5H), 7.23-7.20 (m, 3H), 7.13-7.12 (m, 2H), 7.09-7.05 (m, 3H), 6.96 (s, 1H), 6.77-6.74 (m, 1.5H), 6.72-6.70 (m, 1H), 6.65-6.62 (m, 0.5H), 5.30-5.27 (m, 0.5H), 5.17-5.15 (m, 0.5H), 3.60 (s, 1.5H), 3.57 (s, 1.5H), 3.43-3.39 (m, 1H), 3.16-3.11 (m, 0.5H), 2.77-2.73 (m, 0.5H), 2.16 (dd, J = 14.4 Hz, 4.1 Hz, 0.5H), 2.08 (dd, J = 14.4 Hz, 3.3 Hz, 0.5H), 2.01 (dd, J = 14.3 Hz, 3.5 Hz, 0.5H),

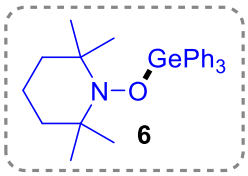
1.70 (dd, J = 14.2 Hz, 4.3 Hz, 0.5H), 1.27 (s, 1.5H), 0.95 (s, 1.5H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 180.7, 180.2, 170.0, 169.9, 140.3, 140.2, 137.1, 136.9, 136.7, 136.2, 135.0, 134.8, 134.7, 134.6, 129.2, 129.1, 128.7, 128.5, 128.3, 128.2, 127.9, 127.8, 127.4, 127.2, 126.7, 123.8, 123.2, 122.3, 122.2, 109.4, 109.3, 54.2, 53.9, 52.4, 52.3, 46.3, 46.0, 34.3, 34.1, 27.6, 26.3, 23.8, 23.5; HRMS (ESI) calcd for $C_{38}H_{35}GeNNaO_3$ [M + Na^+], 650.1721; found: 650.1725.

5. Mechanistic studies

Radical Inhibition Experiment



Radical Inhibitors	Yield of **3a**
No scavenger	95%
TEMPO (3.0 equiv)	N.D.
BHT (3.0 equiv)	N.D.



Detected by HRMS
M + H^+ = 462.1845

The operation followed the general procedure for the synthesis of product **3**, unless 2,2,6,6-tetramethylpipedinyloxy (TEMPO) (0.6 mmol) or butylatedhydroxytoluene (BHT) (0.6 mmol) was added. ^{1}H NMR analysis revealed that **3a** was not detected and **1a** was almost recovered. Besides, the TEMPO-$GePh_3$ adduct **6** was also detected by HRMS (**Figure S1**).

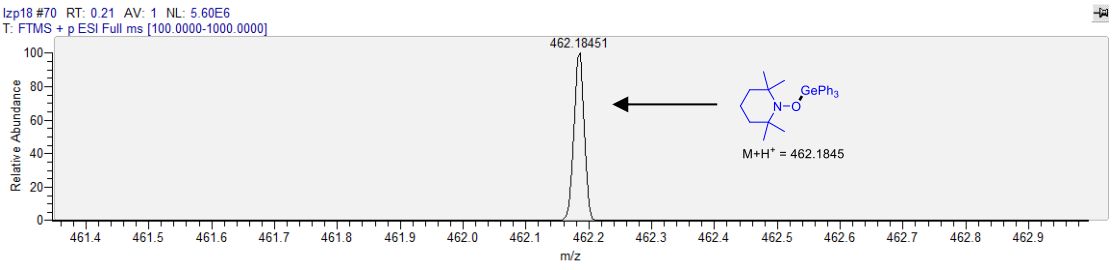
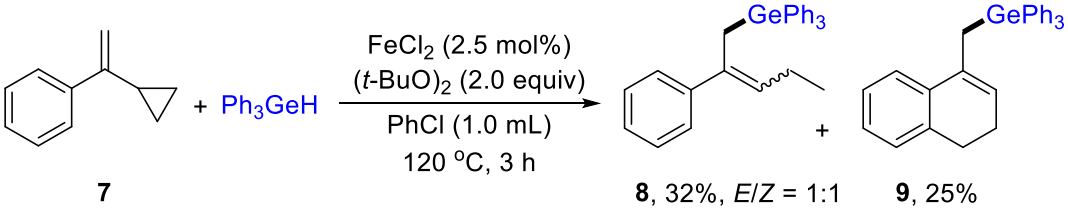


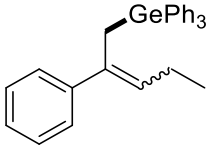
Figure S1. Detection of TEMPO-$GePh_3$ adduct.

Radical Clock Experiment

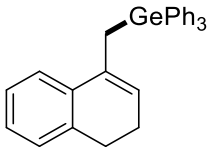


The operation followed the general procedure for the synthesis of product **3**, unless α-cyclopropyl styrene

substrate **7** was used instead of **1a**. The the ring-opening hydrogermylation product **8** and dihydronaphthalene **9** were obtained.



Triphenyl(2-phenylpent-2-en-1-yl)germane (8). (*E*/*Z* = 1/1, *in situ* ^{1}H NMR), (29 mg, 32%, isolated yield, *E*/*Z* = 1/0.6). Isolated by column chromatography on silica gel (petroleum ether/DCM = 50:1, R_f = 0.5); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.37-7.33 (m, 15H), 7.31-7.27 (m, 9H), 7.17-7.12 (m, 6H), 6.93-6.87 (m, 2H), 5.43-5.39 (m, 1.6H), 2.93 (s, 2H), 2.85 (s, 1.2H), 1.97-1.93 (m, 2H), 1.89-1.86 (m, 1.2H), 0.86-0.81 (m, 4.8H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 144.1, 137.1, 136.9, 136.2, 136.1, 135.1, 135.0, 134.8, 129.7, 129.4, 128.7, 128.6, 128.5, 127.9, 127.9, 127.8, 127.7, 126.8, 126.4, 126.3, 26.9, 22.5, 22.4, 20.0, 14.6, 13.8; HRMS (ESI) calcd for $C_{29}H_{28}GeNa$ [M + Na^+], 473.1295; found: 473.1290.



((3,4-Dihydronaphthalen-1-yl)methyl)triphenylgermane (9). (22 mg, 25%). Isolated by column chromatography on silica gel (petroleum ether/DCM = 50:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.42-7.40 (m, 6H), 7.31-7.26 (m, 9H), 7.05 (d, *J* = 7.3 Hz, 1H), 6.98 (s, 2H), 6.87-6.86 (m, 1H), 5.74 (s, 1H), 2.85 (s, 2H), 2.51-2.48 (m, 2H), 2.07-2.06 (m, 2H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 137.0, 136.6, 135.4, 135.0, 133.5, 128.8, 127.9, 127.0, 126.4, 125.9, 124.8, 123.5, 28.4, 23.2, 19.9; HRMS (ESI) calcd for $C_{29}H_{26}GeNa$ [M + Na^+], 471.1139; found: 471.1135.

Hydrogermylation

1v **10**, 77%

The operation was following the general procedure to the synthesis of product **3** unless alkene **1v** was used instead of **1a**. The hydrogermylation product **10** was obtained (76 mg, 77%). Isolated by column chromatography on silica gel (petroleum ether/ethyl acetate = 50:1, R_f = 0.4); ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.31 (d, *J* = 6.1 Hz, 1H), 7.51-7.47 (m, 7H), 7.30-7.25 (m, 10H), 7.22-7.20 (m, 1H), 7.01 (s, 1H), 6.44 (d, *J* = 3.5 Hz, 1H), 3.36-3.30 (m, 1H), 2.20 (dd, *J* = 14.2 Hz, 6.6 Hz, 1H), 1.83 (dd, *J* = 14.0 Hz, 7.6 Hz, 1H), 1.33 (d, *J* = 6.8 Hz, 3H); ^{13}C NMR (150 MHz, $CDCl_3$) δ 176.5, 136.3, 135.7, 134.8, 130.3, 129.0, 128.3, 124.9, 124.2, 123.4, 120.5, 116.8, 108.8, 36.2, 20.9, 18.7; HRMS (ESI) calcd for $C_{30}H_{27}GeNNaO$

[M + Na^+], 514.1197; found: 514.1198.

6. References

[1] K. Yang, Y. Lou, C. Wang, L.-W. Qi, T. Fang, F. Zhang, H. Xu, L. Zhou, W. Li, G. Zhang, P. Yu and Q. Song, *Angew. Chem., Int. Ed.,* 2020, **59**, 3294–3299.

[2] S.-S. Jiang, Y.-T. Xiao, Y.-C. Wu, S.-Z. Luo, R.-J. Song and J.-H. Li, *Org. Biomol. Chem.*, 2020, **18**, 4843–4847.

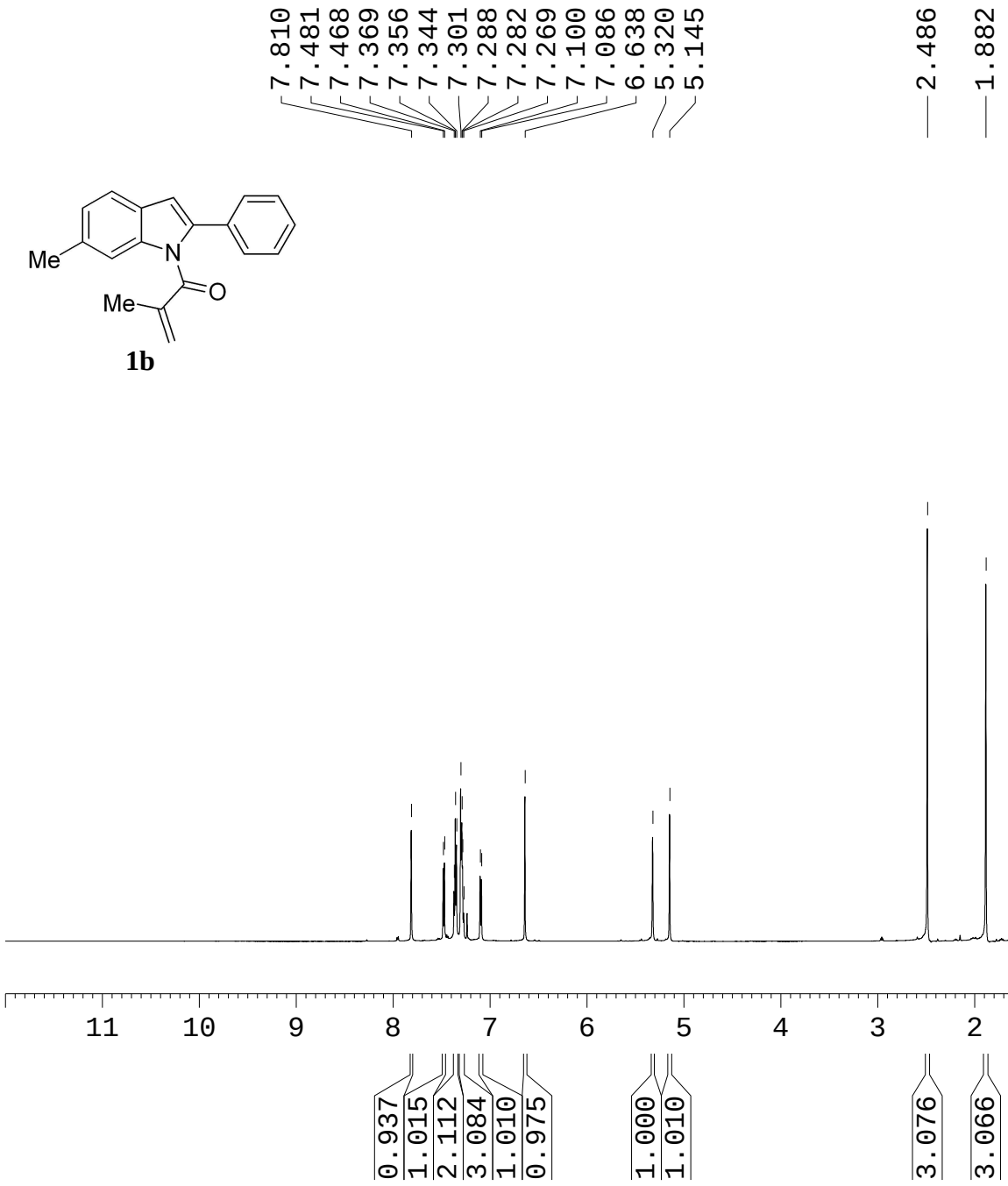
[3] K. Song, G. Li, S. Guo, Z. Zhang and G. Zhang, *Org. Biomol. Chem*., 2021, **19**, 375–378.

[4] K. Sun, S.-J. Li, X.-L. Chen, Y. Liu, X.-Q. Huang, D.-H. Wei, L.-B. Qu, Y.-F. Zhao and B. Yu, *Chem. Commun*., 2019, **55**, 2861–2864.

[5] F.-L. Zeng, K. Sun, X.-L. Chen, X.-Y. Yuan, S.-Q. He, Y. Liu, Y.-Y. Peng, L.-B. Qu, Q.-Y. Lv and B. Yu, *Adv. Synth. Catal*., 2019, **361**, 5176–5181.

[6] M. Zhang, X. Ding, A. Liu, J. Kang, Y. Gao, Z. Wang, H. Li and Q. Wang, *Org. Chem. Front.,* 2021, **8**, 961–967.

7. Copies of ^{1}H NMR and ^{13}C NMR spectra for new compounds.



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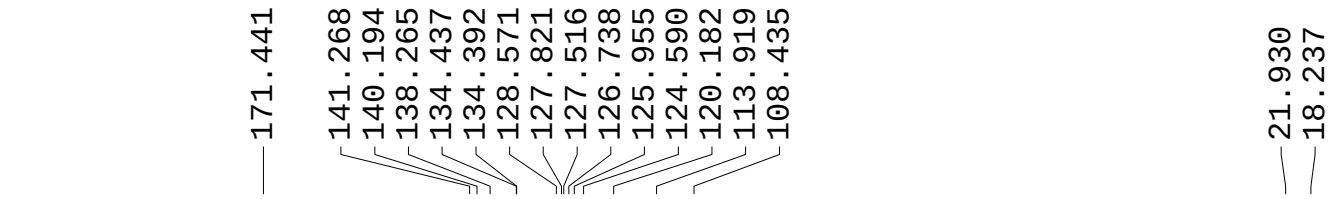
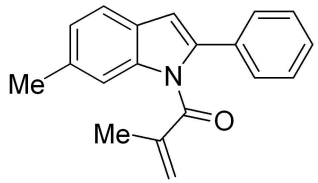
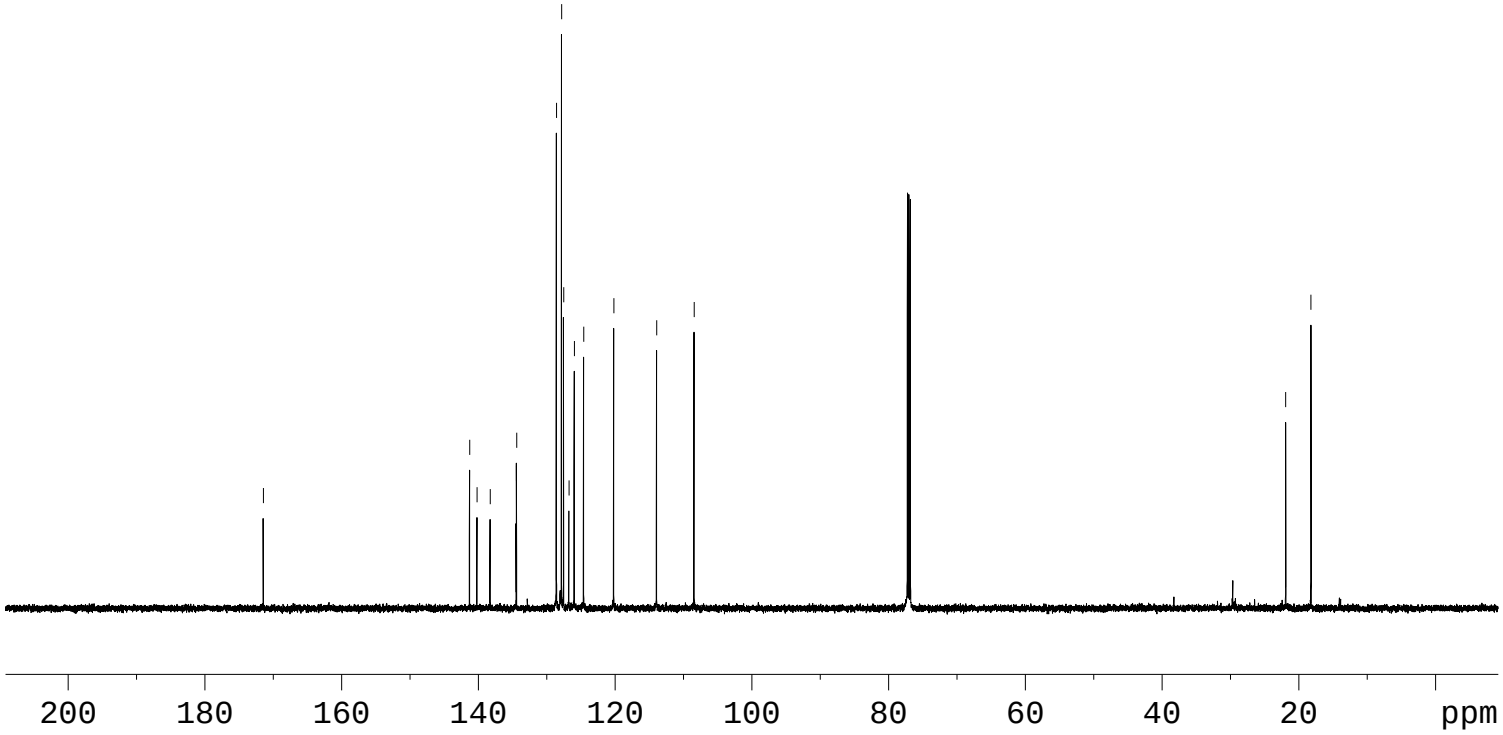




1b



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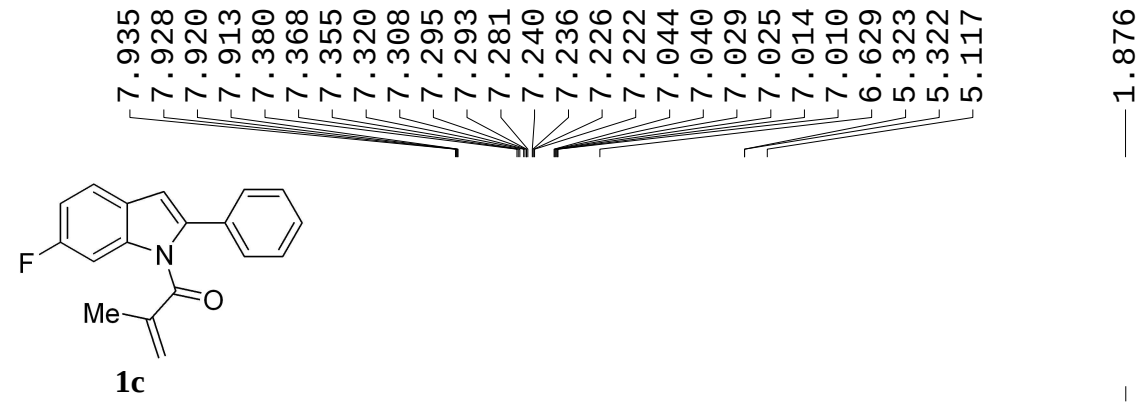

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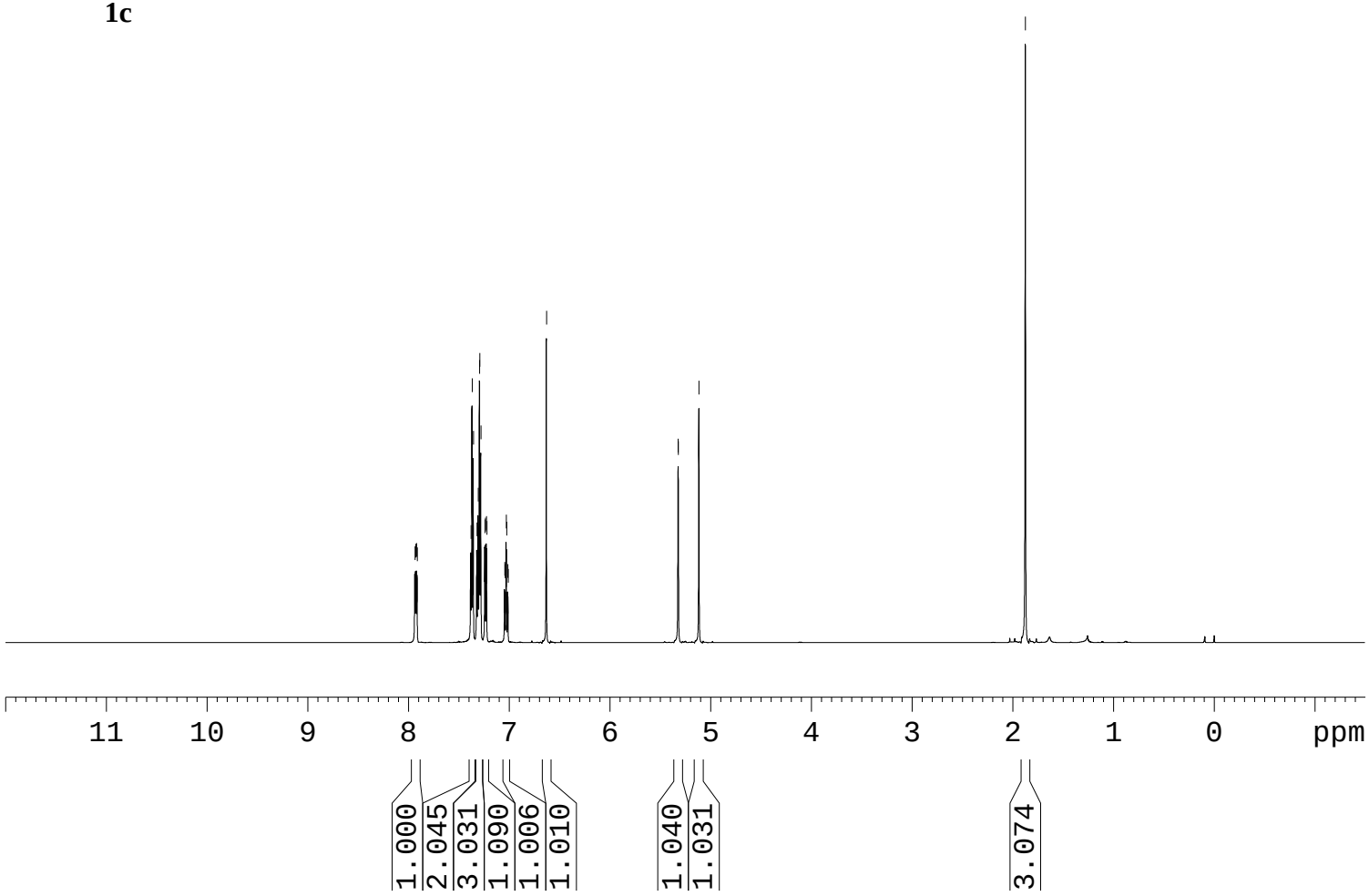

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RG	30.73
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TE	296.6 K
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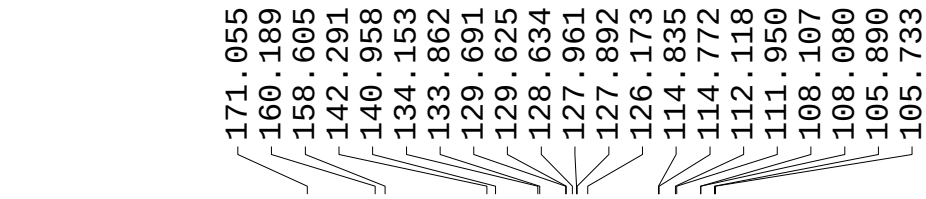

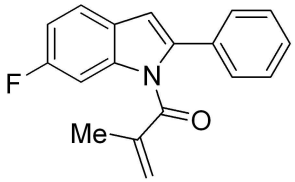

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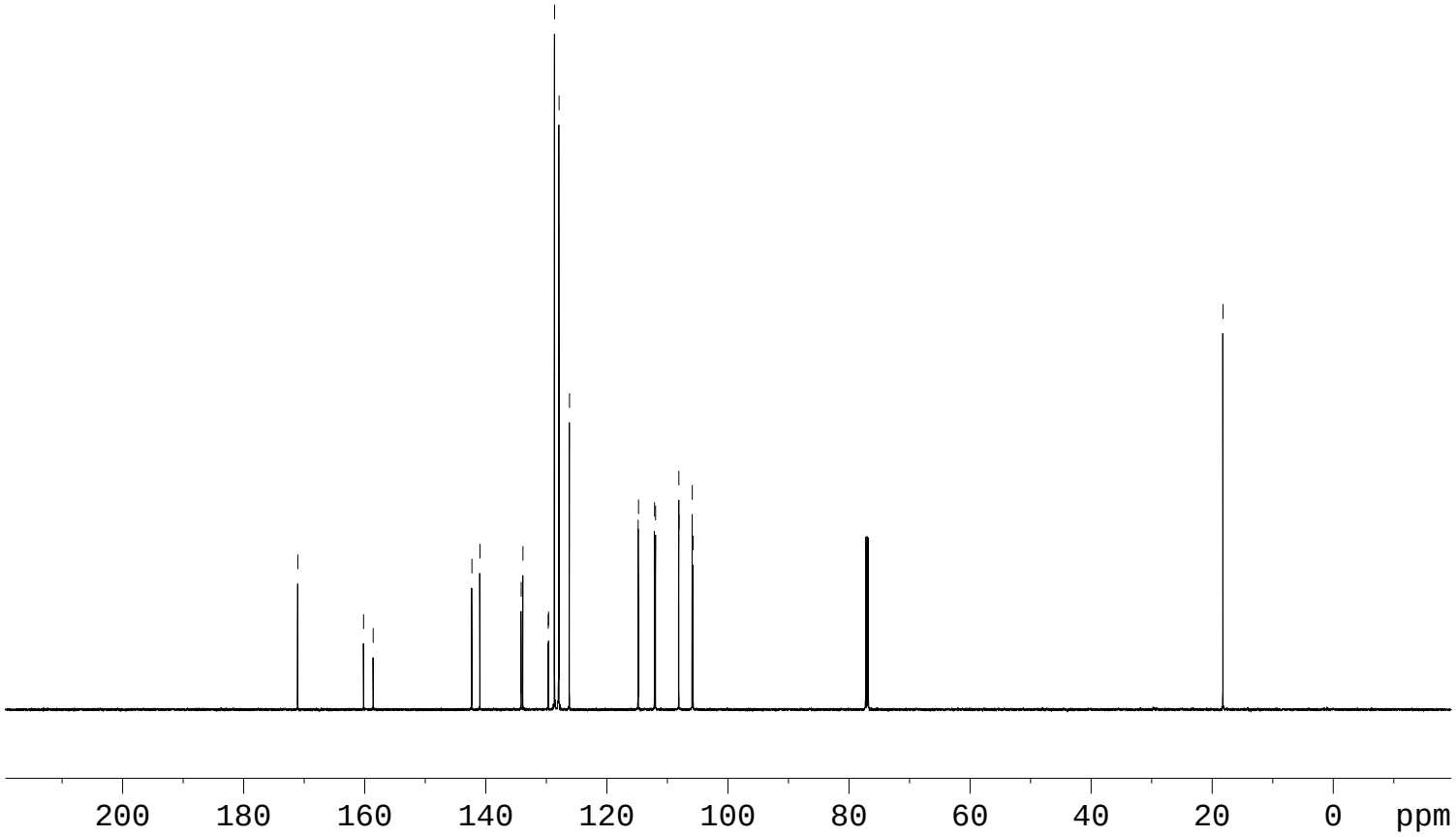

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TE	297.7 K
D1	2.00000000 sec
D11	0.03000000 sec
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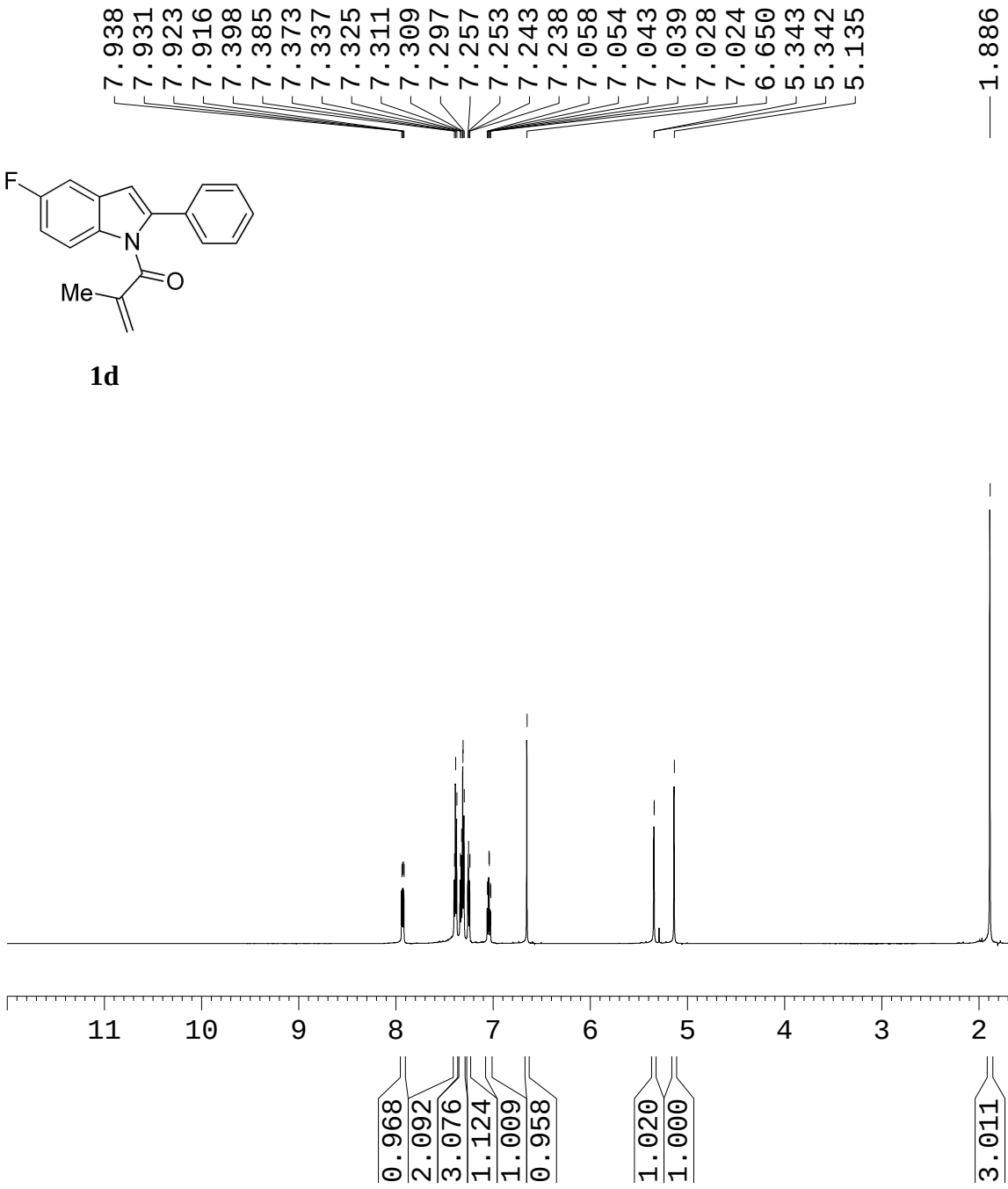
GB	0
PC	1.40

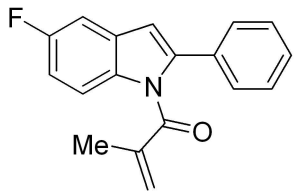


1d

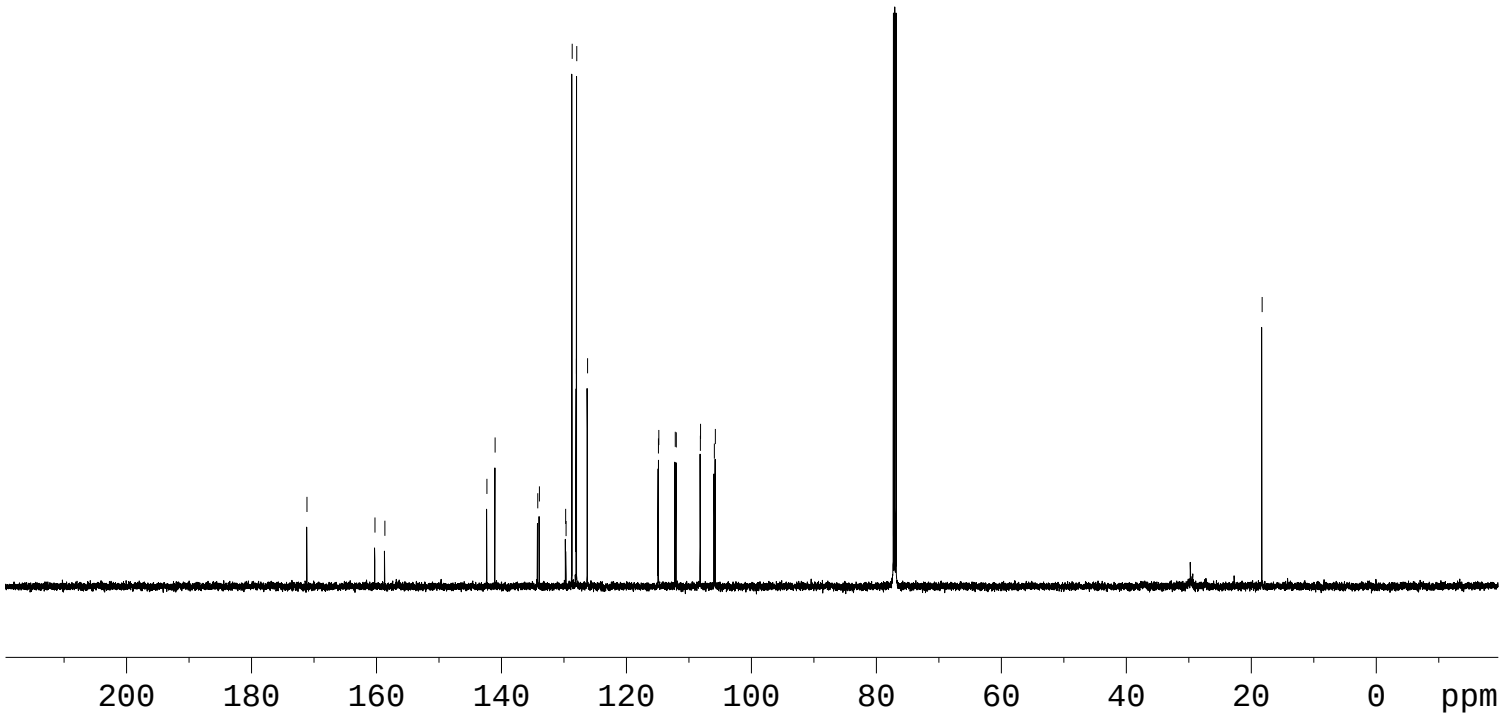
NAME	LYN-290P1-20210511
EXPNO	1
PROCNO	1
Date_	20210511
Time	16.58
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	62.22
DW	52.000 usec
DE	6.50 usec
TE	294.3 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700217 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

171.130
160.247
158.660
142.332
141.020
134.195
133.929
129.732
129.663
128.683
128.007
127.953
126.224
114.881
114.821
112.189
112.021
108.170
108.143
105.932
105.773

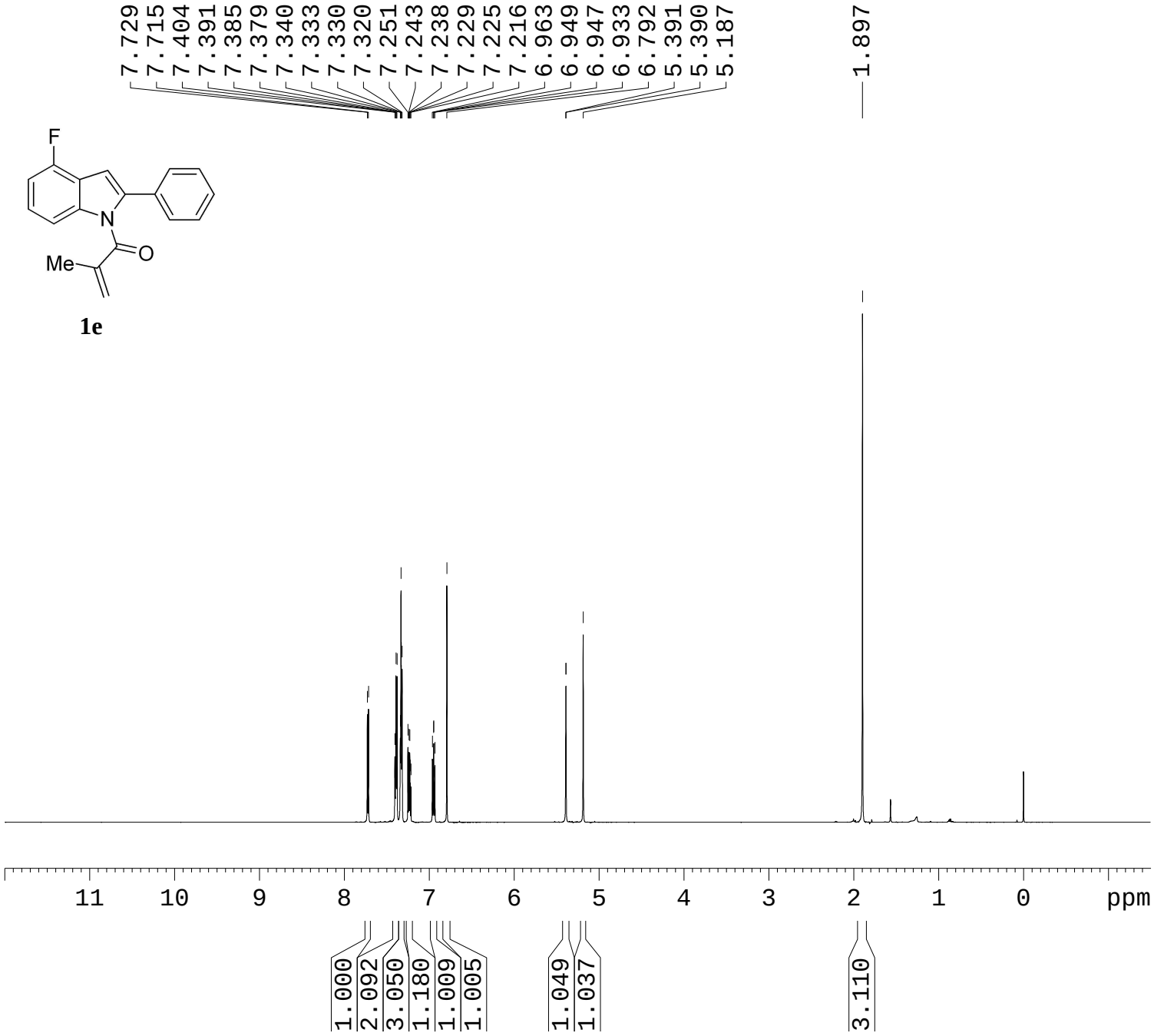
18.266



1d



NAME	lyn-290p-3-c-20210625
EXPNO	1
PROCNO	1
Date_	20210625
Time	19.57
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128722 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

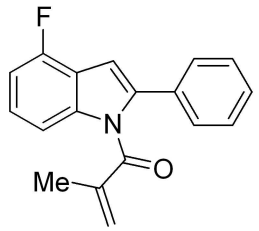


1e

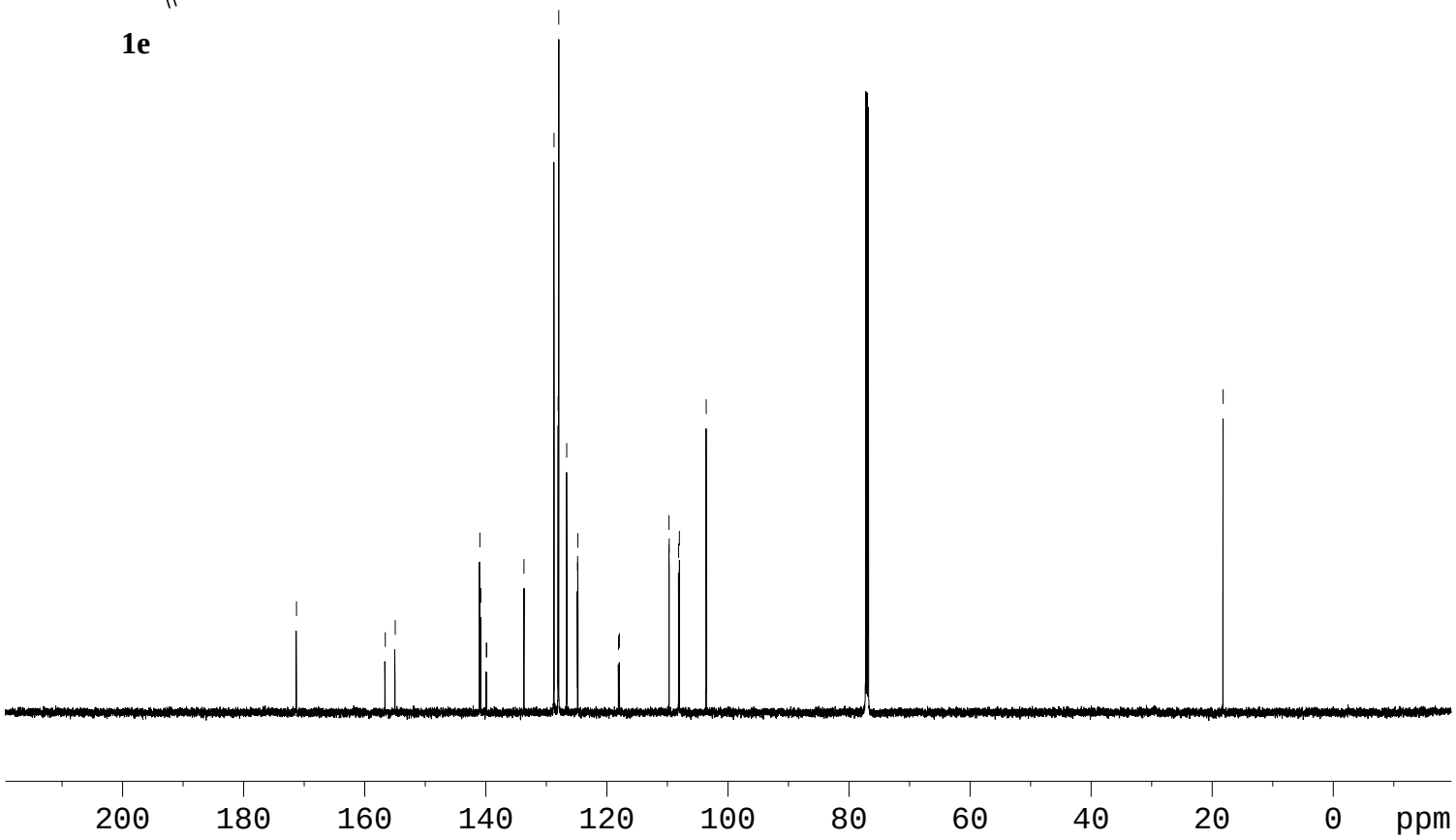
NAME	lyn-275p-20210427
EXPNO	2
PROCNO	1
Date_	20210427
Time	22.33
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	69.87
DW	52.000 usec
DE	6.50 usec
TE	295.1 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700214 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

171.270
156.606
154.964
140.979
140.819
139.911
139.847
133.694
128.730
128.042
127.949
126.633
124.831
124.783
118.077
117.930
109.734
109.707
108.143
108.020
103.587

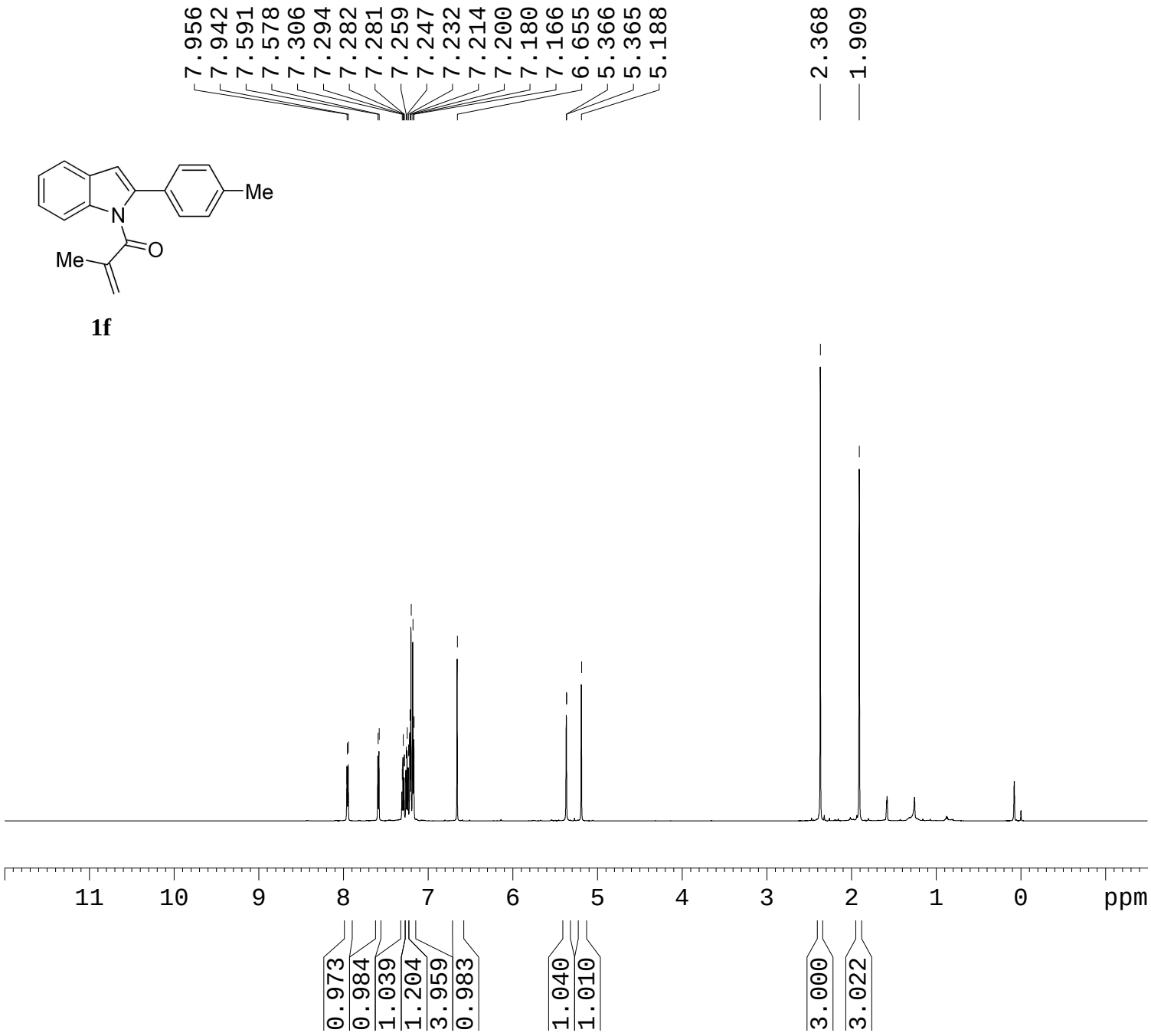
18.188



1e

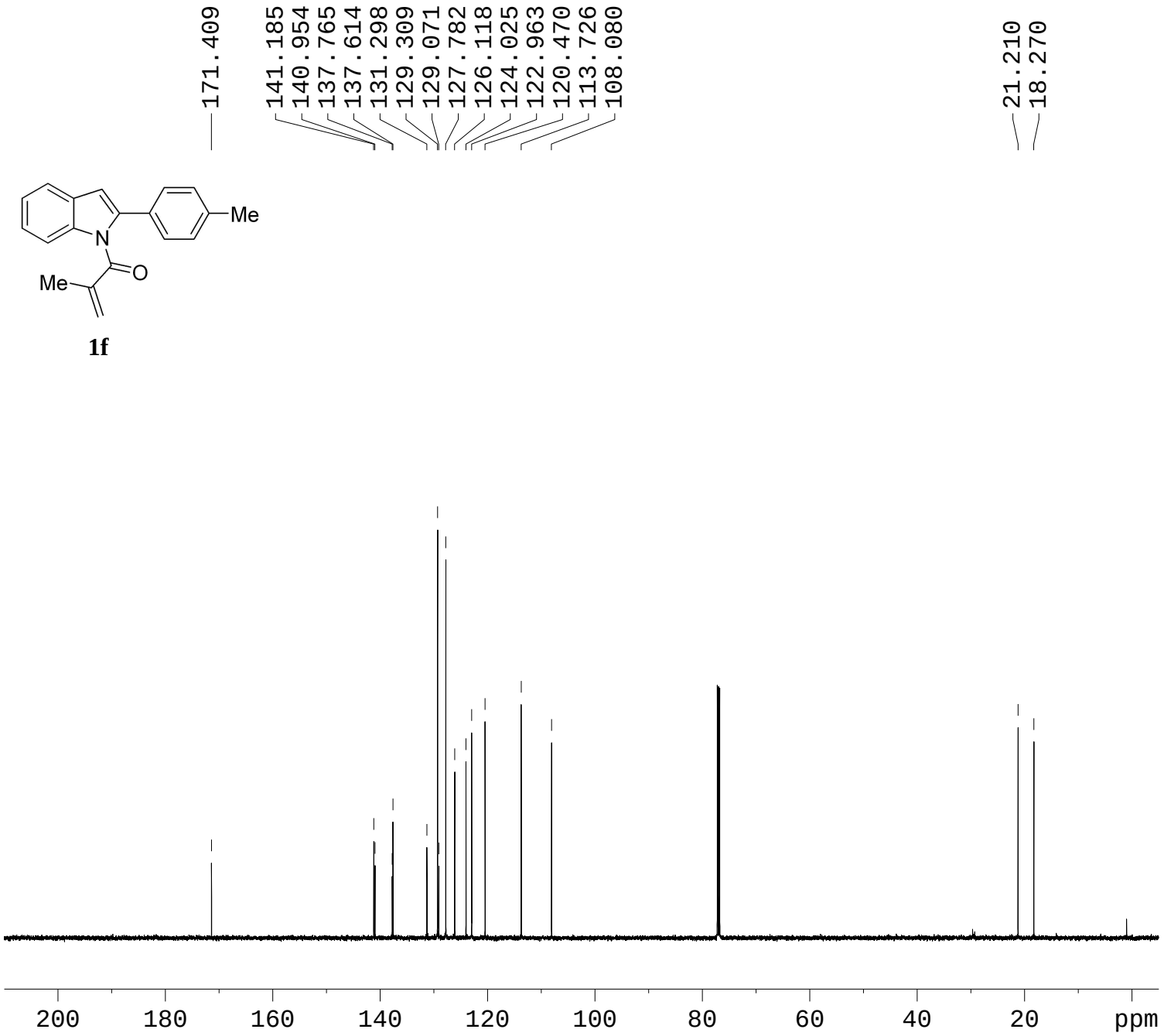


NAME	lyn-275p-3-c-20210625
EXPNO	1
PROCNO	1
Date_	20210625
Time	19.37
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	298.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128729 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



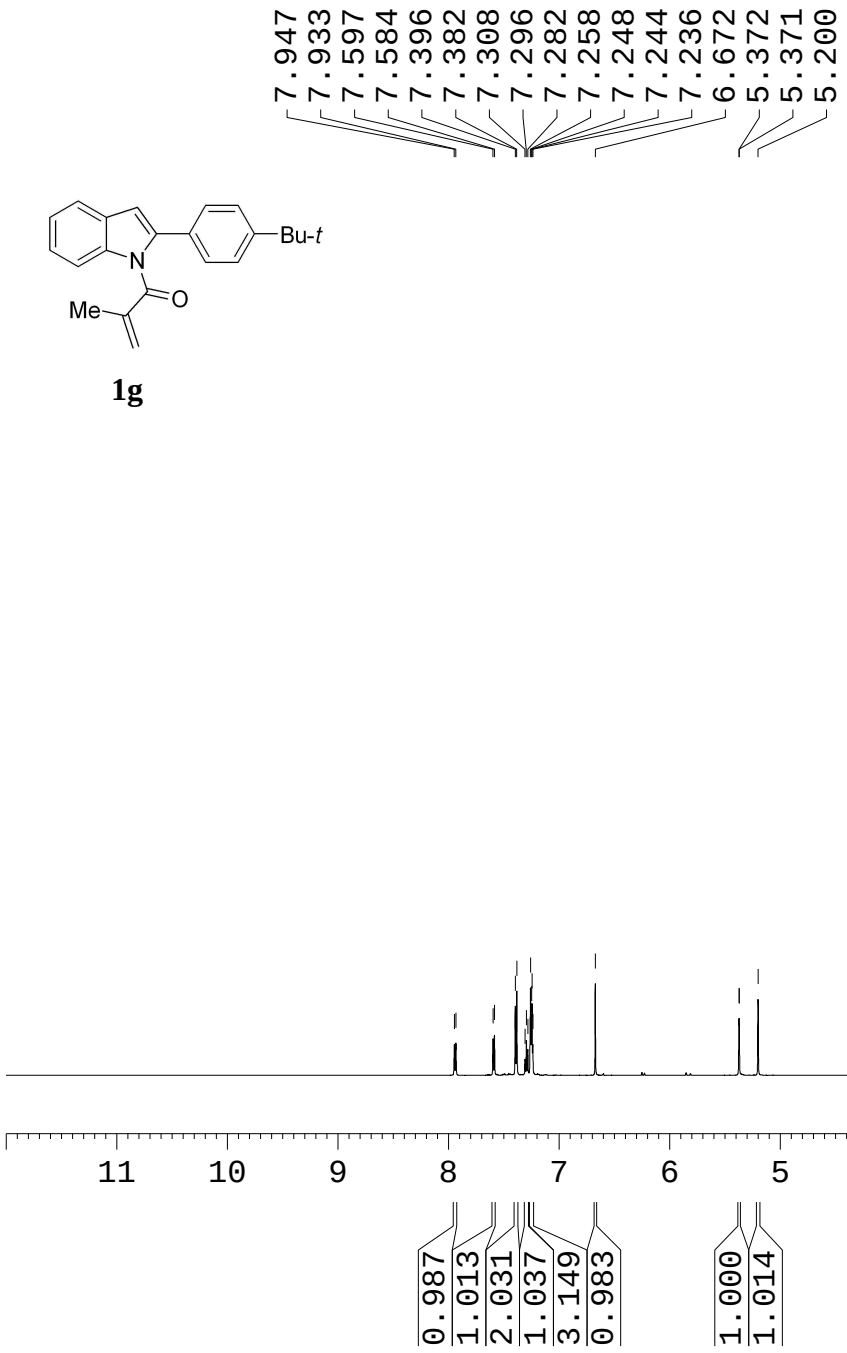
1f

NAME	LYN-230P-4-20210715
EXPNO	1
PROCNO	1
Date_	20210716
Time	2.30
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	50.85
DW	52.000 usec
DE	6.50 usec
TE	298.8 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700320 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



1f

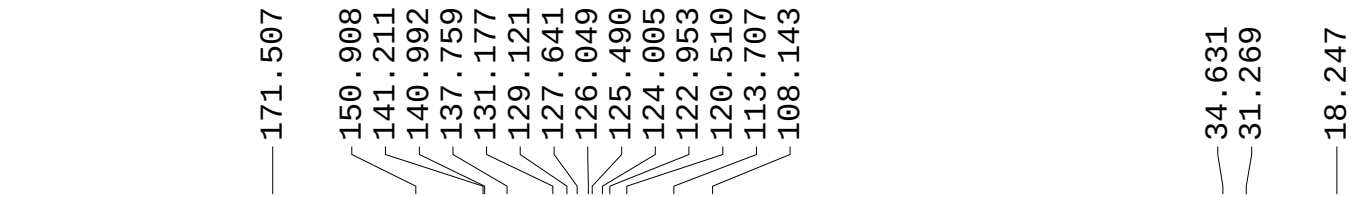
NAME	LYN-230P-4-20210715
EXPNO	2
PROCNO	1
Date_	20210716
Time	2.41
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	299.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128769 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

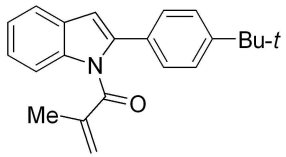


1g

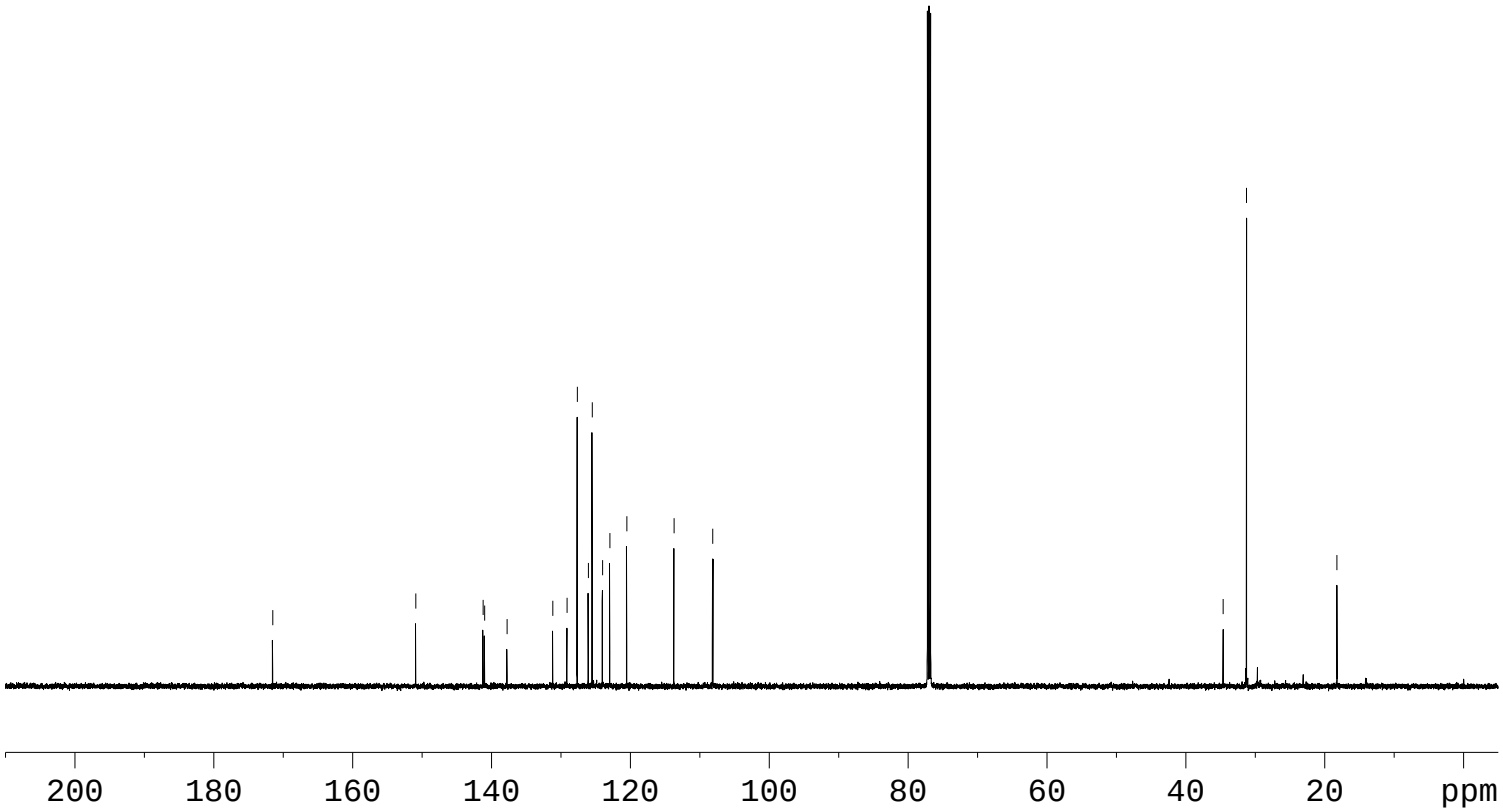
```
NAME      LYN-219p-(re)20210330
EXPNO                    1
PROCNO                   1
Date_             20210330
Time                21.55
INSTRUM             spect
PROBHD    5 mm PABBO BB/
PULPROG                zg30
TD                    65536
SOLVENT               CDCl3
NS                        8
DS                        0
SWH               9615.385 Hz
FIDRES            0.146719 Hz
AQ                3.4079220 sec
RG                    36.09
DW                   52.000 usec
DE                    6.50 usec
TE                   294.4 K
D1             1.00000000 sec
TD0                       1

======== CHANNEL f1 ========
SFO1           600.1739011 MHz
NUC1                    1H
P1                    9.77 usec
SI                    65536
SF             600.1700300 MHz
WDW                     EM
SSB                      0
LB                    0.30 Hz
GB                       0
PC                    1.00
```

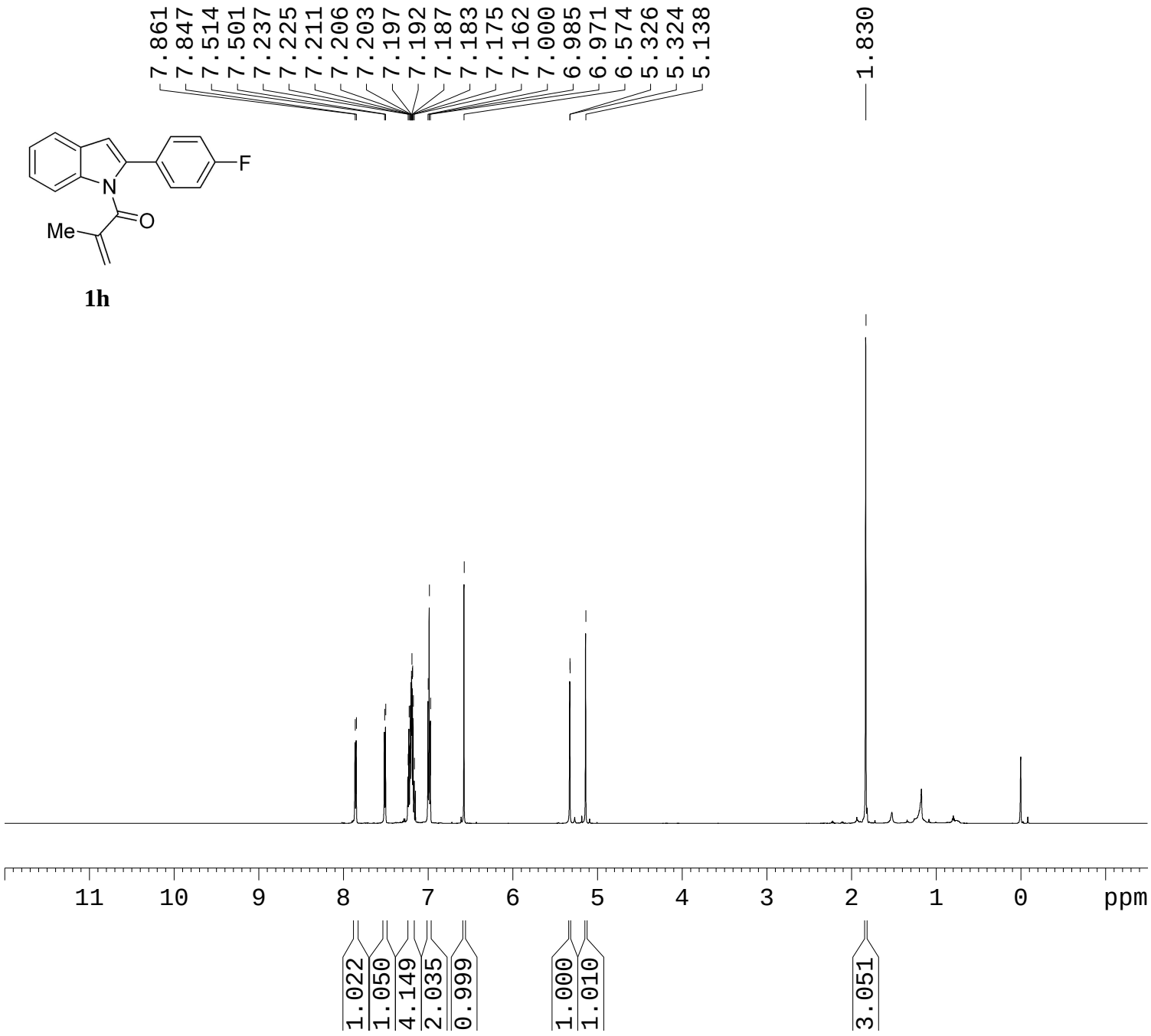




1g

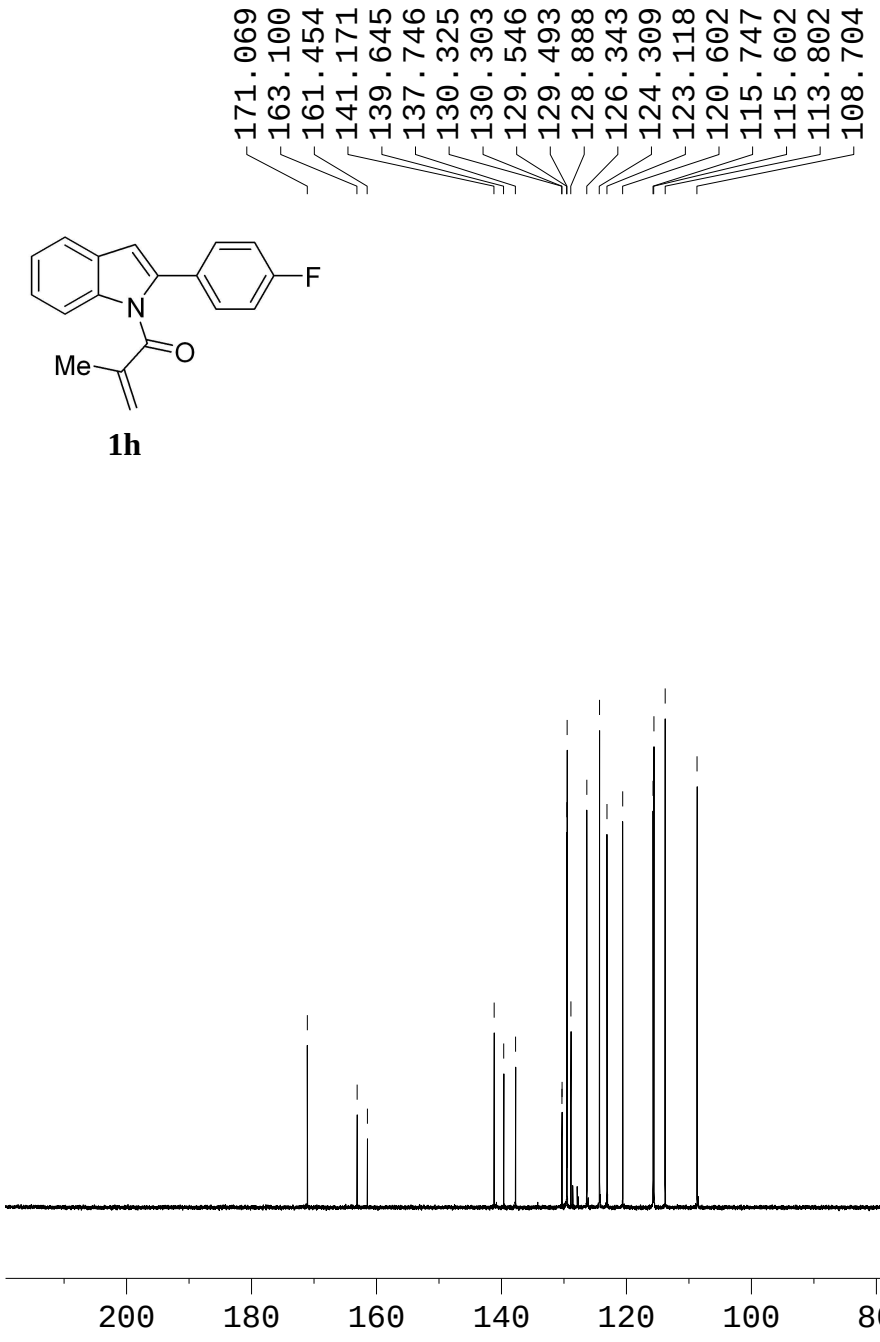


NAME	lyn-323p-4-c
EXPNO	1
PROCNO	1
Date_	20210706
Time	11.04
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128721 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



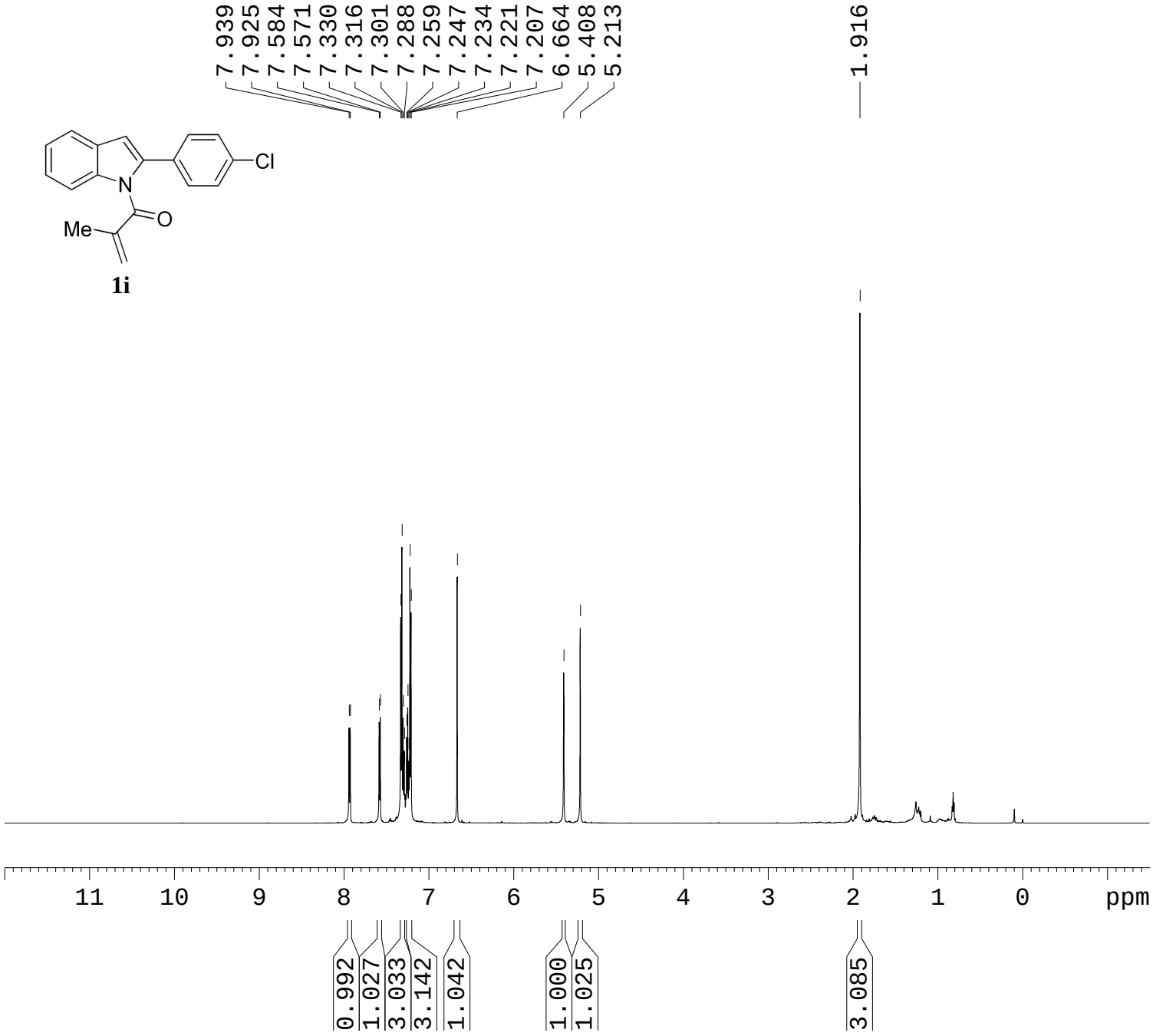
1h

NAME	LYN-202P-3-20210624
EXPNO	1
PROCNO	1
Date_	20210625
Time	0.45
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700832 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

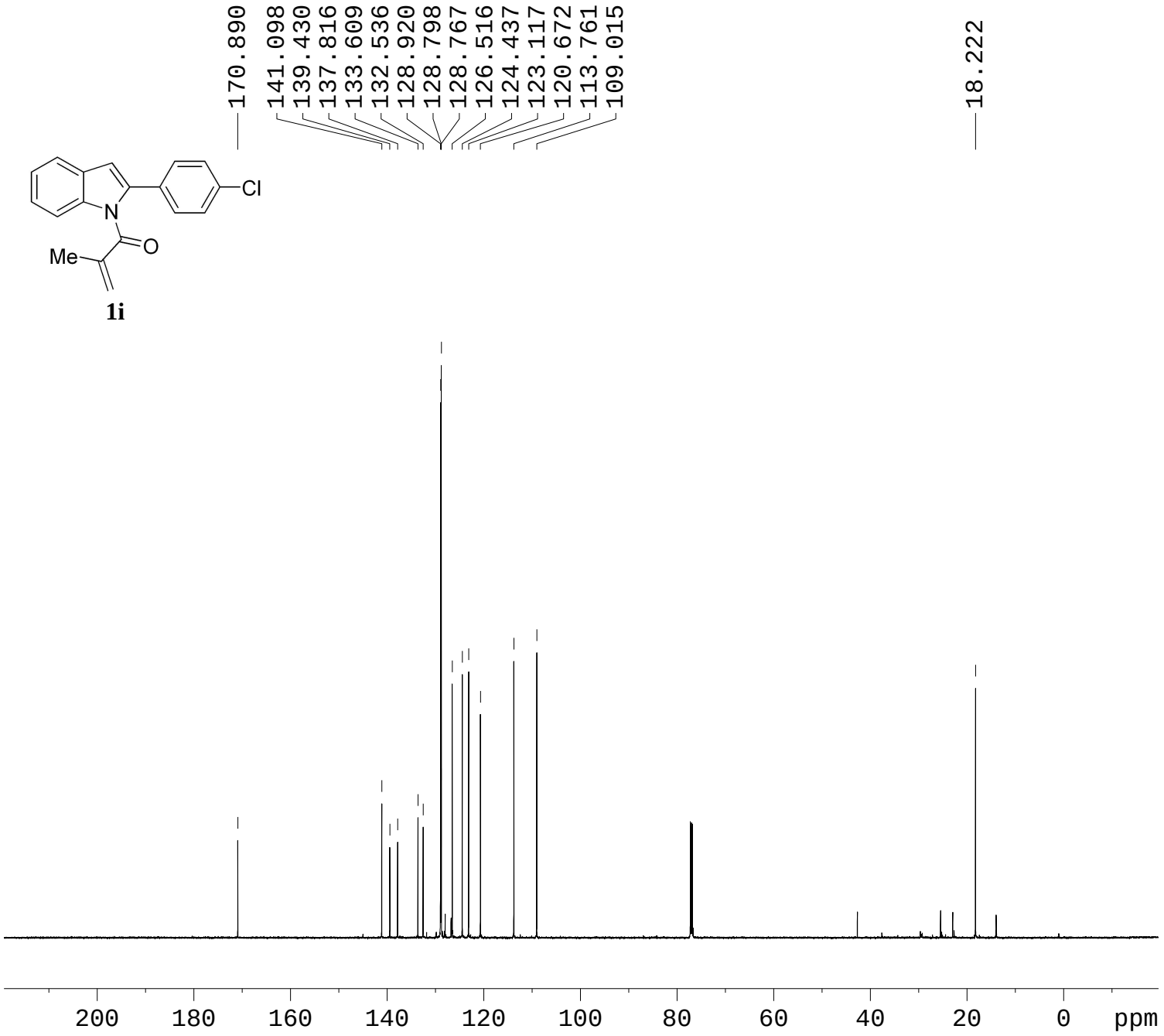


1h

NAME	LYN-202P-3-c
EXPNO	1
PROCNO	1
Date_	20210625
Time	14.43
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.6 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128799 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

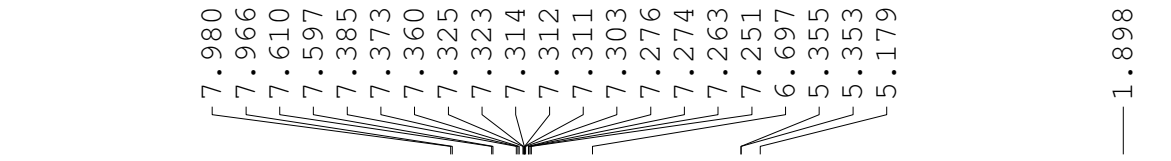


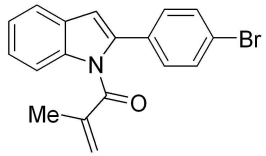
NAME	LYN-246P-3-20210624
EXPNO	1
PROCNO	1
Date_	20210625
Time	0.26
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700478 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



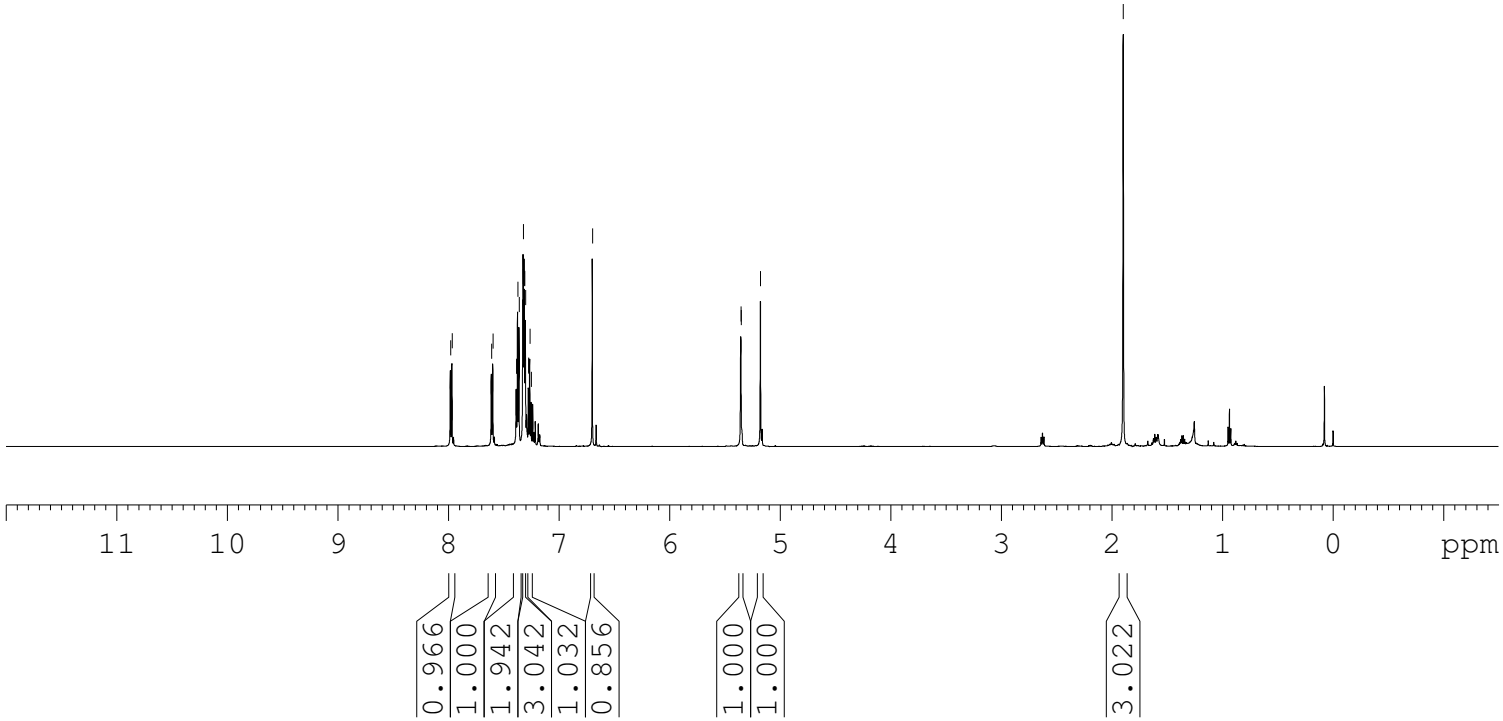
1i

NAME	LYN-246P-3-c
EXPNO	1
PROCNO	1
Date_	20210625
Time	15.05
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	376
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.7 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128913 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

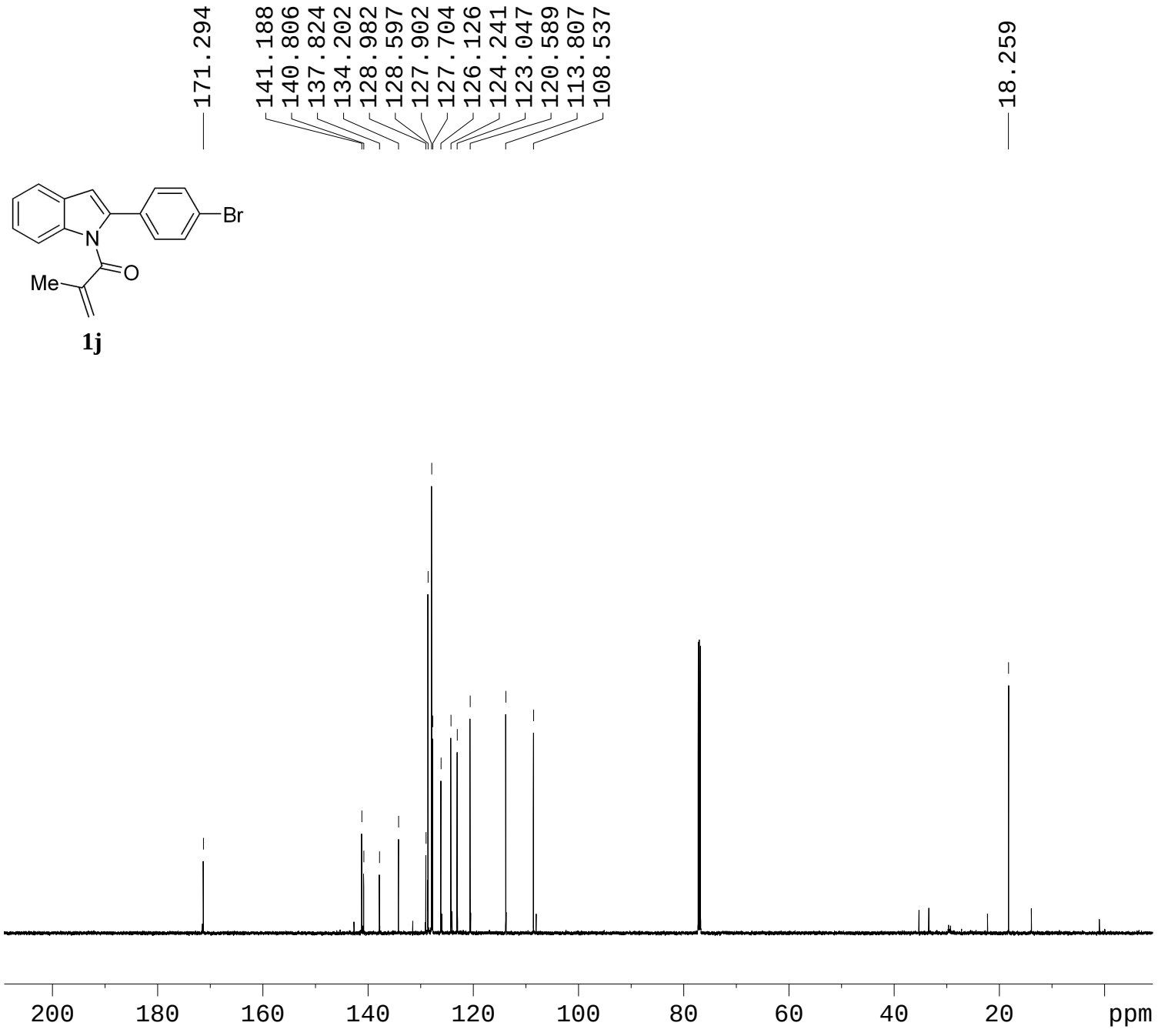




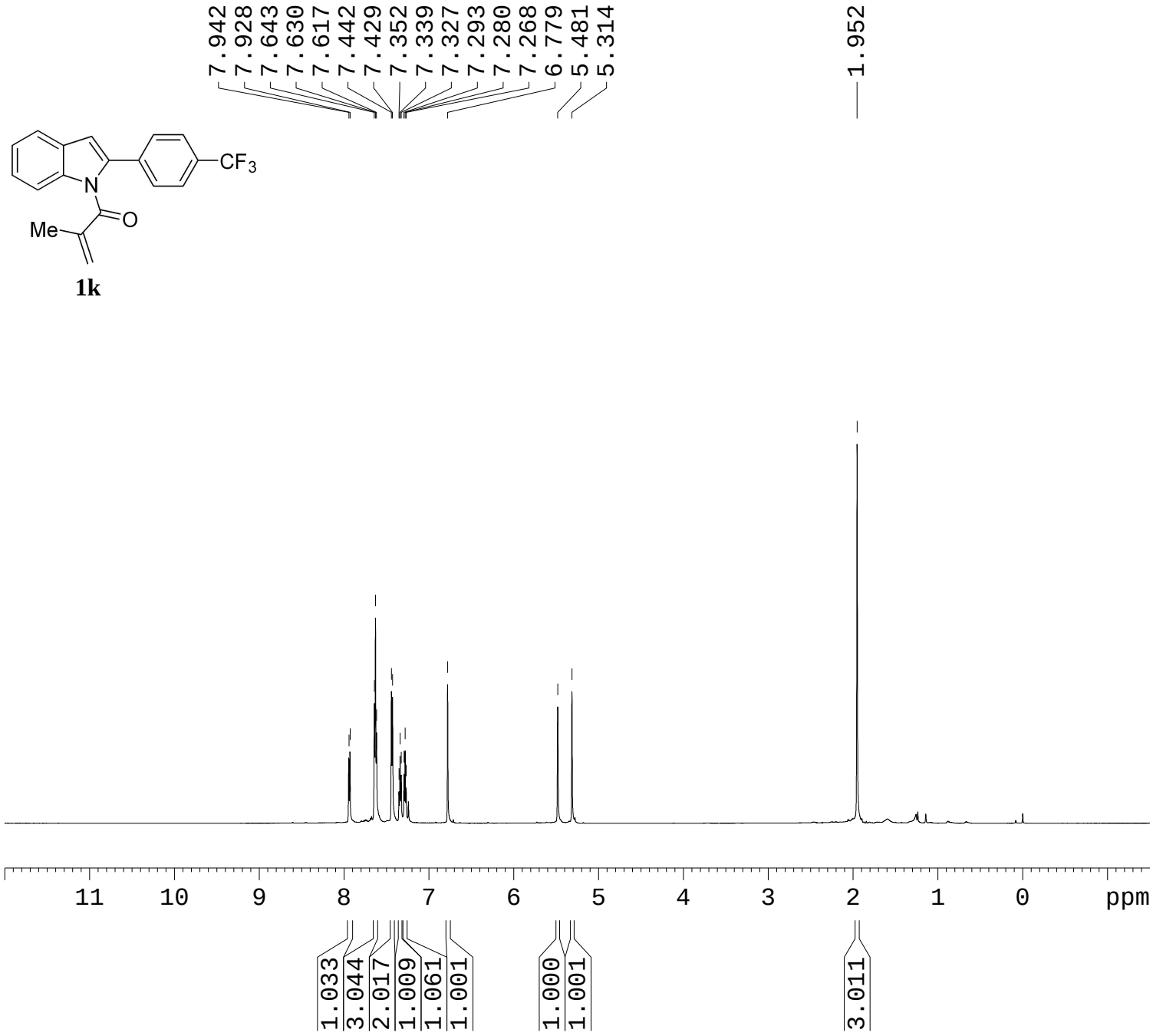
1j



NAME	LYN-253P-3-20210624
EXPNO	1
PROCNO	1
Date_	20210625
Time	0.14
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	50.85
DW	52.000 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700302 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

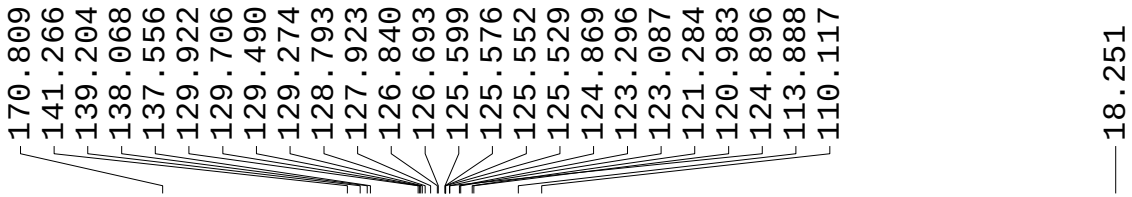


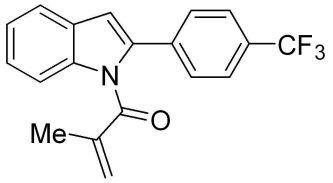
NAME	lyn-253p-3-c-20210625
EXPNO	1
PROCNO	1
Date_	20210625
Time	20.15
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128778 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



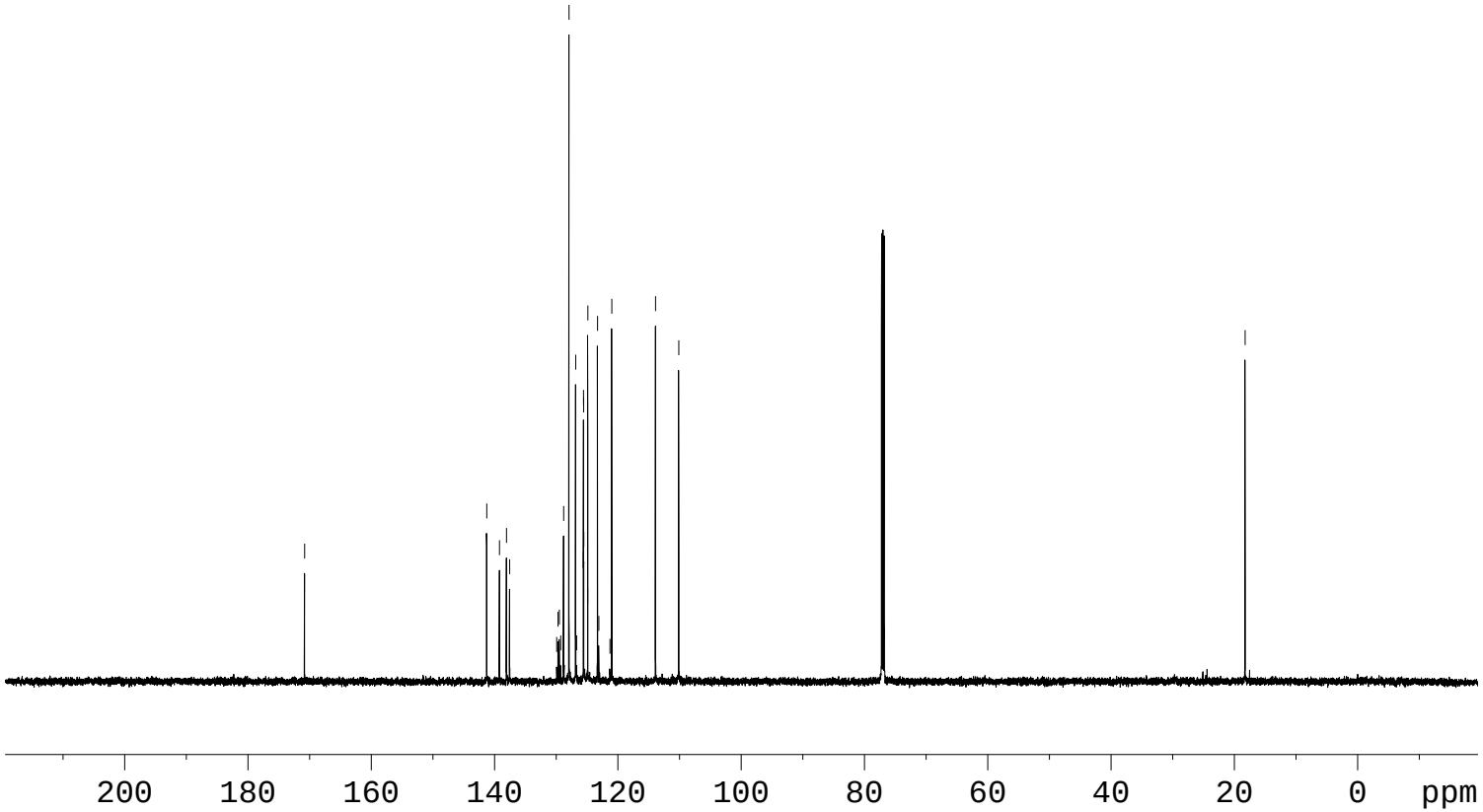
1k

NAME	LYN-247P-20210624
EXPNO	1
PROCNO	1
Date_	20210625
Time	0.37
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	56.75
DW	52.000 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700291 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

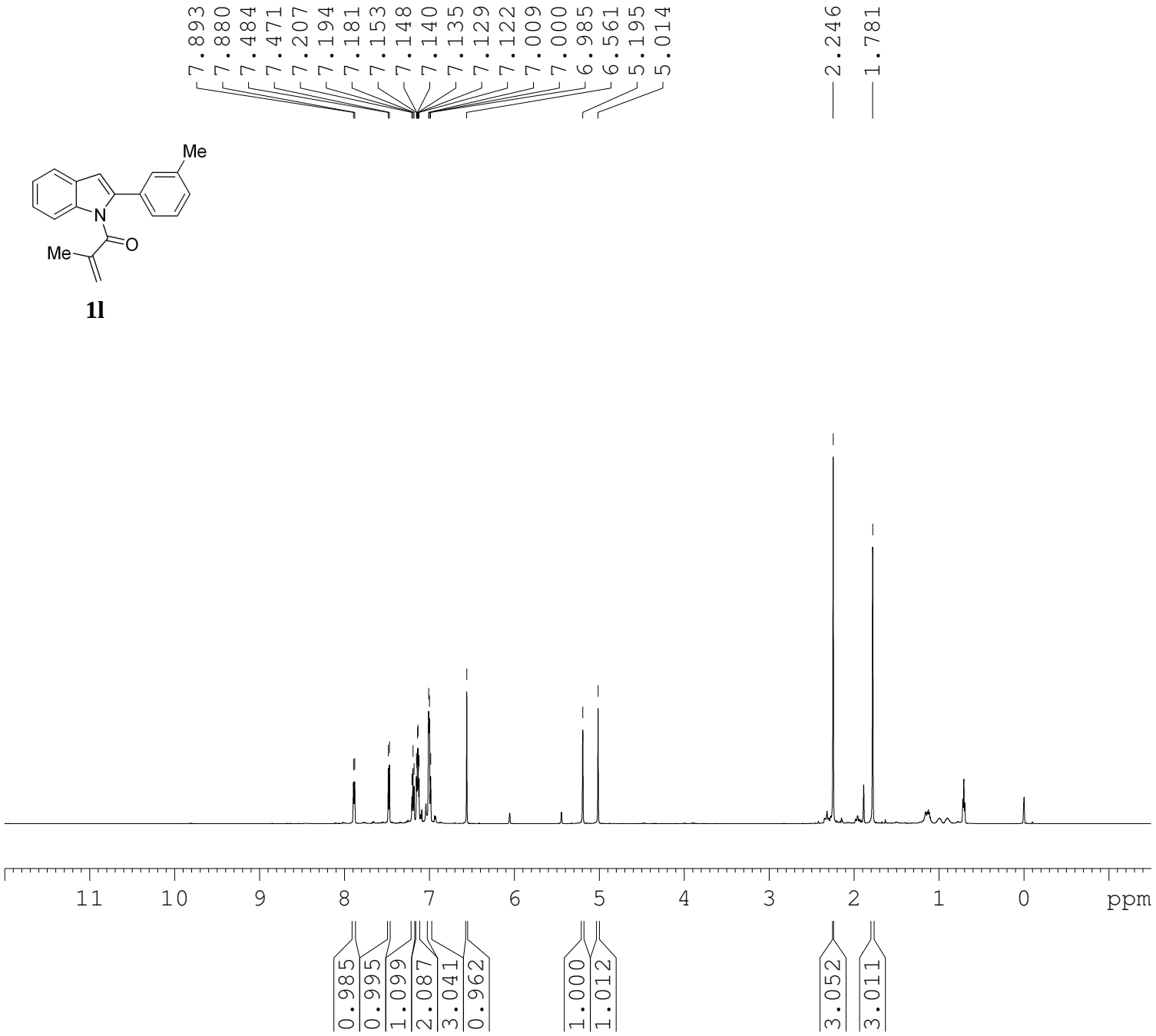




1k

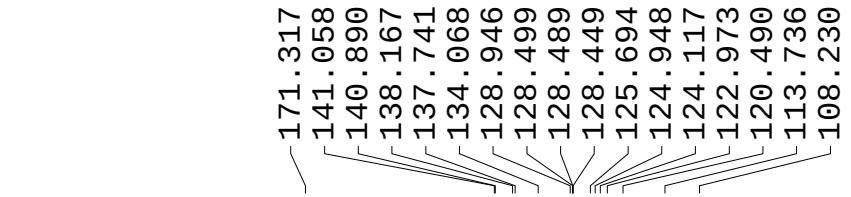


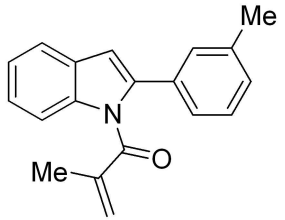
NAME	lyn-247p-c-20210625
EXPNO	1
PROCNO	1
Date_	20210625
Time	19.18
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	298.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128754 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



1l

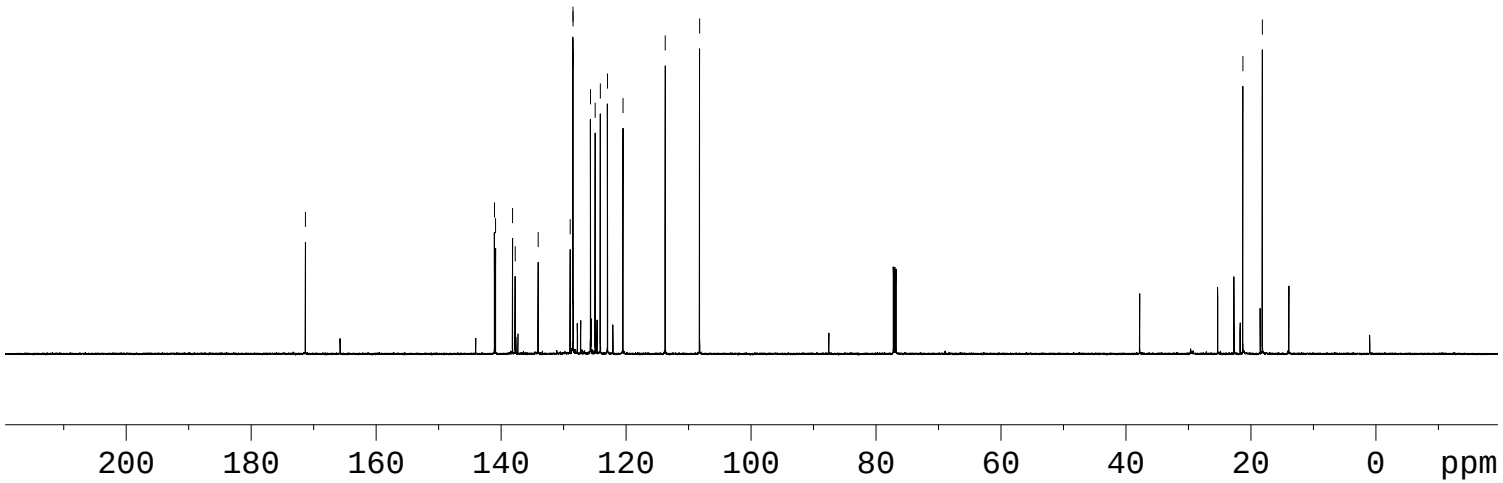
NAME	LYN-260P-3-20210624
EXPNO	1
PROCNO	1
Date_	20210625
Time	0.22
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1701180 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

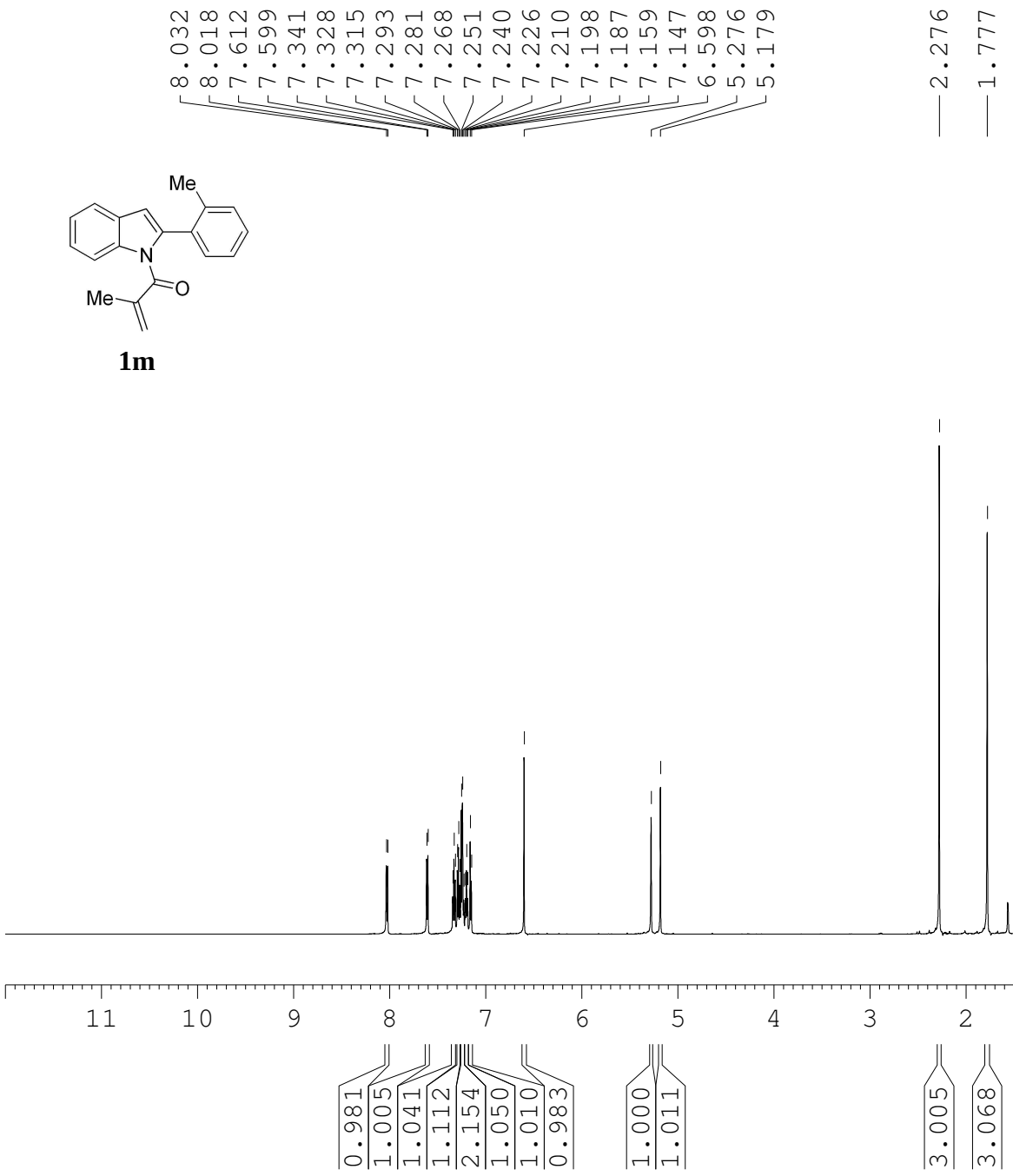




1l

NAME	lyn-260p-3-c
EXPNO	1
PROCNO	1
Date_	20210625
Time	18.56
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128931 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





1m

NAME	lyn-273p-20210426
EXPNO	1
PROCNO	1
Date_	20210426
Time	22.57
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	87.54
DW	52.000 usec
DE	6.50 usec
TE	295.3 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700214 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

171.218
141.220
139.208
137.080
136.283
133.725
130.415
130.333
129.036
128.163
125.655
124.234
124.150
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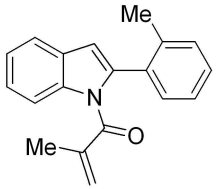
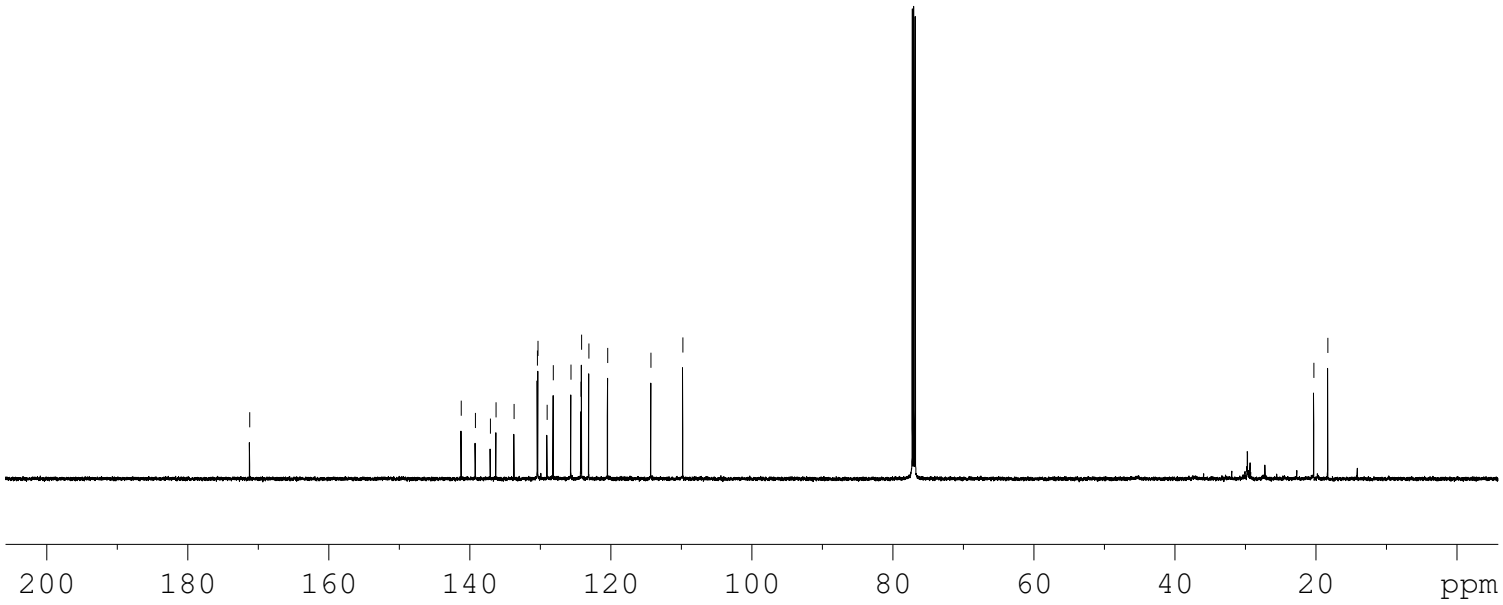
120.448
114.316
109.786

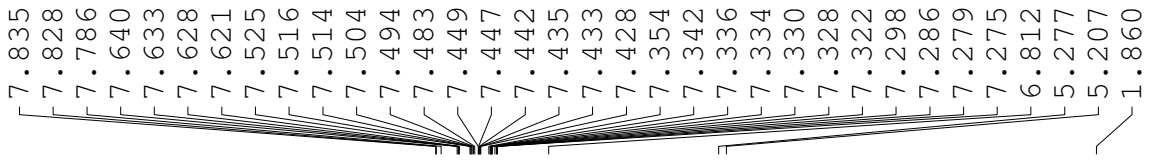
20.296
18.313

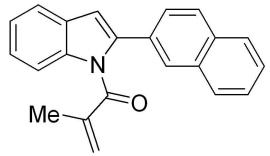


1m



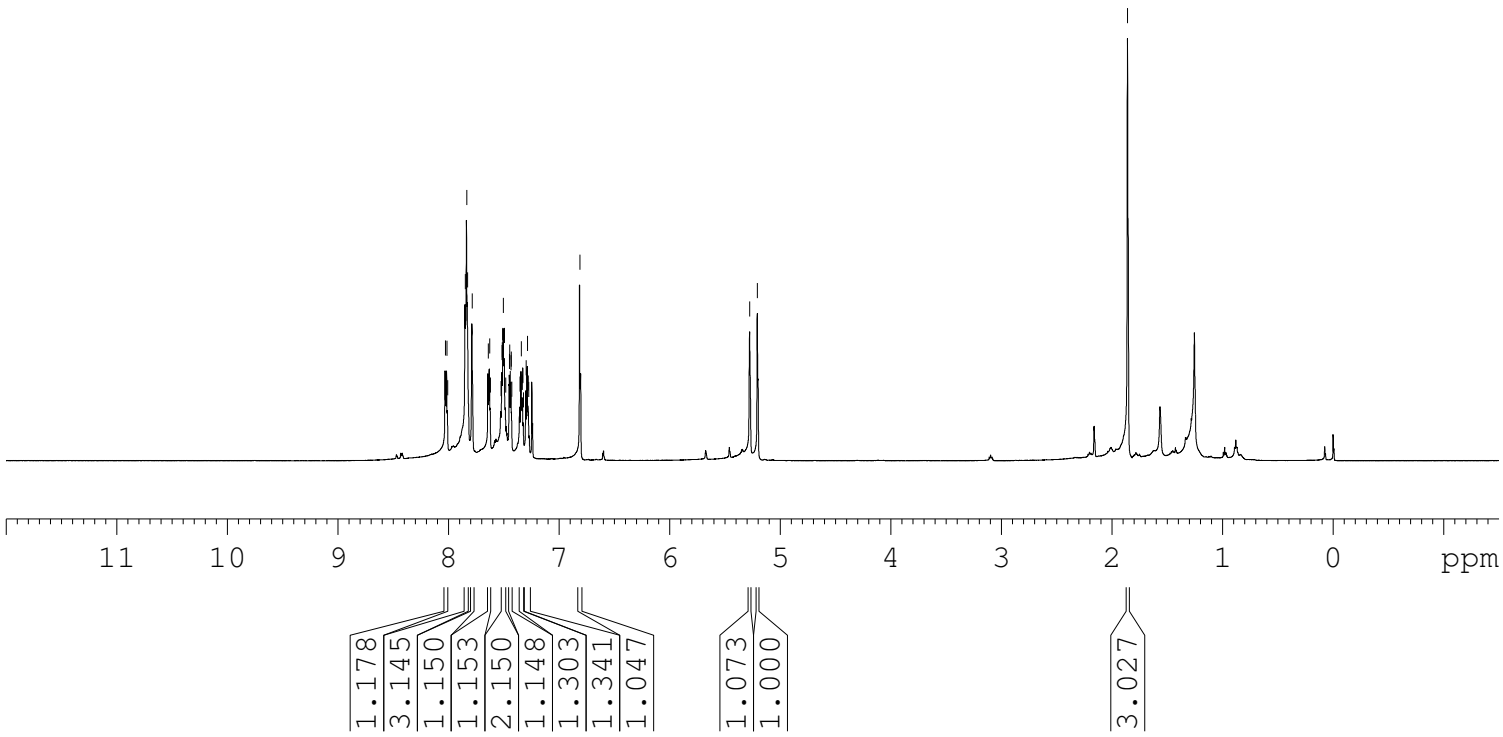
NAME	lyn-273p-3-c-20210625
EXPNO	1
PROCNO	1
Date_	20210625
Time	21.28
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDC13
NS	1024
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128717 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





1n

NAME	lyn-232p-5-20210708
EXPNO	1
PROCNO	1
Date_	20210708
Time	19.39
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	76.92
DW	52.000 usec
DE	6.50 usec
TE	299.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700298 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



171.419
141.248
140.809
138.021
133.246
132.619
131.650
129.055
128.413
127.981
127.807
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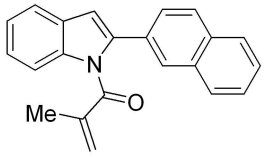
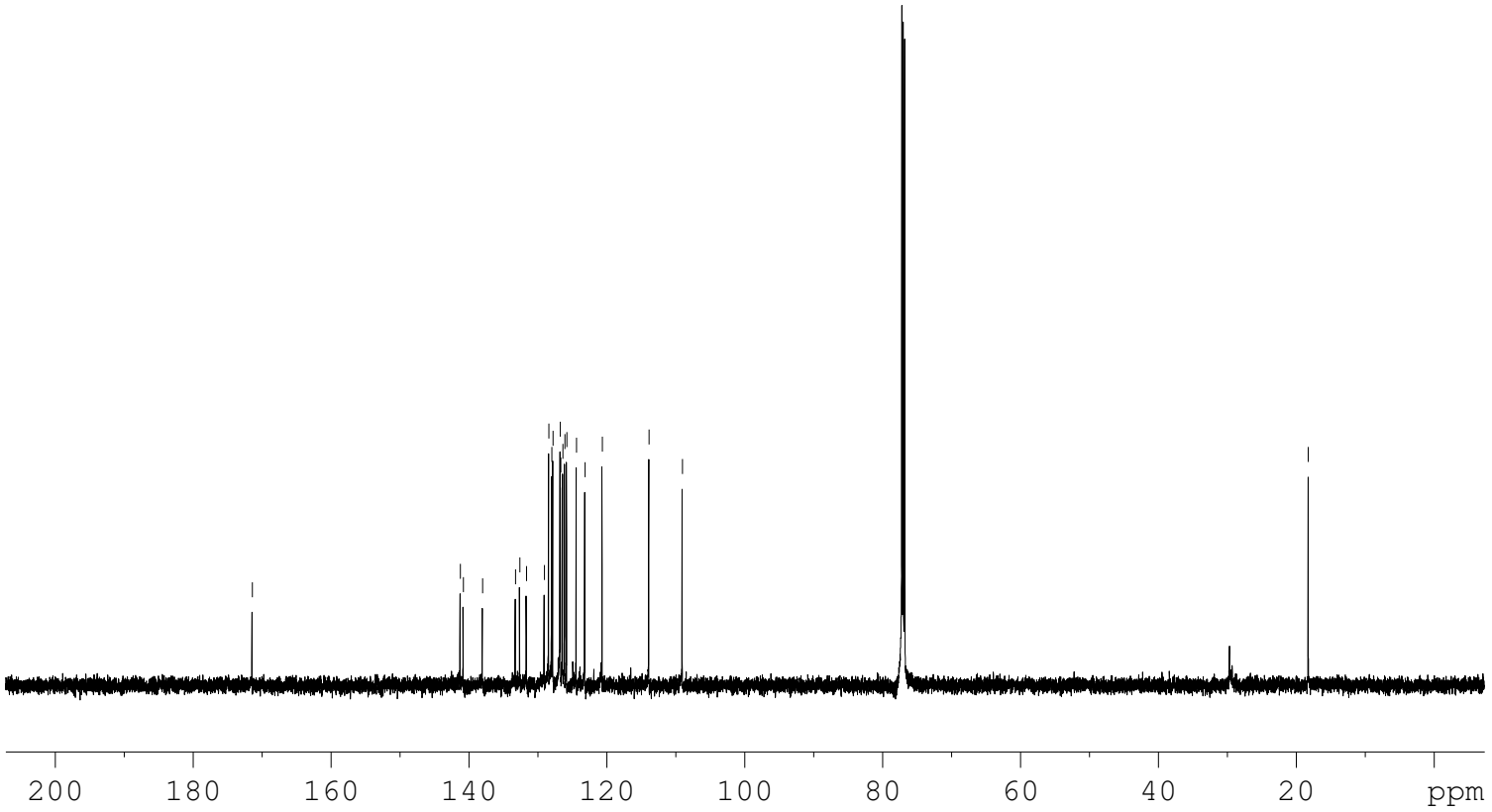
126.682
126.379
126.087
125.802
124.403
123.158
120.655
113.881
109.035

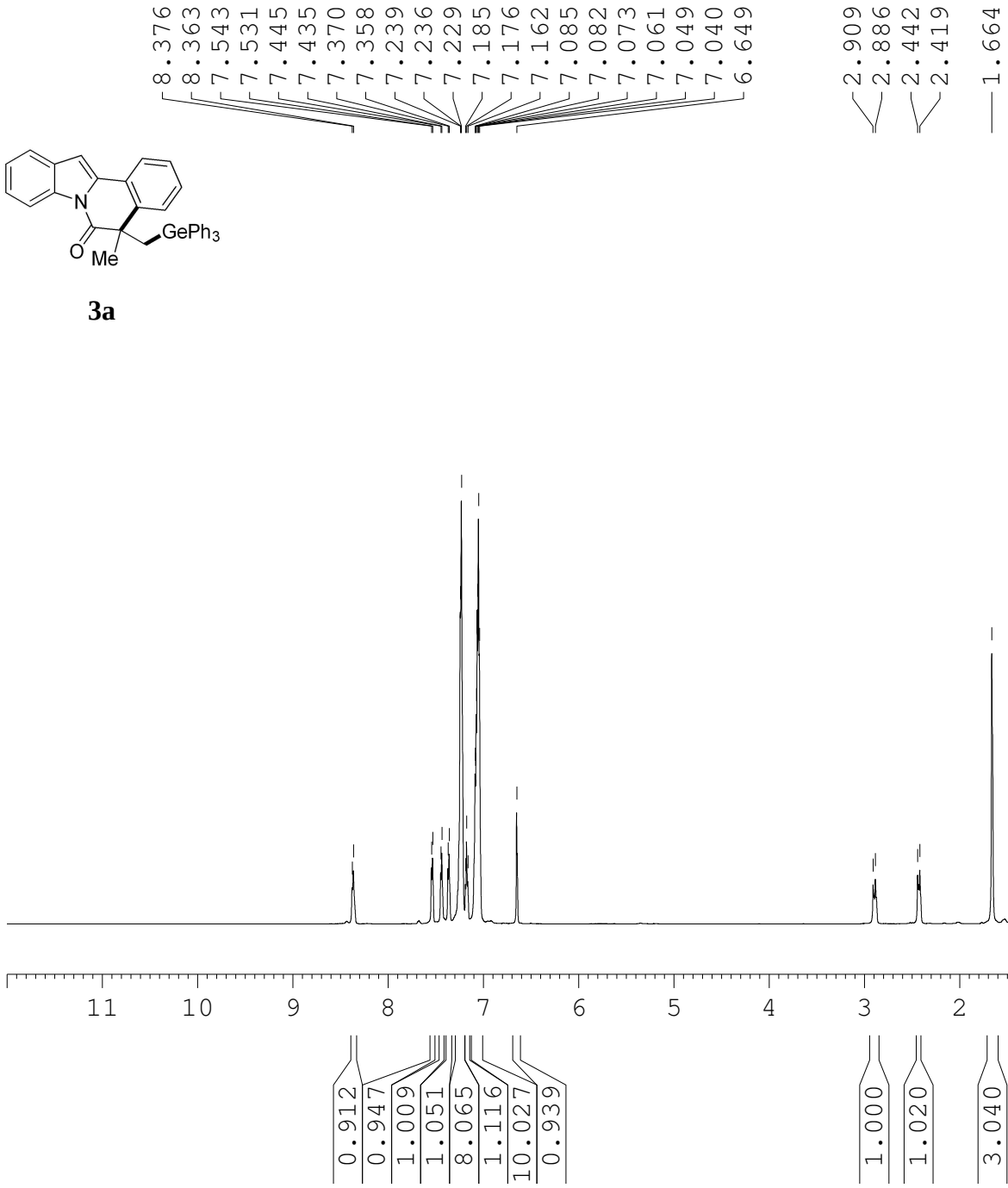
18.278



1n

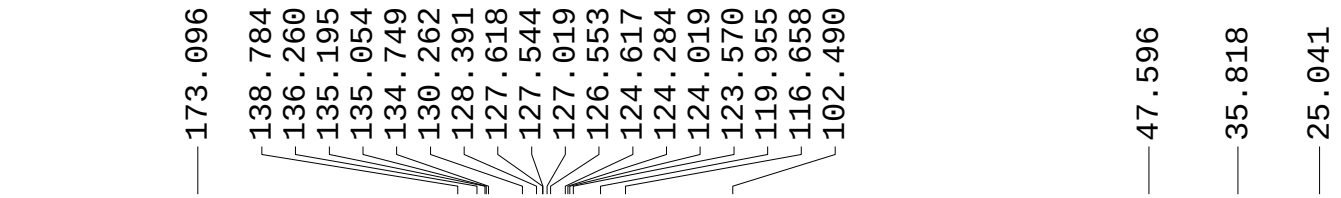


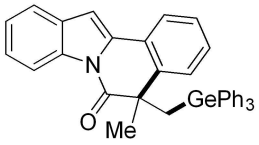
NAME	lyn-232p-5-20210708
EXPNO	2
PROCNO	1
Date_	20210708
Time	19.55
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	300.7 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128733 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



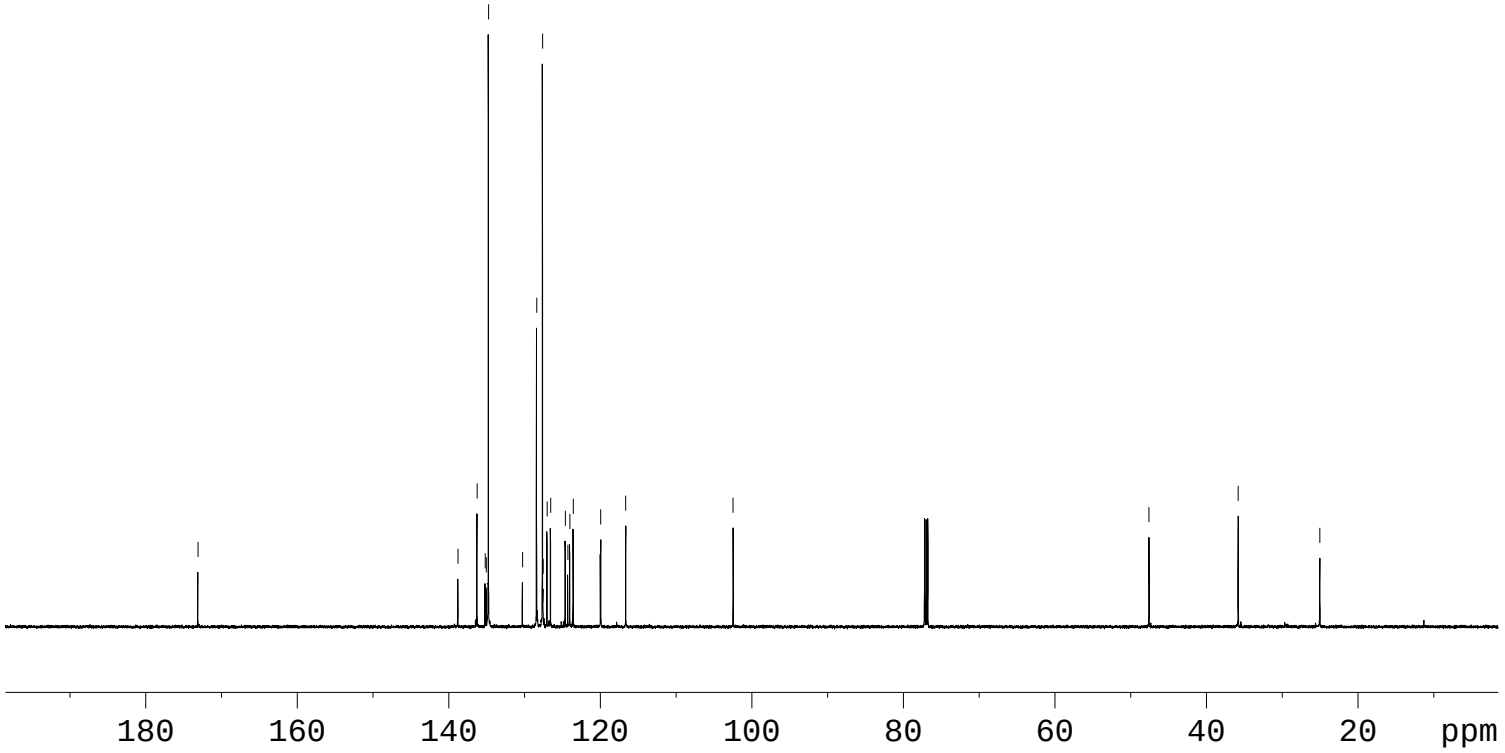
3a

NAME	LYN-283P-20210601
EXPNO	1
PROCNO	1
Date_	20210602
Time	7.00
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	294.9 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700658 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

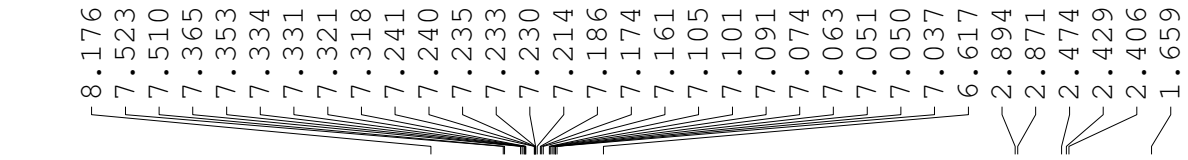


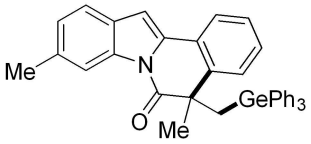


3a



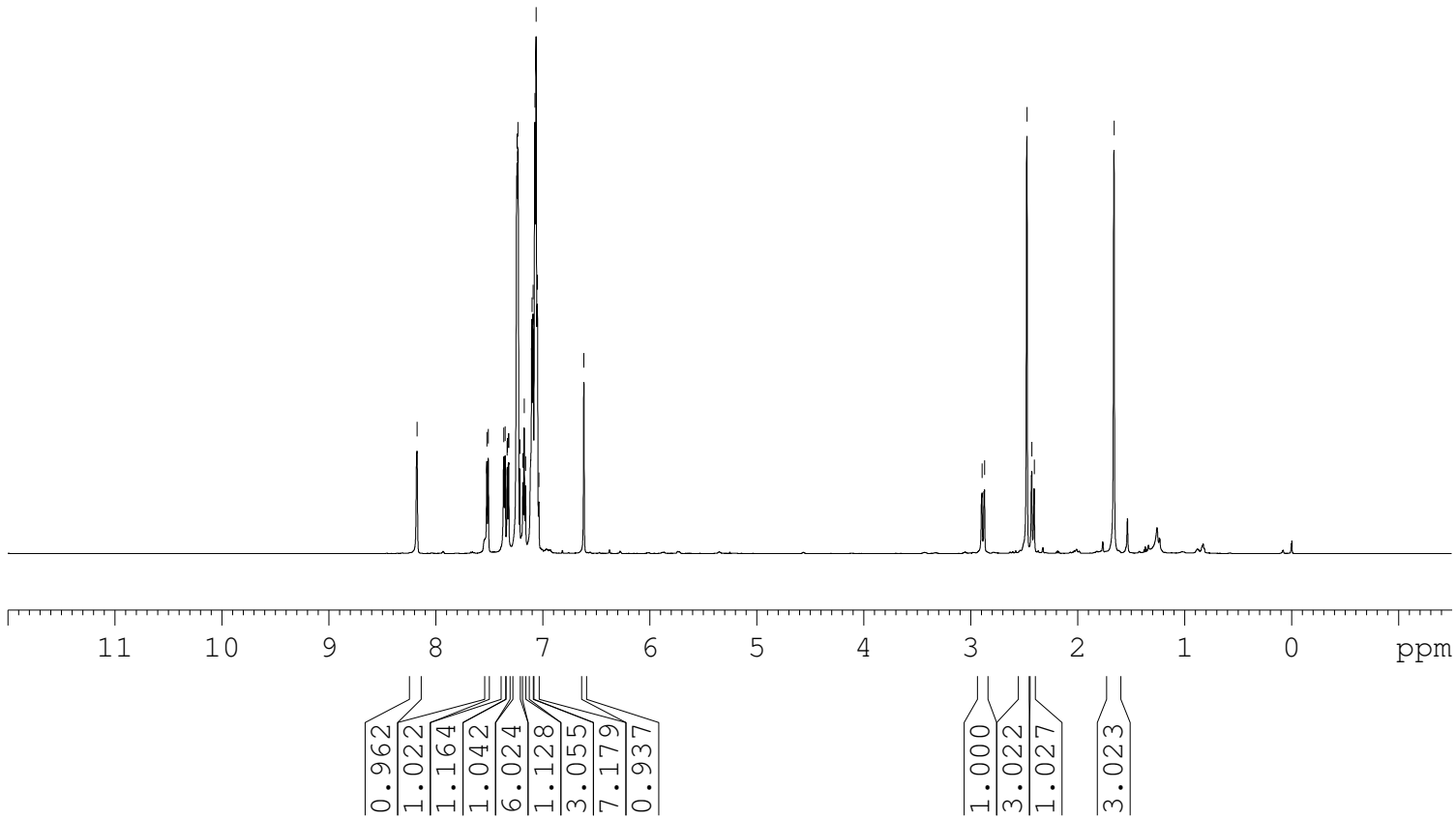
NAME	LYN-283P-20210601
EXPNO	2
PROCNO	1
Date_	20210602
Time	7.11
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128898 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

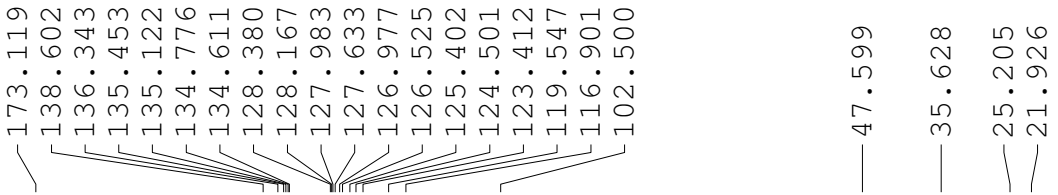


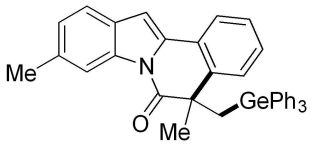


3b

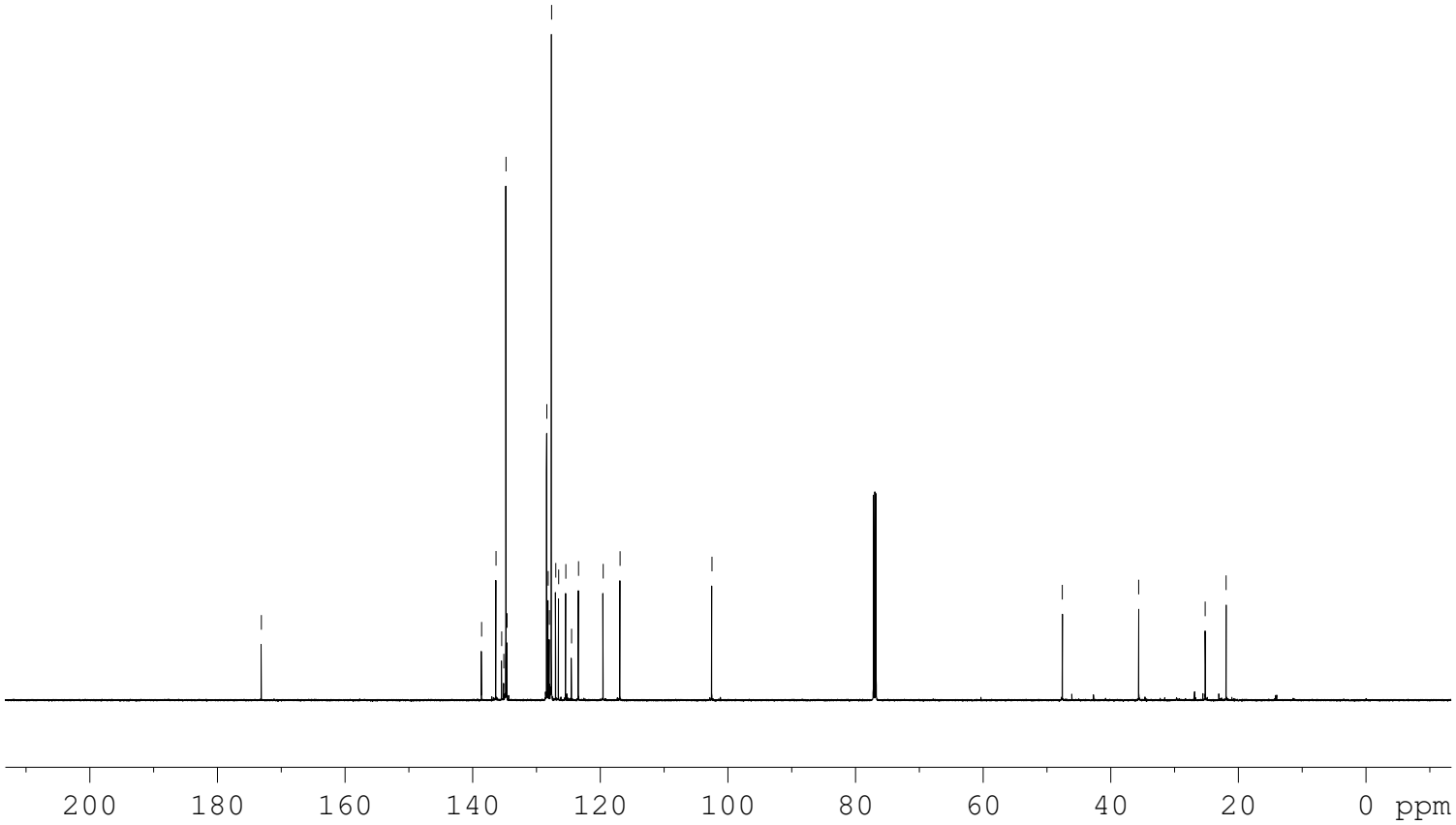
NAME	LYN-295P-NEW
EXPNO	1
PROCNO	1
Date_	20210530
Time	2.27
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	36.09
DW	52.000 usec
DE	6.50 usec
TE	317.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700429 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



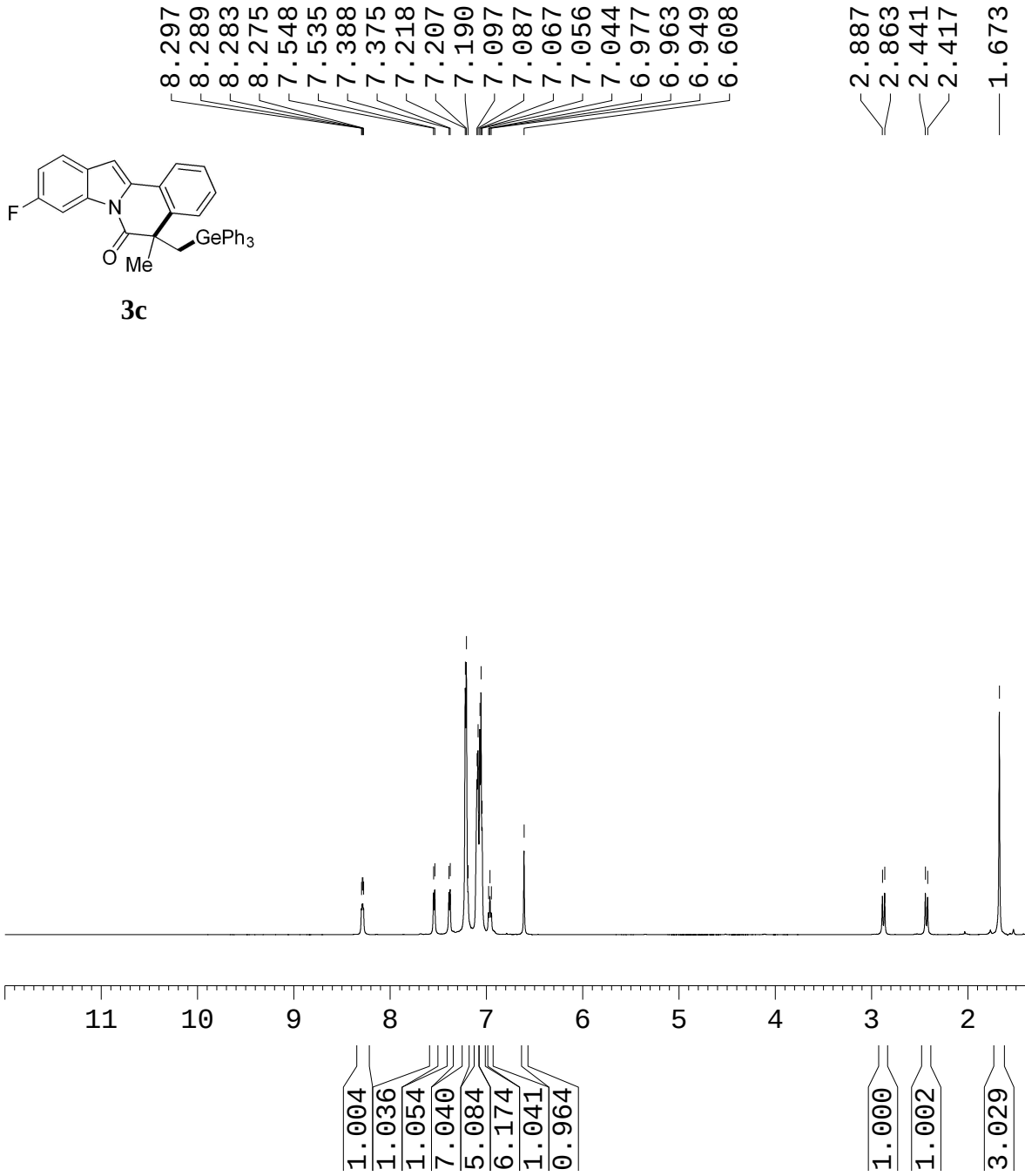




3b



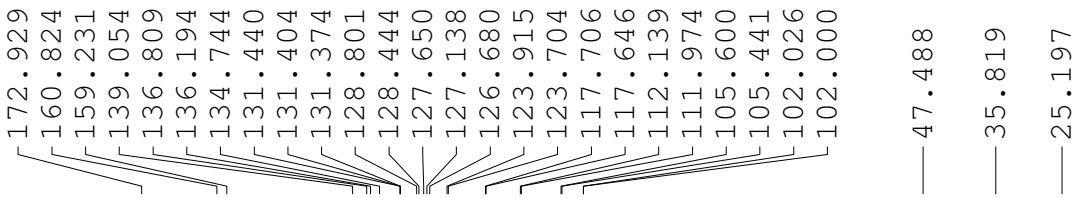
NAME	LYN-295P-20210528
EXPNO	2
PROCNO	1
Date_	20210529
Time	10.16
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	600
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	319.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128820 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

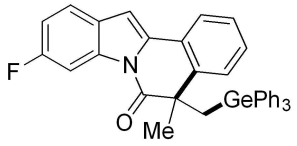


3c

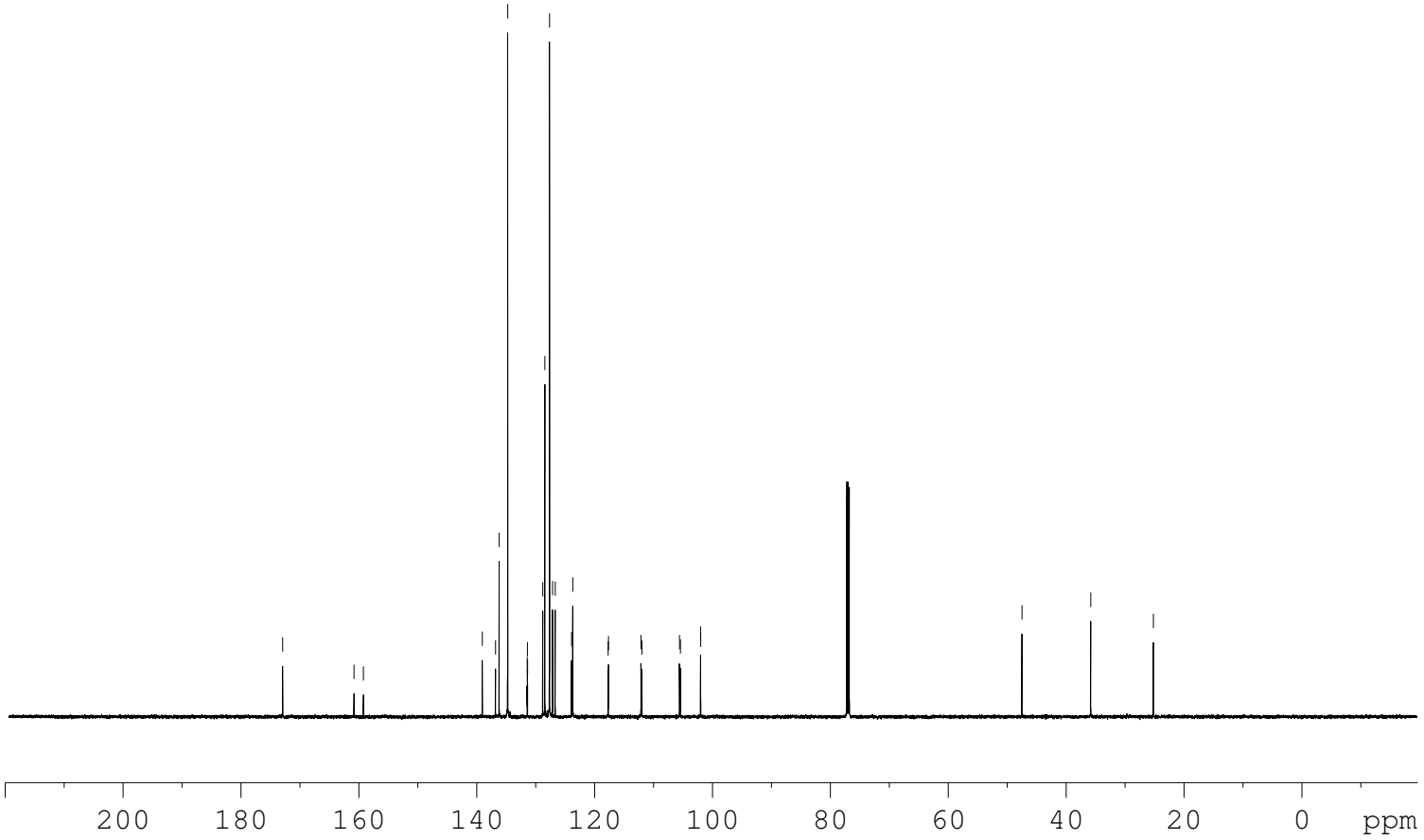
NAME	lyn-278p-20210507
EXPNO	1
PROCNO	1
Date_	20210507
Time	10.10
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	297.5 K
D1	1.00000000 sec
TD0	1

======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700430 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

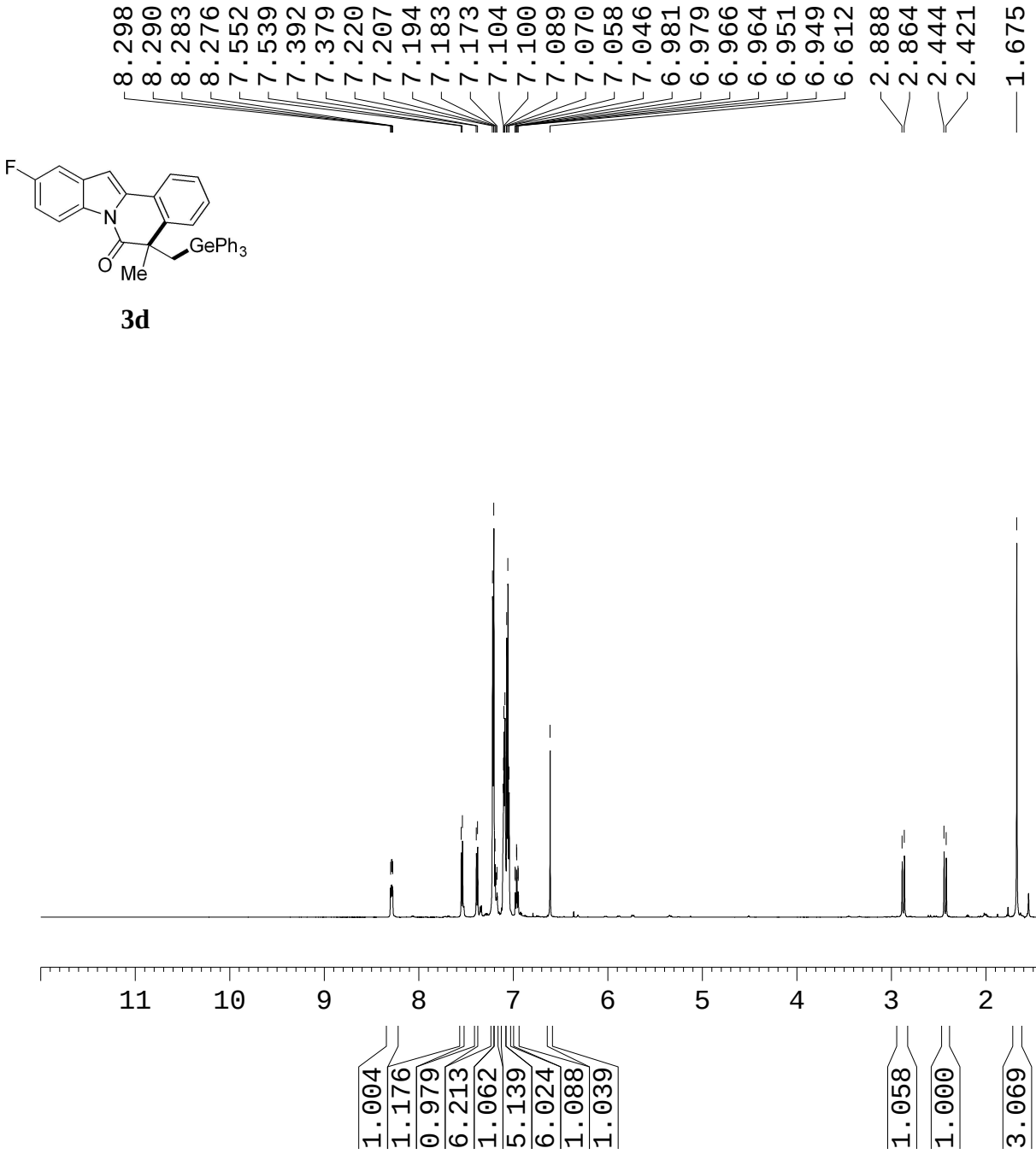




3c



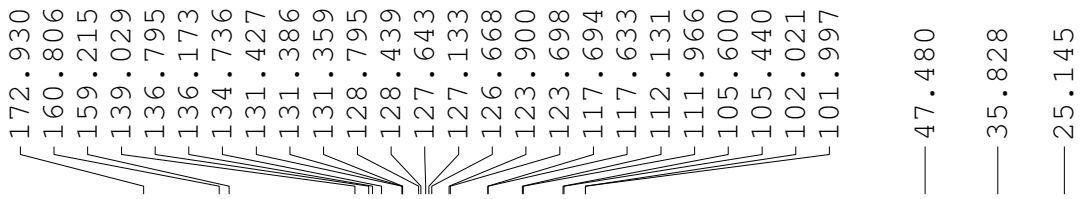
NAME	lyn-278p-20210507
EXPNO	2
PROCNO	1
Date_	20210507
Time	10.21
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	298.7 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128797 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

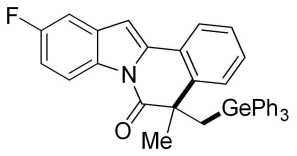


3d

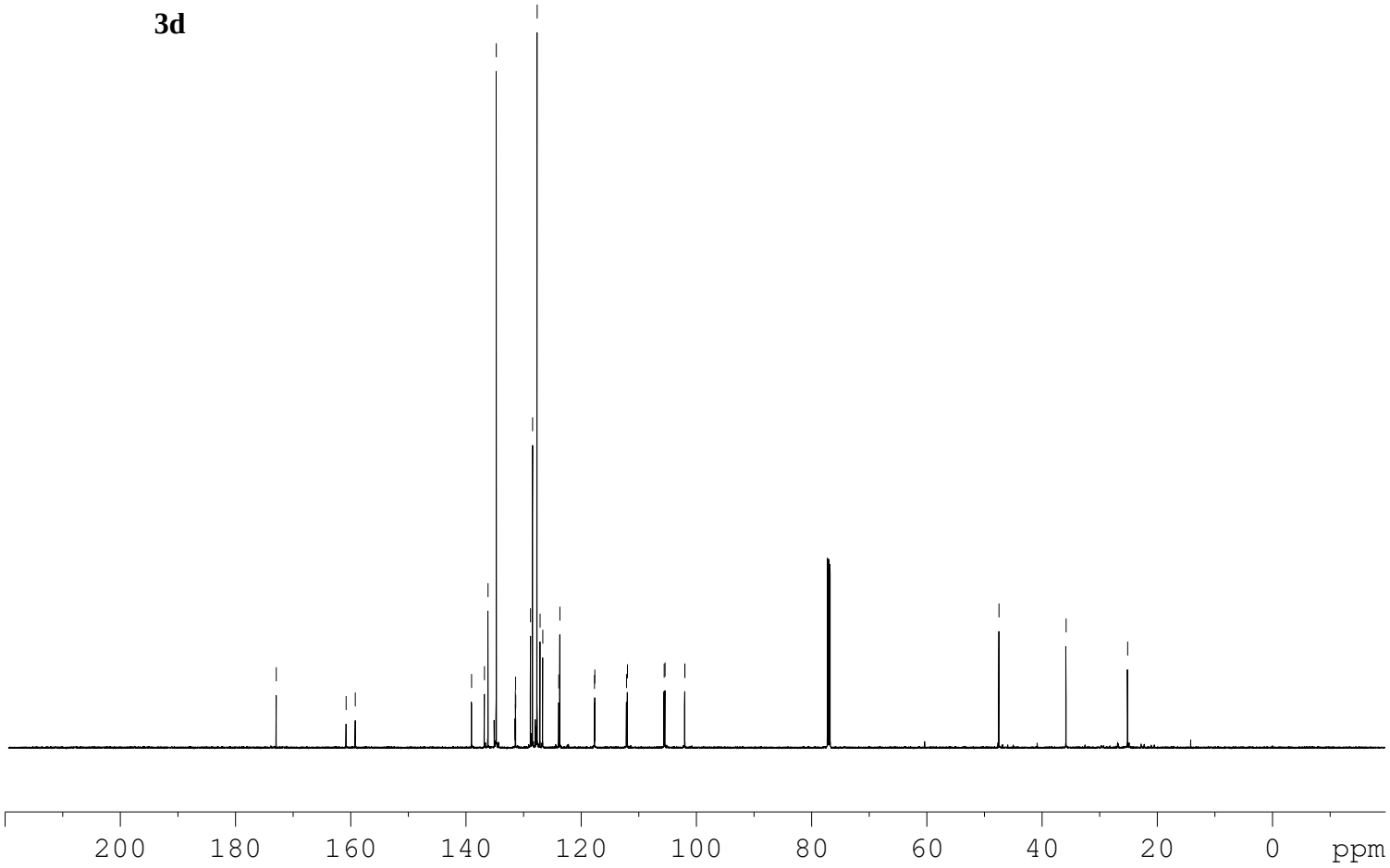
```
NAME        LYN-294P-NEW
EXPNO                  1
PROCNO                 1
Date_           20210530
Time                1.23
INSTRUM            spect
PROBHD   5 mm PABBO BB/
PULPROG             zg30
TD                 65536
SOLVENT            CDCl3
NS                     8
DS                     0
SWH             9615.385 Hz
FIDRES          0.146719 Hz
AQ              3.4079220 sec
RG                  38.1
DW                52.000 usec
DE                 6.50 usec
TE                318.0 K
D1           1.00000000 sec
TD0                    1

======== CHANNEL f1 ========
SFO1         600.1739011 MHz
NUC1                   1H
P1                  9.96 usec
SI                 65536
SF           600.1700378 MHz
WDW                   EM
SSB                    0
LB                  0.30 Hz
GB                     0
PC                  1.00
```

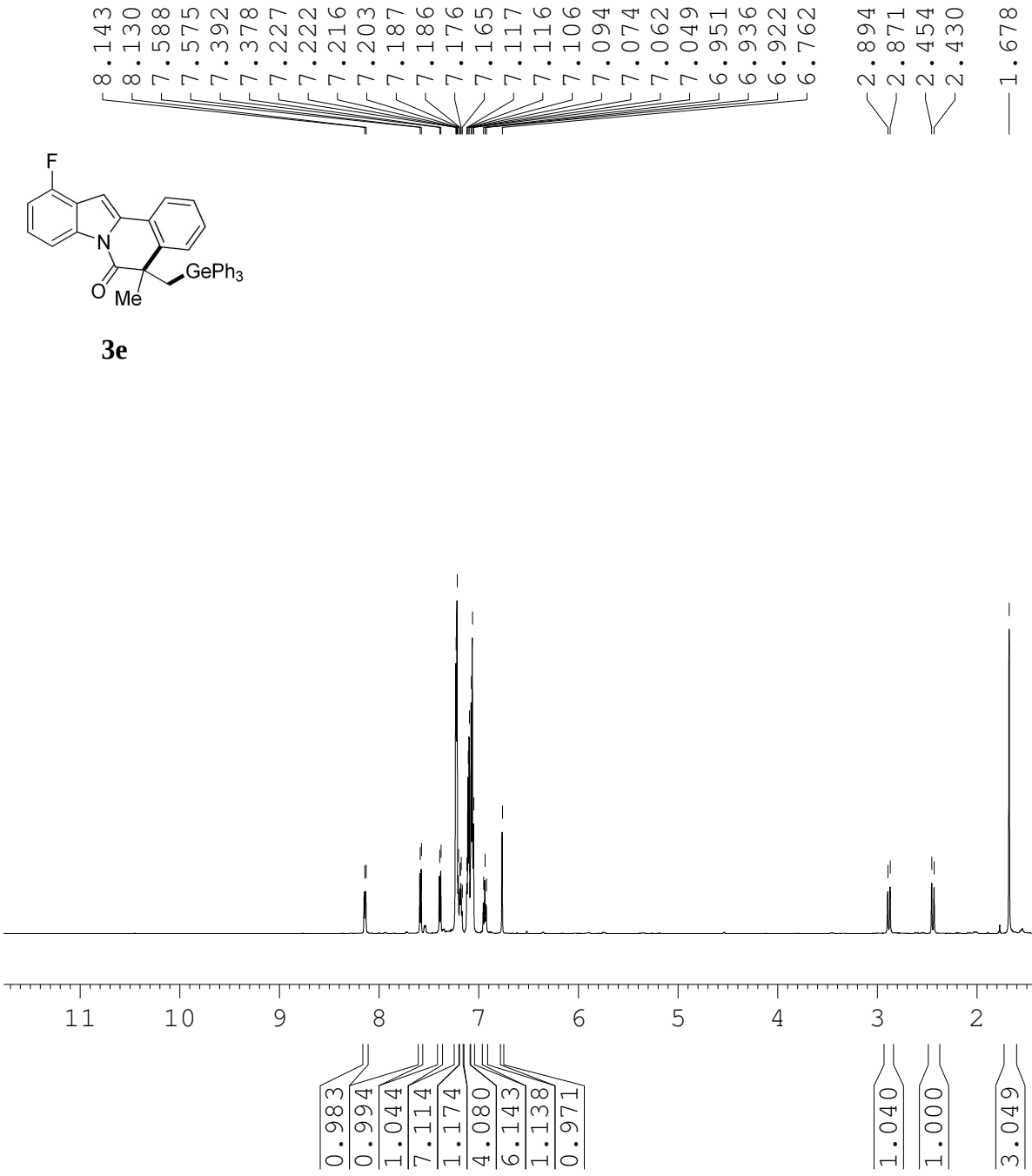




3d

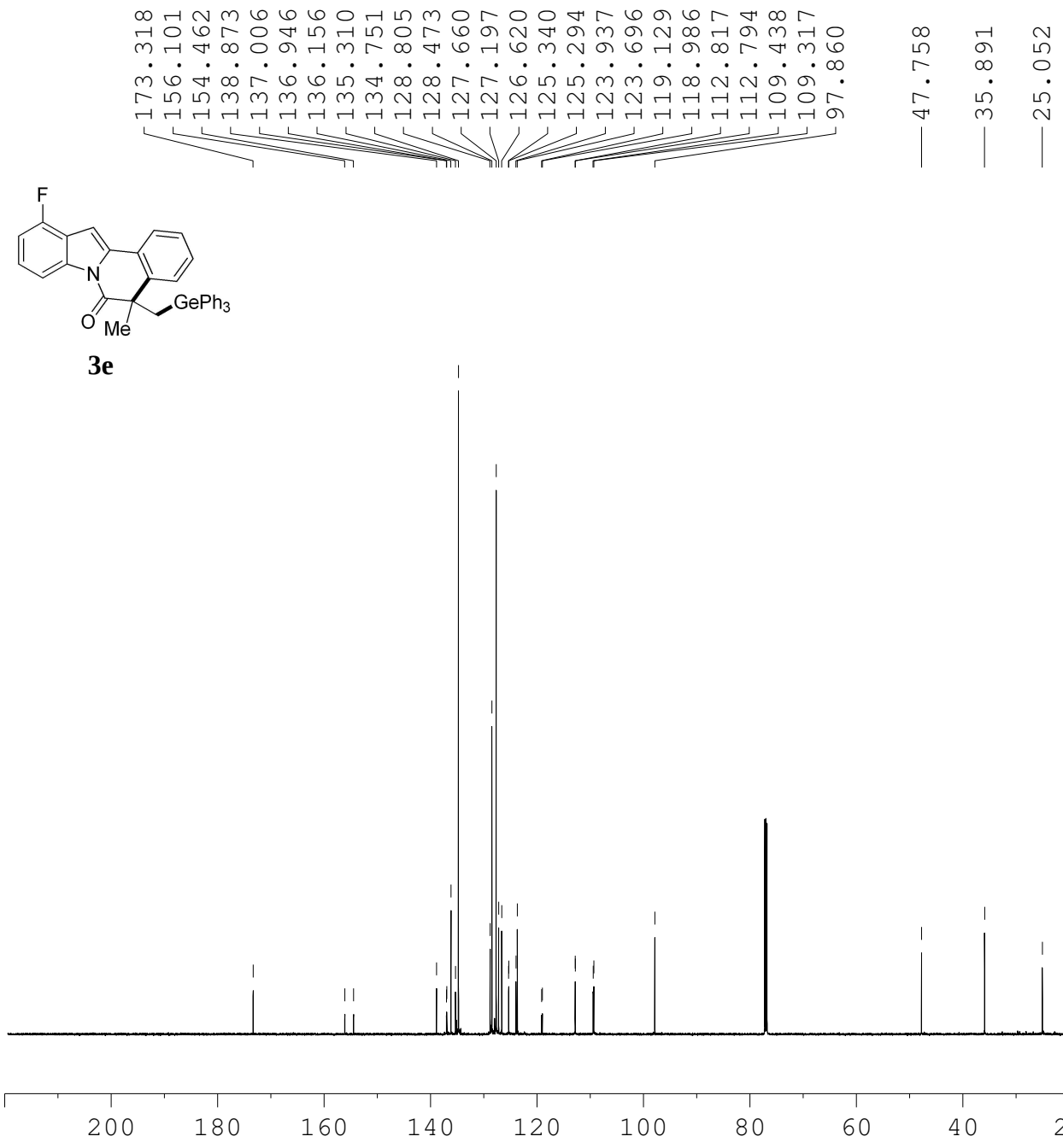


NAME	LYN-294P-20210528
EXPNO	2
PROCNO	1
Date_	20210529
Time	11.47
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	319.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128817 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



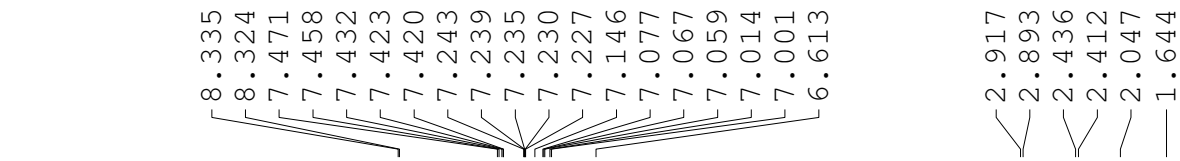
3e

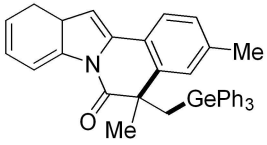
NAME	LYN-313P-NEW
EXPNO	1
PROCNO	1
Date_	20210530
Time	1.27
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	318.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700383 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



3e

NAME	LYN-313P-NEW
EXPNO	2
PROCNO	1
Date_	20210530
Time	1.53
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	319.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128798 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





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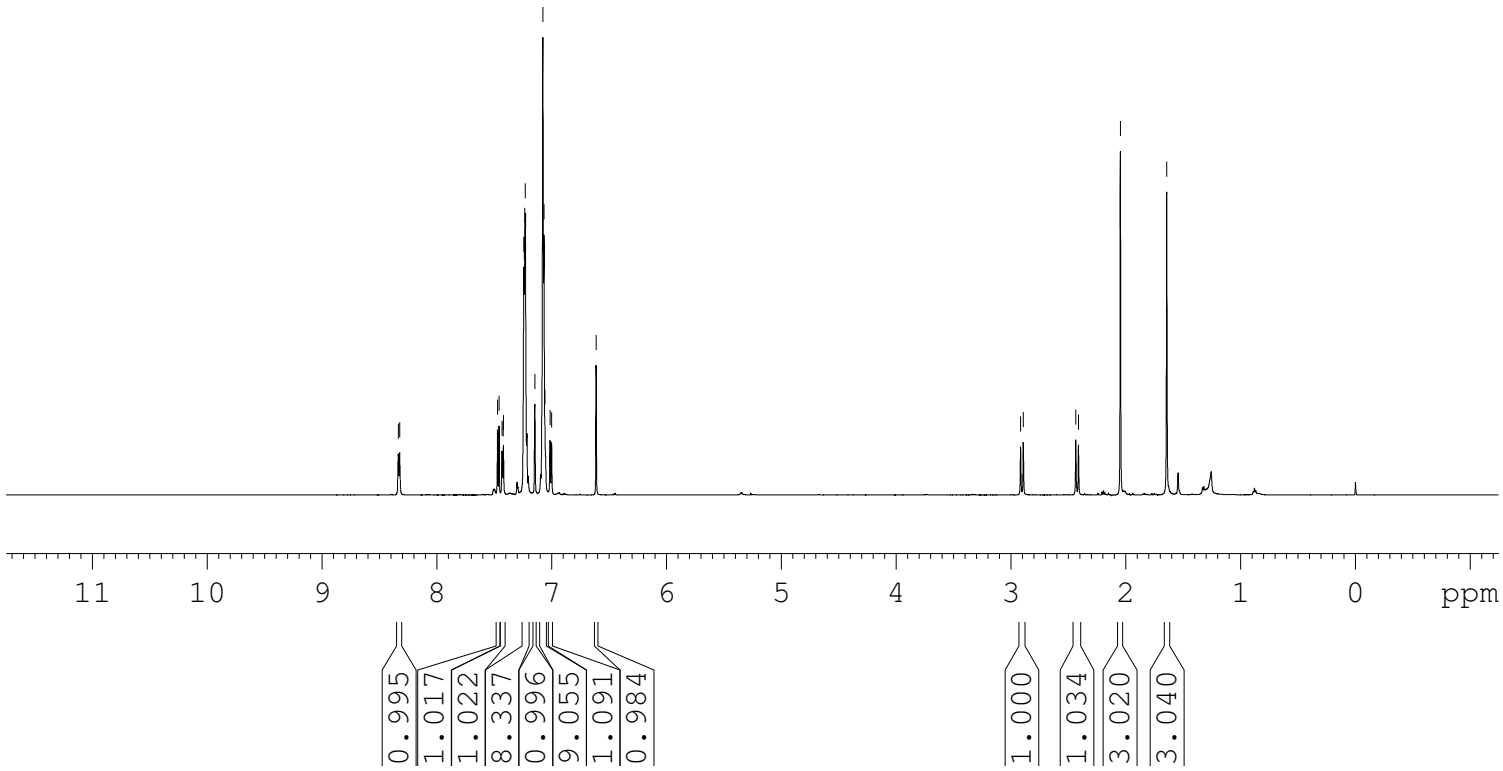
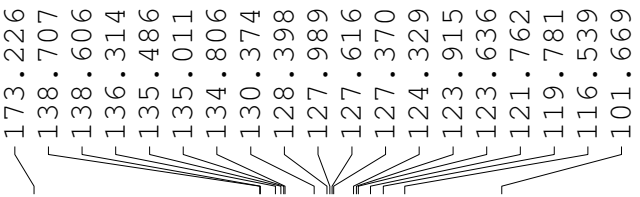
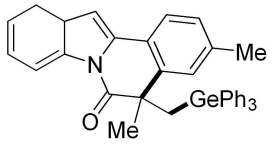


NAME	lyn-236p-1
EXPNO	1
PROCNO	1
Date_	20210612
Time	1.22
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	296.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700355 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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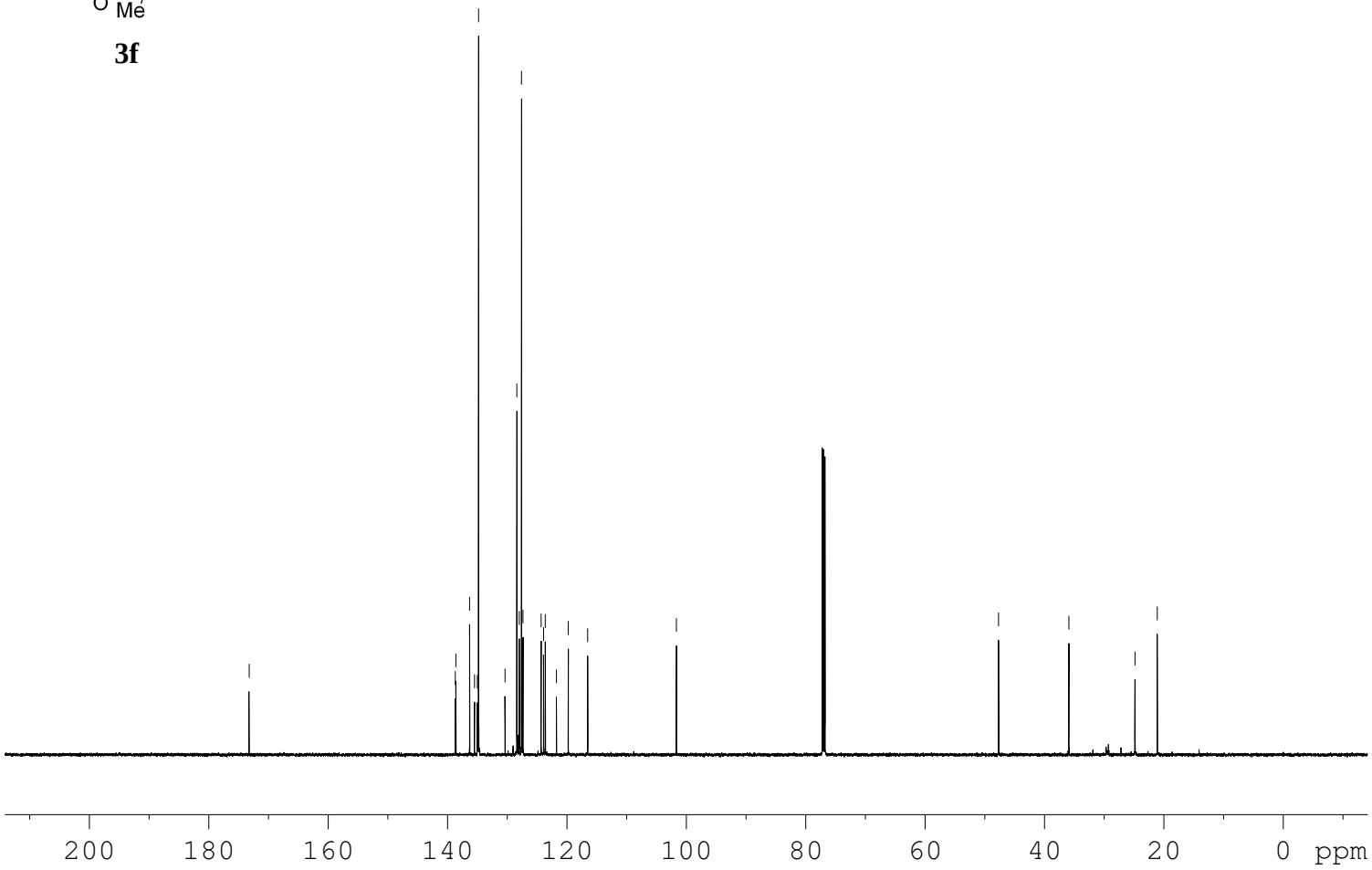
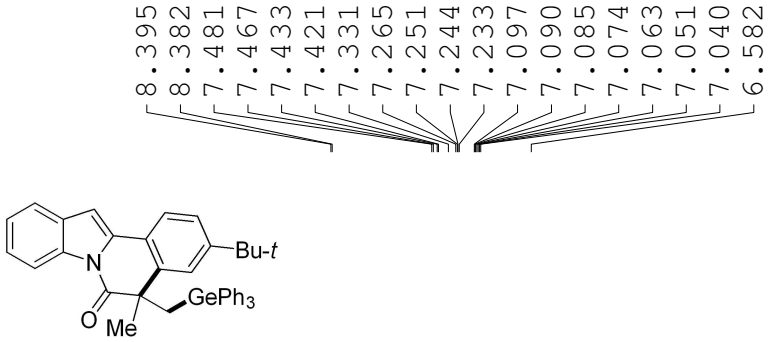
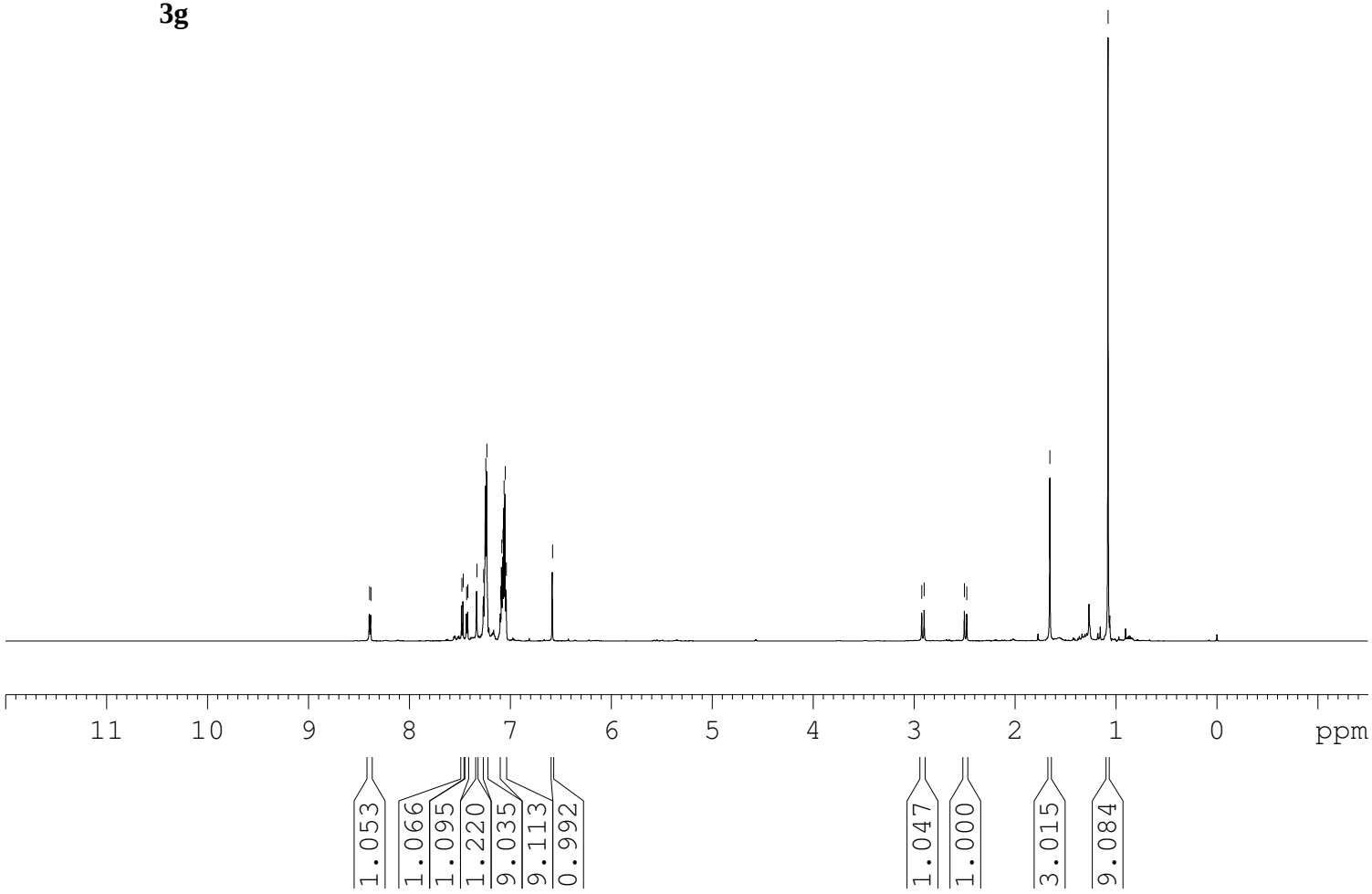


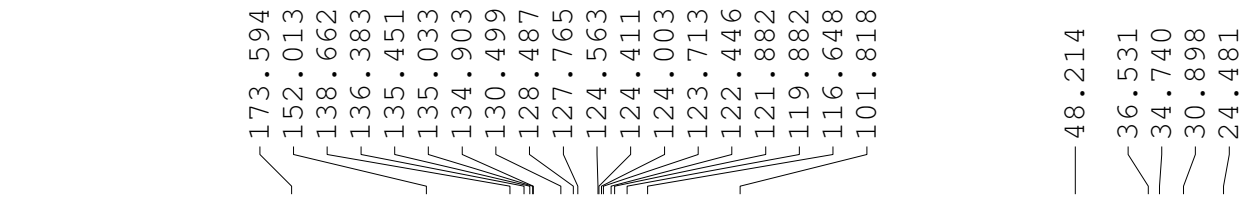
NAME	lyn-236p-1
EXPNO	2
PROCNO	1
Date_	20210612
Time	1.48
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 use
DE	6.50 use
TE	297.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 use
SI	32768
SF	150.9128778 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

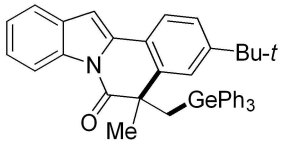


3g

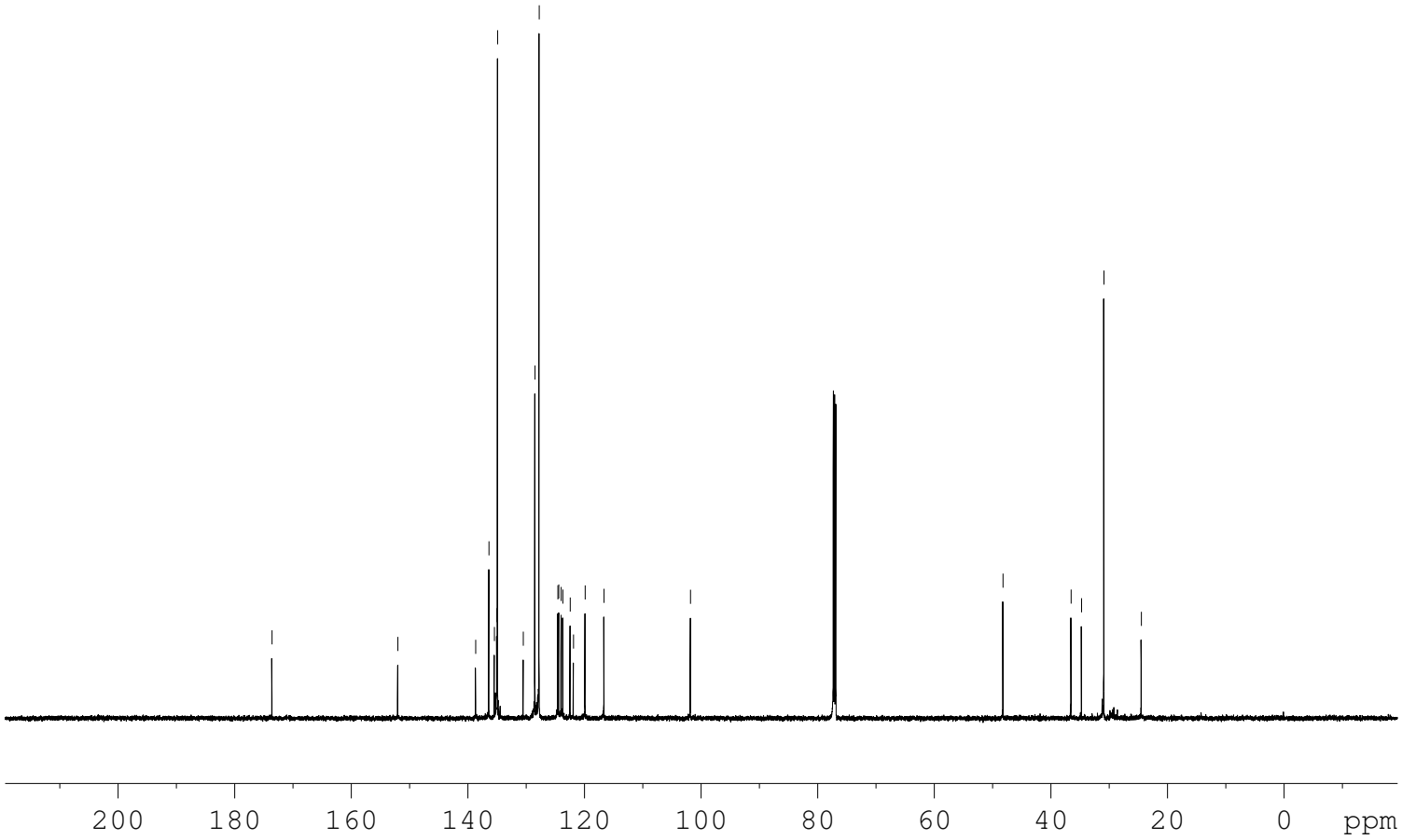


NAME	lyn-343p-20210615
EXPNO	1
PROCNO	1
Date_	20210615
Time	10.54
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	299.7 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700364 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

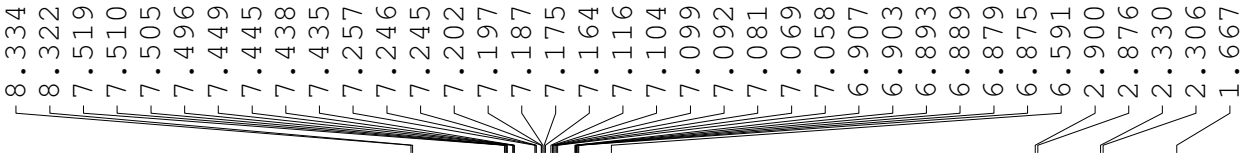


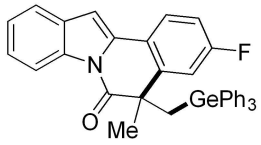


3g

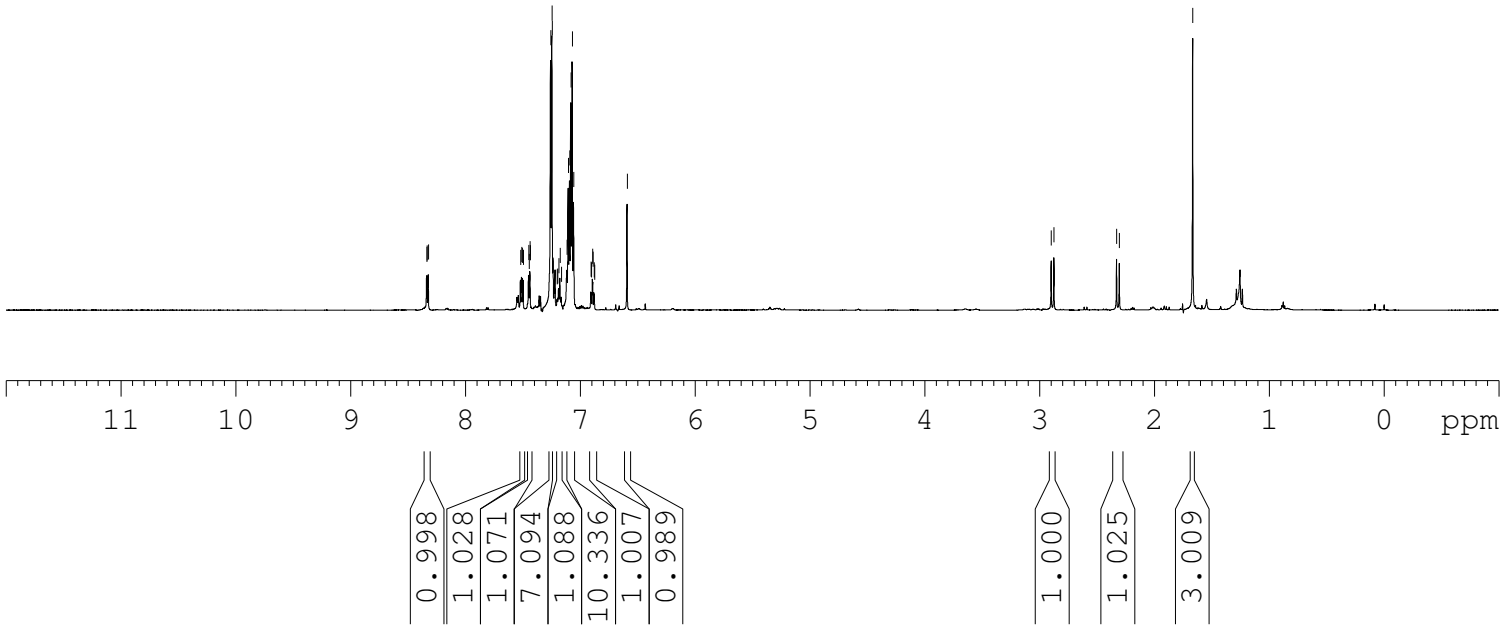


NAME	lyn-343p-20210626
EXPNO	2
PROCNO	1
Date_	20210626
Time	11.16
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128665 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

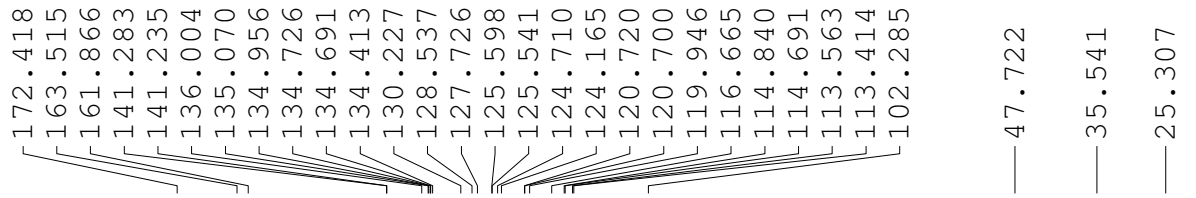


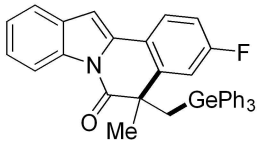


3h

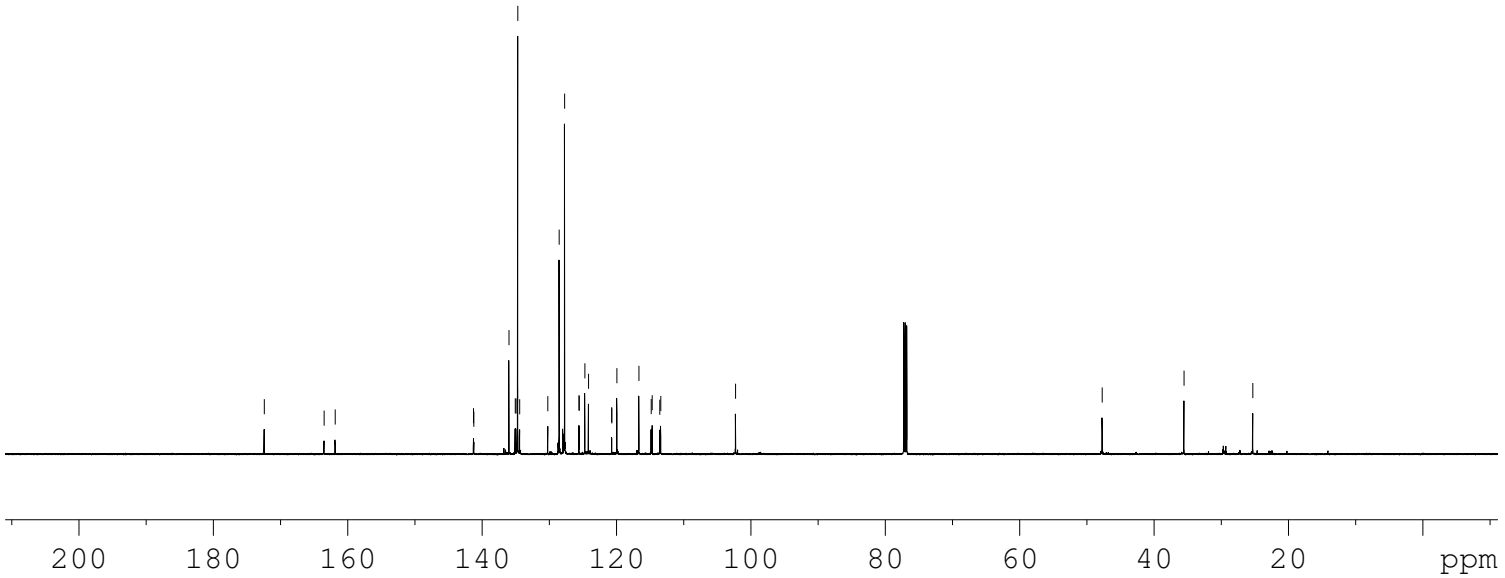


NAME	LYN-3h-20210807
EXPNO	1
PROCNO	1
Date_	20210807
Time	14.34
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	296.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700414 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

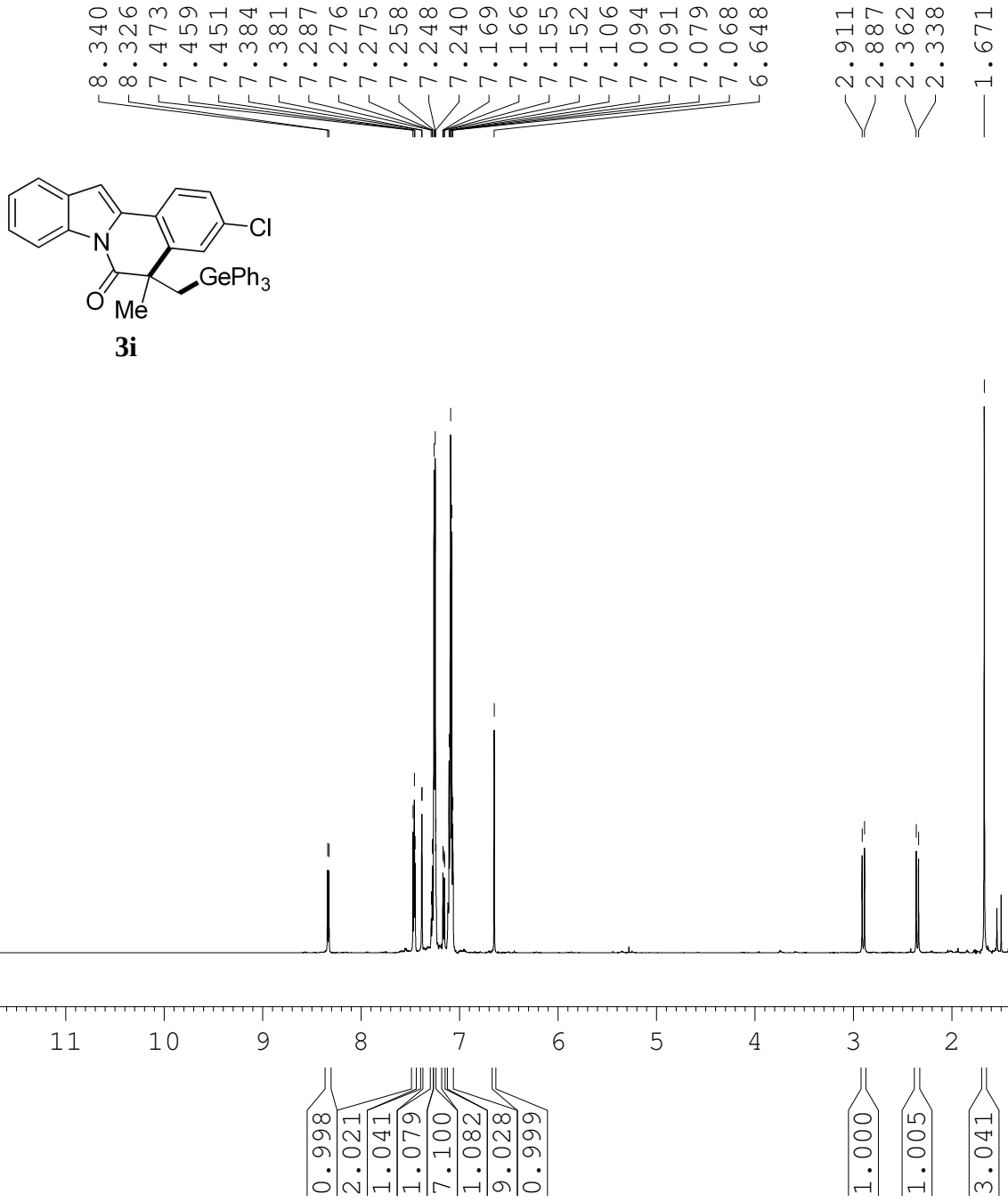




3h

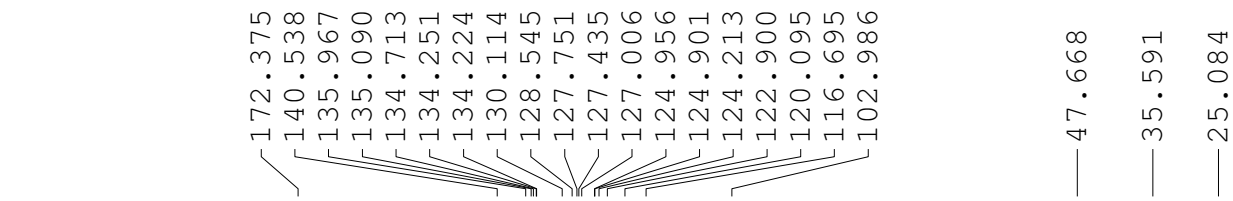


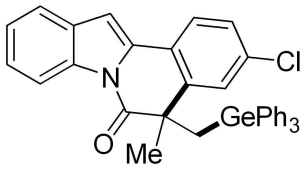
NAME	LYN-3h-20210807
EXPNO	2
PROCNO	1
Date_	20210807
Time	19.21
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128799 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



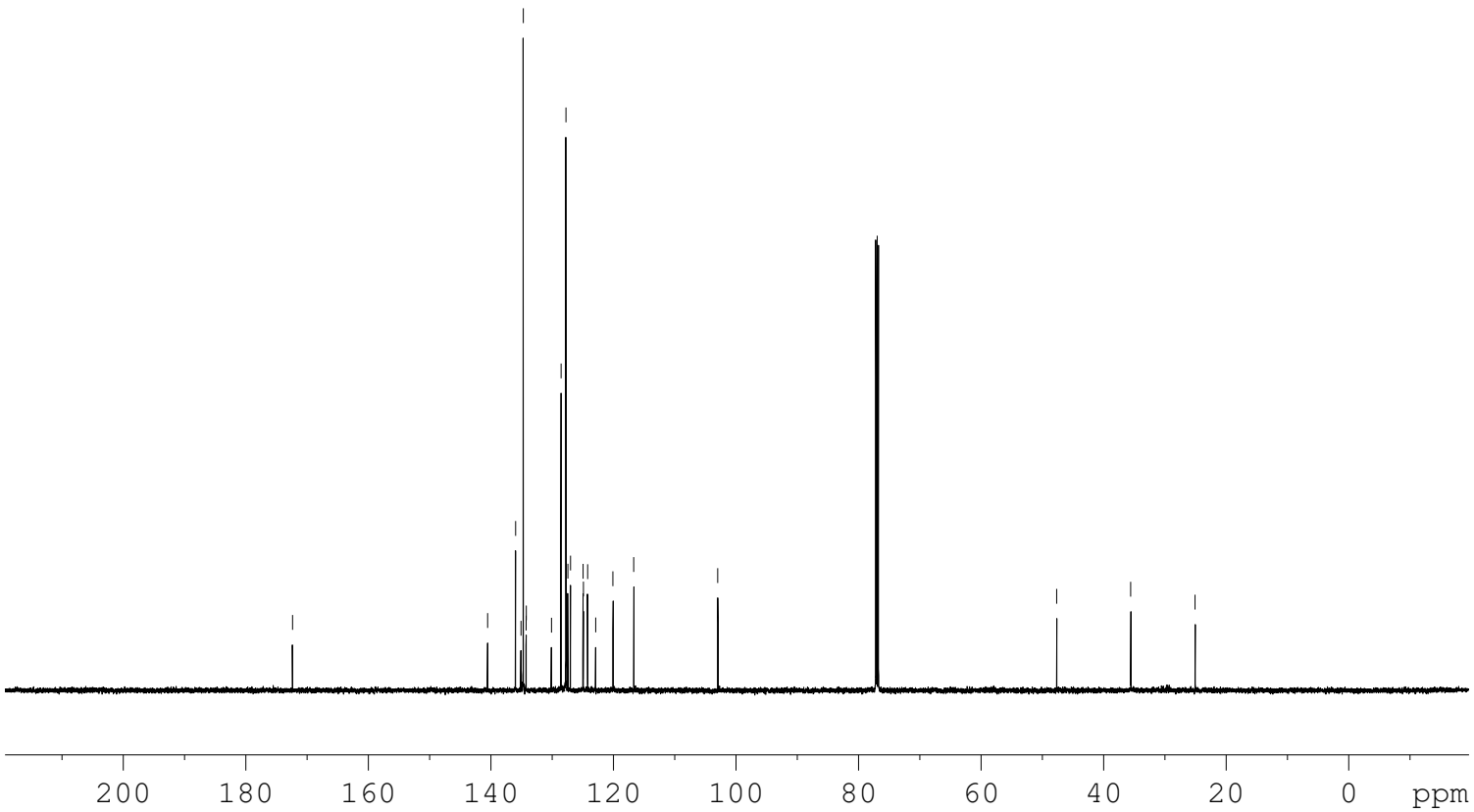
3i

NAME	lyn-250p-20210415
EXPNO	1
PROCNO	1
Date_	20210415
Time	17.32
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	62.22
DW	52.000 usec
DE	6.50 usec
TE	294.6 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700278 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

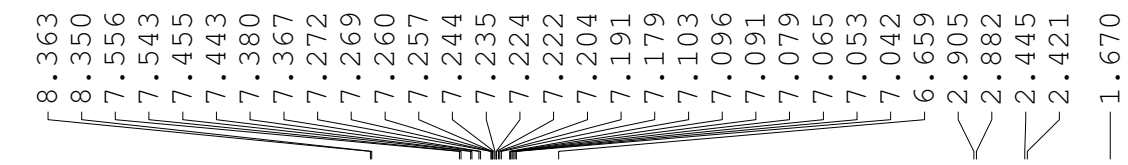


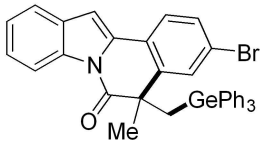


3i

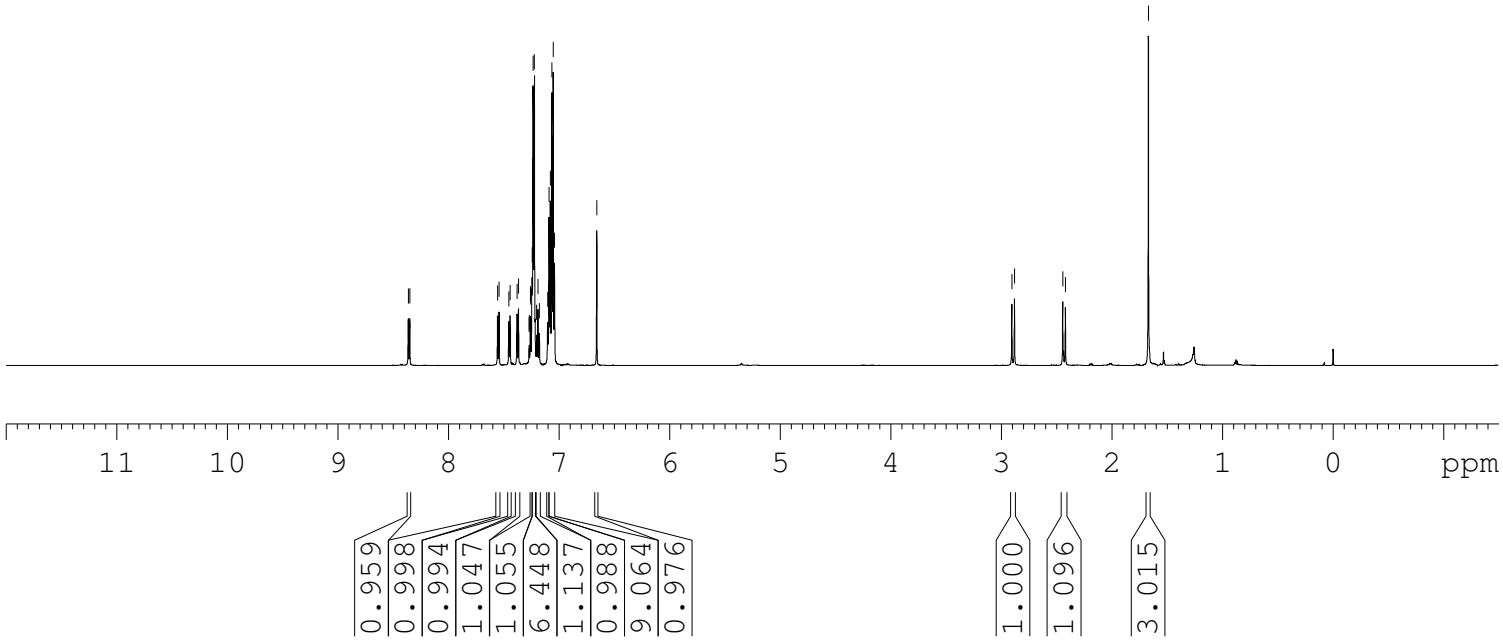


NAME	lyn-250p-20210415
EXPNO	2
PROCNO	1
Date_	20210415
Time	17.43
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	295.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128755 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

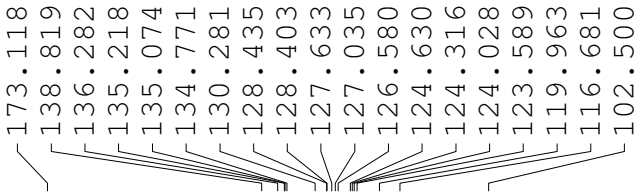


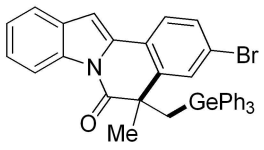


3j

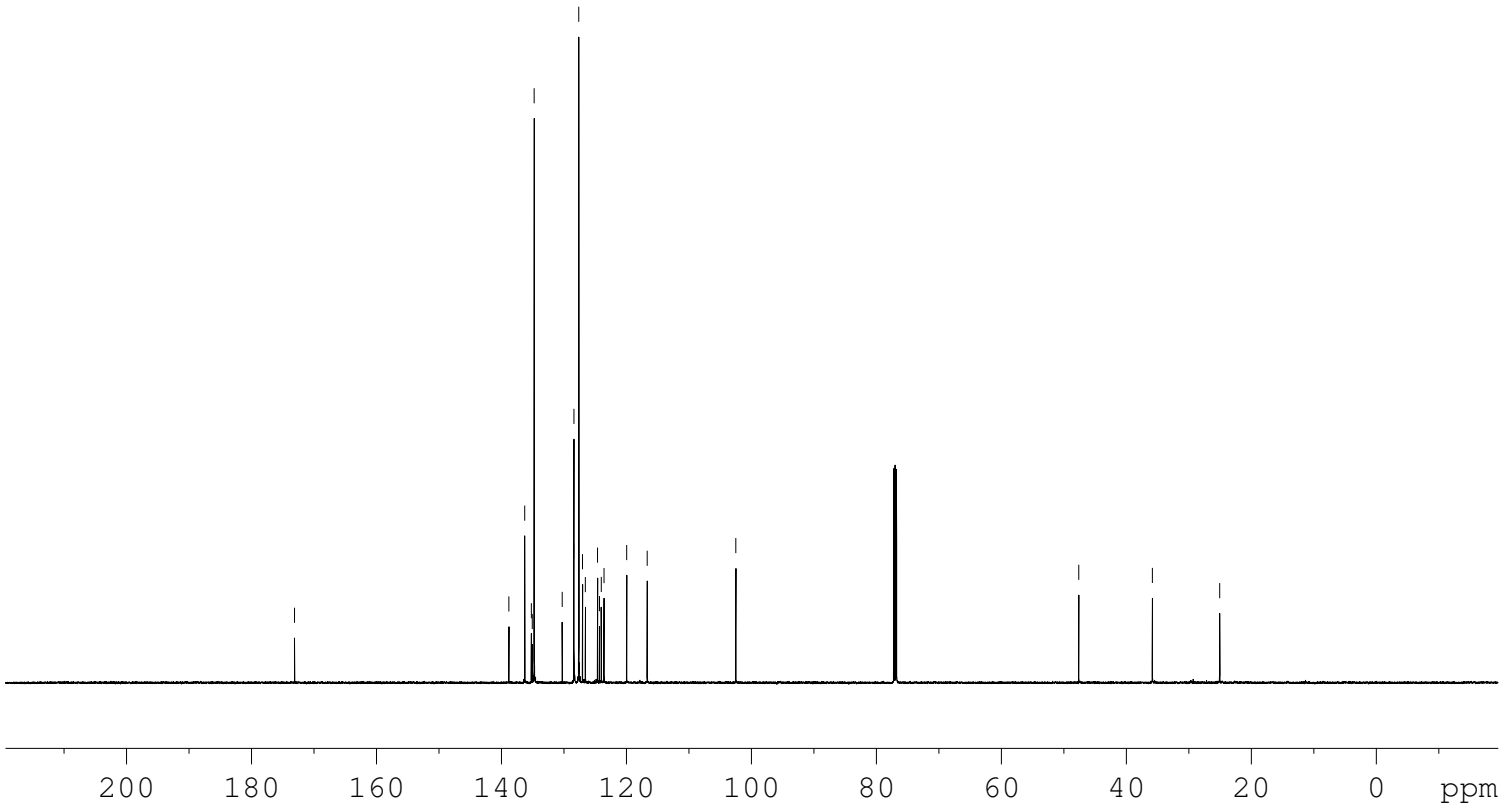


NAME	LYN-257P-NEW	
EXPNO	1	
PROCNO	1	
Date_	20210530	
Time	2.31	
INSTRUM	spect	
PROBHD	5 mm PABBO BB/	
PULPROG	zg30	
TD	65536	
SOLVENT	CDCl3	
NS	8	
DS	0	
SWH	9615.385	Hz
FIDRES	0.146719	Hz
AQ	3.4079220	sec
RG	38.1	
DW	52.000	use
DE	6.50	use
TE	317.9	K
D1	1.00000000	sec
TD0	1	
======== CHANNEL f1 =======		
SFO1	600.1739011	MHz
NUC1	1H	
P1	9.96	use
SI	65536	
SF	600.1700422	MHz
WDW	EM	
SSB	0	
LB	0.30	Hz
GB	0	
PC	1.00	

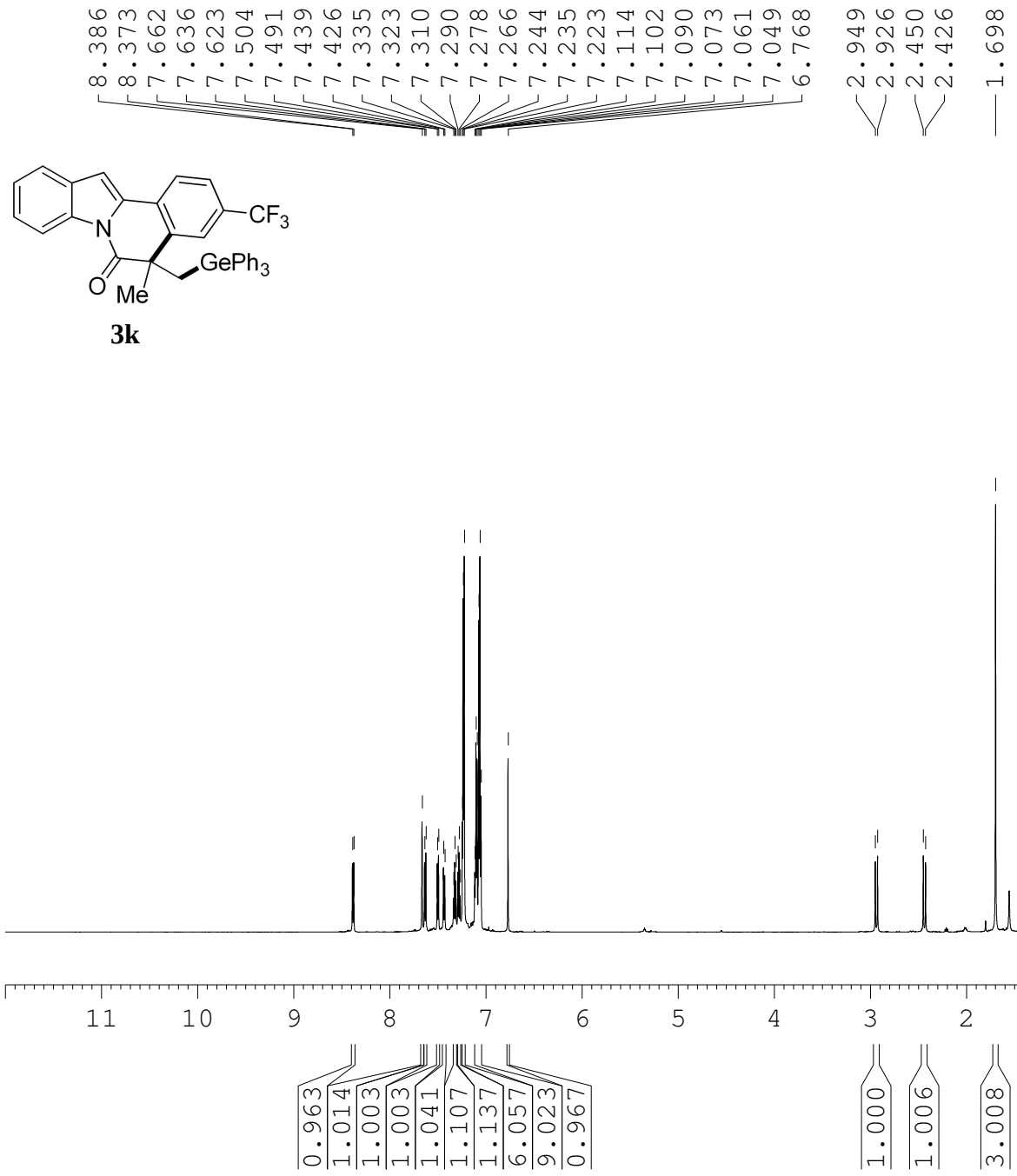




3j

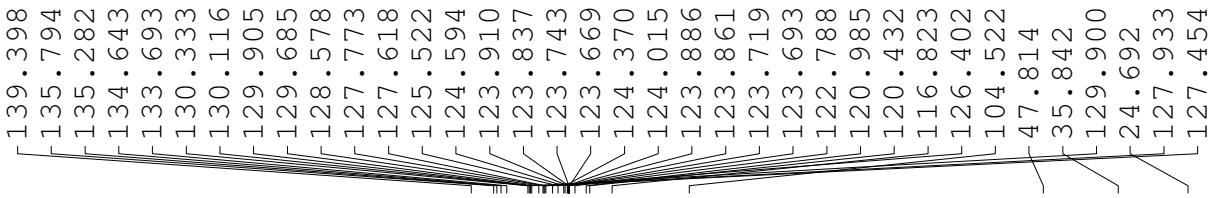


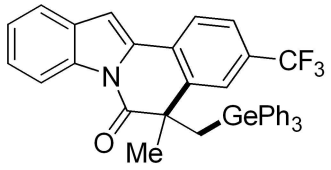
NAME	lyn-257p-20210423
EXPNO	1
PROCNO	1
Date_	20210423
Time	11.37
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128809 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



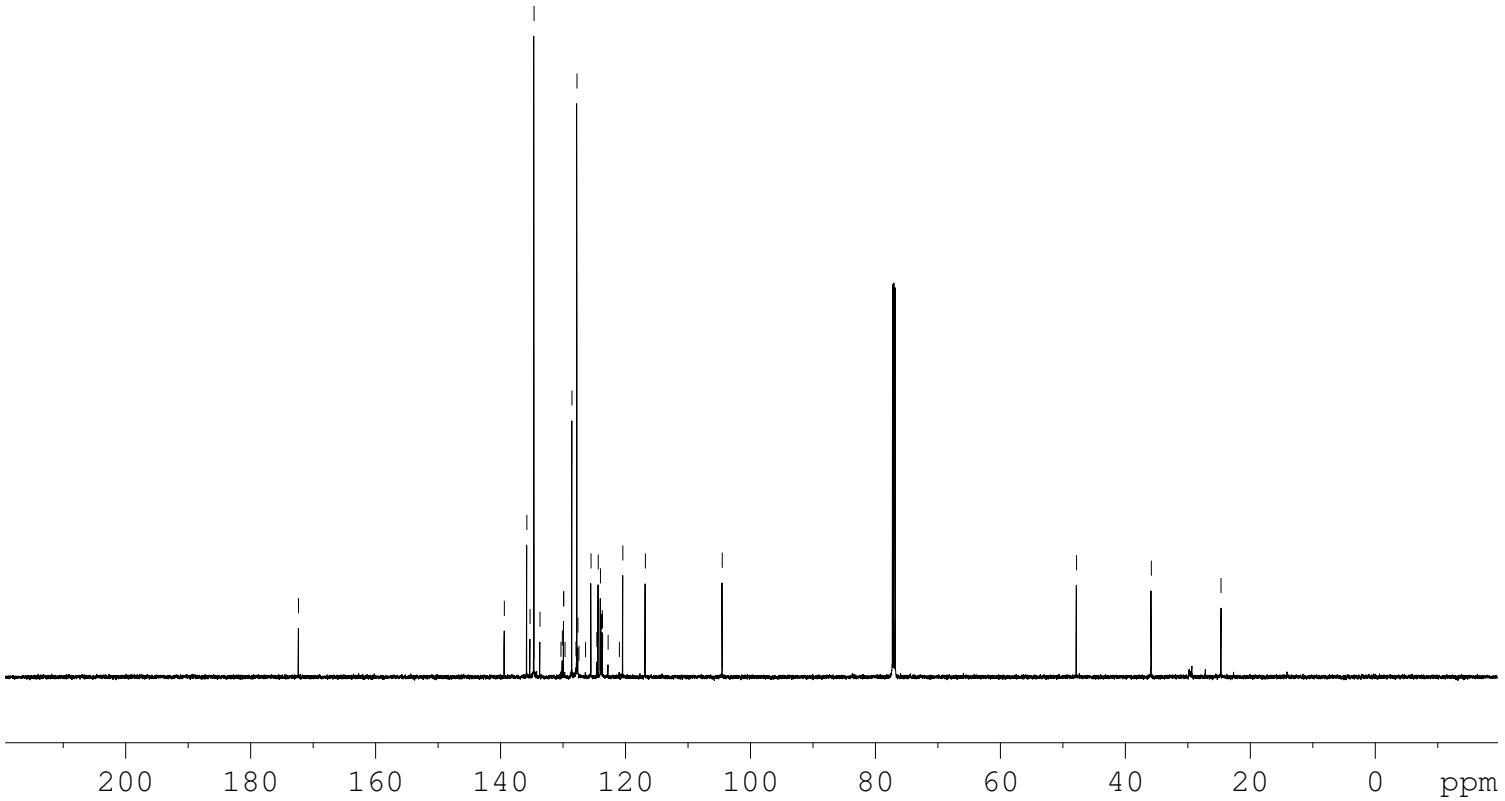
3k

NAME	LYN-251P-NEW-20210601
EXPNO	1
PROCNO	1
Date_	20210602
Time	7.24
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	62.22
DW	52.000 usec
DE	6.50 usec
TE	294.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700262 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

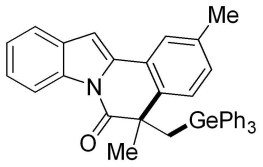




3k

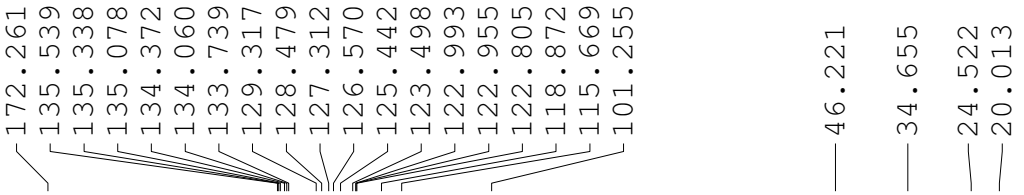


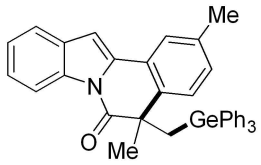
NAME	LYN-251P-NEW-20210601
EXPNO	2
PROCNO	1
Date_	20210602
Time	7.50
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDC13
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128740 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



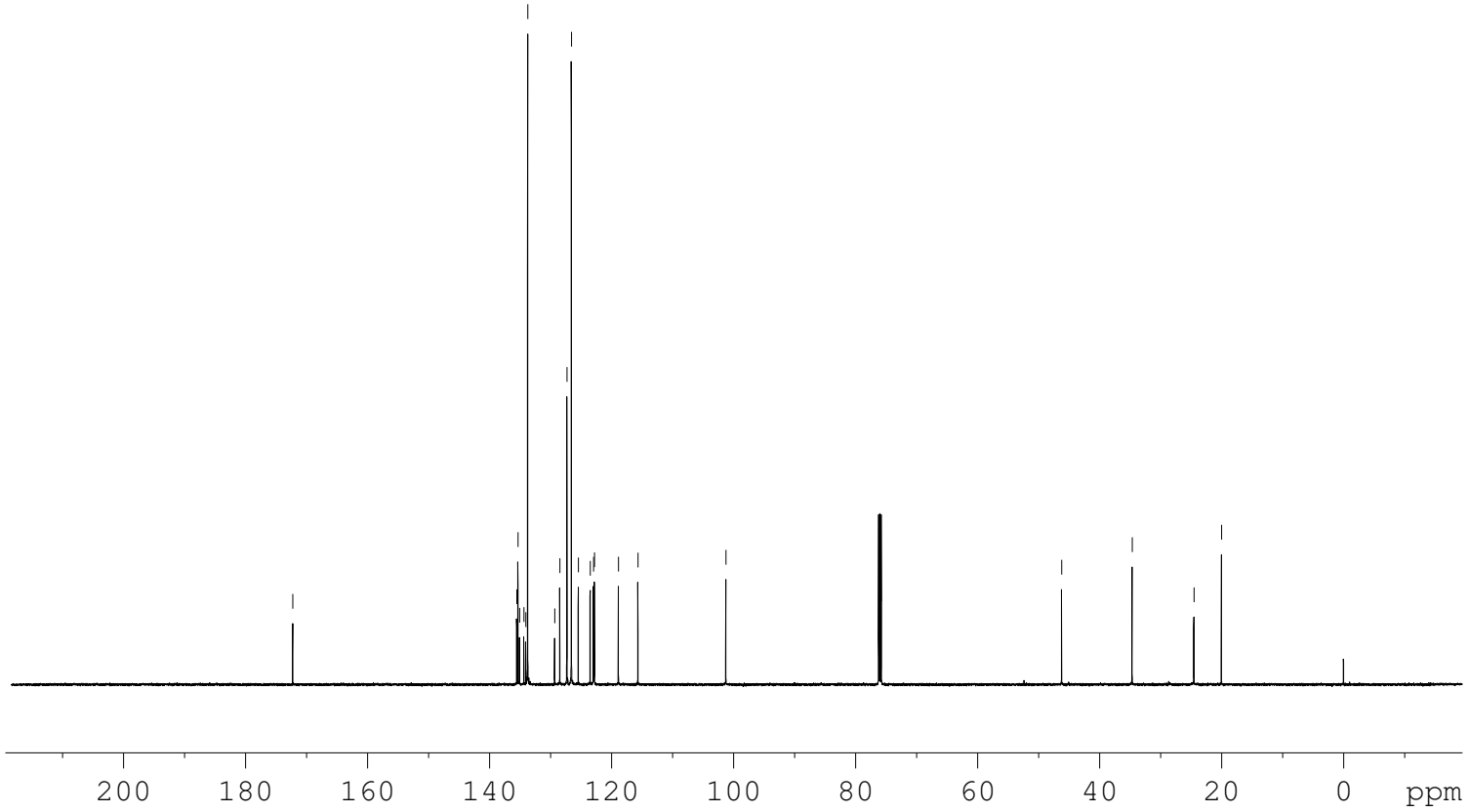
3l

NAME	lyn-268p-xin-20210426
EXPNO	1
PROCNO	1
Date_	20210426
Time	22.53
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	62.22
DW	52.000 usec
DE	6.50 usec
TE	295.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700282 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

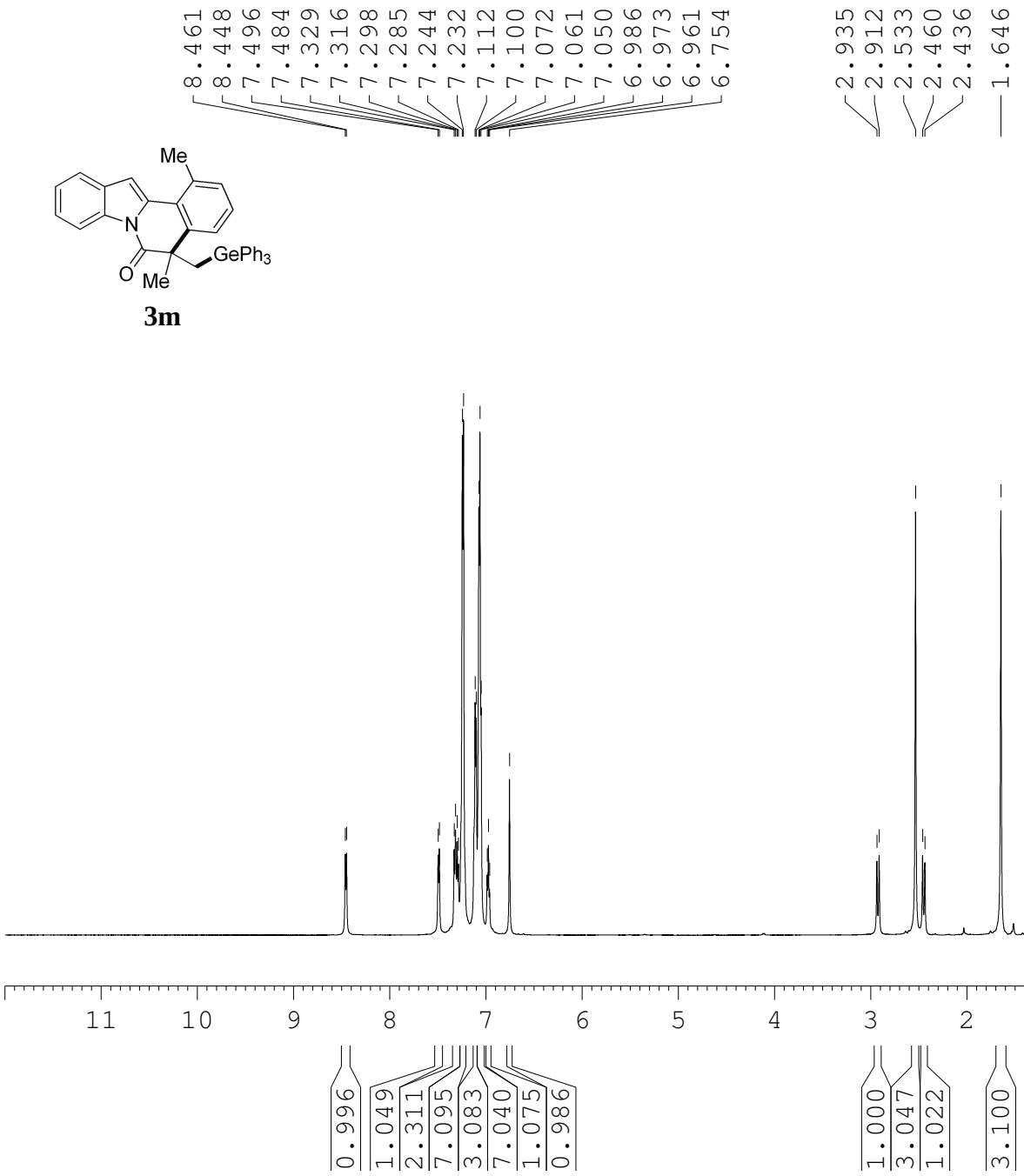




3l

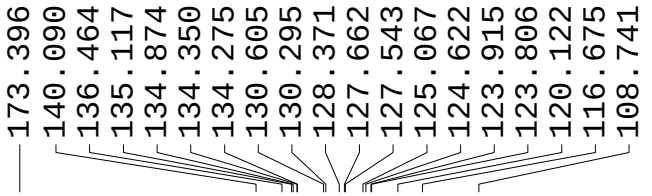


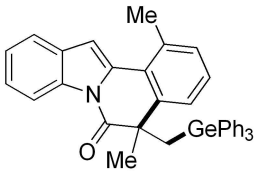
NAME	lyn-268p-20210423
EXPNO	1
PROCNO	1
Date_	20210423
Time	12.00
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9130388 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



3m

NAME	lyn-277p-20210507
EXPNO	1
PROCNO	1
Date_	20210507
Time	10.25
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	297.8 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700436 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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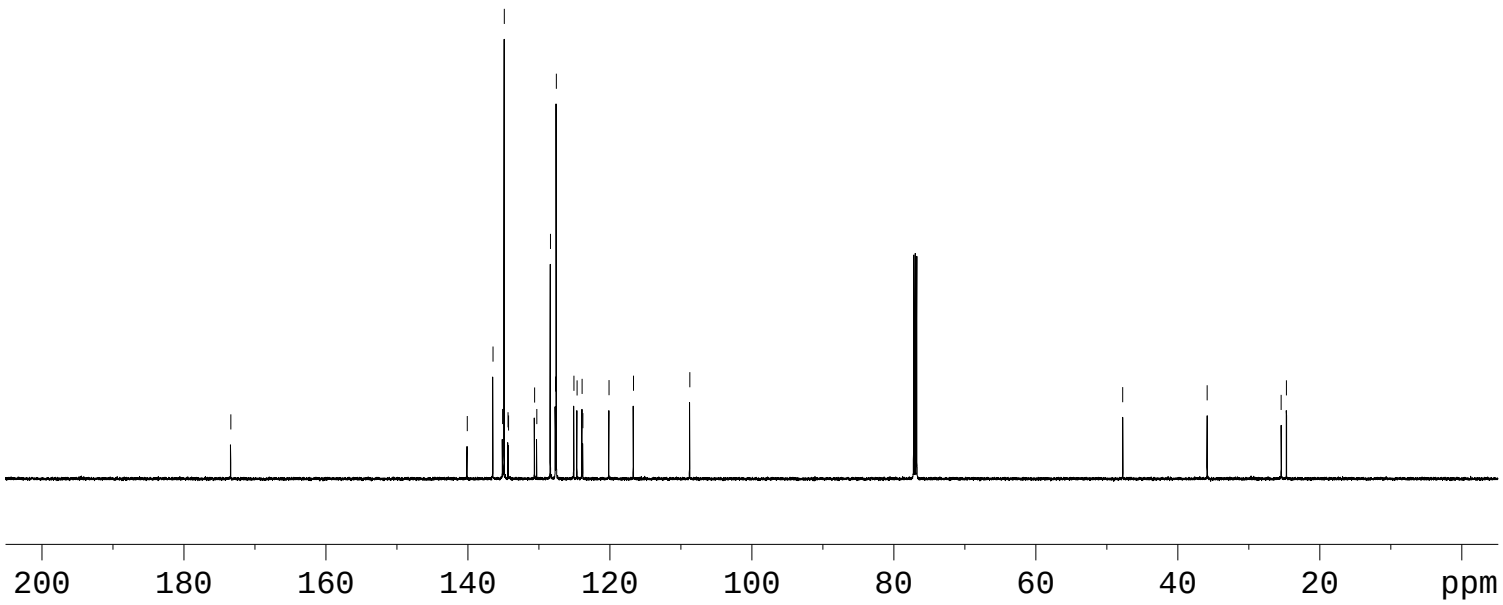
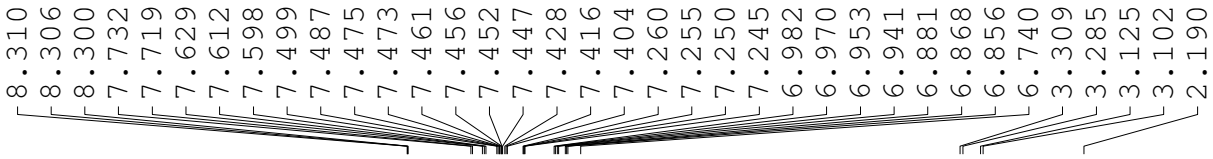
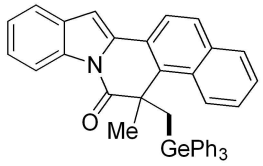
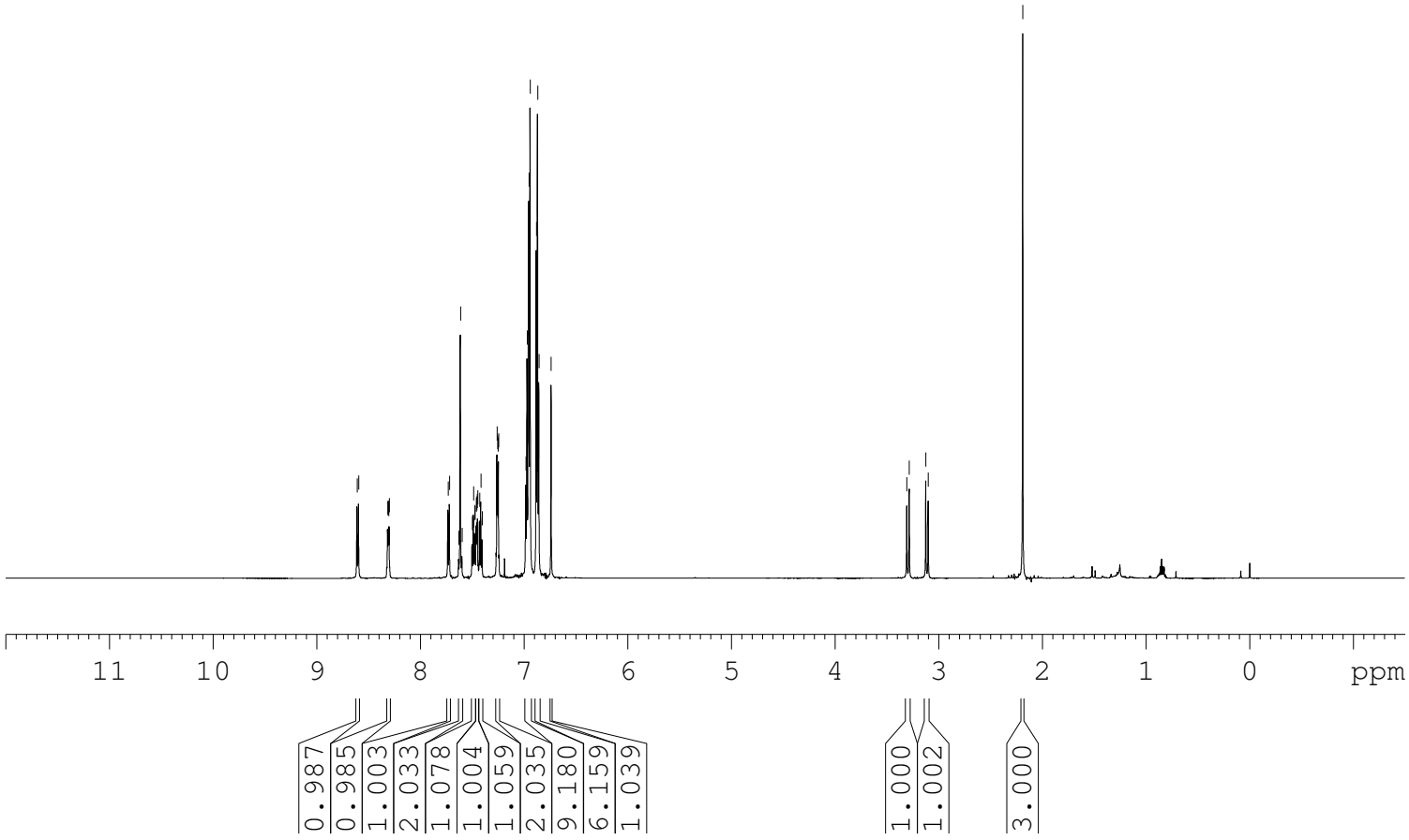


NAME	lyn-277p-20210507
EXPNO	2
PROCNO	1
Date_	20210507
Time	10.36
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	298.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128787 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

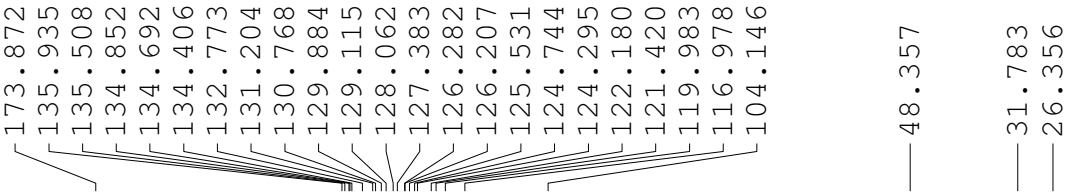


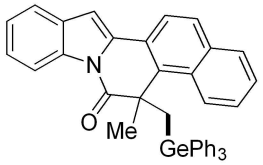


3n



NAME	lyn-234p-2021040
EXPNO	1
PROCNO	1
Date_	20210408
Time	16.38
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	25.32
DW	52.000 usec
DE	6.50 usec
TE	293.8 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700601 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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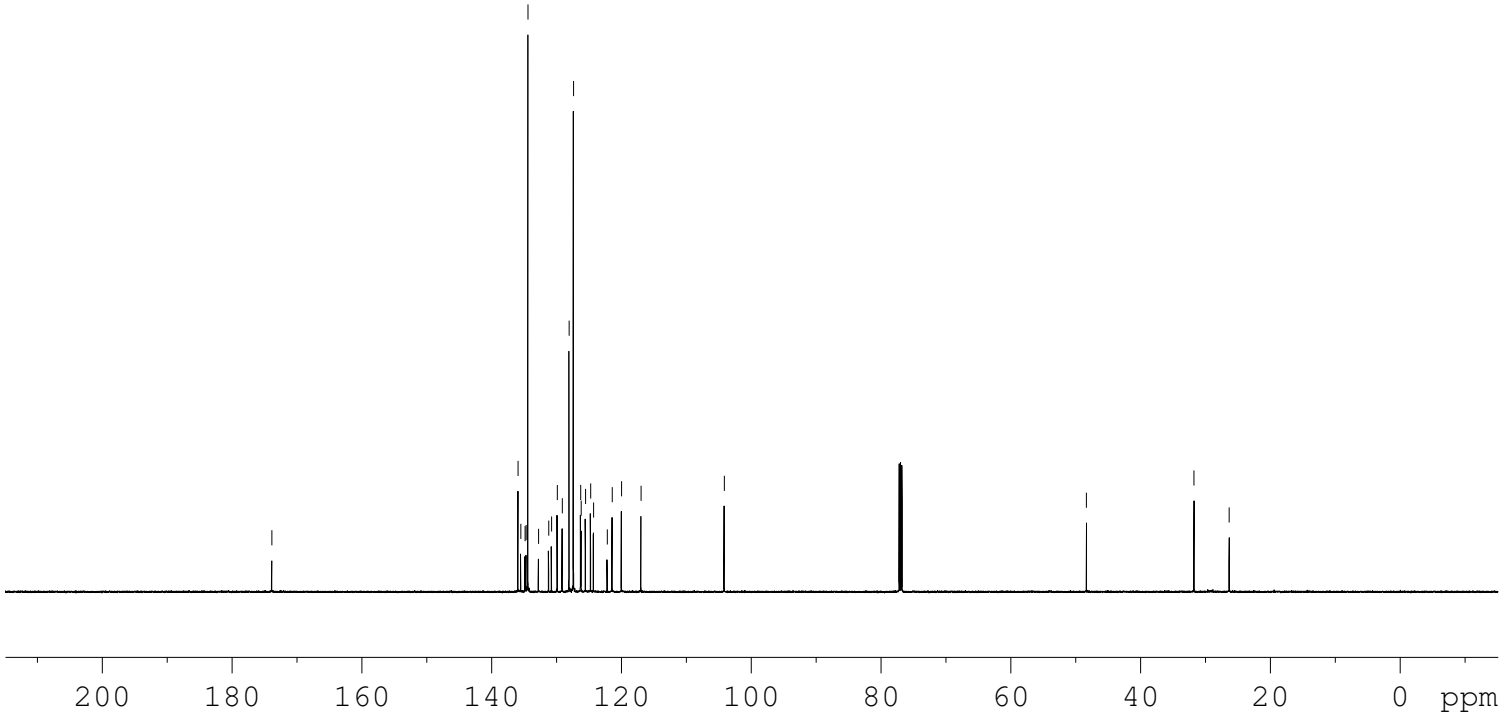
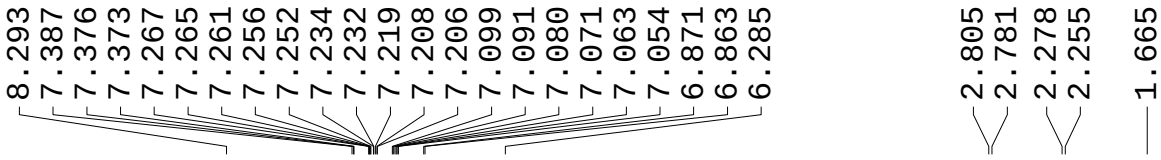
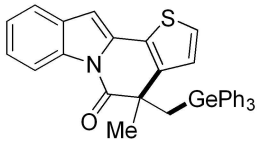
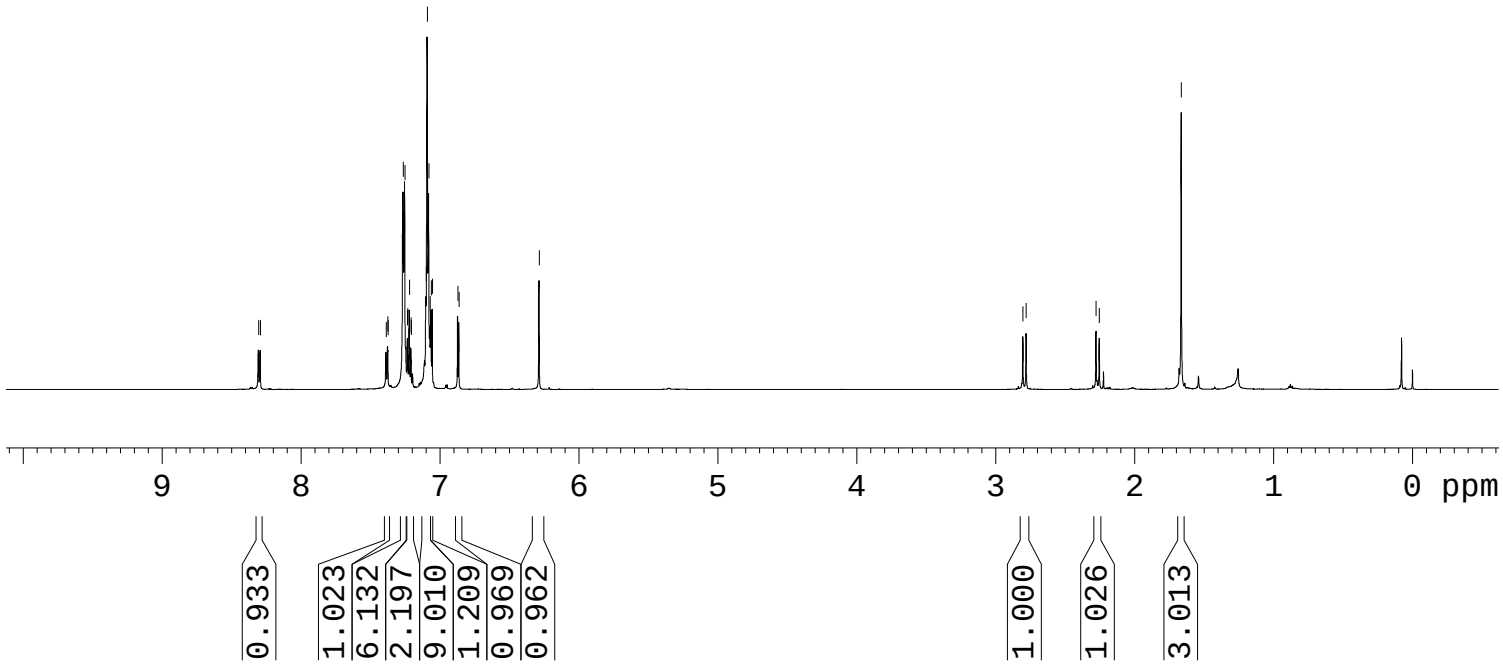


NAME	lyn-234p-2021040
EXPNO	2
PROCNO	1
Date_	20210408
Time	16.49
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	295.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128878 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

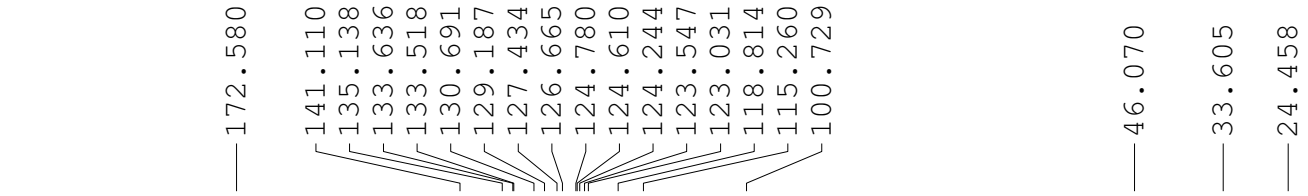


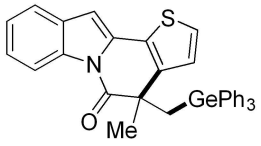


3o

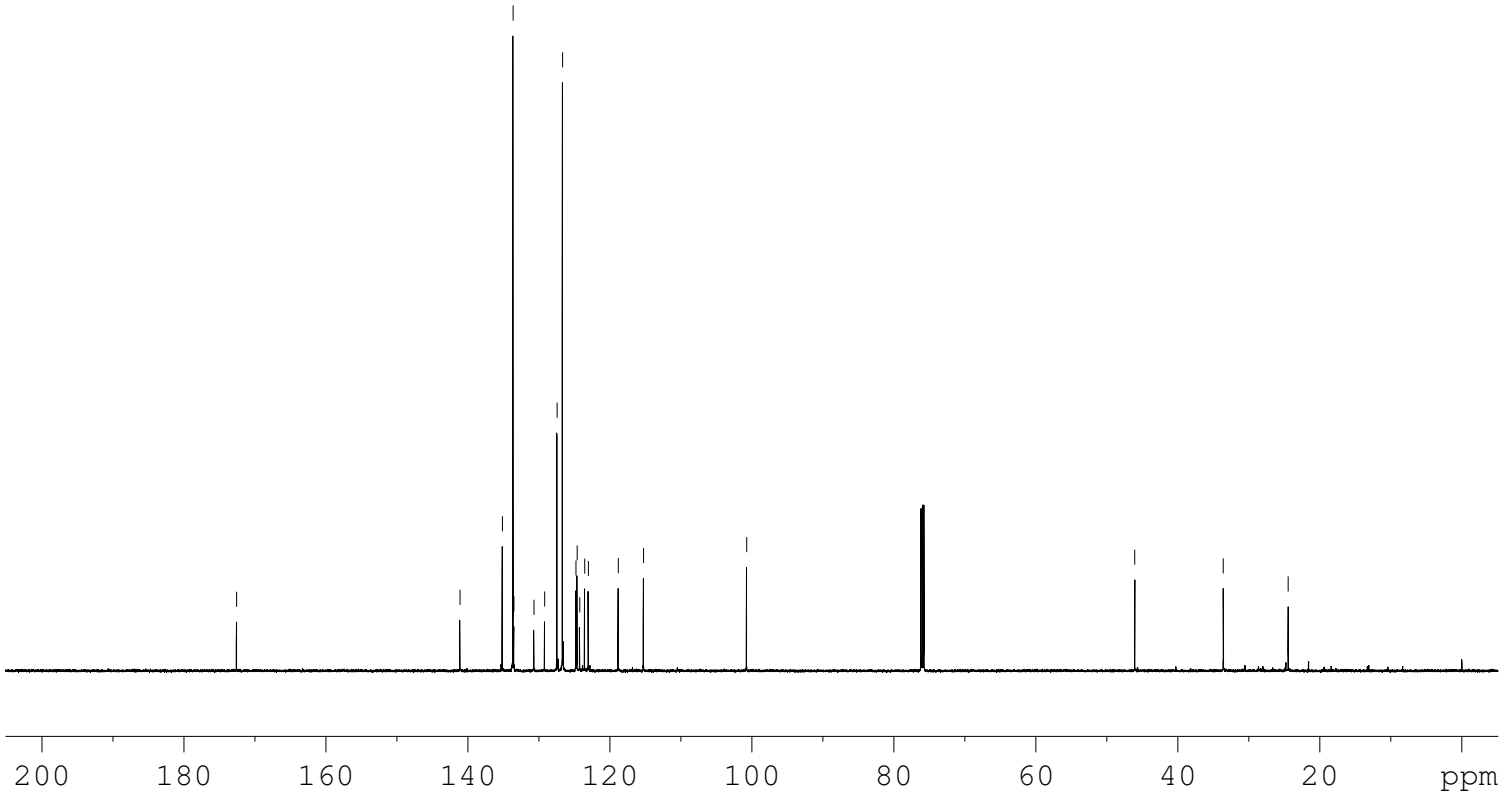


NAME	LYN-233P-NEW
EXPNO	1
PROCNO	1
Date_	20210530
Time	1.19
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	318.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700403 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

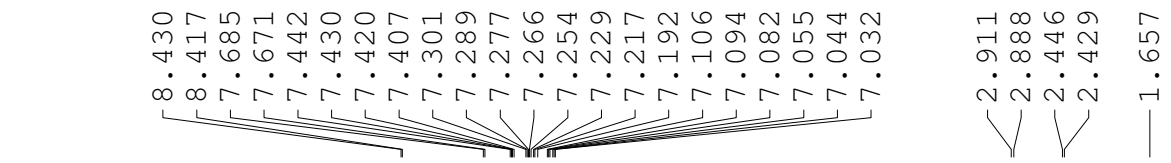


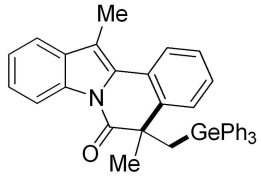


3o

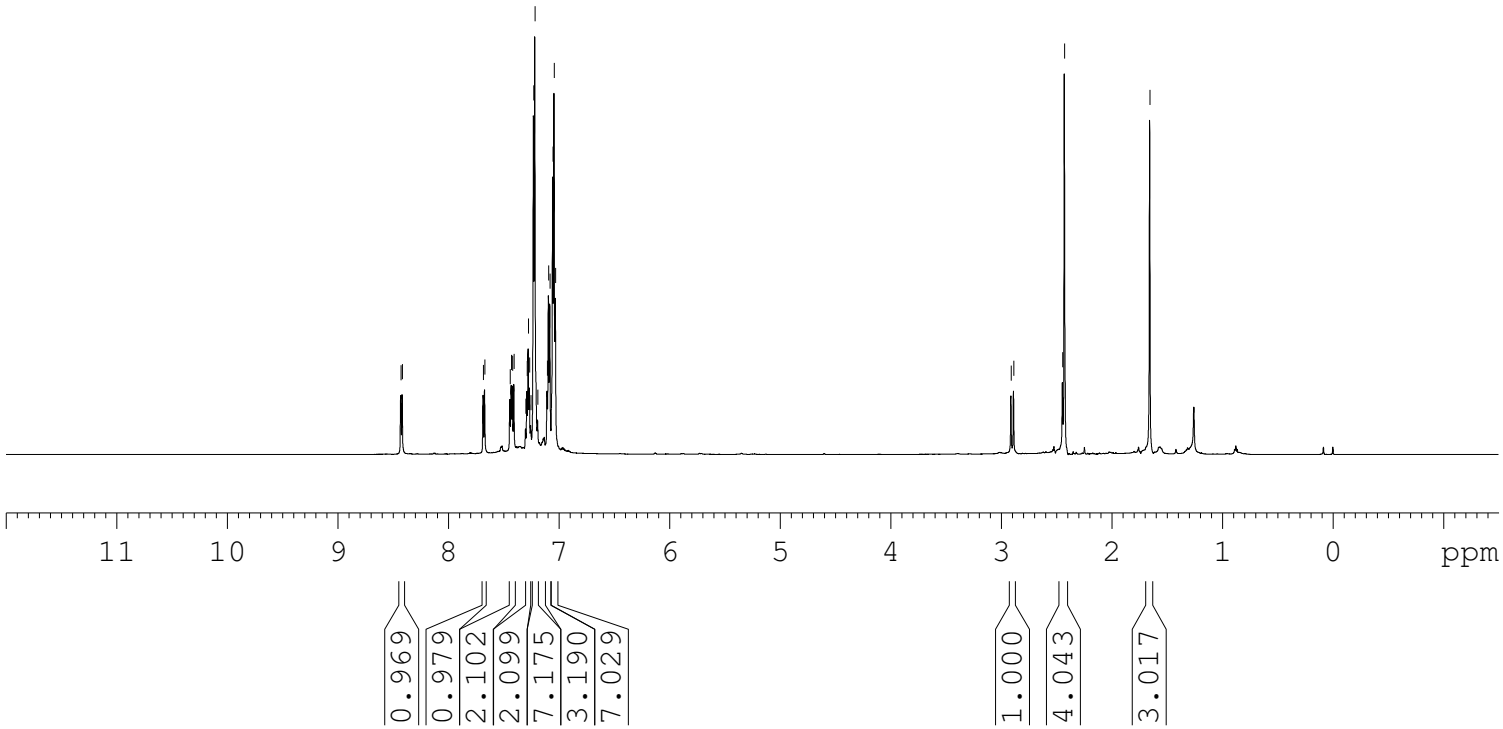


NAME	lyn-233p-20210408
EXPNO	2
PROCNO	1
Date_	20210408
Time	17.04
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	295.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9130370 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

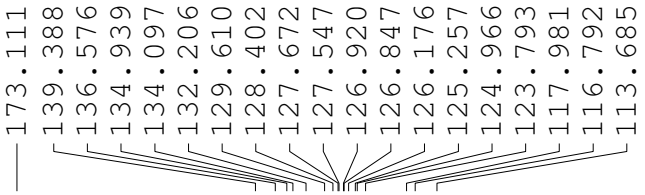


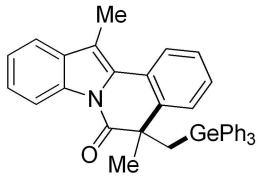


3p

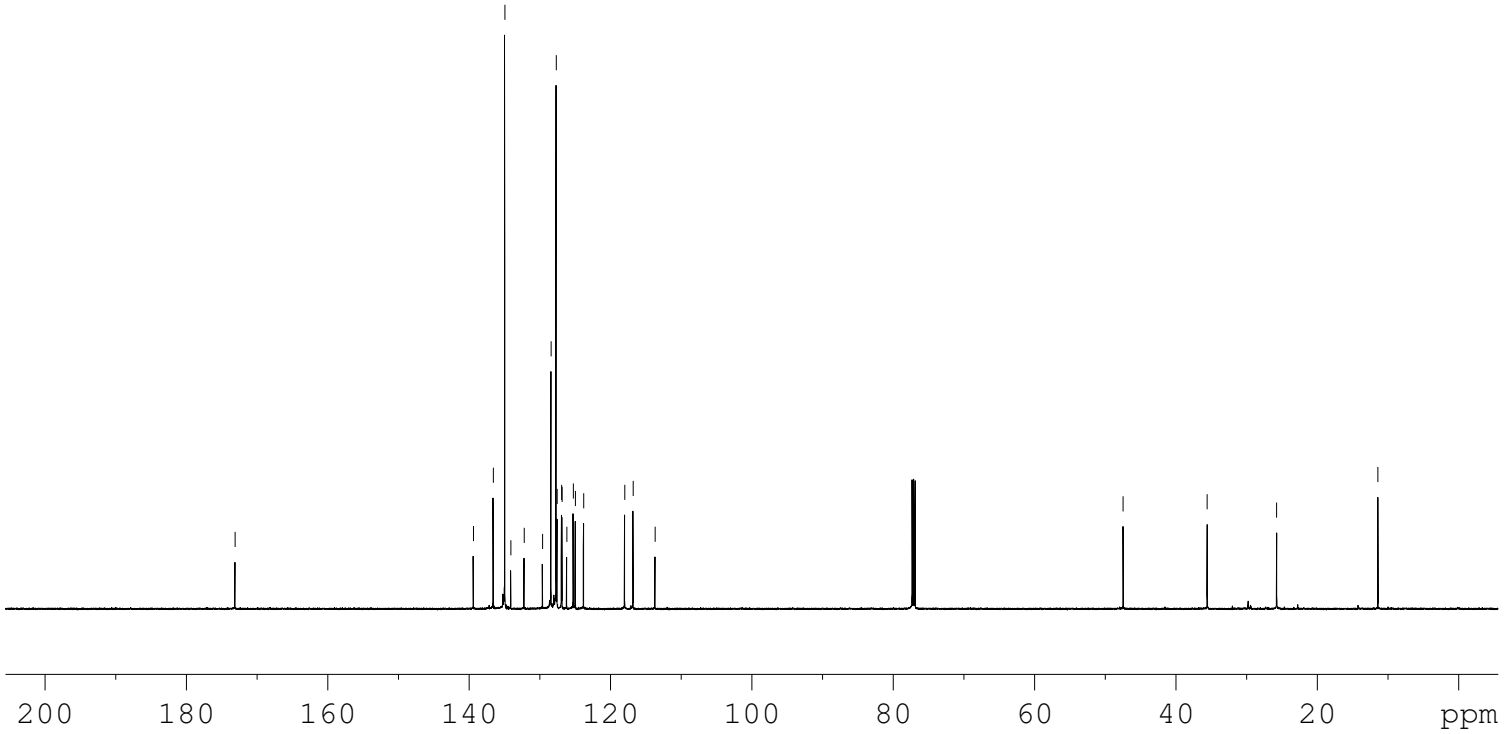


NAME	LYN-362P-c-20210701
EXPNO	1
PROCNO	1
Date_	20210701
Time	20.29
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	28.69
DW	52.000 usec
DE	6.50 usec
TE	296.4 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700582 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

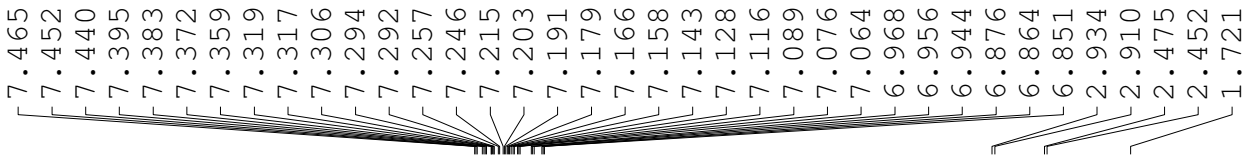


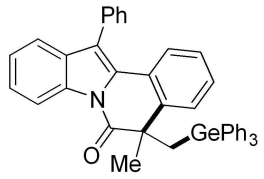


3p



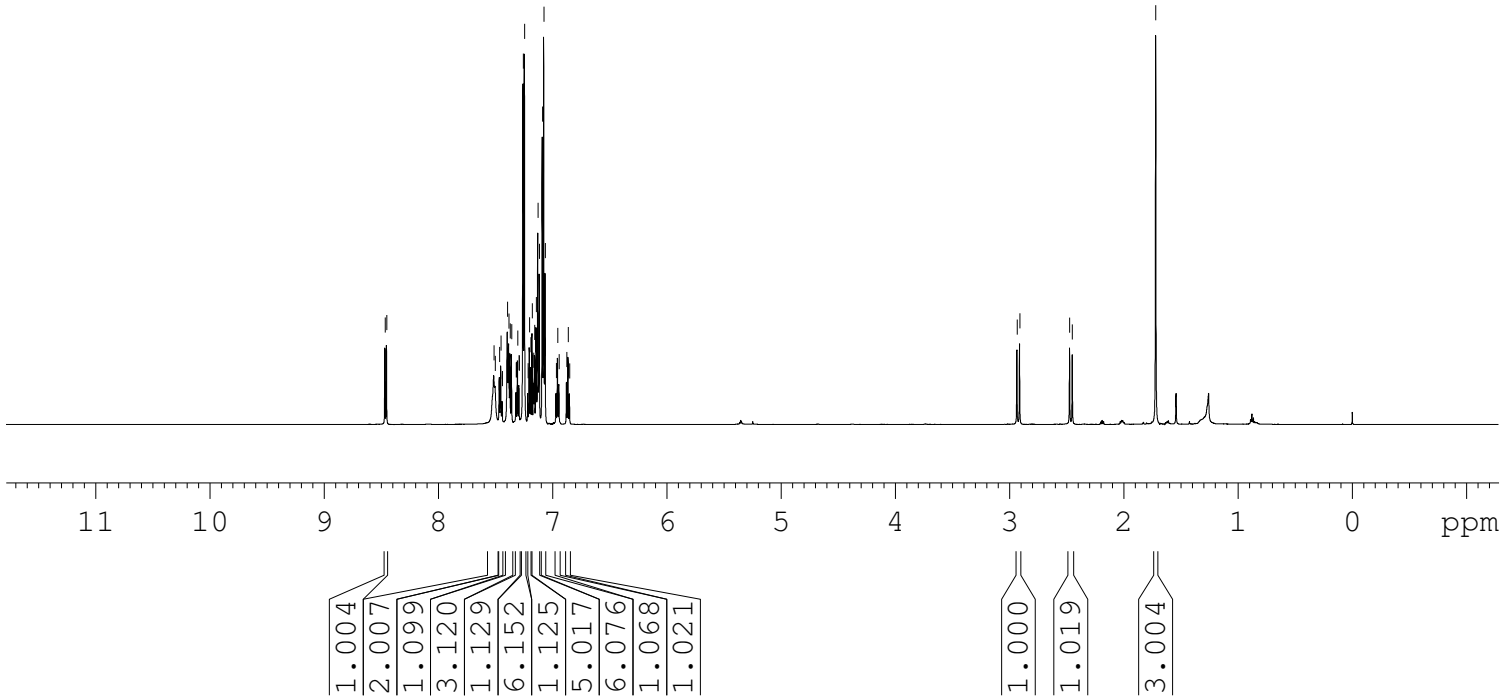
NAME	LYN-362P-c-20210701
EXPNO	2
PROCNO	1
Date_	20210701
Time	20.55
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.7 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128665 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

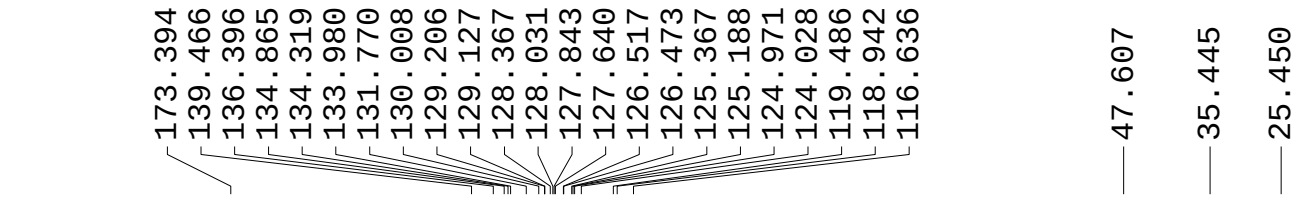


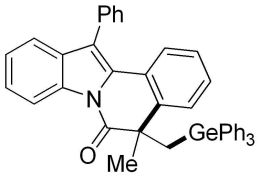


3q

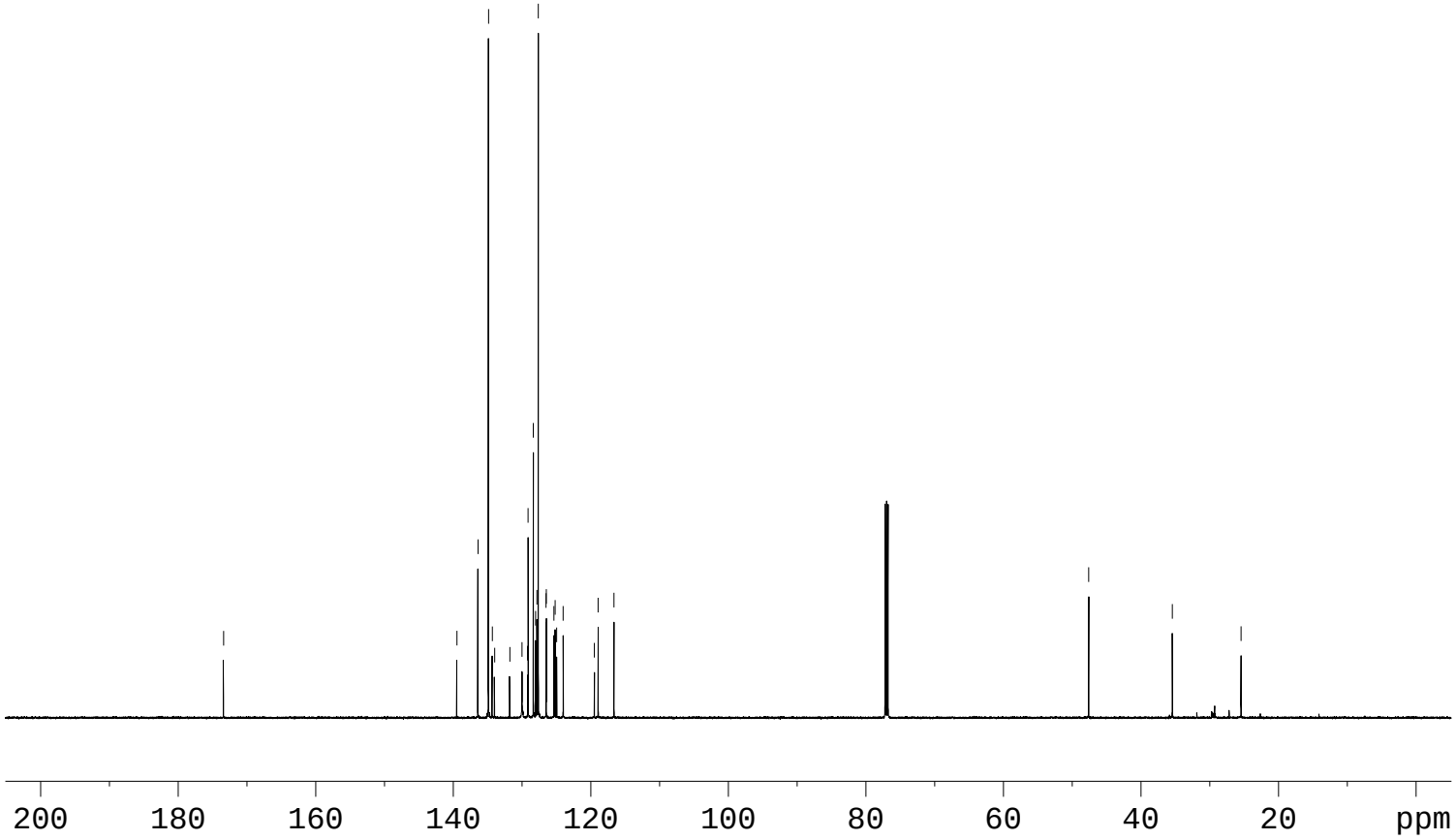
```
NAME      lyn-317p-new-20210608
EXPNO                 1
PROCNO                1
Date_          20210608
Time              14.36
INSTRUM           spect
PROBHD   5 mm PABBO BB/
PULPROG            zg30
TD                65536
SOLVENT           CDCl3
NS                    8
DS                    0
SWH            9615.385 Hz
FIDRES         0.146719 Hz
AQ             3.4079220 sec
RG                30.73
DW               52.000 usec
DE                6.50 usec
TE                295.3 K
D1            1.00000000 sec
TD0                   1

======== CHANNEL f1 ========
SFO1        600.1739011 MHz
NUC1                1H
P1                9.96 usec
SI                65536
SF          600.1700481 MHz
WDW                 EM
SSB                   0
LB                0.30 Hz
GB                    0
PC                1.00
```



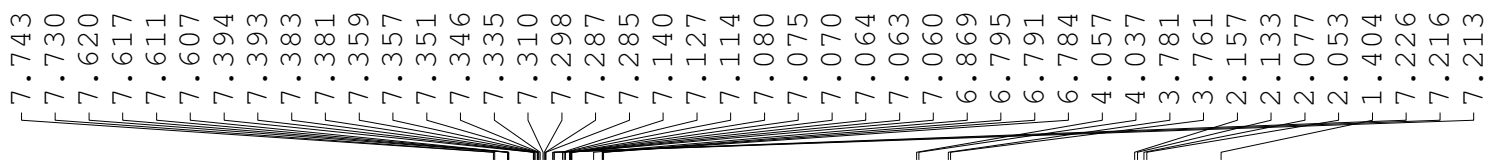


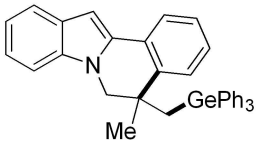


3q

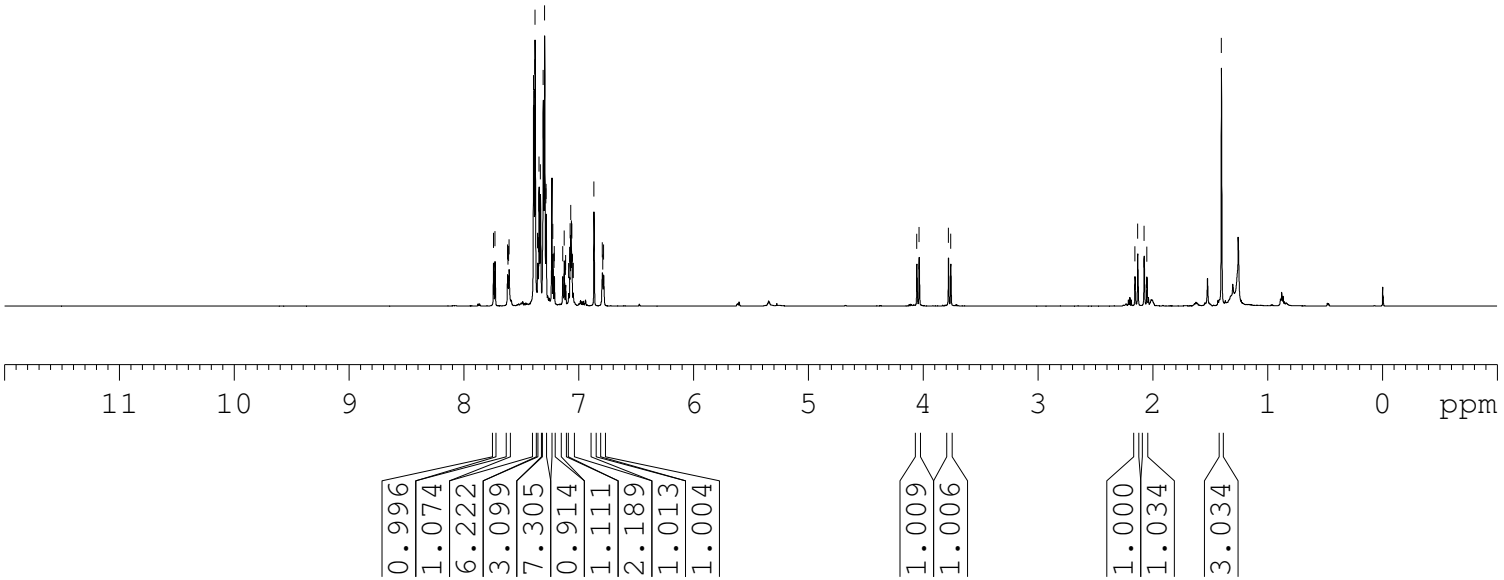


NAME	lyn-317p-new-20210608
EXPNO	2
PROCNO	1
Date_	20210608
Time	14.57
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128822 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

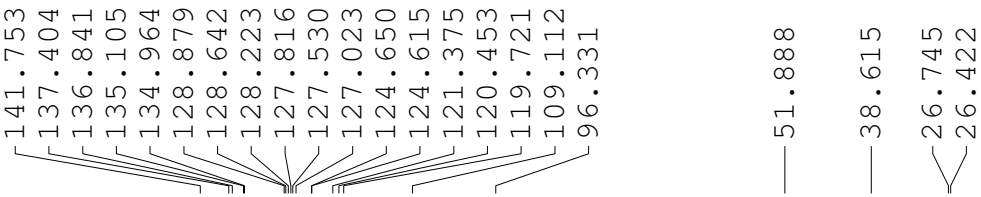


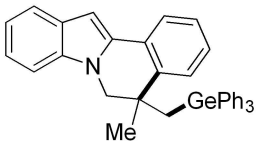


3r

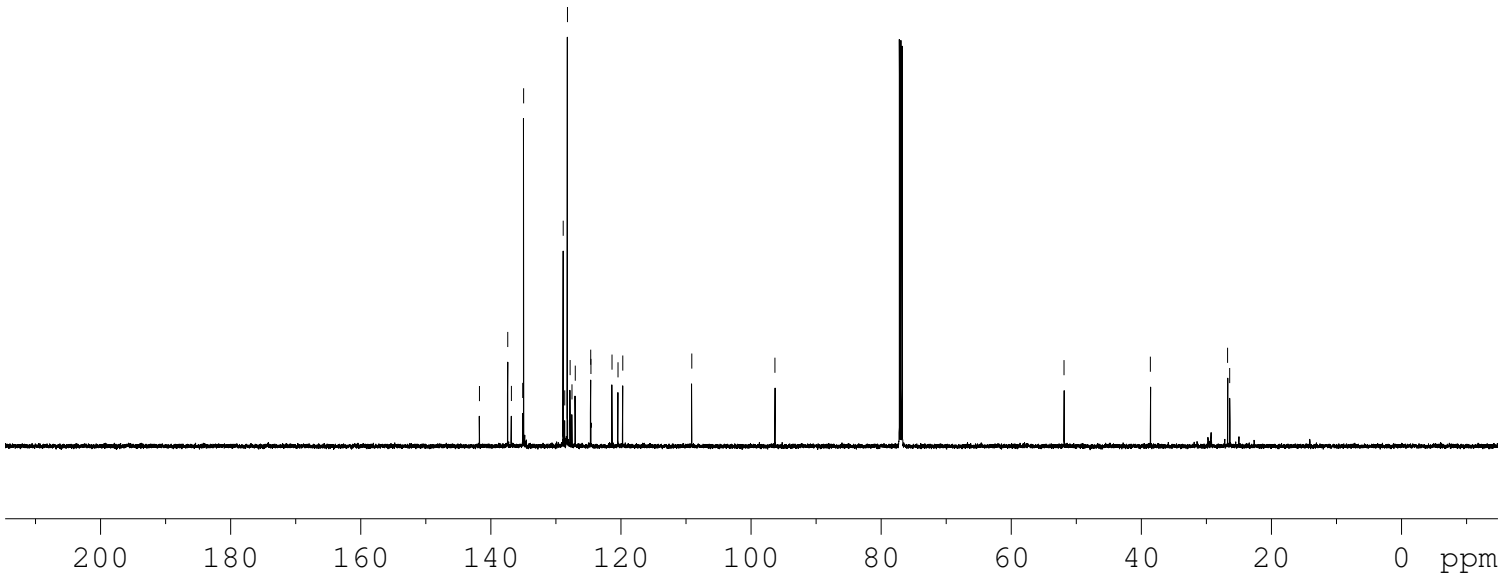


NAME	lyn-3r-20210807
EXPNO	1
PROCNO	1
Date_	20210807
Time	21.15
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	76.92
DW	52.000 usec
DE	6.50 usec
TE	296.4 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700307 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

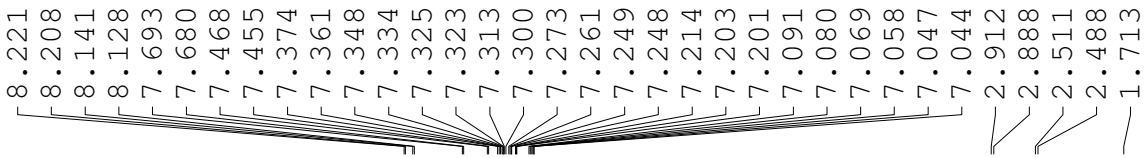


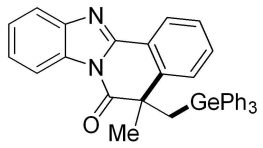


3r

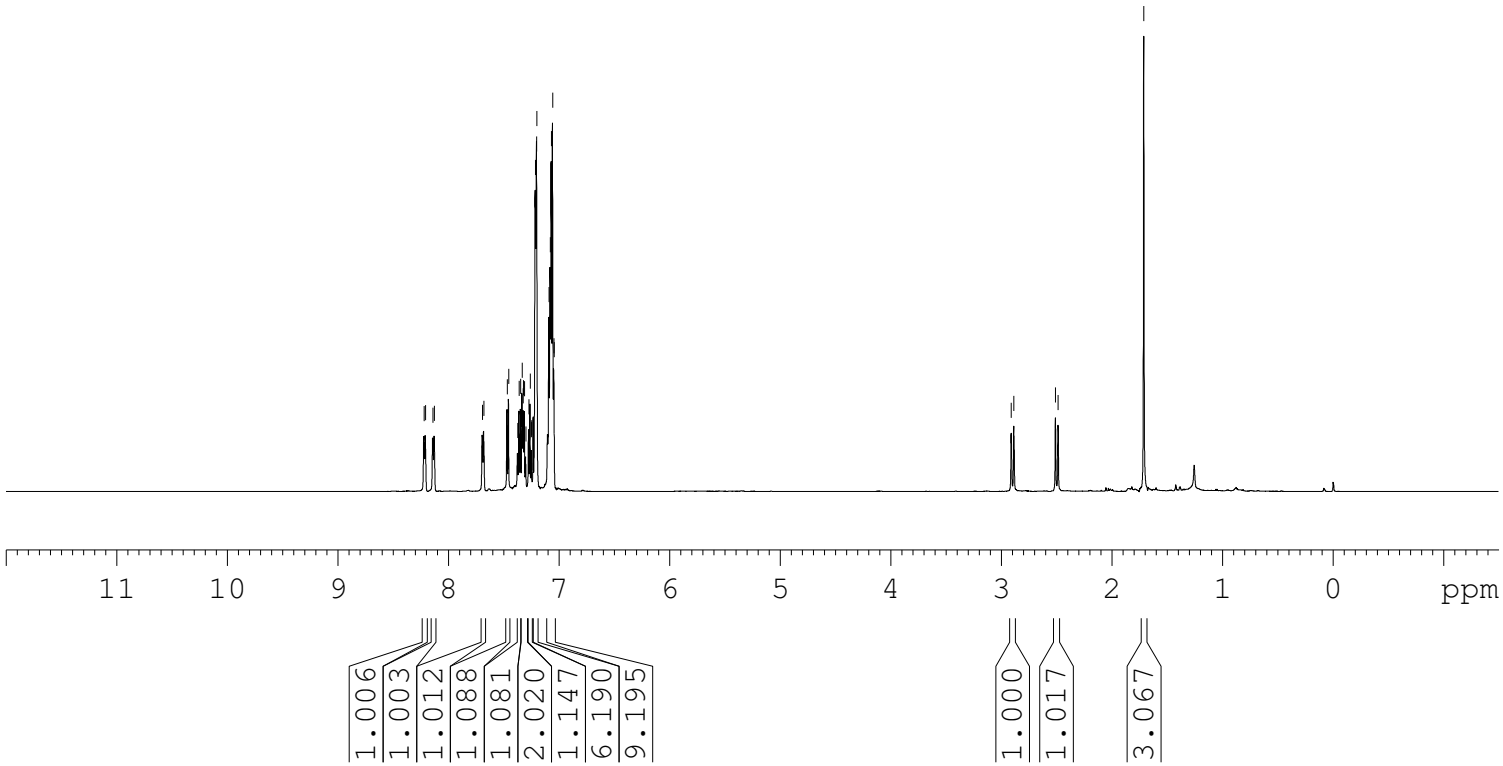


NAME	lyn-3r-20210807
EXPNO	2
PROCNO	1
Date_	20210807
Time	21.45
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.5 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128745 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

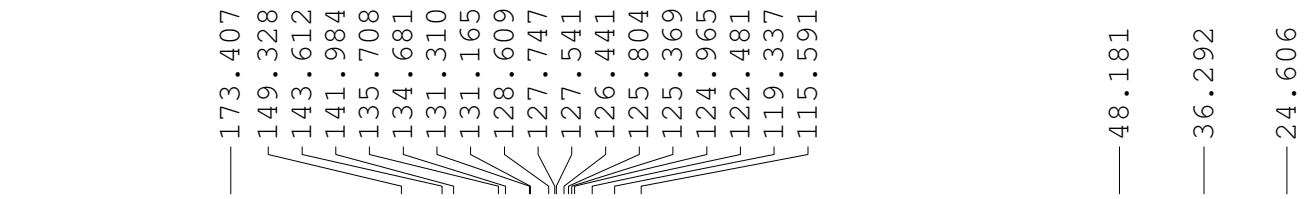


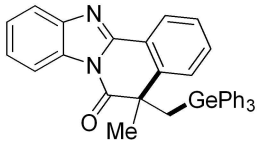


3s

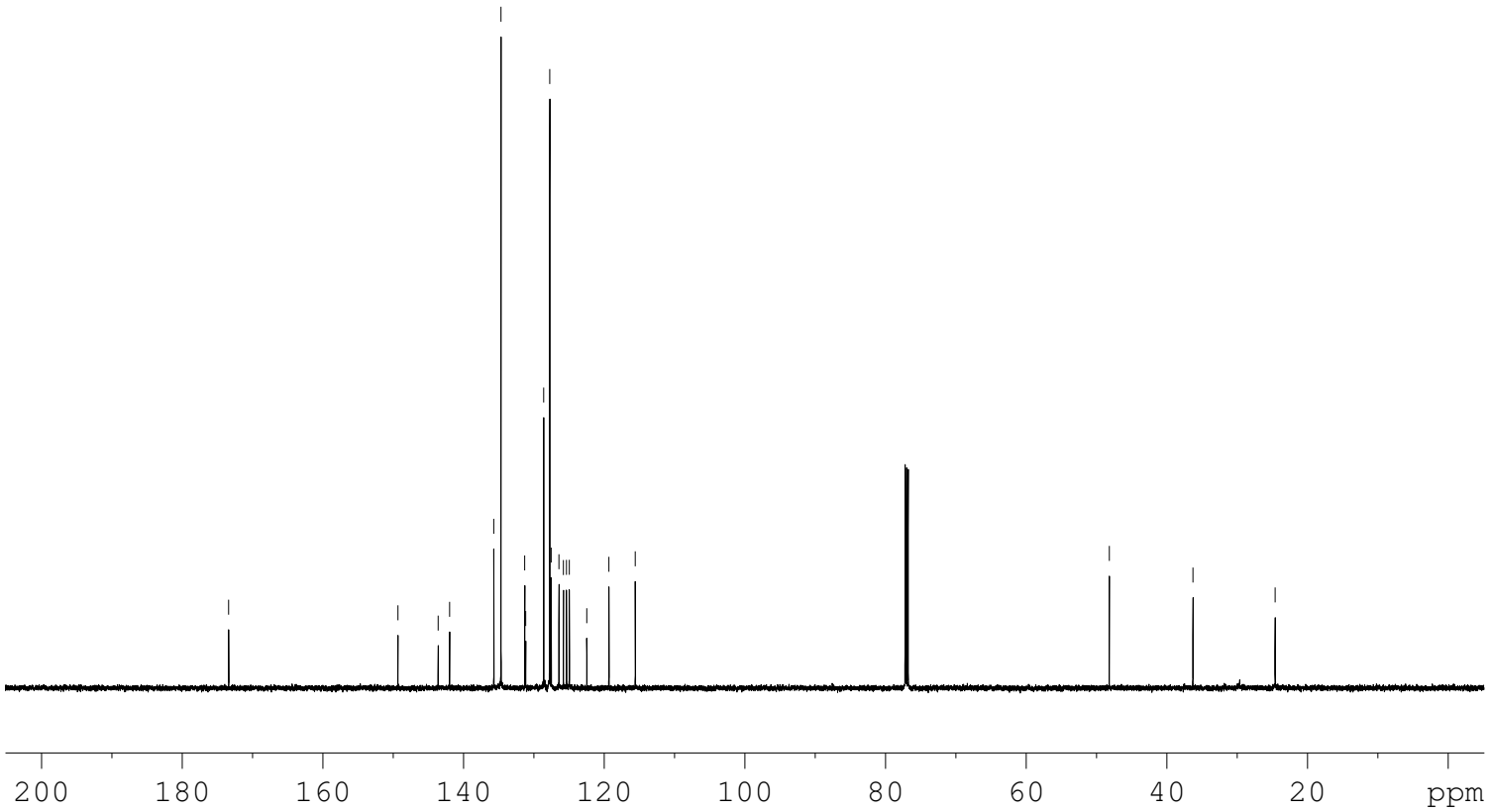


NAME	LYN-195p-20210318
EXPNO	1
PROCNO	1
Date_	20210318
Time	19.14
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	296.2 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.77 usec
SI	65536
SF	600.1700325 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

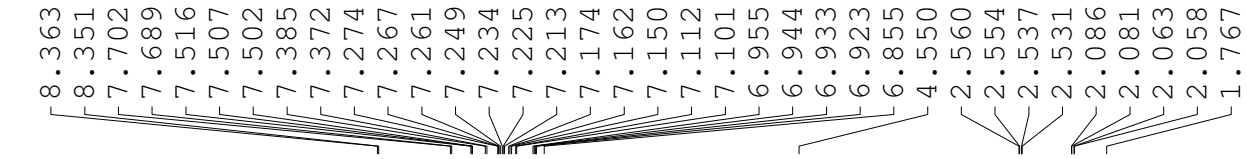


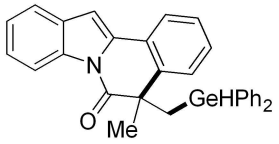


3s



NAME	LYN-195p-20210318
EXPNO	2
PROCNO	1
Date_	20210318
Time	19.19
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	100
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	11.90 usec
SI	32768
SF	150.9128806 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





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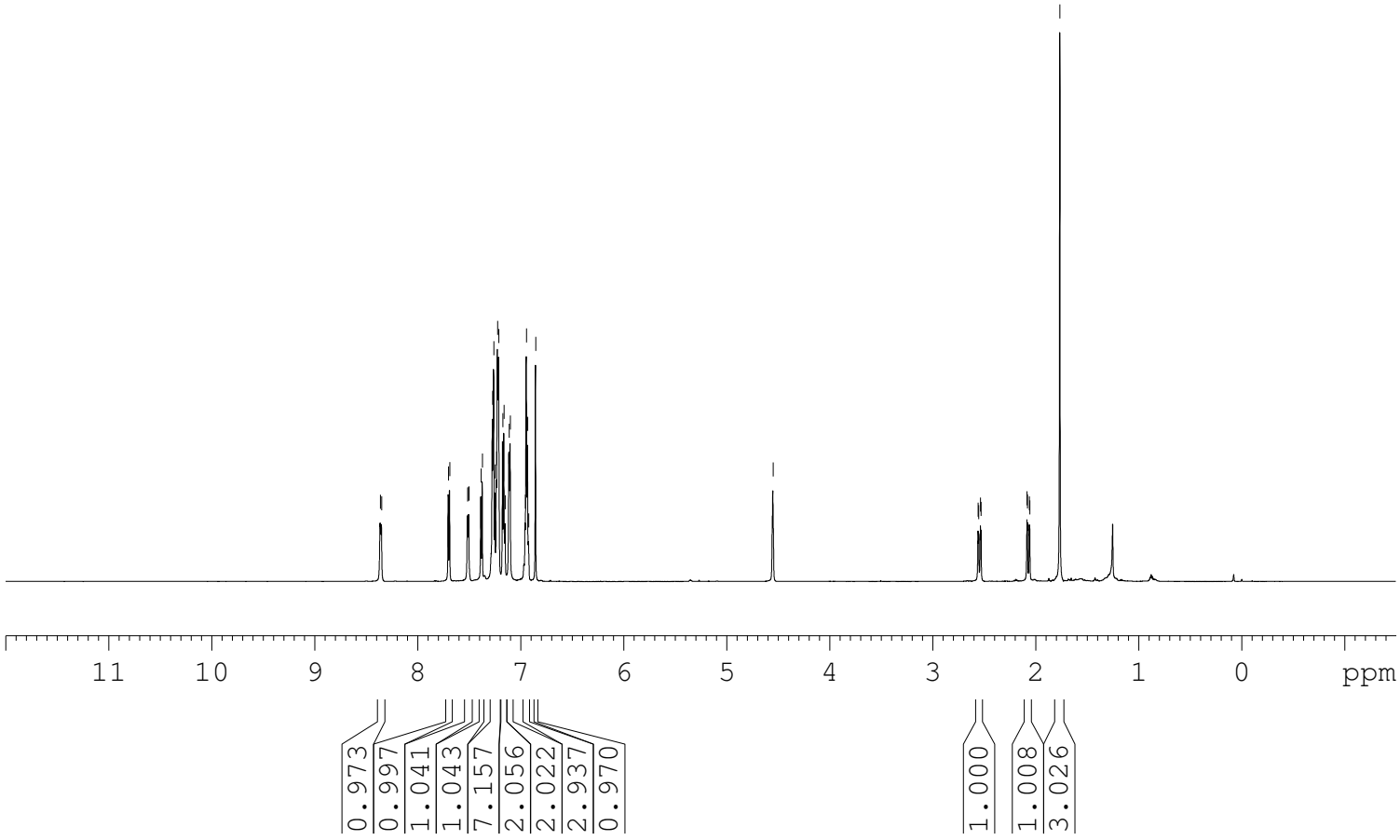
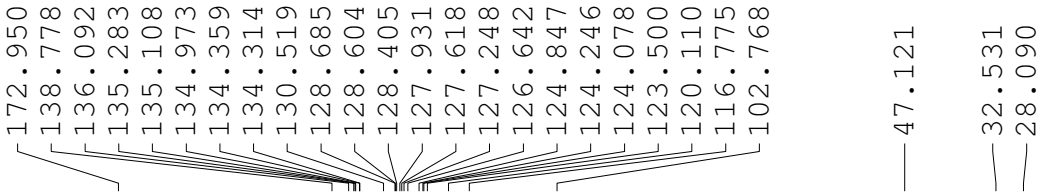
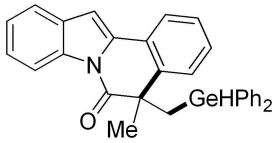


NAME	LYN-282p1-20210509
EXPNO	1
PROCNO	1
Date_	20210509
Time	19.31
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	294.4 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700360 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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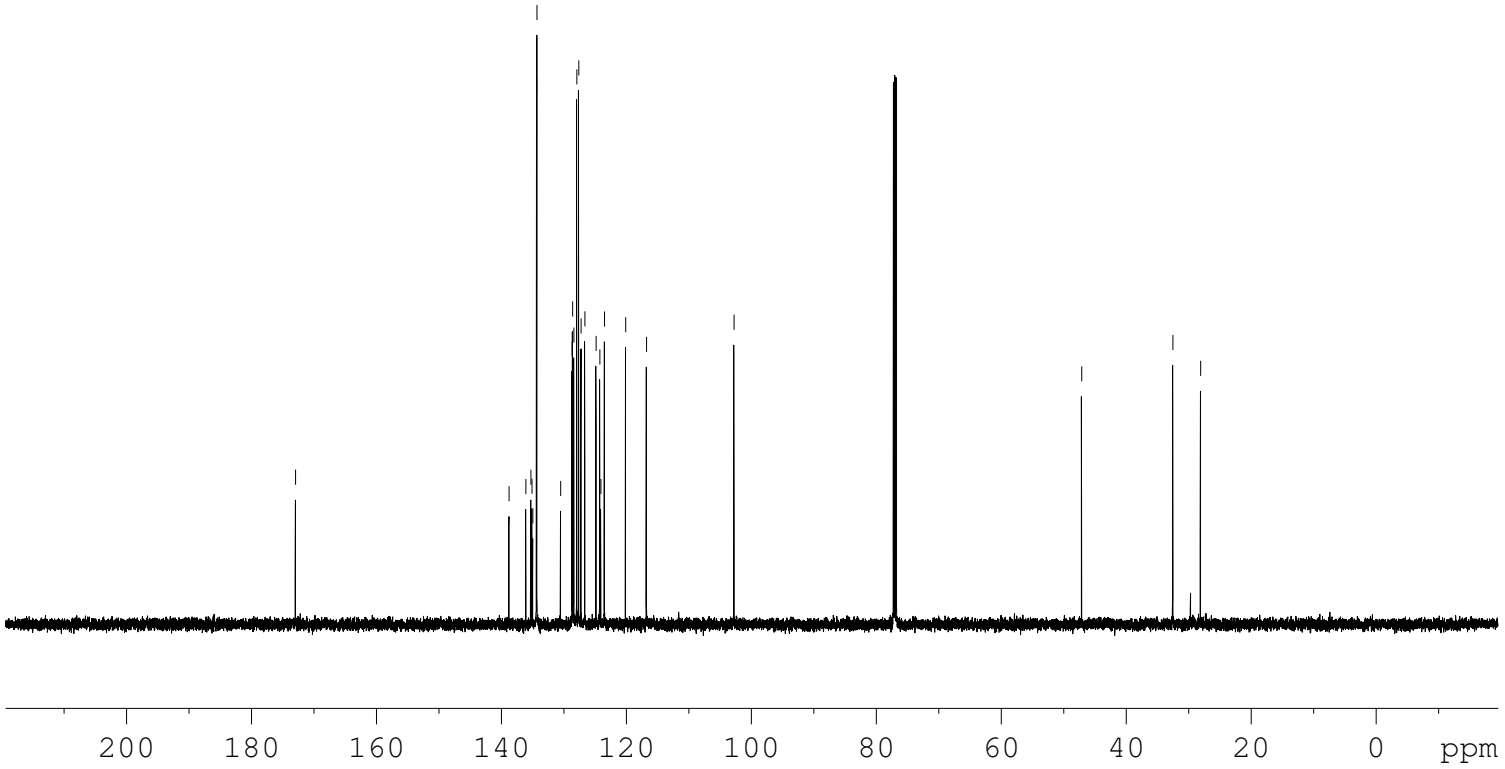
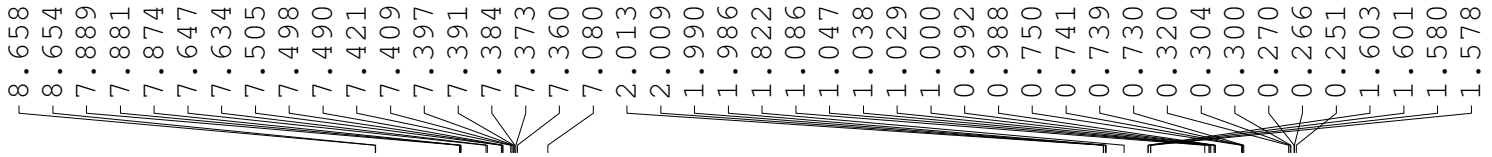
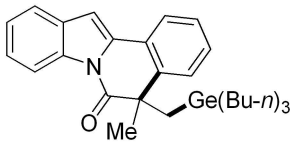
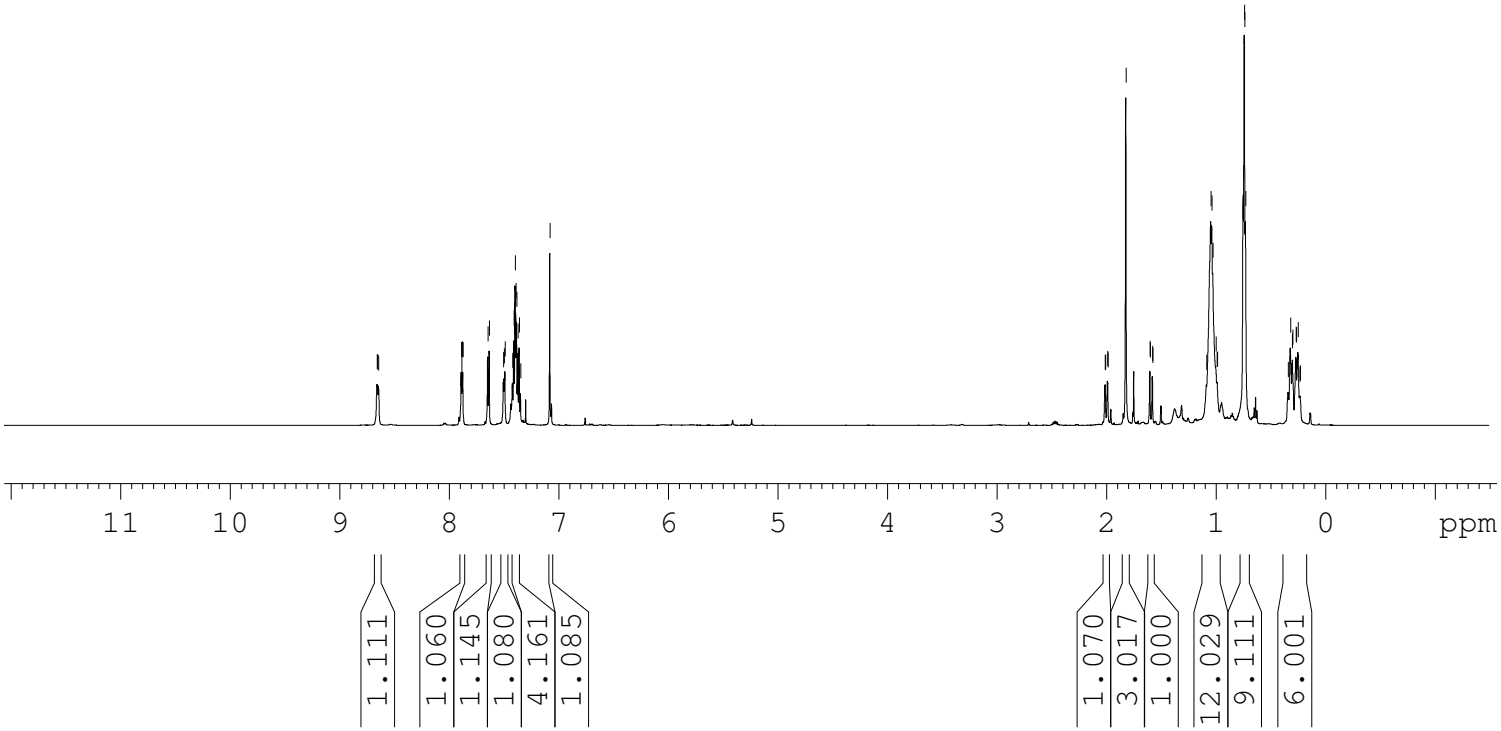


NAME	LYN-282p1-20210509
EXPNO	2
PROCNO	1
Date_	20210509
Time	19.35
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	100
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	295.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128786 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

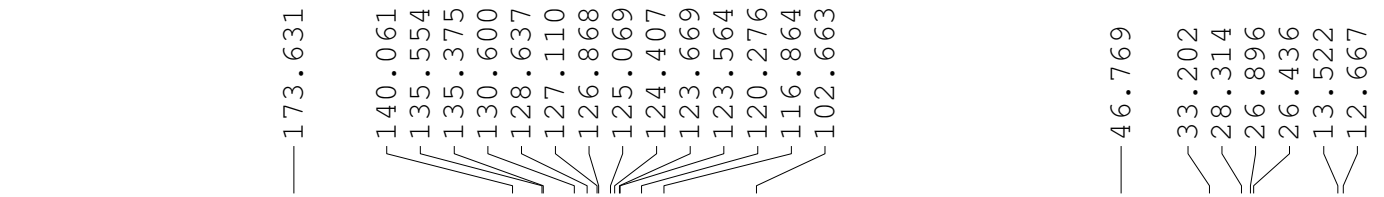


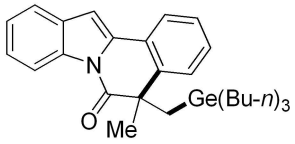


3u



NAME	LYN-3u-20210807
EXPNO	1
PROCNO	1
Date_	20210807
Time	17.33
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	294.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1699916 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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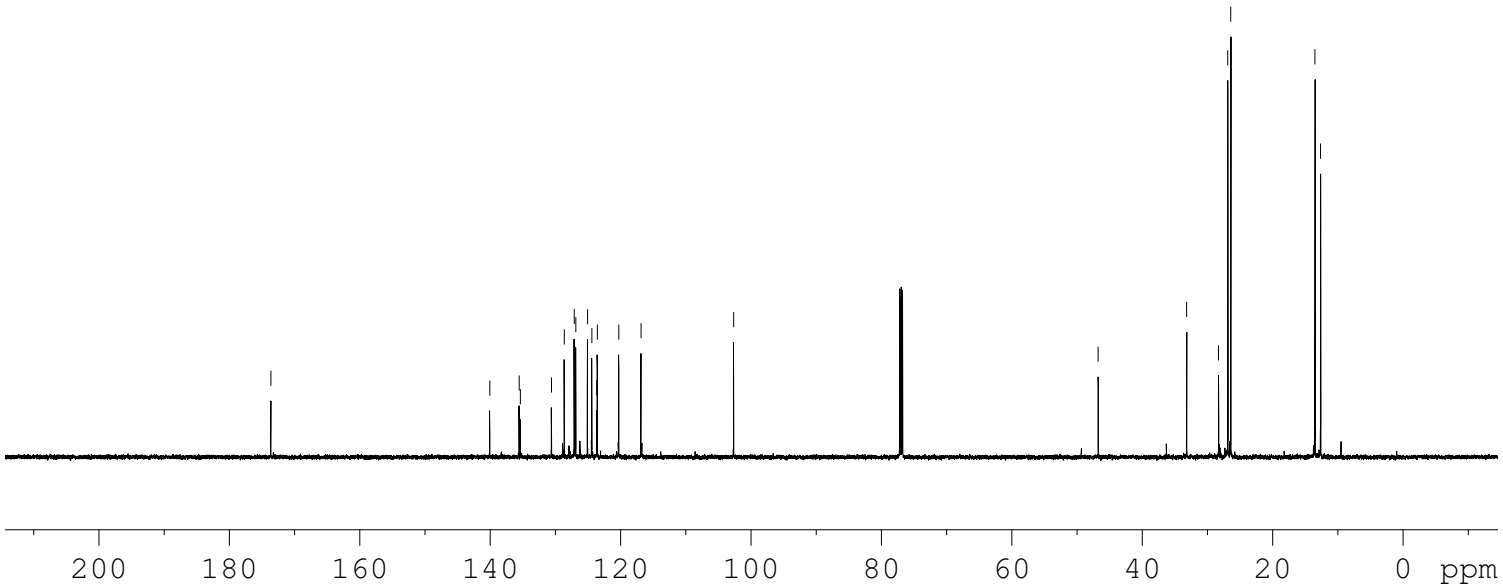
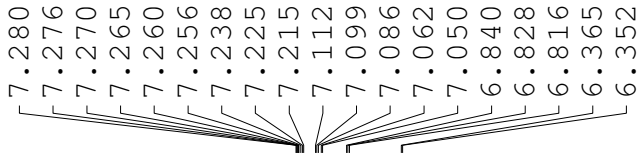
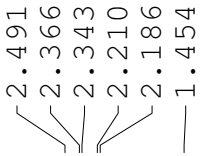
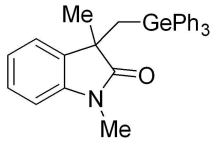


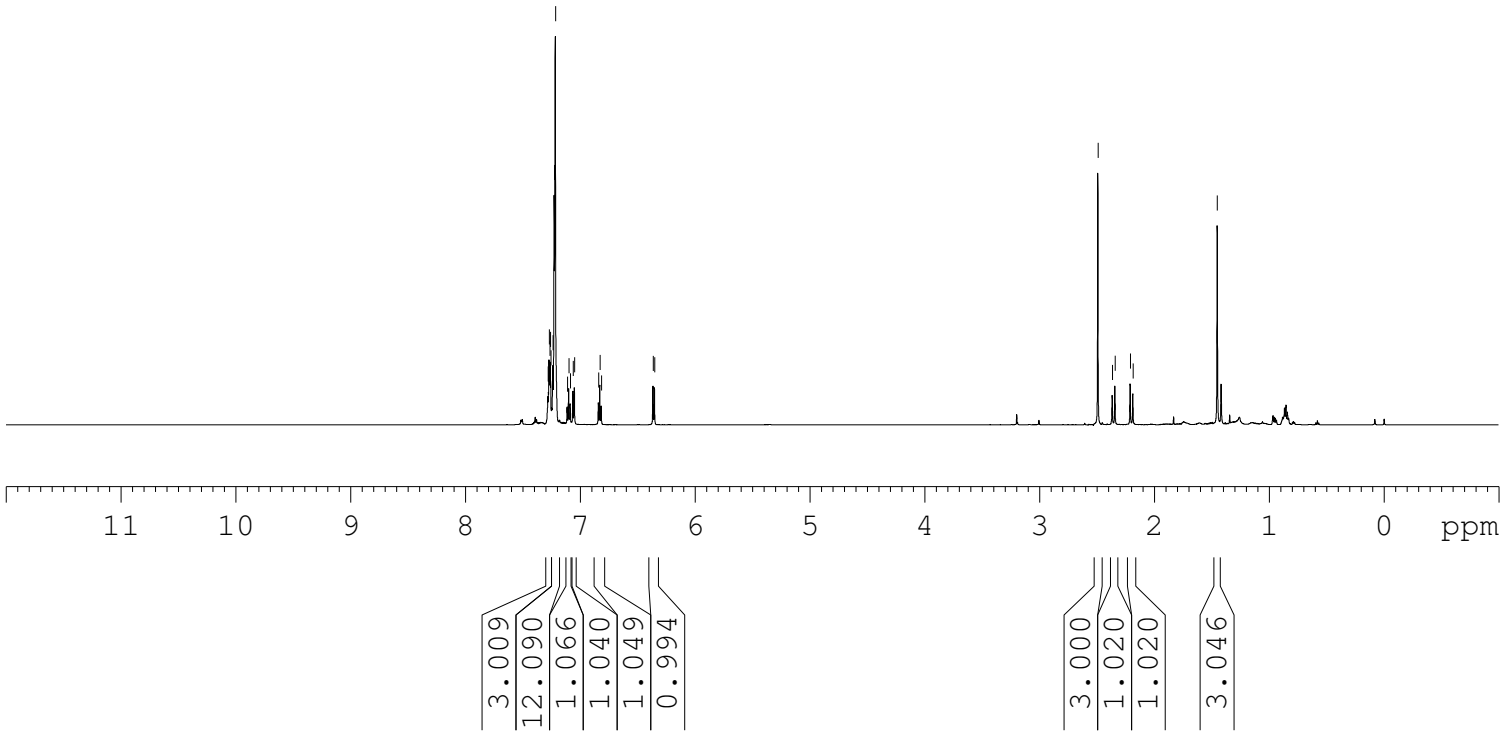
NAME	LYN-3u-20210807
EXPNO	2
PROCNO	1
Date_	20210807
Time	20.47
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	160
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	295.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128763 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



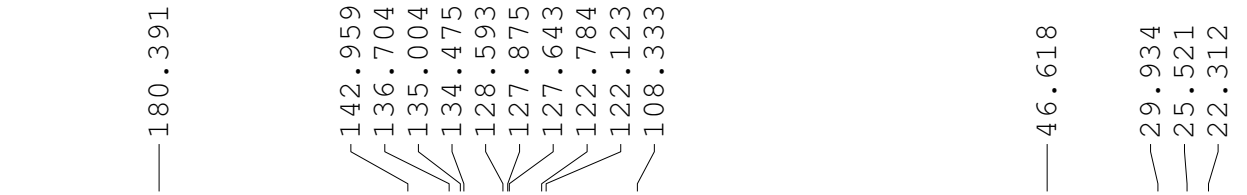


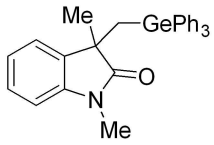


5a

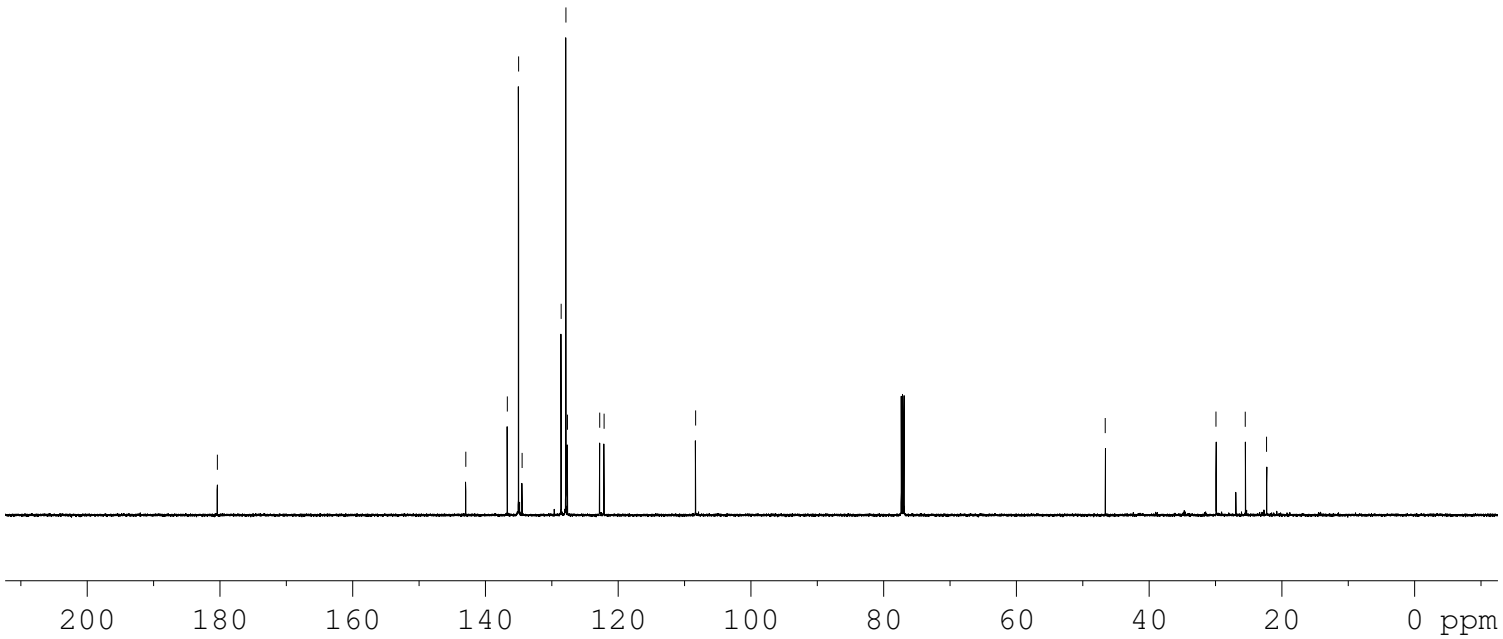


NAME	LYN-5a-20210808
EXPNO	1
PROCNO	1
Date_	20210808
Time	9.15
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	25.32
DW	52.000 usec
DE	6.50 usec
TE	295.7 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.77 usec
SI	65536
SF	600.1700402 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

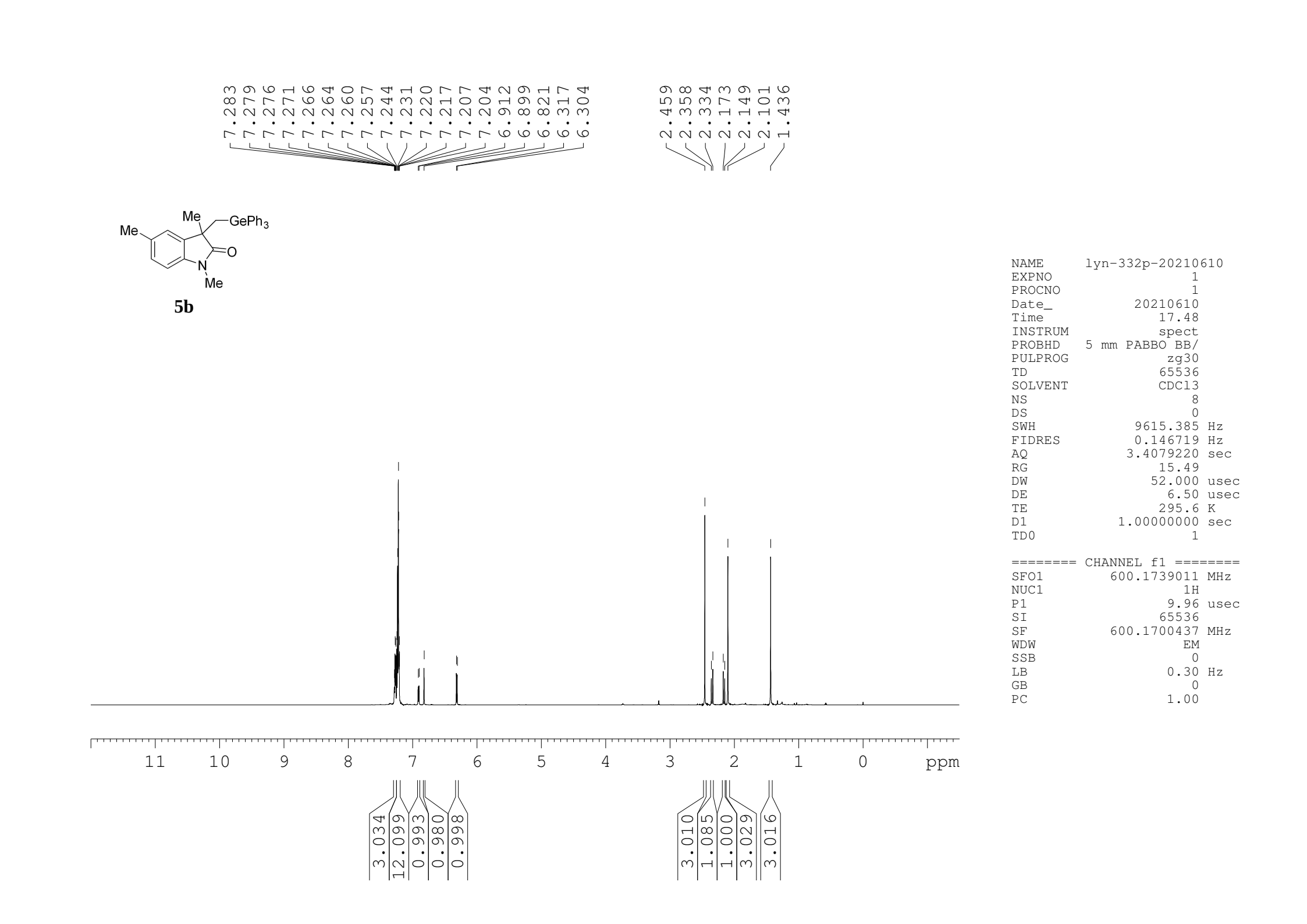




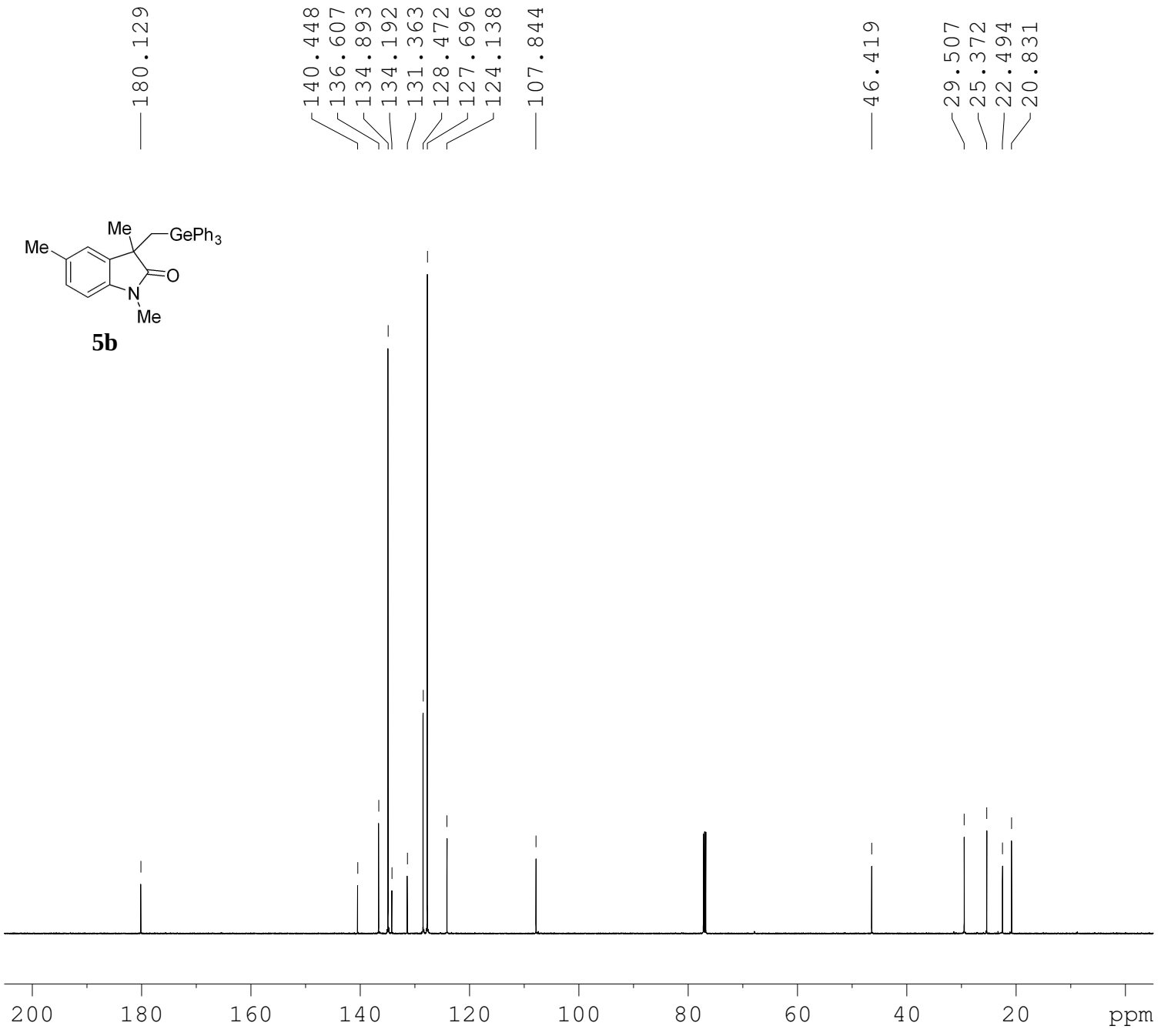
5a



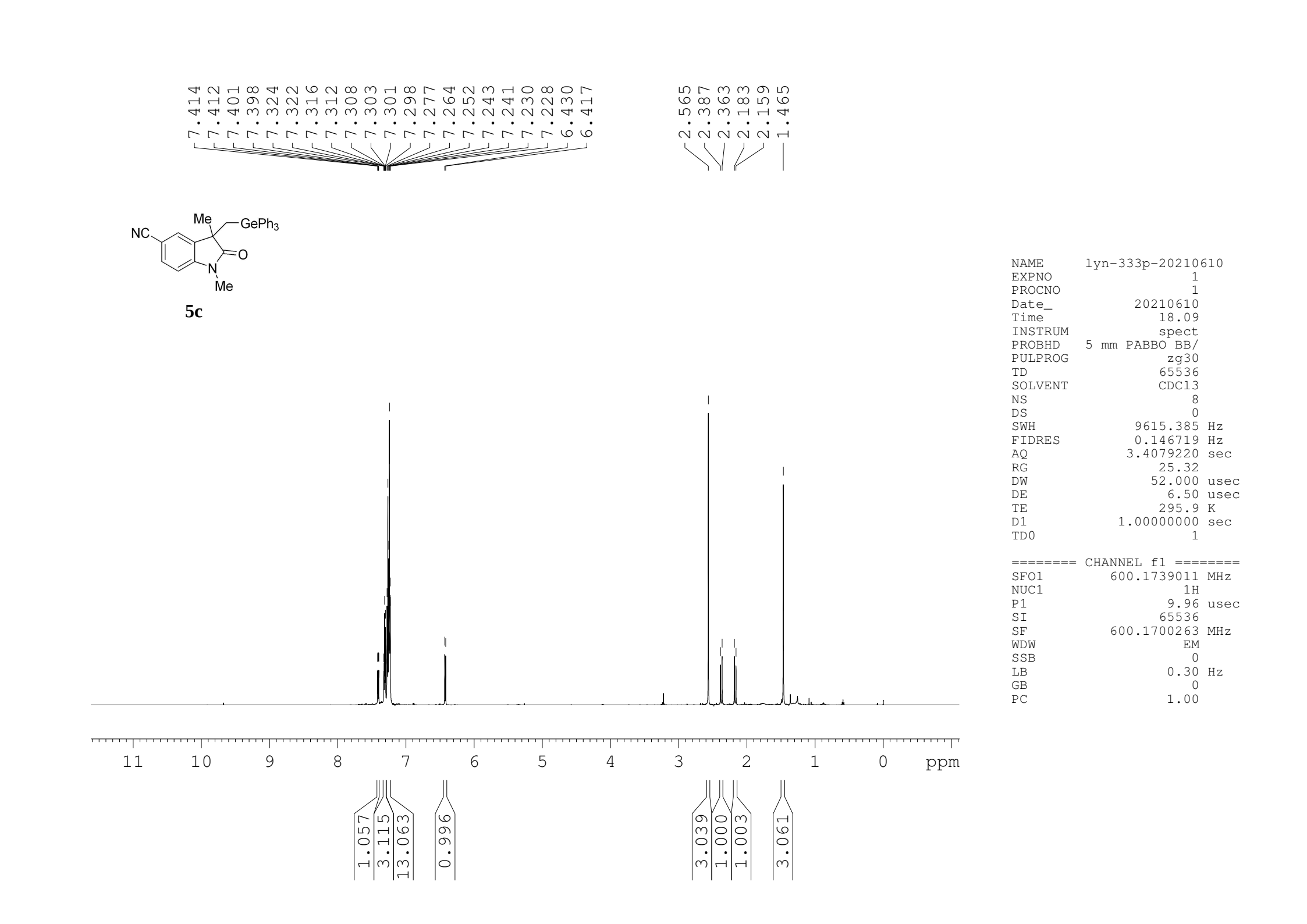
NAME	LYN-5a-20210808
EXPNO	2
PROCNO	1
Date_	20210808
Time	9.48
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	160
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.6 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	11.90 usec
SI	32768
SF	150.9128665 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



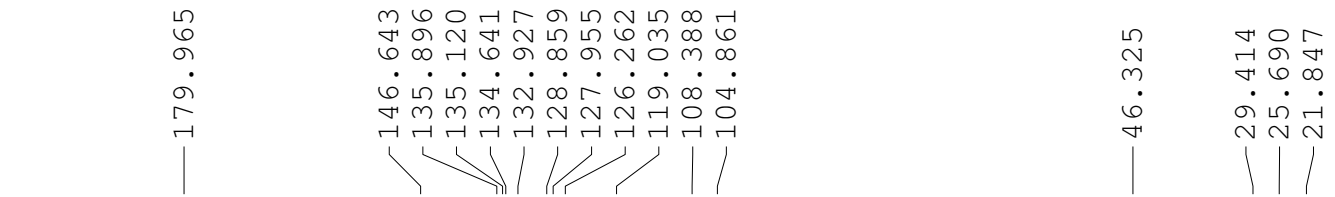
NAME	lyn-332p-20210610
EXPNO	1
PROCNO	1
Date_	20210610
Time	17.48
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	295.6 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700437 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

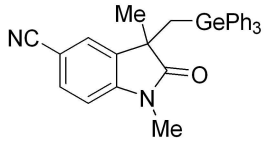


NAME	lyn-332p-20210610
EXPNO	2
PROCNO	1
Date_	20210610
Time	18.05
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128881 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

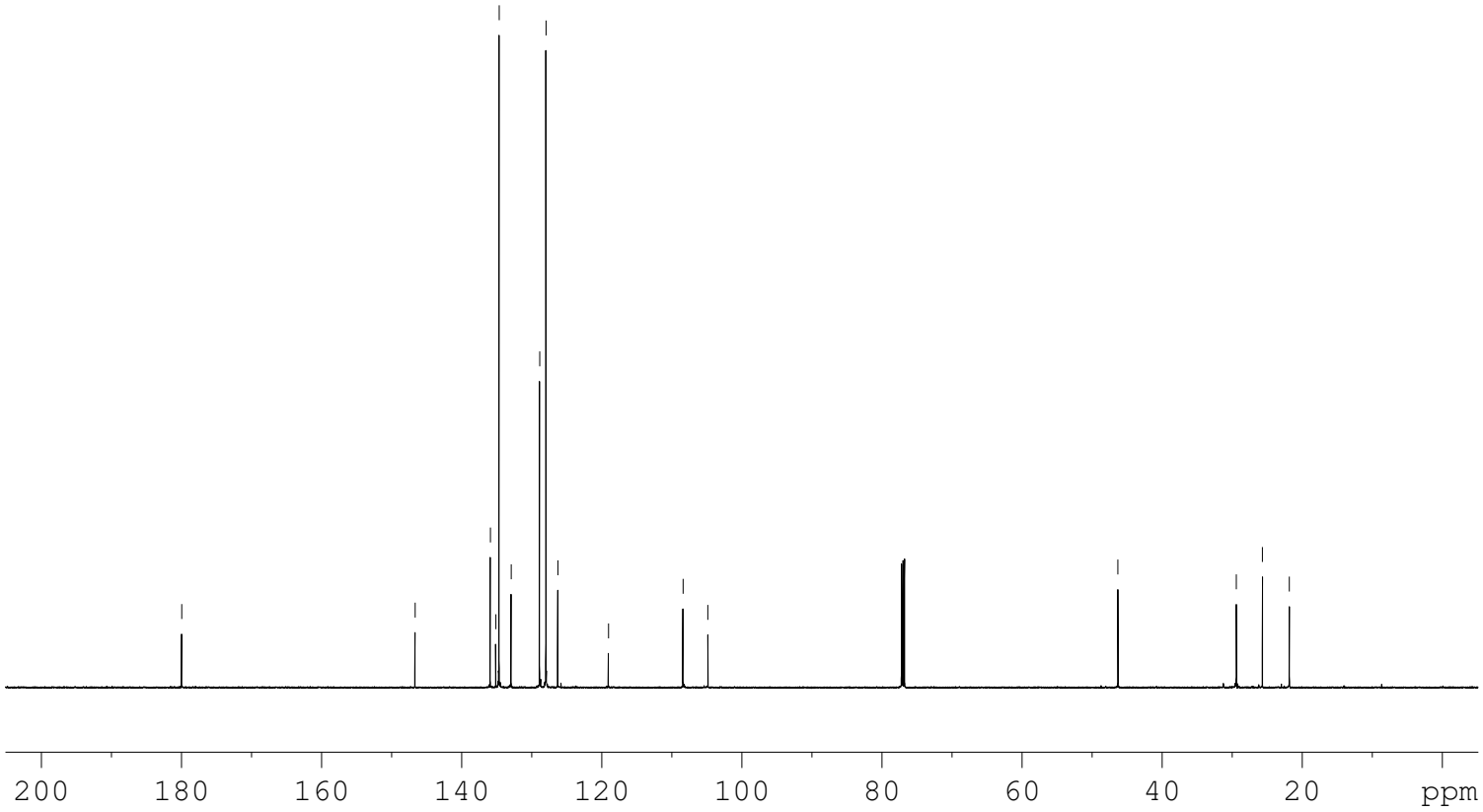


NAME	lyn-333p-20210610
EXPNO	1
PROCNO	1
Date_	20210610
Time	18.09
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	25.32
DW	52.000 usec
DE	6.50 usec
TE	295.9 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700263 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

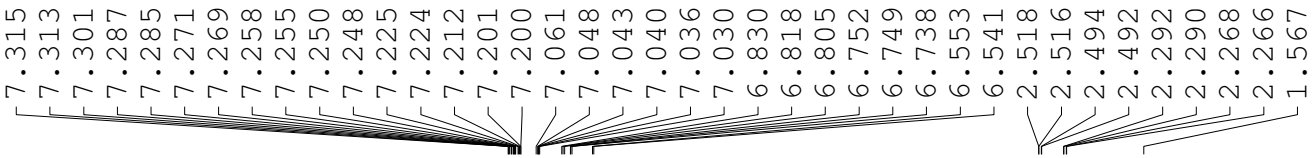


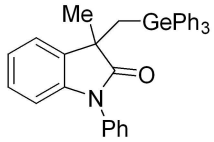


5c

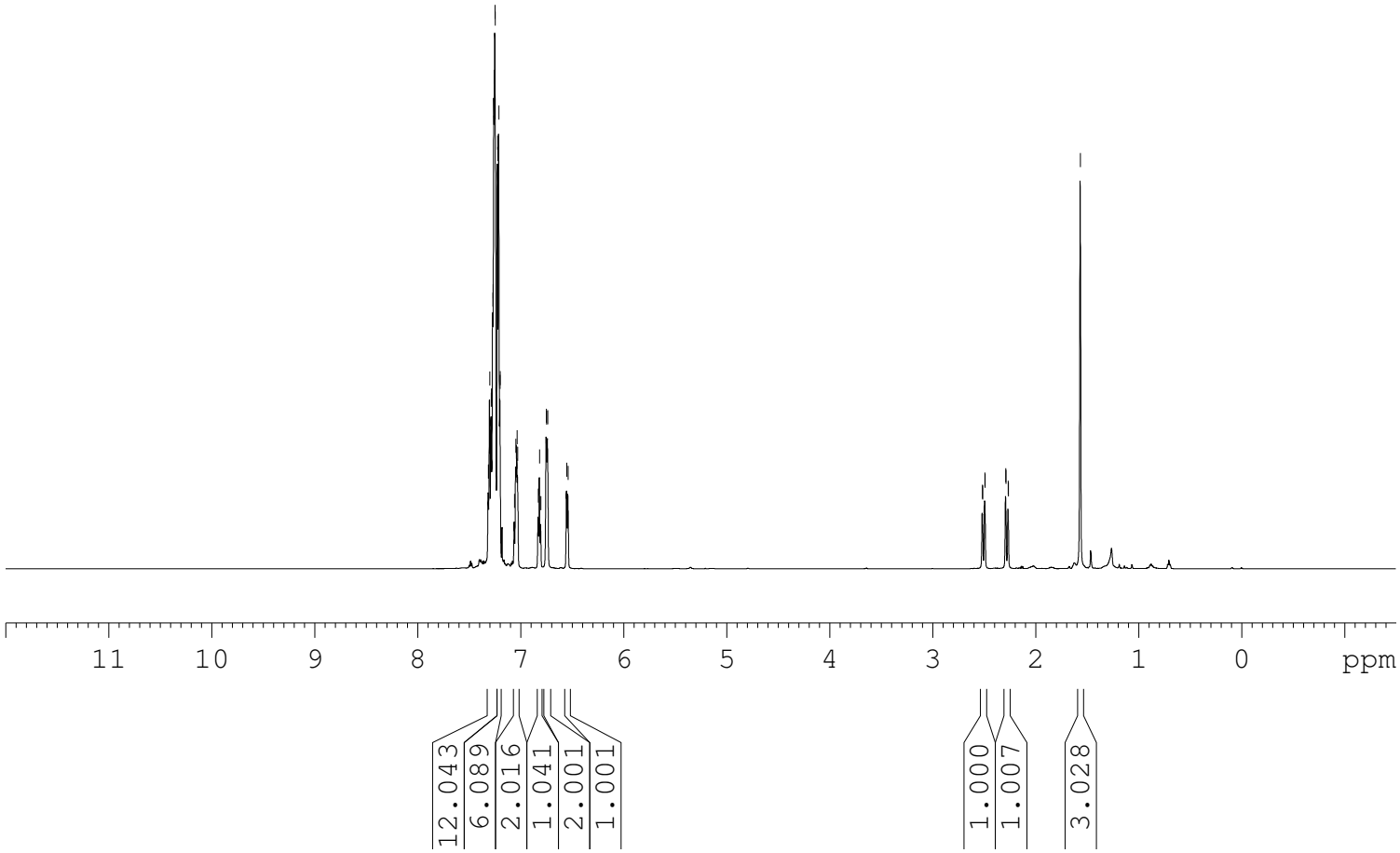


NAME	lyn-333p-20210610
EXPNO	2
PROCNO	1
Date_	20210610
Time	18.25
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	300
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.0 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128886 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

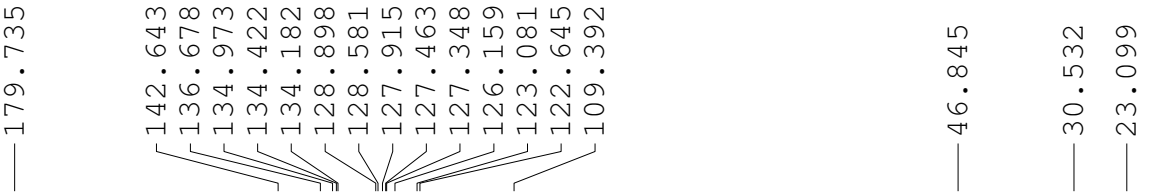


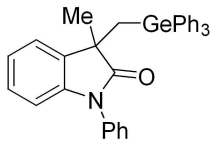


5d

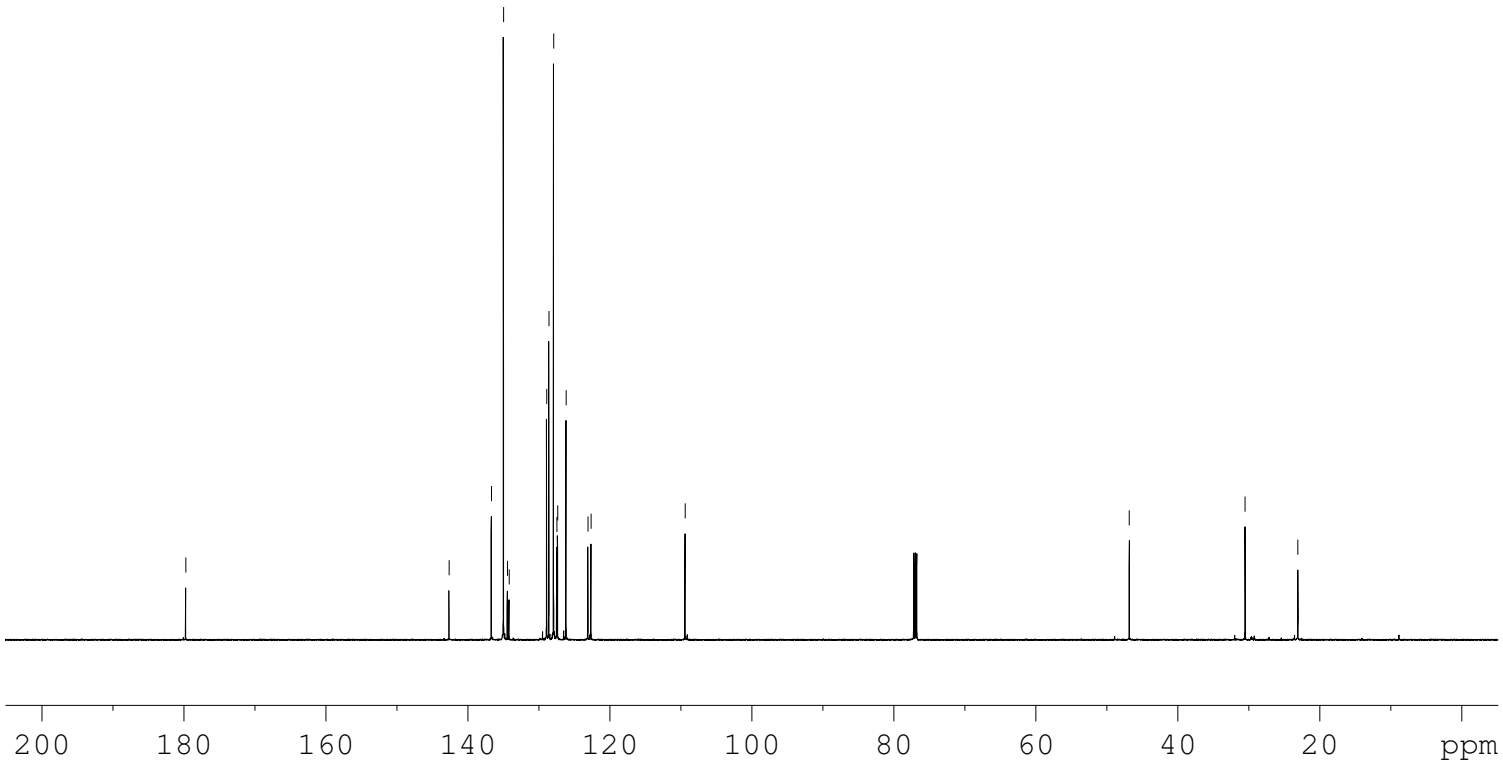


NAME	lyn-335p-1
EXPNO	1
PROCNO	1
Date_	20210612
Time	0.23
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	296.1 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700637 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

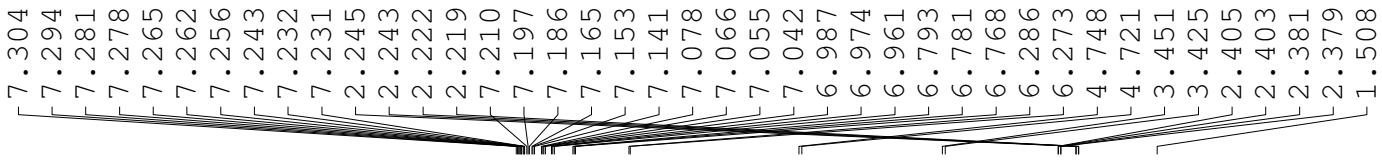


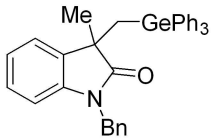


5d

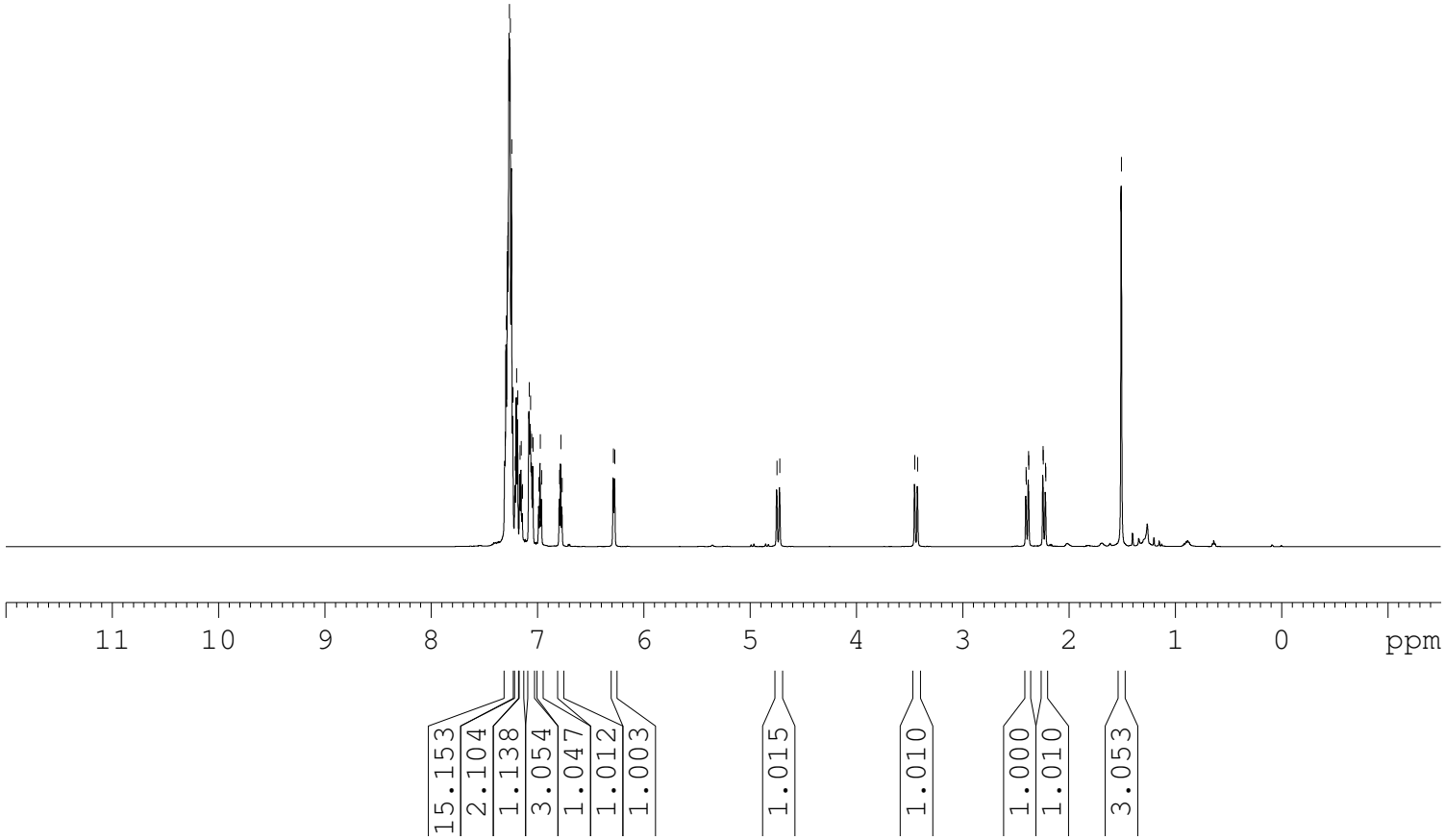


NAME	lyn-335p-1
EXPNO	2
PROCNO	1
Date_	20210612
Time	0.49
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128929 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

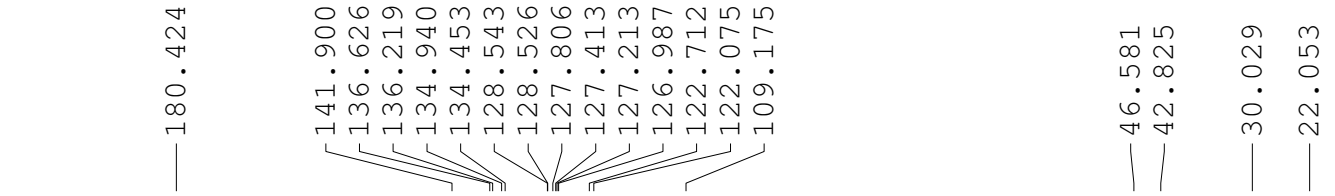


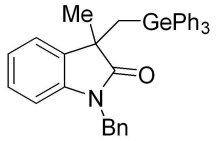


5e



NAME	lyn-334p-1
EXPNO	1
PROCNO	1
Date_	20210611
Time	23.53
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	296.0 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700585 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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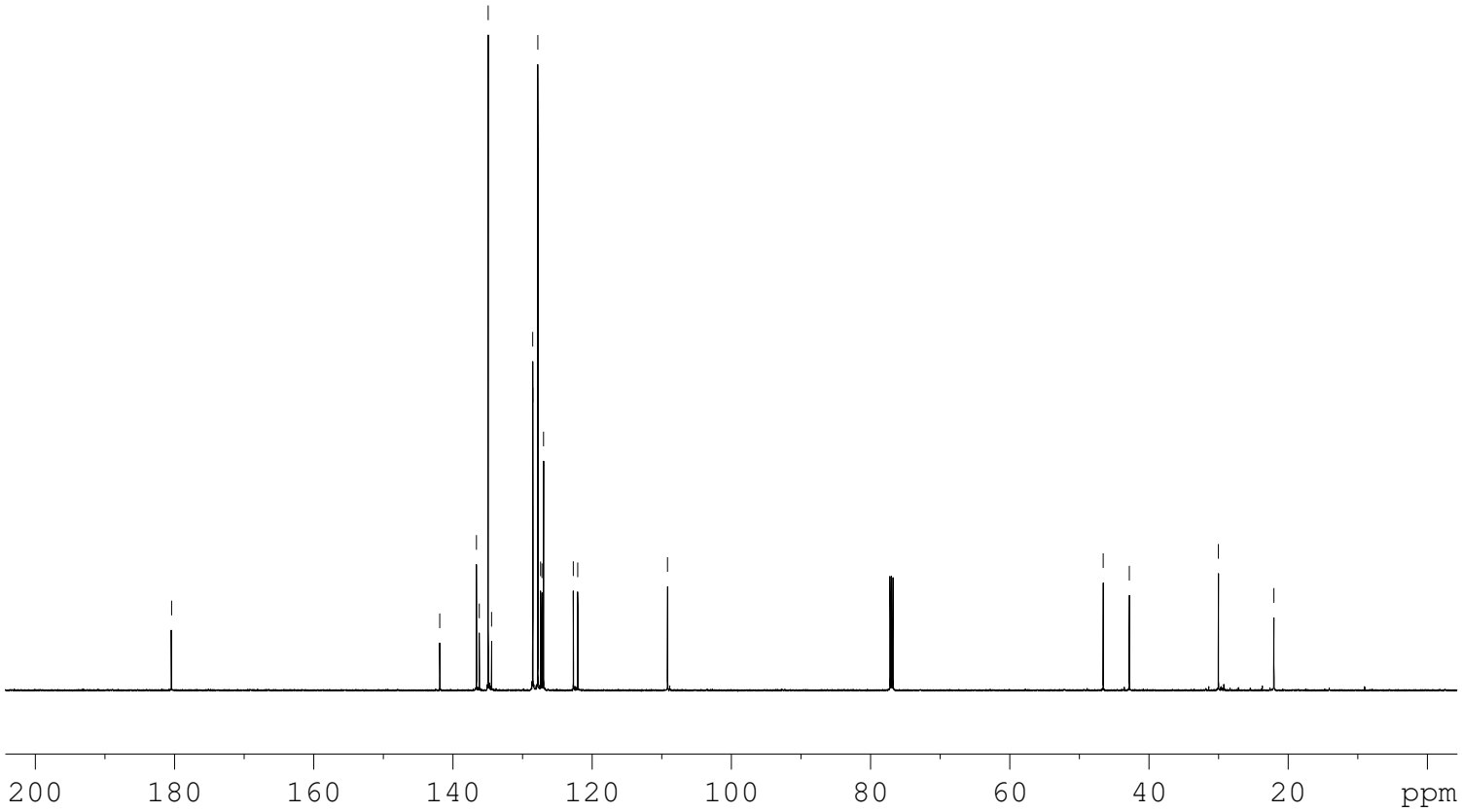
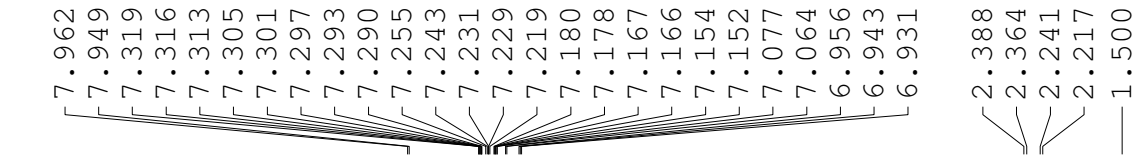
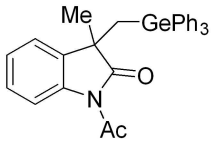


NAME	lyn-334p-1
EXPNO	2
PROCNO	1
Date_	20210612
Time	0.19
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.2 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128897 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





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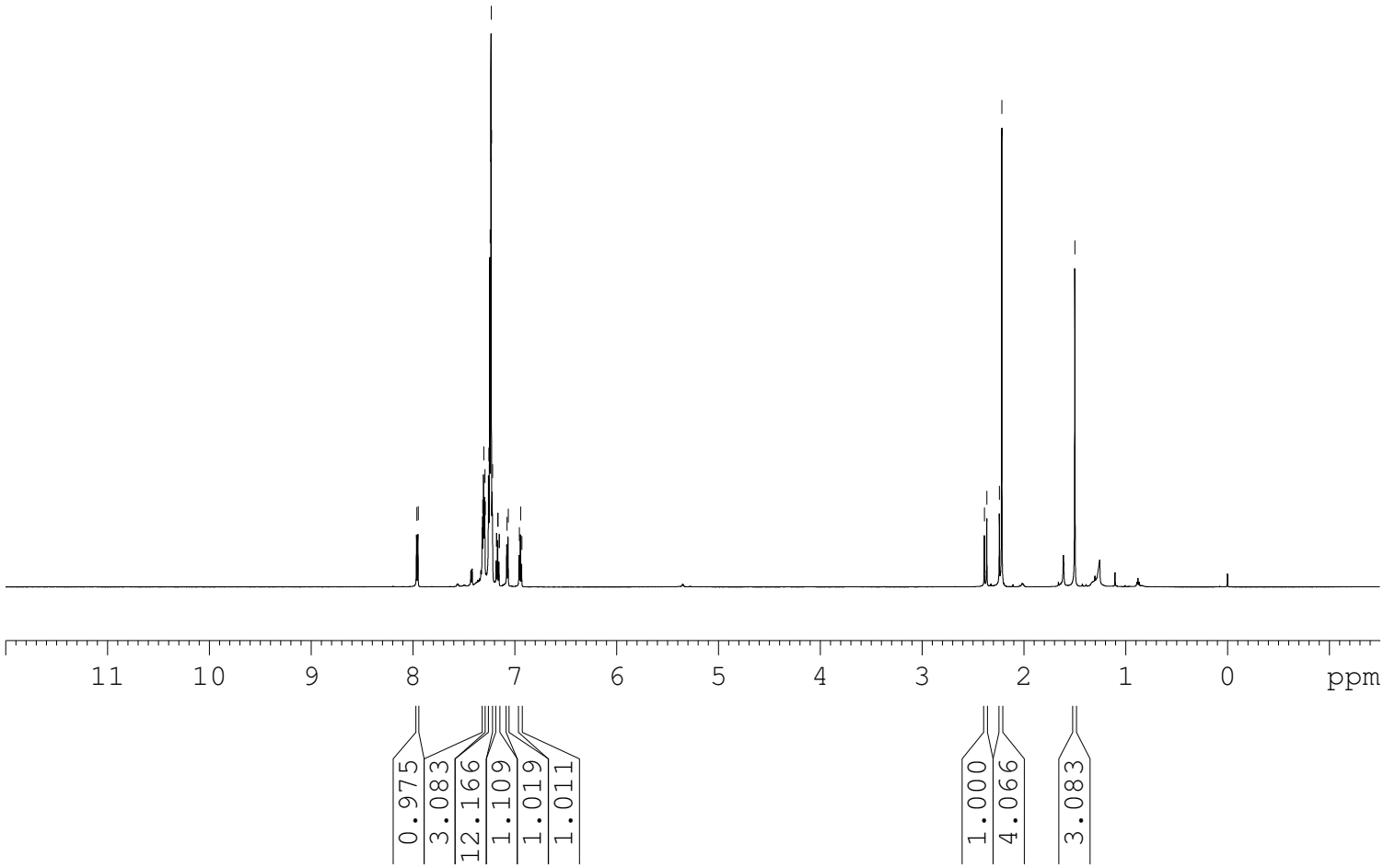
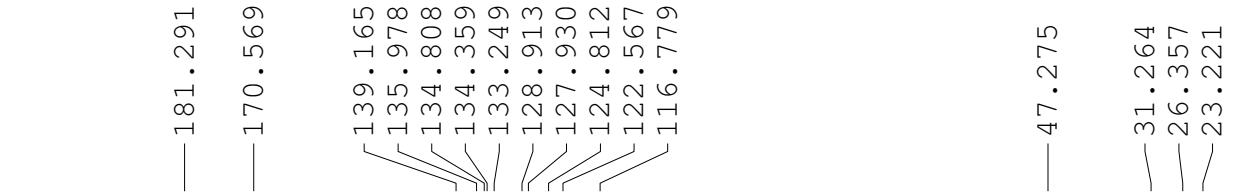
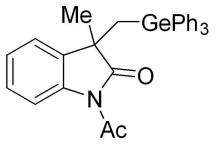


NAME	LYN-326P-20210703
EXPNO	1
PROCNO	1
Date_	20210704
Time	1.11
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	295.7 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700271 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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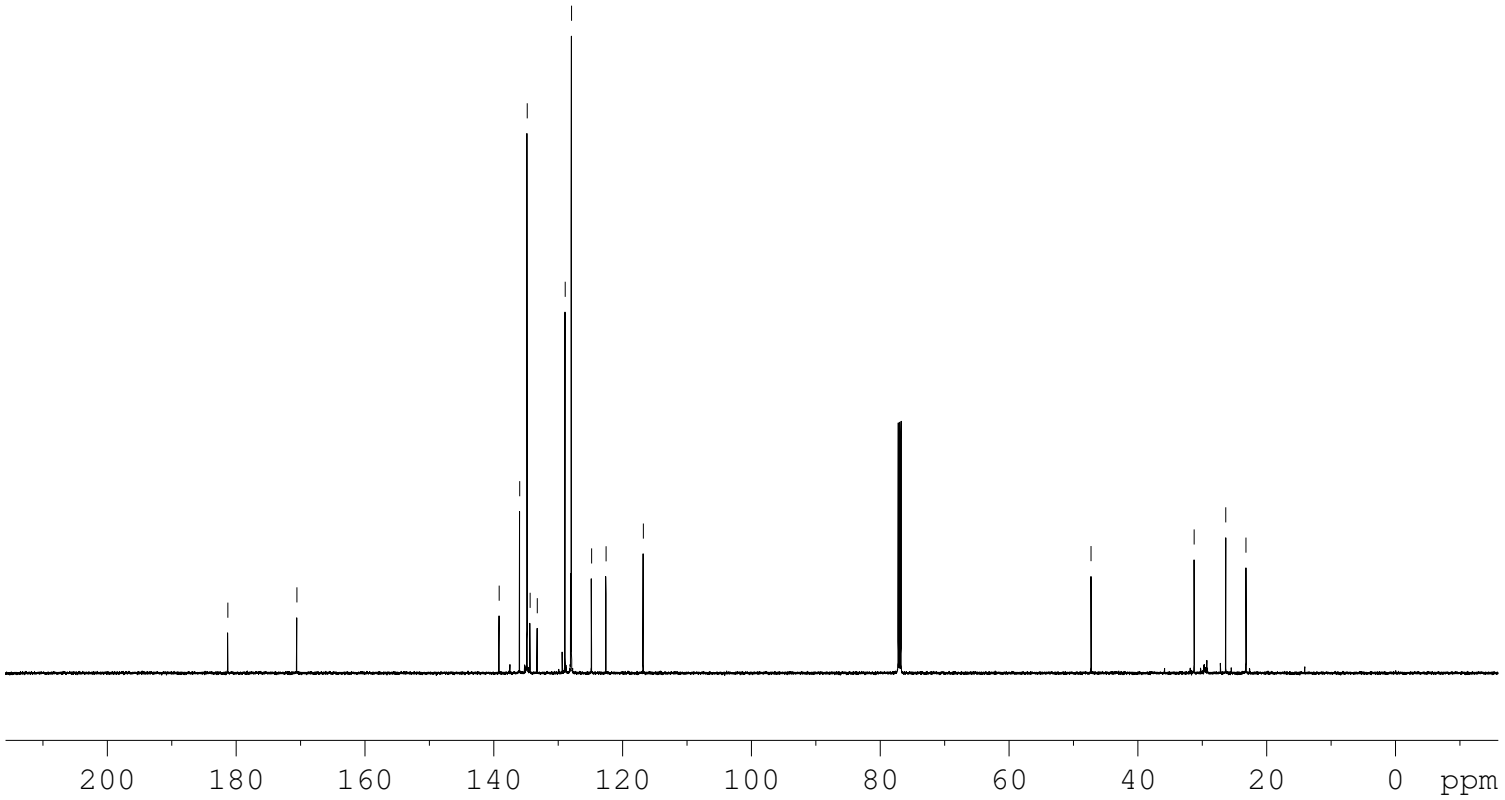
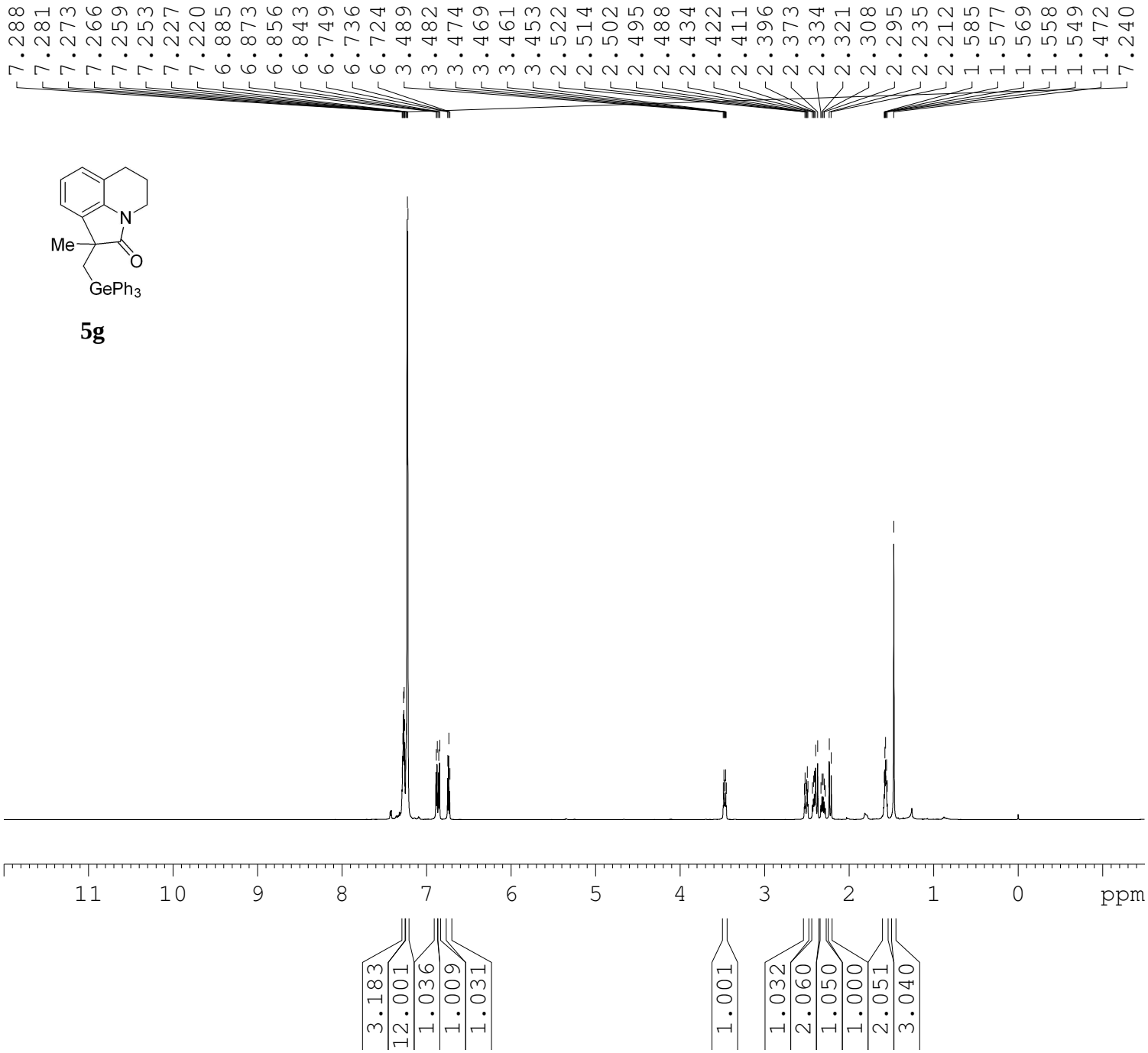
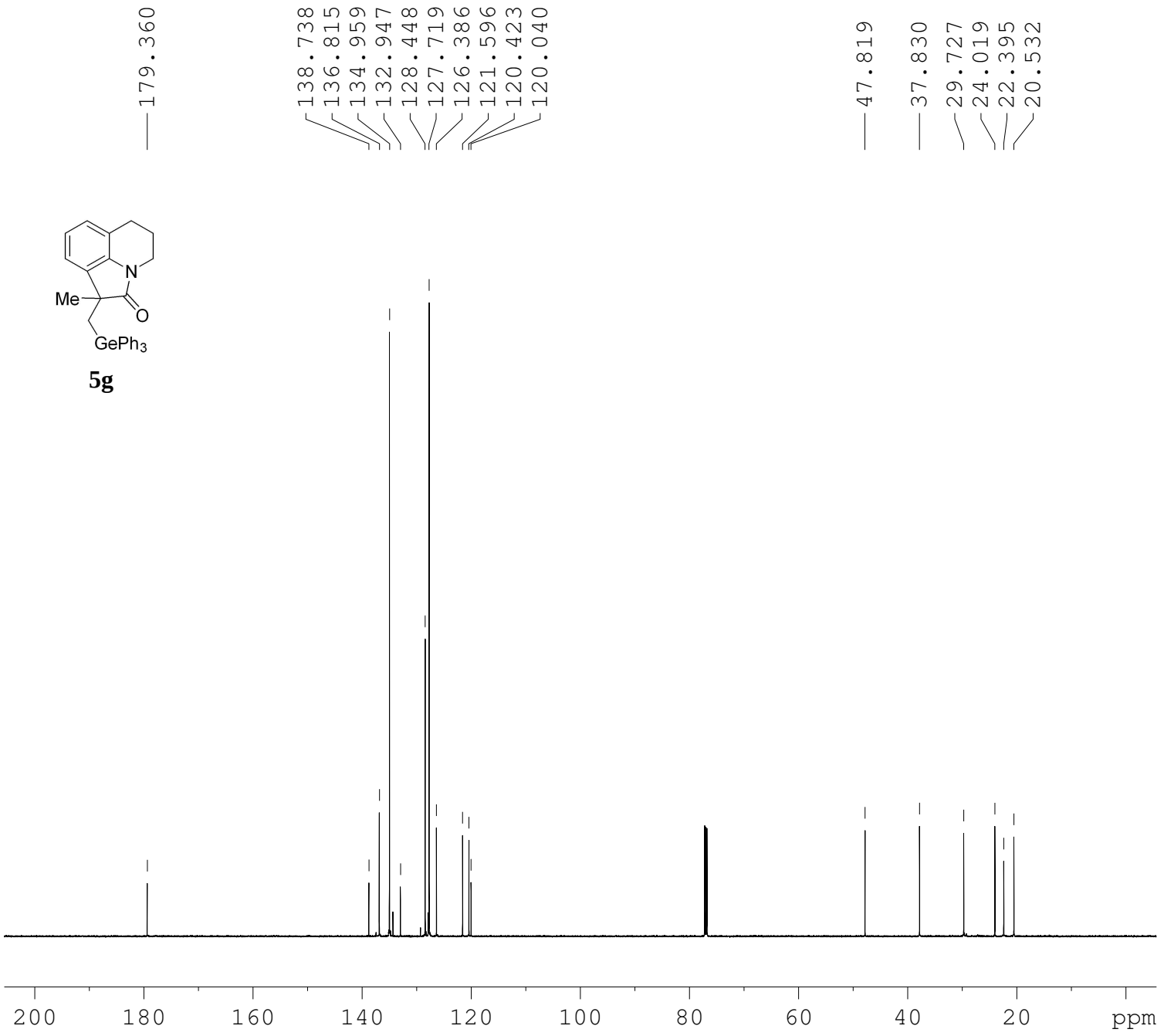


NAME	LYN-326P-20210703
EXPNO	2
PROCNO	1
Date_	20210704
Time	1.37
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128772 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



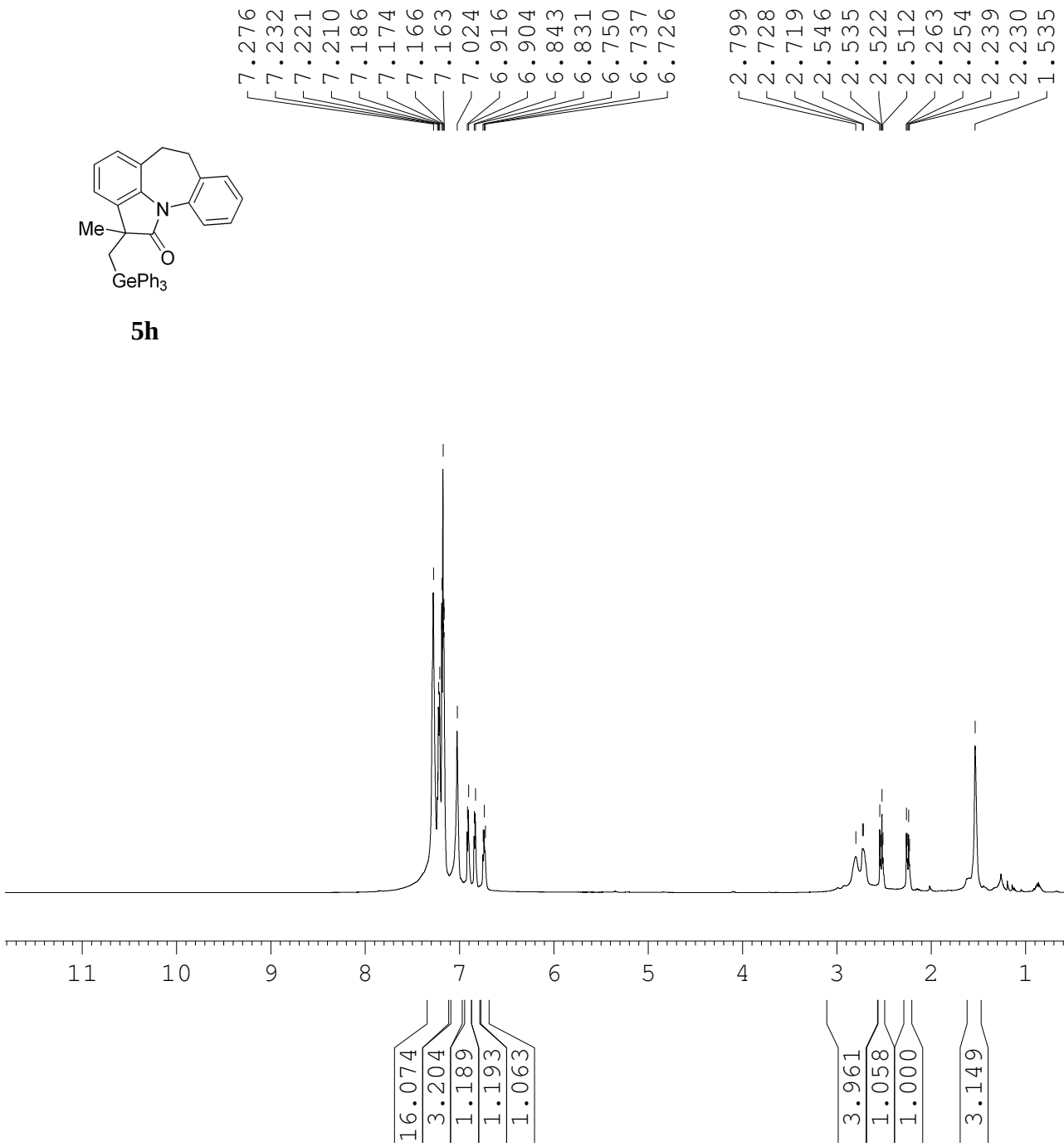
5g

NAME	LYN-340P-2-20210628
EXPNO	1
PROCNO	1
Date_	20210629
Time	4.49
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	28.69
DW	52.000 usec
DE	6.50 usec
TE	296.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700397 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



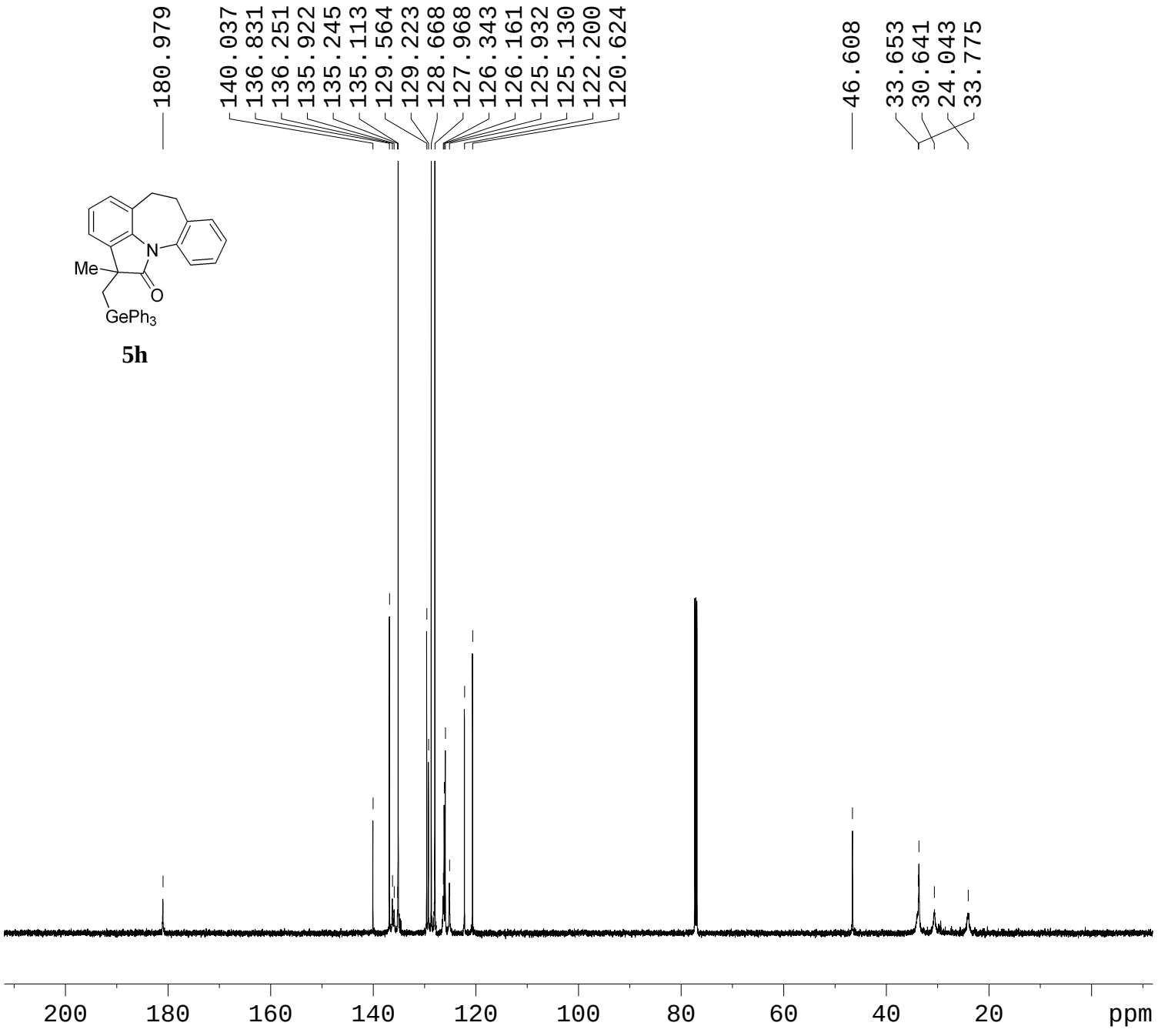
5g

NAME	LYN-340P-2-20210628
EXPNO	2
PROCNO	1
Date_	20210629
Time	5.10
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.8 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128854 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40



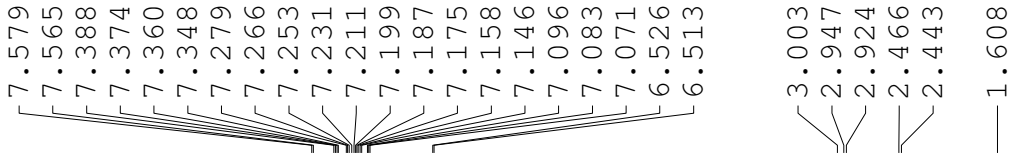
5h

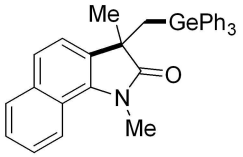
NAME	lyn-338p-1-20210616
EXPNO	1
PROCNO	1
Date_	20210616
Time	14.43
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	298.2 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700687 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



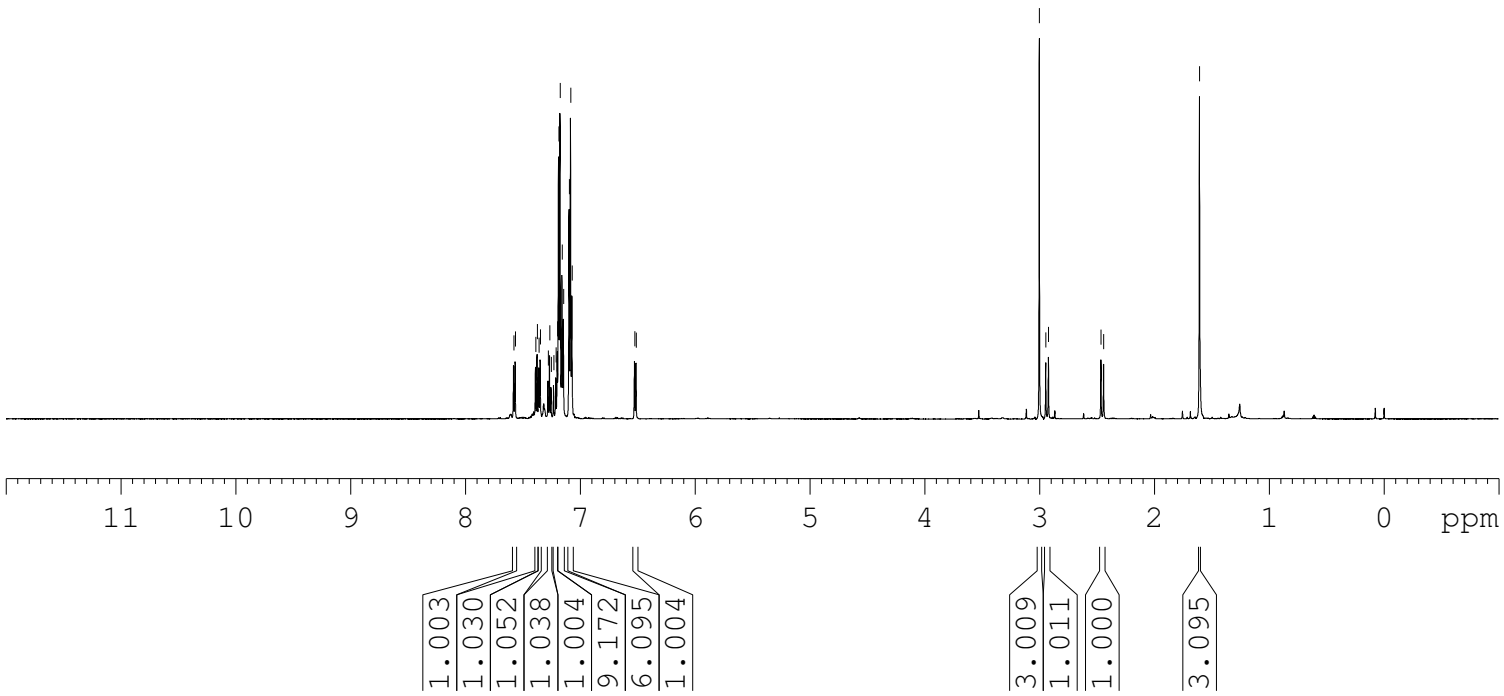
5h

NAME	lyn-338p-1-1
EXPNO	2
PROCNO	1
Date_	20210612
Time	1.18
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128665 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

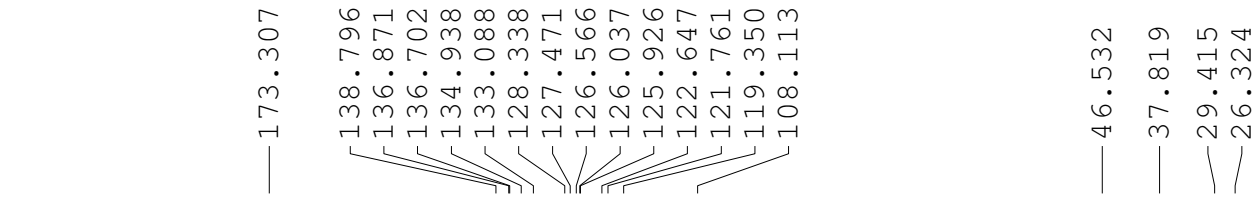


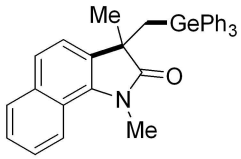


5i

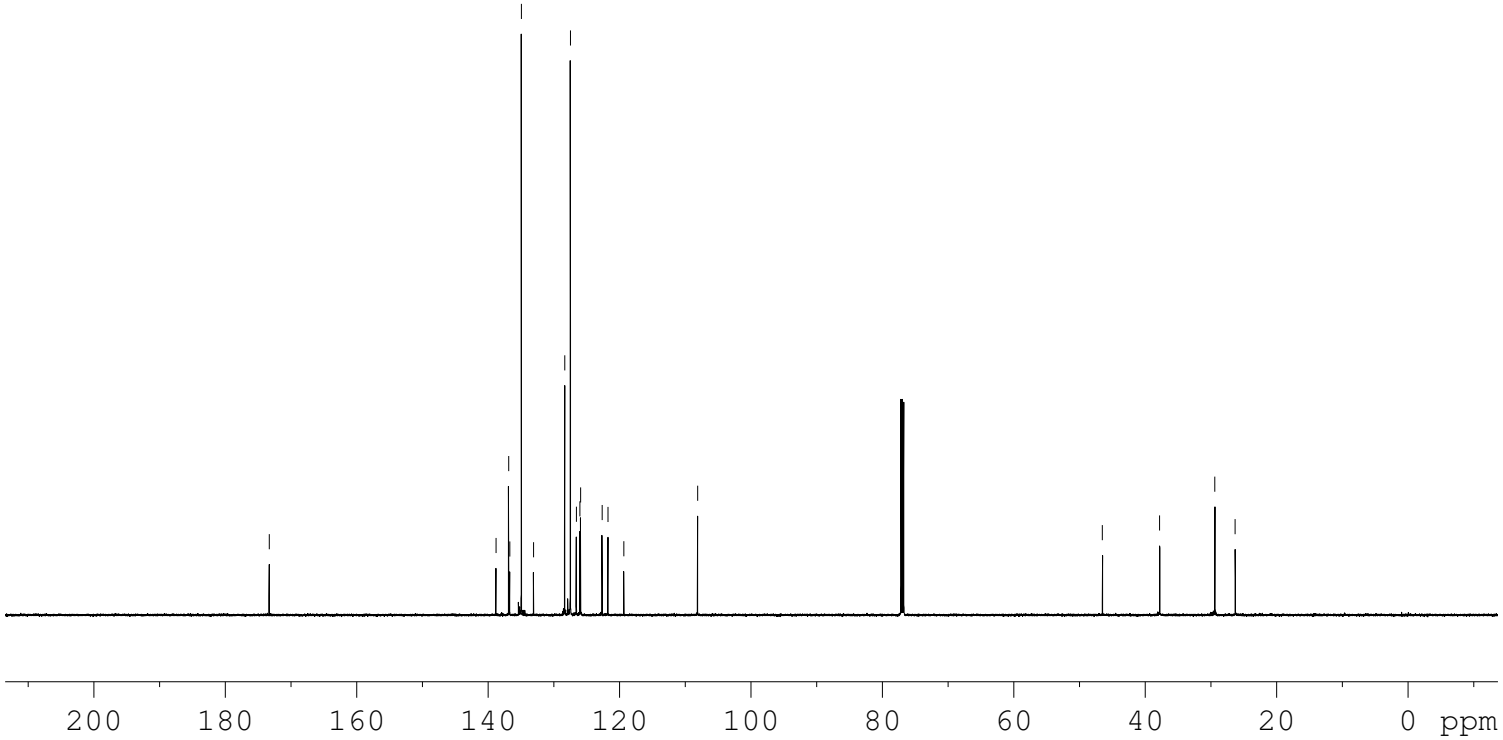


NAME	lyn-5i-1-20210808
EXPNO	1
PROCNO	1
Date_	20210808
Time	12.30
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	299.6 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700329 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

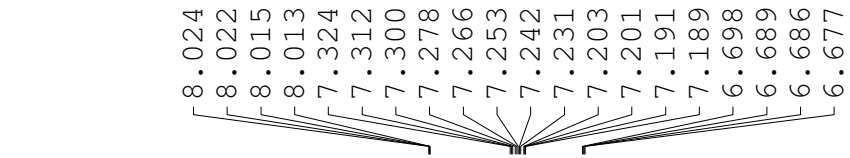


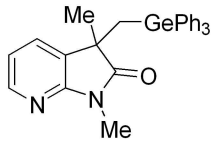


5i

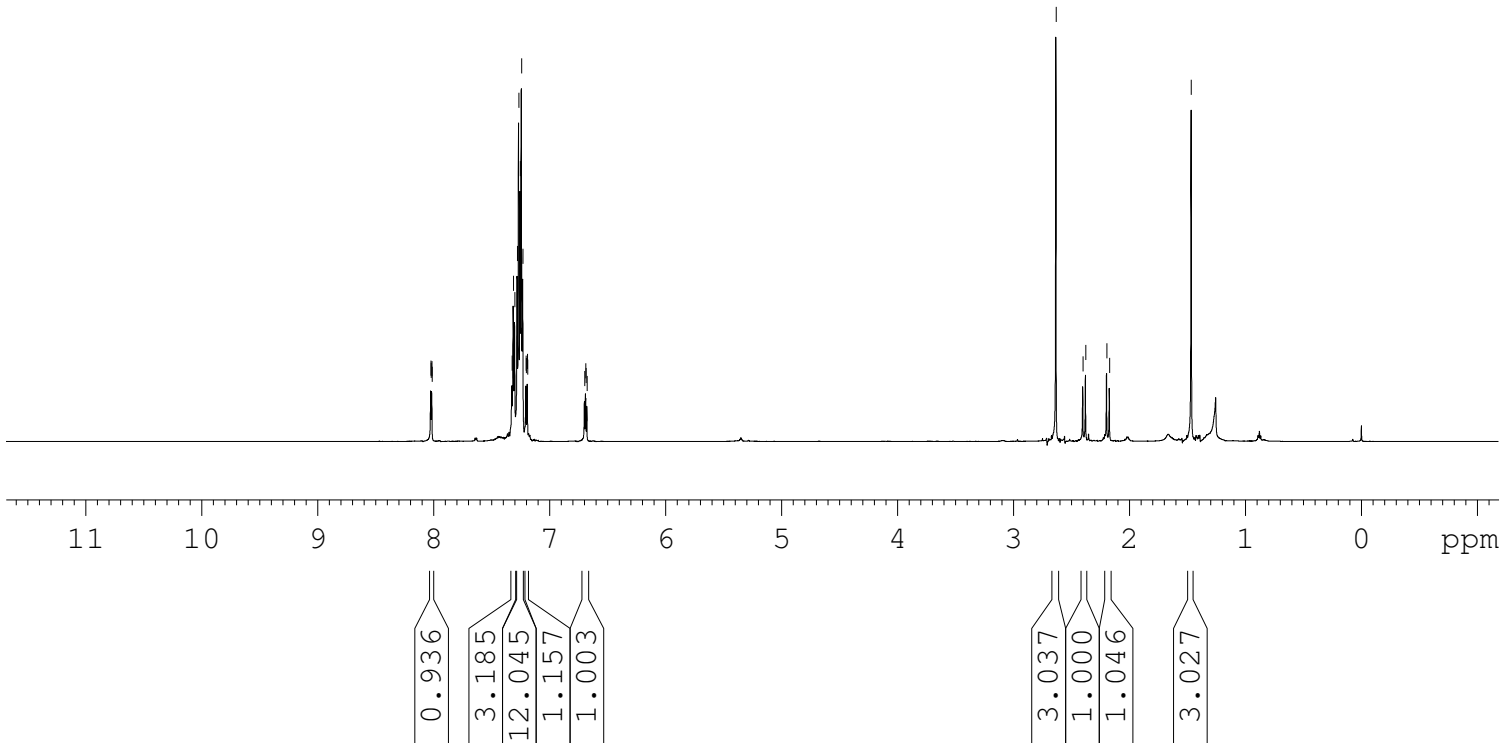


NAME	lyn-5i-2-20210808
EXPNO	1
PROCNO	1
Date_	20210808
Time	13.34
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	298.1 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128778 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

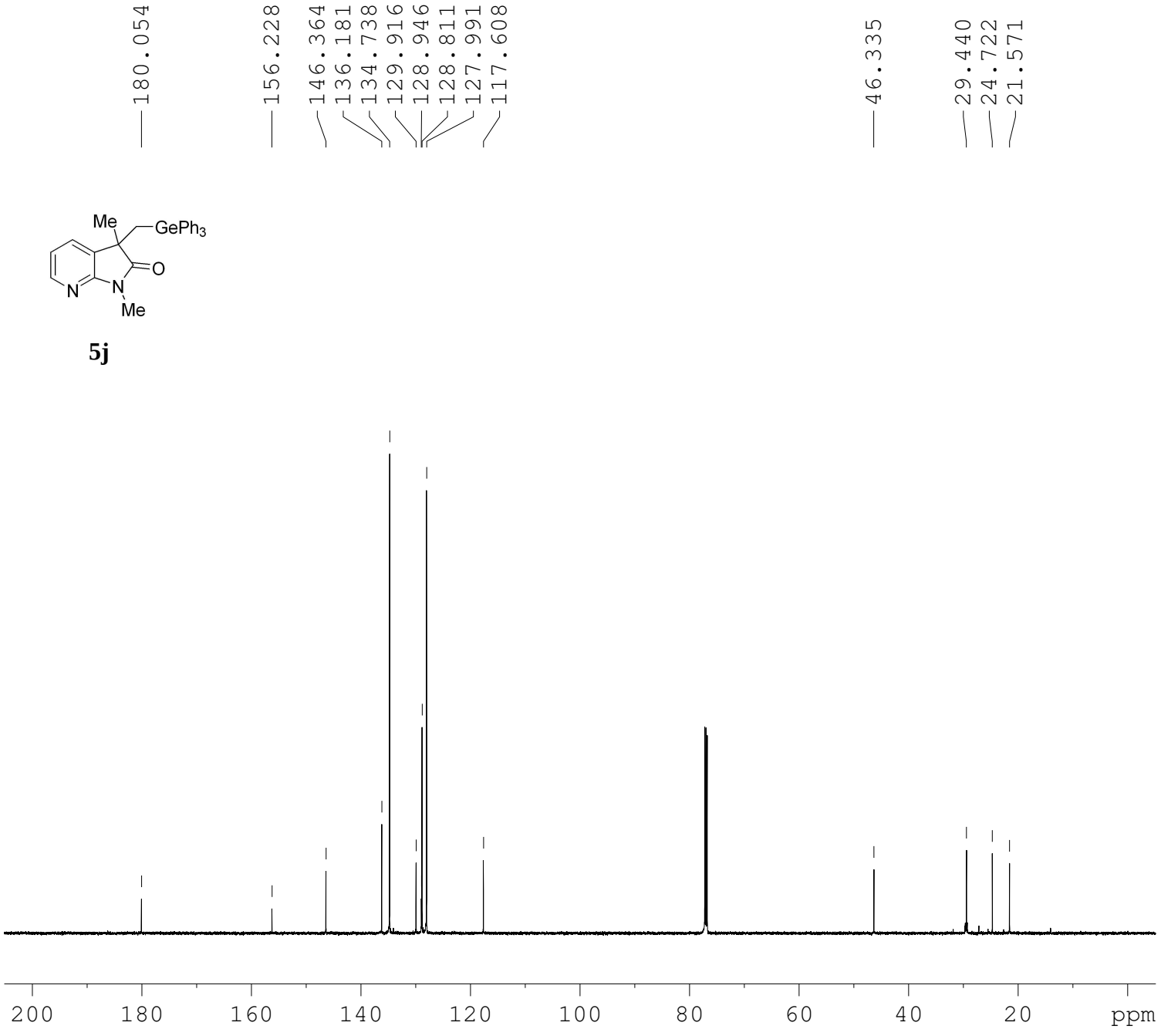




5j

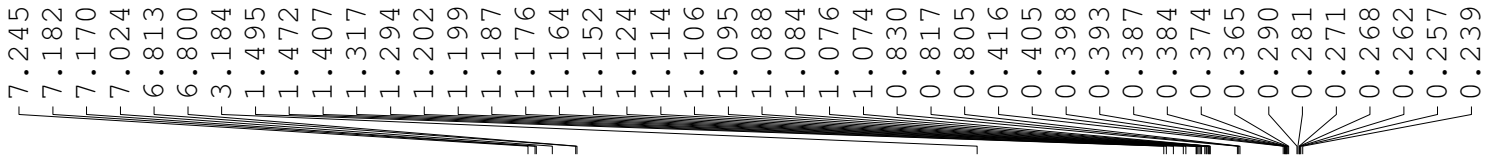


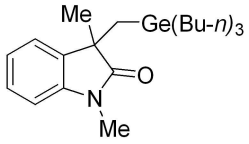
NAME	lyn-349p-2-20210621
EXPNO	1
PROCNO	1
Date_	20210621
Time	20.34
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	69.87
DW	52.000 usec
DE	6.50 usec
TE	301.6 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700203 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



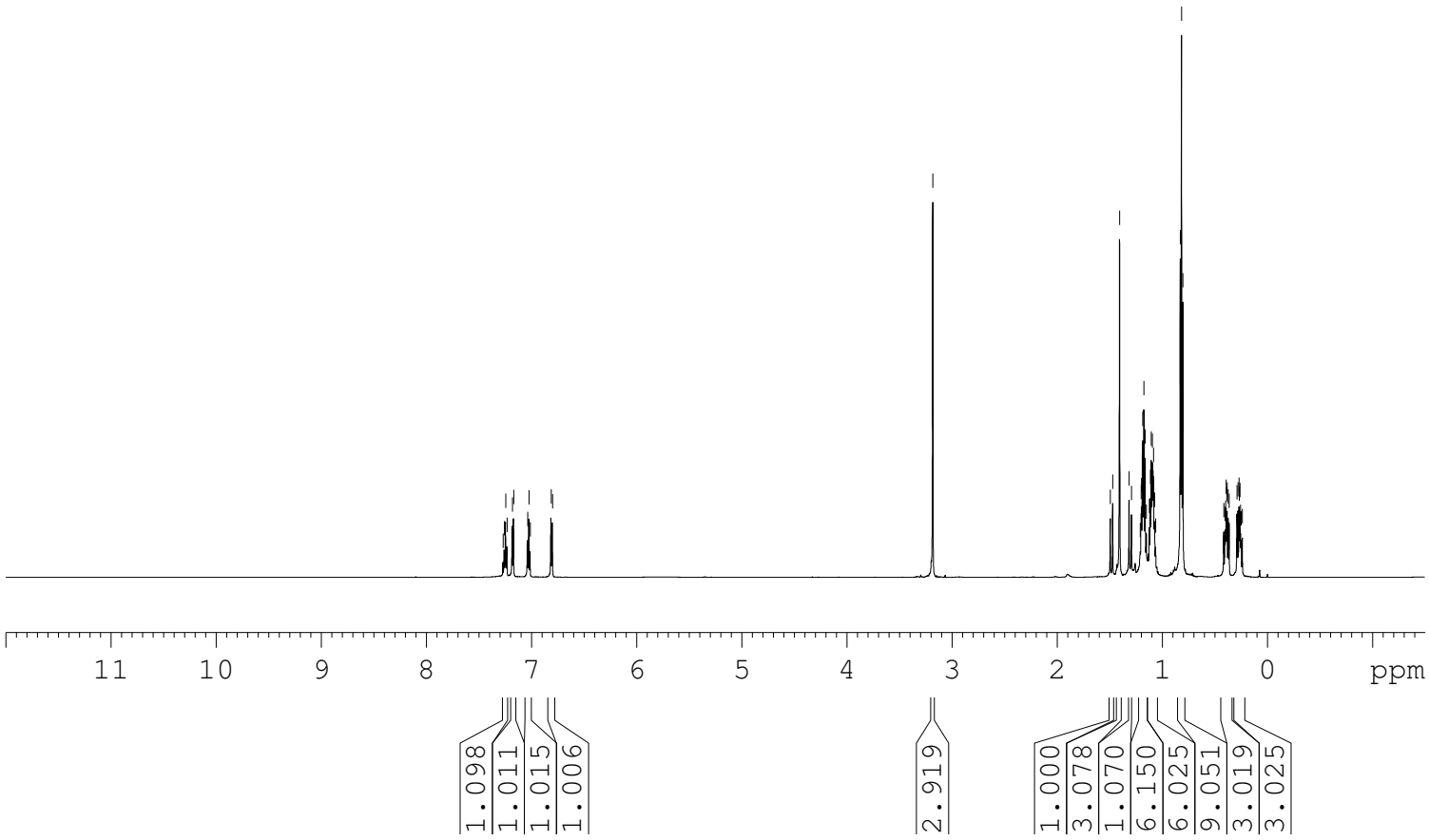
5j

NAME	lyn-349p-2-20210623
EXPNO	1
PROCNO	1
Date_	20210623
Time	18.38
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	298.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128752 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

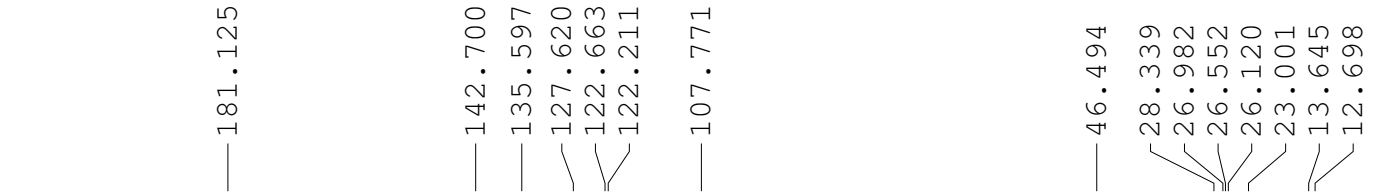


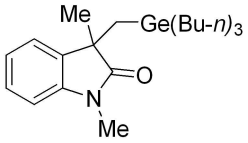


5k

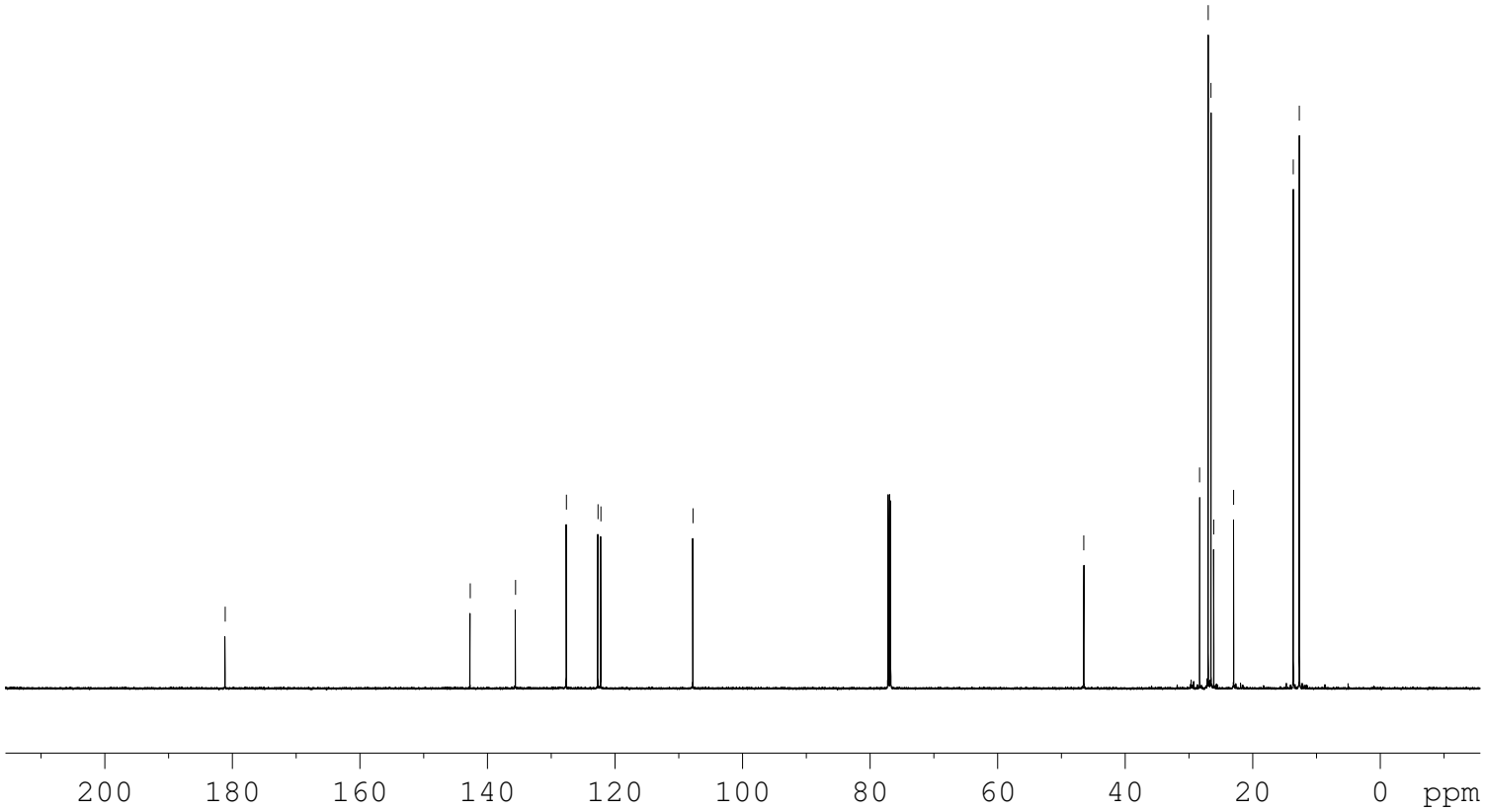


NAME	lyn-345p-20210615
EXPNO	1
PROCNO	1
Date_	20210615
Time	11.02
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	299.6 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700096 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00

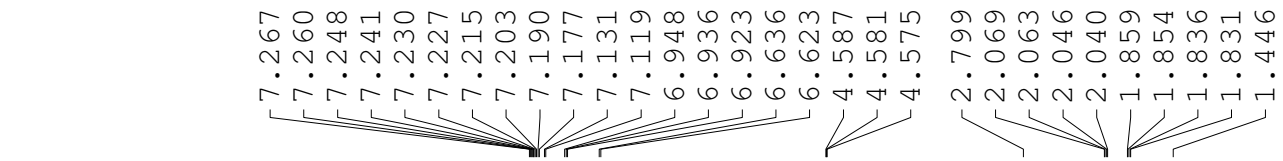


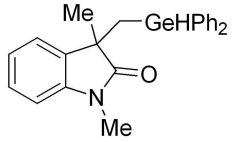


5k

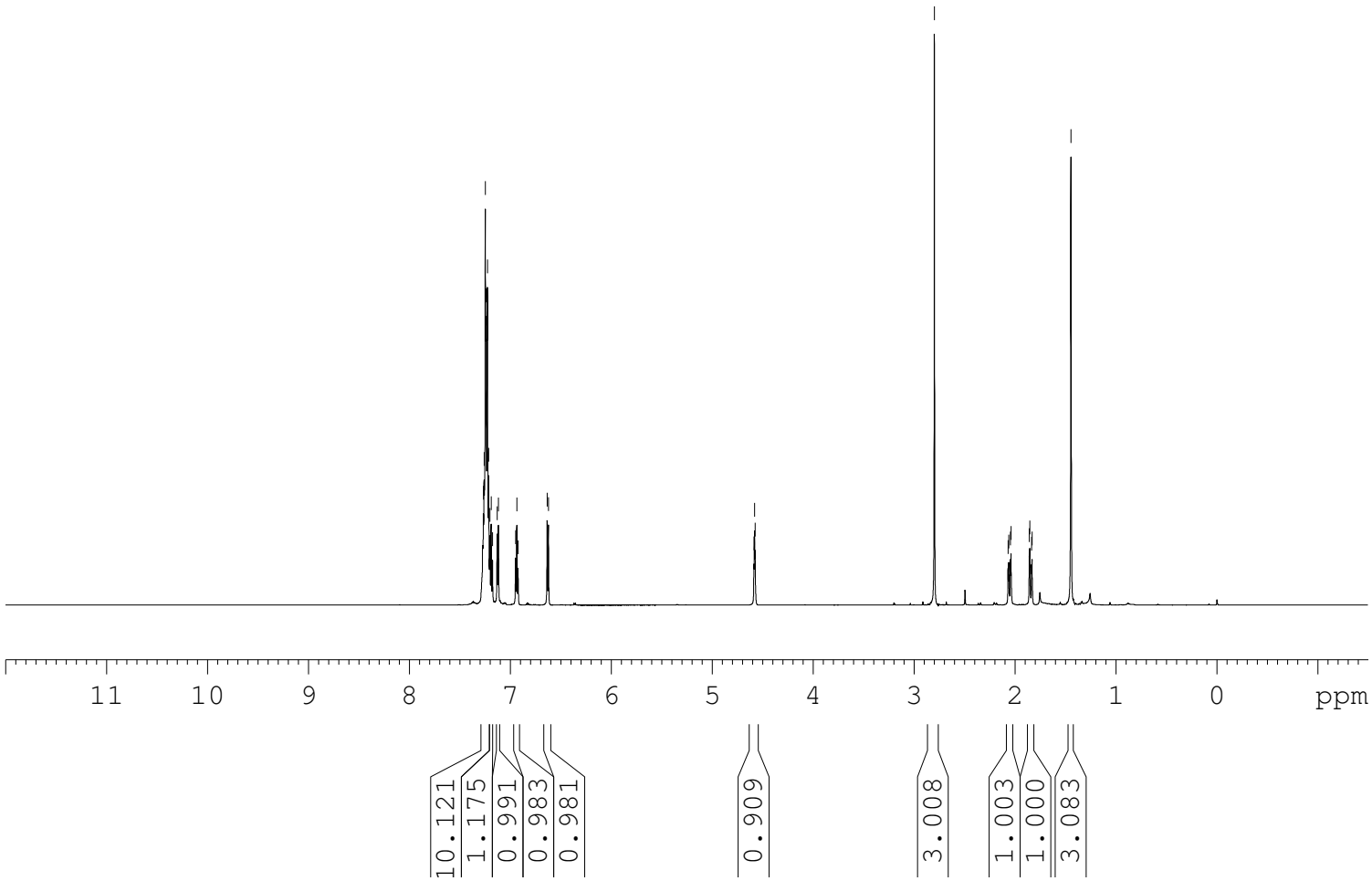


NAME	lyn-345p-c-20210630
EXPNO	2
PROCNO	1
Date_	20210701
Time	3.15
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128741 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

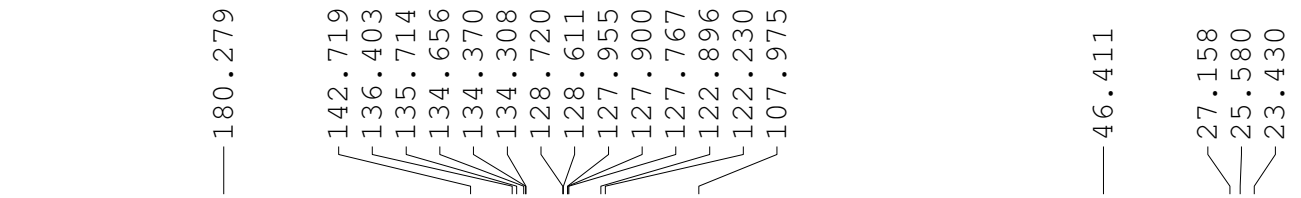


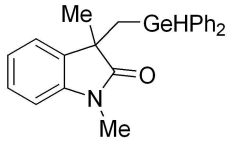


5l



NAME	lyn-346p-20210615
EXPNO	1
PROCNO	1
Date_	20210615
Time	11.06
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	38.1
DW	52.000 usec
DE	6.50 usec
TE	299.5 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700328 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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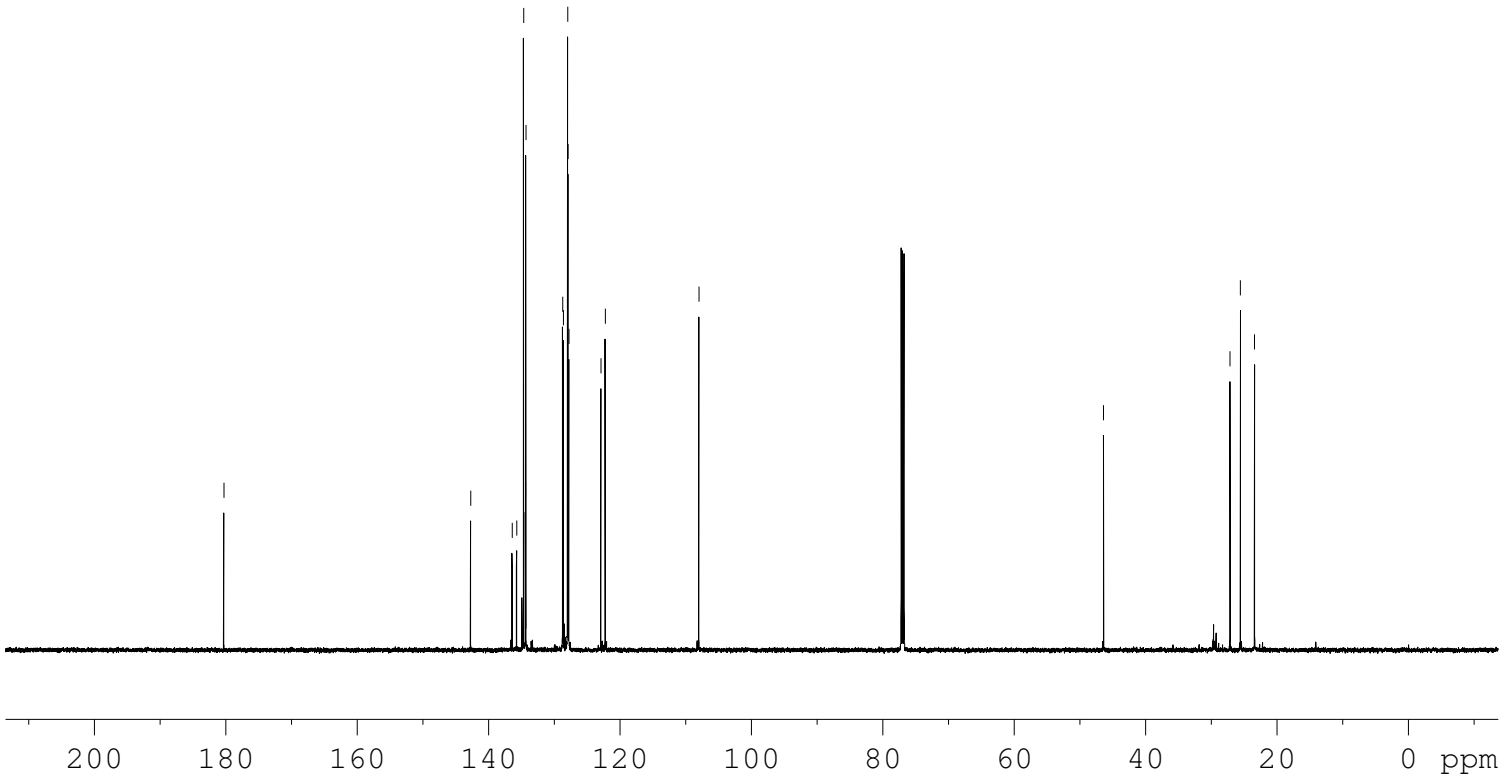
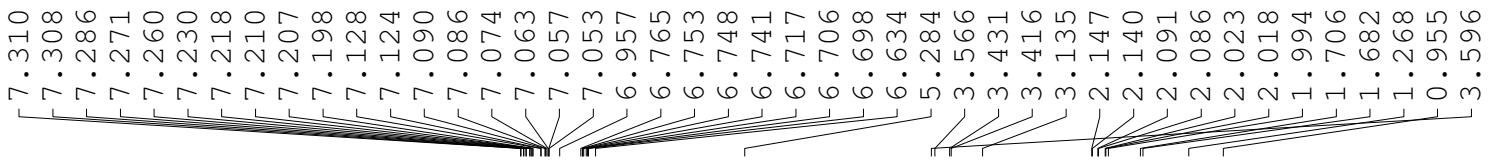
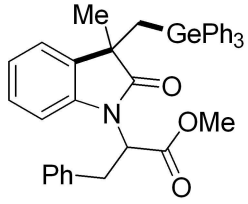


NAME	lyn-346p-c-20210630
EXPNO	2
PROCNO	1
Date_	20210701
Time	3.45
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	297.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128799 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40





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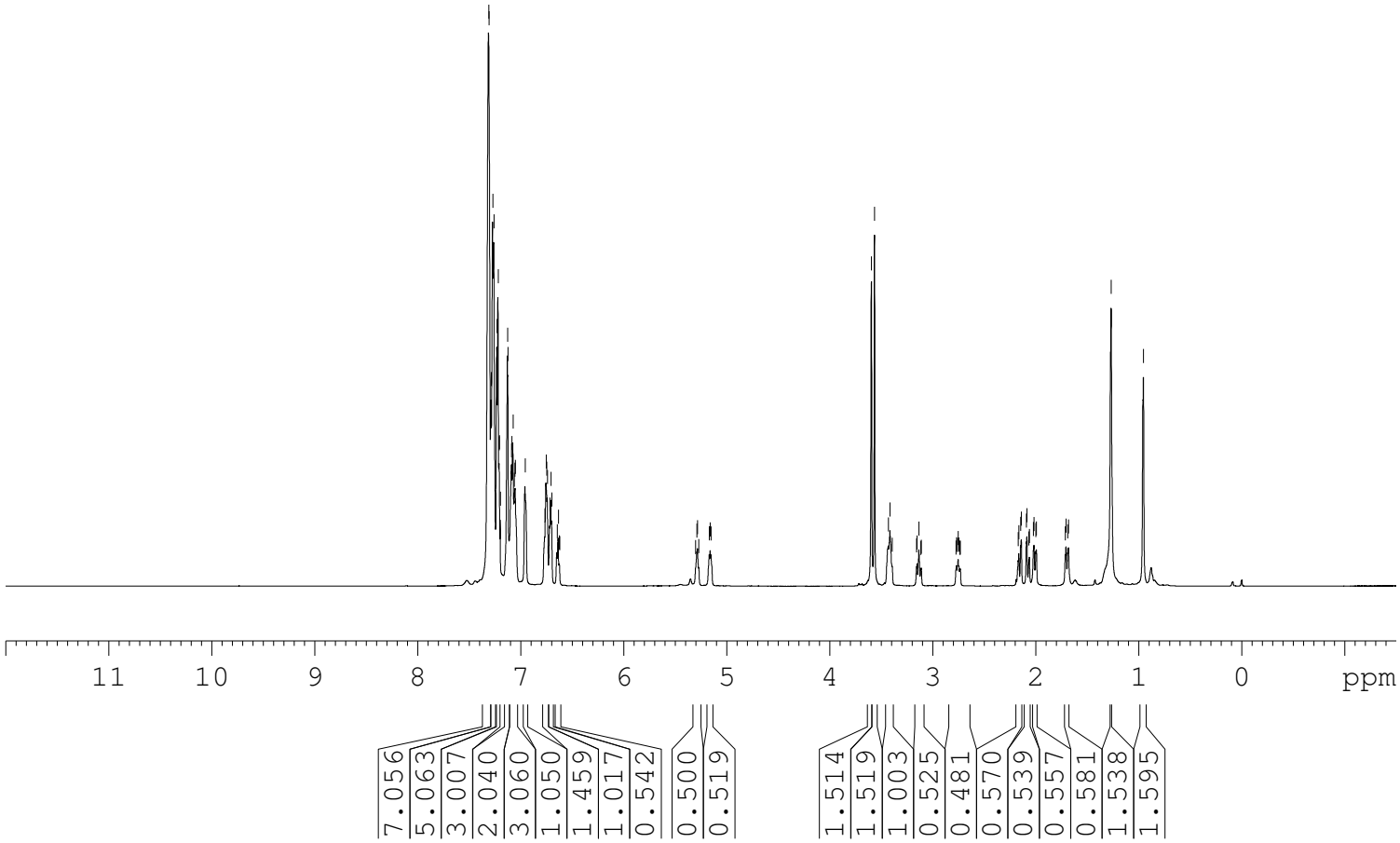
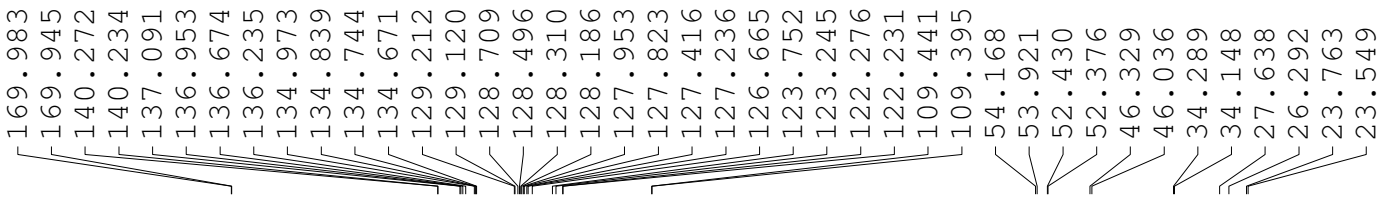
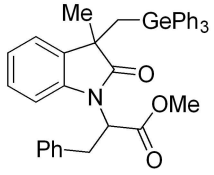


NAME	LYN-358P-NEW-20210706
EXPNO	1
PROCNO	1
Date_	20210706
Time	23.25
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	15.49
DW	52.000 usec
DE	6.50 usec
TE	295.3 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700530 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





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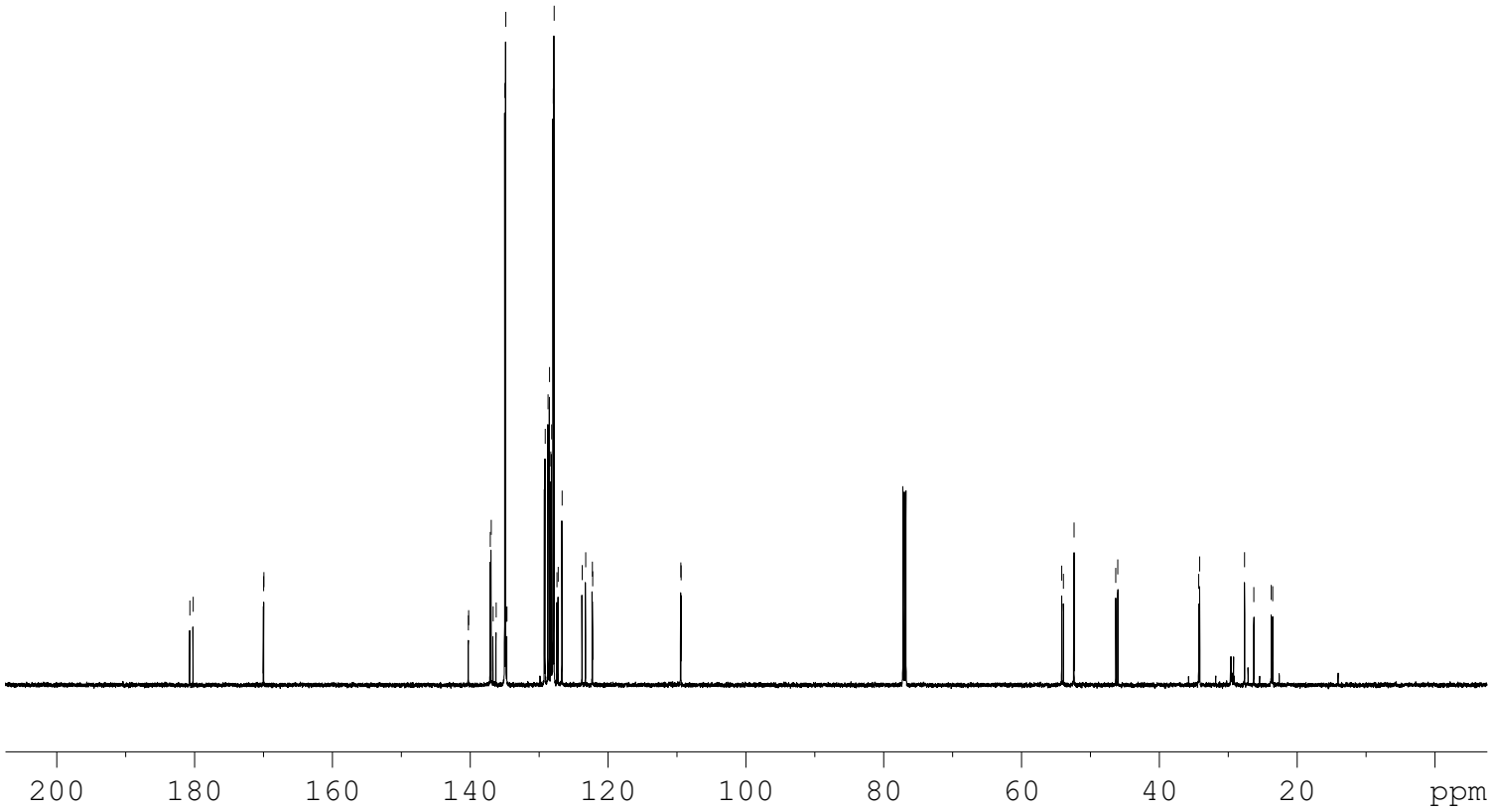
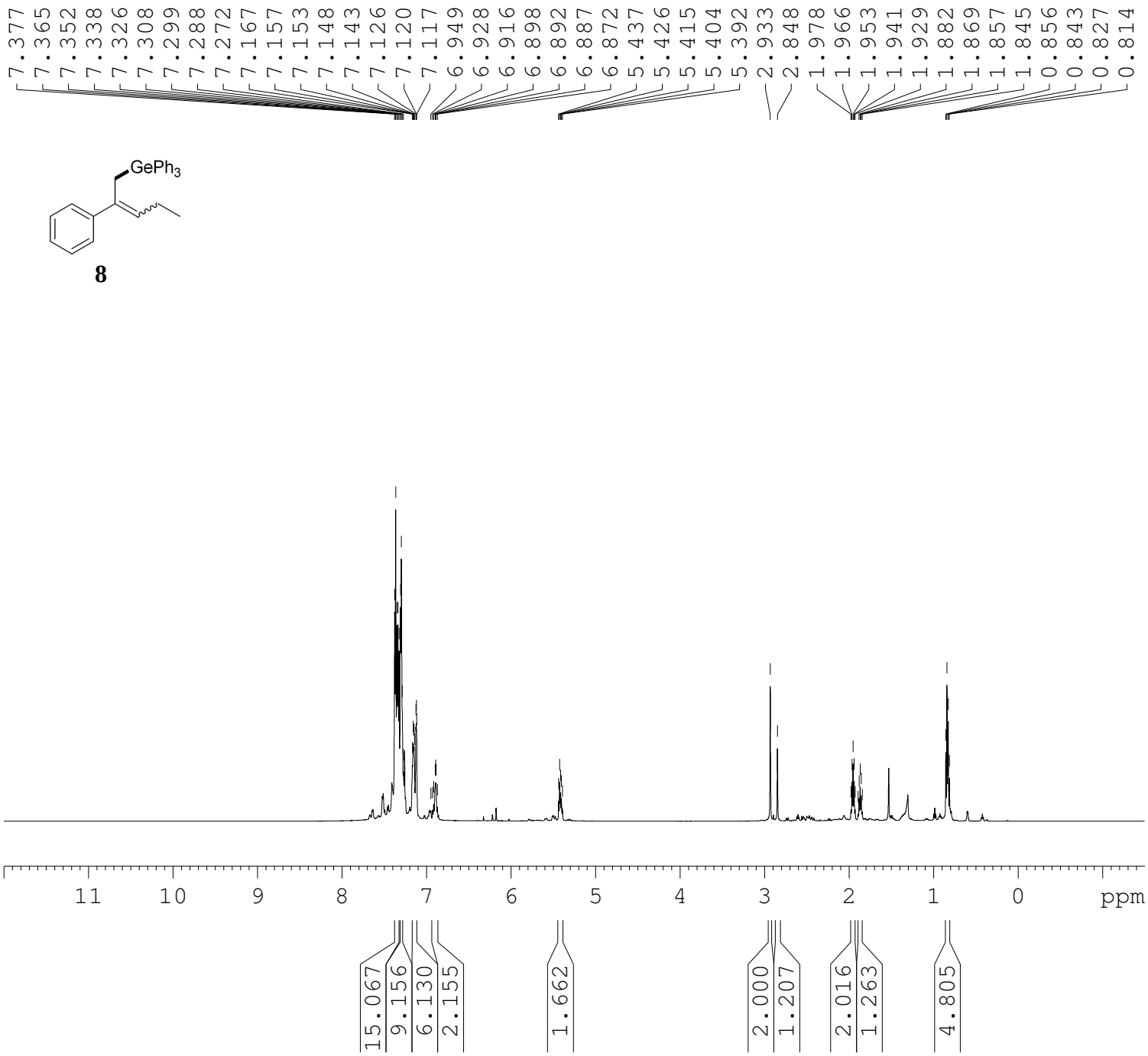
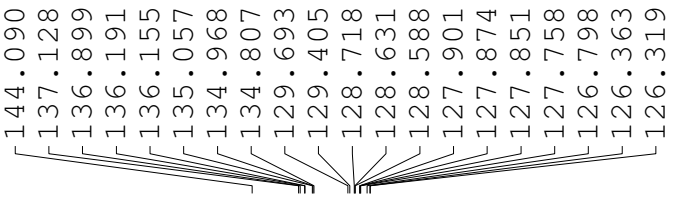


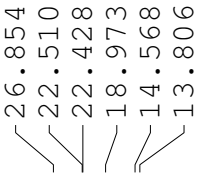
NAME	LYN-358P-NEW-20210706
EXPNO	2
PROCNO	1
Date_	20210706
Time	23.36
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDC13
NS	200
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	296.4 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128920 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

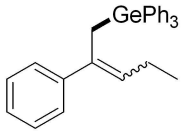


8

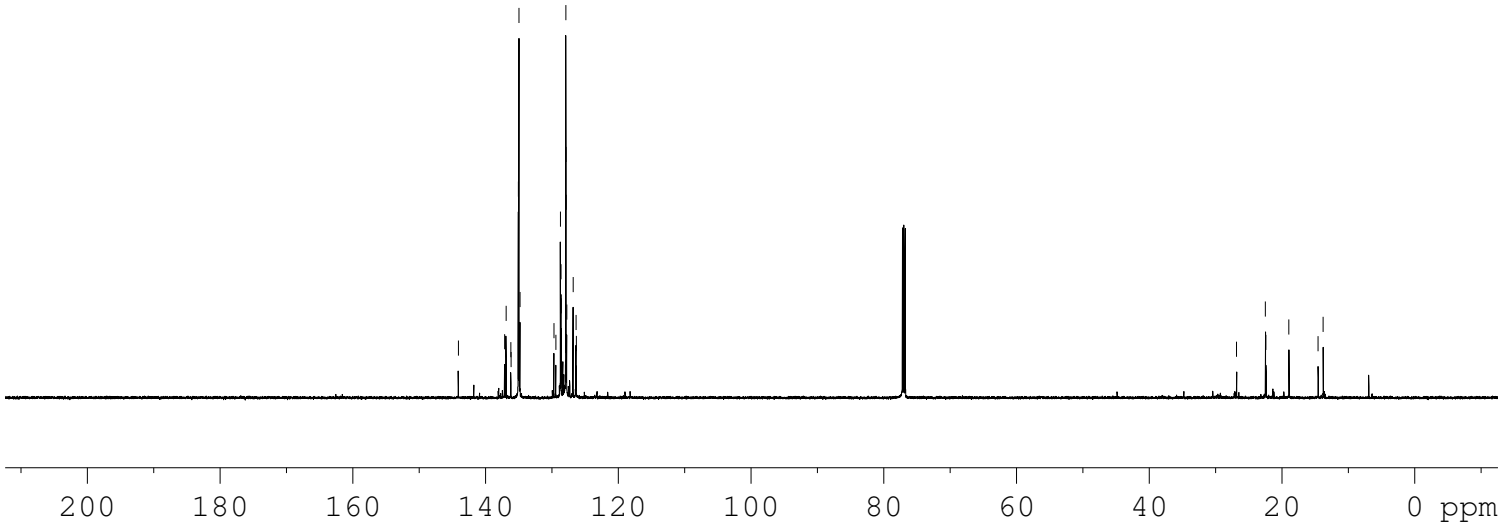
NAME	lyn-8-20210808
EXPNO	1
PROCNO	1
Date_	20210808
Time	16.30
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	302.8 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700177 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



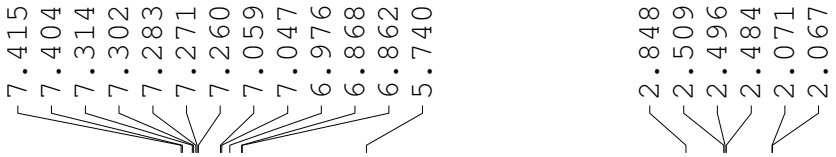


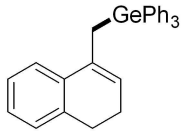


8

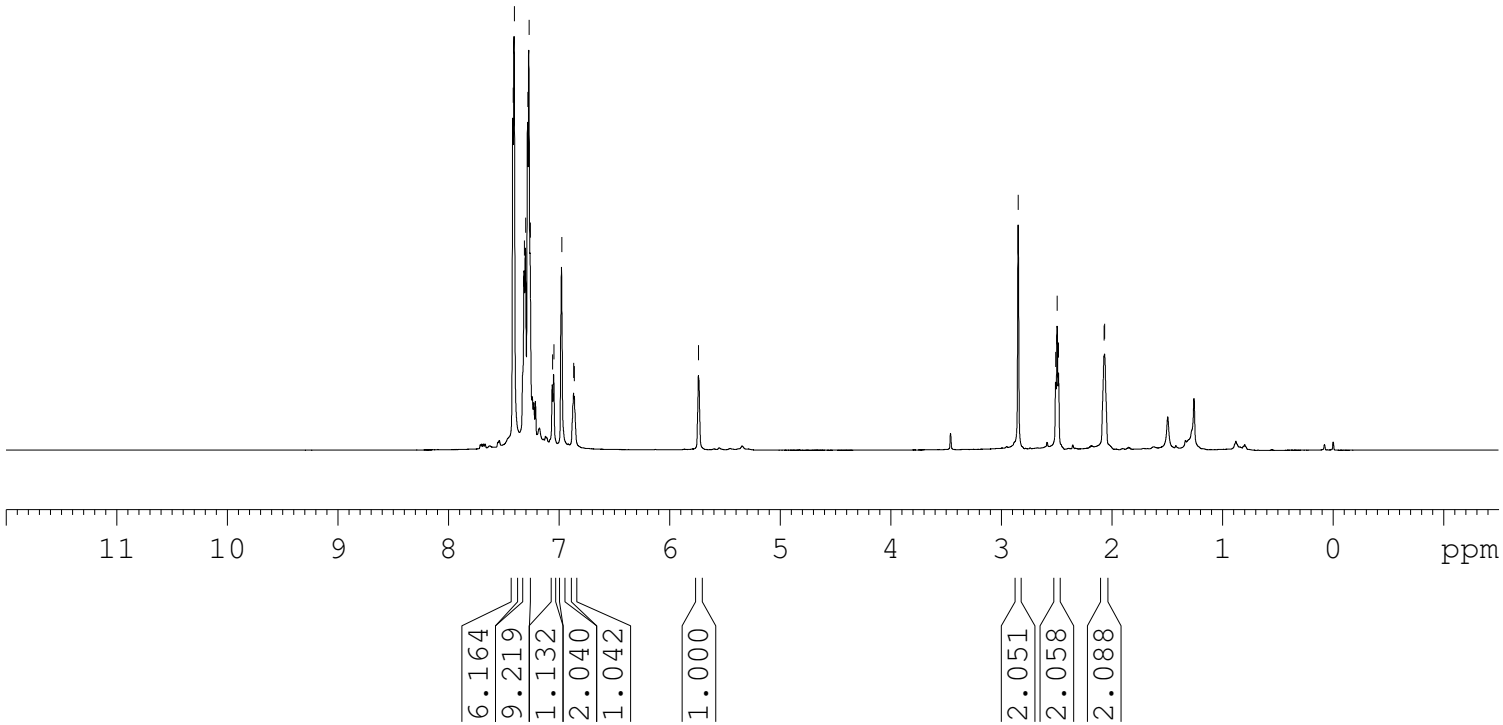


NAME	lyn-8-20210808
EXPNO	2
PROCNO	1
Date_	20210808
Time	17.25
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	400
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	303.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128744 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

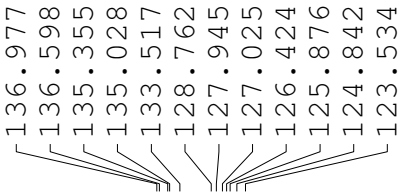


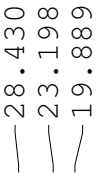


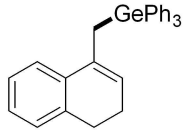
9



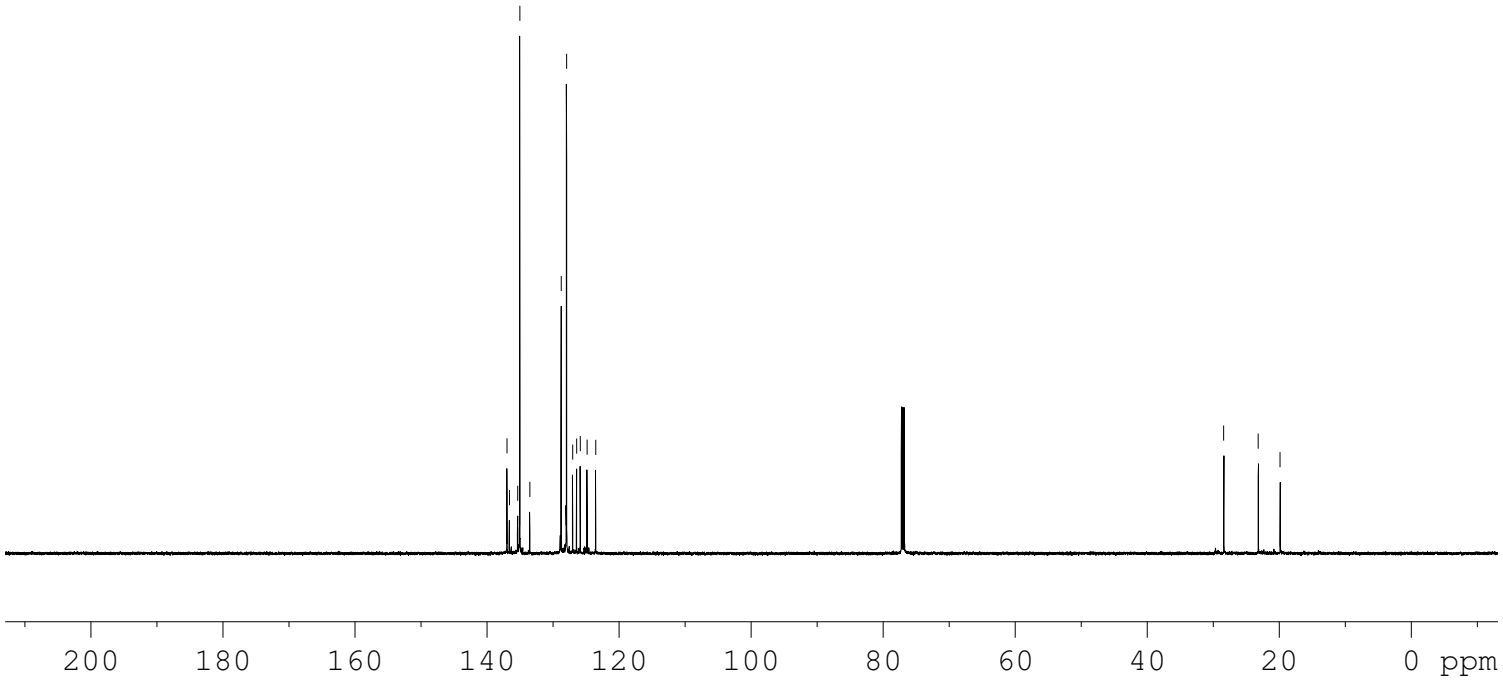
NAME	LYN-9-20210809
EXPNO	1
PROCNO	1
Date_	20210809
Time	10.45
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	50.85
DW	52.000 usec
DE	6.50 usec
TE	302.9 K
D1	1.00000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700482 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00



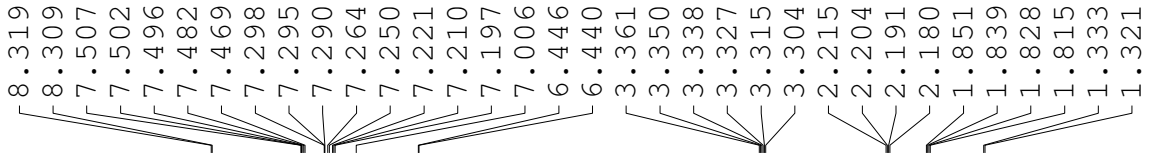


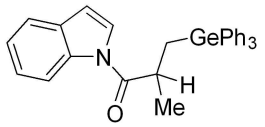


9

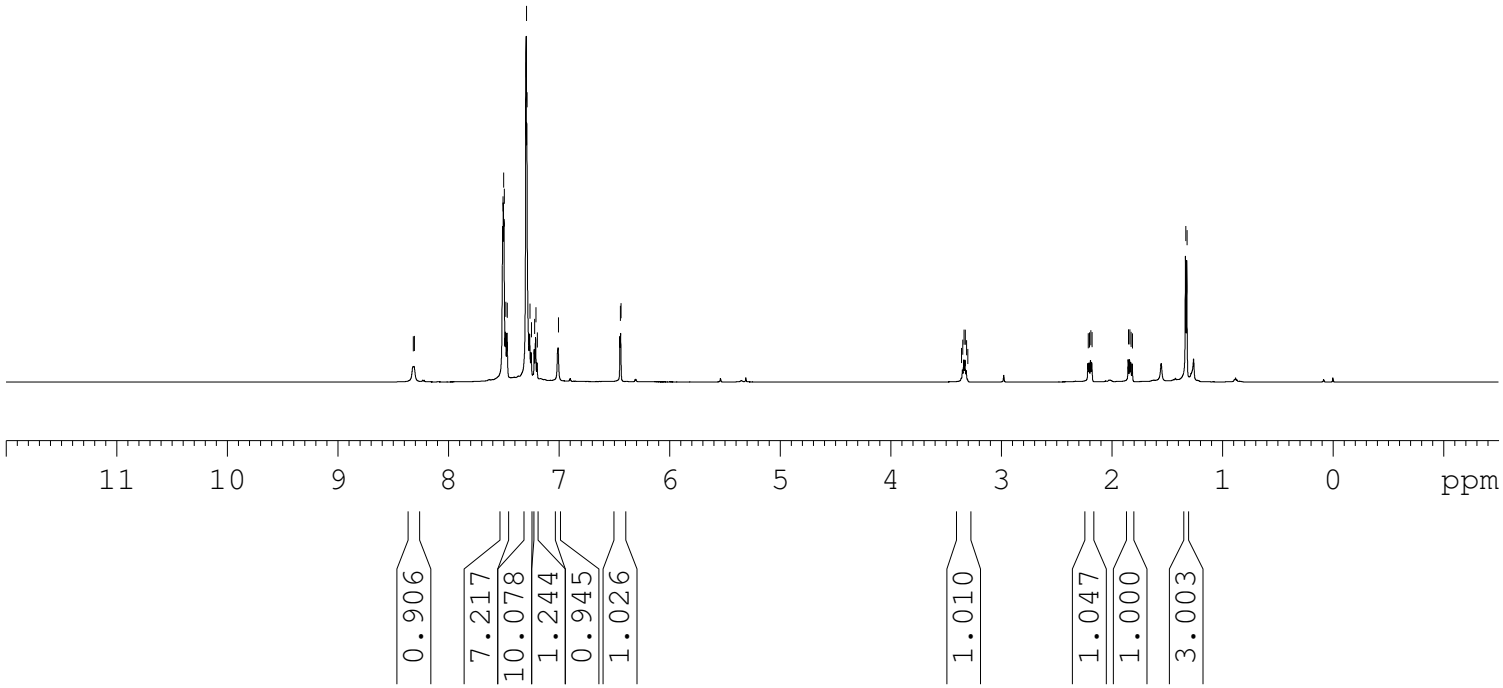


NAME	LYN-9-20210809
EXPNO	2
PROCNO	1
Date_	20210809
Time	11.33
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	304.3 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128755 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40

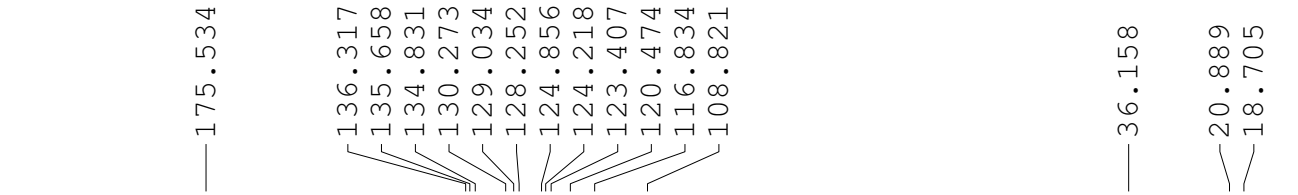


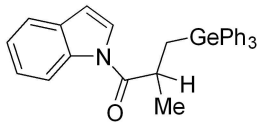


10

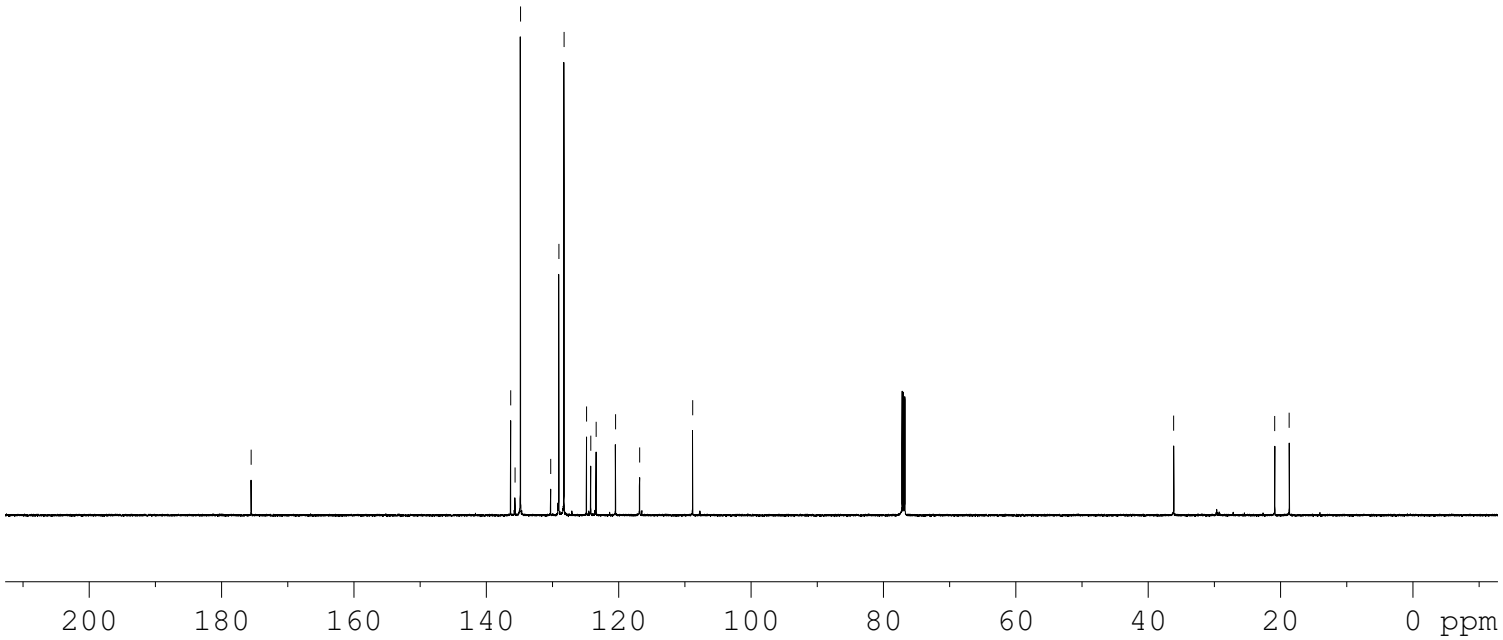


NAME	LYN-10-20210810
EXPNO	1
PROCNO	1
Date_	20210810
Time	11.55
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zg30
TD	65536
SOLVENT	CDCl3
NS	8
DS	0
SWH	9615.385 Hz
FIDRES	0.146719 Hz
AQ	3.4079220 sec
RG	44.5
DW	52.000 usec
DE	6.50 usec
TE	302.9 K
D1	1.00000000 sec
TD0	1
========	CHANNEL f1 ========
SFO1	600.1739011 MHz
NUC1	1H
P1	9.96 usec
SI	65536
SF	600.1700442 MHz
WDW	EM
SSB	0
LB	0.30 Hz
GB	0
PC	1.00





10



NAME	LYN-10-20210810
EXPNO	2
PROCNO	1
Date_	20210810
Time	12.34
INSTRUM	spect
PROBHD	5 mm PABBO BB/
PULPROG	zgpg30
TD	65536
SOLVENT	CDCl3
NS	500
DS	4
SWH	36057.691 Hz
FIDRES	0.550197 Hz
AQ	0.9088159 sec
RG	190.02
DW	13.867 usec
DE	6.50 usec
TE	303.9 K
D1	2.00000000 sec
D11	0.03000000 sec
TD0	1
======== CHANNEL f1 ========	
SFO1	150.9279571 MHz
NUC1	13C
P1	14.00 usec
SI	32768
SF	150.9128776 MHz
WDW	EM
SSB	0
LB	1.00 Hz
GB	0
PC	1.40