Electronic Supplementary Information for

Palladium Catalyzed Cascade Umpolung Allylation/Acetalation for the Construction of Quaternary 3-Amino Oxindoles

Xi-Shang Sun,‡[a] Xin Chang,‡[a] Li-Min Shi,‡[a] Zuo-Fei Wang,[a] Liang Wei,*[a] and Chun-Jiang Wang*[a,b]

E-mail: cjwang@whu.edu.cn

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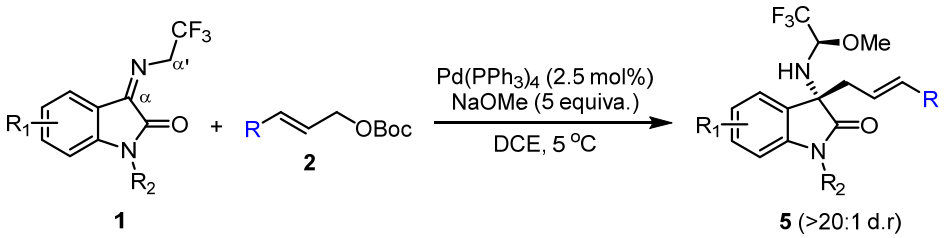
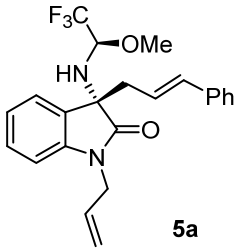
1. General remarks

^{1}H NMR spectra were recorded on a Bruker 400 MHz spectrometer in $CDCl_3$. Chemical shifts are reported in ppm with the internal TMS signal at 0.0 ppm as a standard. The data are reported as (s = single, d = double, t = triple, q = quarte, m = multiple or unresolved, brs = broad single, coupling constant(s) in Hz, integration). ^{13}C NMR spectra were recorded on a Bruker 100 MHz spectrometer in $CDCl_3$. ^{19}F NMR spectra were recorded on a Bruker 376 MHz spectrometer in $CDCl_3$. Chemical shifts are reported in ppm. Commercially obtained reagents were used without further purification. All reactions were monitored by TLC with silica gel-coated plates.

2. General procedure for Pd catalyzed allylic alkylation of *N*-2,2,2-trifluoroethylisatin ketamine



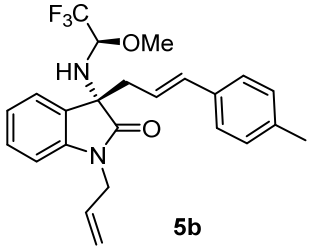
In a 25 mL nitrogen-filled dry Schlenk tube, $Pd(PPh_3)_4$ (6.0 mg, 0.005 mmol), *N*-2,2,2-trifluoroethylisatin ketamine **1** (0.2 mmol), *tert*-butyl cinnamyl carbonates **2** (0.22 mmol) and degassed DCE (2 mL) were added. Once the temperature was reduced to 5 °C , Sodium methoxide (1.0 mmol) was added in one portion under N_2 atmesphere. The reaction was stirred for 12 h at 5 °C untill starting material was consumed (monitored by TLC). The reaction mixture was concentrated via rotary evaporation under reduced pressure, and then purified by flash chromatography on silica gel (PE/EA = 10:1) to give the allylation products **5**.



5a

1-allyl-3-cinnamyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

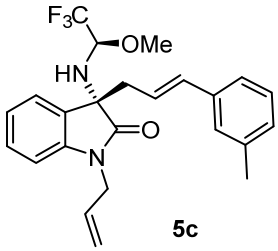
Yellow solid; 77% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.44 – 7.29 (m, 2H), 7.29 – 7.04 (m, 6H), 6.85 (d, *J* = 7.7 Hz, 1H), 6.31 (d, *J* = 15.8 Hz, 1H), 6.00 – 5.83 (m, 1H), 5.81 – 5.61 (m, 1H), 5.13 (dd, *J* = 49.4, 13.7 Hz, 2H), 4.43 (dd, *J* = 16.1, 5.3 Hz, 1H), 4.17 (dd, *J* = 16.1, 5.6 Hz, 1H), 4.07 – 3.83 (m, 1H), 3.13 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.82 (dd, *J* = 13.2, 6.1 Hz, 1H), 2.63 (dd, *J* = 13.2, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.9, 143.5, 136.9, 135.0, 131.3, 129.7, 128.4, 127.4, 126.3, 126.2, 124.9, 123.3 (q, *J* = 285.9 Hz), 122.7, 122.0, 118.1, 109.4, 85.0 (q, *J* = 31.8 Hz), 63.3, 56.9, 56.8, 42.5. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.90 (d, *J* = 4.4 Hz). HRMS Calcd. For $C_{23}H_{23}F_3N_2O_2Na$ ($[M+Na]^+$): 439.1604, found: 439.1592.



5b

(*E*)-1-allyl-3-(3-(p-tolyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

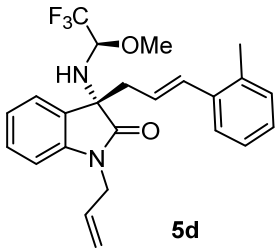
Yellow solid; 77% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40 – 7.28 (m, 2H), 7.20 – 6.96 (m, 5H), 6.85 (d, *J* = 7.7 Hz, 1H), 6.27 (d, *J* = 15.8 Hz, 1H), 5.92 – 5.79 (m, 1H), 5.79 – 5.62 (m, 1H), 5.29 – 4.99 (m, 2H), 4.42 (ddt, *J* = 16.1, 5.4, 1.5 Hz, 1H), 4.17 (ddt, *J* = 16.1, 5.6, 1.3 Hz, 1H), 3.96 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.12 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.80 (ddd, *J* = 13.2, 6.2, 1.3 Hz, 1H), 2.61 (dd, *J* = 13.6, 8.8 Hz, 1H), 2.29 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.0, 143.5, 137.2, 134.8, 134.2, 131.4, 129.7, 129.1, 126.4, 126.1, 124.9, 123.3 (q, *J* = 285.8 Hz), 122.7, 120.9, 118.1, 109.3, 85.0 (q, *J* = 31.8 Hz), 63.4, 56.8, 42.5, 42.5, 21.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.90 (d, *J* = 4.6 Hz). HRMS Calcd. For $C_{24}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 453.1760, found: 453.1758.



5c

(*E*)-1-allyl-3-(3-(m-tolyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

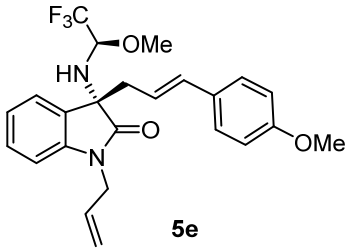
Yellow solid; 73% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.32 (t, *J* = 8.2 Hz, 2H), 7.12 (t, *J* = 6.0 Hz, 2H), 7.00 (s, 3H), 6.85 (d, *J* = 7.6 Hz, 1H), 6.28 (d, *J* = 15.8 Hz, 1H), 5.90 (dt, *J* = 15.3, 7.5 Hz, 1H), 5.82 – 5.61 (m, 1H), 5.15 (dd, *J* = 46.5, 13.7 Hz, 2H), 4.43 (dd, *J* = 15.9, 4.5 Hz, 1H), 4.18 (dd, *J* = 16.1, 5.0 Hz, 1H), 4.05 – 3.85 (m, 1H), 3.13 (d, *J* = 12.6 Hz, 1H), 2.93 (s, 3H), 2.80 (dd, *J* = 13.0, 6.0 Hz, 1H), 2.62 (dd, *J* = 12.8, 9.0 Hz, 1H), 2.29 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 177.94, 142.40, 136.92, 135.85, 134.02, 130.32, 128.68, 127.27, 127.15, 125.98, 125.32, 123.86, 122.30, 122.27 (q, *J* = 286.0 Hz), 121.67, 120.73, 117.00, 108.32, 83.98 (q, *J* = 31.8 Hz), 62.27, 55.80, 41.45, 41.42, 20.29. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.90 (d, *J* = 4.3 Hz). HRMS Calcd. For $C_{24}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 453.1760, found: 453.1759.



5d

(*E*)-1-allyl-3-(3-(o-tolyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

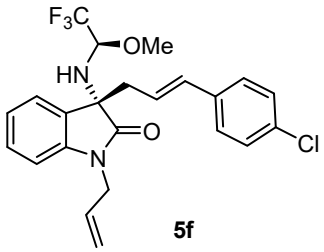
Yellow solid; 61% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42 – 7.29 (m, 2H), 7.22 – 7.01 (m, 5H), 6.86 (d, *J* = 7.8 Hz, 1H), 6.49 (d, *J* = 15.7 Hz, 1H), 5.85 – 5.61 (m, 2H), 5.28 – 5.00 (m, 2H), 4.39 (ddt, *J* = 16.0, 5.5, 1.5 Hz, 1H), 4.20 (ddt, *J* = 16.1, 5.6, 1.4 Hz, 1H), 3.97 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.13 (d, *J* = 12.7 Hz, 1H), 2.94 (s, 3H), 2.82 (ddd, *J* = 13.1, 6.6, 1.3 Hz, 1H), 2.65 (ddd, *J* = 13.2, 8.5, 0.5 Hz, 1H), 2.14 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.9, 143.5, 136.2, 135.3, 133.3, 131.3, 130.0, 129.7, 127.3, 126.4, 125.9, 125.7, 124.9, 123.4, 123.3 (q, *J* = 285.9 Hz), 122.7, 118.1, 109.4, 85.0 (q, *J* = 31.8 Hz), 63.4, 56.7, 42.7, 42.5, 19.6. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.86 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{24}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 453.1760, found: 453.1752.



5e

(*E*)-1-allyl-3-(3-(4-methoxyphenyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 77% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.39 – 7.28 (m, 2H), 7.18 – 7.06 (m, 3H), 6.85 (d, *J* = 7.7 Hz, 1H), 6.82 – 6.72 (m, 2H), 6.25 (d, *J* = 15.8 Hz, 1H), 5.83 – 5.64 (m, 2H), 5.25 – 5.01 (m, 2H), 4.43 (ddt, *J* = 16.1, 5.3, 1.5 Hz, 1H), 4.23 – 4.07 (m, 1H), 3.96 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.77 (s, 3H), 3.12 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.79 (ddd, *J* = 13.2, 6.2, 1.3 Hz, 1H), 2.61 (dd, *J* = 13.4, 8.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.0, 159.1, 143.5, 134.3, 131.3, 129.8, 129.7, 127.4, 126.4, 124.9, 123.3 (q, *J* = 285.8 Hz), 122.7, 119.7, 118.0, 113.8, 109.3, 85.0 (q, *J* = 31.8 Hz), 63.4, 56.8, 55.3, 42.5, 42.4. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.91 (d, *J* = 4.6 Hz). HRMS Calcd. For $C_{24}H_{25}F_3N_2O_3Na$ ($[M+Na]^+$): 469.1709, found: 469.1706.

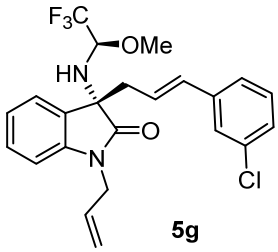


5f

(*E*)-1-allyl-3-(3-(4-chlorophenyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 54% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.37 – 7.30 (m, 2H), 7.20 (d, *J* = 8.5 Hz, 2H), 7.16 – 7.06 (m, 3H), 6.86 (d, *J* = 7.9 Hz, 1H), 6.26 (d, *J* = 15.9 Hz, 1H), 5.94 – 5.80 (m, 1H), 5.78 – 5.62 (m, 1H), 5.26 – 5.01 (m, 2H), 4.52 – 4.37 (m, 1H), 4.22 – 4.10 (m, 1H), 3.95 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.12 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.80 (ddd, *J* = 13.2, 6.2, 1.2 Hz, 1H), 2.63 (dd, *J* = 13.3, 8.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.84, 143.43, 135.38, 133.73, 133.04, 131.26, 129.82, 128.58, 127.40, 126.20, 124.83, 123.28 (q, *J* = 285.9 Hz), 122.79, 122.75, 118.07, 109.40, 85.00 (q, *J* = 31.8 Hz), 63.28, 56.90, 42.44, 42.37. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.93 (d, *J* = 4.5 Hz). HRMS Calcd. For $C_{23}H_{22}ClF_3N_2O_2Na$

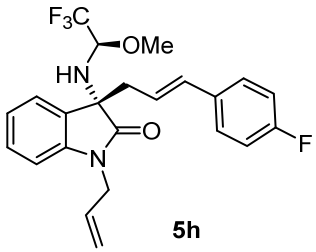
([M+Na]$^+$): 473.1214, found: 473.1205.



5g

(*E*)-1-allyl-3-(3-(3-chlorophenyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 60% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40 – 7.31 (m, 2H), 7.22 – 7.10 (m, 4H), 7.08 – 7.01 (m, 1H), 6.87 (d, *J* = 7.7 Hz, 1H), 6.25 (d, *J* = 15.8 Hz, 1H), 5.99 – 5.83 (m, 1H), 5.80 – 5.66 (m, 1H), 5.31 – 5.04 (m, 2H), 4.53 – 4.38 (m, 1H), 4.23 – 4.12 (m, 1H), 3.95 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.12 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.81 (ddd, *J* = 13.2, 6.3, 1.2 Hz, 1H), 2.63 (dd, *J* = 13.2, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.82, 143.41, 138.75, 134.38, 133.66, 131.25, 129.87, 129.66, 127.37, 126.13, 126.10, 124.84, 124.46, 123.73, 123.28 (q, *J* = 285.9 Hz), 122.79, 118.14, 109.42, 85.01 (q, *J* = 31.7 Hz), 63.25, 56.90, 42.46, 42.35. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.92 (d, *J* = 4.5 Hz). HRMS Calcd. For $C_{23}H_{22}ClF_3N_2O_2Na$ ([M+Na]$^+$): 473.1214, found: 473.1209.

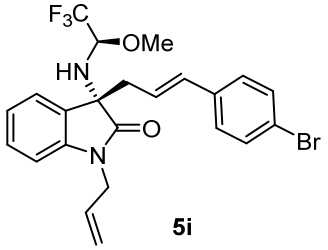


5h

(*E*)-1-allyl-3-(3-(4-fluorophenyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 79% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.33 (t, *J* = 6.2 Hz, 2H), 7.13 (t, *J* = 6.6 Hz, 3H), 7.03 – 6.76 (m, 3H), 6.28 (d, *J* = 15.8 Hz, 1H), 5.90 – 5.61 (m, 2H), 5.12 (dd, *J* = 45.8, 13.7 Hz, 2H), 4.44 (dd, *J* = 16.1, 5.0 Hz, 1H), 4.16 (dd, *J* = 16.0, 5.3 Hz, 1H), 4.05 – 3.86 (m, 1H), 3.12 (d, *J* = 12.6 Hz, 1H), 2.93 (s, 3H), 2.80 (dd, *J* = 13.1, 5.9 Hz, 1H), 2.62 (dd, *J* = 13.1, 8.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.90, 162.19 (d, *J* = 247.7 Hz), 143.44, 133.76,

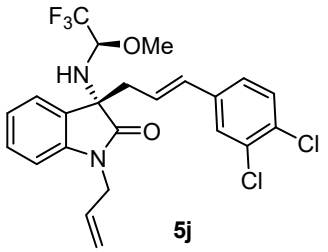
133.08 (d, J = 3.3 Hz), 131.28, 129.78, 127.68 (d, J = 8.0 Hz), 126.28, 124.84, 123.30 (q, J = 286.1 Hz), 122.73, 121.75 (d, J = 2.1 Hz), 118.02, 115.31 (d, J = 21.7 Hz), 109.37, 85.01 (q, J = 31.8 Hz), 63.31, 56.88, 42.43, 42.36. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.93 (d, J = 4.5 Hz), -113.92 – -114.81 (m). HRMS Calcd. For $C_{23}H_{22}F_4N_2O_2Na$ ($[M+Na]^+$): 457.1510, found: 457.1502.



5i

(*E*)-1-allyl-3-(3-(4-bromophenyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 64% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.41 – 7.30 (m, 4H), 7.19 – 7.08 (m, 1H), 7.03 (d, J = 8.5 Hz, 2H), 6.93 – 6.76 (m, 1H), 6.25 (d, J = 15.9 Hz, 1H), 5.95 – 5.82 (m, 1H), 5.77 – 5.60 (m, 1H), 5.26 – 5.03 (m, 2H), 4.43 (ddt, J = 16.1, 5.4, 1.5 Hz, 1H), 4.24 – 4.10 (m, 1H), 3.95 (dq, J = 12.7, 4.8 Hz, 1H), 3.12 (d, J = 12.7 Hz, 1H), 2.93 (s, 3H), 2.80 (ddd, J = 13.2, 6.2, 1.4 Hz, 1H), 2.62 (dd, J = 13.5, 9.0 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.83, 143.41, 135.81, 133.78, 131.53, 131.25, 129.82, 127.72, 126.18, 124.83, 123.27 (q, J = 281.4 Hz), 122.94, 122.75, 121.18, 118.08, 109.39, 84.99 (q, J = 31.8 Hz), 63.25, 56.89, 42.44, 42.37. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.93 (d, J = 4.8 Hz). HRMS Calcd. For $C_{23}H_{23}BrF_3N_2O_2$ ($[M+H]^+$): 495.0890, found: 495.0890.

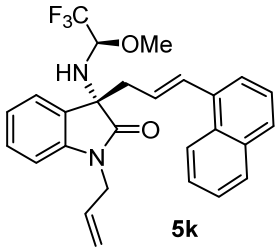


5j

(*E*)-1-allyl-3-(3-(3,4-dichlorophenyl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 79% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38 – 7.27 (m, 3H), 7.24 (d, J = 2.0

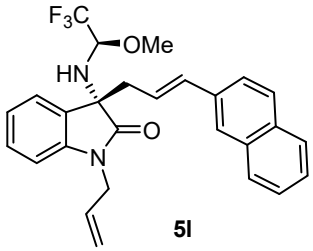
Hz, 1H), 7.14 (td, *J* = 7.6, 0.8 Hz, 1H), 7.00 (dd, *J* = 8.3, 2.0 Hz, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 6.21 (d, *J* = 15.9 Hz, 1H), 5.98 – 5.81 (m, 1H), 5.81 – 5.61 (m, 1H), 5.29 – 5.03 (m, 2H), 4.44 (ddt, *J* = 16.0, 5.4, 1.5 Hz, 1H), 4.16 (ddt, *J* = 16.1, 5.6, 1.3 Hz, 1H), 3.95 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.12 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.80 (ddd, *J* = 13.2, 6.3, 1.3 Hz, 1H), 2.63 (dd, *J* = 13.5, 8.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.8, 143.4, 137.0, 132.7, 132.6, 131.2, 131.1, 130.4, 129.9, 127.9, 126.1, 125.4, 124.8, 124.3, 123.3 (q, *J* = 285.8 Hz), 122.8, 118.2, 109.5, 85.0 (q, *J* = 31.8 Hz), 63.2, 56.9, 42.5, 42.3. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.93 (d, *J* = 4.4 Hz). HRMS Calcd. For $C_{23}H_{21}Cl_2F_3N_2O_2Na$ ($[M+Na]^+$): 507.0824, found: 507.0818.



5k

(*E*)-1-allyl-3-(3-(naphthalen-1-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

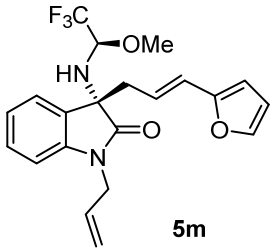
Yellow solid; 73% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.85 – 7.67 (m, 3H), 7.49 – 7.27 (m, 6H), 7.19 – 7.11 (m, 1H), 7.00 (d, *J* = 15.6 Hz, 1H), 6.84 (d, *J* = 7.8 Hz, 1H), 5.88 (ddd, *J* = 15.3, 8.4, 6.7 Hz, 1H), 5.78 – 5.55 (m, 1H), 5.25 – 4.90 (m, 2H), 4.42 – 4.29 (m, 1H), 4.26 – 4.16 (m, 1H), 4.00 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.20 (d, *J* = 12.7 Hz, 1H), 3.01 – 2.88 (m, 4H), 2.76 (dd, *J* = 13.0, 8.6 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.0, 143.6, 135.0, 133.4, 132.9, 131.3, 131.0, 129.8, 128.3, 127.8, 126.4, 125.9, 125.7, 125.5, 125.4, 125.0, 124.0, 123.9, 123.3 (q, *J* = 286.1 Hz), 122.8, 118.2, 109.5, 85.0 (q, *J* = 31.7 Hz), 63.5, 56.8, 42.7, 42.5. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.80 (d, *J* = 4.5 Hz). HRMS Calcd. For $C_{27}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 489.1760, found: 489.1757.



5l

(*E*)-1-allyl-3-(3-(naphthalen-2-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 55% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.83 – 7.64 (m, 3H), 7.54 (s, 1H), 7.48 – 7.28 (m, 5H), 7.18 – 7.08 (m, 1H), 6.85 (d, *J* = 7.8 Hz, 1H), 6.47 (d, *J* = 15.8 Hz, 1H), 6.10 – 5.91 (m, 1H), 5.80 – 5.62 (m, 1H), 5.27 – 4.94 (m, 2H), 4.54 – 4.32 (m, 1H), 4.23 – 4.12 (m, 1H), 3.98 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.16 (d, *J* = 12.7 Hz, 1H), 2.94 (s, 3H), 2.87 (ddd, *J* = 13.2, 6.2, 1.2 Hz, 1H), 2.69 (dd, *J* = 13.3, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.0, 143.5, 135.1, 134.4, 133.5, 132.9, 131.3, 129.8, 128.0, 127.9, 127.6, 126.3, 126.2, 126.1, 125.8, 124.9, 123.4, 123.3 (q, *J* = 31.7 Hz), 122.8, 122.4, 118.1, 109.4, 85.1 (q, *J* = 31.7 Hz), 63.4, 56.9, 42.6, 42.5. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.88 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{27}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 489.1760, found: 489.1757.

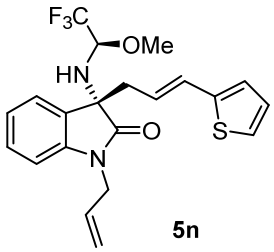


5m

(*E*)-1-allyl-3-(3-(furan-2-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 75% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38 – 7.29 (m, 2H), 7.24 (d, *J* = 1.2 Hz, 1H), 7.17 – 7.08 (m, 1H), 6.86 (d, *J* = 7.7 Hz, 1H), 6.29 (dd, *J* = 3.2, 1.8 Hz, 1H), 6.10 (dd, *J* = 21.3, 9.5 Hz, 2H), 5.90 – 5.64 (m, 2H), 5.30 – 5.00 (m, 2H), 4.47 (ddt, *J* = 16.2, 5.1, 1.5 Hz, 1H), 4.22 – 4.07 (m, 1H), 3.95 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.10 (d, *J* = 12.7 Hz, 1H), 2.92 (s, 3H), 2.80 (ddd, *J* = 13.3, 6.3, 1.2 Hz, 1H), 2.59 (dd, *J* = 13.3, 9.0 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.9, 152.4, 143.5, 141.7, 131.2, 129.8, 126.2, 124.8, 123.3 (q, *J* = 286.0 Hz), 123.2, 122.7, 120.7, 117.8, 111.1, 109.4, 107.5, 85.0 (q, *J* = 31.7 Hz), 63.3, 56.9, 42.4, 42.3. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.93 (d, *J* = 4.4 Hz). HRMS Calcd. For $C_{21}H_{21}F_3N_2O_3Na$ ($[M+Na]^+$):

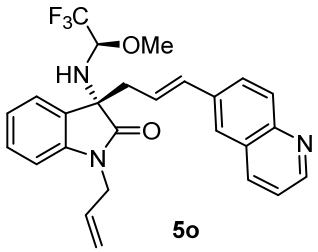
429.1396, found: 429.1396.



5n

(*E*)-1-allyl-3-(3-(thiophen-2-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 50% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.39 – 7.30 (m, 2H), 7.18 – 7.10 (m, 1H), 7.06 (d, *J* = 5.1 Hz, 1H), 6.94 – 6.83 (m, 2H), 6.78 (d, *J* = 3.4 Hz, 1H), 6.42 (d, *J* = 15.7 Hz, 1H), 5.82 – 5.60 (m, 2H), 5.29 – 5.02 (m, 2H), 4.45 (ddt, *J* = 16.1, 5.3, 1.5 Hz, 1H), 4.24 – 4.10 (m, 1H), 3.95 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.10 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.78 (ddd, *J* = 13.3, 6.4, 1.2 Hz, 1H), 2.59 (dd, *J* = 13.3, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.9, 143.5, 142.0, 131.3, 129.8, 128.0, 127.2, 126.1, 125.3, 124.9, 123.9, 123.3 (q, *J* = 285.8 Hz), 122.8, 121.7, 118.1, 109.4, 85.0 (q, *J* = 31.8 Hz), 63.3, 56.9, 42.5, 42.3. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.93 (d, *J* = 4.7 Hz). HRMS Calcd. For $C_{21}H_{21}F_3N_2O_2SNa$ ($[M+Na]^+$): 445.1168, found: 445.1164.

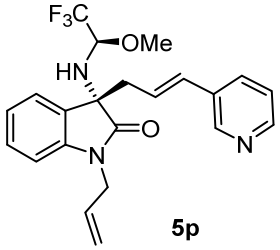


5o

(*E*)-1-allyl-3-(3-(quinolin-6-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 78% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.83 (dd, *J* = 4.1, 1.4 Hz, 1H), 8.07 (d, *J* = 8.2 Hz, 1H), 7.96 (d, *J* = 8.8 Hz, 1H), 7.60 (dd, *J* = 8.8, 1.9 Hz, 1H), 7.53 (d, *J* = 1.5 Hz, 1H), 7.42 – 7.32 (m, 3H), 7.21 – 7.10 (m, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 6.50 (d, *J* = 15.8 Hz, 1H), 6.15 – 5.99 (m, 1H), 5.79 – 5.62 (m, 1H), 5.27 – 4.98 (m, 2H), 4.51 – 4.39 (m, 1H), 4.21 – 4.13 (m, 1H), 3.98 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.17 (d, *J* = 12.7 Hz, 1H), 3.05 – 2.85 (m, 4H),

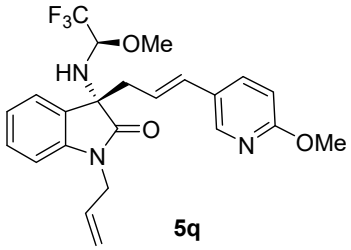
2.71 (dd, J = 13.3, 8.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.89, 150.03, 147.84, 143.45, 136.04, 135.09, 134.26, 131.23, 129.87, 129.43, 128.38, 127.11, 126.19, 125.58, 124.85, 123.81, 123.29 (q, J = 286.2 Hz), 122.81, 121.44, 118.09, 109.45, 85.03 (q, J = 31.8 Hz), 63.35, 56.92, 42.53, 42.45. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.91 (d, J = 4.4 Hz). HRMS Calcd. For $C_{26}H_{24}F_3N_3O_2Na$ ($[M+Na]^+$): 490.1713, found: 490.1708.



5p

(*E*)-1-allyl-3-(3-(pyridin-3-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

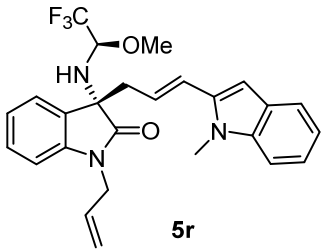
Yellow solid; 83% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 8.51 – 8.26 (m, 2H), 7.50 (dt, J = 7.9, 1.7 Hz, 1H), 7.40 – 7.30 (m, 2H), 7.22 – 7.08 (m, 2H), 6.91 – 6.82 (m, 1H), 6.30 (d, J = 16.0 Hz, 1H), 6.04 – 5.90 (m, 1H), 5.79 – 5.63 (m, 1H), 5.26 – 5.04 (m, 2H), 4.43 (ddt, J = 16.0, 5.5, 1.5 Hz, 1H), 4.18 (ddt, J = 16.0, 5.5, 1.3 Hz, 1H), 3.96 (dq, J = 12.7, 4.8 Hz, 1H), 3.14 (d, J = 12.7 Hz, 1H), 2.93 (s, 3H), 2.84 (ddd, J = 13.3, 6.2, 1.4 Hz, 1H), 2.66 (dd, J = 13.7, 8.7 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.79, 148.40, 147.93, 143.39, 132.83, 132.53, 131.37, 131.23, 129.93, 126.04, 124.84, 124.79, 123.40, 123.26 (q, J = 285.9 Hz), 122.83, 118.16, 109.45, 85.00 (q, J = 31.9 Hz), 63.22, 56.92, 42.47, 42.41. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.94 (d, J = 4.5 Hz). HRMS Calcd. For $C_{22}H_{22}F_3N_3O_2Na$ ($[M+Na]^+$): 440.1556, found: 440.1553.



5q

(*E*)-1-allyl-3-(3-(6-methoxypyridin-3-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

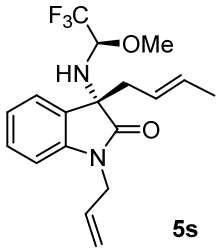
Yellow solid; 64% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.91 (d, *J* = 2.2 Hz, 1H), 7.44 (dd, *J* = 8.6, 2.4 Hz, 1H), 7.40 – 7.29 (m, 2H), 7.19 – 7.08 (m, 1H), 6.86 (d, *J* = 8.2 Hz, 1H), 6.63 (d, *J* = 8.6 Hz, 1H), 6.24 (d, *J* = 15.9 Hz, 1H), 5.88 – 5.62 (m, 2H), 5.27 – 5.03 (m, 2H), 4.53 – 4.38 (m, 1H), 4.23 – 4.11 (m, 1H), 4.01 – 3.87 (m, 4H), 3.12 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.81 (ddd, *J* = 13.2, 6.2, 1.2 Hz, 1H), 2.63 (dd, *J* = 13.3, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.87, 163.50, 145.19, 143.43, 135.46, 131.28, 131.03, 129.80, 126.21, 126.12, 124.83, 123.28 (q, *J* = 285.9 Hz), 122.74, 121.42, 118.08, 110.75, 109.37, 85.00 (q, *J* = 31.8 Hz), 63.31, 56.88, 56.87, 53.45, 42.43. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.94 (d, *J* = 4.7 Hz). HRMS Calcd. For $C_{23}H_{25}F_3N_3O_3$ ($[M+H]^+$): 448.1843, found: 448.1842.



5r

(*E*)-1-allyl-3-(3-(1-methyl-1H-indol-2-yl)allyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

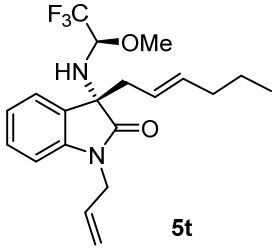
Yellow solid; 76% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.50 (d, *J* = 7.8 Hz, 1H), 7.40 – 7.29 (m, 2H), 7.22 (d, *J* = 8.2 Hz, 1H), 7.19 – 7.10 (m, 2H), 7.09 – 7.01 (m, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 6.41 (s, 1H), 6.37 (d, *J* = 15.7 Hz, 1H), 5.93 (ddd, *J* = 15.5, 8.7, 6.5 Hz, 1H), 5.79 – 5.65 (m, 1H), 5.28 – 5.01 (m, 2H), 4.39 (ddt, *J* = 16.0, 5.5, 1.5 Hz, 1H), 4.21 (ddt, *J* = 16.1, 5.5, 1.3 Hz, 1H), 3.98 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.56 (s, 3H), 3.14 (d, *J* = 12.7 Hz, 1H), 2.98 – 2.82 (m, 4H), 2.67 (dd, *J* = 13.4, 9.0 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.87, 143.53, 137.69, 137.66, 131.29, 129.85, 127.71, 126.15, 125.07, 124.93, 124.15, 123.30 (q, *J* = 286.0 Hz), 122.73, 121.54, 120.27, 119.71, 118.20, 109.49, 109.10, 98.72, 85.00 (q, *J* = 31.8 Hz), 63.43, 56.84, 42.68, 42.52, 29.73. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.87 (d, *J* = 4.7 Hz). HRMS Calcd. For $C_{26}H_{27}F_3N_3O_2$ ($[M+H]^+$): 470.2050, found: 470.2046.



5s

(*E*)-1-allyl-3-(but-2-en-1-yl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

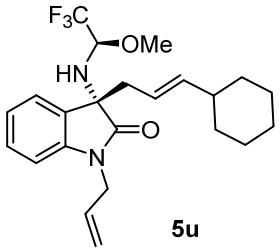
Yellow solid; 88% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.36 – 7.28 (m, 2H), 7.11 (td, *J* = 7.5, 0.8 Hz, 1H), 6.86 (d, *J* = 7.8 Hz, 1H), 5.90 – 5.73 (m, 1H), 5.51 – 5.36 (m, 1H), 5.32 – 5.18 (m, 2H), 5.16 – 5.03 (m, 1H), 4.57 – 4.42 (m, 1H), 4.16 (ddt, *J* = 16.2, 5.5, 1.4 Hz, 1H), 3.92 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.05 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.64 – 2.54 (m, 1H), 2.44 (dd, *J* = 13.2, 8.6 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.1, 143.5, 131.5, 131.0, 129.5, 126.6, 124.7, 123.3 (q, *J* = 286.9 Hz), 122.9, 122.6, 117.7, 109.2, 85.0 (q, *J* = 31.8 Hz), 63.2, 56.8, 42.4, 42.2, 17.9. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.98 (d, *J* = 4.5 Hz). HRMS Calcd. For $C_{18}H_{21}F_3N_2O_2Na$ ($[M+Na]^+$): 377.1447, found: 377.1447.



5t

(*E*)-1-allyl-3-(hex-2-en-1-yl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

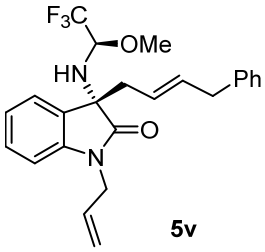
Yellow solid; 98% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35 – 7.27 (m, 2H), 7.11 (td, *J* = 7.5, 0.7 Hz, 1H), 6.86 (d, *J* = 7.8 Hz, 1H), 5.92 – 5.71 (m, 1H), 5.47 – 5.33 (m, 1H), 5.33 – 5.20 (m, 2H), 5.15 – 5.01 (m, 1H), 4.42 (ddt, *J* = 16.1, 5.4, 1.5 Hz, 1H), 4.21 (ddt, *J* = 16.1, 5.5, 1.4 Hz, 1H), 3.93 (dq, *J* = 12.7, 4.9 Hz, 1H), 3.05 (d, *J* = 12.7 Hz, 1H), 2.94 (s, 3H), 2.65 – 2.53 (m, 1H), 2.45 (dd, *J* = 13.2, 8.2 Hz, 1H), 1.94 – 1.74 (m, 2H), 1.29 – 1.14 (m, 2H), 0.75 (t, *J* = 7.4 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.1, 143.5, 136.4, 131.5, 129.5, 126.6, 124.8, 123.3 (q, *J* = 285.9 Hz), 122.5, 121.8, 118.0, 109.2, 84.9 (q, *J* = 31.8 Hz), 63.2, 56.7, 42.4, 42.3, 34.5, 22.3, 13.5. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.92 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{20}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 405.1760, found: 405.1754.



5u

(*E*)-1-allyl-3-(3-cyclohexylallyl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 90% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.34 – 7.27 (m, 2H), 7.10 (td, *J* = 7.5, 0.6 Hz, 1H), 6.86 (d, *J* = 7.8 Hz, 1H), 5.90 – 5.69 (m, 1H), 5.38 – 5.17 (m, 3H), 5.13 – 4.98 (m, 1H), 4.37 (ddt, *J* = 15.9, 5.5, 1.3 Hz, 1H), 4.30 – 4.19 (m, 1H), 3.94 (dq, *J* = 12.7, 4.9 Hz, 1H), 3.05 (d, *J* = 12.7 Hz, 1H), 2.94 (s, 3H), 2.56 (dd, *J* = 13.1, 6.5 Hz, 1H), 2.42 (dd, *J* = 13.1, 8.2 Hz, 1H), 1.83 – 1.70 (m, 1H), 1.68 – 1.38 (m, 5H), 1.26 – 1.00 (m, 3H), 0.96 – 0.79 (m, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.1, 143.5, 142.5, 131.6, 129.5, 126.6, 124.8, 123.3 (q, *J* = 286.0 Hz), 122.5, 119.0, 118.1, 109.1, 84.9 (q, *J* = 31.7 Hz), 63.2, 56.6, 42.5, 42.2, 40.5, 32.8, 32.6, 26.1, 25.9, 25.8. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.90 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{23}H_{29}F_3N_2O_2Na$ ($[M+Na]^+$): 445.2073, found: 445.2067.

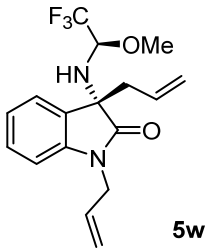


5v

(*E*)-1-allyl-3-(4-phenylbut-2-en-1-yl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 70% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.46 – 7.03 (m, 6H), 6.93 (d, *J* = 7.2 Hz, 2H), 6.86 (d, *J* = 7.8 Hz, 1H), 5.77 (ddd, *J* = 22.4, 10.6, 5.5 Hz, 1H), 5.62 – 5.48 (m, 1H), 5.34 – 5.14 (m, 3H), 4.27 (ddd, *J* = 48.0, 16.0, 5.4 Hz, 2H), 4.02 – 3.86 (m, 1H), 3.19 (d, *J* = 6.5 Hz, 2H), 3.07 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.63 (dd, *J* = 13.2, 6.8 Hz, 1H), 2.50 (dd, *J* = 13.1, 7.9 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.04, 143.51, 140.10, 134.71, 131.55, 129.55, 128.33, 128.31, 126.47, 125.93, 124.87, 123.54, 123.29 (q, *J* = 285.7 Hz), 122.66, 118.10, 109.30, 84.94 (q, *J* = 31.7 Hz), 63.16, 56.72, 42.45, 42.09, 38.80. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.88 (d, *J* = 4.4 Hz). HRMS Calcd. For $C_{24}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 453.1760,

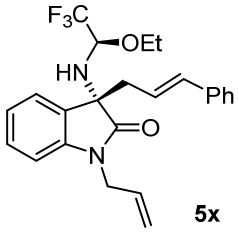
found: 453.1758.



5w

1,3-diallyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

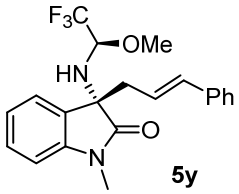
Yellow solid; 70% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.39 – 7.29 (m, 2H), 7.12 (td, *J* = 7.5, 0.8 Hz, 1H), 6.88 (d, *J* = 7.7 Hz, 1H), 5.91 – 5.75 (m, 1H), 5.61 – 5.45 (m, 1H), 5.37 – 5.19 (m, 2H), 5.08 – 4.95 (m, 2H), 4.43 (ddt, *J* = 16.1, 5.4, 1.6 Hz, 1H), 4.23 (ddt, *J* = 16.1, 5.6, 1.4 Hz, 1H), 3.93 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.06 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.72 – 2.60 (m, 1H), 2.49 (dd, *J* = 13.3, 8.4 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.9, 143.5, 131.5, 130.6, 129.6, 126.3, 124.8, 123.3 (q, *J* = 286.0 Hz), 122.6, 120.2, 118.1, 109.3, 84.9 (q, *J* = 31.8 Hz), 62.8, 56.7, 43.2, 42.5. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.91 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{17}H_{19}F_3N_2O_2Na$ ($[M+Na]^+$): 363.1291, found: 363.1286.



5x

1-allyl-3-cinnamyl-3-((1-ethoxy-2,2,2-trifluoroethyl)amino)indolin-2-one：

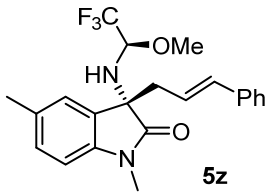
Yellow solid; 77% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.36 – 7.28 (m, 2H), 7.25 – 7.08 (m, 6H), 6.83 (d, *J* = 7.7 Hz, 1H), 6.30 (d, *J* = 15.9 Hz, 1H), 5.95 – 5.80 (m, 1H), 5.76 – 5.59 (m, 1H), 5.22 – 4.98 (m, 2H), 4.56 (ddt, *J* = 16.1, 4.8, 1.6 Hz, 1H), 4.07 – 3.94 (m, 2H), 3.44 – 3.32 (m, 1H), 3.08 (d, *J* = 12.5 Hz, 1H), 2.86 – 2.77 (m, 2H), 2.63 (dd, *J* = 13.2, 8.8 Hz, 1H), 0.96 (t, *J* = 7.0 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.5, 143.4, 136.9, 135.0, 131.2, 129.7, 128.4, 127.4, 126.6, 126.2, 124.8, 123.3 (q, *J* = 285.7 Hz), 122.7, 122.0, 118.0, 109.3, 83.5 (q, *J* = 31.8 Hz), 65.1, 63.5, 42.9, 42.4, 14.9. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.04 (d, *J* = 5.0 Hz). HRMS Calcd. For $C_{24}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 453.1760, found: 453.1757.



5y

3-cinnamyl-1-methyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

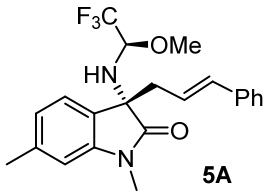
Yellow solid; 59% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.40 – 7.30 (m, 2H), 7.29 – 7.16 (m, 5H), 7.12 (t, *J* = 7.4 Hz, 1H), 6.87 (d, *J* = 7.8 Hz, 1H), 6.32 (d, *J* = 15.8 Hz, 1H), 6.07 – 5.88 (m, 1H), 3.90 (dq, *J* = 12.7, 4.7 Hz, 1H), 3.19 (s, 3H), 3.10 (d, *J* = 12.7 Hz, 1H), 2.93 (s, 3H), 2.80 (ddd, *J* = 13.4, 6.1, 1.1 Hz, 1H), 2.59 (dd, *J* = 13.4, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.4, 144.2, 137.1, 134.8, 129.9, 128.5, 127.4, 126.4, 126.2, 125.0, 123.3 (q, *J* = 285.8 Hz), 122.8, 122.2, 108.4, 85.3 (q, *J* = 31.8 Hz), 63.2, 57.2, 42.0, 26.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.16 (d, *J* = 4.6 Hz). HRMS Calcd. For $C_{21}H_{21}F_3N_2O_2Na$ ($[M+Na]^+$): 413.1447, found: 413.1441.



5z

3-cinnamyl-1,5-dimethyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

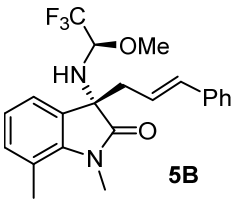
Yellow solid; 74% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.28 – 7.11 (m, 7H), 6.75 (d, *J* = 7.8 Hz, 1H), 6.33 (d, *J* = 15.8 Hz, 1H), 5.99 – 5.86 (m, 1H), 3.92 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.16 (s, 3H), 3.08 (d, *J* = 12.7 Hz, 1H), 2.94 (s, 3H), 2.77 (ddd, *J* = 13.5, 6.2, 1.2 Hz, 1H), 2.60 (dd, *J* = 13.4, 8.8 Hz, 1H), 2.37 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.3, 141.8, 137.2, 134.7, 132.4, 130.2, 128.4, 127.3, 126.4, 126.2, 125.6, 123.3 (q, *J* = 285.7 Hz), 122.3, 108.2, 85.2 (q, *J* = 31.8 Hz), 63.3, 57.2, 42.1, 26.2, 21.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.16 (d, *J* = 4.7 Hz). HRMS Calcd. For $C_{22}H_{23}F_3N_2O_2Na$ ($[M+Na]^+$): 427.1604, found: 427.1599.



5A

3-cinnamyl-1,6-dimethyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

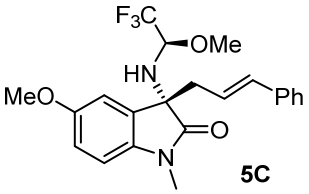
Yellow solid; 67% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31 – 7.14 (m, 6H), 6.92 (d, *J* = 7.4 Hz, 1H), 6.69 (s, 1H), 6.32 (d, *J* = 15.8 Hz, 1H), 6.05 – 5.91 (m, 1H), 3.90 (dq, *J* = 12.6, 4.8 Hz, 1H), 3.18 (s, 3H), 3.06 (d, *J* = 12.7 Hz, 1H), 2.94 (s, 3H), 2.84 – 2.73 (m, 1H), 2.56 (dd, *J* = 13.4, 8.9 Hz, 1H), 2.40 (s, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.69, 144.25, 140.19, 137.16, 134.64, 128.44, 127.34, 126.25, 124.75, 123.34, 123.32 (q, *J* = 287.3 Hz), 123.31, 122.47, 109.34, 85.22 (q, *J* = 31.8 Hz), 63.08, 57.19, 42.04, 26.11, 21.95. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.16 (d, *J* = 4.6 Hz). HRMS Calcd. For $C_{22}H_{23}F_3N_2O_2Na$ ($[M+Na]^+$): 427.1604, found: 427.1601.



5B

3-cinnamyl-1,7-dimethyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 68% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.29 – 7.13 (m, 6H), 7.08 (d, *J* = 7.5 Hz, 1H), 7.00 (t, *J* = 7.5 Hz, 1H), 6.32 (d, *J* = 15.8 Hz, 1H), 6.06 – 5.84 (m, 1H), 3.91 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.46 (s, 3H), 3.08 (d, *J* = 12.7 Hz, 1H), 2.98 (s, 3H), 2.75 (ddd, *J* = 13.3, 6.1, 1.0 Hz, 1H), 2.64 – 2.51 (m, 4H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 180.1, 142.0, 137.2, 134.7, 133.5, 128.5, 127.4, 127.1, 126.3, 123.3 (q, *J* = 285.8 Hz), 122.8, 122.7, 122.3, 120.1, 85.1 (q, *J* = 31.8 Hz), 62.5, 57.0, 42.4, 29.6, 19.1. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.10 (d, *J* = 4.6 Hz). HRMS Calcd. For $C_{22}H_{23}F_3N_2O_2Na$ ($[M+Na]^+$): 427.1604, found: 427.1603.

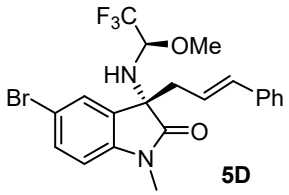


5C

3-cinnamyl-5-methoxy-1-methyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 64% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.31 – 7.15 (m, 5H), 6.94 (d, *J* = 2.5 Hz, 1H), 6.89 (dd, *J* = 8.5, 2.5 Hz, 1H), 6.77 (d, *J* = 8.5 Hz, 1H), 6.34 (d, *J* = 15.8 Hz, 1H), 6.02 – 5.87 (m, 1H), 3.93 (dq, *J* = 12.6, 4.7 Hz, 1H), 3.78 (s, 3H), 3.17 (s, 3H), 3.10 (d, *J* = 12.7 Hz, 1H), 2.96 (s, 3H), 2.78 (ddd, *J* = 13.3, 6.2, 1.2 Hz, 1H), 2.60 (dd, *J* = 13.4, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.0, 156.1, 137.6, 137.1, 134.9, 128.5, 127.7, 127.4, 126.2, 123.3

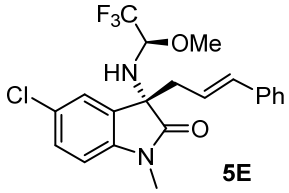
(q, J = 285.9 Hz), 122.1, 114.2, 112.0, 108.9, 85.2 (q, J = 31.9 Hz), 63.7, 57.3, 55.8, 42.1, 26.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.20 (d, J = 4.4 Hz). HRMS Calcd. For $C_{22}H_{23}F_3N_2O_3Na$ ($[M+Na]^+$): 443.1553, found: 443.1549.



5D

5-bromo-3-cinnamyl-1-methyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

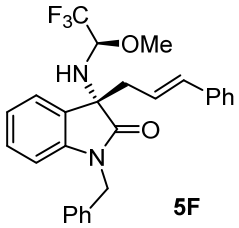
Yellow solid; 87% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.50 (dd, J = 8.3, 2.0 Hz, 1H), 7.46 (d, J = 1.9 Hz, 1H), 7.29 – 7.16 (m, 5H), 6.74 (d, J = 8.3 Hz, 1H), 6.35 (d, J = 15.8 Hz, 1H), 5.96 – 5.79 (m, 1H), 3.99 – 3.85 (m, 1H), 3.16 (s, 3H), 3.12 (d, J = 12.7 Hz, 1H), 2.97 (s, 3H), 2.76 (ddd, J = 13.3, 6.3, 1.2 Hz, 1H), 2.62 (dd, J = 13.4, 8.7 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.7, 143.3, 136.9, 135.4, 132.8, 128.6, 128.5, 127.9, 127.6, 126.3, 123.1 (q, J = 286.0 Hz), 121.3, 115.5, 109.9, 85.2 (q, J = 32.0 Hz), 63.4, 57.2, 42.1, 26.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.01 (d, J = 4.3 Hz). HRMS Calcd. For $C_{21}H_{20}BrF_3N_2O_2Na$ ($[M+Na]^+$): 491.0552, found: 491.0547.



5E

5-chloro-3-cinnamyl-1-methyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one：

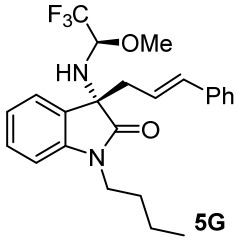
Yellow solid; 68% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.38 – 7.30 (m, 2H), 7.28 – 7.15 (m, 5H), 6.79 (d, J = 8.2 Hz, 1H), 6.34 (d, J = 15.8 Hz, 1H), 5.96 – 5.81 (m, 1H), 3.91 (dq, J = 12.8, 4.7 Hz, 1H), 3.17 (s, 3H), 3.12 (d, J = 12.7 Hz, 1H), 2.97 (s, 3H), 2.77 (ddd, J = 13.3, 6.3, 1.3 Hz, 1H), 2.62 (dd, J = 13.4, 8.7 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 178.85, 142.77, 136.86, 135.37, 129.93, 128.49, 128.28, 128.27, 127.55, 126.28, 125.16, 123.14 (q, J = 286.0 Hz), 121.37, 109.37, 85.18 (q, J = 31.9 Hz), 63.42, 57.19, 42.08, 26.27. ^{19}F NMR (376 MHz, $CDCl_3$) δ -79.03 (d, J = 4.4 Hz). HRMS Calcd. For $C_{21}H_{20}ClF_3N_2O_2Na$ ($[M+Na]^+$): 447.1058, found: 447.1050.



5F

1-benzyl-3-cinnamyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one：

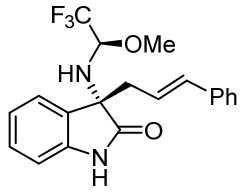
Yellow solid; 56% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.35 (dd, *J* = 7.3, 0.7 Hz, 1H), 7.28 – 7.06 (m, 10H), 7.00 (t, *J* = 7.6 Hz, 2H), 6.72 (d, *J* = 7.8 Hz, 1H), 6.38 (d, *J* = 15.9 Hz, 1H), 5.93 – 5.77 (m, 1H), 5.15 (d, *J* = 15.6 Hz, 1H), 4.58 (d, *J* = 15.6 Hz, 1H), 3.96 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.16 (d, *J* = 12.7 Hz, 1H), 2.89 (ddd, *J* = 13.2, 6.1, 1.4 Hz, 1H), 2.84 (s, 3H), 2.73 (dd, *J* = 13.3, 9.1 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.33, 143.57, 136.87, 135.43, 135.13, 129.83, 128.70, 128.51, 127.53, 127.48, 127.36, 126.35, 126.25, 124.83, 123.34 (q, *J* = 285.8 Hz), 122.81, 121.98, 109.54, 85.04 (q, *J* = 31.8 Hz), 63.41, 56.83, 44.01, 42.56. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.89 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{27}H_{25}F_3N_2O_2Na$ ($[M+Na]^+$): 489.1760, found: 489.1755.



5G

1-butyl-3-cinnamyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one：

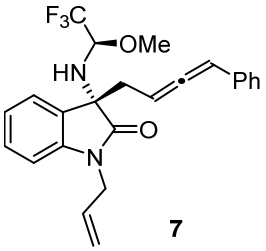
Yellow solid; 60% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.37 – 7.31 (m, 2H), 7.25 – 7.13 (m, 5H), 7.11 (td, *J* = 7.5, 0.6 Hz, 1H), 6.86 (d, *J* = 7.7 Hz, 1H), 6.30 (d, *J* = 15.9 Hz, 1H), 5.95 – 5.79 (m, 1H), 3.95 (dq, *J* = 12.7, 4.8 Hz, 1H), 3.84 – 3.69 (m, 1H), 3.53 (dt, *J* = 14.2, 7.2 Hz, 1H), 3.09 (d, *J* = 12.7 Hz, 1H), 2.92 (s, 3H), 2.80 (ddd, *J* = 13.2, 6.1, 1.3 Hz, 1H), 2.61 (dd, *J* = 13.3, 8.9 Hz, 1H), 1.59 – 1.47 (m, 2H), 1.37 – 1.22 (m, 2H), 0.81 (t, *J* = 7.3 Hz, 3H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.0, 143.8, 137.0, 134.8, 129.8, 128.4, 127.4, 126.5, 126.2, 125.0, 123.3 (q, *J* = 285.9 Hz), 122.5, 122.1, 108.6, 85.1 (q, *J* = 31.7 Hz), 63.3, 56.9, 42.5, 39.9, 29.8, 20.2, 13.6. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.98 (d, *J* = 4.6 Hz). HRMS Calcd. For $C_{24}H_{27}F_3N_2O_2Na$ ($[M+Na]^+$): 455.1917, found: 455.1914.



5H

3-cinnamyl-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 17% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.91 (s, 1H), 7.33 – 7.28 (m, 2H), 7.25 – 7.16 (m, 5H), 7.13 – 7.08 (m, 1H), 6.91 (d, *J* = 7.6 Hz, 1H), 6.34 (d, *J* = 15.6 Hz, 1H), 6.05 – 5.90 (m, 1H), 3.99 – 3.89 (m, 1H), 3.11 (d, *J* = 12.8 Hz, 1H), 3.00 (s, 3H), 2.80 (dd, *J* = 13.6, 6.4 Hz, 1H), 2.61 (dd, *J* = 13.6, 8.8 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 181.0, 141.1, 137.0, 135.0, 129.8, 128.4, 127.4, 126.7, 126.2, 125.3, 123.3 (q, *J* = 285.8 Hz), 122.8, 121.9, 110.2, 85.3 (q, *J* = 31.3 Hz), 63.6, 57.5, 42.2. ^{19}F NMR (376 MHz, Chloroform-*d*) δ -79.19 (d, *J* = 4.5 Hz). HRMS Calcd. For $C_{20}H_{19}F_3N_2O_2Na^+$ ([M+Na]$^+$): 399.1291, found: 399.1321.

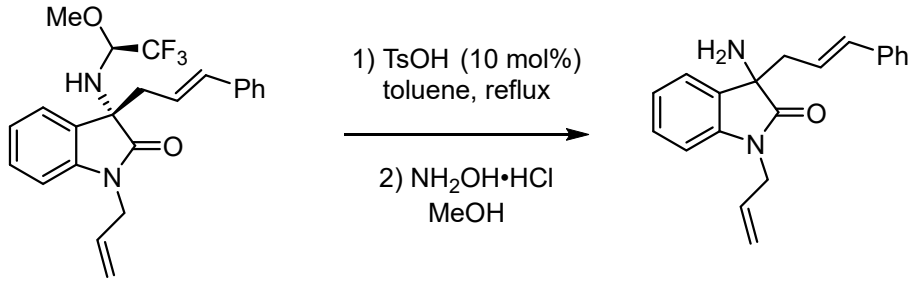


7

1-allyl-3-(4-phenylbuta-2,3-dien-1-yl)-3-((2,2,2-trifluoro-1-methoxyethyl)amino)indolin-2-one:

Yellow solid; 46% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.46 – 7.32 (m, 2H), 7.30 – 7.21 (m, 2H), 7.21 – 7.09 (m, 4H), 6.90 (d, *J* = 7.8 Hz, 1H), 5.97 – 5.75 (m, 2H), 5.49 – 5.17 (m, 3H), 4.52 – 4.23 (m, 2H), 4.07 – 3.90 (m, 1H), 3.16 (d, *J* = 12.8 Hz, 1H), 2.95 (s, 3H), 2.72 (ddd, *J* = 13.7, 6.3, 3.4 Hz, 1H), 2.56 (ddd, *J* = 13.7, 9.0, 1.4 Hz, 1H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 207.3, 178.8, 143.6, 133.9, 131.4, 129.8, 128.5, 126.9, 126.8, 126.1, 125.1, 123.3 (q, *J* = 286.0 Hz), 122.7, 118.4, 109.5, 94.5, 87.6, 84.9 (q, *J* = 31.9 Hz), 62.6, 56.7, 42.6, 38.7. ^{19}F NMR (376 MHz, $CDCl_3$) δ -78.81 (d, *J* = 4.8 Hz). HRMS Calcd. For $C_{24}H_{23}F_3N_2O_2Na$ ([M+Na]$^+$): 451.1603, found: 451.1603.

3. Synthetic Applications

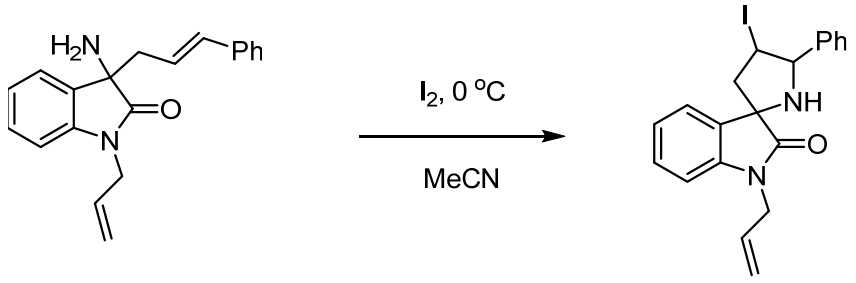


5a **8**

In a 50 mL round-bottom flask, **5a** (2.0 mmol) and TsOH (0.2 mmol) were dissolved in 20 mL toluene. Equipped with a reflux condenser, a magnic stirring bar and Dean-Stark trap, the systerm was heated to reflux for 3 hours.[1] After cooling to rt, NH_2OH·HCl was added. The reaction was stirred for 0.5 h at rt, then solvent was removed by rotary evaporation, **8** were obtained by chromatography on silica gel (PE/EA/Et_3N = 5:1:1) as colorless oil.

1-allyl-3-amino-3-cinnamylindolin-2-one:

Colourless oil; 81% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.42 (dd, *J* = 7.4, 0.8 Hz, 1H), 7.31 – 7.13 (m, 6H), 7.09 (td, *J* = 7.6, 0.9 Hz, 1H), 6.80 (d, *J* = 7.8 Hz, 1H), 6.37 (d, *J* = 15.8 Hz, 1H), 6.02 – 5.83 (m, 1H), 5.71 (ddt, *J* = 17.1, 10.4, 5.3 Hz, 1H), 5.22 – 4.97 (m, 2H), 4.43 (ddt, *J* = 16.3, 5.0, 1.7 Hz, 1H), 4.13 (ddt, *J* = 16.3, 5.4, 1.5 Hz, 1H), 2.77 (ddd, *J* = 13.2, 6.5, 1.4 Hz, 1H), 2.66 (ddd, *J* = 13.2, 8.6, 0.8 Hz, 1H), 2.10 (brs, 2H). ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.8, 142.4, 137.0, 134.6, 131.4, 131.2, 129.0, 128.4, 127.3, 126.2, 123.9, 122.9, 122.8, 117.6, 109.2, 61.4, 42.9, 42.3. HRMS Calcd. For $C_{20}H_{20}N_2ONa$ ($[M+Na]^+$): 327.1468, found: 327.1463.



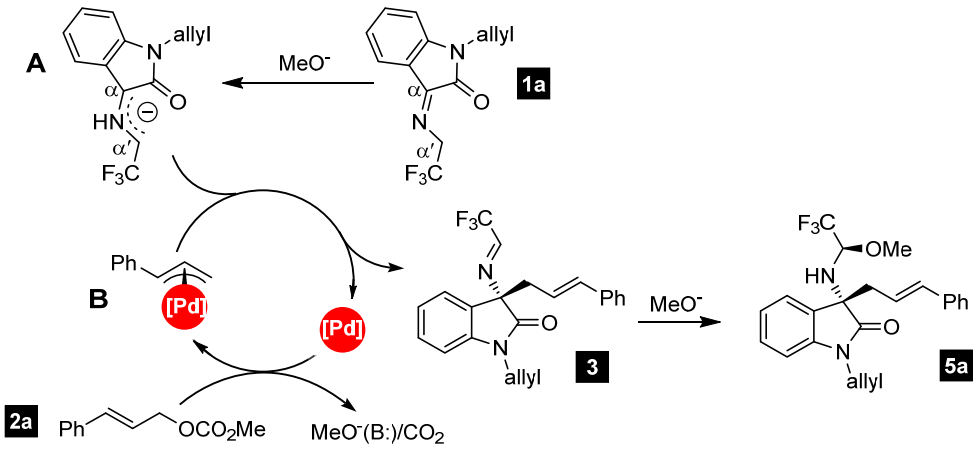
8 **9**

8 (0.2 mmol), I_2 (0.4 mmol) and CH_3CN (1 mL) were added to a 5-mL vial equipped with stirring bar. The mixture was stirred at 0 ºC for 4 h, and TLC showed that **8** was disappeared. The mixture was stirred for 10 min before quenched by addition of CH_2Cl_2 (5 mL) and saturated $Na_2S_2O_3$ (5 mL), and the aqueous layer was extracted with additional portions of CH_2Cl_2. The combined organic layers were combined, concentrated, purified by flash chromatography on silica gel (PE/EA = 5:1) to give the inseparable products **9**.

1-allyl-4'-iodo-5'-phenylspiro[indoline-3,2'-pyrrolidin]-2-one:

Colourless oil; 81% yield. ^{1}H NMR (400 MHz, $CDCl_3$) δ 7.70 – 7.61 (m, 1H), 7.60 – 7.53 (m, 1H), 7.50 – 7.26 (m, 5H), 7.17 – 7.07 (m, 1H), 6.83 (dd, *J* = 7.7, 3.9 Hz, 1H), 5.92 – 5.74 (m, 1H), 5.31 – 5.17 (m, 2H), 4.97$_{major}$ (d, *J* = 10.0 Hz, 0.6H), 4.71$_{minor}$(d, *J* = 10.0 Hz, 0.4H), 4.66 – 4.16 (m, 3H), 2.90 (ddd, *J* = 14.9, 13.2, 8.8 Hz, 1H), 2.77 – 2.62 (m, 1H), 2.39 (brs, 1H). Major: ^{13}C NMR (101 MHz, $CDCl_3$) 179.53, 142.21, 138.94, 133.63, 131.23, 129.05, 128.57, 128.39, 127.44, 123.27, 123.08, 117.81, 109.31, 72.12, 66.96, 49.65, 42.54, 26.39. Minor: ^{13}C NMR (101 MHz, $CDCl_3$) δ 179.59, 142.21, 138.98, 132.83, 131.17, 129.09, 128.75, 128.45, 127.83, 123.46, 123.22, 117.83, 109.25, 74.17, 67.85, 50.53, 42.54, 26.59. HRMS Calcd. For $C_{20}H_{20}IN_2O$ ([M+Na]$^+$): 431.0615, found: 431.0607.

4. Proposed mechanism for cascade umpolung allylation/acetalation



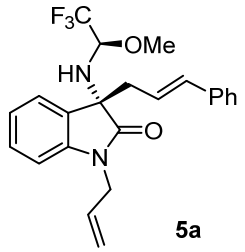
Scheme S1. Proposed Mechanism for cascade umpolung allylation/Acetalation

Under basic condition, *N*-2,2,2-trifluoroethylisatin ketimine **1a** is deprotonated to form 2-azaallyl carbanion **A**. Coordination of allylic carbonate **2a** to Pd(0) followed by oxidative addition-decarboxylation gives Pd-π-Allyl species (**B**). The nucleophilic attack of 2-azaallyl carbanion **A** to electrophilic π-allyl Pd (**B**) generates the allylation product **3** and completes the catalytic cycles. Then, the imine moiety of **3** is attacked by methoxide to form the final product **5a**.

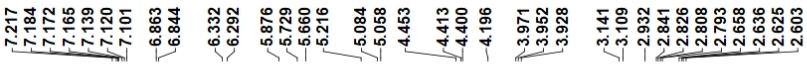
5. References

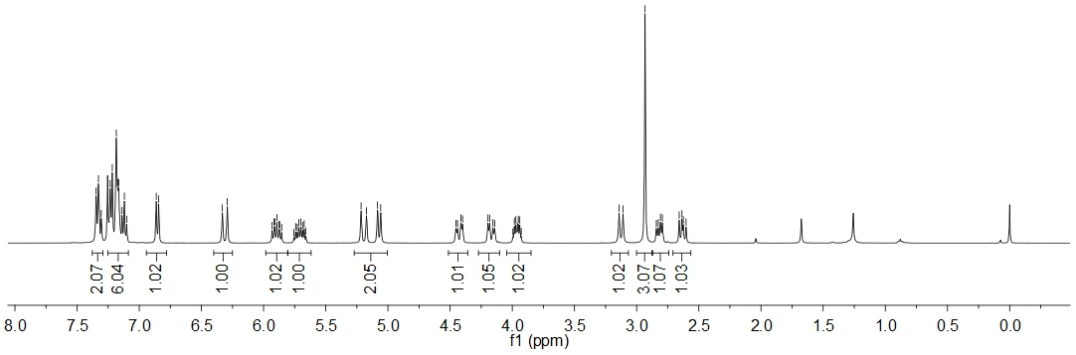
[1] H. Mimura, K. Kawada, T. Yamashita, T. Sakamoto, Y. Kikugawa, *J. Fluorine Chem*. **2010**, *131*, 477-486.

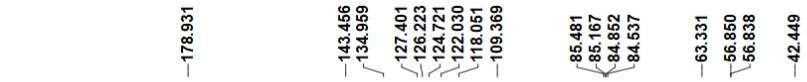
6. NMR spectra

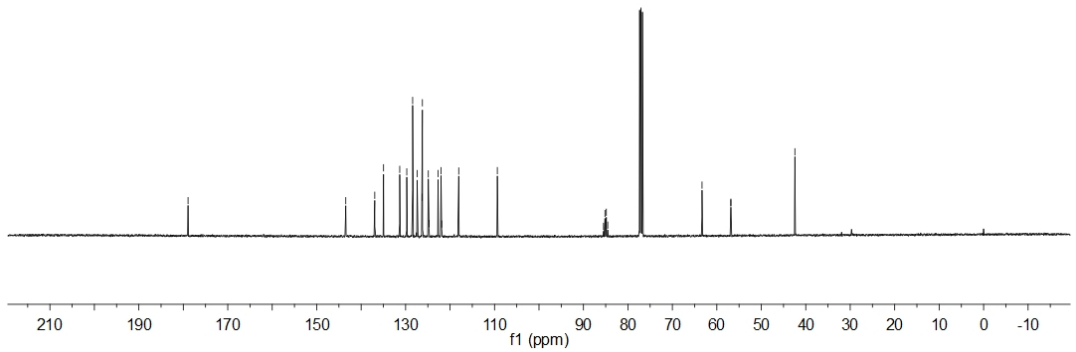


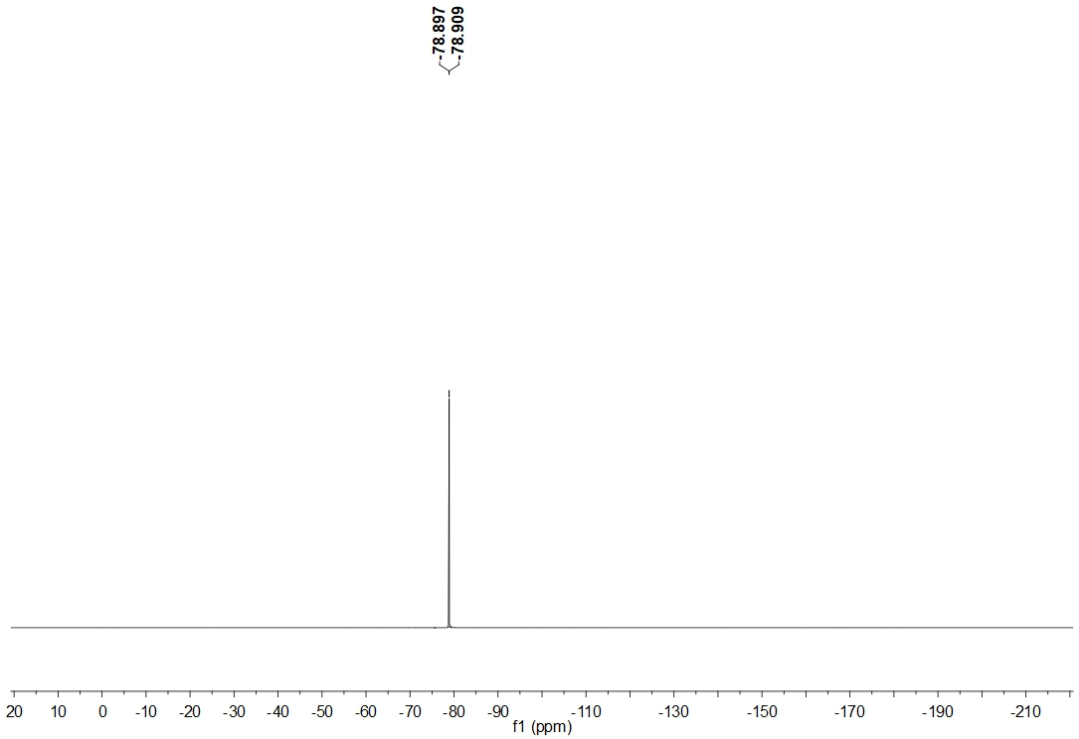
5a







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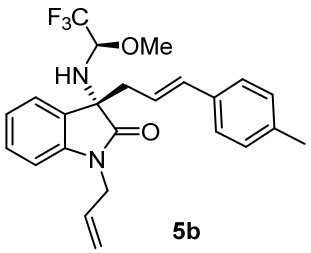
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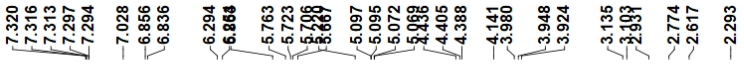
O
N

5b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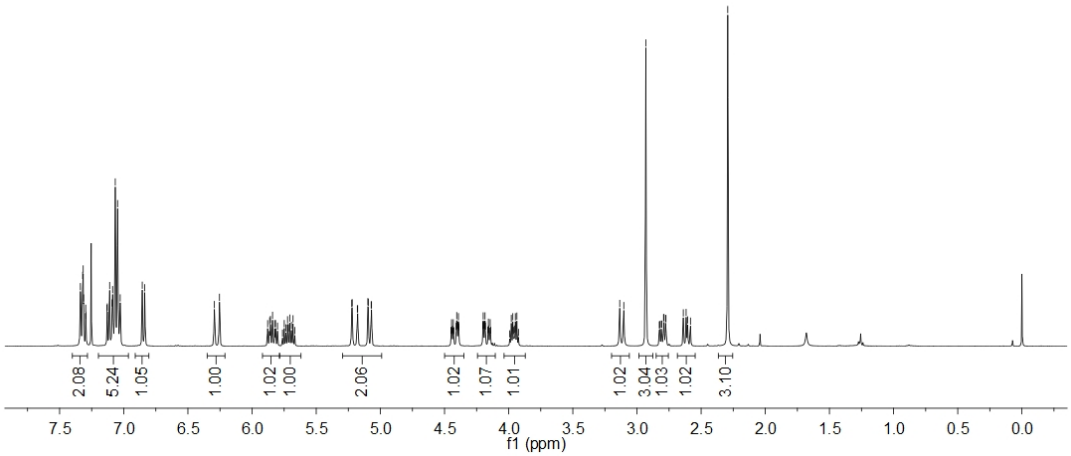
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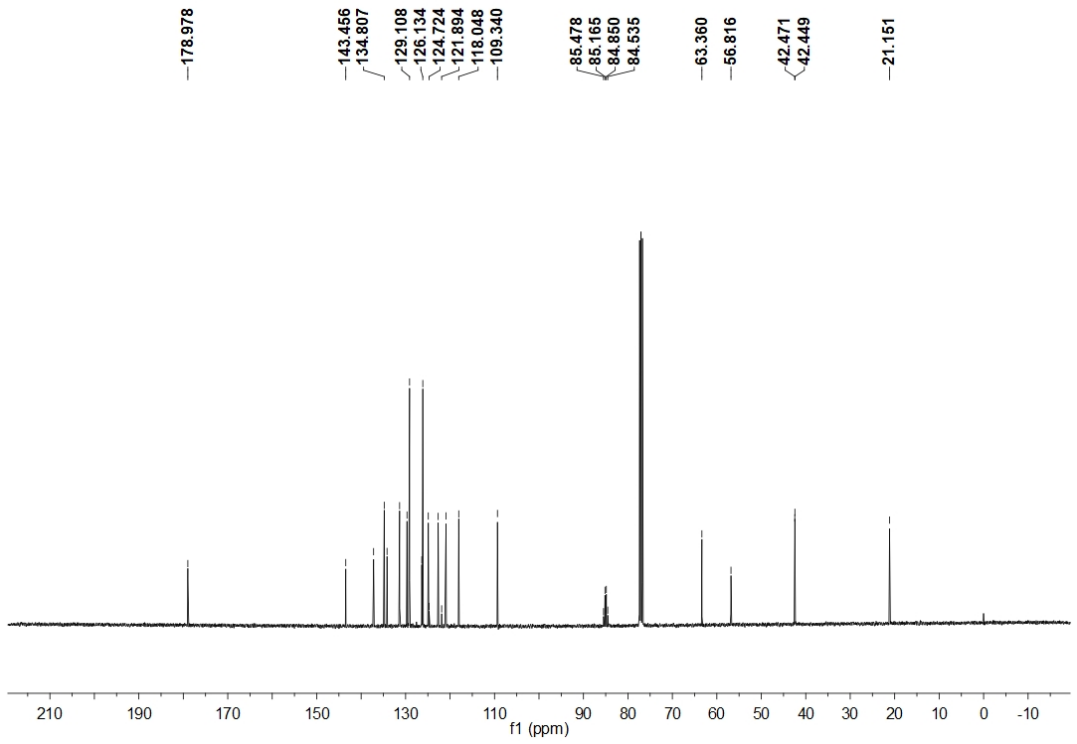
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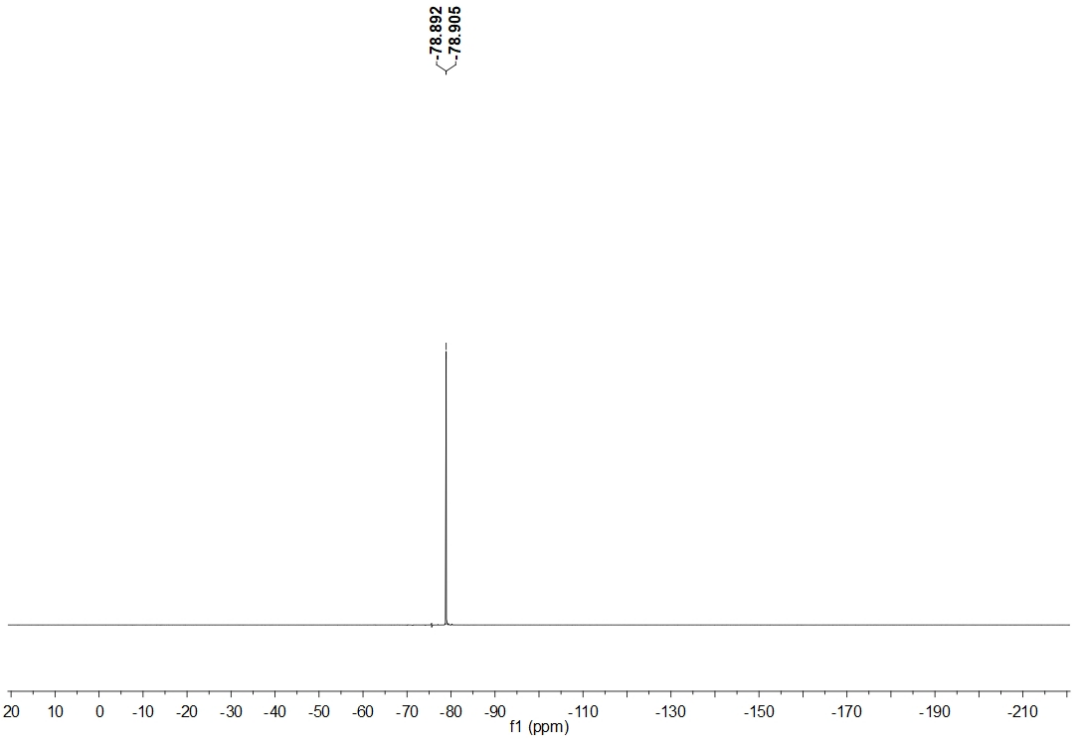
f1 (ppm)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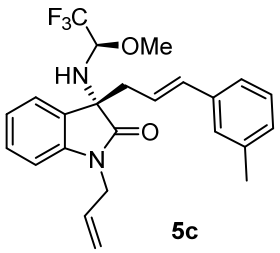
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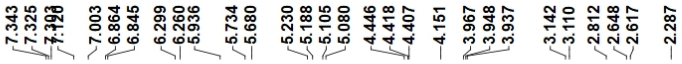
5c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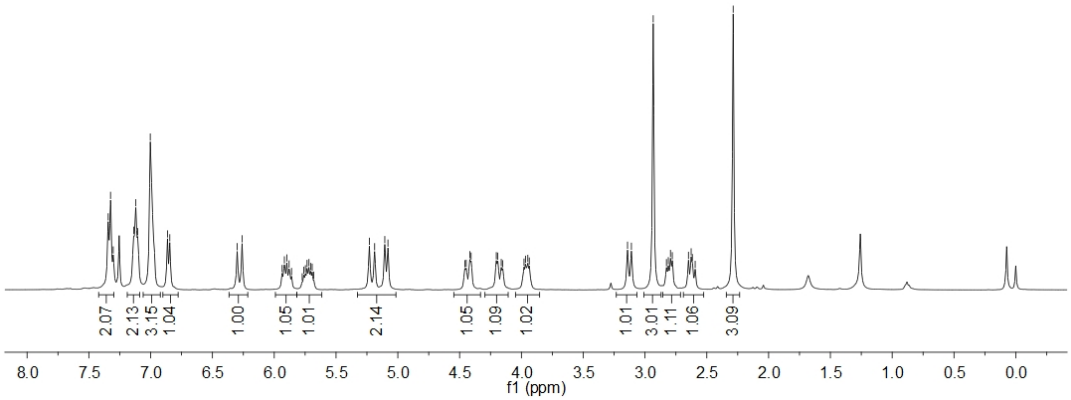
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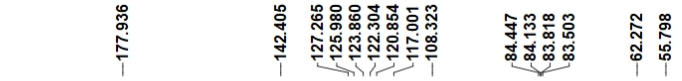
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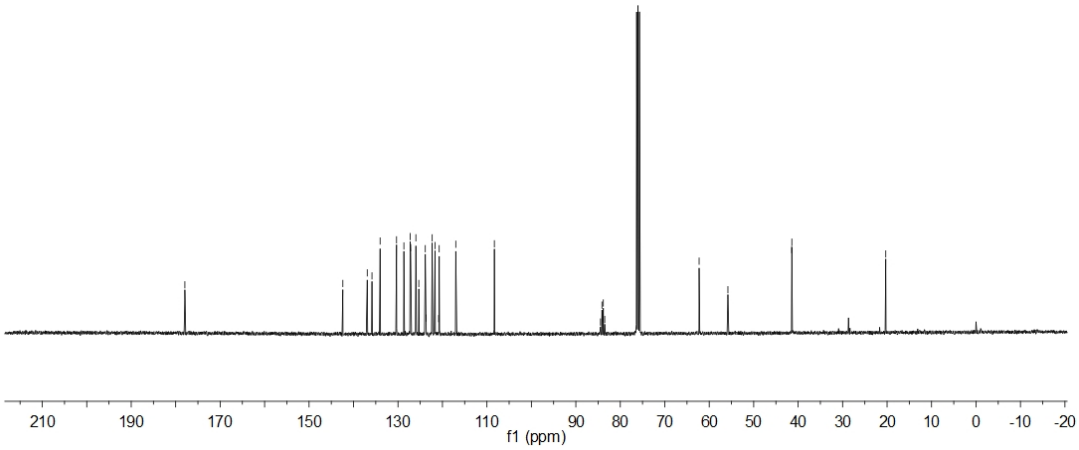
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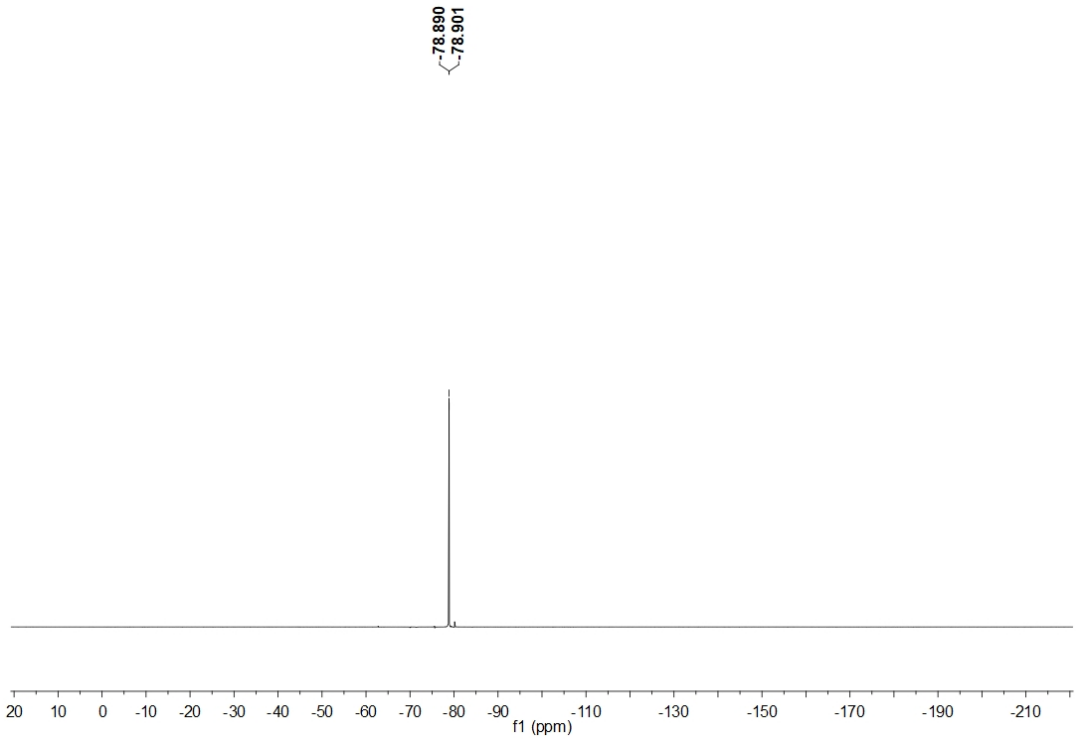
f1 (ppm)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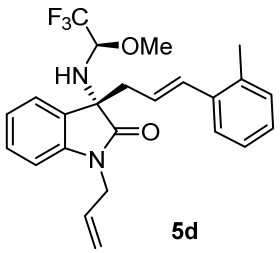
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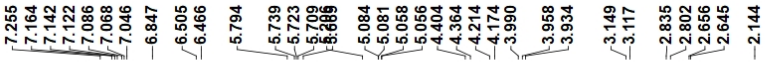
5d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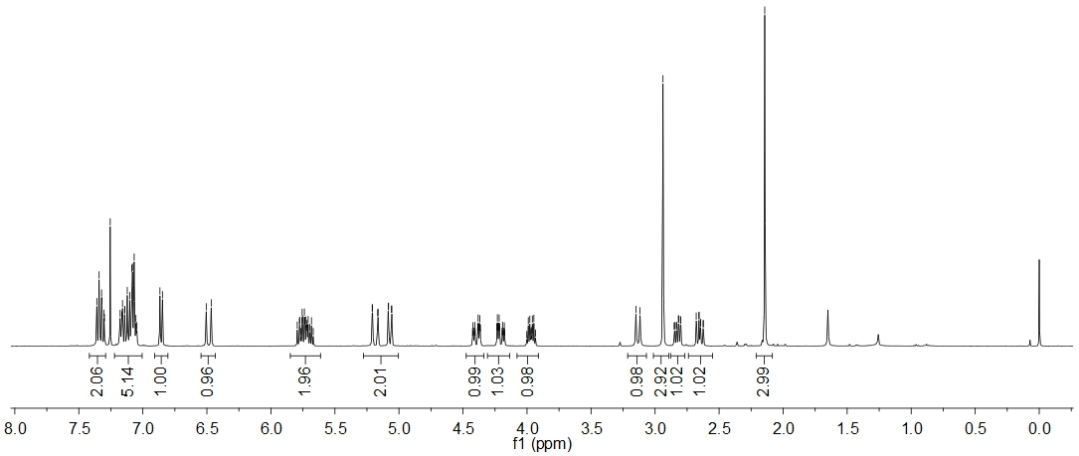
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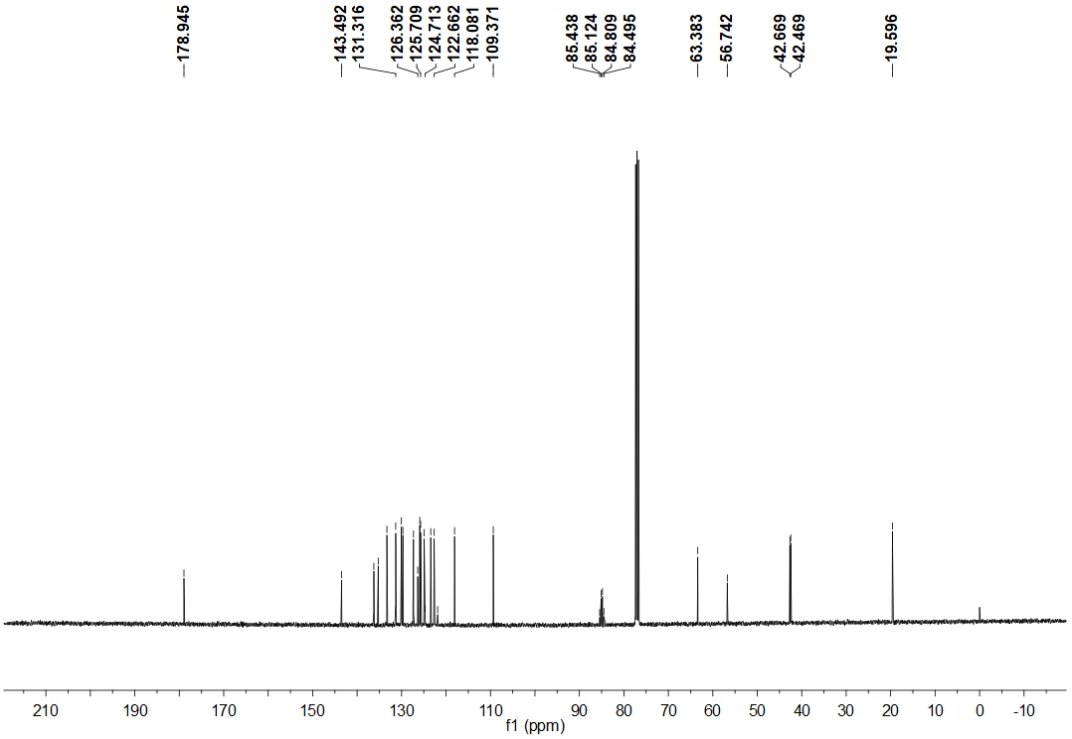
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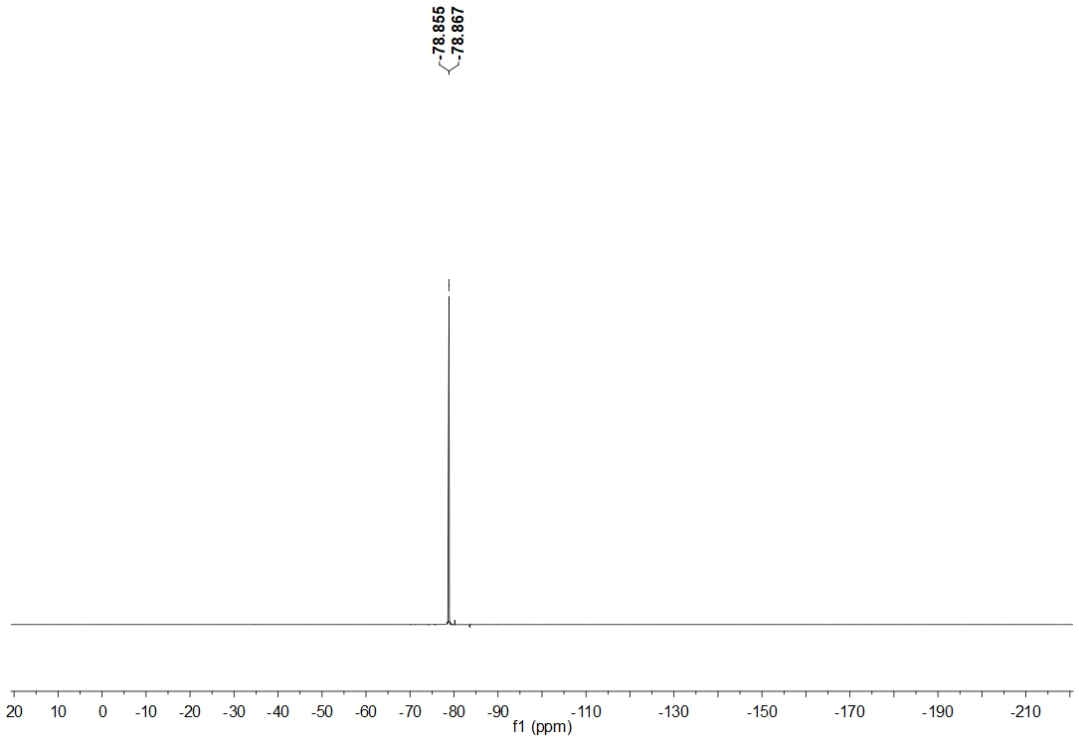
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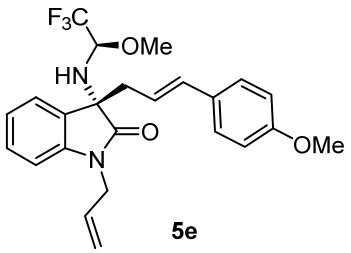
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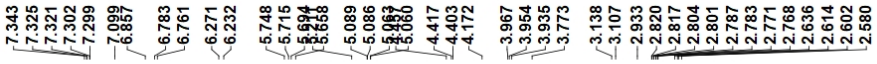
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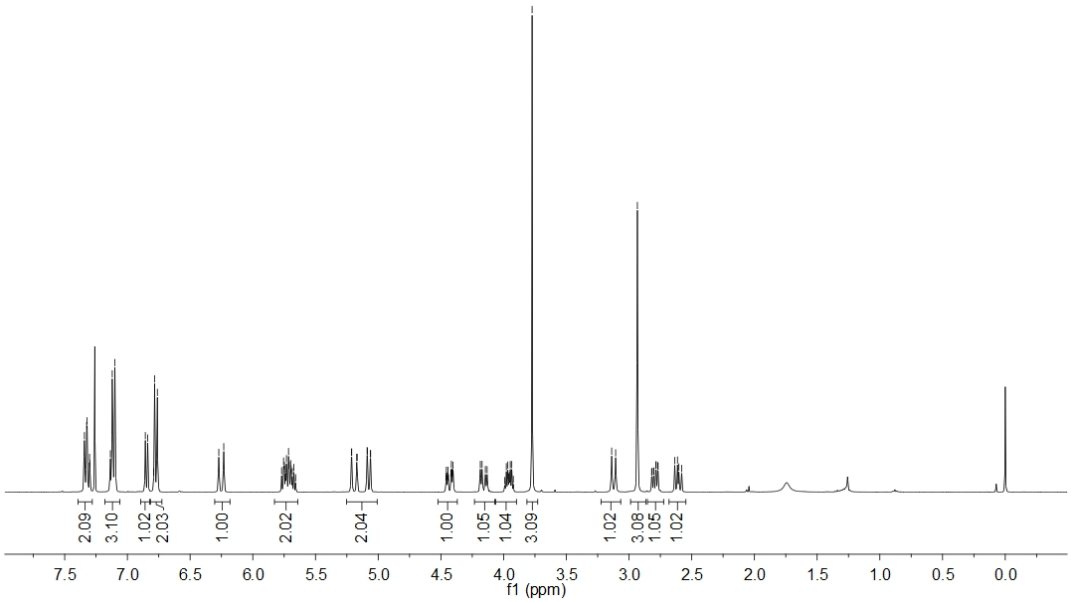
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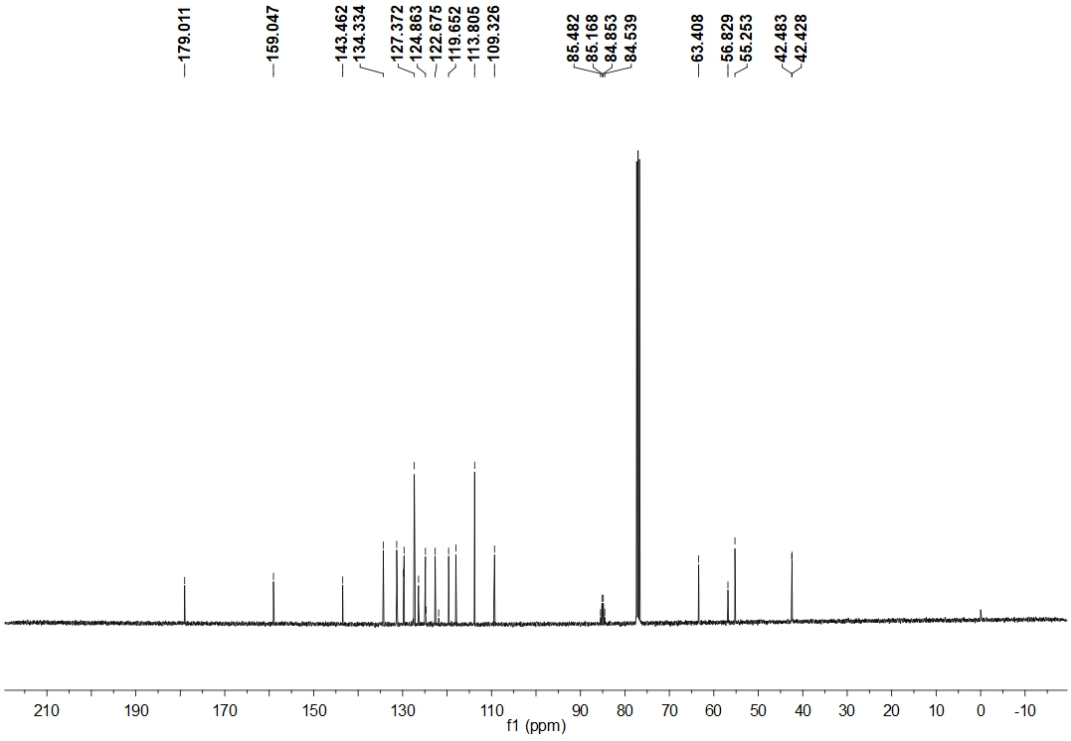
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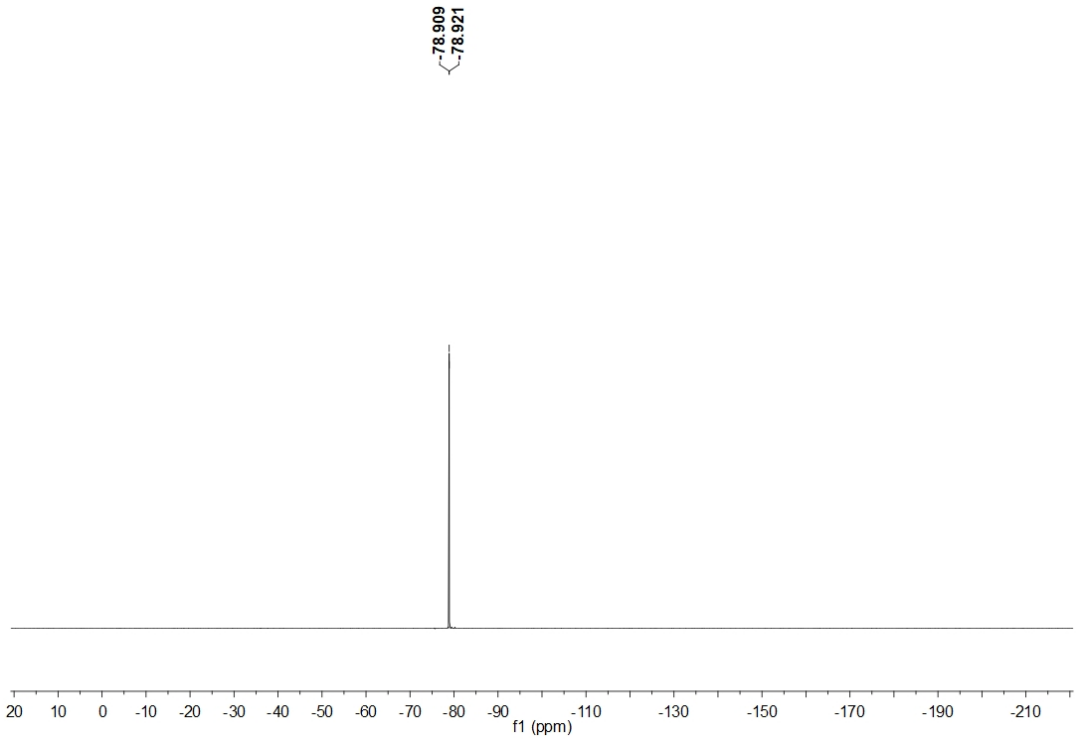
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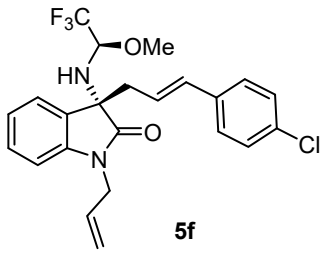
f1 (ppm)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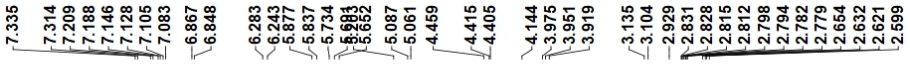
Cl

5f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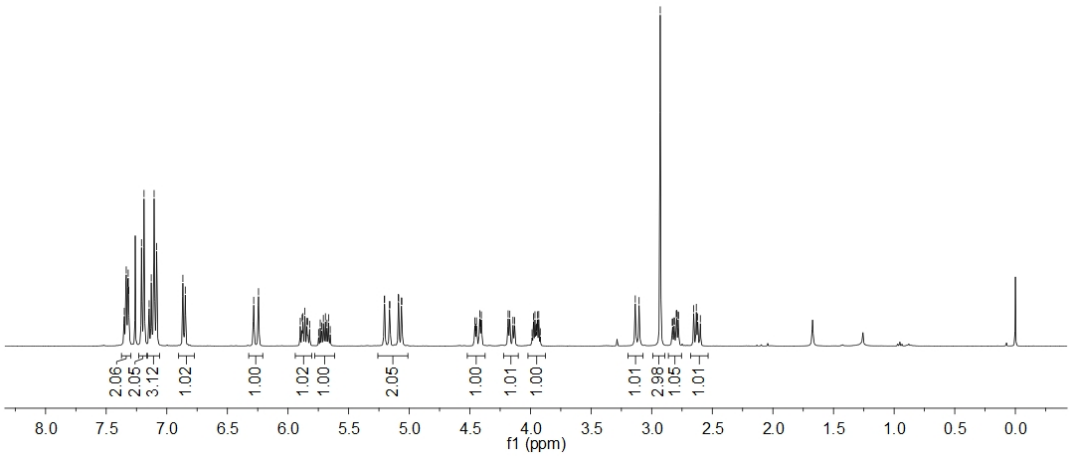
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2.05
3.12
1.02
1.00
1.02
1.00
2.05
1.00
1.01
1.00
1.01
2.98
1.05
1.01
8.0
7.5
7.0
6.5
6.0
5.5
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2.5
2.0
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1.0
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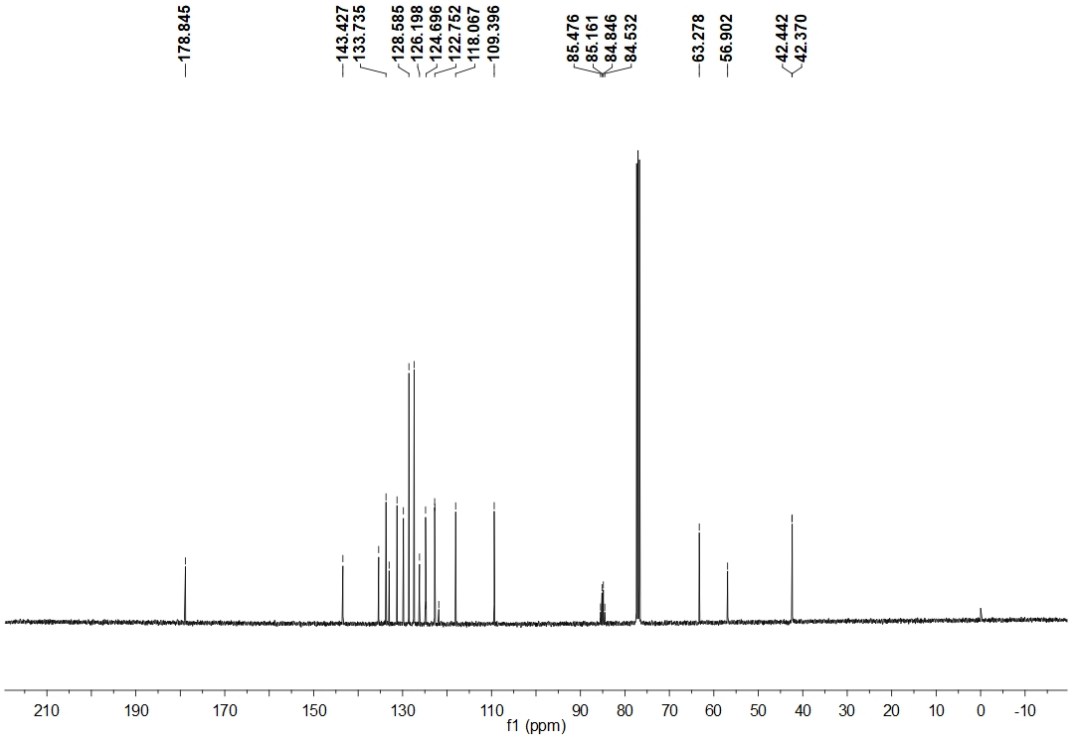
0.0
f1 (ppm)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122.752
118.067
109.396
85.476
85.161
84.846
84.532
63.278
56.902
42.442
42.370
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190
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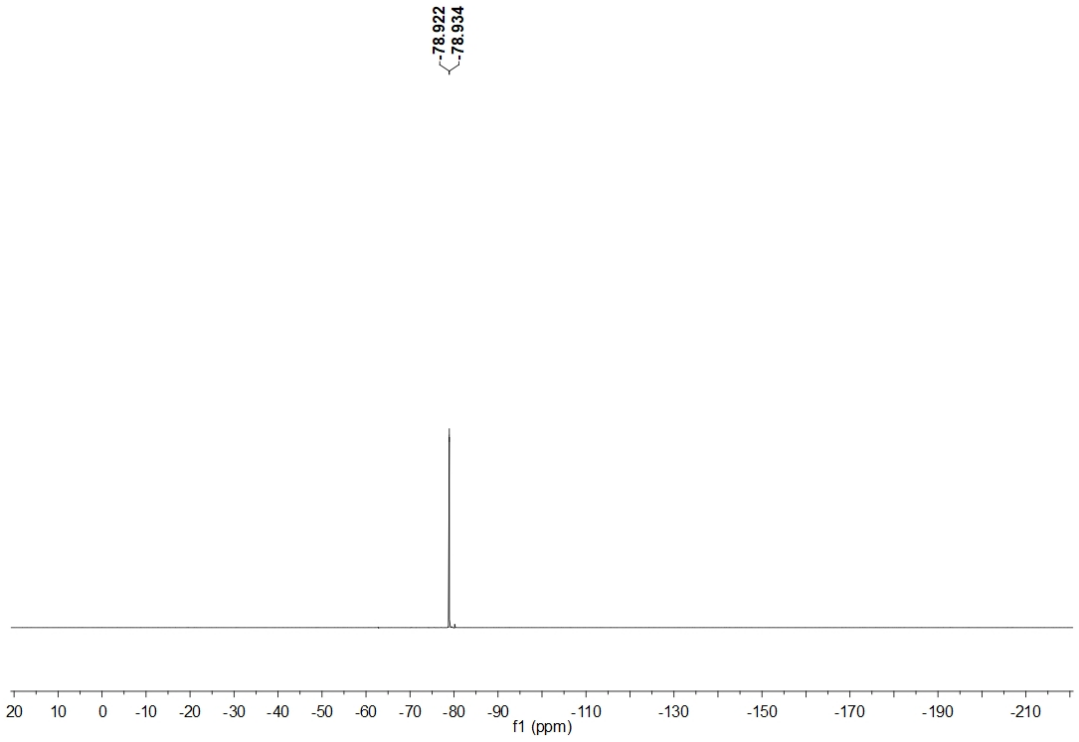
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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20
10
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-10
-20
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-40
-50
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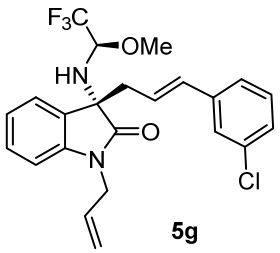
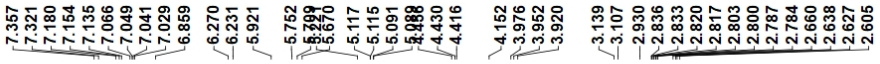
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
Cl

5g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7.066
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7.041
7.029
6.859
6.270
6.231
5.921
5.752
5.117
5.115
5.091
4.430
4.416
4.152
3.976
3.952
3.920
3.139
3.107
2.930
2.836
2.833
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2.817
2.803
2.800
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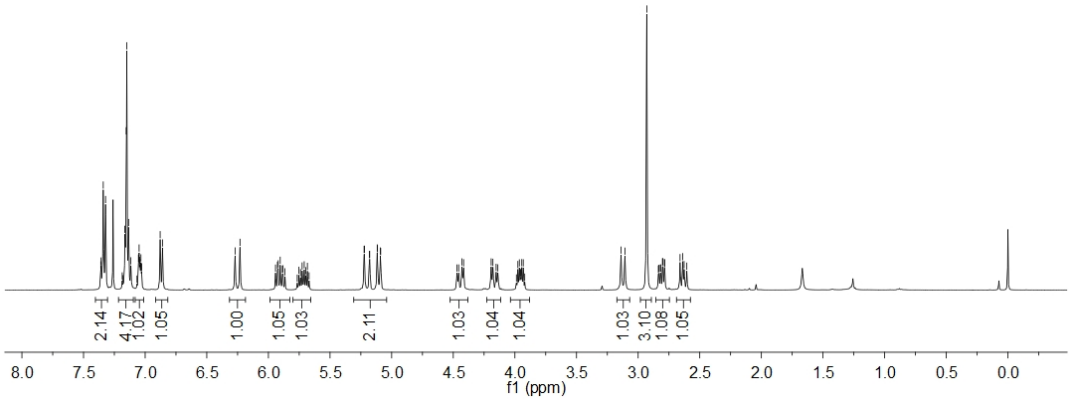
2.784
2.660
2.638
2.627
2.605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1.05
1.03
2.11
1.03
1.04
1.04
1.03
3.10
1.08
1.05
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
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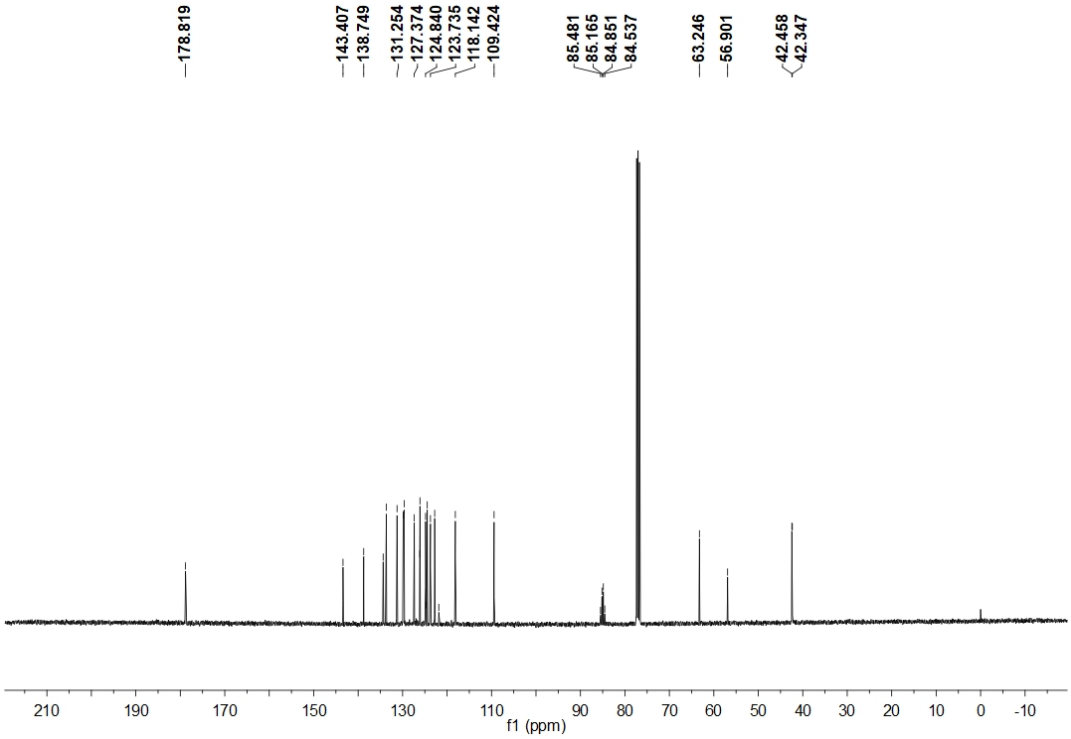
0.0
f1 (ppm)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118.142
109.424
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85.165
84.851
84.537
63.246
56.901
42.458
42.347
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150
130
110
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80
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60
50
40
30
20
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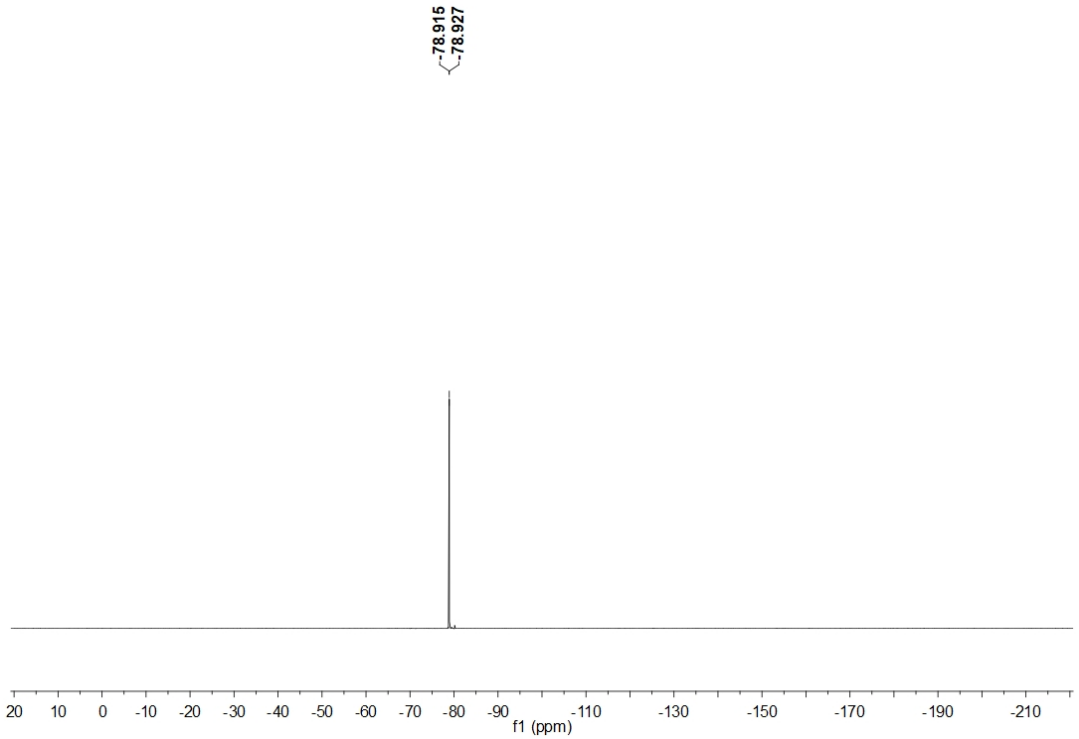
0
-10
f1 (ppm)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-10
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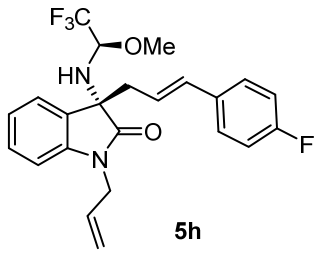
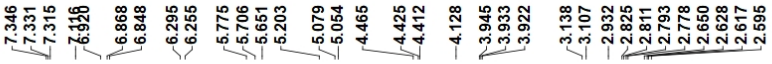
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
F

5h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6.848
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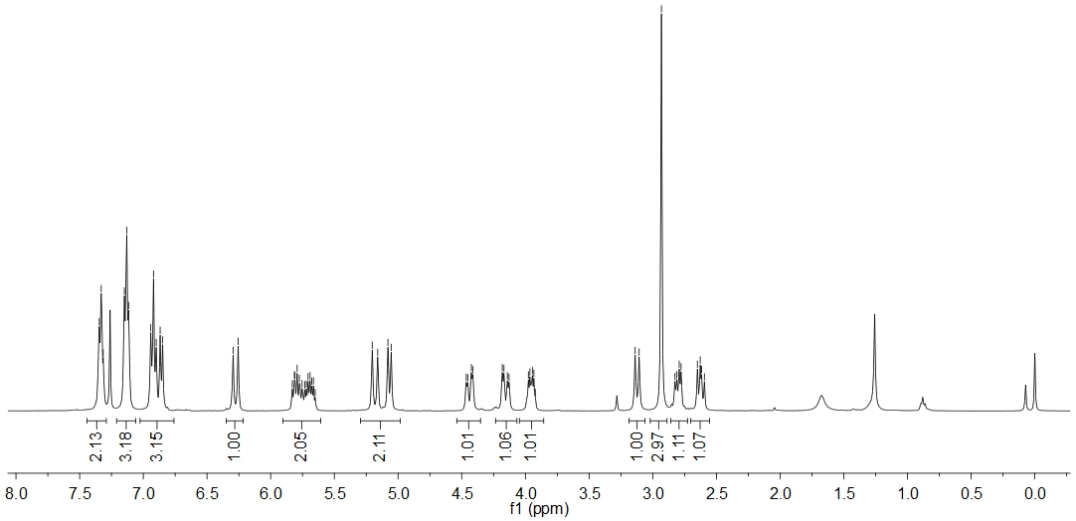
6.255
5.775
5.706
5.651
5.203
5.079
5.054
4.465
4.425
4.412
4.128
3.945
3.933
3.922
3.138
3.107
2.932
2.825
2.811
2.793
2.778
2.650
2.628
2.617
2.595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3.18
3.15
1.00
2.05
2.11
1.01
1.06
1.01
1.00
2.97
1.11
1.07
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
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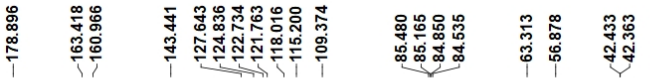
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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163.418
160.966
143.441
127.643
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122.734
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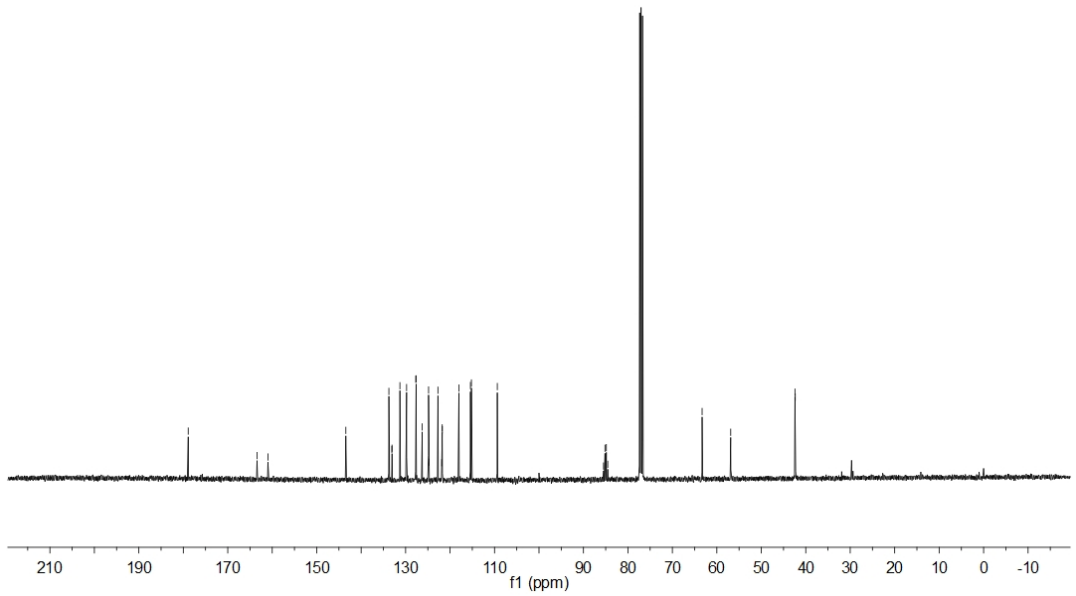
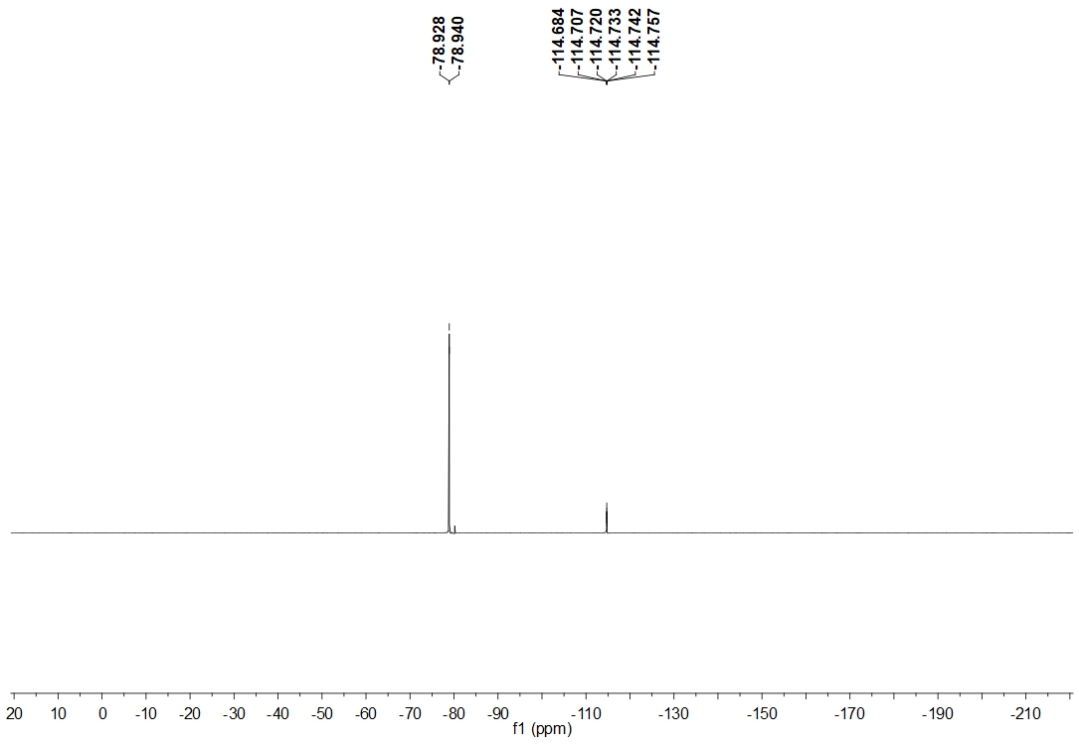
84.535
63.313
56.878
42.433
42.363


210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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-114.684
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-114.720
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-114.757
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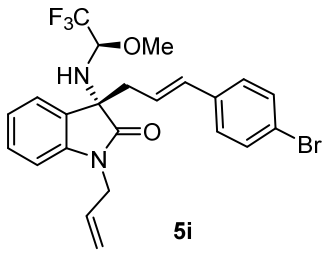
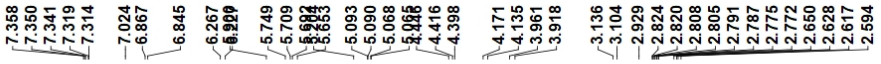
f1 (ppm)


F3C
OMe
HN
O
N
Br

5i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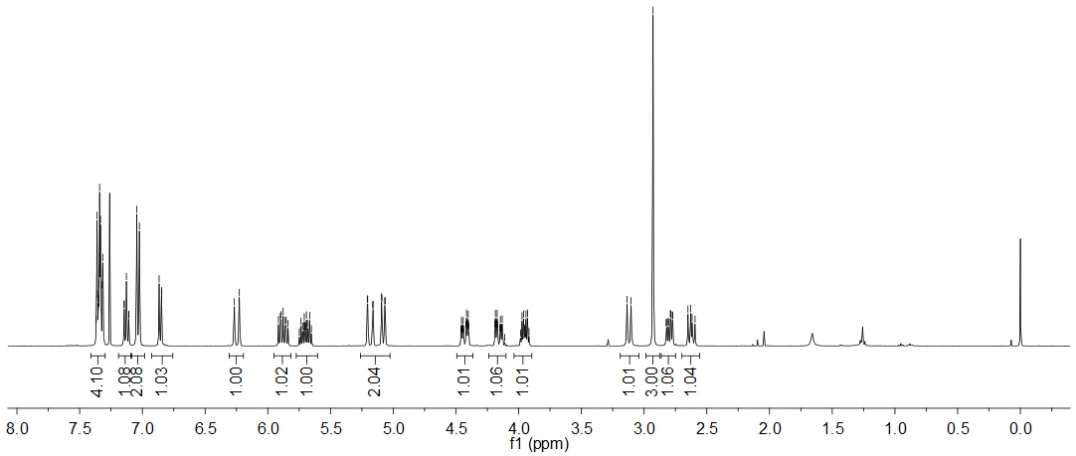
5.749
5.709
5.093
5.090
5.068
4.416
4.398
4.171
4.135
3.961
3.918
3.136
3.104
2.929
2.824
2.820
2.808
2.805
2.791
2.787
2.775
2.772
2.650
2.628
2.617
2.594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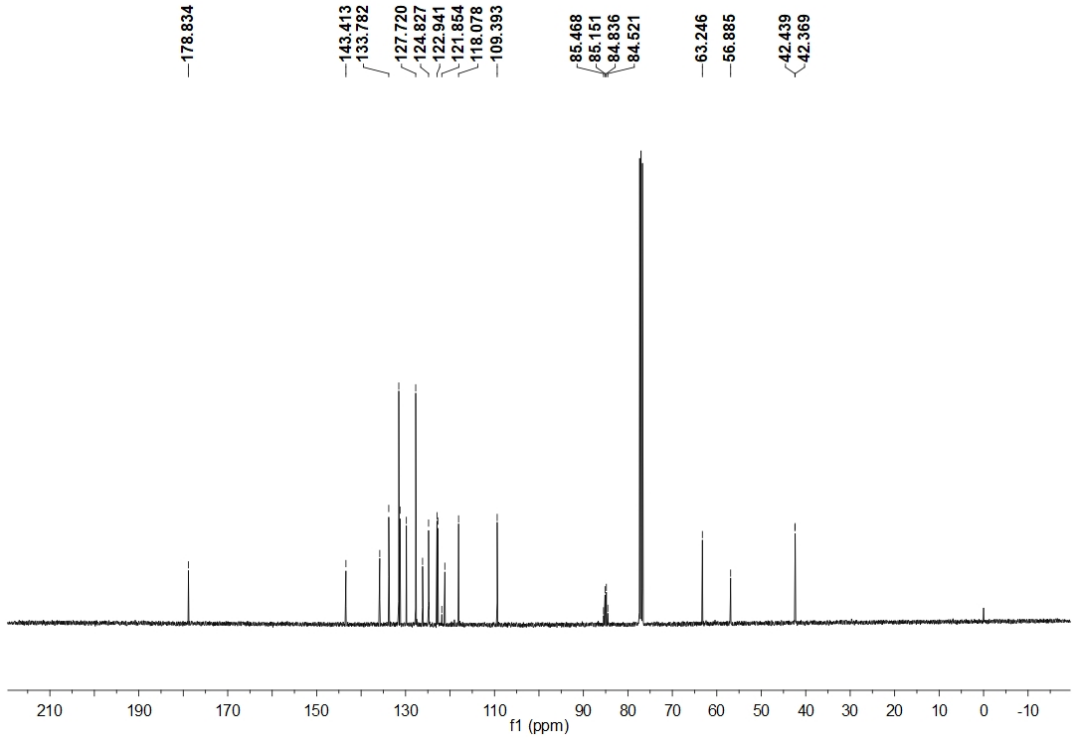
1.00
1.02
1.00
2.04
1.01
1.06
1.01
1.01
3.00
1.06
1.04
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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127.720
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122.941
121.854
118.078
109.393
85.468
85.151
84.836
84.521
63.246
56.885
42.439
42.369
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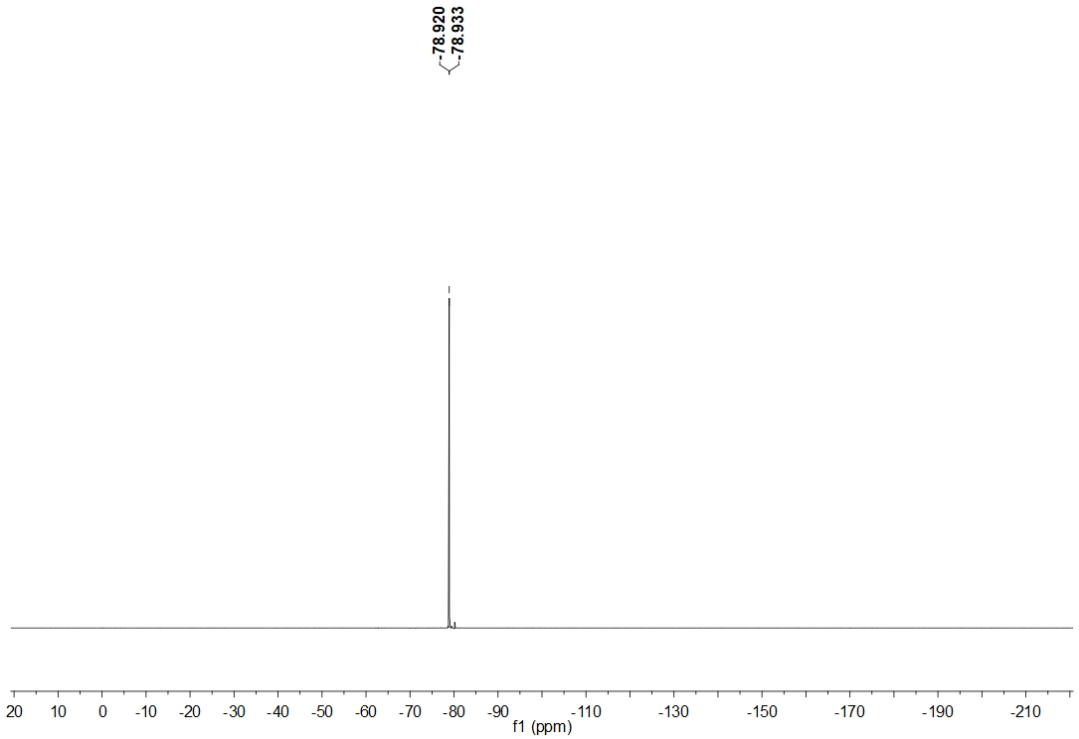
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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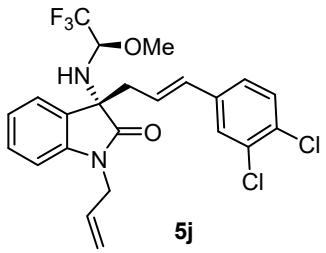
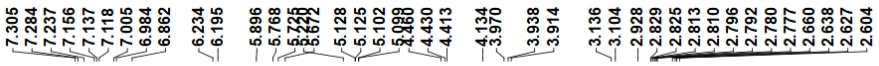
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
Cl
Cl

5j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6.234
6.195
5.896
5.768
5.128
5.125
5.102
4.430
4.413
4.134
3.970
3.938
3.914
3.136
3.104
2.928
2.829
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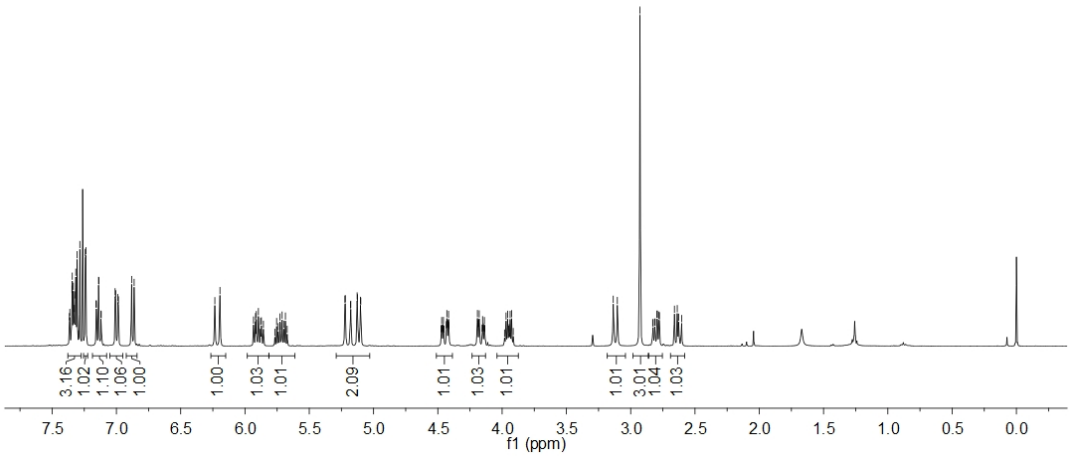
2.777
2.660
2.638
2.627
2.604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1.01
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1.01
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3.01
1.04
1.03
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6.5
6.0
5.5
5.0
4.5
4.0
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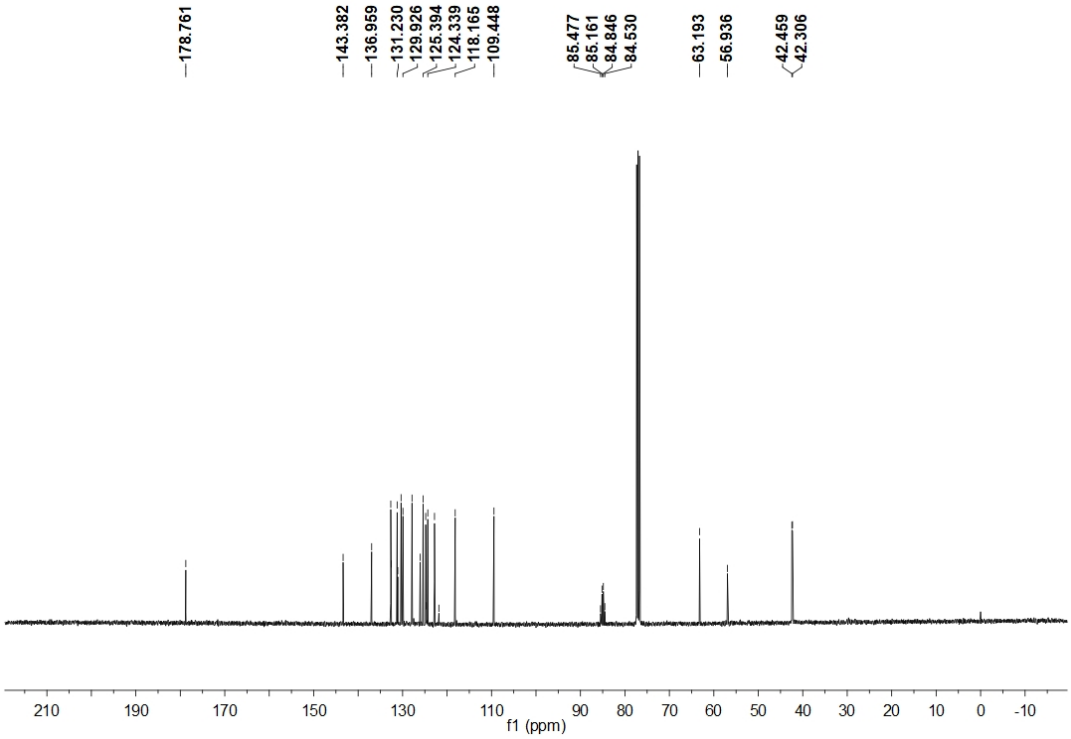
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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118.165
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84.846
84.530
63.193
56.936
42.459
42.306
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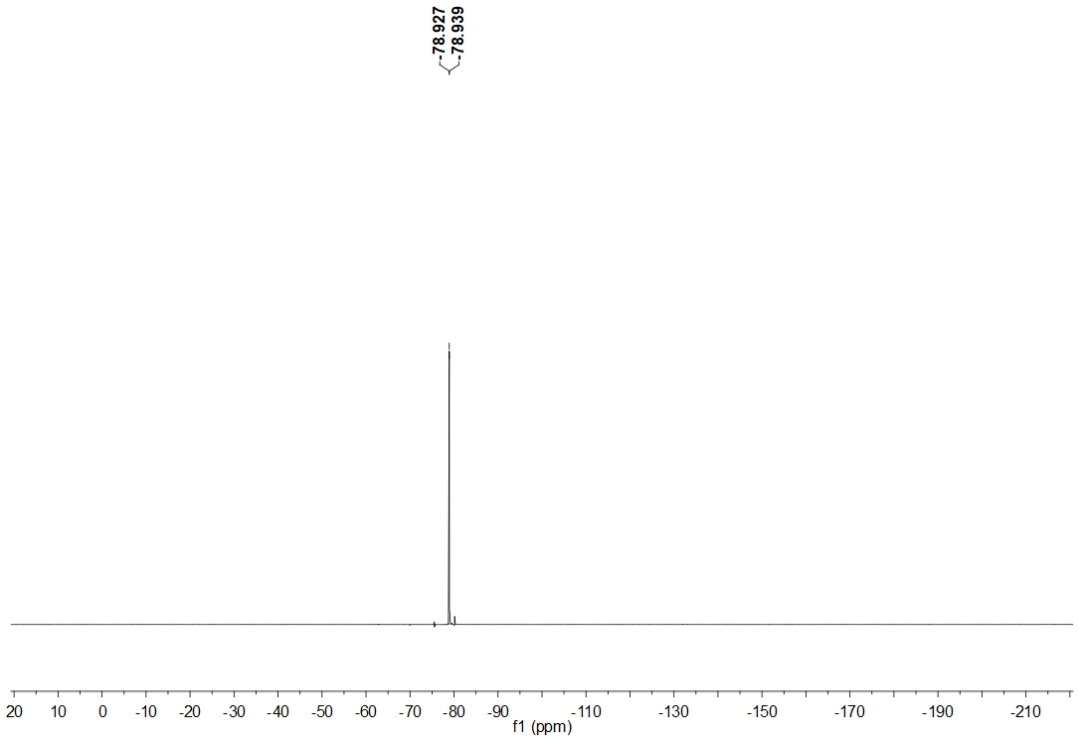
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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-78.939
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
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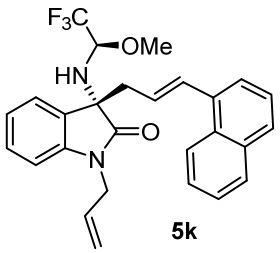
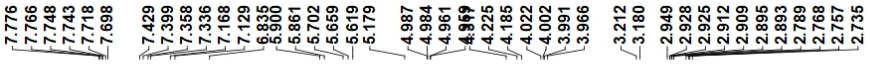
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N

5k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7.168
7.129
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5.900
5.861
5.702
5.659
5.619
5.179
4.987
4.984
4.961
4.225
4.185
4.022
4.002
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3.966
3.212
3.180
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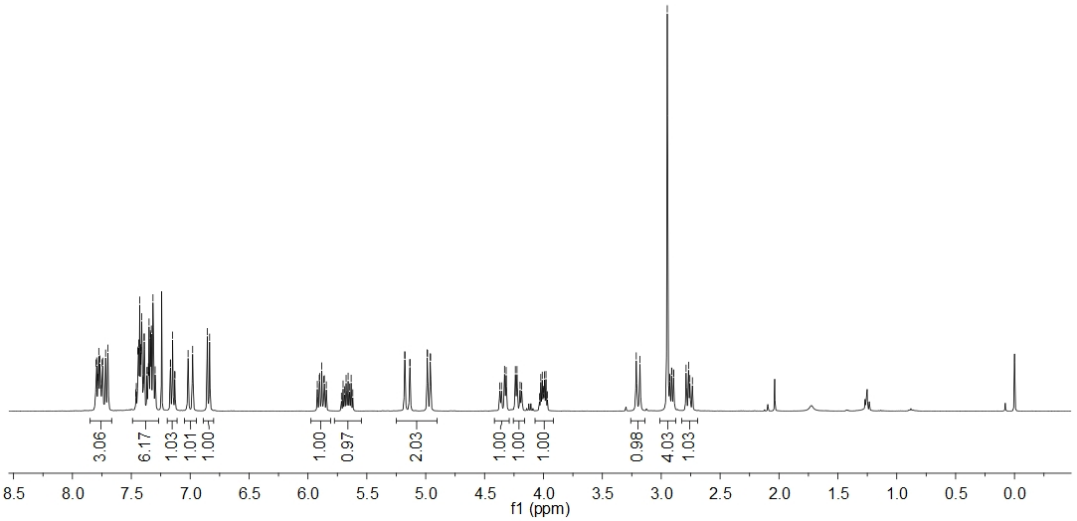
2.757
2.735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6.17
1.03
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1.00
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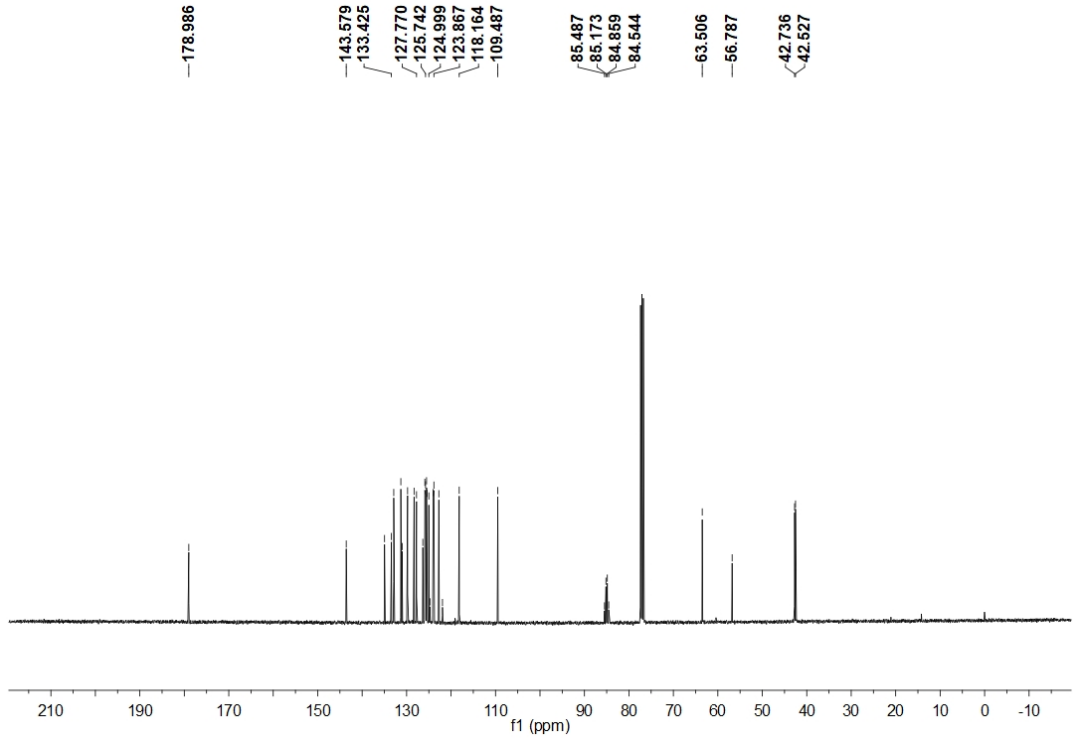
0.97
2.03
1.00
1.00
1.00
0.98
4.03
1.03
f1 (ppm)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85.487
85.173
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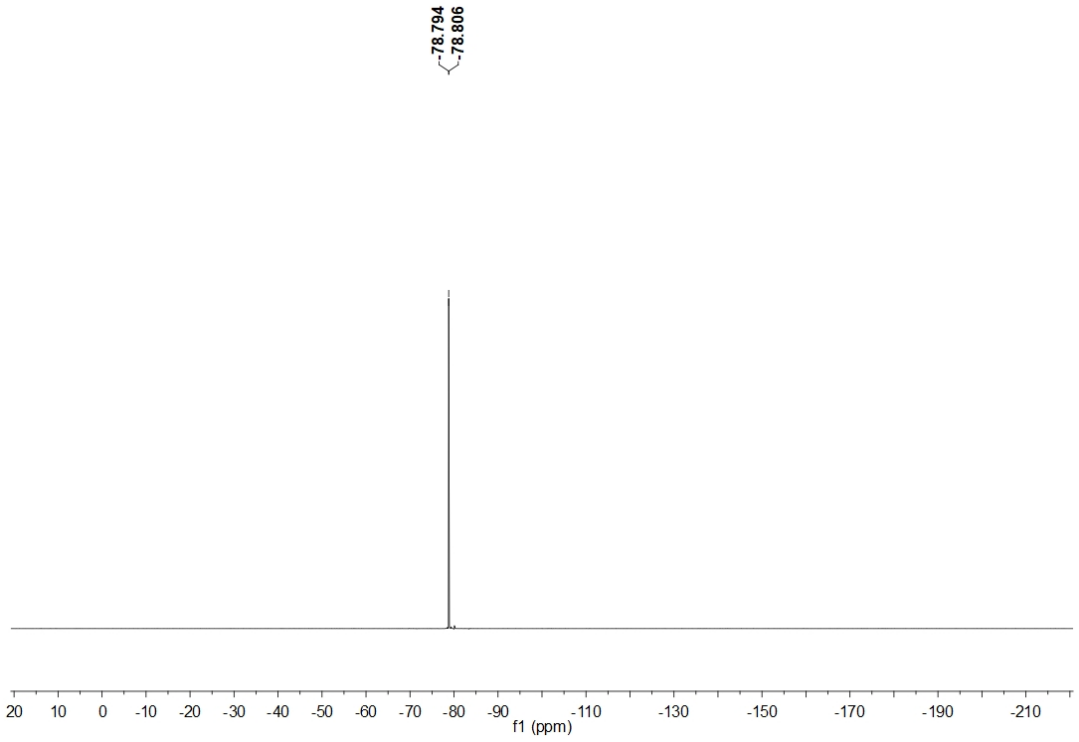
84.544
63.506
56.787
42.736
42.527
f1 (ppm)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10
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-10
-20
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-40
-50
-60
-70
-80
-90
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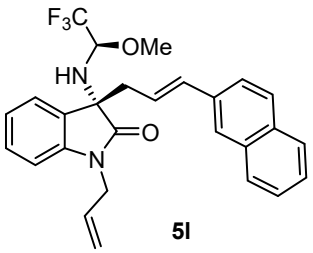
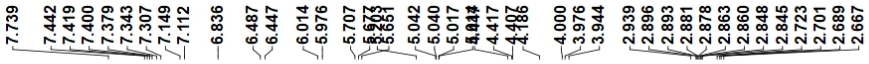
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N

5l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6.014
5.976
5.707
5.042
5.040
5.017
4.417
4.000
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3.944
2.939
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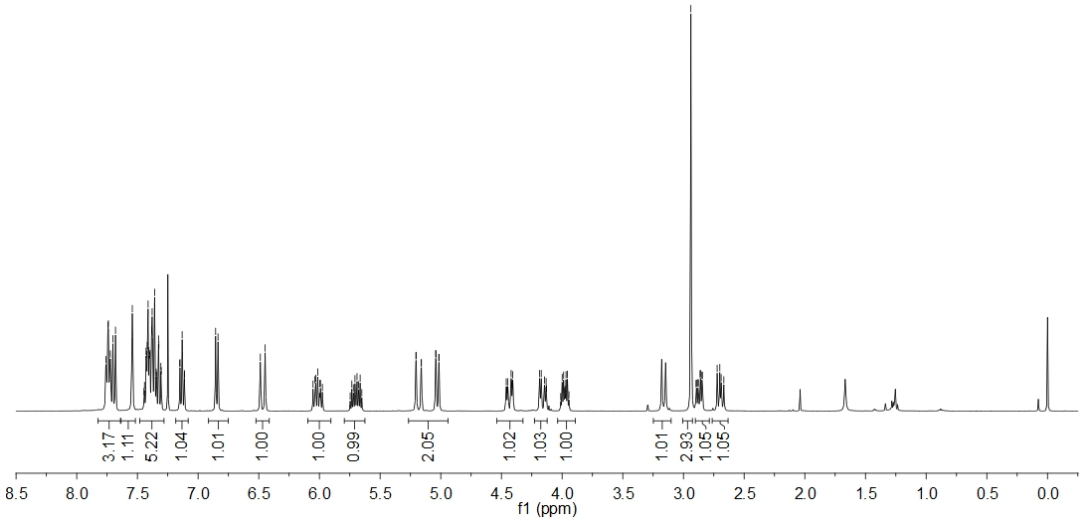
2.667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1.11
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1.01
1.00
1.00
0.99
2.05
1.02
1.03
1.00
1.01
2.93
1.05
1.05
8.5
8.0
7.5
7.0
6.5
6.0
5.5
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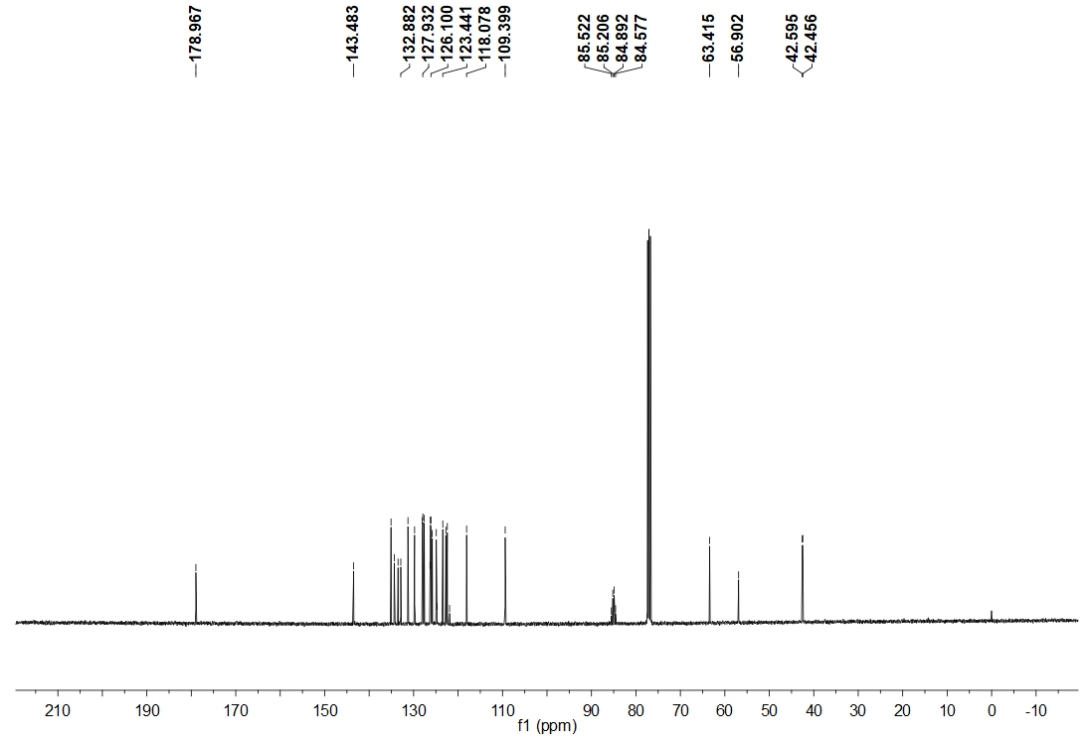
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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109.399
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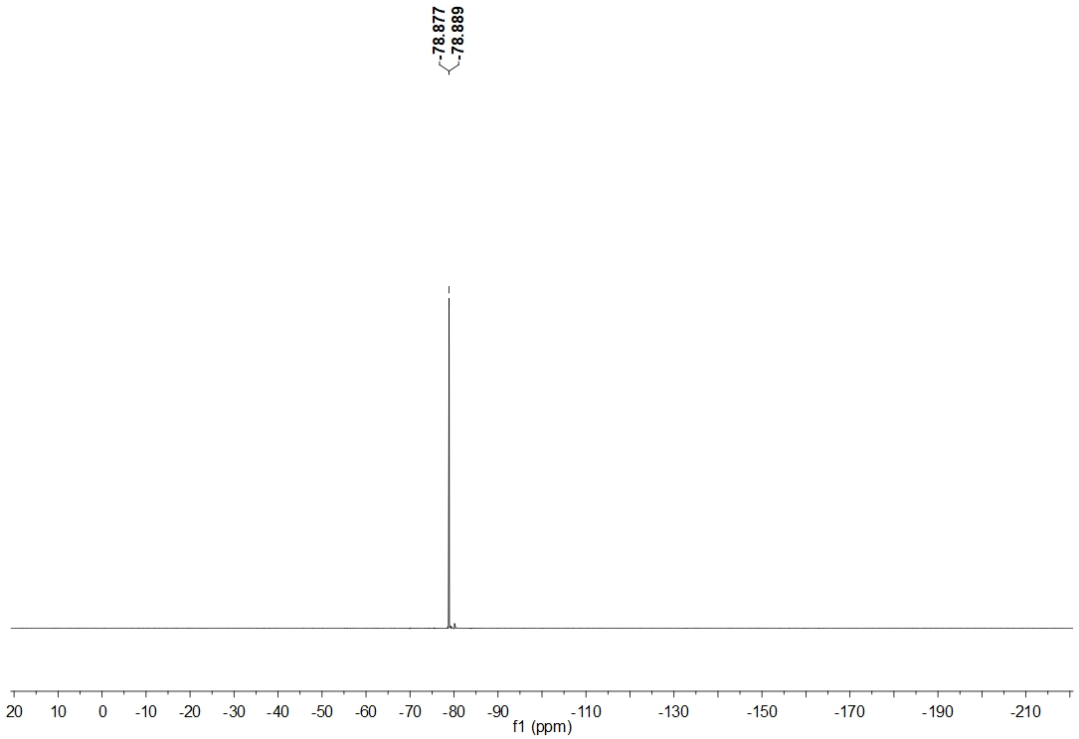
85.206
84.892
84.577
63.415
56.902
42.595
42.456
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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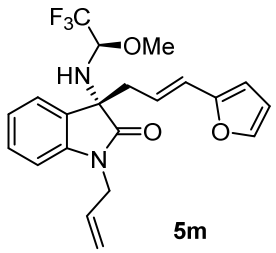
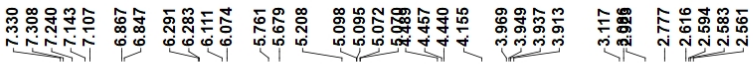
-78.889
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
O
N

5m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7.240
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7.107
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6.847
6.291
6.283
6.111
6.074
5.761
5.679
5.208
5.098
5.095
5.072
4.457
4.440
4.155
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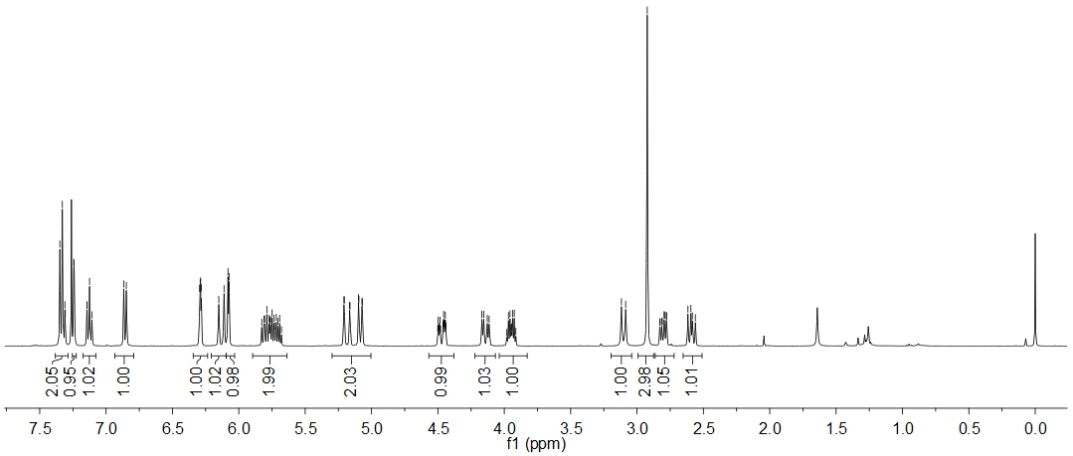
3.949
3.937
3.913
3.117
2.777
2.616
2.594
2.583
2.561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1.02
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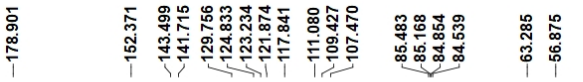
1.99
2.03
0.99
1.03
1.00
1.00
2.98
1.05
1.01
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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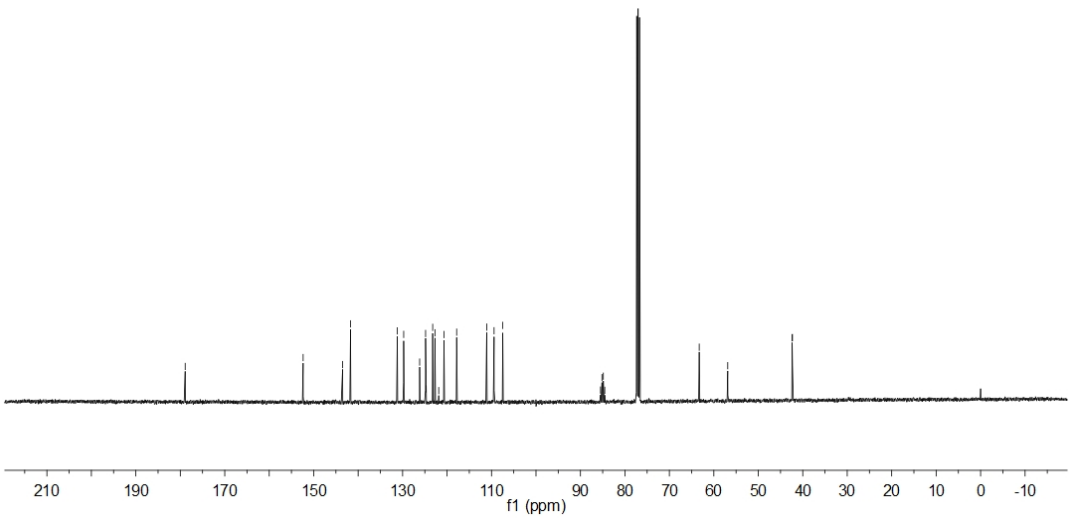
152.371
143.499
141.715
129.756
124.833
123.234
121.874
117.841
111.080
109.427
107.470
85.483
85.168
84.854
84.539
63.285
56.875
42.389
42.320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190
170
150
130
110
90
80
70
60
50
40
30
20
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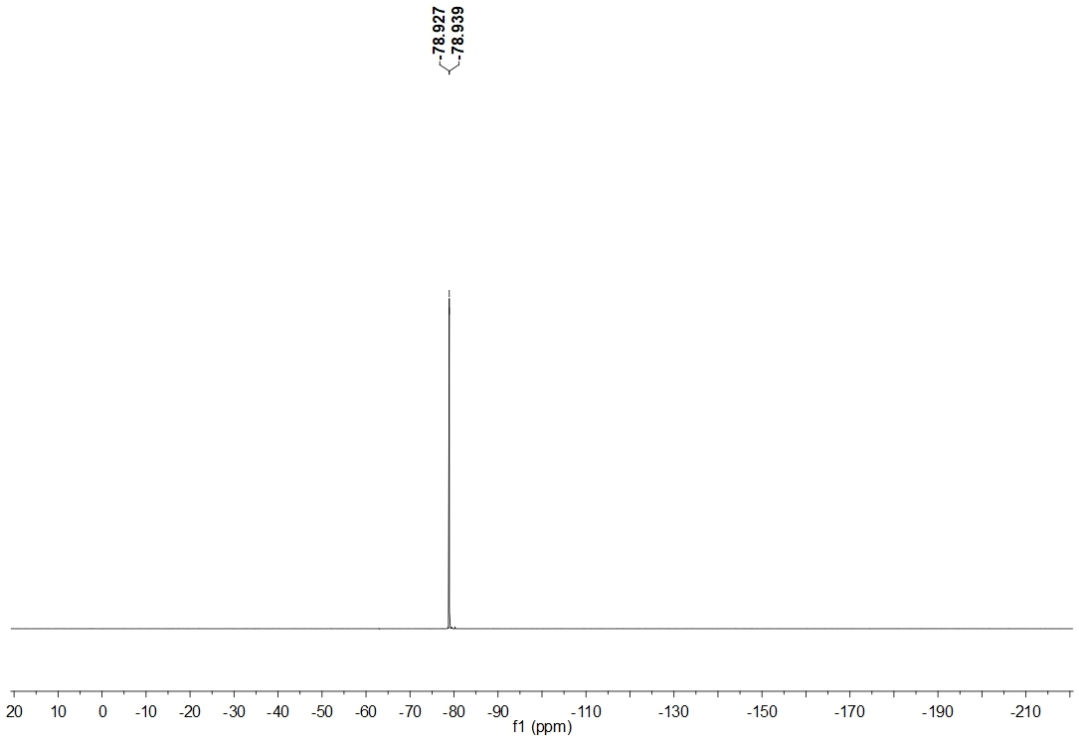
0
-10
f1 (ppm)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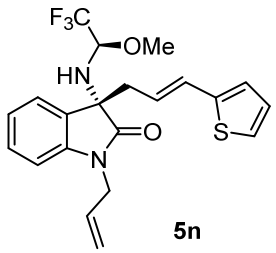
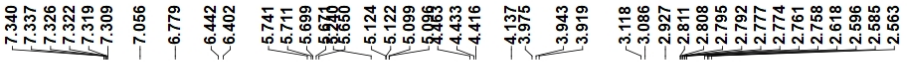
-78.939
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
S
N

5n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6.779
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6.402
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5.711
5.699
5.124
5.122
5.099
4.433
4.416
4.137
3.975
3.943
3.919
3.118
3.086
2.927
2.811
2.808
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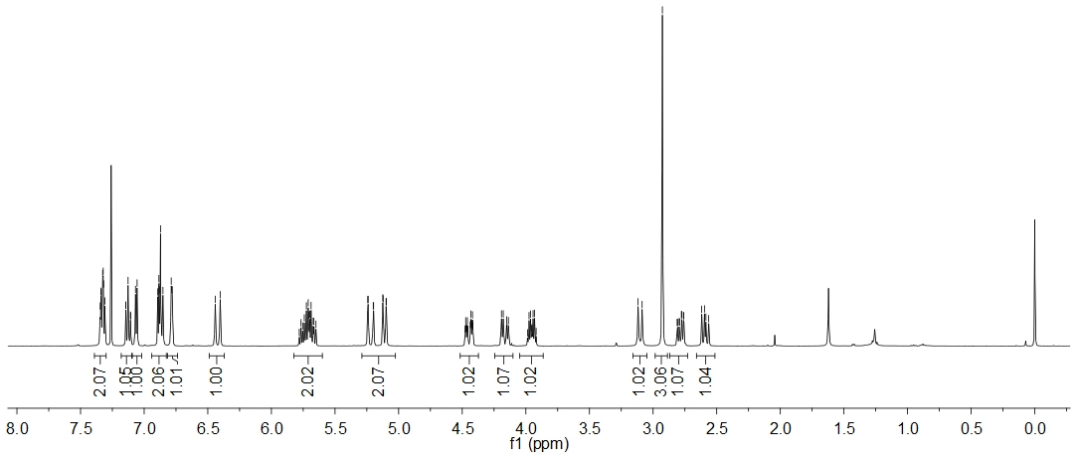
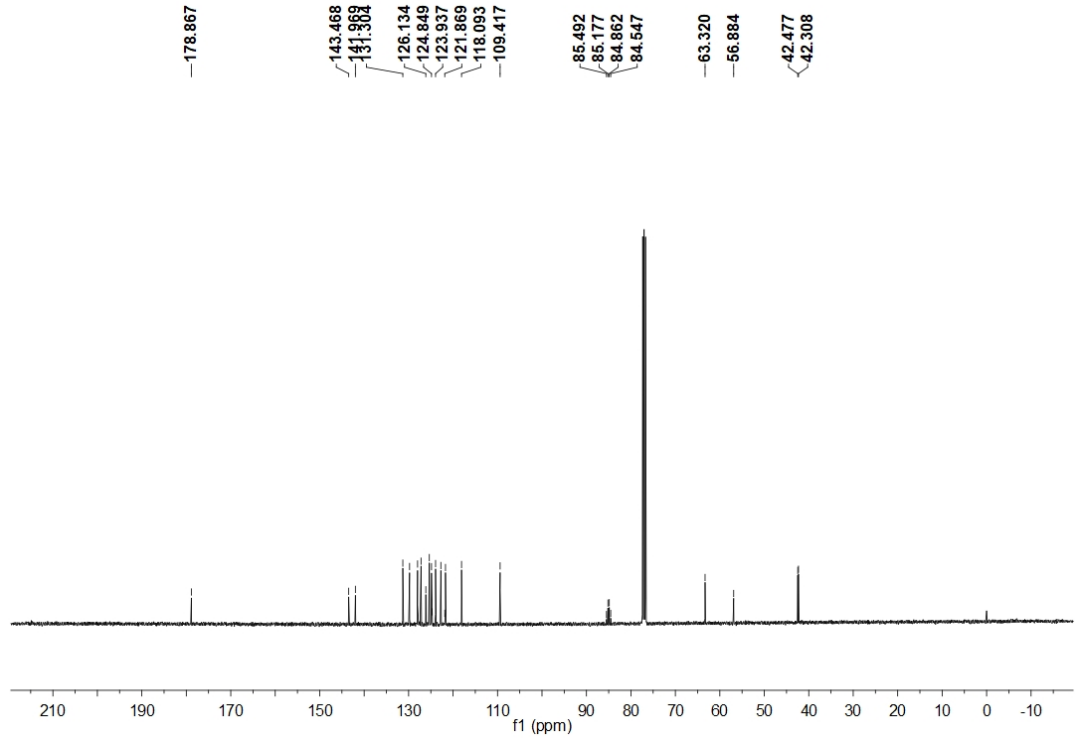
2.792
2.777
2.774
2.761
2.758
2.618
2.596
2.585
2.563


2.07
1.05
1.00
2.06
1.01
1.00
2.02
2.07
1.02
1.07
1.02
1.02
3.06
1.07
1.04
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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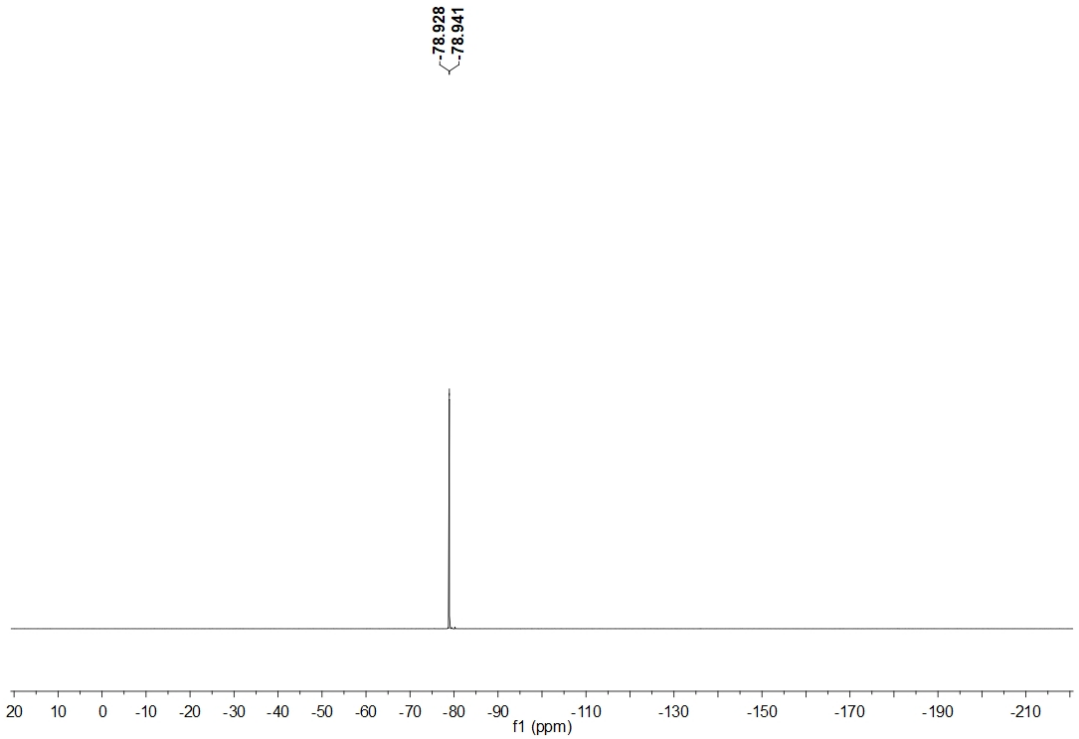
131.304
126.134
124.849
123.937
121.869
118.093
109.417
85.492
85.177
84.862
84.547
63.320
56.884
42.477
42.308
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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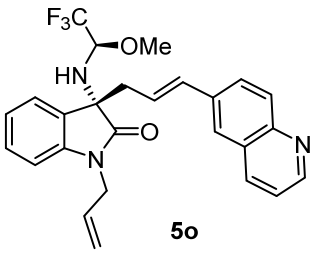
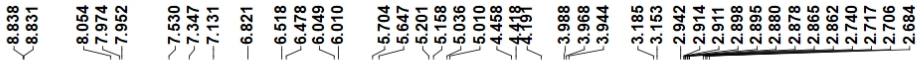
-78.941
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
N

5o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7.952
7.530
7.347
7.131
6.821
6.518
6.478
6.049
6.010
5.704
5.647
5.201
5.158
5.036
5.010
4.458
4.418
4.191
3.988
3.968
3.944
3.185
3.153
2.942
2.914
2.911
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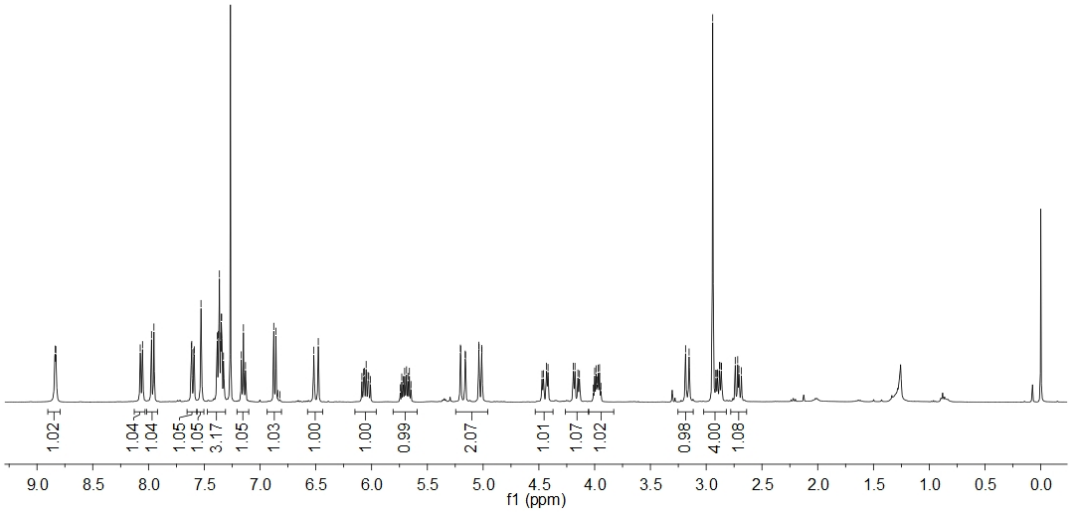
2.895
2.880
2.878
2.865
2.862
2.740
2.717
2.706
2.684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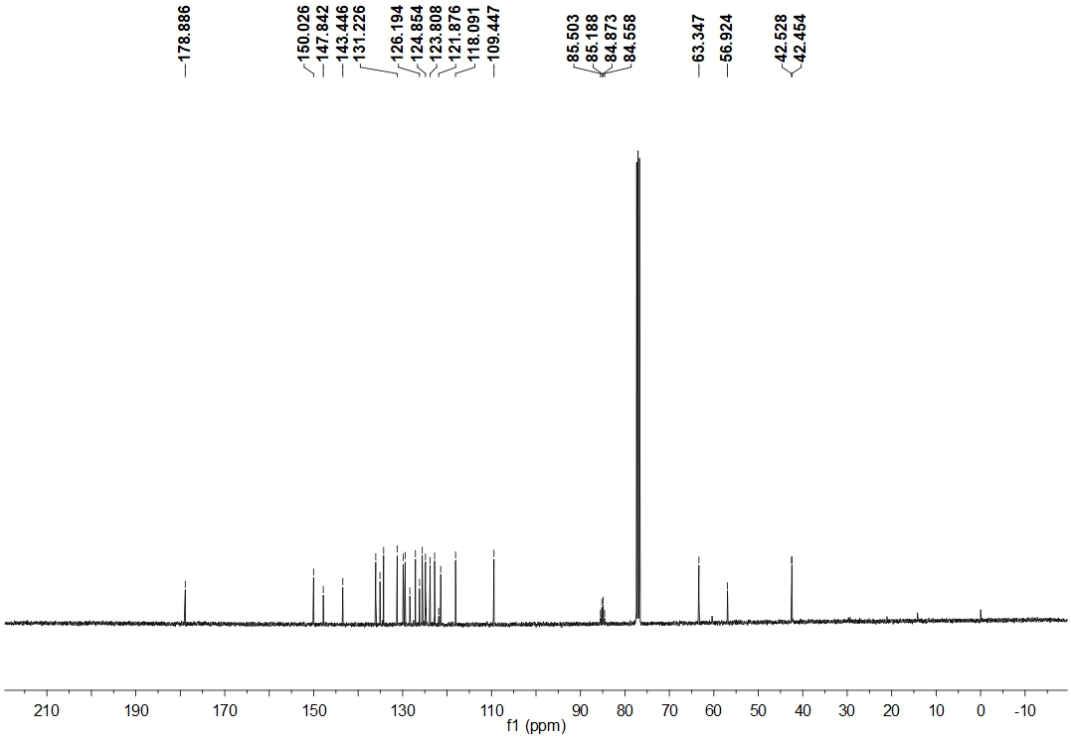
1.04
1.04
1.05
1.05
3.17
1.05
1.03
1.00
1.00
0.99
2.07
1.01
1.07
1.02
0.98
4.00
1.08
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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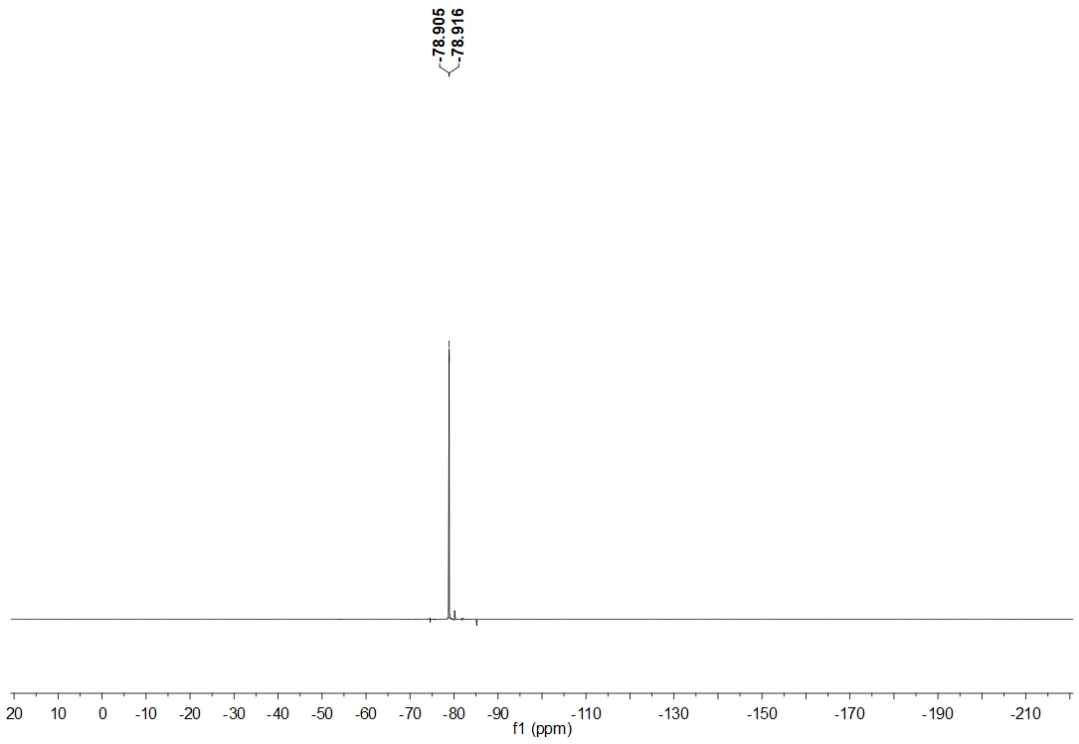
126.194
124.854
123.808
121.876
118.091
109.447
85.503
85.188
84.873
84.558
63.347
56.924
42.528
42.454
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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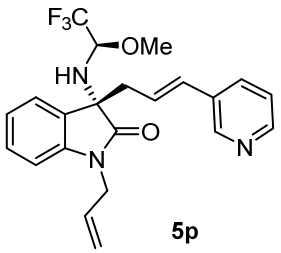
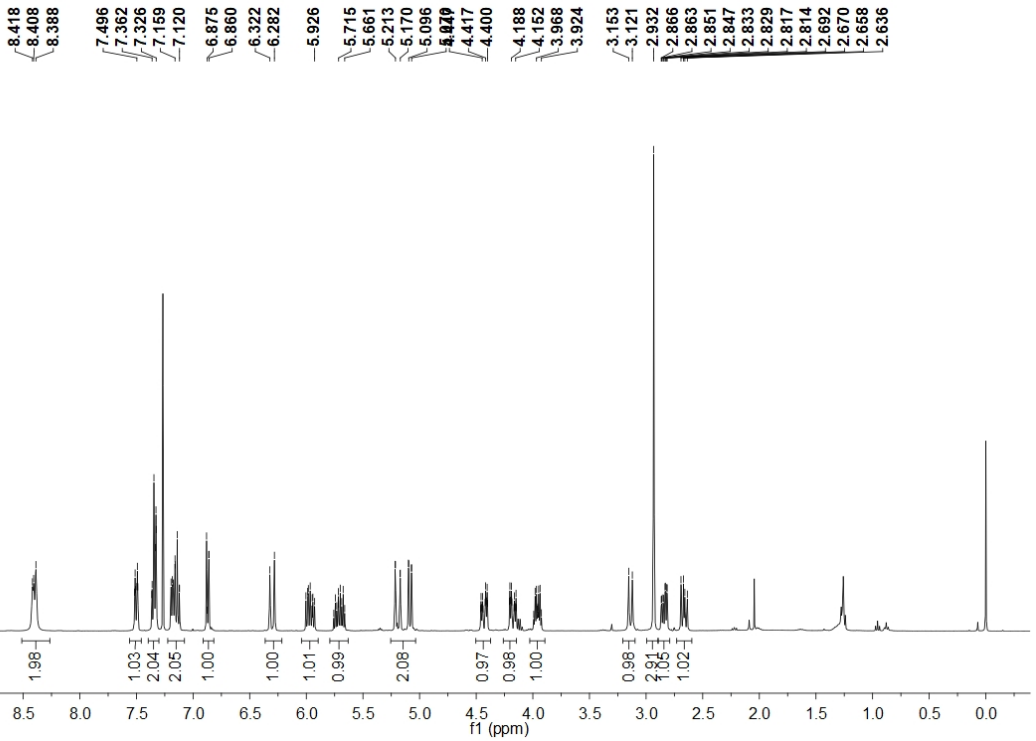
-78.916
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
N

5p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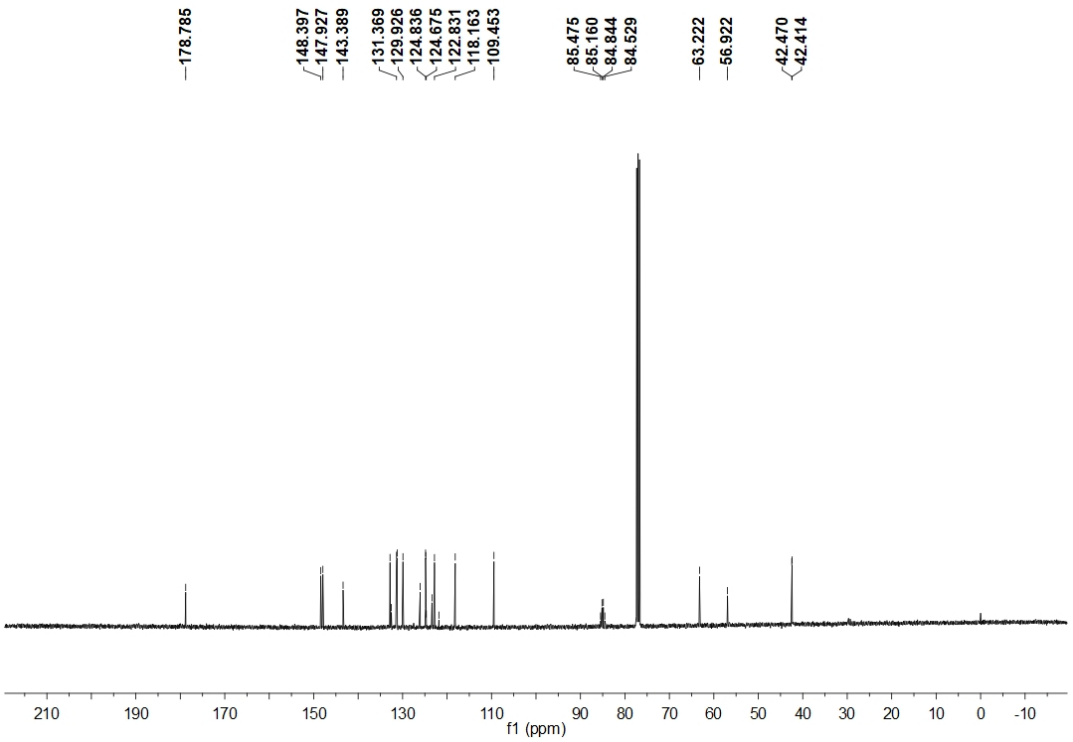
7.326
7.159
7.120
6.875
6.860
6.322
6.282
5.926
5.715
5.661
5.213
5.170
5.096
4.417
4.400
4.188
4.152
3.968
3.924
3.153
3.121
2.932
2.866
2.863
2.851
2.847
2.833
2.829
2.817
2.814
2.692
2.670
2.658
2.636
1.98
1.03
2.04
2.05
1.00
1.00
1.01
0.99
2.08
0.97
0.98
1.00
0.98
2.91
1.05
1.02
f1 (ppm)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129.926
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124.675
122.831
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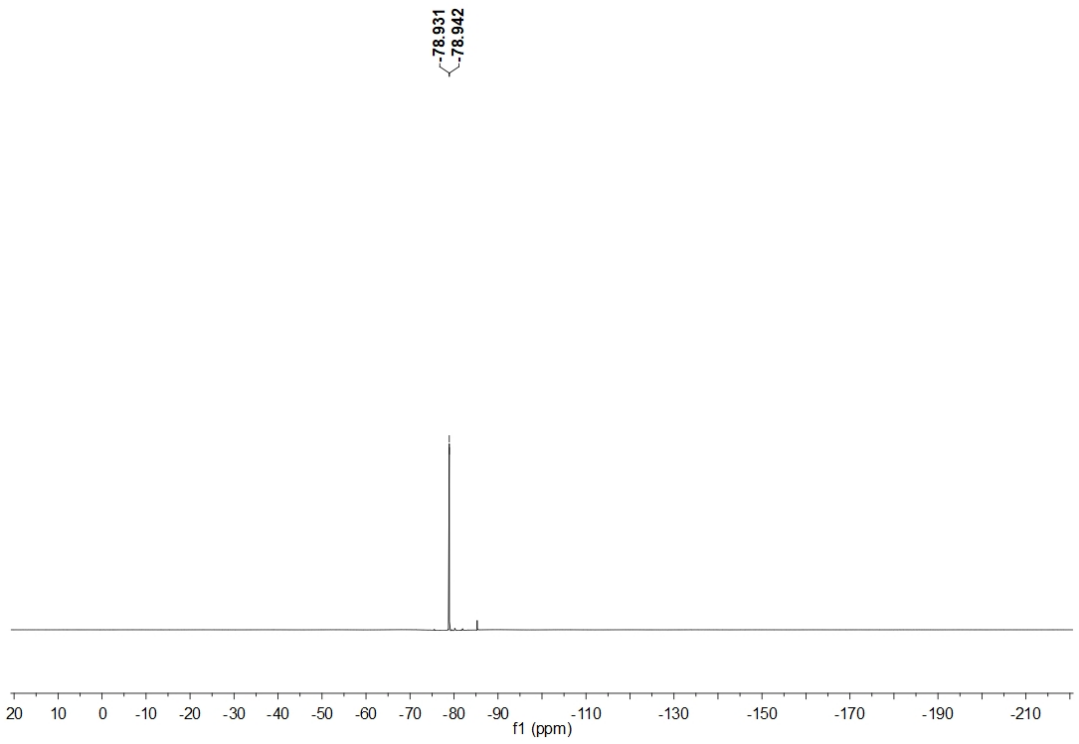
85.475
85.160
84.844
84.529
63.222
56.922
42.470
42.414
f1 (ppm)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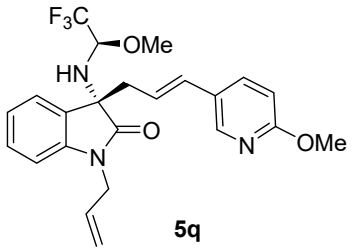
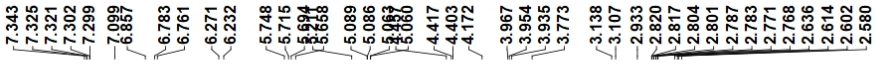
-78.942
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
N
OMe

5q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7.299
7.099
6.857
6.783
6.761
6.271
6.232
5.748
5.715
5.089
5.086
4.417
4.403
4.172
3.967
3.954
3.935
3.773
3.138
3.107
2.933
2.820
2.817
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2.771
2.768
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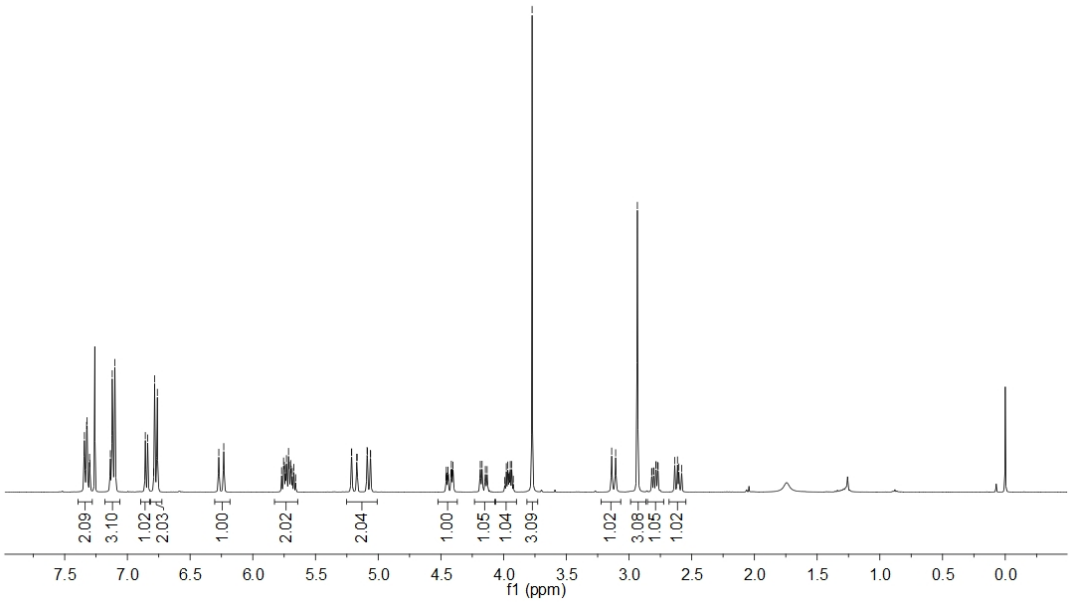
2.602
2.580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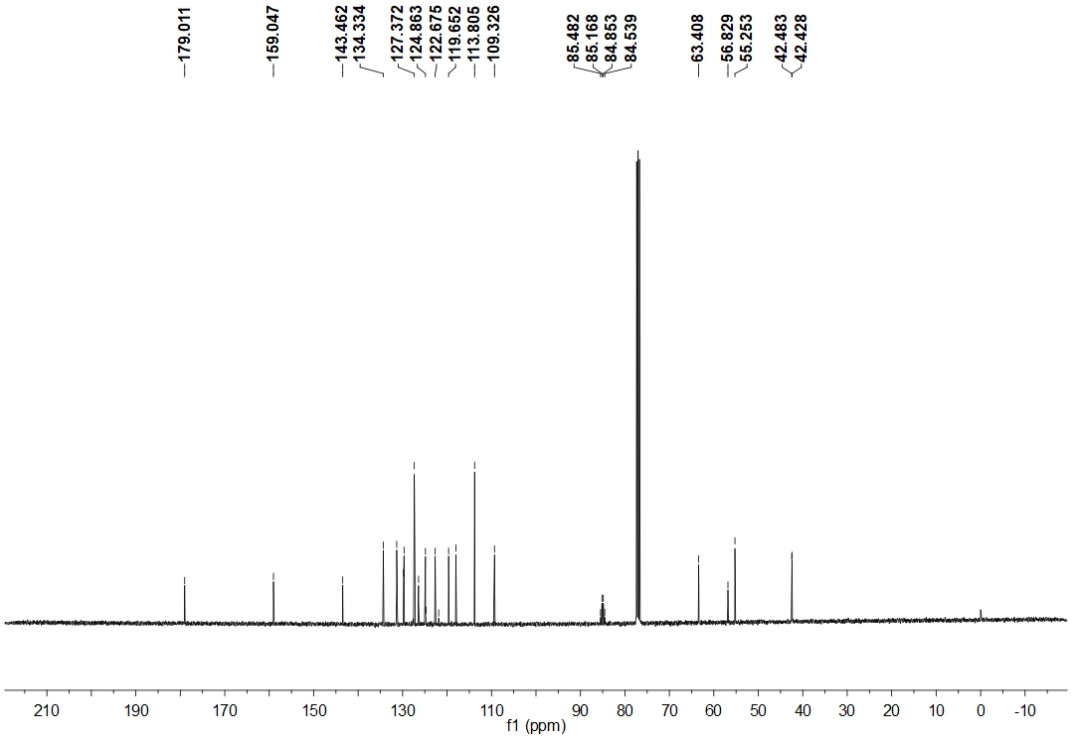
1.02
2.03
1.00
2.02
2.04
1.00
1.05
1.04
3.09
1.02
3.08
1.05
1.02
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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159.047
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134.334
127.372
124.863
122.675
119.652
113.805
109.326
85.482
85.168
84.853
84.539
63.408
56.829
55.253
42.483
42.428
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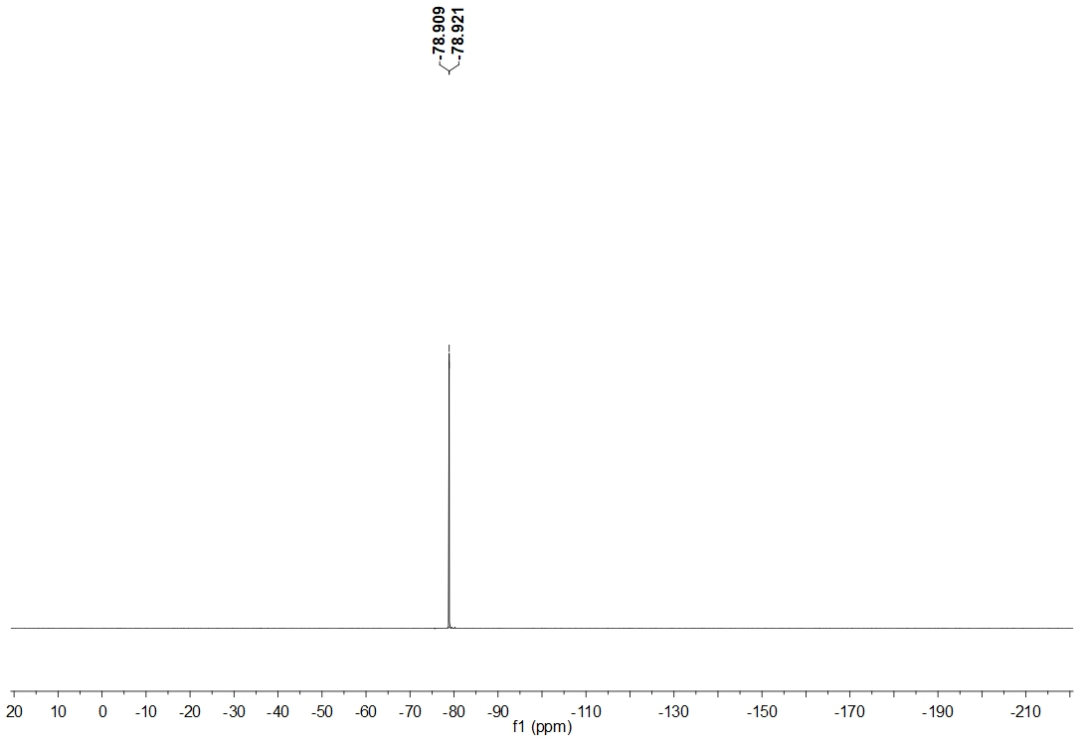
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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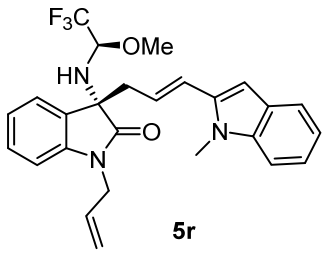
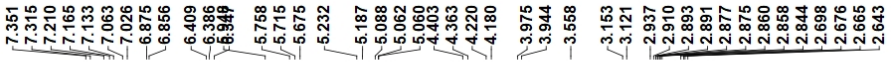
-78.921
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N
N

5r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7.063
7.026
6.875
6.856
6.409
6.386
5.758
5.715
5.675
5.232
5.187
5.088
5.062
5.060
4.403
4.363
4.220
4.180
3.975
3.944
3.558
3.153
3.121
2.937
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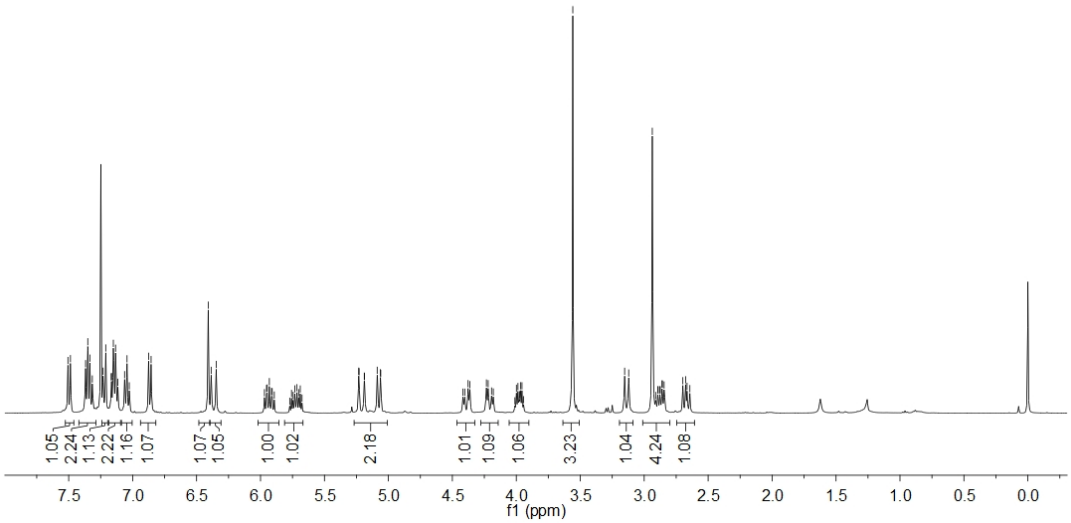
2.665
2.643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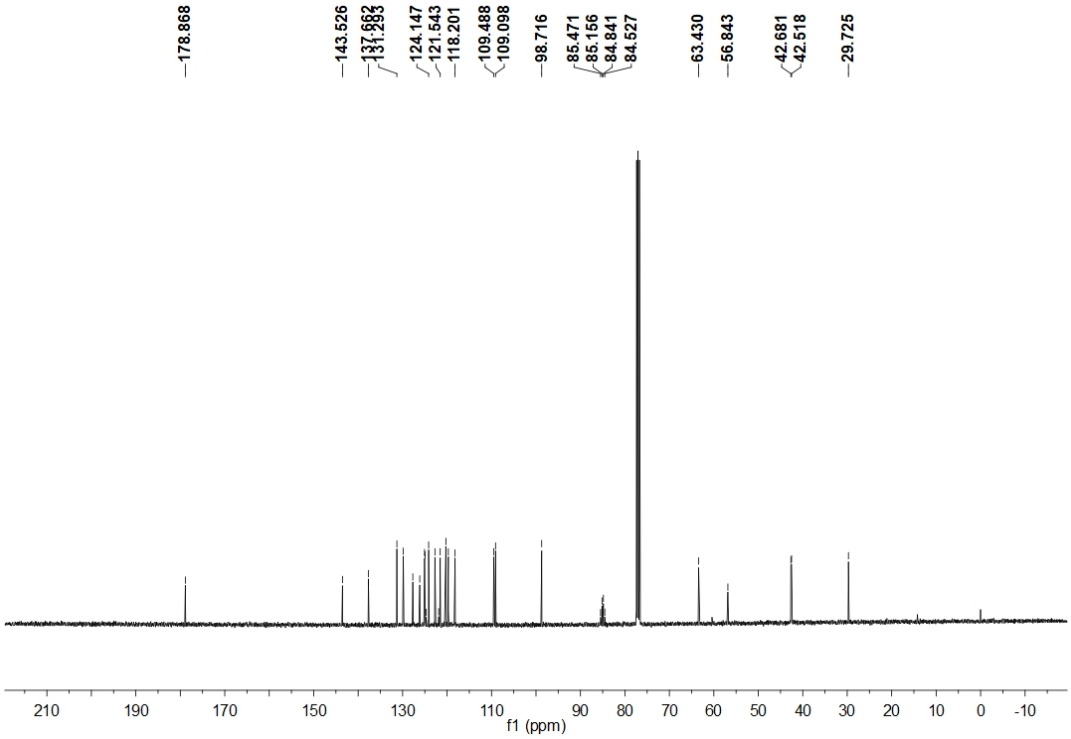
1.13
2.22
1.16
1.07
1.07
1.05
1.00
1.02
2.18
1.01
1.09
1.06
3.23
1.04
4.24
1.08
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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109.488
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98.716
85.471
85.156
84.841
84.527
63.430
56.843
42.681
42.518
29.725
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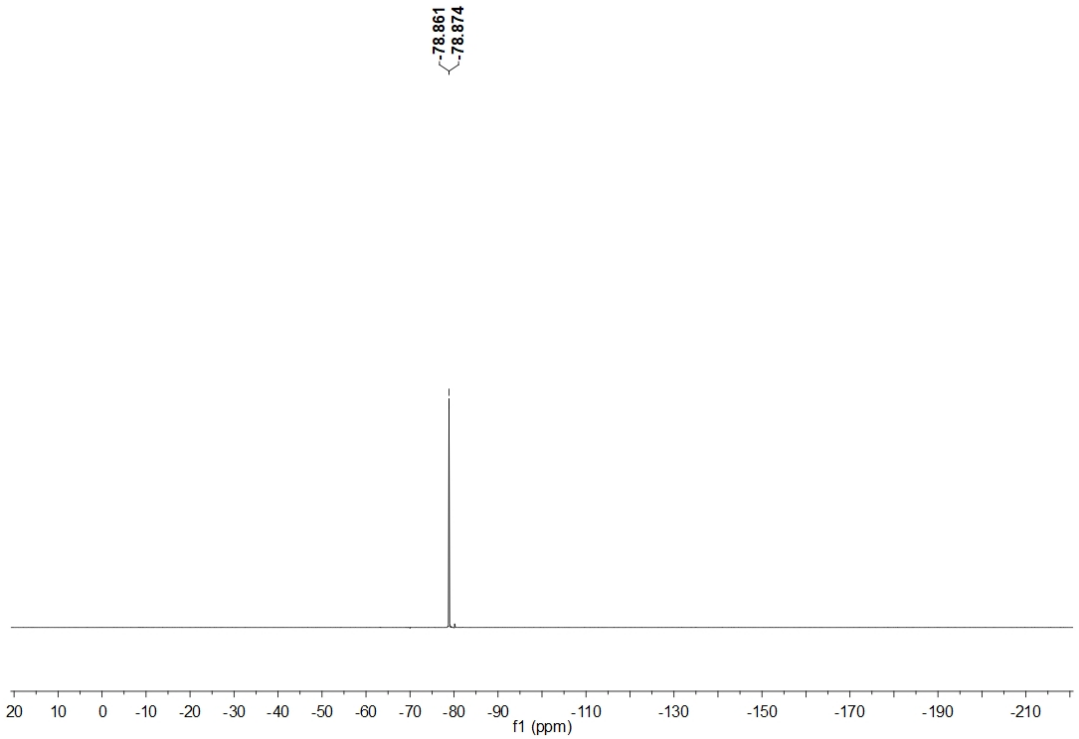
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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20
10
0
-10
-20
-30
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-50
-60
-70
-80
-90
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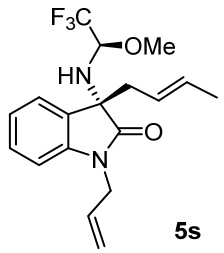
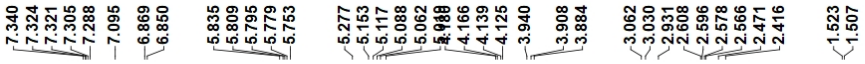
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N

5s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7.095
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5.779
5.753
5.277
5.153
5.117
5.088
5.062
4.166
4.139
4.125
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3.062
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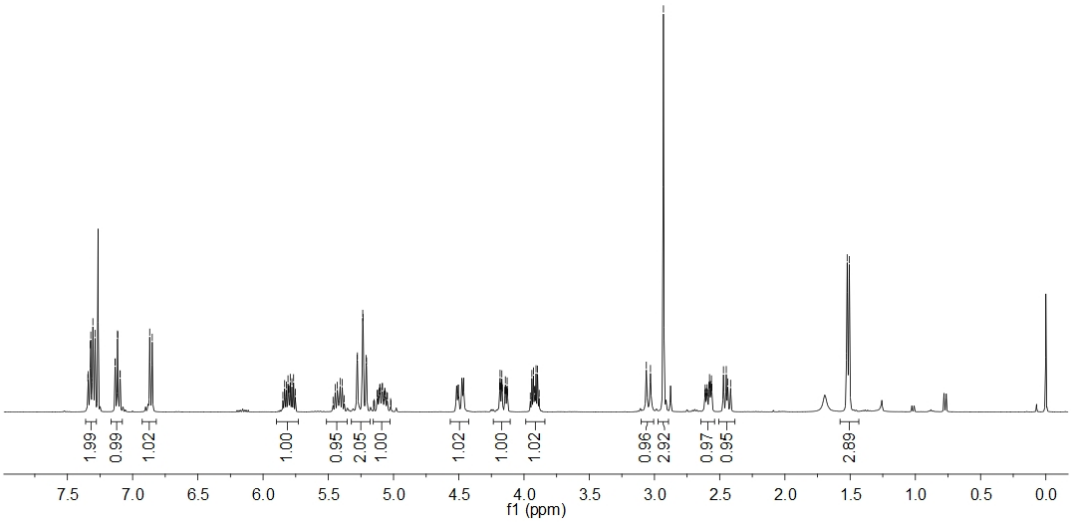
2.578
2.566
2.471
2.416
1.523
1.507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0.99
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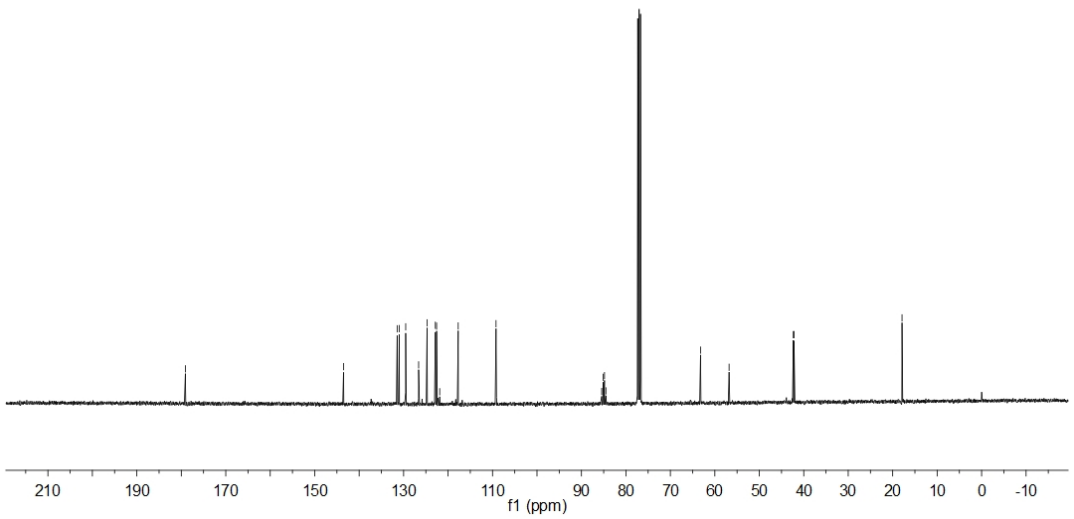
1.00
0.95
2.05
1.00
1.02
1.00
1.02
0.96
2.92
0.97
0.95
2.89
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


179.088
143.511
124.723
122.862
122.579
121.882
117.720
109.211
85.445
85.132
84.817
84.504
63.216
56.797
42.354
42.194
17.897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190
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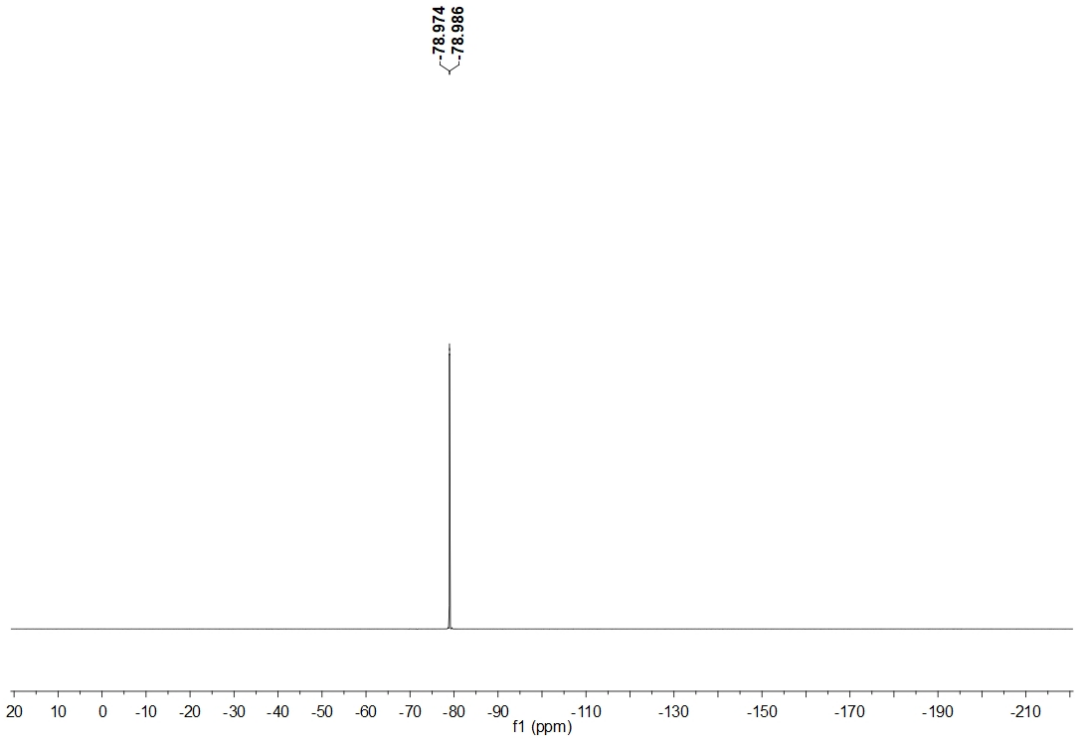
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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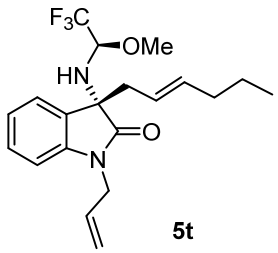
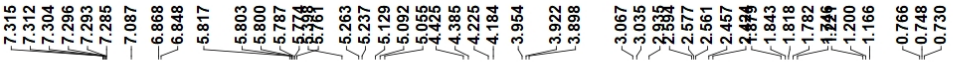
-78.986
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N

5t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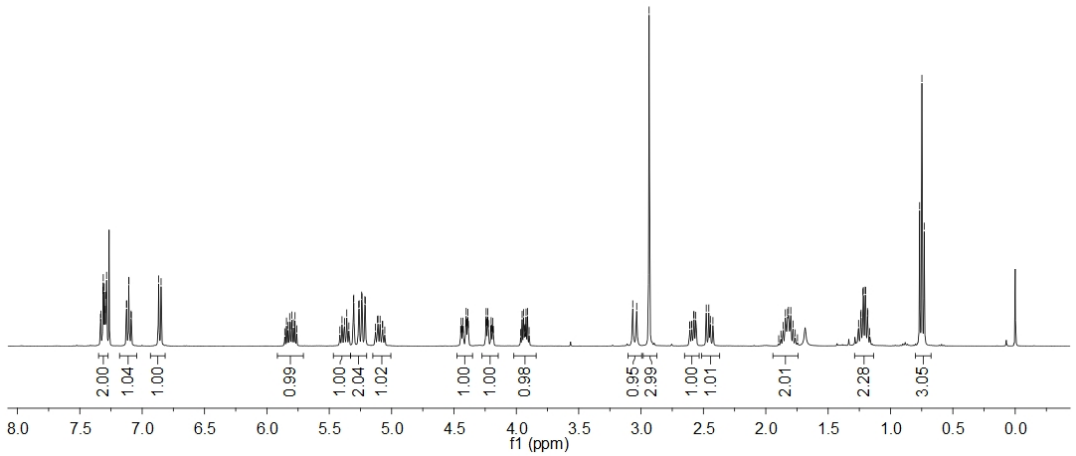
7.312
7.304
7.296
7.293
7.285
7.087
6.868
6.848
5.817
5.803
5.800
5.787
5.263
5.237
5.129
5.092
5.055
4.425
4.385
4.225
4.184
3.954
3.922
3.898
3.067
3.035
2.577
2.561
2.457
1.843
1.818
1.782
1.200
1.166
0.766
0.748
0.730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1.00
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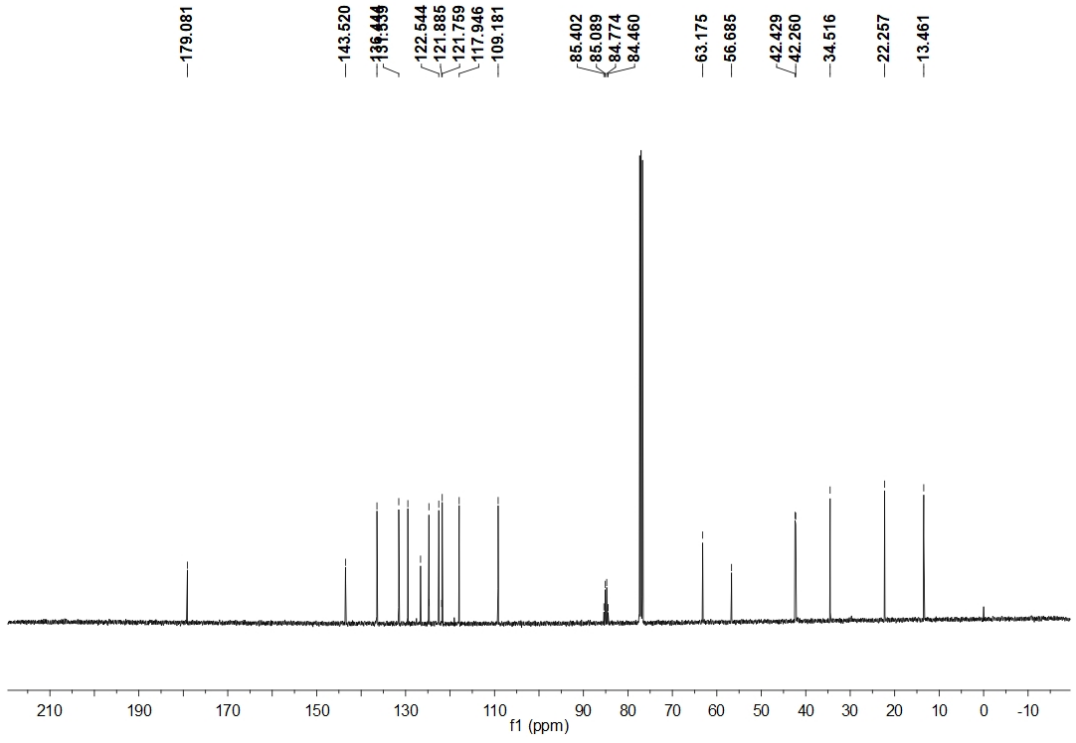
1.00
2.04
1.02
1.00
1.00
0.98
0.95
2.99
1.00
1.01
2.01
2.28
3.05
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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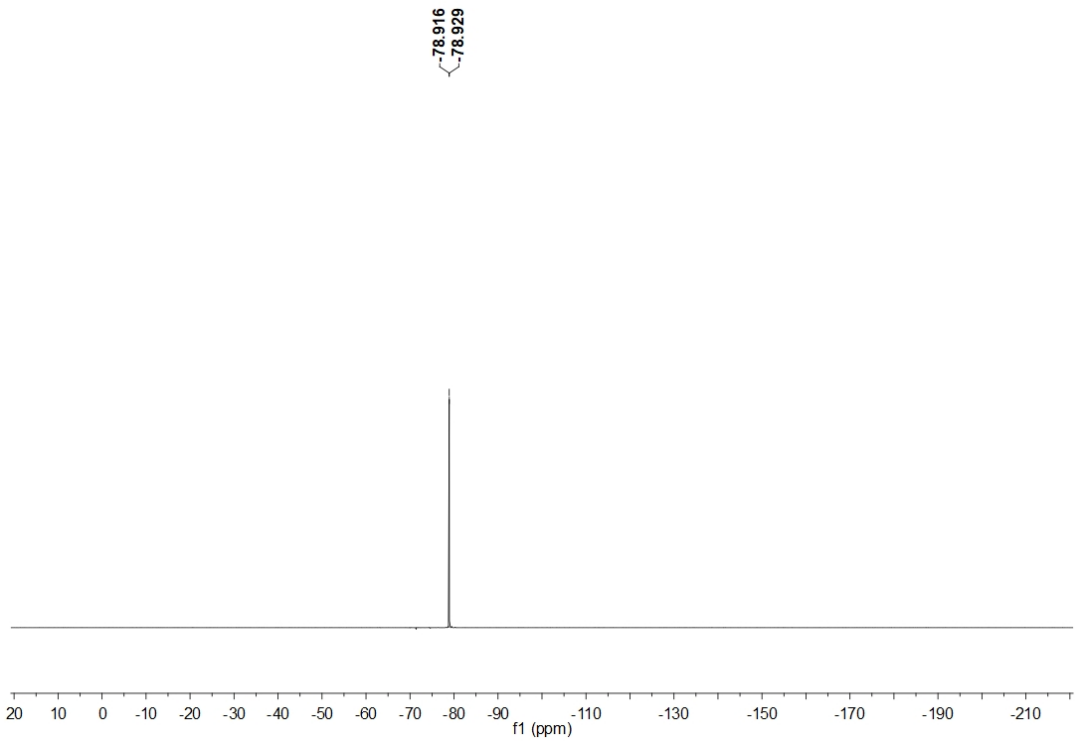
143.520
136.444
131.533
122.544
121.885
121.759
117.946
109.181
85.402
85.089
84.774
84.460
63.175
56.685
42.429
42.260
34.516
22.257
13.461
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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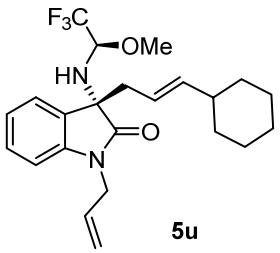
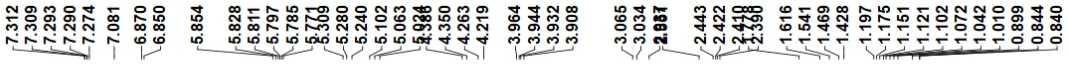
-78.929
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N

5u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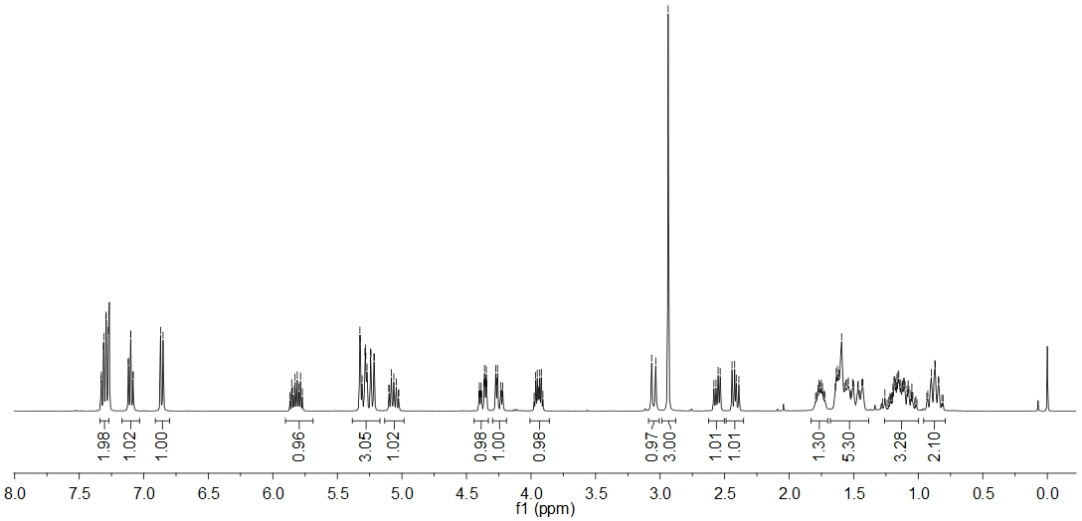
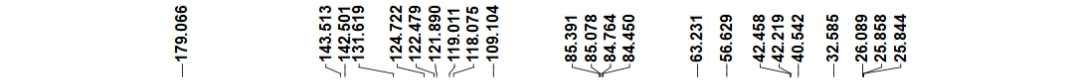
7.293
7.290
7.274
7.081
6.870
6.850
5.854
5.828
5.811
5.797
5.785
5.280
5.240
5.102
5.063
4.350
4.263
4.219
3.964
3.944
3.932
3.908
3.065
3.034
2.443
2.422
2.410
2.390
1.616
1.541
1.469
1.428
1.197
1.175
1.151
1.121
1.102
1.072
1.042
1.010
0.899
0.844
0.840


1.98
1.02
1.00
0.96
3.05
1.02
0.98
1.00
0.98
0.97
3.00
1.01
1.01
1.30
5.30
3.28
2.10
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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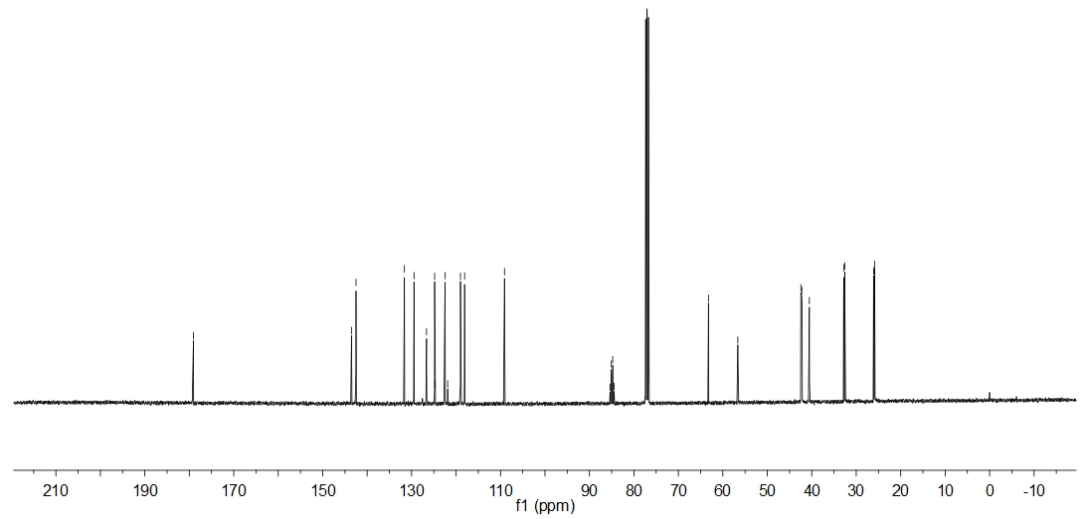
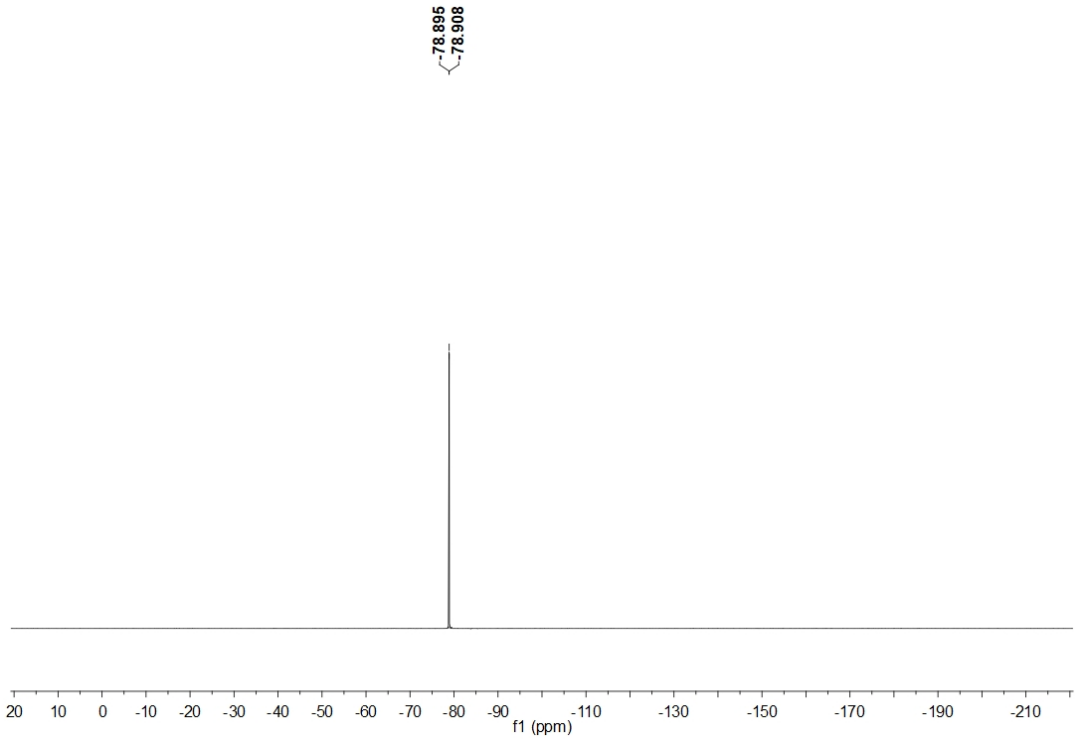
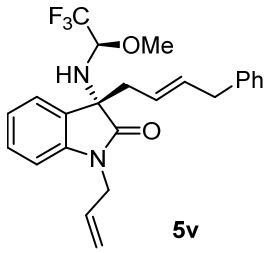
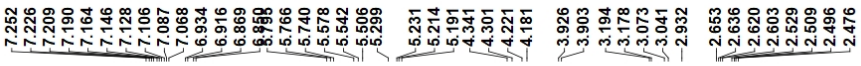
143.513
142.501
131.619
124.722
122.479
121.890
119.011
118.075
109.104
85.391
85.078
84.764
84.450
63.231
56.629
42.458
42.219
40.542
32.585
26.089
25.858
25.844


210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


-78.895
-78.908
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
Ph
O
N

5v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7.209
7.190
7.164
7.146
7.128
7.106
7.087
7.068
6.934
6.916
6.869
5.766
5.740
5.578
5.542
5.506
5.299
5.231
5.214
5.191
4.341
4.301
4.221
4.181
3.926
3.903
3.194
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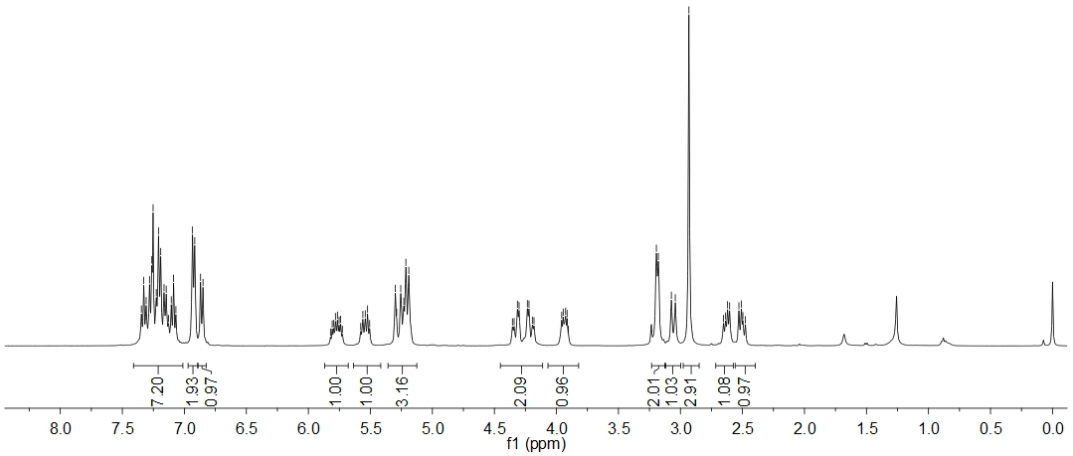
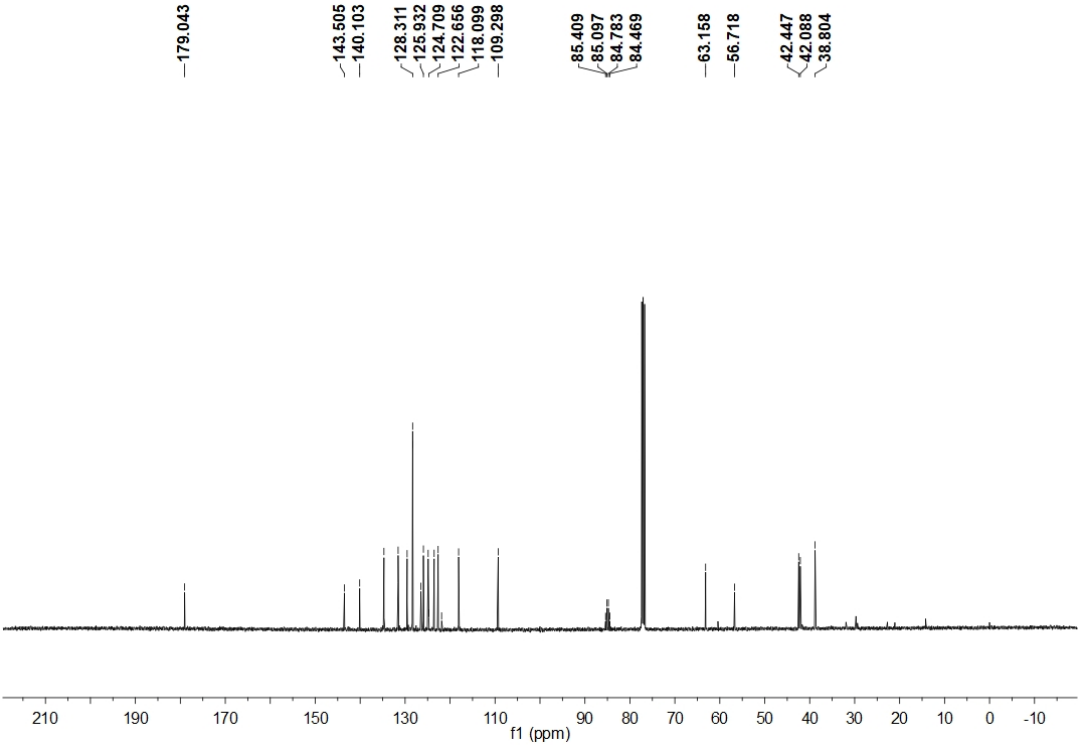
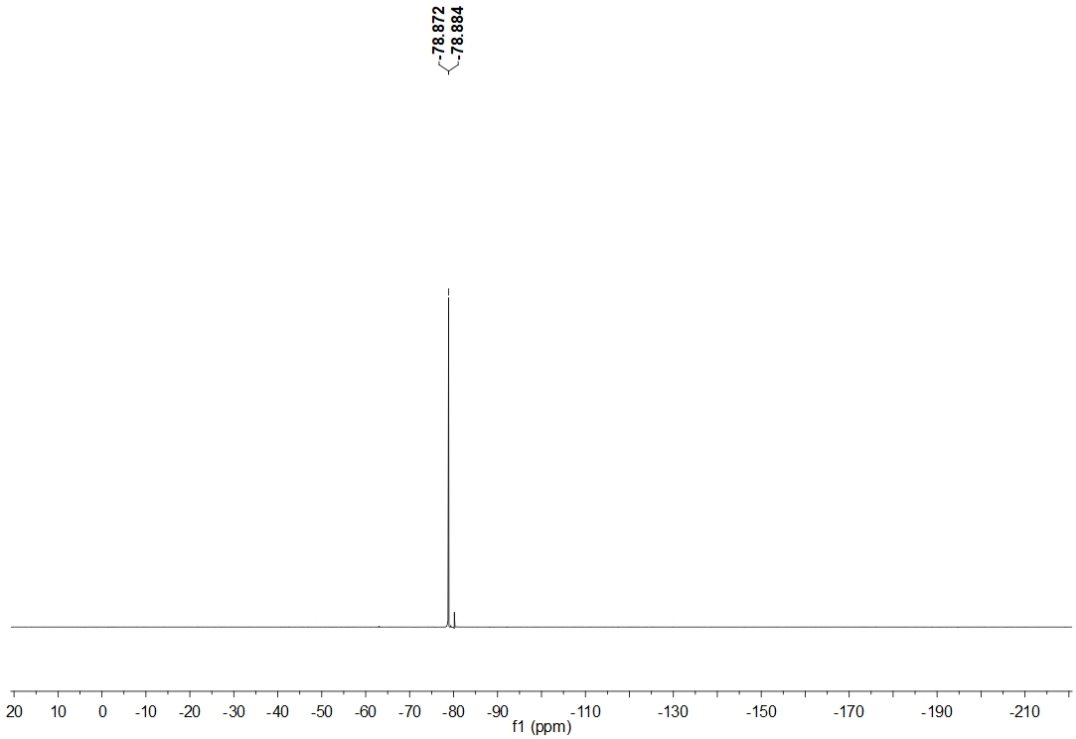
3.073
3.041
2.932
2.653
2.636
2.620
2.603
2.529
2.509
2.496
2.476


7.20
1.93
0.97
1.00
1.00
3.16
2.09
0.96
2.01
1.03
2.91
1.08
0.97
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


179.043
143.505
140.103
128.311
125.932
124.709
122.656
118.099
109.298
85.409
85.097
84.783
84.469
63.158
56.718
42.447
42.088
38.804
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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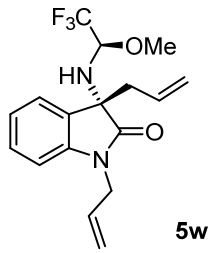
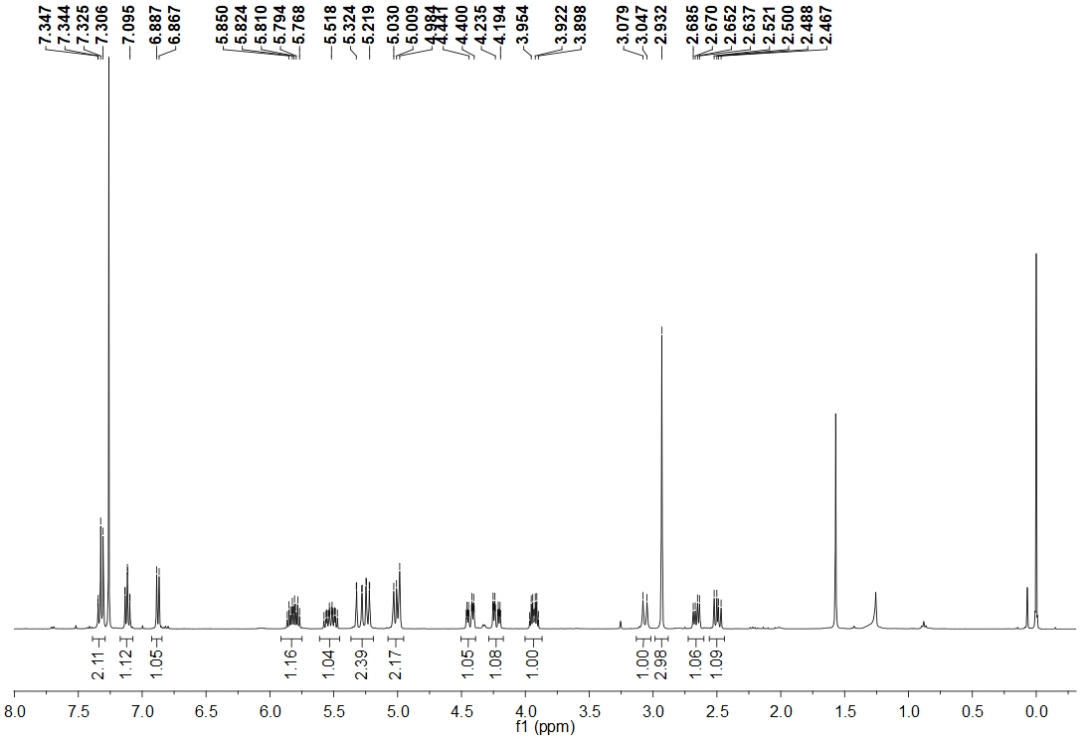
-78.884
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
O
N

5w


7.347
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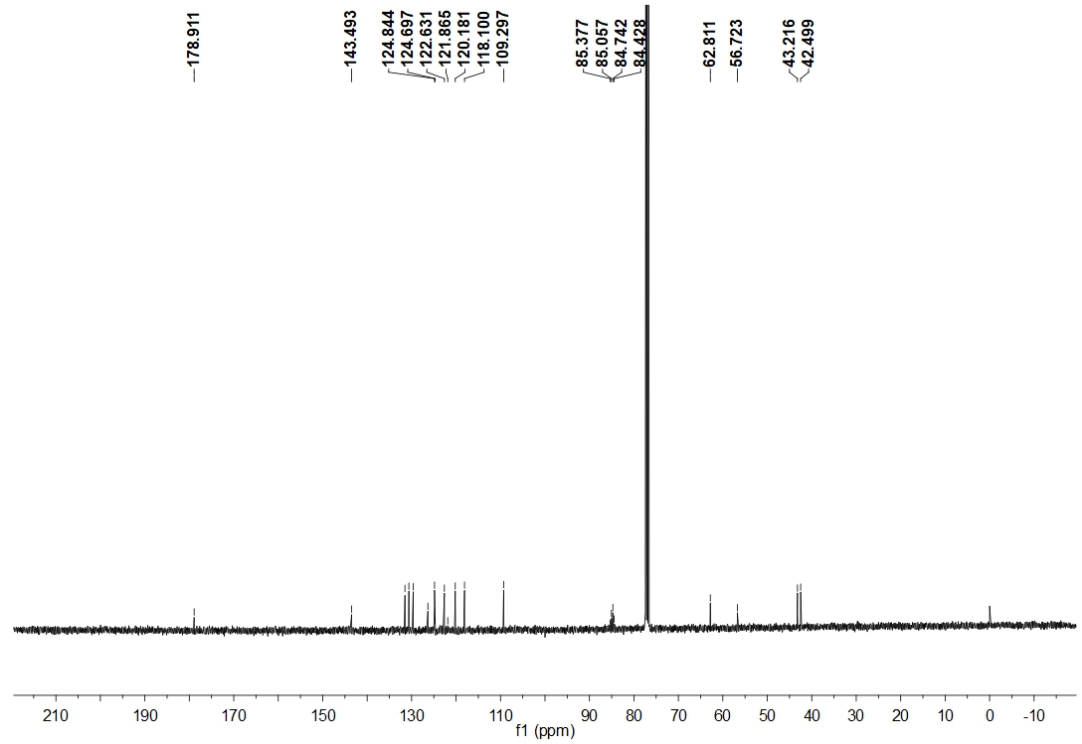
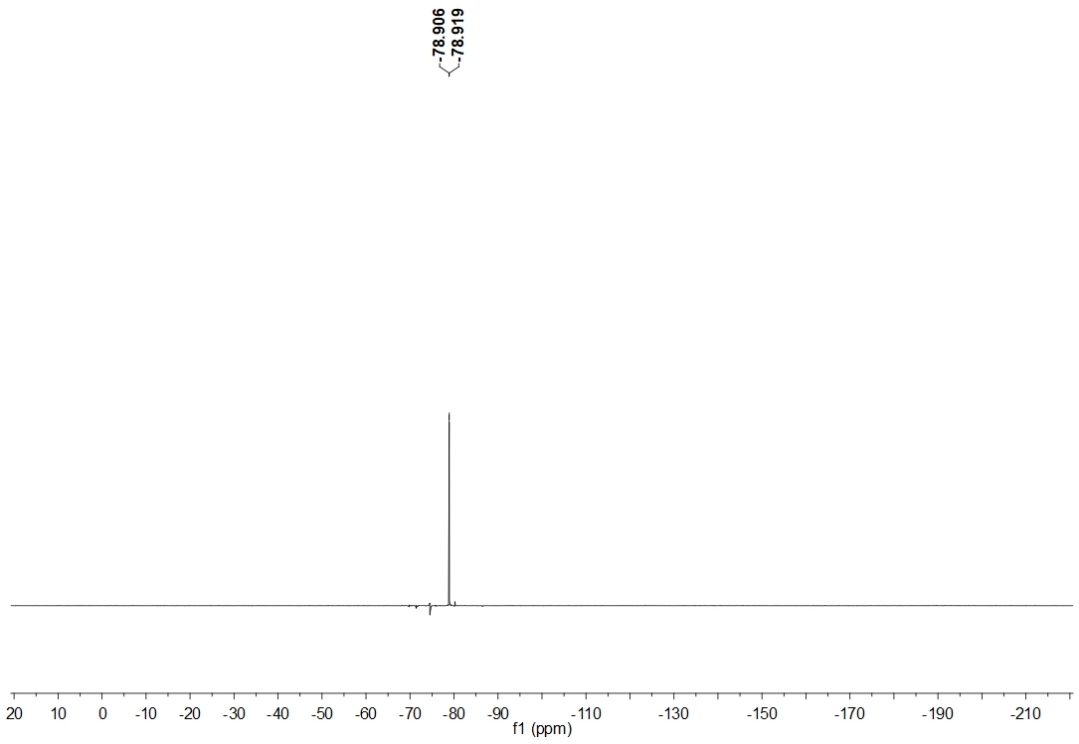
7.325
7.306
7.095
6.887
6.867
5.850
5.824
5.810
5.794
5.768
5.518
5.324
5.219
5.030
5.009
4.984
4.441
4.400
4.235
4.194
3.954
3.922
3.898
3.079
3.047
2.932
2.685
2.670
2.652
2.637
2.521
2.500
2.488
2.467
2.11
1.12
1.05
1.16
1.04
2.39
2.17
1.05
1.08
1.00
1.00
2.98
1.06
1.09
f1 (ppm)


178.911
143.493
124.844
124.697
122.631
121.865
120.181
118.100
109.297
85.377
85.057
84.742
84.428
62.811
56.723
43.216
42.499
f1 (ppm)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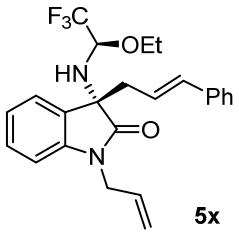
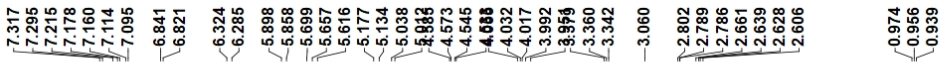
-78.919
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OEt
HN
Ph
O
N

5x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7.295
7.215
7.178
7.160
7.114
7.095
6.841
6.821
6.324
6.285
5.898
5.858
5.699
5.657
5.616
5.177
5.134
5.038
4.573
4.545
4.032
4.017
3.992
3.360
3.342
3.060
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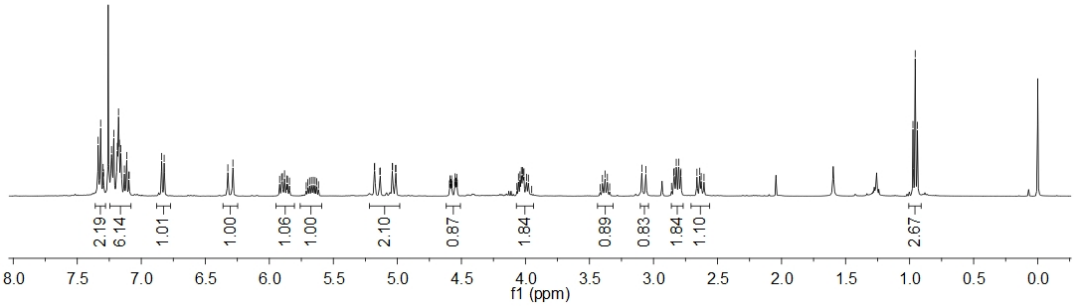
2.789
2.786
2.661
2.639
2.628
2.606
0.974
0.956
0.939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6.14
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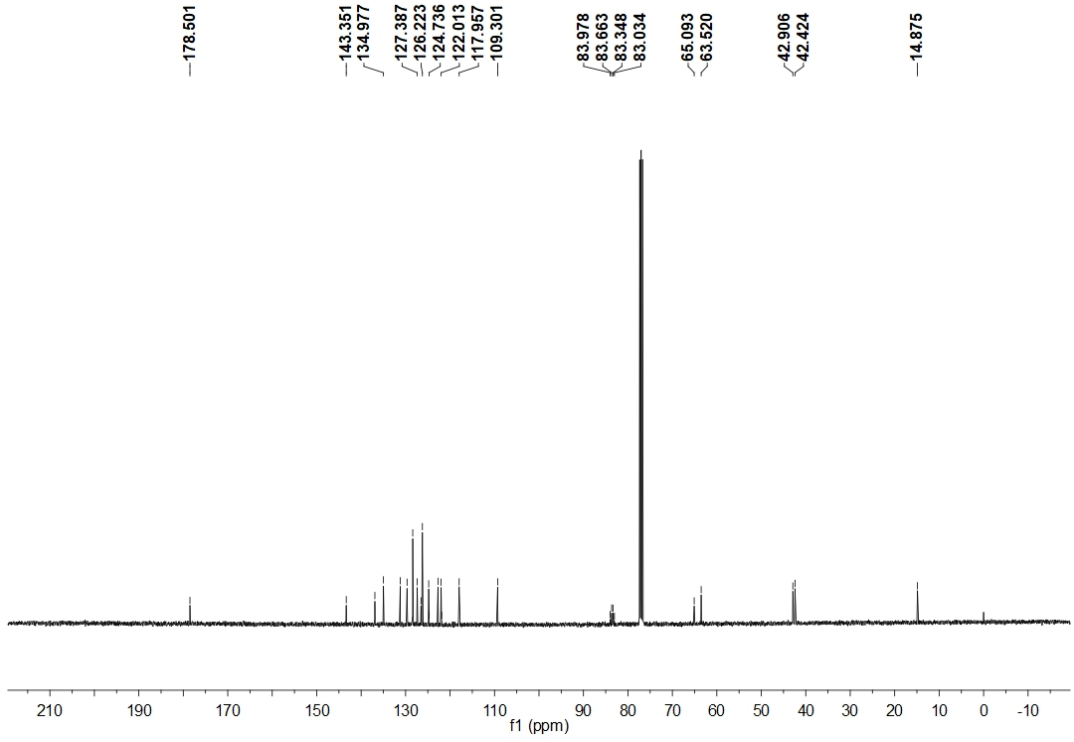
1.00
1.06
1.00
2.10
0.87
1.84
0.89
0.83
1.84
1.10
2.67
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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122.013
117.957
109.301
83.978
83.663
83.348
83.034
65.093
63.520
42.906
42.424
14.875
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150
130
110
90
80
70
60
50
40
30
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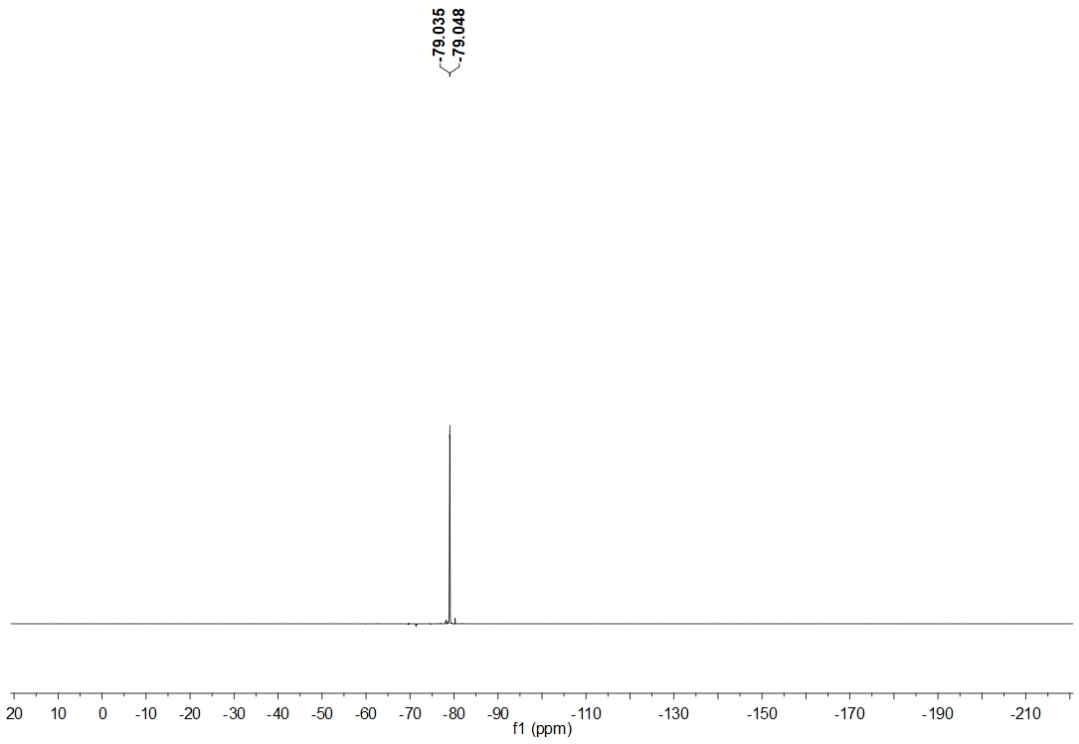
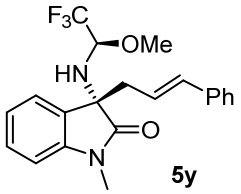
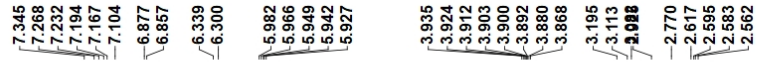
10
0
-10
f1 (ppm)


-79.035
-79.048
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
Ph
O
N

5y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7.232
7.194
7.167
7.104
6.877
6.857
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6.300
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5.966
5.949
5.942
5.927
3.935
3.924
3.912
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3.900
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3.113
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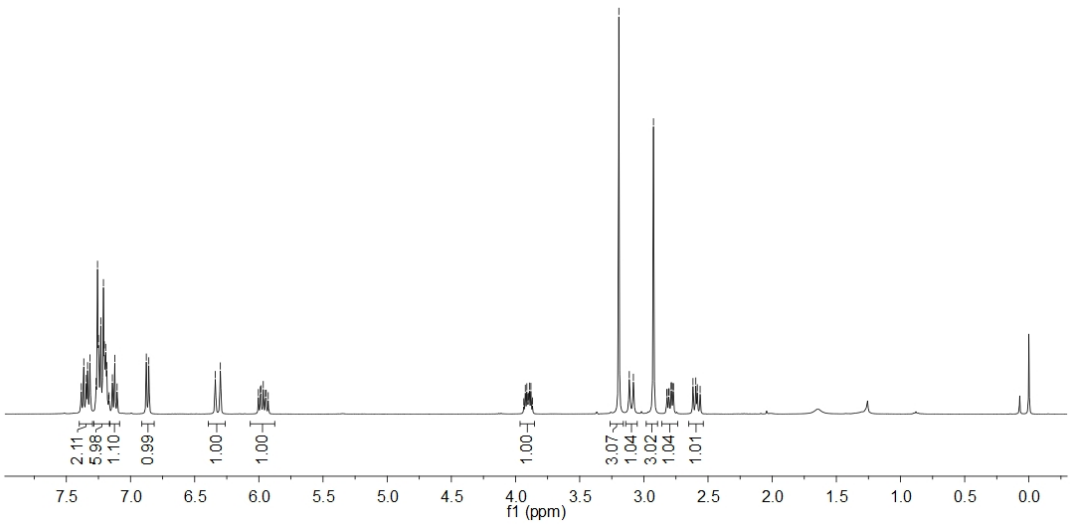
2.595
2.583
2.562


2.11
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1.10
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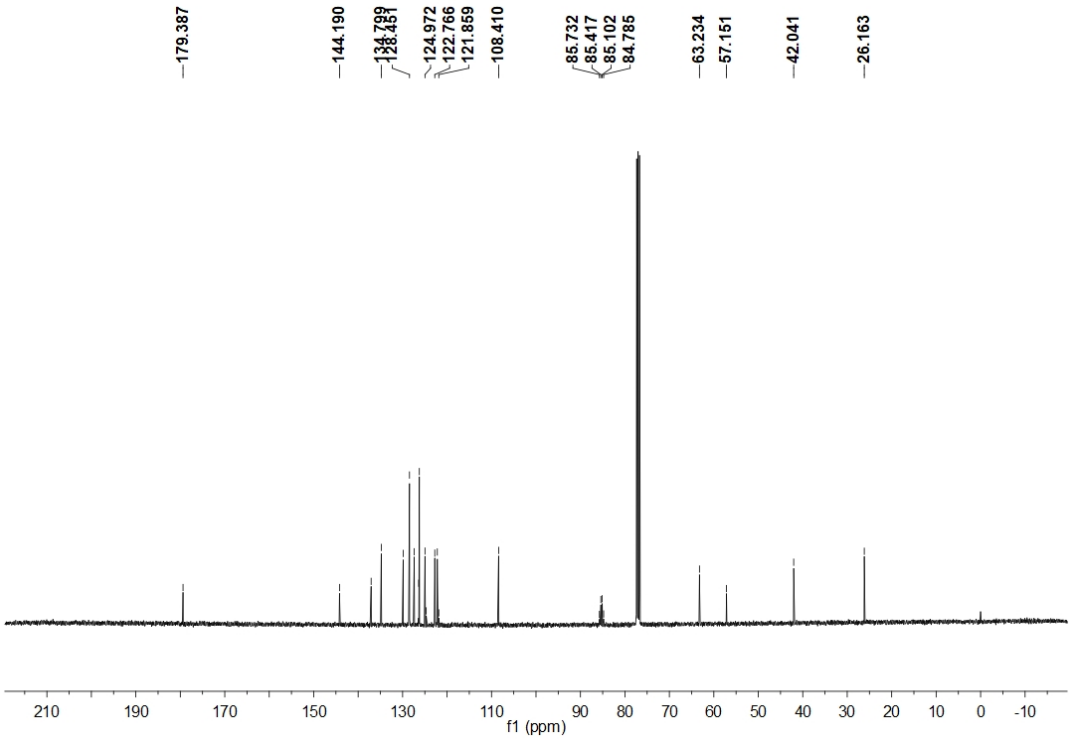
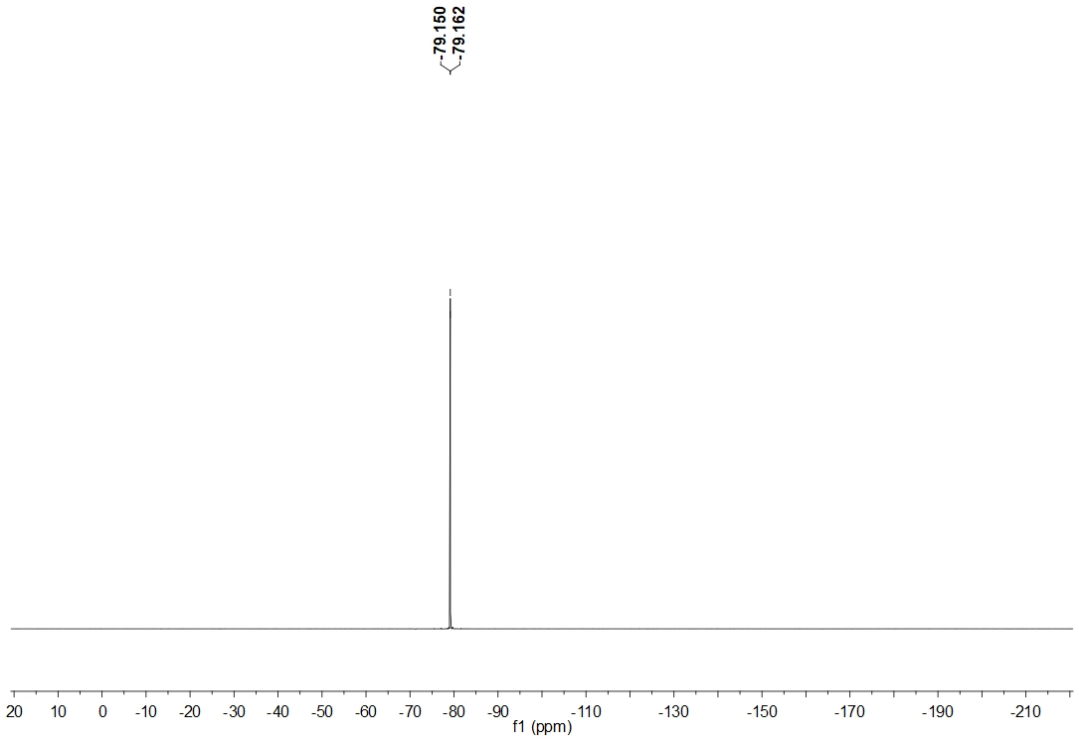
1.00
1.00
1.00
3.07
1.04
3.02
1.04
1.01
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


179.387
144.190
134.799
128.451
124.972
122.766
121.859
108.410
85.732
85.417
85.102
84.785
63.234
57.151
42.041
26.163
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)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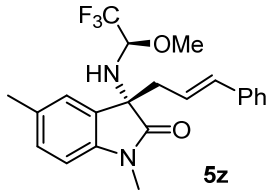
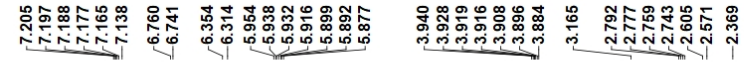
-79.162
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
Ph
O
N

5z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7.197
7.188
7.177
7.165
7.138
6.760
6.741
6.354
6.314
5.954
5.938
5.932
5.916
5.899
5.892
5.877
3.940
3.928
3.919
3.916
3.908
3.896
3.884
3.165
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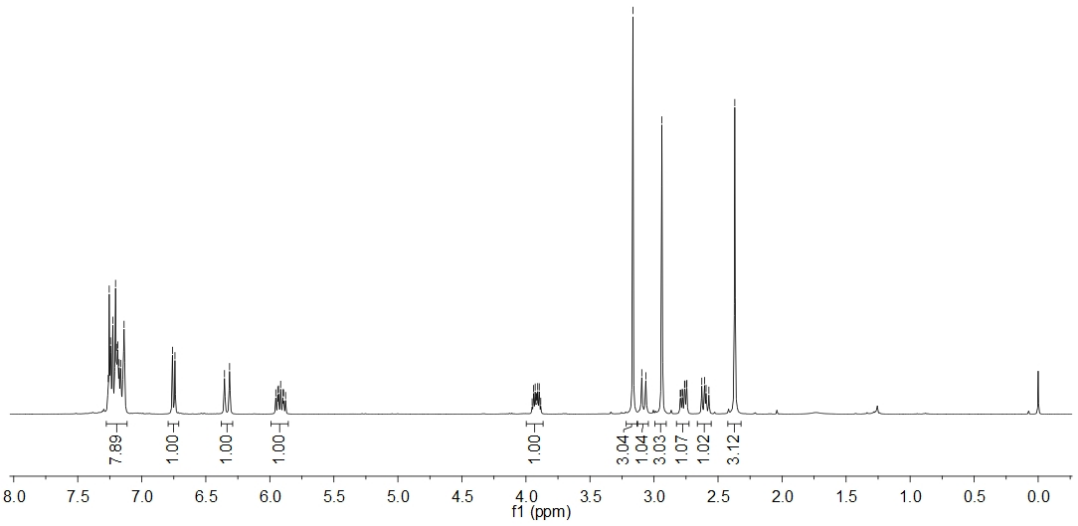
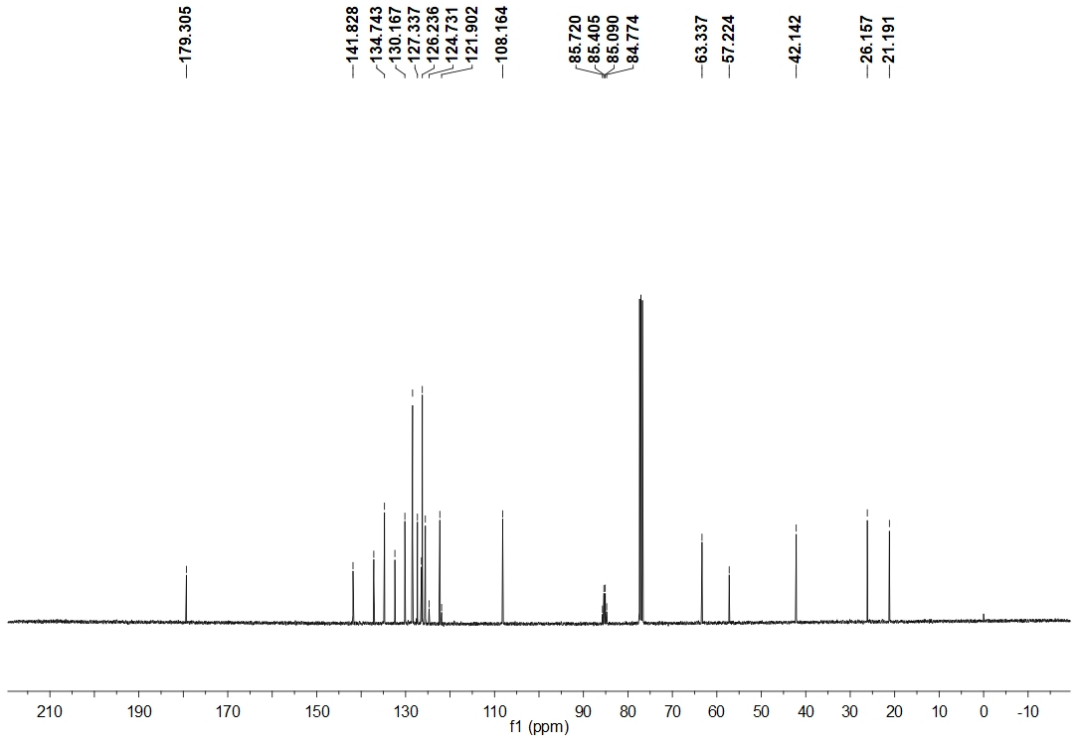
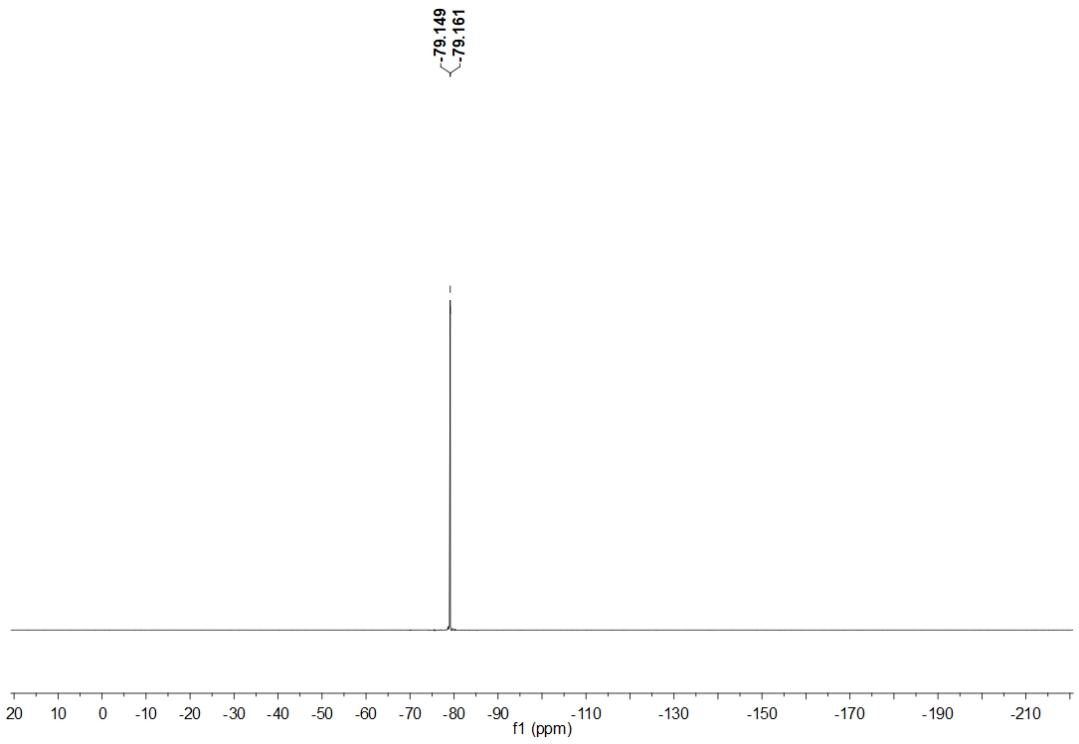
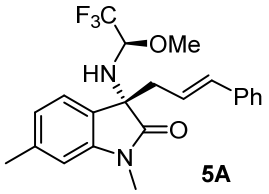
2.777
2.759
2.743
2.605
2.571
2.369

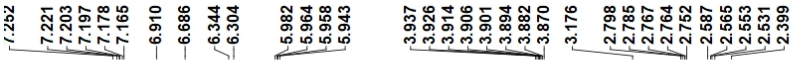

7.89
1.00
1.00
1.00
1.00
3.04
1.04
3.03
1.07
1.02
3.12
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

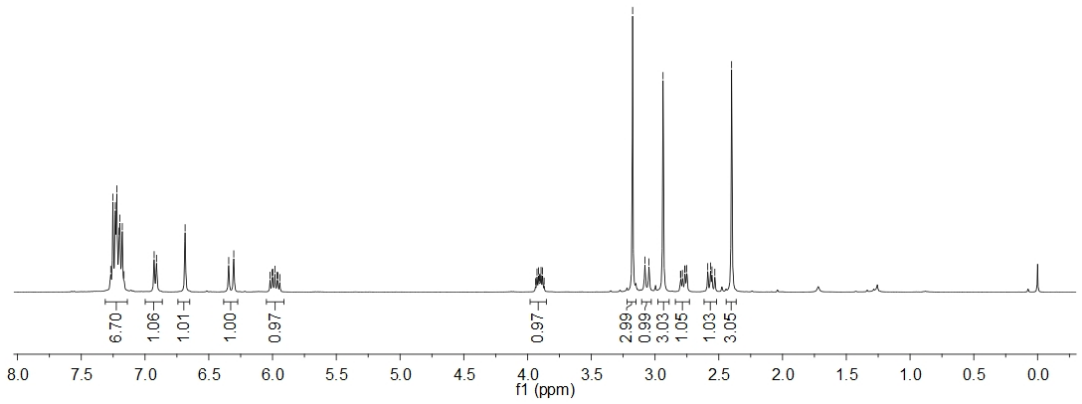

179.305
141.828
134.743
130.167
127.337
126.236
124.731
121.902
108.164
85.720
85.405
85.090
84.774
63.337
57.224
42.142
26.157
21.191
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

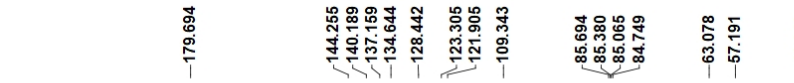

-79.149
-79.161
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)

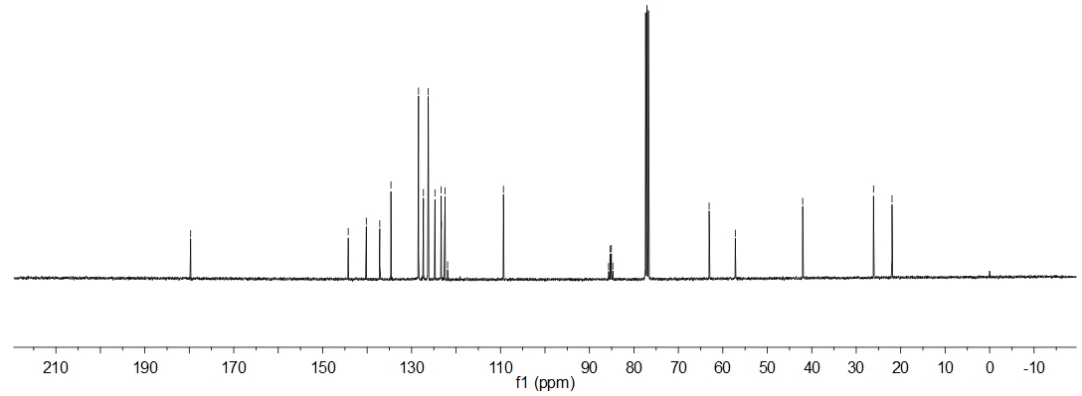

F3C
OMe
HN
Ph
O
N

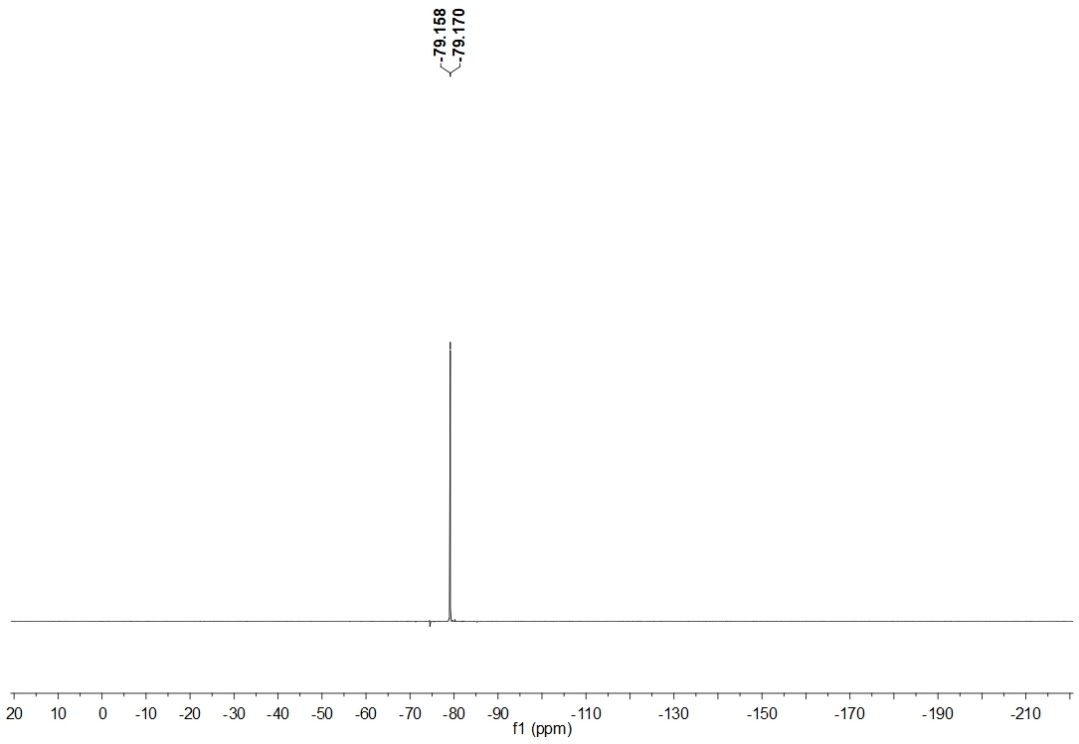
5A

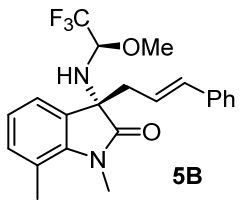

7.252
7.221
7.203
7.197
7.178
7.165
6.910
6.686
6.344
6.304
5.982
5.964
5.958
5.943
3.937
3.926
3.914
3.906
3.901
3.894
3.882
3.870
3.176
2.798
2.785
2.767
2.764
2.752
2.587
2.565
2.553
2.531
2.399


6.70
1.06
1.01
1.00
0.97
0.97
2.99
0.99
3.03
1.05
1.03
3.05
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

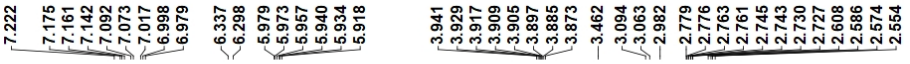

179.694
144.255
140.189
137.159
134.644
128.442
123.305
121.905
109.343
85.694
85.380
85.065
84.749
63.078
57.191
42.043
26.113
21.948

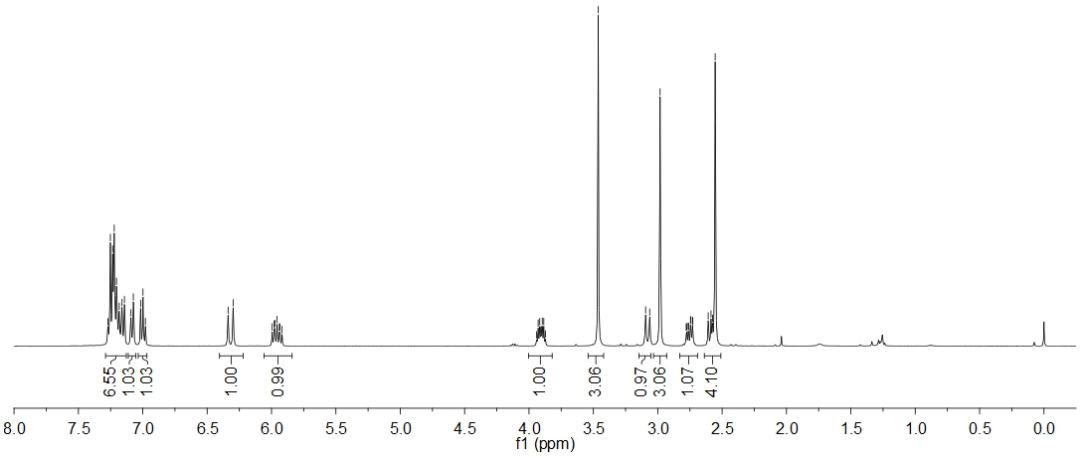

210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

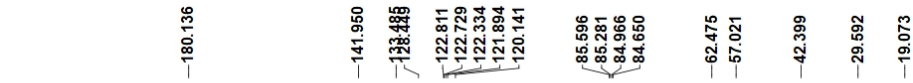

-79.158
-79.170
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)

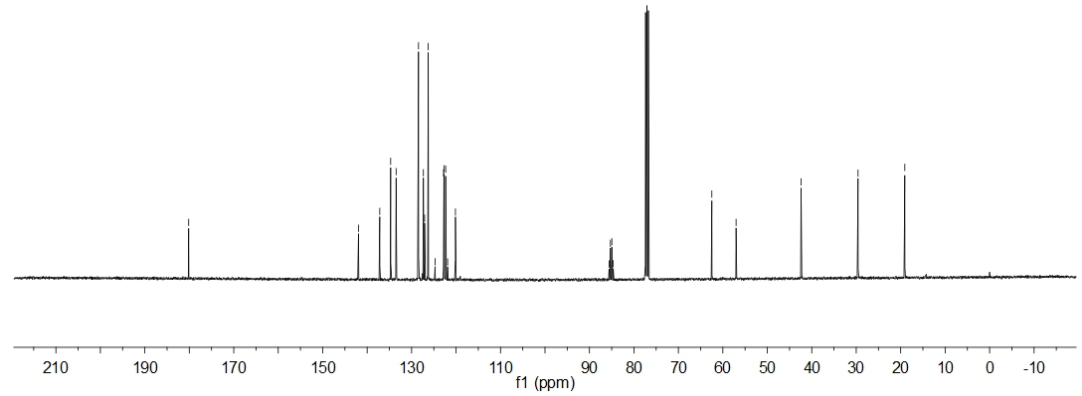

F3C
OMe
HN
Ph
O
N

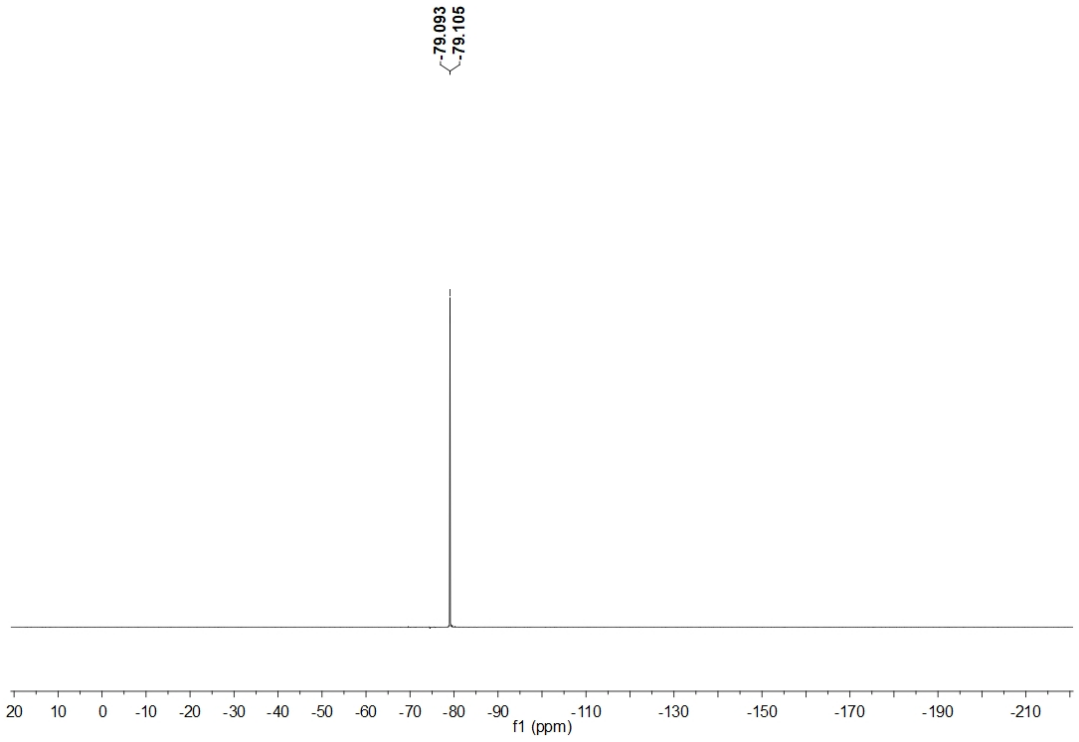
5B

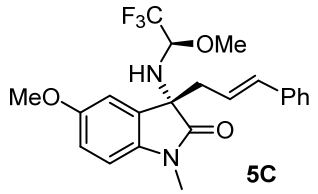

7.222
7.175
7.161
7.142
7.092
7.073
7.017
6.998
6.979
6.337
6.298
5.979
5.973
5.957
5.940
5.934
5.918
3.941
3.929
3.917
3.909
3.905
3.897
3.885
3.873
3.462
3.094
3.063
2.982
2.779
2.776
2.763
2.761
2.745
2.743
2.730
2.727
2.608
2.586
2.574
2.554


6.55
1.03
1.03
1.00
0.99
1.00
3.06
0.97
3.06
1.07
4.10
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

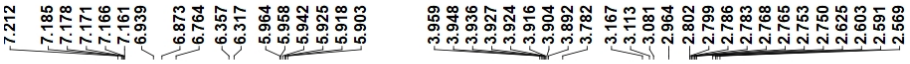

180.136
141.950
133.485
128.438
122.811
122.729
122.334
121.894
120.141
85.596
85.281
84.966
84.650
62.475
57.021
42.399
29.592
19.073

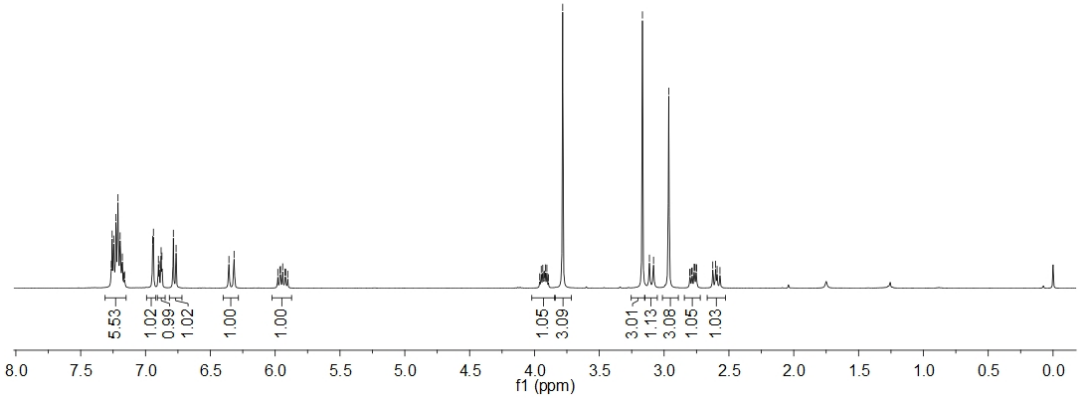

210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

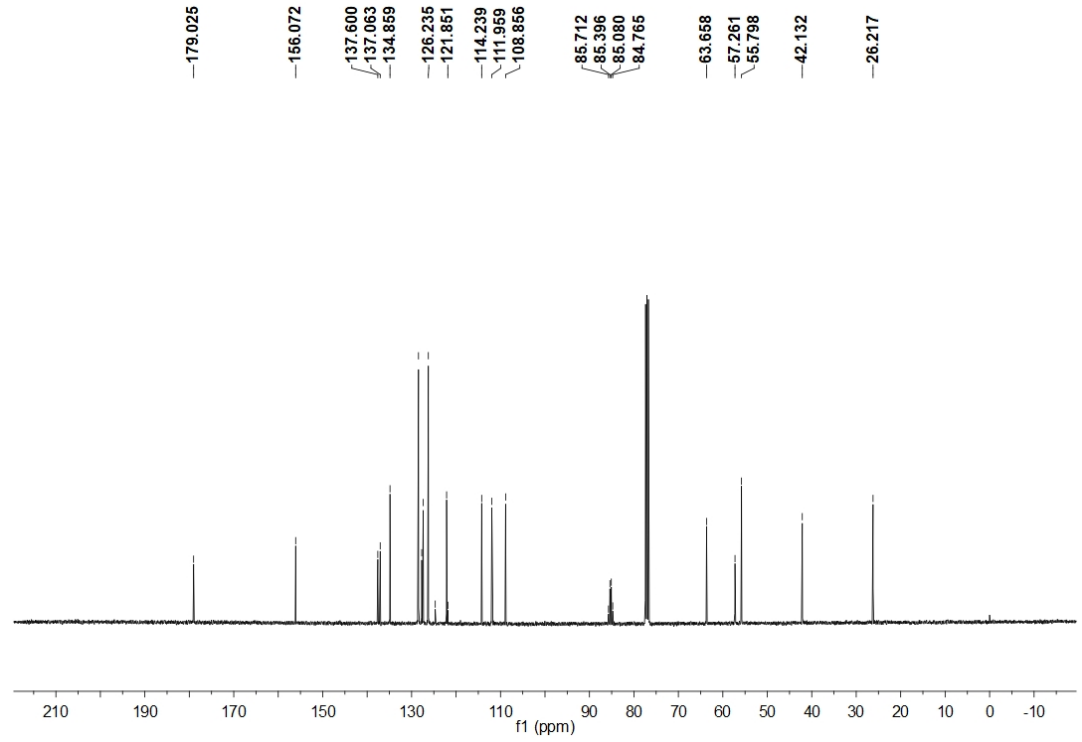

-79.093
-79.105
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)

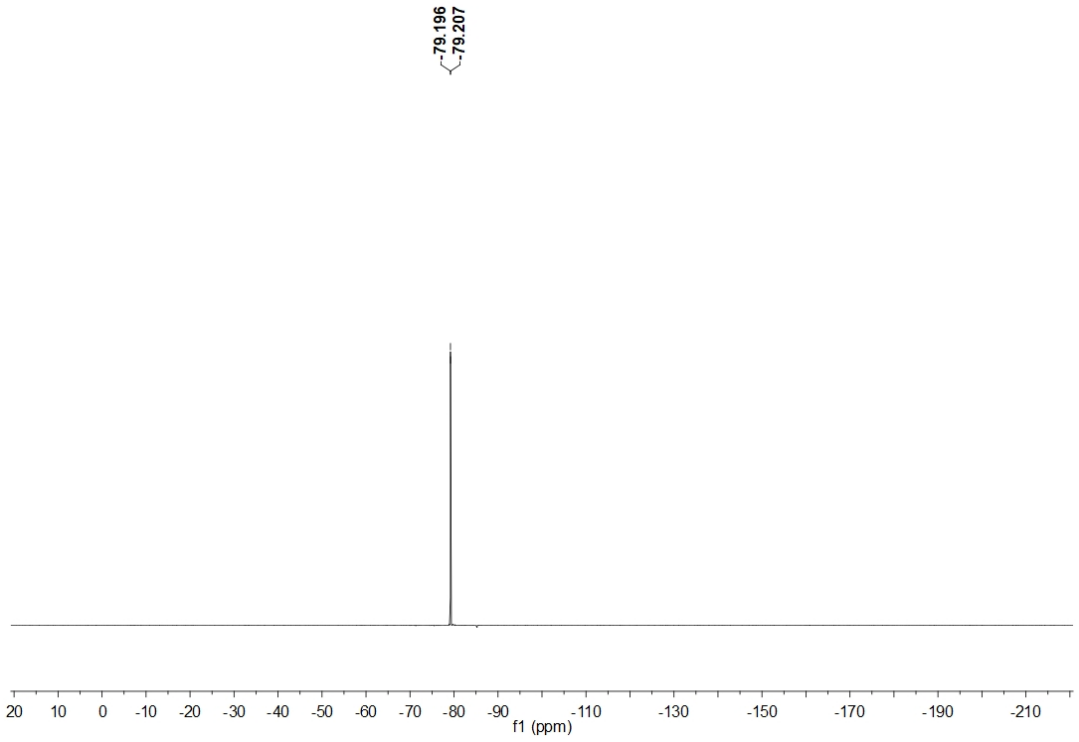

F3C
OMe
HN
MeO
Ph
O
N

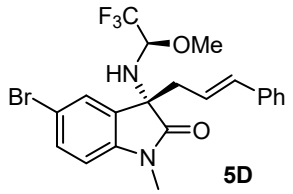
5C


7.212
7.185
7.178
7.171
7.166
7.161
6.939
6.873
6.764
6.357
6.317
5.964
5.958
5.942
5.925
5.918
5.903
3.959
3.948
3.936
3.927
3.924
3.916
3.904
3.892
3.782
3.167
3.113
3.081
2.964
2.802
2.799
2.786
2.783
2.768
2.765
2.753
2.750
2.625
2.603
2.591
2.569

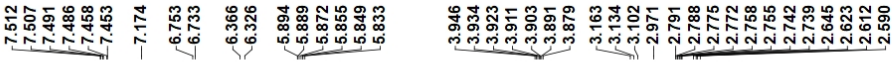

5.53
1.02
0.99
1.02
1.00
1.00
1.05
3.09
3.01
1.13
3.08
1.05
1.03
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


179.025
156.072
137.600
137.063
134.859
126.235
121.851
114.239
111.959
108.856
85.712
85.396
85.080
84.765
63.658
57.261
55.798
42.132
26.217
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


-79.196
-79.207
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
Br
Ph
O
N

5D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7.491
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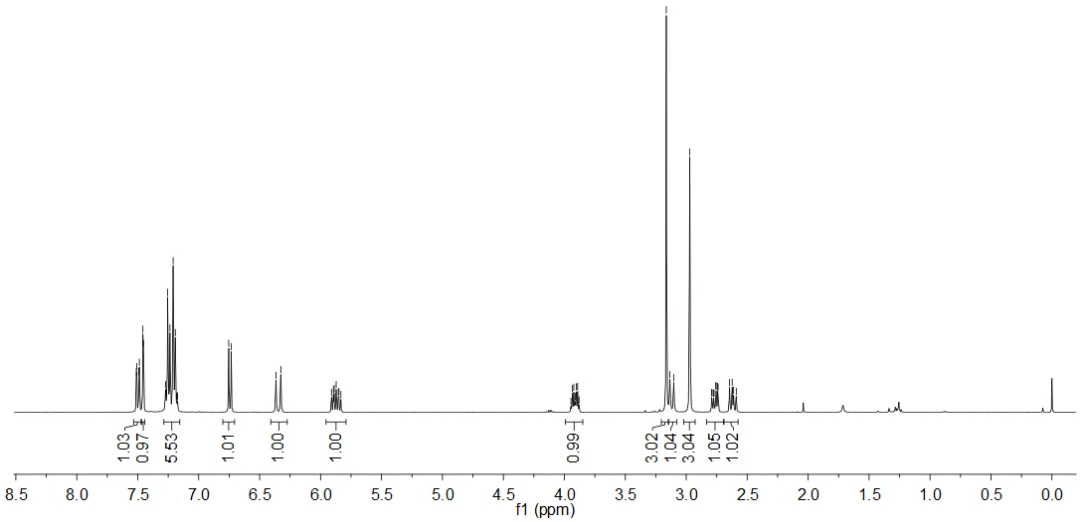
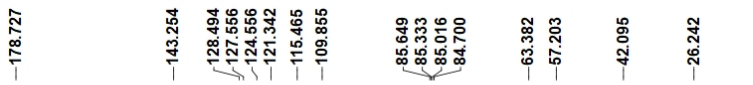
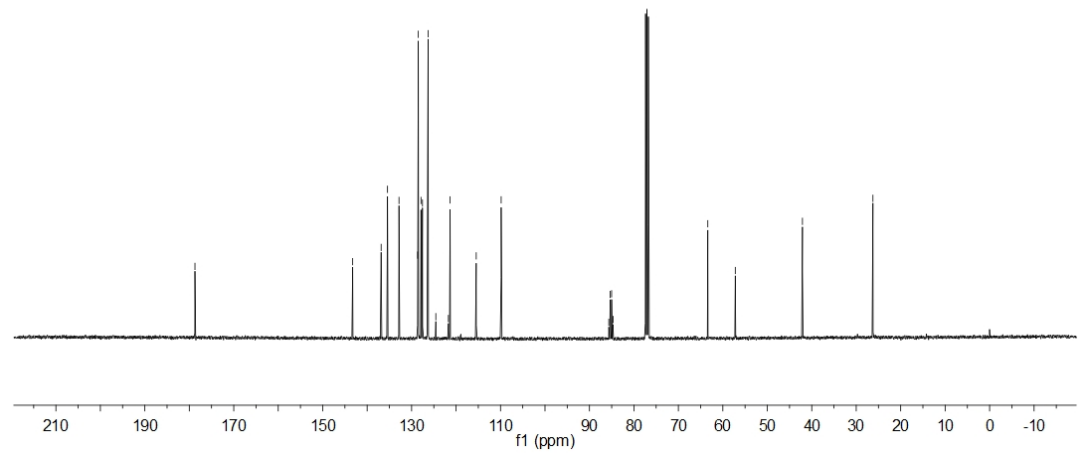
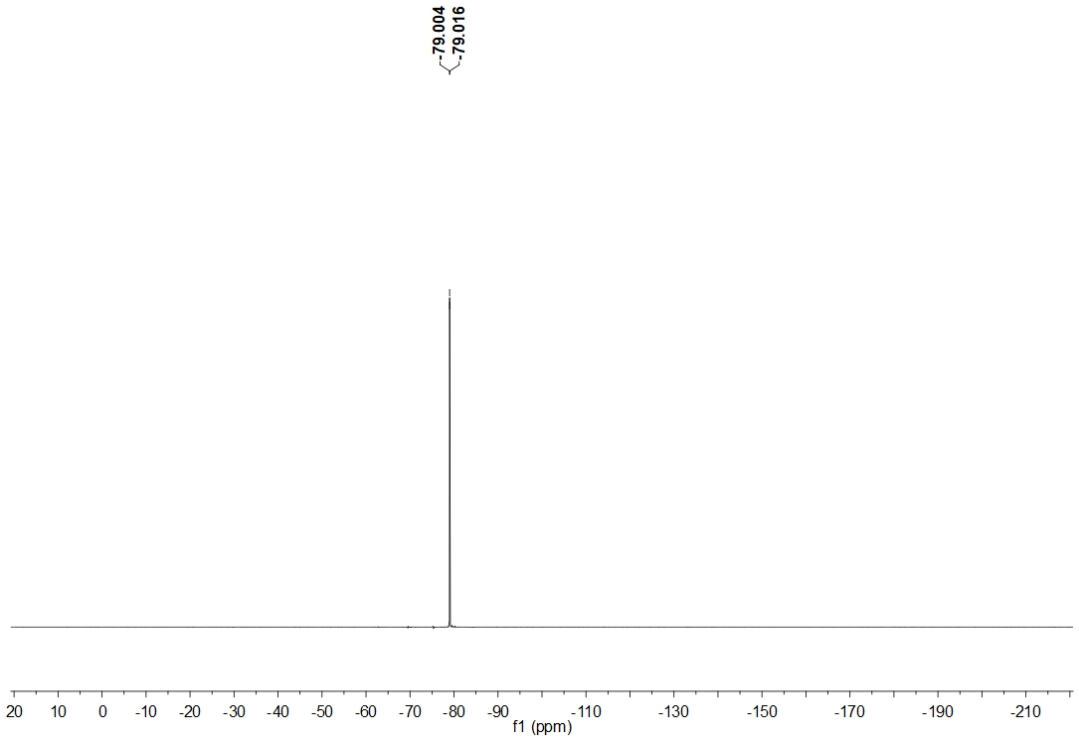
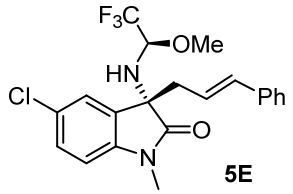
7.458
7.453
7.174
6.753
6.733
6.366
6.326
5.894
5.889
5.872
5.855
5.849
5.833
3.946
3.934
3.923
3.911
3.903
3.891
3.879
3.163
3.134
3.102
2.971
2.791
2.788
2.775
2.772
2.758
2.755
2.742
2.739
2.645
2.623
2.612
2.590


1.03
0.97
5.53
1.01
1.00
1.00
0.99
3.02
1.04
3.04
1.05
1.02
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

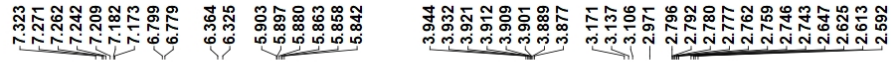

178.727
143.254
128.494
127.556
124.556
121.342
115.465
109.855
85.649
85.333
85.016
84.700
63.382
57.203
42.095
26.242


210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


-79.004
-79.016
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
Cl
Ph
O
N

5E


7.323
7.271
7.262
7.242
7.209
7.182
7.173
6.799
6.779
6.364
6.325
5.903
5.897
5.880
5.863
5.858
5.842
3.944
3.932
3.921
3.912
3.909
3.901
3.889
3.877
3.171
3.137
3.106
2.971
2.796
2.792
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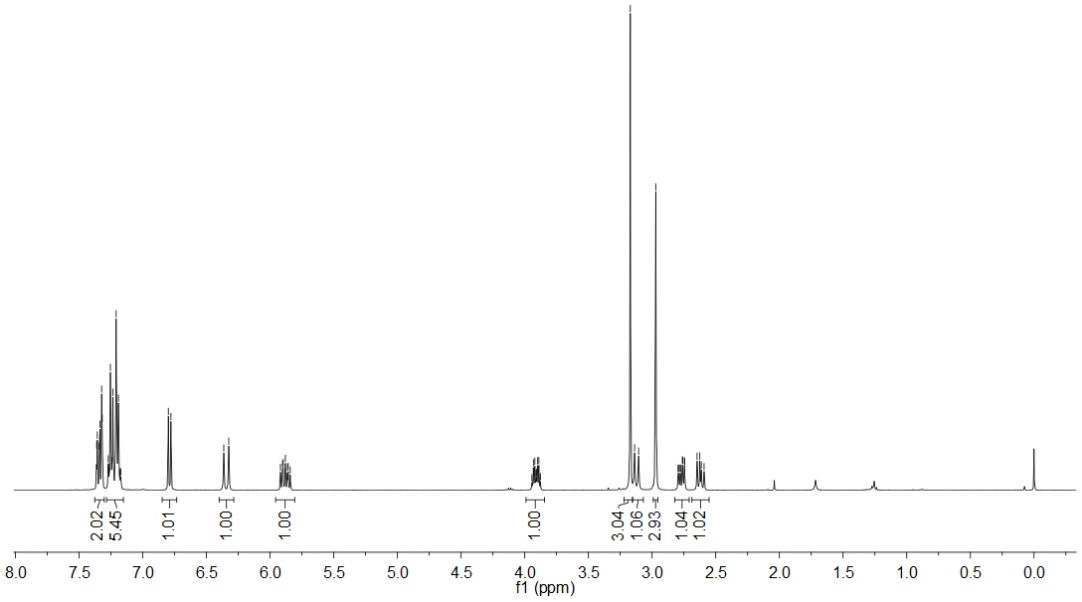
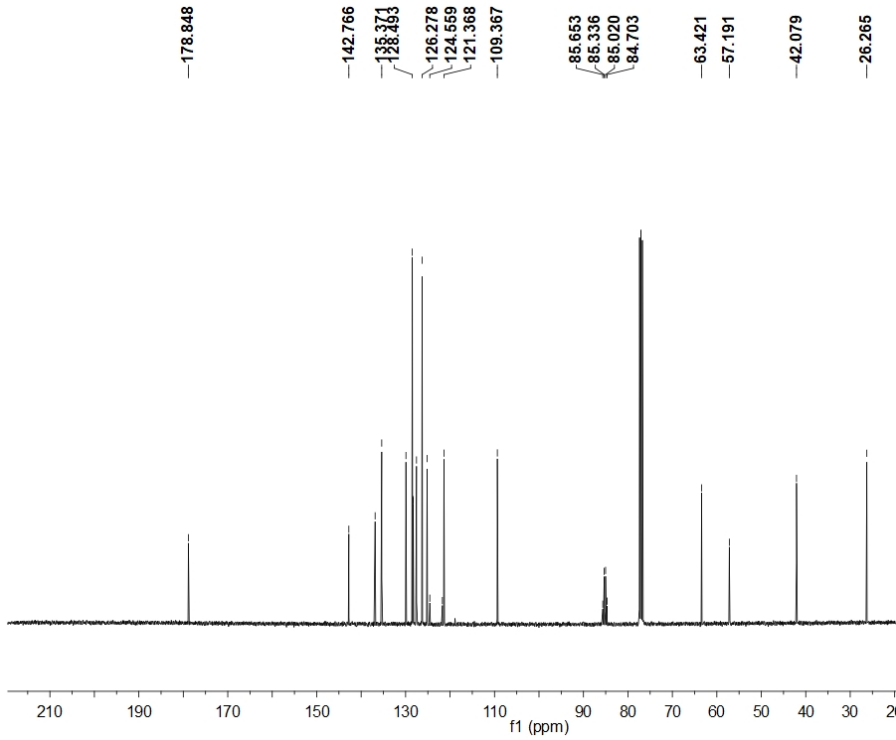
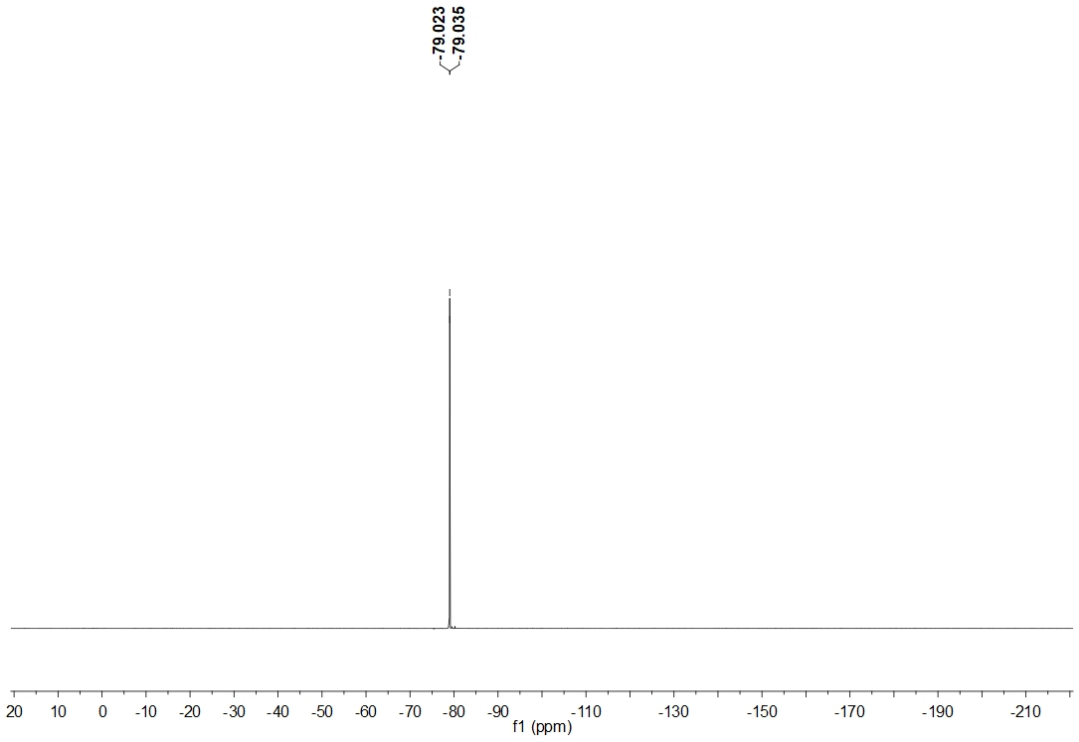
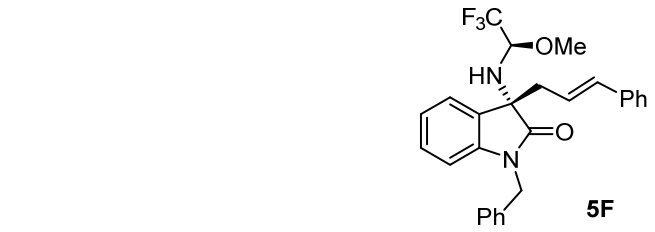
2.759
2.746
2.743
2.647
2.625
2.613
2.592

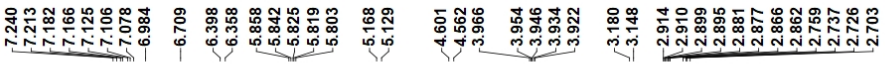

2.02
5.45
1.01
1.00
1.00
1.00
3.04
1.06
2.93
1.04
1.02
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


178.848
142.766
135.371
128.493
126.278
124.559
121.368
109.367
85.653
85.336
85.020
84.703
63.421
57.191
42.079
26.265
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


-79.023
-79.035
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)


F3C
OMe
HN
Ph
O
N
Ph

5F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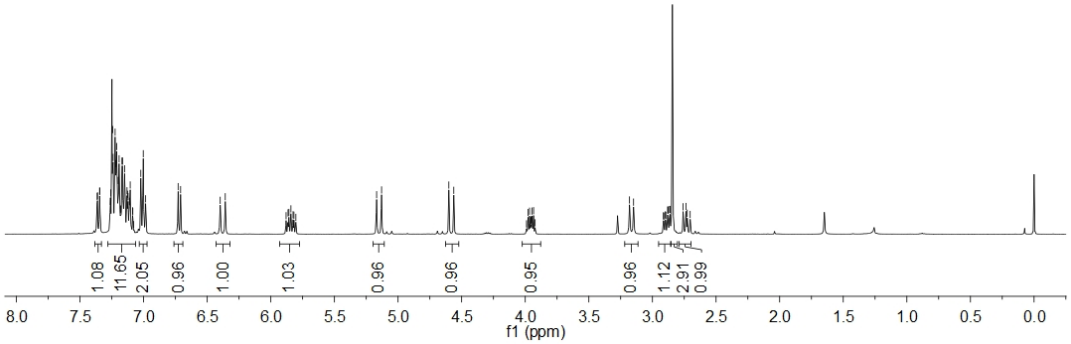
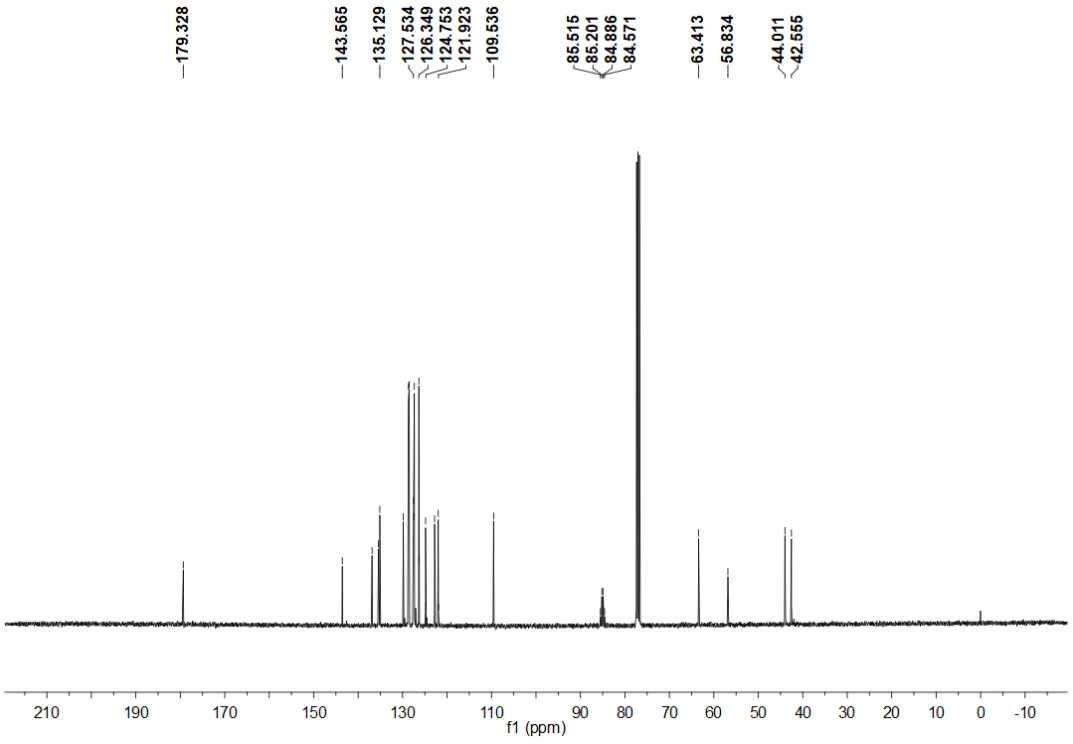
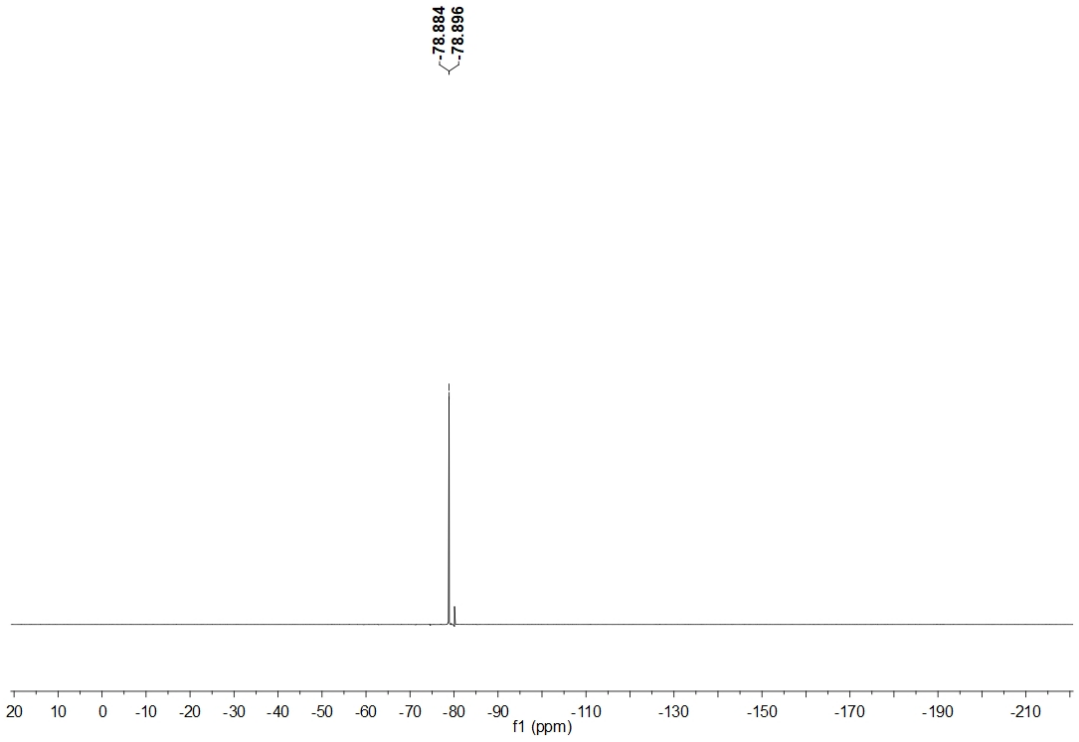
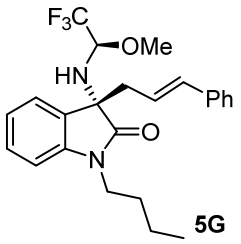
7.213
7.182
7.166
7.125
7.106
7.078
6.984
6.709
6.398
6.358
5.858
5.842
5.825
5.819
5.803
5.168
5.129
4.601
4.562
3.966
3.954
3.946
3.934
3.922
3.180
3.148
2.914
2.910
2.899
2.895
2.881
2.877
2.866
2.862
2.759
2.737
2.726
2.703


1.08
11.65
2.05
0.96
1.00
1.03
0.96
0.96
0.95
0.96
1.12
2.91
0.99
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

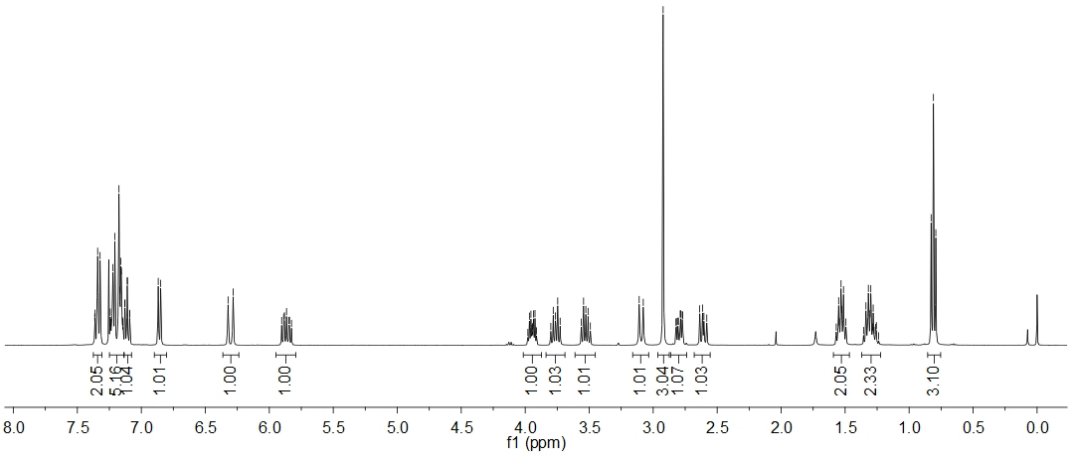

179.328
143.565
135.129
127.534
126.349
124.753
121.923
109.536
85.515
85.201
84.886
84.571
63.413
56.834
44.011
42.555
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


-78.884
-78.896
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)

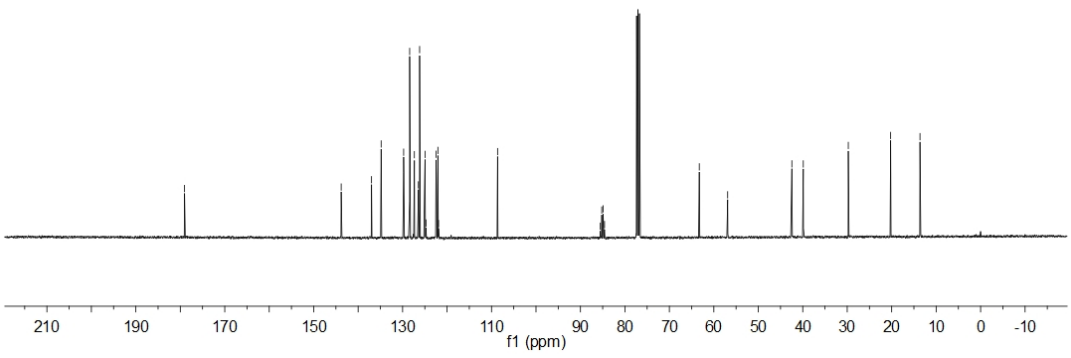


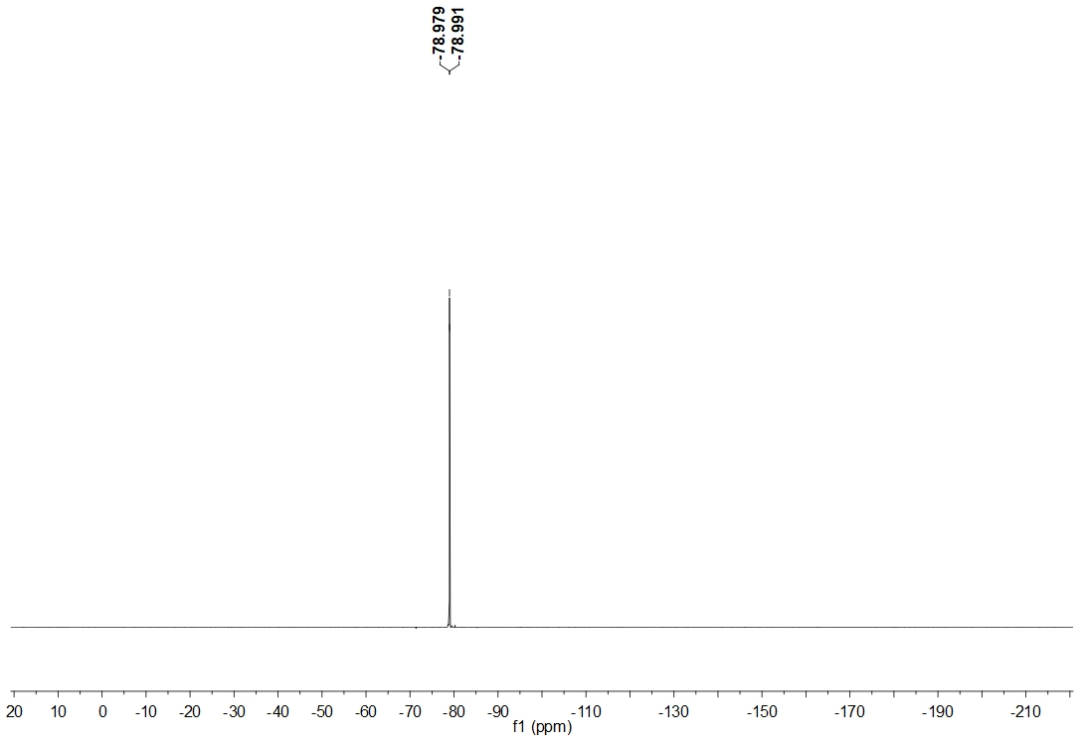
5G

7.207 7.167 7.156 7.143 7.127 7.109 7.090 6.868 6.849 6.322 6.283 5.903 5.888 5.881 5.865 5.848 5.842 5.826 3.936 3.924 3.911 3.800 3.781 3.765 3.746 3.727 3.491 3.109 3.077 2.922 2.803 2.785 2.770 2.615 1.513 1.337 1.299 1.274 1.238 0.828 0.810 0.791



179.041 143.812 134.825 128.413 124.961 122.471 121.919 108.639 85.532 85.218 84.904 84.590 63.272 56.892 42.455 39.880 29.757 20.234 13.636

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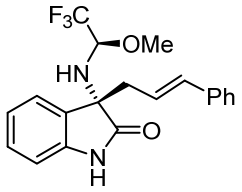
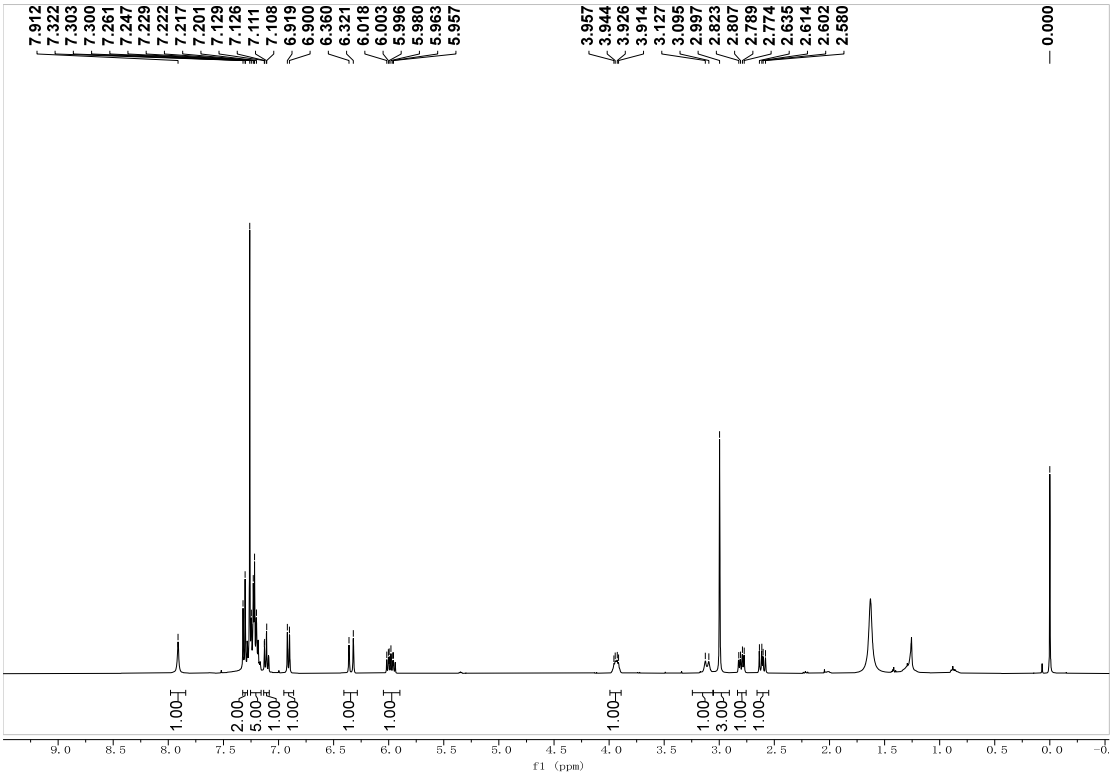
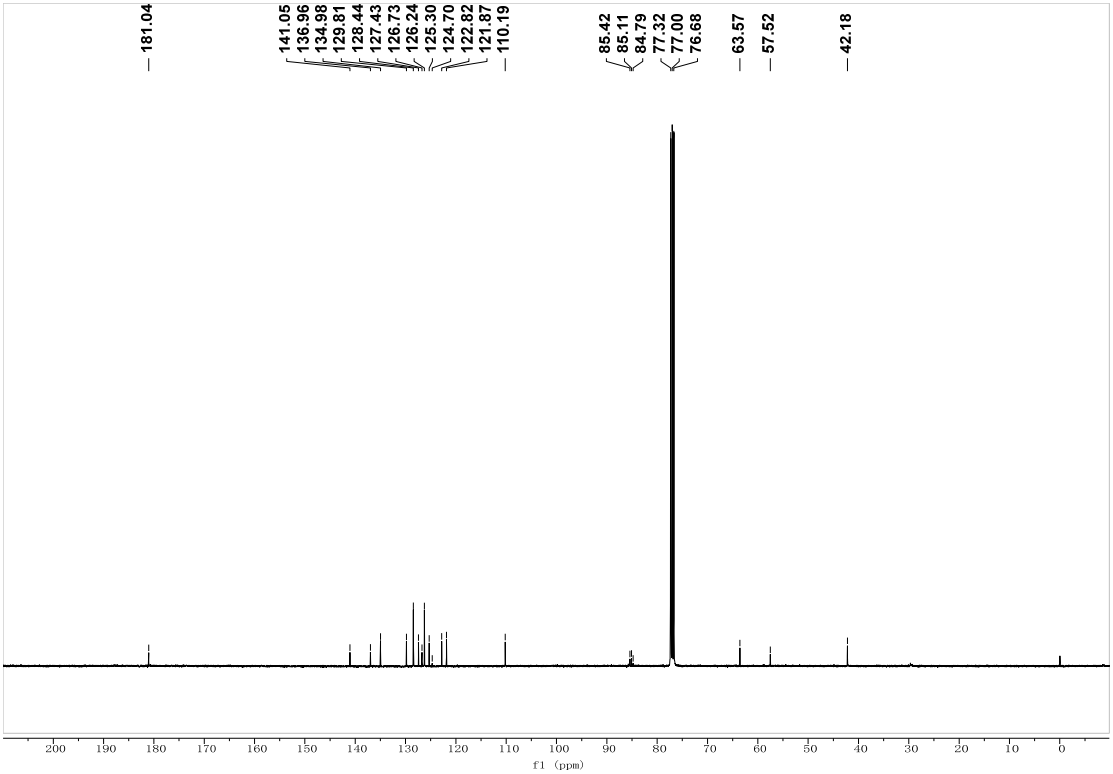
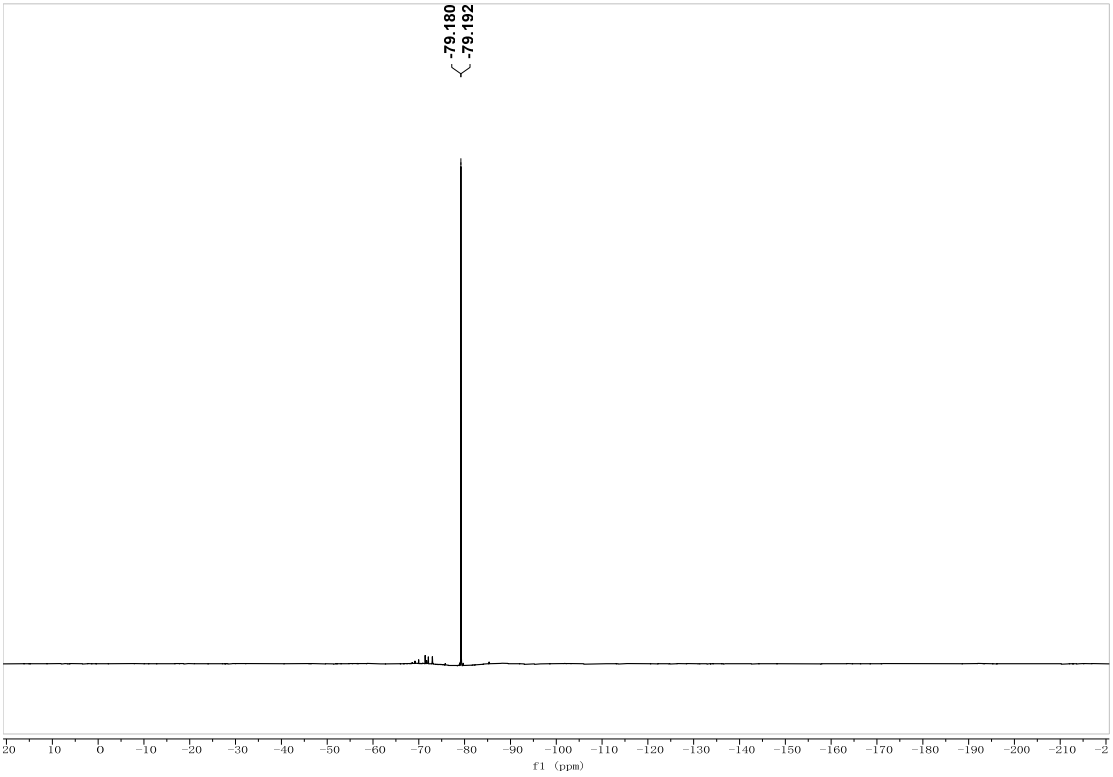
-78.991
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-110
-130
-150
-170
-190
-210
f1 (ppm)

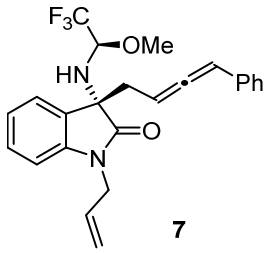

F3C
OMe
HN
Ph
O
N
H

5H

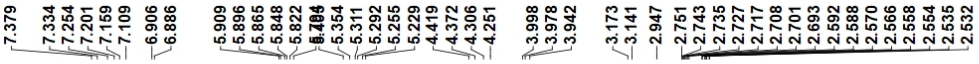

7.912
7.322
7.303
7.300
7.261
7.247
7.229
7.222
7.217
7.201
7.129
7.126
7.111
7.108
6.919
6.900
6.360
6.321
6.018
6.003
5.996
5.980
5.963
5.957
3.957
3.944
3.926
3.914
3.127
3.095
2.997
2.823
2.807
2.789
2.774
2.635
2.614
2.602
2.580
0.000
1.00
2.00
5.00
1.00
1.00
1.00
1.00
3.00
1.00
1.00
f1 (ppm)

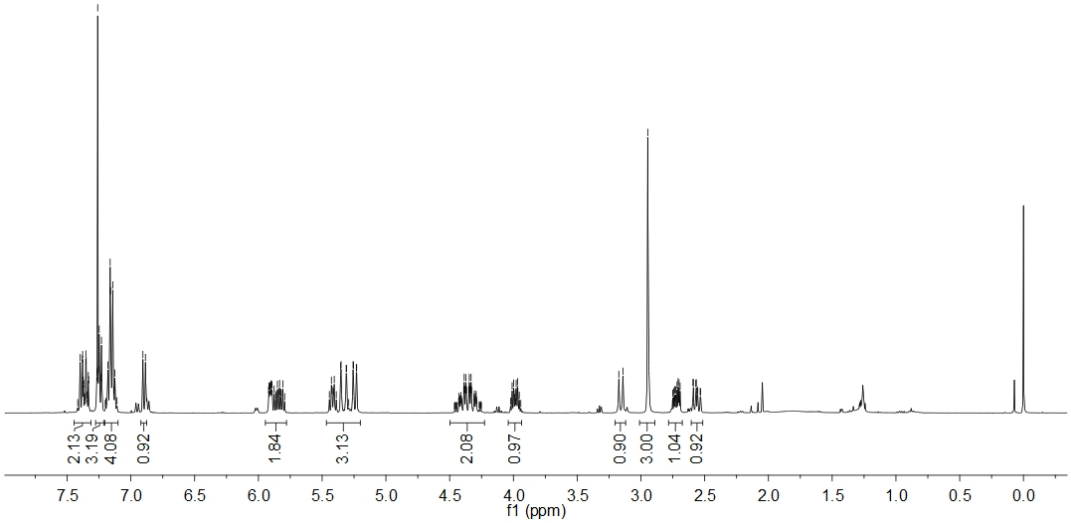

181.04
141.05
136.96
134.98
129.81
128.44
127.43
126.73
126.24
125.30
124.70
122.82
121.87
110.19
85.42
85.11
84.79
77.32
77.00
76.68
63.57
57.52
42.18
f1 (ppm)

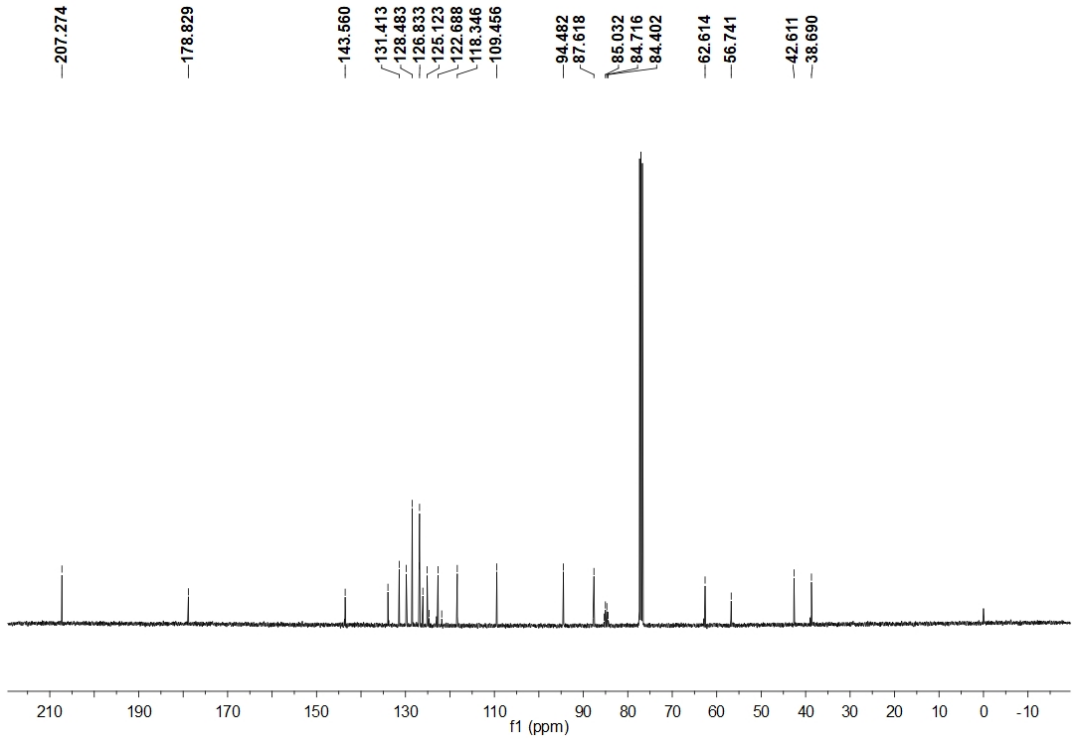

-79.180
-79.192
20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210 -2
f1 (ppm)

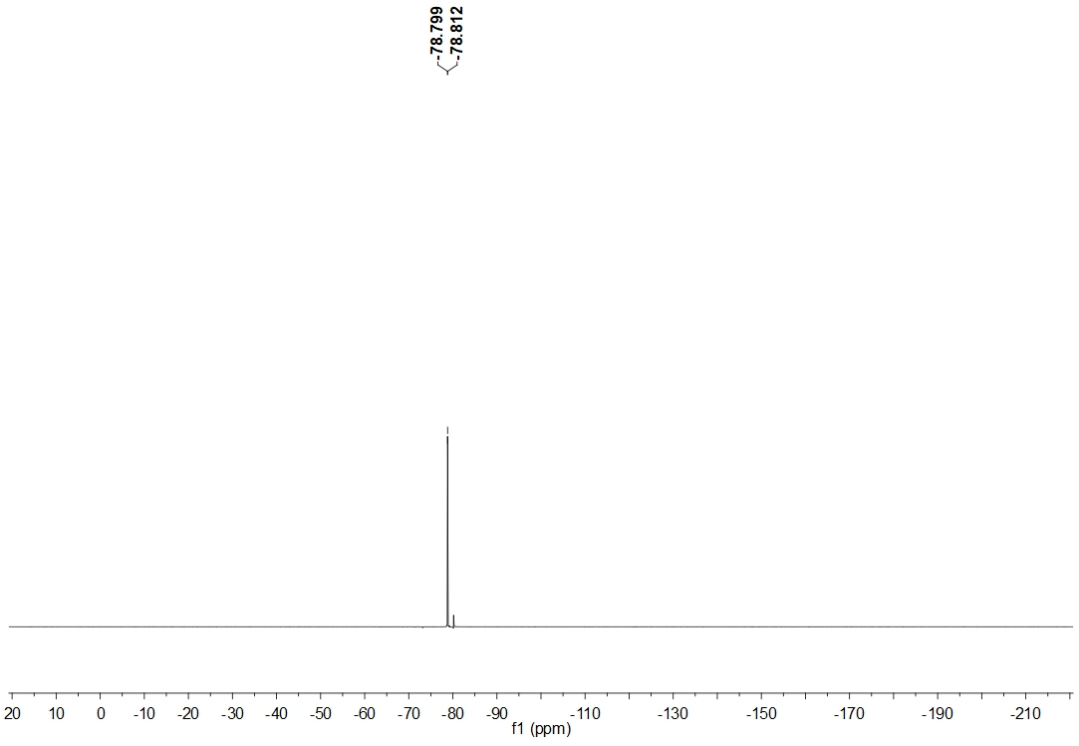

F3C
OMe
HN
Ph
O
N

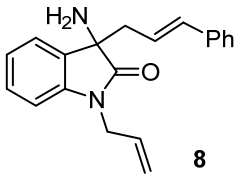
7


7.379
7.334
7.254
7.201
7.159
7.109
6.906
6.886
5.909
5.896
5.865
5.848
5.822
5.354
5.311
5.292
5.255
5.229
4.419
4.372
4.306
4.251
3.998
3.978
3.942
3.173
3.141
2.947
2.751
2.743
2.735
2.727
2.717
2.708
2.701
2.693
2.592
2.588
2.570
2.566
2.558
2.554
2.535
2.532

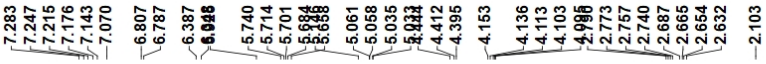

2.13
3.19
4.08
0.92
1.84
3.13
2.08
0.97
0.90
3.00
1.04
0.92
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)

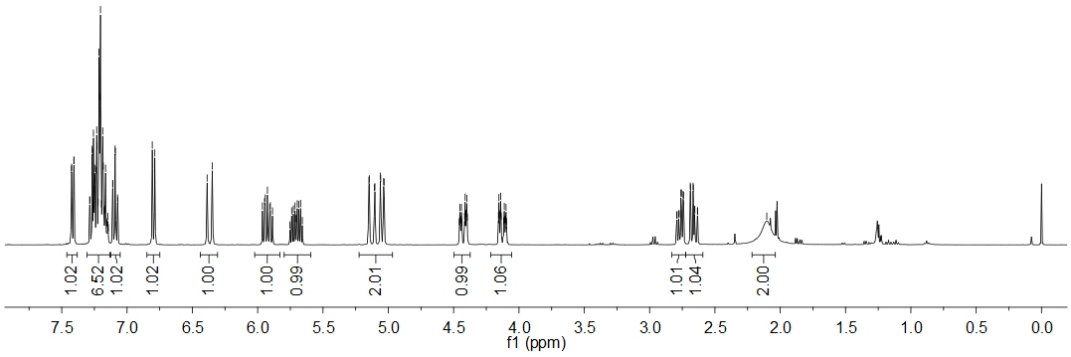

207.274
178.829
143.560
131.413
128.483
126.833
125.123
122.688
118.346
109.456
94.482
87.618
85.032
84.716
84.402
62.614
56.741
42.611
38.690
210 190 170 150 130 110 90 80 70 60 50 40 30 20 10 0 -10
f1 (ppm)

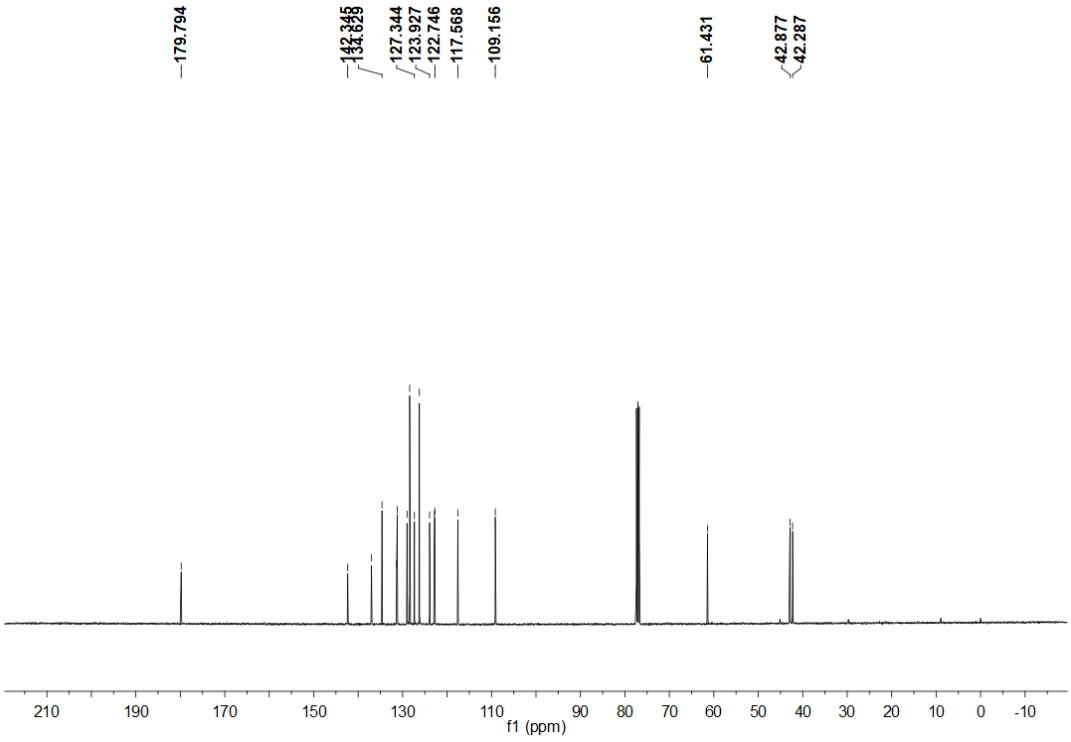

-78.799
-78.812
20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -110 -130 -150 -170 -190 -210
f1 (ppm)


H2N
Ph
O
N

8


7.283
7.247
7.215
7.176
7.143
7.070
6.807
6.787
6.387
5.740
5.714
5.701
5.061
5.058
5.035
4.412
4.395
4.153
4.136
4.113
4.103
2.773
2.757
2.740
2.687
2.665
2.654
2.632
2.103


1.02
6.52
1.02
1.02
1.00
1.00
0.99
2.01
0.99
1.06
1.01
1.04
2.00
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)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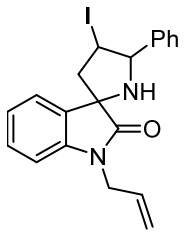
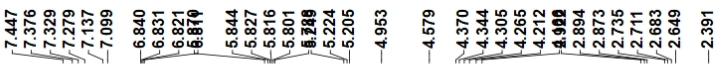
127.344
123.927
122.746
117.568
109.156
61.431
42.877
42.287
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)


I
Ph
NH
O
N

9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7.279
7.137
7.099
6.840
6.831
6.821
5.844
5.827
5.816
5.801
5.224
5.205
4.953
4.579
4.370
4.344
4.305
4.265
4.212
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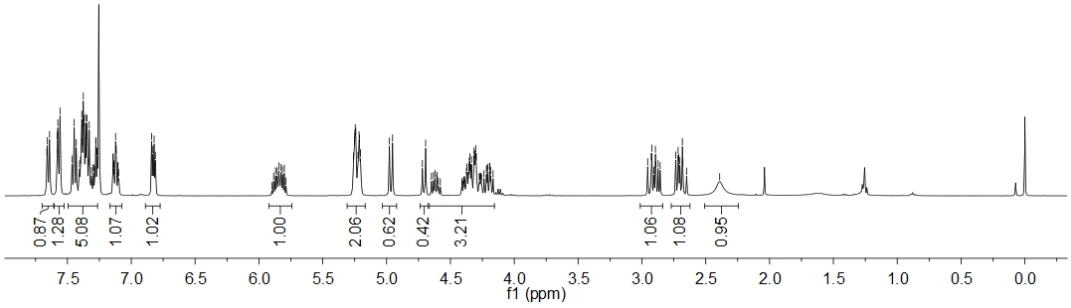
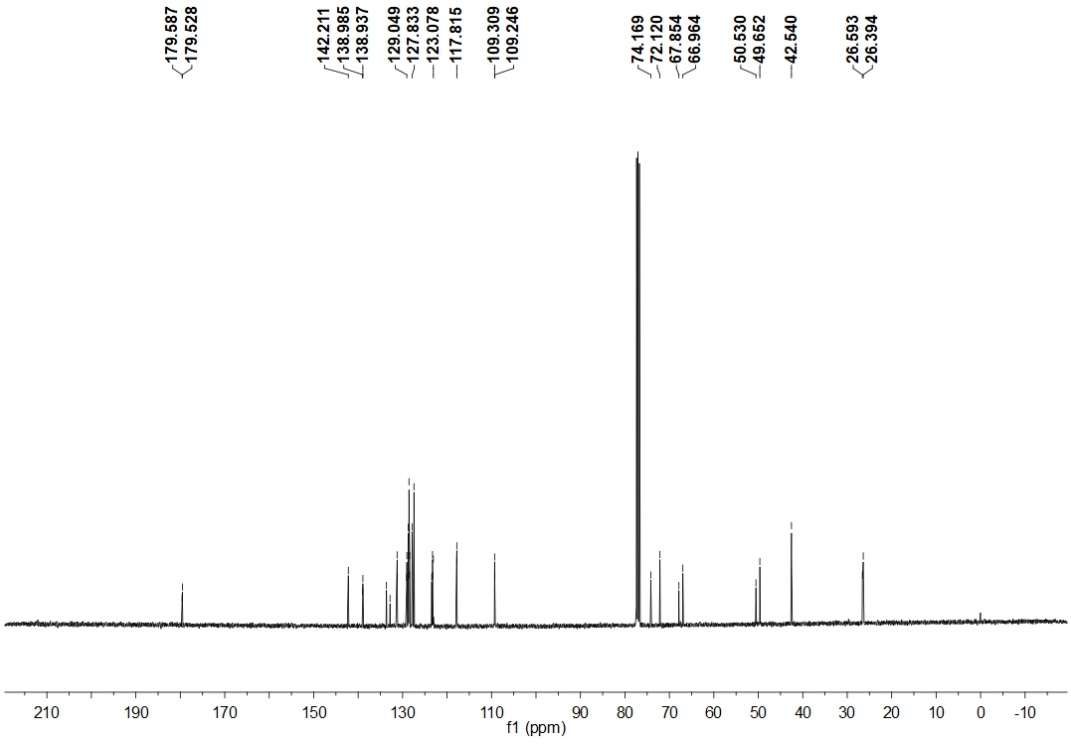
2.735
2.711
2.683
2.649
2.391


0.87
1.28
5.08
1.07
1.02
1.00
2.06
0.62
0.42
3.21
1.06
1.08
0.95
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
f1 (ppm)


179.587
179.528
142.211
138.985
138.937
129.049
127.833
123.078
117.815
109.309
109.246
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72.120
67.854
66.964
50.530
49.652
42.540
26.593
26.394
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)