Supporting Information

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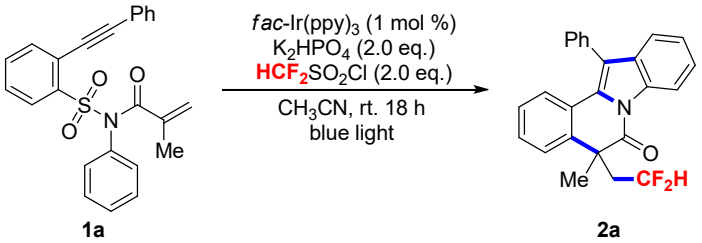
Part 1. General Information

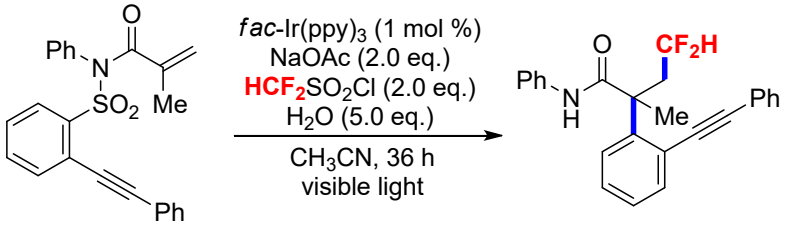
Unless otherwise noted, materials obtained from commercial suppliers were used directly without further purification. Proton nuclear magnetic resonance (^{1}H NMR) spectra were recorded on Bruker 600 MHz spectrometer and Bruker 400 MHz spectrometer. Chemical shifts were recorded in parts per million (ppm, δ) relative to tetramethylsilane (δ = 0.00) or chloroform (δ = 7.26, singlet). ^{1}H NMR splitting patterns are designated as singlet (s), doublet (d), triplet (t), quartet (q), dd (doublet of doublets), m (multiplets), and etc. All first-order splitting patterns were assigned on the basis of the appearance of the multiplet. Splitting patterns that could not be easily interpreted are designated as multiplet (m) or broad (br). Carbon nuclear magnetic resonance (^{13}C NMR) spectra were recorded on a Bruker 600 MHz (150 MHz) spectrometer and Bruker 400 MHz (100 MHz) spectrometer. High-resolution mass spectrometry (HRMS) analysis was carried out using a MS instrument with ESI source.

Part 2. General procedure for the synthesis of products



1a **2a**

To an oven-dried Schlenk tube equipped with a magnetic stirrer, were added **1a** (80.3 mg, 0.2 mmol), *fac*-Ir(ppy)$_3$ (2.4 mg, 0.004 mmol, 0.002 eq) and K_2HPO_4 (68 mg, 0.4 mmol, 2.0 equiv). To this mixture were added 2 mL CH_3CN, 8 mg deionized CF_2HSO_2Cl (60 mg, 0.4 mmol, 2 equiv) under a blanket of nitrogen. The vial was sealed, and stirred under blue light at room temperature for 18 hr. After this time, the CH_3CN was removed in vacuo, and the residue purified by column chromatography on silica gel. This gave product **2a** as light yellow solid (66.0 mg, 85% yield).

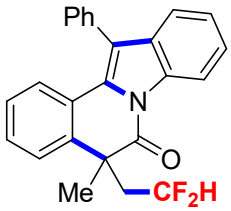


1a **3a**

To an oven-dried Schlenk tube equipped with a magnetic stirrer, were added **1a** (80.3 mg, 0.2 mmol), *fac*-Ir(ppy)$_3$ (2.4 mg, 0.004 mmol, 0.002 eq) and NaOAc (33 mg, 0.4 mmol, 2.0 equiv). To this mixture were added 2 mL CH_3CN, CF_2HSO_2Cl (60 mg, 0.4 mmol, 2 equiv) and H_2O (18 mg, 1.0 mmol, 5 equiv) under a blanket of nitrogen. The vial was sealed, and stirred under visible light at room temperature for 36 hr. After this time, the CH_3CN was removed in vacuo, and the residue purified by column chromatography on silica gel. This gave product **3a** as light yellow solid (53.1 mg, 68% yield).

Part 3. Characterizations of products

5-(2,2-difluoroethyl)-5-methyl-12-phenylindolo[2,1-a]isoquinolin-6(5H)-one (2a)



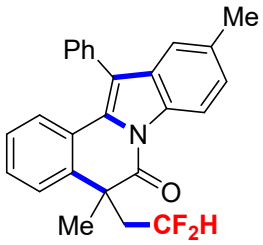
Prepared according to general method and isolated in 85% yield after chromoatography as light yellow solid (66.0 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.66 (d, *J* = 8.2 Hz, 1H), 7.62 – 7.49 (m, 5H), 7.49 – 7.38 (m, 3H), 7.35 – 7.28 (m, 3H), 7.11 – 7.01 (m, 1H), 5.59 (tdd, *J* = 56.1, 6.4, 3.5 Hz, 1H), 3.10 (tdd, *J* = 15.0, 12.1, 6.5 Hz, 1H), 2.58 (dddd, *J* = 24.9, 14.4, 10.6, 3.5 Hz, 1H), 1.79 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.74, 136.67, 134.28, 133.92, 132.33, 130.18, 129.33, 129.00, 128.57, 128.23, 127.27, 126.18, 126.16, 125.68, 125.09, 124.77, 120.87, 119.59, 116.72, 115.47 (t, *J* = 240.2 Hz), 44.98 – 44.92 (m), 44.69 (t, *J* = 21.6 Hz), 29.91.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.21 – -115.73 (m).

HRMS (ESI): calculated for $[C_{25}H_{20}F_2NO]^+$: m/z = 388.1507, found: m/z = 388.1511.

5-(2,2-difluoroethyl)-5,10-dimethyl-12-phenylindolo[2,1-a]isoquinolin-6(5H)-one (2b)



Prepared according to general method and isolated in 66% yield after chromoatography as light yellow solid (53.0 mg)

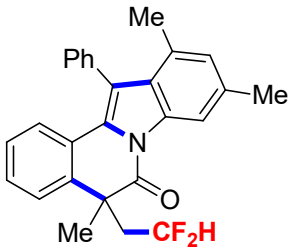
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.51 (d, *J* = 8.4 Hz, 1H), 7.59 – 7.50 (m, 5H), 7.42 (t, *J* = 8.2 Hz, 2H), 7.30 (t, *J* = 7.6 Hz, 1H), 7.25 (d, *J* = 9.0 Hz, 1H), 7.10 – 6.98 (m, 2H), 5.57 (tdd, *J* = 56.1, 6.3, 3.5 Hz, 1H), 3.08 (tdd, *J* = 14.9, 12.3, 6.4 Hz, 1H), 2.55 (dddd,

J = 24.9, 14.4, 10.7, 3.5 Hz, 1H), 2.41 (s, 3H), 1.77 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.49, 136.68, 134.55, 134.07, 132.52, 132.44, 130.19, 129.31, 129.05, 128.43, 128.16, 127.43, 127.21, 126.16, 125.58, 125.18, 120.68, 119.42, 116.36, 115.46 (t, J = 240.1 Hz), 44.87 – 44.80 (m), 44.73 (t, J = 21.4 Hz), 29.86, 21.46.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.24 – -115.75 (m).

HRMS (ESI): calculated for $[C_{26}H_{22}F_2NO]^+$: m/z = 402.1664, found: m/z = 402.1667.

5-(2,2-difluoroethyl)-5,9,11-trimethyl-12-phenylindolo[2,1-a]isoquinolin-6(5H)-one (2c)



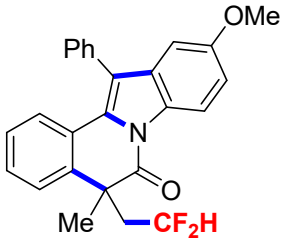
Prepared according to general method and isolated in 80% yield after chromoatography as light yellow solid (66.7 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.48 (s, 1H), 7.62 – 7.42 (m, 5H), 7.39 (d, J = 7.9 Hz, 1H), 7.30 – 7.20 (m, 2H), 7.10 (d, J = 8.1 Hz, 1H), 6.98 (t, J = 7.7 Hz, 1H), 6.89 (s, 1H), 5.57 (tdd, J = 56.2, 6.6, 3.3 Hz, 1H), 3.11 (tdd, J = 14.8, 11.9, 6.6 Hz, 1H), 2.64 – 2.50 (m, 1H), 2.50 (s, 3H), 1.92 (s, 3H), 1.77 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.80, 136.53, 136.28, 136.22, 134.88, 131.12, 130.54, 130.31, 129.20, 128.42, 128.21, 128.04, 127.42, 127.22, 126.11, 125.44, 125.27, 121.76, 115.54 (t, J = 240.1 Hz), 114.90, 44.89 – 44.83 (m), 44.75 (t, J = 21.6 Hz), 30.18, 21.82, 19.76.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.25 – -115.95 (m).

HRMS (ESI): calculated for $[C_{27}H_{24}F_2NO]^+$: m/z = 416.1820, found: m/z = 416.1820.

5-(2,2-difluoroethyl)-10-methoxy-5-methyl-12-phenylindolo[2,1-a]isoquinolin-6(5H)-one (2d)



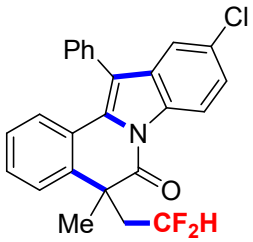
Prepared according to general method and isolated in 10% yield after chromoatography as light yellow solid (8.4 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.53 (d, *J* = 9.0 Hz, 1H), 7.55 - 7.49 (m, 5H), 7.40 (d, *J* = 8.3 Hz, 2H), 7.30 (t, *J* = 7.6 Hz, 1H), 7.10 – 6.97 (m, 2H), 6.72 (d, *J* = 2.5 Hz, 1H), 5.56 (tdd, *J* = 56.2, 6.4, 3.5 Hz, 1H), 3.79 (s, 3H), 3.08 (tdd, *J* = 15.0, 12.1, 6.5 Hz, 1H), 2.55 (dddd, *J* = 24.8, 14.3, 10.6, 3.5 Hz, 1H), 1.77 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.28, 157.45, 136.79, 133.93, 133.42, 130.14, 129.66, 129.39, 128.88, 128.48, 128.22, 127.21, 126.18, 125.56, 125.06, 120.66, 117.58, 115.45 (t, *J* = 240.2 Hz), 114.30, 102.34, 55.73, 44.75 – 44.69 (m), 44.73 (t, *J* = 21.5 Hz), 29.93.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.28 – -115.83 (m).

HRMS (ESI): calculated for $[C_{26}H_{22}F_2NO_2]^+$: m/z = 418.1613, found: m/z = 418.1618.

10-chloro-5-(2,2-difluoroethyl)-5-methyl-12-phenylindolo[2,1-a]isoquinolin-6(5H)-one (2e)



Prepared according to general method and isolated in 55% yield after chromoatography as light yellow solid (46.5 mg)

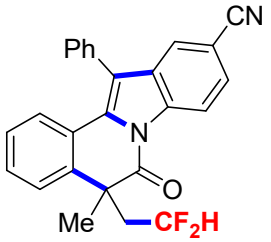
^{1}H NMR (600 MHz, $CDCl_3$) δ 8.57 (d, *J* = 8.7 Hz, 1H), 7.58 (t, *J* = 7.3 Hz, 2H), 7.53 (t, *J* = 7.4 Hz, 1H), 7.49 (d, *J* = 7.1 Hz, 2H), 7.46 (d, *J* = 8.1 Hz, 1H), 7.42 (d, *J* = 7.9 Hz, 1H), 7.37 (dd, *J* = 8.7, 2.0 Hz, 1H), 7.35 – 7.31 (m, 1H), 7.25 (d, *J* = 2.0 Hz, 1H), 7.08 - 7.06 (m, 1H), 5.55 (tdd, *J* = 56.1, 6.6, 3.3 Hz, 1H), 3.09 (tdd, *J* = 14.9, 11.8, 6.6 Hz, 1H), 2.57 (dddd, *J* = 26.7, 14.5, 9.0, 3.3 Hz, 1H), 1.78 (s, 3H). ^{13}C NMR (151 MHz,

$CDCl_3$) δ 171.70, 136.80, 133.70, 133.24, 132.57, 130.51, 130.25, 130.09, 129.49, 128.99, 128.50, 127.40, 126.22, 126.14, 125.81, 124.67, 119.92, 119.18, 117.78, 115.36 (t, J = 240.2 Hz), 44.91 – 44.84 (m), 44.77 (t, J = 19.7 Hz), 29.93.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.34 – -116.04 (m).

HRMS (ESI): calculated for $[C_{25}H_{19}ClF_2NO]^+$: m/z = 422.1118, found: m/z = 422.1120.

5-(2,2-difluoroethyl)-5-methyl-6-oxo-12-phenyl-5,6-dihydroindolo[2,1-a]isoquinoline-10-carbonitrile (2f)



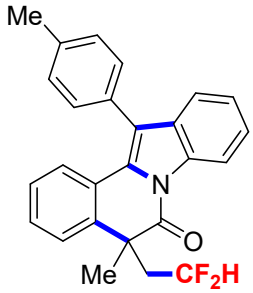
Prepared according to general method and isolated in 58% yield after chromoatography as yellow solid (48.2 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.73 (d, J = 8.5 Hz, 1H), 7.66 (dd, J = 8.5, 1.6 Hz, 1H), 7.63 – 7.52 (m, 4H), 7.51 – 7.41 (m, 4H), 7.37 (td, J = 7.7, 1.2 Hz, 1H), 7.14 – 7.05 (m, 1H), 5.54 (tdd, J = 56.1, 6.7, 3.2 Hz, 1H), 3.09 (tdd, J = 14.7, 12.0, 6.7 Hz, 1H), 2.66-2.52 (m 1H), 1.80 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 172.09, 136.73, 136.04, 132.56, 132.53, 131.10, 130.00, 129.65, 129.48, 129.07, 128.82, 127.60, 126.26, 126.04, 124.23, 119.85, 119.36, 117.48, 115.23 (t, J = 240.3 Hz), 108.20, 45.10 – 45.04 (m), 44.83 (t, J = 21.7 Hz), 29.89.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.49 – -116.24 (m).

HRMS (ESI): calculated for $[C_{26}H_{19}F_2N_2O]^+$: m/z = 413.1460, found: m/z = 413.1461.

5-(2,2-difluoroethyl)-5-methyl-12-(p-tolyl)indolo[2,1-a]isoquinolin-6(5H)-one (2g)



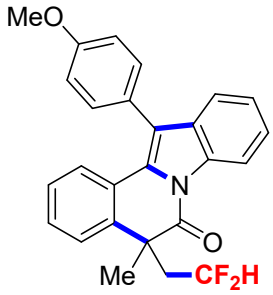
Prepared according to general method and isolated in 84% yield after chromoatography as light yellow solid (67.5 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.66 (d, *J* = 8.2 Hz, 1H), 7.53 (d, *J* = 8.1 Hz, 1H), 7.48 – 7.35 (m, 6H), 7.35 – 7.27 (m, 3H), 7.08 (t, *J* = 7.6 Hz, 1H), 5.59 (tdd, *J* = 56.1, 6.2, 3.5 Hz, 1H), 3.19 – 3.01 (m, 1H), 2.66 – 2.53 (m, 1H), 2.51 (s, 3H), 1.78 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.71, 137.97, 136.61, 134.29, 132.47, 130.74, 130.06, 129.99, 128.90, 128.49, 127.24, 126.13, 126.10, 125.69, 125.22, 124.71, 120.93, 119.64, 116.70, 115.48 (t, *J* = 240.1 Hz), 44.98 – 44.91 (m), 44.67 (t, *J* = 21.6 Hz), 29.89, 21.49.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.20, –-115.75 (m).

HRMS (ESI): calculated for $[C_{26}H_{22}F_2NO]^+$: m/z = 402.1664, found: m/z = 402.1670.

5-(2,2-difluoroethyl)-12-(4-methoxyphenyl)-5-methylindolo[2,1-a]isoquinolin-6(5H)-one (2h)



Prepared according to general method and isolated in 76% yield after chromoatography as yellow solid (63.5 mg)

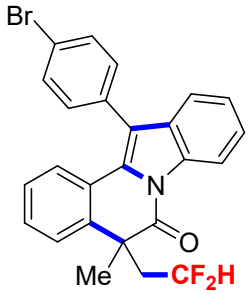
^{1}H NMR (600 MHz, $CDCl_3$) δ 8.65 (d, *J* = 8.2 Hz, 1H), 7.54 (dd, *J* = 8.1, 0.8 Hz, 1H), 7.47 – 7.40 (m, 4H), 7.35 – 7.29 (m, 3H), 7.13 – 7.06 (m, 3H), 5.59 (tdd, *J* = 56.1, 6.4, 3.5 Hz, 1H), 3.94 (s, 3H), 3.10 (tdd, *J* = 15.2, 11.8, 6.5 Hz, 1H), 2.65 – 2.51 (m, 1H),

1.78 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.72, 159.54, 136.62, 134.28, 132.59, 131.33, 128.98, 128.50, 127.28, 126.17, 126.11, 125.83, 125.62, 125.26, 124.74, 120.63, 119.61, 116.72, 115.50 (t, *J* = 240.1 Hz), 114.80, 55.39, 44.97 – 44.90 (m), 44.68 (t, *J* = 21.7 Hz), 29.87.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.18, – -115.71 (m).

HRMS (ESI): calculated for $[C_{26}H_{22}F_2NO_2]^+$: m/z = 418.1613, found: m/z = 418.1618.

12-(4-bromophenyl)-5-(2,2-difluoroethyl)-5-methylindolo[2,1-a]isoquinolin-6(5H)-one (2i)



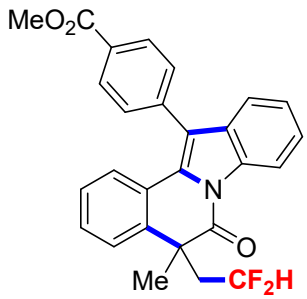
Prepared according to general method and isolated in 70% yield after chromoatography as yellow solid (65.3 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 8.66 (d, *J* = 8.2 Hz, 1H), 7.71 (d, *J* = 8.4 Hz, 2H), 7.50 – 7.38 (m, 5H), 7.38 – 7.26 (m, 3H), 7.14-7.10 (m, 1H), 5.58 (tdd, *J* = 56.1, 6.3, 3.5 Hz, 1H), 3.10 (tdd, *J* = 15.0, 12.3, 6.4 Hz, 1H), 2.64-2.51 (m, 1H), 1.78 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.70, 136.83, 134.29, 132.97, 132.63, 131.96, 131.92, 129.22, 128.82, 127.40, 126.33, 125.57, 124.90, 124.83, 122.43, 119.40, 119.28, 116.80, 115.41 (t, *J* = 240.2 Hz), 45.01 – 44.94 (m), 44.68 (t, *J* = 21.8 Hz), 29.89.

^{19}F NMR (565 MHz, $CDCl_3$) δ -114.28 – -115.83 (m).

HRMS (ESI): calculated for $[C_{25}H_{19}BrF_2NO]^+$: m/z = 466.0613, found: m/z = 466.0617.

Methyl 4-(5-(2,2-difluoroethyl)-5-methyl-6-oxo-5,6-dihydroindolo[2,1-a]-isoquinolin-12-yl)-benzoate (2j)

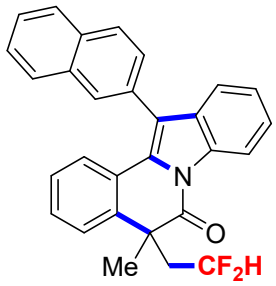


Prepared according to general method and isolated in 64% yield after chromoatography as yellow solid (57.2 mg)

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.66 (d, *J* = 8.2 Hz, 1H), 8.25 (d, *J* = 8.2 Hz, 2H), 7.62 (d, *J* = 7.9 Hz, 2H), 7.45 – 7.43 (m, 2H), 7.40 (d, *J* = 8.1 Hz, 1H), 7.36 – 7.25 (m, 3H), 7.06 (t, *J* = 7.6 Hz, 1H), 5.58 (tdd, *J* = 56.1, 6.4, 3.5 Hz, 1H), 4.01 (s, 3H), 3.10 (tdd, *J* = 15.1, 11.9, 6.5 Hz, 1H), 2.65 – 2.50 (m, 1H), 1.78 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 171.72, 166.88, 139.08, 136.87, 134.33, 131.73, 130.58, 130.40, 129.98, 129.35, 128.89, 127.38, 126.37, 126.32, 125.65, 124.94, 124.71, 119.63, 119.26, 116.82, 115.40 (t, *J* = 240.2 Hz), 52.36, 45.03 – 44.96 (m), 44.65 (t, *J* = 21.4 Hz), 29.91. ^{19}F NMR (565 MHz, $CDCl_3$) δ -114.27 – -115.81 (m).

HRMS (ESI): calculated for $[C_{27}H_{22}F_2NO_3]^+$: m/z = 446.1562, found: m/z = 446.1570.

5-(2,2-difluoroethyl)-5-methyl-12-(naphthalen-2-yl)indolo[2,1-a]isoquinolin-6(5H)-one (2k)



Prepared according to general method and isolated in 66% yield after chromoatography as yellow solid (57.8 mg)

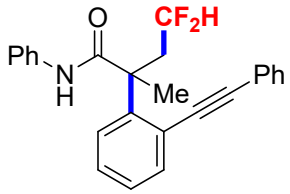
^{1}H NMR (400 MHz, $CDCl_3$) δ 8.67 (d, *J* = 8.2 Hz, 1H), 8.03 (d, *J* = 7.8 Hz, 2H), 8.01 – 7.95 (m, 1H), 7.94 – 7.88 (m, 1H), 7.63 – 7.54 (m, 3H), 7.44 (ddd, *J* = 11.9, 9.9, 6.5 Hz, 3H), 7.35 – 7.26 (m, 3H), 6.97 (dd, *J* = 11.3, 4.1 Hz, 1H), 5.60 (tdd, *J* = 56.1, 6.4,

3.5 Hz, 1H), 3.10 (qd, *J* = 15.0, 6.6 Hz, 1H), 2.58 (dddd, *J* = 24.9, 14.4, 10.9, 3.4 Hz, 1H), 1.80 (s, 3H). 13C NMR (151 MHz, CDCl3) δ 171.77, 136.70, 134.34, 133.87, 133.04, 132.41, 131.39, 129.23, 129.21, 129.10, 128.63, 128.15, 128.08, 127.93, 127.35, 126.53, 126.51, 126.23, 126.18, 125.77, 125.06, 124.83, 120.69, 119.60, 116.77, 115.47 (t, *J* = 240.1 Hz), 45.02 – 44.95 (m), 44.64(t, *J* = 21.4 Hz), 30.15.

^{19}F NMR (377 MHz, $CDCl_3$) δ -114.00 – -115.90 (m).

HRMS (ESI): calculated for $[C_{29}H_{22}F_2NO]^+$: m/z = 438.1664, found: m/z = 438.1665.

4,4-difluoro-2-methyl-N-phenyl-2-(2-(phenylethynyl)phenyl)butanamide (3a)



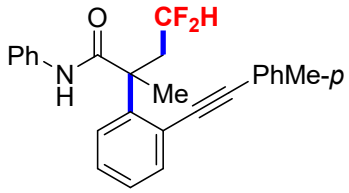
Prepared according to general method and isolated in 68% yield after chromoatography as light yellow solid (53.1 mg)

^{1}H NMR (400 MHz, $CDCl_3$) δ 7.66 (dd, *J* = 7.5, 1.4 Hz, 1H), 7.57 (d, *J* = 7.8 Hz, 1H), 7.52 – 7.44 (m, 3H), 7.41 (td, *J* = 7.5, 1.2 Hz, 1H), 7.35 – 7.27 (m, 5H), 7.21 (t, *J* = 7.9 Hz, 2H), 7.03 (t, *J* = 7.4 Hz, 1H), 6.77 (s, 1H), 5.60 (tdd, *J* = 56.5, 6.0, 3.7 Hz, 1H), 3.24 – 3.03 (m, 1H), 2.86 (qd, *J* = 15.4, 6.0 Hz, 1H), 1.88 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 174.07, 141.71, 137.80, 134.59, 131.57, 129.08, 128.82, 128.71, 128.36, 128.32, 127.29, 124.43, 123.46, 122.51, 120.54, 116.88 (t, *J* = 238.5 Hz), 96.79, 86.99, 49.24 – 49.17 (m), 40.57 (t, *J* = 21.7 Hz), 24.93.

^{19}F NMR (565 MHz, $CDCl_3$) δ -110.66 – -111.76 (m).

HRMS (ESI): calculated for $[C_{25}H_{22}F_2NO]^+$: m/z = 390.1664, found: m/z = 390.1659.

4,4-difluoro-2-methyl-N-phenyl-2-(2-(p-tolylethynyl)phenyl)butanamide (3b)



Prepared according to general method and isolated in 52% yield after chromoatography

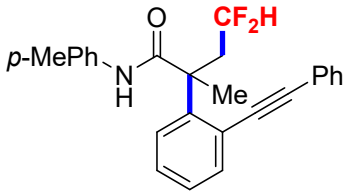
as light yellow solid (42.2 mg).

^{1}H NMR (400 MHz, $CDCl_3$) δ 7.64 (dd, *J* = 7.5, 1.5 Hz, 1H), 7.56 (dd, *J* = 7.8, 0.8 Hz, 1H), 7.45 (td, *J* = 7.6, 1.6 Hz, 1H), 7.42 – 7.35 (m, 3H), 7.34 – 7.29 (m, 2H), 7.21 (t, *J* = 7.9 Hz, 2H), 7.11 (d, *J* = 7.9 Hz, 2H), 7.03 (t, *J* = 7.4 Hz, 1H), 6.77 (s, 1H), 5.59 (tdd, *J* = 56.5, 6.0, 3.7 Hz, 1H), 3.24 – 3.03 (m, 1H), 2.85 (qd, *J* = 15.4, 6.1 Hz, 1H), 2.35 (s, 3H), 1.87 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 174.09, 141.56, 138.93, 137.82, 134.46, 131.46, 129.10, 128.86, 128.81, 128.33, 127.27, 124.39, 123.68, 120.56, 119.45, 116.91 (t, *J* = 238.5 Hz), 97.09, 86.42, 49.22 – 49.16 (m), 40.48 (t, *J* = 22.0 Hz), 24.95, 21.59.

^{19}F NMR (565 MHz, $CDCl_3$) δ -110.69 – -111.79 (m).

HRMS (ESI): calculated for $[C_{26}H_{24}F_2NO]^+$: m/z = 404.1820, found: m/z = 404.1825.

4,4-difluoro-2-methyl-2-(2-(phenylethynyl)phenyl)-N-(p-tolyl)butanamide (3c)



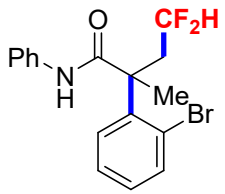
Prepared according to general method and isolated in 59% yield after chromoatography as solid (47.7 mg).

^{1}H NMR (400 MHz, $CDCl_3$) δ 7.65 (dd, *J* = 7.5, 1.5 Hz, 1H), 7.56 (d, *J* = 7.8 Hz, 1H), 7.50 – 7.44 (m, 3H), 7.40 (td, *J* = 7.5, 1.2 Hz, 1H), 7.32 – 7.30 (m, 3H), 7.19 (d, *J* = 8.4 Hz, 2H), 7.00 (d, *J* = 8.3 Hz, 2H), 6.69 (s, 1H), 5.60 (tdd, *J* = 56.5, 5.9, 3.7 Hz, 1H), 3.24 – 3.00 (m, 1H), 2.85 (qd, *J* = 15.4, 6.0 Hz, 1H), 2.24 (s, 3H), 1.86 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.97, 141.86, 135.21, 134.55, 134.06, 131.59, 129.29, 129.00, 128.65, 128.29, 128.27, 127.26, 123.48, 122.56, 120.67, 116.90 (t, *J* = 238.4 Hz), 96.76, 87.03, 49.15 – 49.09 (m), 40.58 (t, *J* = 21.7 Hz), 24.93, 20.80.

^{19}F NMR (565 MHz, $CDCl_3$) δ -110.68 – -111.79 (m).

HRMS (ESI): calculated for $[C_{26}H_{24}F_2NO]^+$: m/z = 404.1820, found: m/z = 404.1821.

2-(2-bromophenyl)-4,4-difluoro-2-methyl-N-phenylbutanamide (3d)



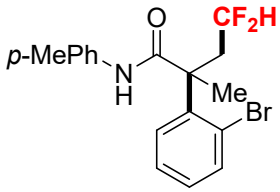
Prepared according to general method and isolated in 90% yield after chromoatography as solid (66.2 mg).

^{1}H NMR (400 MHz, $CDCl_3$) δ 7.69 (dd, *J* = 7.9, 1.3 Hz, 1H), 7.59 (dd, *J* = 7.9, 1.5 Hz, 1H), 7.47 (td, *J* = 7.7, 1.3 Hz, 1H), 7.37 – 7.26 (m, 5H), 7.15 – 7.06 (m, 1H), 6.70 (s, 1H), 5.56 (tdd, *J* = 56.3, 5.9, 3.8 Hz, 1H), 3.08 (dtd, *J* = 22.2, 15.6, 3.8 Hz, 1H), 2.74 (qd, *J* = 15.3, 5.9 Hz, 1H), 1.87 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.45, 139.30, 137.51, 135.58, 130.14, 129.57, 128.97, 128.36, 124.74, 124.48, 120.58, 116.58 (t, *J* = 238.7 Hz), 49.96 – 49.89 (m), 39.50 (t, *J* = 22.1 Hz), 25.81.

^{19}F NMR (565 MHz, $CDCl_3$) δ -111.17 – -112.34 (m).

HRMS (ESI): calculated for $[C_{17}H_{16}B_rF_2NNaO]^+$: m/z = 390.0276, found: m/z = 390.0272.

2-(2-bromophenyl)-4,4-difluoro-2-methyl-N-(p-tolyl)butanamide (3e)



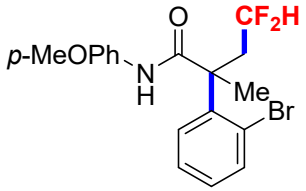
Prepared according to general method and isolated in 80% yield after chromoatography as solid (60.8 mg).

^{1}H NMR (500 MHz, cdcl$_3$) δ 7.68 (d, *J* = 8.0 Hz, 1H), 7.57 (d, *J* = 8.0 Hz, 1H), 7.45 (t, *J* = 7.6 Hz, 1H), 7.30 – 7.24 (m, 1H), 7.21 (d, *J* = 8.3 Hz, 2H), 7.09 (d, *J* = 8.2 Hz, 2H), 6.67 (s, 1H), 5.56 (tdd, *J* = 56.2, 5.6, 3.8 Hz, 1H), 3.13 – 2.98 (m, 1H), 2.73 (qd, *J* = 15.2, 5.8 Hz, 1H), 2.29 (s, 3H), 1.86 (s, 3H). ^{13}C NMR (126 MHz, cdcl$_3$) δ 173.40, 139.44, 135.55, 134.94, 134.44, 130.07, 129.56, 129.45, 128.33, 124.48, 120.74, 116.62 (t, *J* = 238.7 Hz), 49.88 – 49.80 (m), 39.57 (t, *J* = 22.1 Hz), 25.79, 20.88.

^{19}F NMR (565 MHz, $CDCl_3$) δ -111.15 – -112.32 (m).

HRMS (ESI): calculated for $[C_{18}H_{19}B_rF_2NO]^+$: m/z = 382.0613, found: m/z = 382.0612.

2-(2-bromophenyl)-4,4-difluoro-N-(4-methoxyphenyl)-2-methylbutanamide (3f)



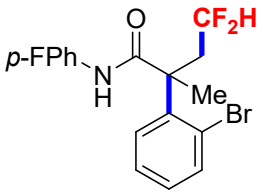
Prepared according to general method and isolated in 77% yield after chromoatography as solid (61.3 mg).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.69 (d, *J* = 7.9 Hz, 1H), 7.58 (d, *J* = 7.8 Hz, 1H), 7.46 (t, *J* = 7.6 Hz, 1H), 7.28 (t, *J* = 7.6 Hz, 1H), 7.24 (d, *J* = 8.9 Hz, 2H), 6.83 (d, *J* = 8.9 Hz, 2H), 6.61 (s, 1H), 5.73 – 5.42 (m, 1H), 3.77 (s, 3H), 3.08-3.03 (m, 1H), 2.73 (qd, *J* = 15.5, 5.8 Hz, 1H), 1.86 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.54, 156.83, 139.47, 135.52, 130.42, 130.07, 129.58, 128.33, 124.43, 122.83, 116.63 (t, *J* = 238.6 Hz), 114.10, 55.49, 49.70 – 49.63 (m), 39.58 (t, *J* = 21.9 Hz), 25.81.

^{19}F NMR (565 MHz, $CDCl_3$) δ -111.06 – -112.20 (m).

HRMS (ESI): calculated for $[C_{18}H_{19}BrF_2NO_2]^+$: m/z = 398.0562, found: m/z = 398.0563.

2-(2-bromophenyl)-4,4-difluoro-N-(4-fluorophenyl)-2-methylbutanamide (3g)



Prepared according to general method and isolated in 85% yield after chromoatography as solid (65.6 mg).

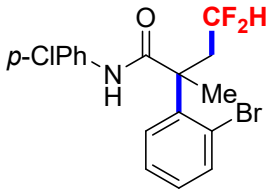
^{1}H NMR (400 MHz, $CDCl_3$) δ 7.69 (dd, *J* = 7.9, 1.3 Hz, 1H), 7.58 (dd, *J* = 7.9, 1.5 Hz, 1H), 7.47 (td, *J* = 7.7, 1.3 Hz, 1H), 7.33 – 7.22 (m, 3H), 6.98 (t, *J* = 8.7 Hz, 2H), 6.72 (s, 1H), 5.55 (tdd, *J* = 56.3, 5.9, 3.8 Hz, 1H), 3.17 – 2.96 (m, 1H), 2.72 (qd, *J* = 15.3, 5.9 Hz, 1H), 1.86 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.64, 159.73 (d, *J* = 244.1

Hz), 139.21, 135.57, 133.38 (d, J = 2.5 Hz), 130.20, 129.61, 128.42, 124.38, 122.81 (d, J = 8.0 Hz), 116.52(t, J = 238.7 Hz), 115.62 (d, J = 22.6 Hz), 49.81 – 49.74(m), 39.53(t, J = 21.9 Hz), 25.77.

^{19}F NMR (565 MHz, $CDCl_3$) δ -111.13 – -112.27 (m), -117.39 (s).

HRMS (ESI): calculated for $[C_{17}H_{16}BrF_3NO]^+$: m/z = 386.0362, found: m/z = 386.0364.

2-(2-bromophenyl)-N-(4-chlorophenyl)-4,4-difluoro-2-methylbutanamide (3h)



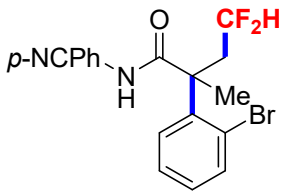
Prepared according to general method and isolated in 88% yield after chromoatography as solid (70.6 mg).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.70 (dd, J = 7.9, 1.2 Hz, 1H), 7.59 (dd, J = 7.9, 1.3 Hz, 1H), 7.54 (d, J = 8.6 Hz, 2H), 7.51 – 7.47 (m, 3H), 7.31 (td, J = 7.7, 1.5 Hz, 1H), 6.84 (s, 1H), 5.54 (tdd, J = 56.3, 5.9, 3.8 Hz, 1H), 3.12 – 3.02 (m, 1H), 2.73 (qd, J = 15.4, 6.0 Hz, 1H), 1.88 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.53, 139.11, 136.09, 135.60, 130.24, 129.81, 129.59, 128.98, 128.43, 124.40, 121.85, 116.46 (t, J = 238.8 Hz), 49.97 – 49.90 (m), 39.49 (t, J = 22.2 Hz), 25.75.

^{19}F NMR (565 MHz, $CDCl_3$) δ -111.21 – -112.37 (m).

HRMS (ESI): calculated for $[C_{17}H_{16}BrClF_2NO]^+$: m/z = 402.0066, found: m/z = 402.0062.

2-(2-bromophenyl)-N-(4-cyanophenyl)-4,4-difluoro-2-methylbutanamide (3i)



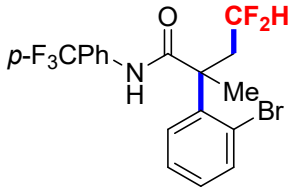
Prepared according to general method and isolated in 76% yield after chromoatography as solid (59.7 mg).

^{1}H NMR (400 MHz, $CDCl_3$) δ 7.69 (dd, *J* = 7.9, 1.2 Hz, 1H), 7.60 – 7.53 (m, 3H), 7.52 – 7.45 (m, 3H), 7.30 (td, *J* = 7.7, 1.6 Hz, 1H), 6.93 (s, 1H), 5.53 (tdd, *J* = 56.1, 6.0, 3.7 Hz, 1H), 3.15 – 2.96 (m, 1H), 2.71 (qd, *J* = 15.4, 6.0 Hz, 1H), 1.86 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.78, 141.72, 138.62, 135.64, 133.18, 130.46, 129.65, 128.57, 124.30, 120.10, 118.69, 116.29 (t, *J* = 238.8 Hz), 107.50, 50.25 – 50.18 (m), 39.46 (t, *J* = 22.1 Hz), 25.60.

^{19}F NMR (565 MHz, $CDCl_3$) δ -111.27 – -112.41 (m).

HRMS (ESI): calculated for $[C_{18}H_{16}BrF_2N_2O]^+$: m/z = 393.0409, found: m/z = 393.0406.

2-(2-bromophenyl)-4,4-difluoro-2-methyl-N-(4-(trifluoromethyl)phenyl)butanamide (3j)



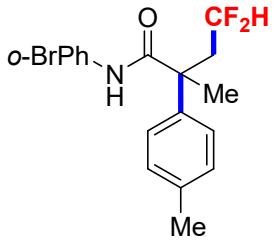
Prepared according to general method and isolated in 74% yield after chromoatography as solid (64.6 mg).

^{1}H NMR (600 MHz, $CDCl_3$) δ 7.70 (dd, *J* = 7.9, 1.2 Hz, 1H), 7.59 (dd, *J* = 7.9, 1.3 Hz, 1H), 7.54 (d, *J* = 8.6 Hz, 2H), 7.49 (m, 3H), 7.31 (td, *J* = 7.7, 1.5 Hz, 1H), 6.84 (s, 1H), 5.54 (tdd, *J* = 56.3, 5.9, 3.8 Hz, 1H), 3.07 (m, 1H), 2.73 (qd, *J* = 15.4, 6.0 Hz, 1H), 1.88 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 173.69, 140.67, 138.86, 135.64, 130.37, 129.61, 128.52, 126.42 (q, *J* = 32.6 Hz), 126.22 (q, *J* = 3.8 Hz), 123.99 (q, *J* = 271.6 Hz). 124.37, 119.94, 116.38 (t, *J* = 238.8 Hz), 50.15 – 50.08 (m), 39.46 (t, *J* = 21.7 Hz), 25.69.

^{19}F NMR (565 MHz, $CDCl_3$) δ -62.18 (s), -111.26 – -112.42 (m).

HRMS (ESI): calculated for $[C_{18}H_{16}BrF_5NO]^+$: m/z = 436.0330, found: m/z = 436.0325.

N-(2-bromophenyl)-4,4-difluoro-2-methyl-2-(p-tolyl)butanamide (3k)



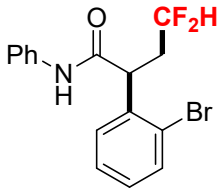
Prepared according to general method and isolated in 75% yield after chromoatography as solid (57.4 mg).

^{1}H NMR (600 MHz, $CDCl_3$) δ 8.26 (dd, *J* = 8.2, 1.0 Hz, 1H), 7.47 – 7.41 (m, 2H), 7.34 – 7.23 (m, 5H), 6.93 (td, *J* = 7.9, 1.3 Hz, 1H), 5.69 (tdd, *J* = 56.3, 5.4, 3.8 Hz, 1H), 2.73 (qd, *J* = 15.2, 5.6 Hz, 1H), 2.63 – 2.47 (m, 1H), 2.37 (s, 3H), 1.81 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 174.39, 138.06, 135.48, 132.18, 130.13, 128.31, 126.70, 125.23, 121.57, 116.63 (t, *J* = 238.6 Hz), 113.60, 48.83- 48.76 (m), 43.05 (t, *J* = 21.7 Hz), 23.46, 21.03.

^{19}F NMR (377 MHz, $CDCl_3$) δ -110.01, – -110.05 (m).

HRMS (ESI): calculated for $[C_{18}H_{19}BrF_2NO]^+$: m/z = 382.0613, found: m/z = 382.0612.

2-(2-bromophenyl)-4,4-difluoro-N-phenylbutanamide (3l)



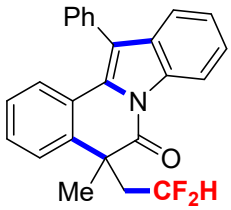
Prepared according to general method and isolated in 84% yield after chromoatography as liquid (59.5 mg).

^{1}H NMR (400 MHz, CDCl3) δ 7.63 (dd, *J* = 8.0, 1.1 Hz, 1H), 7.49 – 7.39 (m, 3H), 7.39 – 7.26 (m, 4H), 7.19 (td, *J* = 7.9, 1.6 Hz, 1H), 7.10 (t, *J* = 7.4 Hz, 1H), 6.10 – 5.73 (m, 1H), 4.37 (dd, *J* = 8.7, 5.8 Hz, 1H), 3.00 – 2.78 (m, 1H), 2.37 – 2.18 (m, 1H); ^{13}C NMR (101 MHz, $CDCl_3$) δ 168.93, 137.42, 133.47, 129.65, 129.05, 128.87, 128.70, 124.73, 124.16, 119.98, 115.88 (t, *J* = 239.5 Hz), 46.28 – 45.37 (m), 36.58 (t, *J* = 22.2 Hz).

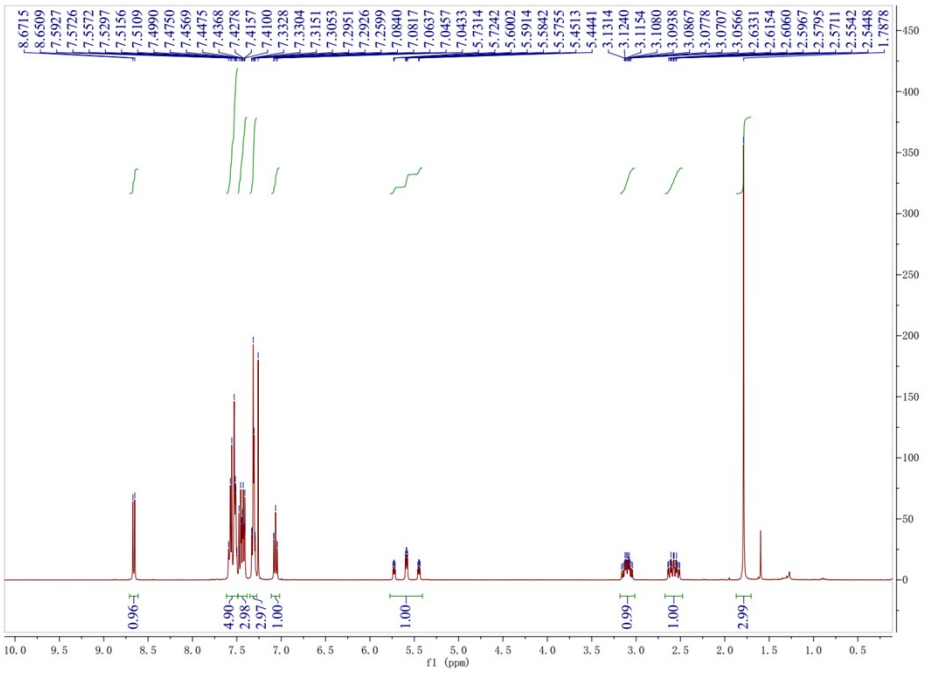
^{19}F NMR (377 MHz, $CDCl_3$) δ -114.68, – -118.34.

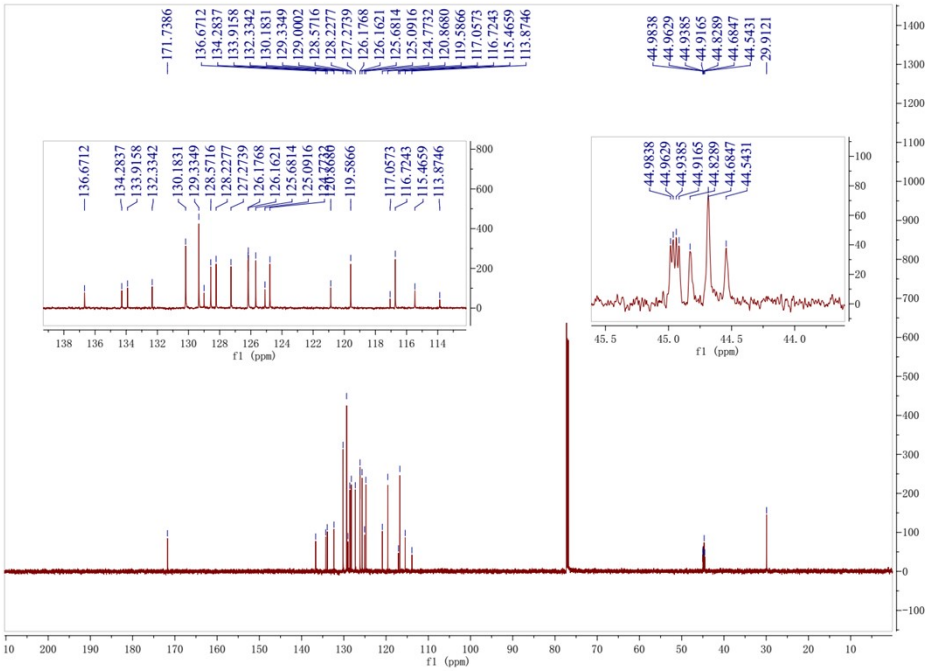
HRMS (ESI): calculated for $[C_{16}H_{14}B_rF_2NNaO]^+$: m/z = 376.0119, found: m/z = 376.0107.

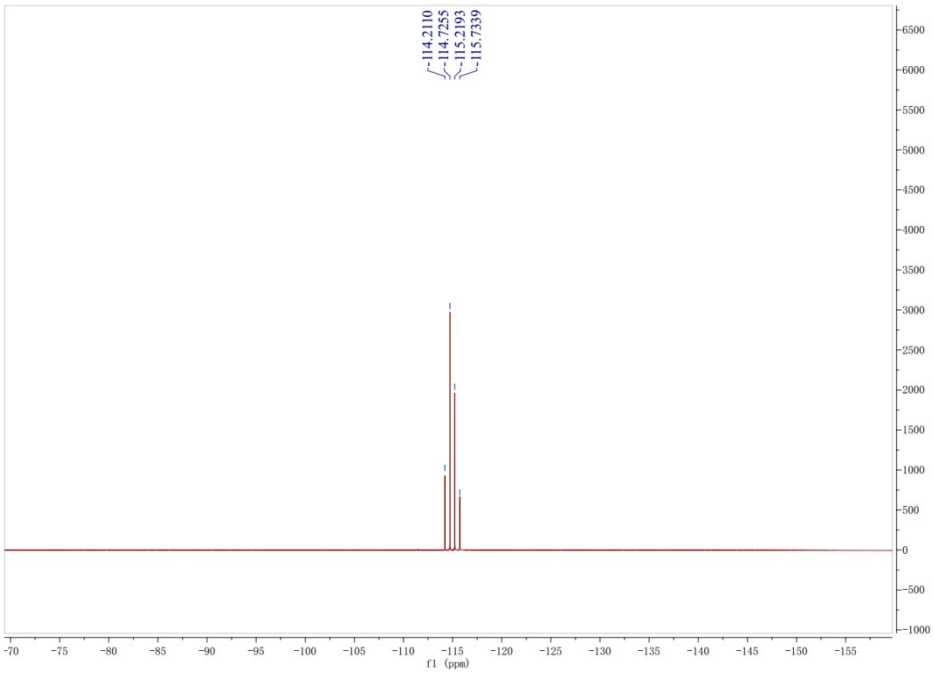
Part 4. ^{1}H NMR, ^{13}C NMR and ^{19}F NMR Spectra

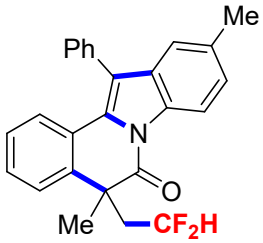


2a

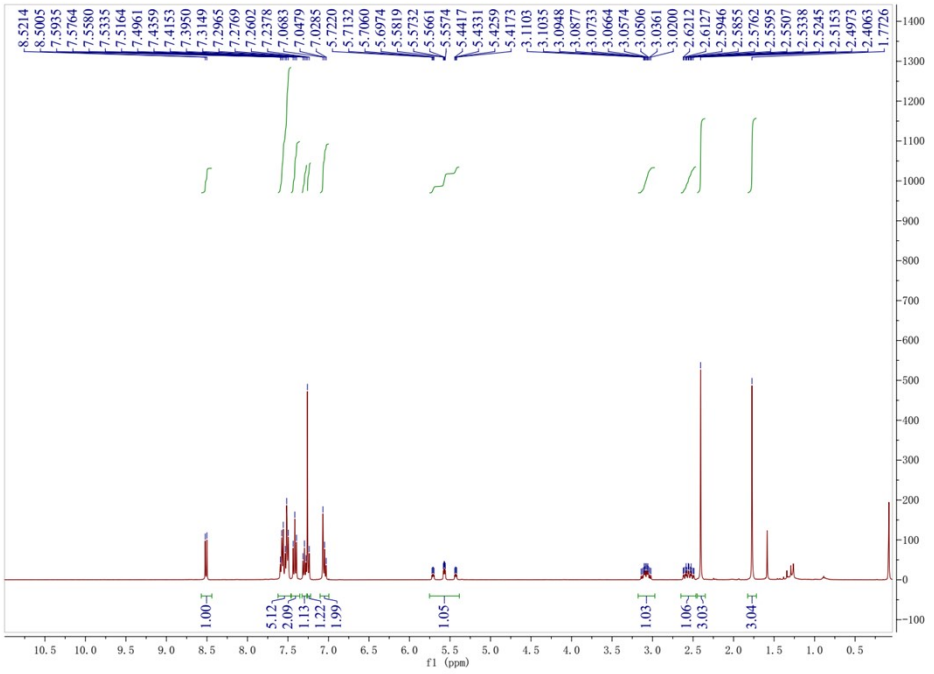


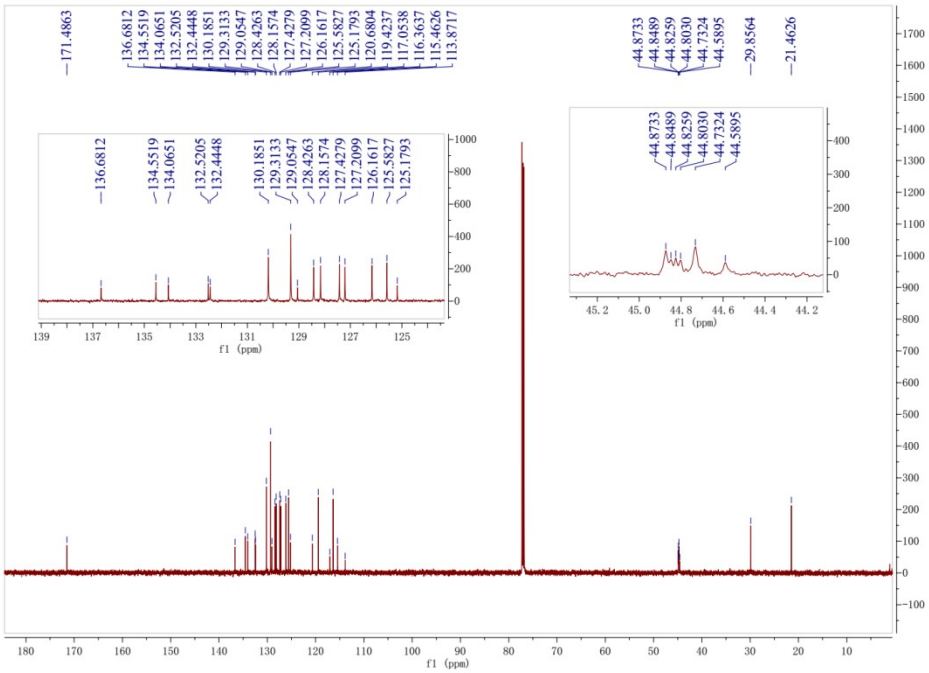


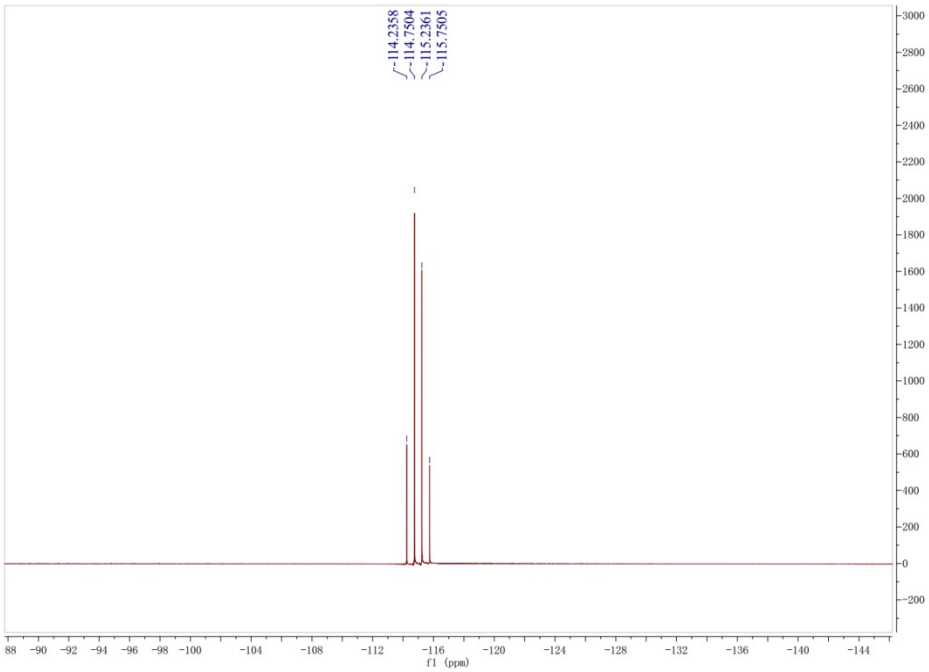

-114.2110
-114.7255
-115.2193
-115.7339
f1 (ppm)

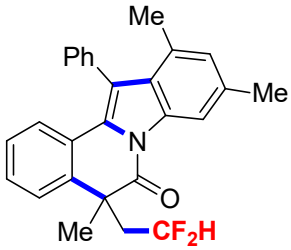

Me
Ph
N
O
Me
CF2H

2b

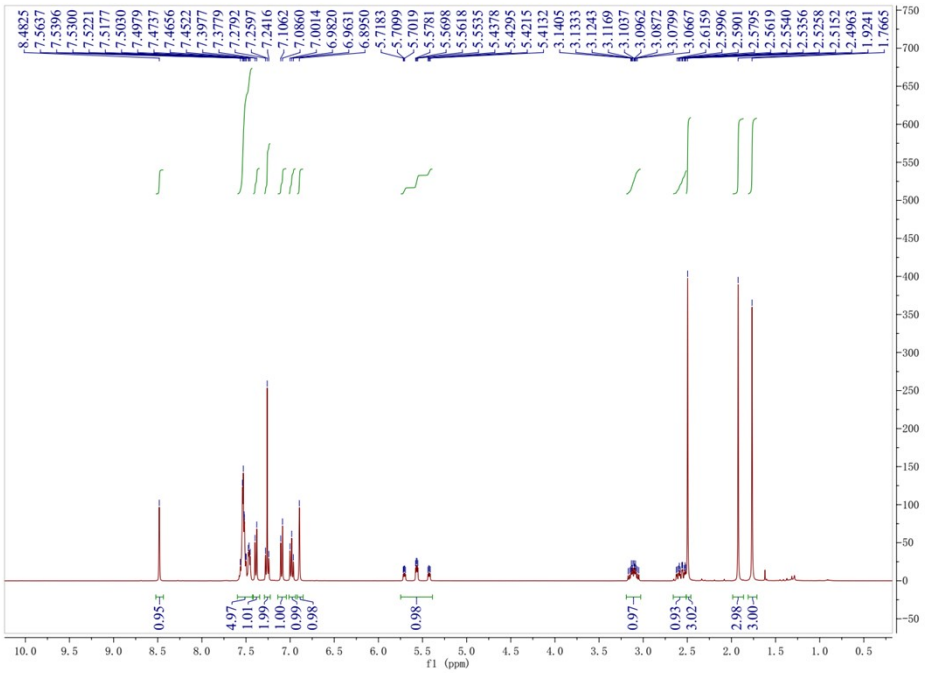

f1 (ppm)







2c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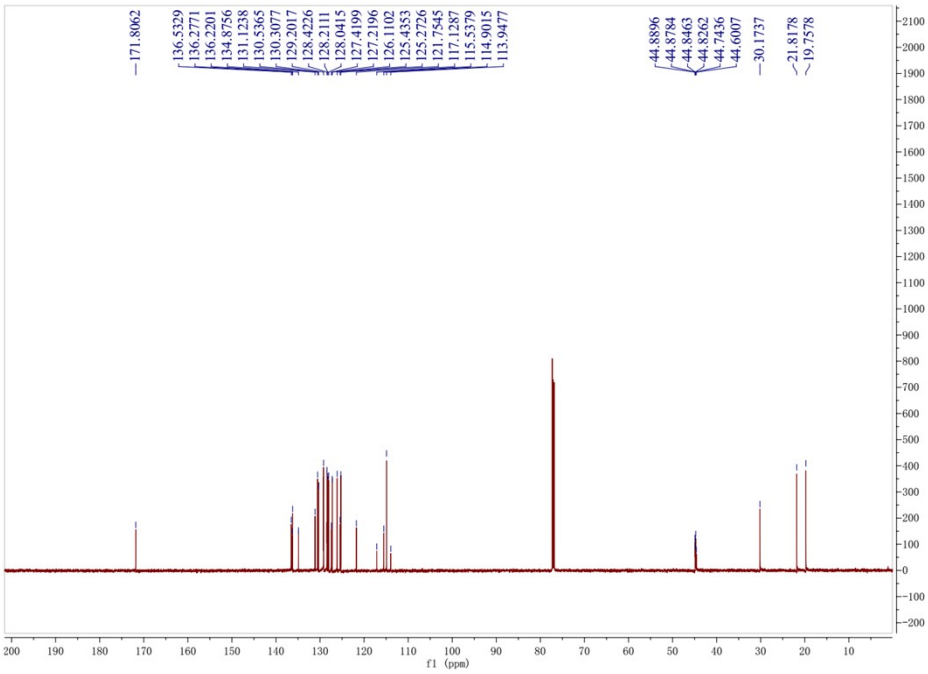
7.4522
7.3977
7.3779
7.2792
7.2597
7.2416
7.1062
7.0860
7.0014
6.9820
6.9631
6.8950
5.7183
5.7099
5.7019
5.5781
5.5698
5.5618
5.5535
5.4378
5.4295
5.4215
5.4132
3.1405
3.1333
3.1243
3.1169
3.1037
3.0962
3.0872
3.0799
3.0667
2.6159
2.5996
2.5901
2.5795
2.5619
2.5540
2.5356
2.5258
2.5152
2.4963
1.9241
1.7665
0.95
4.97
1.01
1.99
1.00
0.99
0.98
0.98
0.97
0.93
3.02
2.98
3.00
f1 (ppm)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134.8756
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130.5365
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129.2017
128.4226
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127.2196
126.1102
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125.2726
121.7545
117.1287
115.5379
114.9015
113.9477
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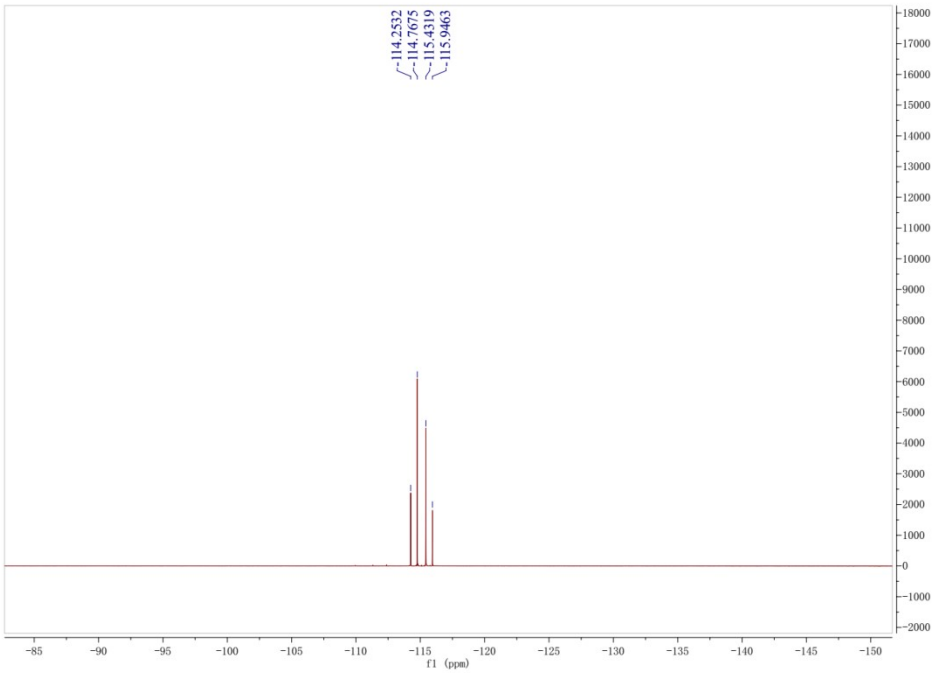
30.1737
21.8178
19.7578
f1 (ppm)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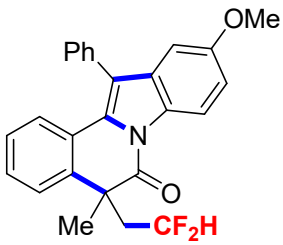
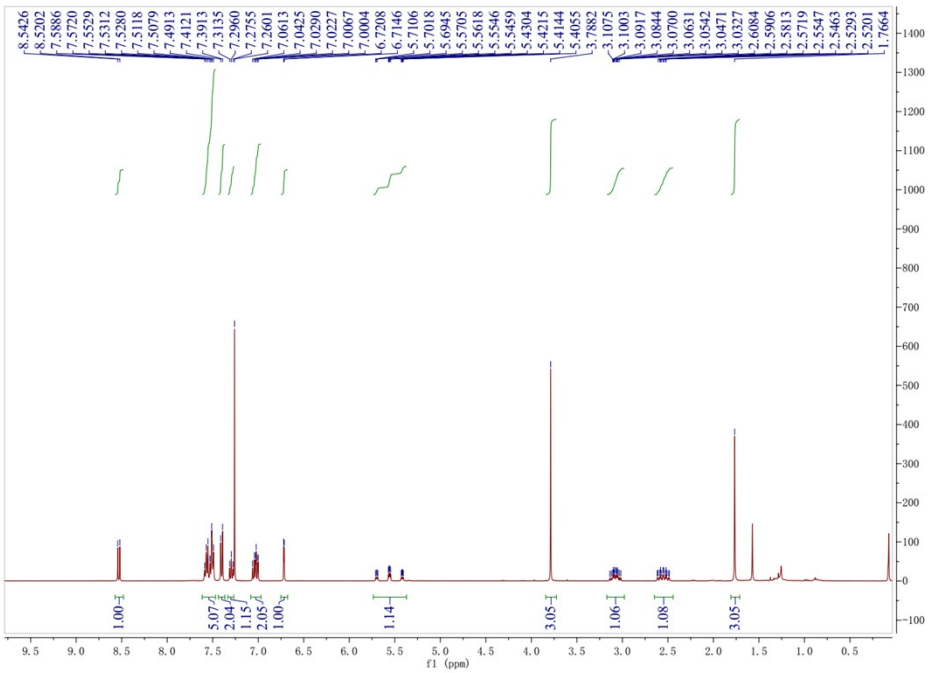
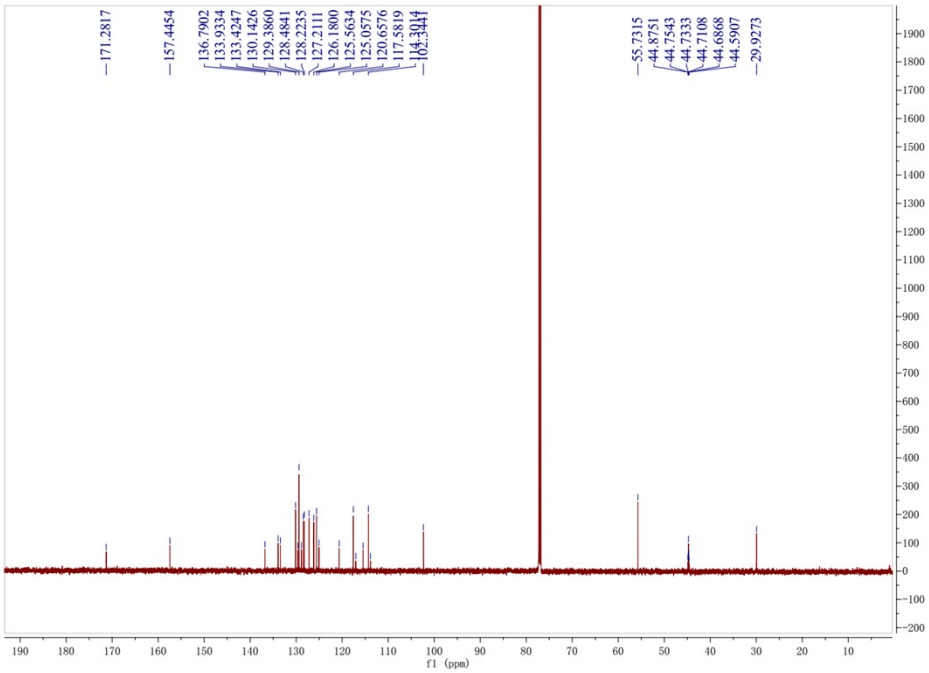
f1 (ppm)


OMe
Ph
N
O
Me
CF2H

2d


f1 (ppm)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133.4247
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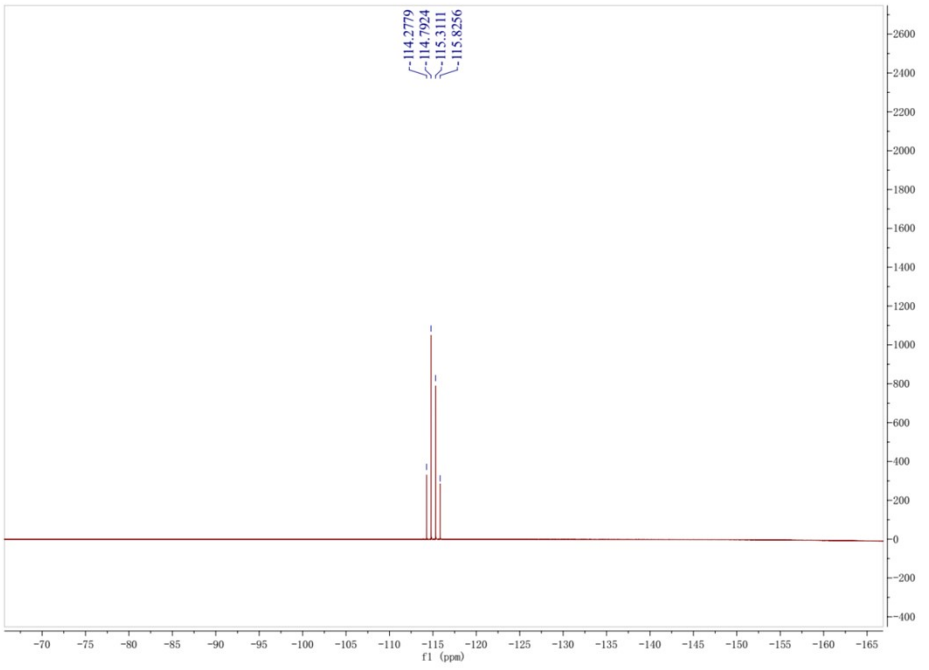
129.3860
128.4841
128.2235
127.2111
126.1800
125.5634
125.0575
120.6576
117.5819
114.3014
102.3441
55.7315
44.8751
44.7543
44.7333
44.7108
44.6868
44.5907
29.9273
f1 (ppm)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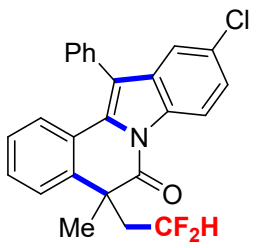
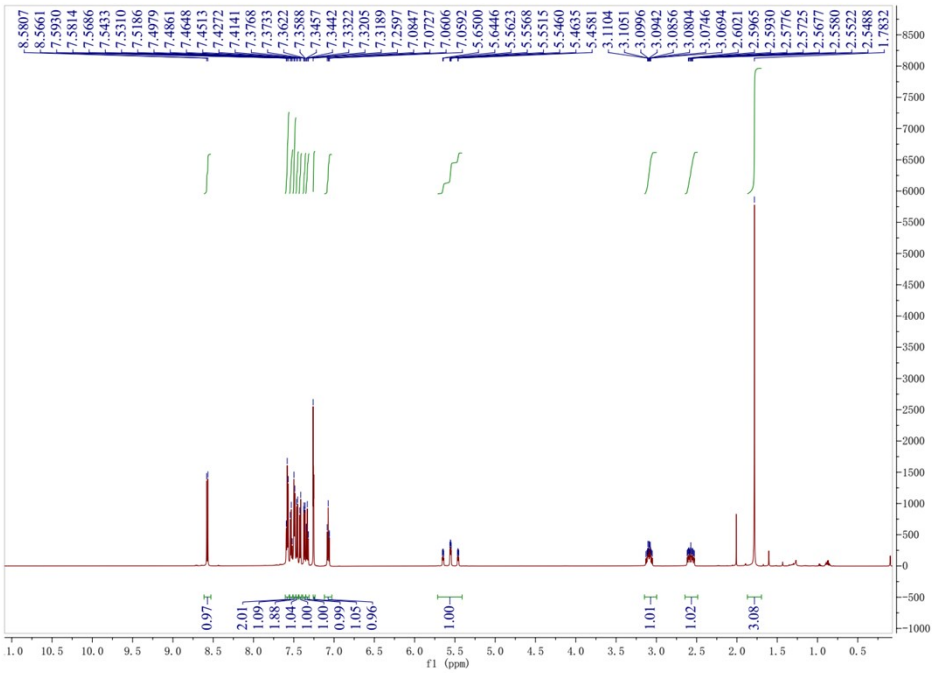
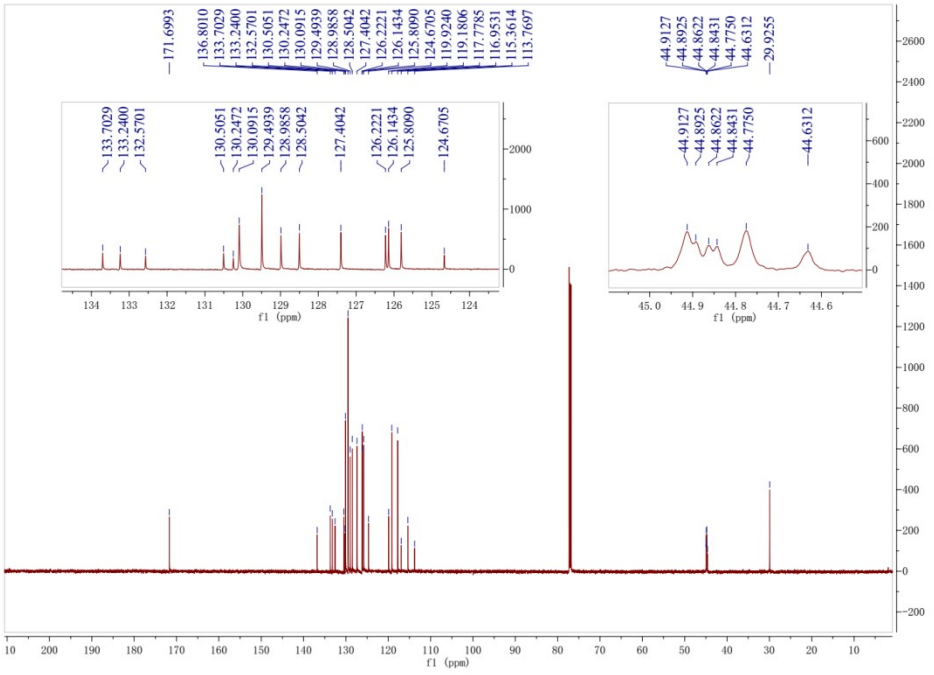
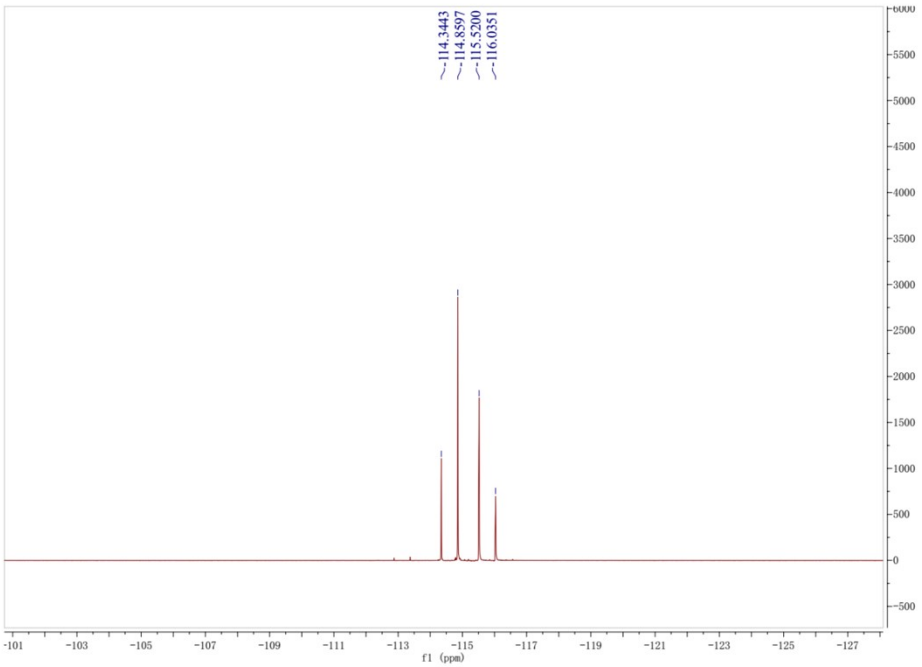
115.3111
115.8256
f1 (ppm)


Cl
Ph
N
O
Me
CF2H

2e



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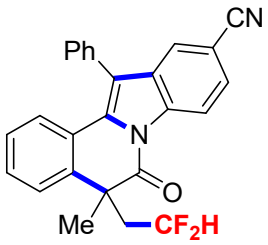
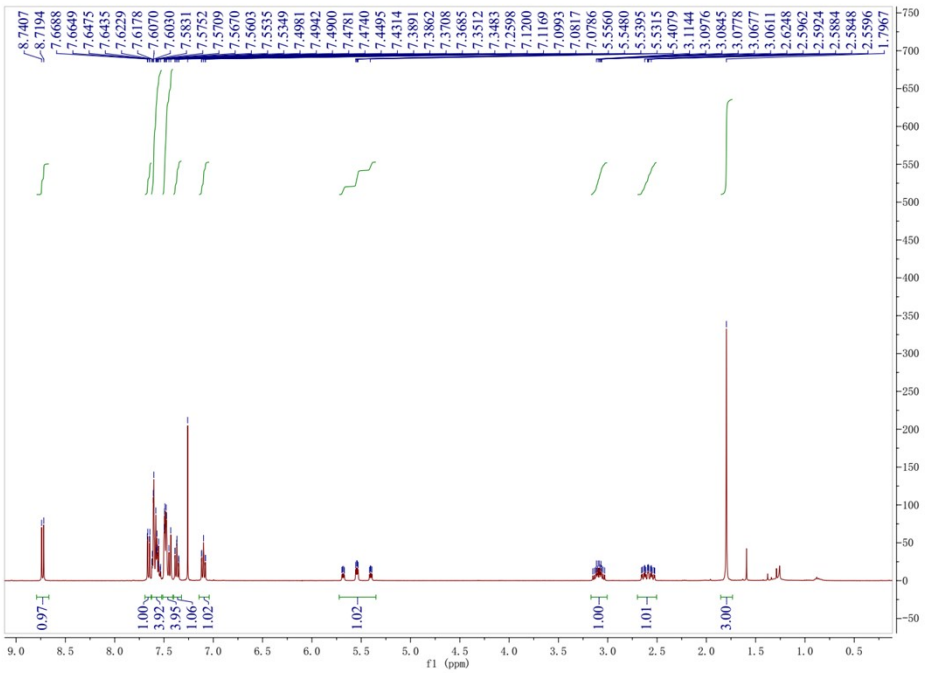
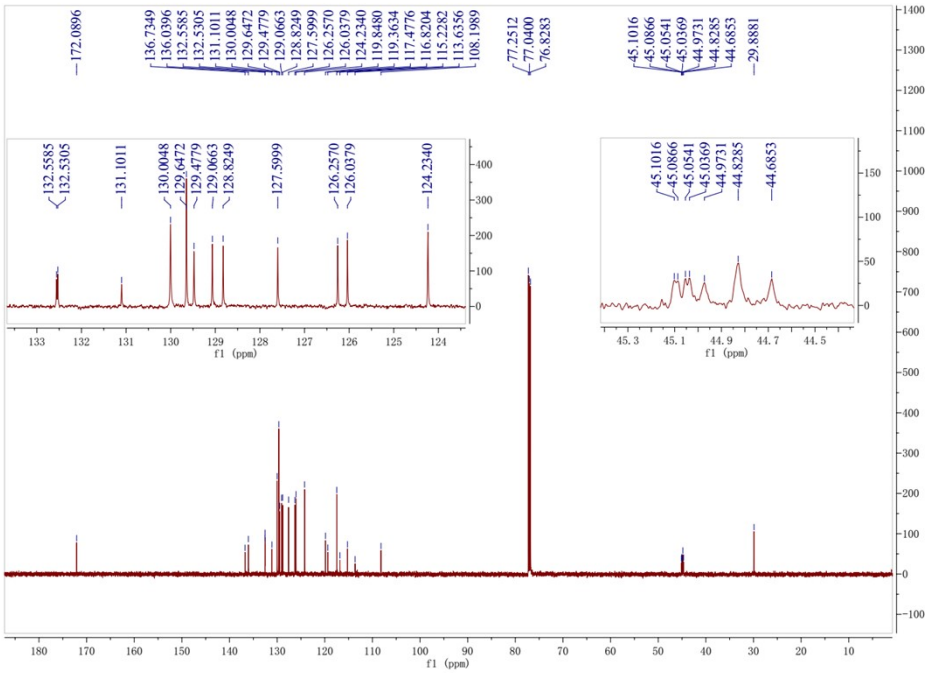
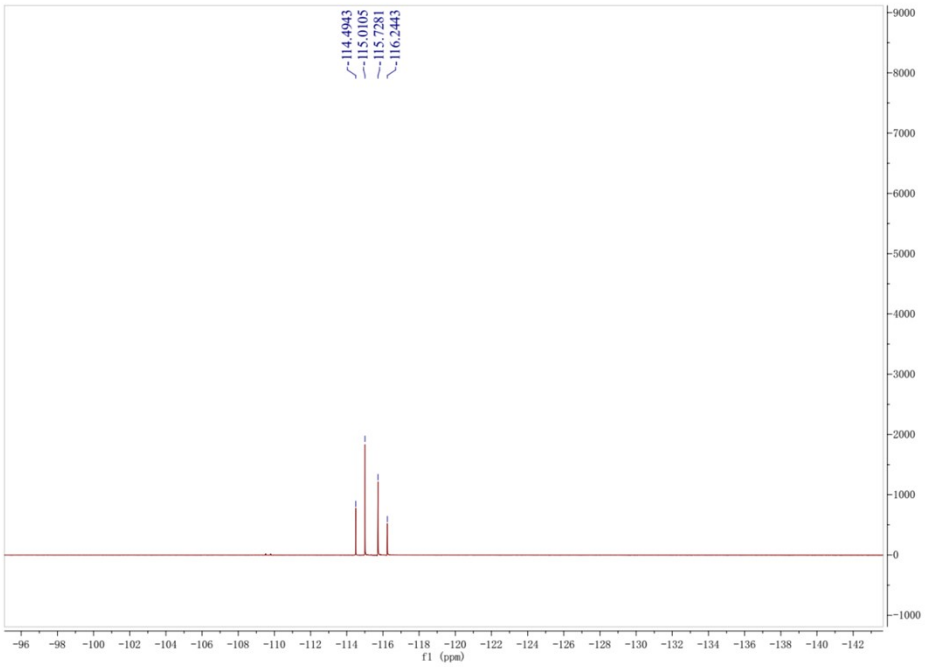
-115.5200
-116.0351
f1 (ppm)

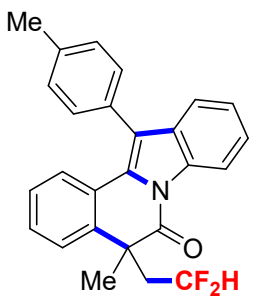

CN
Ph
N
O
Me
CF2H

2f

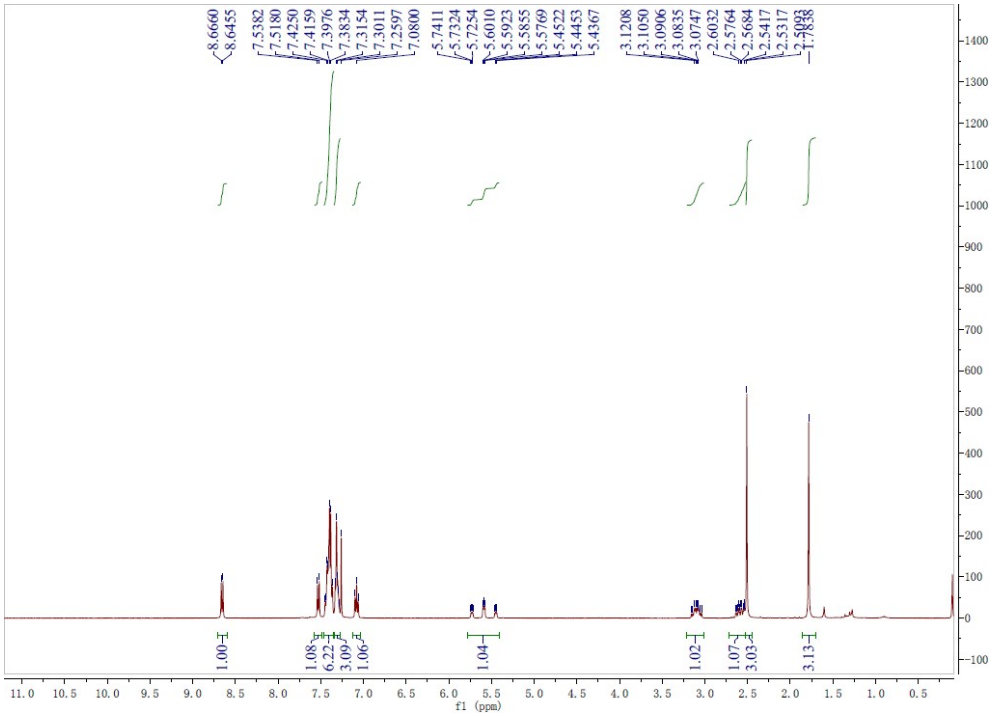

f1 (ppm)







2g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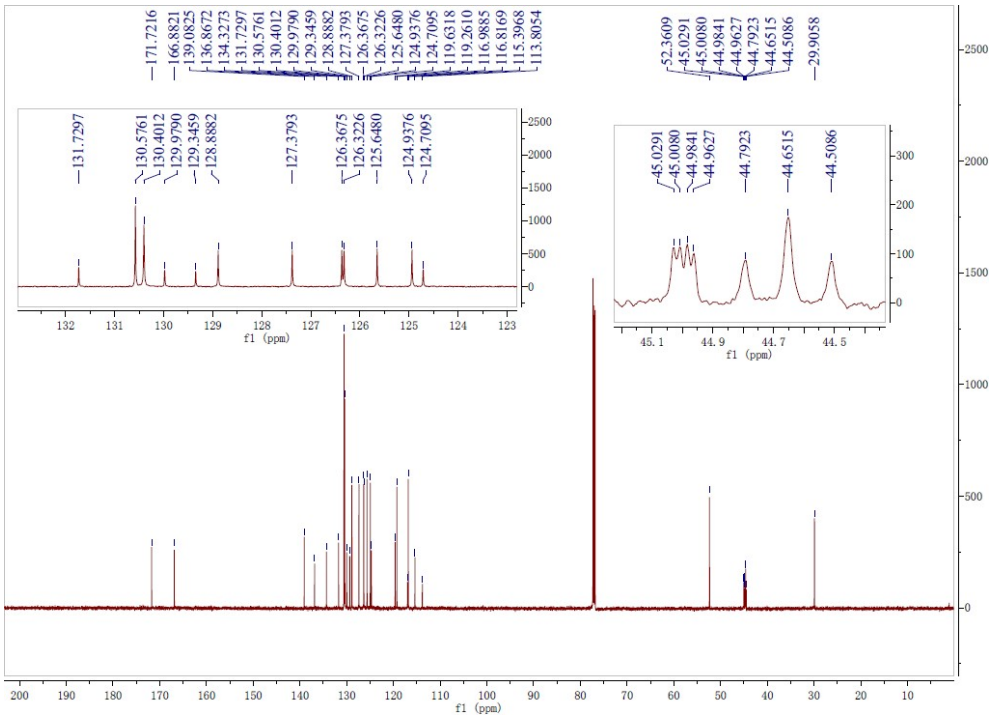
7.5180
7.4250
7.4159
7.3976
7.3834
7.3154
7.3011
7.2597
7.0800
5.7411
5.7324
5.7254
5.6010
5.5923
5.5855
5.5769
5.4522
5.4453
5.4367
3.1208
3.1050
3.0906
3.0835
3.0747
2.6032
2.5764
2.5684
2.5417
2.5317
2.5093
1.7838
1.00
1.08
6.22
3.09
1.06
1.04
1.02
1.07
3.03
3.13
f1 (ppm)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127.3793
126.3675
126.3226
125.6480
124.9376
124.7095
119.6318
119.2610
116.9885
116.8169
115.3968
113.8054
52.3609
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45.0080
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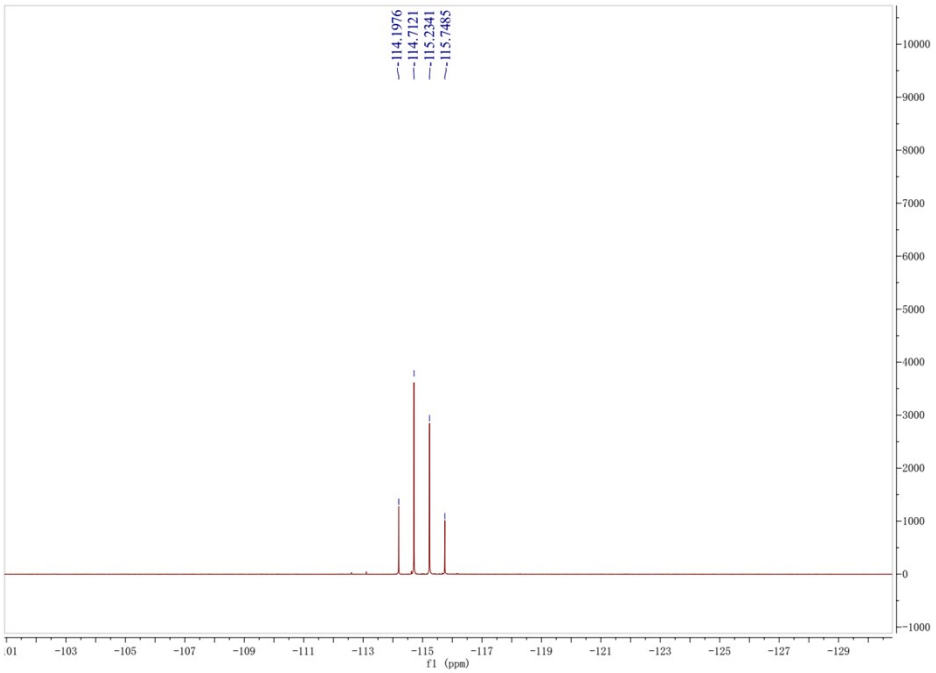
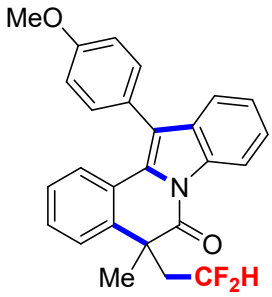
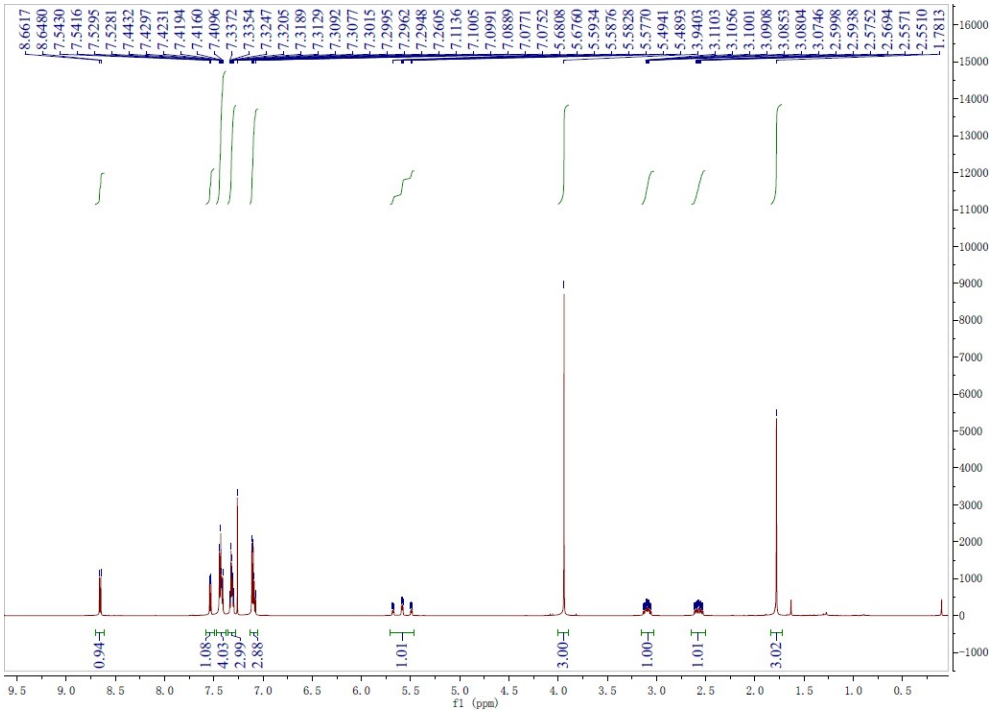
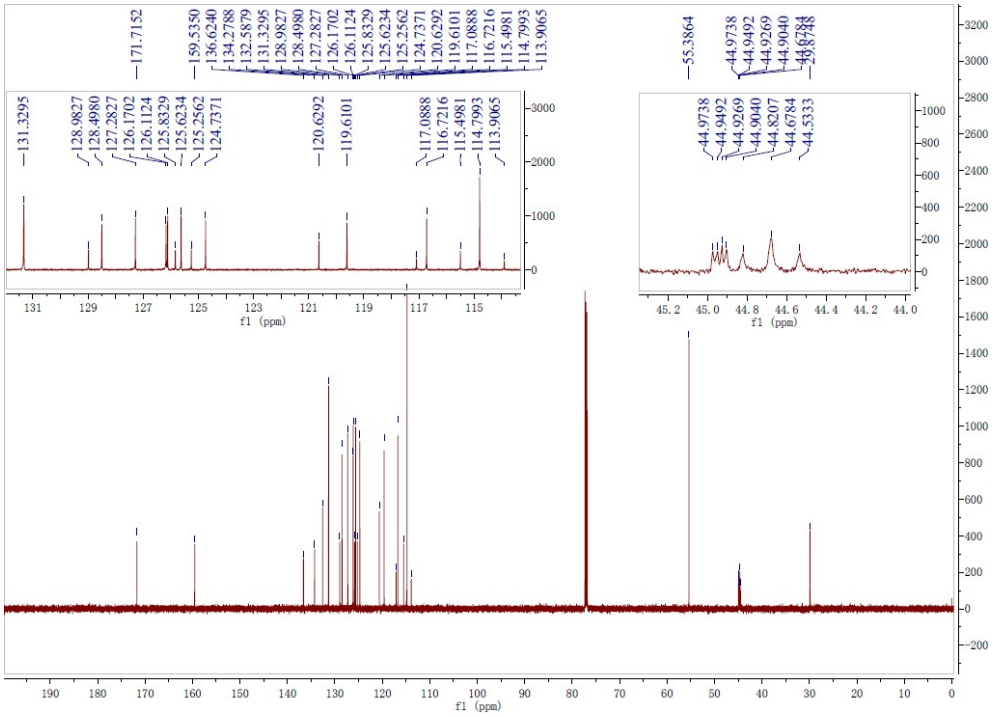
44.9627
44.7923
44.6515
44.5086
29.9058
f1 (ppm)

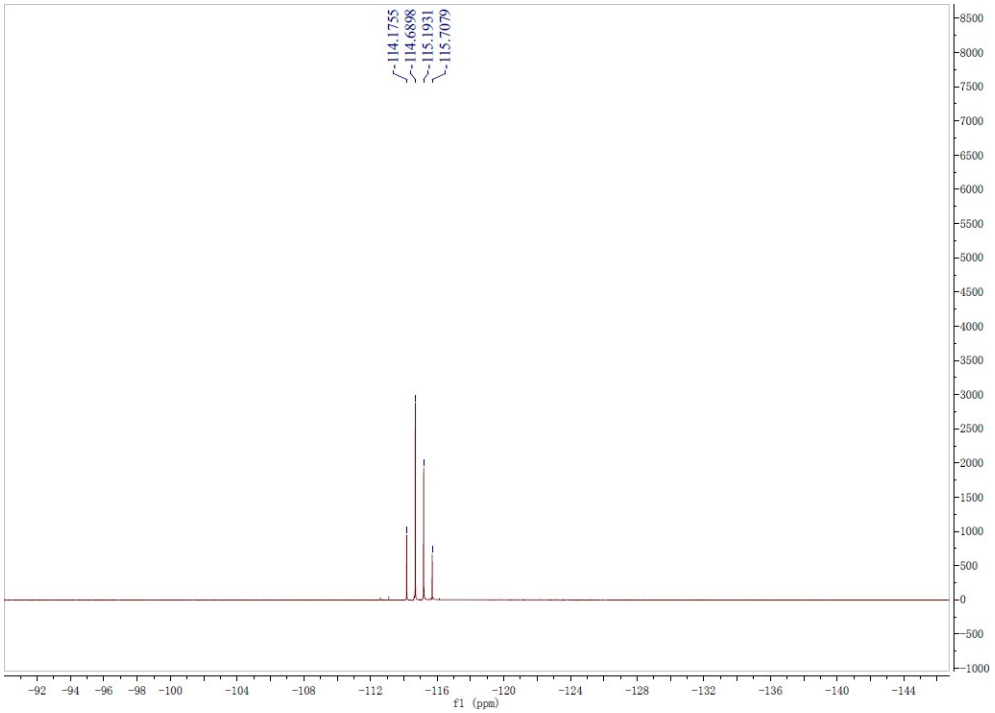


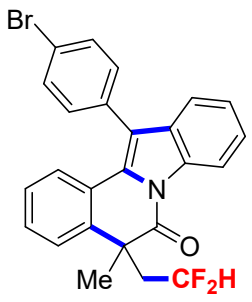


2h

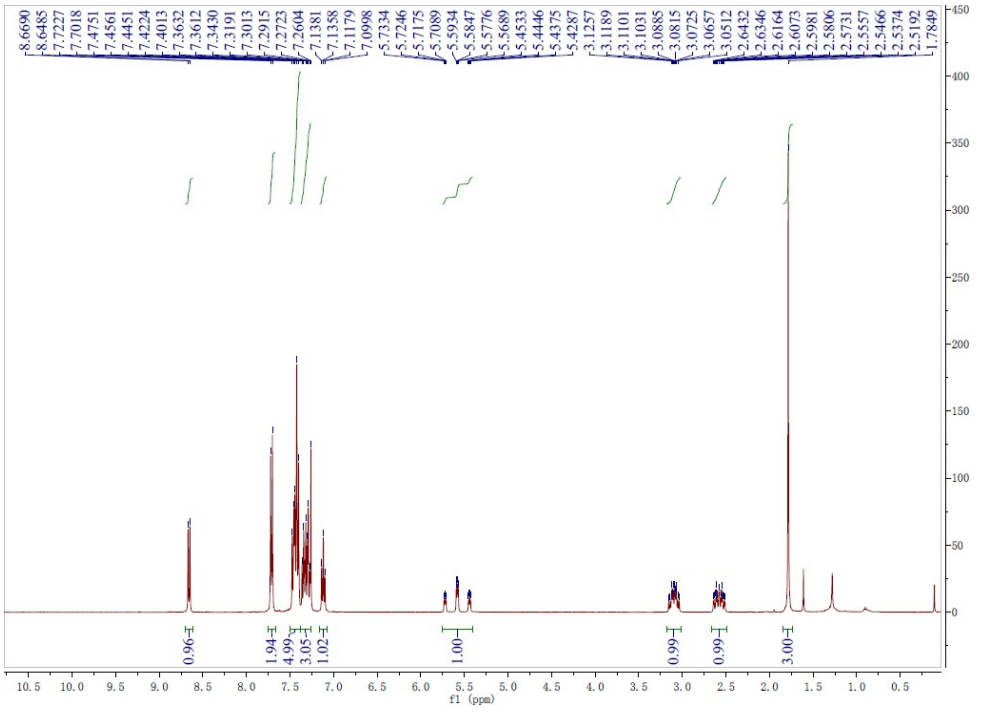


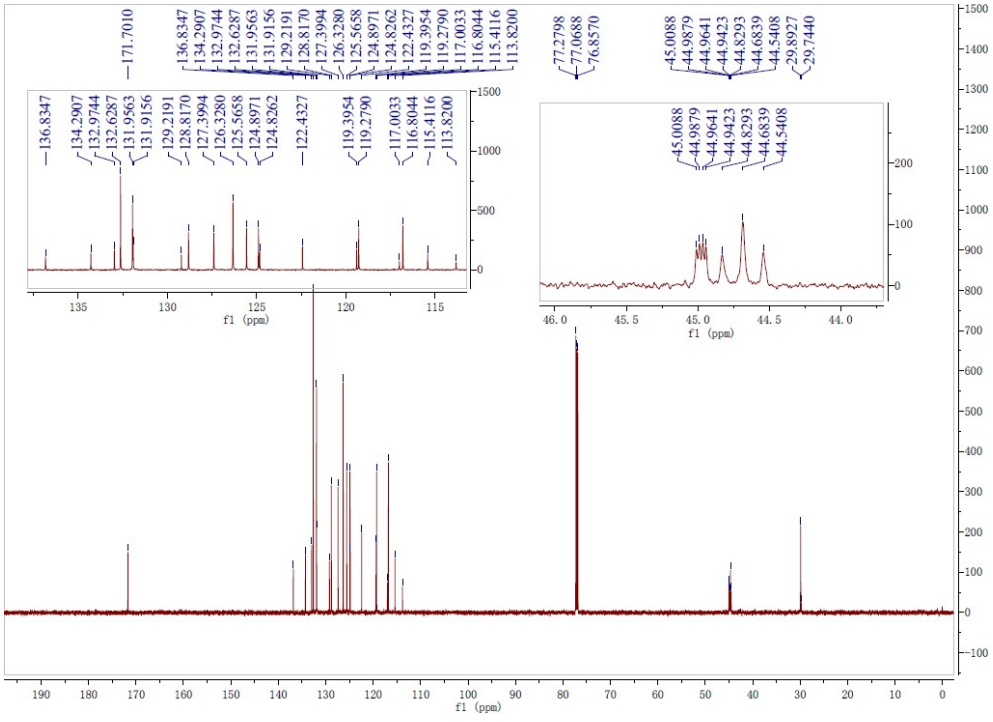


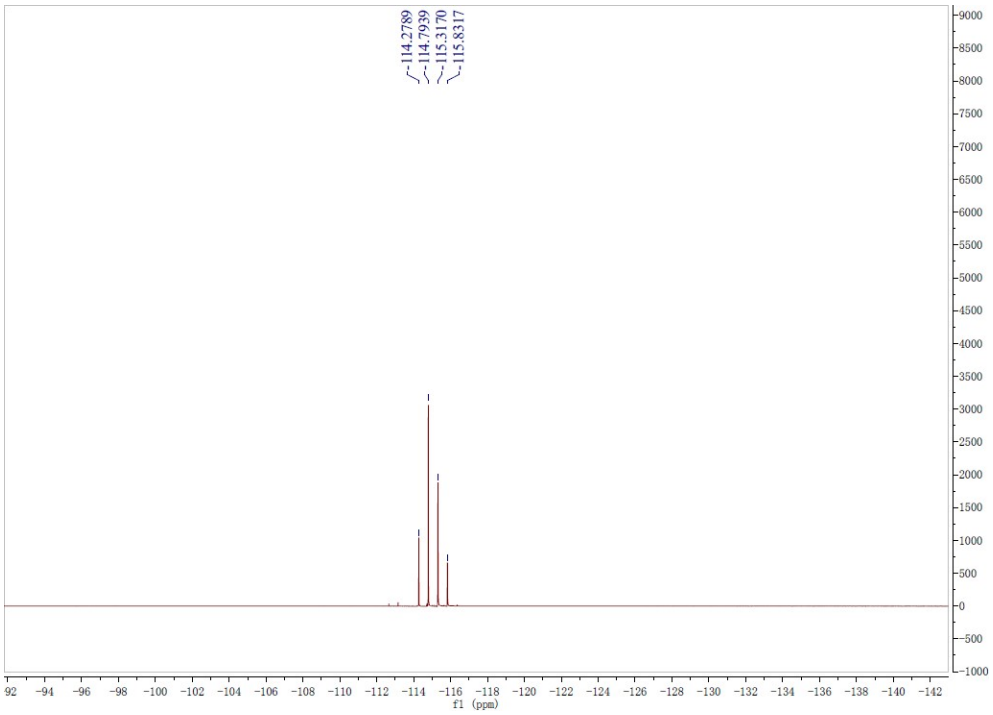




2i



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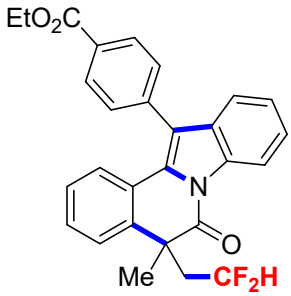
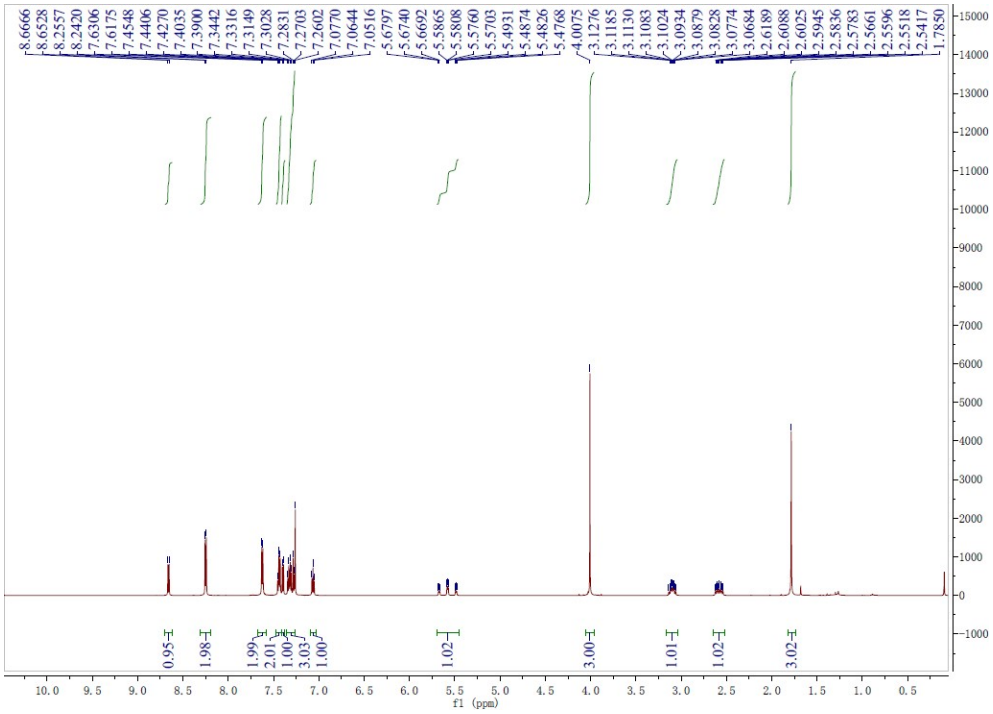
-115.8317
f1 (ppm)


EtO2C
N
O
Me
CF2H

2j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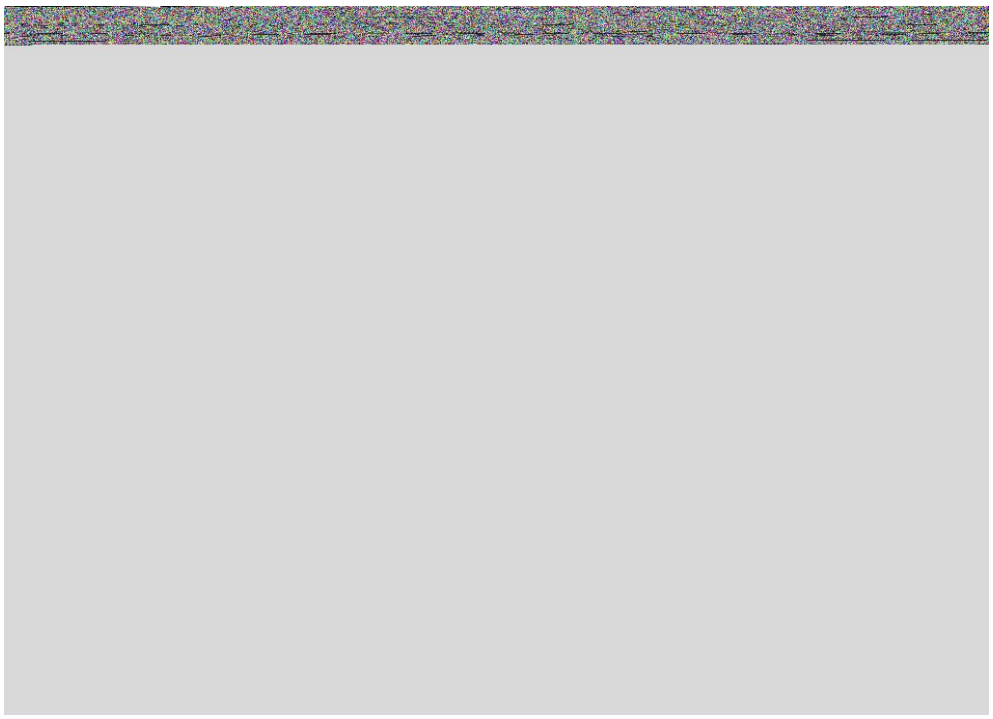
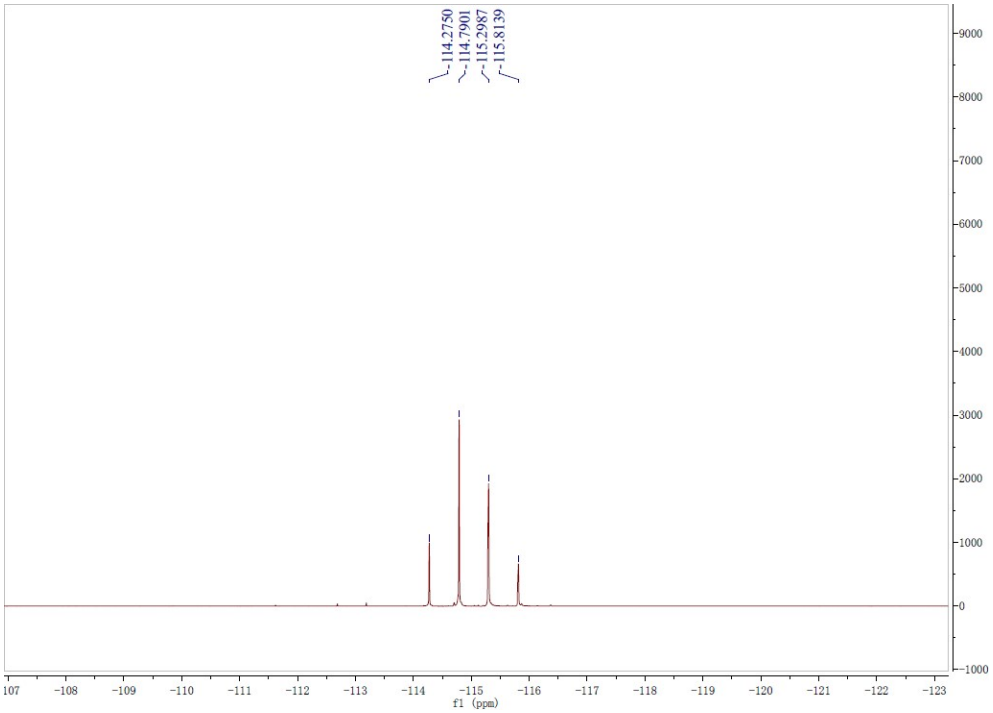
1.99
2.01
1.00
3.03
1.00
1.02
3.00
1.01
1.02
3.02
f1 (ppm)

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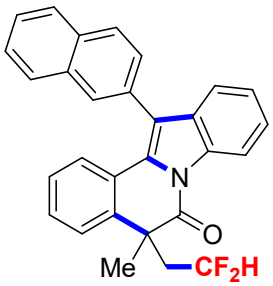
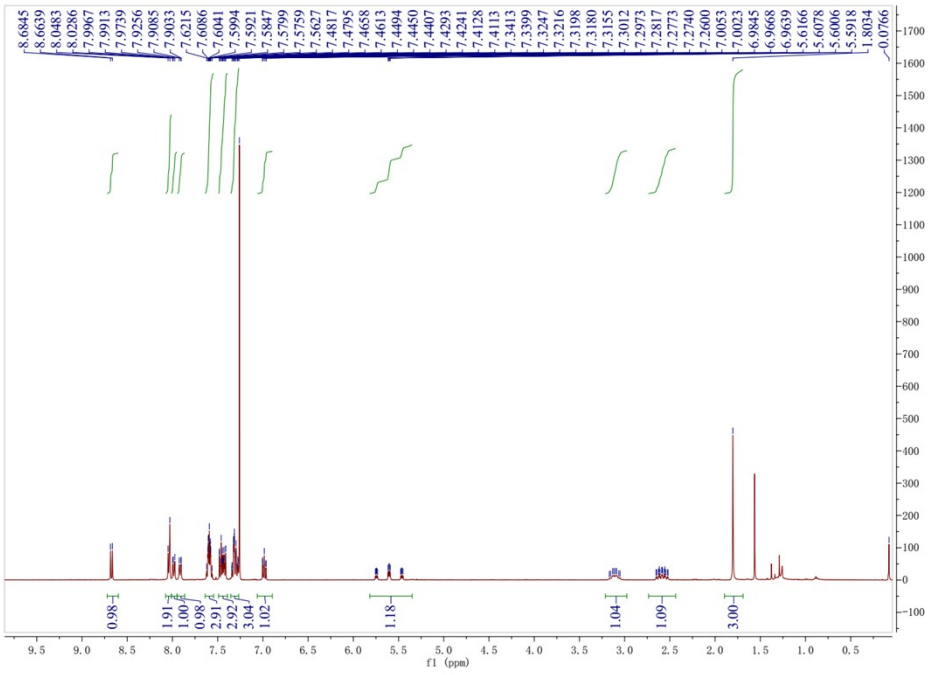
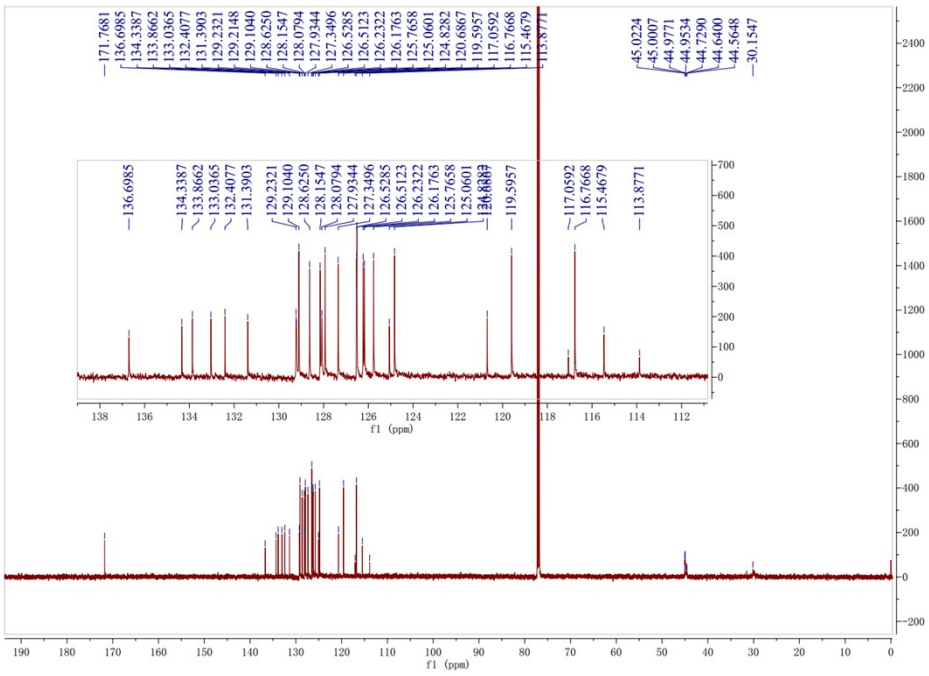
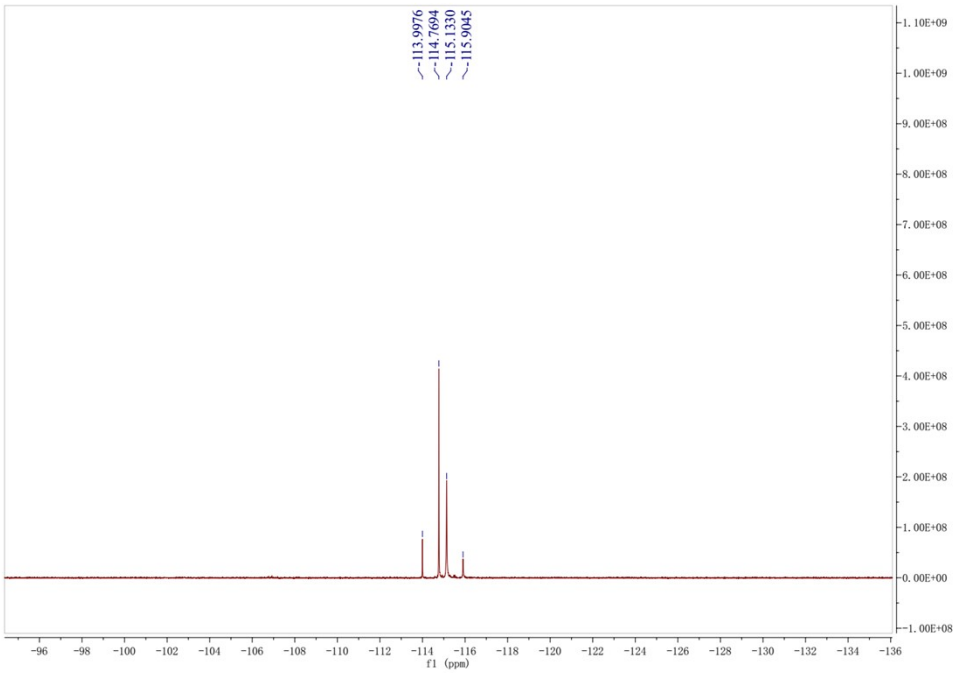
-114.7901
-115.2987
-115.8139
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
107
-108
-109
-110
-111
-112
-113
-114
-115
-116
-117
-118
-119
-120
-121
-122
-123
f1 (ppm)



2k



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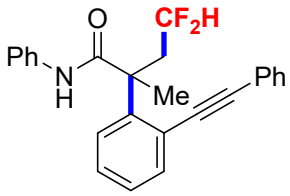
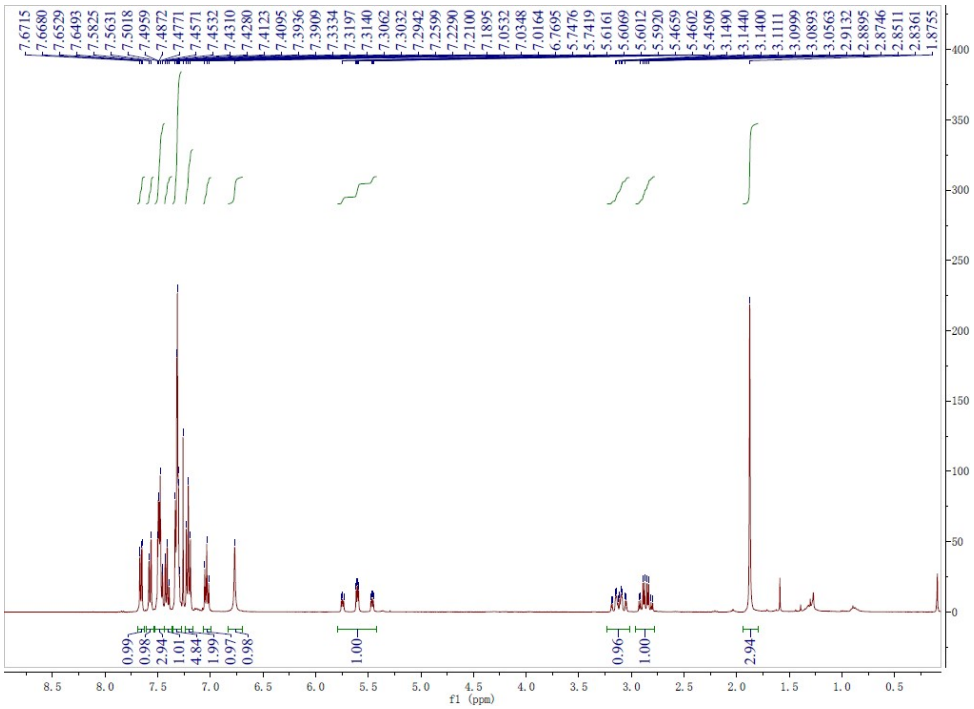
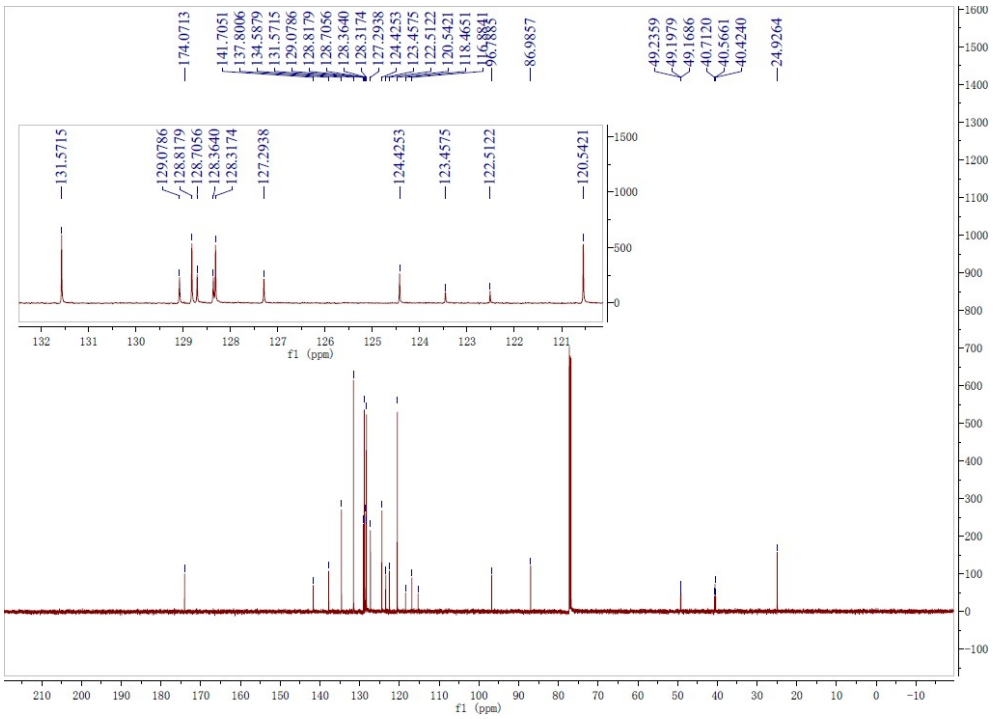
-114.7694
-115.1330
-115.9045
f1 (ppm)


O
CF2H
Ph
N
H
Me
Ph

3a


f1 (ppm)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131.5715
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128.7056
128.3640
128.3174
127.2938
124.4253
123.4575
122.5122
120.5421
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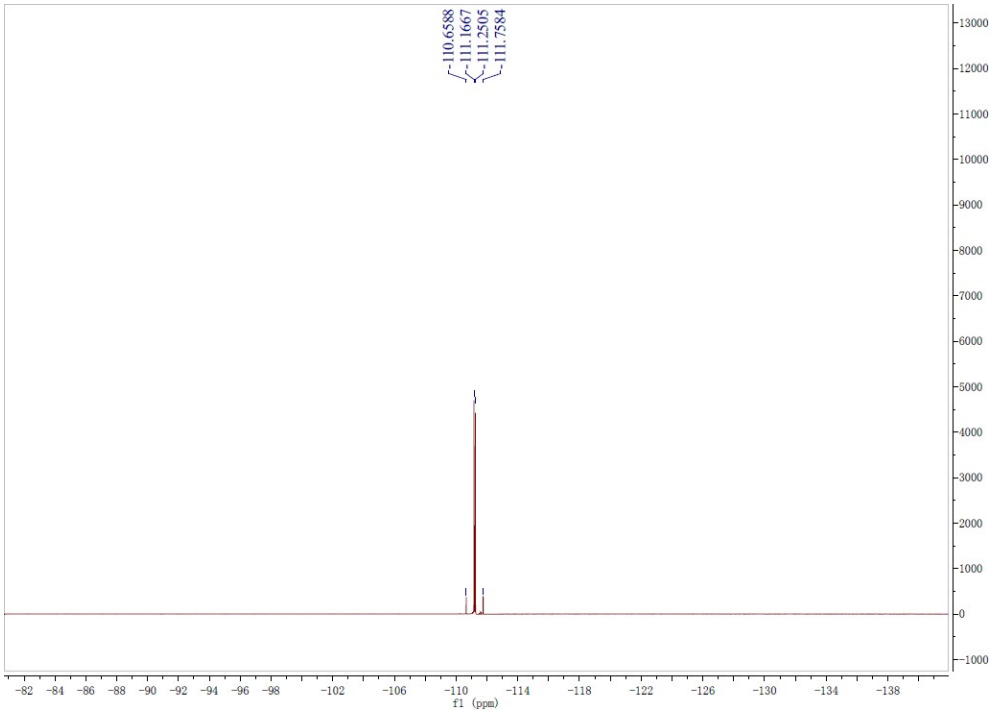
86.9857
49.2359
49.1979
49.1686
40.7120
40.5661
40.4240
24.9264
f1 (ppm)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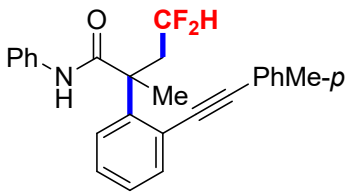
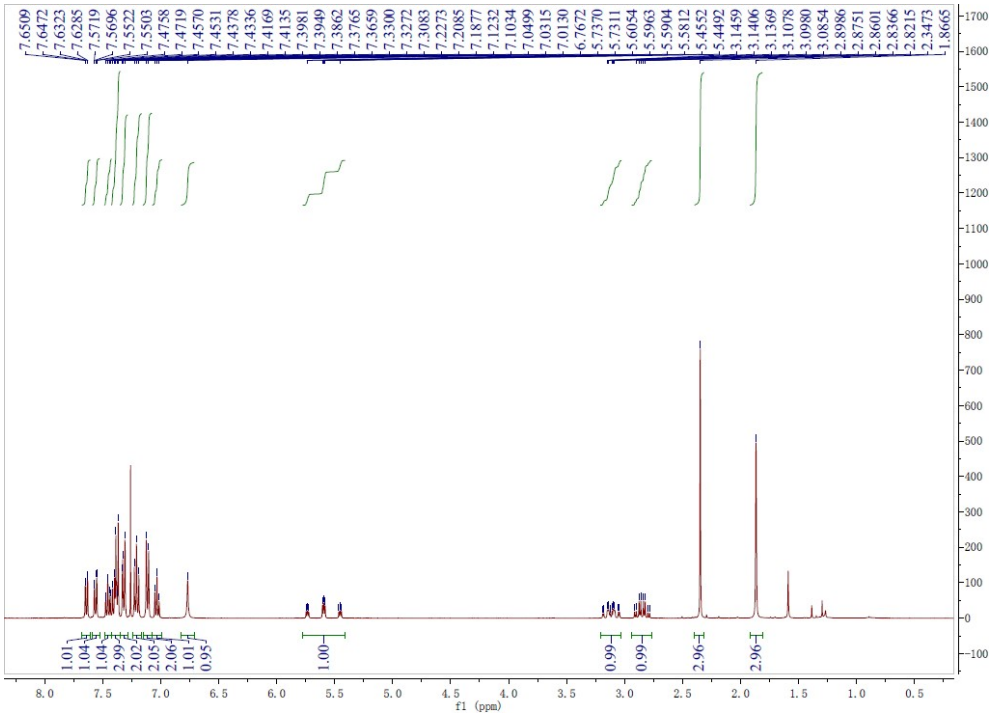
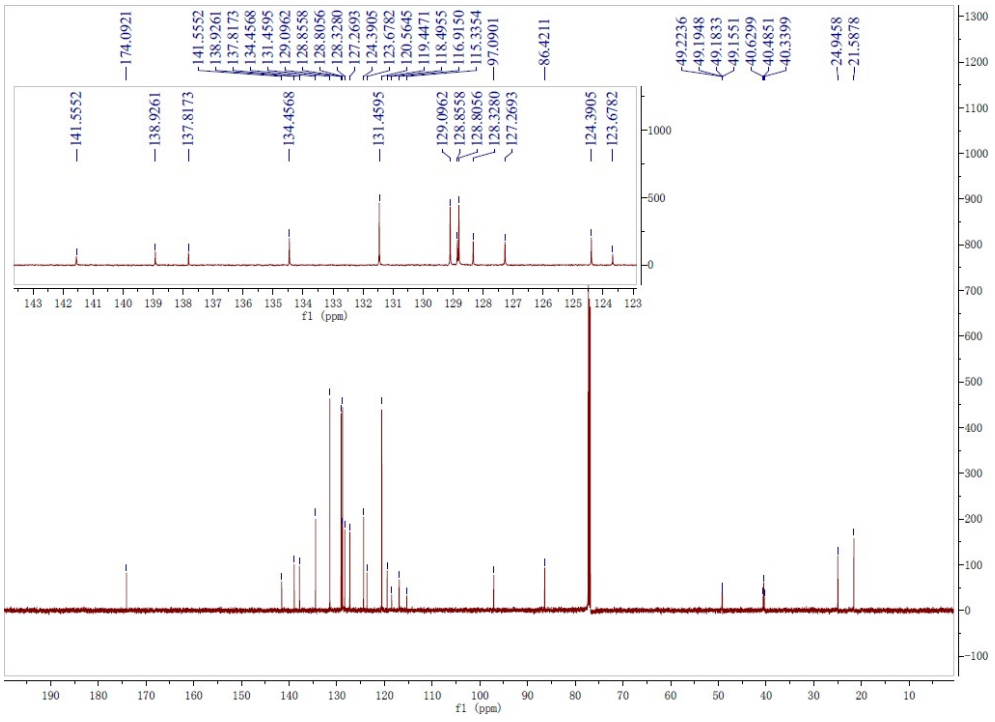
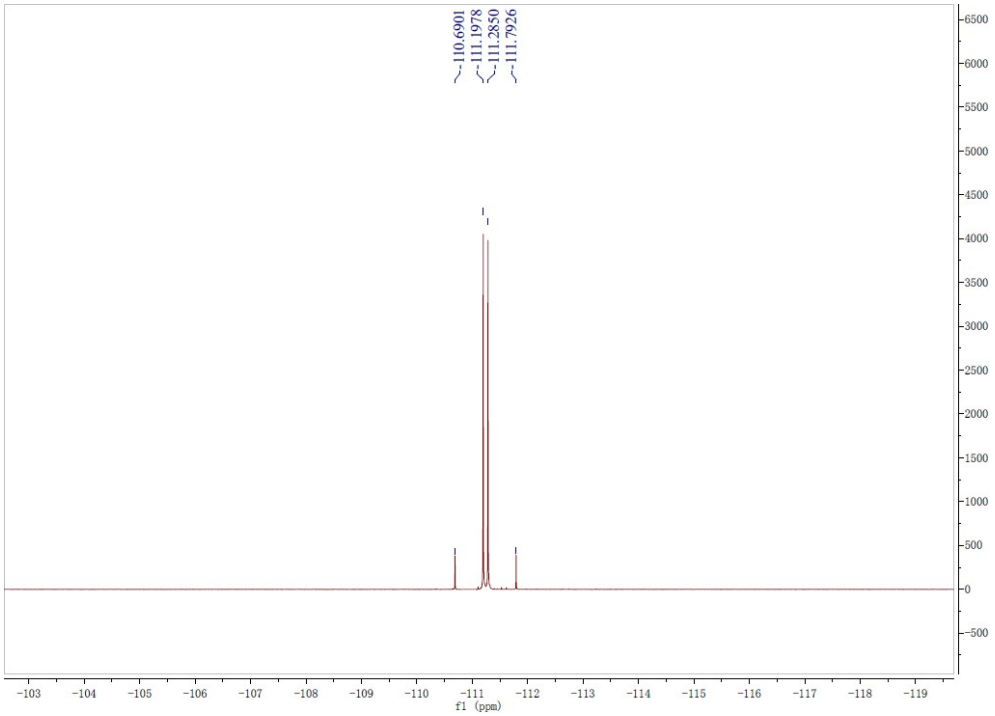
111.2505
111.7584
f1 (ppm)


O
CF2H
Ph
N
H
Me
PhMe-p

3b



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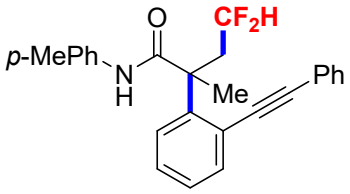
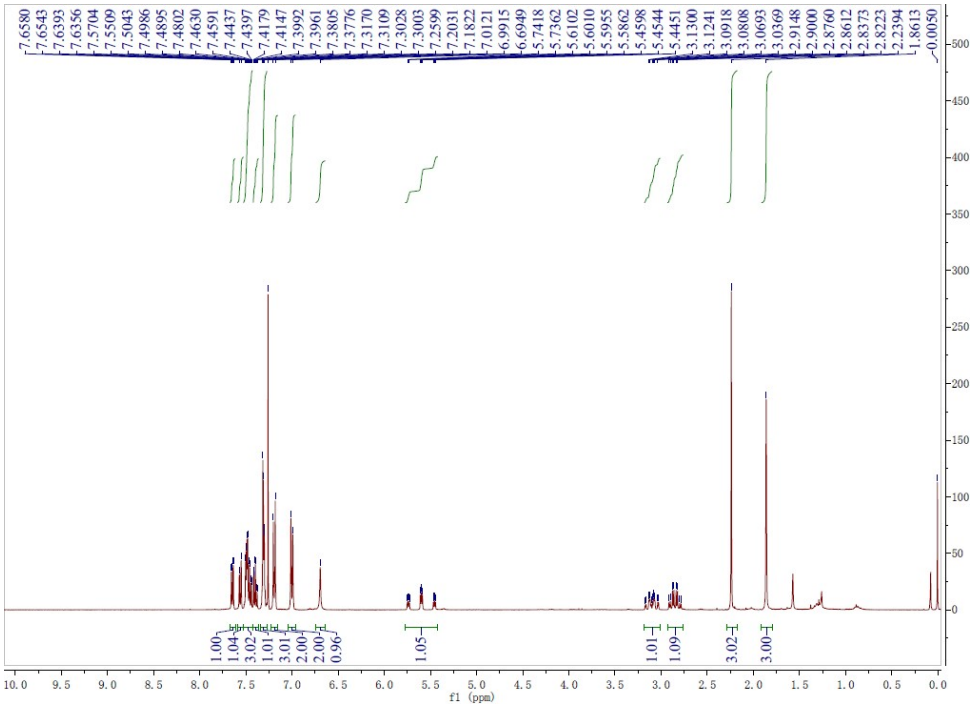
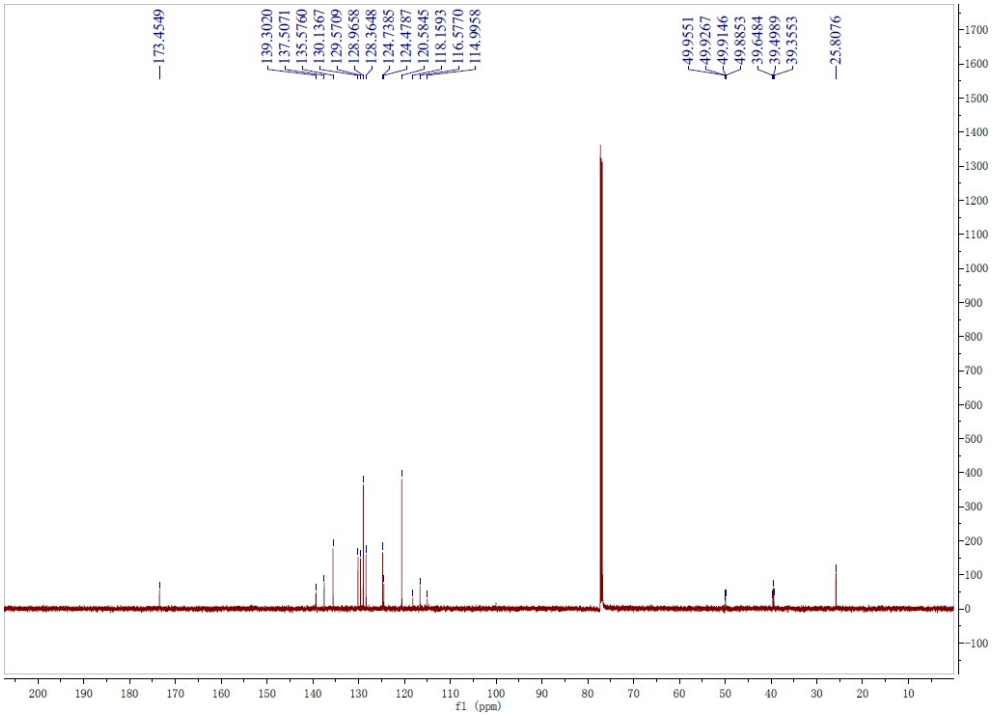
-111.2850
-111.7926
f1 (ppm)


O
CF2H
p-MePh
N
H
Me
Ph

3c


f1 (ppm)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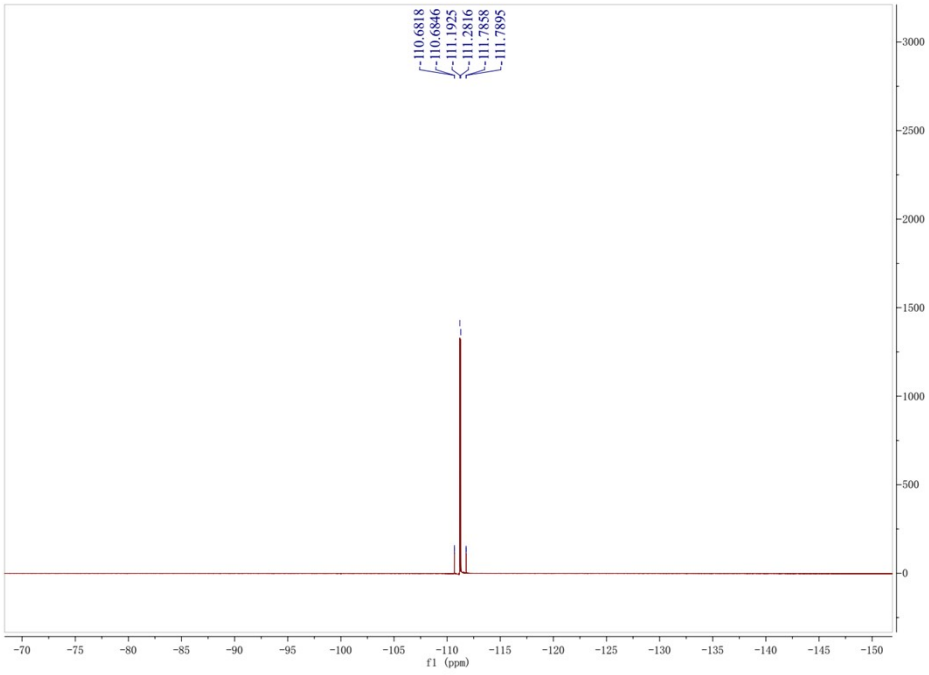
124.4787
120.5845
118.1593
116.5770
114.9958
49.9551
49.9267
49.9146
49.8853
39.6484
39.4989
39.3553
25.8076
f1 (ppm)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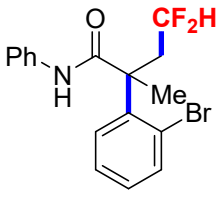
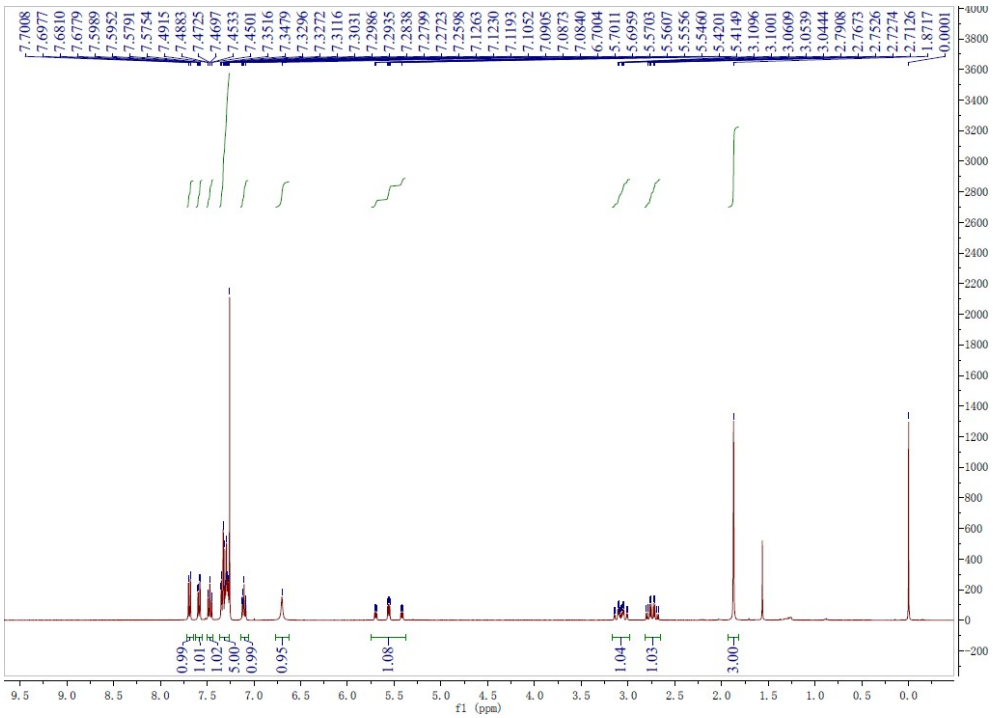
111.7858
111.7895
f1 (ppm)


O
CF2H
Ph
N
H
Me
Br

3d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7.4725
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7.4501
7.3516
7.3479
7.3296
7.3272
7.3116
7.3031
7.2986
7.2935
7.2838
7.2799
7.2723
7.2598
7.1263
7.1230
7.1193
7.1052
7.0905
7.0873
7.0840
6.7004
5.7011
5.6959
5.5703
5.5607
5.5556
5.5460
5.4201
5.4149
3.1096
3.1001
3.0669
3.0539
3.0444
2.7908
2.7673
2.7526
2.7274
2.7126
1.8717
0.0001
0.99
1.01
1.02
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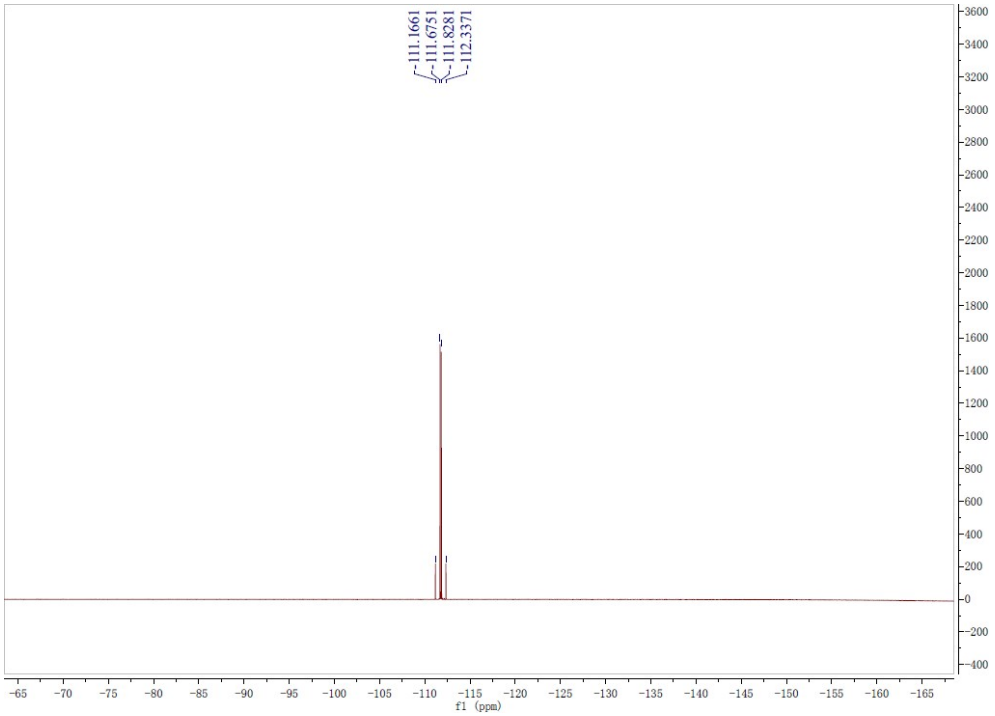
0.95
1.08
1.04
1.03
3.00
f1 (ppm)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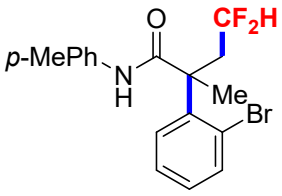
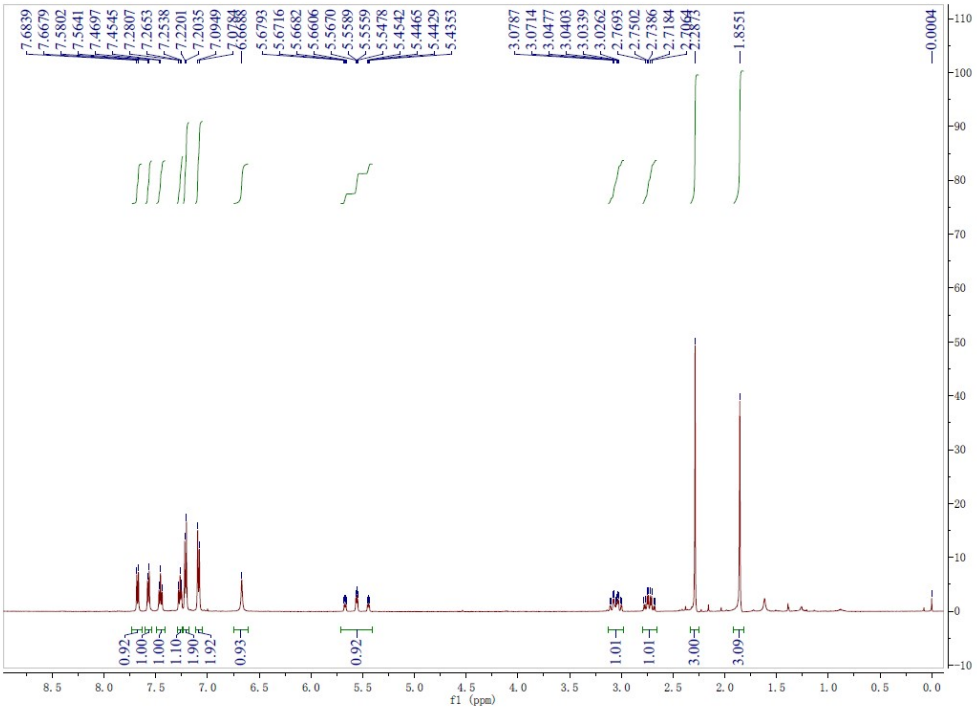

O
CF2H
p-MePh
N
H
Me
Br

3e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7.2538
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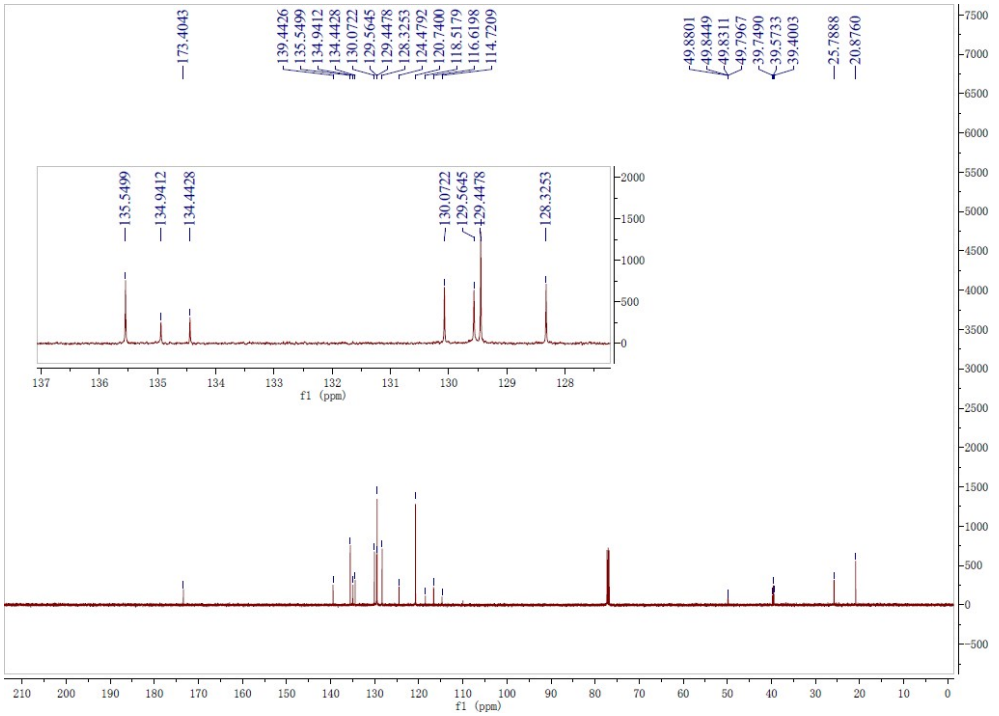
6.6688
5.6793
5.6716
5.6682
5.6606
5.5670
5.5589
5.5559
5.5478
5.4542
5.4465
5.4429
5.4353
3.0787
3.0714
3.0477
3.0403
3.0339
3.0262
2.7693
2.7502
2.7386
2.7184
2.2864
2.2675
1.8551
-0.0004
0.92
1.00
1.00
1.10
1.90
1.92
0.93
0.92
1.01
1.01
3.00
3.09
f1 (ppm)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134.4428
130.0722
129.5645
129.4478
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118.5179
116.6198
114.7209
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39.7490
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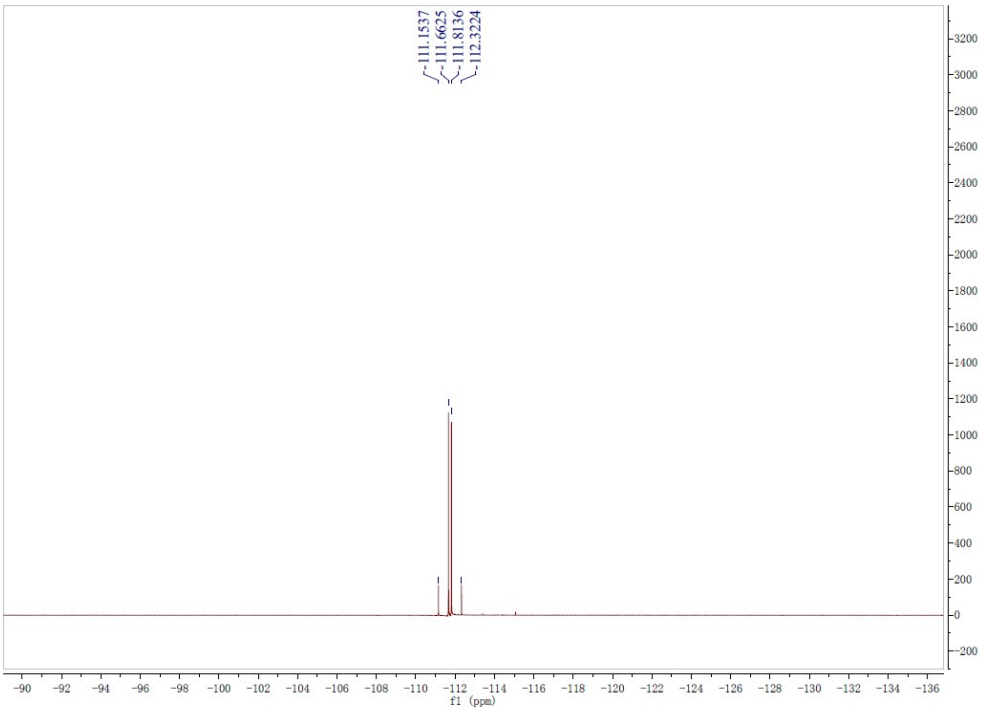
39.4003
25.7888
20.8760
f1 (ppm)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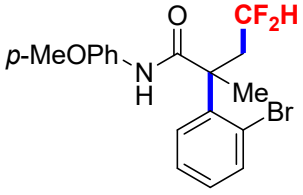
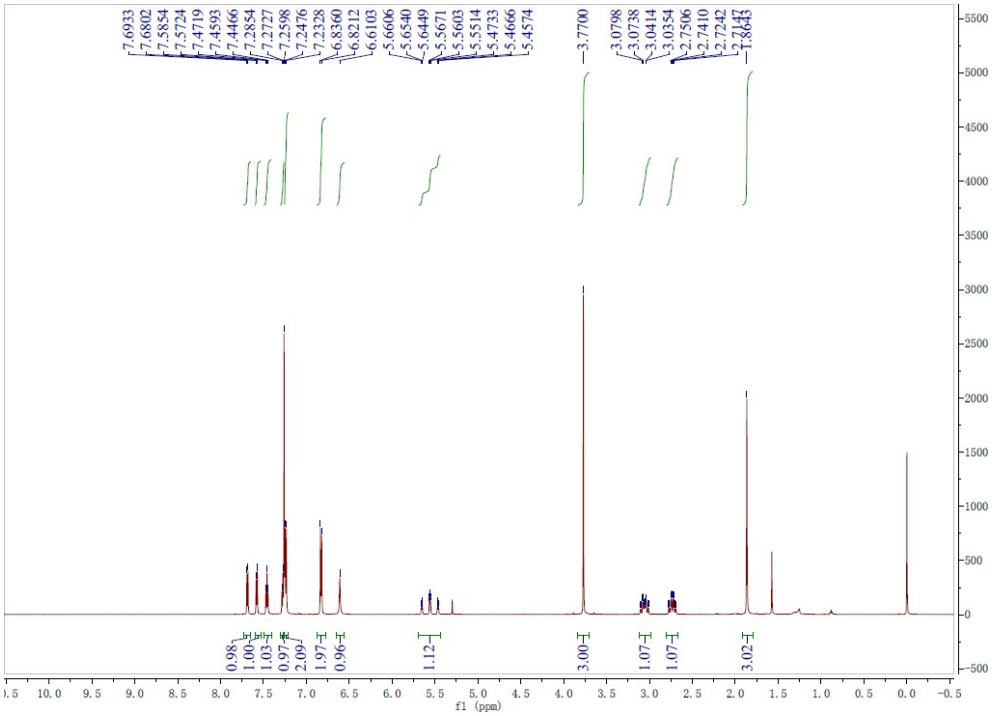
f1 (ppm)


O
CF2H
p-MeOPh
N
H
Me
Br

3f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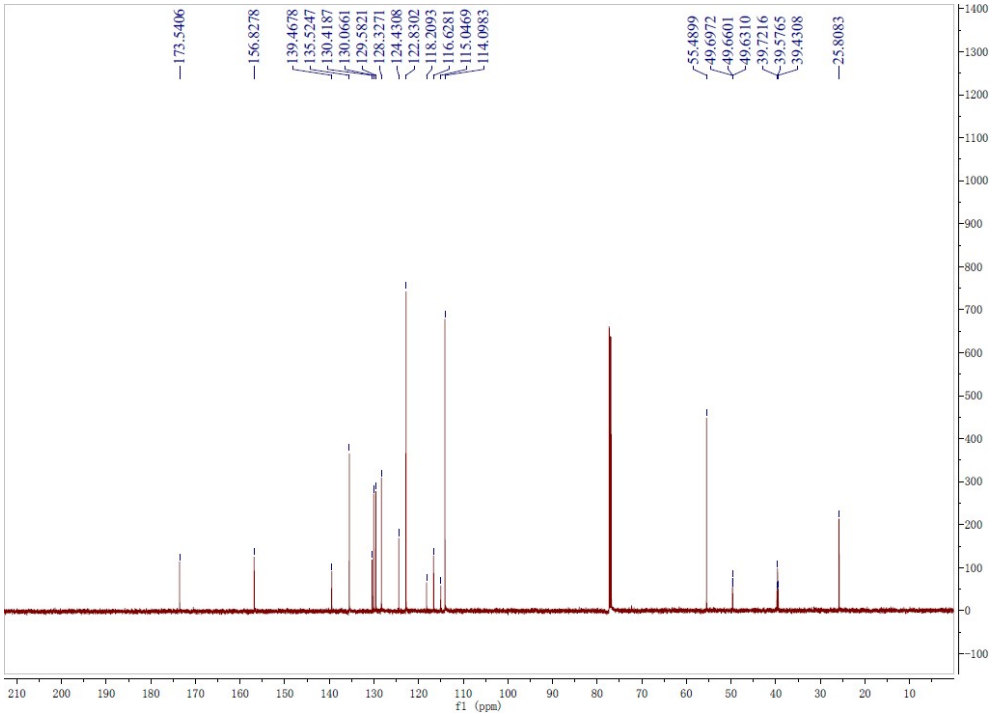
7.2598
7.2476
7.2328
6.8360
6.8212
6.6103
5.6606
5.6540
5.6449
5.5671
5.5603
5.5514
5.4733
5.4666
5.4574
3.7700
3.0798
3.0738
3.0414
3.0354
2.7506
2.7410
2.7242
1.8643
0.98
1.00
1.03
0.97
2.09
1.97
0.96
1.12
3.00
1.07
1.07
3.02
f1 (ppm)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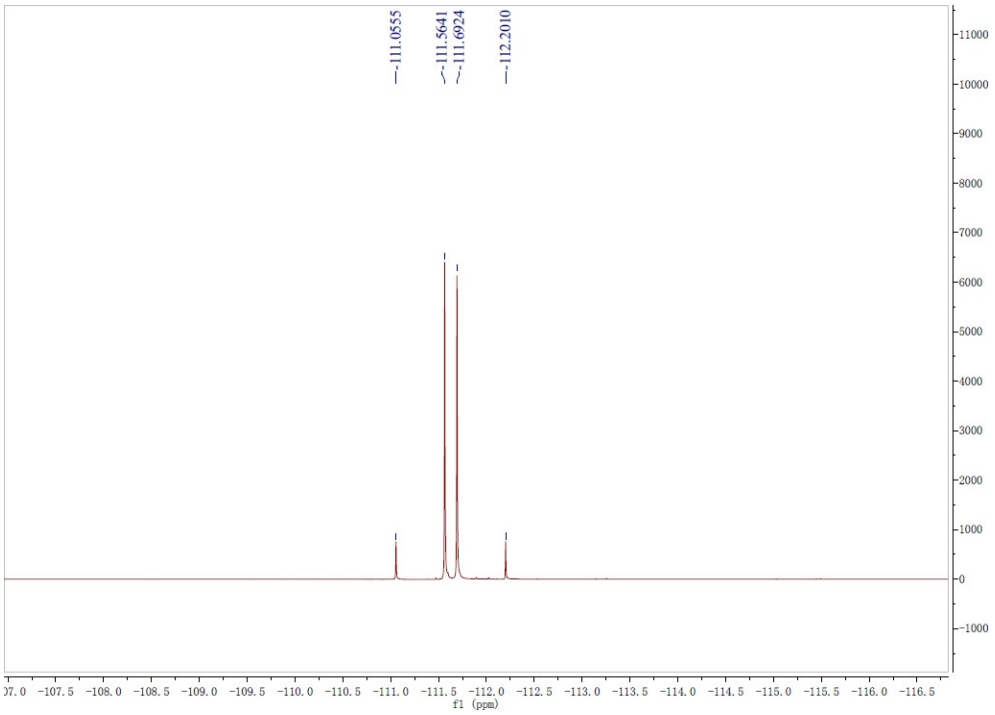
116.6281
115.0469
114.0983
55.4899
49.6972
49.6601
49.6310
39.7216
39.5765
39.4308
25.8083
f1 (ppm)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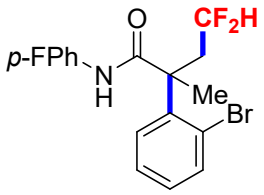
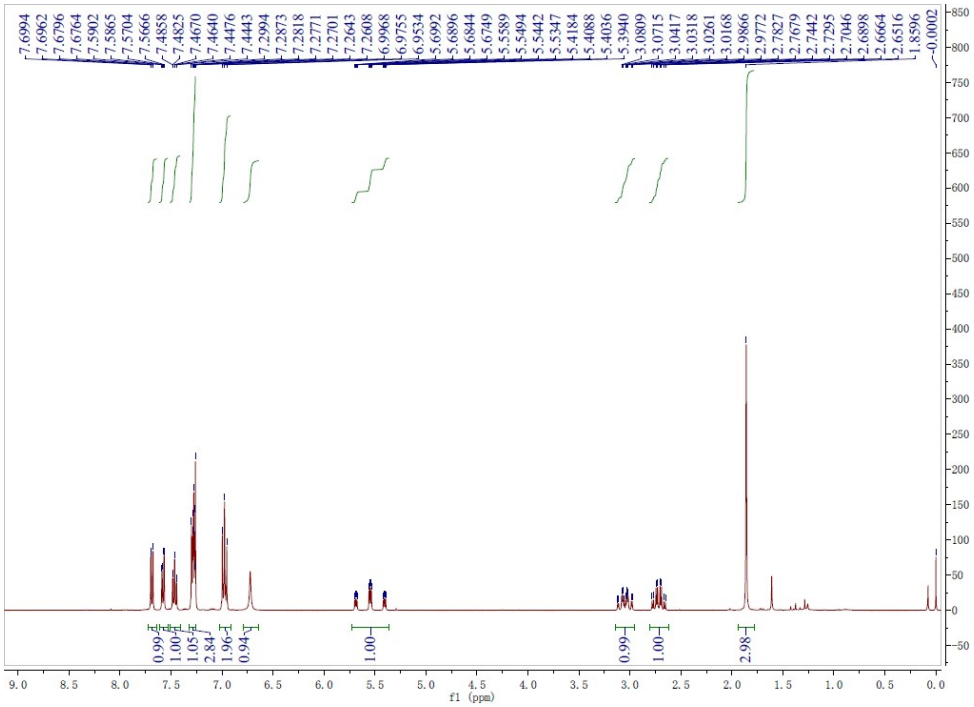
-111.6924
-112.2010
f1 (ppm)


O
CF2H
p-FPh
N
H
Me
Br

3g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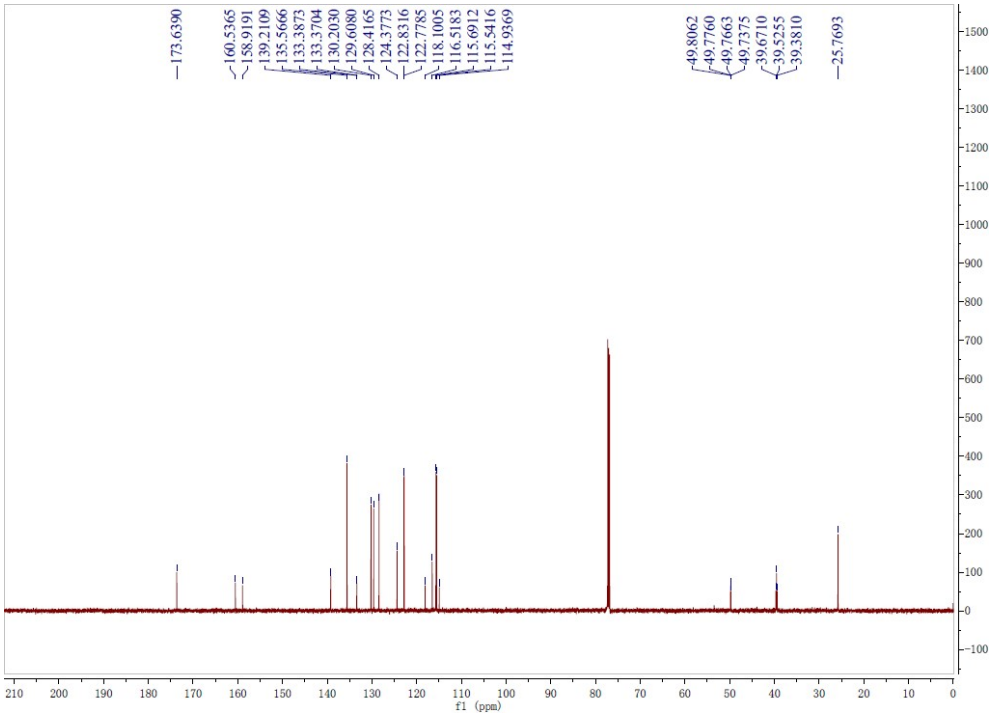
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124.3773
122.8316
122.7785
118.1005
116.5183
115.6912
115.5416
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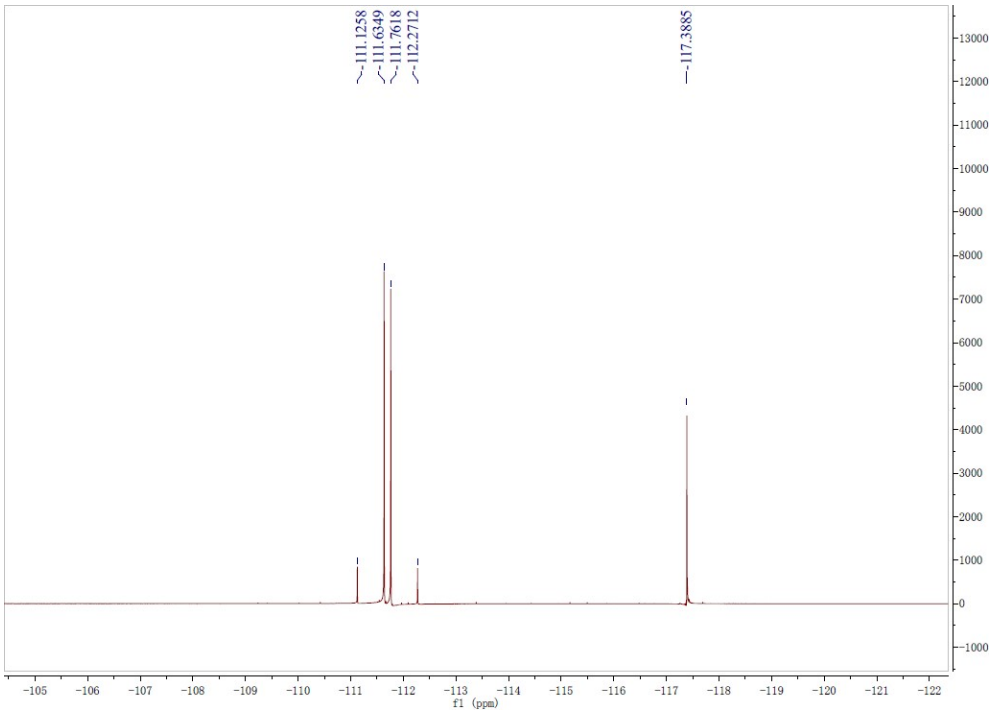
49.8062
49.7760
49.7663
49.7375
39.6710
39.5255
39.3810
25.7693
f1 (ppm)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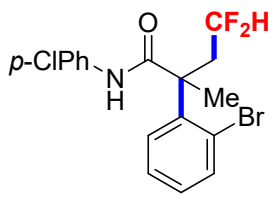
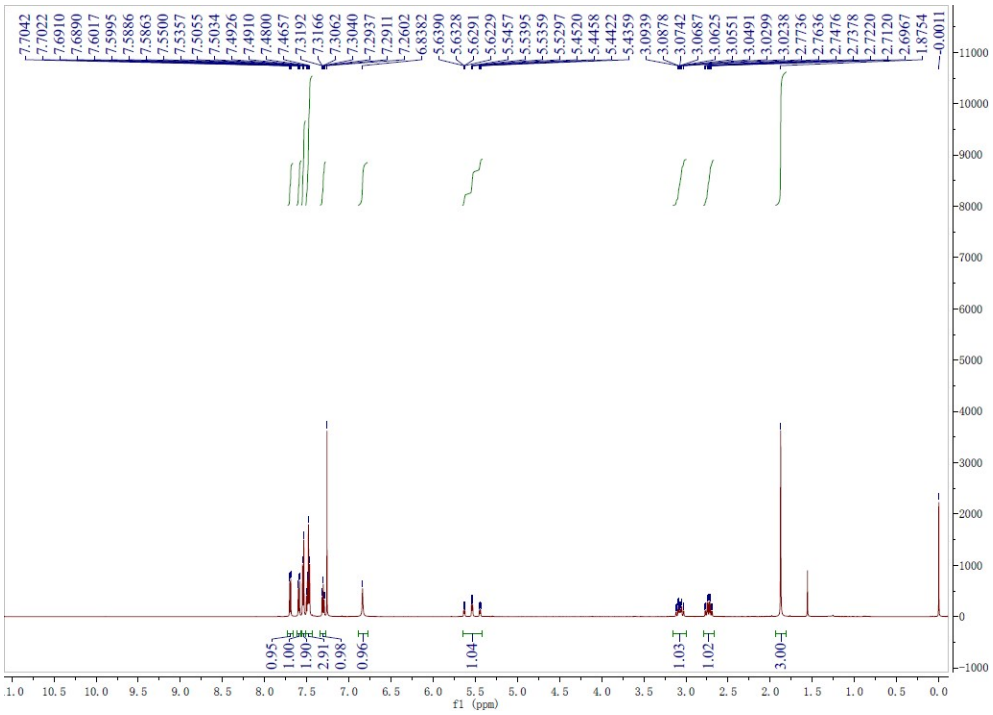
f1 (ppm)


O
CF2H
p-ClPh
N
H
Me
Br

3h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7.5034
7.4926
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7.4800
7.4657
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7.3166
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7.3040
7.2937
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3.0625
3.0551
3.0491
3.0299
3.0238
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2.7378
2.7220
2.7120
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1.8754
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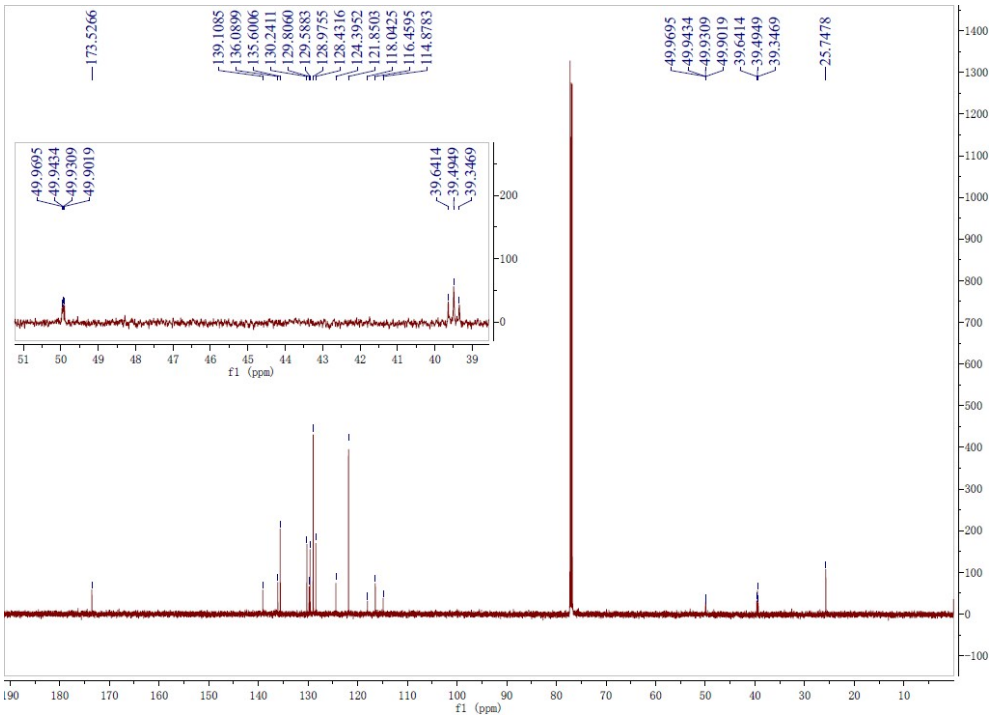
0.98
0.96
1.04
1.03
1.02
3.00
f1 (ppm)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118.0425
116.4595
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39.6414
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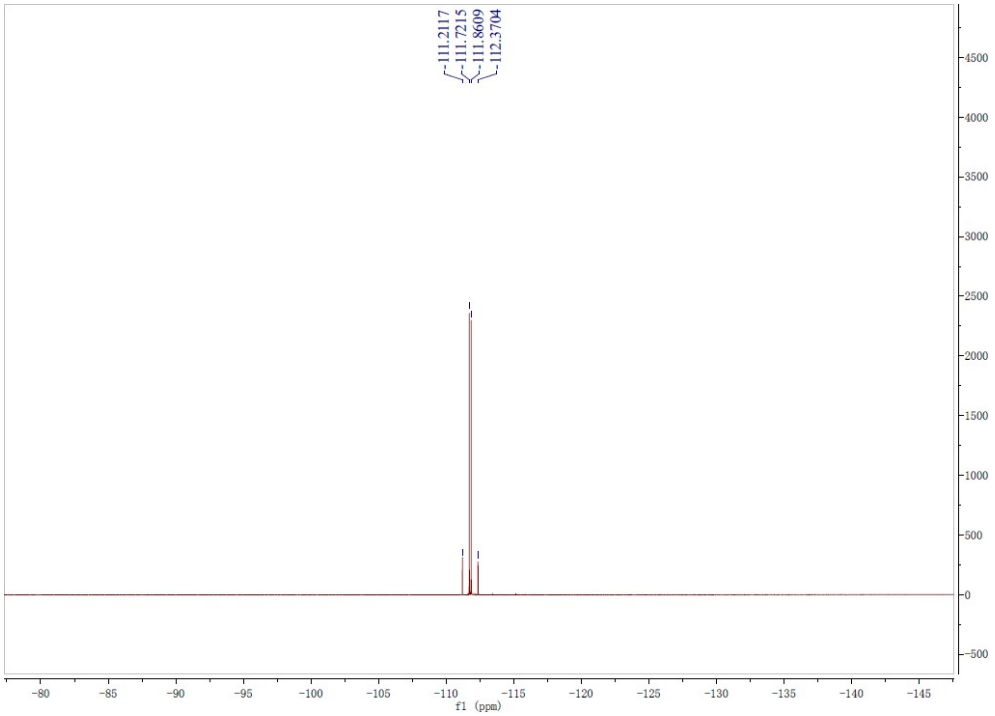
25.7478
f1 (ppm)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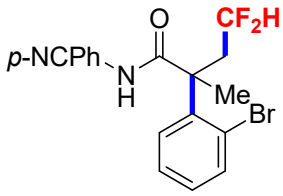
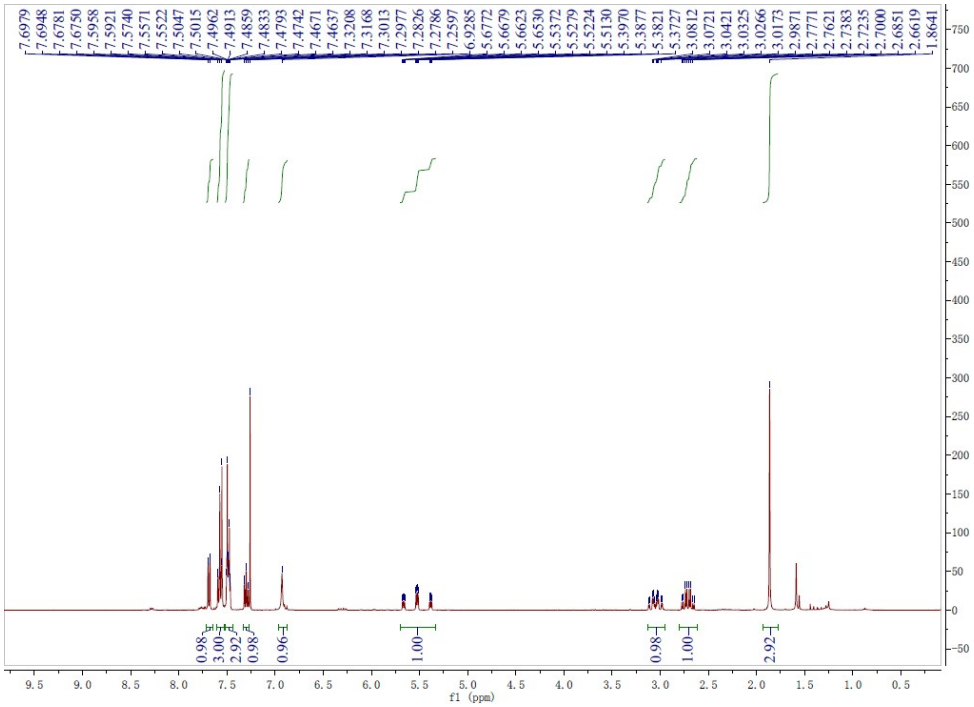

O
CF2H
p-NCPh
N
H
Me
Br

3i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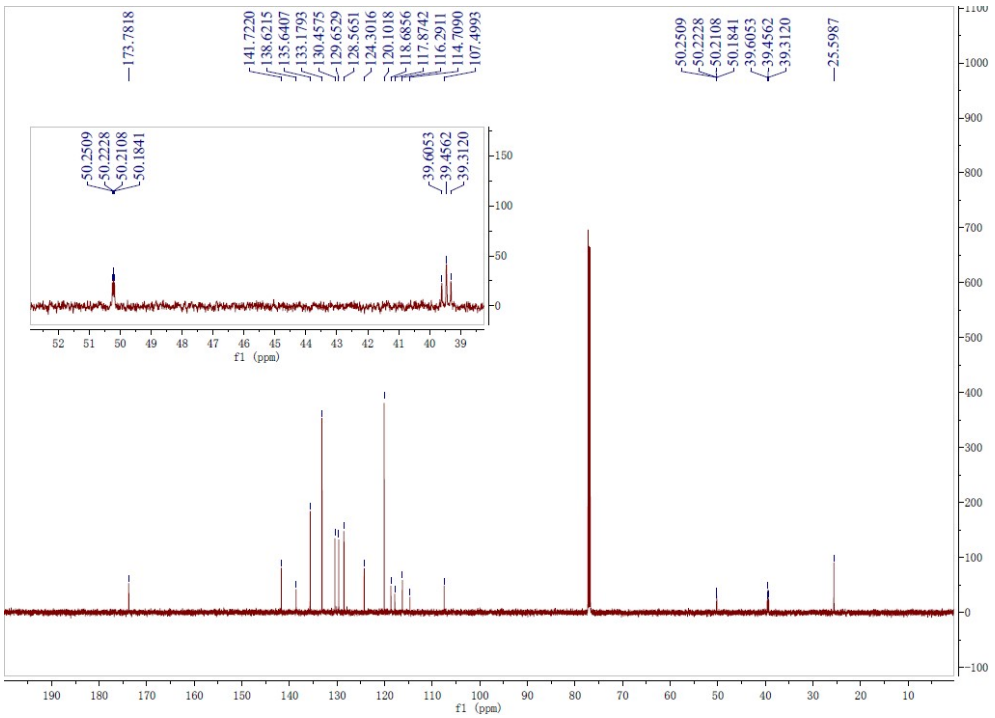
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117.8742
116.2911
114.7090
107.4993
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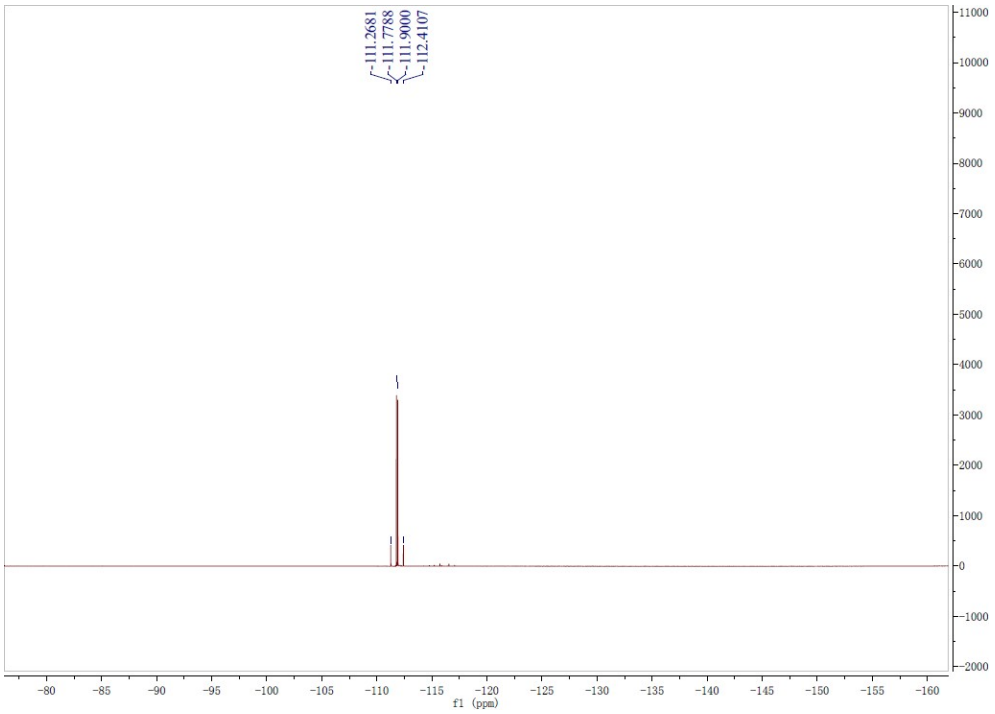
50.2108
50.1841
39.6053
39.4562
39.3120
25.5987
f1 (ppm)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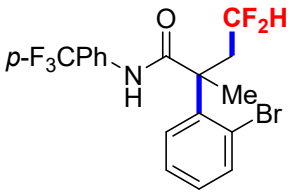
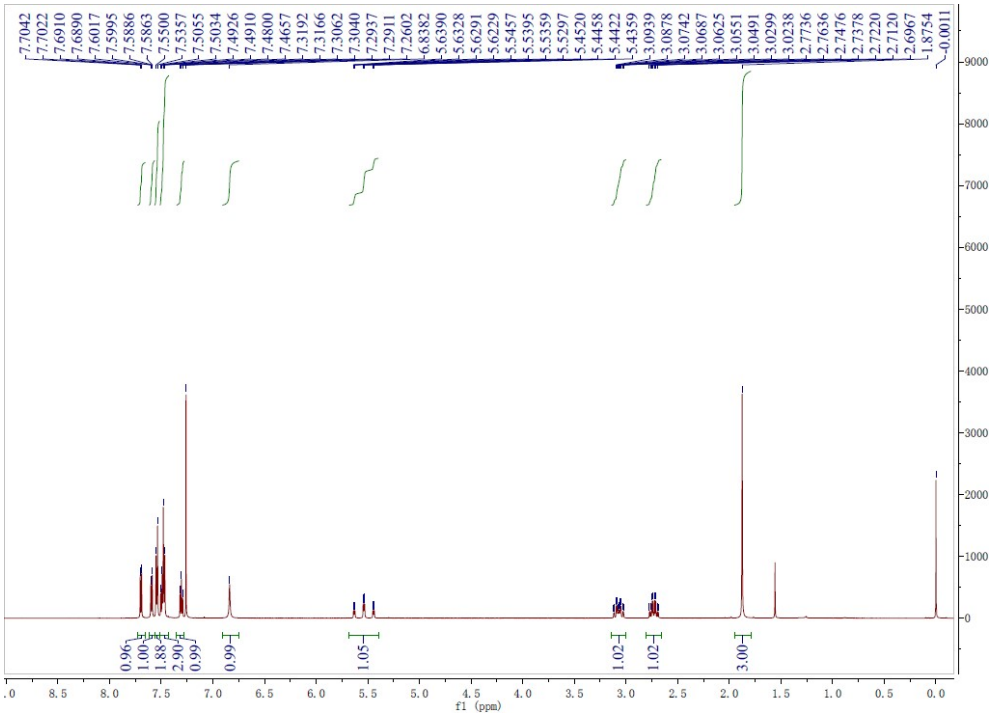

O
CF2H
p-F3CPh
N
H
Me
Br

3j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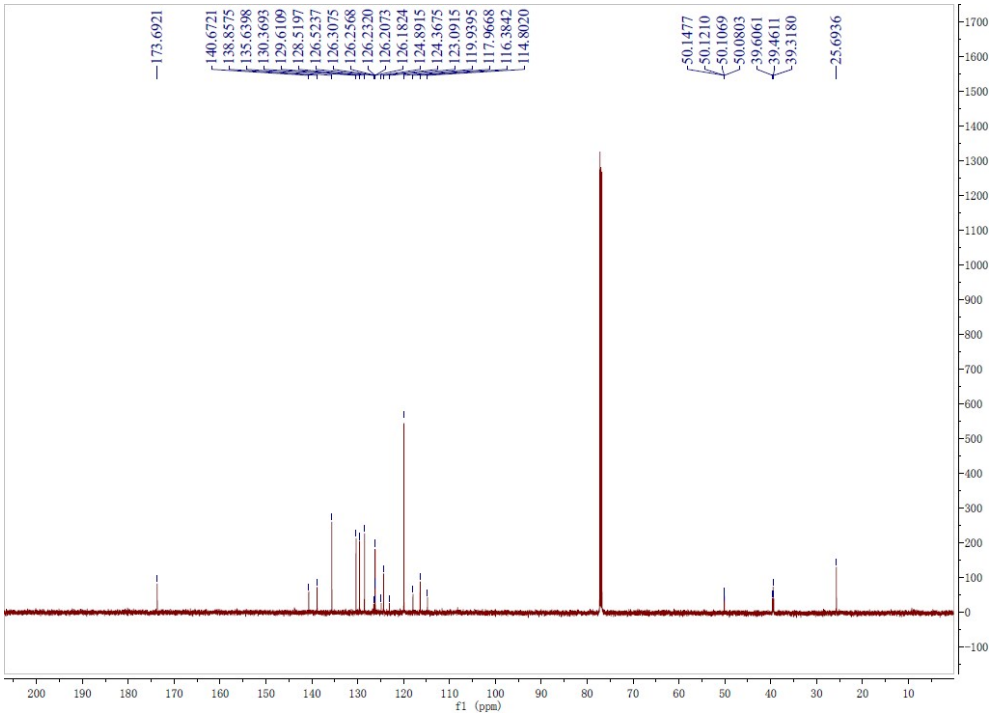
1.02
1.02
3.00
f1 (ppm)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126.2320
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126.1824
124.8915
124.3675
123.0915
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117.9668
116.3842
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50.1210
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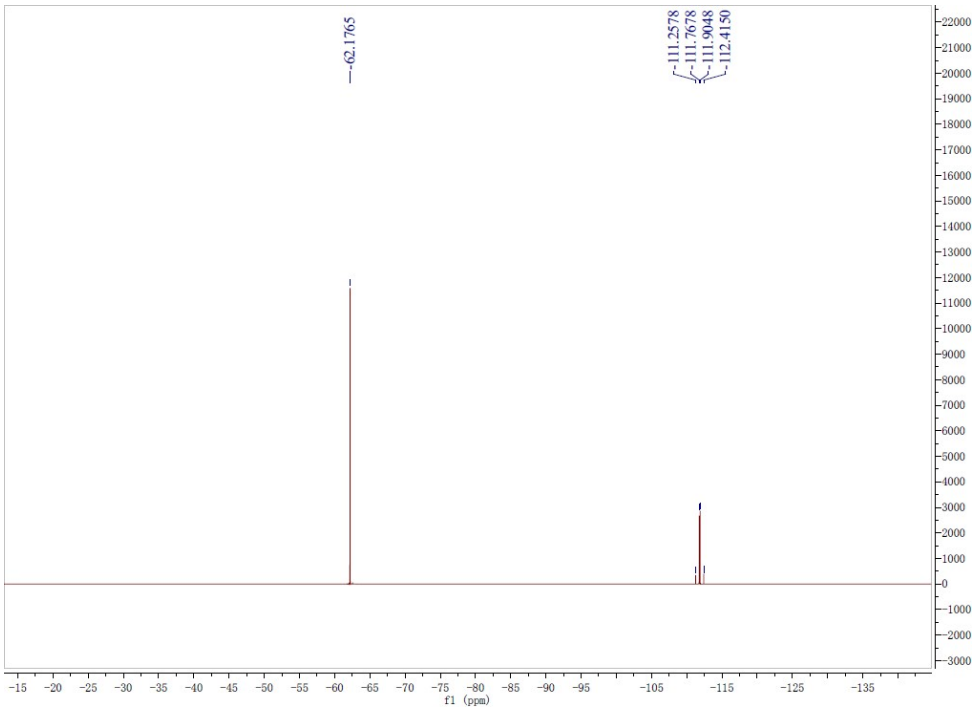
39.4611
39.3180
25.6936
f1 (ppm)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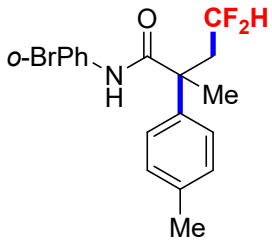
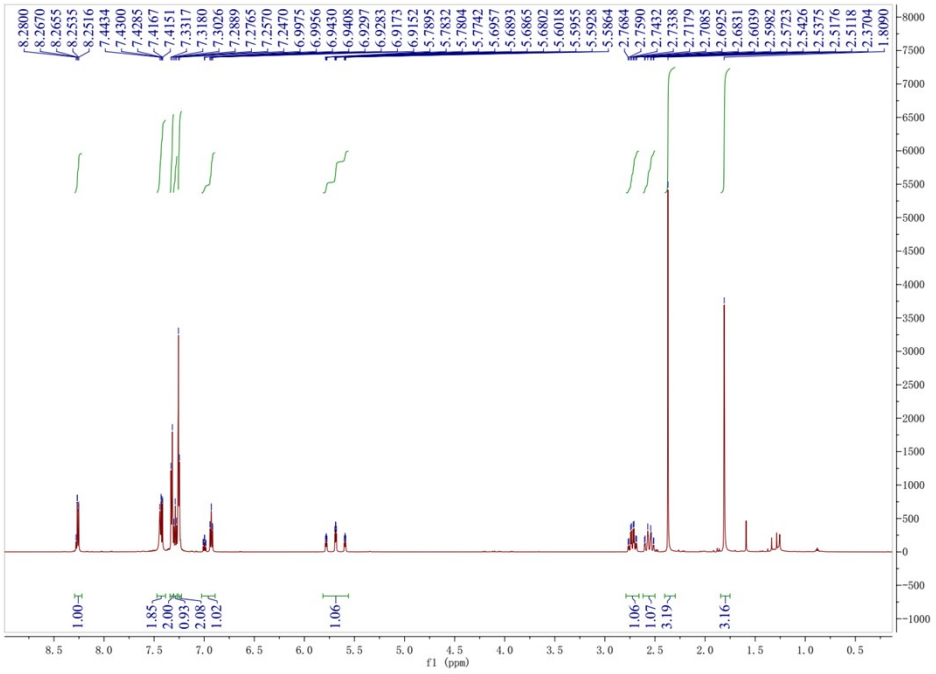
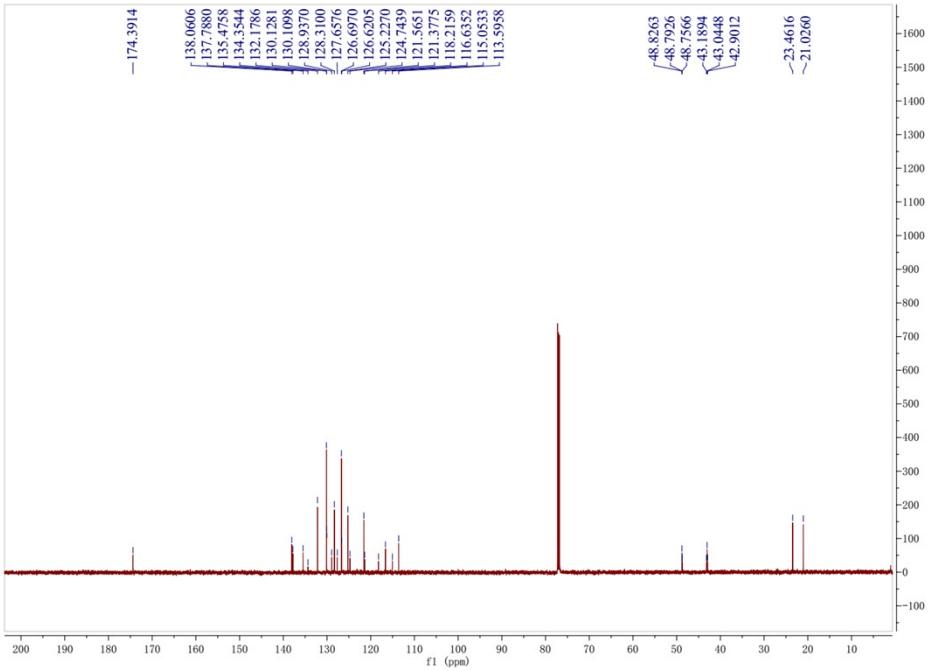
f1 (ppm)


O
CF2H
o-BrPh
N
H
Me
Me

3k


f1 (ppm)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127.6576
126.6970
126.6205
125.2270
124.7439
121.5651
121.3775
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116.6352
115.0533
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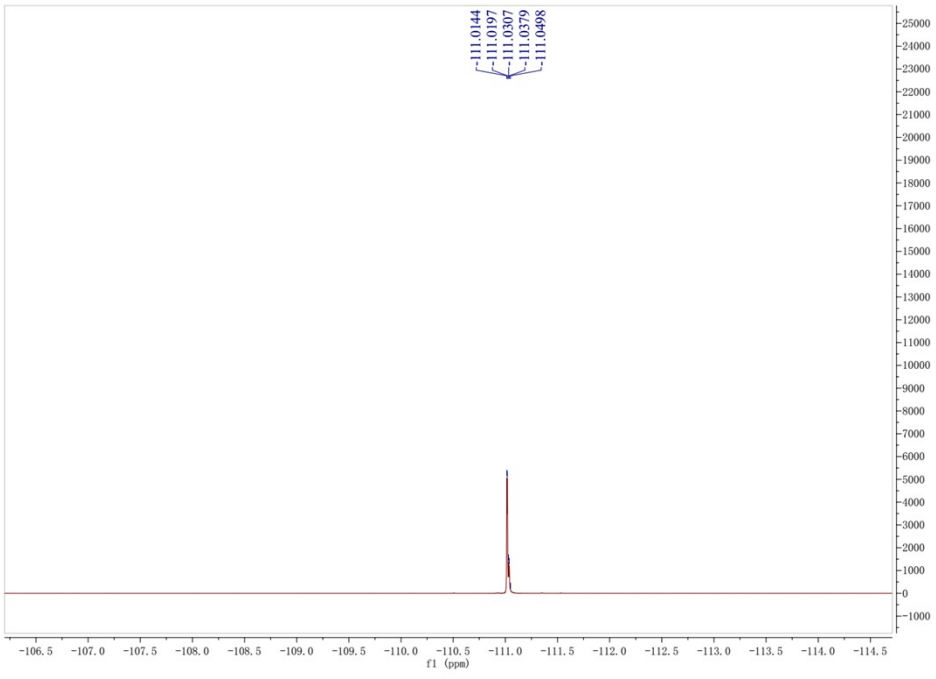
48.8263
48.7926
48.7566
43.1894
43.0448
42.9012
23.4616
21.0260
f1 (ppm)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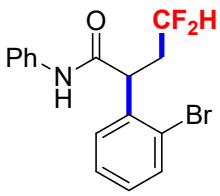
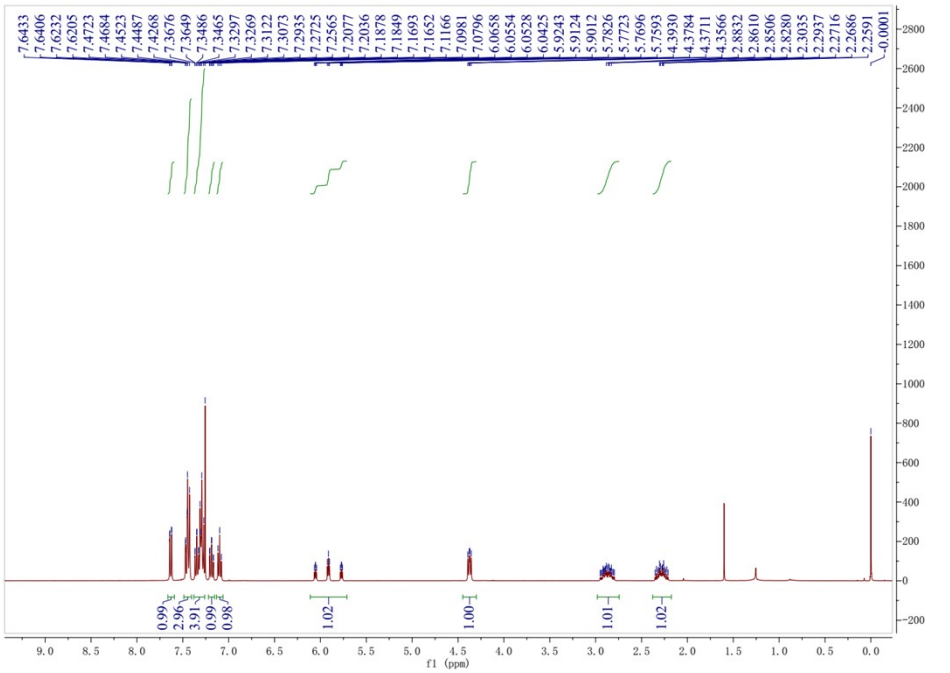

O
CF2H
Ph
N
H
Br

3l


7.6433
7.6406
7.6232
7.6205
7.4723
7.4684
7.4523
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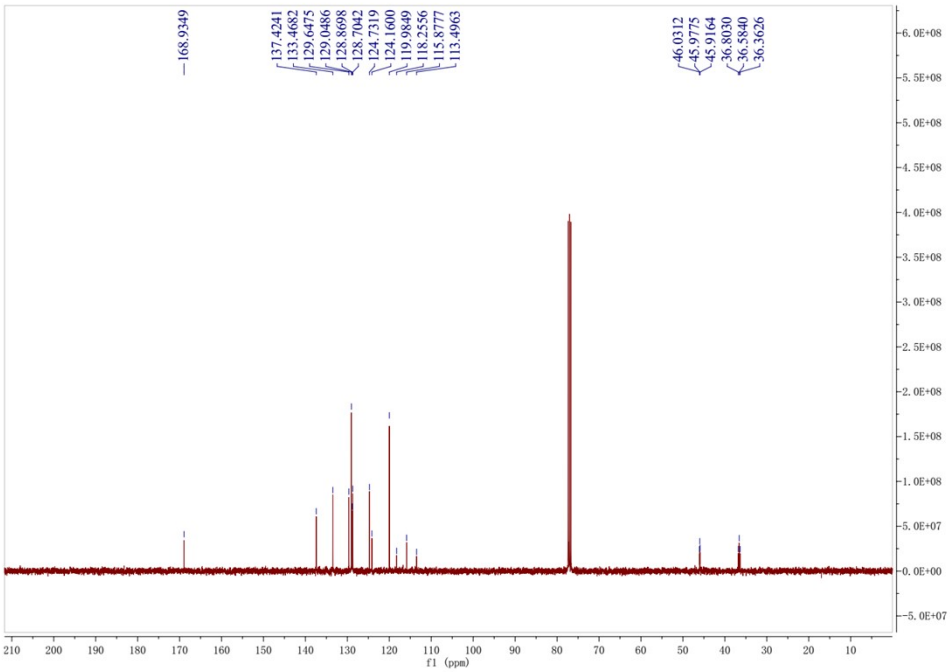
7.4268
7.3676
7.3649
7.3486
7.3465
7.3297
7.3269
7.3122
7.3073
7.2935
7.2725
7.2565
7.2077
7.2036
7.1878
7.1849
7.1693
7.1652
7.1166
7.0981
7.0796
6.0658
6.0554
6.0528
6.0425
5.9243
5.9124
5.9012
5.7826
5.7723
5.7696
5.7593
4.3930
4.3784
4.3711
4.3566
2.8832
2.8610
2.8506
2.8280
2.3035
2.2937
2.2716
2.2686
2.2591
-0.0001
0.99
2.96
3.91
0.99
0.98
1.02
1.00
1.01
1.02
f1 (ppm)


168.9349
137.4241
133.4682
129.6475
129.0486
128.8698
128.7042
124.7319
124.1600
119.9849
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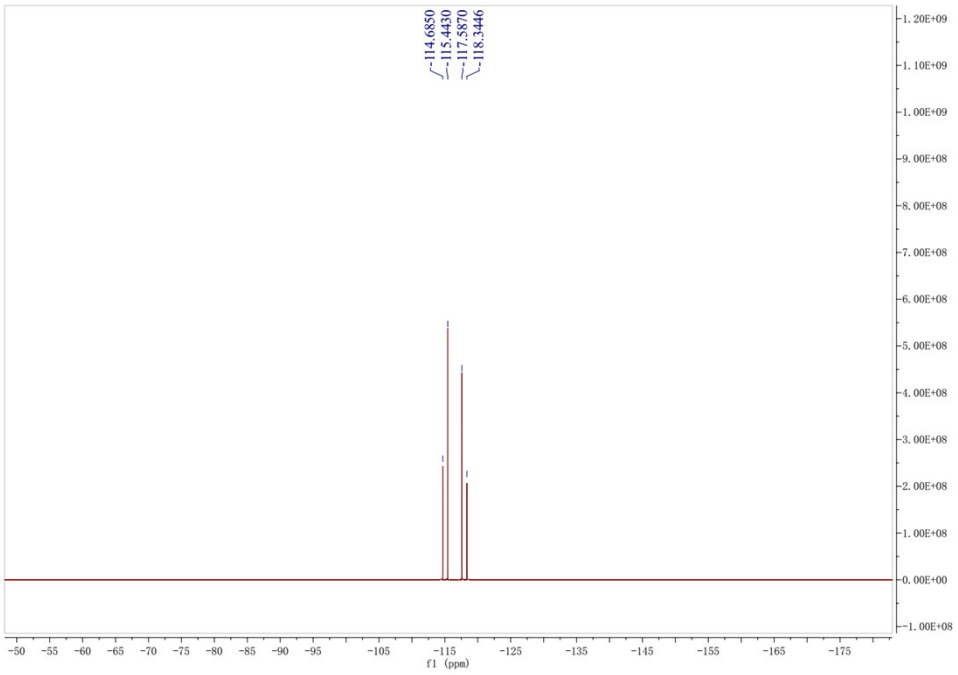
115.8777
113.4963
46.0312
45.9775
45.9164
36.8030
36.5840
36.3626
f1 (ppm)


-114.6850
-115.4430
-117.5870
-118.3446
1.20E+09
1.10E+09
1.00E+09
9.00E+08
8.00E+08
7.00E+08
6.00E+08
5.00E+08
4.00E+08
3.00E+08
2.00E+08
1.00E+08
0.00E+00
-1.00E+08
-50 -55 -60 -65 -70 -75 -80 -85 -90 -95 -105 -115 -125 -135 -145 -155 -165 -175
f1 (ppm)