Supporting Information

for

Visible-Light-Promoted Selective *O*-Alkylation of 2-Pyridones with α-Aryldiazoacetates

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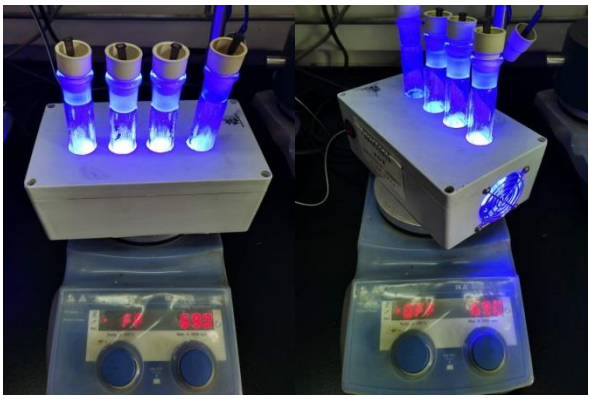
1. General Information

^{1}H NMR, ^{13}C NMR and ^{19}F NMR spectra were recorded on a Varian Mercury-400 Plus or Agilent Technologies DD2 (600 MHz) spectrometers in $CDCl_3$. Chemical shifts (δ) for NMR were quoted in ppm relative to the solvent peak (7.26 ppm for ^{1}H and 77.0 ppm for ^{13}C in $CDCl_3$), Coupling constants *J* are recorded in Hz. High-resolution mass spectra (HRMS) were reported from the Thermo Orbitrap Elite or Bruker Daltonics APEXII 47e FT-ICR instrument with an ESI source. UV-Visible absorption spectra were recorded on an Agilent 8453 spectrophotometer.

Anhydrous acetonitrile (MeCN) was distilled from phosphorus pentoxide (P_2O_5) to use. Anhydrous tetrahydrofuran (THF) was distilled from sodium and benzophenone to use. Anhydrous dichloromethane (DCM) was distilled from calcium hydride (CaH_2) to use. α-Aryldiazoacetates were prepared according to literature reported procedure[1] that will be described in detail later. The other materials obtained from commercial suppliers were used directly without further purification.

Reactions were monitored by thin layer chromatography (TLC) using pre-coated silica gel plates (GF254). Flash column chromatography was performed on silica gel 60 (particle size 200–400 mesh ASTM, purchased from Liangchen, China) and eluted with petroleum ether /ethylacetate. The LED blue lamps employed in this work were bought from Wuhan Jiushang Technology Co. LTD: λ_{max} = 453 nm (415–510 nm); Power (6 W). Features of Reaction Vessel: 10 mL Pyrex glass tube. The distance from the light source to the irradiation vessel is about 1.5 cm. The temperature is controlled by a fan (**Figure S1**).



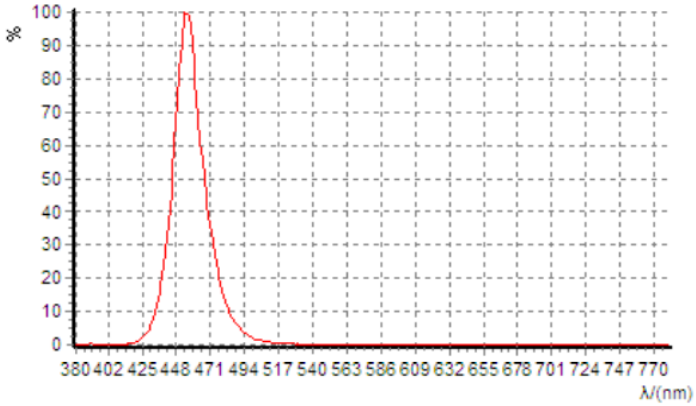


Figure S1. Setup of Photocatalytic Reaction and Light Characteristics

2. UV-Vis Absorption Spectra

The UV-visible absorption spectra of methyl α-phenyldiazoacetate (**1**), 2-pyridone (**2**) and their mixture were measured in dichloromethane, showing that **1** has significant absorption in visible light region but **2** does not, and there is no ground state interaction between them (**Figure S2**).

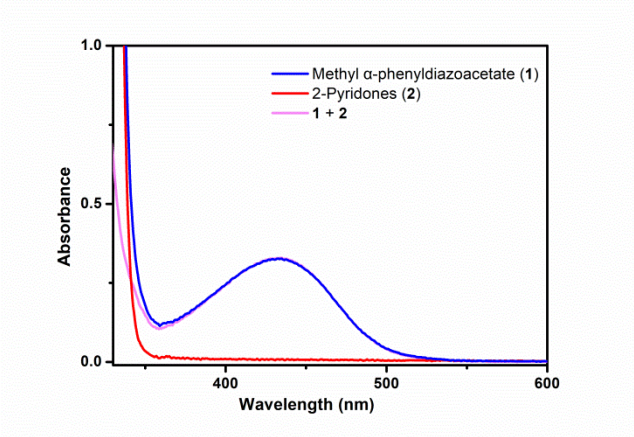


Figure S2. UV-Vis absorption spectra in CH_2Cl_2 (0.05 M).

3. NMR Studies Whether There Are Hydrogen-Bond Interactions

We measured ^{1}H and ^{13}C NMR spectra of a 0.1 M solution of a 1:1 mixture of **1** and **2** in $CDCl_3$. No significant chemical shift perturbation for both the active hydrogen of **2** and the carbonyl carbon of **1** referring to the ^{1}H NMR spectrum of a 0.1 M solution of **2** in $CDCl_3$ and the ^{13}C NMR spectrum of a 0.1 M solution of **1** in $CDCl_3$ (**Figure S3**). These results can rule out the ground-state hydrogen-bond interaction between **1** and **2**.

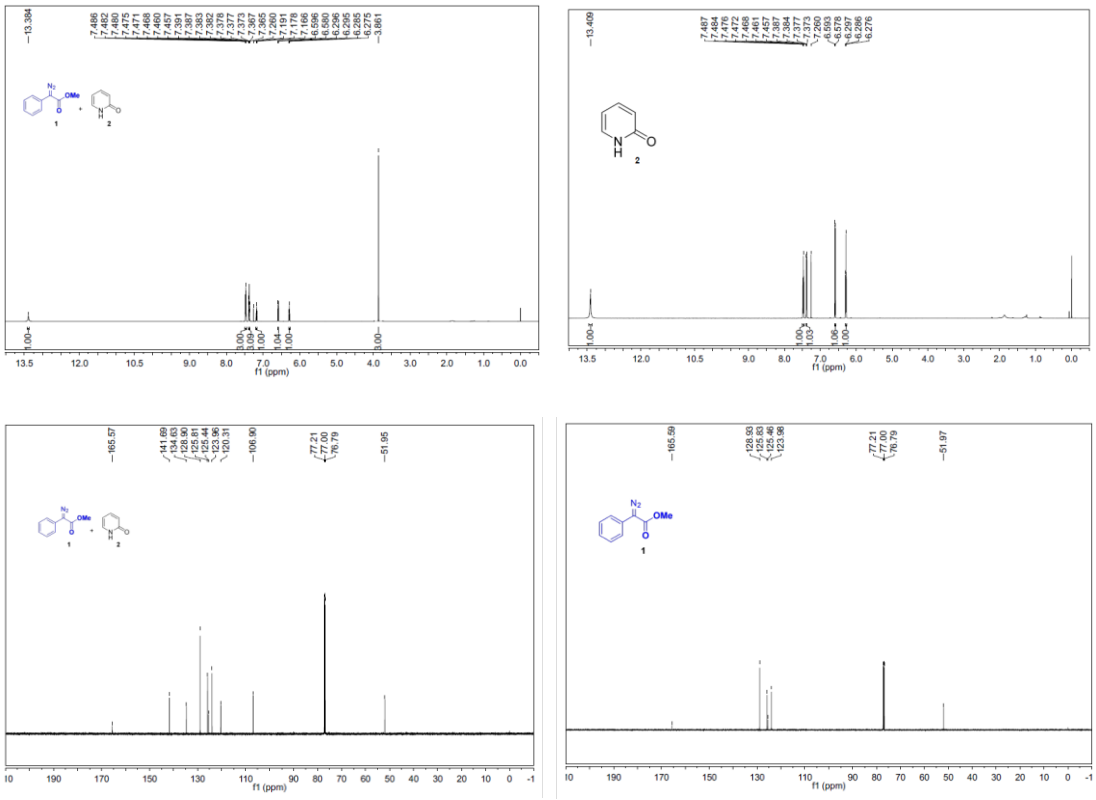
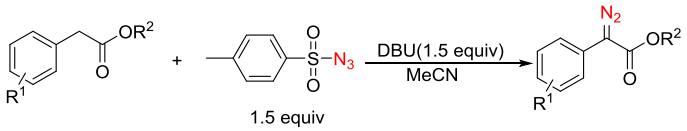


Figure S3. NMR studies in $CDCl_3$ (0.1 M).

4. General Procedure for Preparation of Substrates

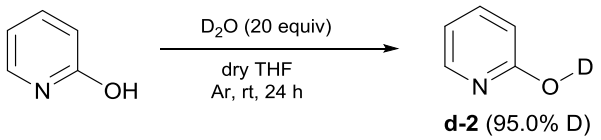
1) General procedure for preparation of α-aryldiazoesters – GP 1[1]



To a mixture of ester (10 mmol) and tosyl azide (2.96 g, 15 mmol, 1.5 equiv) in anhydrous MeCN (15 mL), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU) (2.28 g, 15 mmol, 1.5 equiv) was added. The reaction mixture was stirred at room temperature for overnight. Upon complete consumption of the starting materials, the reaction mixture was quenched with saturated aqueous solution of NH_4Cl (5 mL), extracted with CH_2Cl_2 (3 × 30 mL), washed with brine (3 × 10 mL), dried over $MgSO_4$, and concentrated under reduced pressure. The residue was purified by flash chromatography (hexane/EtOAc, 9:1) to afford the α-diazoester.

All the α-aryldiazoacetates used in this work are reported products.[1-10]

2) General procedure for preparation of deuterated 2-hydroxypyridine

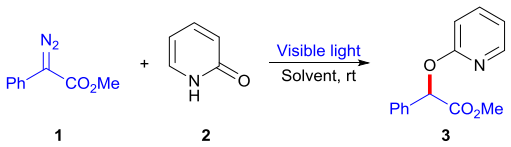


d-2 (95.0% D)

2-Hydroxypyridine (0.29 g, 3 mmol), deuterium oxide (1.20 g, 60 mmol, 20 equiv, 99.9% D) and dry THF (5 mL) were added into a 25 mL Pyrex glass tube. Stirred at room temperature under an argon atmosphere for 24 hours, drain the solvent to obtain deuterated 2-hydroxypyridine **d-2** (95.0% D).

5. Optimization of Reaction Conditions

Table S1. Optimization of the reaction conditions[a]



1 **2** **3**

Entry	Light source	Solvent	Ratio of **1** to **2**	Yield[b] (%)
1	3 W blue LED	DCM	1:2	35
2	**6 W blue LED**	**DCM**	**1:2**	**72**
3	6 W green LED	DCM	1:2	37
4	6 W white LED	DCM	1:2	45
5	15 W blue LED	DCM	1:2	44
6	15 W green LED	DCM	1:2	34
7	15 W white LED	DCM	1:2	38
8	32 W CFL	DCM	1:2	35
9	In dark	DCM	1:2	0
10	6 W blue LED	$CHCl_3$	1:2	30
11	6 W blue LED	DCE	1:2	26
12	6 W blue LED	MeCN	1:2	24
13	6 W blue LED	Hexane	1:2	38
14	6 W blue LED	Toluene	1:2	45
15	6 W blue LED	1,4-Dioxane	1:2	trace

16	6 W blue LED	THF	1:2	trace
17	6 W blue LED	Acetone	1:2	20
18	6 W blue LED	EtOAc	1:2	13
19	6 W blue LED	MeOH	1:2	0
20	6 W blue LED	EtOH	1:2	0
21	6 W blue LED	DCM	1:1	40
22	6 W blue LED	DCM	1:1.5	53
23	6 W blue LED	DCM	1:2	72
24	6 W blue LED	DCM	1:2.5	66
25	6 W blue LED	DCM	1.5:1	60
26	6 W blue LED	DCM	2:1	69
27	6 W blue LED	DCM	3:1	63

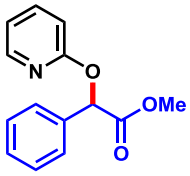
[a]Reaction conditions: **1** (0.3 mmol), **2** (0.6 mmol, 2 equiv), solvent (3 mL), under air (use the small needle of the syringe to keep it connected to air), rt, 6 h. [b]Isolated yields. N.R. = No reaction occurred.

6. General Procedure for the *O*-Alkylation of 2-Pyridones

α-Diazoacetate (0.3 mmol), 2-pyridone (0.6 mmol, 2.0 equiv) and DCM (3 mL) were added into a 10 mL Pyrex glass tube. The reaction mixture was continually stirred under 6 W blue LED irradiation at room temperature until α-diazoacetate was consumed completely (monitored by TLC). The reaction solution was quenched with saturated aq. NaCl (3 mL) and extracted with EtOAc (3 × 5 mL). The combined organic phase was dried over anhydrous Na_2SO_4, filtrated and concentrated under reduced pressure. The crude product was purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product.

7. Characterization Data of Products

1) Methyl 2-phenyl-2-(pyridin-2-yloxy)acetate (3)[11]



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **3**.

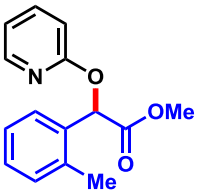
Colorless oil; yield: 52.5 mg (72%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13 (dd, *J* = 5.1, 0.9 Hz, 1H), 7.63–7.60 (m, 3H), 7.43–7.38 (m, 3H), 6.95–6.90 (m, 2H), 6.25 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.8, 162.3, 146.5, 138.8, 135.1, 128.9, 128.6, 127.6, 117.5, 111.3, 75.5, 52.3.

HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{14}H_{14}NO_3^+$: 244.0968; found: 244.0971.

2) Methyl 2-(pyridin-2-yloxy)-2-(*o*-tolyl)acetate (4)[12]



Prepared according to the general procedure from methyl 2-diazo-2-(*o*-tolyl)acetate (57.1 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **4**.

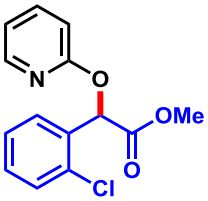
Colorless oil; yield: 53.3 mg (69%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.14 (d, *J* = 5.4 Hz, 1H), 7.61–7.58 (m, 2H), 7.29–7.22 (m, 3H), 6.90 (t, *J* = 6.3 Hz, 2H), 6.57 (s, 1H), 3.73 (s, 3H), 2.53 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 171.0, 162.5, 146.6, 138.8, 137.0, 133.8, 130.7, 128.8, 128.0, 126.3, 117.5, 111.3, 72.5, 52.2, 19.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{16}NO_3^+$: 258.1125; found: 258.1128.

3) Methyl 2-(2-chlorophenyl)-2-(pyridin-2-yloxy)acetate (5)



Prepared according to the general procedure from methyl 2-(2-chlorophenyl)-2-diazoacetate (63.2 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on

silica gel (PE : EtOAc = 12:1) to afford the pure product **5**.

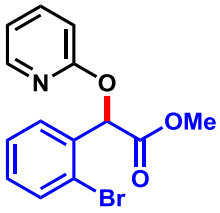
Colorless oil; yield: 66.6 mg (80%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.15–8.13 (m, 1H), 7.67–7.65 (m, 1H), 7.62–7.59 (m, 1H), 7.45–7.43 (m, 1H), 7.33–7.30 (m, 2H), 6.92–6.89 (m, 2H), 6.81 (s, 1H), 3.75 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.3, 162.1, 146.6, 138.9, 134.1, 133.3, 130.1, 129.8, 129.5, 127.1, 117.7, 111.1, 71.9, 52.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}ClNO_3^+$: 278.0578; found: 278.0582.

4) Methyl 2-(2-bromophenyl)-2-(pyridin-2-yloxy)acetate (6)[12]



Prepared according to the general procedure from methyl 2-(2-bromophenyl)-2-diazoacetate (76.5 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **6**.

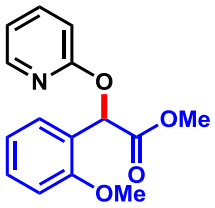
Colorless oil; yield: 76.4 mg (79%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.15–8.13 (m, 1H), 7.65–7.59 (m, 3H), 7.38–7.35 (m, 1H), 7.25–7.22 (m, 1H), 6.93–6.88 (m, 2H), 6.78 (s, 1H), 3.75 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.3, 162.1, 146.6, 138.9, 135.0, 133.1, 130.4, 129.6, 127.8, 124.3, 117.7, 111.1, 74.3, 52.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}BrNO_3^+$: 322.0073; found: 322.0074.

5) Methyl 2-(2-methoxyphenyl)-2-(pyridin-2-yloxy)acetate (7)



Prepared according to the general procedure from methyl 2-diazo-2-(2-methoxyphenyl)acetate (61.2 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **7**.

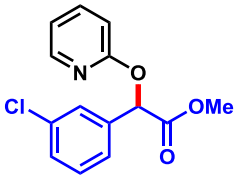
Colorless oil; yield: 58.2 mg (71%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.15–8.14 (m, 1H), 7.60–7.55 (m, 2H), 7.37–7.34 (m, 1H), 7.01 (td, *J* = 7.4, 0.8 Hz, 1H), 6.95 (d, *J* = 8.4 Hz, 1H), 6.91–6.87 (m, 2H), 6.77 (s, 1H), 3.87 (s, 3H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 171.2, 162.6, 157.3, 146.6, 138.7, 130.3, 129.3, 123.8, 120.8, 117.3, 111.3, 111.2, 69.4, 55.8, 52.2.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{16}NO_4^+$: 274.1074; found: 274.1076.

6) Methyl 2-(3-chlorophenyl)-2-(pyridin-2-yloxy)acetate (8)



Prepared according to the general procedure from methyl 2-(3-chlorophenyl)-2-diazoacetate (63.2 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **8**.

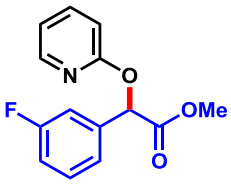
Colorless oil; yield: 67.5 mg (81%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12–8.11 (m, 1H), 7.65–7.62 (m, 2H), 7.50 (dt, *J* = 6.8, 1.8 Hz, 1H), 7.34 (dd, *J* = 5.4, 3.7 Hz, 2H), 6.95–6.91 (m, 2H), 6.22 (s, 1H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.3, 162.0, 146.6, 139.0, 137.0, 134.6, 129.9, 129.0, 127.7, 125.7, 117.8, 111.3, 74.7, 52.5.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}ClNO_3^+$: 278.0578; found: 278.0582.

7) Methyl 2-(3-fluorophenyl)-2-(pyridin-2-yloxy)acetate (9)



Prepared according to the general procedure from methyl 2-diazo-2-(3-fluorophenyl)acetate (58.3 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **9**.

Light yellow oil; yield: 58 mg (74%).

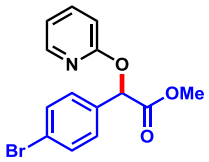
^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13–8.11 (m, 1H), 7.64–7.61(m, 1H), 7.40–7.35 (m, 3H), 7.09–7.05 (m, 1H), 6.96–6.90 (m, 2H), 6.24 (s, 1H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.3, 163.6, 162.0 (d, *J* = 5.25 Hz), 146.6, 139.0, 137.4 (d, *J* = 7.55 Hz), 130.2(d, *J* = 8.15 Hz), 123.2 (d, *J* = 3.0 Hz), 117.7, 115.8 (d, *J* = 21.0 Hz) 114.6 (d, *J* = 22.6 Hz), 111.2, 74.8, 52.5.

^{19}F NMR (376 MHz, $CDCl_3$): δ = -117.86—-117.92 (m).

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}FNO_3^+$: 262.0874; found: 262.0875.

8) Methyl 2-(4-bromophenyl)-2-(pyridin-2-yloxy)acetate (10)



Prepared according to the general procedure from methyl 2-(4-bromophenyl)-2-diazoacetate (76.5 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **10**.

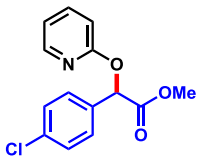
Colorless oil; yield: 79.3 mg (82%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.14–8.09 (m, 1H), 7.64–7.61 (m, 1H), 7.54–7.53 (m, 2H), 7.50–7.49 (m, 2H), 6.92 (dd, *J* = 10.5, 4.5 Hz, 2H), 6.20 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.4, 162.0, 146.6, 139.0, 134.2, 131.9, 129.2, 123.0, 117.7, 111.2, 74.8, 52.5.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}BrNO_3^+$: 322.0073; found: 322.0074.

9) Methyl 2-(4-chlorophenyl)-2-(pyridin-2-yloxy)acetate (11)



Prepared according to the general procedure from methyl 2-(4-chlorophenyl)-2-diazoacetate (63.2 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **11**.

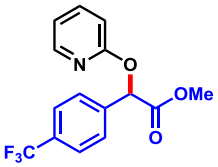
Colorless oil; yield: 70 mg (84%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13–8.10 (m, 1H), 7.63–7.60 (m, 1H), 7.56 (d, *J* = 8.4 Hz, 2H), 7.38 (d, *J* = 8.4 Hz, 2H), 6.93–6.90 (m, 2H), 6.24 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.4, 162.1, 146.6, 139.0, 134.9, 133.8, 128.9, 128.8, 117.7, 111.2, 74.8, 52.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}ClNO_3^+$: 278.0578; found: 278.0583.

10) Methyl 2-(pyridin-2-yloxy)-2-(4-(trifluoromethyl)phenyl)acetate (12)



Prepared according to the general procedure from methyl 2-diazo-2-(4-(trifluoromethyl)phenyl)acetate (73.3 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **12**.

Colorless oil; yield: 71.0 mg (76%).

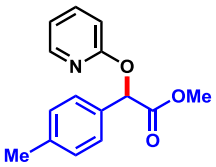
^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (d, *J* = 4.8 Hz, 1H), 7.76 (d, *J* = 8.4 Hz, 2H), 7.67–7.62 (m, 3H), 6.97–6.90 (m, 2H), 6.34 (s, 1H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.1, 162.0, 146.6, 139.2, 139.0, 130.9, 128.4, 127.9, 125.6 (q, *J* = 3.75 Hz), 124.9, 123.1, 117.8, 111.2, 74.8, 52.5.

^{19}F NMR (376 MHz, $CDCl_3$): δ = -63.12 (s).

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{13}F_3NO_3^+$: 312.0842; found: 312.0843.

11) Methyl 2-(pyridin-2-yloxy)-2-(*p*-tolyl)acetate (13)



Prepared according to the general procedure from methyl 2-diazo-2-(p-tolyl)acetate (57.1 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **13**.

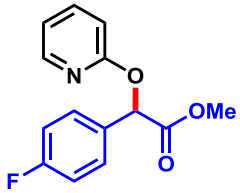
Colorless oil; yield: 47.9 mg (62%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13–8.12 (m, 1H), 7.62–7.59 (m, 1H), 7.50 (d, *J* = 7.8 Hz, 2H), 7.22 (d, *J* = 7.8 Hz, 2H), 6.93–6.89 (m, 2H), 6.20 (s, 1H), 3.72 (s, 3H), 2.37 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.9, 162.4, 146.6, 138.8, 132.1, 129.4, 127.6, 117.5, 111.3, 75.4, 52.3, 21.2.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{16}NO_3^+$: 258.1125; found: 258.1127.

12) Methyl 2-(4-fluorophenyl)-2-(pyridin-2-yloxy)acetate (14)



Prepared according to the general procedure from methyl 2-diazo-2-(4-fluorophenyl)acetate (58.3 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **14**.

Light yellow oil; yield: 61.1 mg (78%).

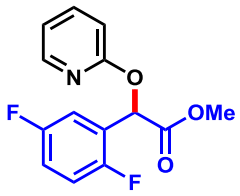
^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (dd, *J* = 4.8, 0.6 Hz, 1H), 7.63–7.58 (m, 3H), 7.09 (t, *J* = 8.7 Hz, 2H), 6.92 (dd, *J* = 10.5, 4.5 Hz, 2H), 6.22 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.7, 163.8, 162.2(d, *J* = 10.95 Hz), 146.6, 138.9, 131.0 (d, *J* = 3.3 Hz), 129.5 (d, *J* = 8.25 Hz), 117.7, 115.6 (d, *J* = 21.45 Hz), 111.2, 74.8, 52.4.

^{19}F NMR (376 MHz, $CDCl_3$): δ = -118.25—-118.33 (m).

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}FNO_3^+$: 262.0874; found: 262.0875.

13) Methyl 2-(2,5-difluorophenyl)-2-(pyridin-2-yloxy)acetate (15)



Prepared according to the general procedure from methyl 2-diazo-2-(2, 5-difluorophenyl)acetate (63.6 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **15**.

Light yellow oil; yield: 67 mg (80%).

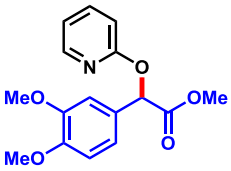
^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (d, *J* = 5.4 Hz, 1H), 7.62 (t, *J* = 7.8 Hz, 1H), 7.37–7.34 (m, 1H), 7.09–7.03 (m, 2H), 6.91 (dd, *J* = 12.3, 6.9 Hz, 2H), 6.64 (s, 1H), 3.75 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.7, 161.9, 159.5, 157.9 (d, *J* = 2.55 Hz), 155.61, 146.6, 139.0, 124.5 (dd, *J* = 16.4, 7.9 Hz), 117.0 (ddd, *J* = 44.3, 24.4, 8.5 Hz), 116.0 (d, *J* = 3.4 Hz), 115.8 (d, *J* = 3.4 Hz), 111.2, 68.5 (d, *J* = 2.8 Hz), 52.5.

^{19}F NMR (376 MHz, $CDCl_3$): δ = -118.22—-118.28 (m), -123.245—-123.34 (m).

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{12}F_2NO_3^+$: 280.0780; found: 280.0781.

14) Methyl 2-(3,4-dimethoxyphenyl)-2-(pyridin-2-yloxy)acetate (16)



Prepared according to the general procedure from methyl 2-diazo-2-(3, 4-dimethoxyphenyl)acetate (70.9 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **16**.

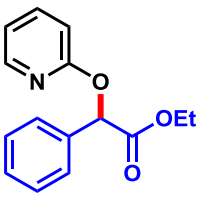
Colorless oil; yield: 53.7 mg (59%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13–8.12 (m, 1H), 7.63–7.60 (m, 1H), 7.14 (dd, *J* = 10.5, 2.1 Hz, 2H), 6.93–6.88 (m, 3H), 6.15 (s, 1H), 3.92 (s, 3H), 3.89 (s, 3H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 171.0, 162.3, 149.6, 149.2, 146.6, 138.9, 127.5, 120.5, 117.5, 111.3, 111.1, 110.6, 75.4, 56.0, 55.9, 52.4.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{16}H_{17}NaO_5^+$: 326.0999; found: 326.1002.

15) ethyl 2-phenyl-2-(pyridin-2-yloxy)acetate (17)



Prepared according to the general procedure from ethyl 2-diazo-2-phenylacetate (57.1 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **17**.

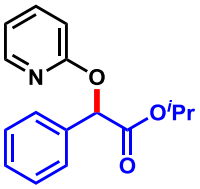
Colorless oil; yield: 57.9 mg (75%).

^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.14–8.12 (m, 1H), 7.65–7.59 (m, 3H), 7.42–7.38 (m, 3H), 6.95–6.89 (m, 2H), 6.21 (s, 1H), 4.24–4.14 (m, 2H), 1.19 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.3, 162.3, 146.5, 138.8, 135.2, 129.1, 128.8, 128.6, 127.6, 127.1, 117.5, 111.2, 75.7, 61.2, 13.9.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{16}NO_3^+$: 258.1125; found: 258.1128.

16) Isopropyl 2-phenyl-2-(pyridin-2-yloxy)acetate (18)



Prepared according to the general procedure from isopropyl 2-diazo-2-phenylacetate (61.3 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **18**.

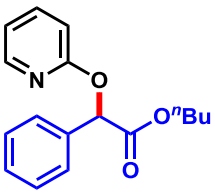
Colorless oil; yield: 62.7 mg (77%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (d, *J* = 5.4 Hz, 1H), 7.63–7.59 (m, 3H), 7.41–7.36 (m, 3H), 6.93–6.88 (m, 2H), 6.17 (s, 1H), 5.07–5.01 (m, 1H), 1.27 (d, *J* = 6.6 Hz, 3H), 1.07 (d, *J* = 6.0 Hz, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.8, 162.5, 146.4, 138.7, 135.4, 128.9, 128.7, 128.5, 128.0, 127.6, 117.4, 111.3, 76.0, 68.7, 21.6, 21.3.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{16}H_{18}NO_3^+$: 272.1281; found: 272.1285.

17) Butyl 2-phenyl-2-(pyridin-2-yloxy)acetate (19)



Prepared according to the general procedure from butyl 2-diazo-2-phenylacetate (65.5 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **19**.

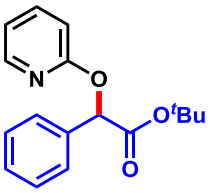
Colorless oil; yield: 66.8 mg (78%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (dd, *J* = 5.4, 1.8 Hz, 1H), 7.64–7.61 (m, 3H), 7.42–7.37 (m, 3H), 6.96–6.89 (m, 2H), 6.22 (s, 1H), 4.17–4.10 (m, 2H), 1.59–1.50 (m, 2H), 1.29–1.20 (m, 2H), 0.84 (t, *J* = 7.2 Hz, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.4, 162.4, 146.5, 138.8, 135.2, 128.8, 128.6, 127.6, 117.5, 111.2, 75.7, 65.0, 30.4, 18.8, 13.5.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{17}H_{20}NO_3^+$: 286.1438; found: 286.1436.

18) *tert*-Butyl 2-phenyl-2-(pyridin-2-yloxy)acetate (20)



Prepared according to the general procedure from *tert*-butyl 2-diazo-2-phenylacetate (65.5 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **20**.

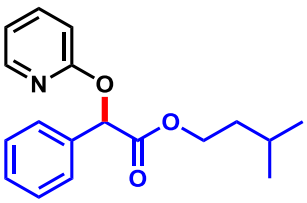
Colorless oil; yield: 55.6 mg (65%);

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.15–8.10 (m, 1H), 7.60 (dd, *J* = 10.5, 4.5 Hz, 3H), 7.42–7.35 (m, 3H), 6.93–6.88 (m, 2H), 6.09 (s, 1H), 1.38 (s, 9H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.3, 162.5, 146.4, 138.7, 135.7, 128.6, 128.5, 127.6, 117.4, 111.3, 81.7, 76.1, 27.8.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{17}H_{19}NNaO_3^+$: 308.1257; found: 308.1255.

19) Isopentyl 2-phenyl-2-(pyridin-2-yloxy)acetate (21)



Prepared according to the general procedure from isopentyl 2-diazo-2-phenylacetate (69.7 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **21**.

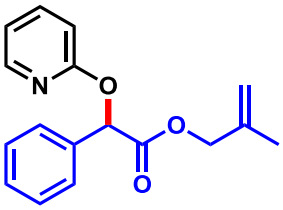
Colorless oil; yield: 62.9 mg (70%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13–8.11 (m, 1H), 7.64–7.60 (m, 3H), 7.42–7.36 (m, 3H), 6.94–6.89 (m, 2H), 6.21 (s, 1H), 4.20–4.13 (m, 2H), 1.55–1.42 (m, 3H), 0.83 (dd, *J* = 18.6, 6.6 Hz, 6H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.4, 162.4, 146.5, 138.8, 135.2, 128.8, 128.6, 127.6, 117.5, 111.2, 75.7, 63.8, 37.1, 24.8, 22.3, 22.2.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{18}H_{22}NO_3^+$: 300.1594; found: 300.1597.

20) 2-Methylallyl 2-phenyl-2-(pyridin-2-yloxy)acetate (22)



Prepared according to the general procedure from 2-methylallyl 2-diazo-2-phenylacetate (64.9 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **22**.

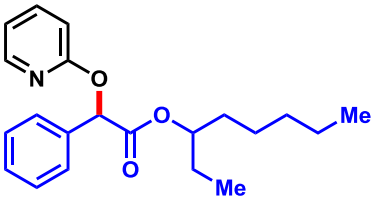
Colorless oil; yield: 51.8 mg (61%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (dd, *J* = 5.1, 0.9 Hz, 1H), 7.65–7.60 (m, 3H), 7.42–7.36 (m, 3H), 6.94–6.89 (m, 2H), 6.28 (s, 1H), 4.86 (d, *J* = 18.6 Hz, 2H), 4.55 (d, *J* = 5.4 Hz, 2H), 1.61 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.0, 162.4, 146.5, 139.6, 138.8, 135.3, 129.7, 128.8, 128.6, 127.7, 117.5, 113.0, 111.3, 75.7, 68.2, 19.1.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{17}H_{18}NO_3^+$: 284.1281; found: 284.1284.

21) Octyl 2-phenyl-2-(pyridin-2-yloxy)acetate (23)



Prepared according to the general procedure from octan-3-yl 2-diazo-2-phenylacetate (82.3 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **23**.

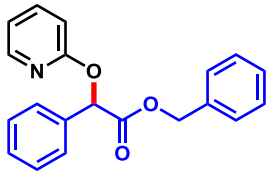
Colorless oil; yield: 69.3 mg (68%).

^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.13–8.09 (m, 1H), 7.64–7.59 (m, 3H), 7.42–7.36 (m, 3H), 6.95–6.88 (m, 2H), 6.15 (s, 1H), 4.98–4.87 (m, 1H), 1.46–1.23 (m, 8H), 1.07–1.00 (m, 4H), 0.93–0.81 (m, 4H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.9, 162.6, 146.5, 138.7, 135.5, 128.7, 128.5, 127.6, 117.4, 111.3, 76.1, 72.0, 35.7, 31.6, 28.9, 24.8, 22.4, 19.9, 14.0.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{21}H_{28}NO_3^+$: 342.2064; found: 342.2066.

22) Benzyl 2-phenyl-2-(pyridin-2-yloxy)acetate (24)



Prepared according to the general procedure from benzyl 2-diazo-2-phenylacetate (75.7 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **24**.

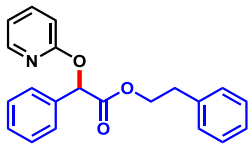
Colorless oil; yield: 75.7 mg (79%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.06 (d, *J* = 4.2 Hz, 1H), 7.63–7.59 (m, 3H), 7.41–7.37 (m, 3H), 7.28 (dd, *J* = 4.2, 1.2 Hz, 3H), 7.20–7.19 (m, 2H), 6.93–6.88 (m, 2H), 6.29 (s, 1H), 5.22 (d, *J* = 12.6 Hz, 1H), 5.13 (d, *J* = 12.6 Hz, 1H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.2, 162.5, 146.6, 138.8, 135.8, 135.2, 128.8, 128.6, 128.3, 128.0, 127.8 , 127.7, 117.5, 111.3, 75.9, 66.7.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{20}H_{17}NNaO_3^+$: 342.1101; found: 342.1103.

23) Phenethyl 2-phenyl-2-(pyridin-2-yloxy)acetate (25)



Prepared according to the general procedure from phenethyl 2-diazo-2-phenylacetate (79.9 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **25**.

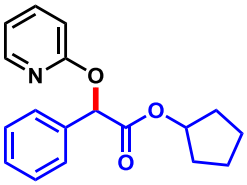
Colorless oil; yield: 74.0 mg (74%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.10 (d, *J* = 1.8 Hz, 1H), 7.62–7.57 (m, 3H), 7.38–7.37 (m, 3H), 7.22–7.19 (m, 3H), 7.10 (d, *J* = 6.6 Hz, 2H), 6.93–6.90 (m, 2H), 6.24 (s, 1H), 4.36–4.34 (m, 2H), 2.93–2.84 (m, 2H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.2, 162.5, 146.6, 138.8, 137.7, 135.3, 128.8, 128.7, 128.6, 128.4, 127.7, 126.4, 117.5, 111.3, 75.8, 65.6, 34.9.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{21}H_{19}NNaO_3^+$: 356.1257; found: 356.1260.

24) Cyclopentyl 2-phenyl-2-(pyridin-2-yloxy)acetate (26)



Prepared according to the general procedure from cyclopentyl 2-diazo-2-phenylacetate (69.1 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **26.**

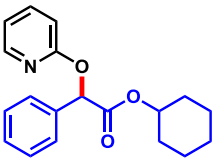
Colorless oil; yield: 73.1 mg (82%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12 (d, *J* = 3.6 Hz, 1H), 7.62–7.58 (m, 3H), 7.41–7.34 (m, 3H), 6.93–6.88 (m, 2H), 6.19 (s, 1H), 5.20 (s, 1H), 1.81–1.78 (m, 2H), 1.72–1.67(m, 2H), 1.57–1.46 (m, 4H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.9, 162.6, 146.5, 138.7, 135.5, 129.0, 128.6, 128.5, 128.1, 127.6, 117.4, 111.2, 78.1, 76.0, 32.4, 32.3, 23.6, 23.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{18}H_{20}NO_3^+$: 298.1438; found: 298.1441.

25) Cyclohexyl 2-phenyl-2-(pyridin-2-yloxy)acetate (27)



Prepared according to the general procedure from cyclohexyl 2-diazo-2-phenylacetate (73.3 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **27**.

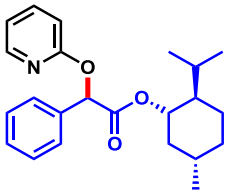
Colorless oil; yield: 70.1 mg (75%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12–8.11 (m, 1H), 7.64–7.59 (m, 3H), 7.40–7.36 (m, 3H), 6.94–6.89 (m, 2H), 6.18 (s, 1H), 4.83–4.79 (m, 1H), 1.82 (dd, *J* = 6.3, 4.5 Hz, 1H), 1.74–1.70 (m, 1H), 1.61 (d, *J* = 12.0 Hz, 1H), 1.54–1.46 (m, 3H), 1.26–1.23 (m, 4H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.8, 162.4, 146.4, 138.7, 135.4, 128.7, 128.5, 127.6, 117.4, 111.2, 75.9, 73.3, 31.2, 30.9, 25.3, 23.4, 23.2.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{19}H_{21}NNaO_3^+$: 334.1414; found: 334.1412.

26) (1*S*, 2*R*, 5*S*)-2-Isopropyl-5-methylcyclohexyl 2-phenyl-2-(pyridin-2-yloxy)acetate (28)



Prepared according to the general procedure from (1*S*,2*R*,5*S*)-2-isopropyl-5-methylcyclohexyl 2-diazo-2-phenylacetate (90.1 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **28**.

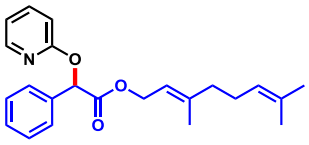
Colorless oil; yield: 66.1 mg (60%). d.r. = 1:1.

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.13–8.12 (m, 1H), 8.07–8.06 (m, 1H), 7.63–7.59 (m, 5H), 7.41–7.37 (m, 5H), 6.93–6.89 (m, 4H), 6.17 (s, 1H), 6.12 (s, 1H), 4.74 (td, *J* = 11.0, 4.4 Hz, 1H), 4.63 (td, *J* =11.0, 4.4Hz, 1H), 2.17–2.11 (m, 1H), 2.02–1.99 (m, 1H), 1.74–1.62 (m, 5H), 1.59–1.55 (m, 1H), 1.47–1.39 (m, 3H), 1.31–1.26 (m, 2H), 1.18– 0.94 (m, 4H), 0.95 (d, *J* = 7.2, 4H), 0.88 (d, *J* = 6.6 Hz, 3H), 0.81 (d, *J* = 6.6 Hz, 4H), 0.76 (d, *J* =7.2 Hz, 4H), 0.59 (d, *J* = 7.2Hz, 3H), 0.43 (d, *J* = 7.2 Hz, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ =170.0, 169.9, 162.5 162.4, 146.6, 146.3, 138.8, 138.7, 135.3 135.2, 128.8, 128.7, 128.6, 128.5, 127.7, 127.5, 117.5, 117.4, 111.3, 111.2, 76.1, 76.0, 75.3, 74.9, 47.1, 46.9, 40.4, 40.2, 34.2, 34.1, 31.4, 31.3, 26.0, 25.3, 23.4, 23.0, 22.0, 21.91, 20.8, 20.6, 16.3, 15.6.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{23}H_{30}NO_3^+$: 368.2220; found: 368.2212.

27) (*E*)-3,7-Dimethylocta-2,6-dien-1-yl 2-phenyl-2-(pyridin-2-yloxy)acetate (29)



Prepared according to the general procedure from (*E*)-3,7-dimethylocta-2,6-dien-1-yl 2-diazo-2-phenylacetate (89.5 mg, 0.3 mmol) and 2-pyridone (57.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **29**.

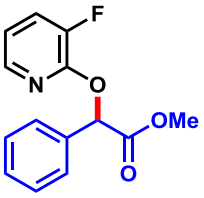
Colorless oil; yield: 70.2 mg (64%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.12–8.11 (m, 1H), 7.62–7.59 (m, 3H), 7.41–7.37 (m, 3H), 6.93–6.89 (m, 2H), 6.21 (s, 1H), 5.27 (t, *J* = 6.9 Hz, 1H), 5.05–5.03 (m, 1H), 4.66 (dd, *J* = 12.6, 7.2 Hz, 1H), 4.57 (dd, *J* = 12.6, 7.2 Hz, 1H), 2.05–2.0 (m, 4H), 1.71 (s, 3H), 1.66 (s, 3H), 1.56 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.3, 162.4, 146.5, 142.7, 138.8, 135.2, 132.0, 128.8, 128.6, 127.7, 123.6, 118.7, 117.5, 111.3, 75.7, 61.9, 32.1, 26.6, 25.6, 23.4, 17.6.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{23}H_{27}NNaO_3^+$: 388.1883; found: 388.1886.

28) Methyl 2-((3-fluoropyridin-2-yl)oxy)-2-phenylacetate (30)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 3-fluoropyridin-2(1*H*)-one (67.9 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **30**.

Colorless oil; yield: 54.9 mg (70%).

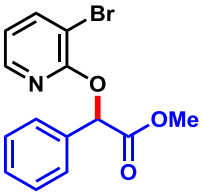
^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.89 (dd, *J* = 5.1, 1.5 Hz, 1H), 7.64 (d, *J* = 6.6 Hz, 2H), 7.42–7.36 (m, 4H), 6.92–6.89 (m, 1H), 6.25 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.2, 151.6, 148.1, 146.4, 141.0 (d, *J* = 6.4 Hz), 134.5, 129.1, 128.7, 127.6, 123.7 (d, *J* = 15.2 Hz), 117.9, 75.8, 52.5.

^{19}F NMR (376 MHz, $CDCl_3$): δ = -138.63—-138.66 (m).

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}FNO_3^+$: 262.0874; found: 262.0875.

29) Methyl 2-((3-bromopyridin-2-yl)oxy)-2-phenylacetate (31)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 3-bromopyridin-2(1*H*)-one (104.4 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **31**.

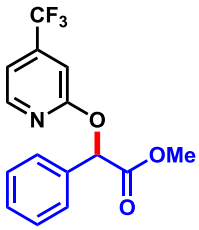
Colorless oil; yield: 96.7 mg (76%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.06 (dd, *J* = 4.8, 1.8 Hz, 1H), 7.85 (dd, *J* = 7.5, 1.5 Hz, 1H), 7.69 (dd, *J* = 5.1, 3.3 Hz, 2H), 7.44–7.37 (m, 3H), 6.83 (dd, *J* = 7.5, 5.1 Hz, 1H), 6.21 (s, 1H), 3.71 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.2, 158.5, 145.2, 142.0, 134.6, 128.9, 128.7, 127.3, 118.7, 107.0, 76.4, 52.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{13}BrNO_3^+$: 322.0073; found: 322.0074.

30) Methyl 2-phenyl-2-((4-(trifluoromethyl)pyridin-2-yl)oxy)acetate (32)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 4-(trifluoromethyl)pyridin-2(1*H*)-one (97.9 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **32**.

Colorless oil; yield: 68.2 mg (73%).

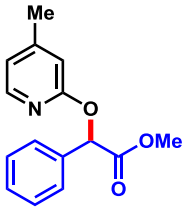
^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.29 (d, *J* = 5.4 Hz, 1H), 7.60 (dd, *J* = 7.8, 1.2 Hz, 2H), 7.44–7.38 (m, 3H), 7.18 (s, 1H), 7.13 (d, *J* = 5.4 Hz, 1H), 6.25 (s, 1H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.2, 162.7, 148.0, 141.4, 141.2, 134.5, 129.2, 128.8, 127.7, 123.4, 121.6, 113.2 (d, *J* = 3.3 Hz), 108.1 (d, *J* = 4.05 Hz), 76.2, 52.5.

^{19}F NMR (376 MHz, $CDCl_3$): δ = -70.15 (s).

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{13}F_3NO_3^+$: 312.0842; found: 312.0843.

31) Methyl 2-((4-methylpyridin-2-yl)oxy)-2-phenylacetate (33)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 4-methylpyridin-2(1*H*)-one (65.5 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **33**.

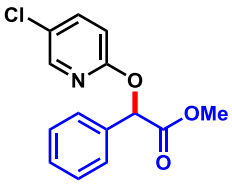
Colorless oil; yield: 54.8 mg (71%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.98 (d, *J* = 7.2 Hz, 1H), 7.63–7.59 (m, 2H), 7.42–7.37 (m, 3H), 6.80–6.70 (m, 2H), 6.23 (s, 1H), 3.71 (s, 3H), 2.31 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.9, 162.6, 150.3, 146.1, 135.2, 128.8, 128.6, 127.6, 119.1, 111.3, 75.4, 52.3, 20.9.

HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{15}H_{16}NO_3^+$: 258.1125; found: 258.1127.

32) Methyl 2-((5-chloropyridin-2-yl)oxy)-2-phenylacetate (34)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 5-chloropyridin-2(1*H*)-one (77.7 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **34**.

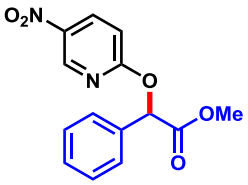
Colorless oil; yield: 58.3 mg (70%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.07 (d, *J* = 2.4 Hz, 1H), 7.60–7.57 (m, 3H), 7.43–7.39 (m, 3H), 6.89 (d, *J* = 8.7 Hz, 1H), 6.17 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.4, 160.7, 144.9, 138.9, 134.7, 129.1, 128.7, 127.6, 125.1, 112.3, 76.0, 52.5.

HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{14}H_{13}ClNO_3^+$: 278.0578; found: 278.0582.

33) Methyl 2-((5-nitropyridin-2-yl)oxy)-2-phenylacetate (35)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 5-nitropyridin-2(1*H*)-one (84.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **35**.

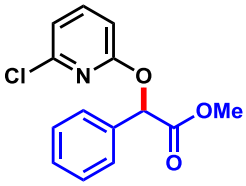
Colorless oil; yield: 57.1 mg (68%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 9.05 (d, *J* = 2.4 Hz, 1H), 8.42–8.40 (m, 1H), 7.59–7.58 (m, 2H), 7.45–7.41 (m, 3H), 7.03 (d, *J* = 9.0 Hz, 1H), 6.32 (s, 1H), 3.74 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.5, 165.6, 144.3, 140.2, 134.4, 134.0, 129.4, 128.9, 127.7, 111.6, 76.8, 52.6.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{14}H_{12}NaN_2O_5^+$: 311.0638; found: 311.0641.

34) Methyl 2-((6-chloropyridin-2-yl)oxy)-2-phenylacetate (36)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 6-chloropyridin-2(1*H*)-one (77.7 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **36**.

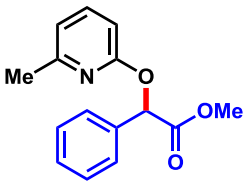
Colorless oil; yield: 62.5 mg (75%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.61–7.55 (m, 3H), 7.43–7.39 (m, 3H), 6.95 (d, *J* = 7.8 Hz, 1H), 6.85 (d, *J* = 8.4 Hz, 1H), 6.20 (s, 1H), 3.75 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.2, 161.8, 147.9, 141.0, 134.5, 129.1, 128.7, 127.7, 117.3, 109.4, 76.0, 52.4.

HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{14}H_{13}ClNO_3^+$: 278.0578; found: 278.0583.

35) Methyl 2-((6-methylpyridin-2-yl)oxy)-2-phenylacetate (37)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 6-methylpyridin-2(1*H*)-one (65.5 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **37**.

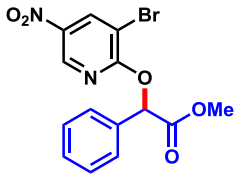
Colorless oil; yield: 60.2 mg (78%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.63–7.62 (m, 2H), 7.49 (dd, *J* = 8.4, 7.2 Hz, 1H), 7.43–7.36 (m, 3H), 6.74 (dd, *J* = 18.6, 7.8 Hz, 2H), 6.20 (s, 1H), 3.72 (s, 3H), 2.41 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 171.0, 161.6, 155.8, 139.1, 135.2, 128.8, 128.6, 127.7, 116.5, 107.7, 75.5, 52.2, 23.9.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{16}NO_3^+$: 258.1125; found: 258.1128.

36) Methyl 2-((3-bromo-5-nitropyridin-2-yl)oxy)-2-phenylacetate (38)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 3-bromo-5-nitropyridin-2(1*H*)-one (131.4 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **38**.

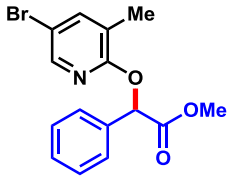
Colorless oil; yield: 72.7 mg (66%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.98 (d, *J* = 2.4 Hz, 1H), 8.68 (d, *J* = 2.4 Hz, 1H), 7.65 (dd, *J* = 7.8, 1.2 Hz, 2H), 7.45–7.42 (m, 3H), 6.29 (s, 1H), 3.73 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.0, 162.0, 142.2, 140.0, 137.1, 133.4, 130.1, 129.4, 128.9, 127.4, 107.1, 77.9, 52.8.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{14}H_{12}BrN_2O_5^+$: 366.9924; found: 366.9927.

37) Methyl 2-((5-bromo-3-methylpyridin-2-yl)oxy)-2-phenylacetate (39)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 5-bromo-3-methylpyridin-2(1*H*)-one (112.8 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **39**.

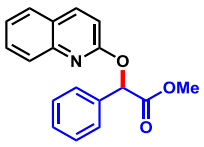
Colorless oil; yield: 57.3 mg (57%).

^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.01 (dd, *J* = 2.4, 0.4 Hz, 1H), 7.64–7.62 (m, 2H), 7.56–7.55 (m, 1H), 7.45–7.39 (m, 3H), 6.17 (s, 1H), 3.71 (s, 3H), 2.31 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.4, 159.5, 144.2, 141.2, 135.0, 128.8, 128.6, 128.5, 127.4, 123.0, 112.4, 75.8, 52.3, 41.1, 15.5.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{15}BrNO_3^+$: 336.0230; found: 336.0231.

38) Methyl 2-phenyl-2-(quinolin-2-yloxy)acetate (40)[11]



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and quinolin-2(1*H*)-one (87.1 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **40**.

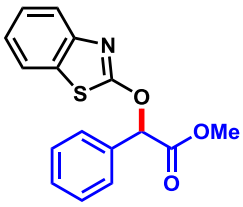
Colorless oil; yield: 71.3mg (81%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 8.05 (d, *J* = 8.4 Hz, 1H), 7.83 (d, *J* = 8.4 Hz, 1H), 7.74 (d, *J* = 7.8 Hz, 1H), 7.69 (d, *J* = 7.2 Hz, 2H), 7.65–7.62 (m, 1H), 7.46–7.39 (m, 4H), 7.10 (d, *J* = 9.0 Hz, 1H), 6.45 (s, 1H), 3.75 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 170.8, 160.6, 146.0, 139.3, 135.0, 129.6, 129.0, 128.7, 127.8, 127.40, 127.37, 125.4, 124.4, 112.7, 75.8, 52.4.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{18}H_{16}NO_3^+$: 294.1125; found: 294.1125.

39) Methyl 2-(benzo[*d*]thiazol-2-yloxy)-2-phenylacetate (41)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and benzo[*d*]thiazol-2-ol (90.7 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **41**.

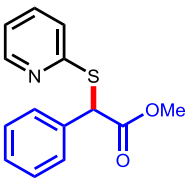
Colorless oil; yield: 61.9 mg (69%).

^{1}H NMR (600 MHz, $CDCl_3$): δ = 7.71–7.64 (m, 2H), 7.60 (dd, *J* = 7.5, 2.1 Hz, 2H), 7.45–7.42 (m, 3H), 7.38–7.36 (m, 1H), 7.24 (d, *J* = 7.3 Hz, 1H), 6.44 (s, 1H), 3.77 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 171.4, 169.1, 148.8, 133.7, 132.3, 129.5, 128.9, 127.7, 126.0, 123.8, 121.3, 121.2, 80.1, 52.8.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{16}H_{14}NO_3S^+$: 300.0689; found: 300.0691.

40) Methyl 2-phenyl-2-(pyridin-2-ylthio)acetate (42)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3

mmol) and pyridine-2-thiol (66.7 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **42**.

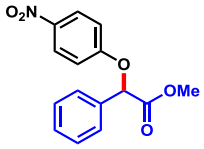
Colorless oil; yield: 49.0mg (63%).

^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.41–8.40 (m, 1H), 7.52 (dt, *J* = 3.8, 2.2 Hz, 2H), 7.45–7.42 (m, 1H), 7.36–7.3 (m, 3H), 7.16 (dt, *J* = 8.2, 1.0 Hz, 1H), 6.99–6.95 (m, 1H), 5.74 (s, 1H), 3.72 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 171.2, 157.2, 149.2, 136.0, 135.0, 128.7, 128.5, 128.2, 121.6, 119.8, 52.7, 51.4.

HRMS (ESI): *m/z* $[M+Na]^+$ calcd for $C_{14}H_{13}NNaO_2S^+$: 282.0559; found: 282.0559.

41) Methyl 2-(4-nitrophenoxy)-2-phenylacetate (43)[11]



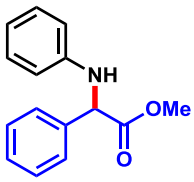
Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 4-nitrophenol (83.5 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **43**.

Colorless oil; yield: 68.9 mg (80%).

^{1}H NMR (400 MHz, $CDCl_3$): δ = 8.22–8.16 (m, 2H), 7.59–7.54 (m, 2H), 7.45–7.40 (m, 3H), 7.04–6.99 (m, 2H), 5.73 (s, 1H), 3.76 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.2, 162.0, 142.2, 134.1, 129.5, 129.0, 127.1, 125.9, 115.4, 78.8, 52.9.

42) Methyl 2-phenyl-2-(phenylamino)acetate (44)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and aniline (55.9 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **44**.

Colorless oil; yield: 57.2 mg (79%).

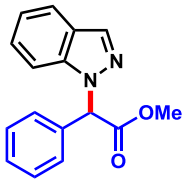
^{1}H NMR (400 MHz, $CDCl_3$): δ = 7.56 (dd, *J* = 5.2, 3.6 Hz, 2H), 7.43–7.33 (m, 3H), 7.20–7.14 (m, 2H),

6.78–6.72 (m, 1H), 6.61 (dd, *J* = 8.6, 1.0 Hz, 2H), 5.14 (s, 1H), 5.03 (s, 1H), 3.76 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 172.2, 145.9, 137.6, 129.1, 128.8, 128.2, 127.2, 118.0, 113.3, 60.7, 52.7.

HRMS (ESI): *m/z* $[M+H]^+$ calcd for $C_{15}H_{16}NO_2^+$: 242.1176; found: 242.1176.

43) Methyl 2-(1*H*-indazol-1-yl)-2-phenylacetate (45)



Prepared according to the general procedure from methyl 2-diazo-2-phenylacetate (52.9 mg, 0.3 mmol) and 1*H*-indazole (70.9 mg, 0.6 mmol, 2.0 equiv). Purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **45**.

Colorless oil; yield: 49.0 mg (57%).

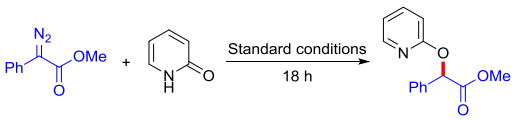
^{1}H NMR (400 MHz, $CDCl_3$): δ = (d, *J* = 0.8 Hz, 1H), 7.73 (dd, *J* = 8.0, 0.8 Hz, 1H), 7.45–7.34 (m, 5H), 7.32–7.27 (m, 1H), 7.21–7.12 (m, 2H), 6.51 (s, 1H), 3.82 (s, 3H).

^{13}C NMR (150 MHz, $CDCl_3$): δ = 169.2, 139.8, 134.4, 134.1, 129.6, 128.8, 128.4, 128.1, 128.0, 126.6, 124.7, 121.2, 121.0, 109.9, 65.9, 52.9.

HRMS (ESI): m/z $[M+Na]^+$ calcd for $C_{16}H_{14}N_2NaO_2^+$: 289.0947; found: 289.0947.

8. Gram-Scale and Control Experiments

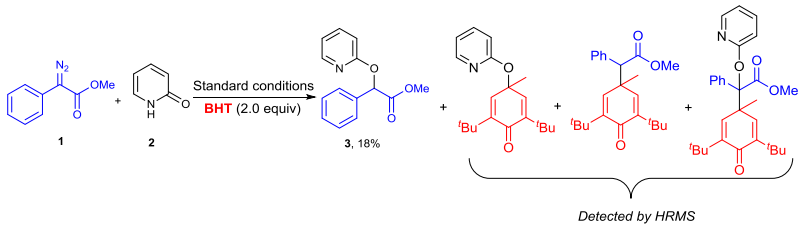
1) Procedure for gram-scale synthesis of 3



Methyl 2-diazo-2-phenylacetate **1** (1.00 g, 5.67 mmol), 2-pyridone **2** (1.08 g, 11.34 mmol, 2.0 equiv) and DCM (25 mL) were added into a 50 mL Pyrex glass tube. The reaction mixture was continually stirred under 6 W blue LED irradiation at room temperature for 18 hours until **1** was consumed completely (monitored by TLC). The reaction solution was quenched with saturated aq. NaCl (9 mL) and extracted with EtOAc (3 × 15 mL). The combined organic phase was dried over

anhydrous Na_2SO_4, filtrated and concentrated under reduced pressure. The crude product was purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure product **3** (0.93 g, 67% yield).

2) Radical-trapping experiment with 2,6-di-*tert*-butyl-4-methylphenol



Methyl α-phenyldiazoacetate **1** (52.9 mg, 0.3 mmol), 2-pyridone **2** (57.1 mg, 0.6 mmol, 2.0 equiv), 2, 6-di-*tert*-butyl-4-methylphenol (BHT) (132.2 mg, 0.6 mmol, 2.0 equiv) and DCM (3 mL) were added into a 10 mL Pyrex glass tube. The resulting mixture was continually stirred under 6 W blue LED irradiation at room temperature for 6 hours. The reaction solution was concentrated under reduced pressure. Then, the residue was analyzed by HRMS, and the radical intermediates trapped by BHT were detected (**Figure S4–S6,** data of $[M+H]^+$ are showed). In addition, **3** was obtained in 18% yield by column chromatography isolation on silica gel (PE : EtOAc = 12:1).

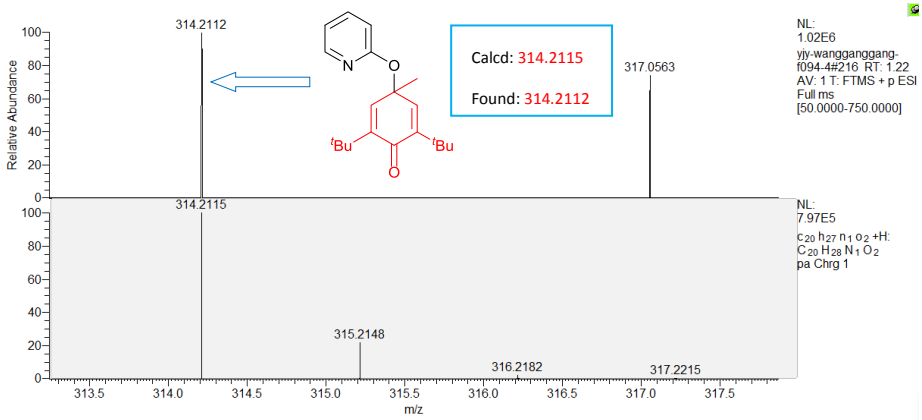


Figure S4

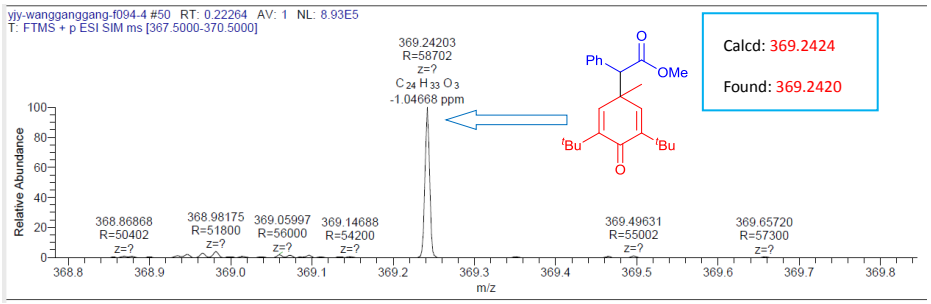


Figure S5

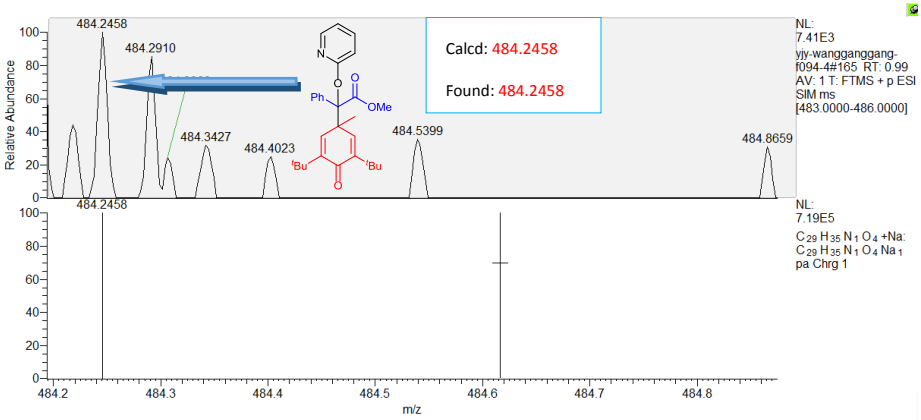
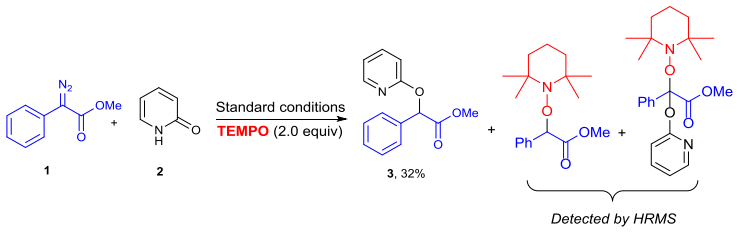


Figure S6

3) Radical-trapping experiment with TEMPO



Methyl 2-diazo-2-phenylacetate **1** (52.9 mg, 0.3 mmol), 2-pyridones **2** (57.1 mg, 0.6 mmol, 2.0 equiv), TEMPO (93.8 mg, 0.6 mmol, 2.0 equiv) and DCM (3 mL) were added into a 10 mL Pyrex glass tube. The resulting mixture was continually stirred at room temperature under 6 W blue LED irradiation for 6 hours. The reaction solution was concentrated under reduced pressure. Then, the residue was analyzed by HRMS, and the radical intermediates trapped by TEMPO were detected (**Figure S7**–**S8,** data of $[M+H]^+$ are showed). In addition, **3** was obtained in 32% yield by column chromatography isolation on silica gel (PE : EtOAc = 12:1).

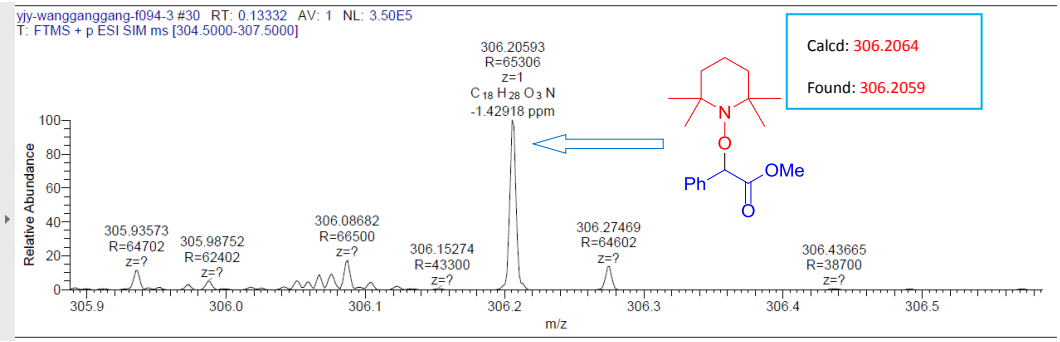


Figure S7

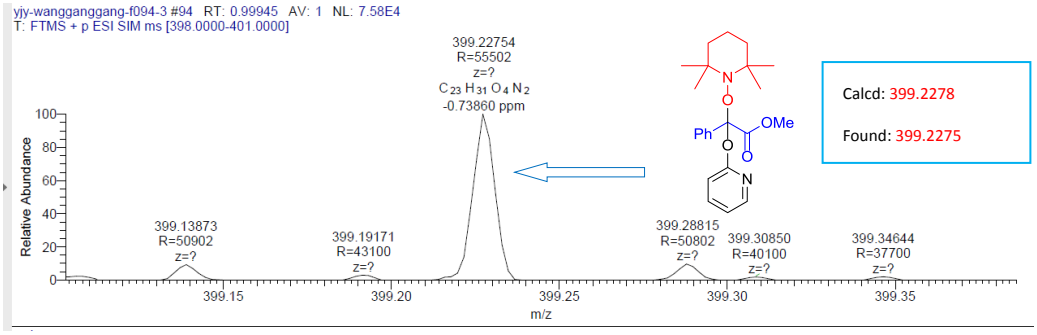
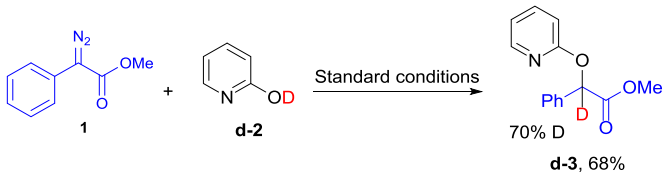


Figure S8

4) Deuterium labeling experiment



Methyl 2-diazo-2-phenylacetate **1** (52.9 mg, 0.3 mmol), deuterated 2-pyridone **d-2** (58.9 mg, 0.6 mmol, 2 equiv) and dry DCM (3 mL) were added into a 10 mL Pyrex glass tube. The resulting mixture was continually stirred at room temperature under an argon atmosphere by 6 W blue LED irradiation for 6 hours. The reaction solution was concentrated under reduced pressure. The crude product was purified by column chromatography on silica gel (PE : EtOAc = 12:1) to afford the pure deuterated product **d-3** (49.6 mg, 68% yield). Then, **d-3** was analyzed by ^{1}H NMR (**Figure S9)**, showing that 70% of deuterium are incorporated.

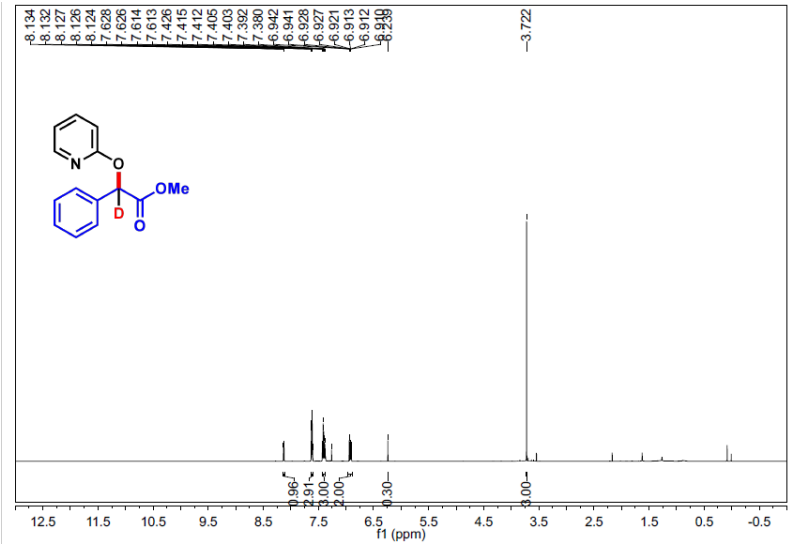


Figure S9

9. Quantum Chemical Calculations

The DFT computations employed the (U)M062X/def2-TZVPP SMD (CH_2Cl_2) level of theory to find the optimized geometries. Frequency calculations using the identical method and basis set were done to determine that the geometries were at local minima. All the computations were done with the Gaussian 16 program.[13] The calculated results show that O–H (C_5H_5NOH) and N–H (C_5H_5NHO) bond dissociation energy (BDE) is 87.7 kcal/mol and 89.9 kcal/mol respectively.

XYZ Cartesian coordinates

12
C_5H_5NHO

C	-1.04953	0.05771	0.00005
C	-0.24596	1.25613	0.00001
C	1.11074	1.19437	-0.00000
C	1.79483	-0.05022	-0.00001
C	1.04867	-1.18142	-0.00001
H	-0.77630	2.19772	-0.00001
H	1.68576	2.11209	-0.00002
H	2.87185	-0.10536	-0.00002
H	1.46804	-2.17701	-0.00002
O	-2.27719	0.00921	-0.00004
N	-0.30612	-1.11268	0.00001
H	-0.84148	-1.97185	0.00003

12
C_5H_5NOH

C	-0.89950	0.02637	-0.00002
C	-0.18750	1.22740	-0.00000
C	1.18875	1.15041	0.00000
C	1.80837	-0.09841	0.00000
C	1.00402	-1.22046	0.00000
H	-0.71679	2.16926	0.00000
H	1.78052	2.05649	0.00001
H	2.88418	-0.19528	0.00001
H	1.43781	-2.21333	0.00001
N	-0.33243	-1.16510	-0.00001
O	-2.24550	0.08170	0.00001
H	-2.57959	-0.82688	0.00001

11

C_5H_5NO

C	1.01377	-0.01651	-0.00009
C	0.25569	1.22098	0.00002
C	-1.11650	1.19259	0.00006
C	-1.74500	-0.04555	0.00005
C	-0.95036	-1.22745	0.00001
H	0.81721	2.14476	0.00004
H	-1.69335	2.10718	0.00011
H	-2.82183	-0.13342	0.00009
H	-1.45399	-2.18893	0.00001
N	0.34779	-1.24014	-0.00004
O	2.24647	0.00088	-0.00003

10. References

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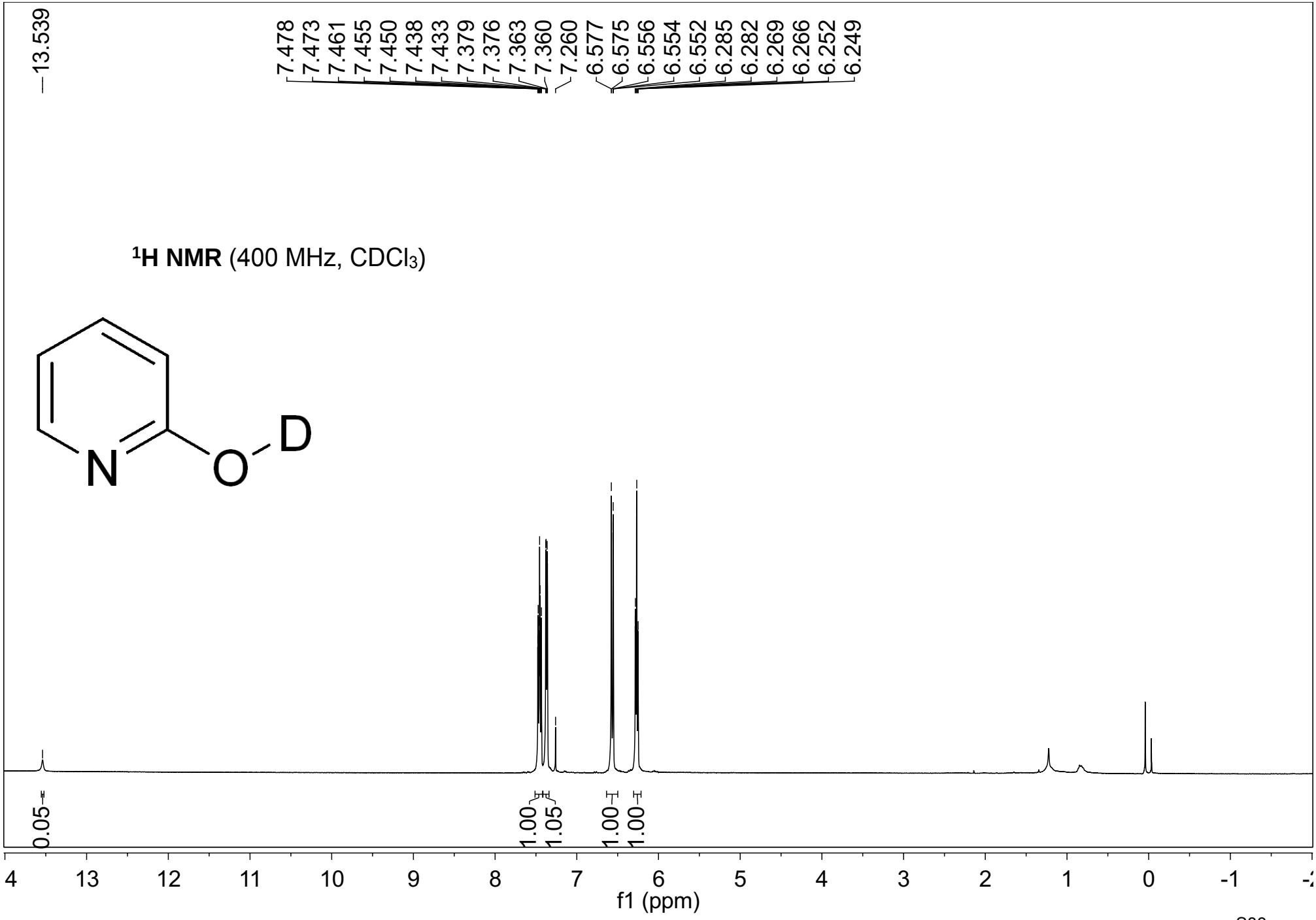
[13] Frisch, M. J.; Trucks, G. W.; Schlegel, G. W.; Scuseria, G. W. *Gaussian 16, Revision C.01; Gaussian, Inc., Wallingford CT, 2016*.

11. Cope of NMR Spectra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7.433
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7.376
7.363
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6.577
6.575
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6.554
6.552
6.285
6.282
6.269
6.266
6.252
6.249
1H NMR (400 MHz, CDCl3)
N
O
D
0.05
1.00
1.05
1.00
1.00
4
13
12
11
10
9
8
7
6
5
4
3
2
1
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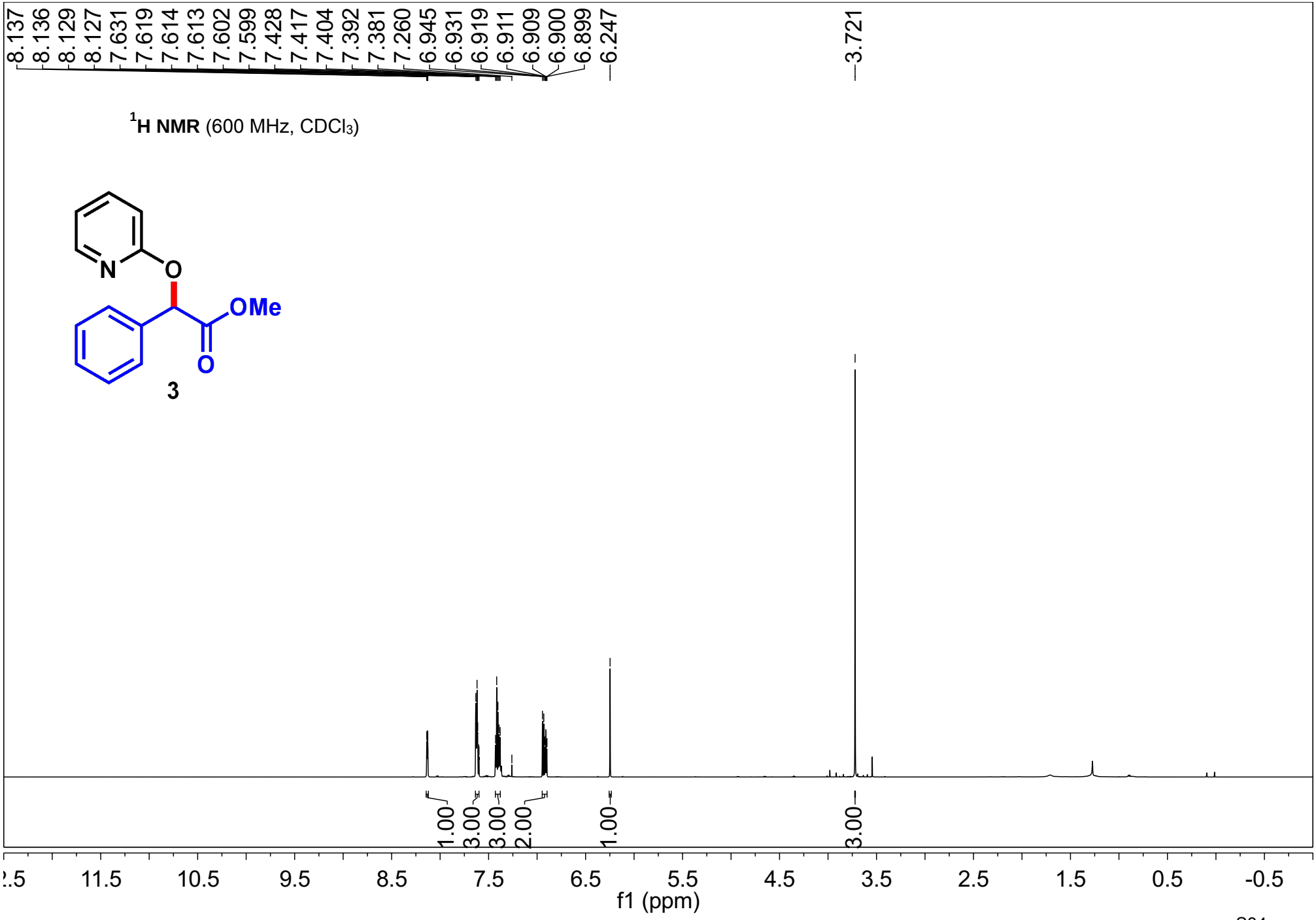
-1
f1 (ppm)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7.404
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7.381
7.260
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6.931
6.919
6.911
6.909
6.900
6.899
6.247
3.721
1H NMR (600 MHz, CDCl3)
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OMe
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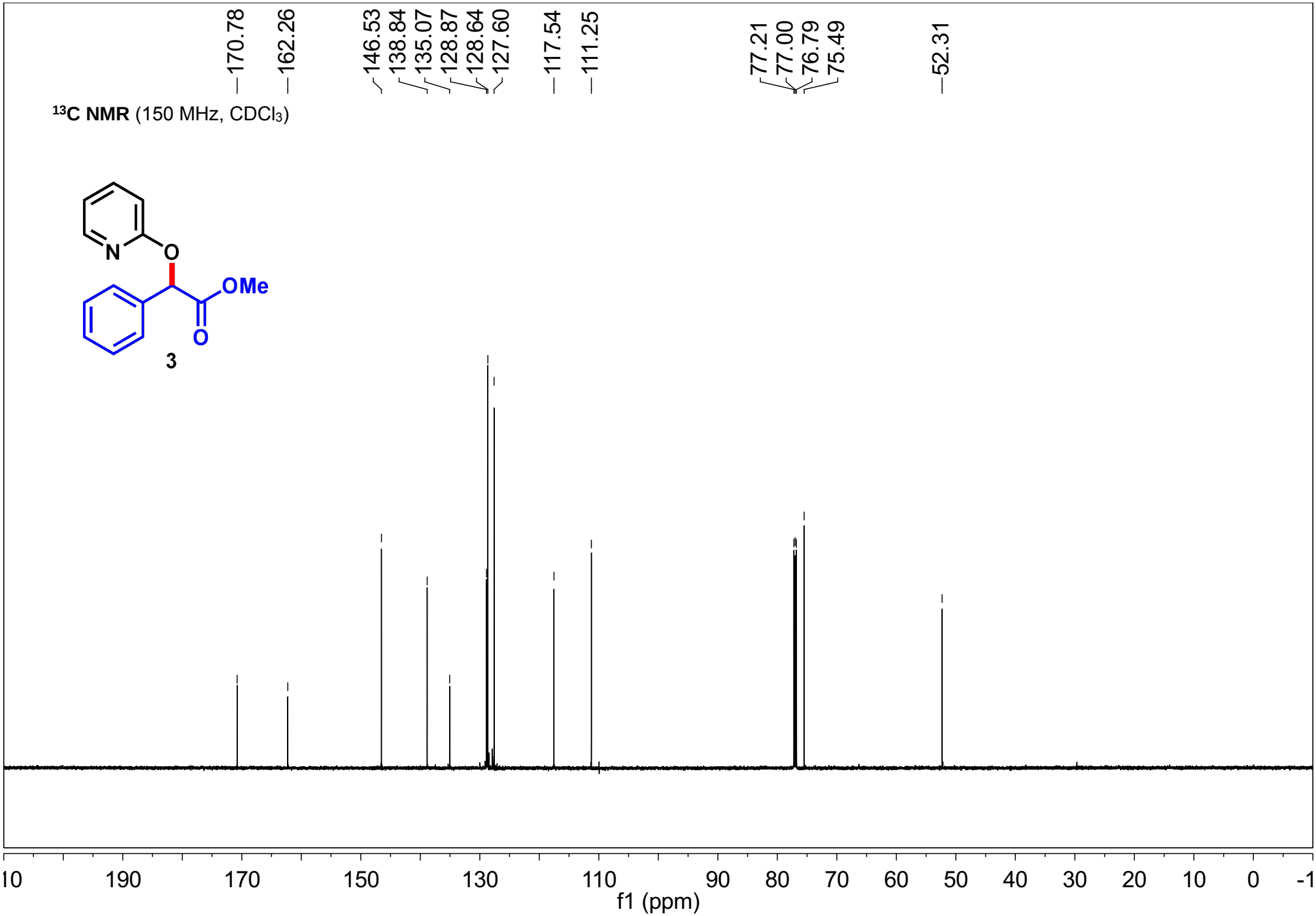
1.00
3.00
3.00
2.00
1.00
3.00
f1 (ppm)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76.79
75.49
52.31
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
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150
130
110
90
80
70
60
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40
30
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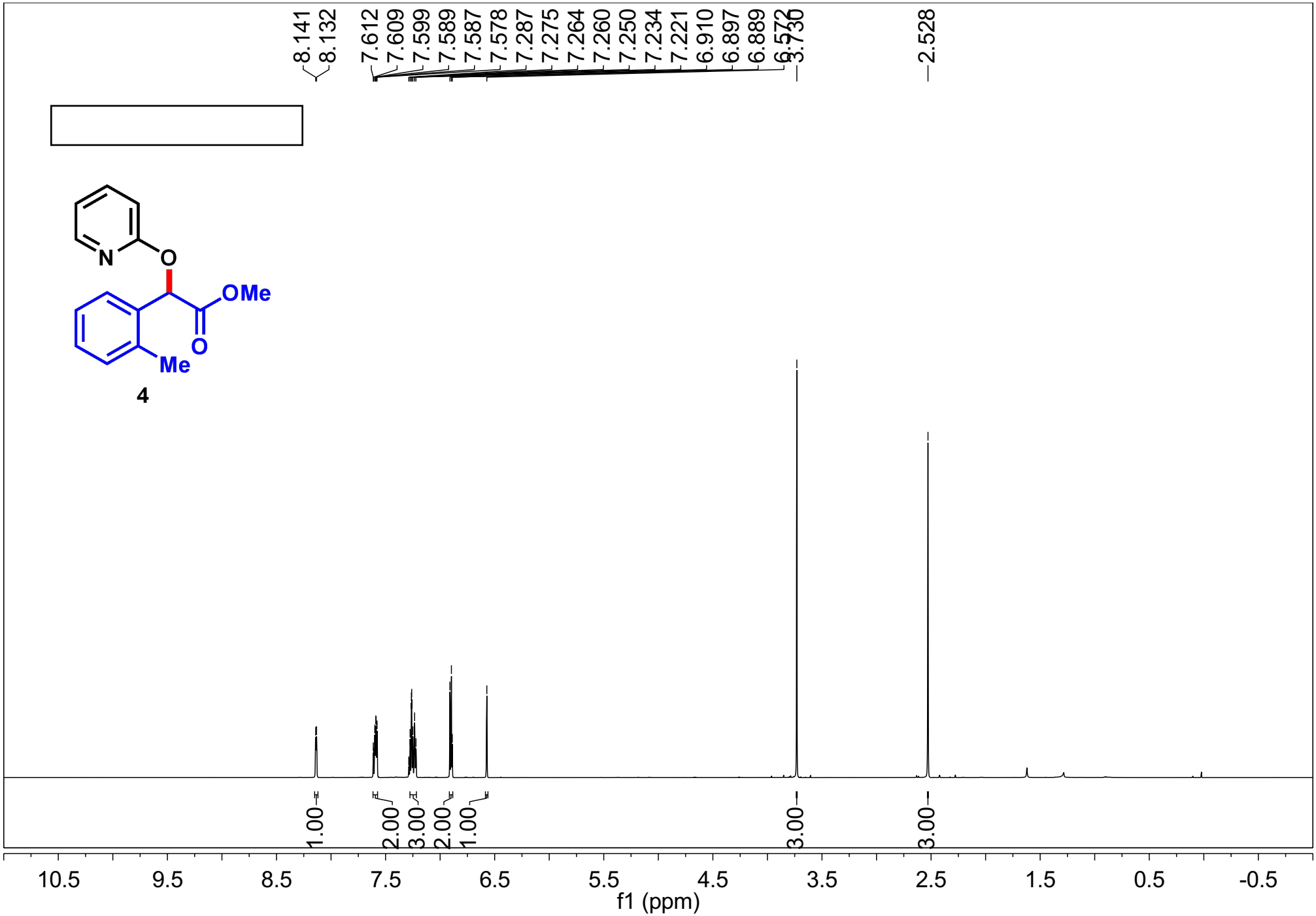
f1 (ppm)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7.275
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7.250
7.234
7.221
6.910
6.897
6.889
6.572
3.730
2.528
N
O
OMe
O
Me
4
1.00
2.00
3.00
2.00
1.00
3.00
3.00
10.5
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6.5
5.5
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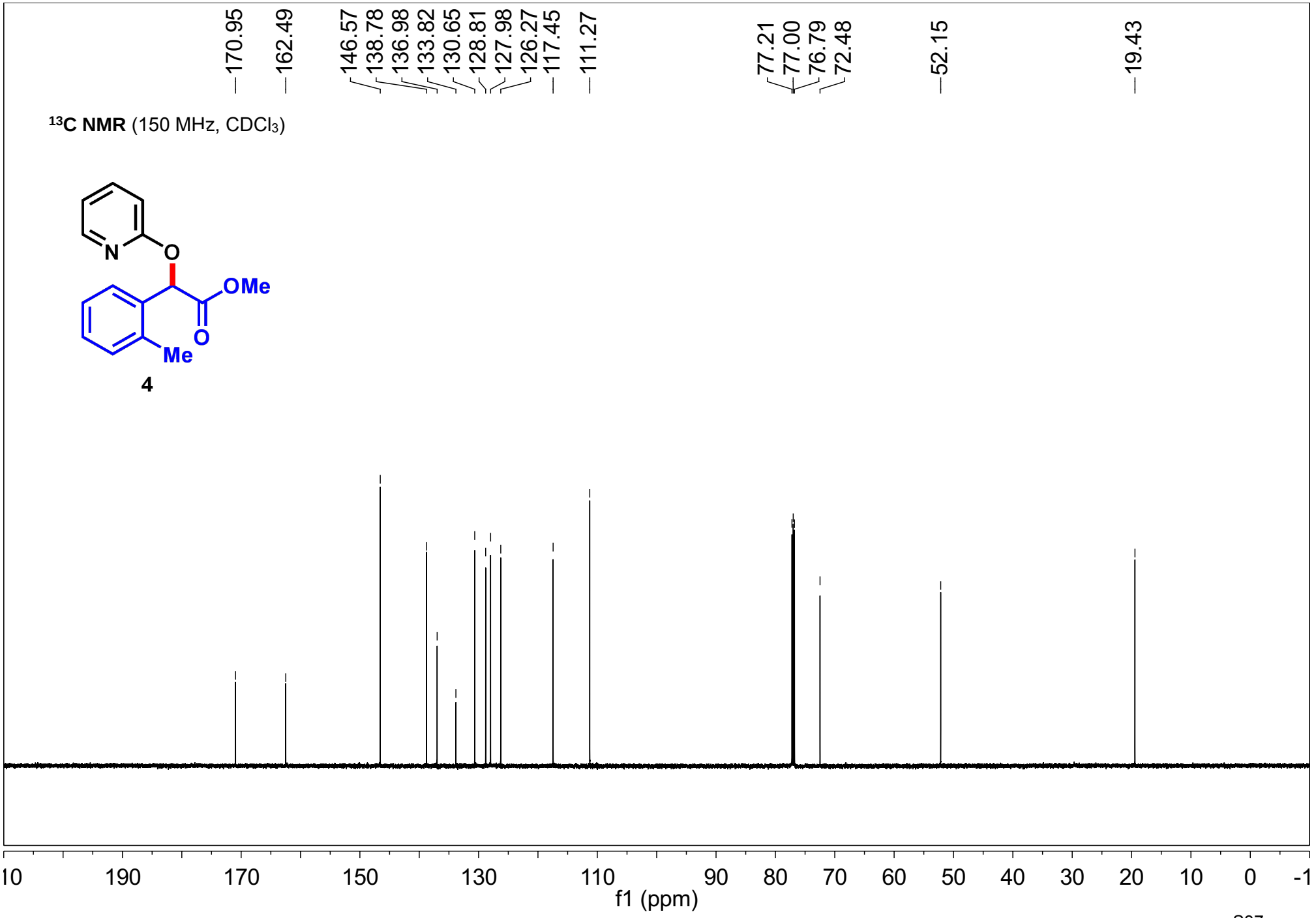
f1 (ppm)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77.00
76.79
72.48
52.15
19.43
13C NMR (150 MHz, CDCl3)
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O
OMe
O
Me
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110
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80
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40
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20
10
0
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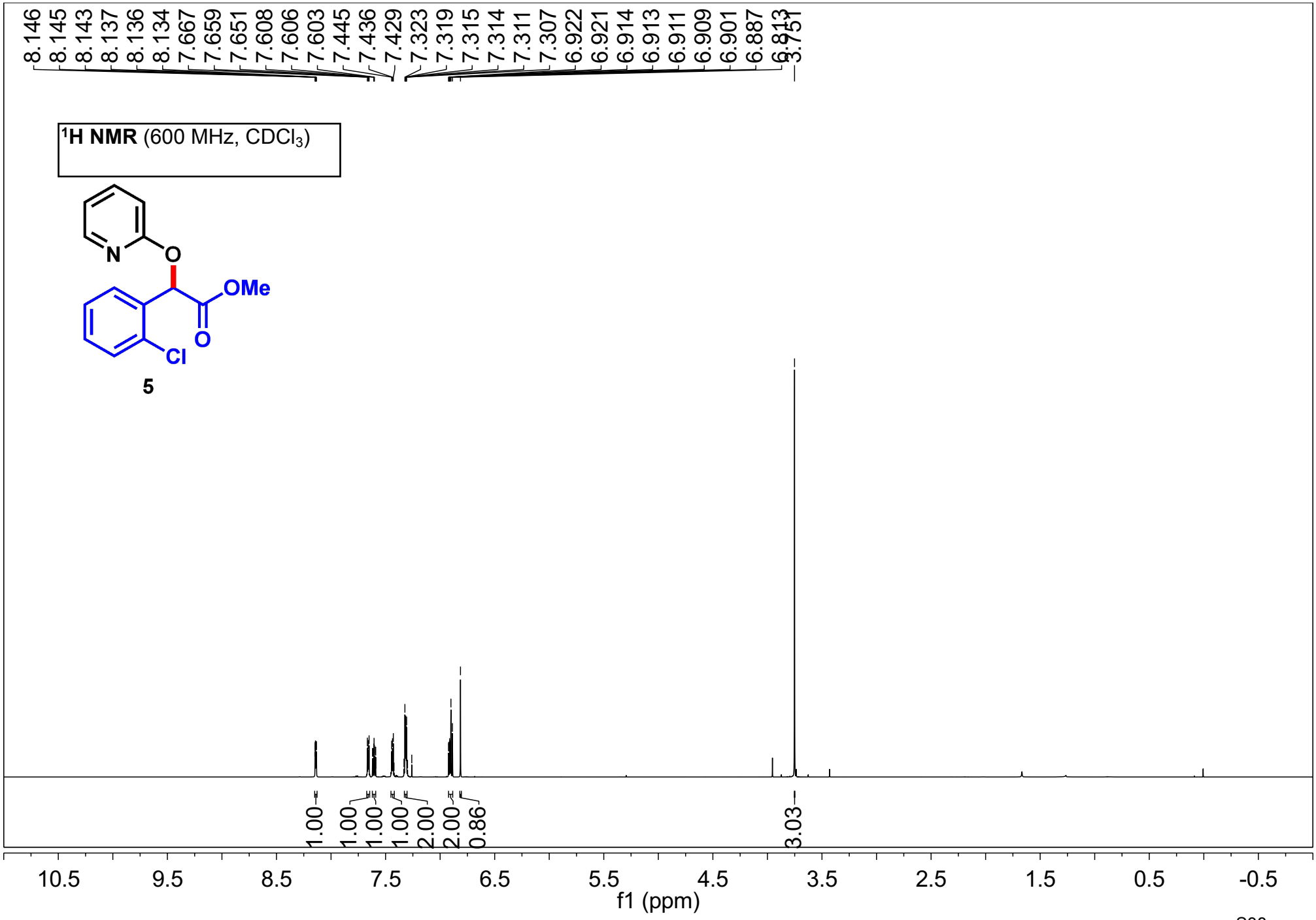
f1 (ppm)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7.429
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7.314
7.311
7.307
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6.909
6.901
6.887
6.813
3.751
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O
OMe
O
Cl
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1.00
1.00
1.00
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2.00
0.86
3.03
10.5
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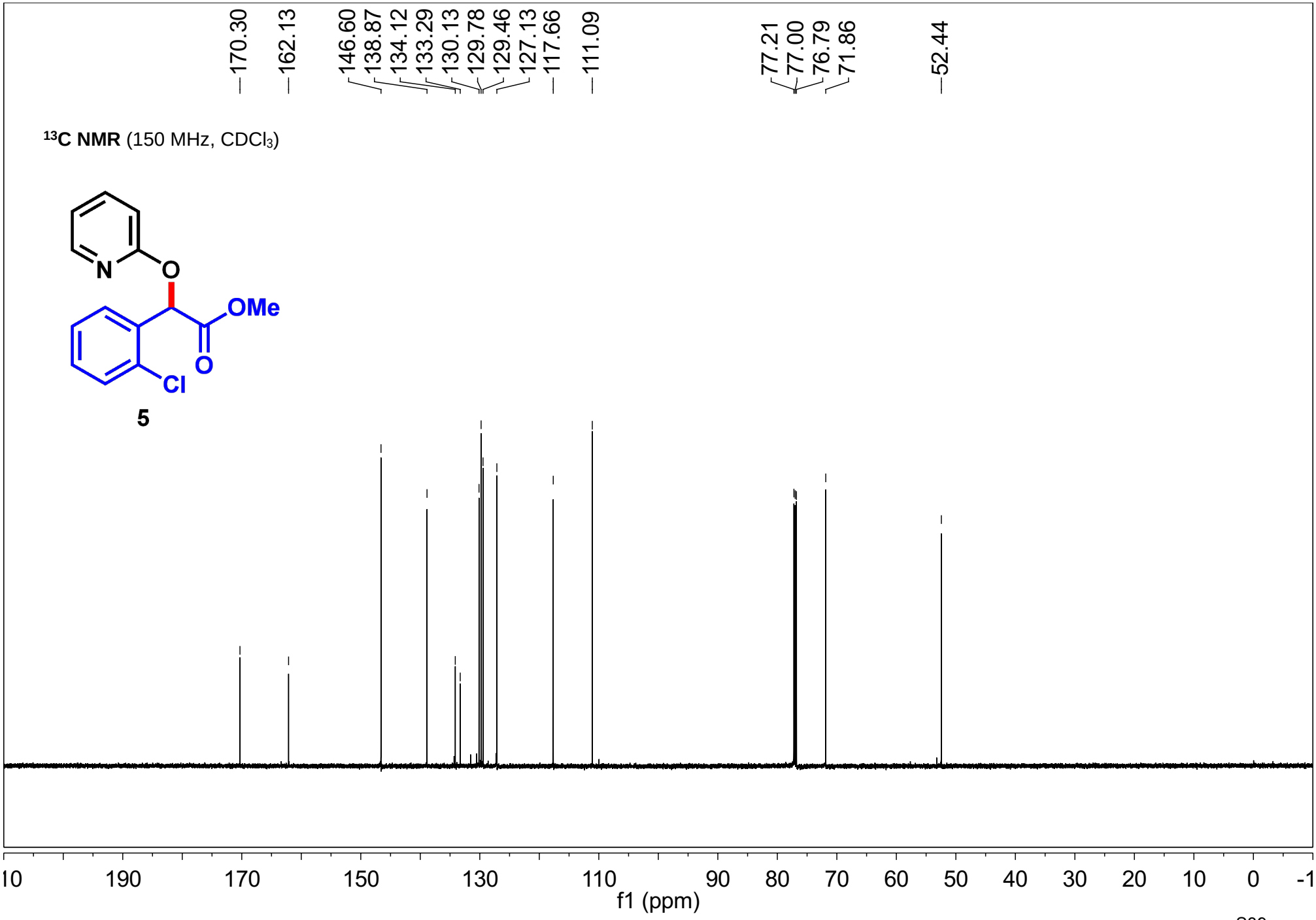
f1 (ppm)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77.21
77.00
76.79
71.86
52.44
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
Cl
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150
130
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30
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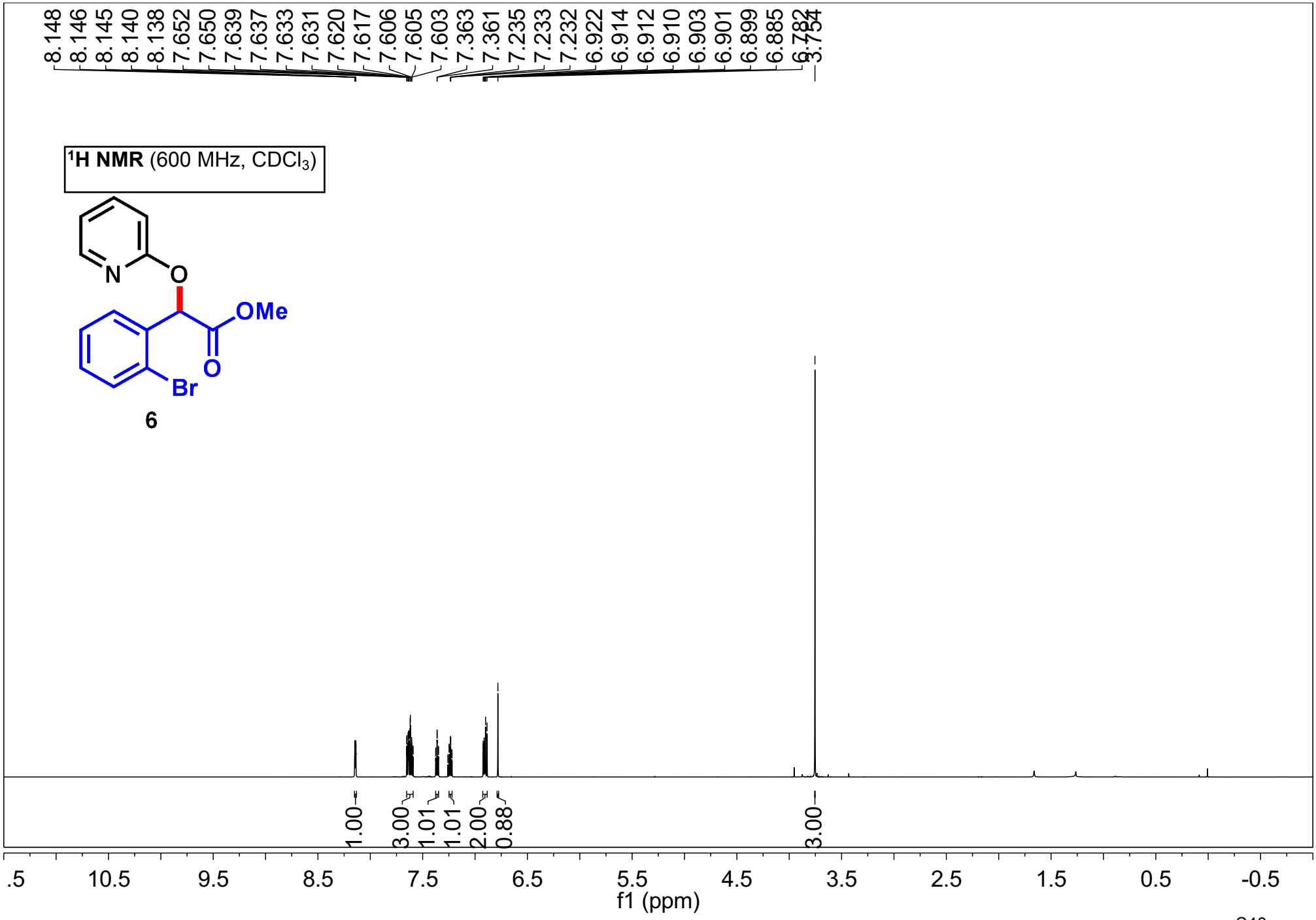
f1 (ppm)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7.605
7.603
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7.361
7.235
7.233
7.232
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6.901
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O
OMe
O
Br
6
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3.00
1.01
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3.00
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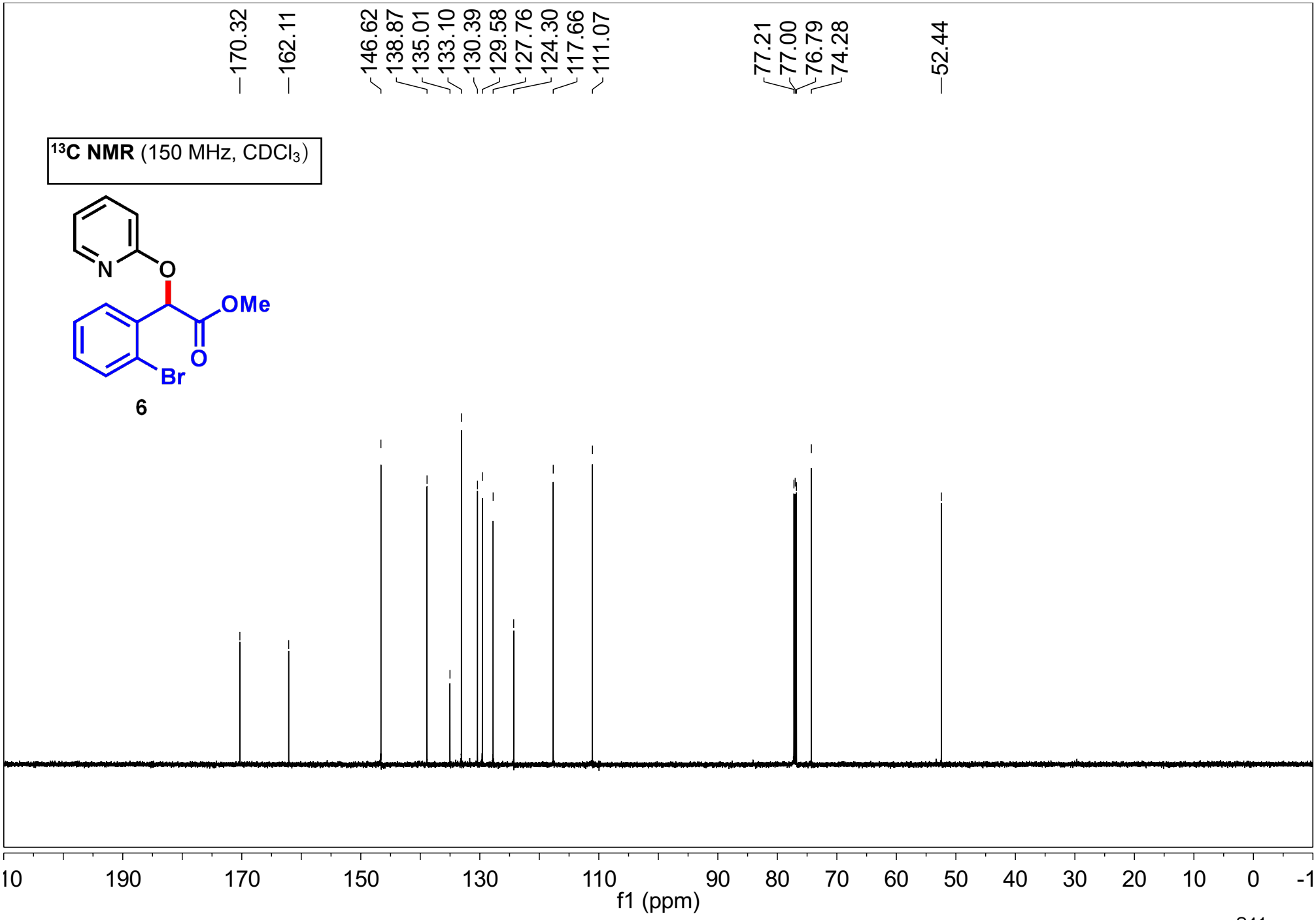
f1 (ppm)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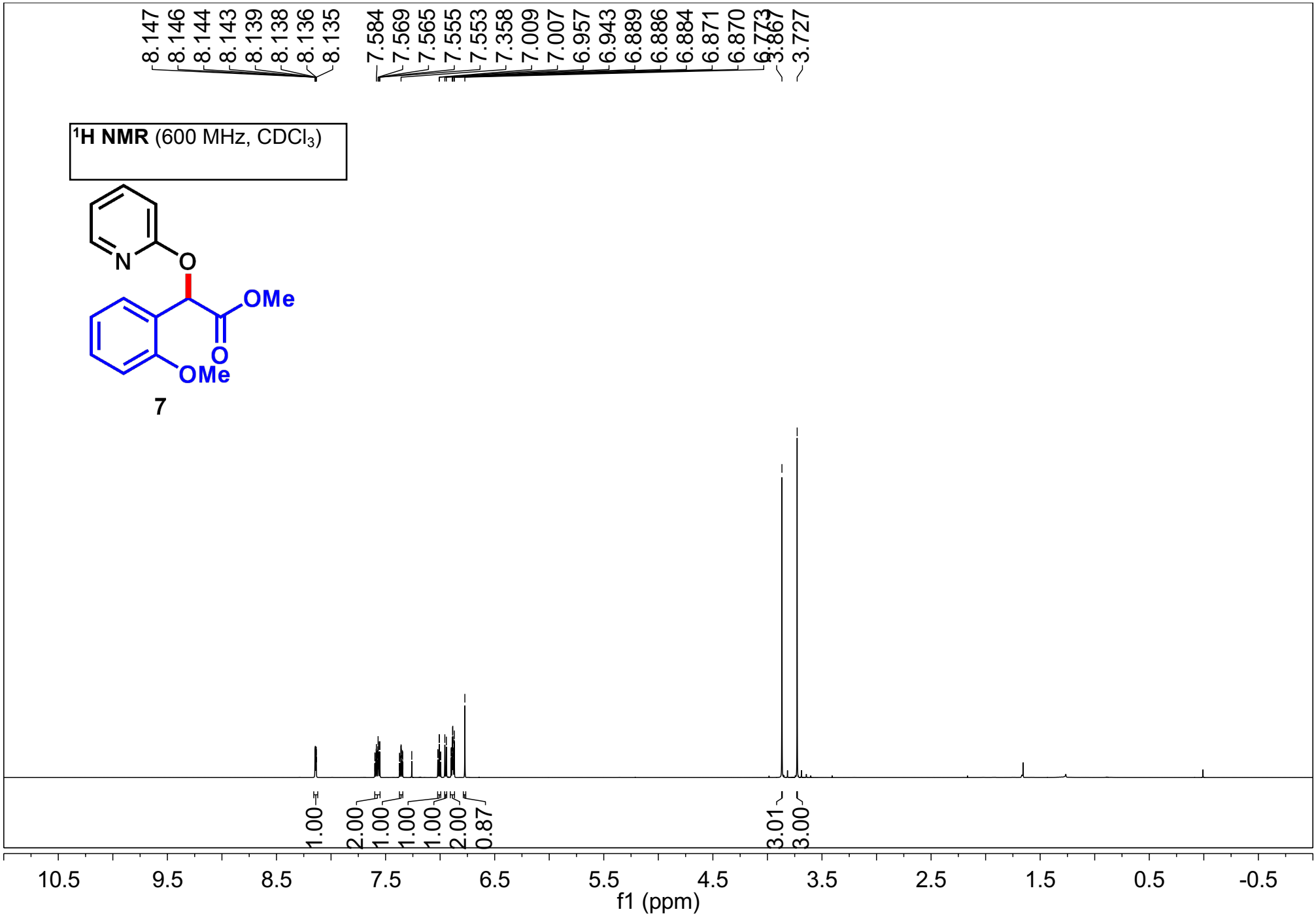
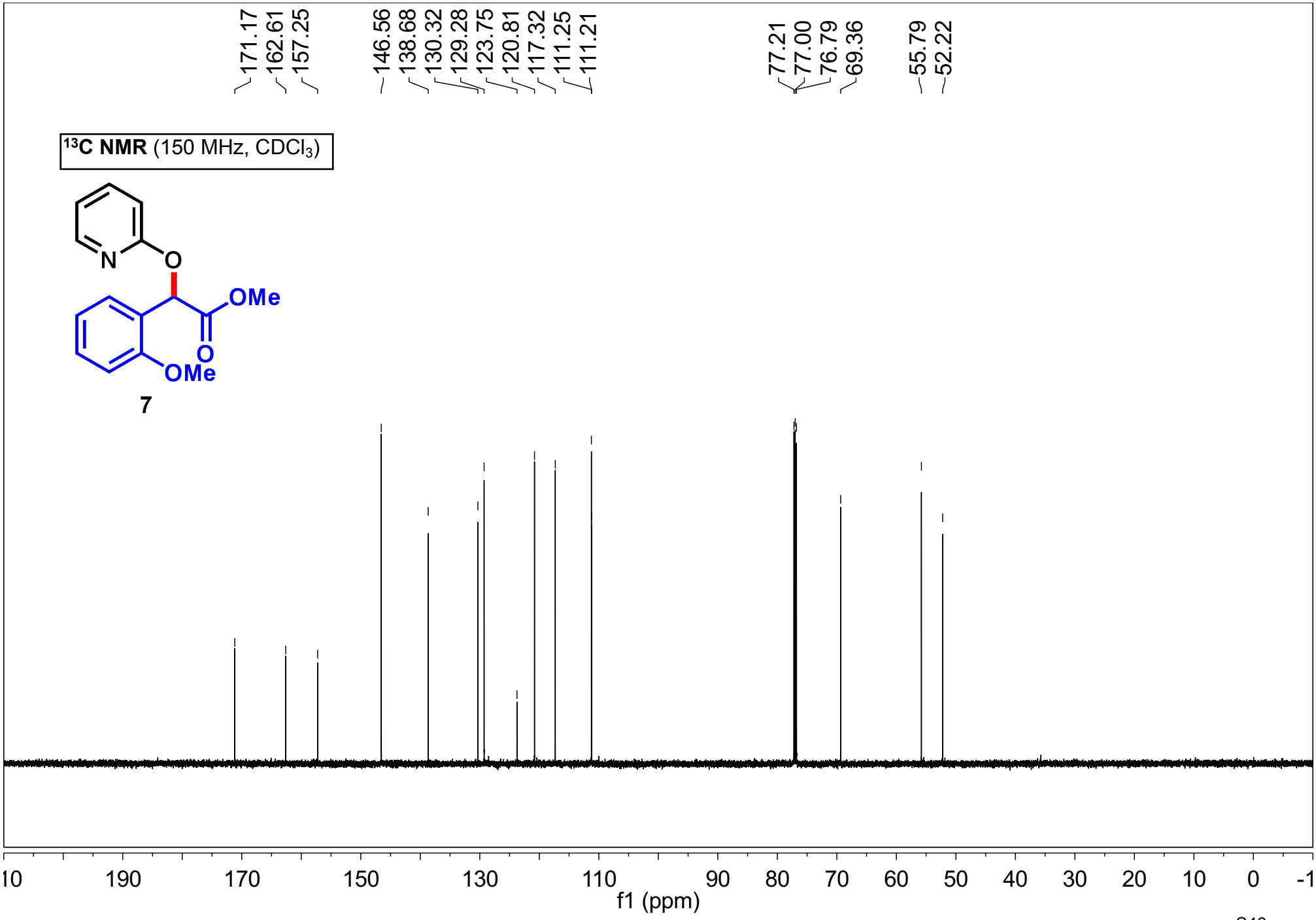
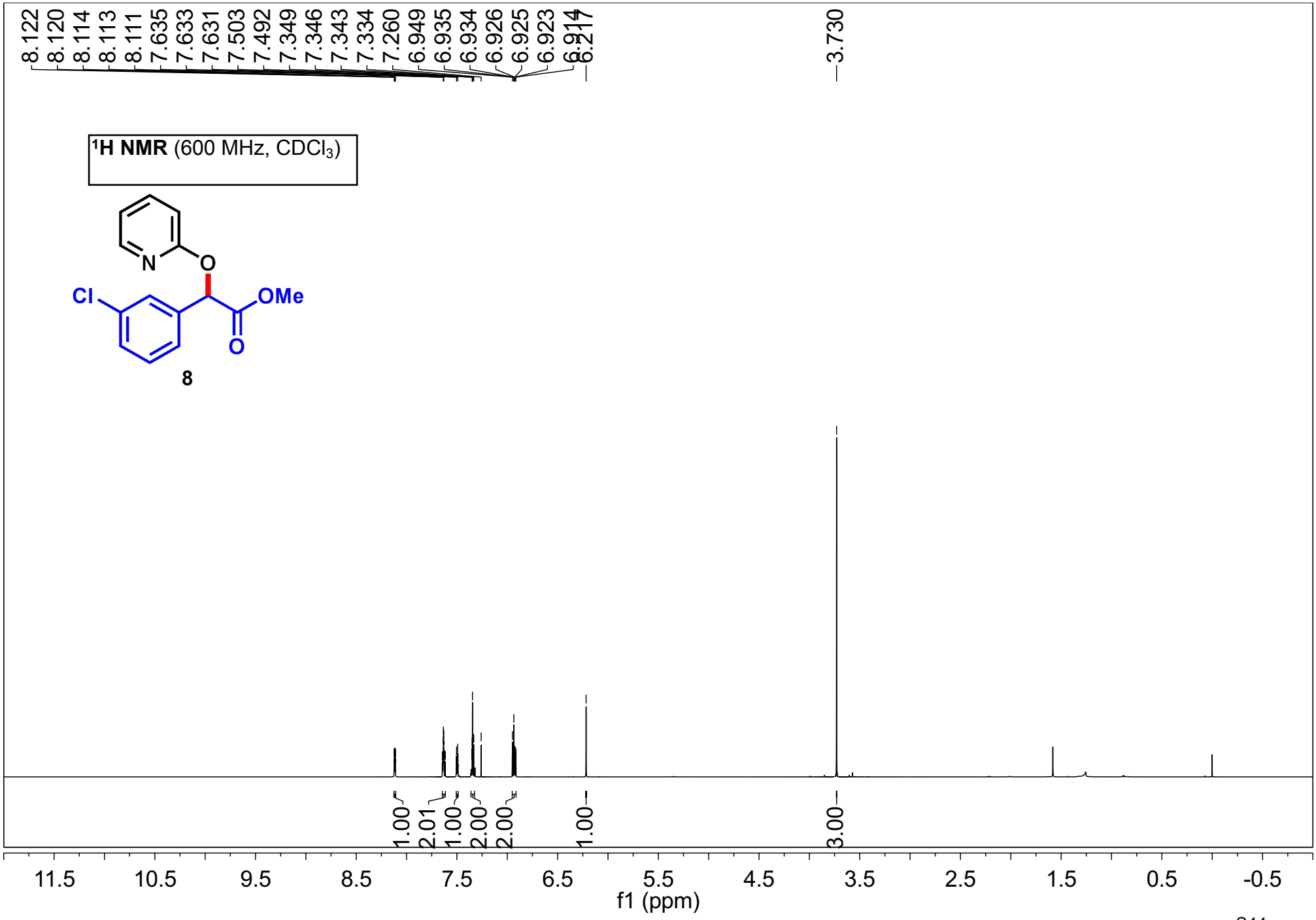
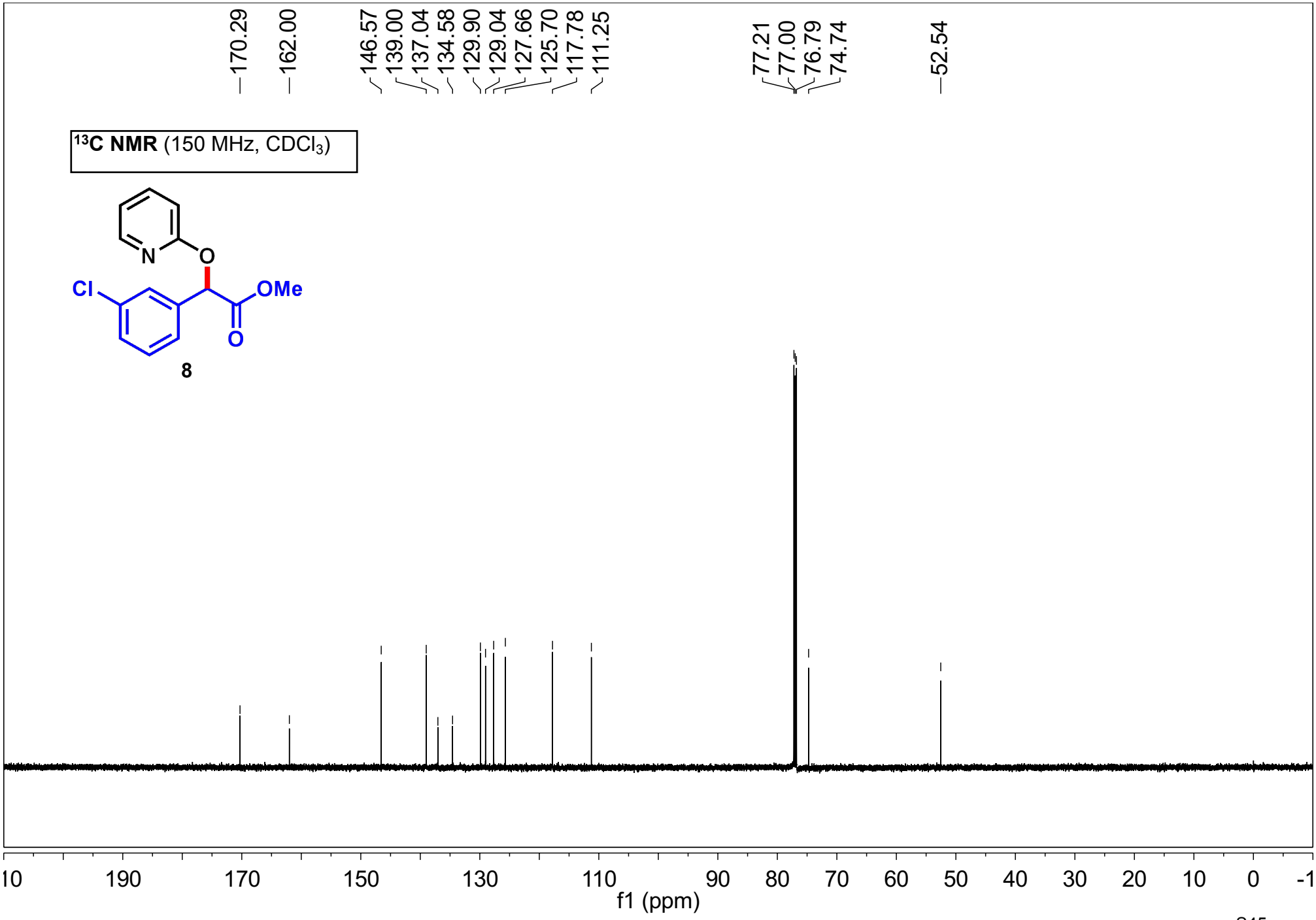
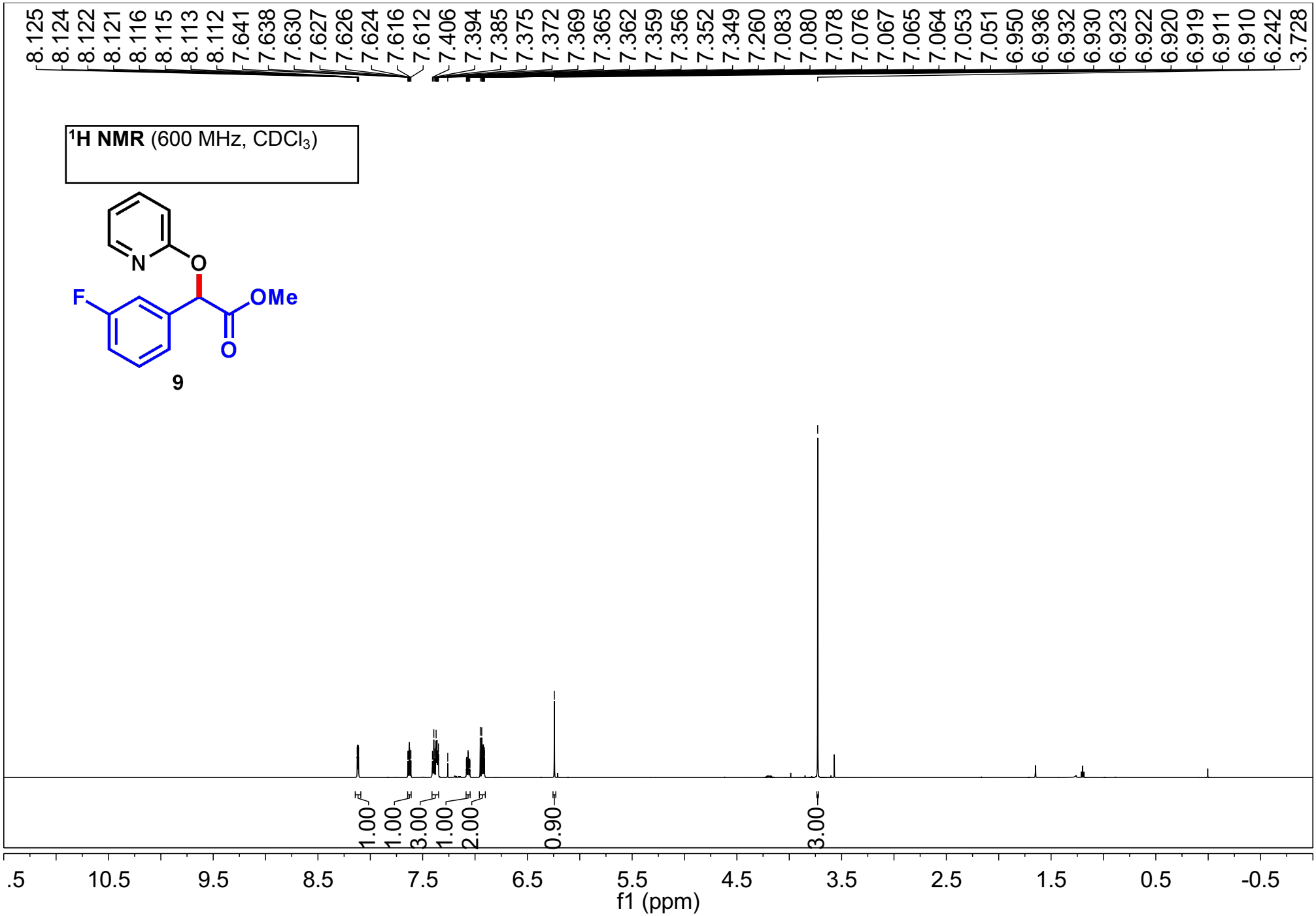
77.00
76.79
74.28
52.44
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
Br
6
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

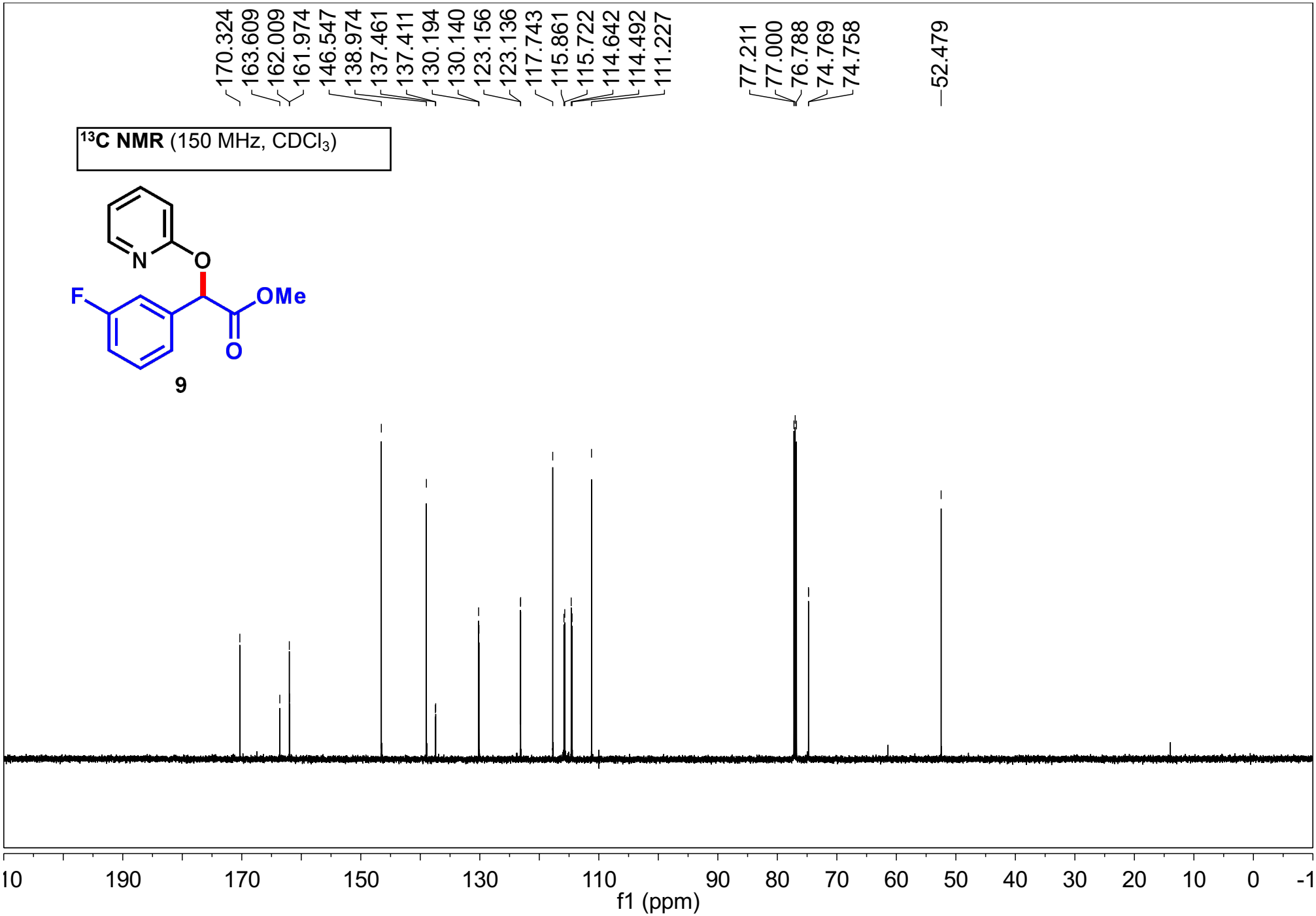

8.147
8.146
8.144
8.143
8.139
8.138
8.136
8.135
7.584
7.569
7.565
7.555
7.553
7.358
7.009
7.007
6.957
6.943
6.889
6.886
6.884
6.871
6.870
6.773
3.867
3.727
1H NMR (600 MHz, CDCl3)
N
O
OMe
O
OMe
7
1.00
2.00
1.00
1.00
1.00
2.00
0.87
3.01
3.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


171.17
162.61
157.25
146.56
138.68
130.32
129.28
123.75
120.81
117.32
111.25
111.21
77.21
77.00
76.79
69.36
55.79
52.22
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
OMe
7
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

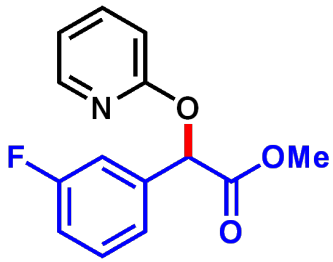

8.122
8.120
8.114
8.113
8.111
7.635
7.633
7.631
7.503
7.492
7.349
7.346
7.343
7.334
7.260
6.949
6.935
6.934
6.926
6.925
6.923
6.914
6.217
3.730
1H NMR (600 MHz, CDCl3)
N
O
Cl
OMe
O
8
1.00
2.01
1.00
2.00
2.00
1.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


170.29
162.00
146.57
139.00
137.04
134.58
129.90
129.04
127.66
125.70
117.78
111.25
77.21
77.00
76.79
74.74
52.54
13C NMR (150 MHz, CDCl3)
N
O
Cl
OMe
O
8
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

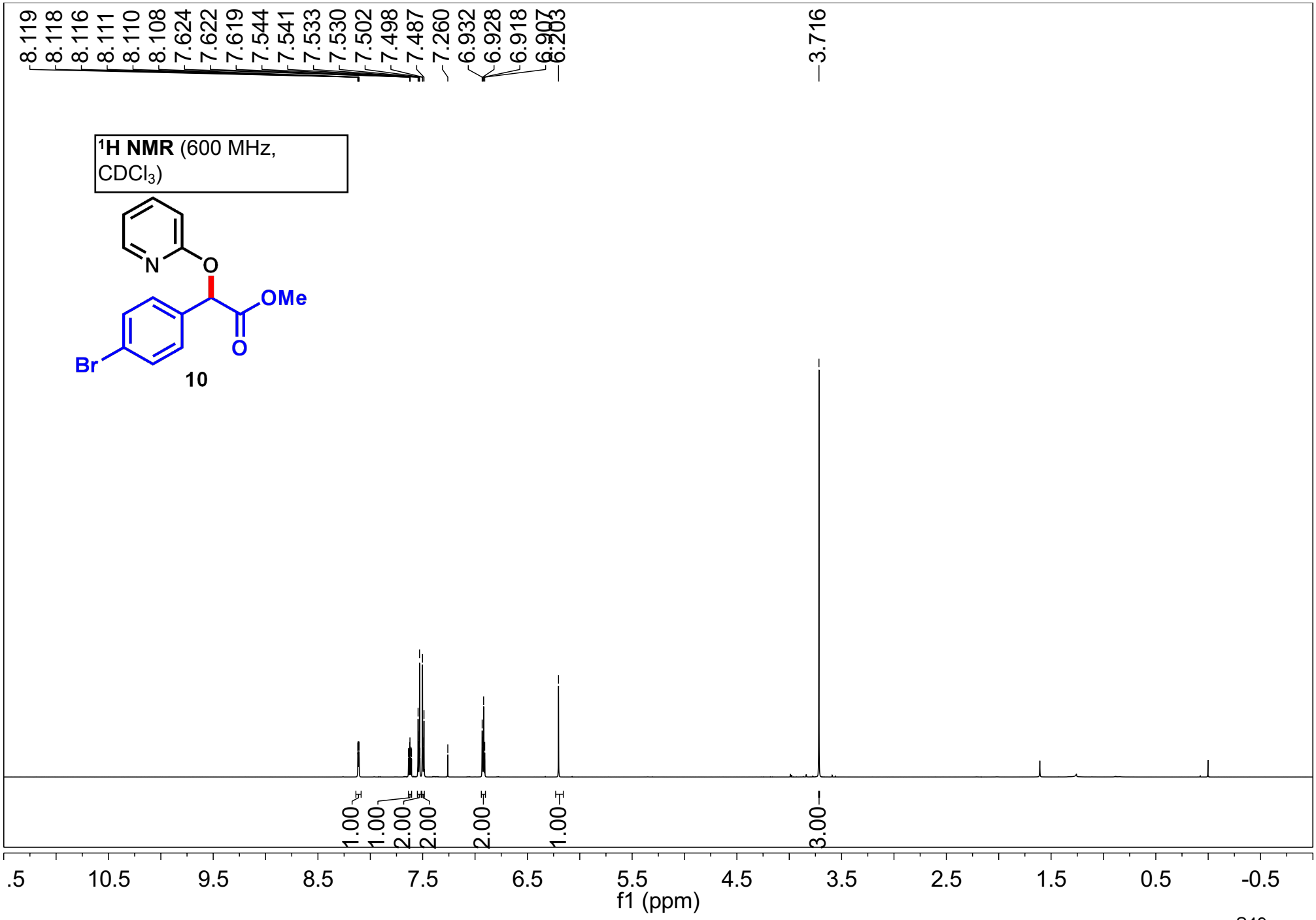

8.125
8.124
8.122
8.121
8.116
8.115
8.113
8.112
7.641
7.638
7.630
7.627
7.626
7.624
7.616
7.612
7.406
7.394
7.385
7.375
7.372
7.369
7.365
7.362
7.359
7.356
7.352
7.349
7.260
7.083
7.080
7.078
7.076
7.067
7.065
7.064
7.053
7.051
6.950
6.936
6.932
6.930
6.923
6.922
6.920
6.919
6.911
6.910
6.242
3.728
1H NMR (600 MHz, CDCl3)
N
O
F
OMe
O
9
1.00
1.00
3.00
1.00
2.00
0.90
3.00
.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

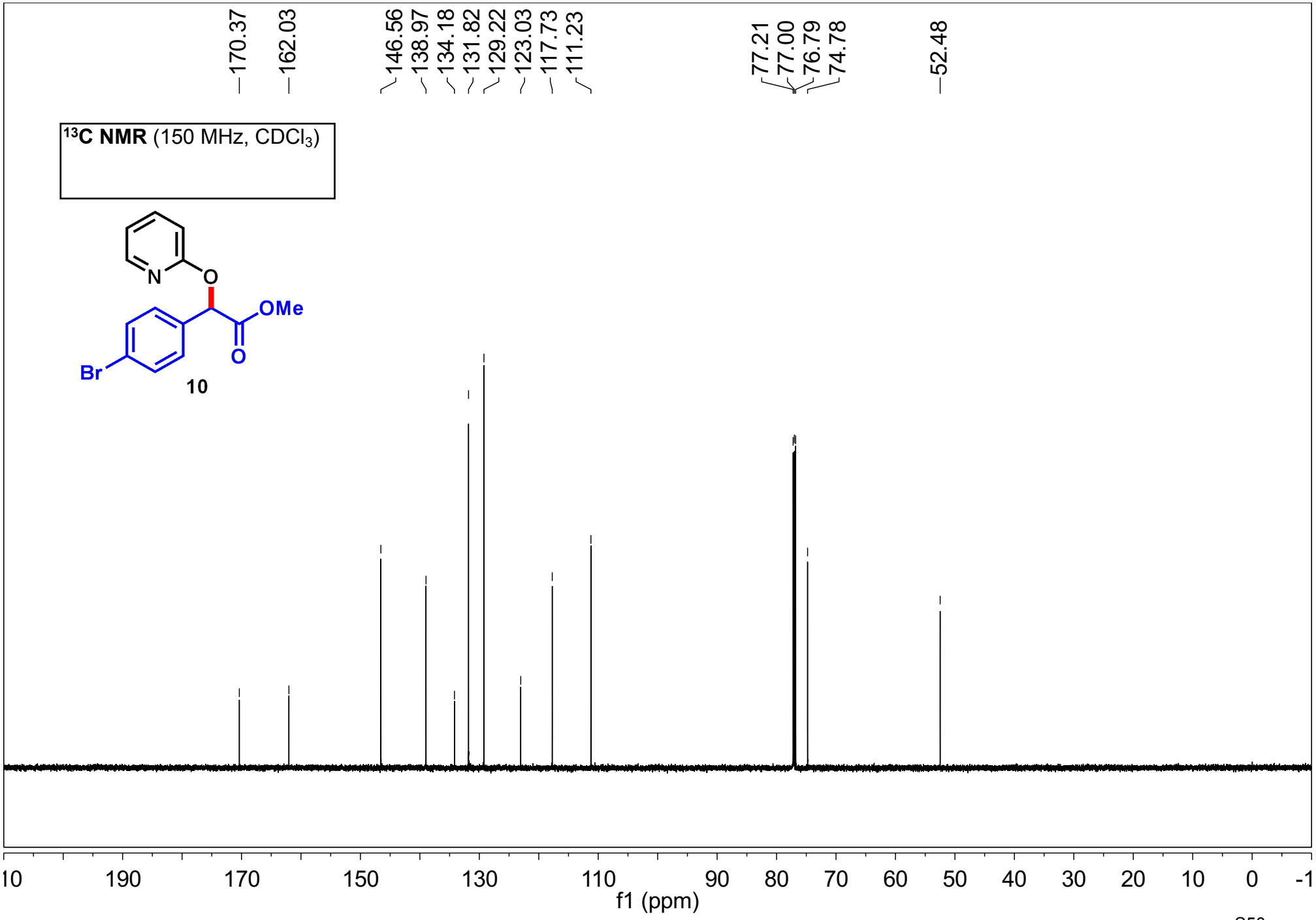

170.324
163.609
162.009
161.974
146.547
138.974
137.461
137.411
130.194
130.140
123.156
123.136
117.743
115.861
115.722
114.642
114.492
111.227
77.211
77.000
76.788
74.769
74.758
52.479
13C NMR (150 MHz, CDCl3)
N
O
F
OMe
O
9
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

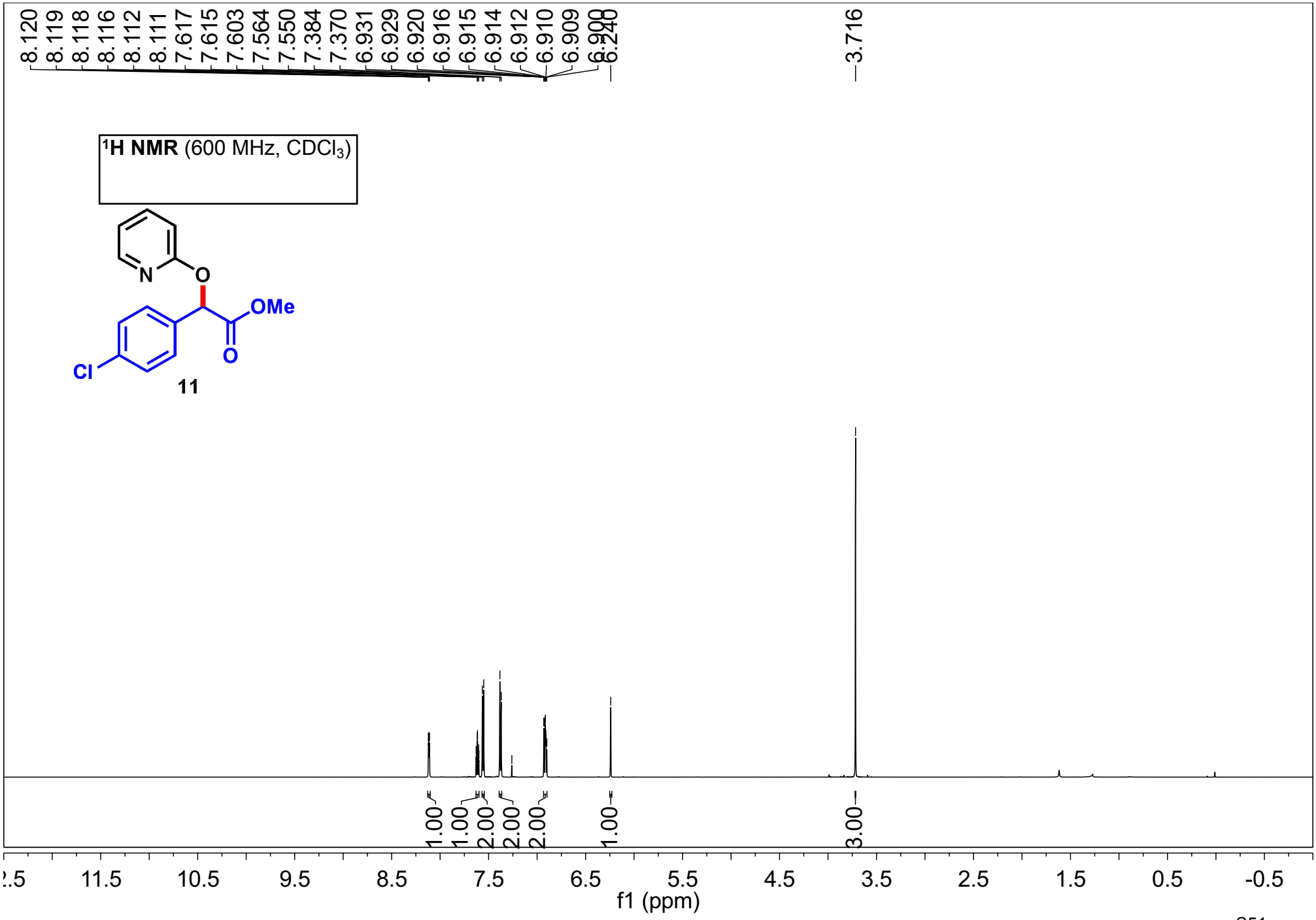
^{19}F NMR (376 MHz, $CDCl_3$)

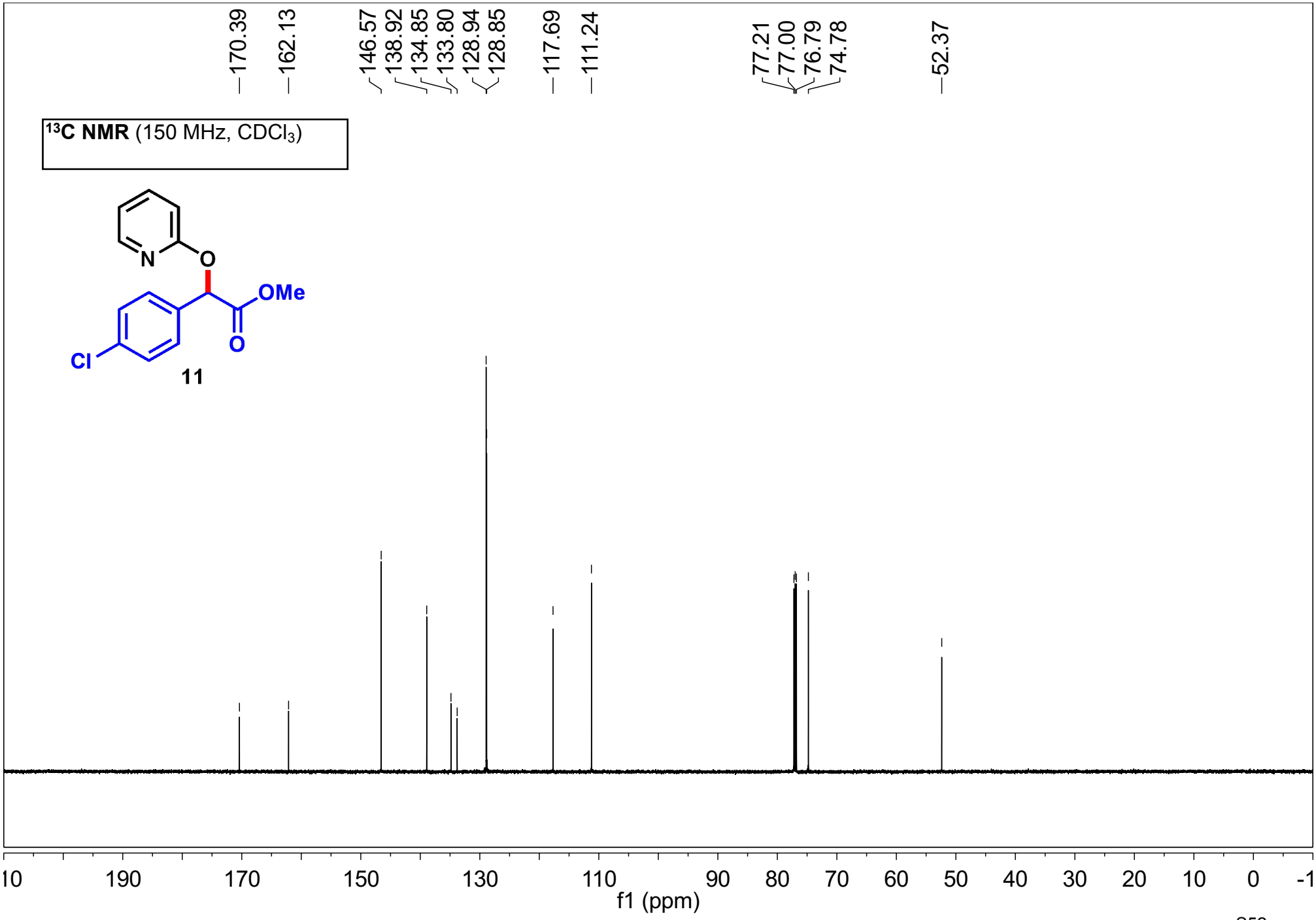


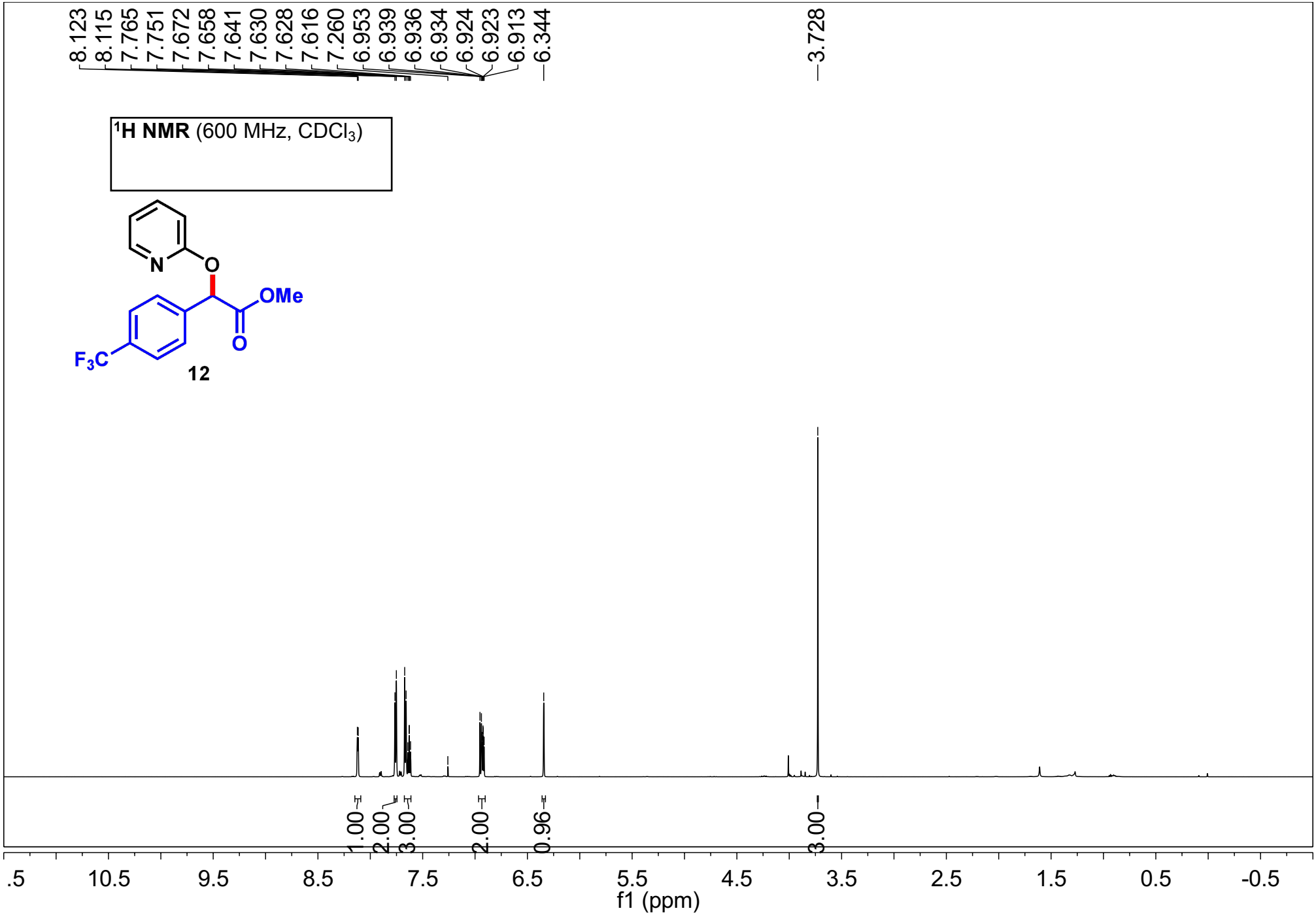
9

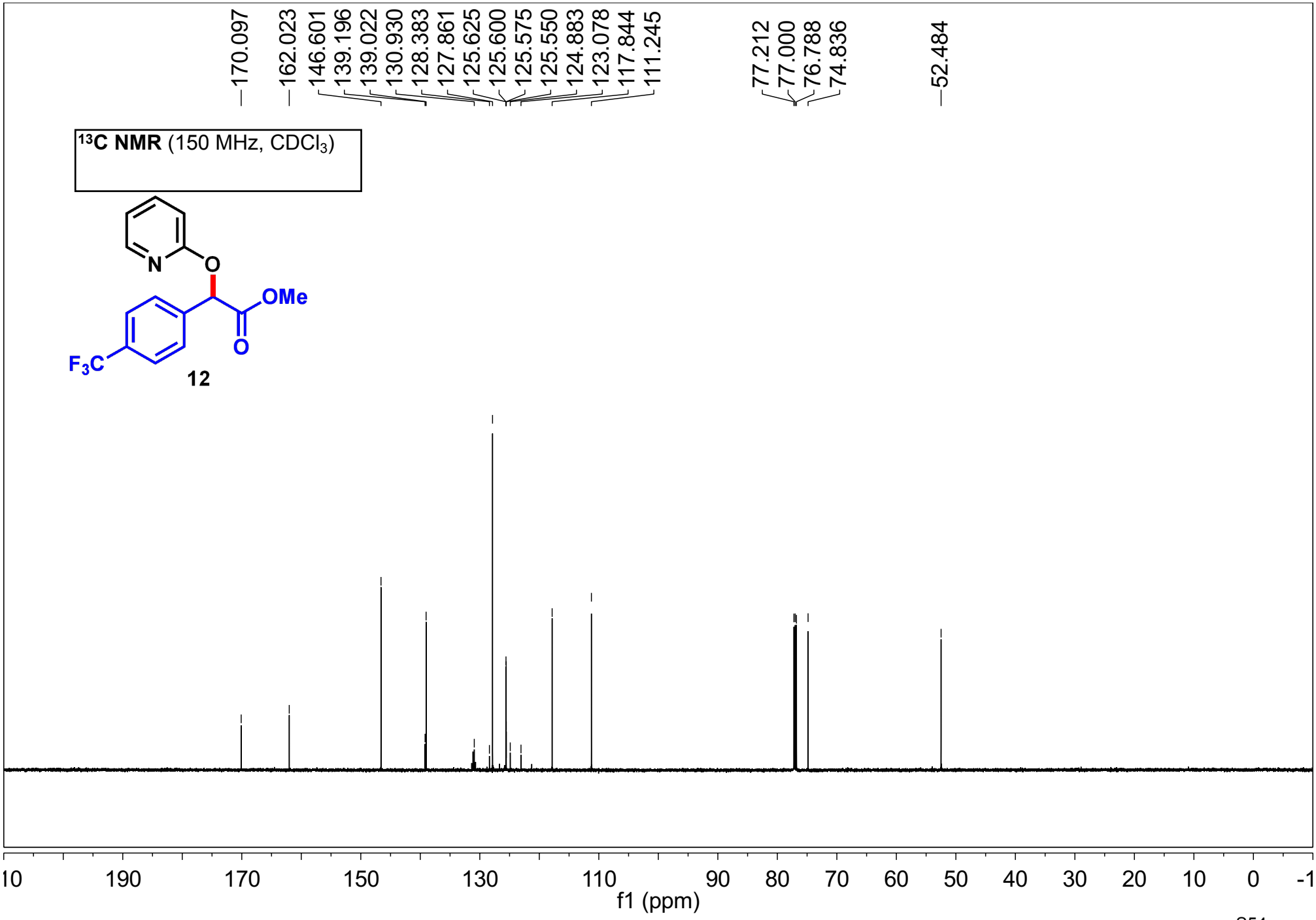

8.119
8.118
8.116
8.111
8.110
8.108
7.624
7.622
7.619
7.544
7.541
7.533
7.530
7.502
7.498
7.487
7.260
6.932
6.928
6.918
6.907
6.203
3.716
¹H NMR (600 MHz, CDCl3)
N
O
OMe
O
Br
10
1.00
1.00
2.00
2.00
2.00
1.00
3.00
.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


170.37
162.03
146.56
138.97
134.18
131.82
129.22
123.03
117.73
111.23
77.21
77.00
76.79
74.78
52.48
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
Br
10
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

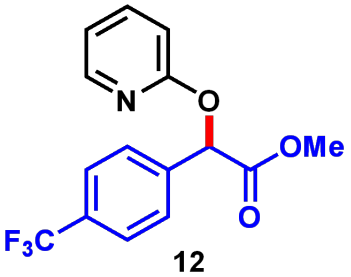

8.120
8.119
8.118
8.116
8.112
8.111
7.617
7.615
7.603
7.564
7.550
7.384
7.370
6.931
6.929
6.920
6.916
6.915
6.914
6.912
6.910
6.909
6.900
6.240
3.716
¹H NMR (600 MHz, CDCl₃)
N
O
OMe
O
Cl
11
1.00
1.00
2.00
2.00
2.00
1.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


170.39
162.13
146.57
138.92
134.85
133.80
128.94
128.85
117.69
111.24
77.21
77.00
76.79
74.78
52.37
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
Cl
11
f1 (ppm)

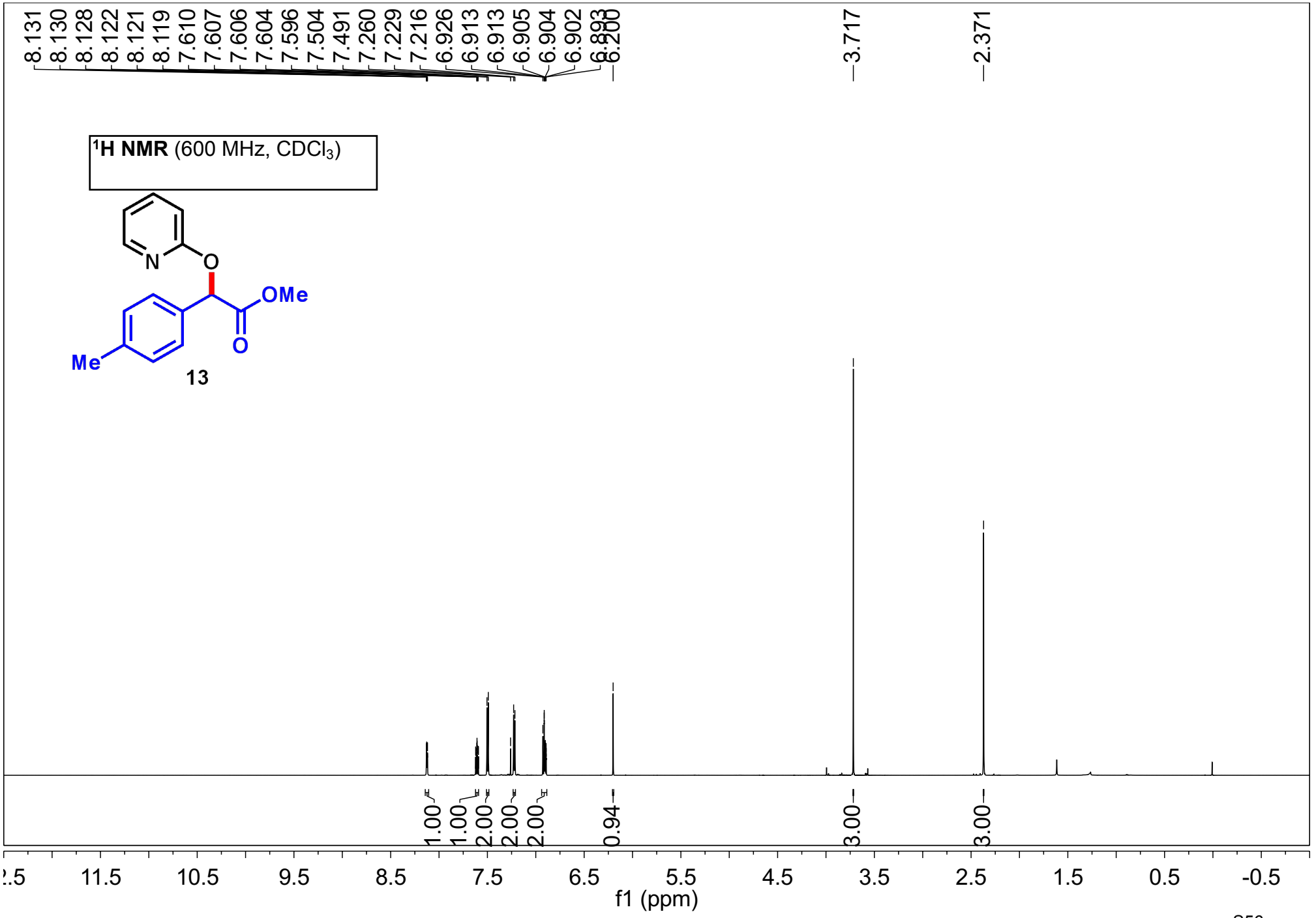

8.123
8.115
7.765
7.751
7.672
7.658
7.641
7.630
7.628
7.616
7.260
6.953
6.939
6.936
6.934
6.924
6.923
6.913
6.344
3.728
1H NMR (600 MHz, CDCl3)
N
O
OMe
O
F3C
12
1.00
2.00
3.00
2.00
0.96
3.00
.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

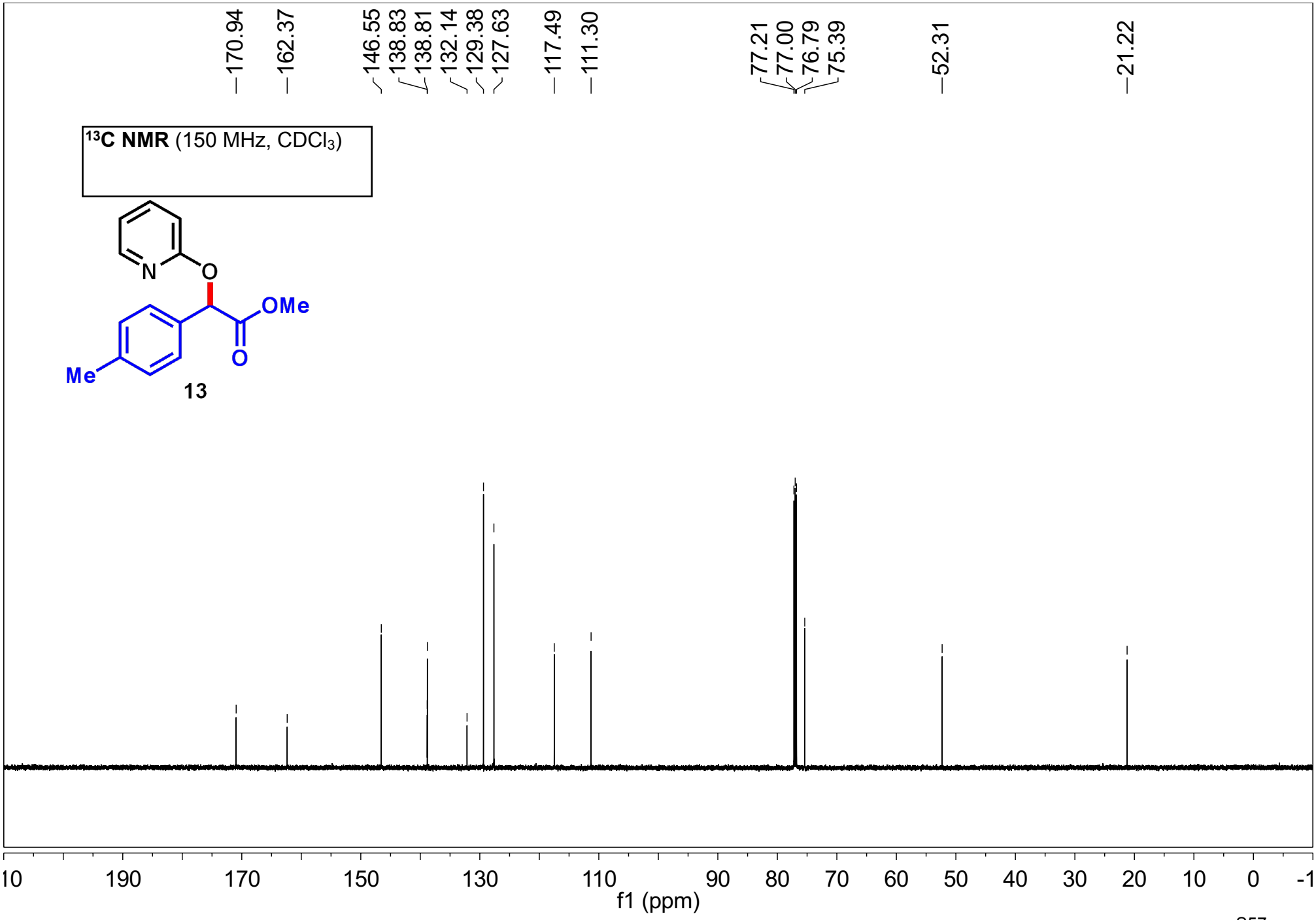

170.097
162.023
146.601
139.196
139.022
130.930
128.383
127.861
125.625
125.600
125.575
125.550
124.883
123.078
117.844
111.245
77.212
77.000
76.788
74.836
52.484
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
F3C
12
f1 (ppm)

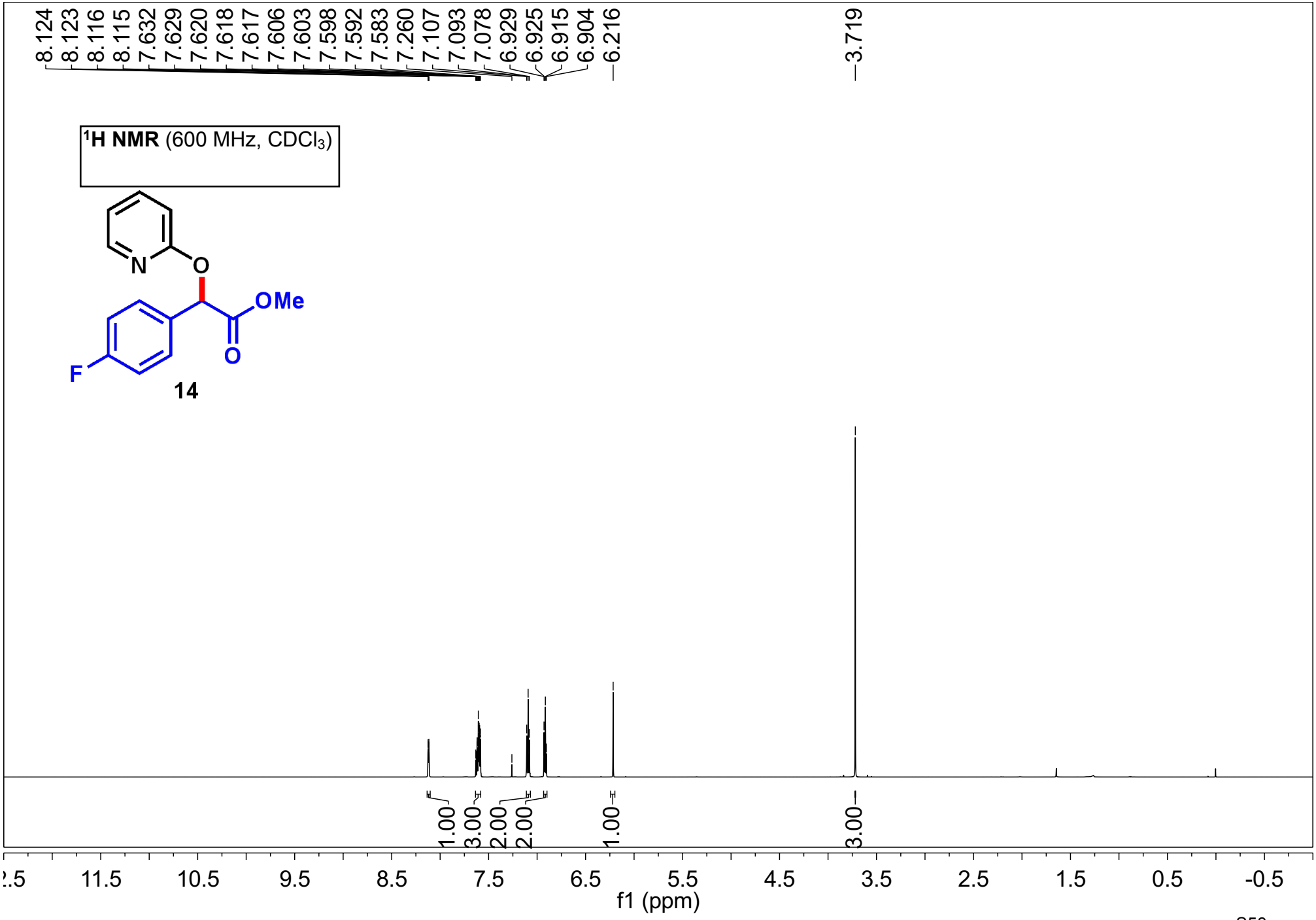
^{19}F NMR (376 MHz, $CDCl_3$)

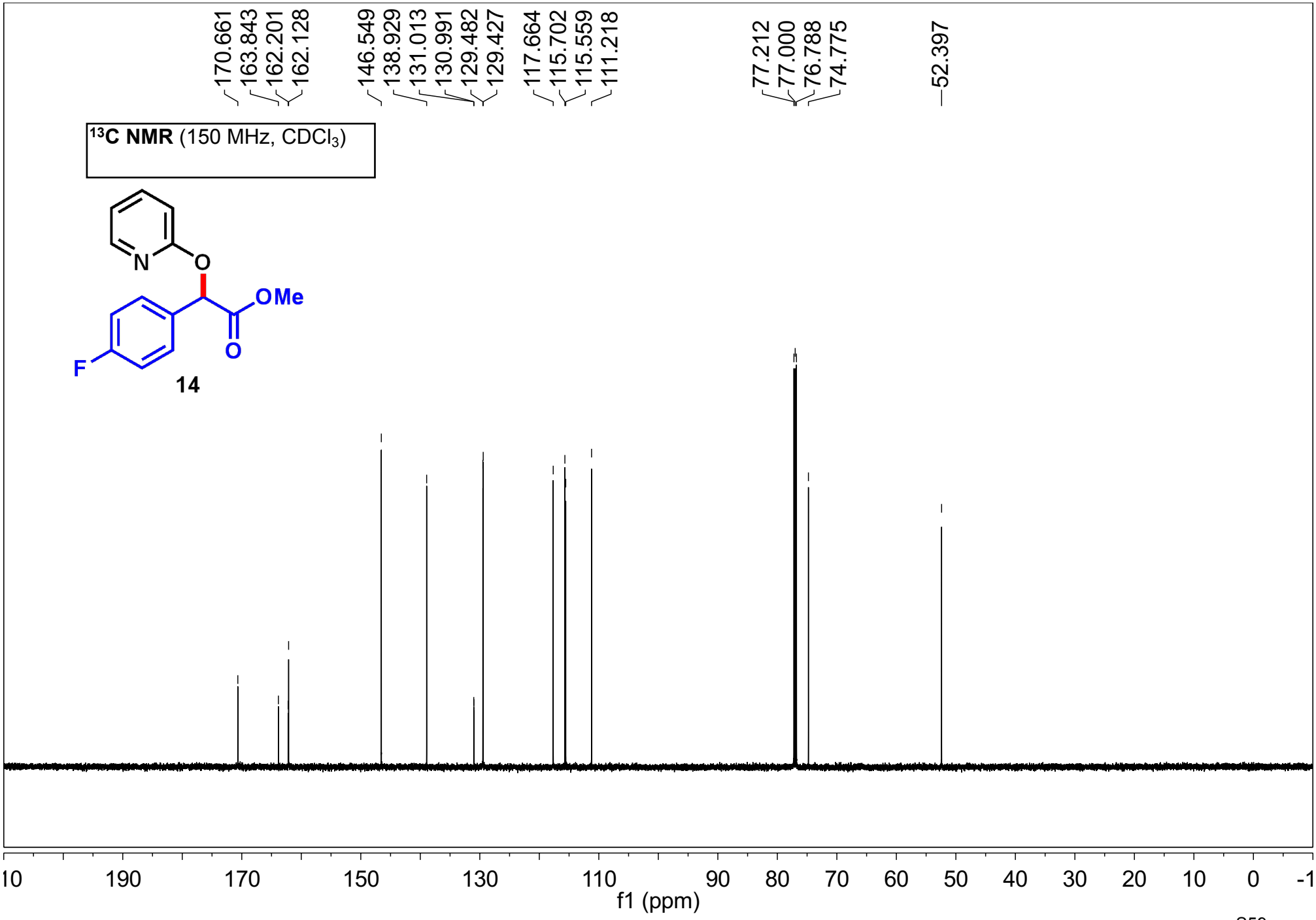


12

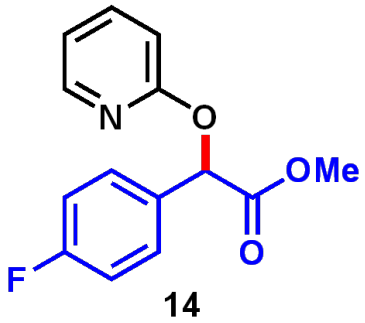

8.131
8.130
8.128
8.122
8.121
8.119
7.610
7.607
7.606
7.604
7.596
7.504
7.491
7.260
7.229
7.216
6.926
6.913
6.913
6.905
6.904
6.902
6.893
6.880
6.200
3.717
2.371
1H NMR (600 MHz, CDCl3)
N
O
OMe
O
Me
13
1.00
1.00
2.00
2.00
2.00
0.94
3.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


170.94
162.37
146.55
138.83
138.81
132.14
129.38
127.63
117.49
111.30
77.21
77.00
76.79
75.39
52.31
21.22
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
Me
13
f1 (ppm)

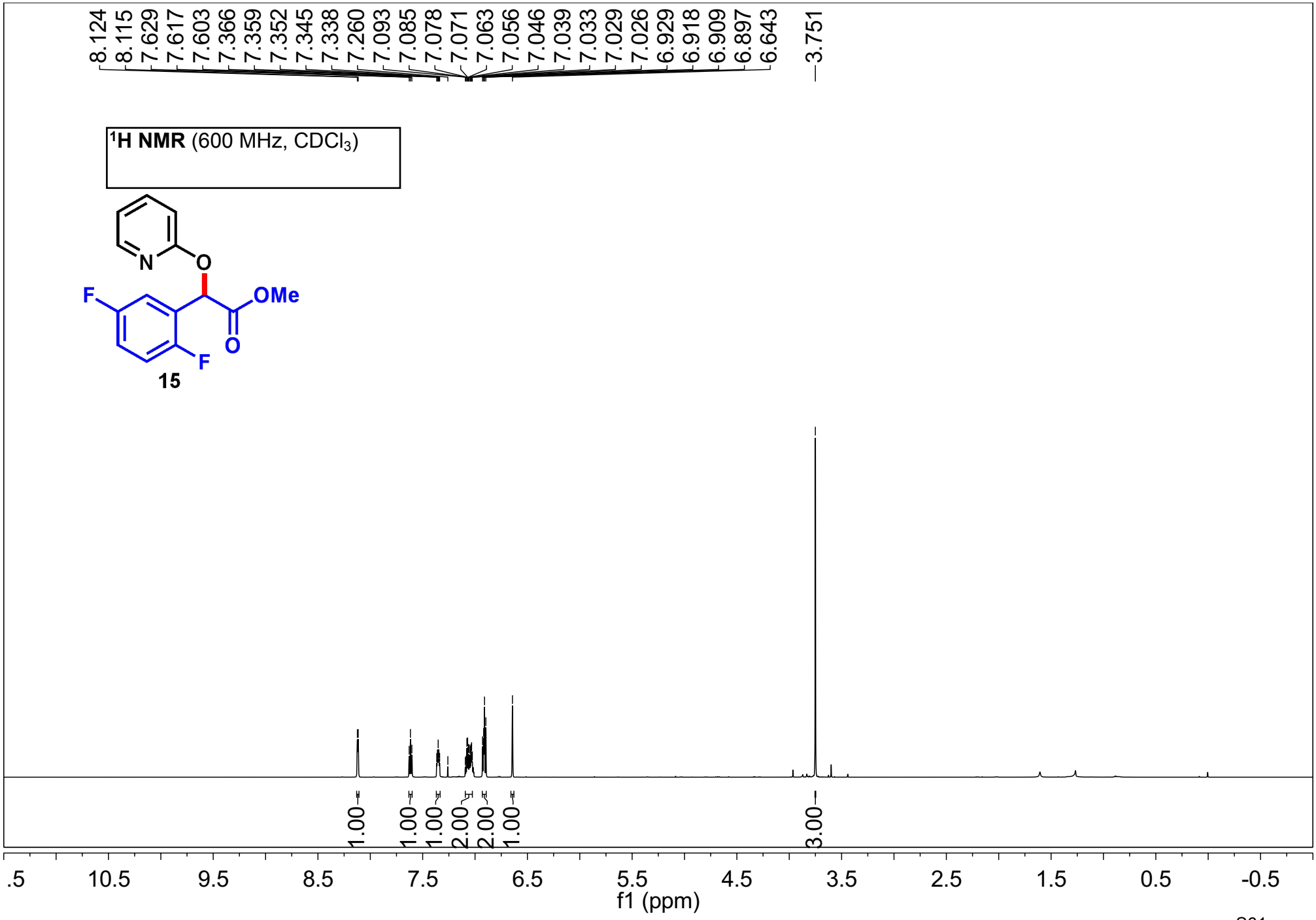

8.124
8.123
8.116
8.115
7.632
7.629
7.620
7.618
7.617
7.606
7.603
7.598
7.592
7.583
7.260
7.107
7.093
7.078
6.929
6.925
6.915
6.904
6.216
3.719
1H NMR (600 MHz, CDCl3)
N
O
OMe
O
F
14
1.00
3.00
2.00
2.00
1.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

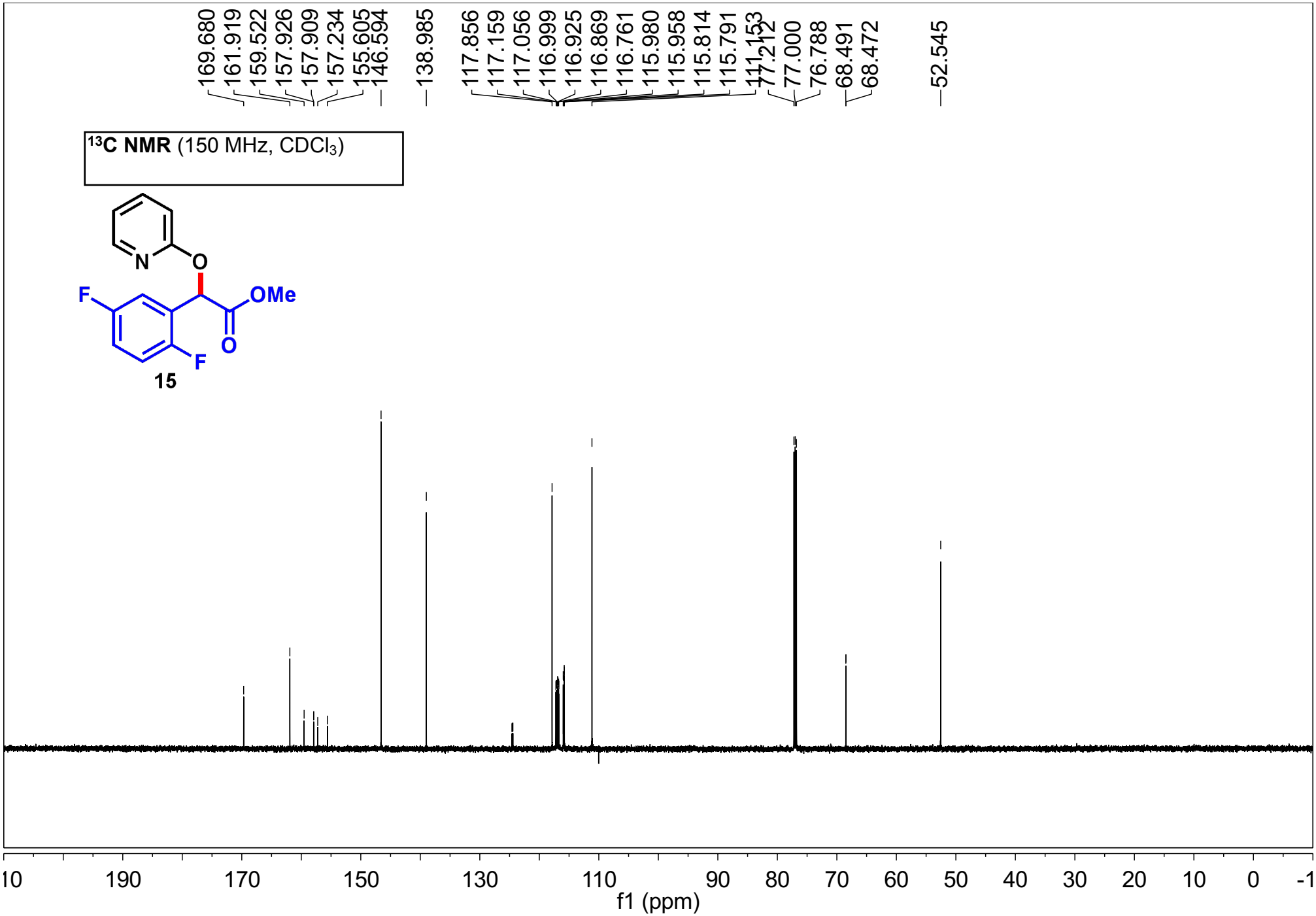

170.661
163.843
162.201
162.128
146.549
138.929
131.013
130.991
129.482
129.427
117.664
115.702
115.559
111.218
77.212
77.000
76.788
74.775
52.397
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
F
14
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

^{19}F NMR (376 MHz, $CDCl_3$)

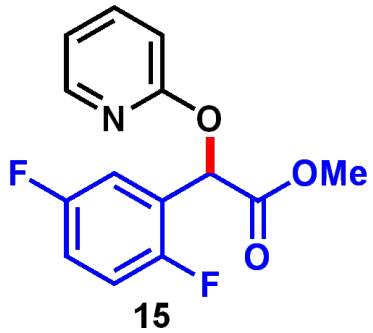


14

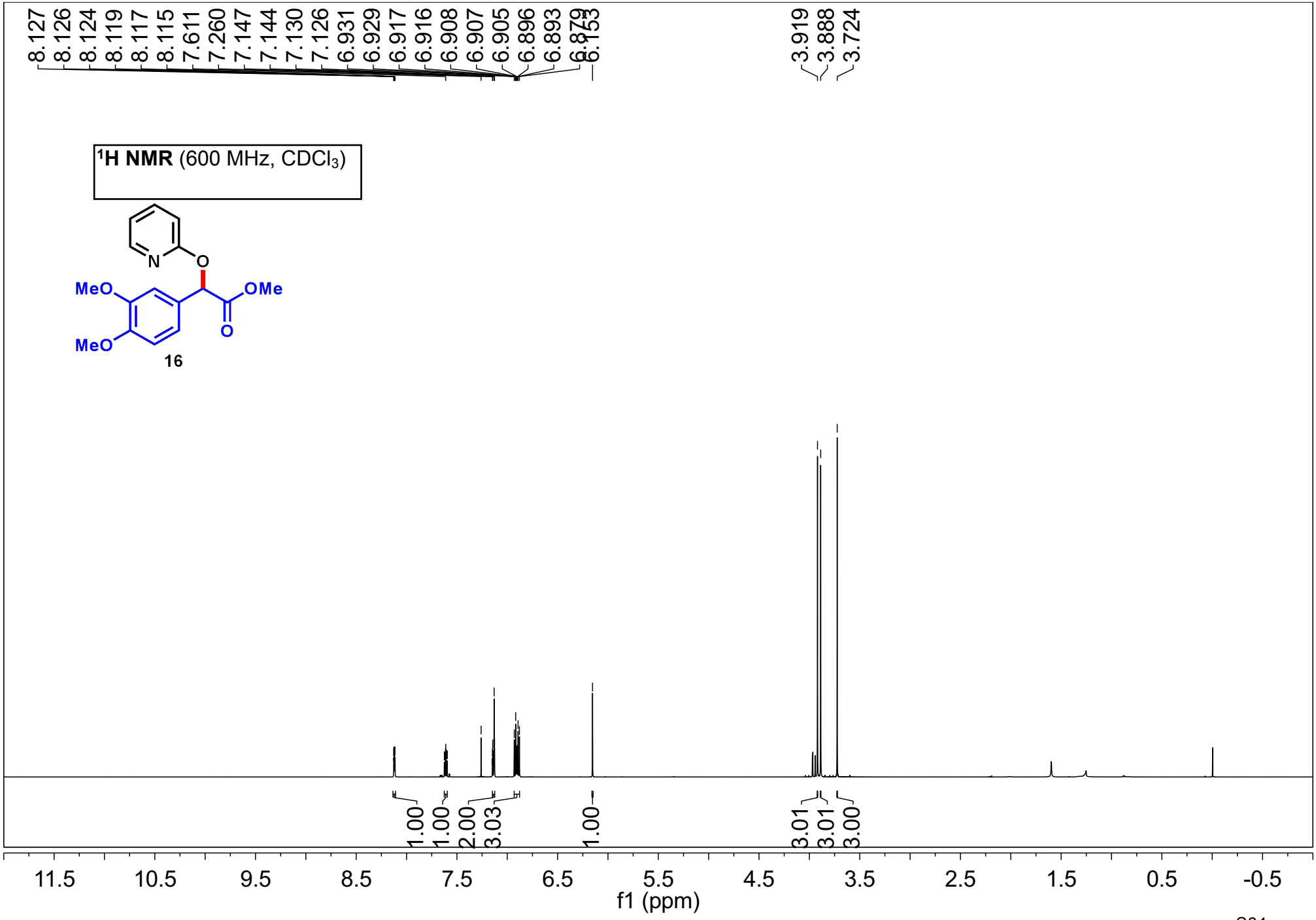

8.124
8.115
7.629
7.617
7.603
7.366
7.359
7.352
7.345
7.338
7.260
7.093
7.085
7.078
7.071
7.063
7.056
7.046
7.039
7.033
7.029
7.026
6.929
6.918
6.909
6.897
6.643
3.751
1H NMR (600 MHz, CDCl3)
N
O
F
OMe
O
F
15
1.00
1.00
1.00
2.00
2.00
1.00
3.00
.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

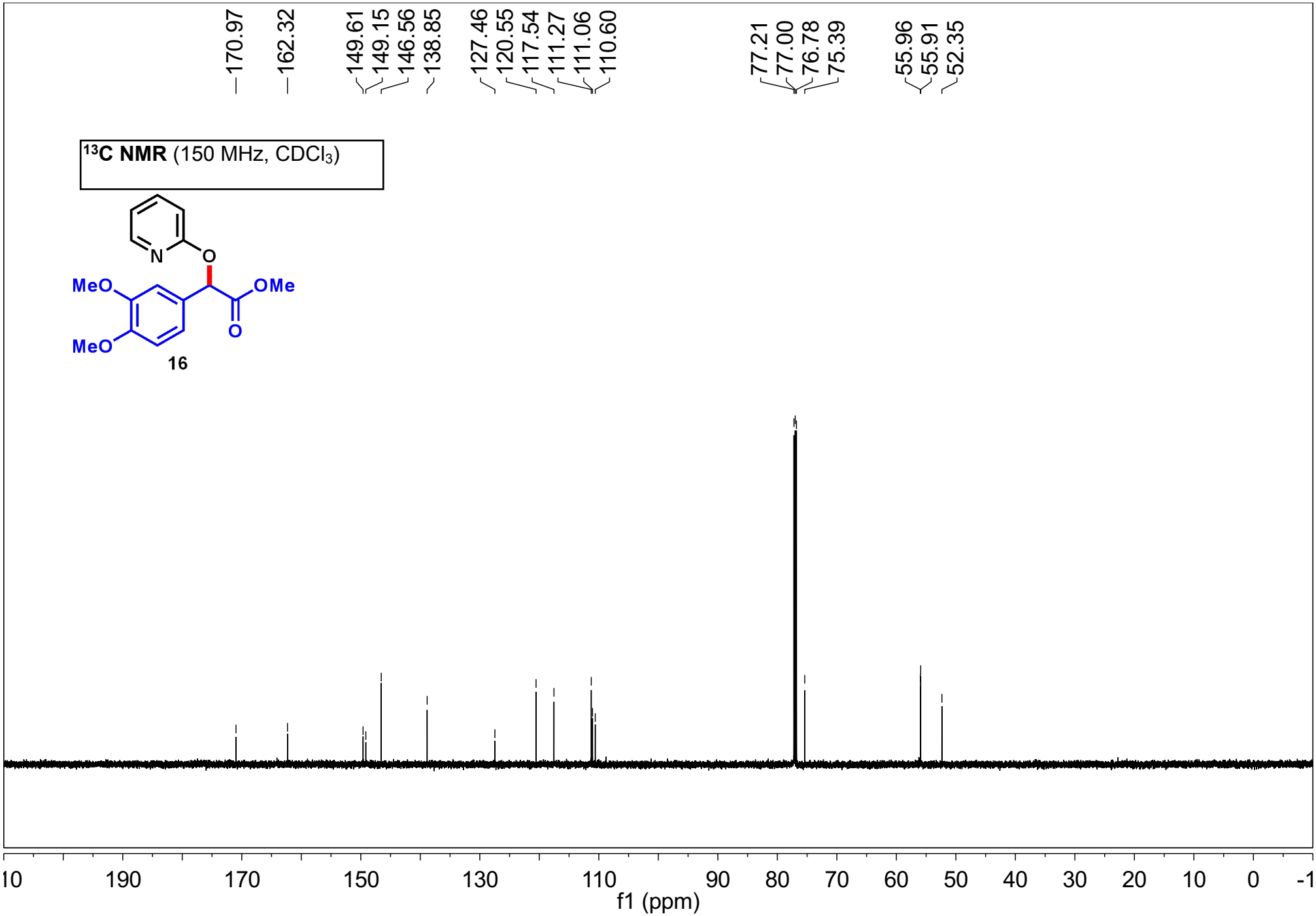

169.680
161.919
159.522
157.926
157.909
157.234
155.605
146.594
138.985
117.856
117.159
117.056
116.999
116.925
116.869
116.761
115.980
115.958
115.814
115.791
111.153
77.212
77.000
76.788
68.491
68.472
52.545
13C NMR (150 MHz, CDCl3)
N
O
F
OMe
O
F
15
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

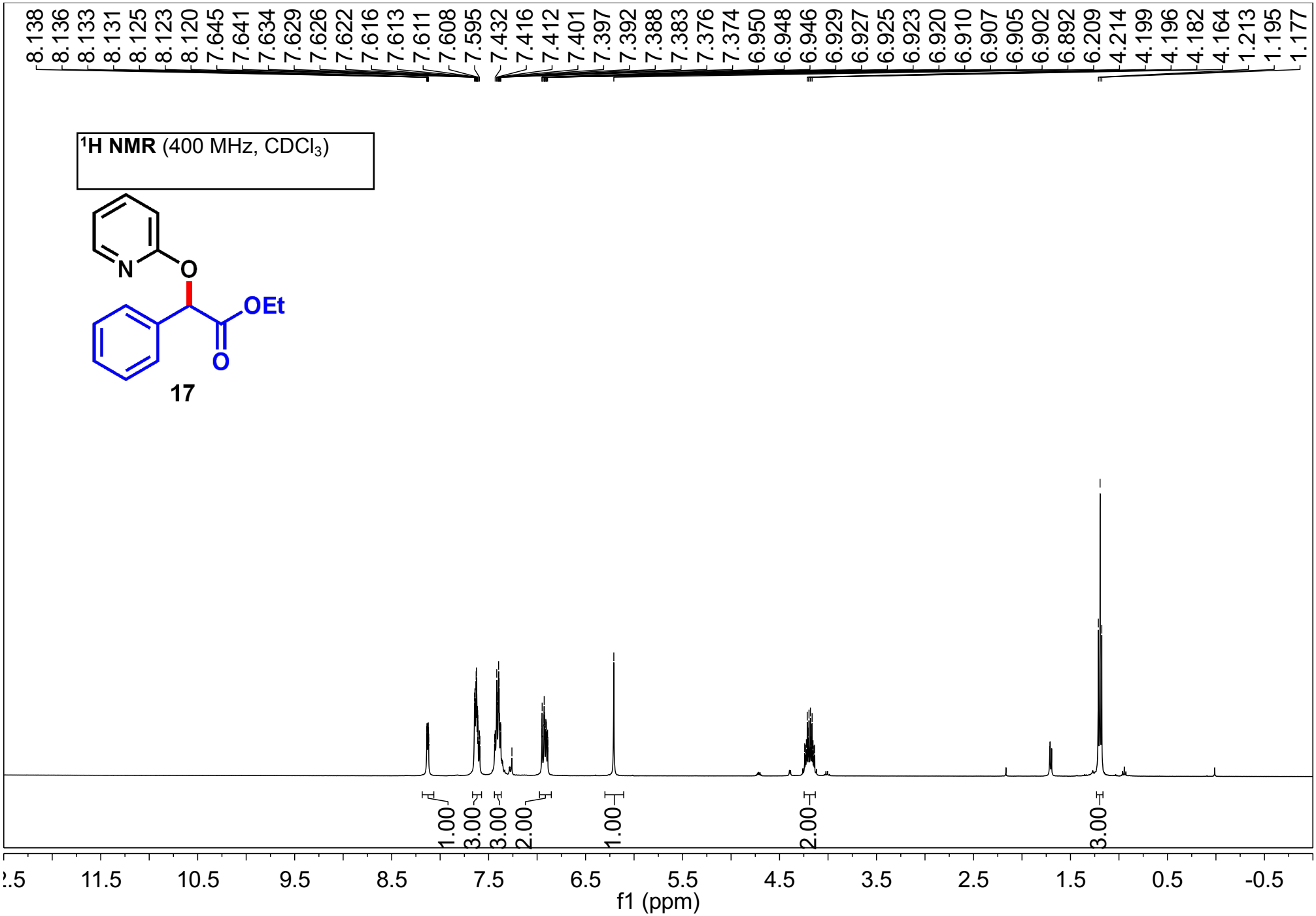
^{19}F NMR (376 MHz, $CDCl_3$)

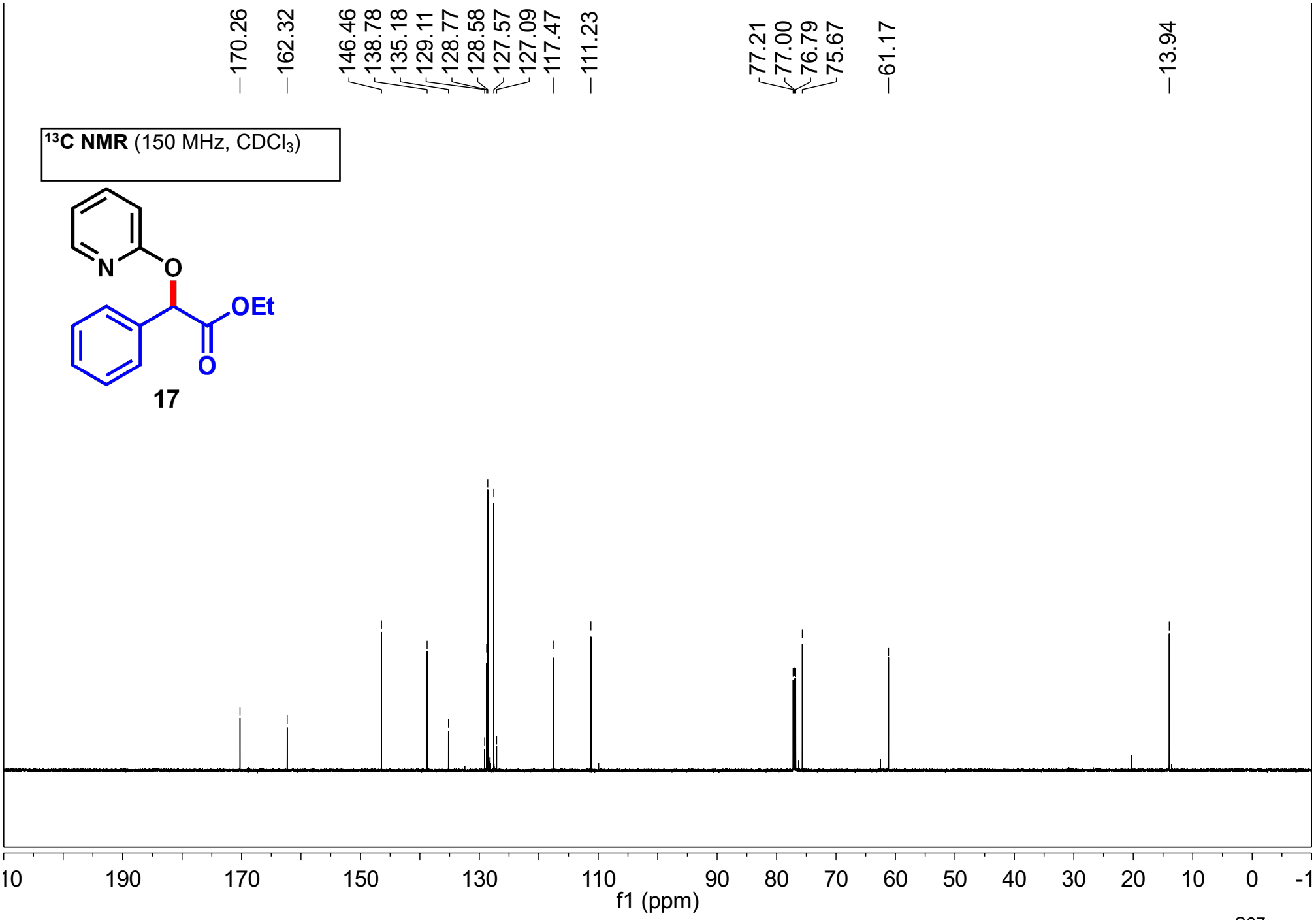


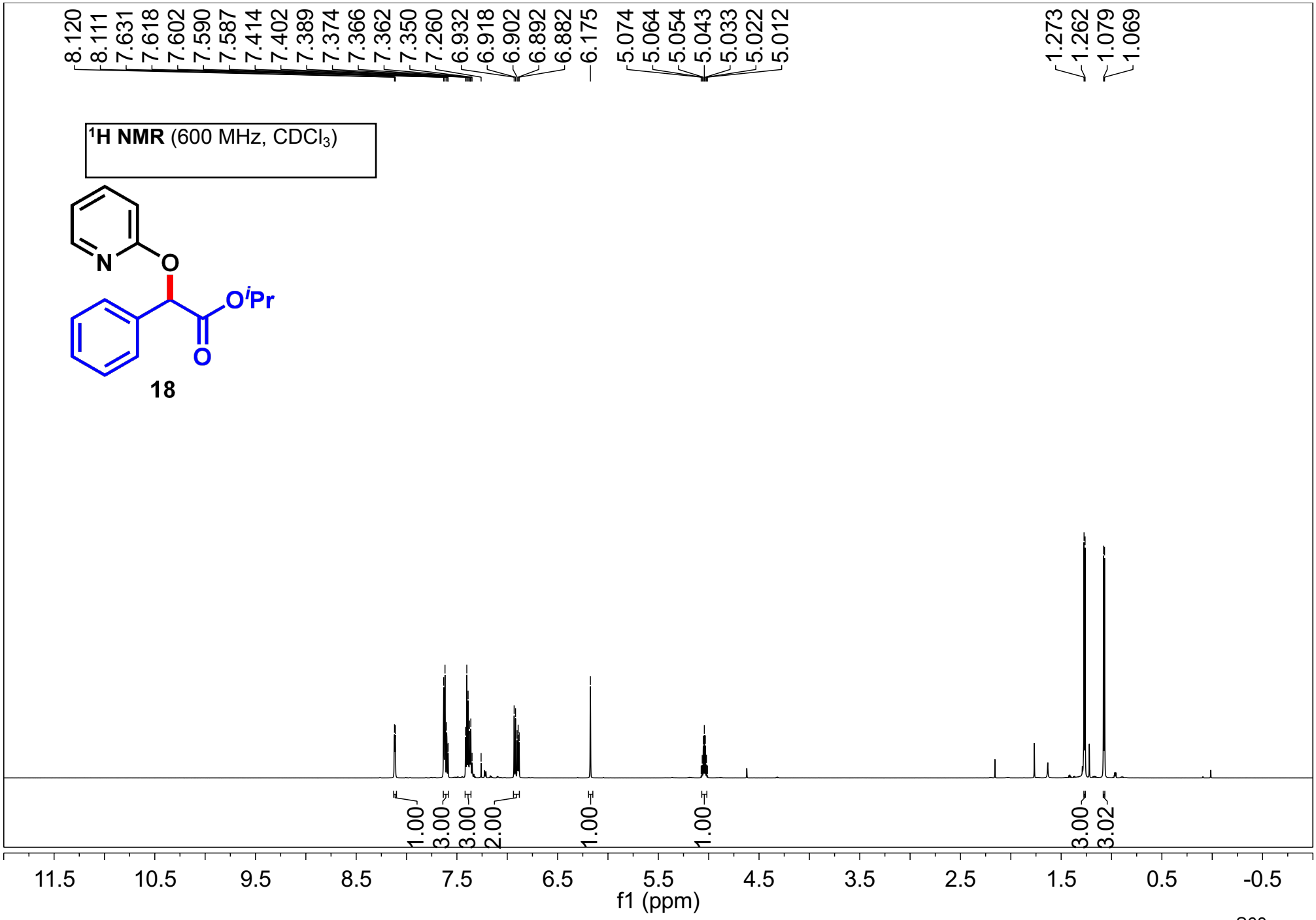
15

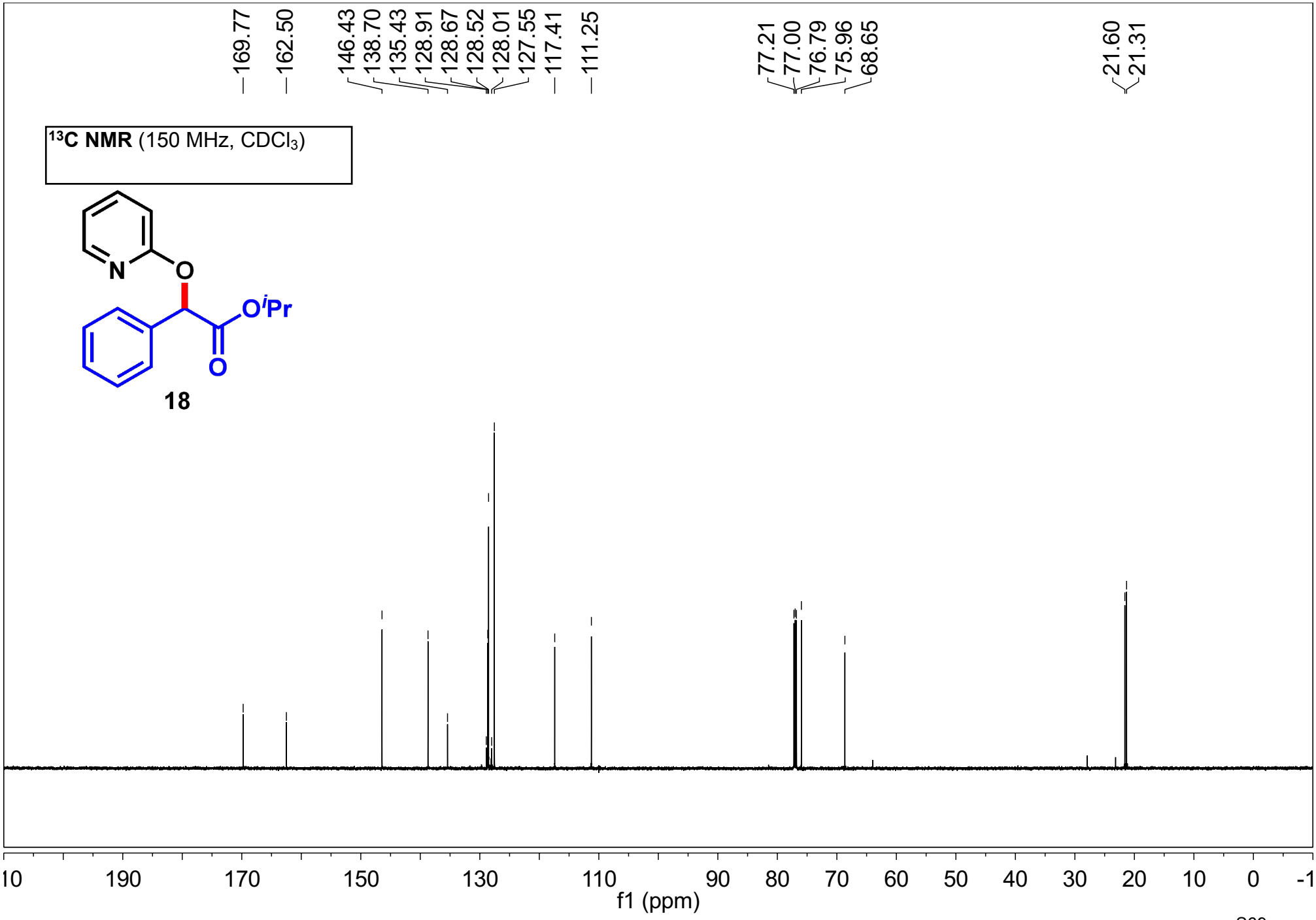

8.127
8.126
8.124
8.119
8.117
8.115
7.611
7.260
7.147
7.144
7.130
7.126
6.931
6.929
6.917
6.916
6.908
6.907
6.905
6.896
6.893
6.879
6.153
3.919
3.888
3.724
1H NMR (600 MHz, CDCl3)
N
O
MeO
OMe
MeO
O
16
1.00
1.00
2.00
3.03
1.00
3.01
3.01
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

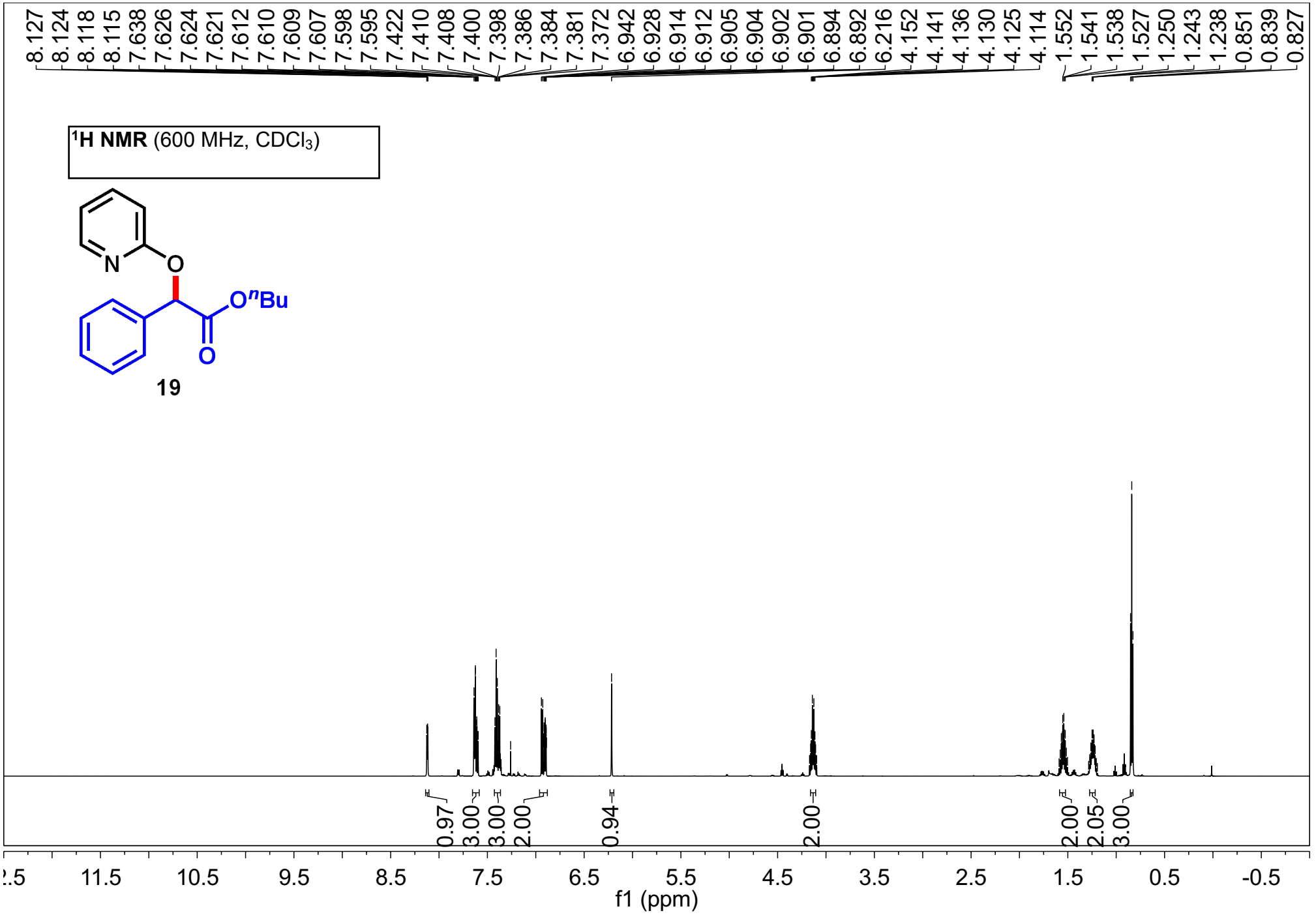

170.97
162.32
149.61
149.15
146.56
138.85
127.46
120.55
117.54
111.27
111.06
110.60
77.21
77.00
76.78
75.39
55.96
55.91
52.35
13C NMR (150 MHz, CDCl3)
N
O
MeO
OMe
MeO
O
16
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

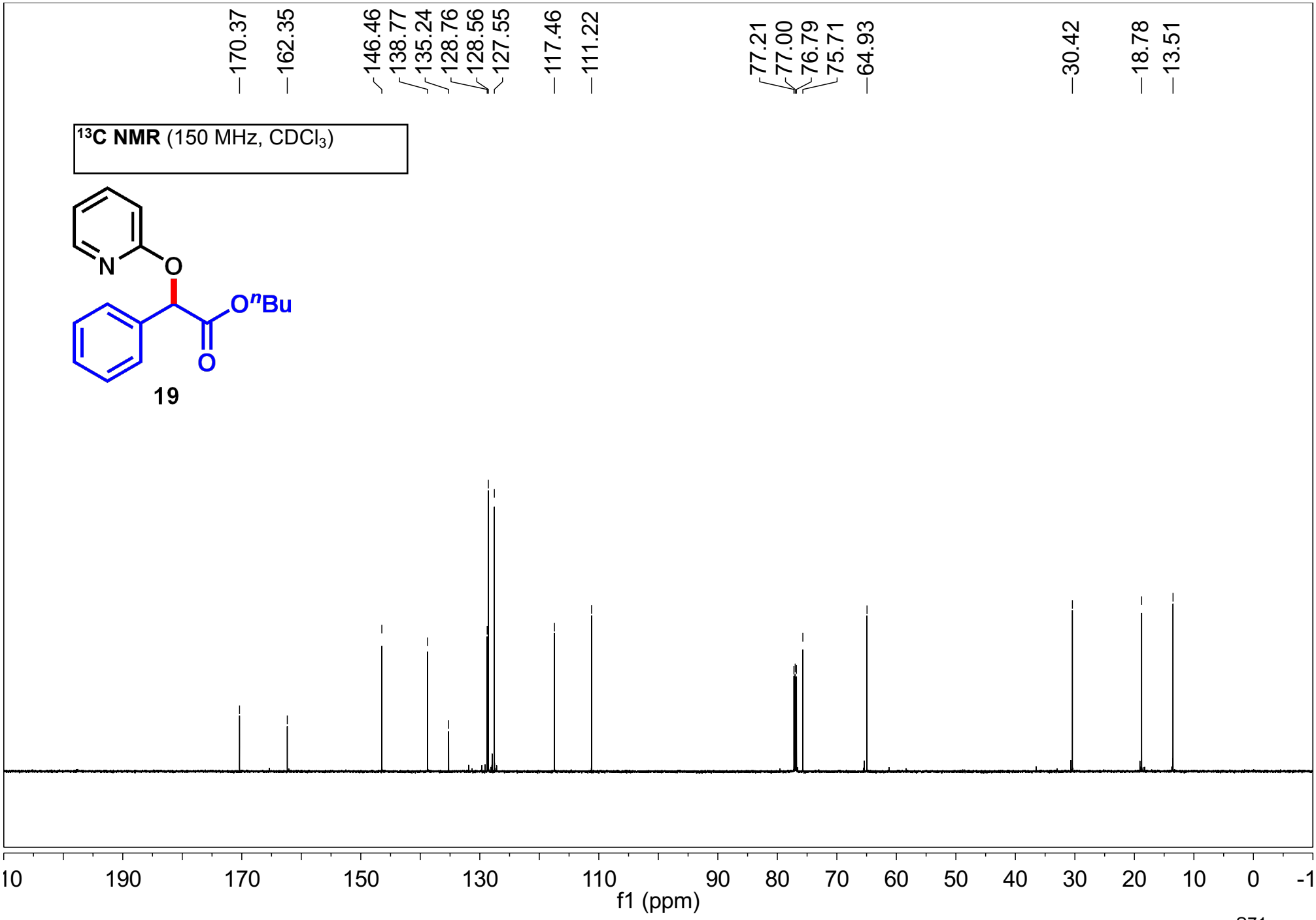

8.138
8.136
8.133
8.131
8.125
8.123
8.120
7.645
7.641
7.634
7.629
7.626
7.622
7.616
7.613
7.611
7.608
7.595
7.432
7.416
7.412
7.401
7.397
7.392
7.388
7.383
7.376
7.374
6.950
6.948
6.946
6.929
6.927
6.925
6.923
6.920
6.910
6.907
6.905
6.902
6.892
6.209
4.214
4.199
4.196
4.182
4.164
1.213
1.195
1.177
1H NMR (400 MHz, CDCl3)
N
O
OEt
O
17
1.00
3.00
3.00
2.00
1.00
2.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

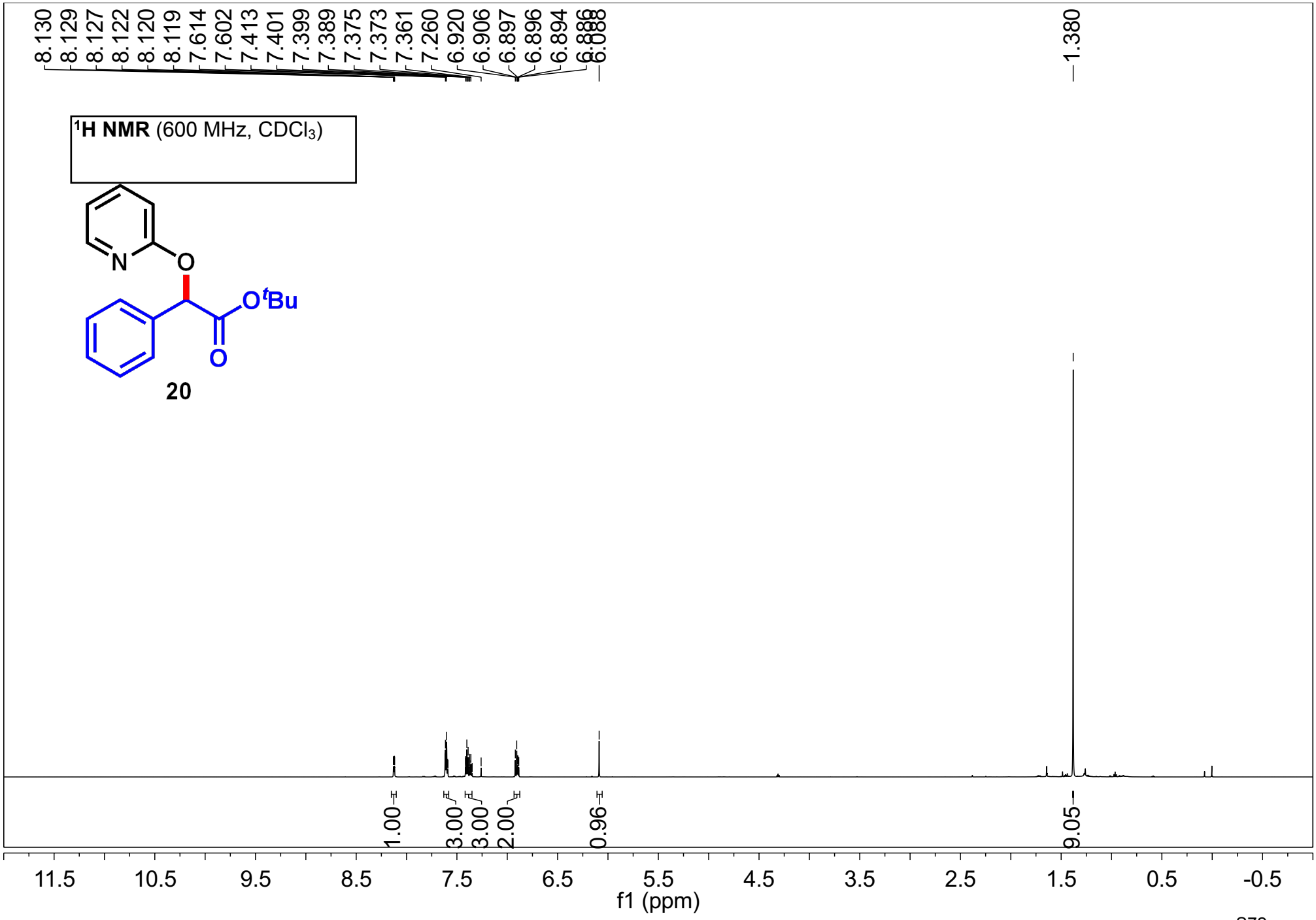

170.26
162.32
146.46
138.78
135.18
129.11
128.77
128.58
127.57
127.09
117.47
111.23
77.21
77.00
76.79
75.67
61.17
13.94
13C NMR (150 MHz, CDCl3)
N
O
OEt
O
17
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

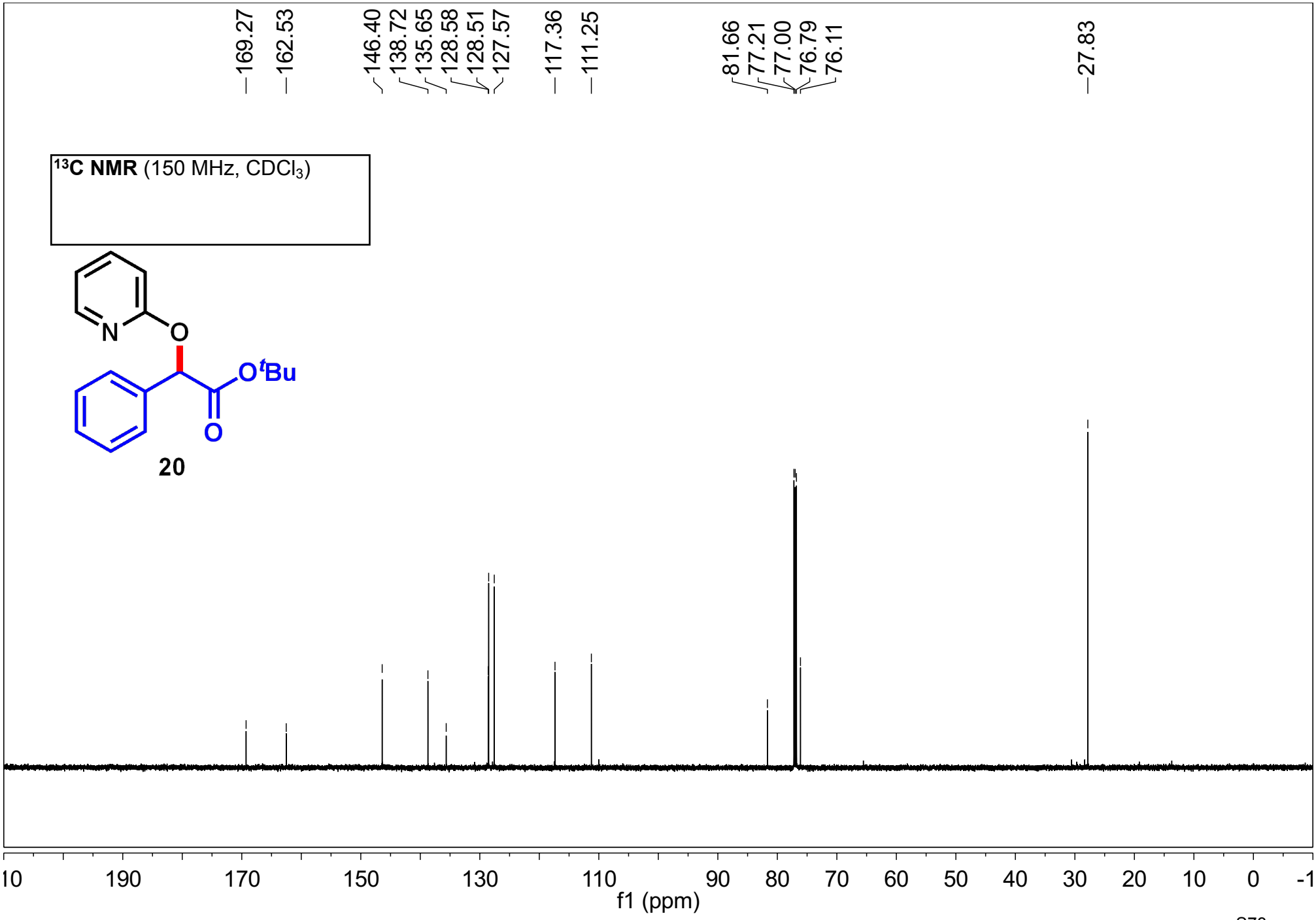

8.120
8.111
7.631
7.618
7.602
7.590
7.587
7.414
7.402
7.389
7.374
7.366
7.362
7.350
7.260
6.932
6.918
6.902
6.892
6.882
6.175
5.074
5.064
5.054
5.043
5.033
5.022
5.012
1.273
1.262
1.079
1.069
1H NMR (600 MHz, CDCl3)
N
O
O
O
iPr
18
1.00
3.00
3.00
2.00
1.00
1.00
3.00
3.02
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

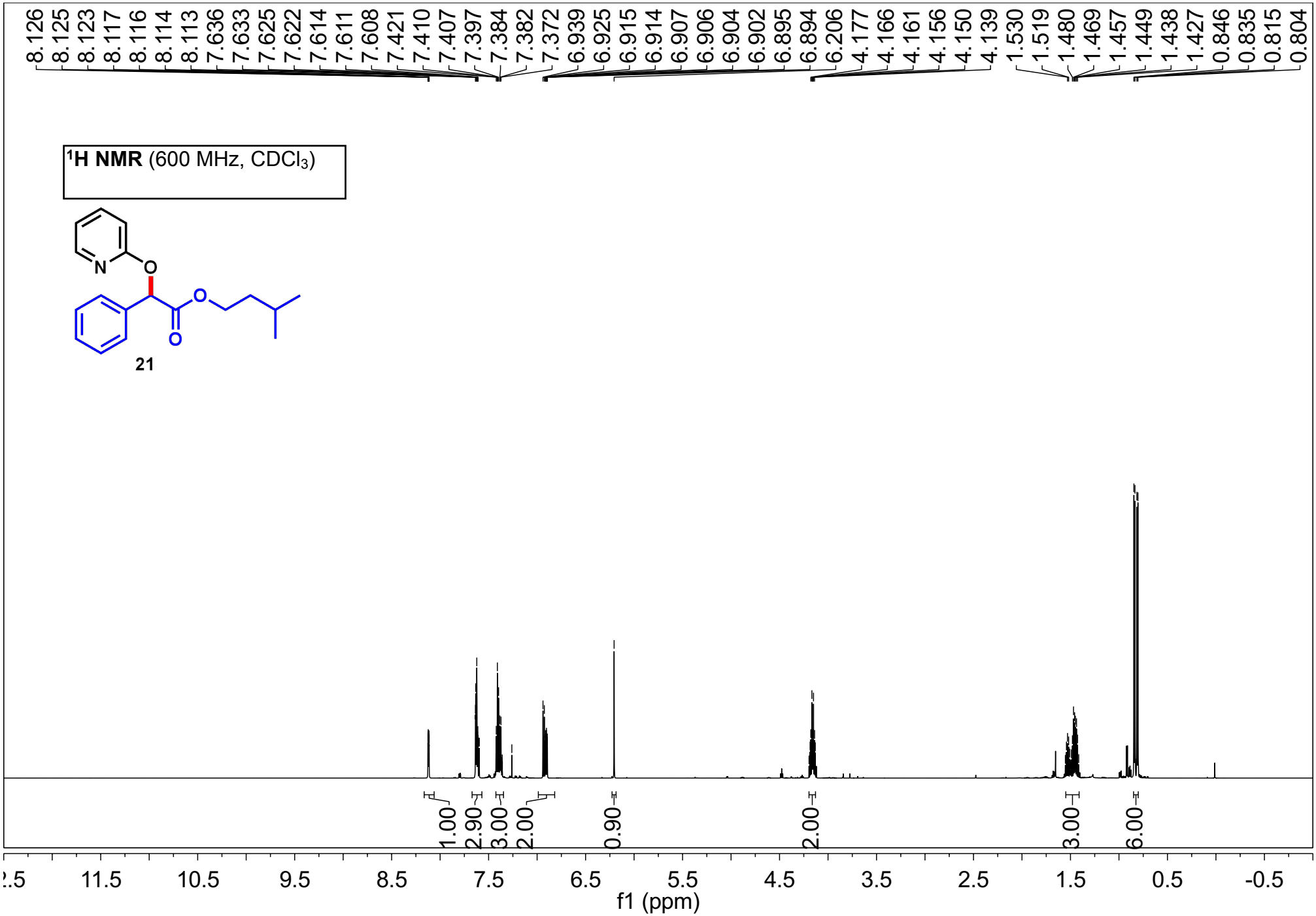

169.77
162.50
146.43
138.70
135.43
128.91
128.67
128.52
128.01
127.55
117.41
111.25
77.21
77.00
76.79
75.96
68.65
21.60
21.31
13C NMR (150 MHz, CDCl3)
N
O
O
O
iPr
18
f1 (ppm)

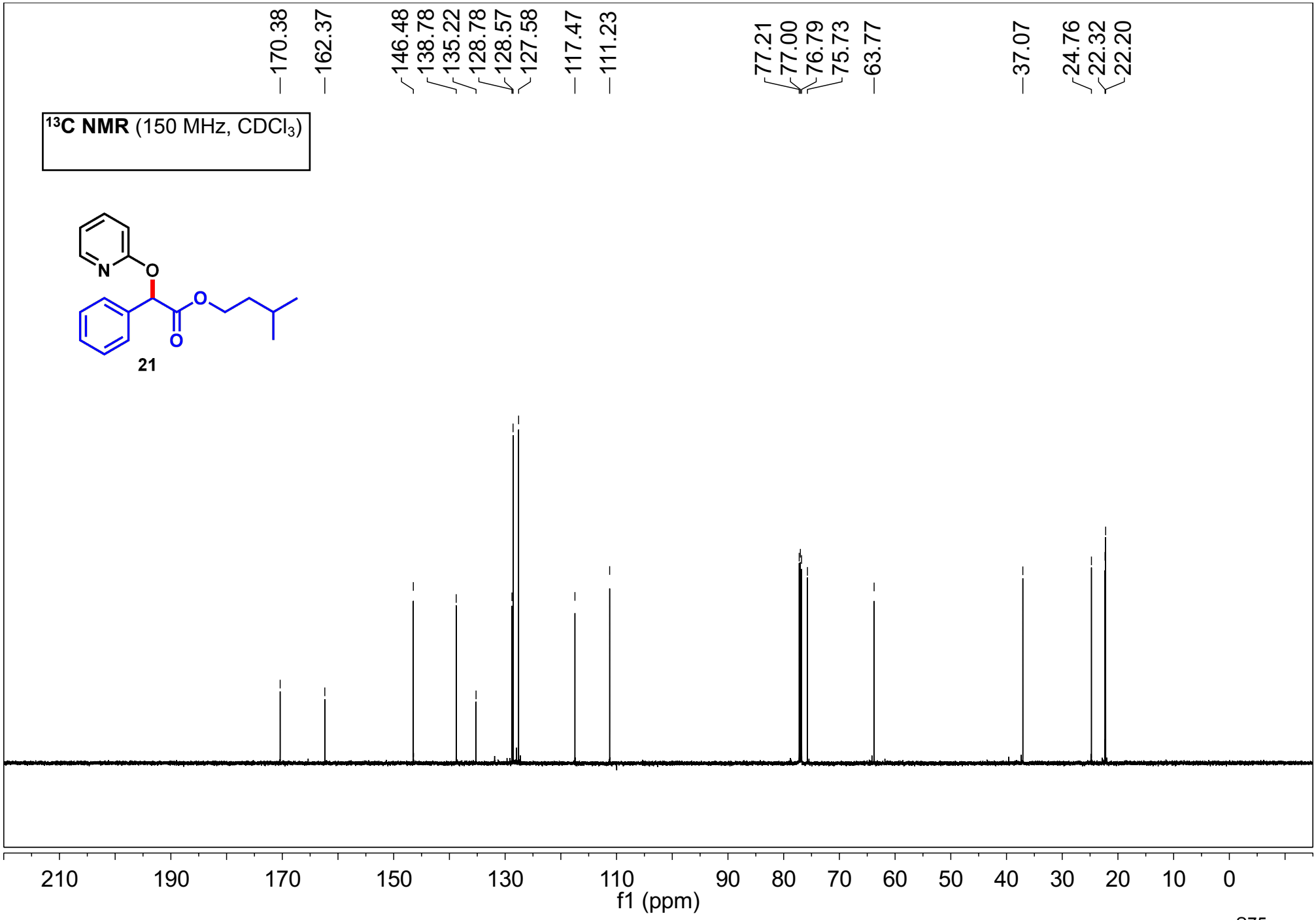

8.127
8.124
8.118
8.115
7.638
7.626
7.624
7.621
7.612
7.610
7.609
7.607
7.598
7.595
7.422
7.410
7.408
7.400
7.398
7.386
7.384
7.381
7.372
6.942
6.928
6.914
6.912
6.905
6.904
6.902
6.901
6.894
6.892
6.216
4.152
4.141
4.136
4.130
4.125
4.114
1.552
1.541
1.538
1.527
1.250
1.243
1.238
0.851
0.839
0.827
¹H NMR (600 MHz, CDCl₃)
N
O
O
O
nBu
19
0.97
3.00
3.00
2.00
0.94
2.00
2.00
2.05
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

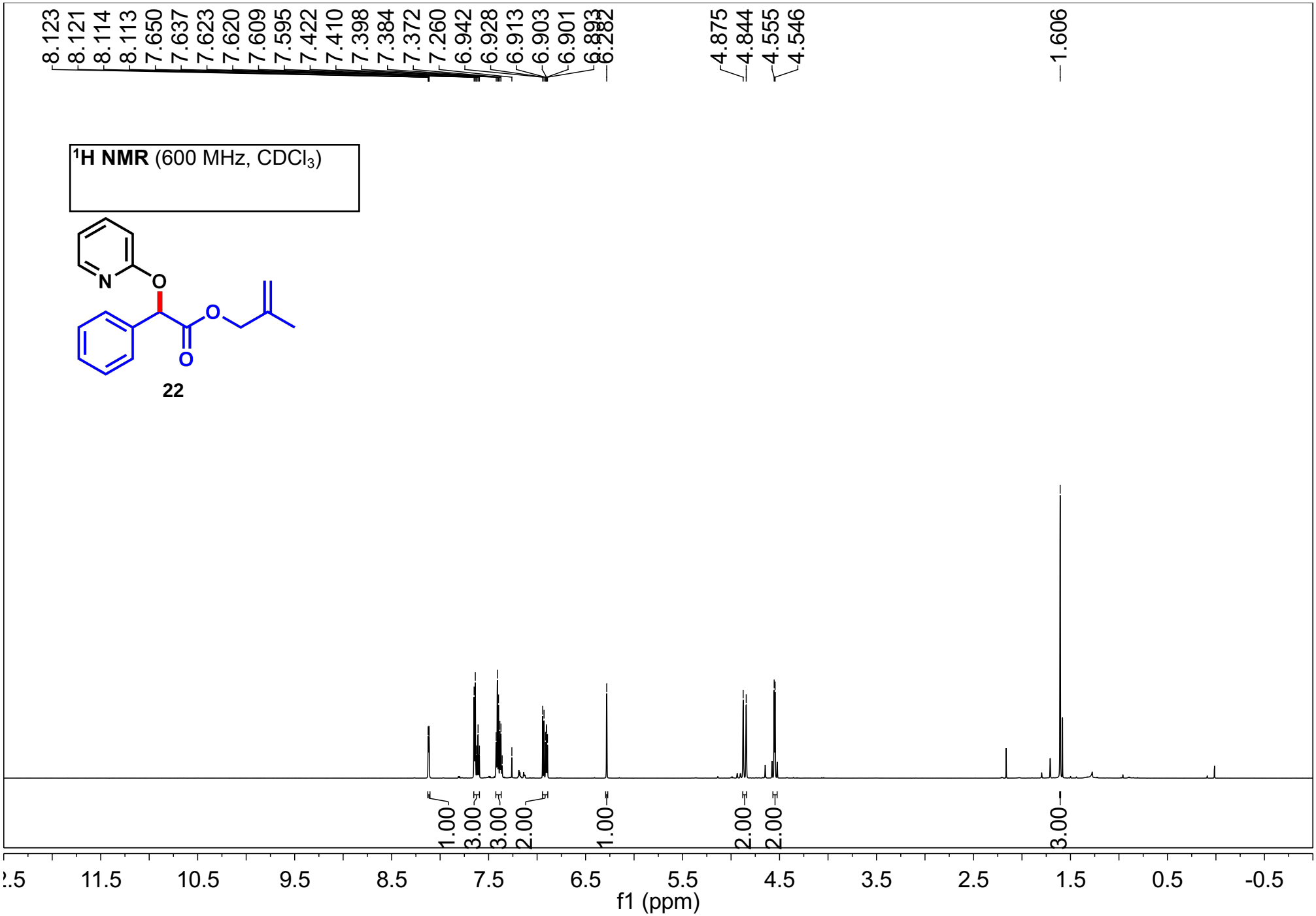

170.37
162.35
146.46
138.77
135.24
128.76
128.56
127.55
117.46
111.22
77.21
77.00
76.79
75.71
64.93
30.42
18.78
13.51
13C NMR (150 MHz, CDCl3)
N
O
O
O
nBu
19
f1 (ppm)

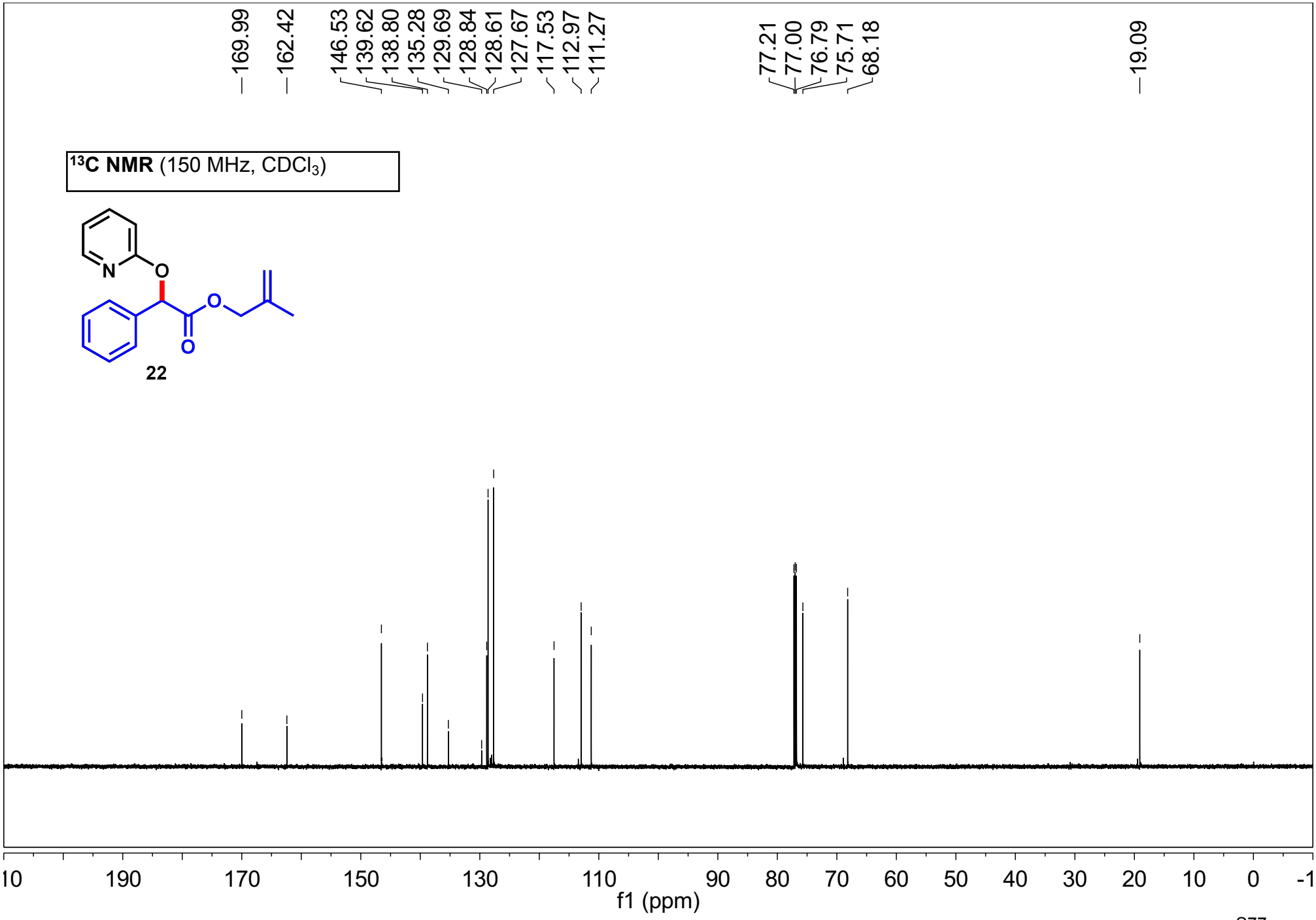

8.130
8.129
8.127
8.122
8.120
8.119
7.614
7.602
7.413
7.401
7.399
7.389
7.375
7.373
7.361
7.260
6.920
6.906
6.897
6.896
6.894
6.886
6.088
1.380
1H NMR (600 MHz, CDCl3)
N
O
O
O tBu
20
1.00
3.00
3.00
2.00
0.96
9.05
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

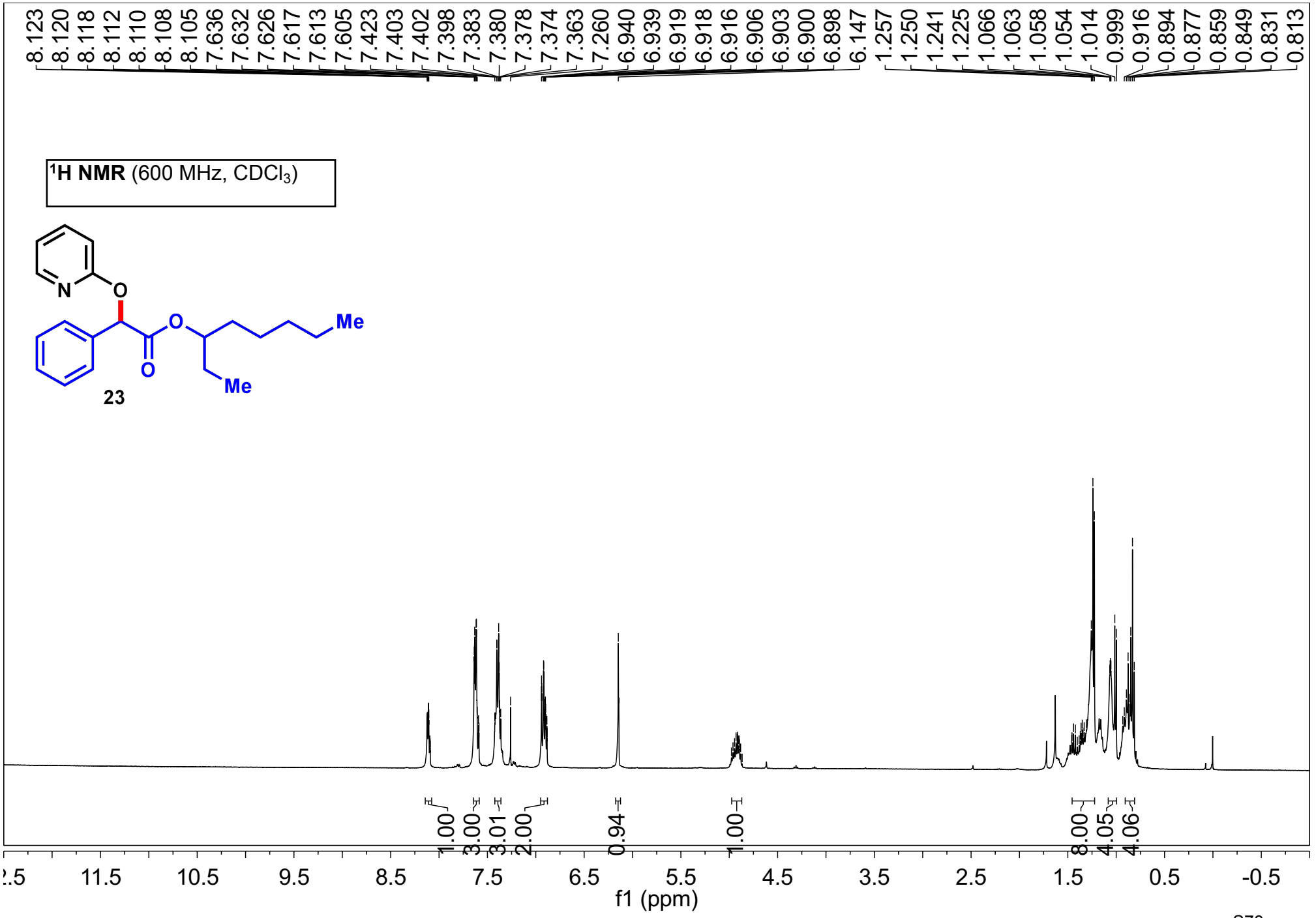

169.27
162.53
146.40
138.72
135.65
128.58
128.51
127.57
117.36
111.25
81.66
77.21
77.00
76.79
76.11
27.83
13C NMR (150 MHz, CDCl3)
N
O
O
OtBu
20
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

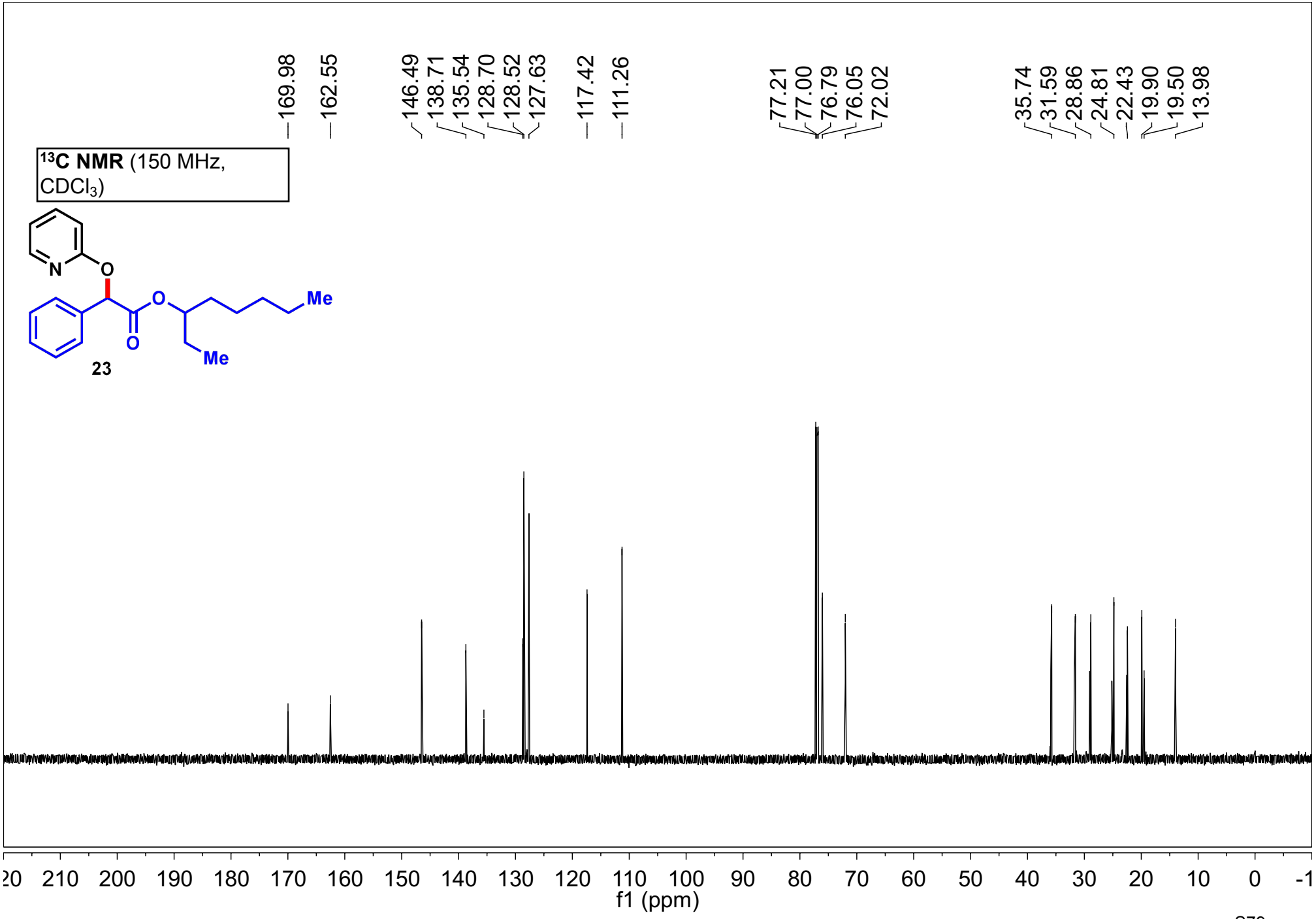

8.126
8.125
8.123
8.117
8.116
8.114
8.113
7.636
7.633
7.625
7.622
7.614
7.611
7.608
7.421
7.410
7.407
7.397
7.384
7.382
7.372
6.939
6.925
6.915
6.914
6.907
6.906
6.904
6.902
6.895
6.894
6.206
4.177
4.166
4.161
4.156
4.150
4.139
1.530
1.519
1.480
1.469
1.457
1.449
1.438
1.427
0.846
0.835
0.815
0.804
1H NMR (600 MHz, CDCl3)
N
O
O
O
21
1.00
2.90
3.00
2.00
0.90
2.00
3.00
6.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

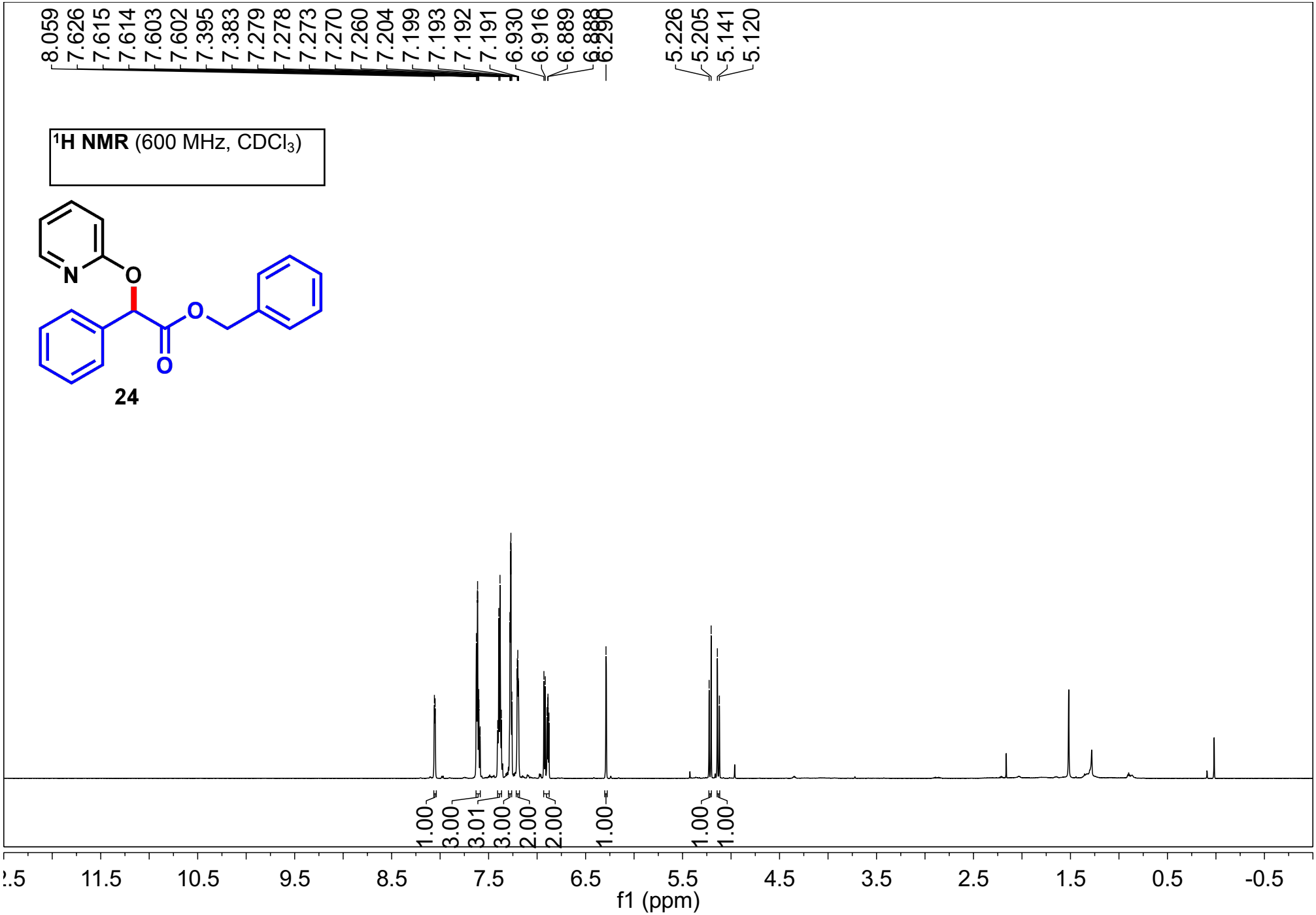

170.38
162.37
146.48
138.78
135.22
128.78
128.57
127.58
117.47
111.23
77.21
77.00
76.79
75.73
63.77
37.07
24.76
22.32
22.20
13C NMR (150 MHz, CDCl3)
N
O
O
O
21
210
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
f1 (ppm)

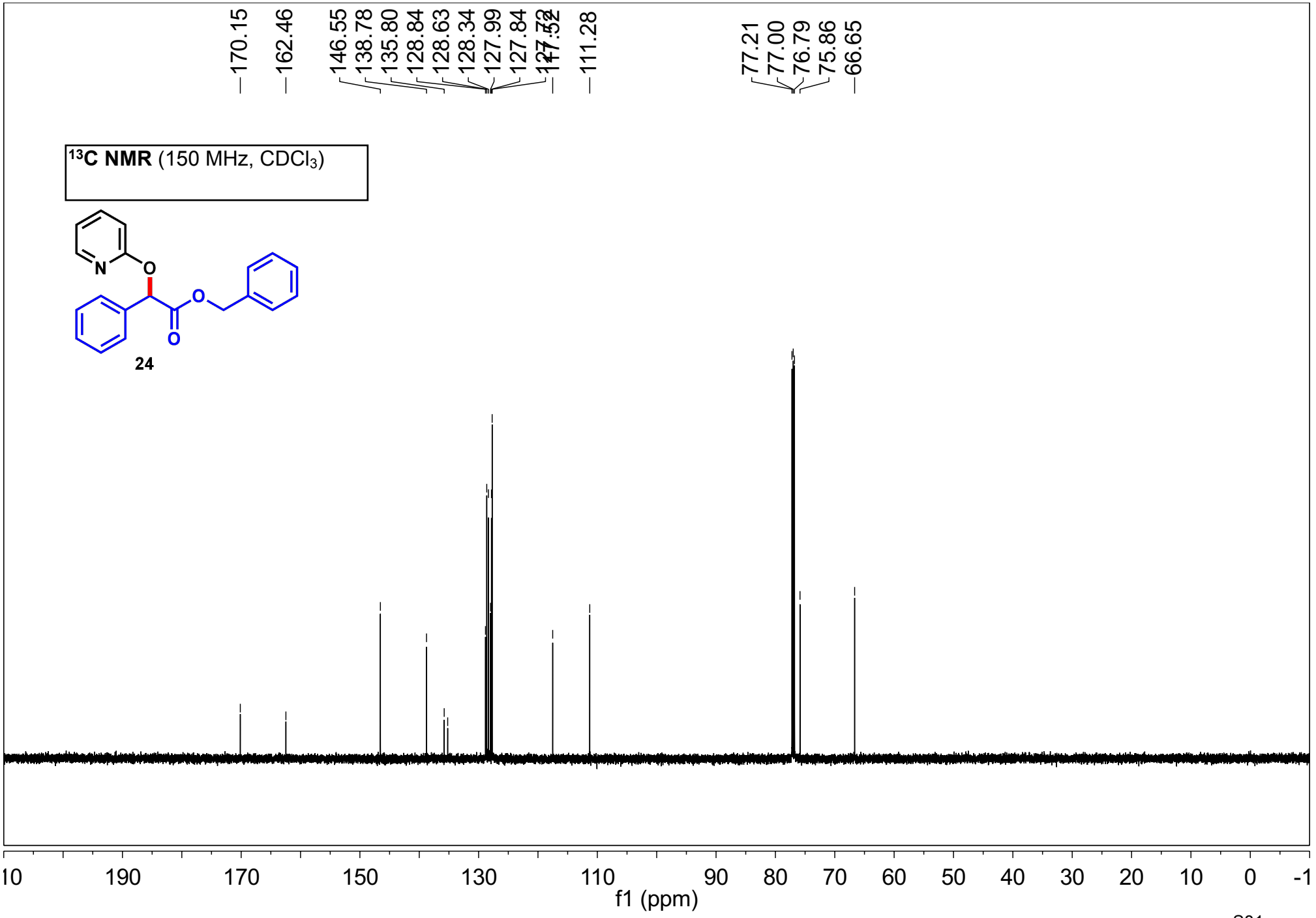

8.123
8.121
8.114
8.113
7.650
7.637
7.623
7.620
7.609
7.595
7.422
7.410
7.398
7.384
7.372
7.260
6.942
6.928
6.913
6.903
6.901
6.893
6.882
4.875
4.844
4.555
4.546
1.606
1H NMR (600 MHz, CDCl3)
N
O
O
O
22
1.00
3.00
3.00
2.00
1.00
2.00
2.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

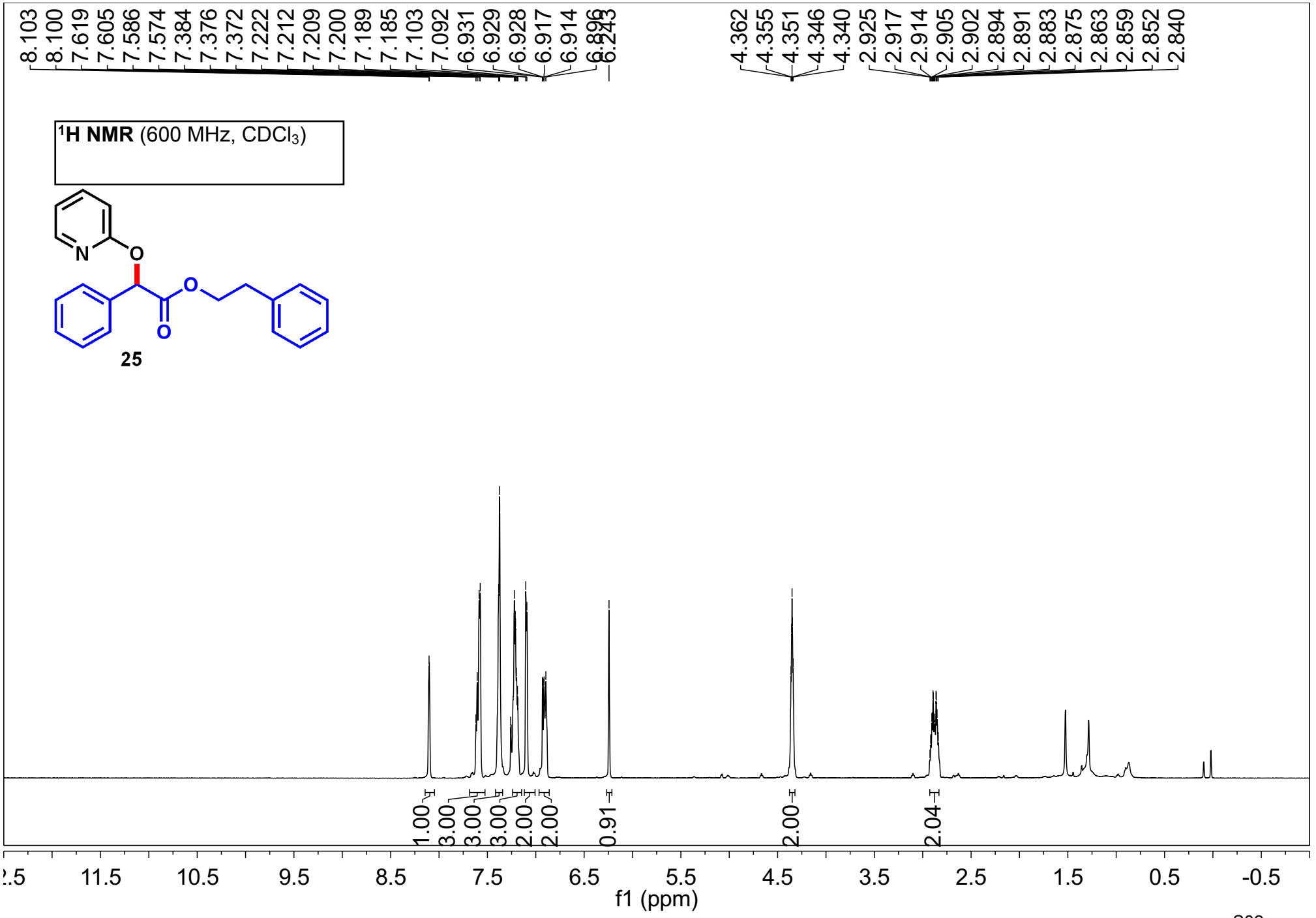

169.99
162.42
146.53
139.62
138.80
135.28
129.69
128.84
128.61
127.67
117.53
112.97
111.27
77.21
77.00
76.79
75.71
68.18
19.09
13C NMR (150 MHz, CDCl3)
N
O
O
O
22
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

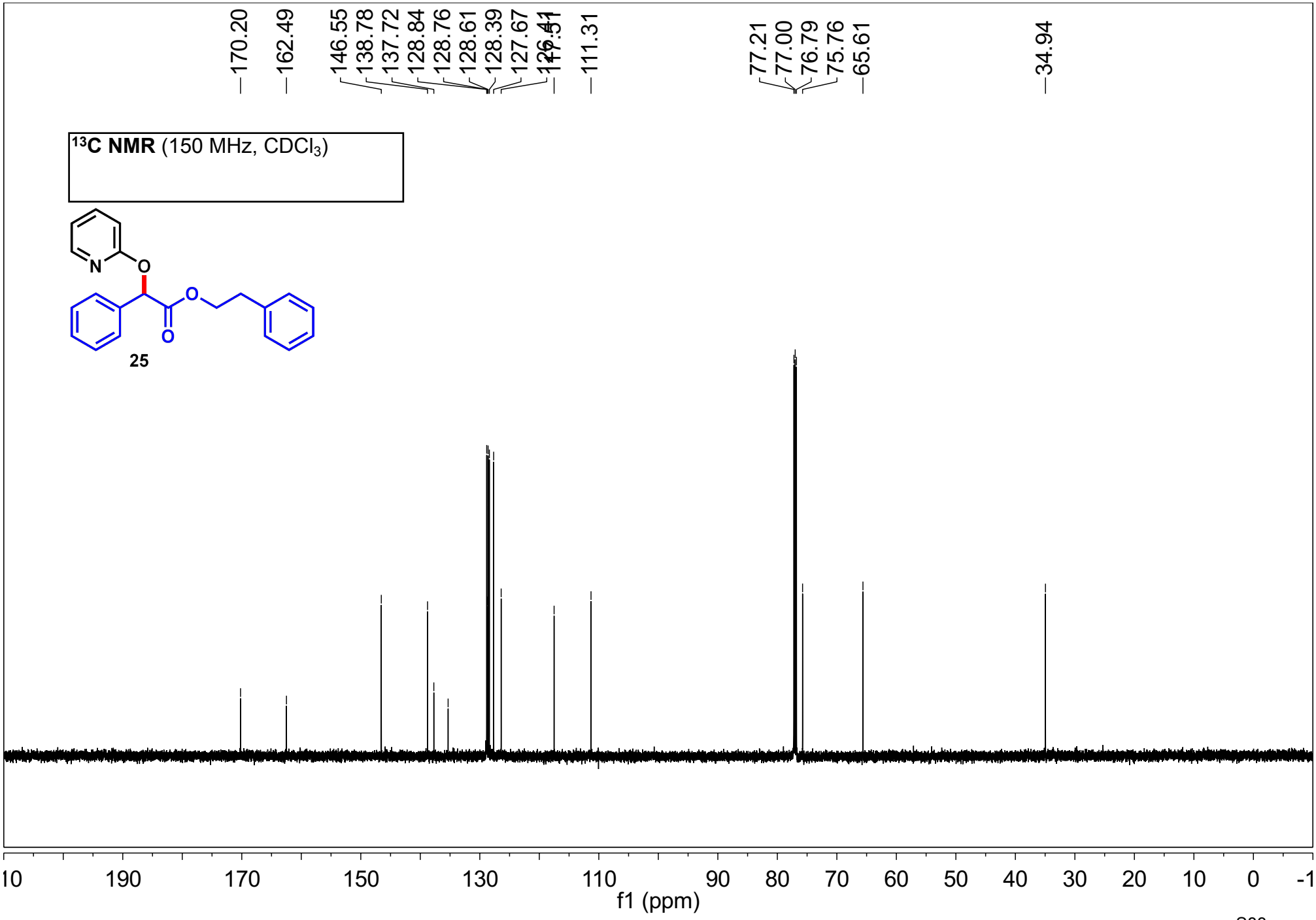

8.123
8.120
8.118
8.112
8.110
8.108
8.105
7.636
7.632
7.626
7.617
7.613
7.605
7.423
7.403
7.402
7.398
7.383
7.380
7.378
7.374
7.363
7.260
6.940
6.939
6.919
6.918
6.916
6.906
6.903
6.900
6.898
6.147
1.257
1.250
1.241
1.225
1.066
1.063
1.058
1.054
1.014
0.999
0.916
0.894
0.877
0.859
0.849
0.831
0.813
1H NMR (600 MHz, CDCl3)
N
O
O
O
Me
Me
23
1.00
3.00
3.01
2.00
0.94
1.00
8.00
4.05
4.06
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

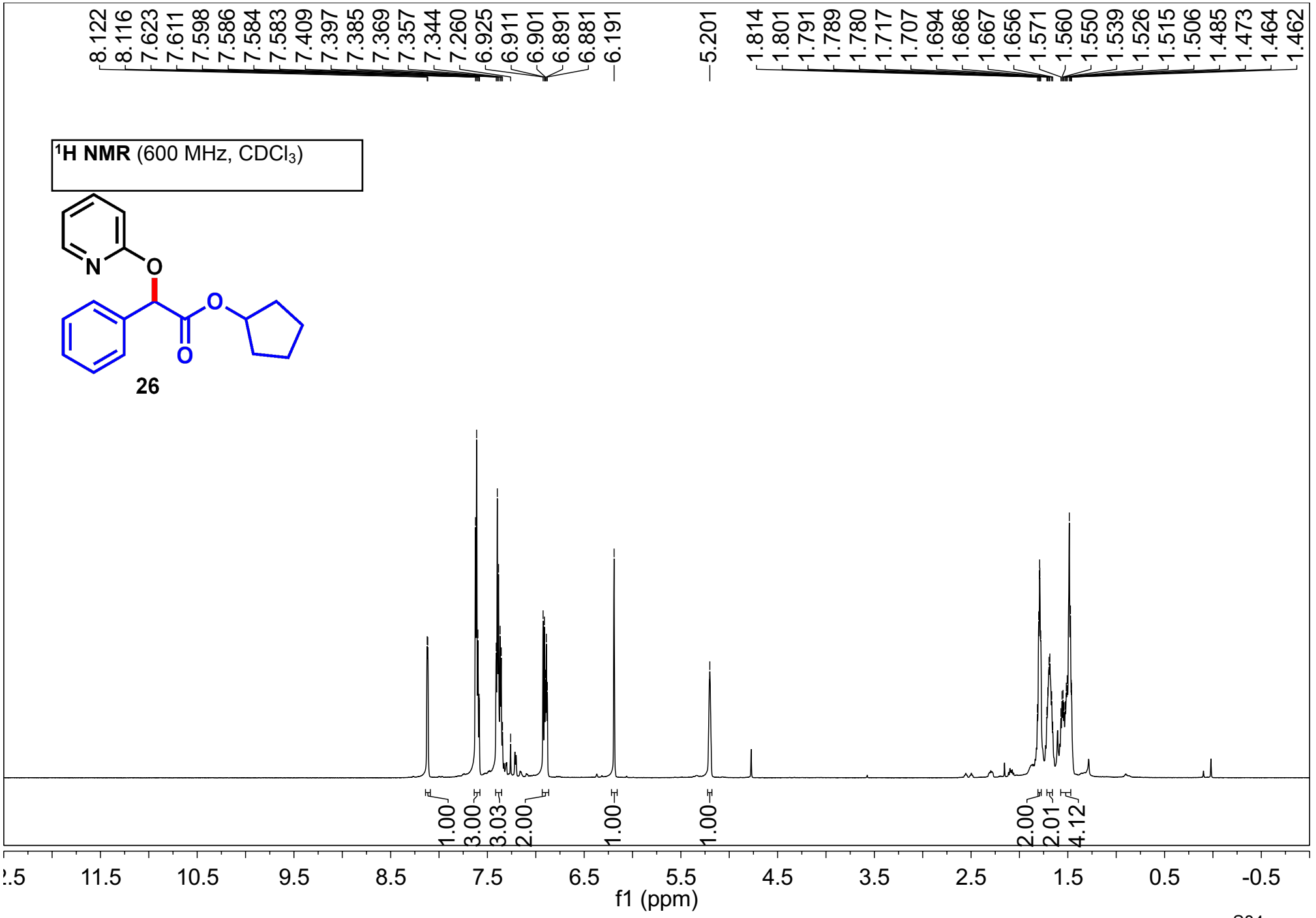

169.98
162.55
146.49
138.71
135.54
128.70
128.52
127.63
117.42
111.26
77.21
77.00
76.79
76.05
72.02
35.74
31.59
28.86
24.81
22.43
19.90
19.50
13.98
13C NMR (150 MHz, CDCl3)
N
O
O
O
Me
Me
23
f1 (ppm)

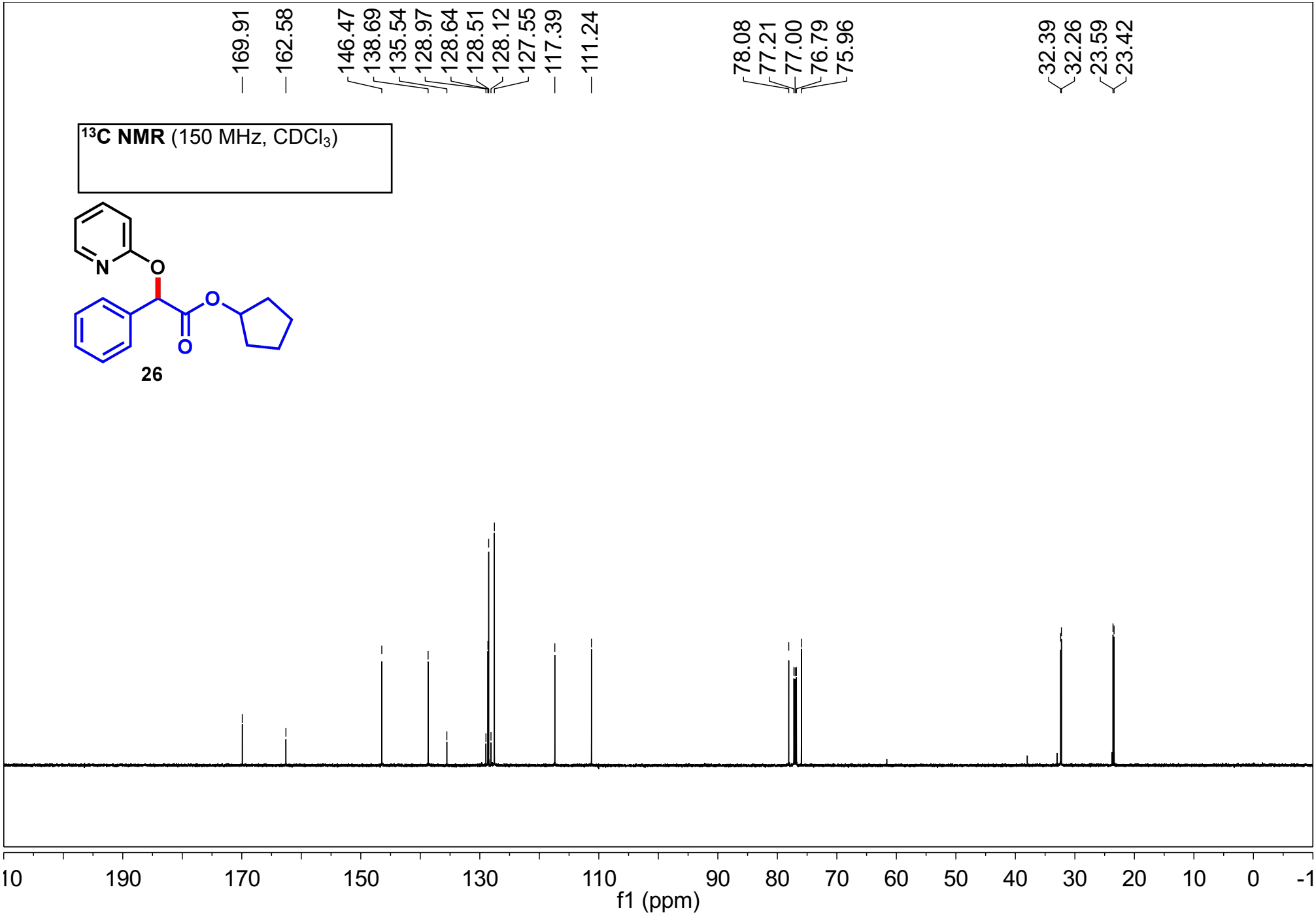

8.059
7.626
7.615
7.614
7.603
7.602
7.395
7.383
7.279
7.278
7.273
7.270
7.260
7.204
7.199
7.193
7.192
7.191
6.930
6.916
6.889
6.888
6.290
5.226
5.205
5.141
5.120
1H NMR (600 MHz, CDCl3)
N
O
O
O
24
1.00
3.00
3.01
3.00
2.00
2.00
1.00
1.00
1.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

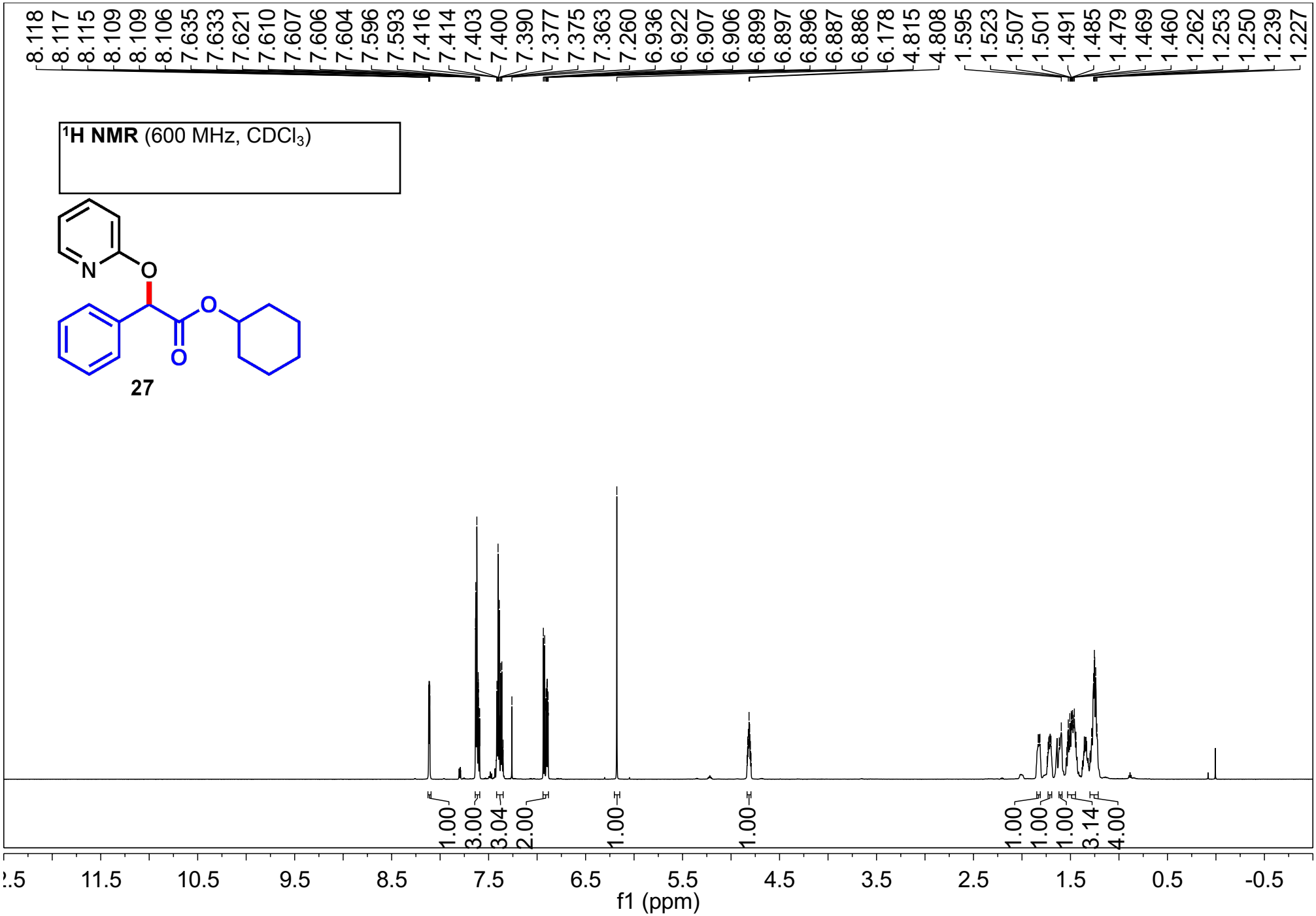

170.15
162.46
146.55
138.78
135.80
128.84
128.63
128.34
127.99
127.84
111.28
77.21
77.00
76.79
75.86
66.65
13C NMR (150 MHz, CDCl3)
N
O
O
O
24
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

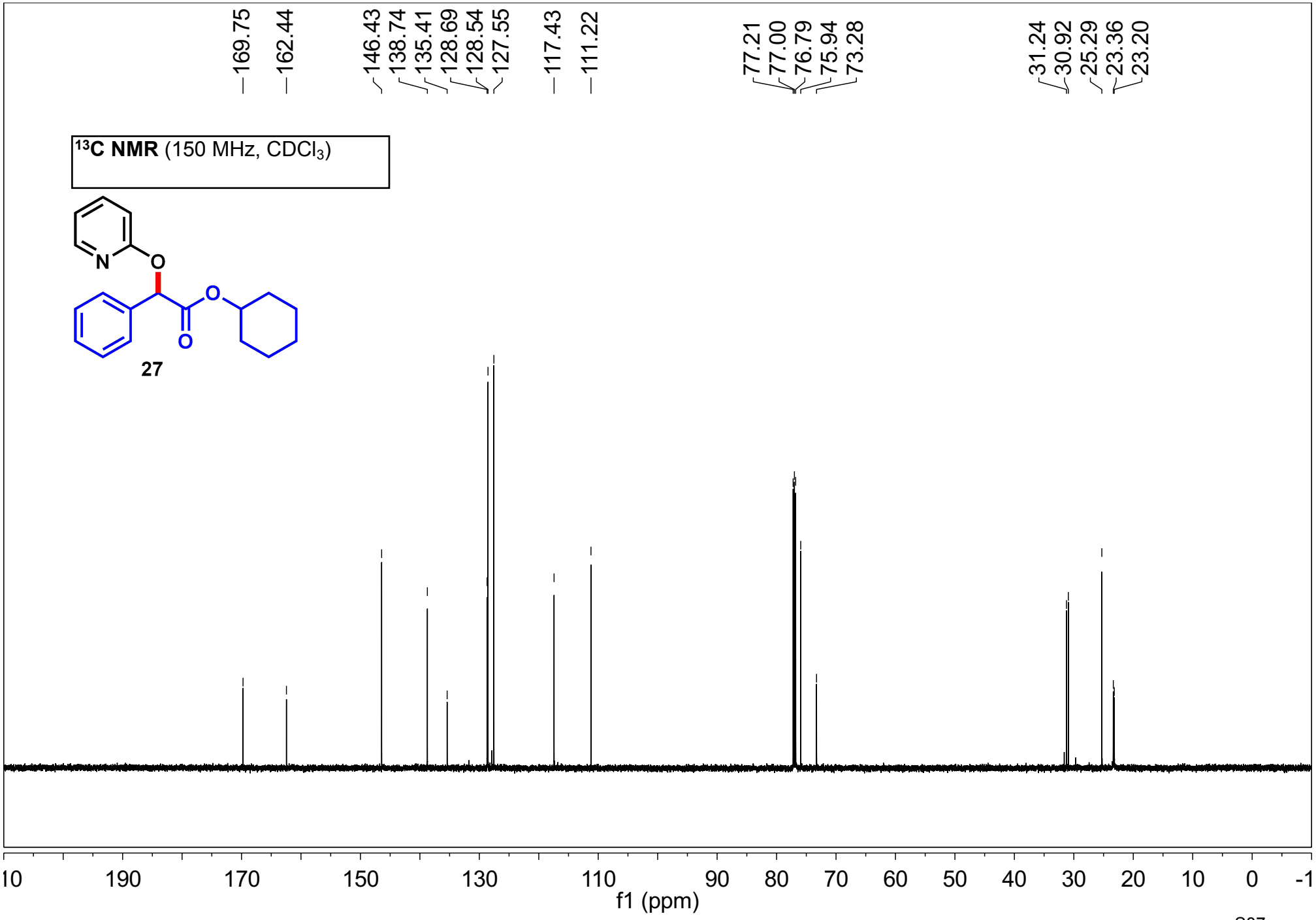

8.103
8.100
7.619
7.605
7.586
7.574
7.384
7.376
7.372
7.222
7.212
7.209
7.200
7.189
7.185
7.103
7.092
6.931
6.929
6.928
6.917
6.914
6.896
6.243
4.362
4.355
4.351
4.346
4.340
2.925
2.917
2.914
2.905
2.902
2.894
2.891
2.883
2.875
2.863
2.859
2.852
2.840
1H NMR (600 MHz, CDCl3)
N
O
O
O
25
1.00
3.00
3.00
3.00
2.00
2.00
0.91
2.00
2.04
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

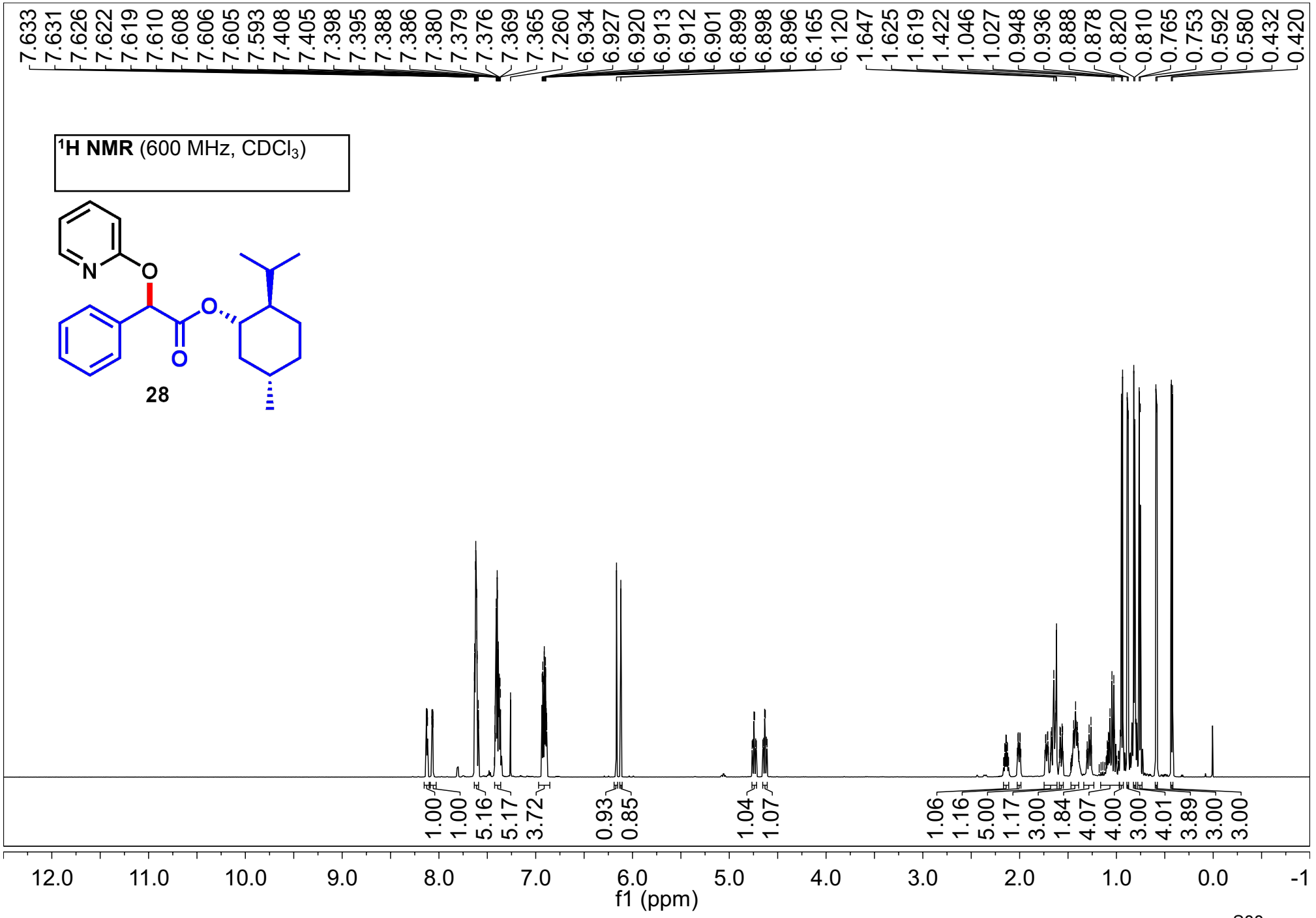

170.20
162.49
146.55
138.78
137.72
128.84
128.76
128.61
128.39
127.67
126.41
117.51
111.31
77.21
77.00
76.79
75.76
65.61
34.94
13C NMR (150 MHz, CDCl3)
N
O
O
O
25
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

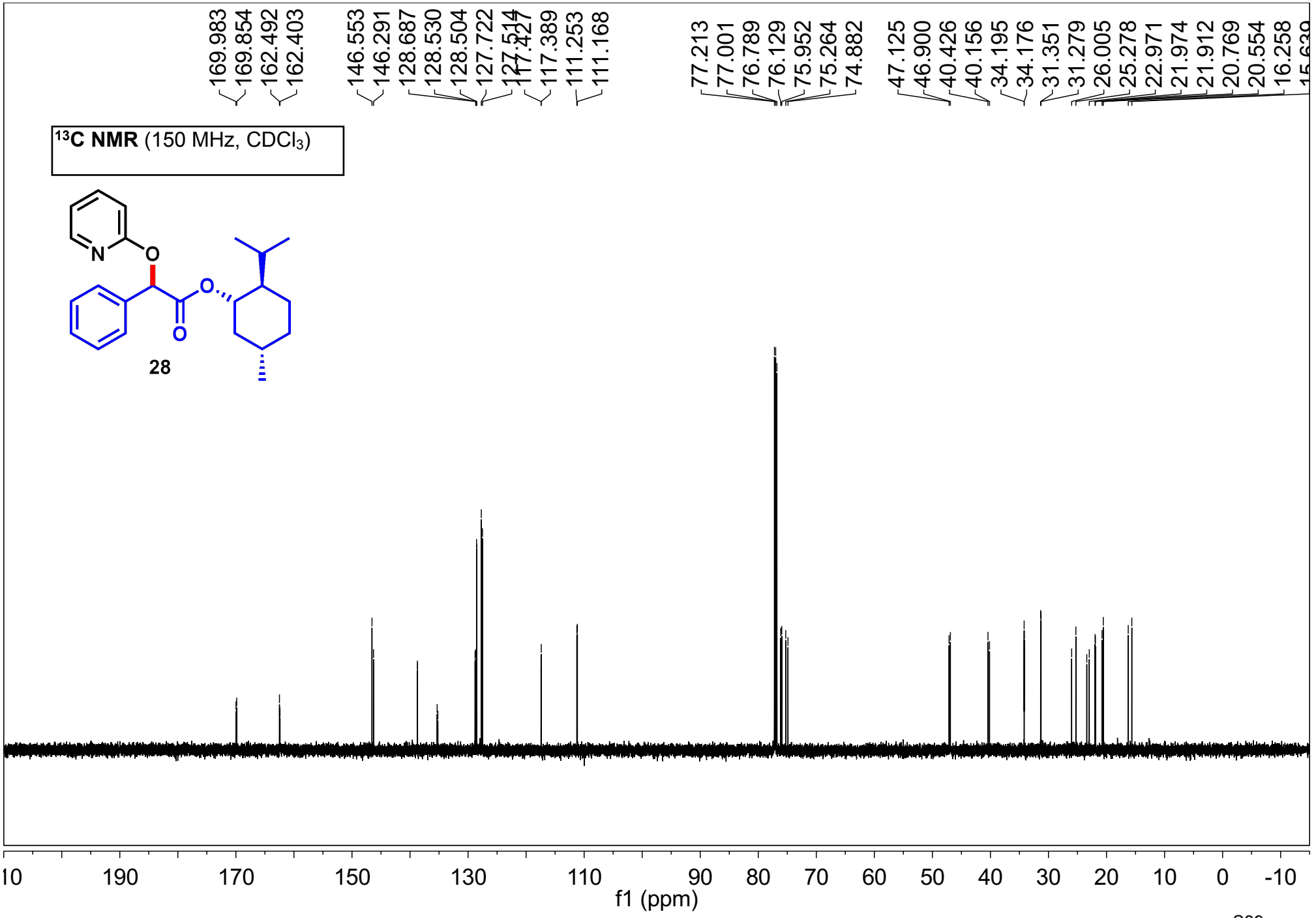

8.122
8.116
7.623
7.611
7.598
7.586
7.584
7.583
7.409
7.397
7.385
7.369
7.357
7.344
7.260
6.925
6.911
6.901
6.891
6.881
6.191
5.201
1.814
1.801
1.791
1.789
1.780
1.717
1.707
1.694
1.686
1.667
1.656
1.571
1.560
1.550
1.539
1.526
1.515
1.506
1.485
1.473
1.464
1.462
1H NMR (600 MHz, CDCl3)
N
O
O
O
26
1.00
3.00
3.03
2.00
1.00
1.00
2.00
2.01
4.12
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

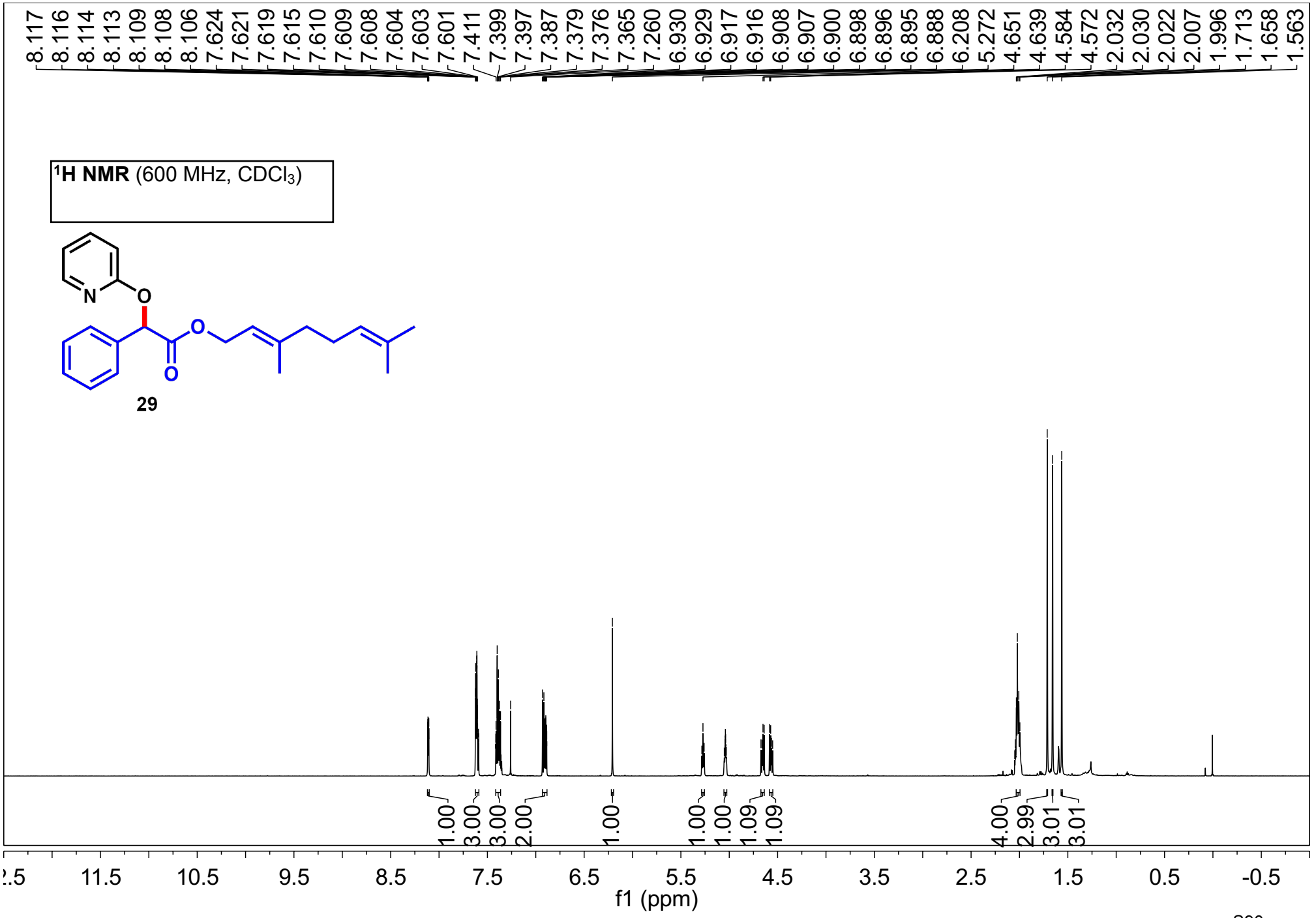

169.91
162.58
146.47
138.69
135.54
128.97
128.64
128.51
128.12
127.55
117.39
111.24
78.08
77.21
77.00
76.79
75.96
32.39
32.26
23.59
23.42
13C NMR (150 MHz, CDCl3)
N
O
O
O
26
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

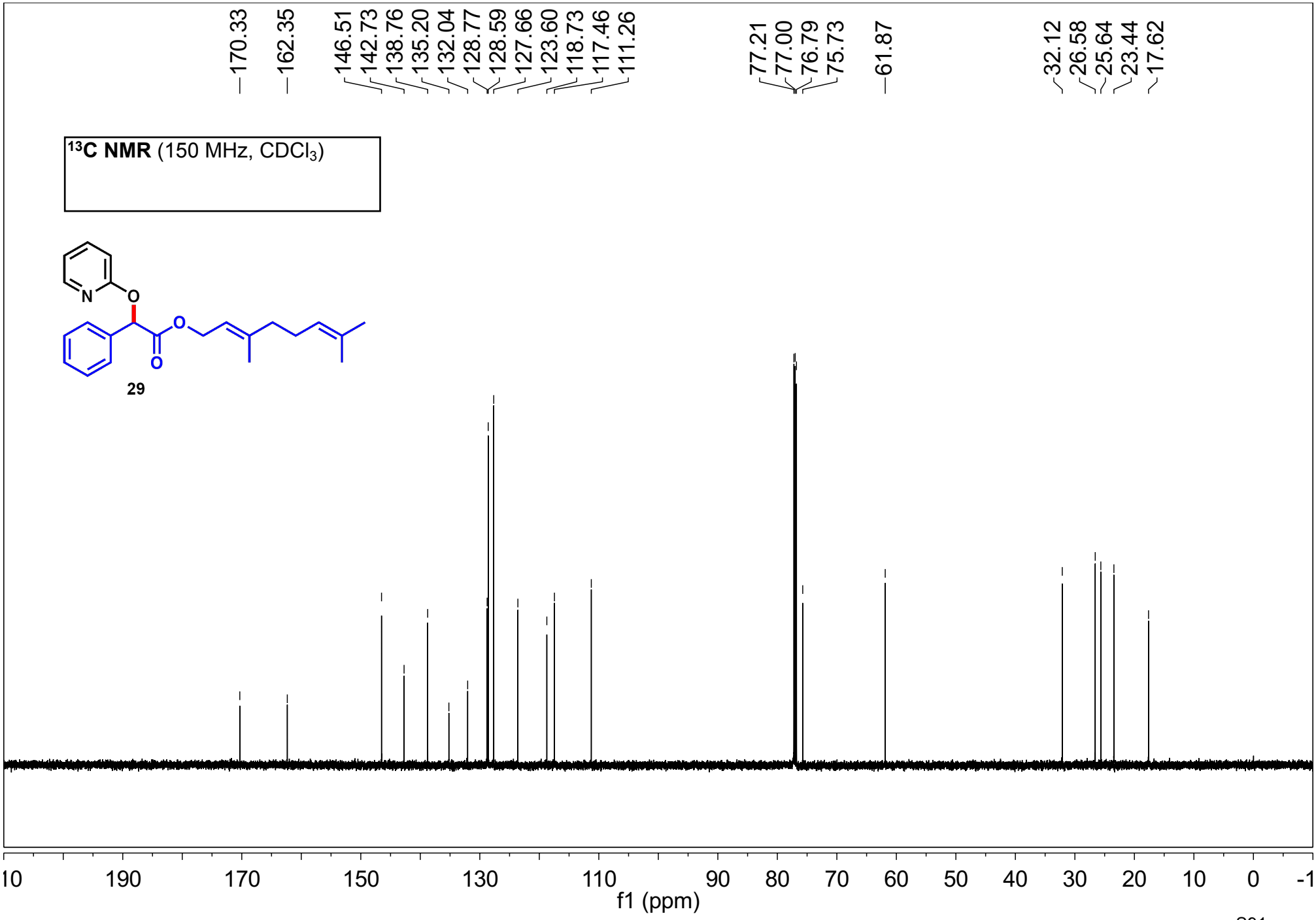

8.118
8.117
8.115
8.109
8.109
8.106
7.635
7.633
7.621
7.610
7.607
7.606
7.604
7.596
7.593
7.416
7.414
7.403
7.400
7.390
7.377
7.375
7.363
7.260
6.936
6.922
6.907
6.906
6.899
6.897
6.896
6.887
6.886
6.178
4.815
4.808
1.595
1.523
1.507
1.501
1.491
1.485
1.479
1.469
1.460
1.262
1.253
1.250
1.239
1.227
¹H NMR (600 MHz, CDCl3)
N
O
O
O
27
1.00
3.00
3.04
2.00
1.00
1.00
1.00
1.00
1.00
3.14
4.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

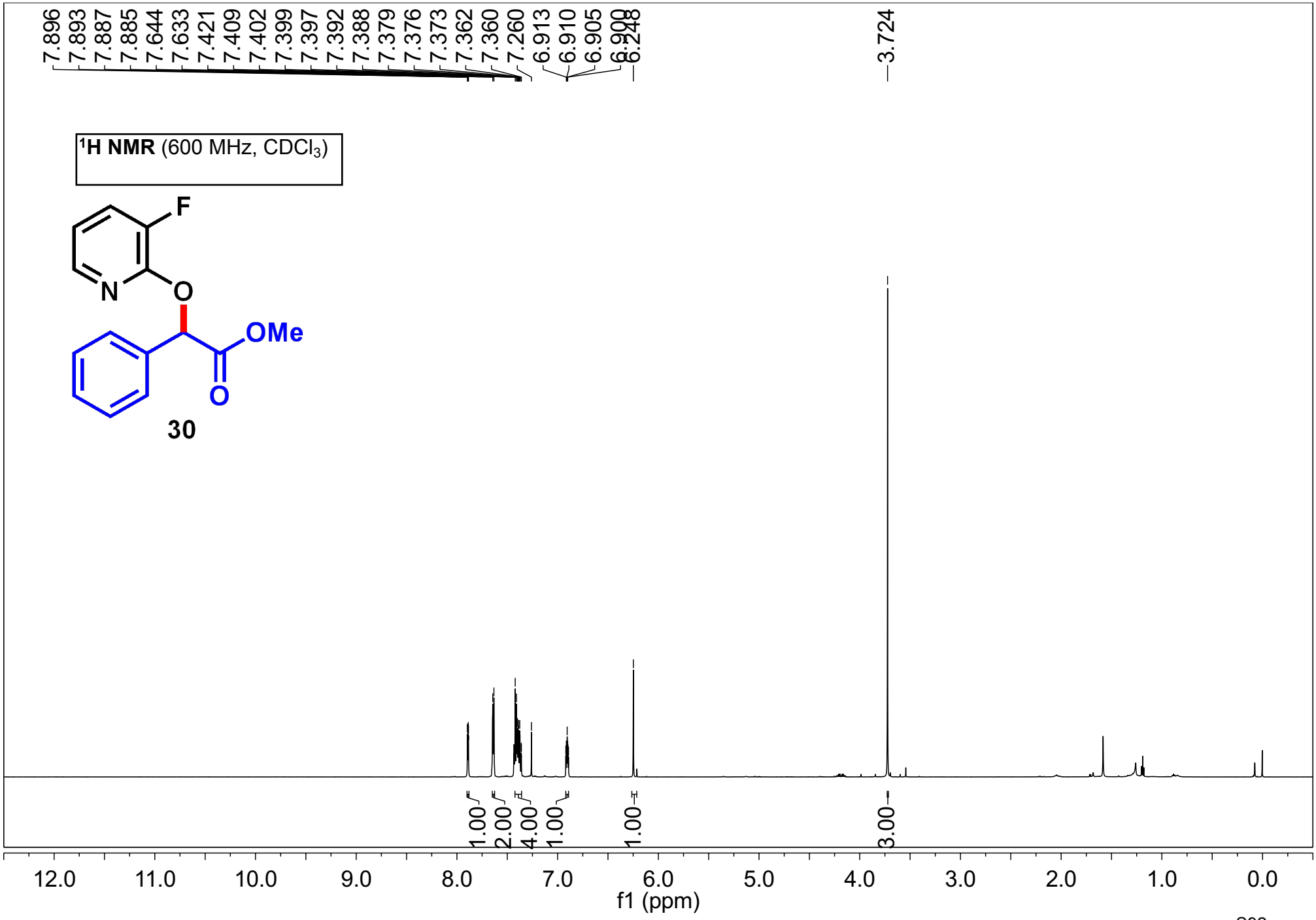

169.75
162.44
146.43
138.74
135.41
128.69
128.54
127.55
117.43
111.22
77.21
77.00
76.79
75.94
73.28
31.24
30.92
25.29
23.36
23.20
13C NMR (150 MHz, CDCl3)
N
O
O
O
27
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

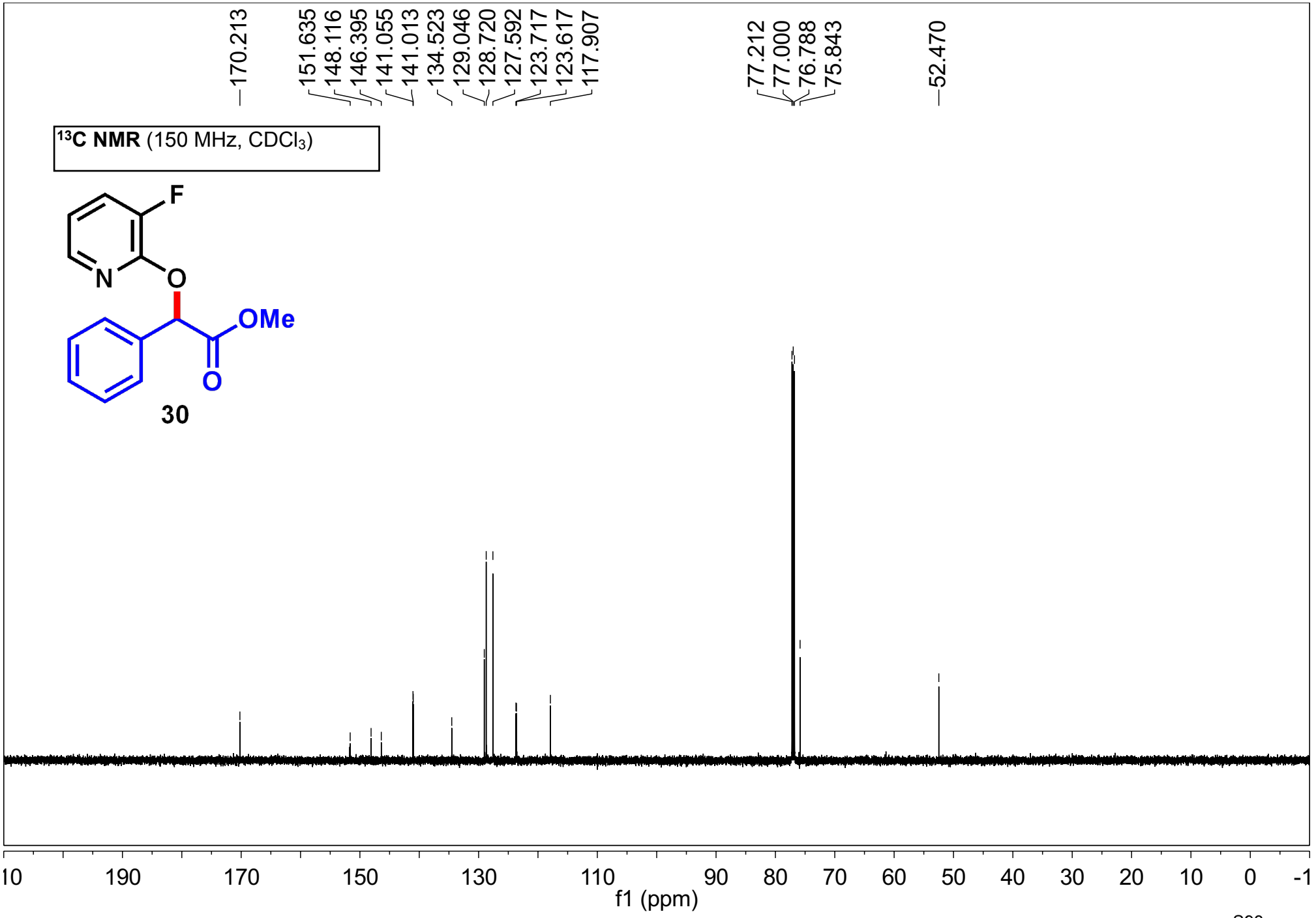

7.633
7.631
7.626
7.622
7.619
7.610
7.608
7.606
7.605
7.593
7.408
7.405
7.398
7.395
7.388
7.386
7.380
7.379
7.376
7.369
7.365
7.260
6.934
6.927
6.920
6.913
6.912
6.901
6.899
6.898
6.896
6.165
6.120
1.647
1.625
1.619
1.422
1.046
1.027
0.948
0.936
0.888
0.878
0.820
0.810
0.765
0.753
0.592
0.580
0.432
0.420
1H NMR (600 MHz, CDCl3)
N
O
O
O
28
1.00
1.00
5.16
5.17
3.72
0.93
0.85
1.04
1.07
1.06
1.16
5.00
1.17
3.00
1.84
4.07
4.00
3.00
4.01
3.89
3.00
3.00
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1
f1 (ppm)


169.983
169.854
162.492
162.403
146.553
146.291
128.687
128.530
128.504
127.722
127.514
127.427
117.389
111.253
111.168
77.213
77.001
76.789
76.129
75.952
75.264
74.882
47.125
46.900
40.426
40.156
34.195
34.176
31.351
31.279
26.005
25.278
22.971
21.974
21.912
20.769
20.554
16.258
13C NMR (150 MHz, CDCl3)
N
O
O
O
28
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-10
f1 (ppm)

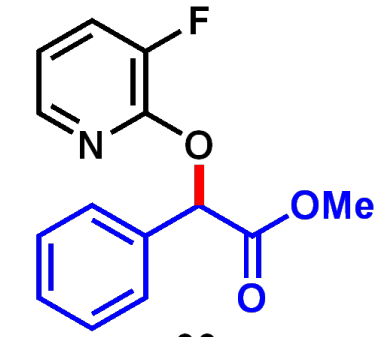

8.117
8.116
8.114
8.113
8.109
8.108
8.106
7.624
7.621
7.619
7.615
7.610
7.609
7.608
7.604
7.603
7.601
7.411
7.399
7.397
7.387
7.379
7.376
7.365
7.260
6.930
6.929
6.917
6.916
6.908
6.907
6.900
6.898
6.896
6.895
6.888
6.208
5.272
4.651
4.639
4.584
4.572
2.032
2.030
2.022
2.007
1.996
1.713
1.658
1.563
1H NMR (600 MHz, CDCl3)
N
O
O
O
29
1.00
3.00
3.00
2.00
1.00
1.00
1.00
1.09
1.09
4.00
2.99
3.01
3.01
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


170.33
162.35
146.51
142.73
138.76
135.20
132.04
128.77
128.59
127.66
123.60
118.73
117.46
111.26
77.21
77.00
76.79
75.73
61.87
32.12
26.58
25.64
23.44
17.62
13C NMR (150 MHz, CDCl3)
N
O
O
O
29
f1 (ppm)


7.896
7.893
7.887
7.885
7.644
7.633
7.421
7.409
7.402
7.399
7.397
7.392
7.388
7.379
7.376
7.373
7.362
7.360
7.260
6.913
6.910
6.905
6.900
6.248
3.724
1H NMR (600 MHz, CDCl3)
F
N
O
OMe
O
30
1.00
2.00
4.00
1.00
1.00
3.00
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
f1 (ppm)


170.213
151.635
148.116
146.395
141.055
141.013
134.523
129.046
128.720
127.592
123.717
123.617
117.907
77.212
77.000
76.788
75.843
52.470
13C NMR (150 MHz, CDCl3)
F
N
O
OMe
O
30
f1 (ppm)

^{19}F NMR (376 MHz, $CDCl_3$)



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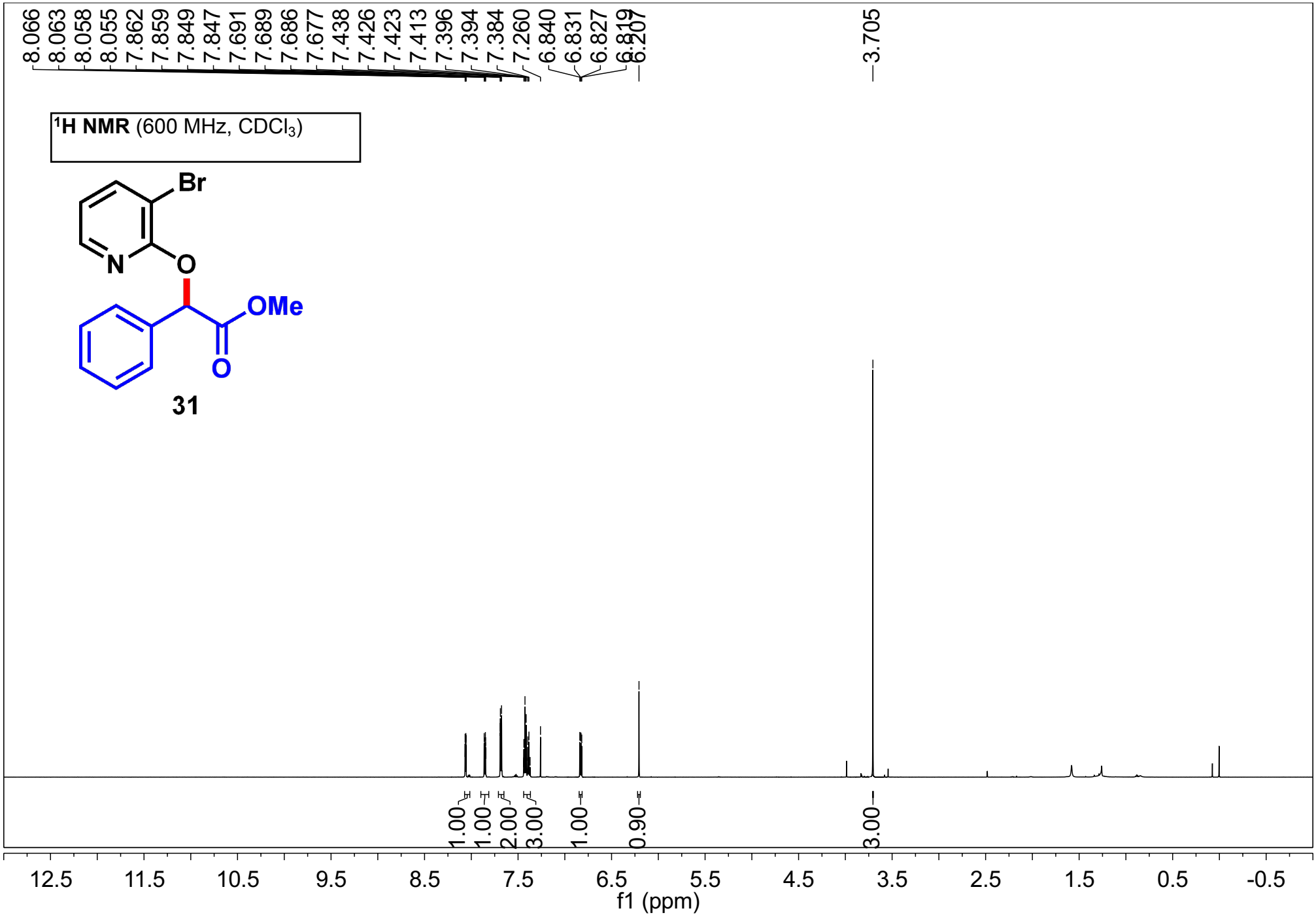
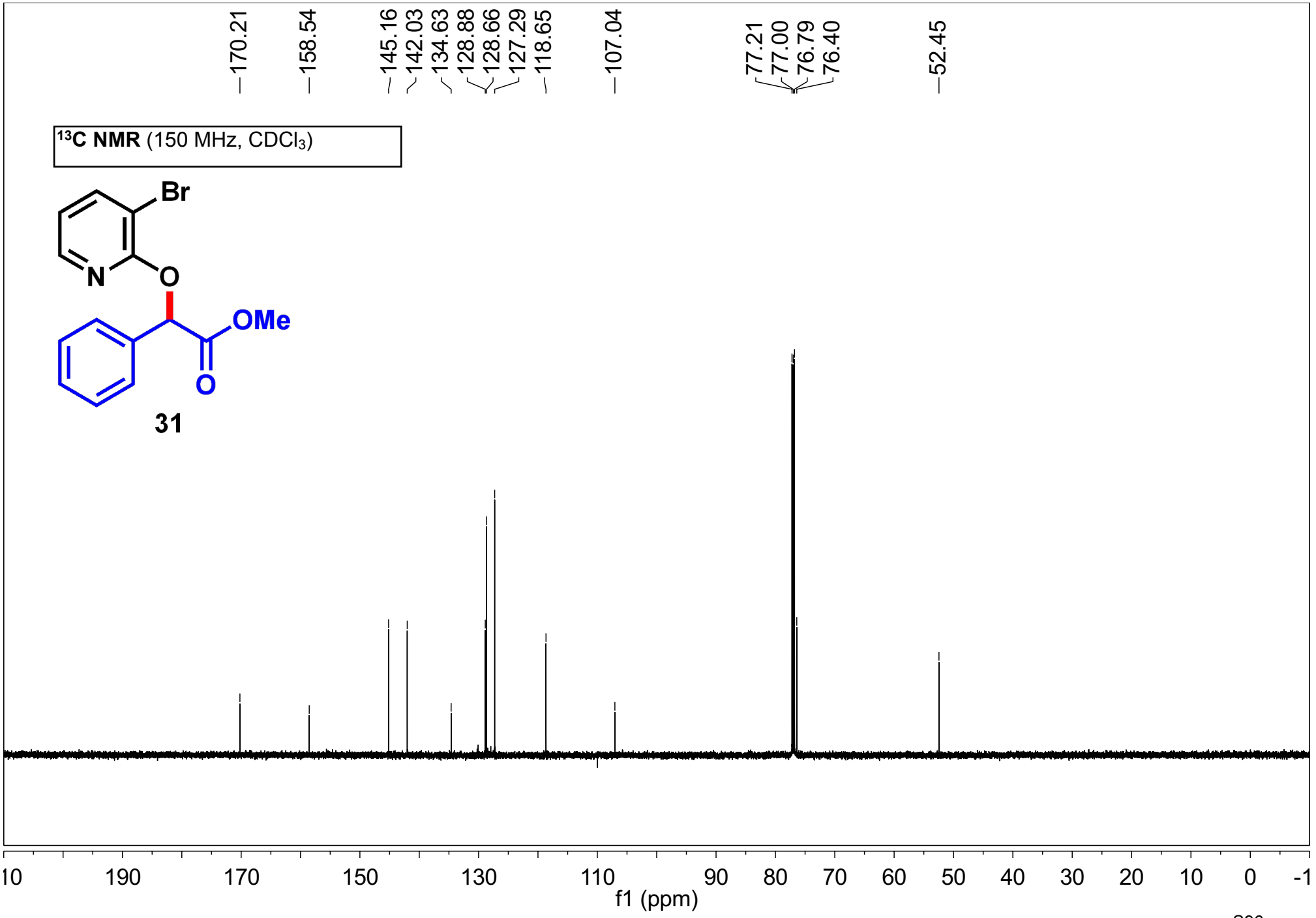
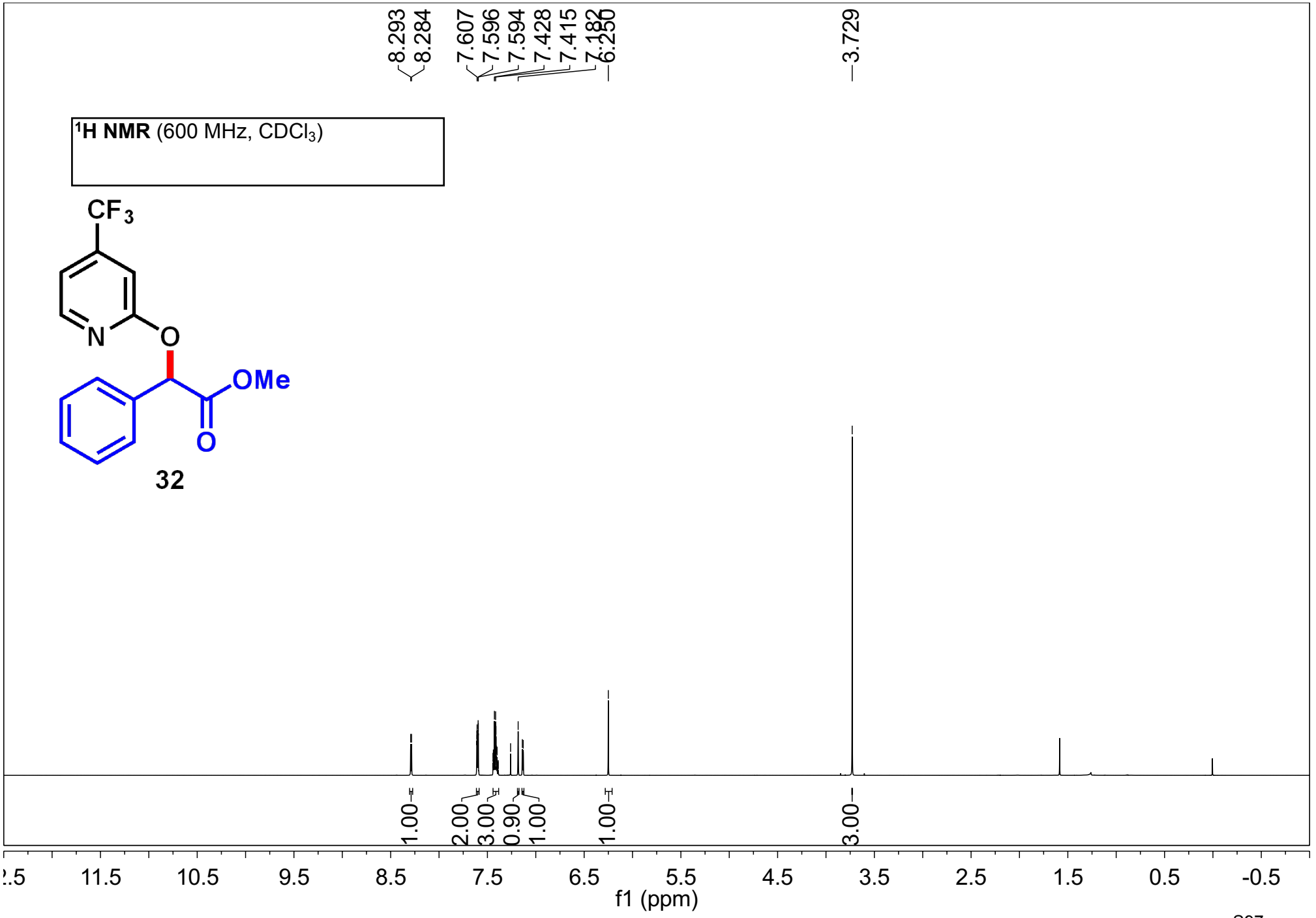
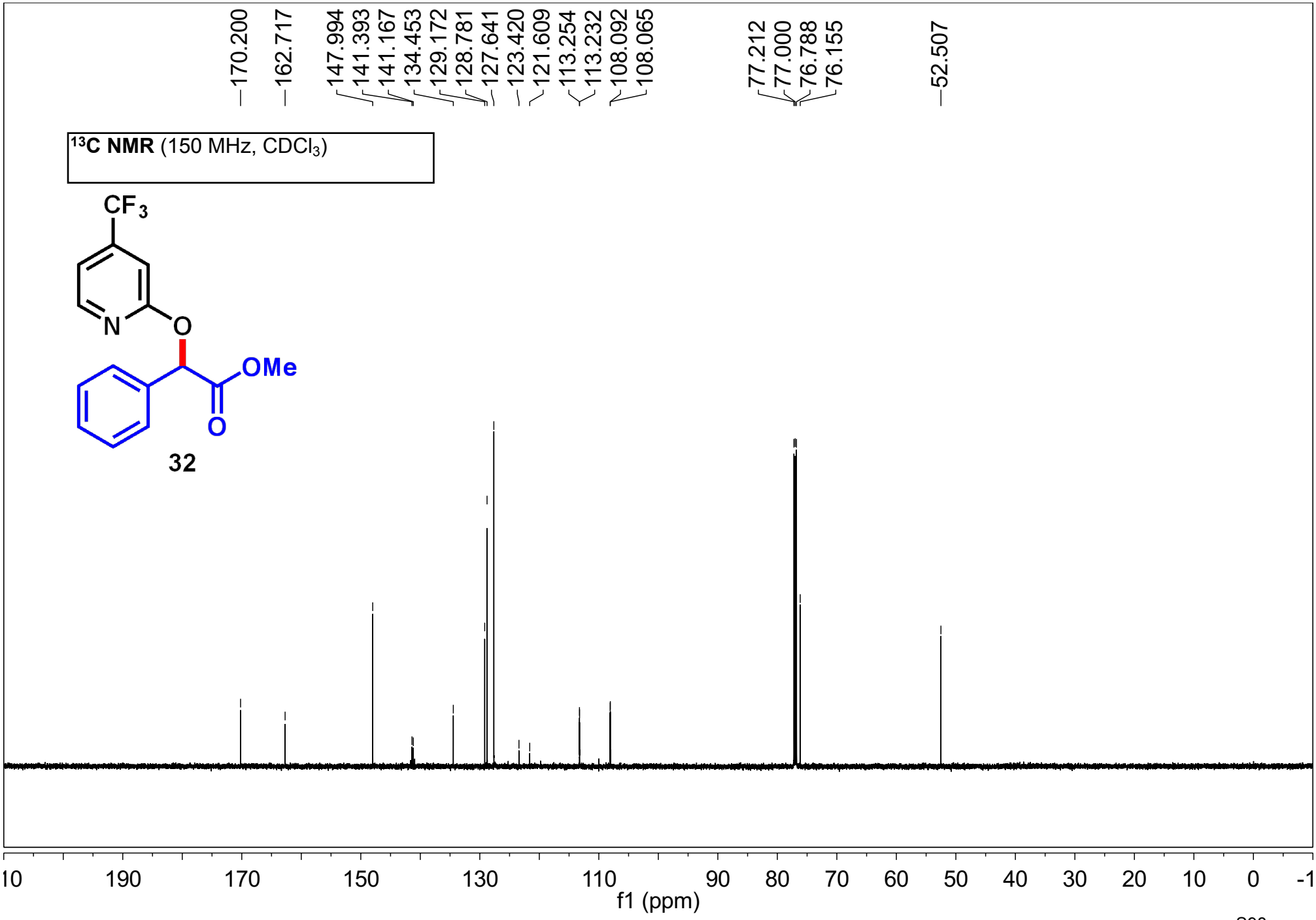
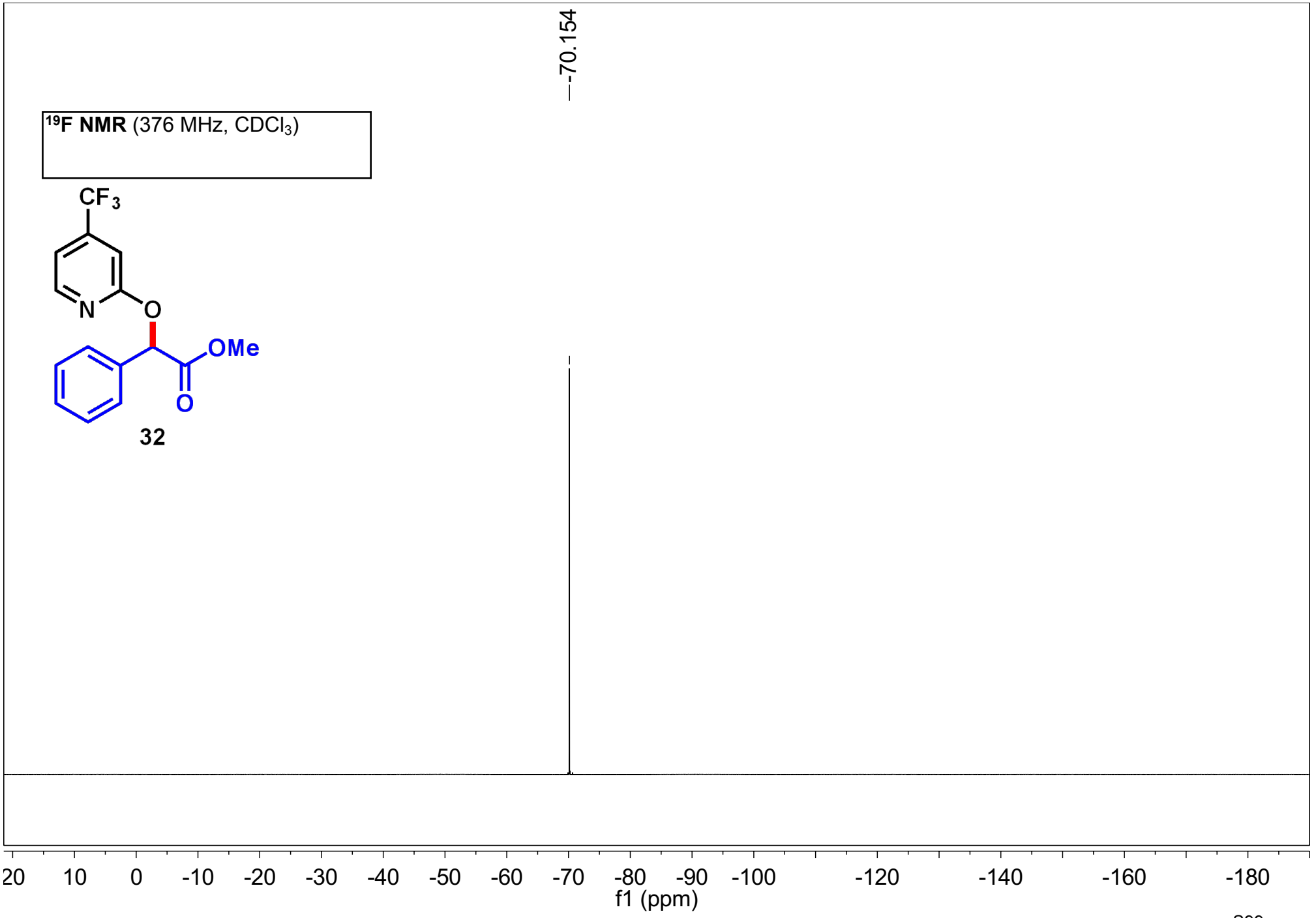
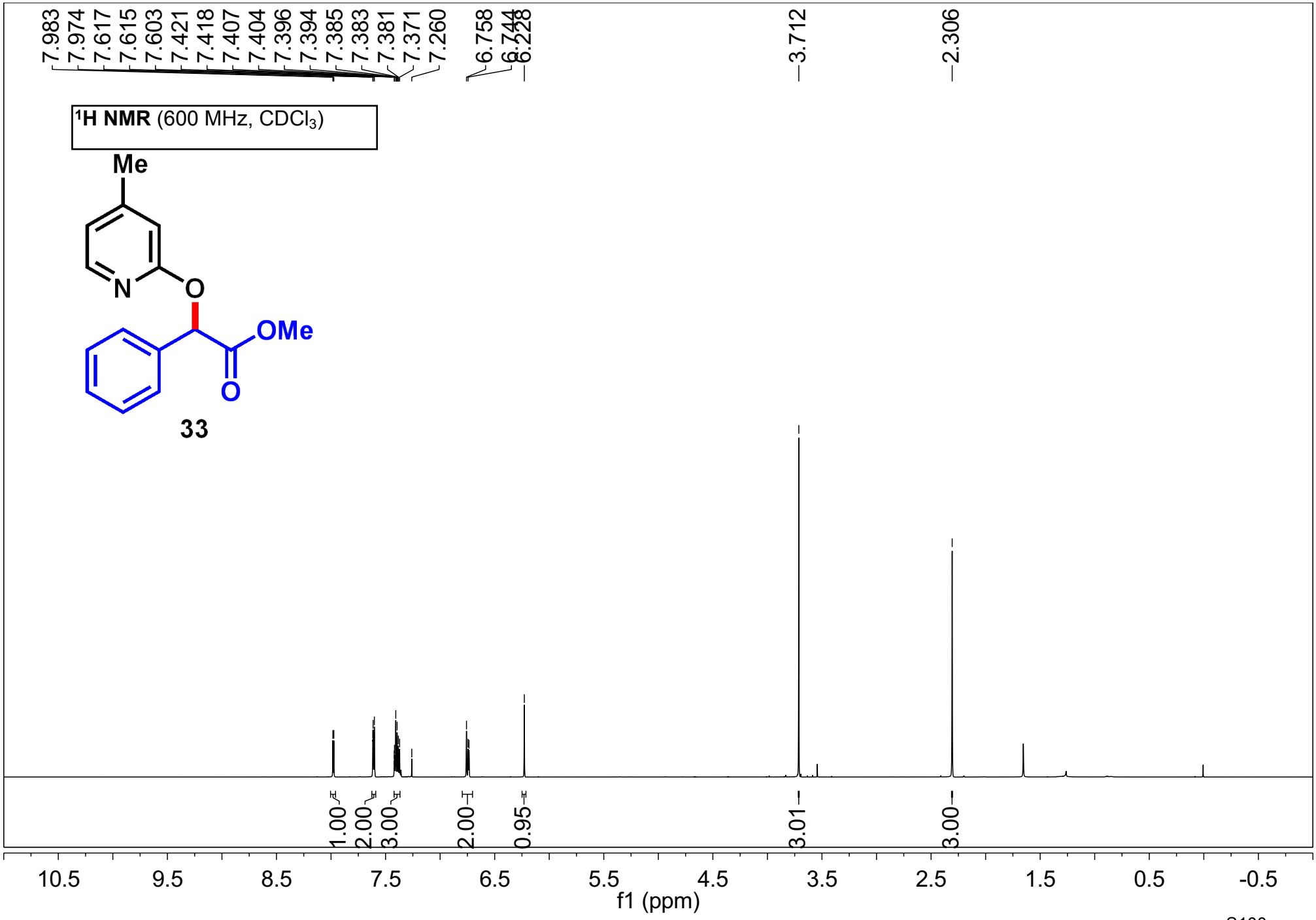

8.066
8.063
8.058
8.055
7.862
7.859
7.849
7.847
7.691
7.689
7.686
7.677
7.438
7.426
7.423
7.413
7.396
7.394
7.384
7.260
6.840
6.831
6.827
6.819
6.207
3.705
1H NMR (600 MHz, CDCl3)
Br
N
O
OMe
O
31
1.00
1.00
2.00
3.00
1.00
0.90
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

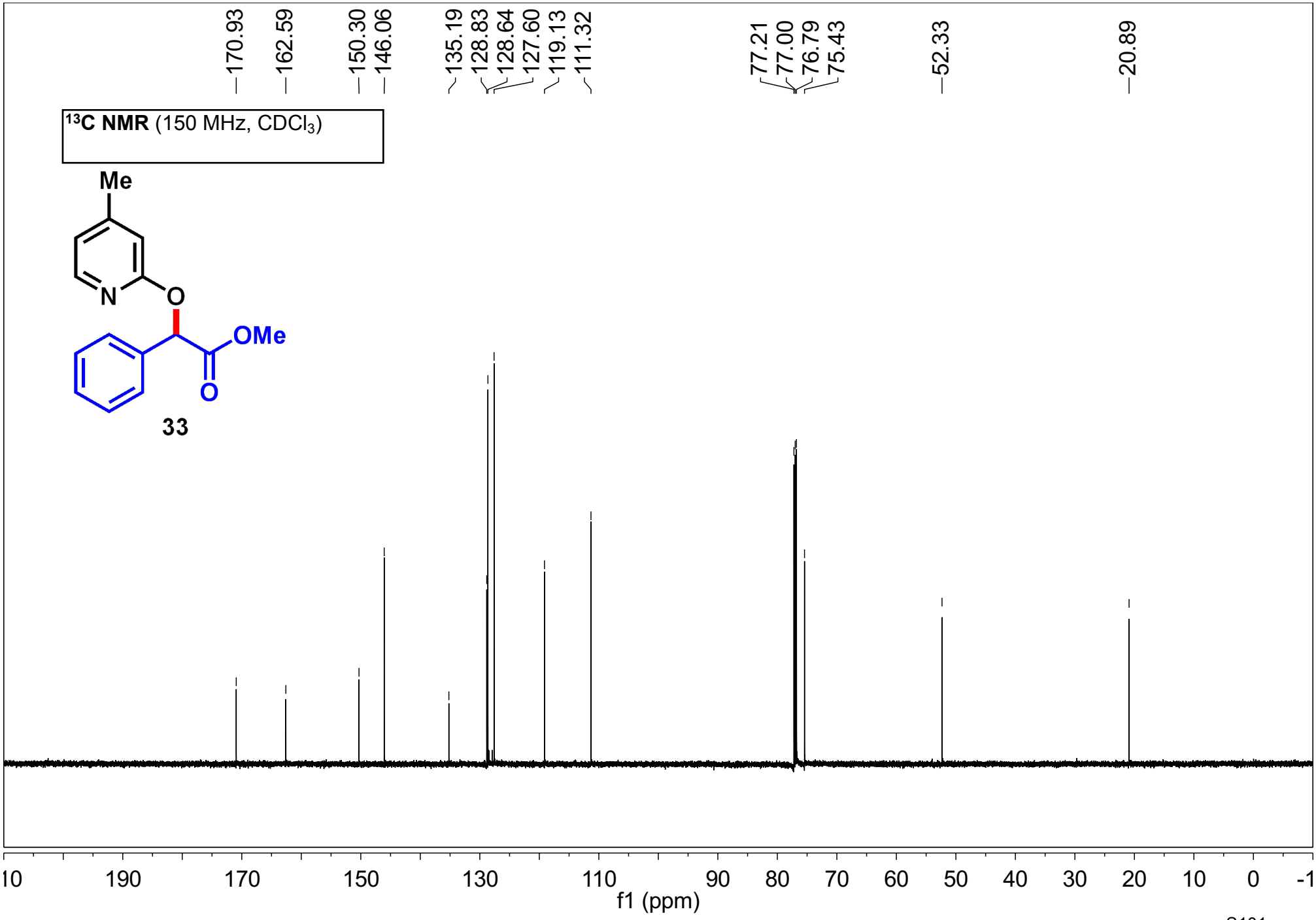

170.21
158.54
145.16
142.03
134.63
128.88
128.66
127.29
118.65
107.04
77.21
77.00
76.79
76.40
52.45
13C NMR (150 MHz, CDCl3)
Br
N
O
OMe
O
31
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

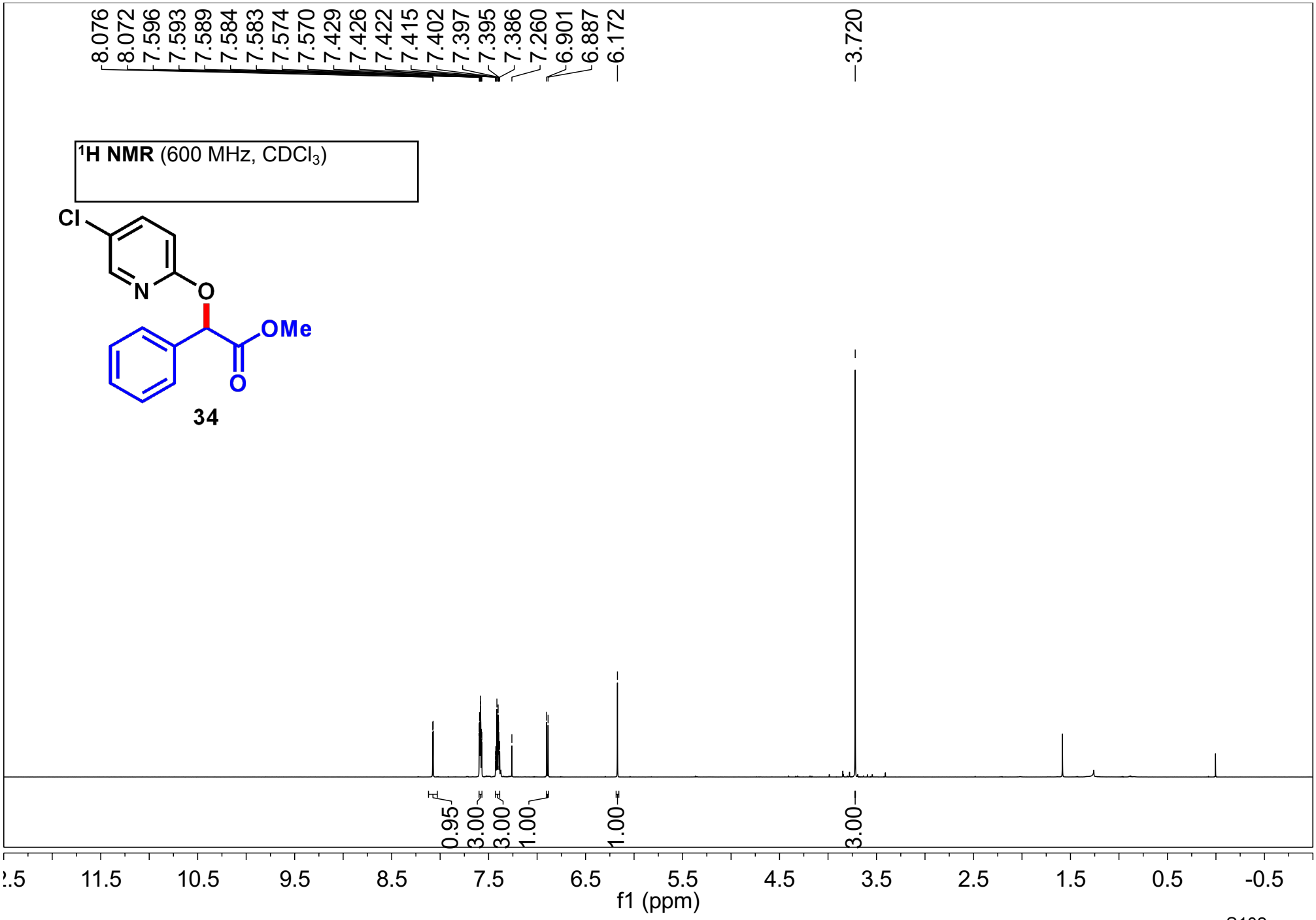

8.293
8.284
7.607
7.596
7.594
7.428
7.415
7.182
6.250
3.729
^{1}H NMR (600 MHz, $CDCl_3$)
CF_3
N
O
OMe
O
32
1.00
2.00
3.00
0.90
1.00
1.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

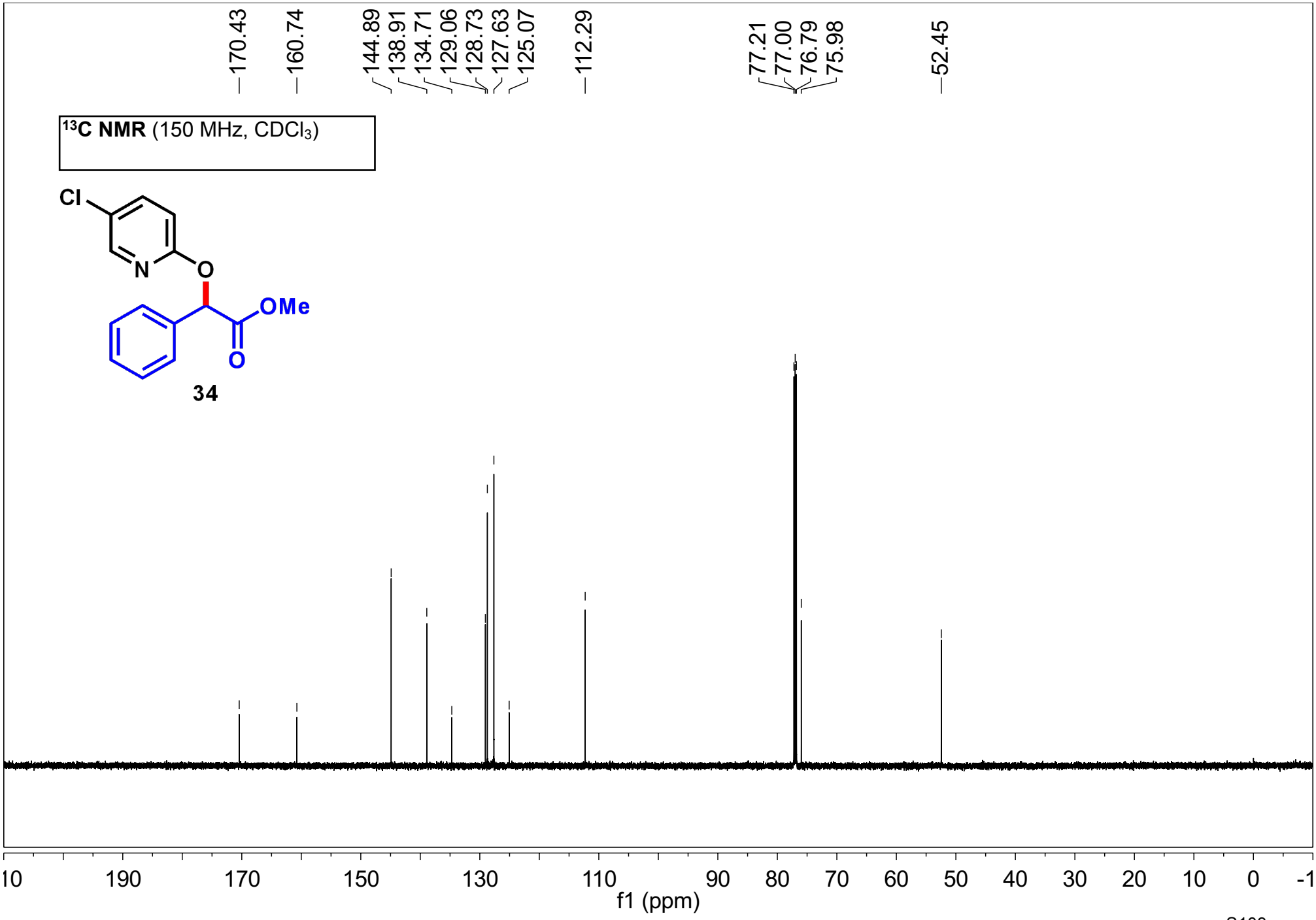

170.200
162.717
147.994
141.393
141.167
134.453
129.172
128.781
127.641
123.420
121.609
113.254
113.232
108.092
108.065
77.212
77.000
76.788
76.155
52.507
13C NMR (150 MHz, CDCl3)
CF3
N
O
OMe
O
32
f1 (ppm)

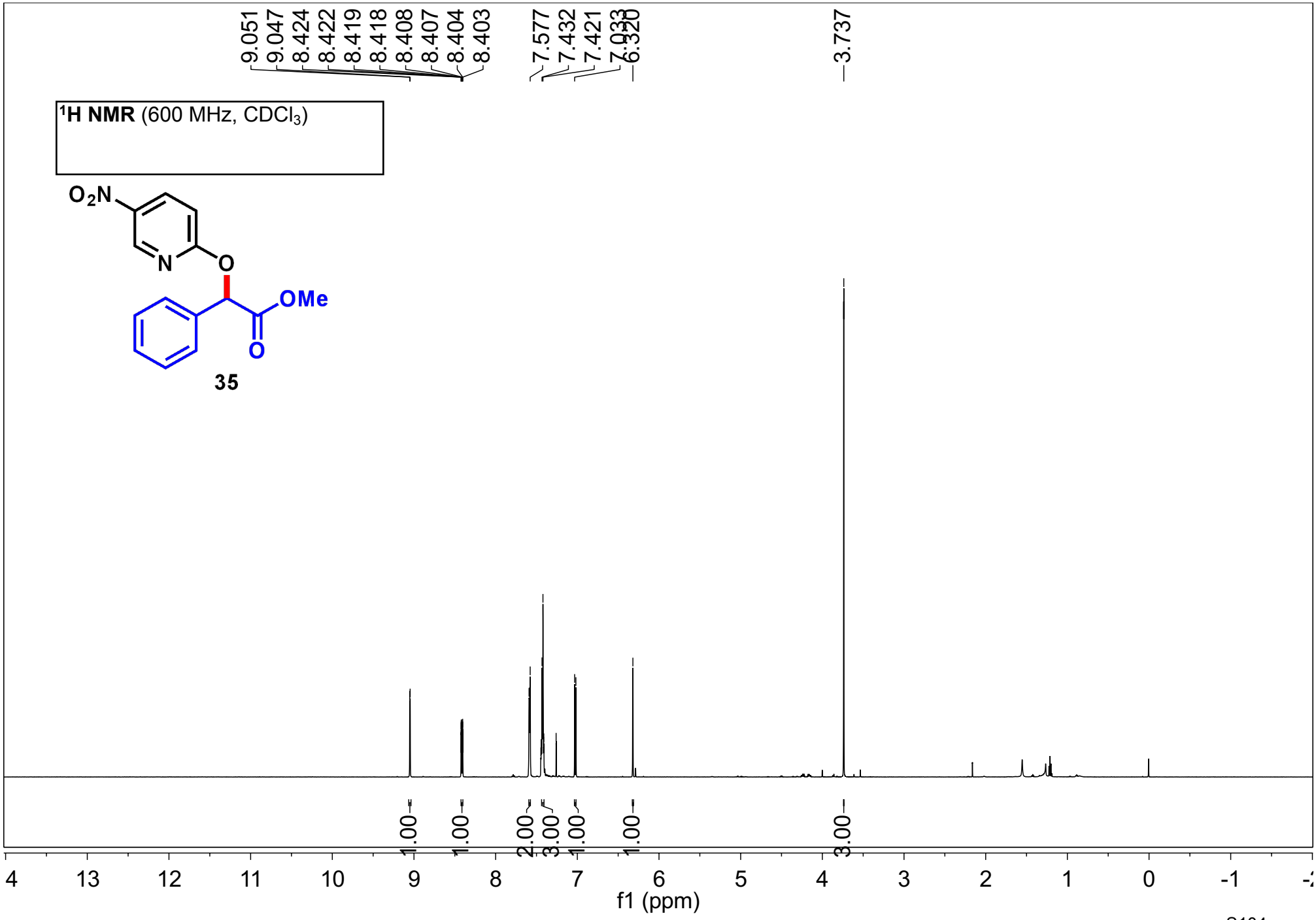

-70.154
19F NMR (376 MHz, CDCl3)
CF3
N
O
OMe
O
32
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-120
-140
-160
-180
f1 (ppm)

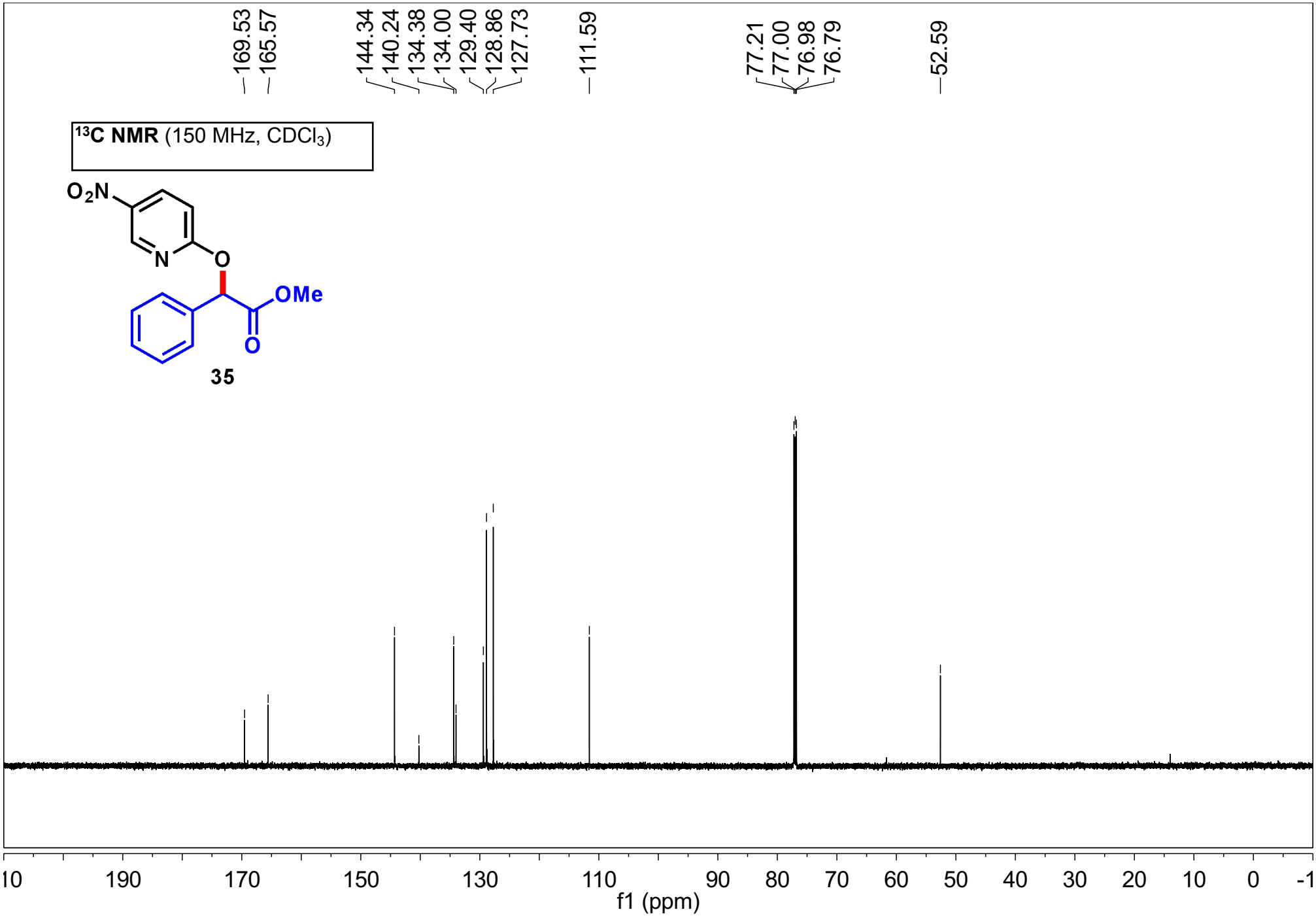

7.983
7.974
7.617
7.615
7.603
7.421
7.418
7.407
7.404
7.396
7.394
7.385
7.383
7.381
7.371
7.260
6.758
6.744
6.228
3.712
2.306
1H NMR (600 MHz, CDCl3)
Me
N
O
OMe
O
33
1.00
2.00
3.00
2.00
0.95
3.01
3.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

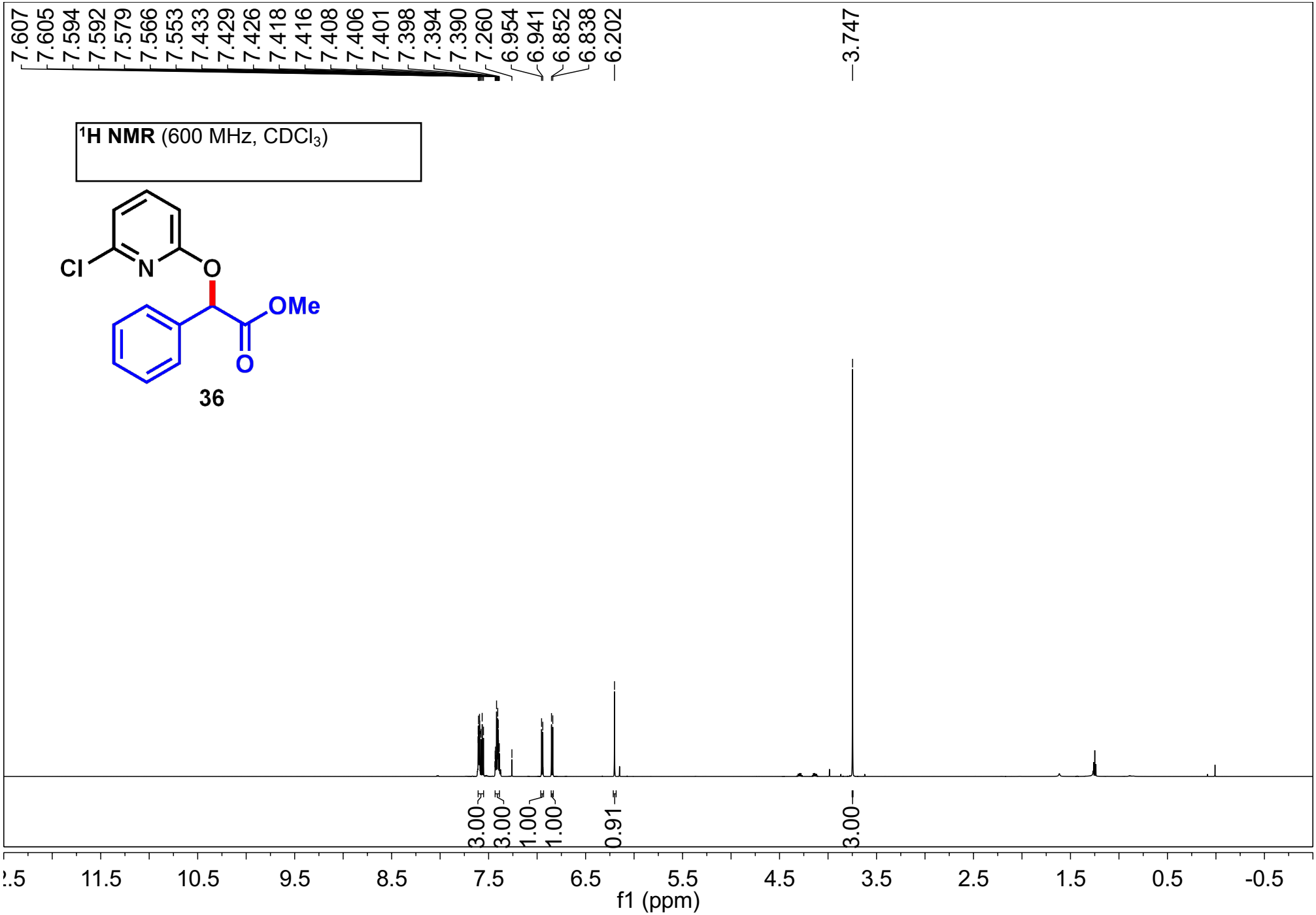

170.93
162.59
150.30
146.06
135.19
128.83
128.64
127.60
119.13
111.32
77.21
77.00
76.79
75.43
52.33
20.89
13C NMR (150 MHz, CDCl3)
Me
N
O
OMe
O
33
f1 (ppm)

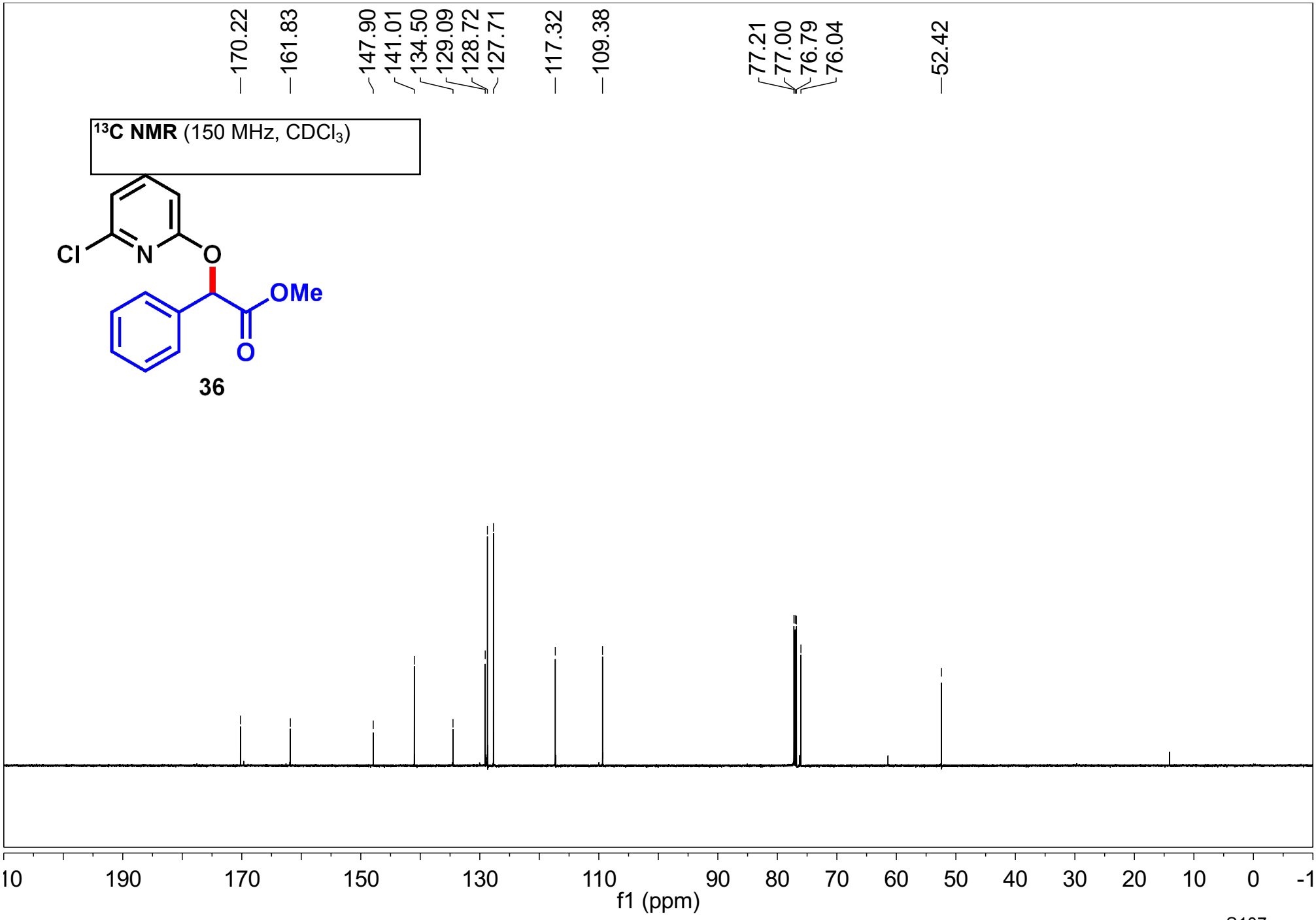

8.076
8.072
7.596
7.593
7.589
7.584
7.583
7.574
7.570
7.429
7.426
7.422
7.415
7.402
7.397
7.395
7.386
7.260
6.901
6.887
6.172
3.720
¹H NMR (600 MHz, CDCl₃)
Cl
N
O
OMe
O
34
0.95
3.00
3.00
1.00
1.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

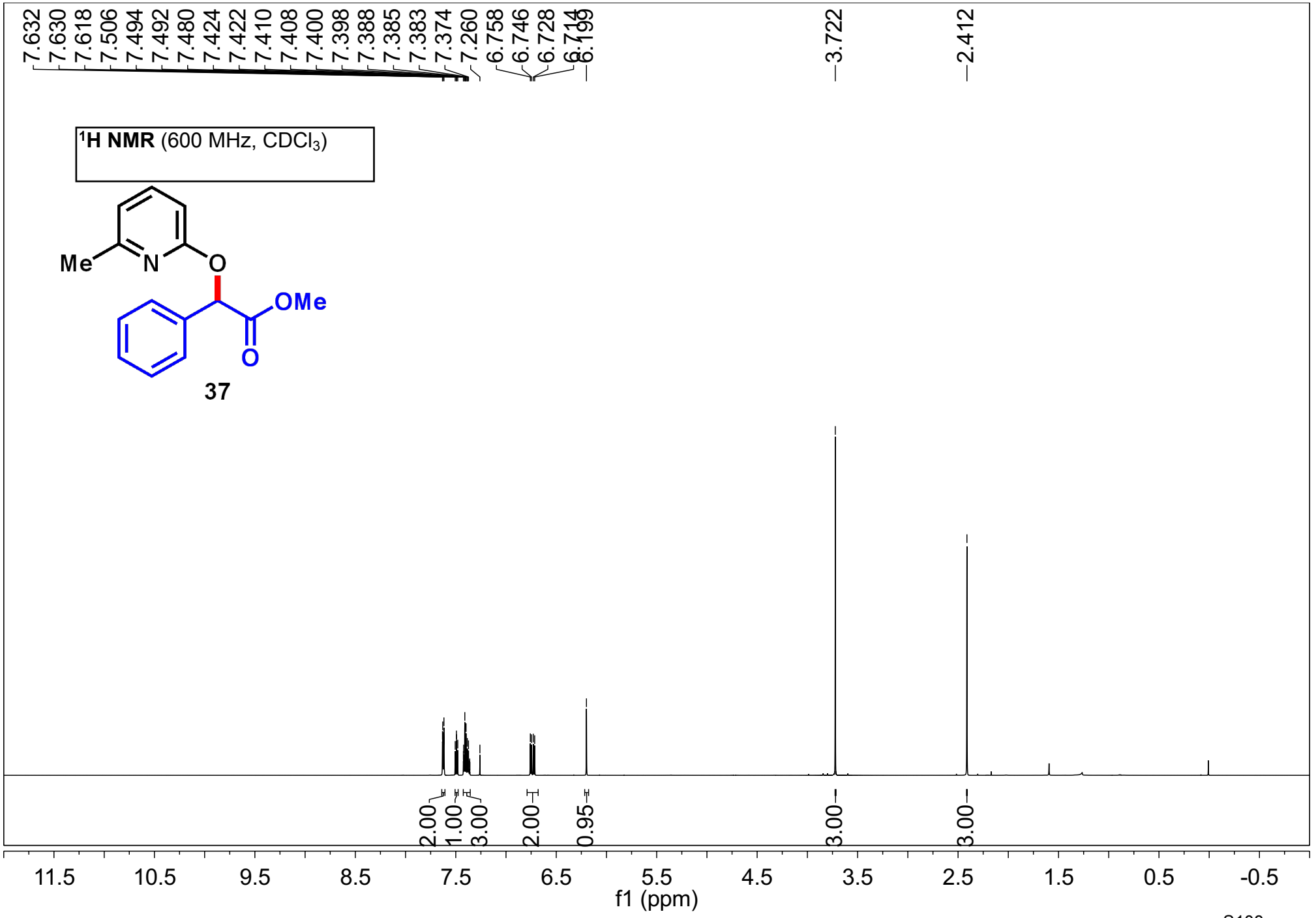

170.43
160.74
144.89
138.91
134.71
129.06
128.73
127.63
125.07
112.29
77.21
77.00
76.79
75.98
52.45
13C NMR (150 MHz, CDCl3)
Cl
N
O
OMe
O
34
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

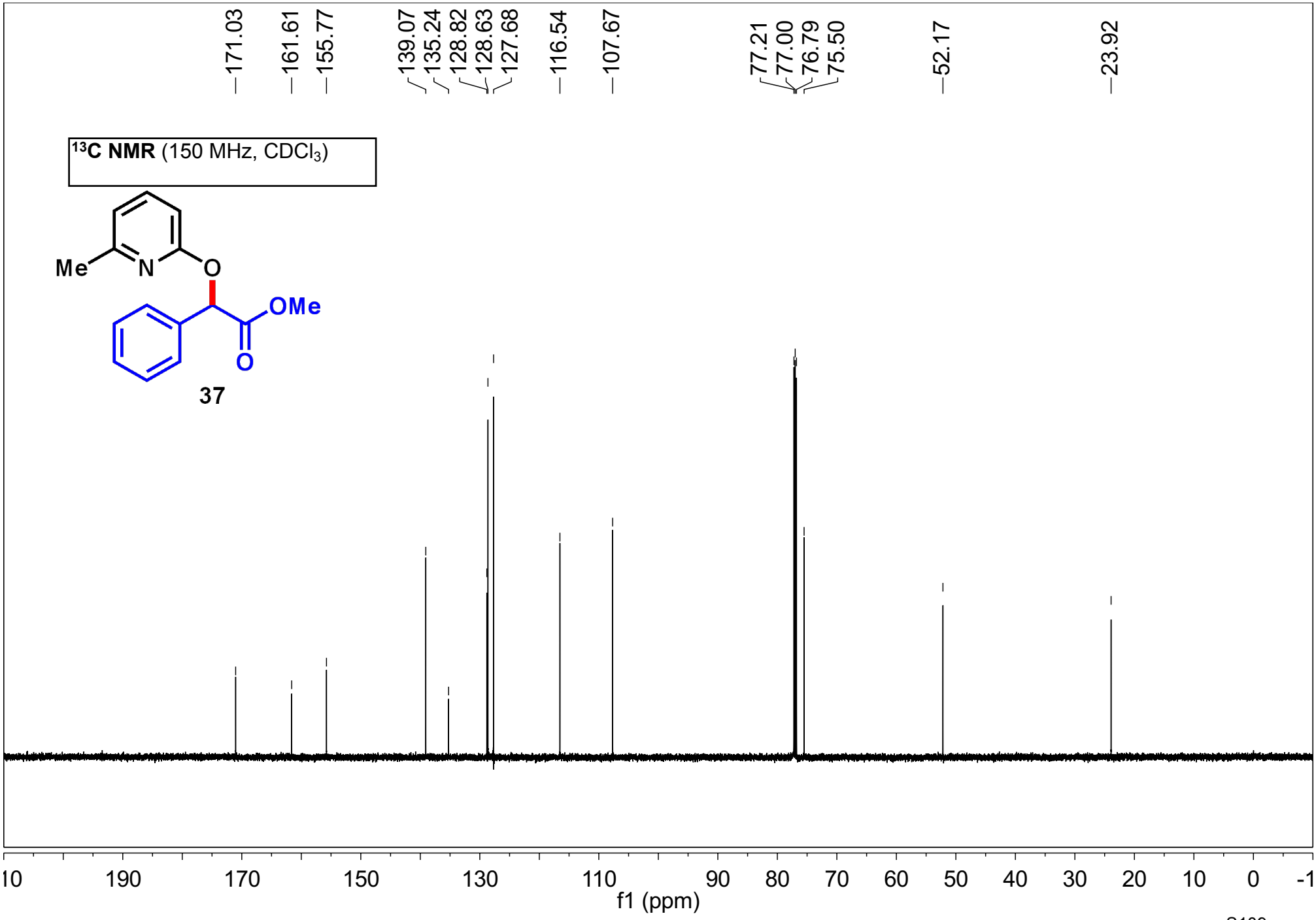

9.051
9.047
8.424
8.422
8.419
8.418
8.408
8.407
8.404
8.403
7.577
7.432
7.421
7.033
6.320
3.737
1H NMR (600 MHz, CDCl3)
O2N
N
O
OMe
O
35
1.00
1.00
2.00
3.00
1.00
1.00
3.00
4
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
f1 (ppm)

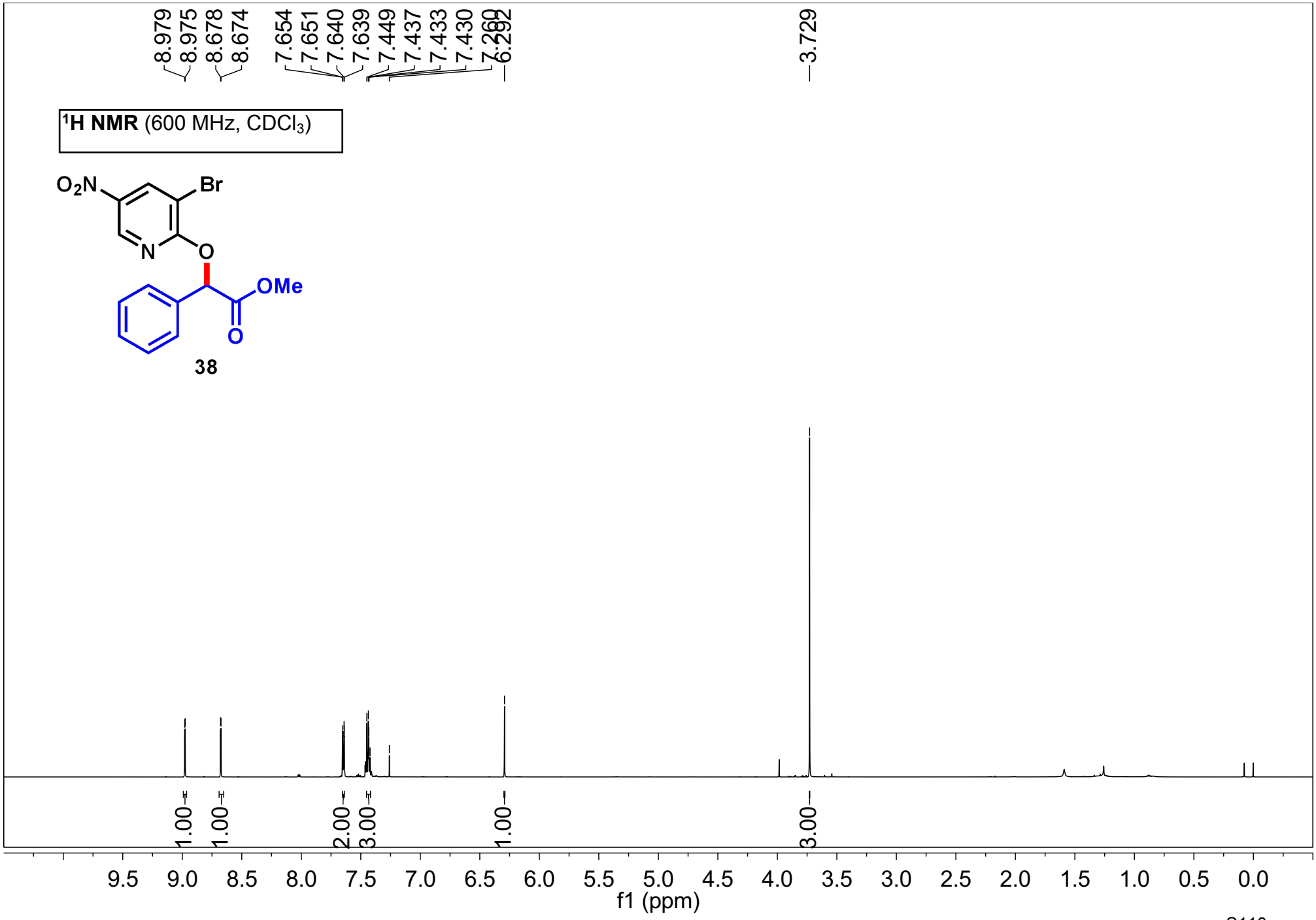

169.53
165.57
144.34
140.24
134.38
134.00
129.40
128.86
127.73
111.59
77.21
77.00
76.98
76.79
52.59
13C NMR (150 MHz, CDCl3)
O2N
N
O
OMe
O
35
f1 (ppm)

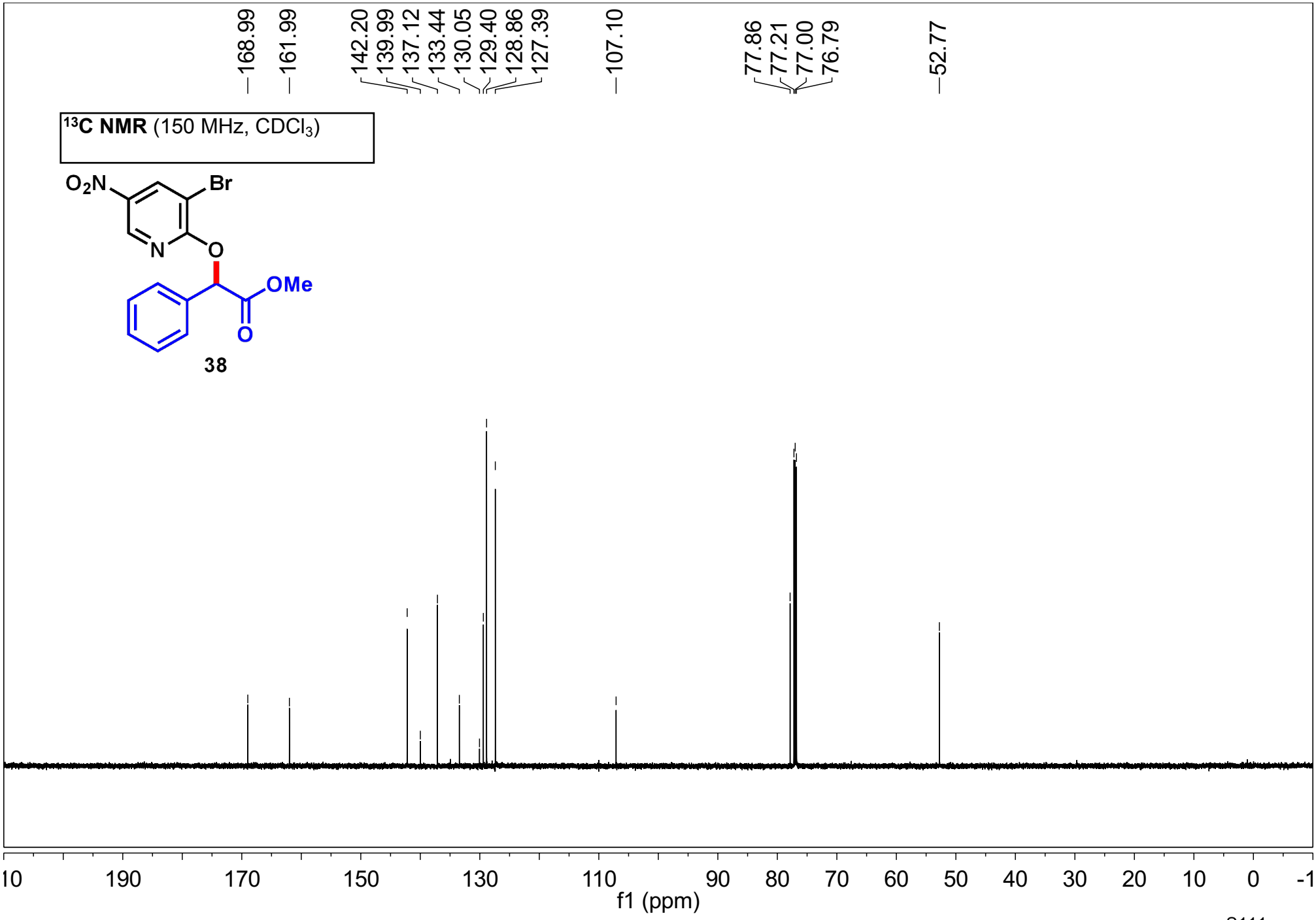

7.607
7.605
7.594
7.592
7.579
7.566
7.553
7.433
7.429
7.426
7.418
7.416
7.408
7.406
7.401
7.398
7.394
7.390
7.260
6.954
6.941
6.852
6.838
6.202
3.747
¹H NMR (600 MHz, CDCl₃)
Cl
N
O
OMe
O
36
3.00
3.00
1.00
1.00
0.91
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

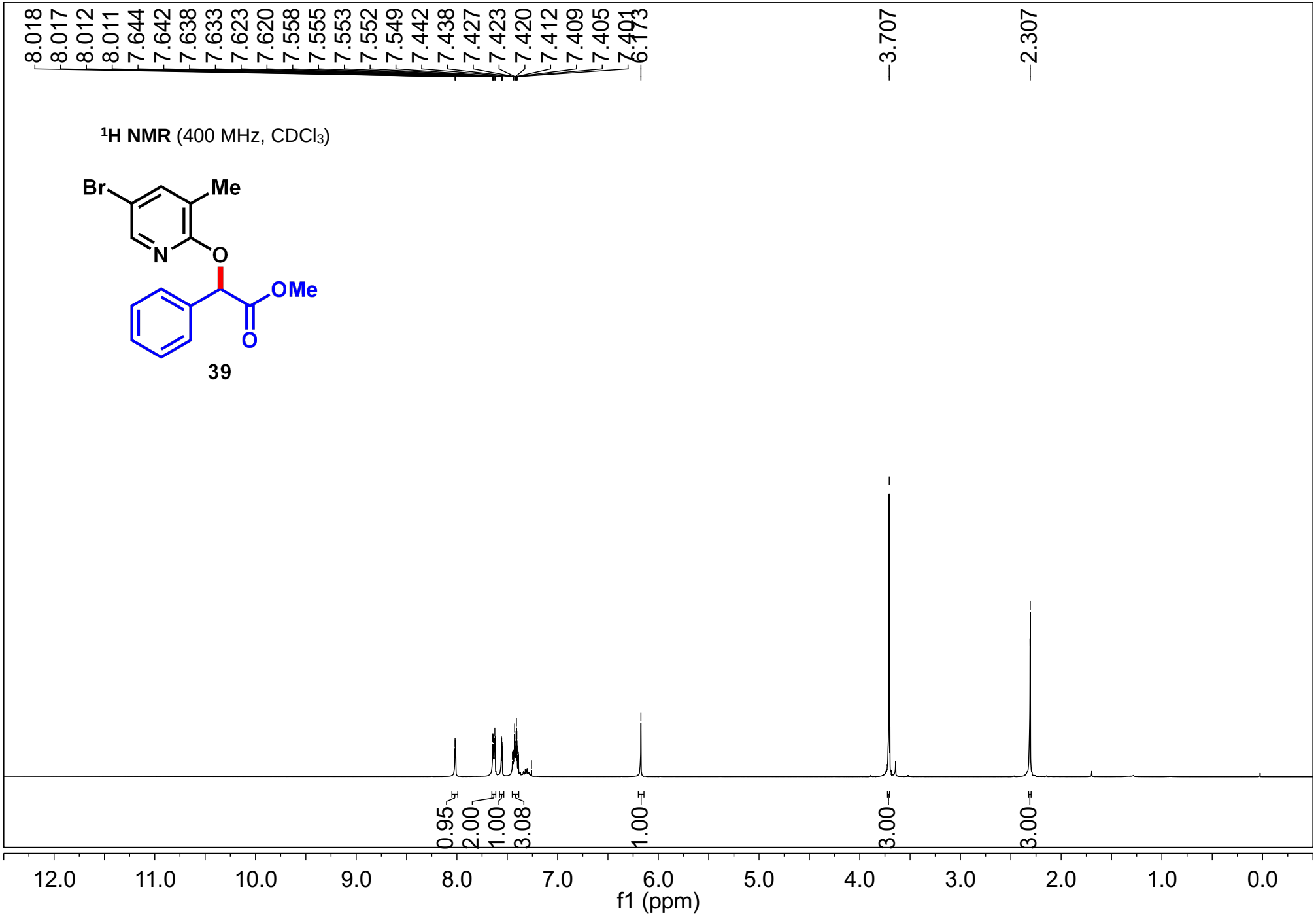

170.22
161.83
147.90
141.01
134.50
129.09
128.72
127.71
117.32
109.38
77.21
77.00
76.79
76.04
52.42
13C NMR (150 MHz, CDCl3)
Cl
N
O
OMe
O
36
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)


7.632
7.630
7.618
7.506
7.494
7.492
7.480
7.424
7.422
7.410
7.408
7.400
7.398
7.388
7.385
7.383
7.374
7.260
6.758
6.746
6.728
6.714
6.199
3.722
2.412
¹H NMR (600 MHz, CDCl₃)
Me
N
O
OMe
O
37
2.00
1.00
3.00
2.00
0.95
3.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)


171.03
161.61
155.77
139.07
135.24
128.82
128.63
127.68
116.54
107.67
77.21
77.00
76.79
75.50
52.17
23.92
13C NMR (150 MHz, CDCl3)
Me
N
O
OMe
O
37
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

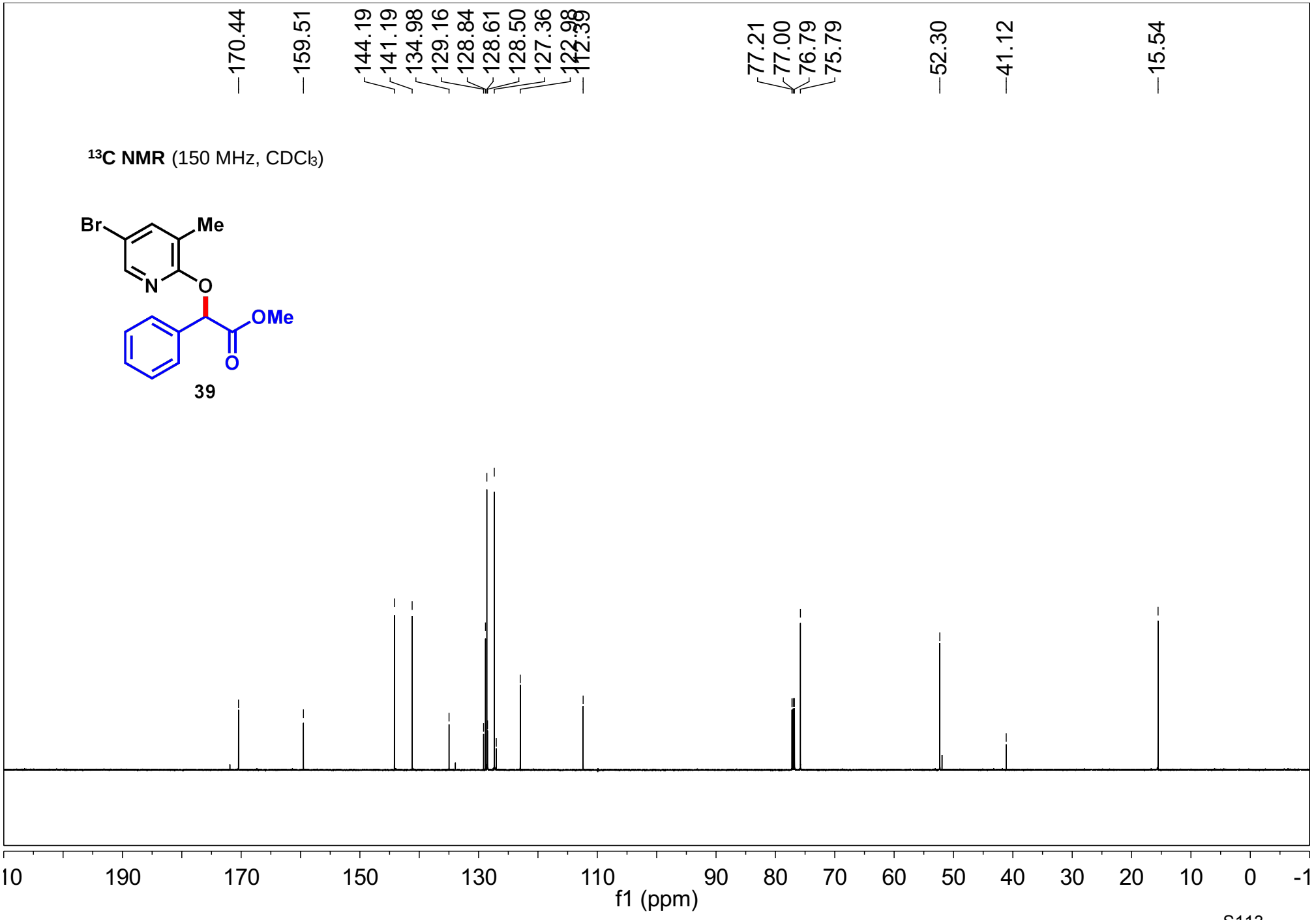

8.979
8.975
8.678
8.674
7.654
7.651
7.640
7.639
7.449
7.437
7.433
7.430
7.260
6.292
3.729
1H NMR (600 MHz, CDCl3)
O2N
Br
N
O
OMe
O
38
1.00
1.00
2.00
3.00
1.00
3.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
f1 (ppm)

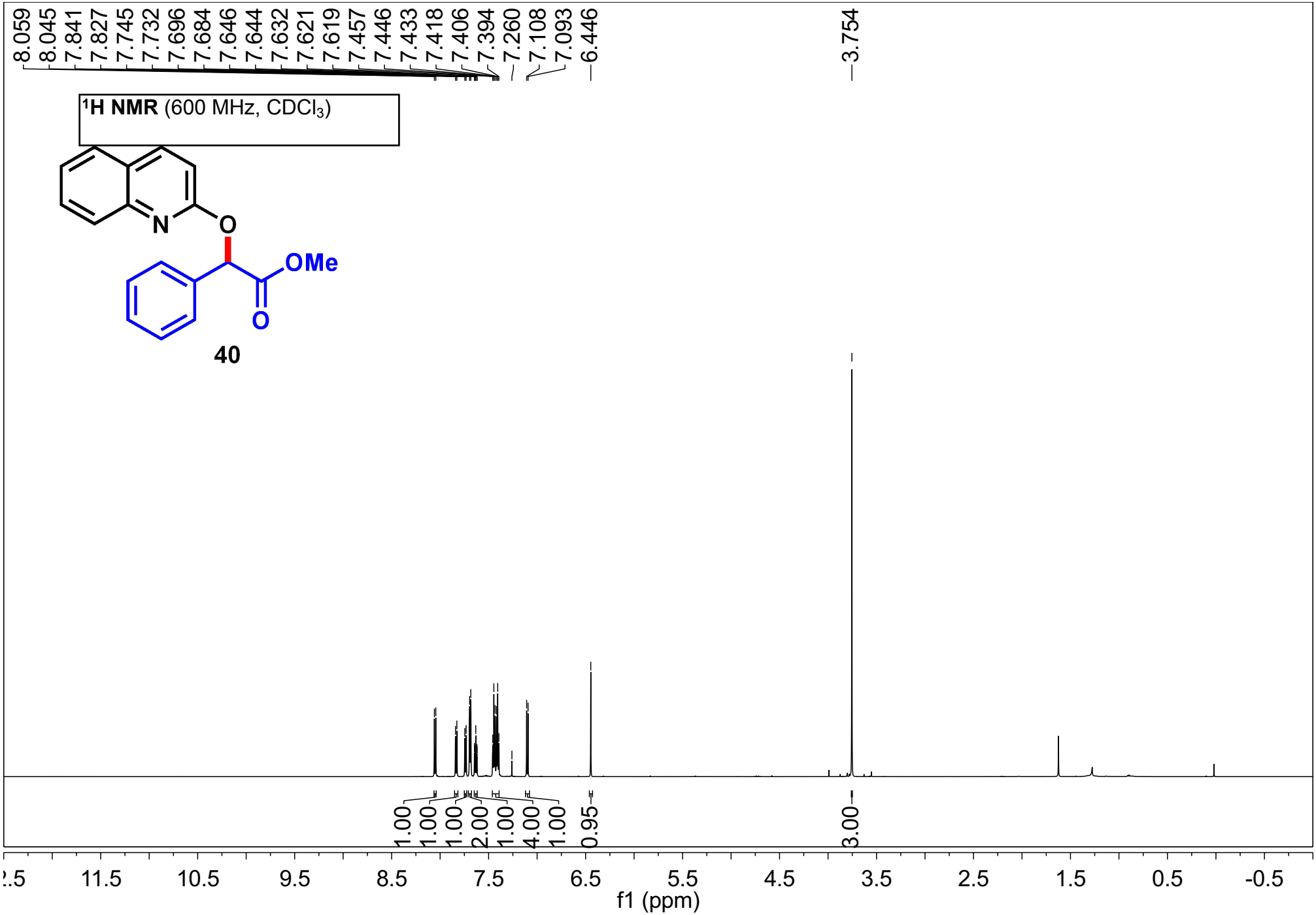

168.99
161.99
142.20
139.99
137.12
133.44
130.05
129.40
128.86
127.39
107.10
77.86
77.21
77.00
76.79
52.77
13C NMR (150 MHz, CDCl3)
O2N
Br
N
O
OMe
O
38
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

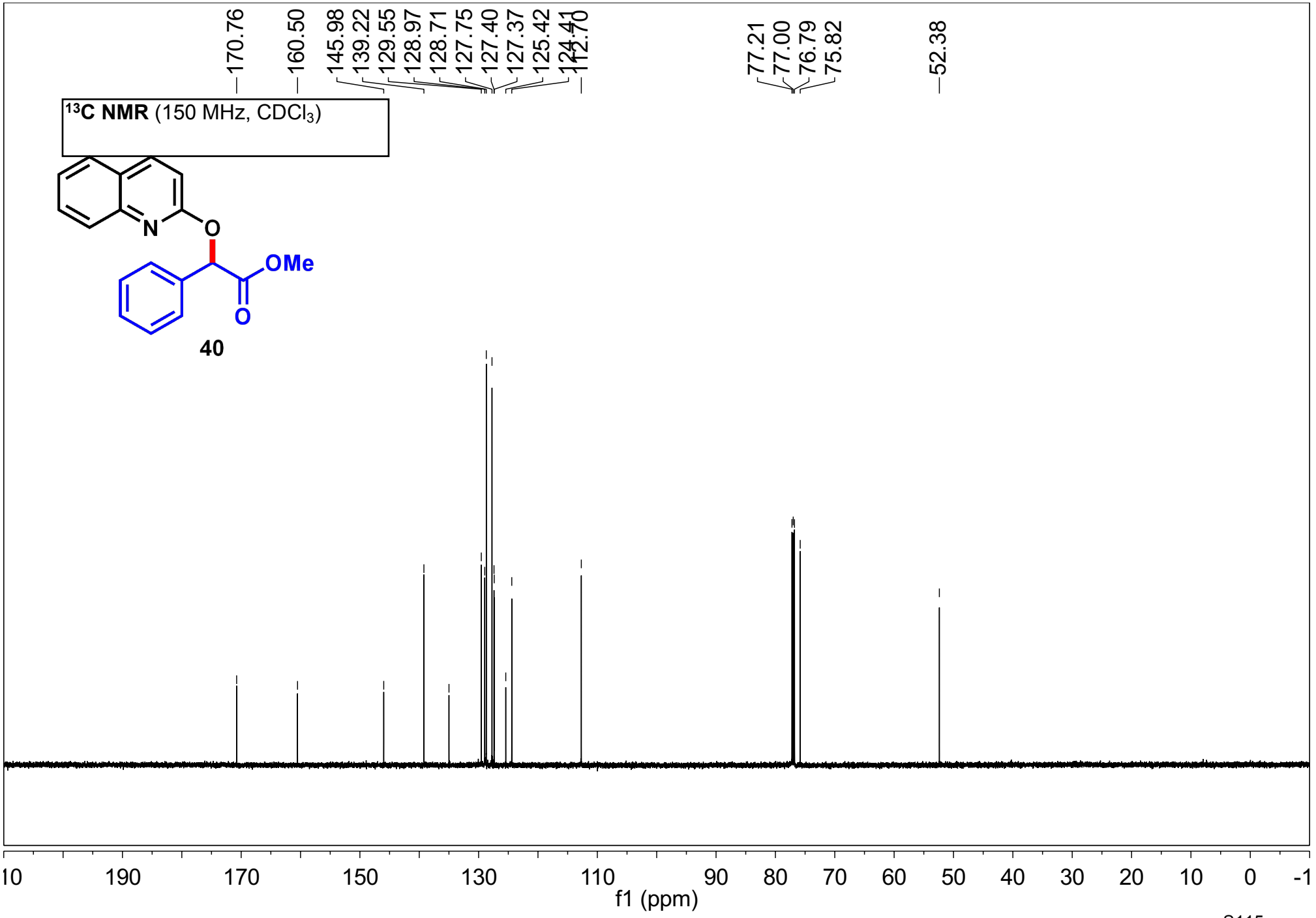


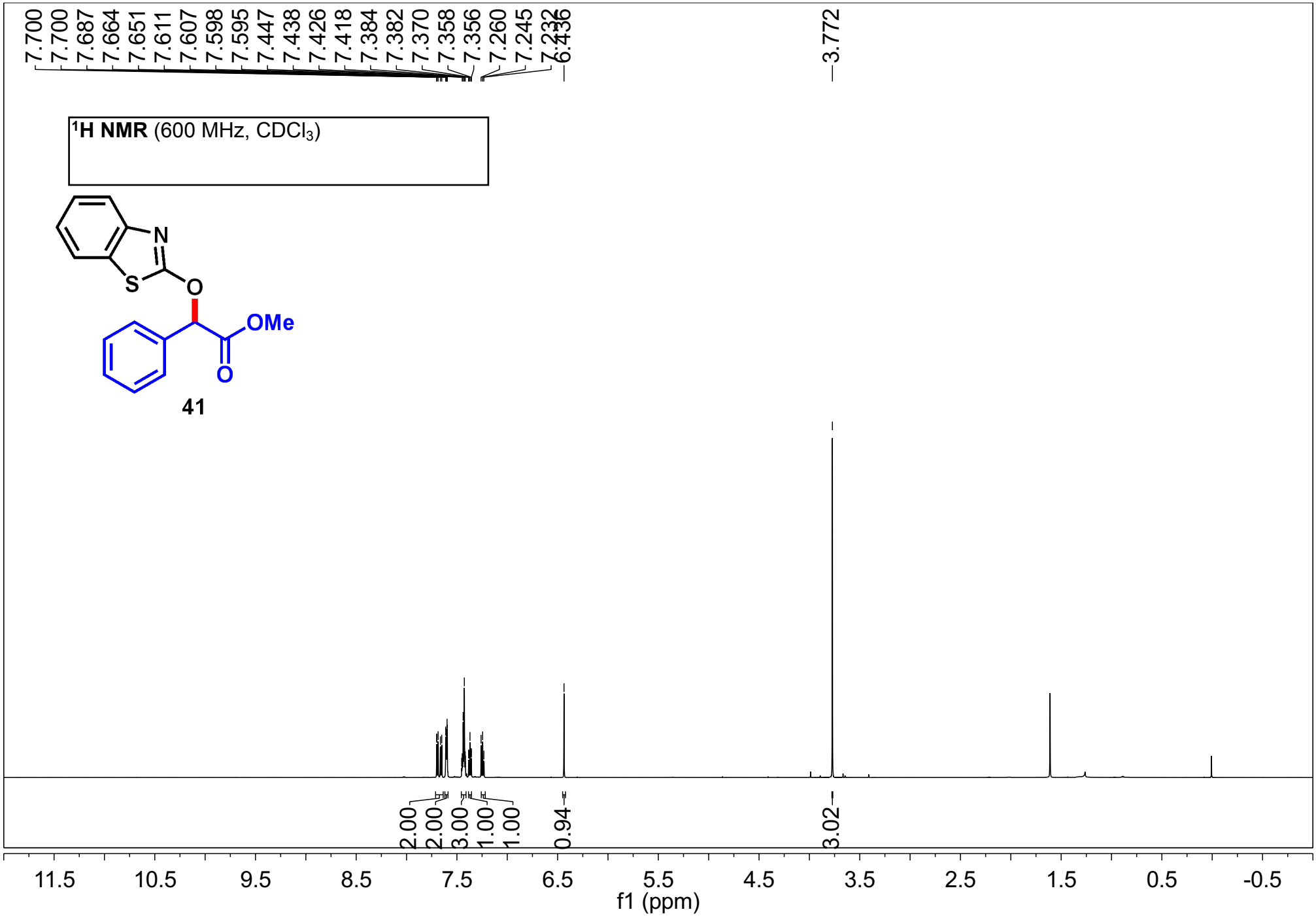
^{1}H NMR (400 MHz, $CDCl_3$)

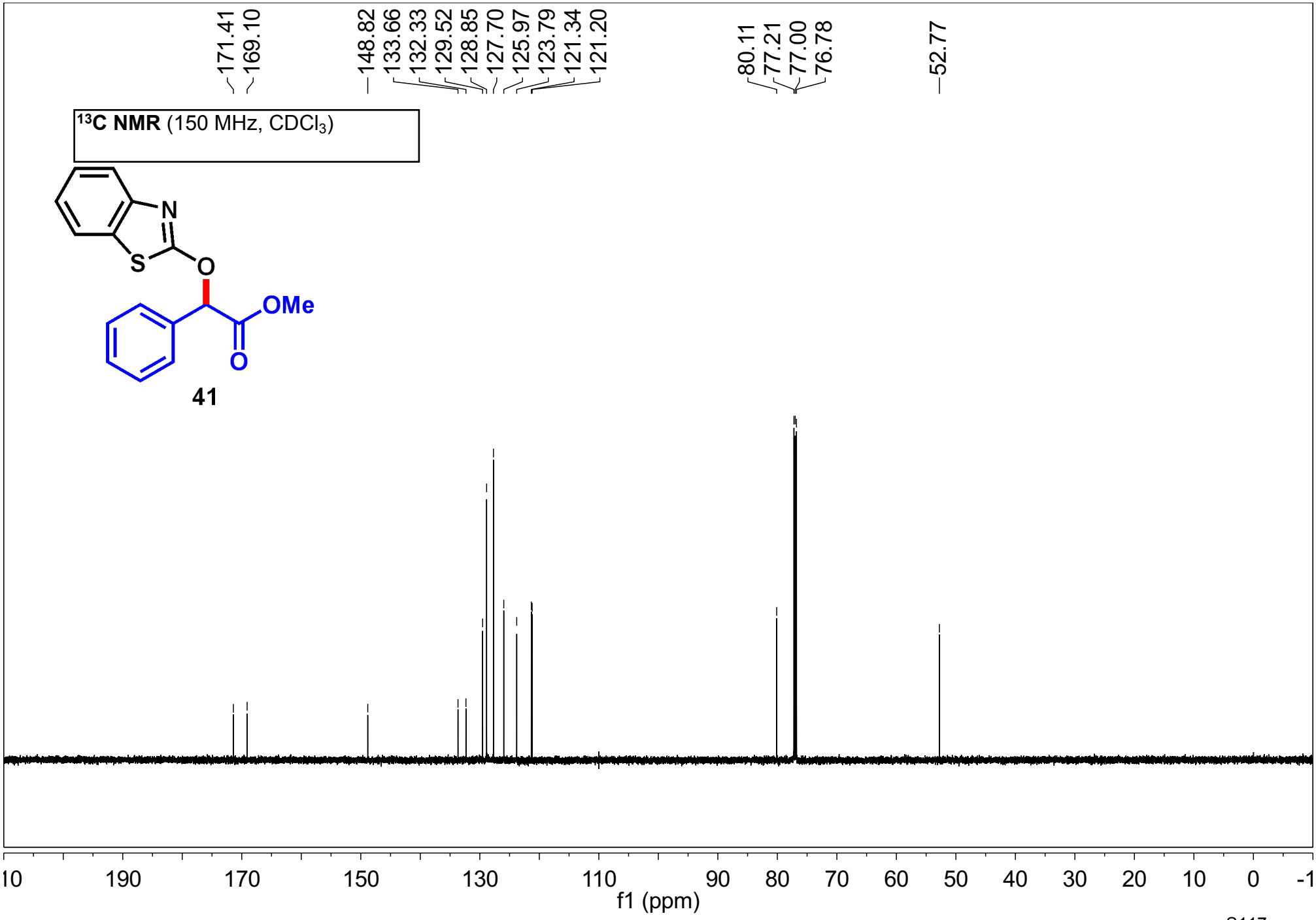
39

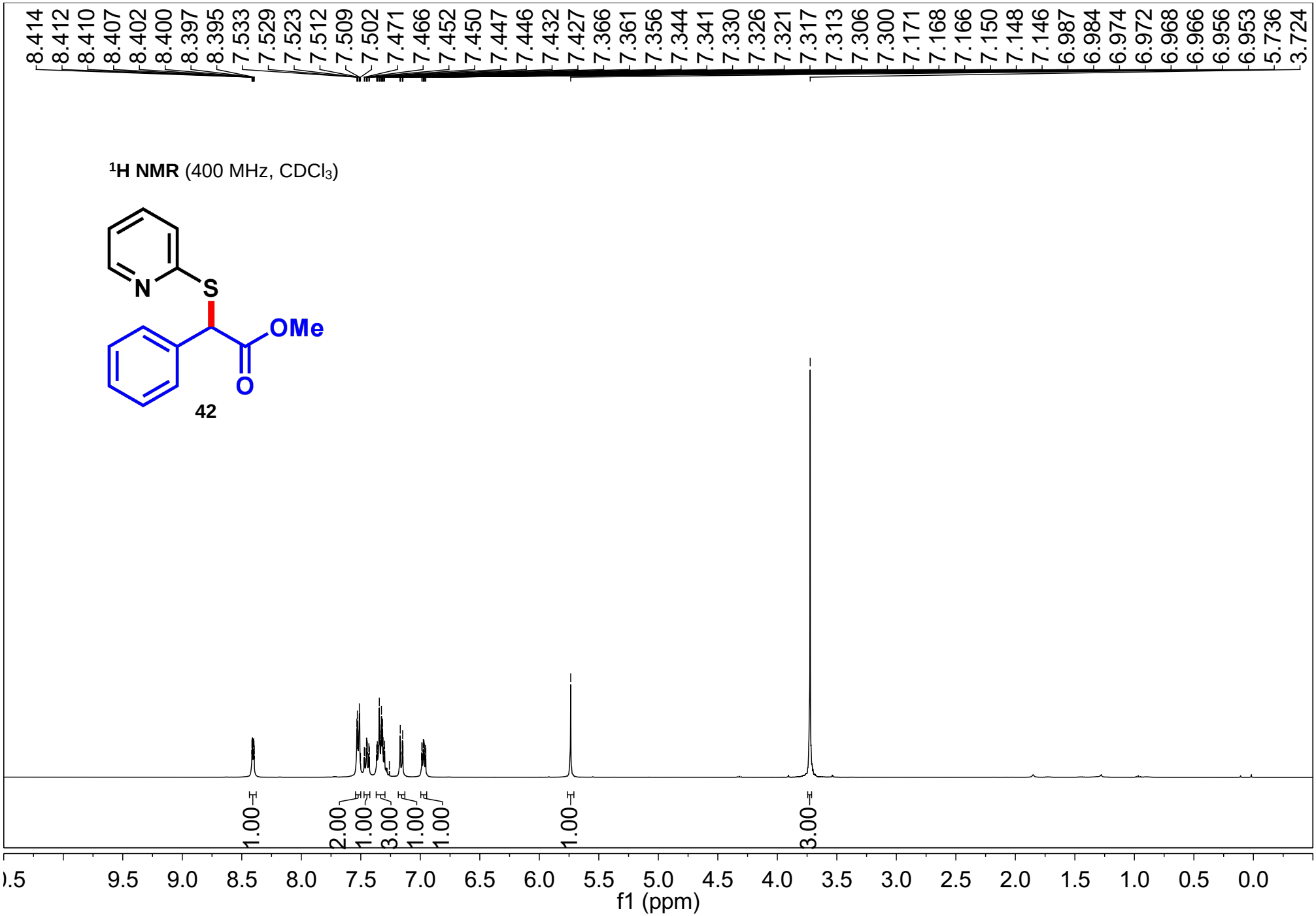

170.44
159.51
144.19
141.19
134.98
129.16
128.84
128.61
128.50
127.36
122.98
112.39
77.21
77.00
76.79
75.79
52.30
41.12
15.54
13C NMR (150 MHz, CDCl3)
Br
Me
N
O
OMe
O
39
f1 (ppm)

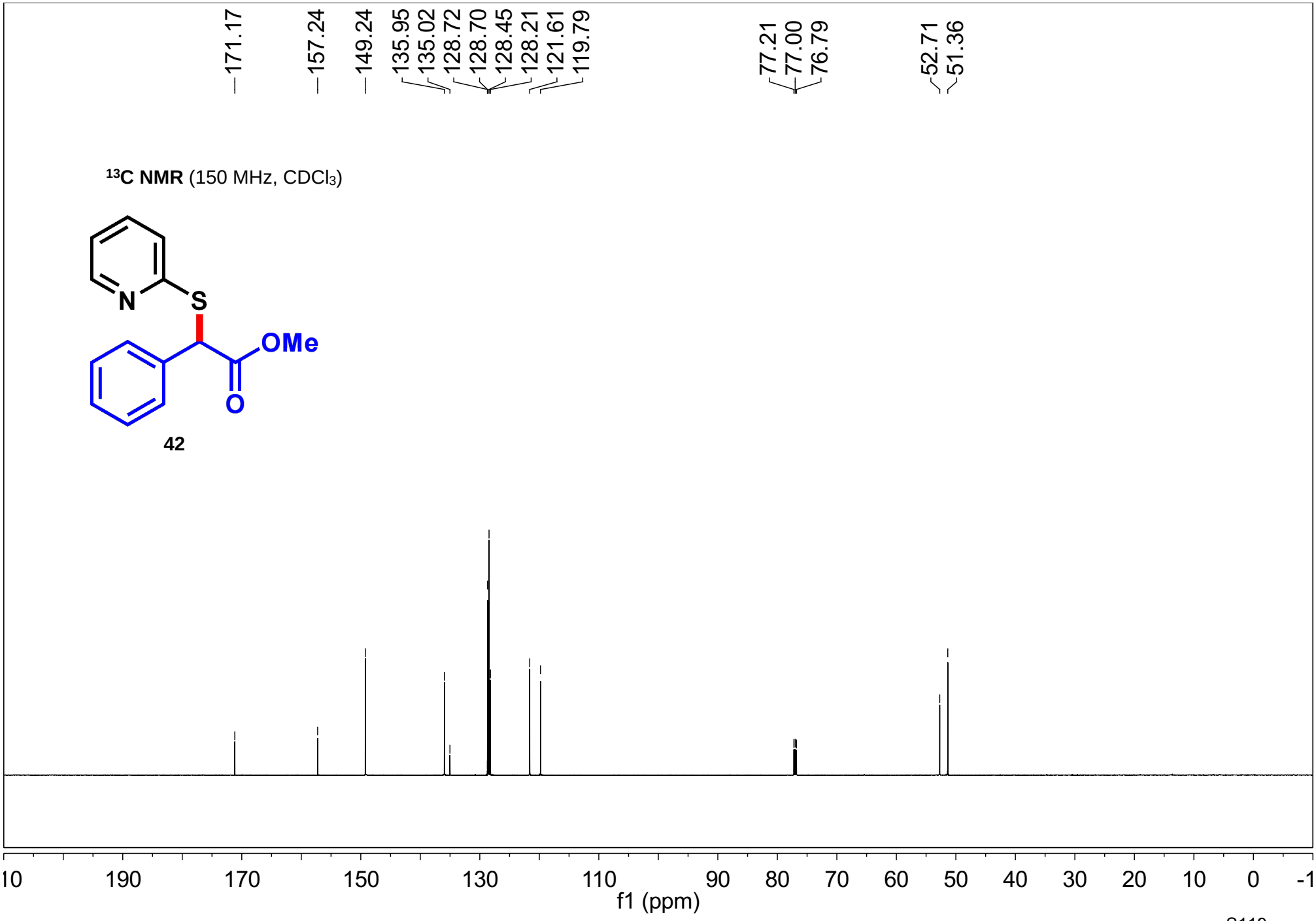

8.059
8.045
7.841
7.827
7.745
7.732
7.696
7.684
7.646
7.644
7.632
7.621
7.619
7.457
7.446
7.433
7.418
7.406
7.394
7.260
7.108
7.093
6.446
3.754
1H NMR (600 MHz, CDCl3)
N
O
OMe
O
40
1.00
1.00
1.00
2.00
1.00
4.00
1.00
0.95
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

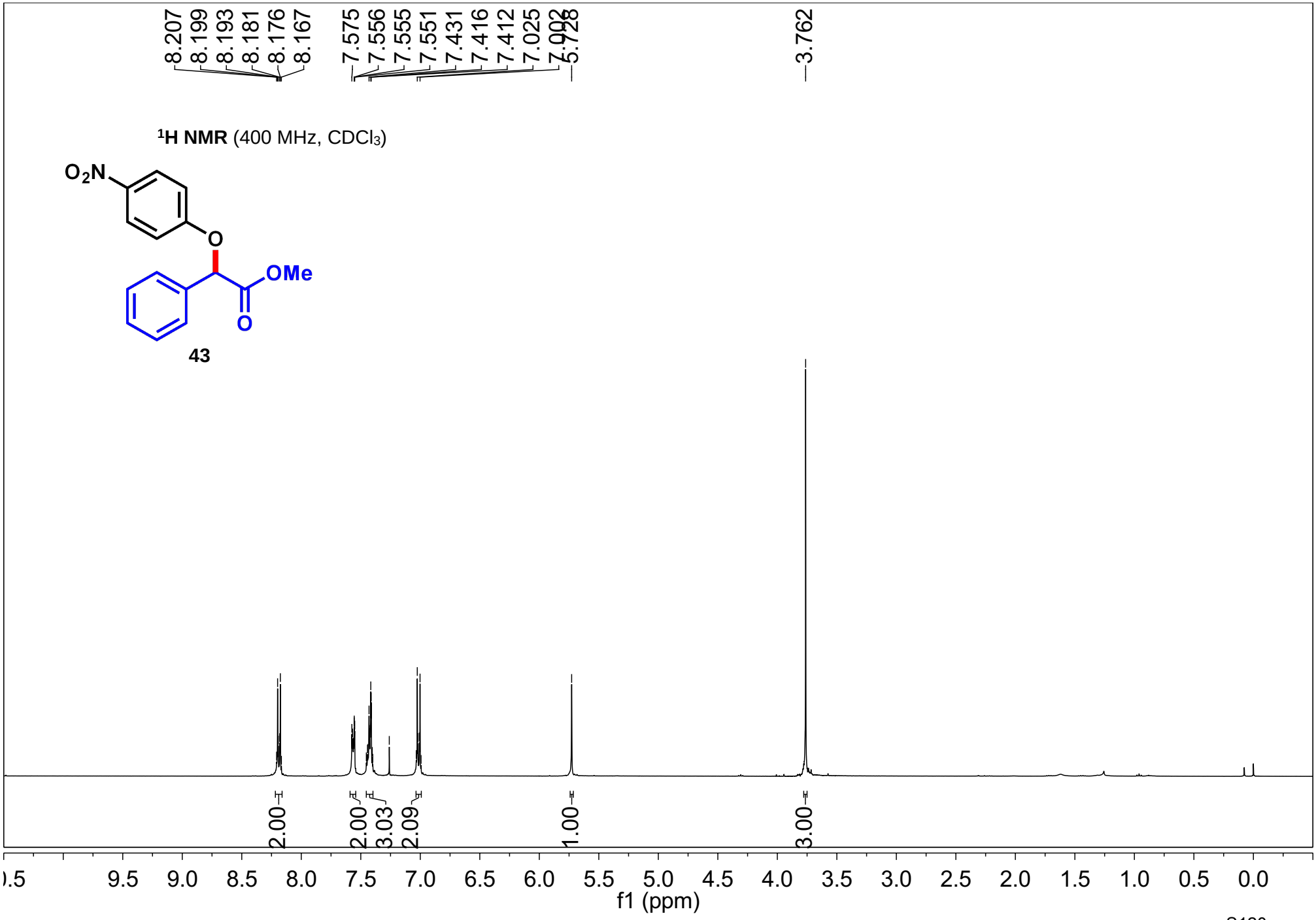

170.76
160.50
145.98
139.22
129.55
128.97
128.71
127.75
127.40
127.37
125.42
124.41
112.70
77.21
77.00
76.79
75.82
52.38
13C NMR (150 MHz, CDCl3)
N
O
OMe
O
40
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

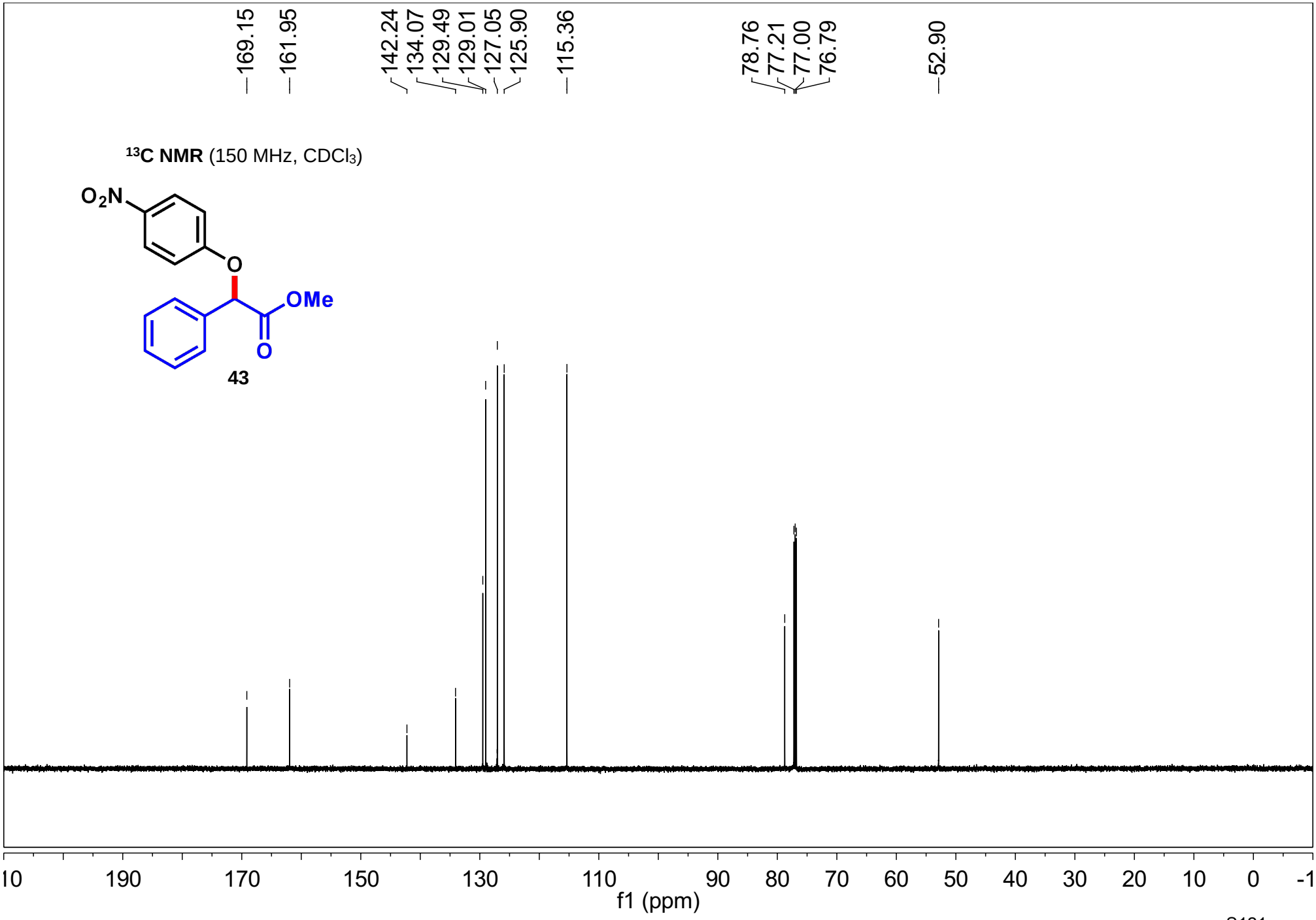

7.700
7.700
7.687
7.664
7.651
7.611
7.607
7.598
7.595
7.447
7.438
7.426
7.418
7.384
7.382
7.370
7.358
7.356
7.260
7.245
7.232
6.436
3.772
1H NMR (600 MHz, CDCl3)
N
S
O
OMe
O
41
2.00
2.00
3.00
1.00
1.00
0.94
3.02
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)

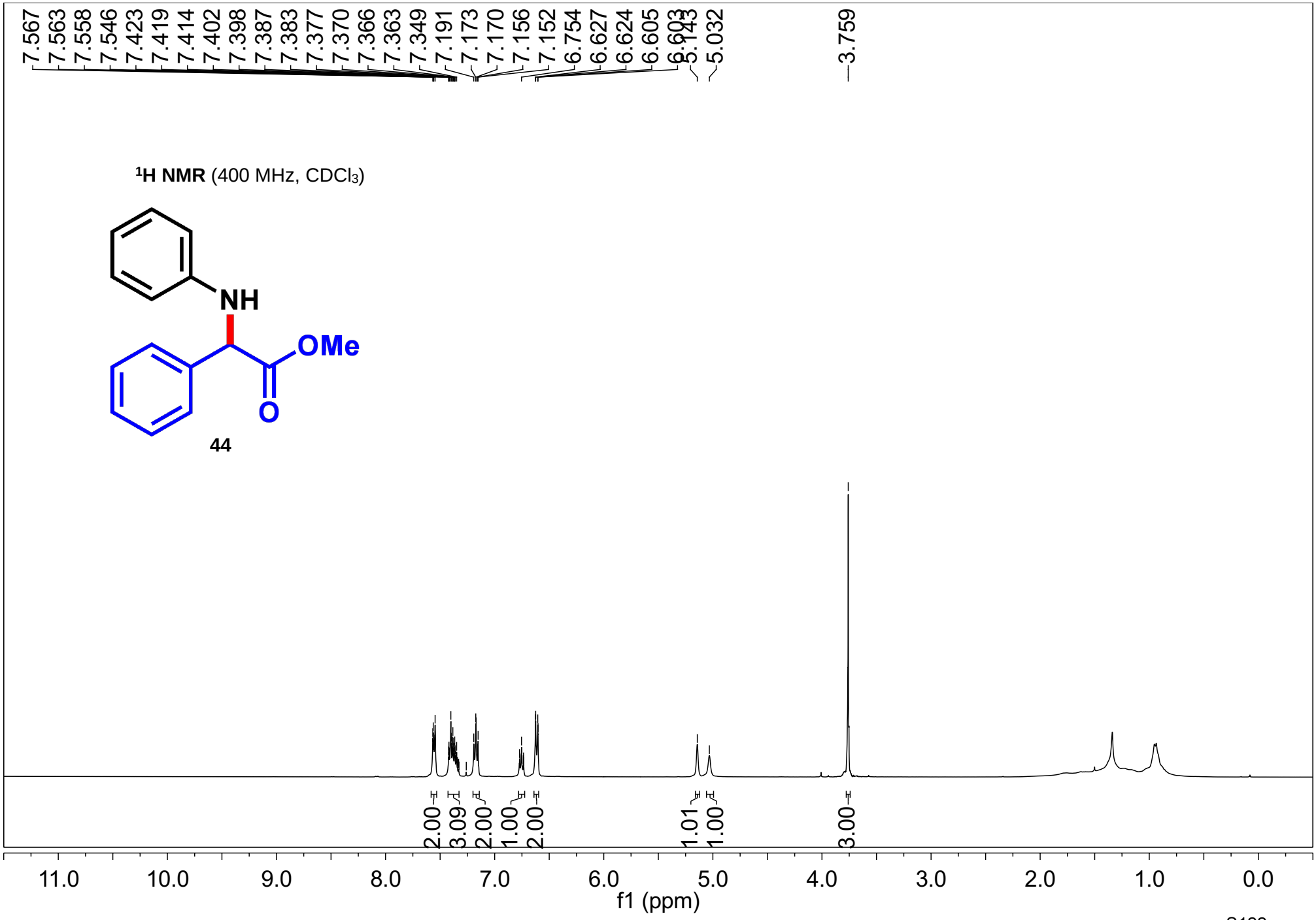

171.41
169.10
148.82
133.66
132.33
129.52
128.85
127.70
125.97
123.79
121.34
121.20
80.11
77.21
77.00
76.78
52.77
13C NMR (150 MHz, CDCl3)
N
S
O
OMe
O
41
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

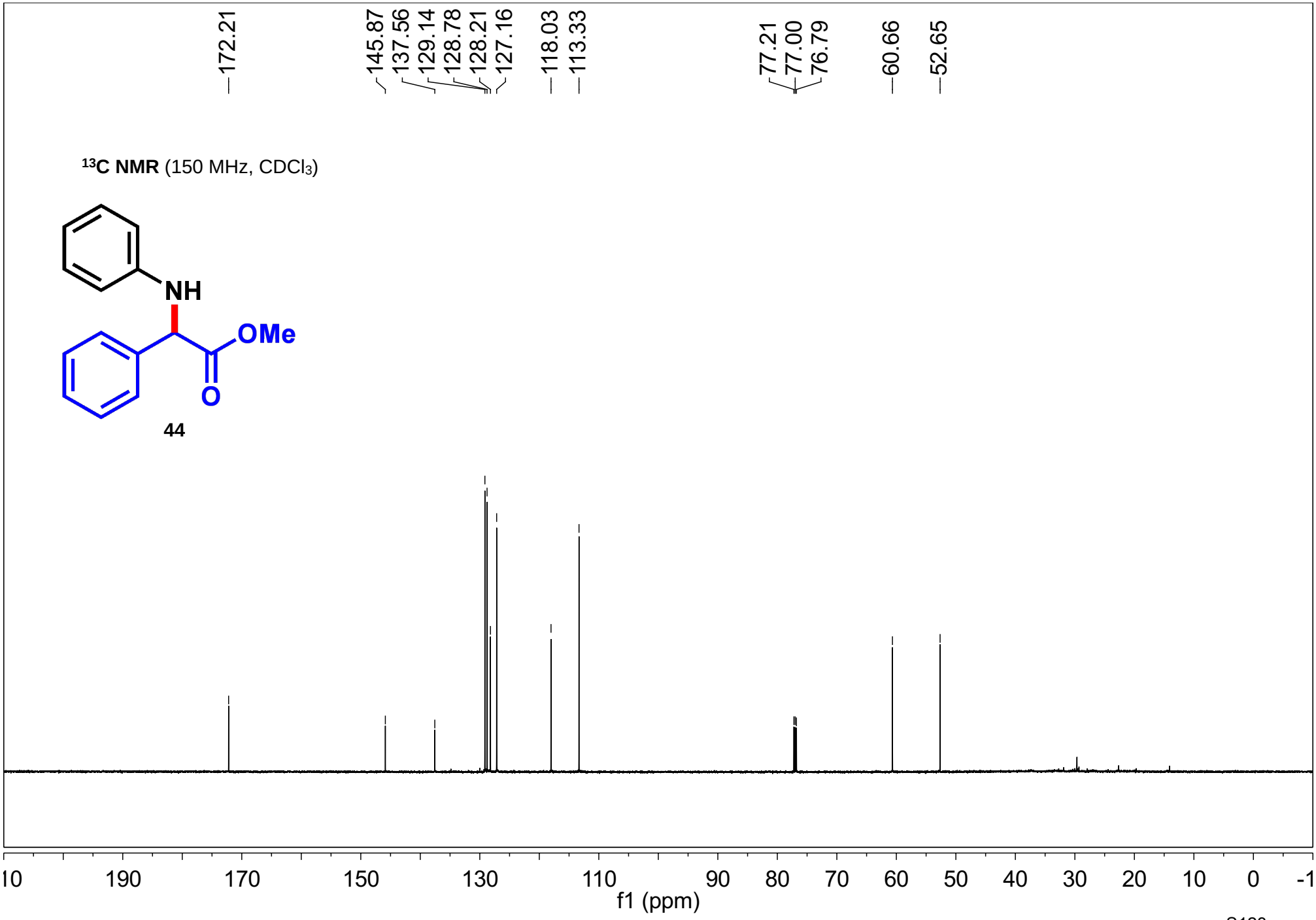

8.414
8.412
8.410
8.407
8.402
8.400
8.397
8.395
7.533
7.529
7.523
7.512
7.509
7.502
7.471
7.466
7.452
7.450
7.447
7.446
7.432
7.427
7.366
7.361
7.356
7.344
7.341
7.330
7.326
7.321
7.317
7.313
7.306
7.300
7.171
7.168
7.166
7.150
7.148
7.146
6.987
6.984
6.974
6.972
6.968
6.966
6.956
6.953
5.736
3.724
1H NMR (400 MHz, CDCl3)
N
S
OMe
O
42
1.00
2.00
1.00
3.00
1.00
1.00
1.00
3.00
9.5
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)

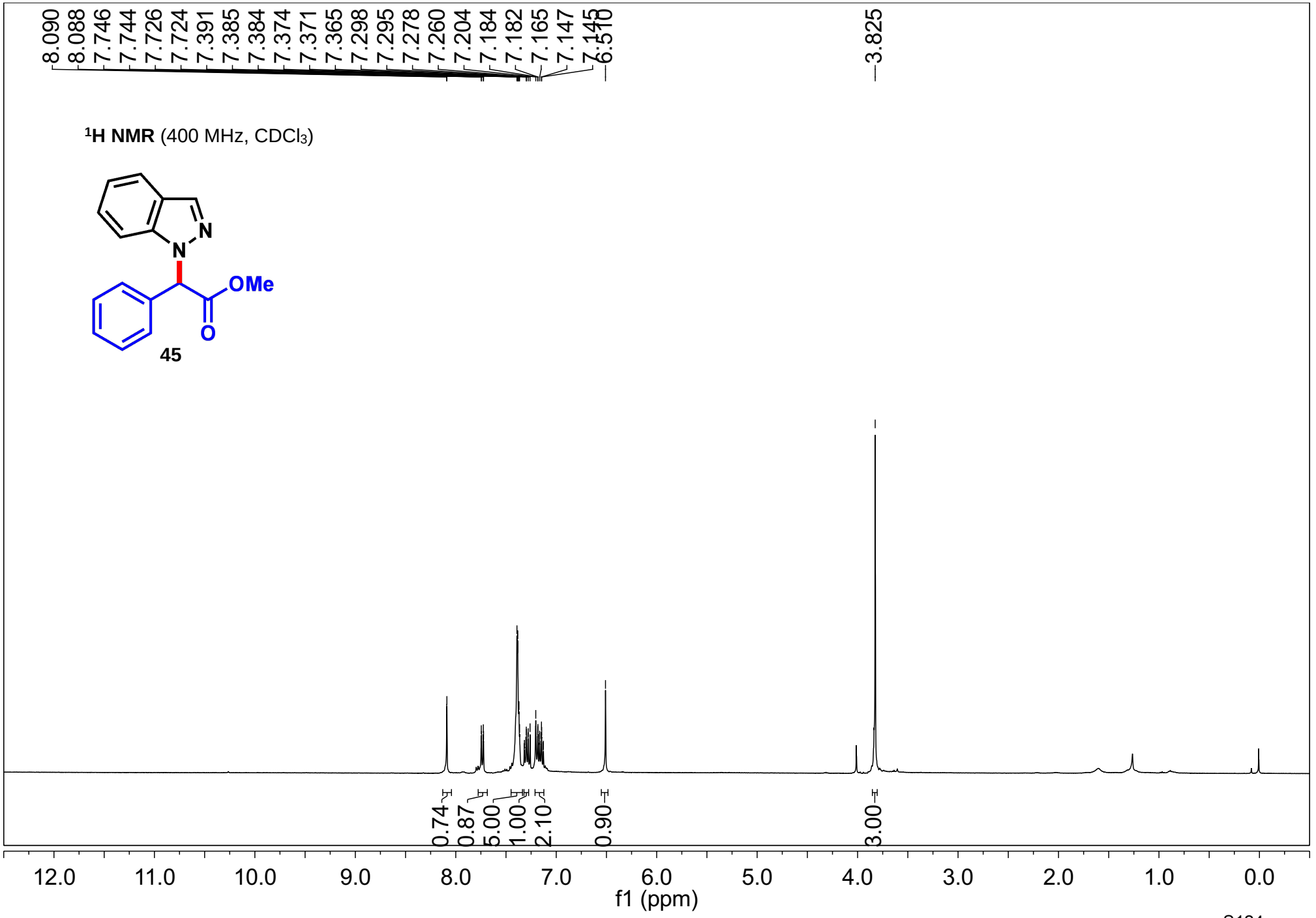

171.17
157.24
149.24
135.95
135.02
128.72
128.70
128.45
128.21
121.61
119.79
77.21
77.00
76.79
52.71
51.36
13C NMR (150 MHz, CDCl3)
N
S
OMe
O
42
f1 (ppm)


8.207
8.199
8.193
8.181
8.176
8.167
7.575
7.556
7.555
7.551
7.431
7.416
7.412
7.025
7.002
5.728
3.762
1H NMR (400 MHz, CDCl3)
O2N
O
OMe
O
43
2.00
2.00
3.03
2.09
1.00
3.00
f1 (ppm)


169.15
161.95
142.24
134.07
129.49
129.01
127.05
125.90
115.36
78.76
77.21
77.00
76.79
52.90
13C NMR (150 MHz, CDCl3)
O2N
O
OMe
O
43
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)

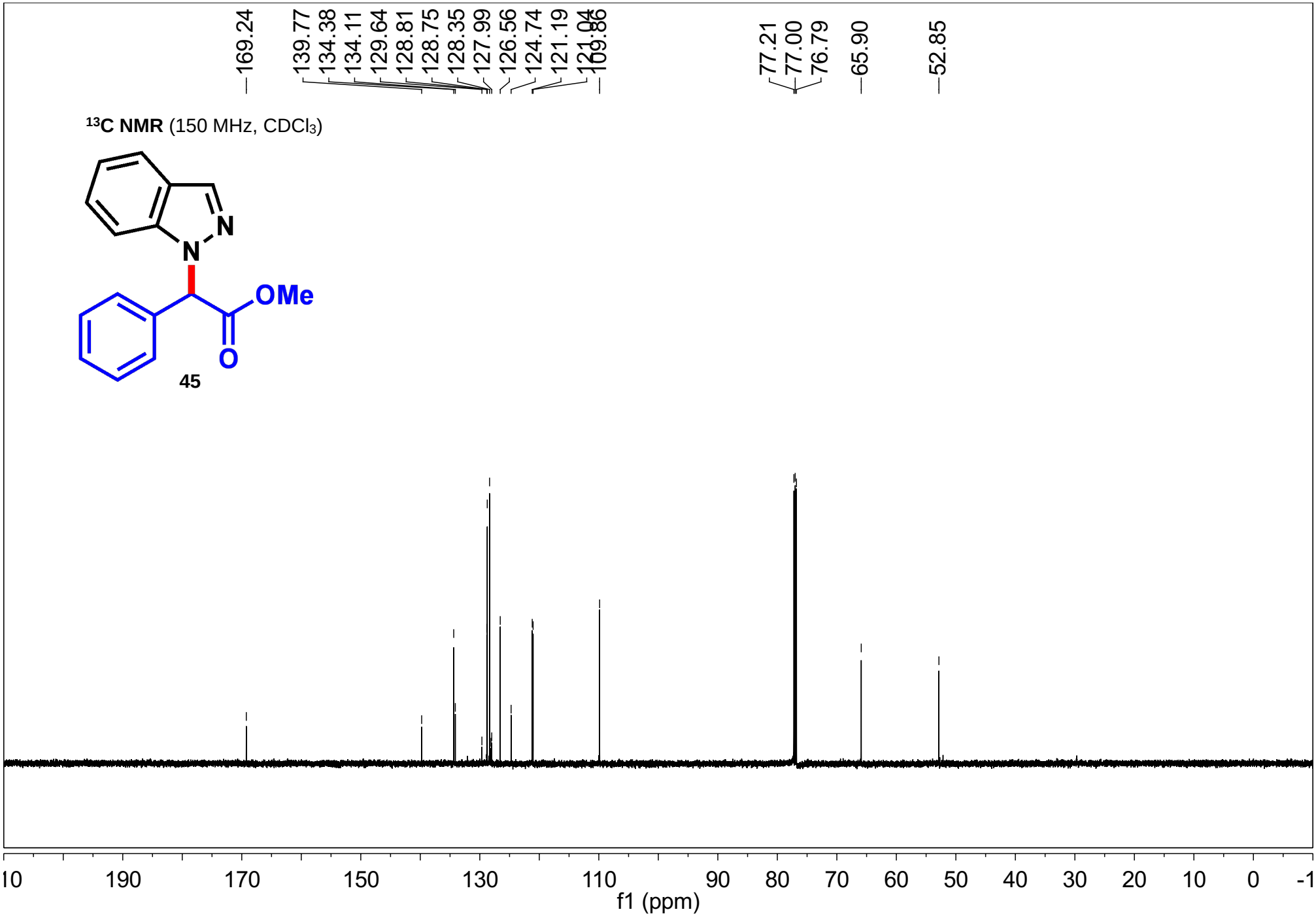

7.567
7.563
7.558
7.546
7.423
7.419
7.414
7.402
7.398
7.387
7.383
7.377
7.370
7.366
7.363
7.349
7.191
7.173
7.170
7.156
7.152
6.754
6.627
6.624
6.605
6.603
5.143
5.032
3.759
1H NMR (400 MHz, CDCl3)
NH
OMe
O
44
2.00
3.09
2.00
1.00
2.00
1.01
1.00
3.00
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
f1 (ppm)

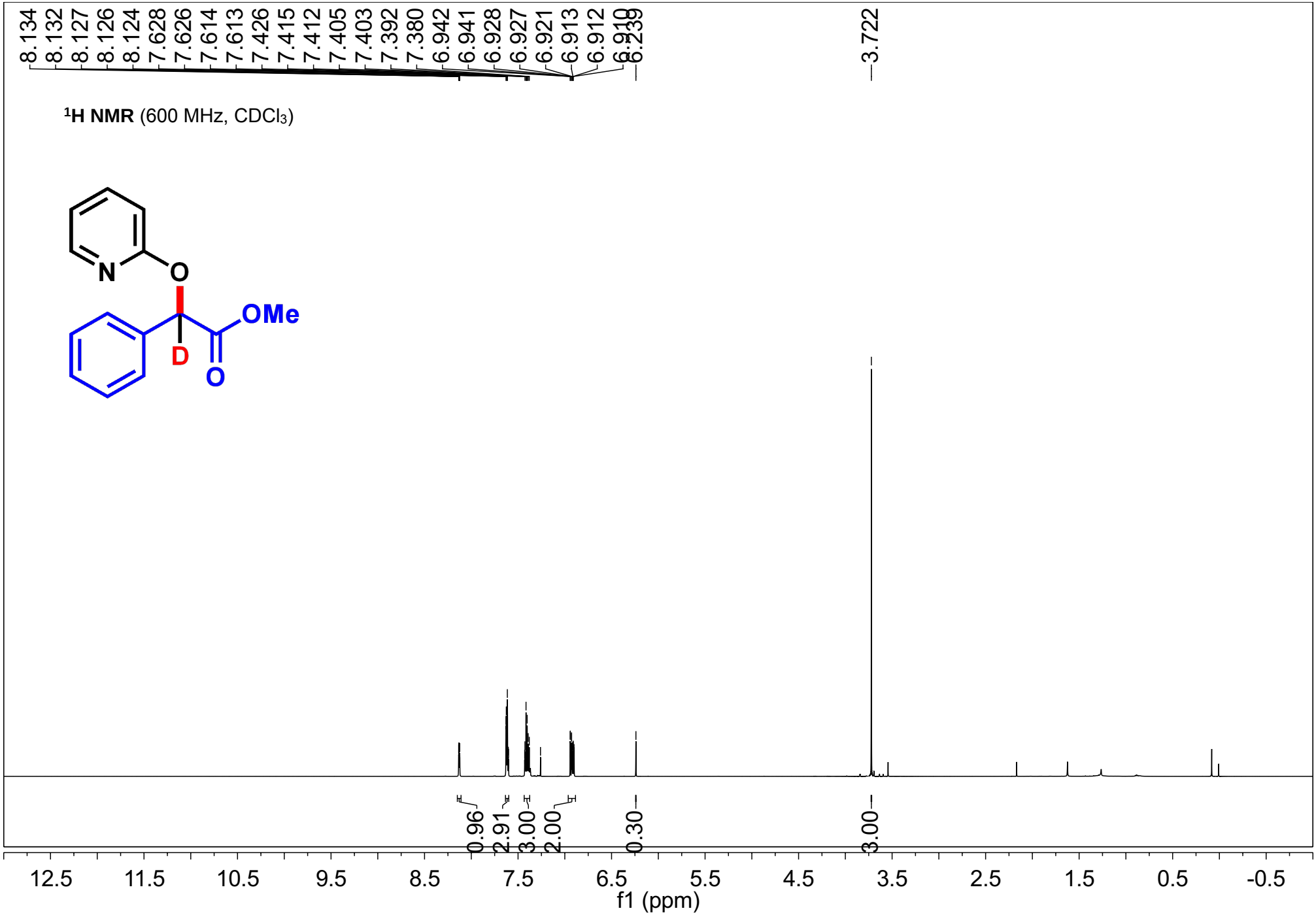

172.21
145.87
137.56
129.14
128.78
128.21
127.16
118.03
113.33
77.21
77.00
76.79
60.66
52.65
13C NMR (150 MHz, CDCl3)
NH
OMe
O
44
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)



^{1}H NMR (400 MHz, $CDCl_3$)

45


169.24
139.77
134.38
134.11
129.64
128.81
128.75
128.35
127.99
126.56
124.74
121.19
121.04
109.86
77.21
77.00
76.79
65.90
52.85
13C NMR (150 MHz, CDCl3)
N
N
OMe
O
45
10
190
170
150
130
110
90
80
70
60
50
40
30
20
10
0
-1
f1 (ppm)


8.134
8.132
8.127
8.126
8.124
7.628
7.626
7.614
7.613
7.426
7.415
7.412
7.405
7.403
7.392
7.380
6.942
6.941
6.928
6.927
6.921
6.913
6.912
6.910
6.239
3.722
¹H NMR (600 MHz, CDCl₃)
N
O
OMe
D
O
0.96
2.91
3.00
2.00
0.30
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
f1 (ppm)