Supporting Information

Rapid assembly of α-ketoamides via metal- and solvent-free decarboxylative strategy

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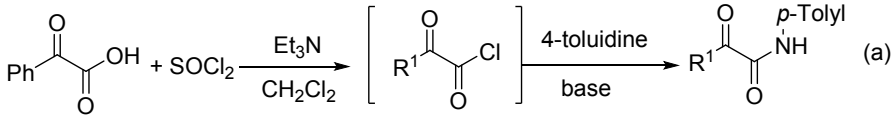
A. General information

Melting points were measured with a melting point instrument and were uncorrected. ^{1}H and ^{13}C NMR spectra were recorded using a 500 MHz NMR spectrometer. The chemical shifts are referenced to signals at 7.26 and 77.0 ppm, respectively, and chloroform is solvent with TMS as the internal standard. GC-MS was obtained using electron ionization. HRMS was obtained with a LCMS-IT-TOF mass spectrometer. TLC was performed by using commercially prepared 300-400 mesh silica gel plates and visualization was effected at 254 nm. High-resolution mass spectra (ESI) were obtained with a LCMS-IT-TOF mass spectrometer. All isocyanates, including alkyl and aryl isocyanates, were purchased from commercial sources.

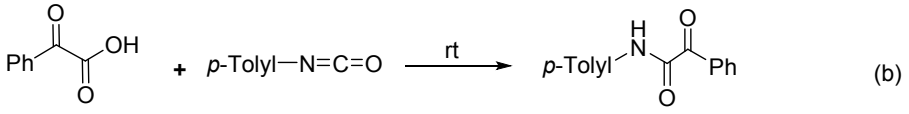
B. Comparison between this method and the classic methods

By consulting the Scifinder database, the amidations of α-oxocarboxylic acids and amines are the most common methods for the the synthesis of α-ketoamides.[1] However, equivalent carboxylic acid activating reagents such as thionyl chloride, oxalyl chloride, 1-(3-dimethylaminopropyl)-3-ethylcarbodiimide hydrochloride (EDA.HCl) or hydroxybenzotriazole (HOBt) are necessary. Among them, the addition of thionyl chloride or oxalyl chloride leads to higher yields, which is used more frequently in two steps preparation. Here we compared our method with the classic methods in terms of cost, atomic utilization, environmental impact, and ease of operation. (100-mmol scale, using 4-toluidine as substrate, the comparative literature is Ref 1d-10.1021/acs.joc.8b00844).

Classic meathods



This meathod



b-1: Cost comparison

The price of related compounds (https://www.energy-chemical.com/front/index.htm)

Phenylglyoxylic acid	**246** CNY/25 g	4-Toluidine	**45** CNY/100 g
p-Tolylisocyanate	**85** CNY/25 g	$NaHCO_3$	**55** CNY/500 g
$SOCl_2$	**20** CNY/25 g	CH_2Cl_2	**20** CNY/500 mL
Distilled water	**3** CNY/500 mL	Triethylamine	**30** CNY/100 g
Na_2SO_4	**55** CNY/500 g		

All raw materials used in the classic method (100-mmol scale): Phenylglyoxylic acid: 15 g; 4-Toluidine: 10.7 g; Triethylamine: 20.2 g; $NaHCO_3$: About 150g; Na_2SO_4: about 250g; Solvent CH_2Cl_2:1000 mL; required CH_2Cl_2 for extraction: (the ref has no specific data); required water for extraction: 6000 mL.

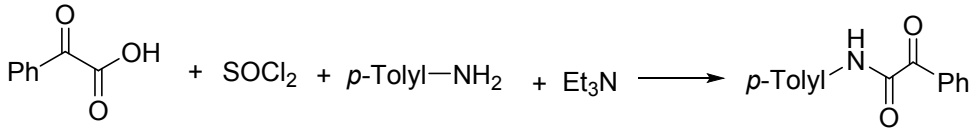
Total cost (CH_2Cl_2 required for extraction is not calculated): (246*15/25)+(45*10.7/100)+(30*20.2/100)+(55*150/500)+(55*250/500)+(20*1000/500)+(3*6000/500) = 278.4 CNY

All raw materials used in our method (100-mmol scale): Phenylglyoxylic acid: 15 g; p-Tolylisocyanate: 14.6 g; CH_2Cl_2:50 mL

Total cost: (246*15/25)+ (85*14.6/25)+ (20*50/500) **=** 197.3 CNY

b-2: Atom economy

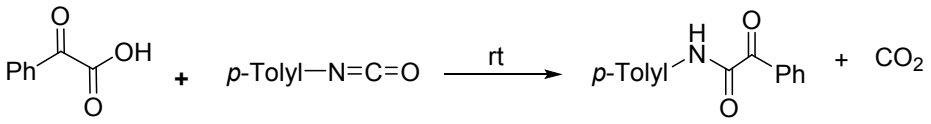
Classic method:



Mr =150 Mr = 117.9 Mr = 107 Mr = 101 Mr = 239

The atomic utilization rate may := 239/(150+117.9*2+107+101*2) = 34.4%

This meathod



Mr =150 Mr = 133 Mr = 239

The atomic utilization rate may : 239/283 = 84.4%

b-3. Impact on people and the environment

Classic method: $SOCl_2$ and its by-products are highly toxic; Excessive use of CH_2Cl_2 harms human health.

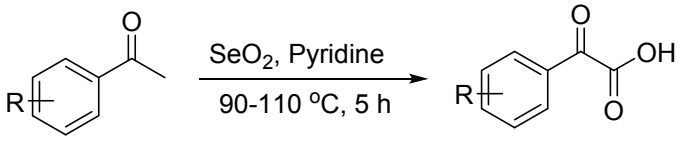
This method: No pollution to the environment.

b-4. Operational factors

Classic method: Two-step operation; Extraction and washing.

This method: No need for extraction and washing.

C. Typical procedure for preparation of α-oxocarboxylic acids [1]



Scheme 1

1a and all alkyl keto acid were purchased from commercial sources. Aryl keto acid were prepared from oxidation of corresponding methyl ketones with SeO_2 (Scheme 1). Methyl ketones (5 mmol), SeO_2 (6 mmol), 20 mL of pyridine were added in a 50 mL round-bottom flask. The reaction mixture stirred at 110 °C for 1 h, then reduce the temperature to 90 °C for 4 h. the desired products **1** were isolated by silica-gel column chromatography.

2-oxo-2-(4-(trifluoromethyl)phenyl)acetic acid, white solid; ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.12 (d, J = 8.2 Hz, 2H), 7.63 (d, J = 8.3 Hz, 1H), 7.27 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 185.7, 164.0, 136.1 (q, J = 7.6 Hz), 134.6, 130.8, 125.8 (q, J = 3.6 Hz) , 123.1 (q, J = 268.4 Hz).

2-(4-Methoxynaphthalen-1-yl)-2-oxoacetic acid, white solid; ^{1}H NMR (500 MHz, DMSO) δ 9.04 (d, J = 8.6 Hz, 1H), 8.09 (dd, J = 8.4, 0.6 Hz, 1H), 7.95 (d, J = 8.3 Hz, 1H), 7.60 (ddd, J = 8.5, 6.9, 1.4 Hz, 1H), 7.45 (ddd, J = 8.2, 6.9, 1.1 Hz, 1H), 6.95 (d, J = 8.4 Hz, 1H), 3.90 (s, 3H); ^{13}C NMR (126 MHz, DMSO) δ 190.5, 167.6, 161.2, 138.5, 132.2, 130.2, 126.9, 125.5, 125.4, 122.8, 119.7, 104.2, 56.8.

D. Typical procedure for preparation of 3, **4a**, **5a**, **6a**, **6b**.

Typical procedure for preparation of 3aa-3ag,3am-3aq, 3am-3aq, 3au-3bd, 3be, 3bf, 3bo-3bv: α-oxocarboxylic acids **1** (0.3 mmol), isocyanates **2** (0.36 mmol) were added to a 10 mL screw-capped tube under air. The reaction mixture was stirred at 25 ^{o}C for 16 h. The crude product was purified by flash column chromatography to afford the α-ketoamides **3**.

Typical procedure for preparation of α-ketoamides 3ah-3al, 3ar-3at, 3bg-3bn, 3bw, 3bx:: When both of α-oxocarboxylic acids and isocyanates are solid or difficult to mix, a small amount of solvent is needed, which can make them better mix. Therefore, the preparation methods of these compounds are: α-oxocarboxylic acids **1** (0.3 mmol), isocyanates **2** (0.36 mmol), CH_2Cl_2 (0.5 mL) were added to a 10 mL screw-capped tube. The reaction mixture was stirred at 25 ^{o}C for 16 h. The crude product was purified by flash column chromatography to afford the α-ketoamides.

Typical procedure for preparation of 3by:

1a (0.3 mmol), **2bu** (0.36 mmol) were added to a 10 mL screw-capped tube under air. The reaction mixture was stirred at room temperature for 16 h. Then Cs_2CO_3 (0.45 mmol), 1-(2-bromoethyl)-4-(trifluoromethyl) benzene (0.45 mmol), toluene (2 mL) were added and the mixture stirred at 100 ^{o}C (oil bath) for 24 h. Then the crude product was cooled to room temperature and the solvent was removed and concentrated under reduced pressure to give crude raffinate. The crude raffinate was purified by column chromatography using silica gel with eluent (petroleum ether: EtOAc = 10 : 1) to afford **3by**.

Typical procedure for preparation of 4a: **1a** (0.3 mmol), **2a** (0.36 mmol) were added to a 10 mL screw-capped tube under air. The reaction mixture was stirred at room temperature for 16 h. Then 1*H*-indole (0.45 mmol), K_3PO_4 (9.6 mg), Bu_4NBr (10 mg), distilled water (1 mL) were added and the mixture stirred at room temperature for 36 h. Upon completion of the reaction as indicated by TLC, the mixture was extracted with EtOAc, dried over $MgSO_4$, filtered, and concentrated under reduced pressure to give crude raffinate. The crude raffinate was purified by column chromatography using silica gel with eluent (petroleum ether: EtOAc = 3 : 1) to afford **4a**.

Typical procedure for preparation of **5a**: **1a** (0.3 mmol), **2a** (0.36 mmol) were added to a 10 mL screw-capped tube under air. The reaction mixture was stirred at room temperature 16 h. Then NaOH (18 mg), H_2O (21.6 mg), DMF (1 mL) were added and the mixture stirred at 100 ^oC for 24 h. Upon completion of the reaction as indicated by TLC, the mixture was extracted with EtOAc, dried over $MgSO_4$, filtered, and concentrated under reduced pressure to give crude raffinate. The crude raffinate was purified by column chromatography using silica gel with eluent (petroleum ether: EtOAc = 3 : 1) to afford **5a**.

Typical procedure for preparation of **6a and 6b**: **1a** (0.3 mmol), **2a** (0.36 mmol) were added to a 10 mL screw-capped tube under air. The reaction mixture was stirred at room temperature for 16 h. Then cyclic secondary amines (0.45 mmol), benzoic acid (7.5 mg), toluene (3 mL) were added and the mixture stirred at 120 ^oC for 24 h. Upon completion of the reaction as indicated by TLC, the mixture was extracted with EtOAc, dried over MgSO4, filtered, and concentrated under reduced pressure to give crude raffinate. The crude raffinate was purified by column chromatography using silica gel with eluent (petroleum ether: EtOAc = 5 : 1) to afford **6a** and **6b**.

E: Spectroscopic data for 3, 4a, 5a, 6a, 6b.

2-Oxo-*N*,2-diphenylacetamide (3aa): yellow solid (61.5 mg, 91% yield); mp 61.0-62.0 ^{o}C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.97 (s, 1H), 8.42 (d, *J* = 7.6 Hz, 2H), 7.73 – 7.64 (m, 3H), 7.52 (t, *J* = 7.7 Hz, 2H), 7.41 (t, *J* = 7.9 Hz, 2H), 7.21 (t, *J* = 7.4 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.5, 158.9, 136.6, 134.7, 133.1, 131.5, 129.3, 128.6, 125.4, 119.9; HRMS (ESI) m/z: calcd for $C_{14}H_{12}NO_2$ $[M+H]^+$ 226.0863; found 226.0856.

2-Oxo-2-phenyl-*N*-(*p*-tolyl)acetamide (3ab): yellow solid (64.5 mg, 90% yield); mp 104.2-105.1 ^{o}C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.04 (s, 1H), 8.39 (dd, *J* = 8.2, 1.0 Hz, 2H), 7.62 (dd, *J* = 15.8, 8.0 Hz, 3H), 7.48 (t, *J* = 7.8 Hz, 2H), 7.18 (d, *J* = 8.3 Hz, 2H), 2.34 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.7, 159.1, 135.0, 134.6, 134.2, 133.2, 131.5, 129.7, 128.6, 120.0, 21.0, 20.8; HRMS (ESI) m/z: calcd for $C_{15}H_{13}NNaO_2$ $[M+Na]^+$ 262.0838; found 262.0837.

***N*-(4-Ethylphenyl)-2-oxo-2-phenylacetamide (3ac):** yellow solid (68.5 mg, 90% yield); mp 96.2-98.1 ^{o}C; R_f = 0.5 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.04 (s, 1H), 8.45 – 8.34 (m, 2H), 7.68 – 7.59 (m, 3H), 7.48 (t, *J* = 7.8 Hz, 2H), 7.21 (d, *J* = 8.4 Hz, 2H), 2.65 (q, *J* = 7.6 Hz, 2H), 1.25 (t, *J* = 7.6 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.7, 159.0, 141.5, 134.6, 134.4, 133.2, 131.5, 128.6, 120.1, 28.4, 15.7; HRMS (ESI) m/z: calcd for $C_{16}H_{16}NO_2$ $[M+H]^+$ 254.1176; found 254.1174.

***N*-(4-Butylphenyl)-2-oxo-2-phenylacetamide (3ad)** yellow solid (73.2 mg, 87% yield); mp 112.0-113.5 ^{o}C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.93 (s, 1H), 8.41 (d, *J* = 7.5 Hz, 2H), 7.65 (dd, *J* = 16.5, 8.1 Hz, 3H), 7.51 (t, *J* = 7.8 Hz, 2H), 7.42 (d, *J* = 8.6 Hz, 2H), 1.33 (s, 9H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.6, 158.8, 148.4, 134.6, 134.0, 133.2, 131.5, 128.6, 126.1, 119.7, 34.5, 31.4; HRMS (ESI) m/z: calcd for $C_{18}H_{20}NO_2$ $[M+H]^+$ 282.1489; found 282.1494.

***N*-(4-Methoxyphenyl)-2-oxo-2-phenylacetamide (3ae):** yellow solid (65.1 mg, 85% yield); mp 102.0-103.5 ^{o}C; R_f = 0.40 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR

(500 MHz, $CDCl_3$) δ 8.93 (s, 1H), 8.40 (dt, J = 8.5, 1.4 Hz, 2H), 7.67 – 7.58 (m, 3H), 7.53 – 7.45 (m, 2H), 6.95 – 6.87 (m, 2H), 3.80 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.7, 158.8, 157.1, 134.6, 133.2, 131.5, 129.9, 128.6, 121.6, 114.4, 55.5; HRMS (ESI) m/z: calcd for $C_{15}H_{14}NO_3$ $[M+H]^+$ 256.0968; found 256.0965.

***N*-(4-Fluorophenyl)-2-oxo-2-phenylacetamide (3af):** yellow solid (64.0 mg, 88% yield); mp 112.0-113.5 °C; R_f = 0.5 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.96 (s, 1H), 8.55 – 8.34 (m, 2H), 7.67 (dt, J = 14.6, 6.1 Hz, 3H), 7.52 (t, J = 7.7 Hz, 2H), 7.09 (t, J = 8.6 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.3, 159.9 (d, J = 243.9 Hz), 158.8, 134.8, 133.0, 132.7, 131.5, 128.6, 121.7(d, J = 8.1 Hz) , 116.0 (d, J = 22.4 Hz) ; HRMS (ESI) m/z: calcd for $C_{14}H_{10}FNNaO_2$ $[M+Na]^+$ 266.0588; found 266.0585.

***N*-(4-Chlorophenyl)-2-oxo-2-phenylacetamide (3ag):** yellow solid (66.8 mg, 86% yield); mp 128.5-129.5 °C; R_f = 0.5 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.00 (s, 1H), 8.40 (dd, J = 8.3, 1.1 Hz, 2H), 7.70 – 7.63 (m, 3H), 7.51 (dd, J = 10.9, 4.8 Hz, 2H), 7.40 – 7.33 (m, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.1, 158.8, 135.2, 134.8, 132.9, 131.5, 130.4, 129.3, 128.7, 121.1; HRMS (ESI) m/z: calcd for $C_{14}H_{10}ClNNaO_2$ $[M+Na]^+$ 282.0292; found 282.0291.

***N*-(4-Bromophenyl)-2-oxo-2-phenylacetamide (3ah)**: yellow solid (74.4 mg, 82% yield); mp 121.5-122.5 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.00 (s, 1H), 8.40 (d, J = 7.7 Hz, 2H), 7.66 (t, J = 7.4 Hz, 1H), 7.61 (d, J = 8.7 Hz, 2H), 7.51 (t, J = 7.8 Hz, 4H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.1, 158.8, 135.7, 134.8, 132.9, 132.3, 131.5, 128.7, 121.5, 118.1; HRMS (ESI) m/z: calcd for $C_{14}H_{10}BrNNaO_2$ $[M+Na]^+$ 325.9787; found 325.9783.

***N*-(4-Iodophenyl)-2-oxo-2-phenylacetamide (3ai):** yellow solid (84.2 mg, 80% yield); mp 130.4-131.1 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.99 (s, 1H), 8.39 (dt, J = 8.5, 1.4 Hz, 2H), 7.72 – 7.63 (m, 3H), 7.49 (ddt, J = 9.7, 4.8, 2.2 Hz, 4H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.0, 158.9, 138.2, 136.4, 134.8,

132.9, 131.5, 128.6, 121.7, 88.9; HRMS (ESI) m/z: calcd for $C_{14}H_{10}INNaO_2$ $[M+Na]^+$ 373.9648; found 373.9642.

N-(4-Acetylphenyl)-2-oxo-2-phenylacetamide (3aj): yellow solid (68.0 mg, 85% yield); mp 120.0-122.0 °C; R_f = 0.4 (petroleum ether: ethyl acetate = 5: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.30 (s, 1H), 8.35 (dd, *J* = 8.3, 1.2 Hz, 2H), 7.96 (d, *J* = 8.7 Hz, 2H), 7.80 (d, *J* = 8.7 Hz, 2H), 7.66 – 7.59 (m, 1H), 7.48 (t, *J* = 7.8 Hz, 2H), 2.57 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 197.0, 186.9, 159.3, 141.0, 134.9, 133.7, 132.8, 131.4, 129.8, 128.7, 119.4, 26.5; HRMS (ESI) m/z: calcd for $C_{16}H_{14}NO_2$ $[M+H]^+$ 268.0968; found 268.0968.

N-(4-Cyanophenyl)-2-oxo-2-phenylacetamide (3ak): yellow solid (59.6 mg, 82% yield); mp 110.4-111.5 °C; R_f = 0.4 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.23 (s, 1H), 8.39 (d, *J* = 7.9 Hz, 2H), 7.85 (d, *J* = 8.6 Hz, 2H), 7.68 (dd, *J* = 7.5, 4.0 Hz, 3H), 7.53 (t, *J* = 7.8 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.5, 159.0, 140.6, 135.1, 133.5, 132.6, 131.5, 128.8, 120.0, 118.6, 108.4; HRMS (ESI) m/z: calcd for $C_{15}H_{11}N_2O_2$ $[M+H]^+$ 251.0815; found 251.0807.

2-Oxo-2-phenyl-*N*-(4-(trifluoromethyl)phenyl)acetamide (3al): light yellow solid (73.2 mg, 83% yield); mp 128.5-132.2 °C; R_f = 0.50; ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.17 (s, 1H), 8.40 (d, *J* = 7.4 Hz, 2H), 7.84 (d, *J* = 7.2 Hz, 2H), 7.66 (dd, *J* = 14.8, 7.3 Hz, 3H), 7.52 (t, *J* = 6.7 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.8, 159.0, 139.7, 134.9, 132.8, 131.5, 128.7, 127.1 (q, *J* = 32.5), 126.5 (q, *J* = 4.5), 124.0 (q, *J* = 270.0), 119.72; HRMS (ESI) m/z: calcd for $C_{15}H_{11}F_3NO_2$ $[M+H]^+$ 294.0736; found 294.0735.

***N*-(2-Chlorophenyl)-2-oxo-2-phenylacetamide (3am)**: light yellow solid (47.2 mg, 61% yield); mp 67.5-69.2 °C; R_f = 0.55; ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.58 (s, 1H), 8.52 (dd, *J* = 8.3, 1.4 Hz, 1H), 8.42 (dd, *J* = 8.3, 1.2 Hz, 2H), 7.66 (dd, *J* = 10.6, 4.2 Hz, 1H), 7.52 (dd, *J* = 10.9, 4.7 Hz, 2H), 7.44 (dd, *J* = 8.0, 1.4 Hz, 1H), 7.38 – 7.30 (m, 1H), 7.13 (td, *J* = 7.8, 1.5 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.7, 158.8, 134.8, 133.6, 132.9,

131.5, 129.4, 128.7, 127.8, 125.7, 123.9, 121.2; HRMS (ESI) m/z: calcd for $C_{14}H_{10}ClNO_2$ $[M+H]^+$ 260.0473; found 260.0471.

2-Oxo-2-phenyl-*N*-(*m*-tolyl)acetamide (3an): yellow solid (59.5 mg, 83% yield); mp 89.5-92.2 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.02 (s, 1H), 8.37 (d, *J* = 7.9 Hz, 2H), 7.60 (t, *J* = 7.4 Hz, 1H), 7.54 (s, 1H), 7.46 (dd, *J* = 16.7, 8.5 Hz, 3H), 7.24 (t, *J* = 7.8 Hz, 1H), 6.98 (d, *J* = 7.5 Hz, 1H), 2.34 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.6, 159.1, 139.2, 136.7, 134.6, 133.1, 131.5, 129.1, 128.6, 126.1, 120.6, 117.2, 21.6; HRMS (ESI) m/z: calcd for $C_{15}H_{13}NNaO_2$ $[M+Na]^+$ 262.0838; found 262.0836.

***N*-(3-Fluorophenyl)-2-oxo-2-phenylacetamide (3ao):** yellow solid (60.5 mg, 82% yield); mp 101.5-102.2 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.09 (s, 1H), 8.39 (dd, *J* = 8.2, 0.9 Hz, 2H), 7.71 – 7.60 (m, 2H), 7.49 (t, *J* = 7.8 Hz, 2H), 7.37 – 7.28 (m, 2H), 6.93 – 6.85 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.1, 163.0 (d, *J* = 245.0 Hz), 159.0, 138.2 (d, *J* = 10.0 Hz), 134.8, 132.9, 131.5, 130.3 (d, *J* = 8.7 Hz), 128.6, 115.4 (d, *J* = 2.5 Hz), 112.1 (d, *J* = 21.3 Hz), 107.5 (d, *J* = 26.3 Hz); HRMS (ESI) m/z: calcd for $C_{14}H_{10}FNNaO_2$ $[M+Na]^+$ 266.0588; found 266.0586.

***N*-(3-Chlorophenyl)-2-oxo-2-phenylacetamide (3ap):** yellow solid (62.2 mg, 80% yield); mp 114.1-114.8 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.02 (s, 1H), 8.40 (d, *J* = 7.7 Hz, 2H), 7.85 (s, 1H), 7.66 (t, *J* = 7.3 Hz, 1H), 7.51 (dd, *J* = 13.2, 5.8 Hz, 3H), 7.36 – 7.28 (m, 1H), 7.17 (d, *J* = 7.9 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.0, 158.9, 137.8, 135.0, 134.8, 132.9, 131.5, 130.2, 128.6, 125.4, 120.1, 118.0; HRMS (ESI) m/z: calcd for $C_{14}H_{10}ClNNaO_2$ $[M+Na]^+$ 282.0292; found 282.0291.

***N*-(3,4-Dimethylphenyl)-2-oxo-2-phenylacetamide (3aq)**: white solid (65.2 mg, 86% yield); mp 98.5-100.0 °C; R_f = 0.55; ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.91 (s, 1H), 8.41 (dd, *J* = 7.7, 0.5 Hz, 2H), 7.65 (t, *J* = 7.4 Hz, 1H), 7.50 (t, *J* = 7.7 Hz, 3H), 7.43 (dd, *J* = 8.1, 2.1

Hz, 1H), 7.14 (d, *J* = 8.1 Hz, 1H), 2.28 (s, 3H), 2.25 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.6, 158.8, 137.6, 134.6, 134.4, 133.8, 133.2, 131.5, 130.2, 128.6, 121.2, 117.4, 20.0, 19.4; HRMS (ESI) m/z: calcd for $C_{16}H_{16}NO_2$ $[M+H]^+$ 254.1176; found 254.1173.

***N*-(3,5-Dimethylphenyl)-2-oxo-2-phenylacetamide (3ar):** yellow solid (64.0 mg, 84% yield); mp 110.5-112.1 °C; R_f = 0.60 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 8.88 (s, 1H), 8.43 – 8.39 (m, 2H), 7.68 – 7.62 (m, 1H), 7.52 – 7.47 (m, 2H), 7.34 (s, 2H), 6.84 (s, 1H), 2.34 (s, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 187.5, 158.9, 139.0, 136.5, 134.6, 133.2, 131.5, 128.6, 127.1, 117.7, 21.4; HRMS (ESI) m/z: calcd for $C_{16}H_{15}NNaO_2$ $[M+Na]^+$ 276.0994; found 276.0992.

***N*-(3,5-Dimethoxyphenyl)-2-oxo-2-phenylacetamide (3as):** light yellow solid (58.0 mg, 68% yield); mp 123.5-124.5 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 8.92 (s, 1H), 8.40 (d, *J* = 7.7 Hz, 2H), 7.66 (t, *J* = 7.4 Hz, 1H), 7.52 (t, *J* = 7.7 Hz, 2H), 6.94 (d, *J* = 2.0 Hz, 2H), 6.32 (t, *J* = 2.0 Hz, 1H), 3.82 (s, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 187.3, 161.2, 158.8, 138.3, 134.7, 133.0, 131.5, 128.6, 98.1, 97.8, 55.5; HRMS (ESI) m/z: calcd for $C_{16}H_{15}NNaO_4$ $[M+Na]^+$ 308.0893; found 308.0890.

***N*-(Naphthalen-2-yl)-2-oxo-2-phenylacetamide (3at)**: light yellow solid (67.5 mg, 82% yield); mp 141.3-142.5 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 9.19 (s, 1H), 8.53 – 8.37 (m, 3H), 7.83 (dd, *J* = 15.6, 8.3 Hz, 3H), 7.66 (t, *J* = 7.4 Hz, 1H), 7.60 (dd, *J* = 8.8, 1.9 Hz, 1H), 7.51 (dd, *J* = 15.4, 7.7 Hz, 3H), 7.45 (t, *J* = 7.4 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 187.4, 159.1, 134.7, 134.1, 133.7, 133.1, 131.6, 131.1, 129.1, 128.6, 127.9, 127.7, 126.8, 125.6, 119.6, 117.2; HRMS (ESI) m/z: calcd for $C_{18}H_{13}NNaO_2$ $[M+Na]^+$ 298.0838; found 298.0833.

***N*-Ethyl-2-oxo-2-phenylacetamide (3au)**: light yellow oil (41.2 mg, 78% yield); R_f = 0.4 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 8.29 (dd, *J* = 8.3, 1.2 Hz, 2H), 7.58 (dd, *J* = 10.6, 4.3 Hz, 1H), 7.44 (dd, *J* = 11.0, 4.7 Hz, 2H), 7.23 – 7.04 (m, 1H), 3.45 – 3.33 (m, 2H), 1.22 (t, *J* = 7.3 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ*

173.2, 160.3, 134.2, 133.3, 131.0, 128.4, 34.3, 14.4; HRMS (ESI) m/z: calcd for $C_{10}H_{12}NO_2$ $[M+H]^+$ 178.0863; found 178.0856.

2-Oxo-2-phenyl-*N*-propylacetamide (3av): light yellow oil (47.6 mg, 83% yield); R_f = 0.4 (petroleum ether: ethyl acetate = 10: 1); ^1H NMR (500 MHz, $CDCl_3$) δ 8.36 – 8.23 (m, 2H), 7.61-7.57 (m, 1H), 7.50 – 7.39 (m, 2H), 7.18 (s, 1H), 3.40 – 3.27 (m, 2H), 1.61 (ddd, *J* = 14.5, 7.3, 3.7 Hz, 2H), 0.96 (td, *J* = 7.4, 3.8 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 188.0, 161.9, 134.3, 133.4, 131.2, 128.5, 41.1, 22.6, 11.4; HRMS (ESI) m/z: calcd for $C_{11}H_{14}NO_2$ $[M+H]^+$ 192.1019; found 192.1010.

***N*-Isopropyl-2-oxo-2-phenylacetamide (3aw)**: light yellow solid (44.5 mg, 78% yield); mp 75.3-78.1 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^1H NMR (500 MHz, $CDCl_3$) δ 8.34 (dd, *J* = 8.2, 1.0 Hz, 2H), 7.62 (s, 1H), 7.48 (t, *J* = 7.8 Hz, 2H), 6.91 (s, 1H), 4.17 (qt, *J* = 13.2, 6.6 Hz, 1H), 1.27 (d, *J* = 6.6 Hz, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 188.0, 160.9, 134.3, 133.4, 131.2, 128.4, 41.7, 22.4; HRMS (ESI) m/z: calcd for $C_{11}H_{14}NO_2$ $[M+H]^+$ 192.1019; found 192.1015.

***N*-Butyl-2-oxo-2-phenylacetamide (3ax)**: light yellow oil (49.4 mg, 80% yield); R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^1H NMR (500 MHz, $CDCl_3$) δ 8.30 – 8.25 (m, 2H), 7.56 (td, *J* = 7.4, 1.3 Hz, 1H), 7.46 – 7.38 (m, 2H), 7.23 (s, 1H), 3.34 (td, *J* = 7.1, 1.0 Hz, 2H), 1.59 – 1.48 (m, 2H), 1.35 (dd, *J* = 14.9, 7.6 Hz, 2H), 0.90 (td, *J* = 7.3, 1.1 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.9, 161.8, 134.1, 133.2, 131.0, 128.3, 39.0, 31.1, 19.9, 13.5; HRMS (ESI) m/z: calcd for $C_{12}H_{16}NO_2$ $[M+H]^+$ 206.1176; found 206.1167.

***N*-(*tert*-Butyl)-2-oxo-2-phenylacetamide (3ay)**: light yellow oil (43.5 mg, 70% yield); R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^1H NMR (500 MHz, $CDCl_3$) δ 8.34 – 8.26 (m, 2H), 7.60 (d, *J* = 7.4 Hz, 1H), 7.47 (t, *J* = 7.8 Hz, 2H), 6.93 (s, 1H), 1.46 (s, 9H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 188.6, 161.1, 134.2, 133.4, 131.2, 128.4, 51.7, 28.4; HRMS (ESI) m/z: calcd for $C_{12}H_{16}NO_2$ $[M+H]^+$ 206.1176; found 206.1171.

***N*-Cyclohexyl-2-oxo-2-phenylacetamide (3az)**: light yellow solid (54.4 mg, 78% yield); mp 117.5-119.2 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^1H NMR (500

MHz, $CDCl_3$) δ 8.29 (d, *J* = 7.7 Hz, 2H), 7.57 (t, *J* = 7.3 Hz, 1H), 7.43 (t, *J* = 7.6 Hz, 2H), 7.04 (s, 1H), 3.99 – 3.71 (m, 1H), 1.95 (d, *J* = 10.1 Hz, 2H), 1.79 – 1.68 (m, 2H), 1.61 (d, *J* = 12.9 Hz, 1H), 1.38 (dd, *J* = 24.7, 12.3 Hz, 2H), 1.29 – 1.15 (m, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 188.2, 161.0, 134.3, 133.5, 131.2, 128.4, 48.5, 32.7, 25.4, 24.8; HRMS (ESI) m/z: calcd for $C_{14}H_{18}NO_2$ $[M+H]^+$ 232.1332; found 232.1323.

***N*-Benzyl-2-oxo-2-phenylacetamide (3ba)**: light yellow oil (59.4 mg, 83% yield); R_f = 0.5 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.41 – 8.31 (m, 2H), 7.62 (t, *J* = 7.4 Hz, 1H), 7.54 (s, 1H), 7.46 (d, *J* = 7.9 Hz, 2H), 7.33 (dt, *J* = 10.4, 7.8 Hz, 4H), 4.56 (d, *J* = 6.1 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.7, 161.7, 137.2, 134.49, 133.4, 131.3, 128.9, 128.6, 127.9, 127.8, 43.5; HRMS (ESI) m/z: calcd for $C_{15}H_{14}NO_2$ $[M+H]^+$ 240.1019; found 240.1010.

2-Oxo-*N*-phenethyl-2-phenylacetamide (3bb): light yellow solid (61.5 mg, 81% yield); mp 97.3-99.0 ^{o}C; R_f = 0.5 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.29 (dd, *J* = 8.1, 0.9 Hz, 2H), 7.61 (s, 1H), 7.46 (t, *J* = 7.8 Hz, 2H), 7.32 (d, *J* = 7.5 Hz, 2H), 7.26 – 7.19 (m, 3H), 3.66 (dd, *J* = 13.5, 6.9 Hz, 2H), 2.91 (t, *J* = 7.1 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.7, 161.8, 138.2, 134.3, 133.2, 131.0, 128.6, 128.6, 128.4, 126.6, 40.5, 35.3; HRMS (ESI) m/z: calcd for $C_{16}H_{16}NO_2$ $[M+H]^+$ 254.1176; found 254.1166.

***N*-(2-Chloroethyl)-2-oxo-2-phenylacetamide (3bc)**: light yellow solid (51.0 mg, 80% yield); mp 51.0-53.0 ^{o}C; R_f = 0.4 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.31 (d, *J* = 7.6 Hz, 2H), 7.61 (d, *J* = 7.4 Hz, 1H), 7.54 (s, 1H), 7.47 (t, *J* = 7.8 Hz, 2H), 3.76 – 3.71 (m, 2H), 3.69 (d, *J* = 5.2 Hz, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.2, 162.0, 134.6, 133.1, 131.2, 128.6, 43.1, 41.2; HRMS (ESI) m/z: calcd for $C_{10}H_{11}ClNO_2$ $[M+H]^+$ 212.0473; found 212.0465.

***N*-Allyl-2-oxo-2-phenylacetamide (3bd)**: yellow solid (44.2 mg, 78% yield); mp 60.3-62.0 ^{o}C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.29 (d, *J* = 7.9 Hz, 2H), 7.58 (t, *J* = 7.4 Hz, 1H), 7.43 (t, *J* = 7.8 Hz, 2H), 7.32 (s, 1H),

5.85 (ddd, *J* = 22.7, 10.7, 5.6 Hz, 1H), 5.20 (dd, *J* = 36.5, 13.7 Hz, 2H), 3.98 (s, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 187.8, 161.8, 134.4, 133.3, 133.1, 131.2, 128.5, 117.1, 41.7; HRMS (ESI) m/z: calcd for $C_{11}H_{12}NO_2$ $[M+H]^+$ 190.0863; found 190.0855.

2-oxo-*N*,2-di-p-tolylacetamide (3be): yellow solid (65.2 mg, 86% yield); mp 104.0-105.5 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.97 (s, 1H), 8.33 (d, *J* = 8.2 Hz, 2H), 7.59 (d, *J* = 8.4 Hz, 2H), 7.29 (d, *J* = 8.2 Hz, 2H), 7.18 (d, *J* = 8.2 Hz, 2H), 2.43 (s, 3H), 2.34 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.0, 159.2, 145.9, 134.9, 134.3, 131.7, 130.7, 129.7, 129.3, 119.9, 21.9, 21.0; HRMS (ESI) m/z: calcd for $C_{16}H_{16}NO_2$ $[M+H]^+$ 254.1176; found 254.1168.

2-(4-Methoxyphenyl)-2-oxo-*N*-phenylacetamide (3bf): light yellow solid (64.0 mg, 84% yield); mp 114.0-115.5 °C; R_f = 0.35 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 9.05 (s, 1H), 8.49 (d, *J* = 8.8 Hz, 2H), 7.70 (d, *J* = 8.0 Hz, 2H), 7.39 (t, *J* = 7.8 Hz, 2H), 7.19 (t, *J* = 7.4 Hz, 1H), 6.97 (d, *J* = 8.9 Hz, 2H), 3.90 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 185.3, 164.9, 159.6, 136.8, 134.3, 129.2, 126.1, 125.2, 119.9, 114.0, 55.6; HRMS (ESI) m/z: calcd for $C_{15}H_{14}NO_3$ $[M+H]^+$ 256.0968; found 256.0959.

2-(4-Fluorophenyl)-2-oxo-*N*-(*p*-tolyl)acetamide (3bg): yellow solid (64.7 mg, 84% yield); mp 113.0-114.5°C; R_f = 0.60 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 8.94 (s, 1H), 8.56 – 8.49 (m, 2H), 7.57 (d, *J* = 8.4 Hz, 2H), 7.22 – 7.15 (m, 4H), 2.35 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 185.7, 166.8 (d, *J* = 256.2 Hz), 158.7, 135.2, 134.6 (d, *J* = 10.2 Hz), 134.0, 129.8, 129.6, 129.6, 119.9, 115.9 (d, *J* = 22.5 Hz), 21.0; HRMS (ESI) m/z: calcd for $C_{15}H_{13}FNO_2$ $[M+H]^+$ 258.0925; found 258.0920.

2-(4-Chlorophenyl)-2-oxo-*N*-phenylacetamide (3bh): yellow solid (71.1 mg, 87% yield); mp 124.4-125.2 °C; R_f = 0.60 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) *δ* 8.91 (s, 1H), 8.46 – 8.37 (m, 2H), 7.57 (d, *J* = 8.4 Hz, 2H), 7.50 – 7.46 (m, 2H), 7.20 (d, *J* = 8.2 Hz, 2H), 2.35 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) *δ* 186.2,

158.5, 141.4, 135.3, 133.9, 133.0, 131.5, 129.8, 129.0, 119.9, 21.0; HRMS (ESI) m/z: calcd for $C_{15}H_{13}ClNO_2$ $[M+H]^+$ 274.0629; found 274.0621.

2-(4-Bromophenyl)-2-oxo-N-(p-tolyl)acetamide (3bi): yellow solid (80.3 mg, 85% yield); mp 123.0-125.0 °C; R_f = 0.5 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.92 (s, 1H), 8.31 (d, *J* = 8.5 Hz, 2H), 7.64 (d, *J* = 8.5 Hz, 2H), 7.57 (d, *J* = 8.4 Hz, 2H), 7.19 (d, *J* = 8.3 Hz, 2H), 2.35 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.5, 158.5, 135.3, 133.9, 133.0, 132.0, 131.9, 130.4, 129.8, 119.9, 21.0; HRMS (ESI) m/z: calcd for $C_{15}H_{12}BrNNaO_2$ $[M+Na]^+$ 339.9944; found 339.9936.

2-(4-Iodophenyl)-2-oxo-*N*-phenylacetamide (3bj): yellow solid (84.1 mg, 80% yield); mp 136.0-137.0 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.99 (s, 1H), 8.12 (d, *J* = 8.5 Hz, 2H), 7.91 (dd, *J* = 45.2, 8.6 Hz, 2H), 7.68 (d, *J* = 7.9 Hz, 2H), 7.48 – 7.36 (m, 2H), 7.20 (t, *J* = 7.4 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.8, 158.6, 138.0, 136.5, 132.7, 132.3, 129.3, 125.5, 120.0, 103.8; HRMS (ESI) m/z: calcd for $C_{14}H_{10}INNaO_2$ $[M+Na]^+$ 373.9648; found 373.9644.

2-Oxo-*N*-phenyl-2-(4-(trifluoromethyl)phenyl)acetamide (3bk): yellow solid (73.6 mg, 84% yield); mp 116.0-117.5 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.04 (s, 1H), 8.47 (d, *J* = 8.2 Hz, 2H), 7.70 (dd, *J* = 18.2, 8.1 Hz, 4H), 7.38 (t, *J* = 7.9 Hz, 2H), 7.20 (t, *J* = 7.4 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.7, 158.3, 136.4, 135.8, 135.4 (q, *J* = 32.5), 131.8, 129.3, 125.6, 125.5 (q, *J* = 3.75), 123.5 (q, *J* = 271.3) , 120.1; HRMS (ESI) m/z: calcd for $C_{15}H_{10}F_3NNaO_2$ $[M+Na]^+$ 316.0556; found 316.0553.

2-(3,4-Dichlorophenyl)-2-oxo-*N*-phenylacetamide (3bl): yellow solid (70.8 mg, 80% yield); mp 136.0-137.5 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, DMSO) δ 10.98 (s, 1H), 8.27 (s, 1H), 8.04 (d, *J* = 6.9 Hz, 1H), 7.82 (dd, *J* = 44.6, 7.0 Hz, 3H), 7.39 (s, 2H), 7.17 (s, 1H); ^{13}C NMR (126 MHz, DMSO) δ 187.0, 161.9, 138.0, 138.0, 133.5, 132.3, 132.2, 131.8, 130.7, 129.4, 125.2, 120.8; HRMS (ESI) m/z: calcd for $C_{14}H_9Cl_2NNaO_2$ $[M+Na]^+$ 315.9903; found 315.9911.

2-(Furan-2-yl)-2-oxo-*N*-phenylacetamide (3bm): yellow solid (50.9 mg, 79% yield); mp 119.0-120.0 °C; R_f = 0.40 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.11 (s, 1H), 8.27 (d, *J* = 3.7 Hz, 1H), 7.81 – 7.76 (m, 1H), 7.73 – 7.64 (m, 2H), 7.38 (t, *J* = 8.0 Hz, 2H), 7.19 (d, *J* = 7.4 Hz, 1H), 6.65 (dd, *J* = 3.6, 1.6 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 173.5, 157.6, 149.8, 149.3, 136.4, 129.3, 127.5, 125.4, 120.0, 113.4; HRMS (ESI) m/z: calcd for $C_{12}H_9NNaO_3$ $[M+Na]^+$ 238.0475; found 238.0474.

2-(Naphthalen-1-yl)-2-oxo-*N*-phenylacetamide (3bn): yellow solid (69.3 mg, 84% yield); mp 138.0-139.9 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1);^{1}H NMR (500 MHz, $CDCl_3$) δ 9.18 (s, 1H), 8.58 (d, *J* = 8.5 Hz, 1H), 8.36 (d, *J* = 7.3 Hz, 1H), 8.08 (d, *J* = 8.2 Hz, 1H), 7.91 (d, *J* = 8.0 Hz, 1H), 7.75 (d, *J* = 7.7 Hz, 2H), 7.67 – 7.60 (m, 1H), 7.60 – 7.51 (m, 2H), 7.40 (t, *J* = 7.9 Hz, 2H), 7.21 (t, *J* = 7.4 Hz, 1H)； ^{13}C NMR (126 MHz, $CDCl_3$) δ 190.2, 159.4, 136.8, 134.8, 133.9, 133.3, 131.3, 129.4, 129.3, 128.9, 128.6, 126.7, 125.4, 125.3, 124.3, 120.0； HRMS (ESI) m/z: calcd for $C_{18}H_{13}NNaO_2$ $[M+Na]^+$ 298.0838; found 298.0837.

2-Oxo-*N*-phenylpropanamide (3bo): yellow solid (35.7 mg, 73% yield); mp 114.0-115.5 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.75 (s, 1H), 7.70 – 7.57 (m, 2H), 7.37 (t, *J* = 8.0 Hz, 2H), 7.18 (d, *J* = 7.4 Hz, 1H), 2.56 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 197.3, 157.5, 136.2, 129.2, 125.3, 119.7, 24.0; HRMS (ESI) m/z: calcd for $C_9H_9NNaO_2$ $[M+Na]^+$ 186.0525; found 186.0525.

2-Oxo-*N*-phenylbutanamide (3bp): yellow solid (42.0 mg, 79% yield); mp 98.0-99.0 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.80 (s, 1H), 7.64 (d, *J* = 7.7 Hz, 2H), 7.36 (t, *J* = 7.9 Hz, 2H), 7.17 (d, *J* = 7.4 Hz, 1H), 3.12 – 3.00 (m, 2H), 1.15 (t, *J* = 7.2 Hz, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 200.0, 157.6, 136.4, 129.2, 125.2, 119.8, 30.0, 7.2; HRMS (ESI) m/z: calcd for $C_{10}H_{11}NNaO_2$ $[M+Na]^+$ 200.0682; found 200.0682.

3-Methyl-2-oxo-*N*-phenylbutanamide (3bq): yellow solid (41.4 mg, 78% yield); mp 96.0-97.4 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz,

$CDCl_3$) δ 8.93 (s, 1H), 7.66 (d, J = 8.3 Hz, 2H), 7.39 – 7.27 (m, 2H), 7.13 (d, J = 0.7 Hz, 1H), 3.69 (dd, J = 13.8, 6.9 Hz, 1H), 1.17 (d, J = 7.0 Hz, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 202.6, 157.4, 136.6, 129.1, 125.2, 119.9, 33.9, 17.9; HRMS (ESI) m/z: calcd for $C_{11}H_{13}NNaO_2$ $[M+Na]^+$ 214.0838; found 214.0838.

2-Cyclopropyl-2-oxo-*N*-phenylacetamide (3br): yellow solid (42.6 mg, 80% yield); mp 101.0-102.0 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.89 (s, 1H), 7.66 (d, J = 8.1 Hz, 2H), 7.35 (dd, J = 11.2, 4.2 Hz, 2H), 7.15 (t, J = 7.4 Hz, 1H), 3.23 – 3.10 (m, 1H), 1.21 (dd, J = 7.3, 5.6 Hz, 4H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 198.5, 157.8, 136.5, 129.2, 125.2, 119.9, 15.3, 14.8; HRMS (ESI) m/z: calcd for $C_{11}H_{11}NNaO_2$ $[M+Na]^+$ 212.0682; found 212.0681.

3,3-Dimethyl-2-oxo-*N*-phenylbutanamide (3bs): yellow solid 49.3 mg, 80% yield); mp 97.0-98.0 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.89 (s, 1H), 7.67 – 7.60 (m, 2H), 7.34 (dd, J = 11.2, 4.7 Hz, 2H), 7.14 (t, J = 7.4 Hz, 1H), 1.40 (s, 9H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 203.4, 157.0, 136.7, 129.1, 125.1, 119.9, 43.1, 26.5; HRMS (ESI) m/z: calcd for $C_{12}H_{15}NNaO_2$ $[M+Na]^+$ 228.0995; found 228.0993.

4-Methyl-2-oxo-*N*-phenylpentanamide (3bt): yellow solid (49.1 mg, 80% yield); mp 89.5-90.5 °C; R_f = 0.55 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.91 (s, 1H), 7.71 – 7.58 (m, 2H), 7.32 (t, J = 8.0 Hz, 2H), 7.13 (t, J = 7.4 Hz, 1H), 2.87 (d, J = 6.9 Hz, 2H), 2.20 (dp, J = 13.5, 6.7 Hz, 1H), 0.96 (d, J = 6.8 Hz, 6H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 199.2, 157.8, 136.5, 129.2, 125.2, 119.8, 44.9, 24.5, 22.6; HRMS (ESI) m/z: calcd for $C_{12}H_{15}NNaO_2$ $[M+Na]^+$ caled: 228.0995; found 228.0992.

2-Oxo-*N*,3-diphenylpropanamide (3bu): yellow solid (61.6 mg, 86% yield); mp 97.0-98.3 °C; R_f = 0.40 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.75 (s, 1H), 7.67 – 7.61 (m, 2H), 7.39 – 7.34 (m, 4H), 7.31 (d, J = 7.1 Hz, 3H), 7.19 (d, J = 7.4 Hz, 1H), 4.32 (s, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 196.3, 157.4, 136.3, 132.5,

129.9, 129.3, 128.8, 127.4, 125.4, 119.8, 42.7; HRMS (ESI) m/z: calcd for $C_{15}H_{12}NNaO_2$ $[M+Na]^+$ 262.0838; found 262.0835.

2-Oxo-*N*,4-diphenylbutanamide (3bv): yellow solid (64.5 mg, 85% yield); mp 102.0-103.3 °C; R_f = 0.50 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.81 (s, 1H), 7.71 – 7.61 (m, 2H), 7.38 (t, *J* = 8.0 Hz, 2H), 7.32 (t, *J* = 7.5 Hz, 2H), 7.24 (t, *J* = 5.3 Hz, 2H), 7.19 (t, *J* = 7.4 Hz, 1H), 3.38 (t, *J* = 7.5 Hz, 2H), 3.01 (t, *J* = 7.5 Hz, 2H);^{13}C NMR (126 MHz, $CDCl_3$) δ 198.5, 157.5, 140.3, 136.4, 129.3, 128.6, 128.4, 126.4, 125.3, 119.9, 38.1, 29.3; HRMS (ESI) m/z: calcd for $C_{16}H_{15}NNaO_2$ $[M+Na]^+$ 276.0995; found 276.0992.

2-Oxo-*N*-((4-phenoxymethyl)phenyl)-2-(4-(trifluoromethyl)phenyl)acetamide (3bw): yellow solid (95.5 mg, 80% yield); mp 152.0-153.5 °C; R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.95 (s, 1H), 8.50 (d, *J* = 8.2 Hz, 2H), 7.74 (d, *J* = 8.3 Hz, 2H), 7.62 (d, *J* = 8.9 Hz, 2H), 7.48 – 7.38 (m, 4H), 7.36 (d, *J* = 7.2 Hz, 1H), 7.00 (d, *J* = 8.9 Hz, 2H), 5.07 (s, 2H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 186.8, 158.0, 156.4, 136.7, 135.9, 135.4 (q, *J* = 32.8 Hz), 131.8, 129.8, 128.7, 128.1, 127.5, 125.5 (q, *J* = 3.8 Hz), 124.5 (q, *J* = 271.3 Hz), 121.6, 115.4, 70.3; HRMS (ESI) m/z: calcd for $C_{22}H_{17}F_3NO_3$ $[M+H]^+$ 400.1155; found 400.1161.

***N*-(4-Chloro-3-(trifluoromethyl)phenyl)-2-(4-methoxynaphthalen-1-yl)-2-oxoacetamide (3bx)** : yellow solid (100.6 mg, 83% yield); R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 9.37 (s, 1H), 8.79 (d, *J* = 8.6 Hz, 1H), 8.53 (d, *J* = 8.4 Hz, 1H), 8.32 (d, *J* = 8.3 Hz, 1H), 8.08 (d, *J* = 2.5 Hz, 1H), 7.76 (dd, *J* = 8.7, 2.5 Hz, 1H), 7.65 – 7.60 (m, 1H), 7.54 (dd, *J* = 11.2, 3.9 Hz, 1H), 7.39 (d, *J* = 8.7 Hz, 1H), 6.77 (d, *J* = 8.4 Hz, 1H), 4.05 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 187.0, 161.3, 160.8, 137.7, 135.9, 133.0, 132.0, 129.5, 129.9 (q, *J* = 31.5 Hz), 127.6, 126.2, 125.8, 125.3, 123.8, 122.7, 122.5 (q, J = 271.3 Hz), 121.1, 118.9 (q, J = 6.2 Hz), 102.5, 56.1; HRMS (ESI) m/z: calcd for $C_{20}H_{14}ClF_3NO_3$ $[M+H]^+$ 408.0609; found 408.0602.

***N*-(3,4-Dimethylphenyl)-2-oxo-2-phenyl-*N*-(4-(trifluoromethyl)phenethyl)acetamide (3by)**: yellow oil (88.7 mg, 70% yield); R_f =

0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.65 – 7.57 (m, 4H), 7.54 (t, *J* = 7.4 Hz, 1H), 7.43 – 7.33 (m, 4H), 6.93 (d, *J* = 8.0 Hz, 1H), 6.77 (d, *J* = 1.4 Hz, 1H), 6.68 (dd, *J* = 7.9, 2.0 Hz, 1H), 4.24 (t, *J* = 7.3 Hz, 2H), 3.02 (t, *J* = 7.3 Hz, 2H), 2.15 (s, 3H), 2.08 (s, 3H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 190.6, 167.0, 142.4, 138.2, 137.2, 136.7, 134.2, 133.6, 130.5, 129.6, 129.3, 129.0 (q, *J* = 33.4 Hz), 128.7, 128.6, 125.4 (1, *J* = 3.6 Hz), 125.0, 124.3 (q, *J* = 272.4 Hz, 1H), 48.6, 33.5, 19.7, 19.4; HRMS (ESI) m/z: calcd for $C_{25}H_{23}F_3NO_2$ $[M+H]^+$ 426.1675; found 426.1677.

2-Hydroxy-2-(1*H*-indol-3-yl)-*N*,2-diphenyl acetamide (4a)[1d]: yellow solid (64.4 mg, 63% yield); R_f = 0.35 (petroleum ether: ethyl acetate = 3: 1); ^{1}H NMR (500 MHz, DMSO) δ 11.05 (s, 1H), 9.98 (s, 1H), 7.78 (d, *J* = 8.0 Hz, 2H), 7.69 (d, *J* = 7.8 Hz, 2H), 7.34 (ddd, *J* = 21.0, 16.3, 7.6 Hz, 7H), 7.17 (s, 1H), 7.07 (t, *J* = 7.4 Hz, 2H), 6.93 – 6.86 (m, 2H); ^{13}C NMR (126 MHz, DMSO) δ 172.6, 144.0, 139.0, 137.1, 129.1, 128.0, 127.6, 127.3, 126.3, 125.2, 124.1, 121.6, 121.2, 120.3, 119.0, 118.8, 112.0, 78.0; HRMS (ESI) m/z: calcd for $C_{22}H_{19}N_2O_2$ $[M+H]^+$ 343.1441; found 343.1437.

2-Hydroxy-N,2-diphenylacetamide (5a)[1e]: white solid (50.4 mg, 74% yield); R_f = 0.35 (petroleum ether: ethyl acetate = 3: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 8.21 (s, 1H), 7.52 (d, *J* = 7.7 Hz, 2H), 7.47 (d, *J* = 6.8 Hz, 2H), 7.41 – 7.34 (m, 3H), 7.33 – 7.27 (m, 2H), 7.12 (t, *J* = 7.4 Hz, 1H), 5.16 (d, *J* = 3.2 Hz, 1H), 3.60 (s, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 170.0, 139.0, 137.1, 129.1, 129.0, 128.9, 126.9, 124.8, 119.8, 74.7; HRMS (ESI) m/z: calcd for $C_{14}H_{13}NNaO_3$ $[M+Na]^+$ 250.0838; found 250.0830.

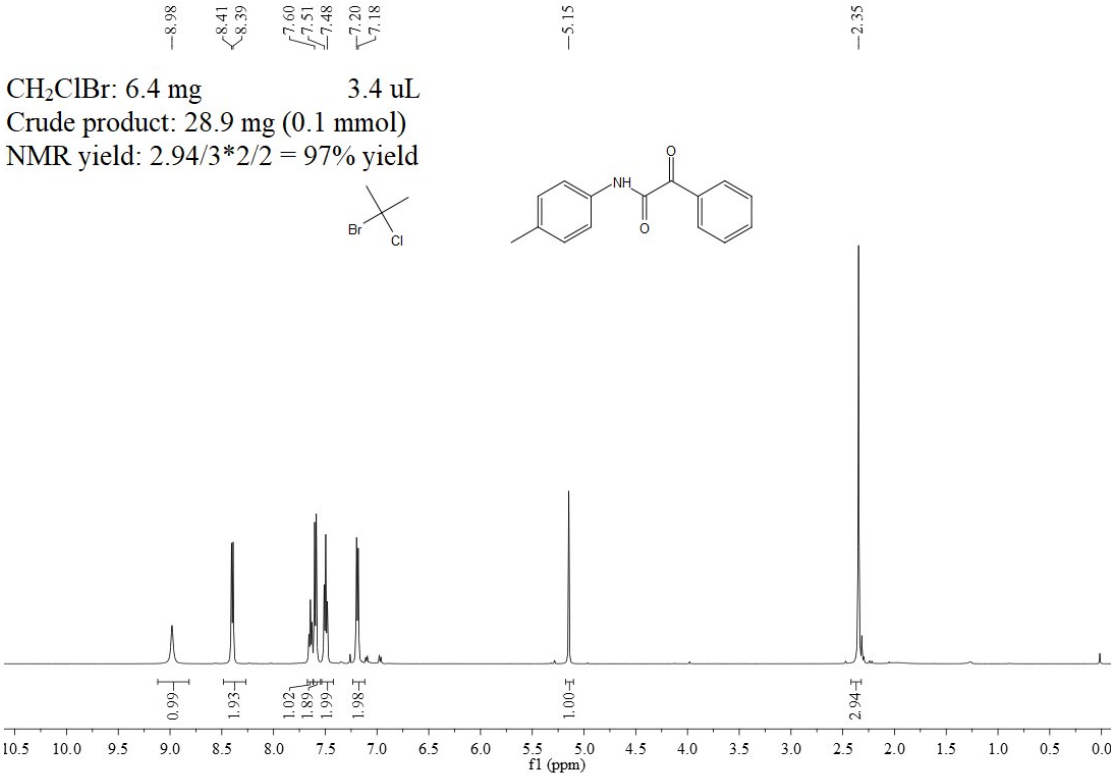
1,3-Diphenyl-1,5,6,10b-tetrahydroimidazo[2,1-*a*]isoquinolin-2(3*H*)-one (6a) [1c]: yellow oil (73.3 mg, 72% yield); R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.56 (d, *J* = 7.3 Hz, 2H), 7.45 – 7.36 (m, 6H), 7.33 (t, *J* = 7.3 Hz, 1H), 7.27 – 7.21 (m, 2H), 7.18 (d, *J* = 6.7 Hz, 1H), 7.01 – 6.94 (m, 1H), 6.73 (d, *J* = 7.8 Hz, 1H), 6.26 (s, 1H), 4.54 (d, *J* = 13.7 Hz, 1H), 3.33 – 3.23 (m, 1H), 3.13 – 3.01 (m, 2H), 2.72 (dt, *J* = 15.7, 4.7 Hz, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 170.9, 137.4, 136.4, 135.5, 133.5, 129.4, 128.8, 128.7, 128.4, 128.3, 128.1, 127.3, 126.5, 126.3,

124.8, 74.6, 67.2, 45.0, 24.4; HRMS (ESI) m/z: calcd for $C_{23}H_{20}N_2NaO$ $[M+Na]^+$ 363.1468; found 363.1462.

1,3-Diphenyltetrahydro-1H-pyrrolo[1,2-a]imidazol-2(3*H*)-one (6b):[1c] yellow oil (65.1 mg, 78% yield); R_f = 0.45 (petroleum ether: ethyl acetate = 10: 1); ^{1}H NMR (500 MHz, $CDCl_3$) δ 7.71 – 7.61 (m, 2H), 7.56 – 7.49 (m, 2H), 7.39 (t, *J* = 7.9 Hz, 4H), 7.31 (d, *J* = 7.3 Hz, 1H), 7.19 (dd, *J* = 10.7, 4.1 Hz, 1H), 5.54 (dd, *J* = 5.9, 4.1 Hz, 1H), 4.58 (s, 1H), 3.47 – 3.34 (m, 1H), 2.94 (dd, *J* = 16.2, 8.1 Hz, 1H), 2.31 (dt, *J* = 12.4, 6.1 Hz, 1H), 2.01 – 1.94 (m, 2H), 1.91-1.84 (m, 1H); ^{13}C NMR (126 MHz, $CDCl_3$) δ 171.7, 138.2, 137.2, 129.0, 128.6, 127.7, 126.9, 125.2, 121.2, 79.9, 70.8, 55.5, 31.4, 24.2; HRMS (ESI) m/z: calcd for $C_{18}H_{18}N_2NaO$ $[M+Na]^+$ 301.1311; found 301.1303.

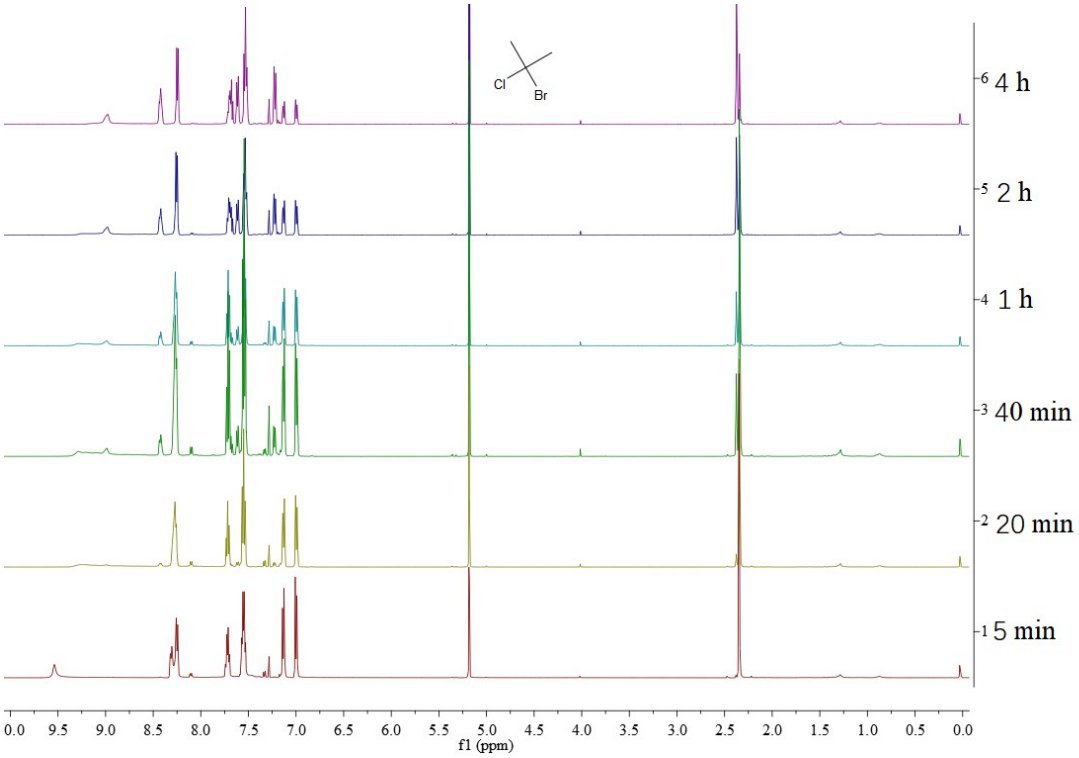
F. 100-mmol scale synthesis experiment of 3ab

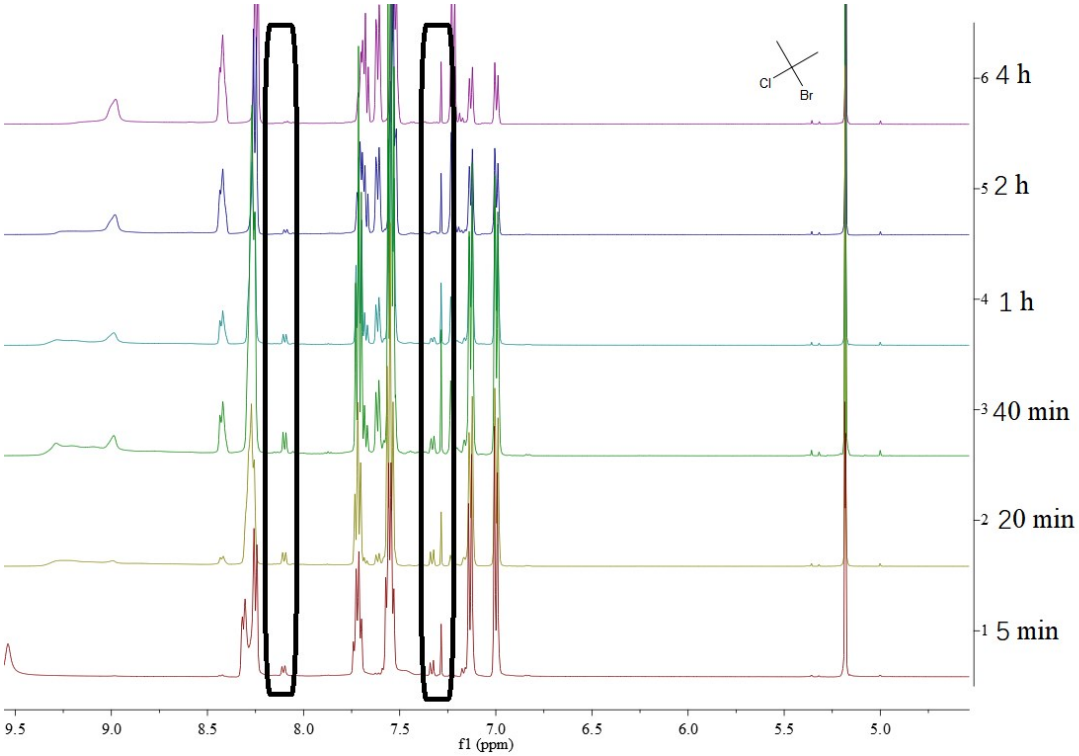
In a 250 mL, two-necked, round bottomed flask was placed α-oxocarboxylic acids **1a** (15.0 g, 100 mmol), *p*-Tolyl isocyanate **2b** (14.6g, 110 mmol) in 50 mL anhydrous CH_2Cl_2. The reaction mixture was stirred at room temperature for 24 h. The NMR spectrum before separation is shown below (28.9 mg crude product and 6.4 mg CH_2ClBr). The product was recrystallized from hot diethyl ether to give **3ab** (22.47 g, 94% yield).



G. Control experiments

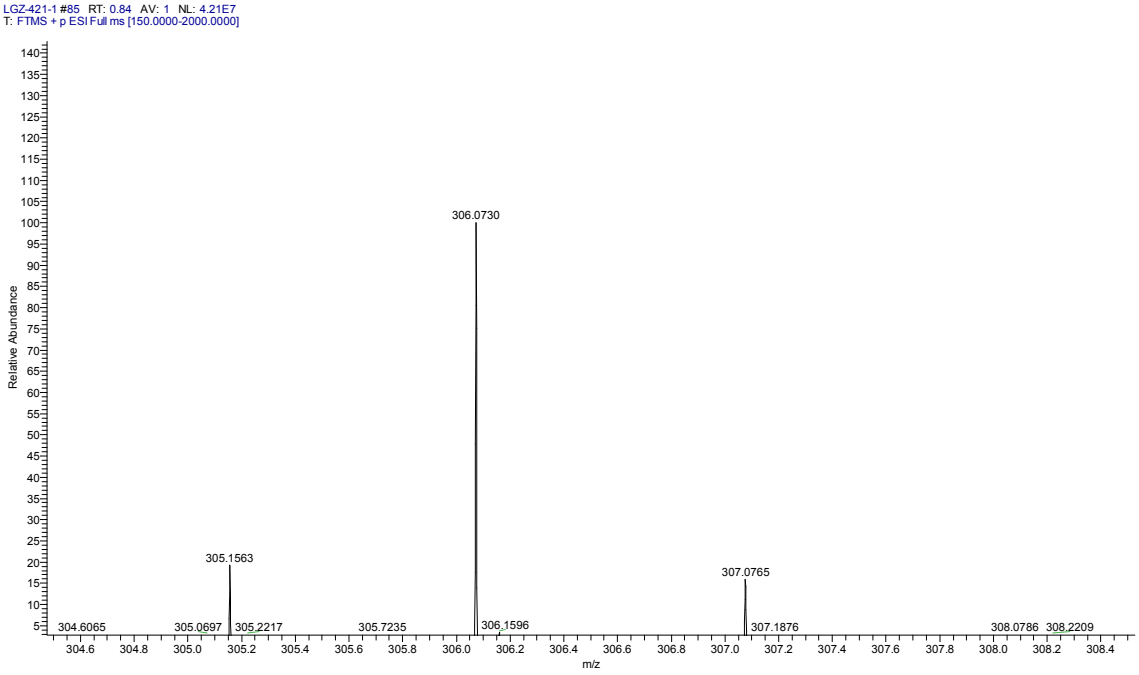
g-1 NMR detection experiments:





g-2. HRMS of *α*-oxocarbamic acid anhydride

HRMS (ESI) m/z: calcd for $C_{16}H_{13}NNaO_4$ $[M+Na]^+$ 306.0737; found 306.0730.



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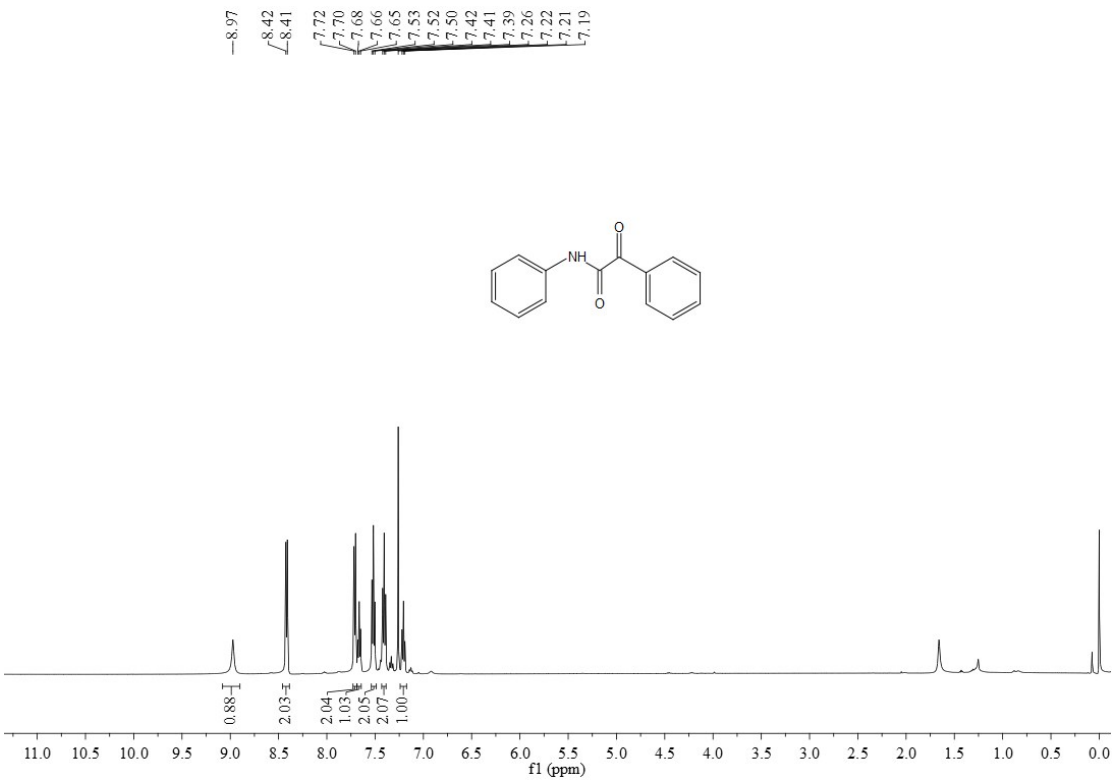
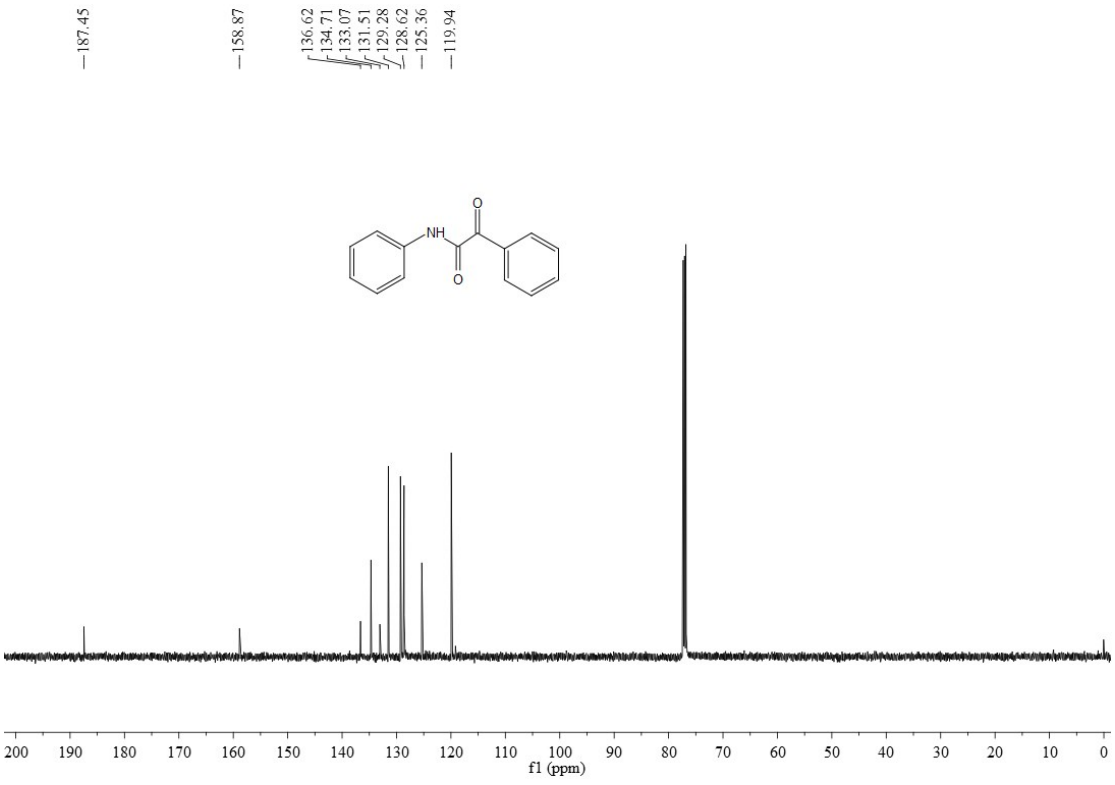
[1] a) N. C. Mamillapalli, G. Sekar, *Chem. - Eur. J*. **2015**, *21*, 18584-18588; b) A. Muthukumar, N. C. Mamillapalli, G. Sekar, *Adv. Synth. Catal*. **2016**, *358*, 643-652; c) Z. Zhu, X. Lv, J. E. Anesini, D. Seidel, *Org. Lett*. **2017**, *19*, 6424-6427; d) A. Muthukumar, G. Sekar, *J. Org. Chem*. **2018**, *83*, 8827−8839. e) R. Ye, F. Hao, G. Liu, Q. Zuo, L. Deng, Z. Jin, J. Wu, *Org. Chem. Front*., **2019**, *6*, 3562-3565; f) R. Agarwal, Y. Liao, D. -J. Lin, Z.-X. Yang, C.-F. Lai, C. -T. Chen, *Org. Chem. Front*. **2020**,*7*, 2505-2510.

[2] W. Kuldeep, C. Yang, P. R. West, K. C. Deming, C. S. R., R. R. E., *Synth Commun*., 2008, **38**, 4434.

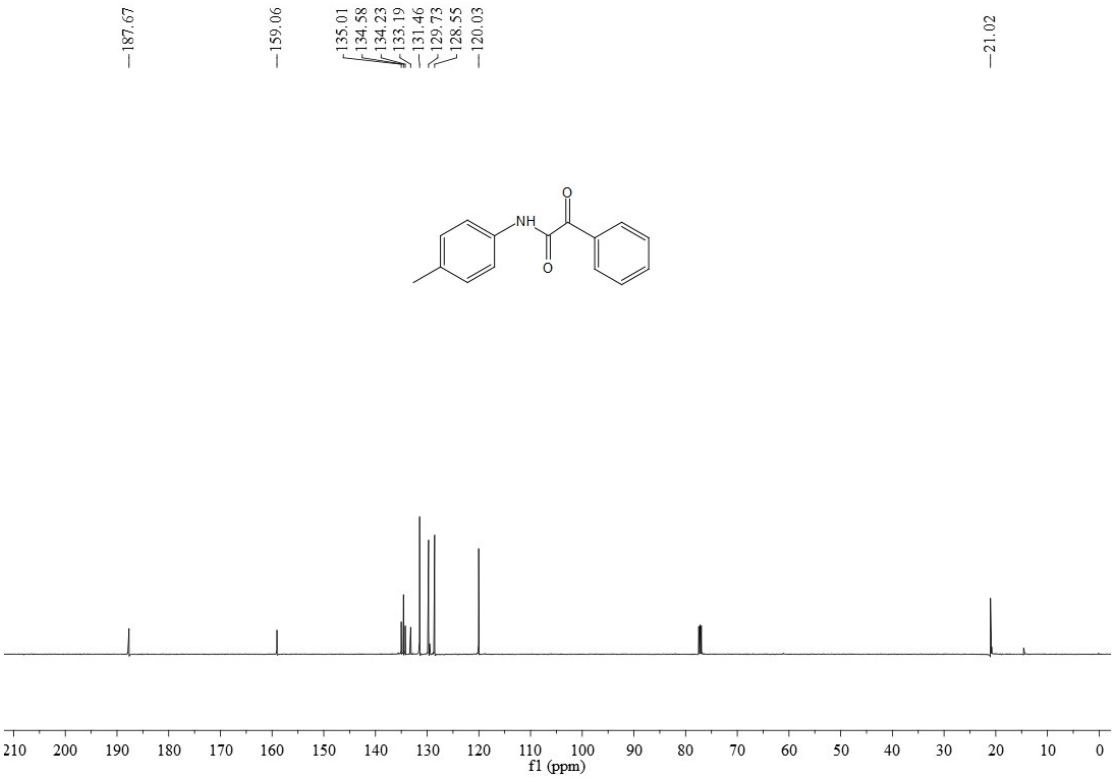
F. Copies of ^{1}H and ^{13}C NMR spectra

^{1}H NMR and ^{13}C NMR of 2-oxo-*N*,2-diphenylacetamide (3aa)

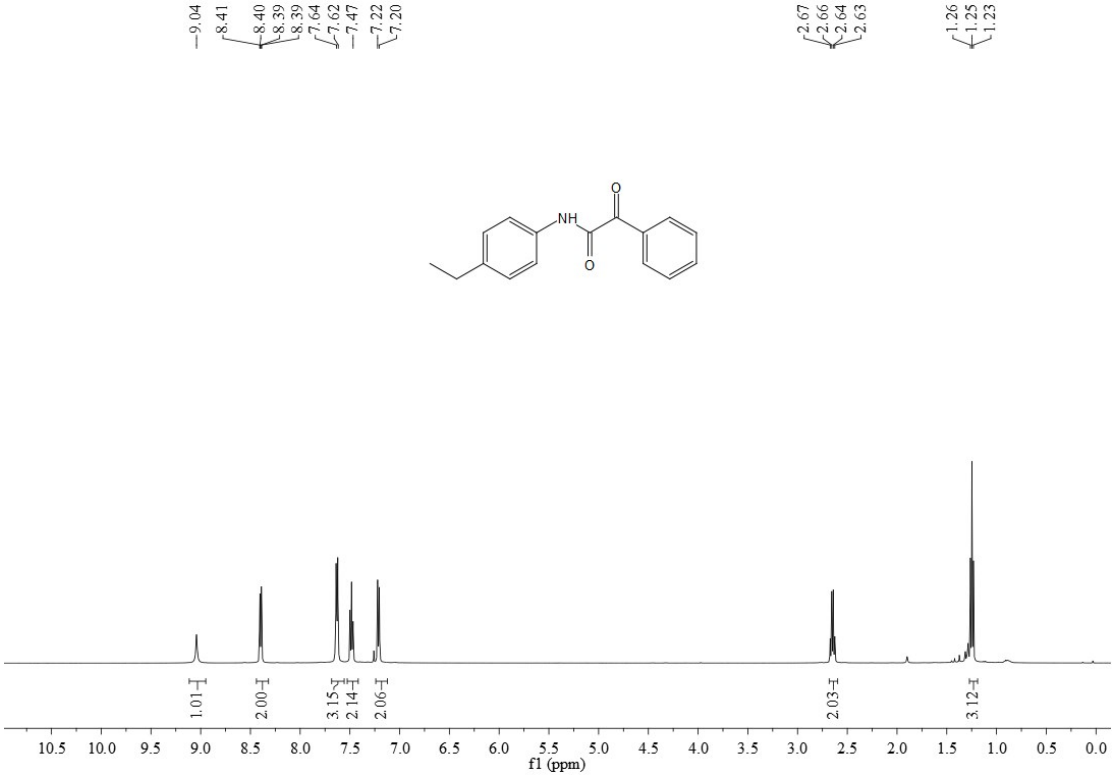


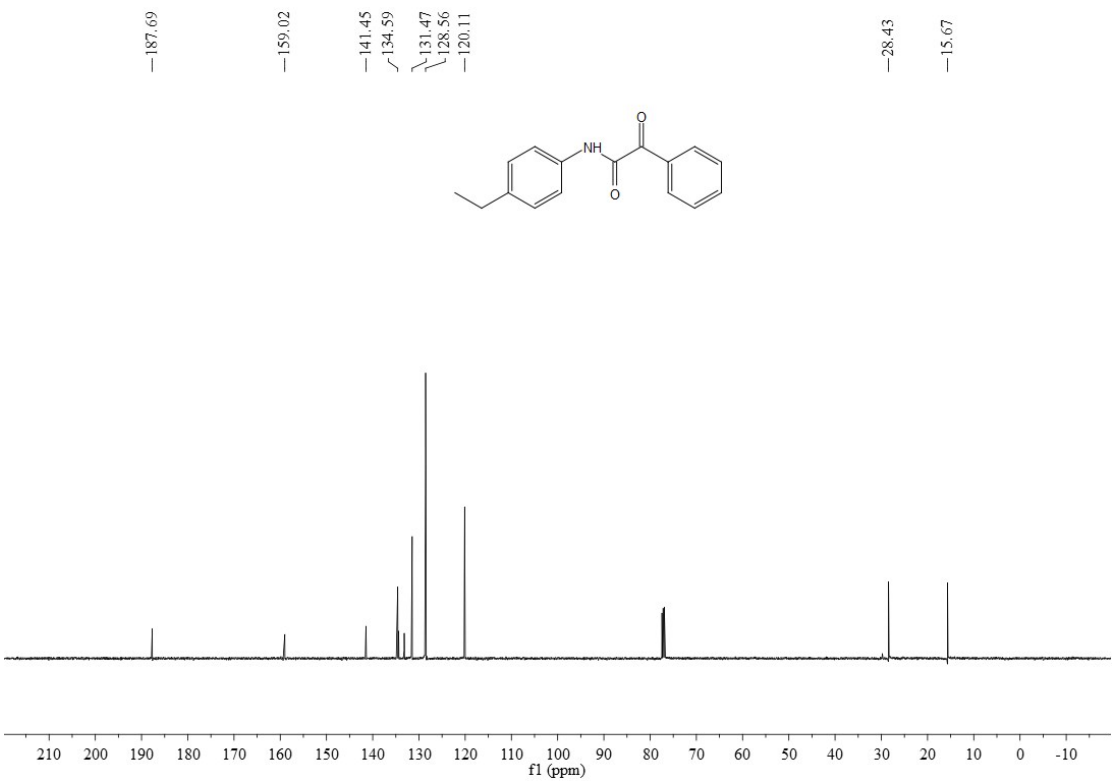


^{1}H NMR and ^{13}C NMR of 2-oxo-2-phenyl-*N*-(*p*-tolyl)acetamide (3ab)

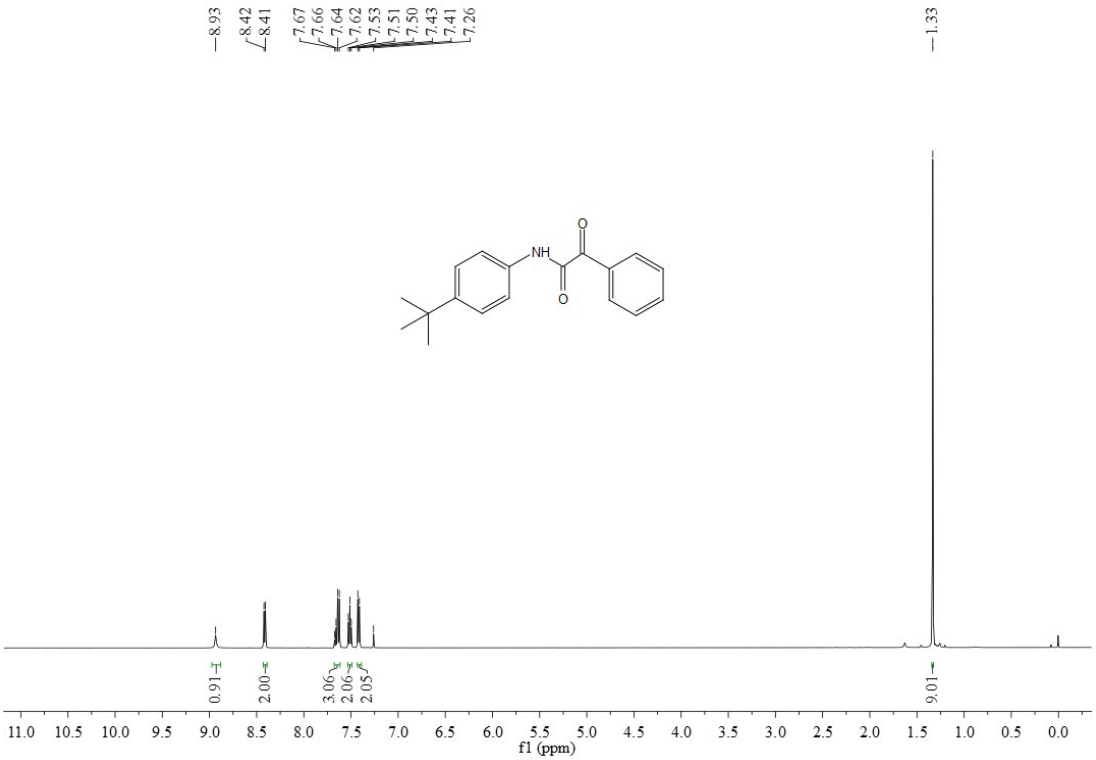


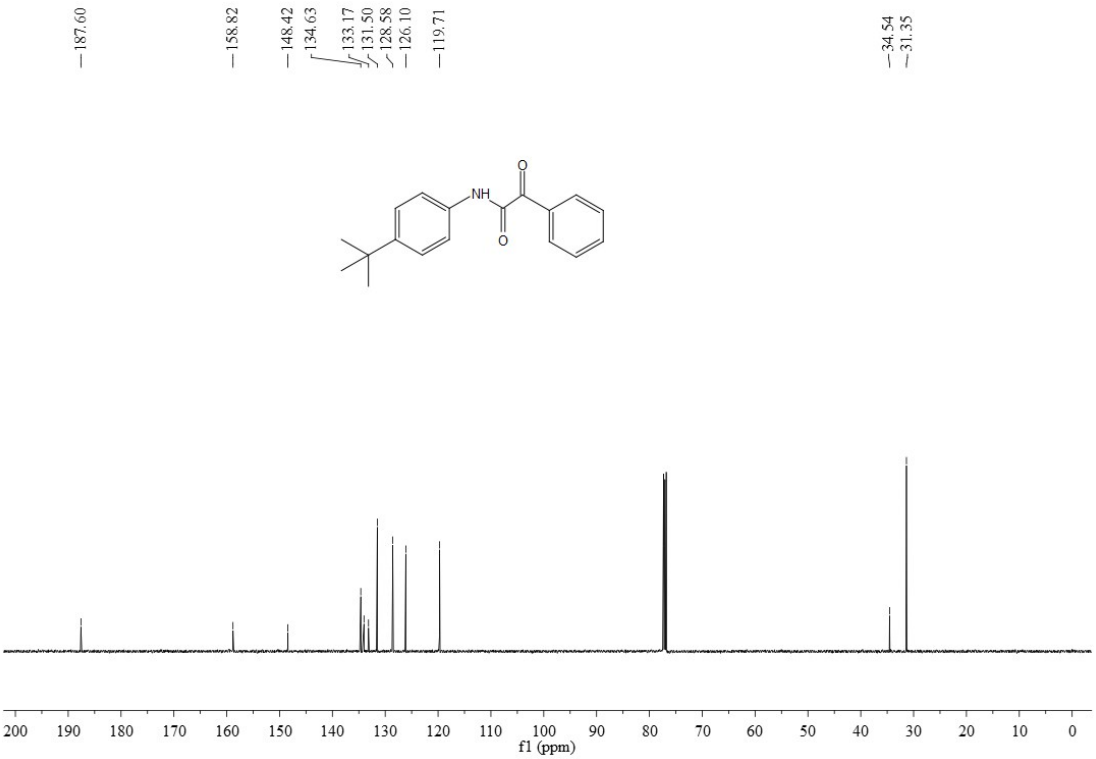
^{1}H NMR and ^{13}C NMR of *N*-(4-ethylphenyl)-2-oxo-2-phenylacetamide (3ac)



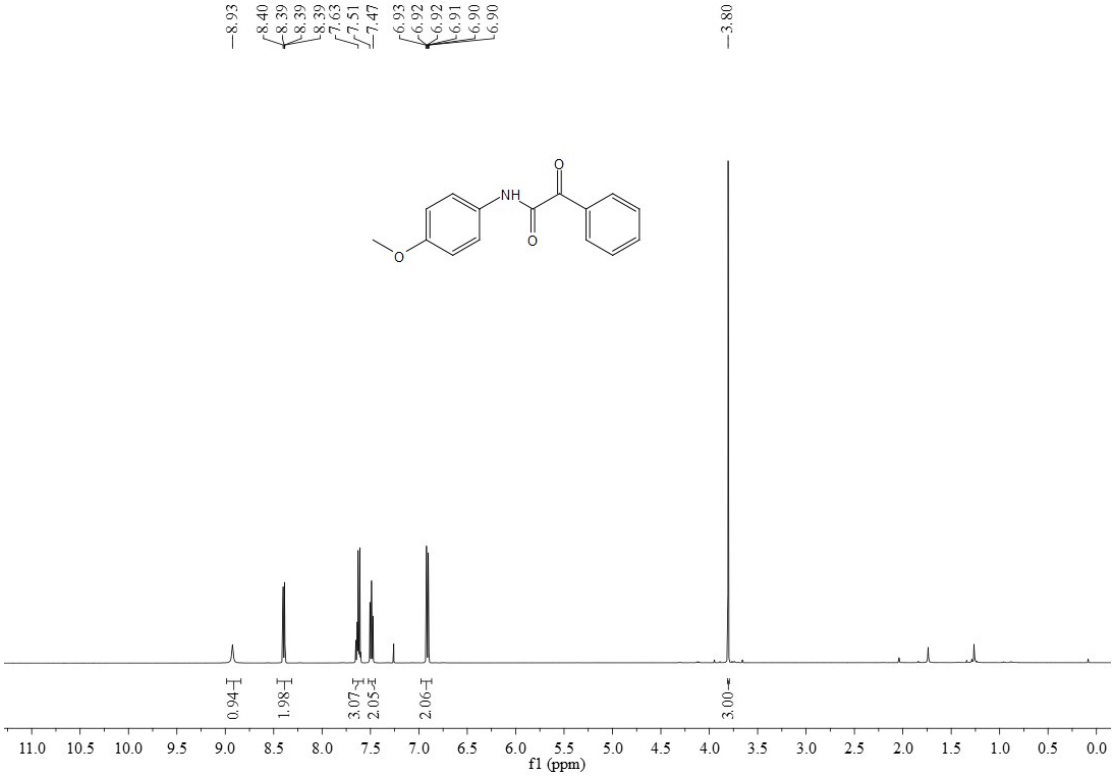


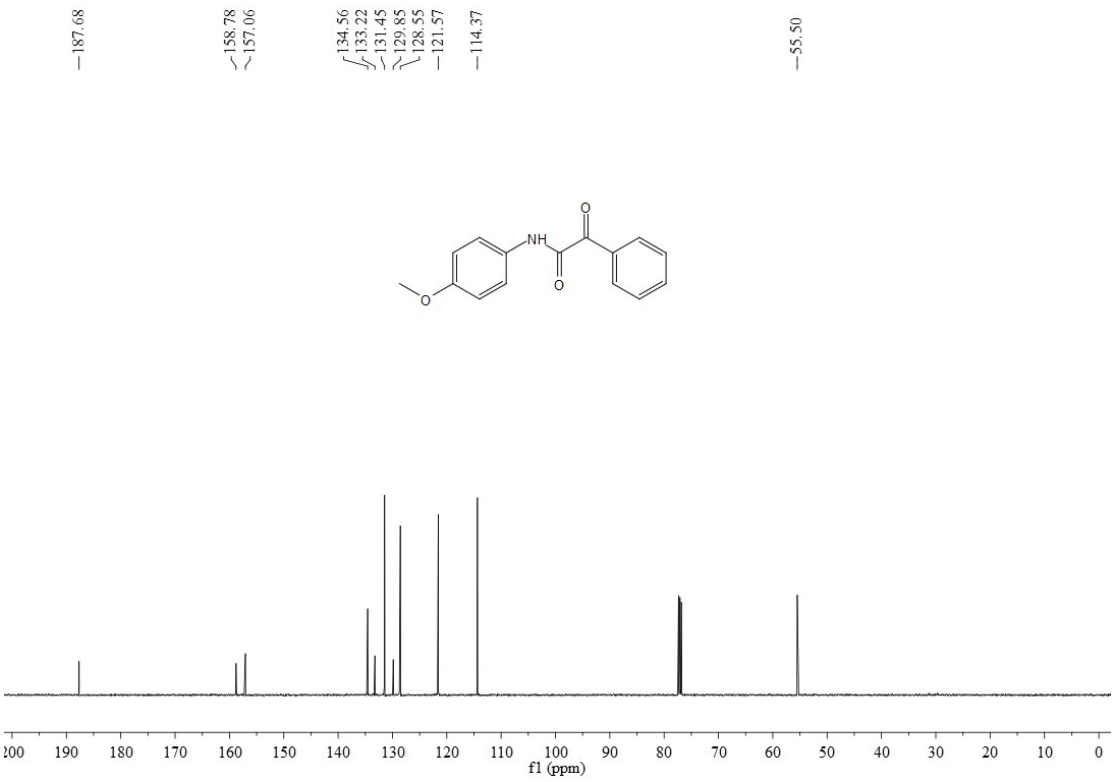
^{1}H NMR and ^{13}C NMR of *N*-(4-butylphenyl)-2-oxo-2-phenylacetamide (3ad)



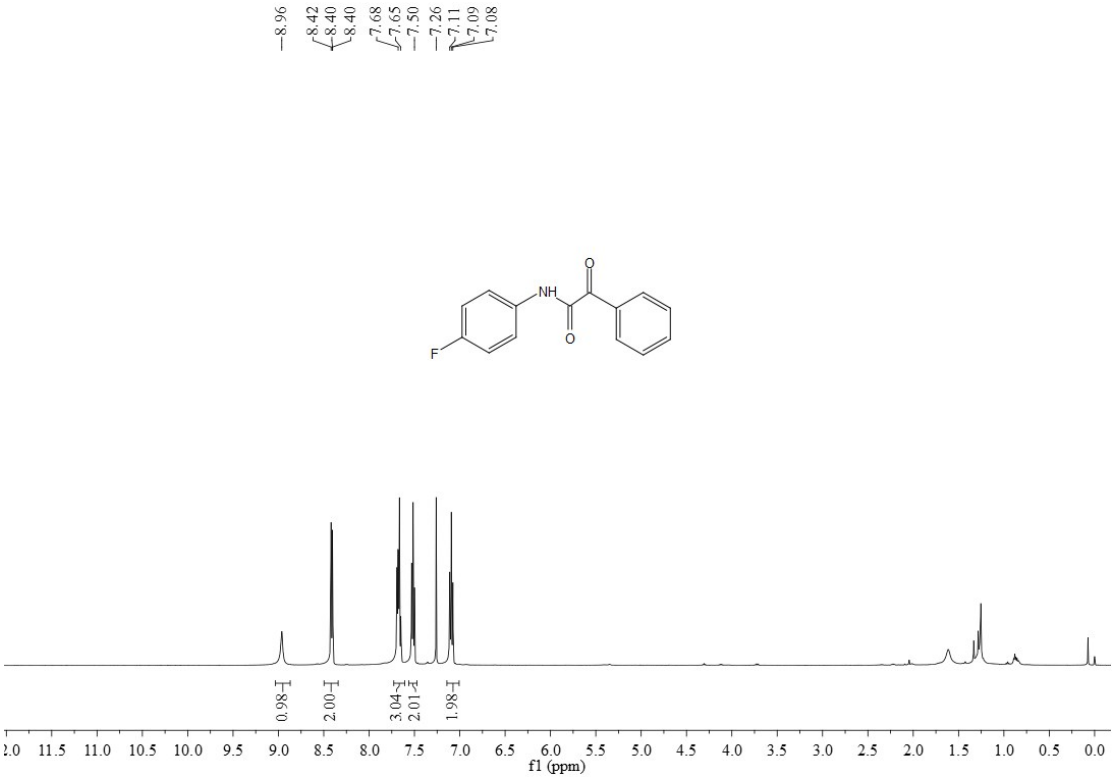


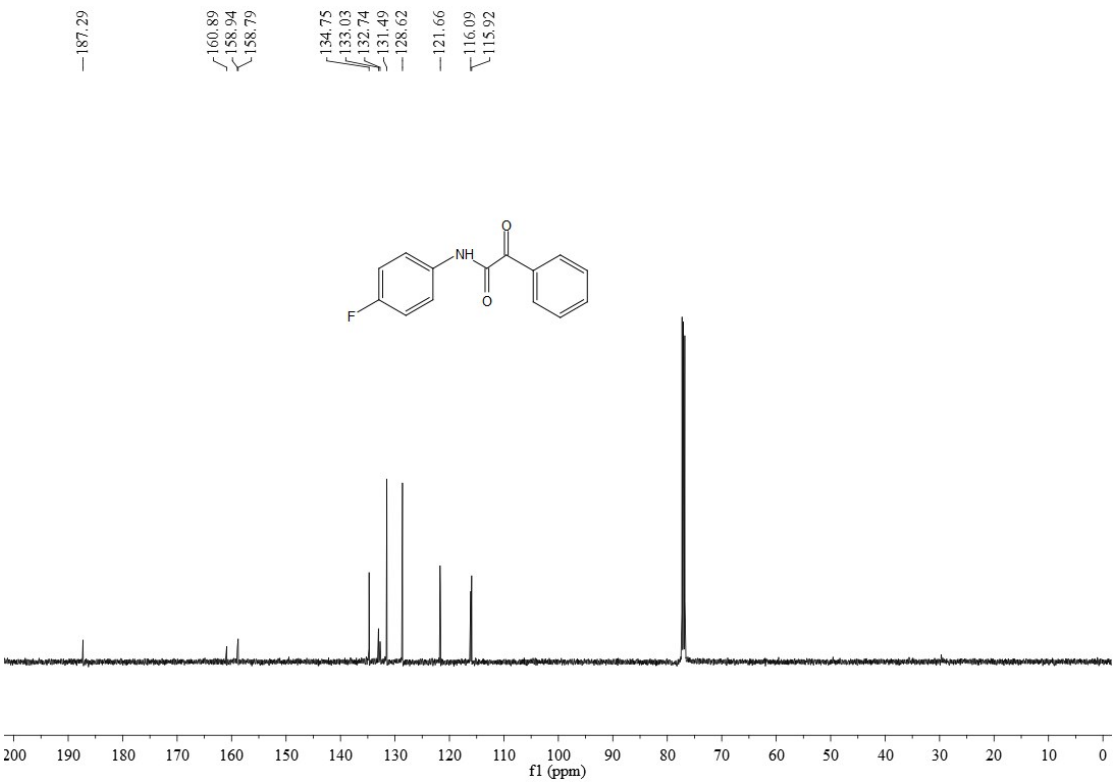
^{1}H NMR and ^{13}C NMR of *N*-(4-methoxyphenyl)-2-oxo-2-phenylacetamide (3ae)



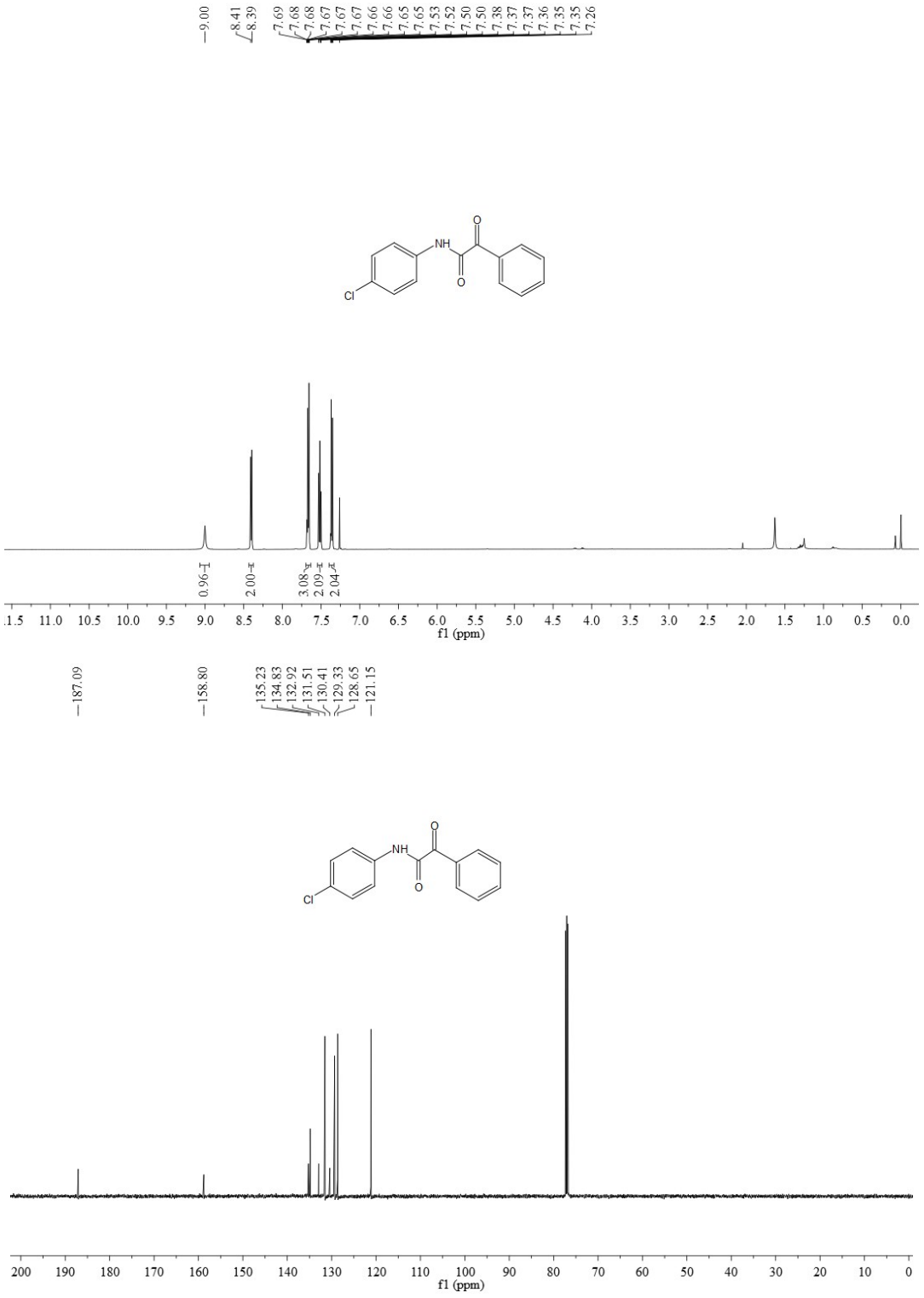


^{1}H NMR and ^{13}C NMR of *N*-(4-fluorophenyl)-2-oxo-2-phenylacetamide (3af)

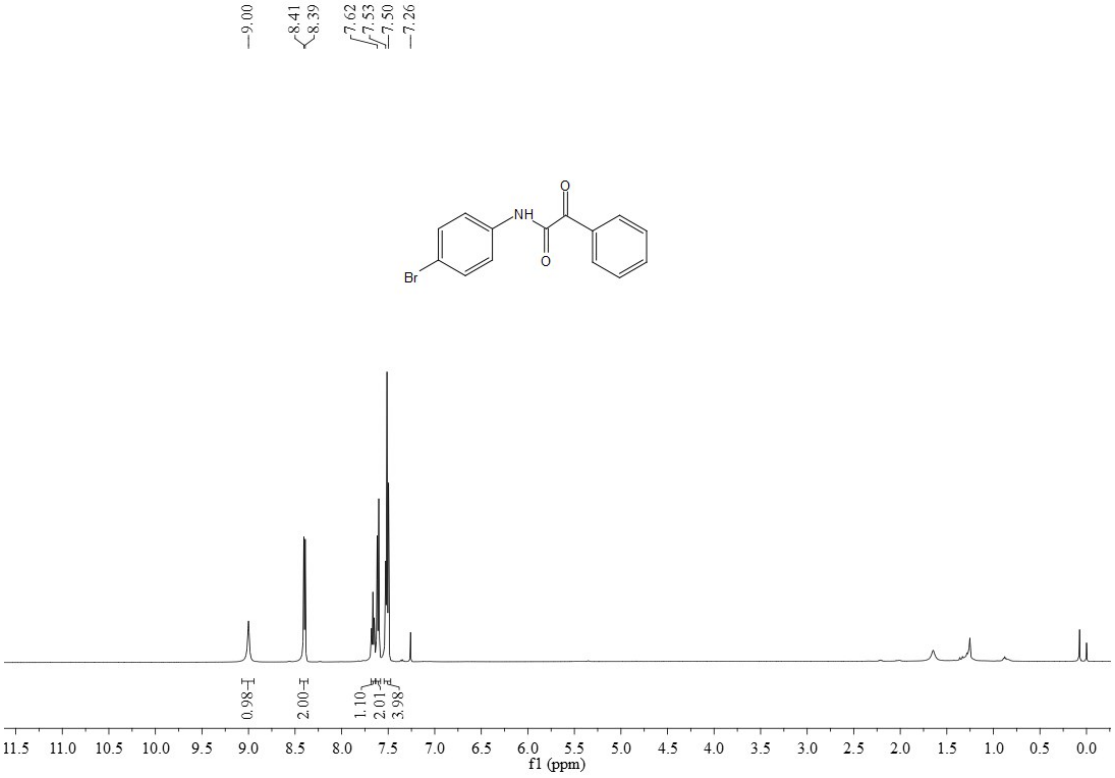


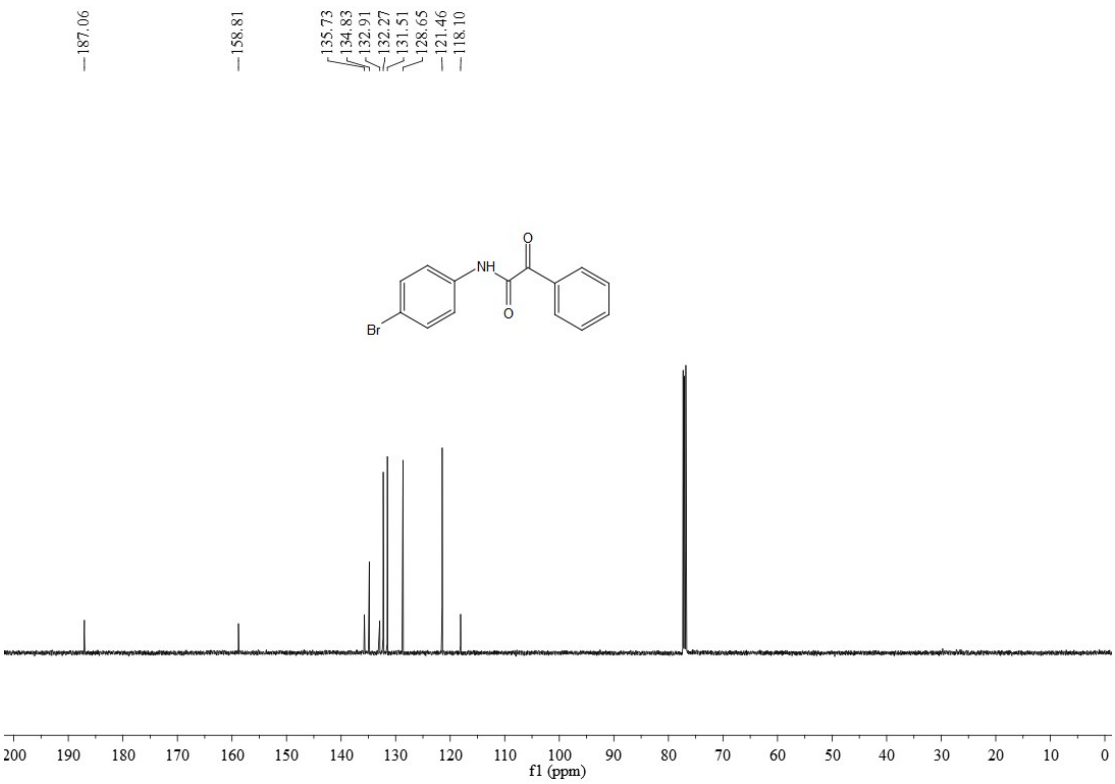


^{1}H NMR and ^{13}C NMR of *N*-(4-chlorophenyl)-2-oxo-2-phenylacetamide (3ag)

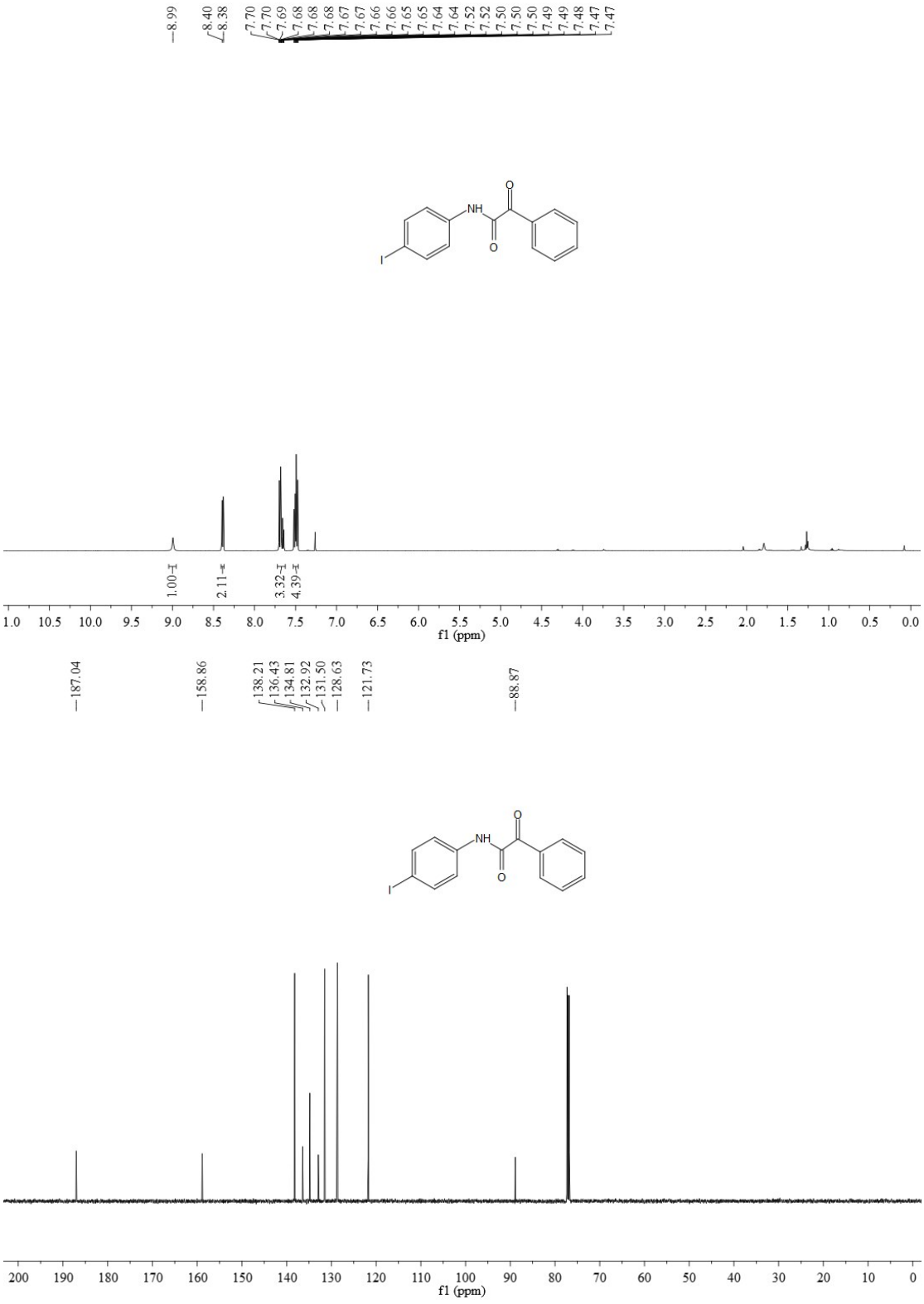


^{1}H NMR and ^{13}C NMR of *N*-(4-bromophenyl)-2-oxo-2-phenylacetamide (3ah)

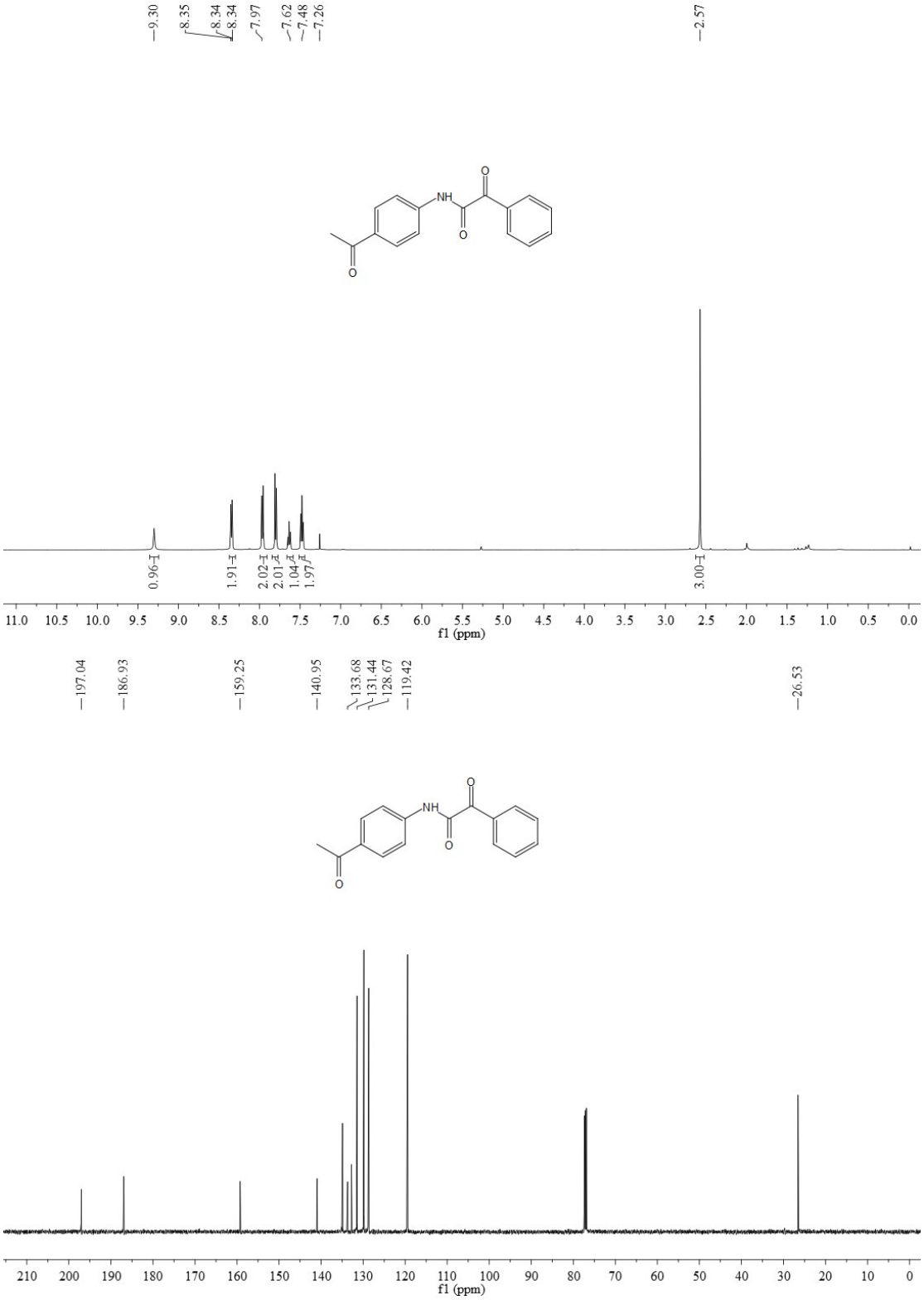




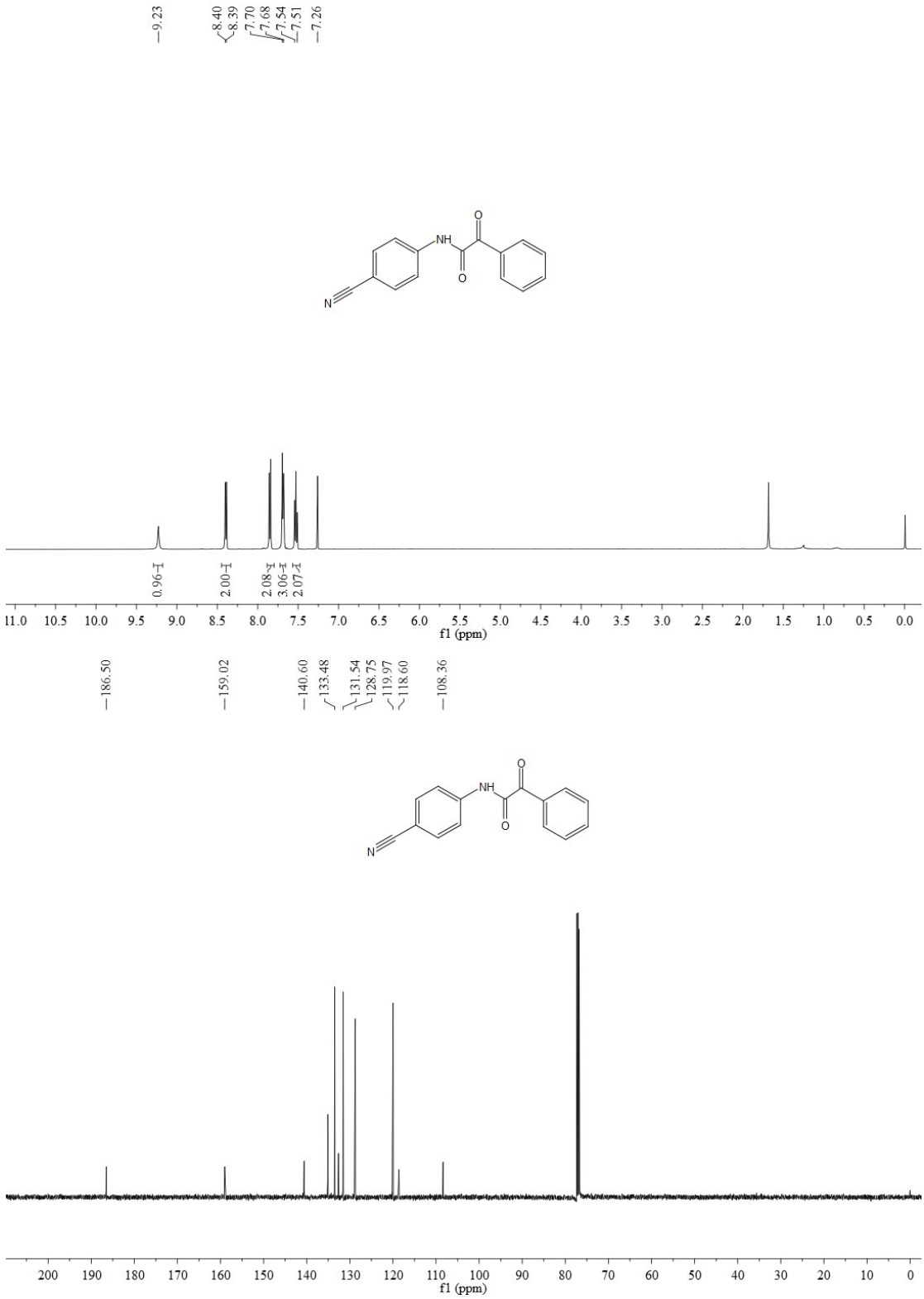
^{1}H NMR and ^{13}C NMR of *N*-(4-iodophenyl)-2-oxo-2-phenylacetamide (3ai)



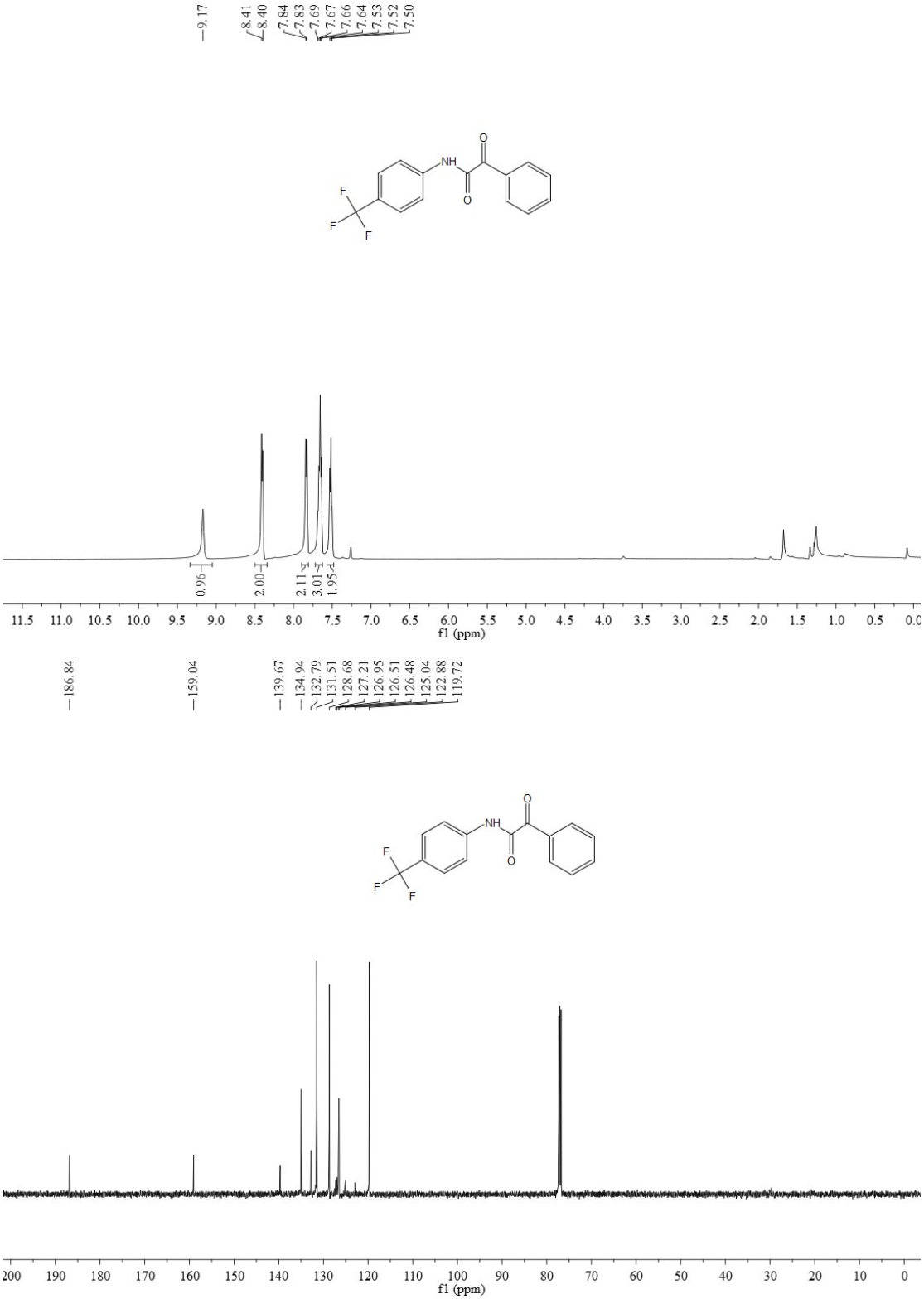
^{1}H NMR and ^{13}C NMR of *N*-(4-acetylphenyl)-2-oxo-2-phenylacetamide (3aj)



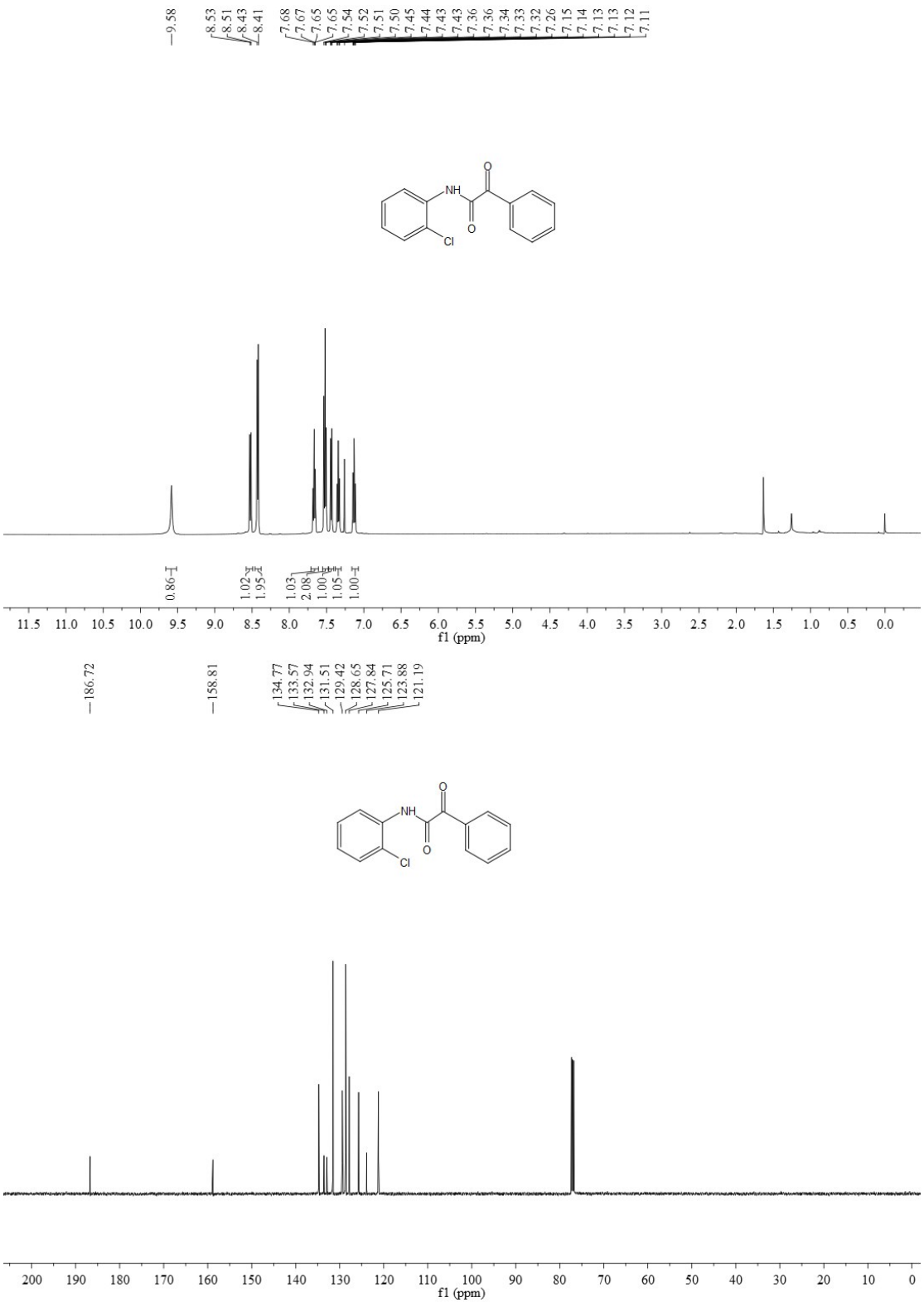
^{1}H NMR and ^{13}C NMR of N-(4-cyanophenyl)-2-oxo-2-phenylacetamide (3ak)



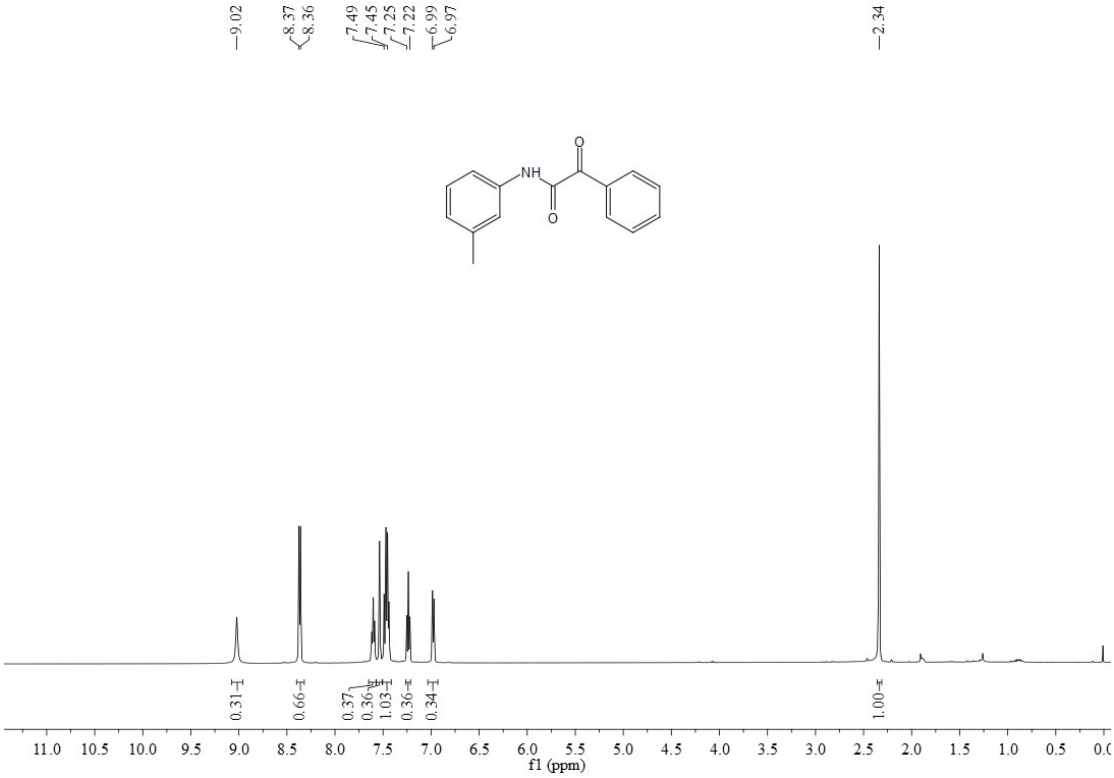
^{1}H NMR and ^{13}C NMR of 2-oxo-2-phenyl-*N*-(4-(trifluoromethyl)phenyl)acetamide (3al)

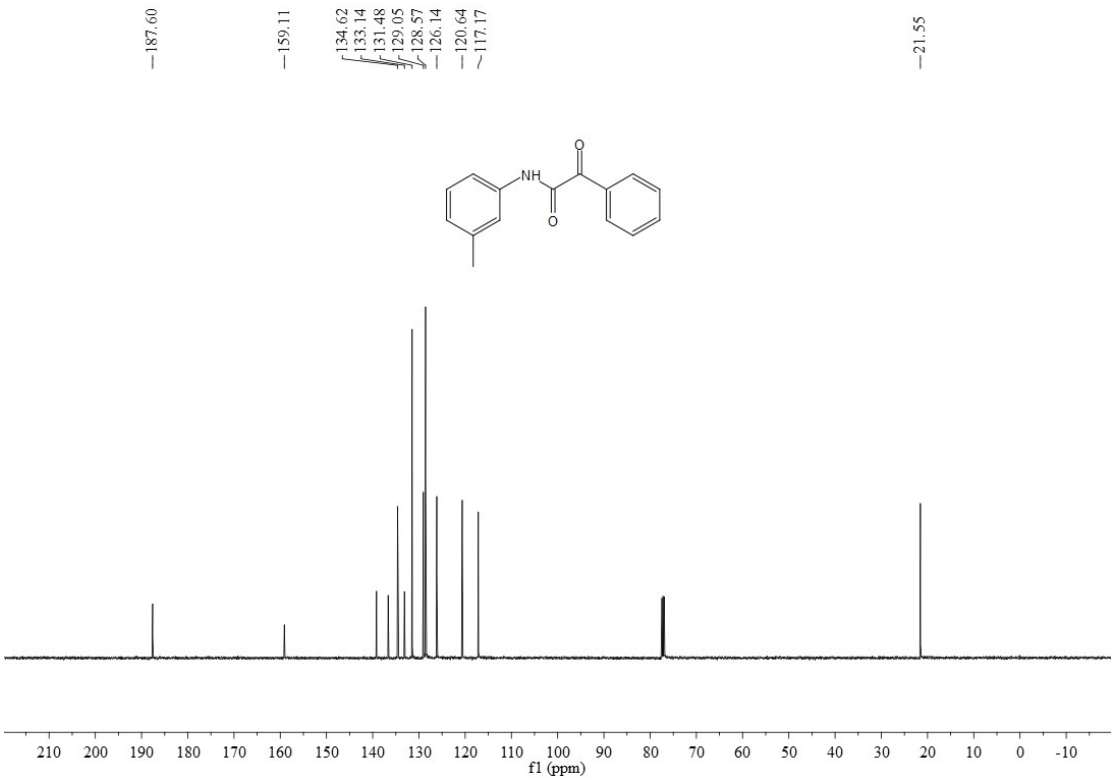


^{1}H NMR and ^{13}C NMR of *N*-(2-chlorophenyl)-2-oxo-2-phenylacetamide (3am)

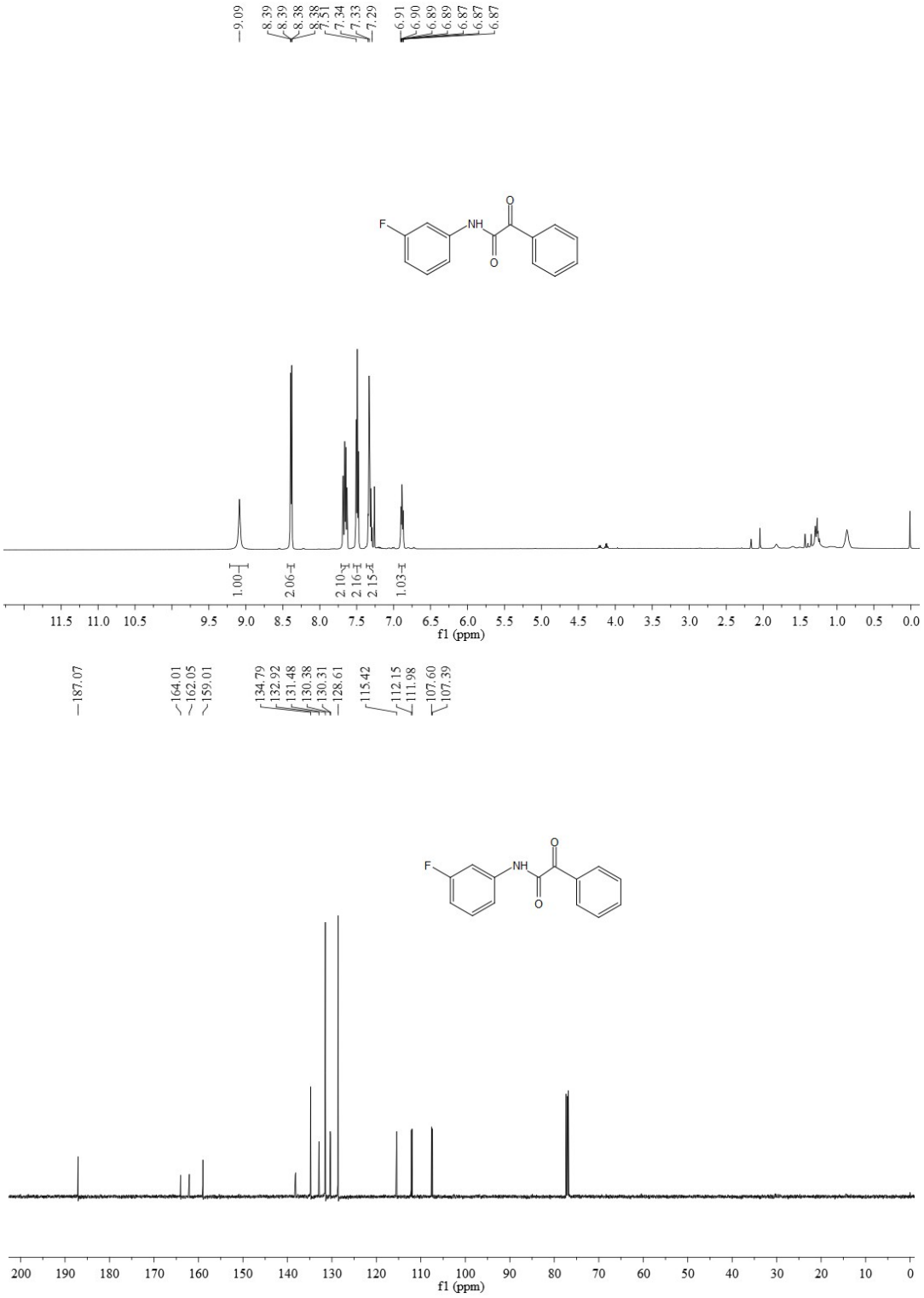


^{1}H NMR and ^{13}C NMR of 2-oxo-2-phenyl-*N*-(m-tolyl)acetamide (3an)

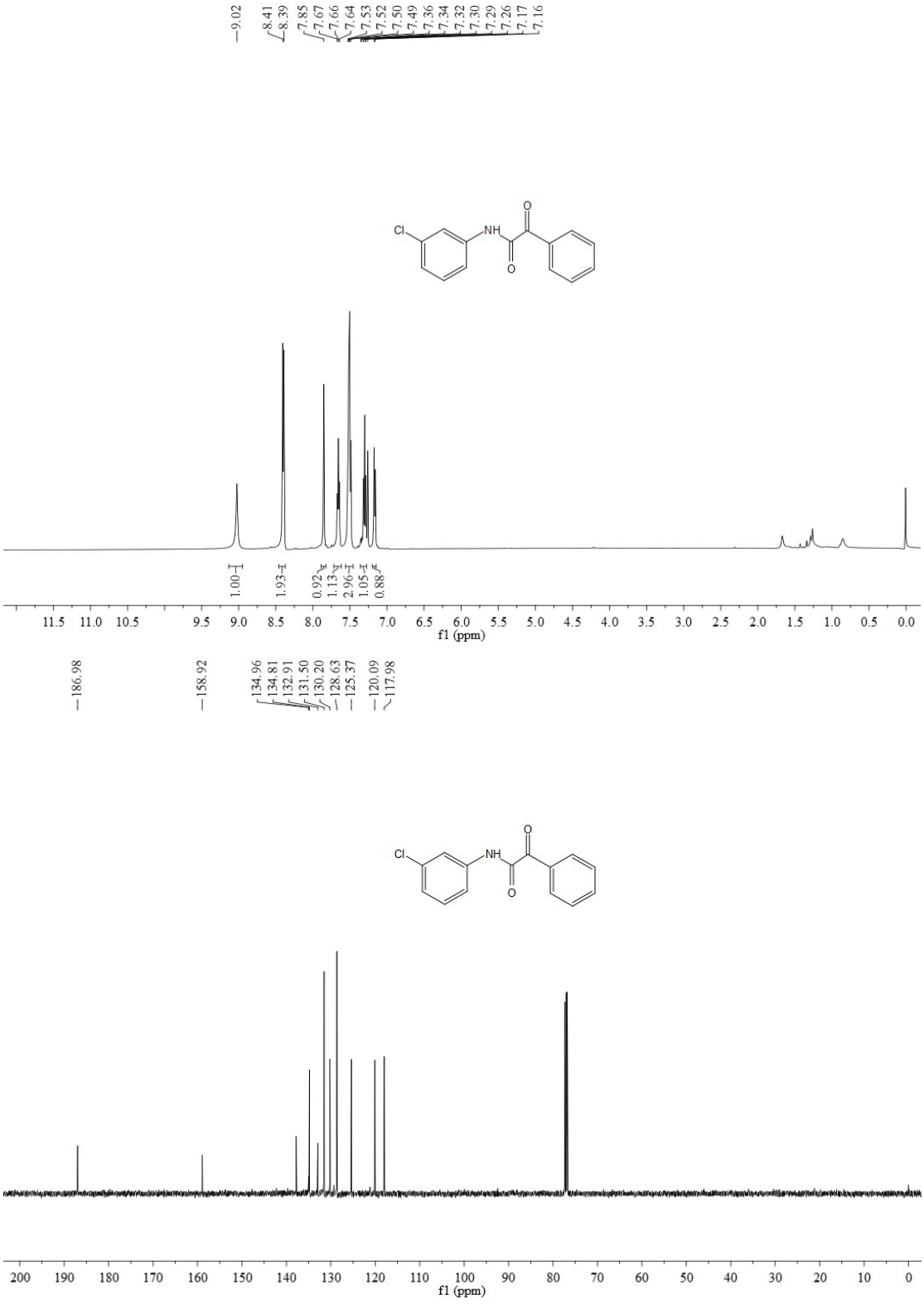




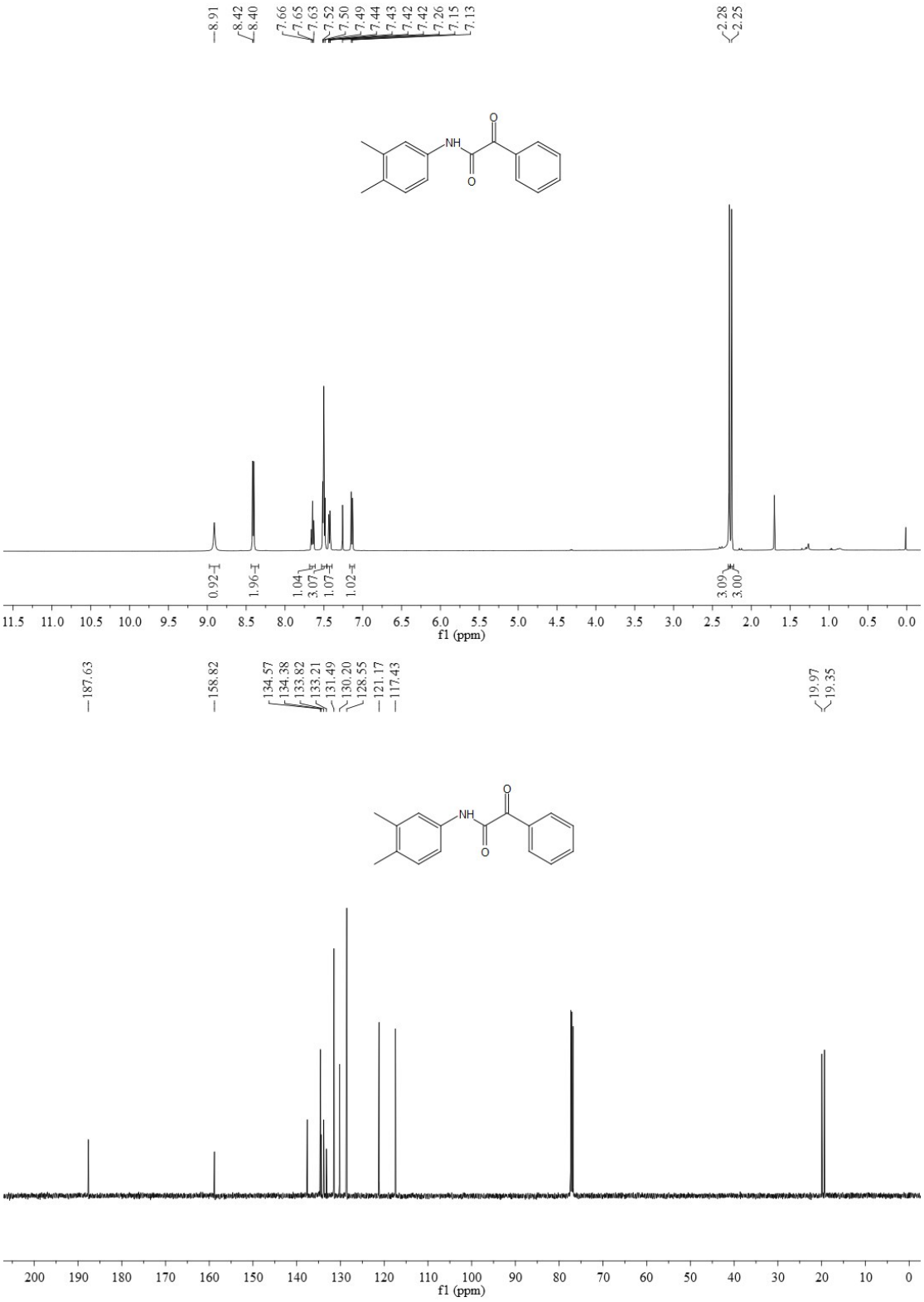
^{1}H NMR and ^{13}C NMR of *N*-(3-fluorophenyl)-2-oxo-2-phenylacetamide (3ao)



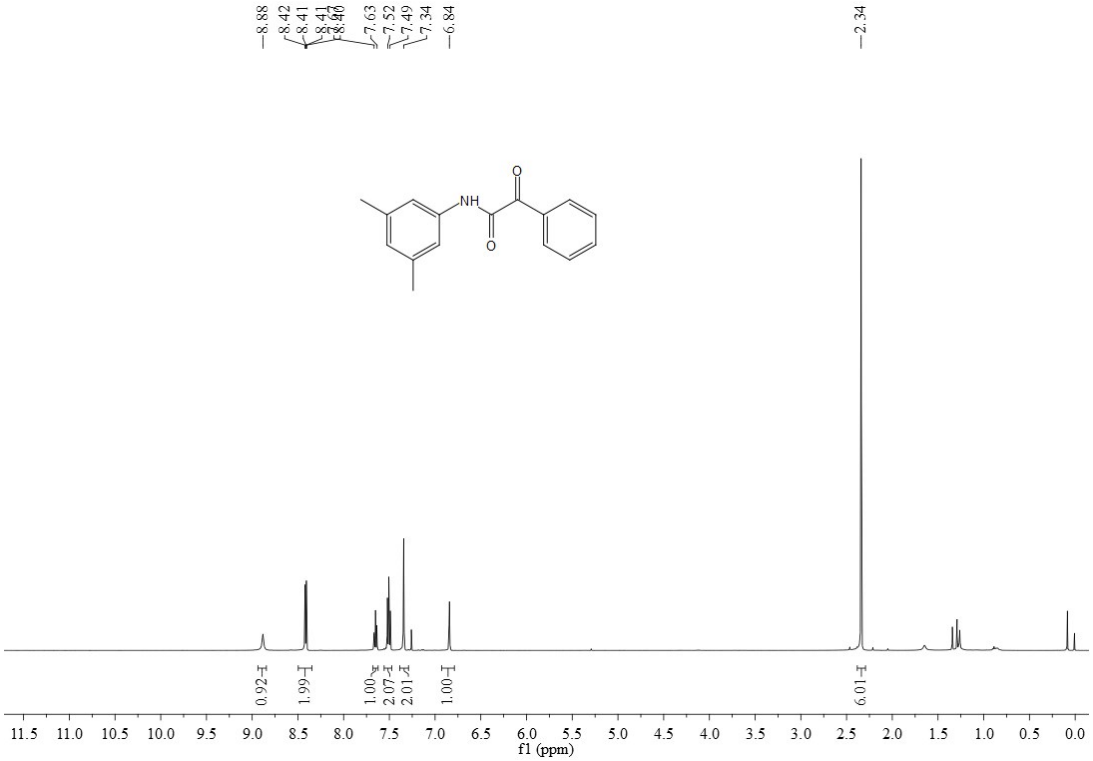
^{1}H NMR and ^{13}C NMR of *N*-(3-chlorophenyl)-2-oxo-2-phenylacetamide (3ap)

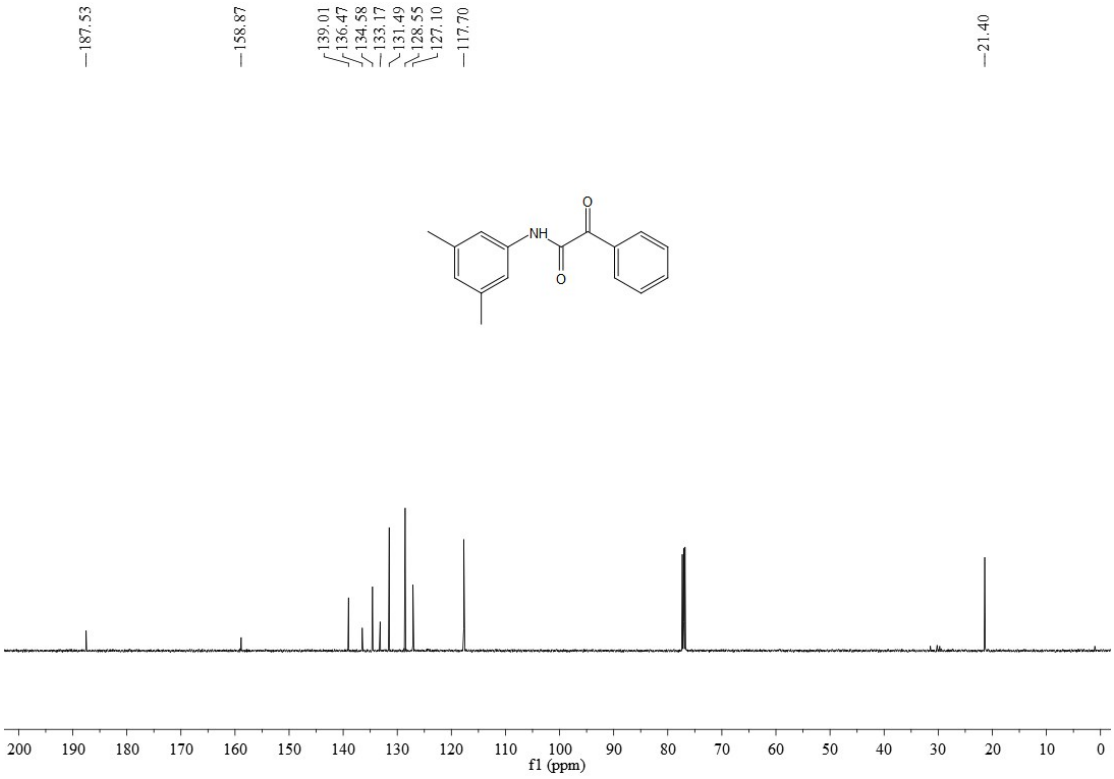


^{1}H NMR and ^{13}C NMR of *N*-(3,4-Dimethylphenyl)-2-oxo-2-phenylacetamide (3aq)

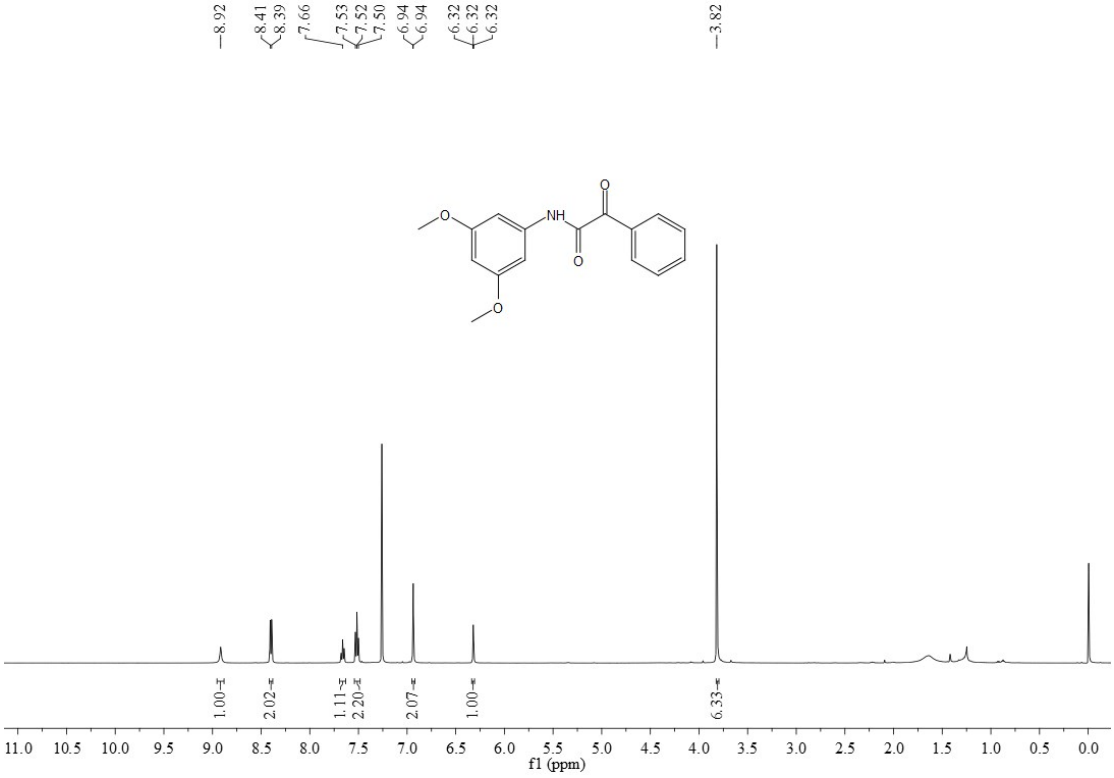


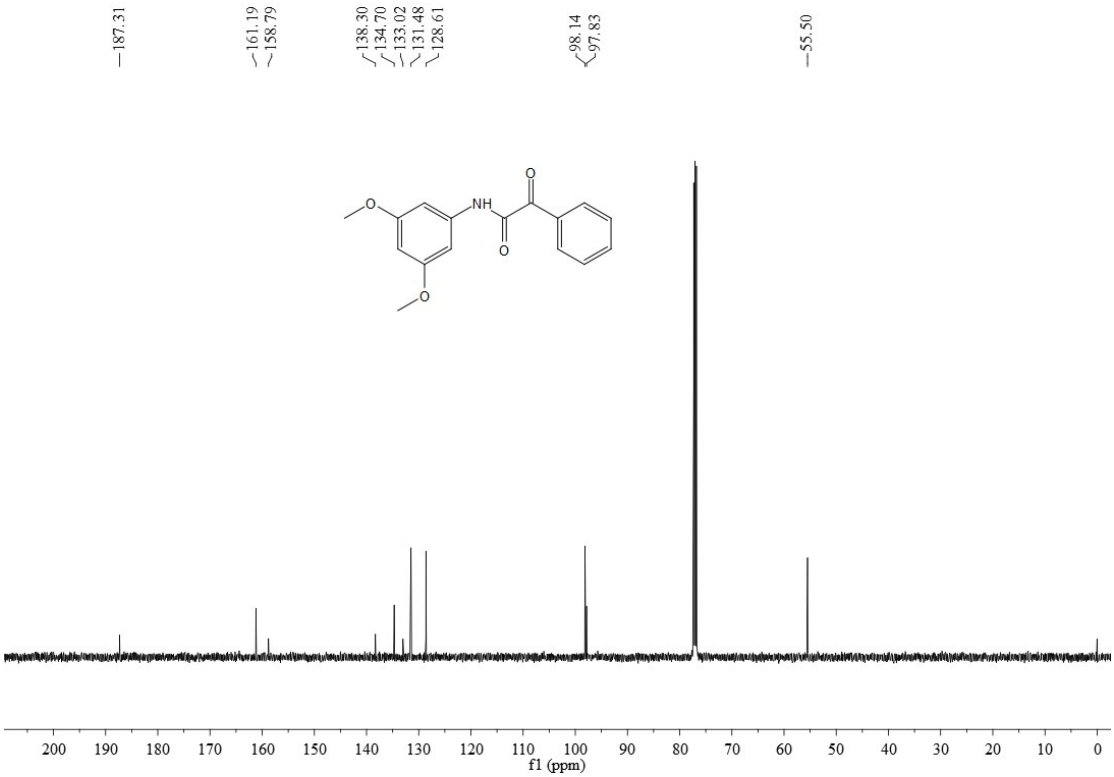
^{1}H NMR and ^{13}C NMR of *N*-(3,5-dimethylphenyl)-2-oxo-2-phenylacetamide (3ar)



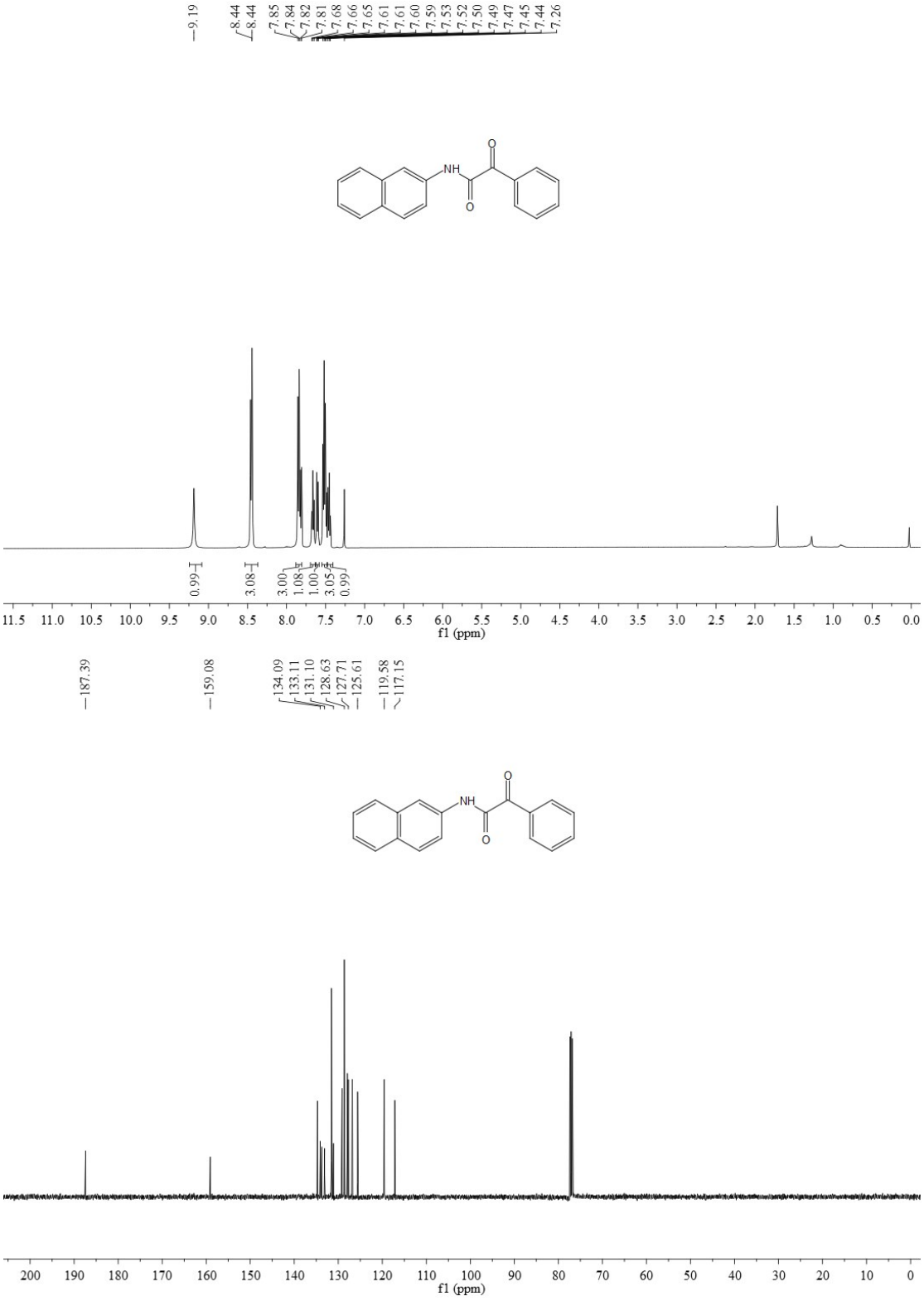


^{1}H NMR and ^{13}C NMR of *N*-(3,5-dimethoxyphenyl)-2-oxo-2-phenylacetamide (3as)

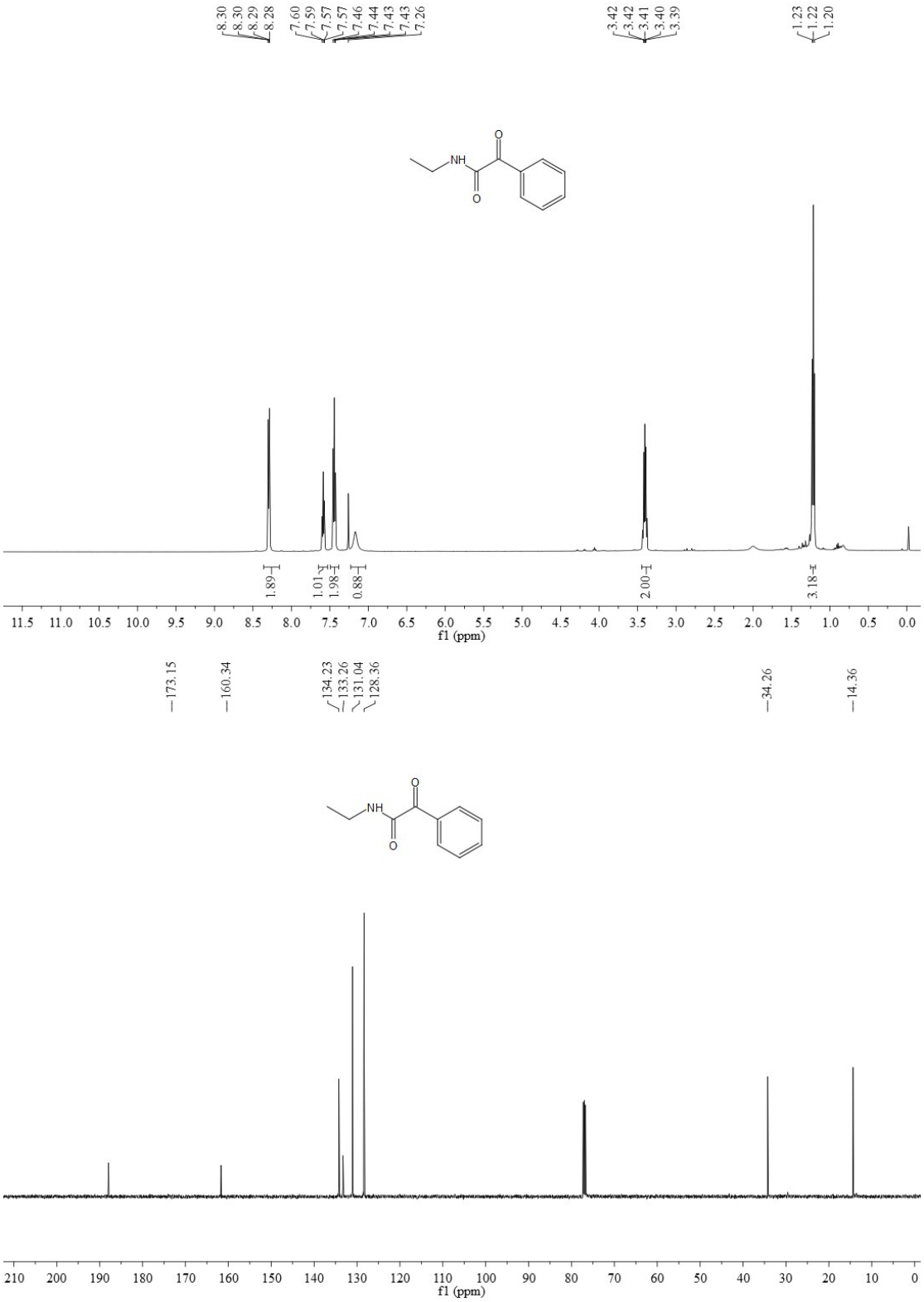




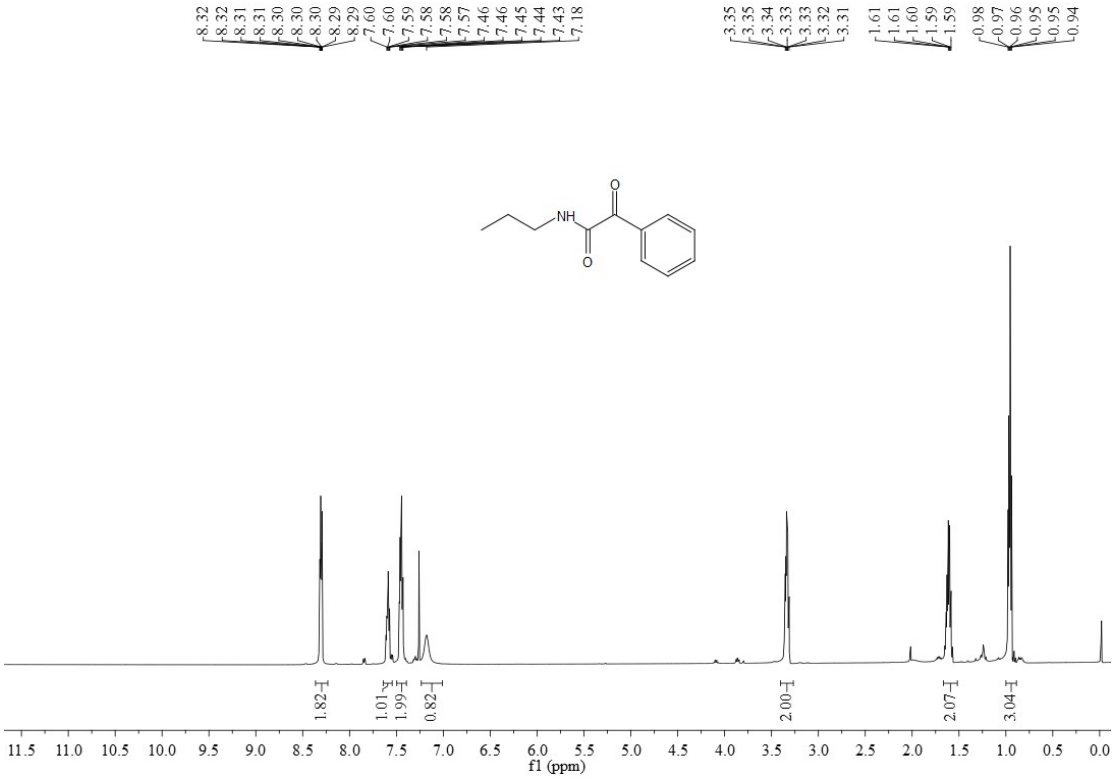
^{1}H NMR and ^{13}C NMR of *N*-(naphthalen-2-yl)-2-oxo-2-phenylacetamide (3at)

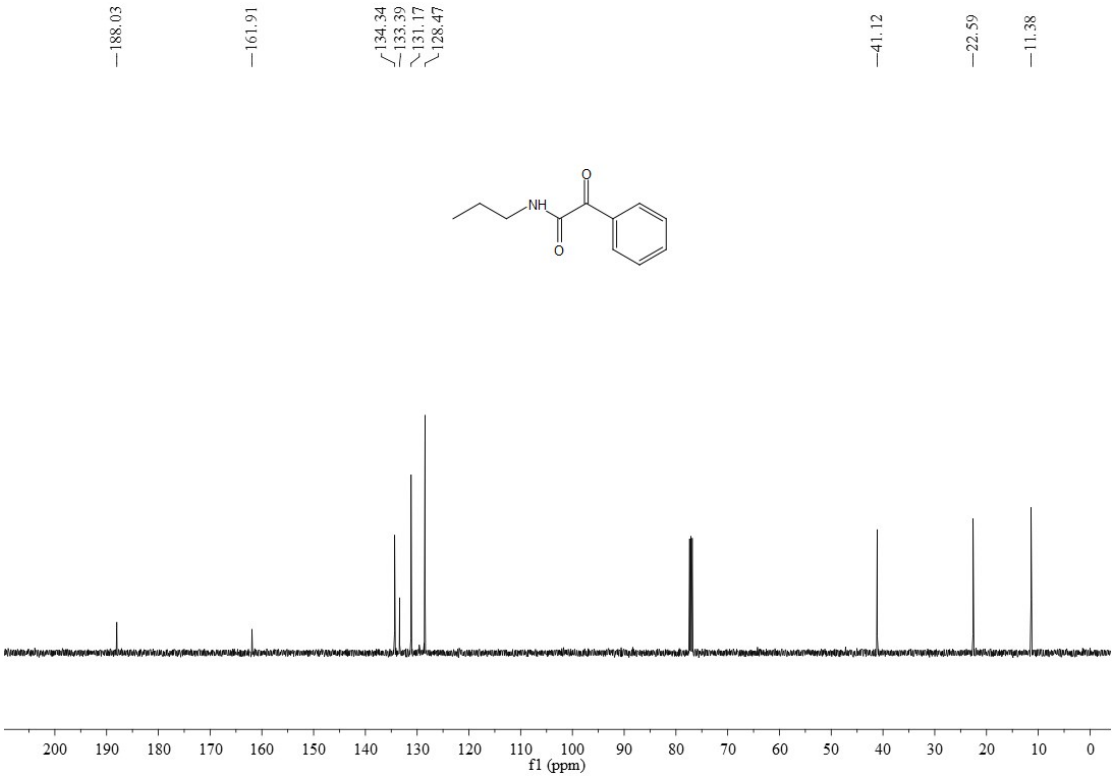


^{1}H NMR and ^{13}C NMR of *N*-ethyl-2-oxo-2-phenylacetamide (3au)

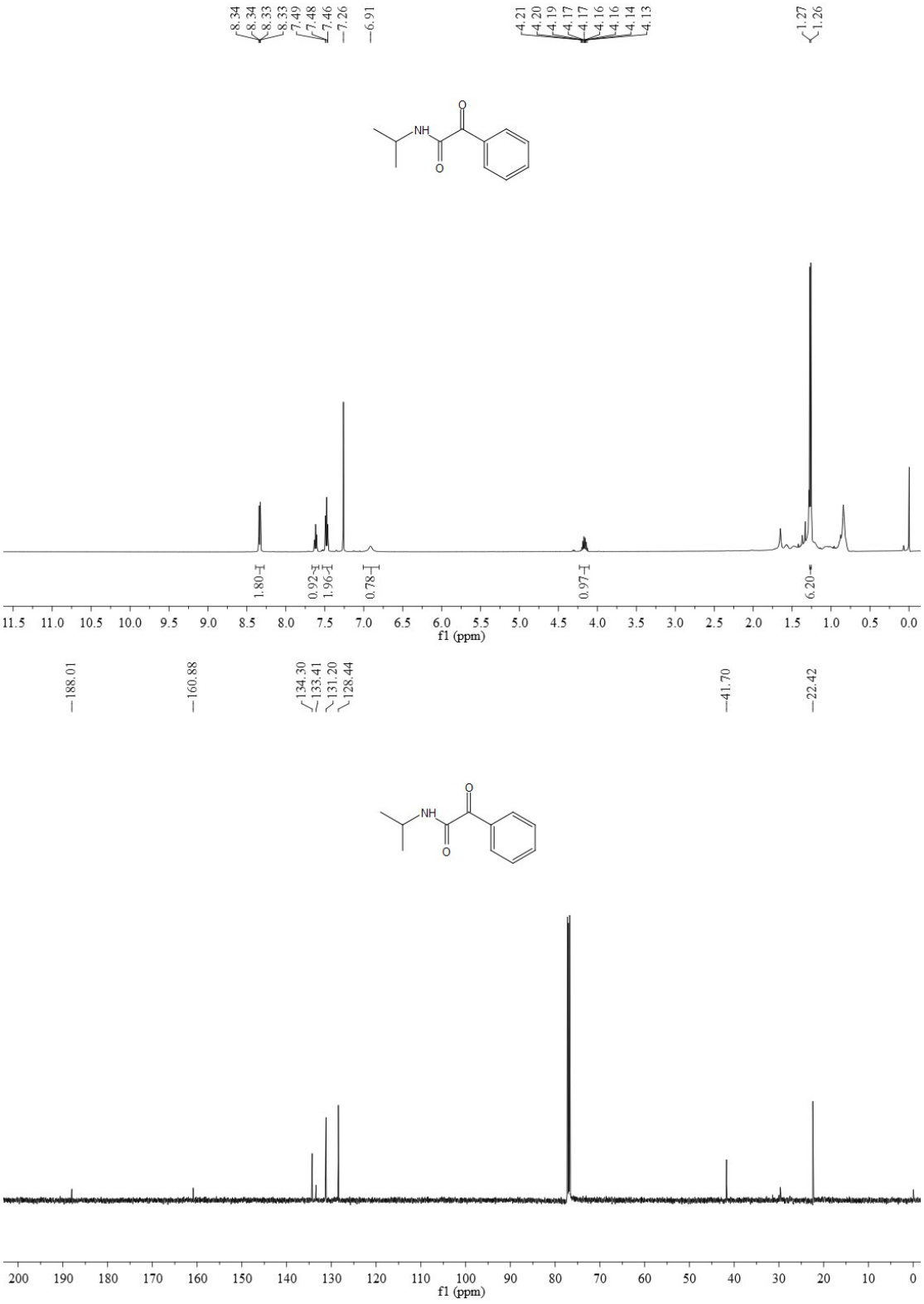


^{1}H NMR and ^{13}C NMR of 2-oxo-2-phenyl-*N*-propylacetamide (3av)

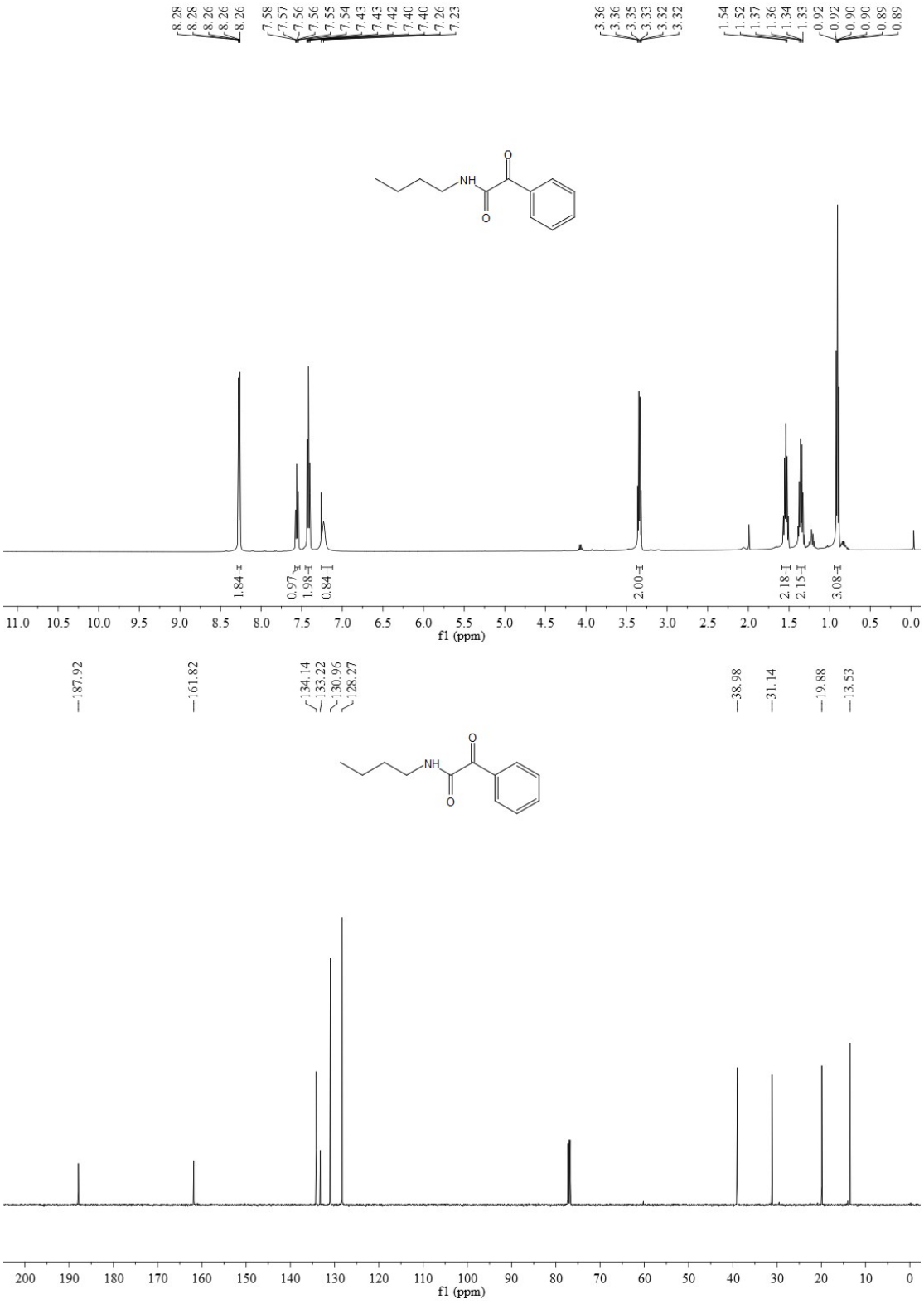




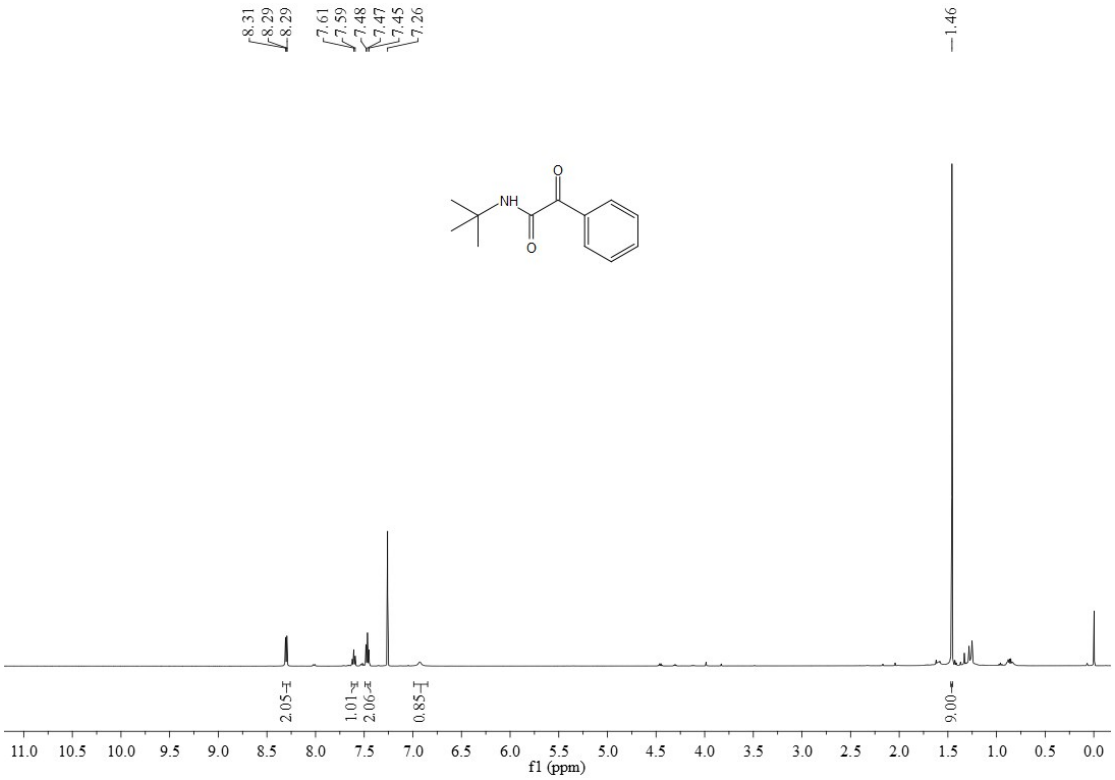
^{1}H NMR and ^{13}C NMR of *N*-isopropyl-2-oxo-2-phenylacetamide (3aw)

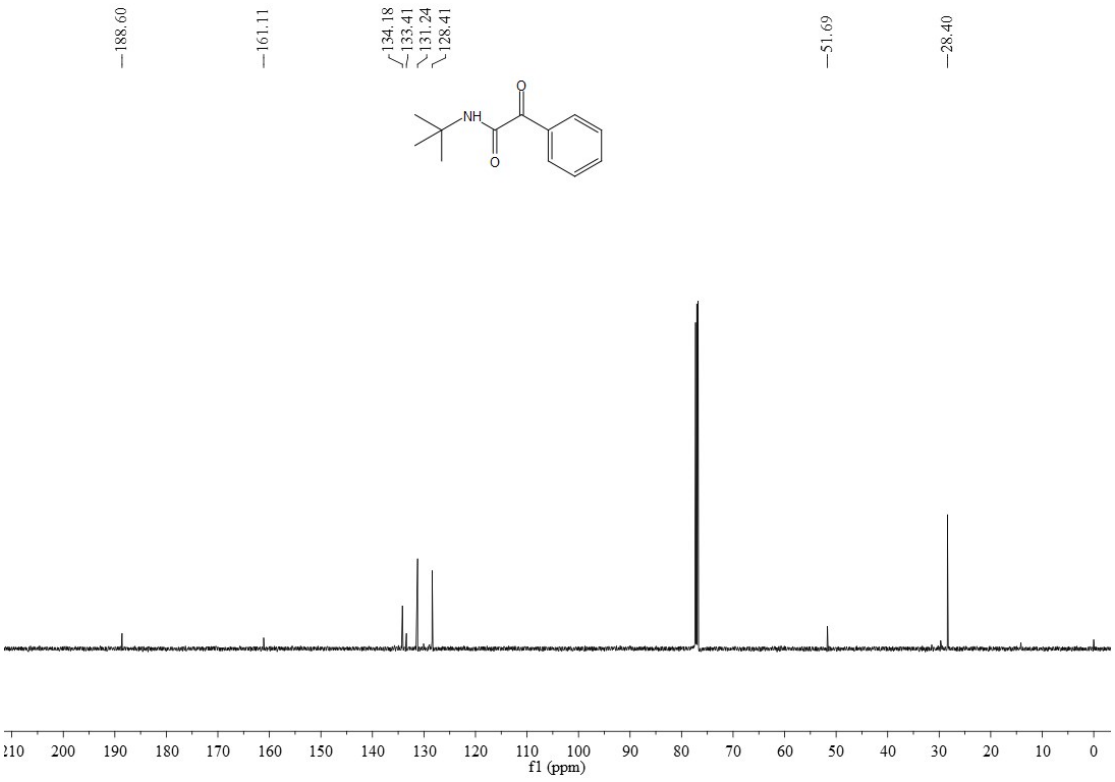


^{1}H NMR and ^{13}C NMR of *N*-butyl-2-oxo-2-phenylacetamide (3ax)

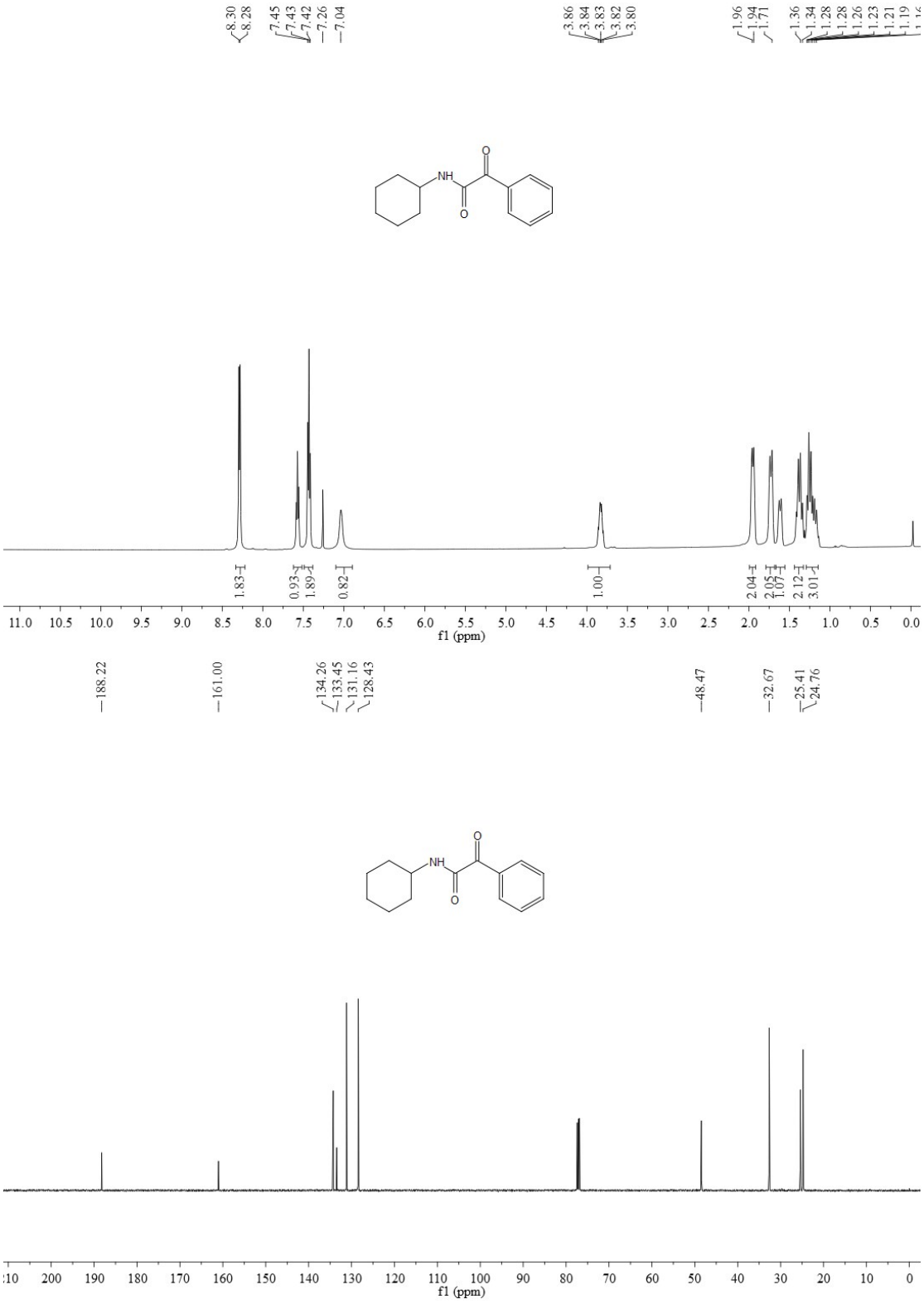


^{1}H NMR and ^{13}C NMR of *N*-(*tert*-butyl)-2-oxo-2-phenylacetamide (3ay)

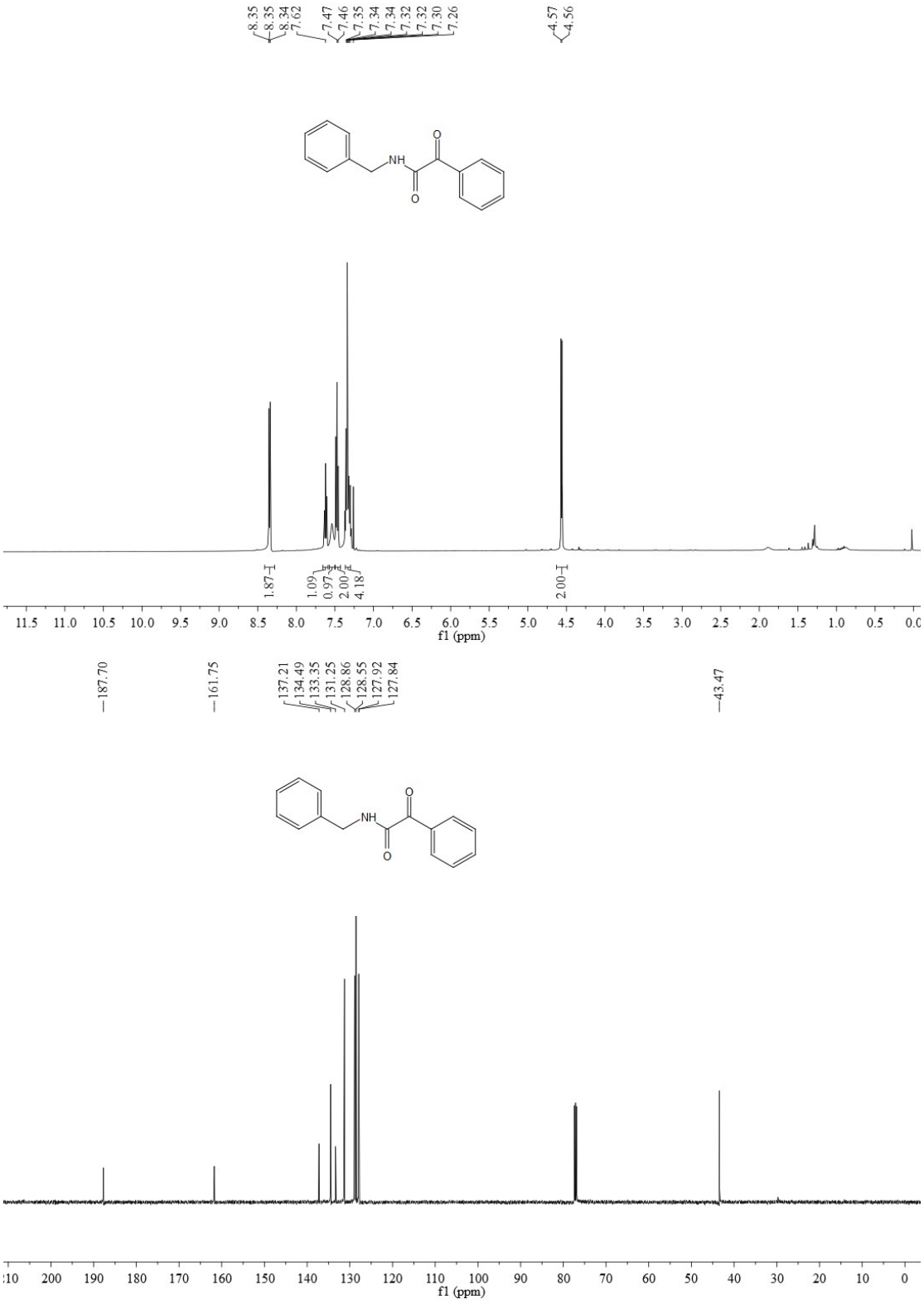




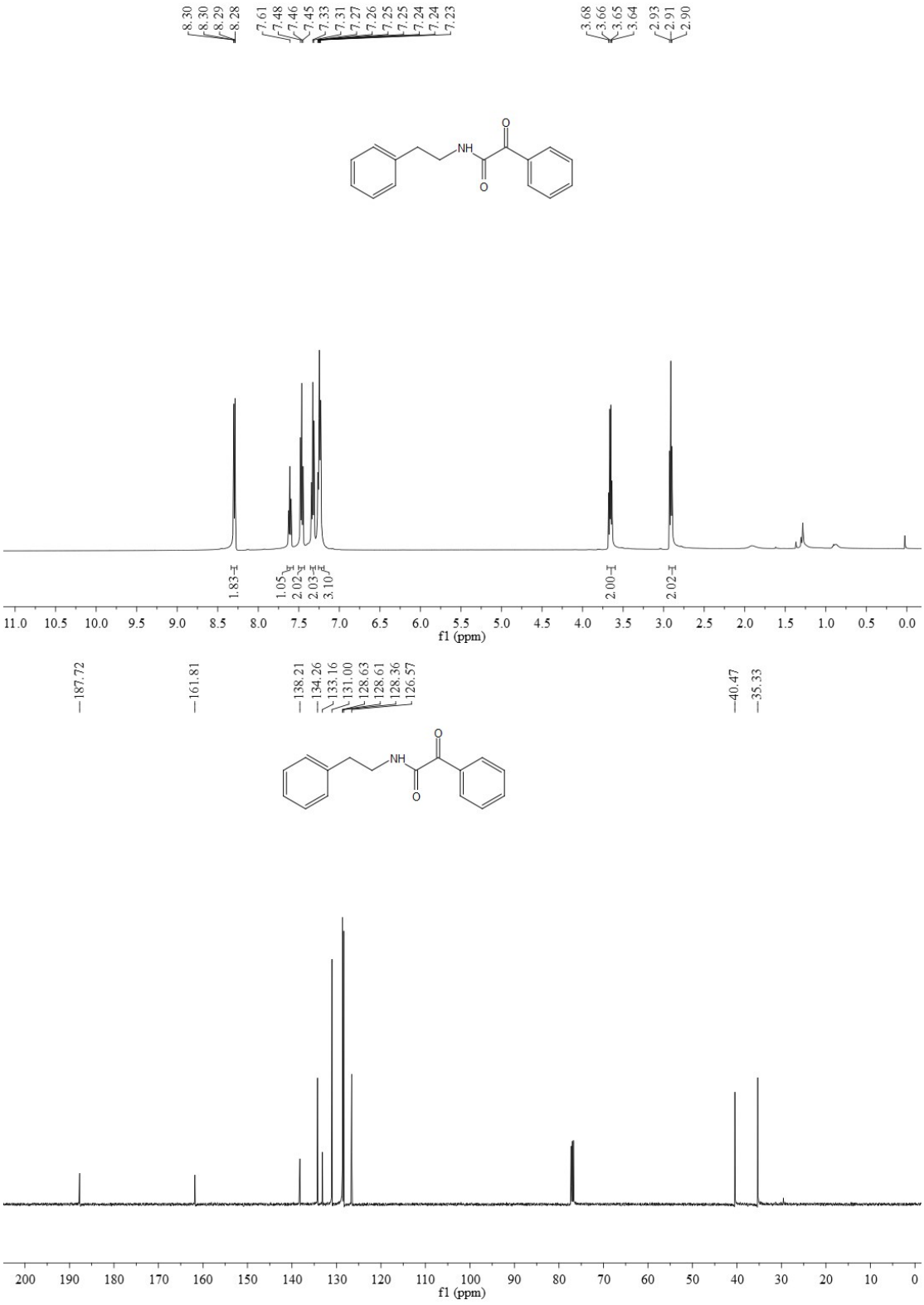
^{1}H NMR and ^{13}C NMR of *N*-cyclohexyl-2-oxo-2-phenylacetamide (3az)



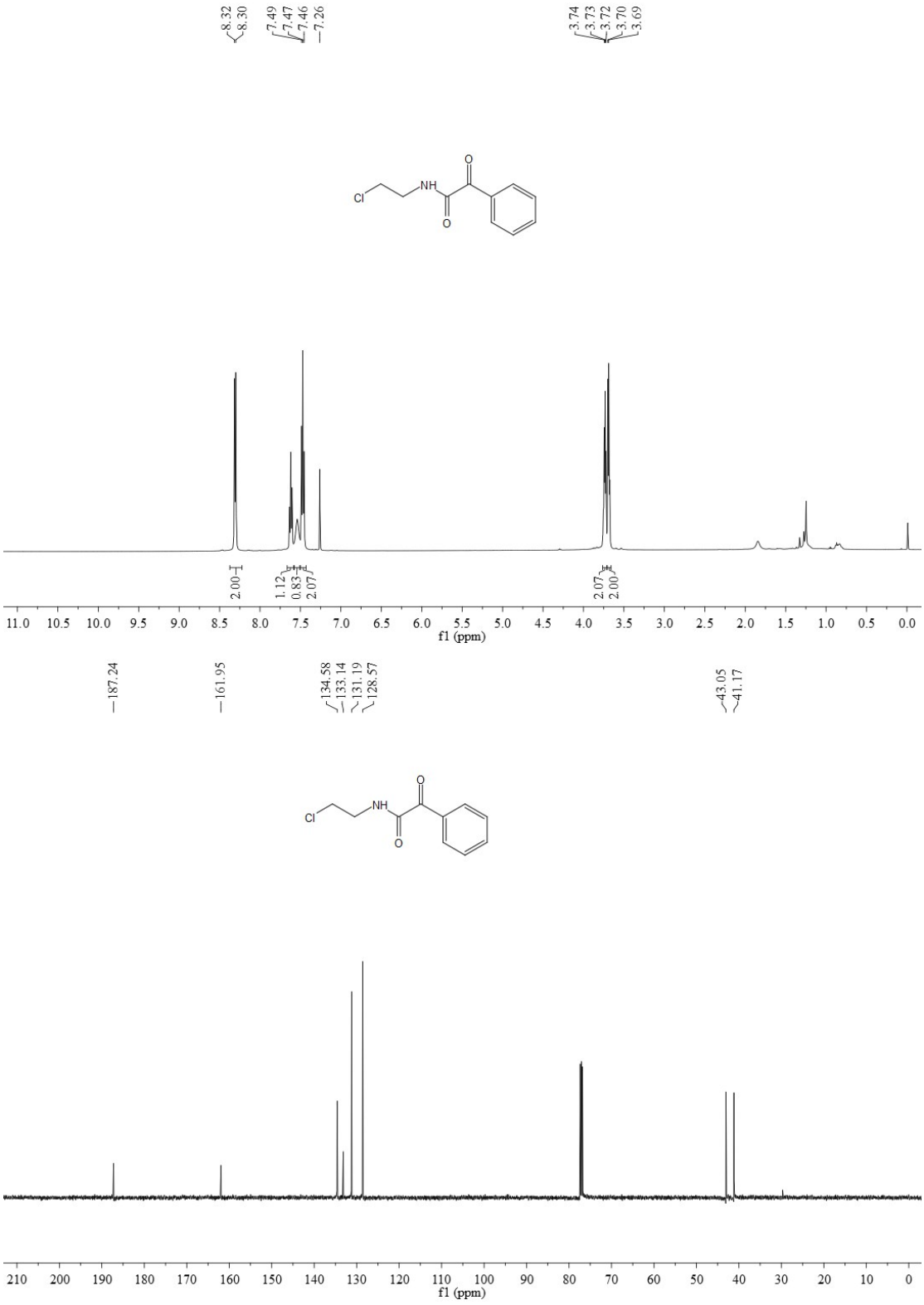
^{1}H NMR and ^{13}C NMR of *N*-benzyl-2-oxo-2-phenylacetamide (3ba)



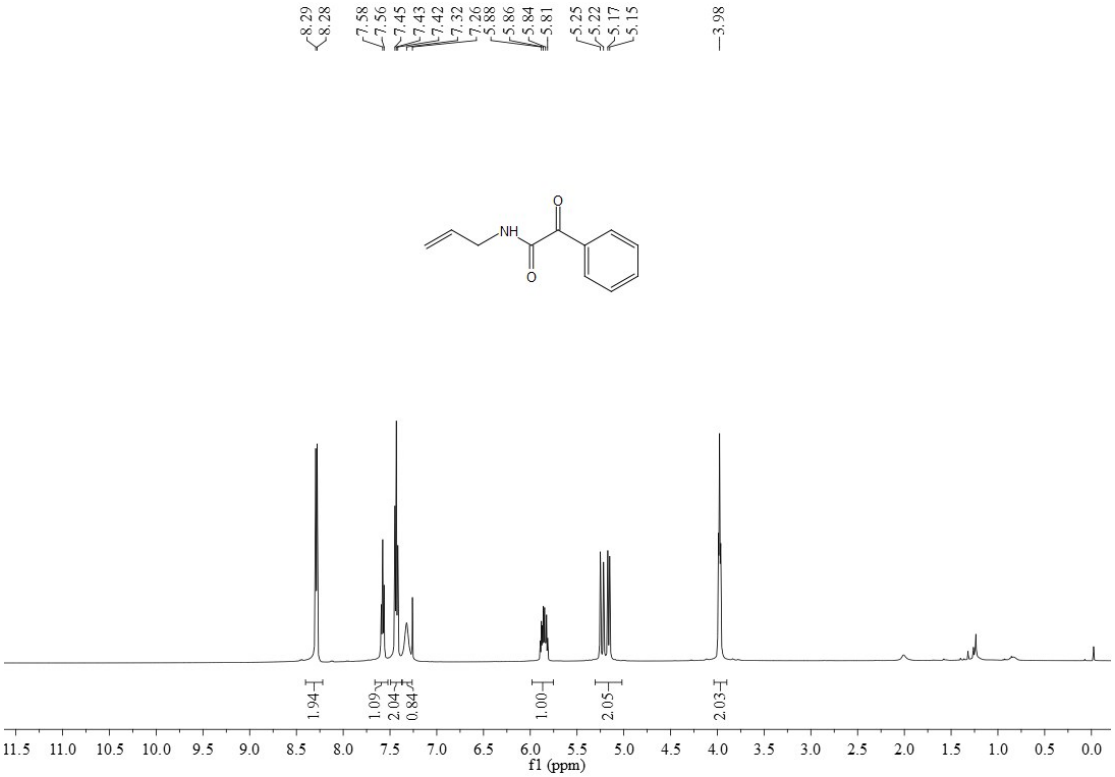
^{1}H NMR and ^{13}C NMR of 2-oxo-*N*-phenethyl-2-phenylacetamide (3bb)

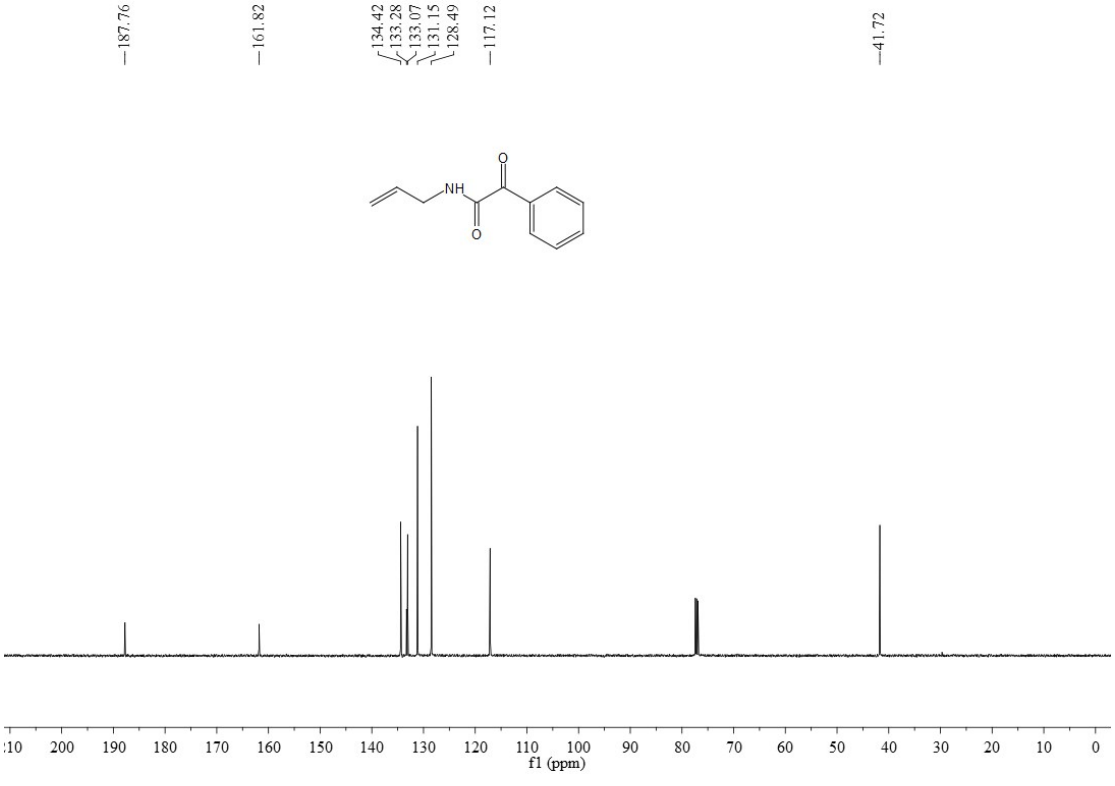


^{1}H NMR and ^{13}C NMR of *N*-(2-chloroethyl)-2-oxo-2-phenylacetamide (3bc)

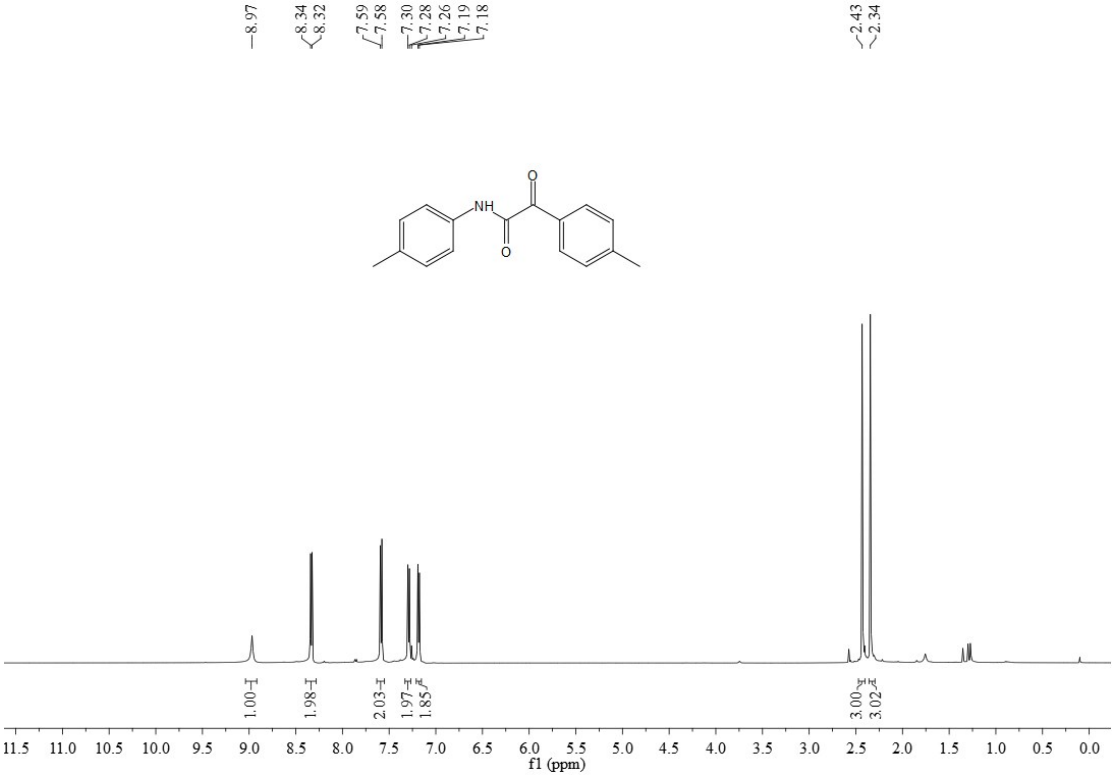


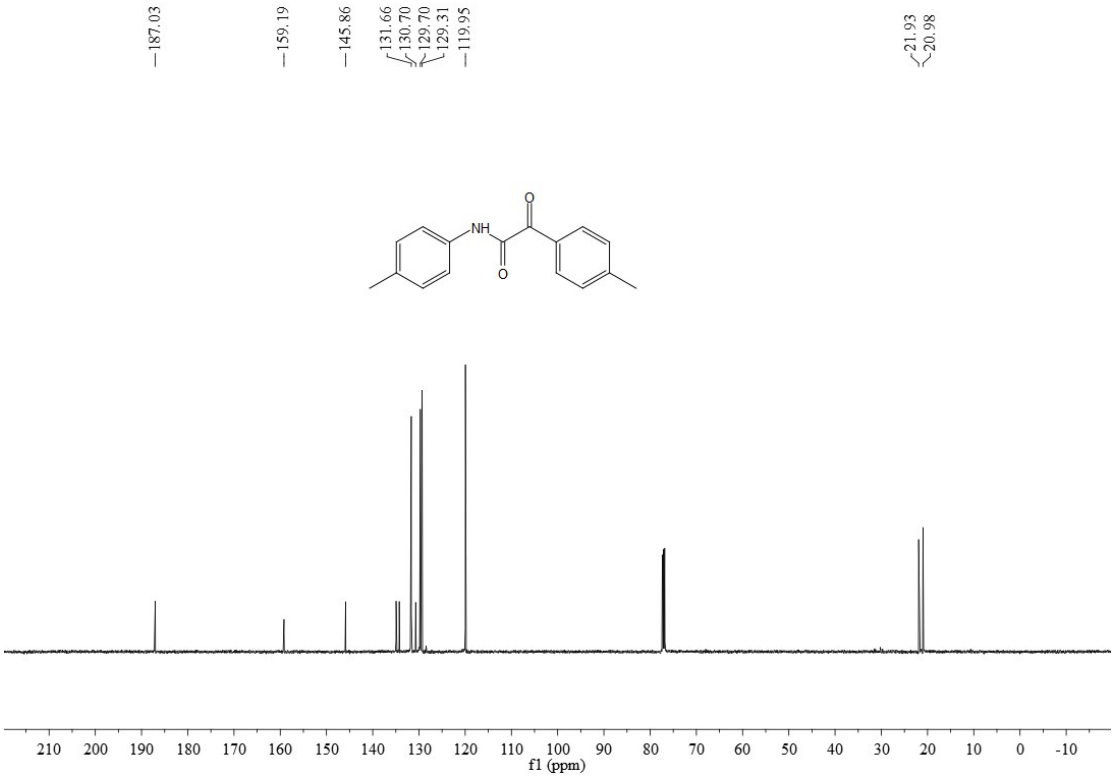
^{1}H NMR and ^{13}C NMR of *N*-allyl-2-oxo-2-phenylacetamide (3bd)



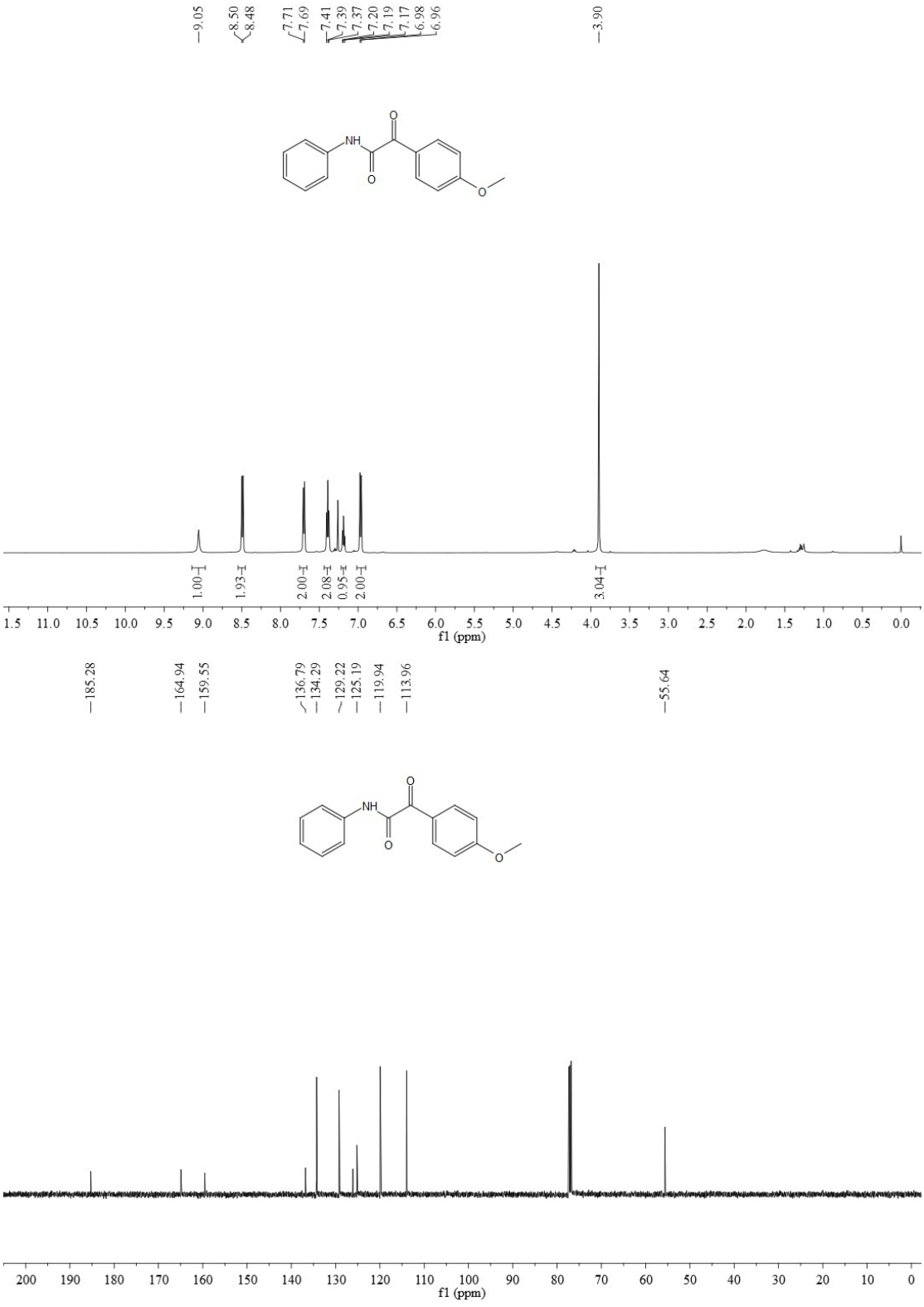


^{1}H NMR and ^{13}C NMR of 2-oxo-*N*,2-di-*p*-tolylacetamide (3be)

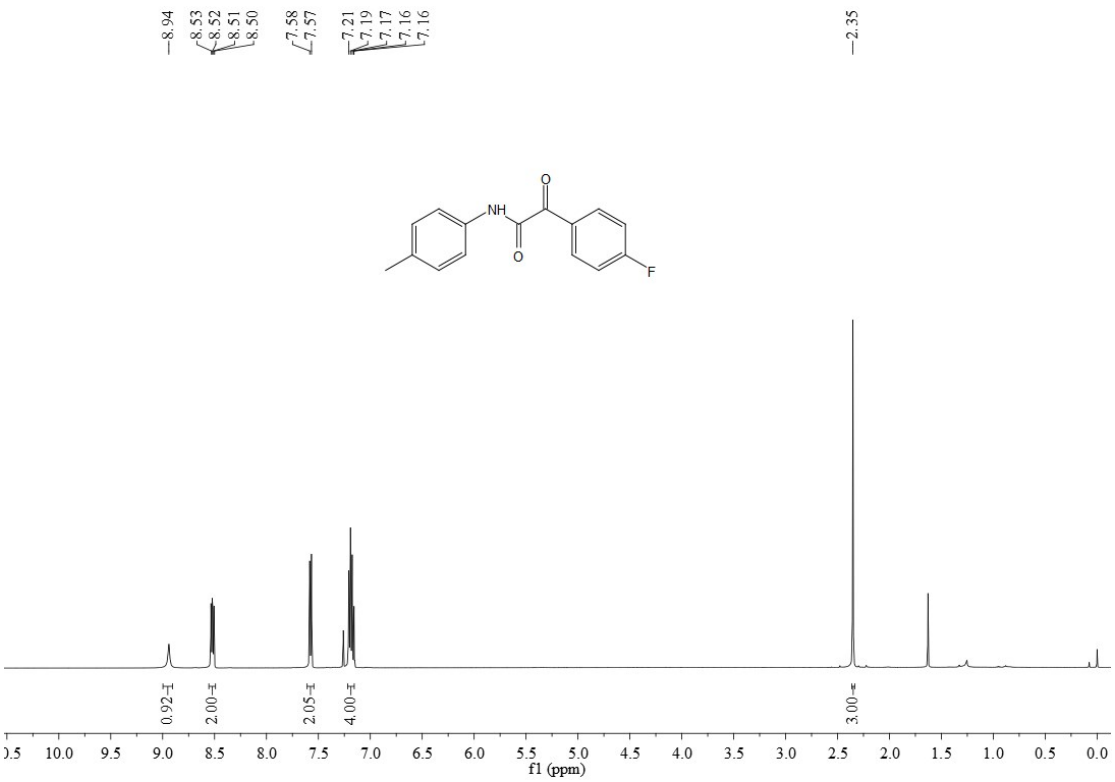


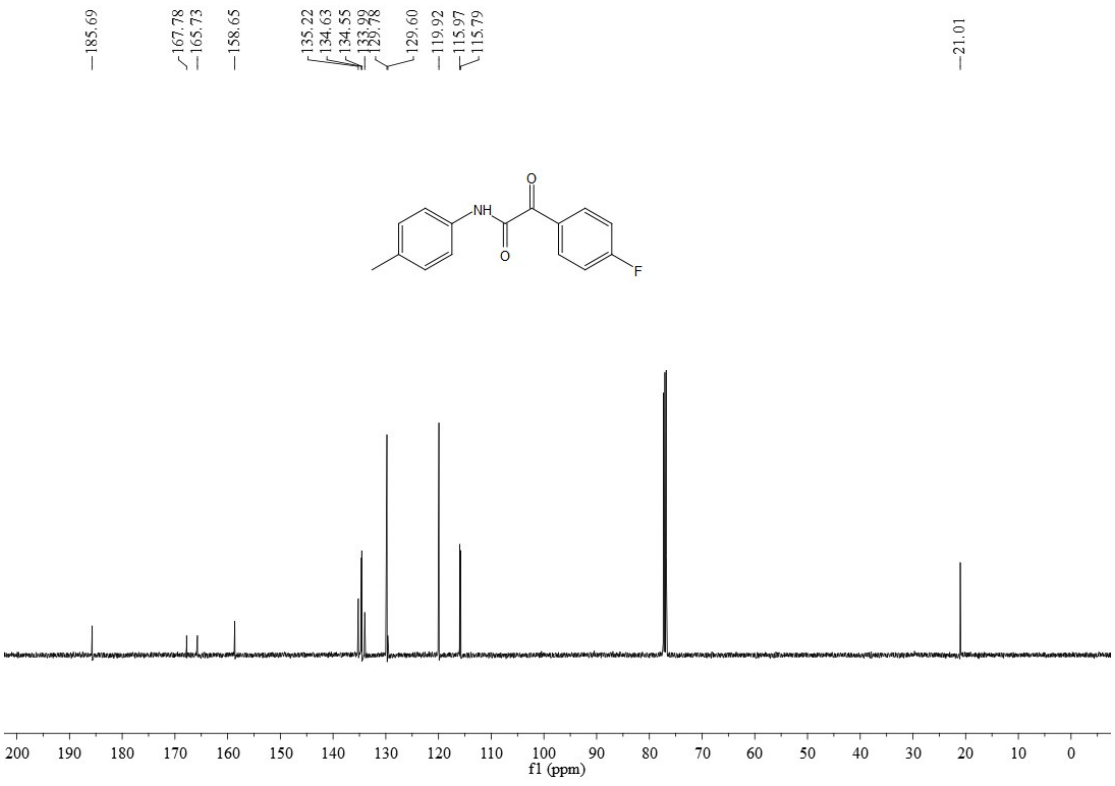


^{1}H NMR and ^{13}C NMR of 2-(4-methoxyphenyl)-2-oxo-*N*-phenylacetamide (3bf)

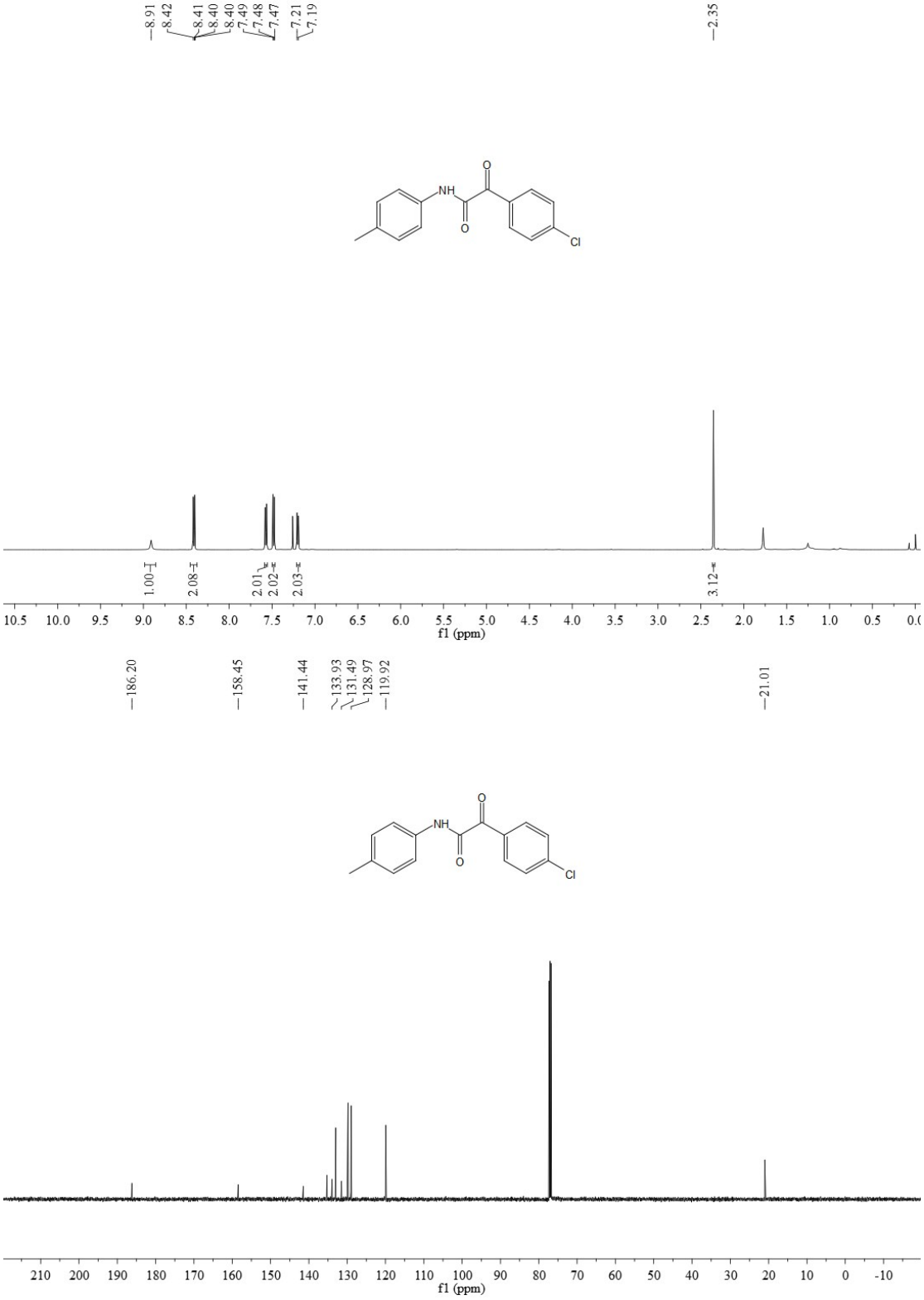


^{1}H NMR and ^{13}C NMR of 2-(4-fluorophenyl)-2-oxo-N-(p-tolyl)acetamide (3bg)

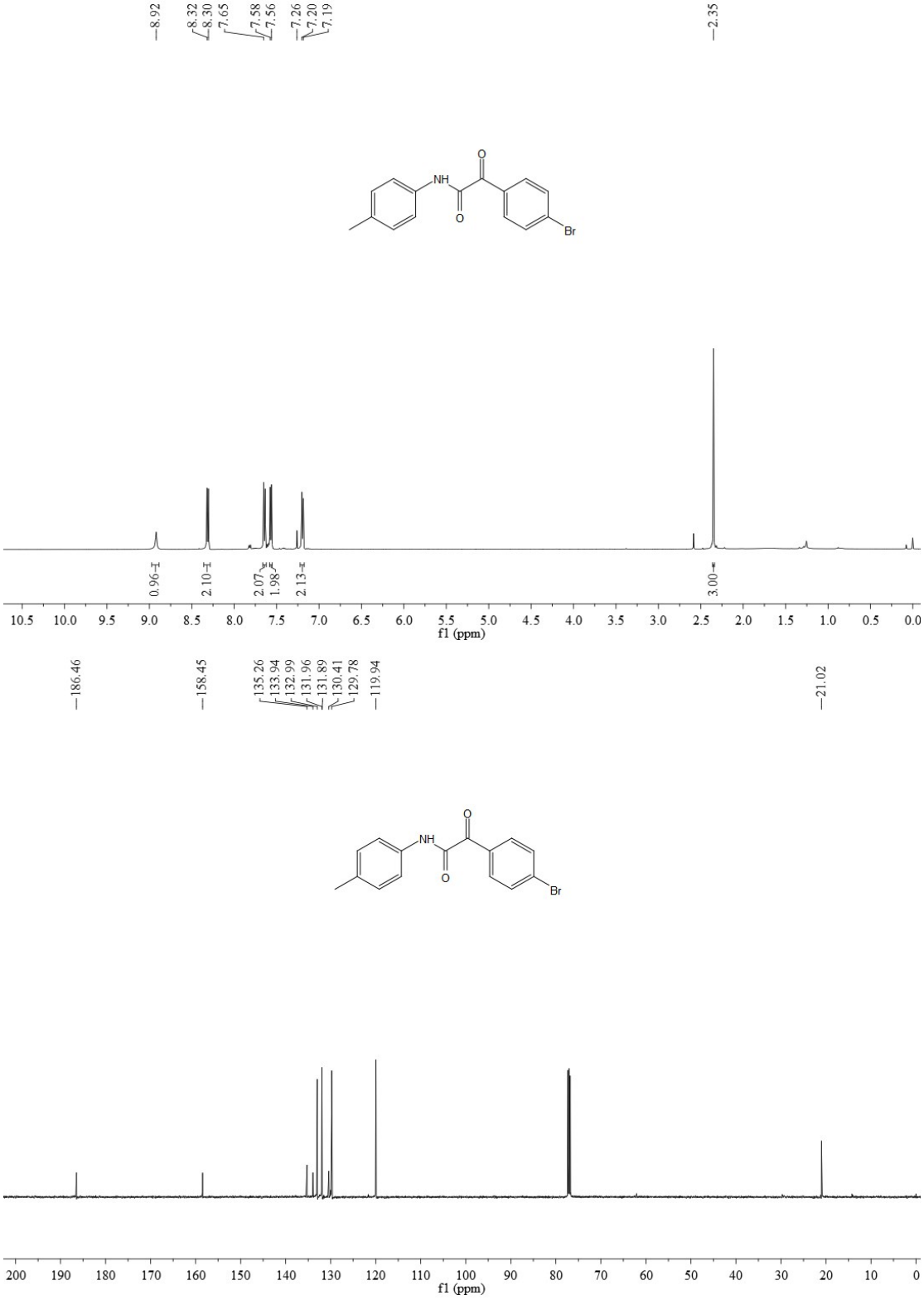




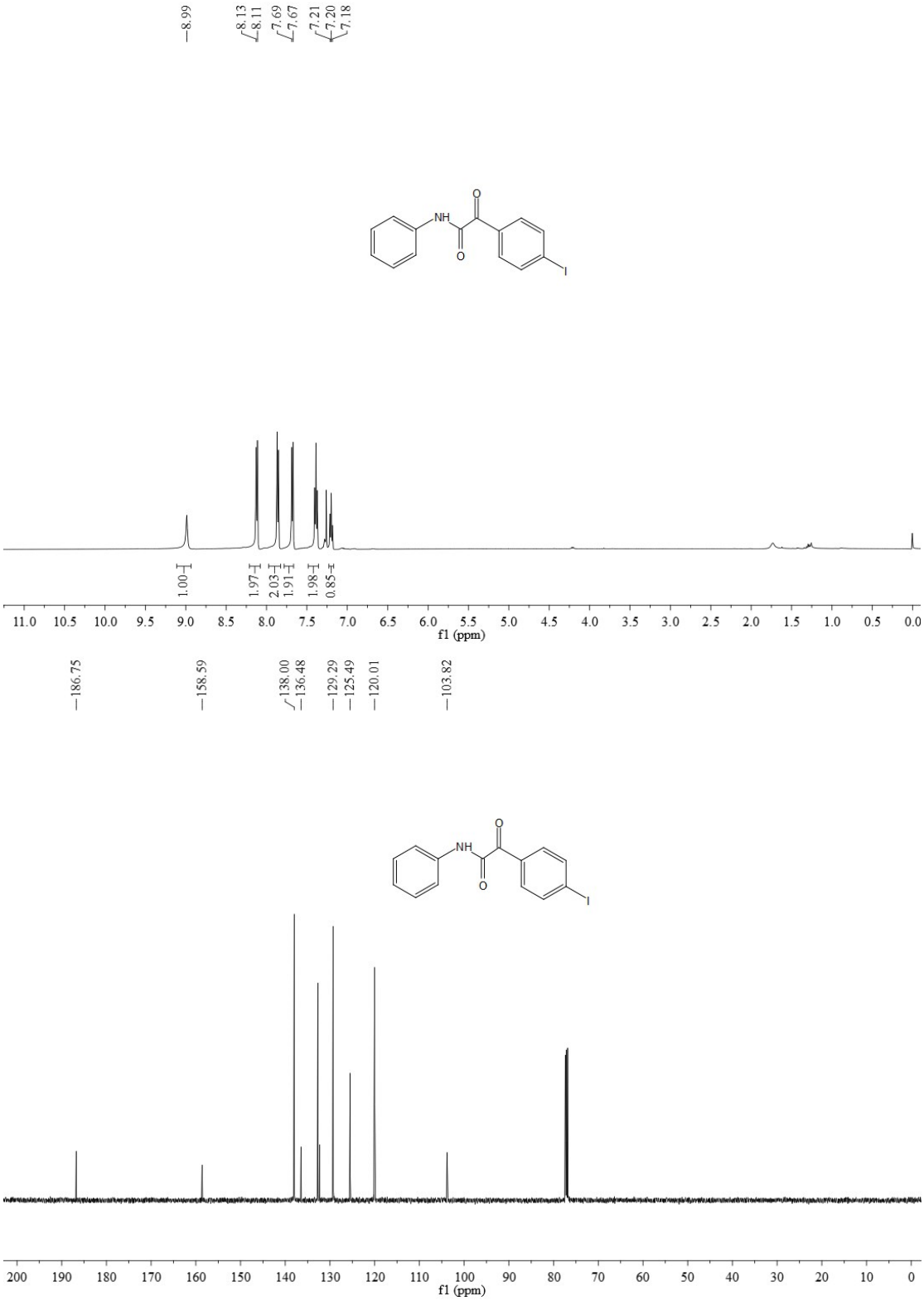
^{1}H NMR and ^{13}C NMR of 2-(4-chlorophenyl)-2-oxo-*N*-(p-tolyl)acetamide (3bh)



^{1}H NMR and ^{13}C NMR of 2-(4-bromophenyl)-2-oxo-N-(p-tolyl)acetamide (3bi)

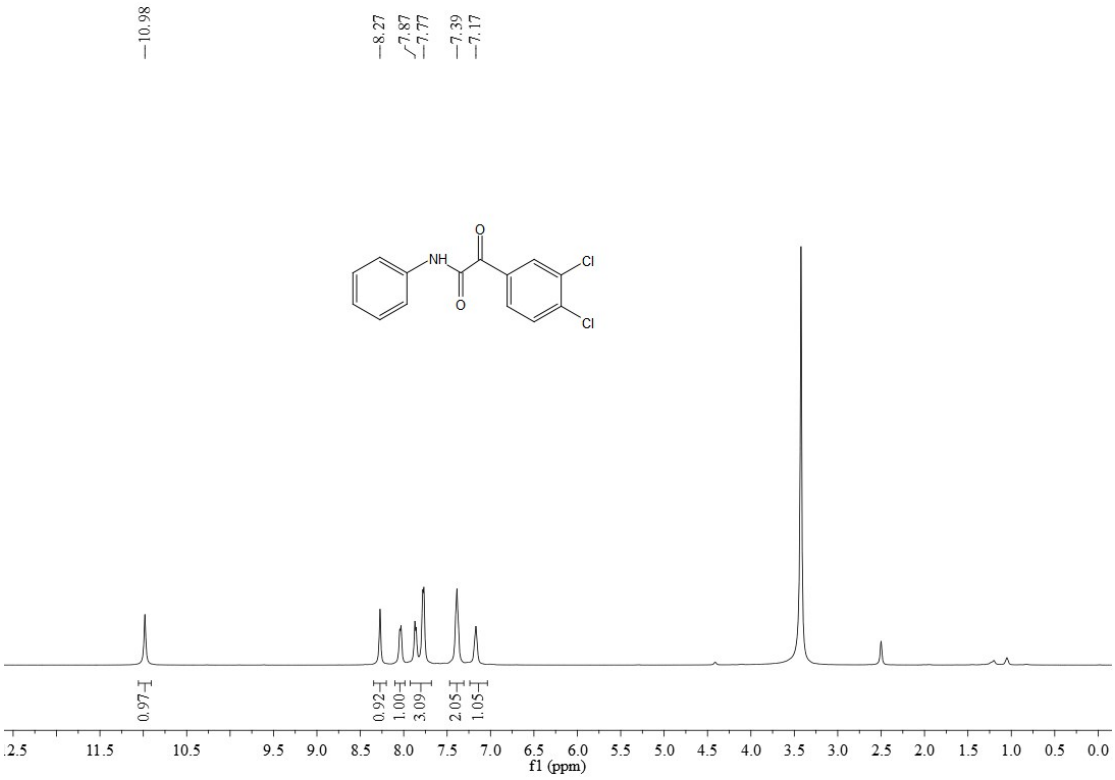


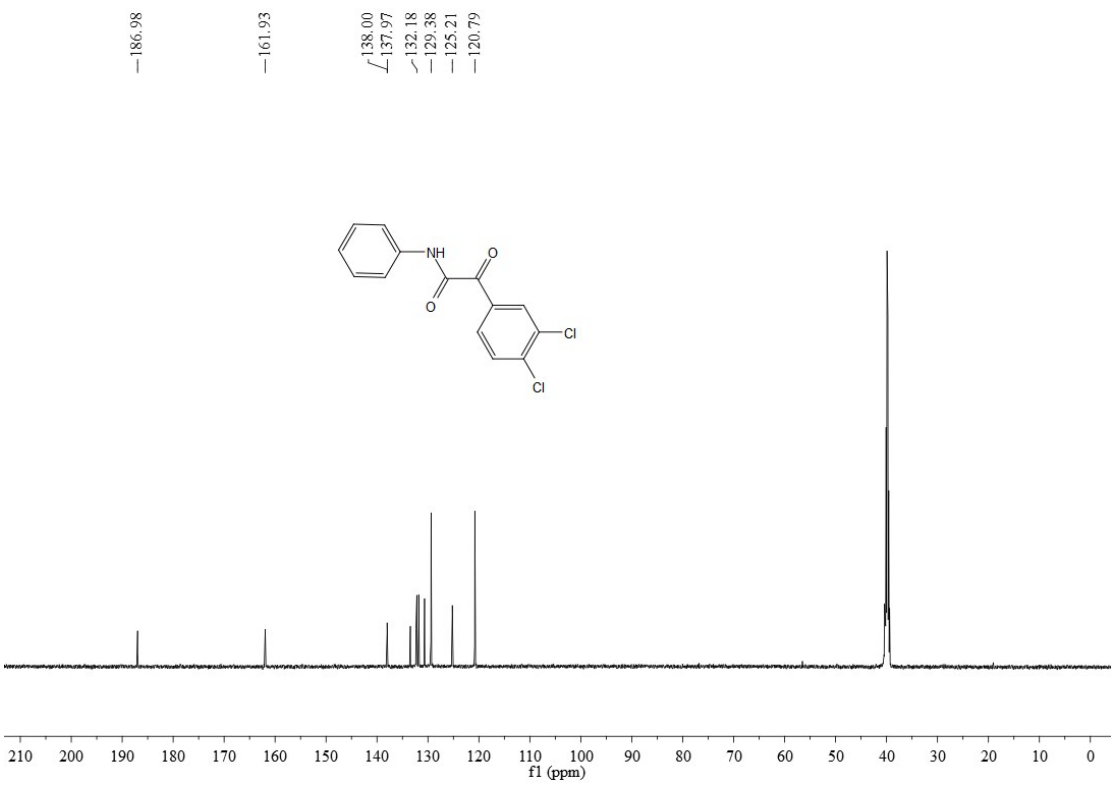
^{1}H NMR and ^{13}C NMR of 2-(4-iodophenyl)-2-oxo-*N*-phenylacetamide (3bj)



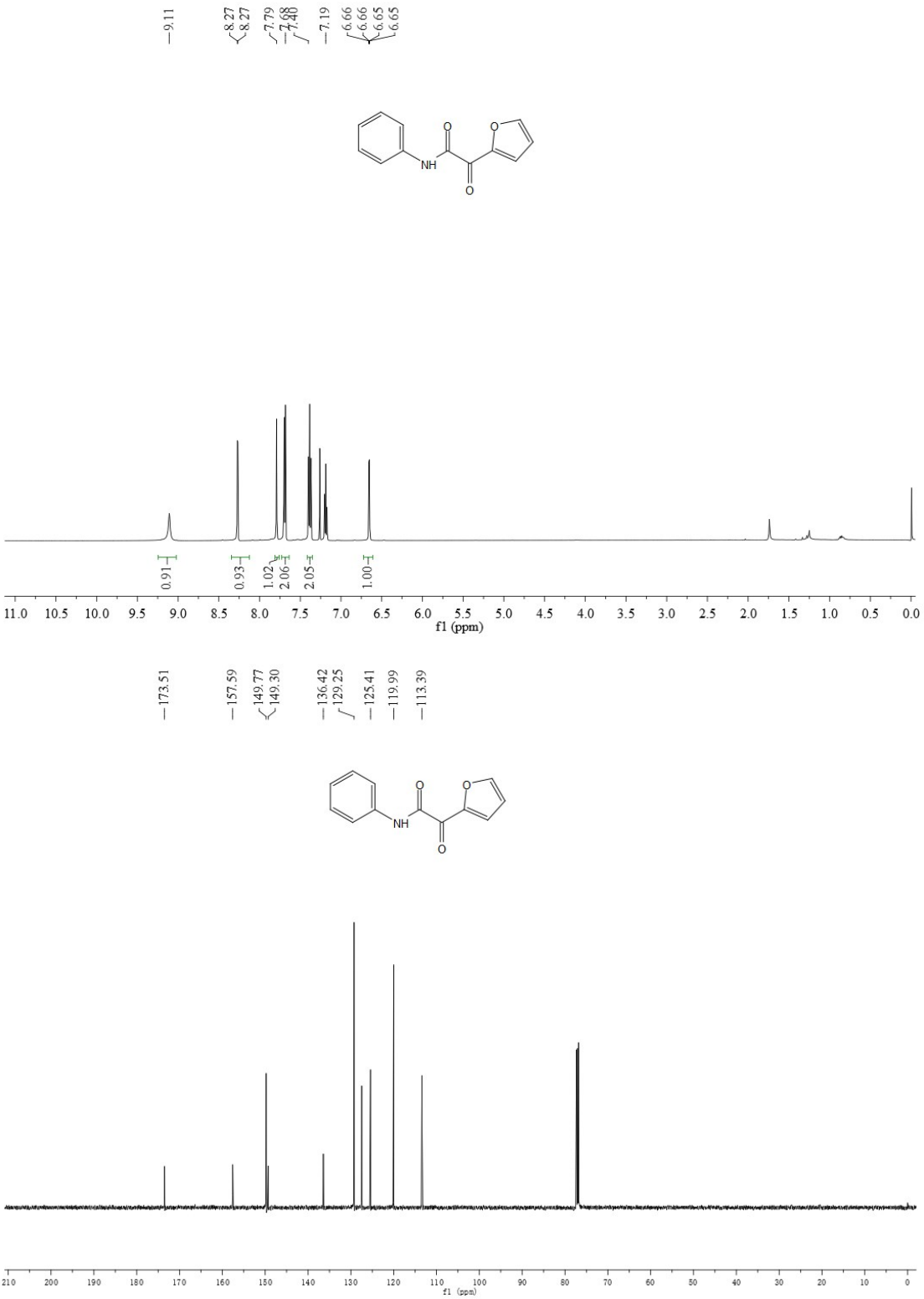
^{1}H NMR and ^{13}C NMR of 2-oxo-N-phenyl-2-(4-(trifluoromethyl)phenyl)acetamide (3bk)

^{1}H NMR and ^{13}C NMR of 2-(3,4-dichlorophenyl)-2-oxo-*N*-phenylacetamide (3bl)

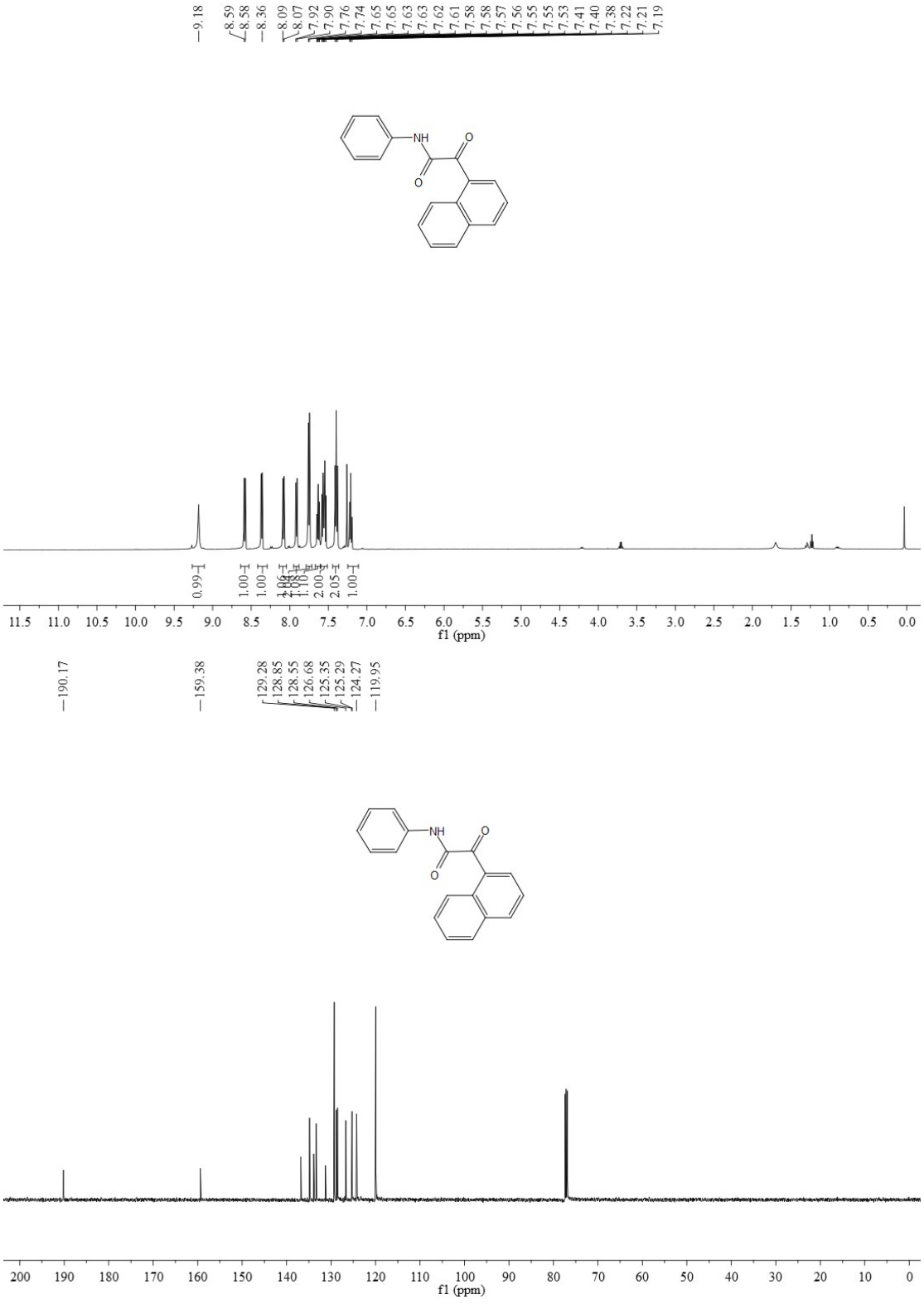




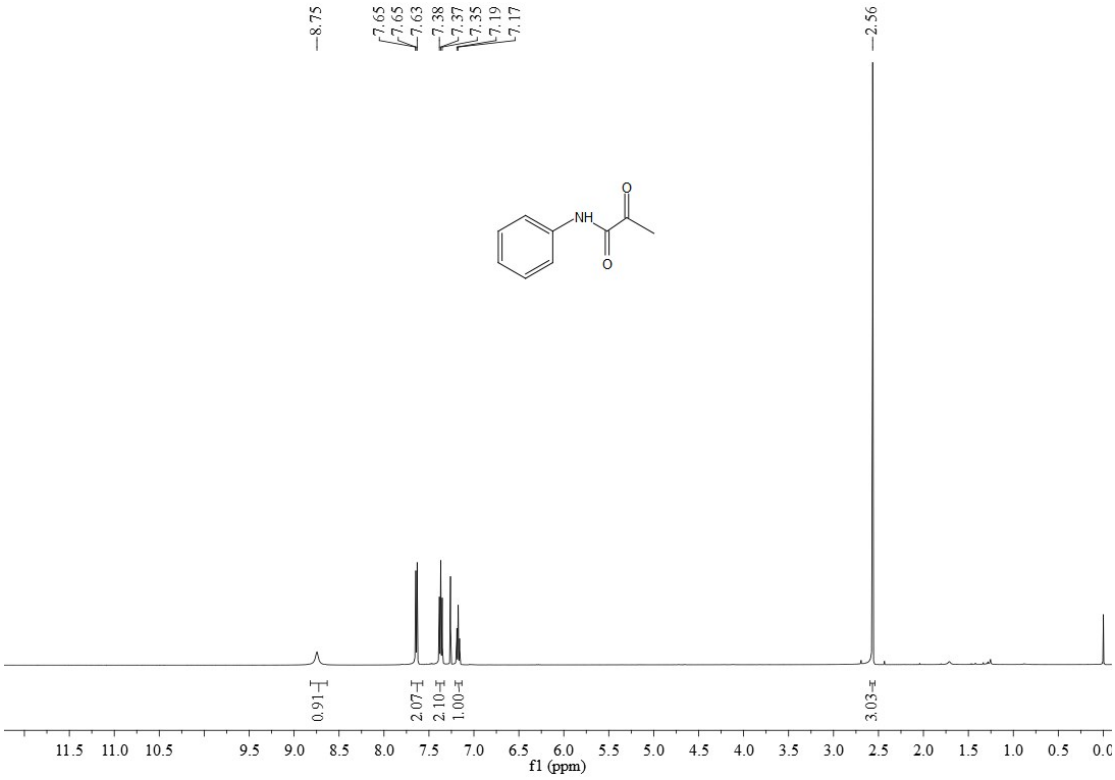
^{1}H NMR and ^{13}C NMR of 2-(furan-2-yl)-2-oxo-*N*-phenylacetamide (3bm)

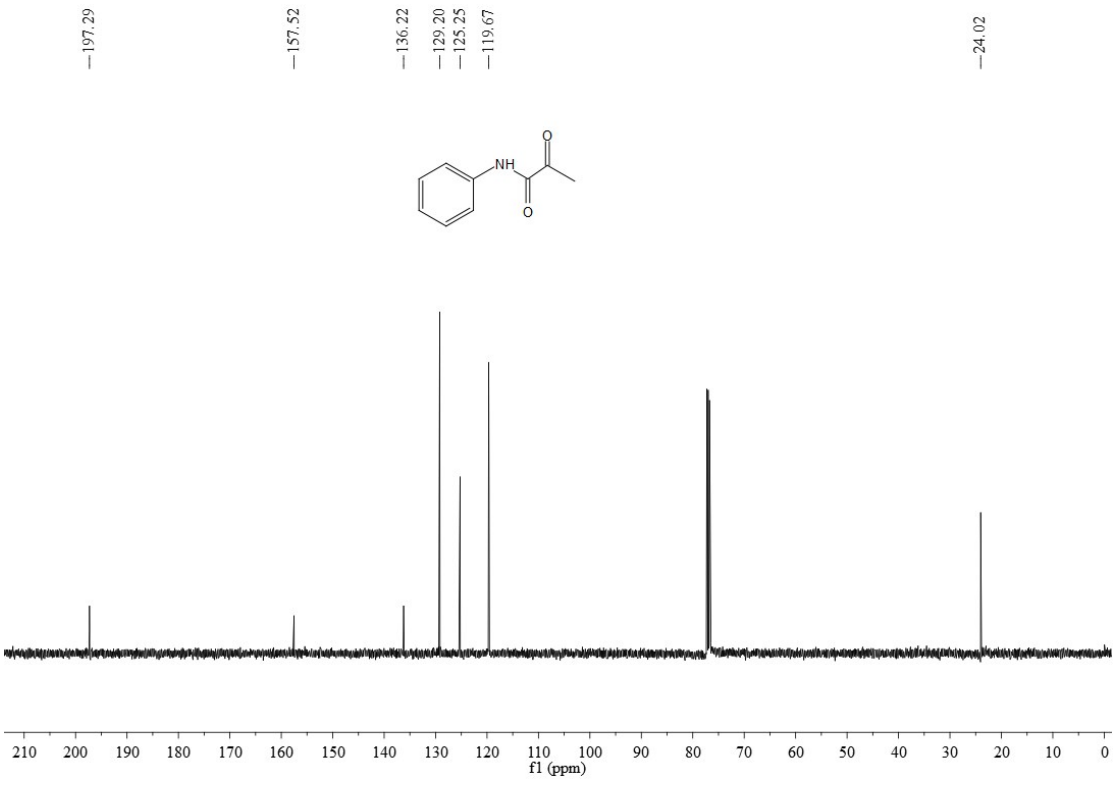


^{1}H NMR and ^{13}C NMR of 2-(Naphthalen-1-yl)-2-oxo-*N*-phenylacetamide (3bn)

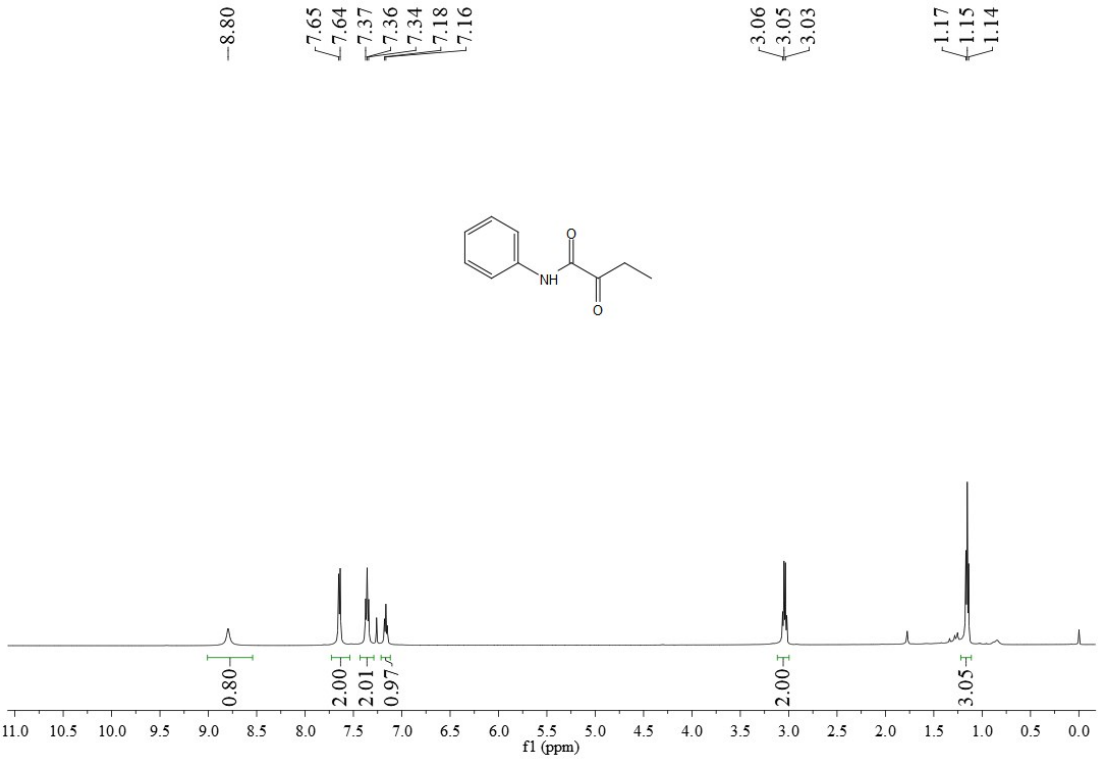


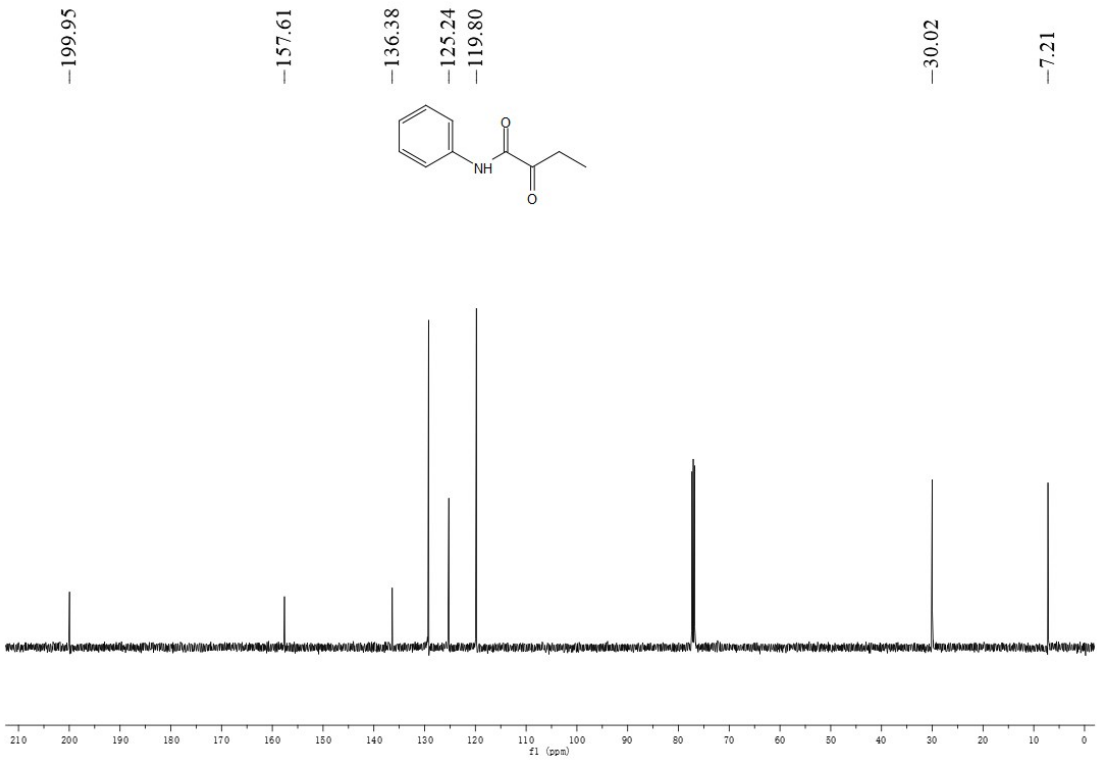
^{1}H NMR and ^{13}C NMR of 2-oxo-*N*-phenylpropanamide (3bo)



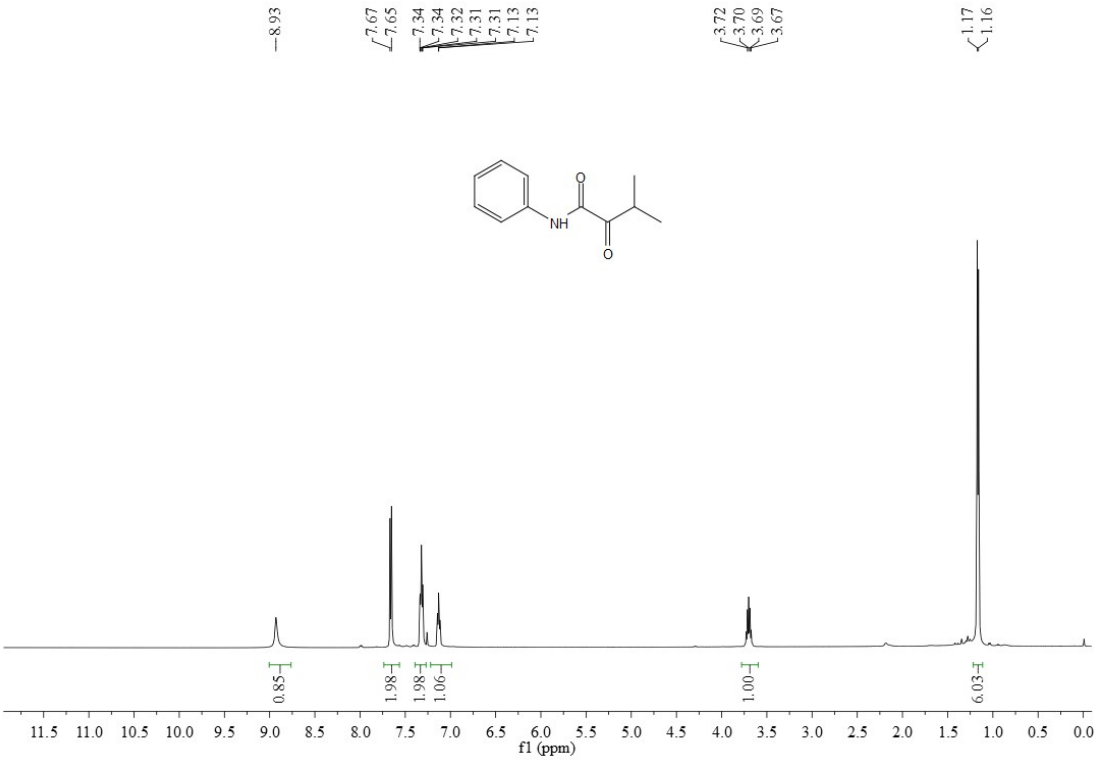


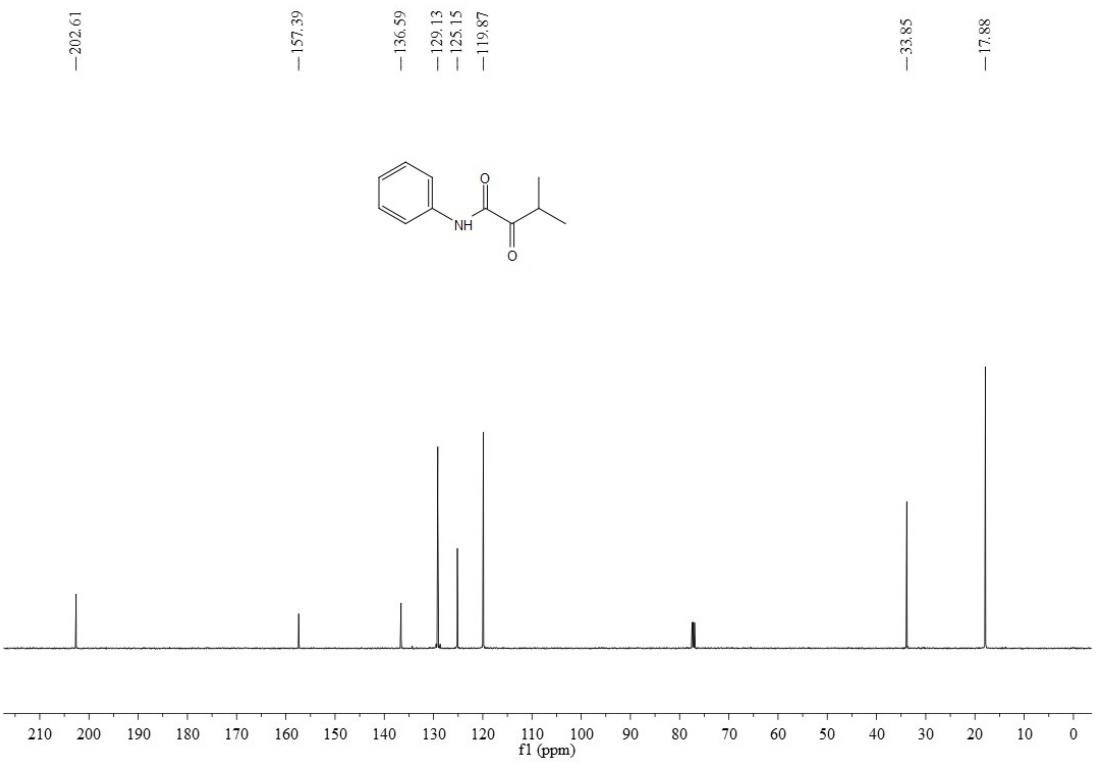
^{1}H NMR and ^{13}C NMR of 2-oxo-*N*-phenylbutanamide (3bp)



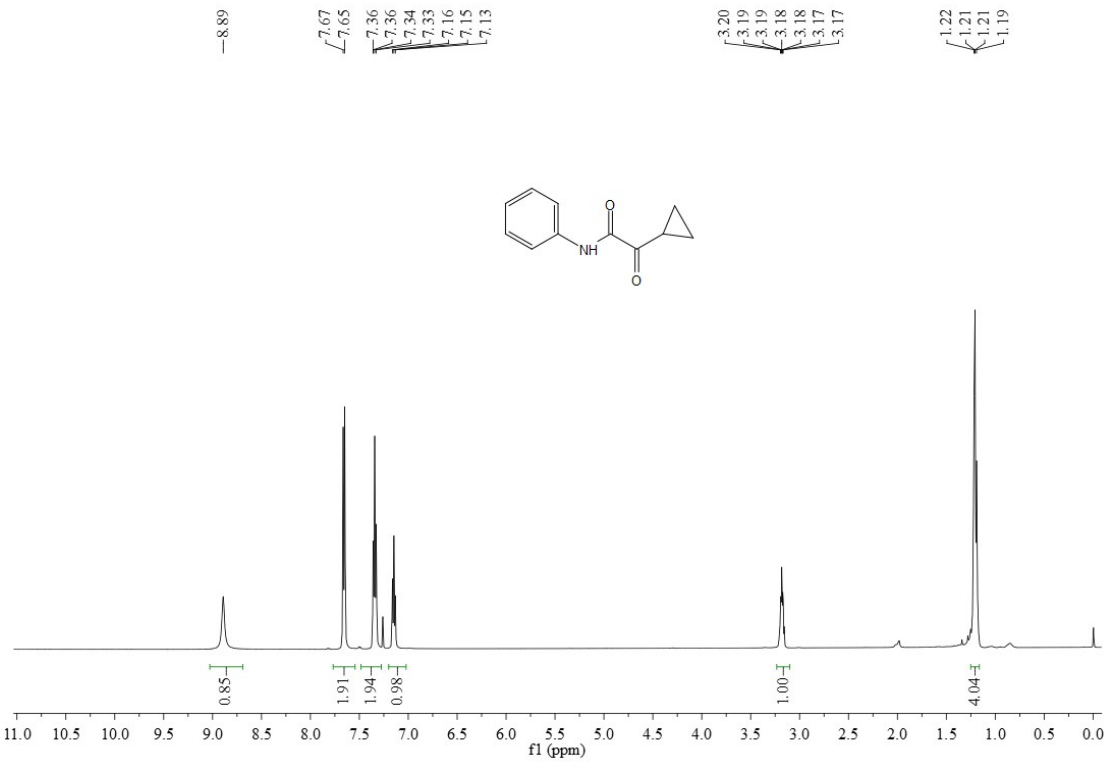


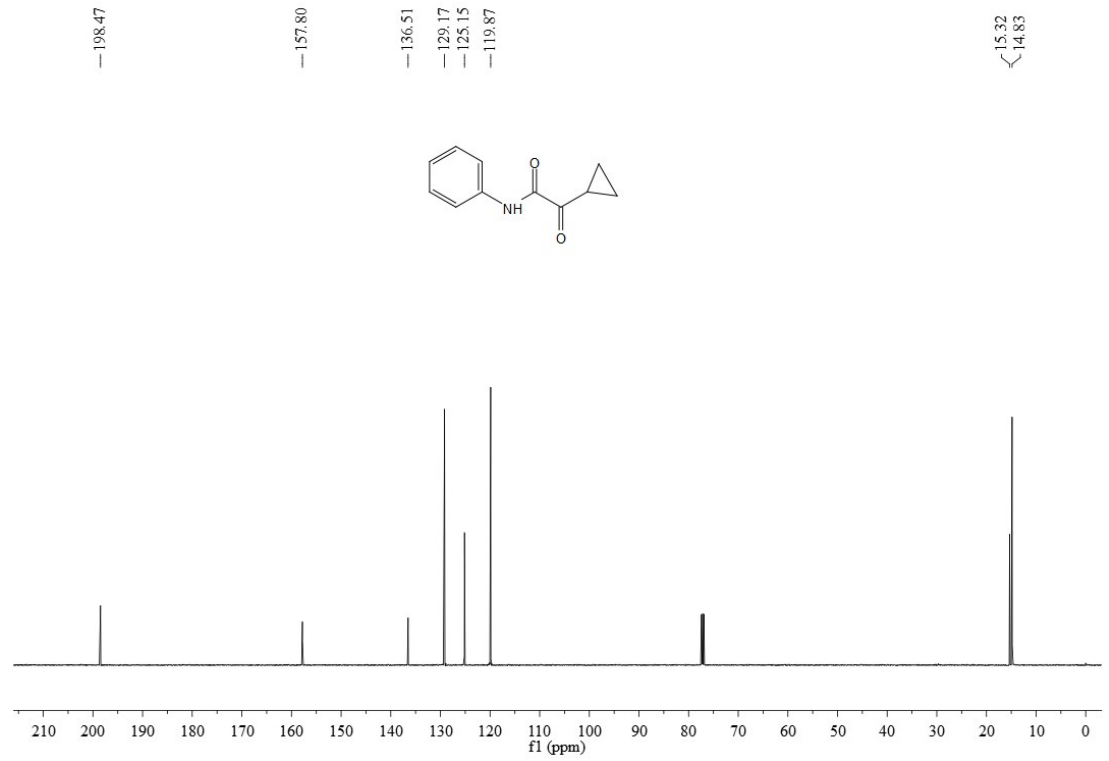
^{1}H NMR and ^{13}C NMR of 3-methyl-2-oxo-N-phenylbutanamide (3bq)



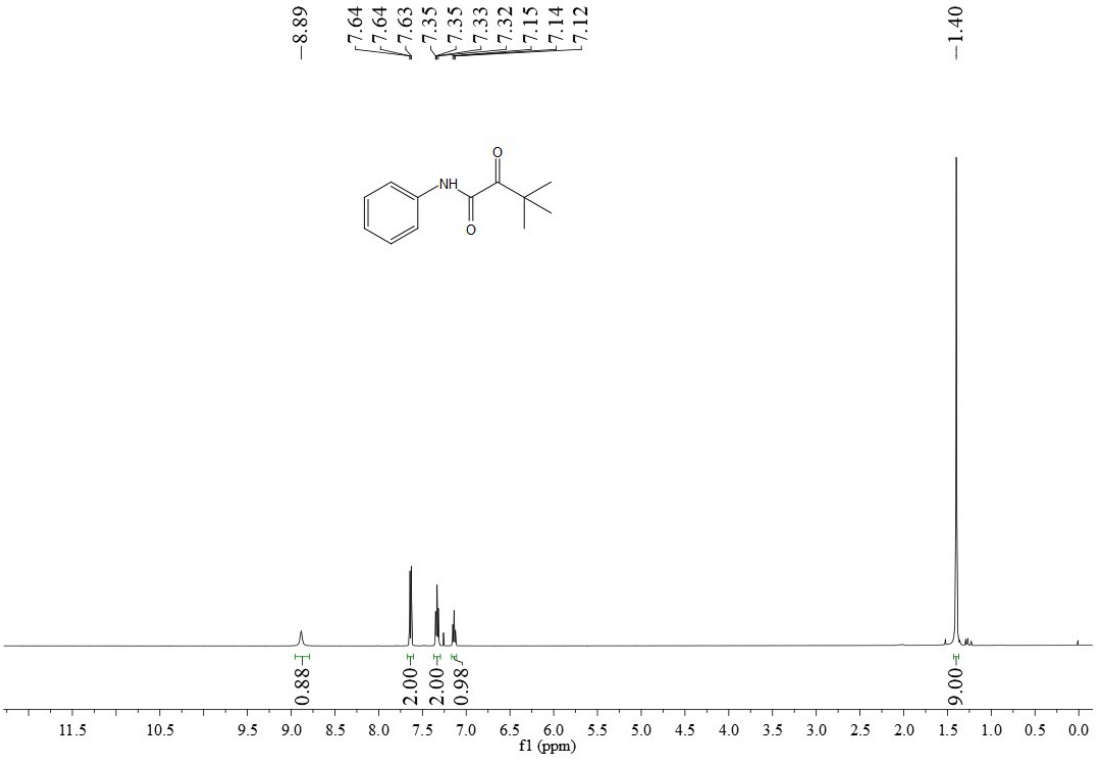


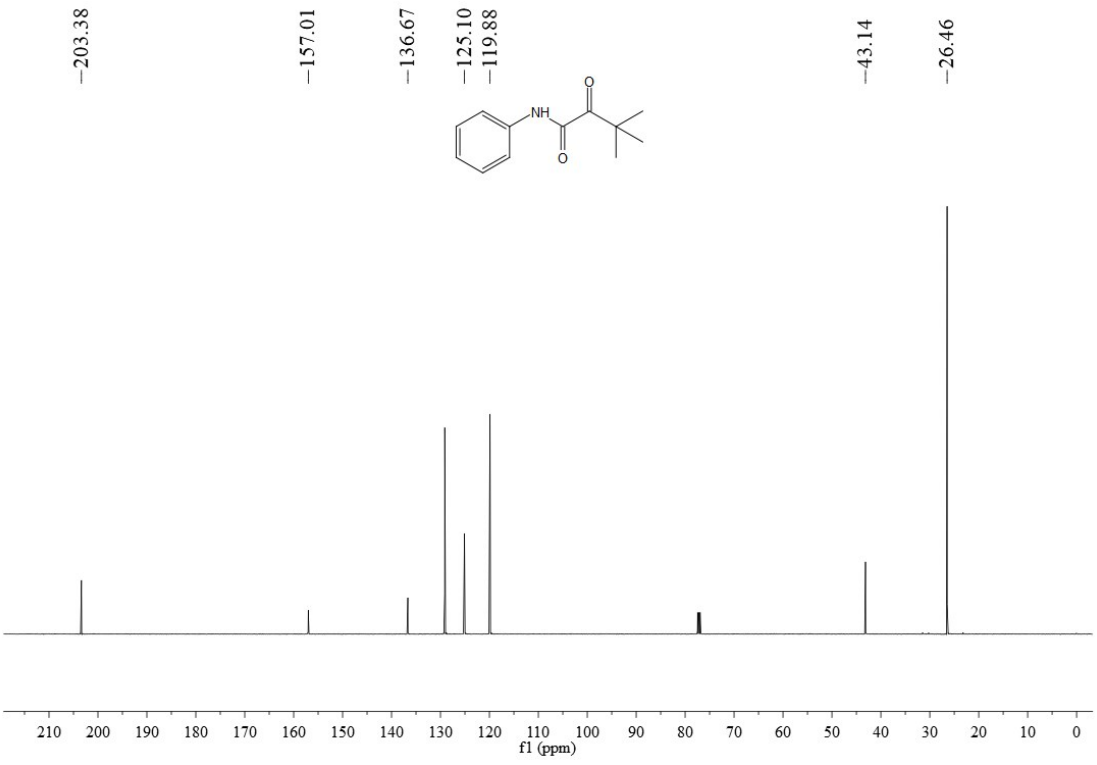
^{1}H NMR and ^{13}C NMR of 2-cyclopropyl-2-oxo-N-phenylacetamide (3br)



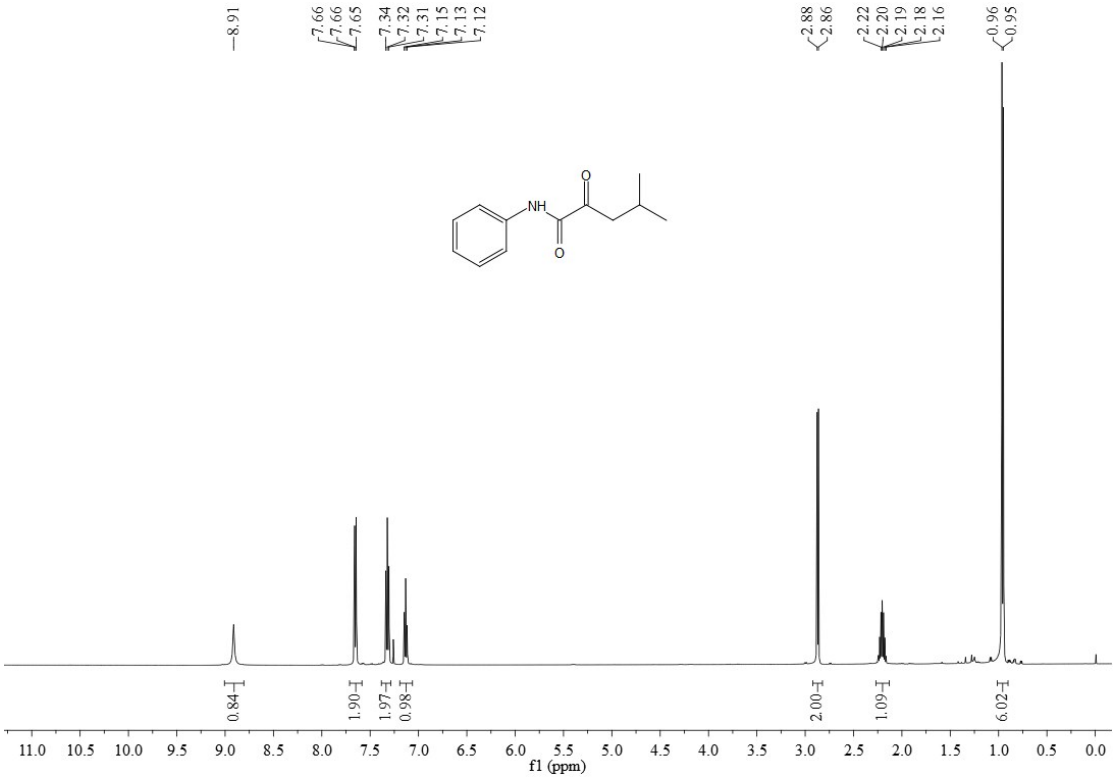


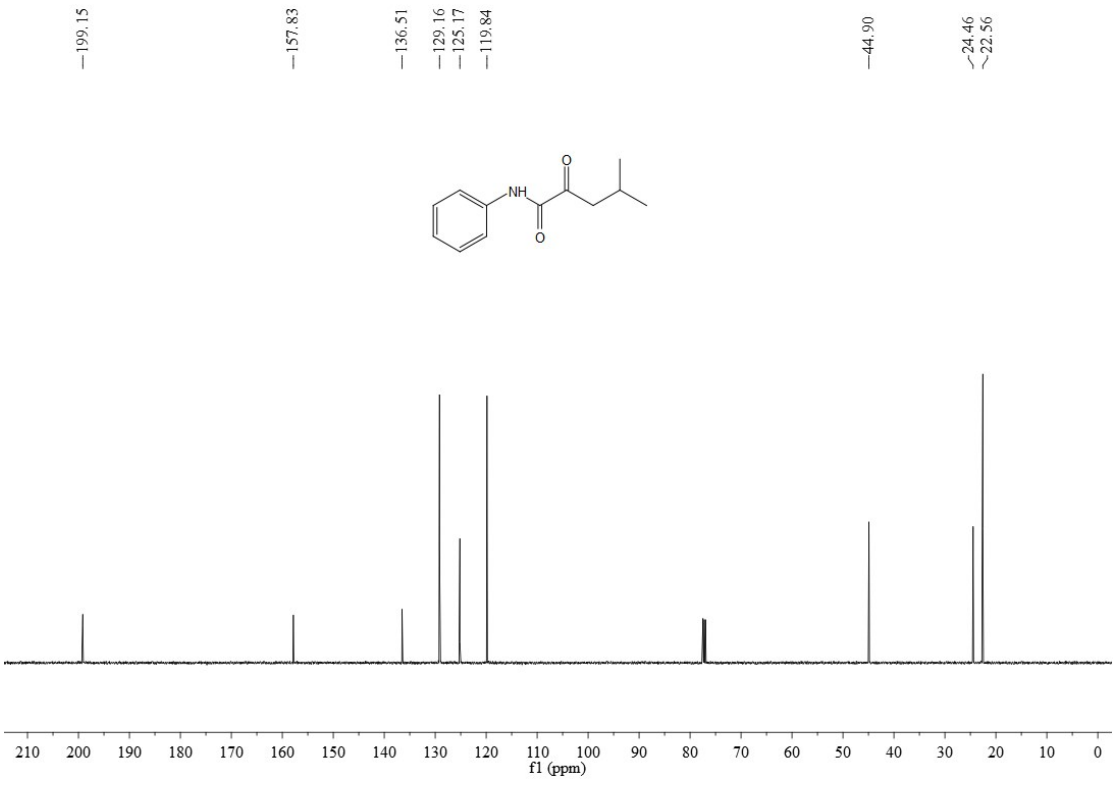
^{1}H NMR and ^{13}C NMR of 3,3-dimethyl-2-oxo-*N*-phenylbutanamide (3bs)



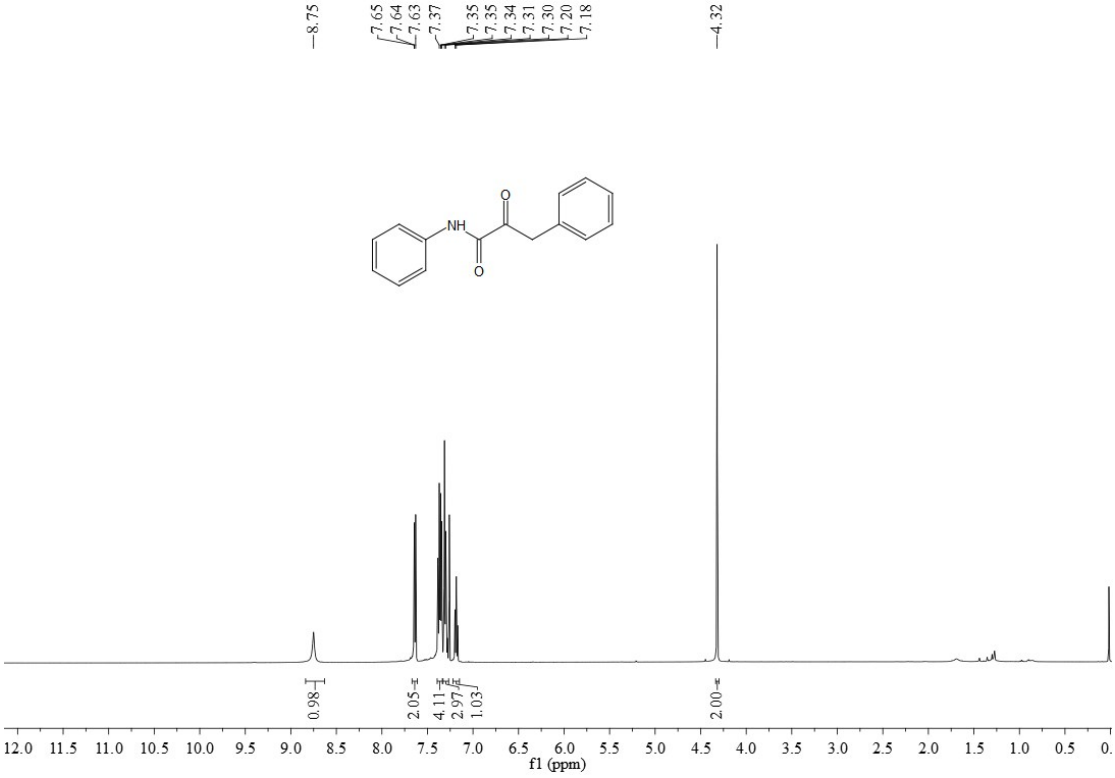


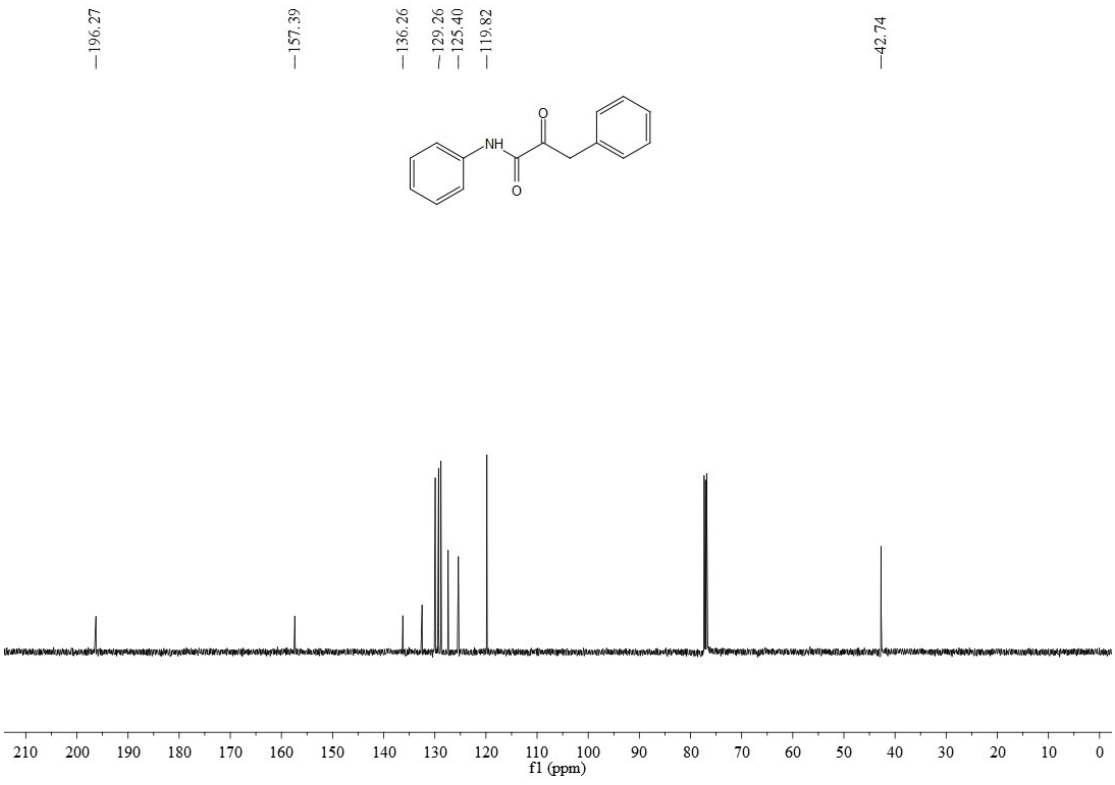
^{1}H NMR and ^{13}C NMR of 4-methyl-2-oxo-*N*-phenylpentanamide (3bt)



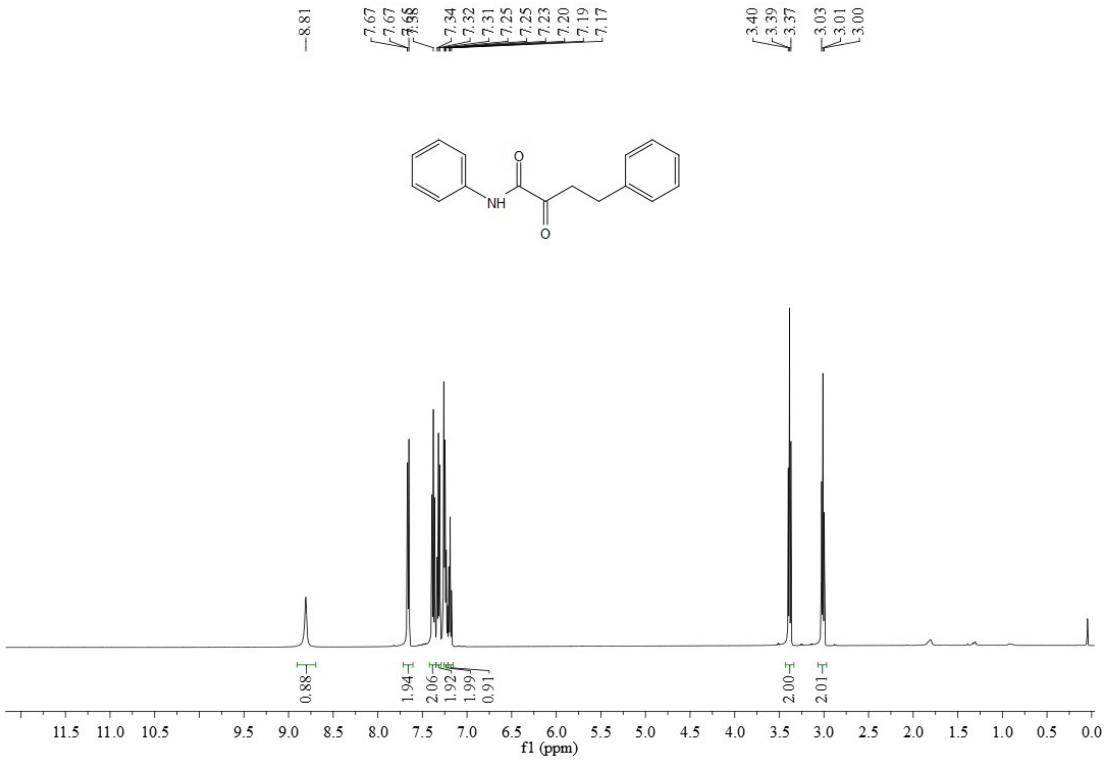


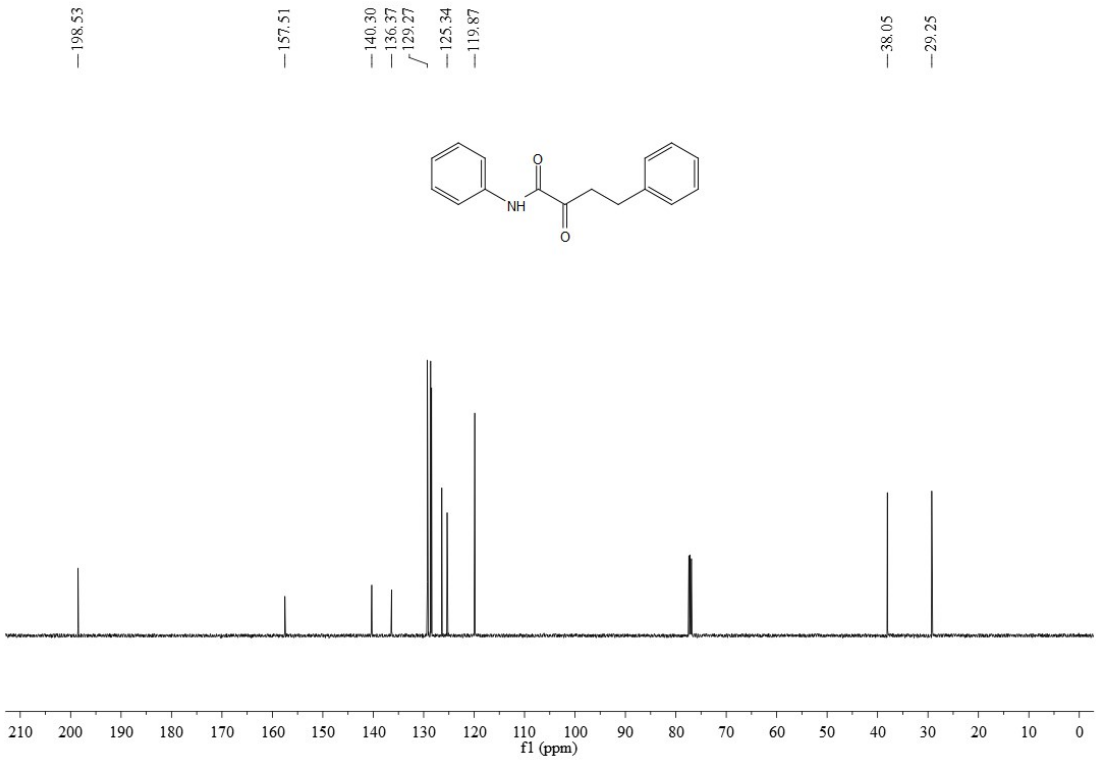
^{1}H NMR and ^{13}C NMR of 2-oxo-*N*,3-diphenylpropanamide (3bu)



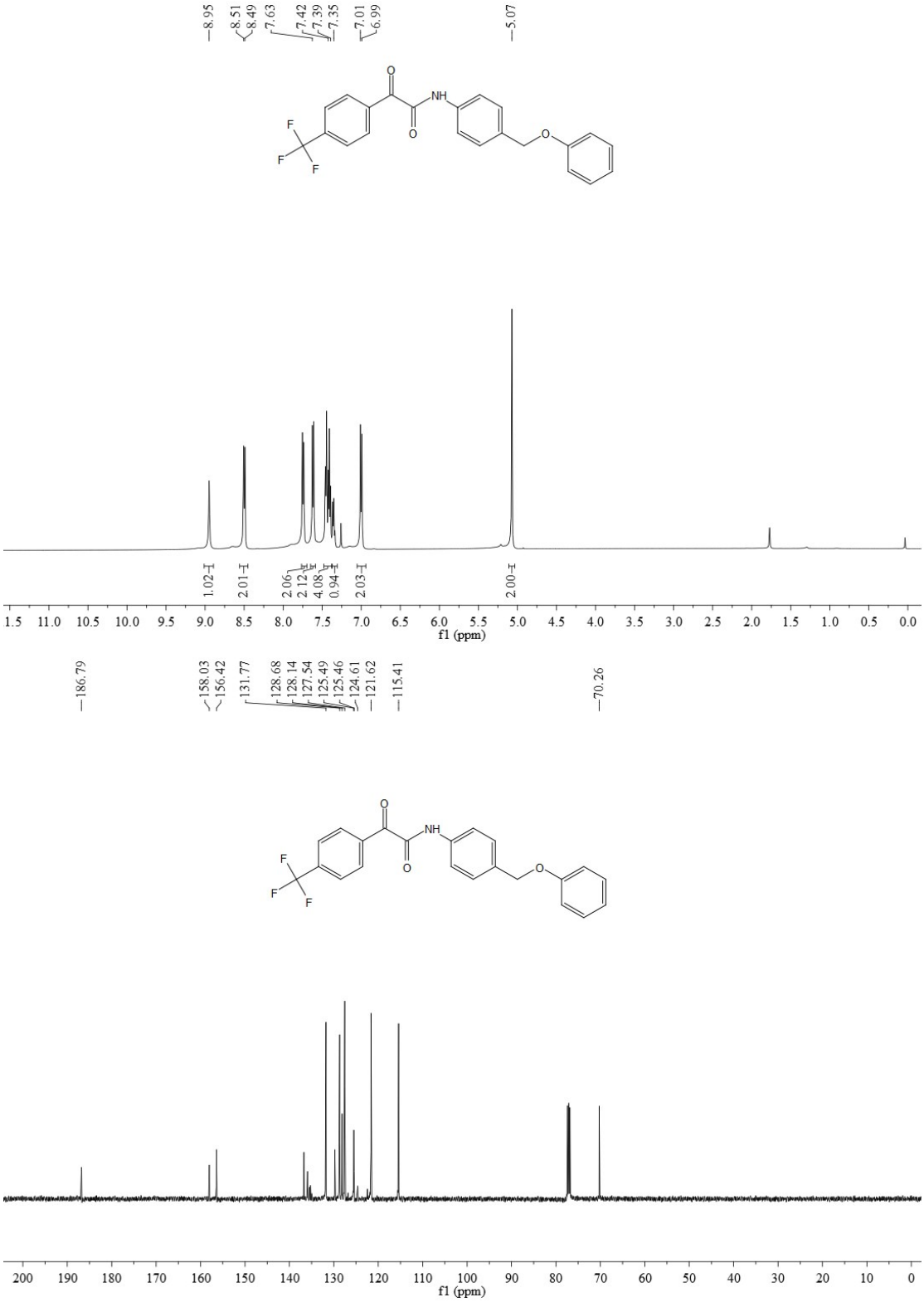


^{1}H NMR and ^{13}C NMR of 2-oxo-*N*,3-diphenylpropanamide (3bv)

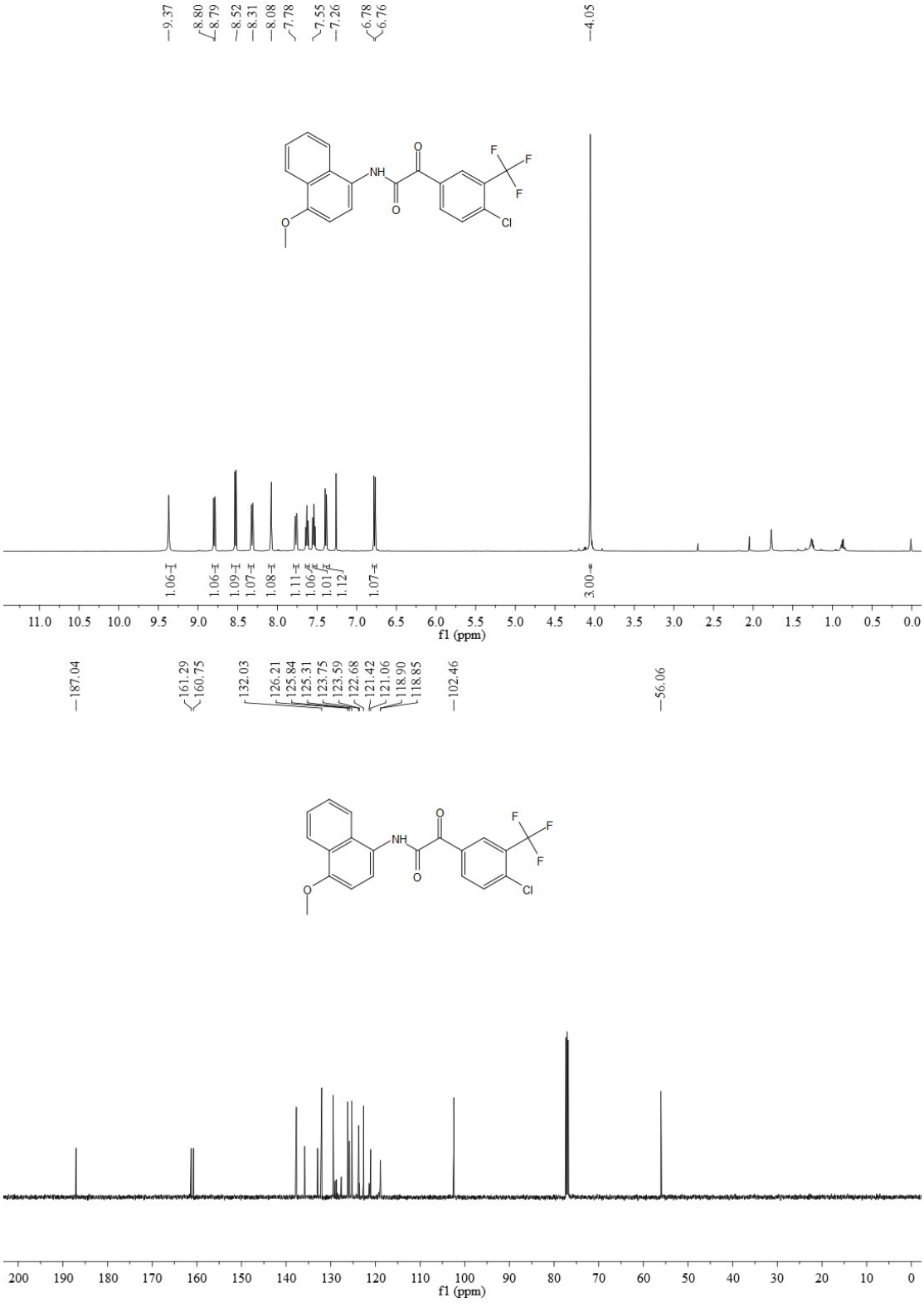




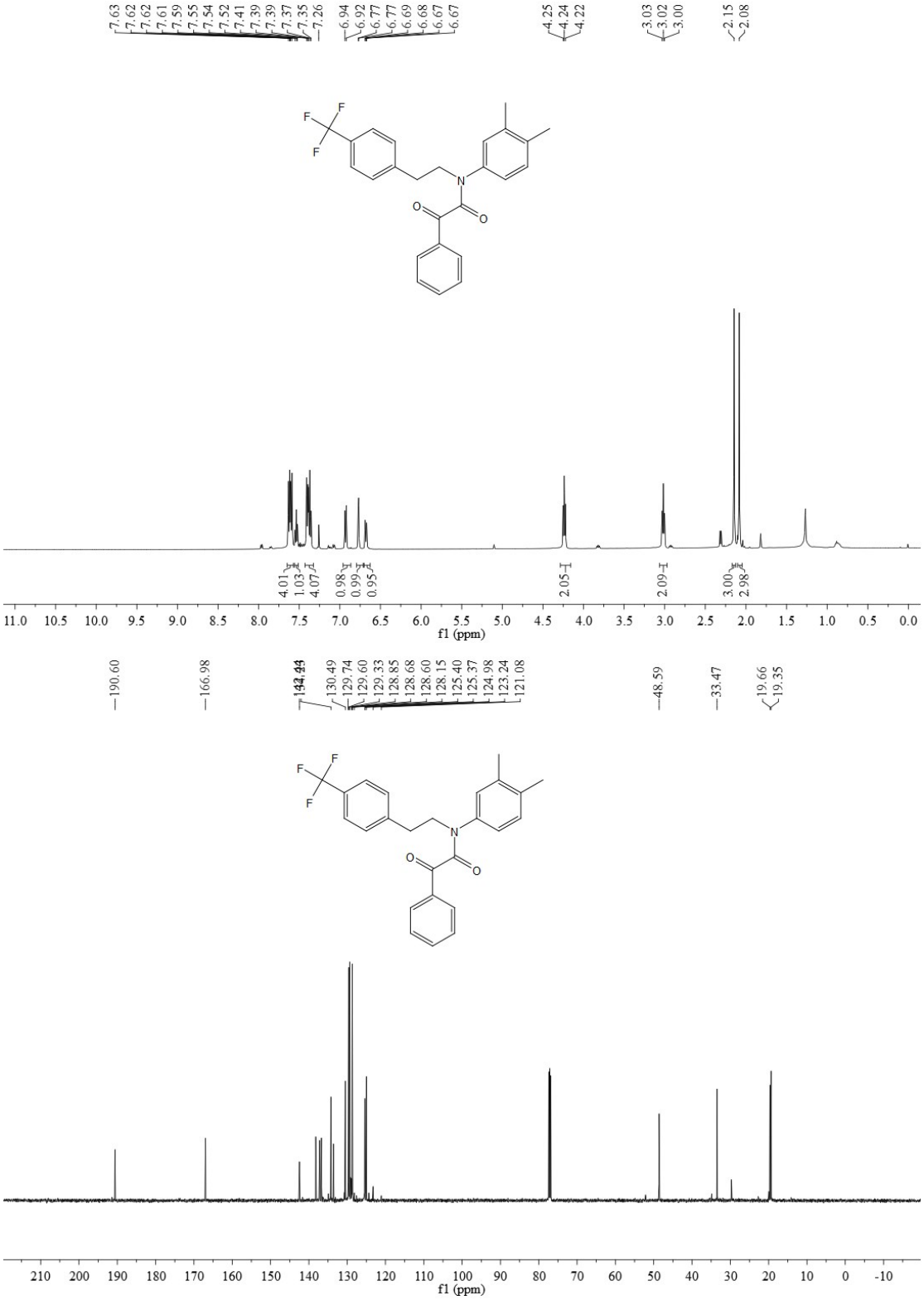
^{1}H NMR and ^{13}C NMR of 2-oxo-N-(4-(phenoxymethyl)phenyl) -2-(4-(trifluoromethyl)phenyl)acetamide (3bw)



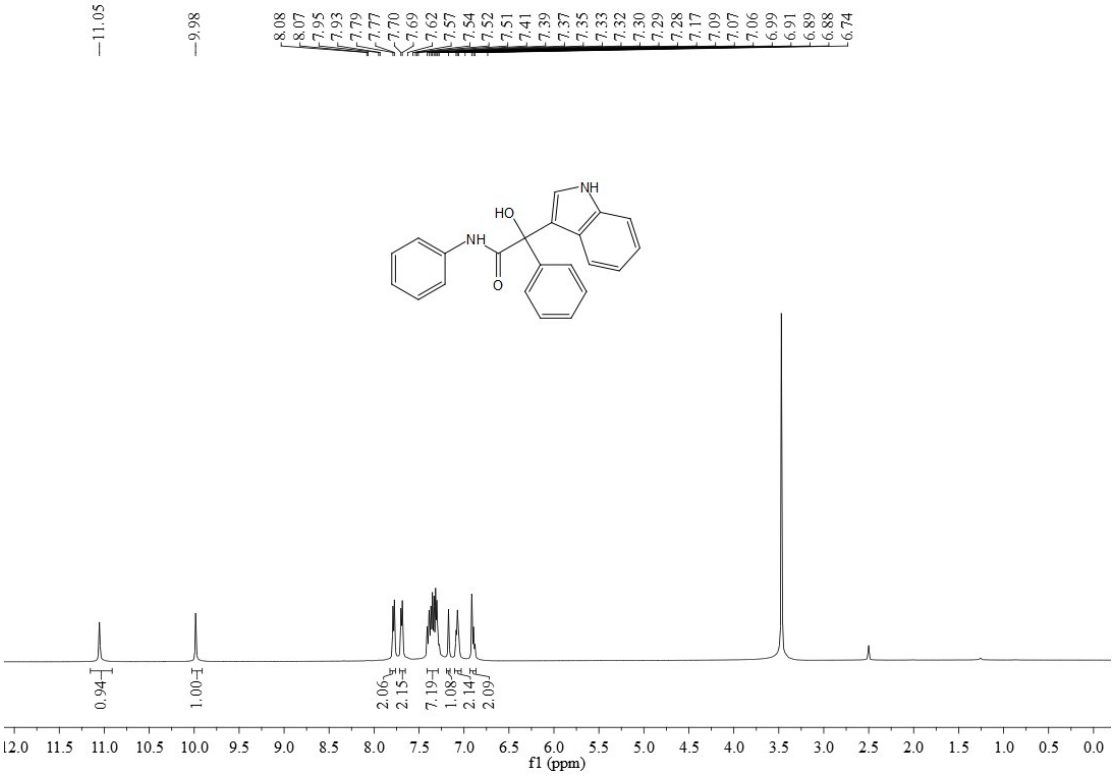
^{1}H NMR and ^{13}C NMR of 2-(4-chloro-3-(trifluoromethyl)phenyl)- N-(4-methoxynaphthalen-1-yl)-2-oxoacetamide (3bx)

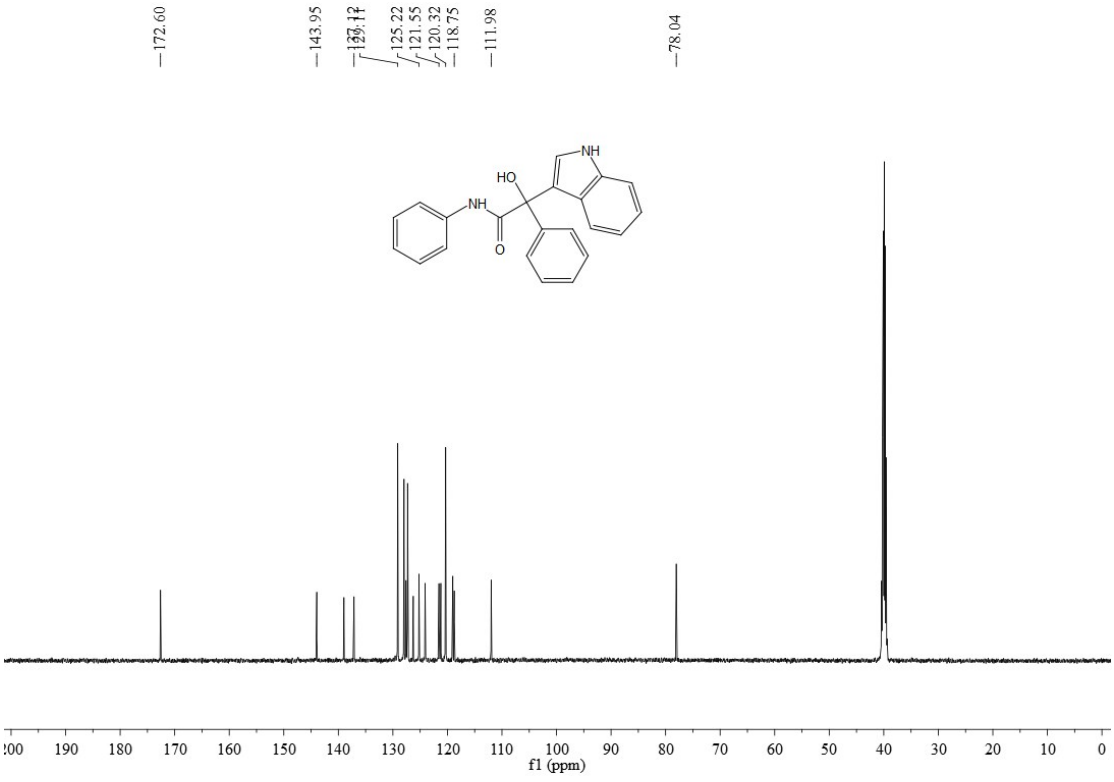


^{1}H NMR and ^{13}C NMR of N-(3,4-dimethylphenyl)-2-oxo-2-phenyl-*N*-(4-(trifluoromethyl)phenethyl)acetamide (3bz)

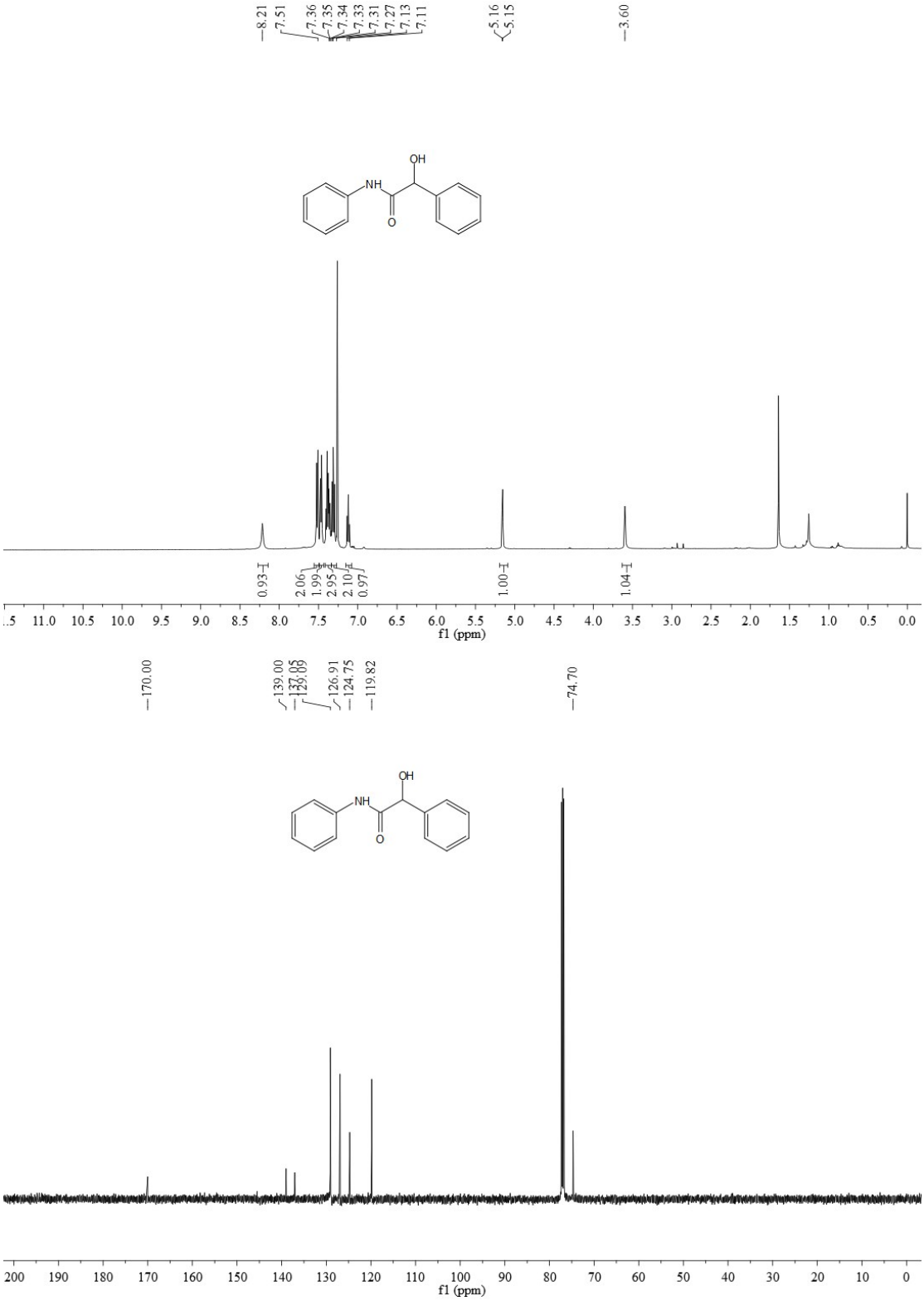


^{1}H NMR and ^{13}C NMR of 2-hydroxy-2-(1H-indol-3-yl)-N,2-diphenylacetamide (4a)

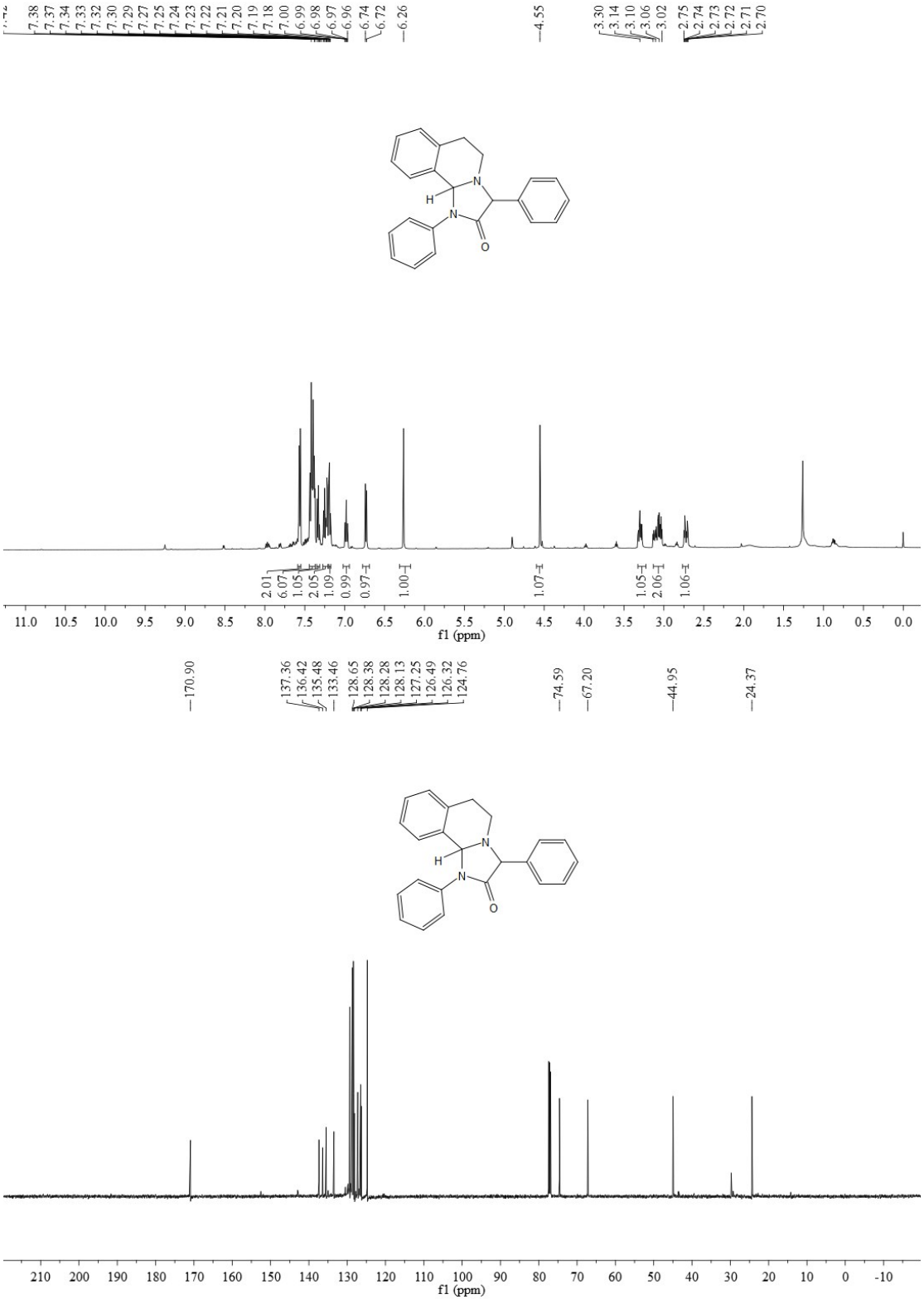




^{1}H NMR and ^{13}C NMR of 2-hydroxy-*N*,2-diphenylacetamide (5a)



^{1}H NMR and ^{13}C NMR of 1,3-diphenyl-1,5,6,10b-tetrahydroimidazo[2,1-a]isoquinolin-2(3H)-one (6a)



^{1}H NMR and ^{13}C NMR of 1,3-diphenyltetrahydro-1H-pyrrolo[1,2-a]imidazol-2(3H)-one (6b)