Supporting Information

$TsOH \cdot H_2O$-Mediated *N*-amidation of Quinoline *N*-oxides: Facile and Regioselective Synthesis of *N*-(quinolin-2-yl)amides

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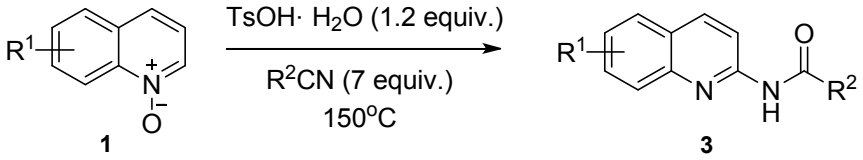
Table of Content

1. General information

Commercially available reagents were used as received without further purificationUnless otherwise specified. All reagents were carried out in air at room temperature. All unknown products were characterized by ^{1}H NMR, ^{13}C NMR spectroscopy, and high-resolution mass spectrometry (HRMS). ^{1}H and ^{13}C NMR spectra were recorded on a Bruker NMR spectrometer (400 MHz and 100 MHz, respectively) and Chemical shifts were calibrated using residual undeuterated solvent as an internal reference (^{1}H NMR: DMSO 2.50 ppm, ^{13}C NMR: DMSO 40.0 ppm). Column chromatography was performed on silica gel (200-300 mesh) using ethyl acetate (EA)/petroleum ether (PE) as eluents.

2. Experimental Section

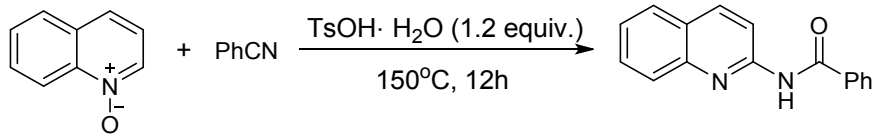
General procedure for the synthesis of *N*-(quinolin-2-yl)amides



1 **3**

In a pressure tube was placed quinoline*N*-oxide (0.3 mmol), nitriles (2.1mmol) and $TsOH{\cdot}H_2O$ (0.36mmol), and then the resulting solution was stirred at 150°C for about 12h (monitored by TLC). After completion of the reaction, the reaction was cooled to room temperature, then water (10mL) was added to the reaction mixtue, it was extracted with CH_2Cl_2 (10 mL x 2) and the combined organic layers were washed with brine and dried over anhydrous Na_2SO_4. After removal of the solvent in vacuo, the crude product was subjected to silica gel column chromatography to afford the product **3**.

Large - scale synthesis of 3a

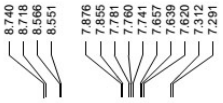


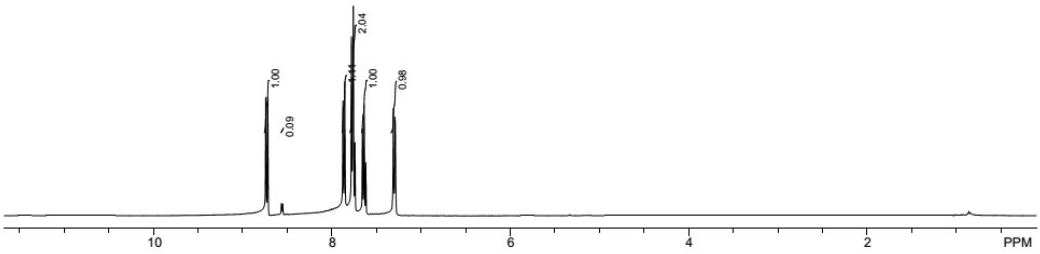
1a, 8 mmol, 1.16g **3a**, 82%, 1.62g

In a pressure tube was placed quinoline*N*-oxide(8 mmol, 1.16g), benzonitrile (56 mmol, 5.77g) and $TsOH{\cdot}H_2O$ (9.6mmol, 1.82g), and then the resulting solution was stirred at 150°C for about 12h (monitored by TLC). After completion of the reaction, the reaction was cooled to room temperature, then water (20mL) was added to the reaction mixtue, it was extracted with CH_2Cl_2 (20 mL x 3) and the combined organic layers were washed with brine and dried over anhydrous Na_2SO_4. After removal of the solvent in vacuo, the crude product was subjected to silica gel column chromatography to afford 1.62g of **3a**, yield 82%.

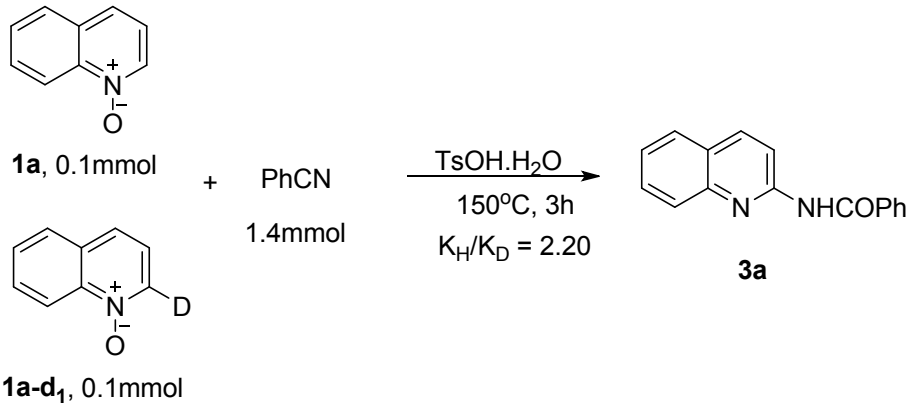
Preparation of 2-*d*1-Quinoline-*N*-Oxide

D_2O (1.5 mL), NaOH (200 mg, 5 mmol), quinoline-*N*-oxide (258 mg, 2.0 mmol)were weighed into 30-mL pressure tube sealed with rubber plugs. The reaction mixture was stirred at 100 ℃ for overnight. After cooling to room temperature, the mixture was then extracted with EtOAc (3 x 10 mL). The combined organicphase was washed with saturated NaCl solution (3 x 5 mL), dried over $MgSO_4$, and filtered. EtOAc was removed under reduced pressure to obtain the crude product 2-d_1-quinoline *N*-Oxide. It was further purified by flash column chromatography and percentage of *d*-incorporation was determined by ^{1}H NMR. Peak areas at 8.73 ppm and 8.56 ppm were compared to obtain the deuterium incorporation. Deuterium incorporation was detected to be 91% by ^{1}H NMR (see ^{1}H spectrum).

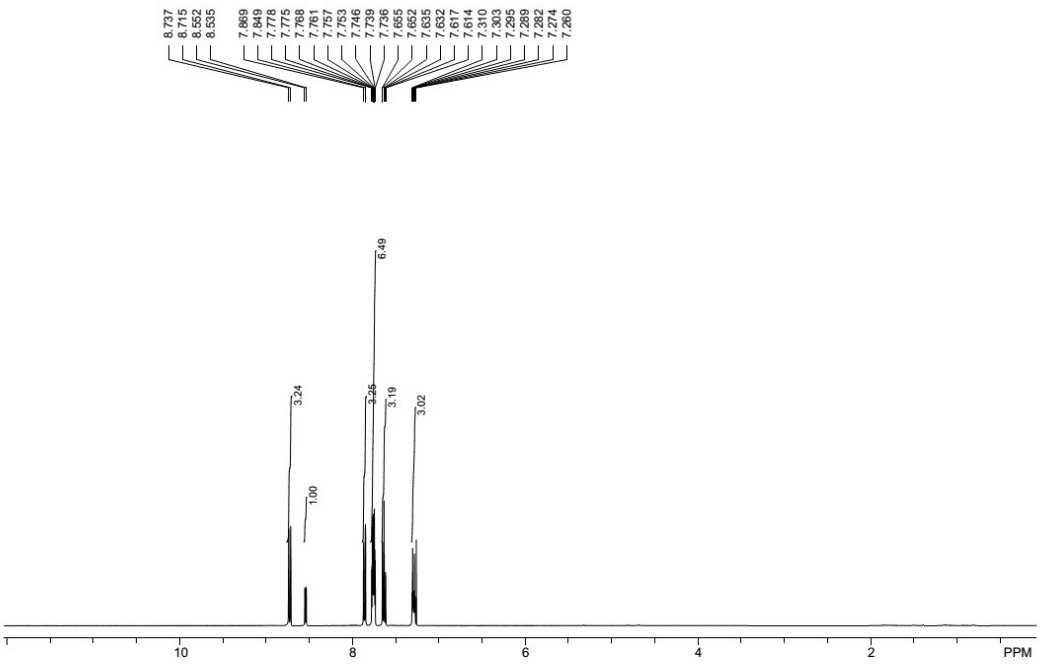




KIE Experiment

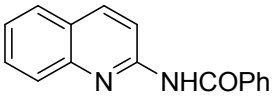


Quinoline *N*-oxide **1a** and 2-d_1-quinoline *N*-oxide **1a-d$_1$** (1:1) (totally 0.2 mmol, deuteration ratio has been calculated), PhCN (1.4 mmol, 7 equiv), TsOH·H_2O (0.24 mmol, 1.2 equiv) were added into a pressure tube, The reaction mixture was stirred at 150 °C for 3 h, After cooling to room temperature, residual starting material (mixture of 2-d_1-quinoline-*N*-oxide and quinolone -*N*-oxide) was recovered by column chromatography on silica gel (200-300 mesh), which was characterized by ^{1}H NMR spectroscopy. The experiments were repeated three times, and calculated KIE values are 2.24, 2.15 and 2.21. The average k_H/k_D = 2.20 was calculated based on the isolated yields. Representative ^{1}H NMR spectra copy was shown below:


8.737
8.715
8.552
8.535
7.869
7.849
7.778
7.775
7.768
7.761
7.757
7.753
7.746
7.739
7.736
7.655
7.652
7.635
7.632
7.617
7.614
7.310
7.303
7.295
7.289
7.282
7.274
7.260
6.49
3.24
3.25
3.19
3.02
1.00
10
8
6
4
2
PPM

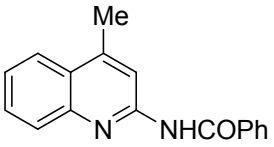
3. Characterization of products

N-(quinolin-2-yl)benzamide (3a)[1]



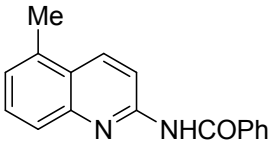
^{1}H NMR (400MHz, d^6– DMSO) δ: 11.18 (s, 1 H), 8.42 – 8.35 (m, 2 H), 8.14 – 8.12 (m, 2 H), 7.92 – 7.89 (m, 2 H), 7.73 – 7.69 (m, 1 H), 7.61 – 7.57 (m, 1 H), 7.53 – 7.47 (m, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.0, 152.5, 147.0, 138.5, 134.5, 132.7, 132.6, 130.5, 128.9, 128.8, 128.3, 127.6, 126.4, 125.7, 116.1.

N-(4-methylquinolin-2-yl)benzamide(3b)[2]



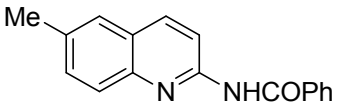
^{1}H NMR (400MHz, d^6 – DMSO)δ: 11.05 (s, 1 H), 8.24 (s, 1 H), 8.12 – 8.10 (m, 2 H), 8.02 (d, *J*= 8.0 Hz, 1 H), 7.88 (d, *J*= 8.4 Hz, 1 H), 7.71 (t, *J*= 8.0 Hz, 1 H), 7.62 – 7.58 (m, 1 H), 7.54 – 7.50 (m, 3 H), 2,69 (s, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 166.9, 152.2, 146.8, 146.6, 134.5, 132.6, 130.2, 128.9, 128.7, 128.1, 126.3, 125.5, 124.7, 116.9, 19.3.

N-(5-methylquinolin-2-yl)benzamide(3c)



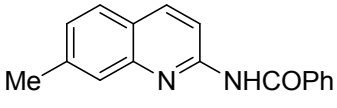
^{1}H NMR (400MHz, d^6 – DMSO) δ: 11.13 (s, 1 H), 8.47 (d, *J*= 9.2 Hz, 1 H), 8.39 (d, J= 9.2 Hz, 1 H), 8.12 – 8.10 (m, 2 H), 7.73 (d, *J*= 8.4 Hz, 1 H), 7.60 – 7.57 (m, 2 H), 7.54 – 7.50 (m, 2 H), 7.32 (d, *J*= 7.2 Hz, 1 H), 2.63 (s, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.0, 152.1, 147.3, 135.3, 135.3, 134.5, 132.6, 130.2, 128.9, 128.7, 126.1, 125.9, 125.5, 115.5, 18.8; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1175.

N-(6-methylquinolin-2-yl)benzamide (3d)



^{1}H NMR (400MHz, d^6 – DMSO)δ: 11.10 (s, 1 H), 8.32 (d, *J*= 8.8 Hz, 1 H), 8.28 (d, *J*= 8.8 Hz, 1 H), 8.11 – 8.09 (m, 2 H), 7.78 (d, *J*= 8.4 Hz, 1 H), 7.68 (s, 1 H), 7.60 – 7.59 (m, 1 H), 7.57 – 7.50 (m, 3 H), 2.46 (s, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 166.9, 151.7, 145.3, 137.8, 135.1, 134.5, 132.6, 132.6, 128.9, 128.7, 127.4, 127.1, 126.3, 116.0, 21.5; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1177.

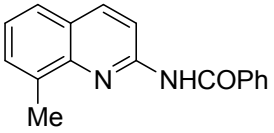
N-(7-methylquinolin-2-yl)benzamide (3e)



^{1}H NMR (400MHz, d^6 – DMSO)δ: 11.13 (s, 1 H), 8.35 (d, *J*= 8.8 Hz, 1 H), 8.31 (d, *J*= 8.8 Hz, 1 H), 8.13 – 8.11 (m, 2 H), 7.85 (d, *J*= 8.4 Hz, 1 H), 7.68 (s, 1 H), 7.63 – 7.61 (m, 1 H), 7.55 (t, *J*= 8.0 Hz, 2 H), 7.37 (dd, J_1= 1.6 Hz, J_2= 8.4 Hz, 1 H), 2.53 (s, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.0, 152.4, 147.2, 140.4, 138.2, 134.5, 132.6,

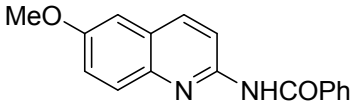
128.9, 128.7, 128.0, 127.8, 126.6, 124.4, 115.1, 22.0, HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1176.

N-(8-methylquinolin-2-yl)benzamide (3f)



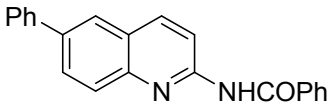
^{1}H NMR (400 MHz, d^6 - DMSO) δ: 10.86 (s, 1 H), 8.34 (d, *J*= 9.2 Hz, 1 H), 8.26 (d, *J*= 9.2 Hz, 1 H), 8.07 – 8.05 (m,2 H), 7.74 (d, *J*= 7.6 Hz, 1 H), 7.61 – 7.51 (m, 4 H), 7.38 (t, *J*= 8.0 Hz, 1 H), 2.68 (s, 3 H); ^{13}C NMR (100 MHz, d^6 - DMSO): δ = 167.0, 151.2, 145.7, 138.7, 135.5, 134.6, 132.5, 130.4, 128.8, 128.7, 126.2, 126.1, 125.4, 115.9, 18.0; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1174.

N-(6-methoxyquinolin-2-yl)benzamide (3g)[3]



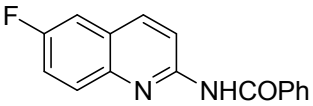
^{1}H NMR (400MHz, d^6– DMSO) δ: 11.04 (s, 1 H), 8.32 (d, J= 9.2 Hz, 1 H), 8.27 (d, J= 8.8 Hz, 1 H), 8.11 – 8.09 (m, 2 H), 7.80 (d, J= 8.8 Hz, 1 H), 7.60 – 7.57 (m, 1 H), 7,51 (t, J= 7.6 Hz, 2 H), 7.38 – 7.34 (m, 2 H), 3.87 (s, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 166.8, 157.0, 150.5, 142.6, 137.3, 134.6, 132.5, 129.1, 128.9, 128.7, 127.3, 122.7, 116.4, 106.5, 56.0.

N-(6-phenylquinolin-2-yl)benzamide (3h)



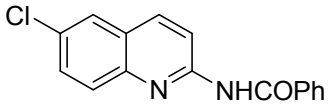
H NMR (400MHz, d^6– DMSO) δ: 11.19 (s, 1 H), 8.45 (d, *J*= 9.2 Hz, 1 H), 8.39 (d, *J*= 9.2 Hz, 1 H), 8.24 (d, *J*= 2.0 Hz, 1 H), 8.12 – 8.12 (m, 2 H), 8.06 (dd, J_1= 2.4 Hz, J_2= 8.8 Hz, 1 H), 7.95 (d, *J*= 8.8 Hz, 1 H), 7.81 (d, *J*= 7.2 Hz, 2 H), 7.63 – 7.60 (m, 1 H), 7.55 – 7.49 (m, 4 H), 7.42 – 7.40 (m, 1 H); ^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.0, 152.5, 146.4, 140.0, 138.9, 137.3, 134.5, 132.7, 129.6, 129.6, 128.9, 128.8, 128.2, 127.5, 126.6, 125.8, 116.4; HRMS (ESI) *m/z* calcd. for $C_{22}H_{17}N_2O$ $[M+H]^+$: 325.1335, found 325.1337.

N-(6-fluoroquinolin-2-yl)benzamide (3i)



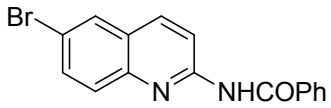
^{1}H NMR (400MHz, d^6– DMSO) δ: 11.16 (s,1 H), 8.38 (s, 2 H), 8.10 – 8.08 (m, 2 H), 7.91 (dd, J_1= 5.6 Hz, J_2= 9.6 Hz, 1 H), 7.75 (dd, J_1= 3.2 Hz, J_2= 9.2 Hz, 1 H), 7.65 – 7.62 (m, 1 H), 7.60 – 7.59 (m, 1 H), 7.54 – 7.50 (m, 2 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.0, 160.7, 158.3, 152.0, 144.0, 138.1, 139.1, 134.4, 132.7, 130.3, 130.2, 128.9, 128.7, 126.8, 126.7, 120.4, 120.2, 117.0, 111.7, 111.5;^{19}F NMR (376 MHz, d^6- DMSO) δ: -115.6; HRMS (ESI) *m/z* calcd. for $C_{16}H_{12}FN_2O$ $[M+H]^+$: 267.0928, found 267.0923.

N-(6-chloroquinolin-2-yl)benzamide (3j)



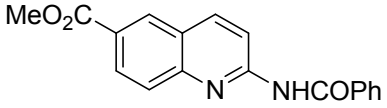
^{1}H NMR (400MHz, d^6– DMSO) δ: 11.21 (s, 1 H), 8.39 (d, *J*= 9.2 Hz, 1 H), 8.35 (d, *J*= 8.8 Hz, 1 H), 8.09 (d, *J*= 9.2 Hz, 2 H), 8.04 (d, *J*= 2.4 Hz, 1 H), 7.86 (d, *J*= 8.8 Hz, 1 H), 7.70 (dd, J_1= 2.4 Hz, J_2= 8.8 Hz, 1 H), 7.62 – 7.59 (m, 1 H), 7.52 (t, *J*= 7.6 Hz, 2 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.1, 152.9, 145.4, 137.9, 134.3, 132.7, 130.9, 129.9, 129.6, 128.9, 128.8, 127.0. 127.0, 117.0; HRMS (ESI) *m/z* calcd.for $C_{16}H_{12}ClN_2O$ $[M+H]^+$: 283.0633, found 283.0630.

N-(6-bromoquinolin-2-yl)benzamide (3k)



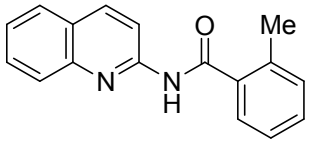
^{1}H NMR (400 MHz, d^6– DMSO) δ: 11.21 (s, 1 H), 8.39 (d, *J*= 9.2 Hz, 1 H), 8.35 (d, *J*= 9.2 Hz, 1 H), 8.20 (d, *J*= 2.0 Hz,1 H),8.09 – 8.07 (m, 2 H), 7.80 – 7.79 (m, 2 H), 7.62 – 7.59 (m, 1 H), 7.54 – 7.50 (m, 2 H); ^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.1, 152.9, 145.6, 137.8, 134.3, 133.4, 132.7, 130.3, 129.8, 128.9, 128.8, 127.6, 118.3, 116.9; HRMS (ESI) *m/z* calcd. for $C_{16}H_{12}BrN_2O$ $[M+H]^+$: 327.0128, found 327.0131.

methyl 2-benzamidoquinoline-6-carboxylate (3l)



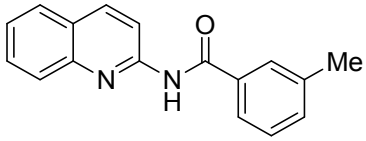
^{1}H NMR (400MHz, d^6– DMSO) δ: 11.30 (s, 1 H), 8,60 (d, *J*= 2.0 Hz, 1 H), 8.56 (d, *J*= 9.2 Hz, 1 H), 8.42 (d, *J*= 9.2 Hz, 1 H), 8,16 (dd, J_1= 2.0 Hz, J_2= 8.8 Hz, 1 H) 8.09 – 8.08 (m, 2 H), 7.91 (d, *J*= 8.8 Hz, 1 H), 7.64 – 7.60 (m, 1 H), 7.54 – 7.51 (m, 2 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 167.2, 166.5, 154.3, 149.1, 140.1, 134.2, 132.8, 131.1, 129.5, 128.9, 128.8, 128.0, 126.4, 125.5, 116.6, 52.8; HRMS (ESI) *m/z* calcd. for $C_{18}H_{15}N_2O_3$ $[M+H]^+$: 307.1077, found 307.1070.

2-methyl-N-(quinolin-2-yl)benzamide (3m)



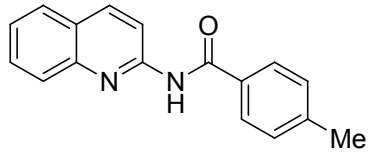
^{1}H NMR (400MHz, d^6– DMSO) δ: 11.08 (s, 1 H), 8.42 – 8.35 (m, 2 H), 7.95 (d, *J*= 8.4 Hz, 1 H), 7.83 (d, *J*= 8.4 Hz, 1 H), 7.74 – 7.70 (m, 1 H), 7.54 – 7.50 (m, 2 H), 7.39 (d, *J*= 7.6 Hz, 1 H), 7.30 (d, *J*= 8.0 Hz, 1 H), 2.43 (s, 3 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 169.4, 152.2, 146.9, 138.6, 136.7, 136.1, 131.0, 130.4, 128.5, 128.1, 127.6, 126.3, 126.0, 125.6, 115.6, 20.0; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1174.

3-methyl-N-(quinolin-2-yl)benzamidee (3n)



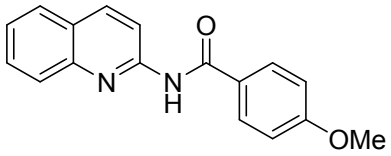
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.06 (s, 1 H), 8.38 (s, 2 H), 7.94 - 7.87 (m, 4 H), 7.74 - 7.70 (m, 1 H), 7.52 - 7.48 (m, 1 H), 7.40 - 7.39 (m, 2 H), 2.38 (s, 3 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 167.1, 152.4, 146.9, 138.5, 138.2, 134.4, 133.2, 130.5, 129.3, 128.8, 128.3, 127.6, 126.3, 125.8, 125.6, 116.0, 21.4; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1172.

4-methyl-N-(quinolin-2-yl)benzamide (3o)



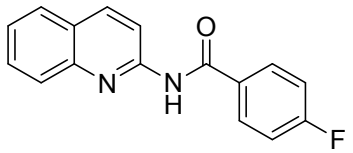
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.09 (s, 1 H), 8.38 (s, 2 H), 8.02 (d, *J*= 8.0 Hz, 2 H), 7.93 (dd, J_1= 8.0 Hz, J_2= 0.8 Hz, 1 H), 7.88 (d, *J*= 8.4 Hz, 1 H), 7.74 - 7.70 (m, 1 H), 7.52 - 7.48 (m, 1 H), 7.31 (d, *J*= 7.6 Hz, 2 H), 2.37 (s, 3 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 166.8, 152.5, 147.0, 142.8, 138.5, 131.6, 130.5, 129.5, 128.8, 128.3, 127.6, 126.3, 125.6, 116.0, 21.6; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 263.1179, found 263.1174.

4-methoxy-N-(quinolin-2-yl)benzamide (3p)[4]



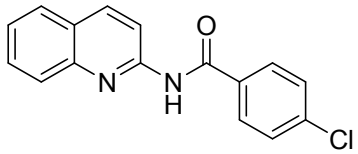
^{1}H NMR (400MHz, d^6- DMSO) δ: 10.98 (s, 1 H), 8.36 (s, 2 H), 8.12 (d, *J*= 8.0 Hz, 2 H), 7.93 – 7.87 (m, 2 H), 7.71 – 7.70 (m, 1 H), 7.49 – 7.48 (m, 1 H), 7.05 (d, *J*= 8.4 Hz, 2 H), 3.83 (s, 3 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 166.3, 162.9, 152.6, 147.0,138.4, 130.7, 130.4, 128.3, 127.5, 126.5, 126.3, 125.6, 116.1, 114.1, 55.9.

4-fluoro-N-(quinolin-2-yl)benzamide (3q)



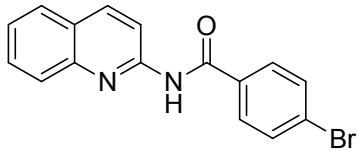
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.23 (s, 1 H), 8.36 (s, 2 H), 8.20 - 8.17 (m, 2 H), 7.92 - 7.87 (m, 2 H), 7.73 - 7.69 (m, 1 H), 7.49 (t, *J*= 7.6 Hz, 1 H), 7.33 (t, *J*= 8.8 Hz, 2 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 166.2, 166.0, 163.7, 152.4, 146.9, 138.6, 135.9, 135.8, 131.6, 131.5, 131.0, 131.0, 130.5, 128.3, 127.6, 126.4, 125.7, 117.6, 117.4, 116.0, 115.9, 115.7;^{19}F NMR (379MHz, d^6- DMSO) δ: -107.9; HRMS (ESI) *m/z* calcd. for $C_{17}H_{15}N_2O$ $[M+H]^+$: 267.0928, found 267.0930.

4-chloro-N-(quinolin-2-yl)benzamide (3r)



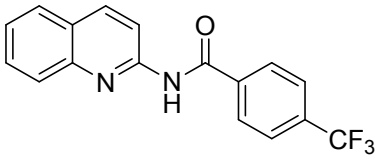
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.23 (s, 1 H), 8.38 (d, *J*= 8.8 Hz, 1 H), 8.33 (d, *J*= 8.8 Hz, 1 H), 8.10 - 8.08 (m, 2 H), 7.93 (d, *J*= 8.0 Hz, 1 H), 7.88 (d, *J*= 8.4 Hz, 1 H), 7.74 - 7.70 (m, 1 H), 7.58 (d, *J*= 8.4 Hz, 2 H), 7.56 - 7.49 (m, 1 H); ^{13}C NMR (100 MHz, d^6- DMSO) δ: 166.1, 152.3, 146.9, 138.7, 137.6, 133.3, 130.7, 130.6, 129.0, 128.4, 127.7, 126.4, 125.9, 116.0;HRMS (ESI) *m/z* calcd. for $C_{16}H_{12}ClN_2O$ $[M+H]^+$: 283.0633, found 283.0627.

4-bromo-N-(quinolin-2-yl)benzamide (3s)



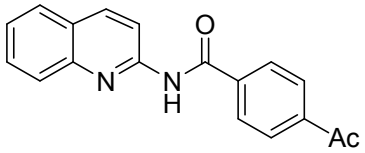
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.26 (s, 1H), 8.41 (d, *J*= 8.8 Hz, 1 H), 8.34 (d, *J*= 9.2 Hz, 1 H), 8.03 - 8.01 (m, 2 H), 7.95 (dd, J_1= 8.0 Hz, J_2= 1.2 Hz, 1 H), 7.88 (d. *J*= 8.4 Hz, 1 H), 7.74 - 7.72 (m, 3 H), 7.56 - 7.51 (m, 1 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 166.2, 152.3, 146.9, 138.7, 133.6, 131.9, 130.8, 130.6, 128.4, 127.6, 126.5, 126.4, 125.8, 115.9; HRMS (ESI) *m/z* calcd. for $C_{16}H_{12}BrN_2O$ [M+H]$^+$: 327.0128, found 327.0124.

N-(quinolin-2-yl)-4-(trifluoromethyl)benzamide (3t)



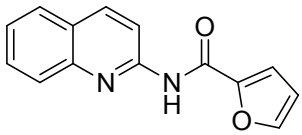
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.42 (s, 1 H), 8.42 (d, *J*= 9.2 Hz, 1 H), 8.36 (d, *J*= 9.2 Hz, 1 H), 8.25 (d, *J*= 8.0 Hz, 1 H), 7.96 (d, *J*= 9.2 Hz, 1 H), 7.89 (d, *J*= 8.4 Hz, 3 H), 7.76 - 7.72 (m, 1 H), 7.55 - 7.51 (m, 1 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 166.0, 152.1, 146.9, 138.8, 138.4, 130.6, 129.7, 128.4, 127.7, 126.4, 125.9, 125.9, 125.8, 115.9; ^{19}F NMR (376MHz, d^6- DMSO) δ: -61.4;HRMS (ESI) *m/z* calcd. for $C_{17}H_{12}F_3N_2O$ [M+H]$^+$: 317.0896, found 317.0887.

4-acetyl-N-(quinolin-2-yl)benzamide (3u)



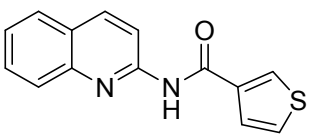
^{1}H NMR (400MHz, d^6- DMSO) δ: 11.35 (s, 1 H), 8.43 (d, *J*=8.8 Hz, 1 H), 8.36 (d, *J*= 9.2 Hz, 1 H), 8.20 - 8.18 (m, 2 H), 8.09 - 8.06 (m, 2 H), 7.97 (d, *J*= 8.0 Hz, 1 H), 7.89 (d, *J*= 8.4 Hz, 1 H), 7.75 (t, *J*= 7.2 Hz, 1 H), 7.56 – 7.52 (m, 1 H), 2.65 (s, 3 H); ^{13}C NMR (100 MHz, d^6- DMSO) δ: 198.3, 166.3, 152.2, 146.9, 139.7, 138.7, 138.3, 130.6, 129.0, 128.6, 128.3, 127.6, 126.4, 125.8, 115.9, 27.5; HRMS (ESI) *m/z* calcd. for $C_{18}H_{15}N_2O_2$ [M+H]$^+$: 291.1128, found 291.1130.

N-(quinolin-2-yl)furan-2-carboxamide (3v)



^{1}H NMR (400MHz, d^6 - DMSO) δ: 10.93 (s, 1 H), 8.39 (d, *J*= 9.2 Hz, 1 H), 8.33 (d, *J*= 9.2 Hz, 1 H), 7.98 (s, 1 H), 7.93 (d, *J*= 8.0 Hz, 1 H), 7.87 (d, *J*= 8.4 Hz, 1 H), 7.72 - 7.71 (m, 2 H), 7.51 (t, *J*= 7.2 Hz, 1 H), 6.73 - 6.71 (m, 1 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 157.4, 151.9, 147.3, 147.1, 146.9, 138.7, 130.6, 128.3, 127.5, 126.3, 125.7, 116.4, 115.6, 112.7; HRMS (ESI) *m/z* calcd. for $C_{14}H_{11}N_2O_2$ [M+H]$^+$: 239.0815, found 239.0814.

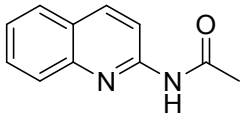
N-(quinolin-2-yl)thiophene-3-carboxamide (3w)



^{1}H NMR (400MHz, d^6- DMSO) δ: 11.01 (s, 1 H), 8.66 (dd, J_1= 2.8 Hz, J_2= 1.2 Hz, 1 H), 8.38 (s, 2 H), 7.94 (d, *J*= 8.0 Hz, 1 H), 7.88 (d, *J*= 8.4 Hz, 1 H), 7.78 (dd, J_1= 5.2 Hz, J_2= 1.2 Hz, 1 H), 7.73 - 7.72 (m, 1 H), 7.66 - 7.64 (m, 1 H), 7.52 - 7.48 (m, 1 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 162.1, 152.3, 146.9, 138.6, 137.5, 131.6, 130.5,

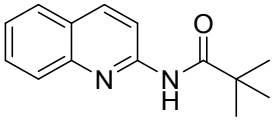
128.3, 128.1, 127.5, 127.4, 126.3, 125.6, 115.9; HRMS (ESI) *m/z* calcd. for $C_{18}H_{15}N_2O_2$ $[M+H]^+$: 255.0587, found 255.0582.

N-(quinolin-2-yl)acetamide (3x)



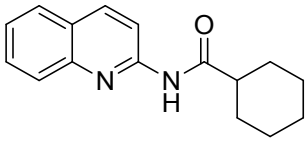
^{1}H NMR (400MHz, d^6 – DMSO) δ: 10.83 (s, 1 H), 8.33 (d, *J*= 8.8 Hz, 1 H), 8.28 (d, *J*= 9.2 Hz, 1 H), 7.90 (d, *J*= 12.0 Hz, 1 H), 7.81 – 7.79 (m, 1 H), 7.71 – 7.68 (m, 1 H), 7.49 – 7.45 (m, 1 H), 2.15 (s, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 170.5, 152.2, 146.8, 138.8, 130.5, 128.3, 127.3, 126.1, 125.4, 114.8, 24.6.

N-(quinolin-2-yl)pivalamide (3y)



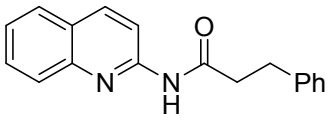
^{1}H NMR (400MHz, d^6- DMSO) δ: 10.13 (s, 1 H), 8.32 (d, *J*= 8.8 Hz, 1 H), 8.24 (d, *J*= 9.2 Hz, 1 H), 7.86 - 7.80 (m, 2 H), 7.65 (t, *J*= 7.2 Hz, 1 H), 7.41 (t, *J*= 7.6 Hz, 1 H), 1.28 (s, 9 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 178.2, 152.6, 146.9, 138.3, 130.3, 128.2, 127.4, 126.2, 125.2, 115.7, 40.1, 27.4.

N-(quinolin-2-yl)cyclohexanecarboxamide (3z)



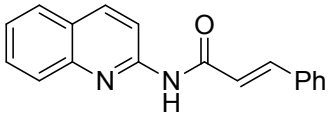
^{1}H NMR (400MHz, d^6 – DMSO) δ: 10.69 (s, 1 H), 8.31 (s, 2 H), 7.88 (dd, J_1= 8.0 Hz, J_2= 0.8 Hz, 1 H), 7.79 (d, *J*= 8.4 Hz, 1 H), 7.70 – 7.66 (m, 1 H), 7.48 – 7.44 (m, 1 H), 2.59 – 2.53 (m, 1 H), 1.83 (d, *J*= 12.0 Hz, 2 H), 1.75 – 1.72 (m, 2 H), 1.64 – 1.62 (m, 1 H), 1.43 -1.36 (m, 2 H), 1.28 – 1.15 (m, 3 H);^{13}C NMR (100 MHz, d^6– DMSO) δ: 176.3, 152.5, 146.9, 138.6, 130.4, 128.2, 127.4, 126.1, 125.3, 114.9, 44.9, 29.5, 25.9, 25.7; HRMS (ESI) *m/z* calcd. for $C_{16}H_{19}N_2O$ $[M+H]^+$: 255.1492, found 255.1487.

3-phenyl-N-(quinolin-2-yl)propanamide (3aa)



^{1}H NMR (400MHz, d^6- DMSO) δ: 10.86 (s, 1 H), 8.33 (s, 2 H), 7.89 (dd, J_1= 8.0 Hz, J_2= 0.8 Hz, 1 H), 7.79 (d, *J*= 8.4 Hz, 1 H), 7.71 - 7.67 (m, 1 H), 7.49 - 7.45 (m, 1 H), 7.28 - 7.27 (m, 4 H), 7.19 - 7.15 (m, 1 H), 2.94 (t, *J*= 7.2 Hz, 2 H), 2.78 (t, *J*= 8.4 Hz, 2 H);^{13}C NMR (100 MHz, d^6- DMSO) δ: 172.5, 152.2, 146.9, 141.6, 138.8, 130.5, 128.8, 128.3, 127.4, 126.5, 126.1, 125.3, 114.8, 38.4, 31.2; HRMS (ESI) *m/z*calcd. for $C_{18}H_{17}N_2O$ $[M+H]^+$: 277.1335, found 277.1338.

N-(quinolin-2-yl)cinnamamide (3ab)



^{1}H NMR (400MHz, d^6– DMSO) δ: 11.09 (s, 1 H), 8.50 (d, J= 8.8 Hz, 1 H), 8.36 (d, *J*= 9.2 Hz, 1 H), 7.91 (d, *J*=

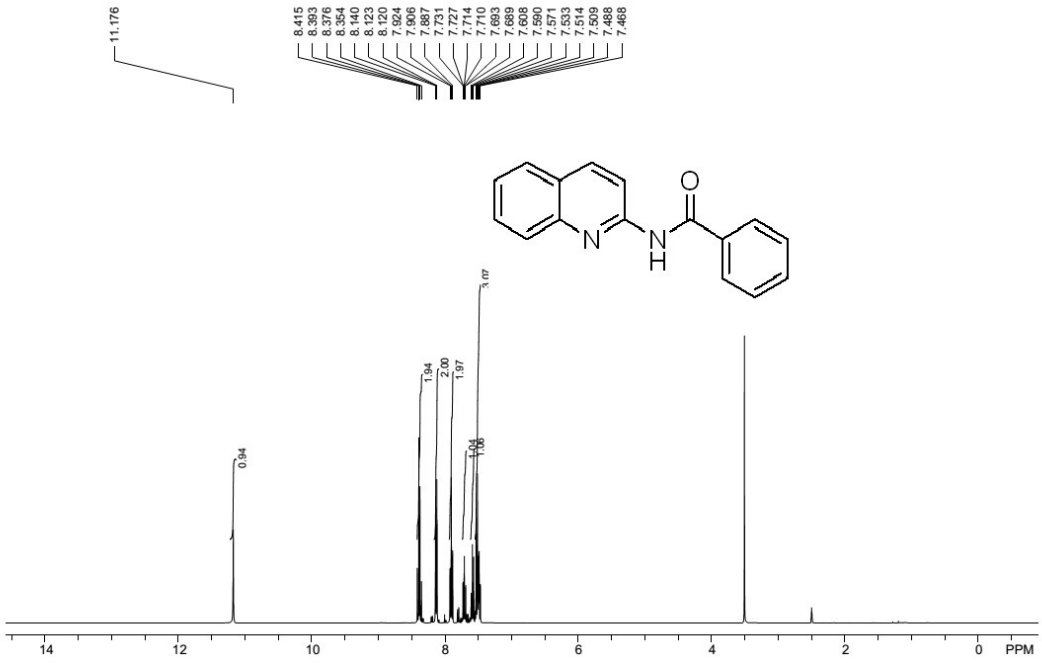
7.6 Hz, 1 H), 7.84 (d, *J*= 8.4 Hz, 1 H), 7.74 – 7.69 (m, 2 H), 7.64 – 7.62 (m, 2 H), 7.50 – 7.40 (m, 4 H), 7.14 (d, *J*= 15.6 Hz, 1 H);^{13}C NMR (100 MHz, d^{6}– DMSO) δ: 165.1, 152.4, 147.0, 141.9, 138.8, 135.1, 130.5, 130.5, 129.5, 128.4, 128.3, 127.4, 126.2, 125.4, 122.4, 115.0; HRMS (ESI) *m/z* calcd. for $C_{18}H_{15}N_2O$ $[M+H]^+$: 275.1179, found 275.1177.

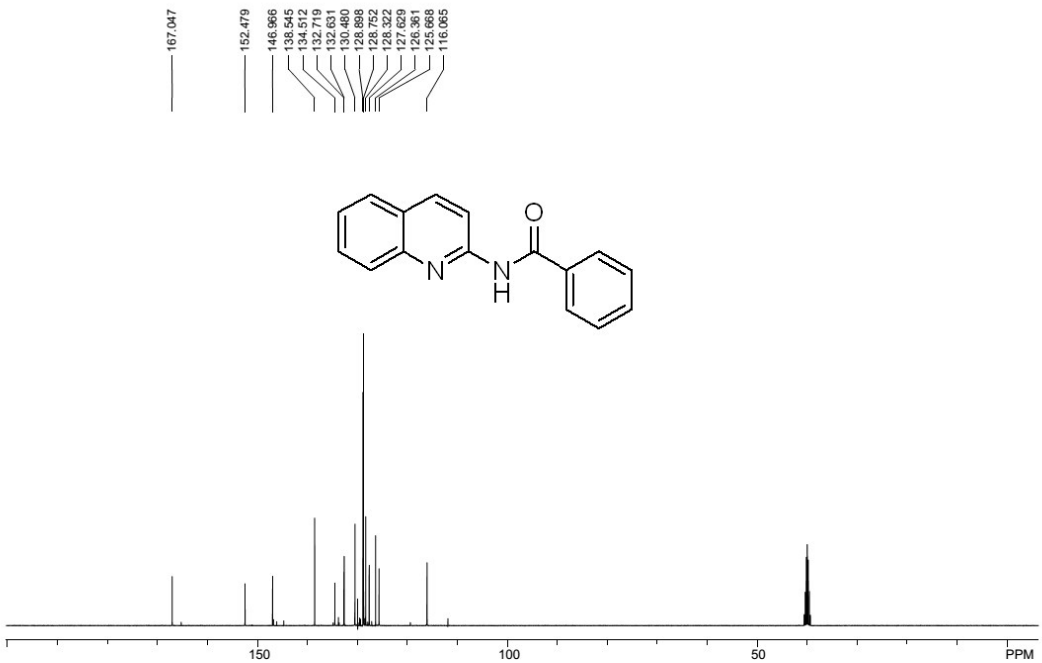
4. Reference

1. J. L. Vrijdag, F. Delgado, N. Alonso, W. M. De Borggraeve, N. Perez-Macias and J. Alcazar, *Chem. Commun.*, 2014, 50, 15094-15097.
2. S. Sharif, J. Day, H. N. Hunter, Y. Lu, D. Mitchell, M. J. Rodriguez and M. G. Organ, *J.Am.Chem.Soc.*, 2017, 139, 18436-18439.
3. M. Couturier, L. Caron, S. Tumidajski, K. Jones and T. D. White, *Org. Lett.*, 2006, 8, 1929-1932.
4. L. Deng, B. Huang and Y. Liu, *Org. Biomol. Chem.*, 2018, 16, 1552-1556.

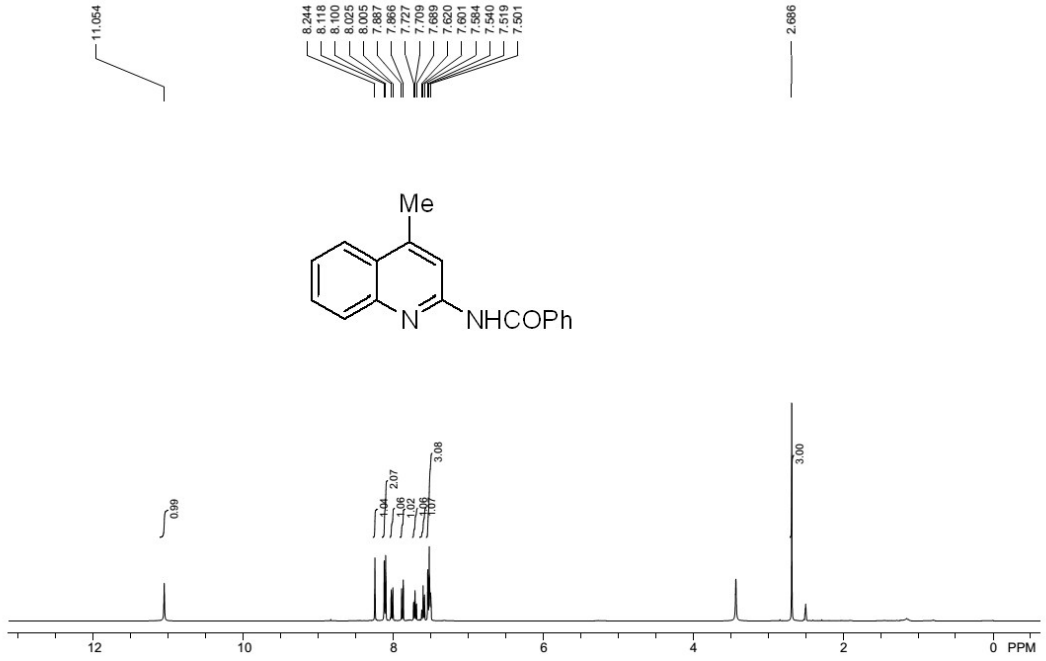
5. Copies of ^{1}H NMR and ^{13}C NMR spectra

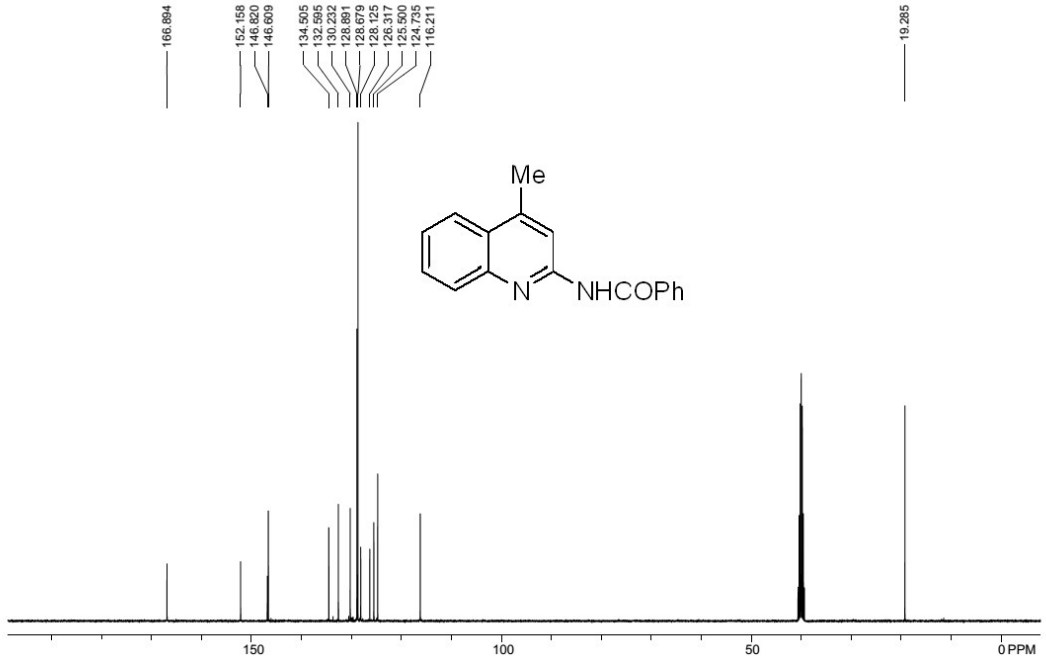
N-(quinolin-2-yl)benzamide (3a)



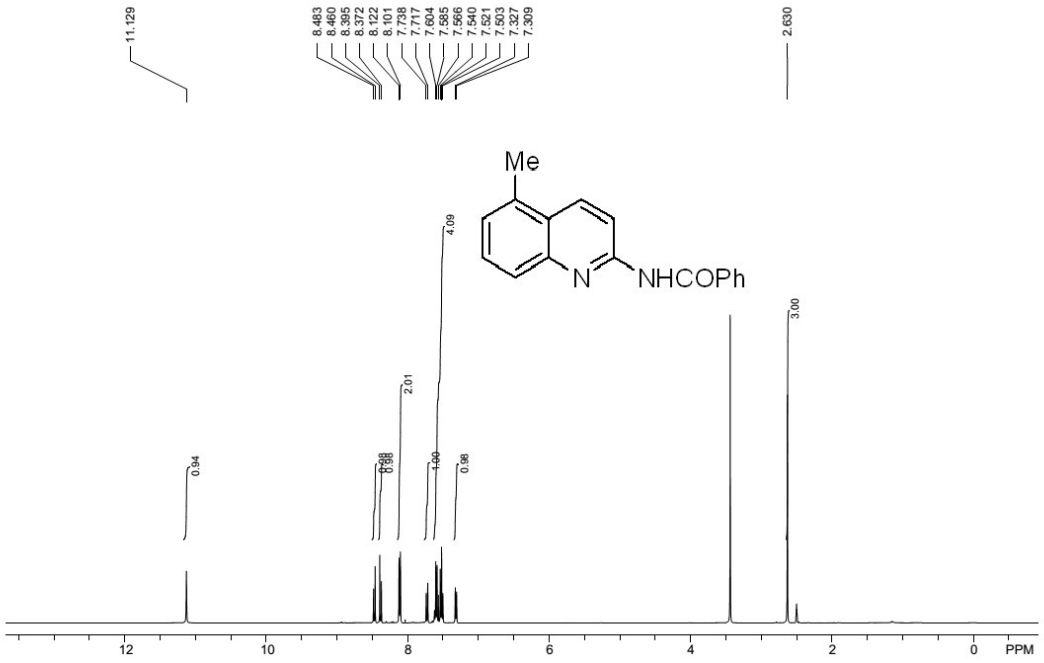


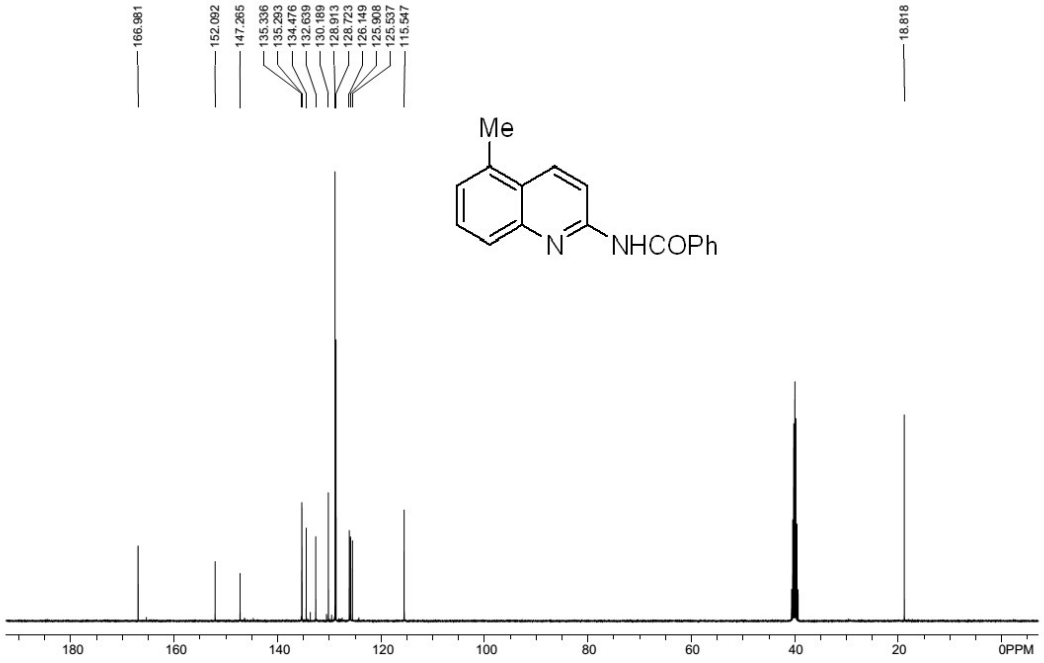
N-(4-methylquinolin-2-yl)benzamide(3b)



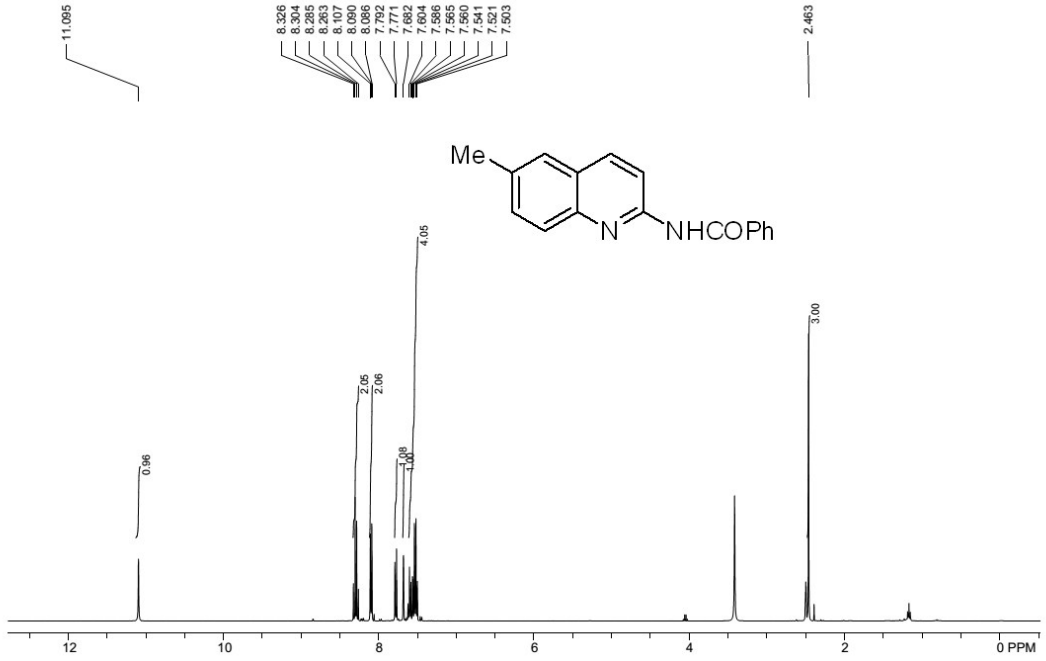


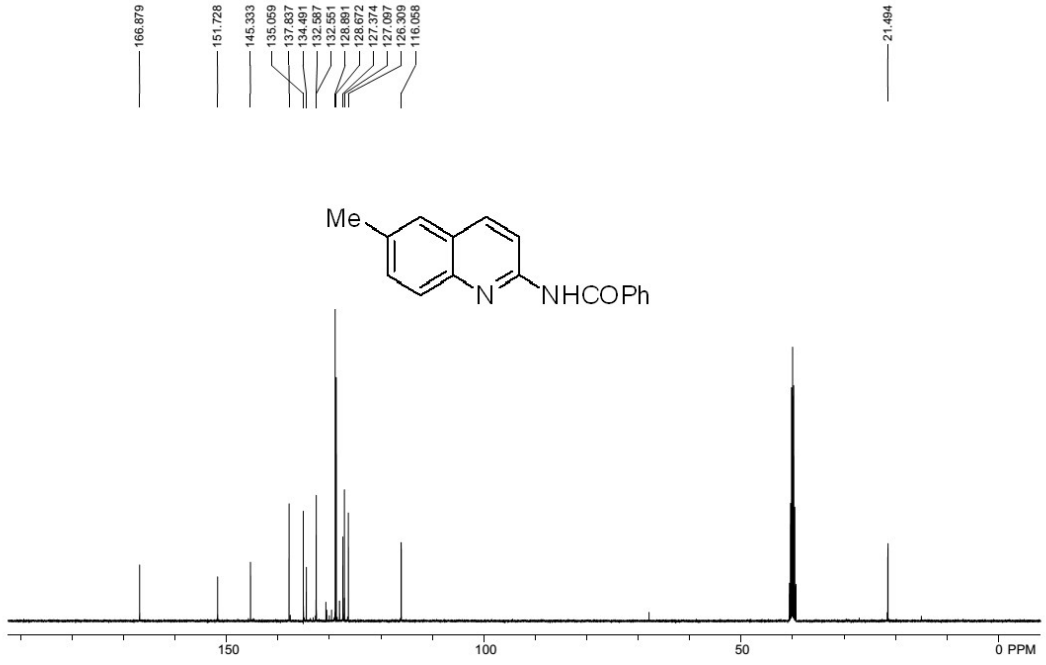
N-(5-methylquinolin-2-yl)benzamide(3c)



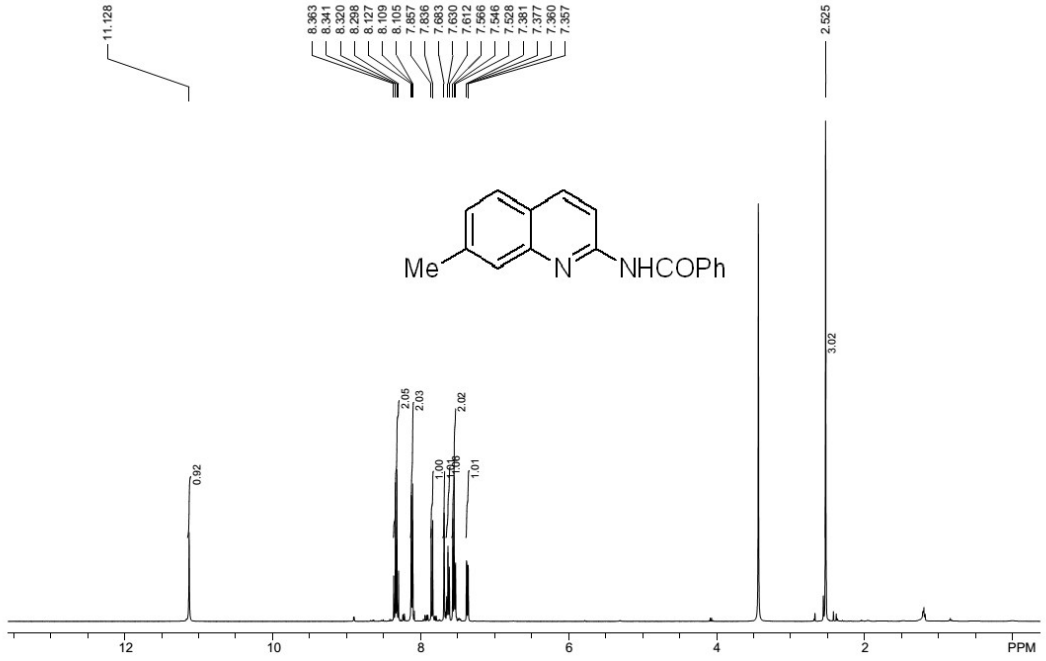


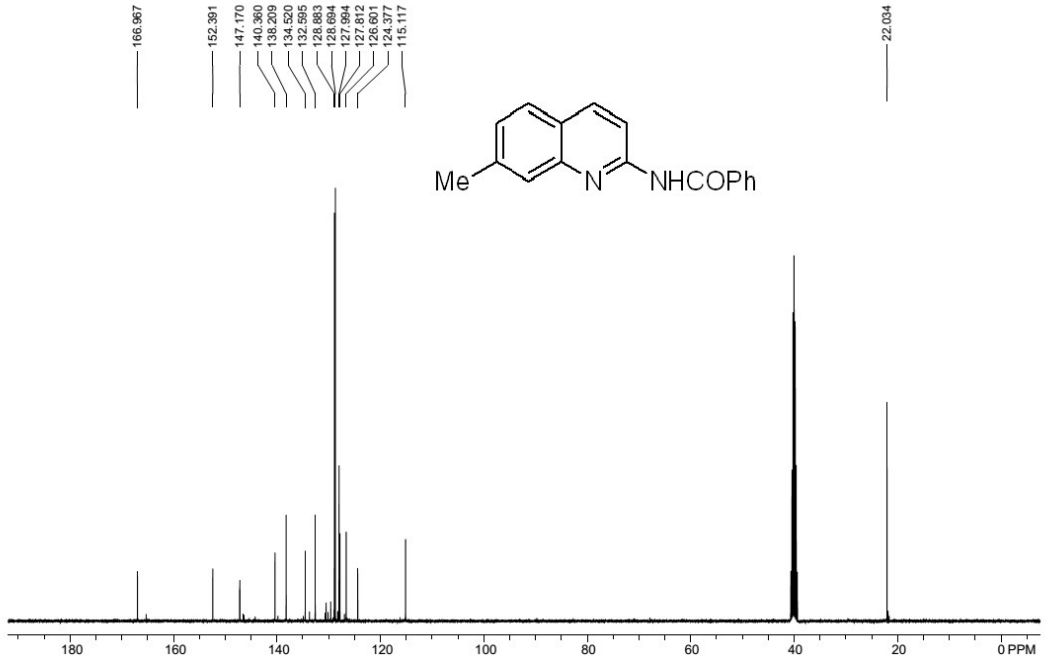
N-(6-methylquinolin-2-yl)benzamide (3d)



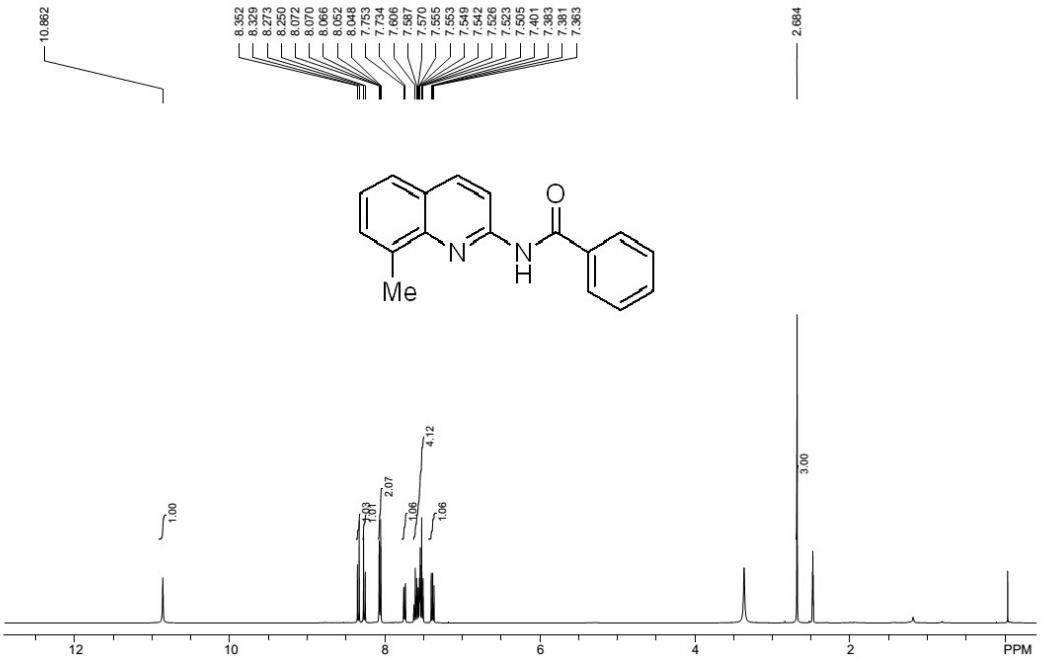


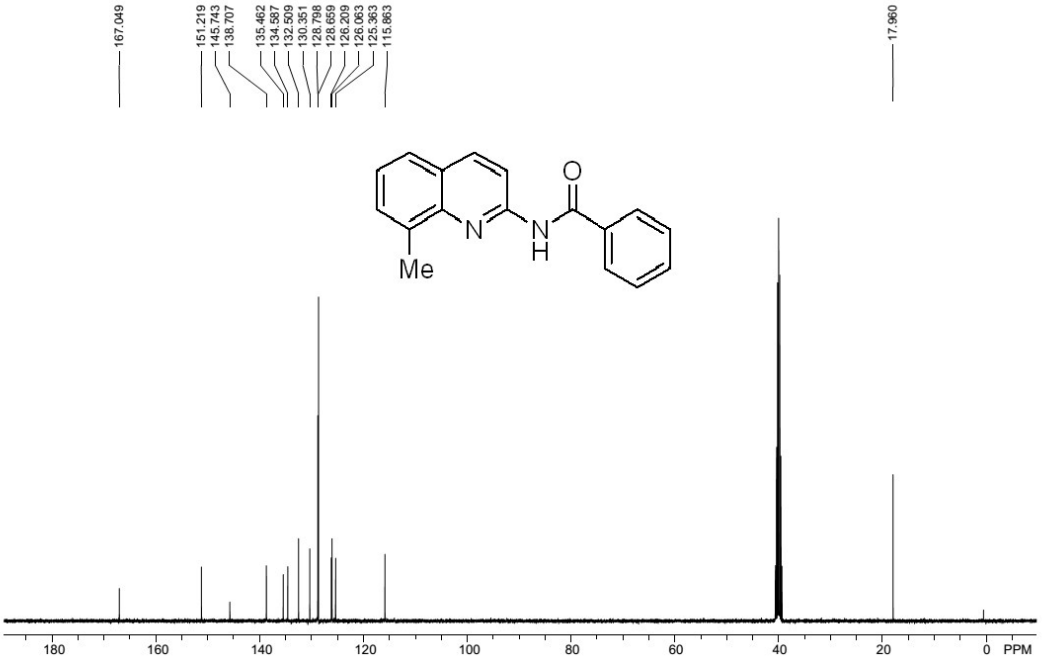
N-(7-methylquinolin-2-yl)benzamide (3e)



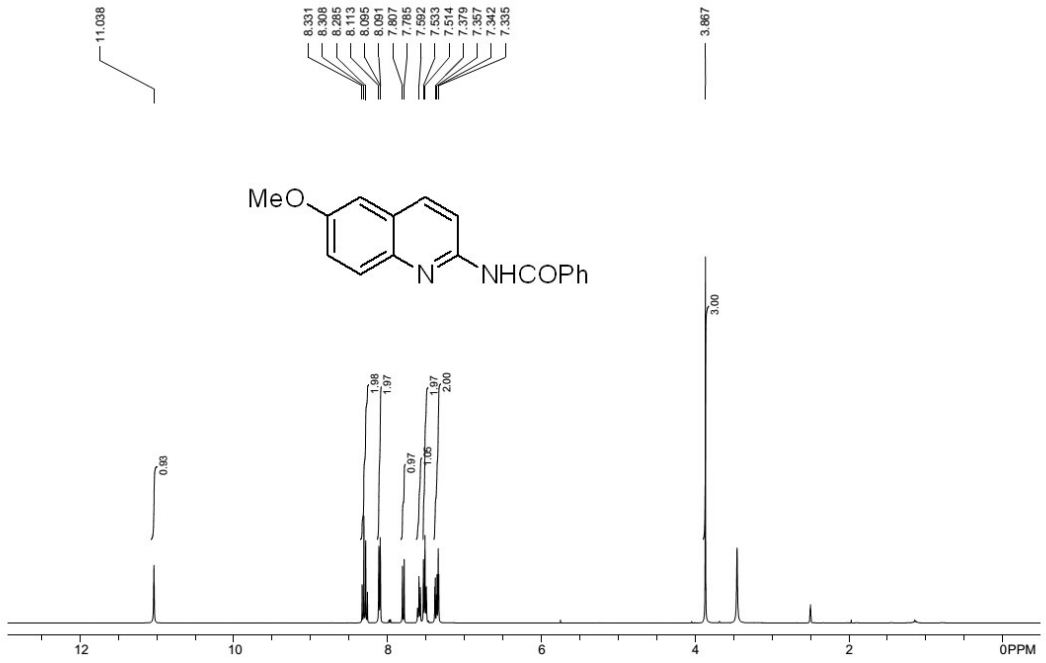


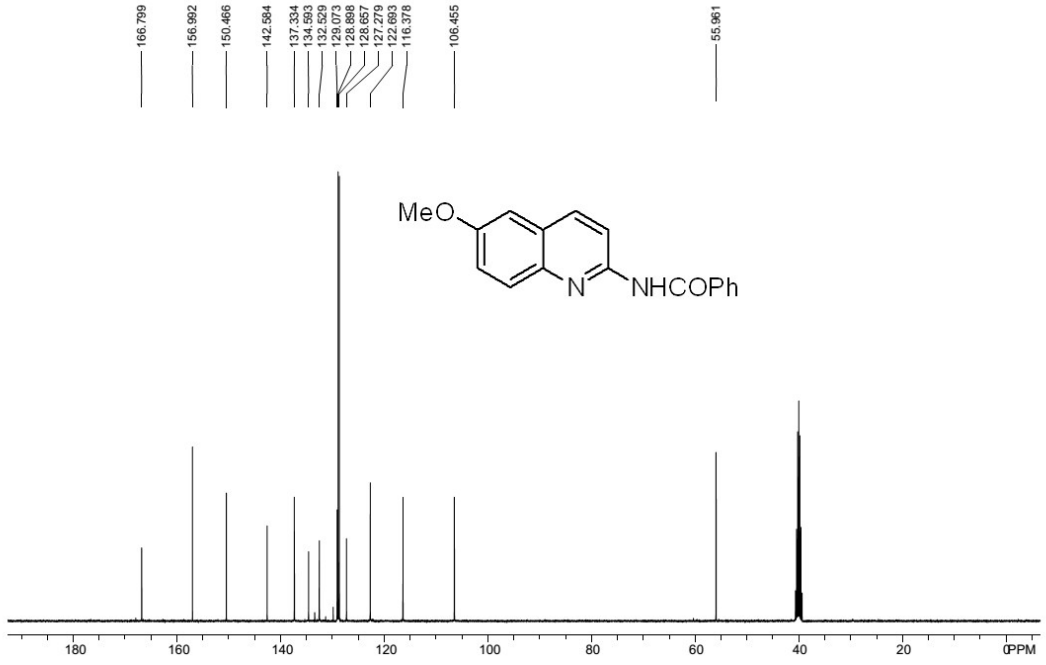
N-(8-methylquinolin-2-yl)benzamide (3f)



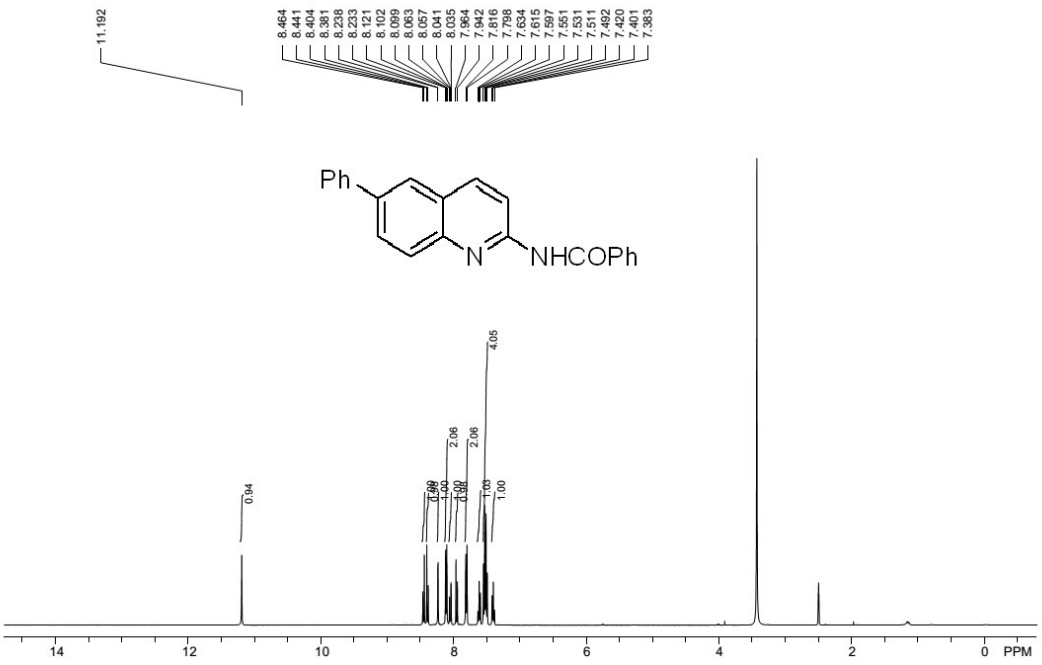


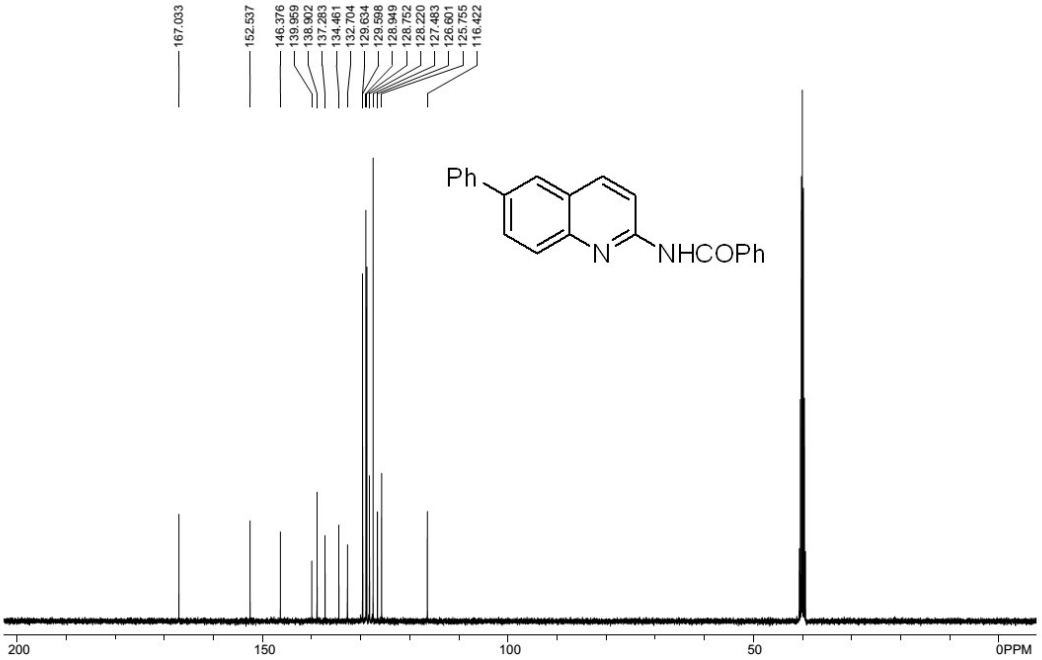
N-(6-methoxyquinolin-2-yl)benzamide (3g)



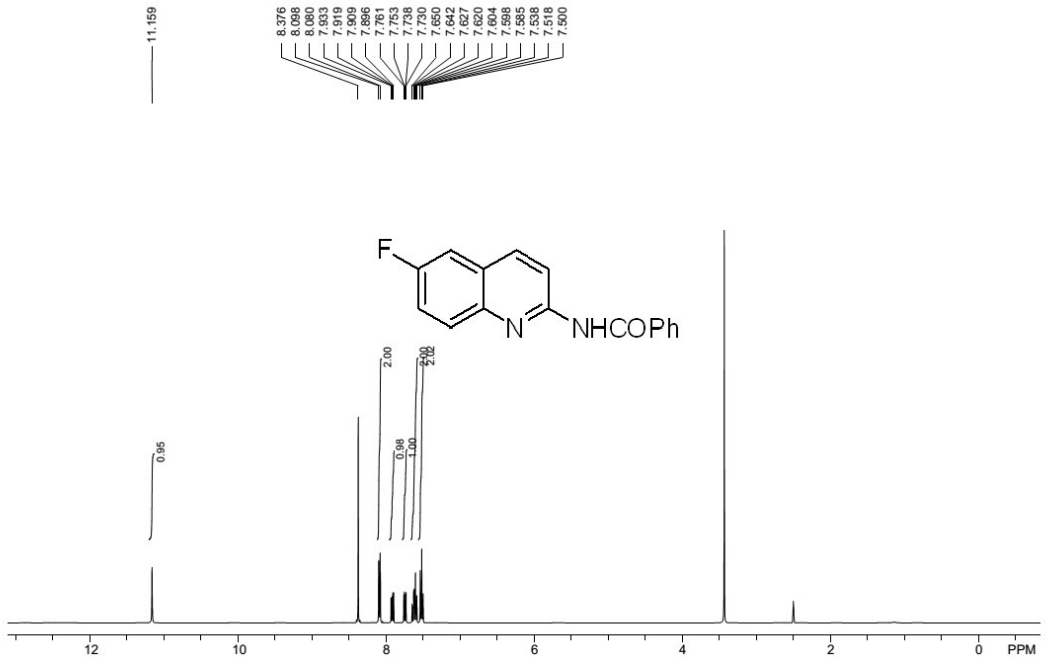


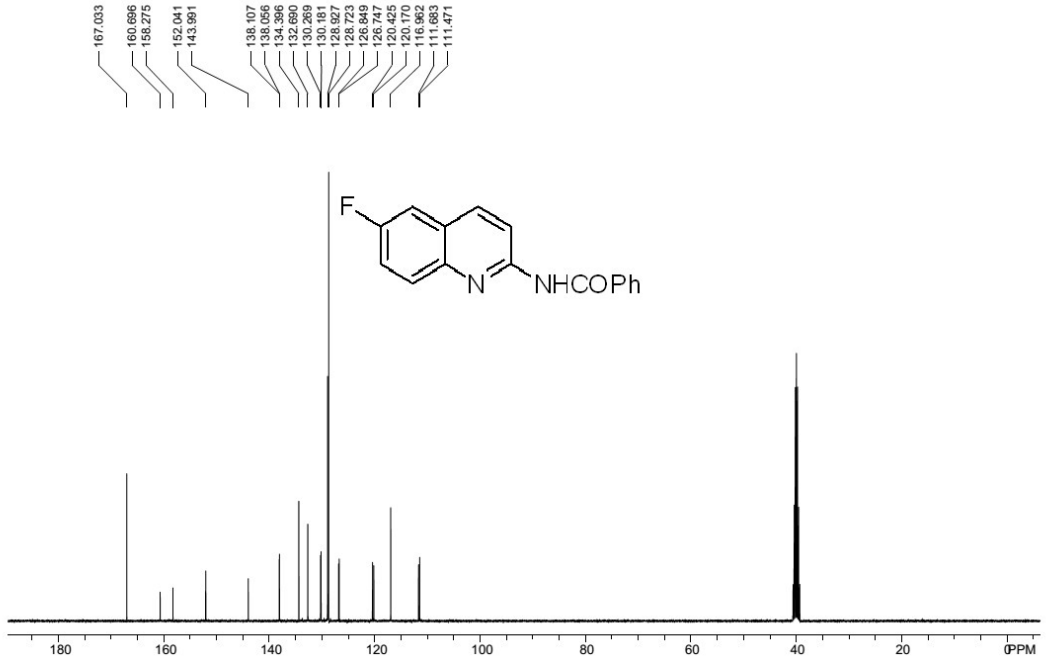
N-(6-phenylquinolin-2-yl)benzamide (3h)



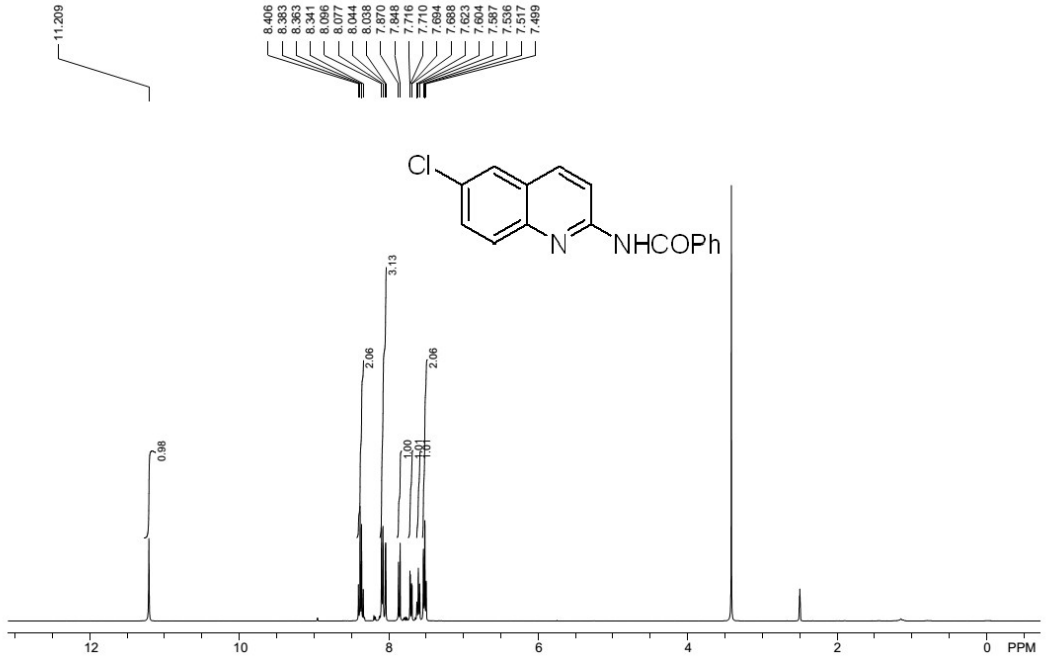


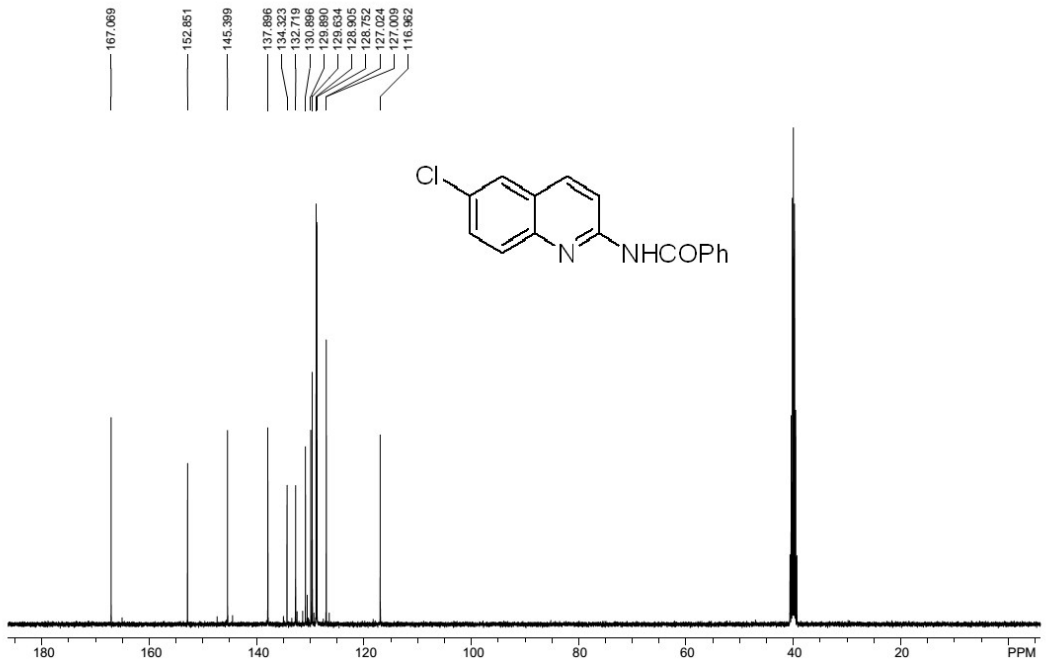
N-(6-fluoroquinolin-2-yl)benzamide (3i)



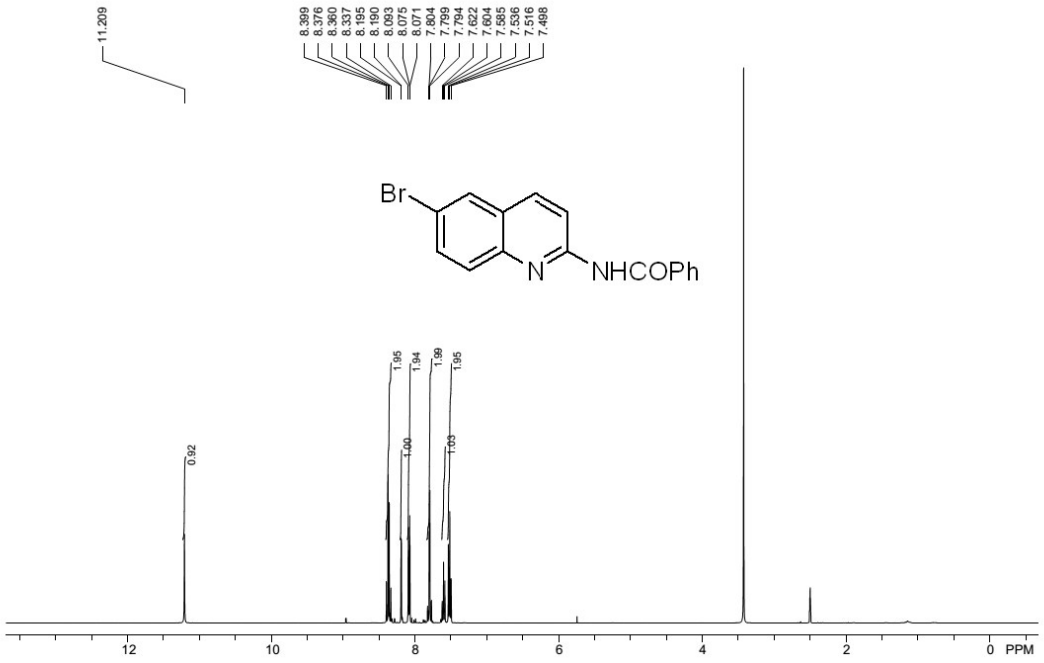


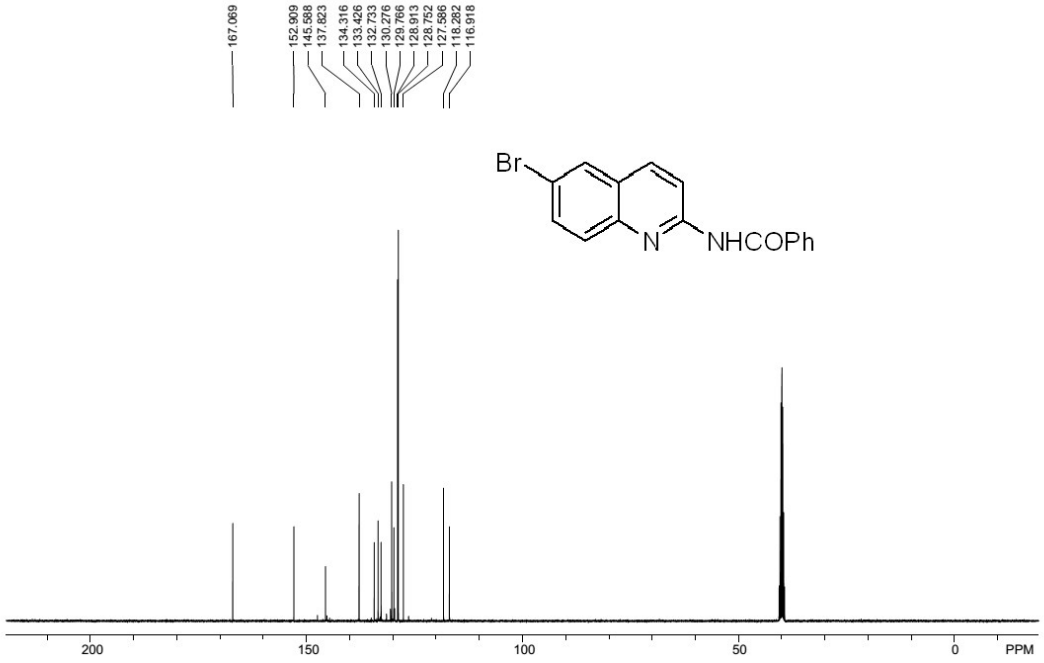
N-(6-chloroquinolin-2-yl)benzamide (3j)



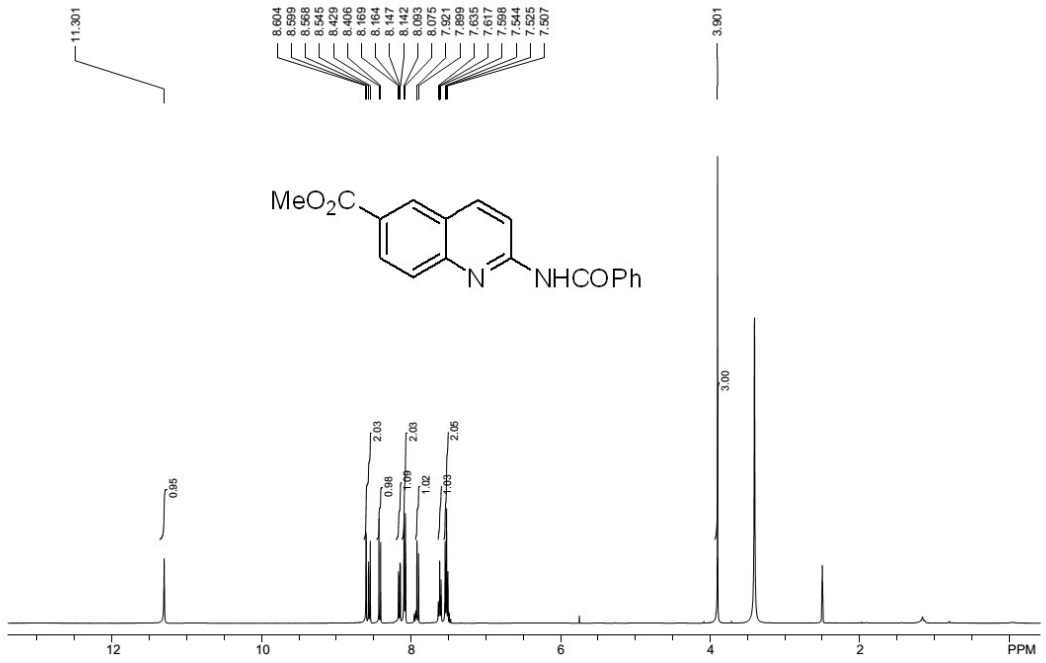


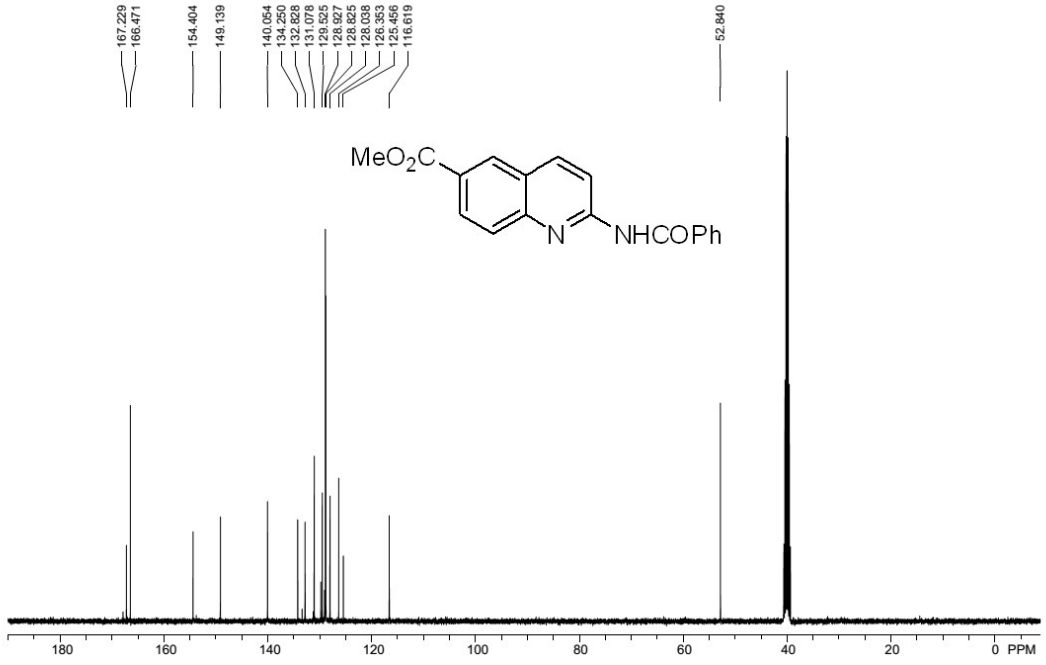
N-(6-bromoquinolin-2-yl)benzamide (3k)



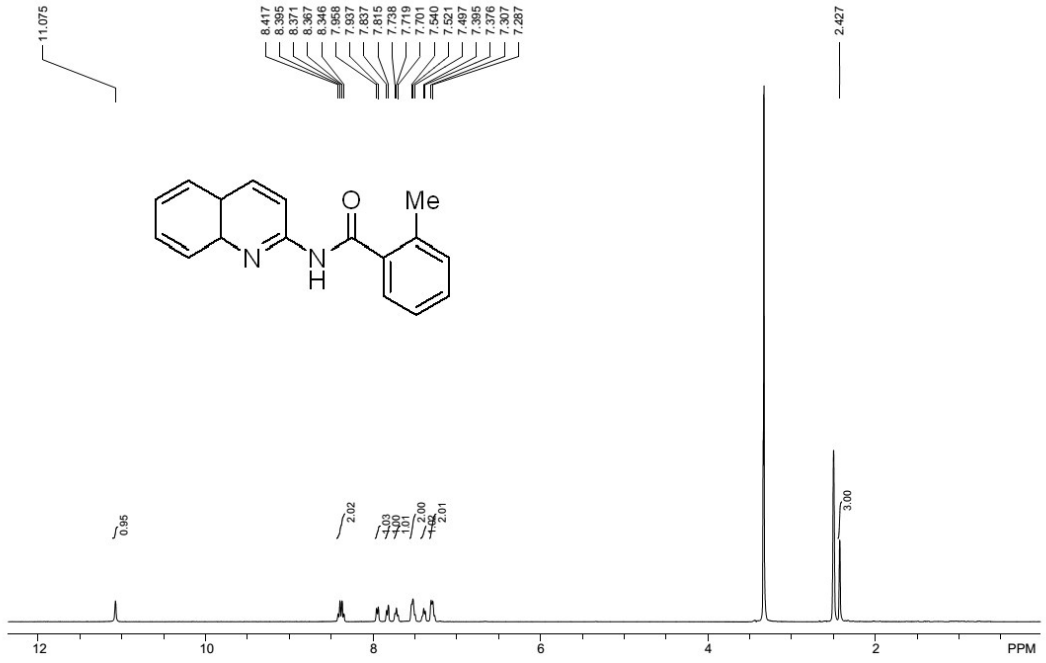


methyl 2-benzamidoquinoline-6-carboxylate (3l)

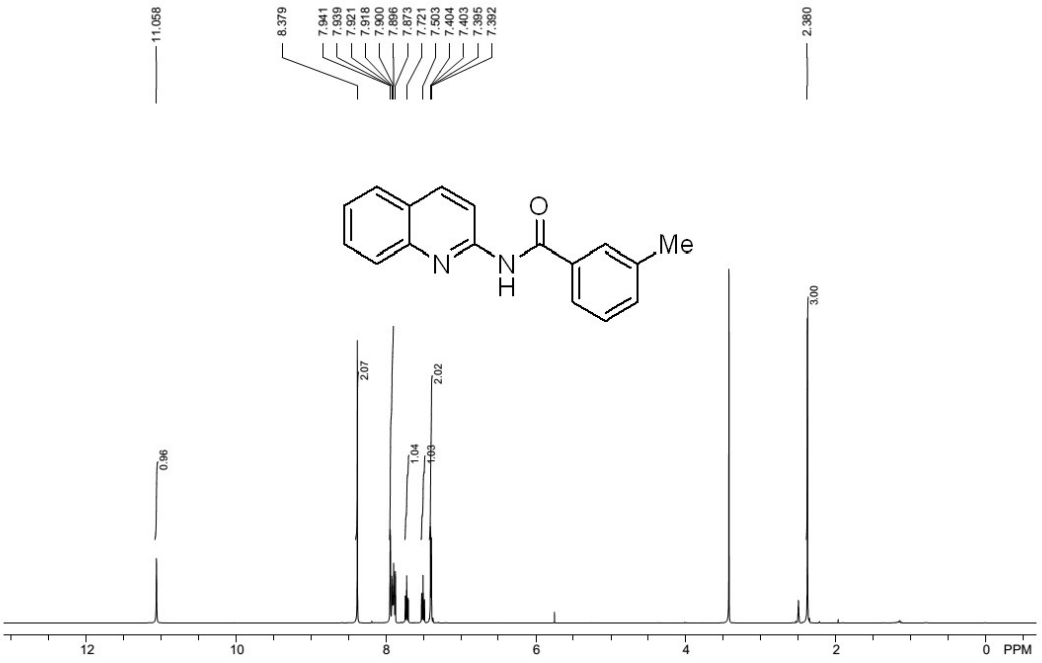


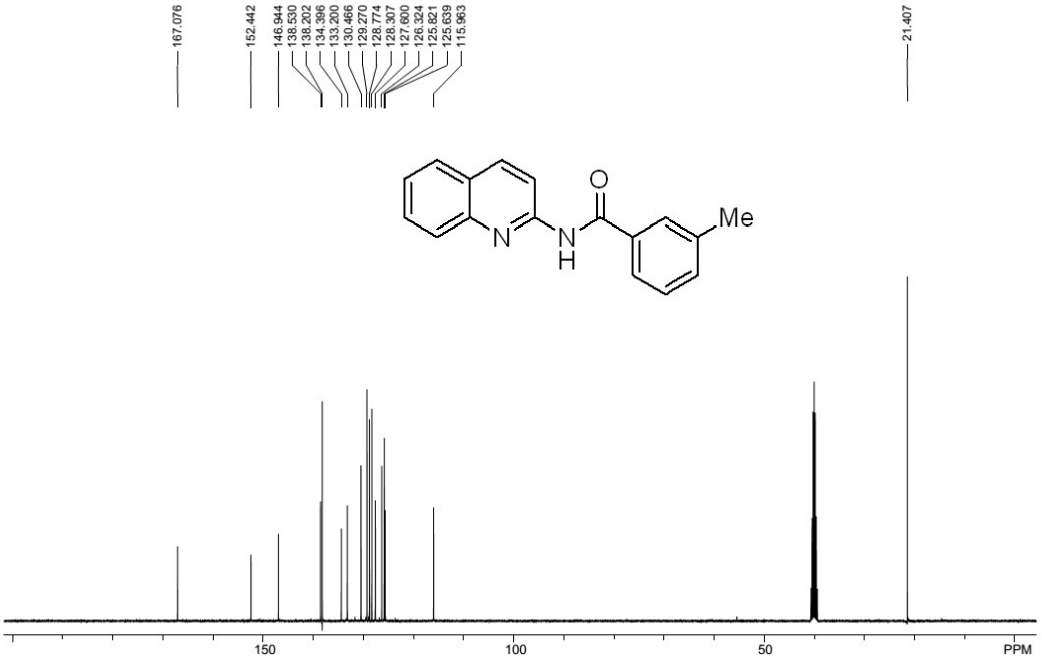


2-methyl-N-(quinolin-2-yl)benzamide (3m)

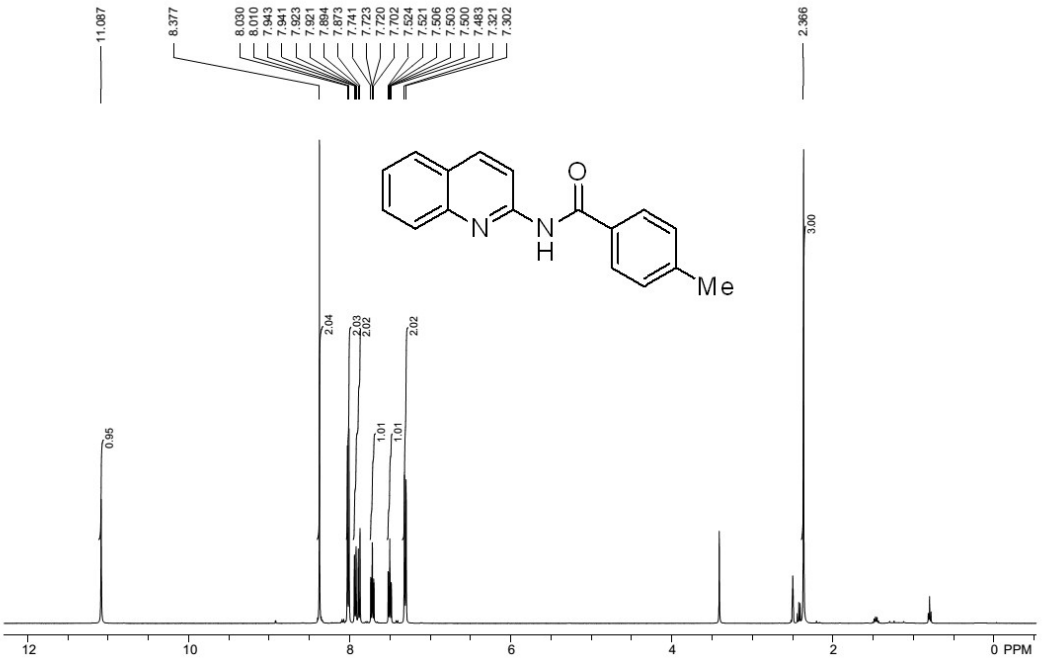


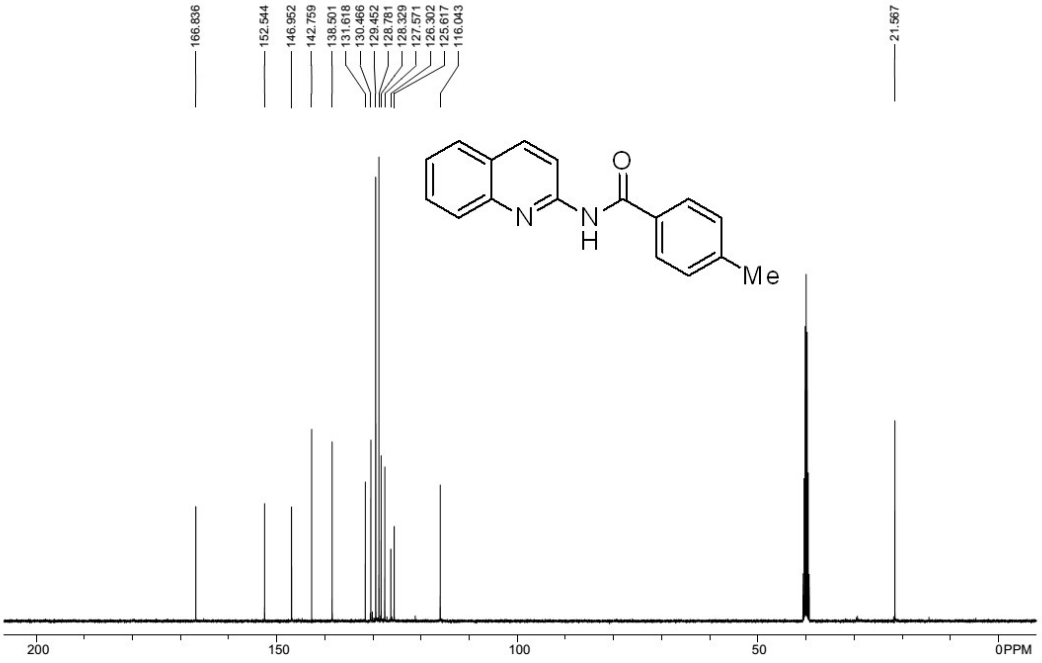
3-methyl-N-(quinolin-2-yl)benzamidee (3n)



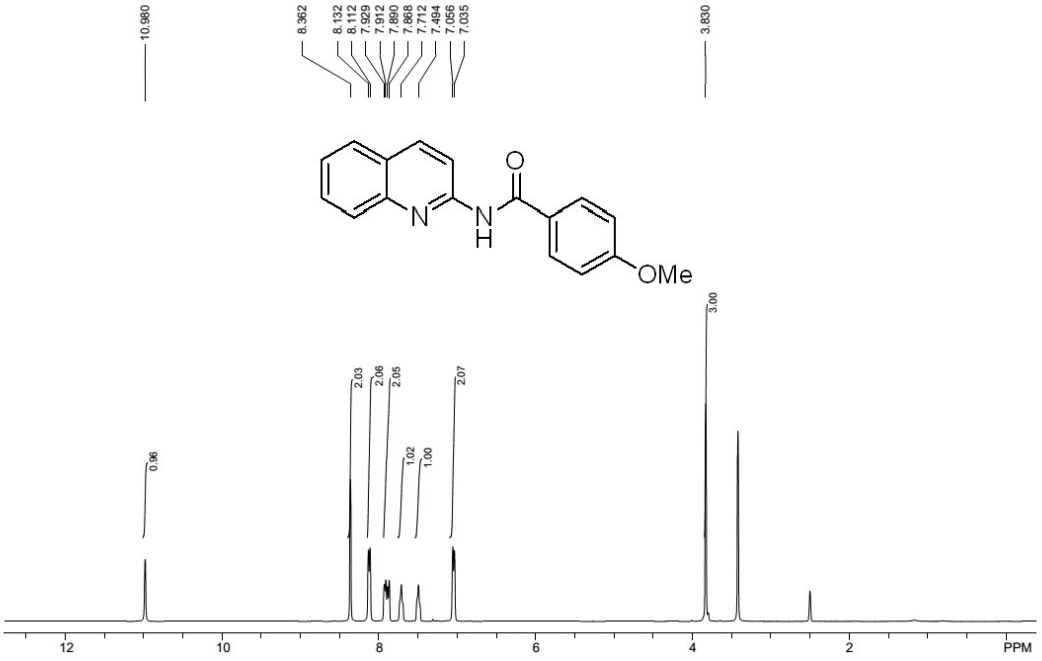


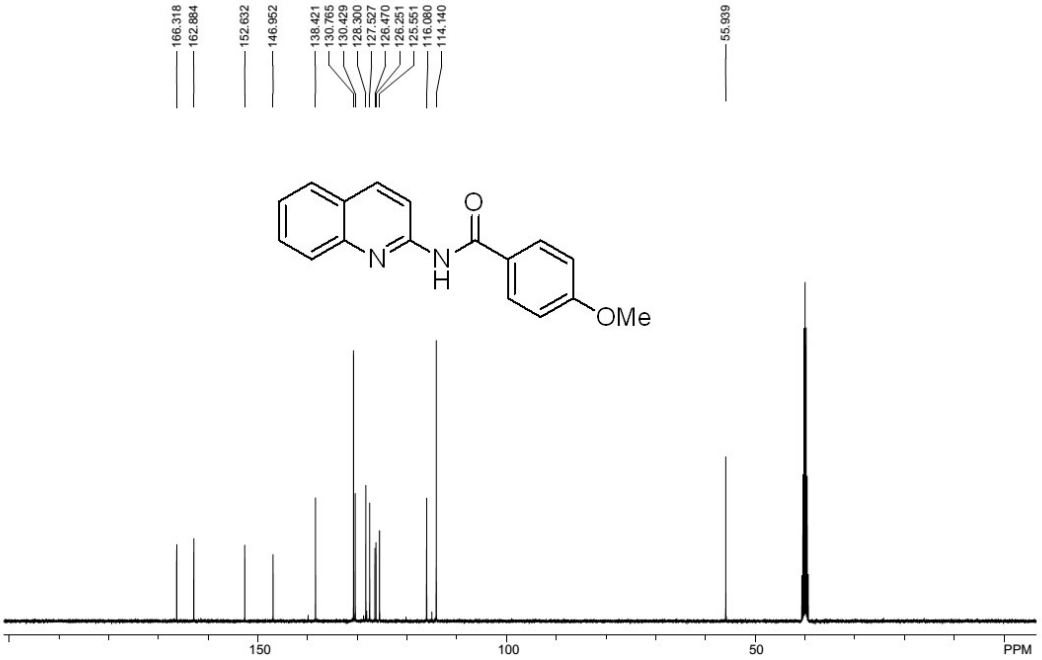
4-methyl-N-(quinolin-2-yl)benzamide (3o)



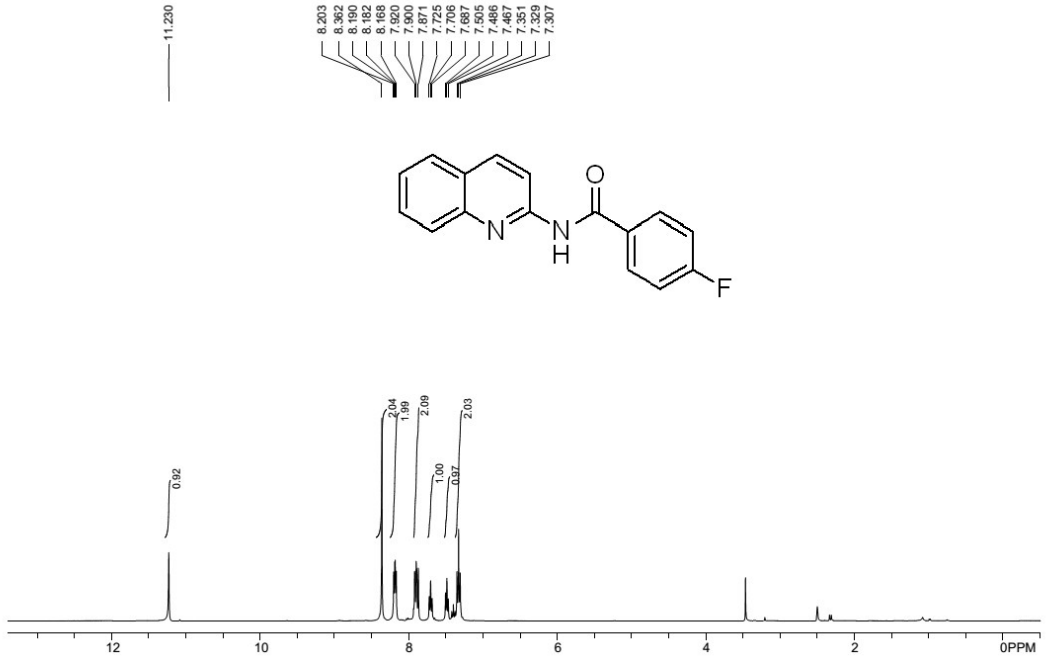


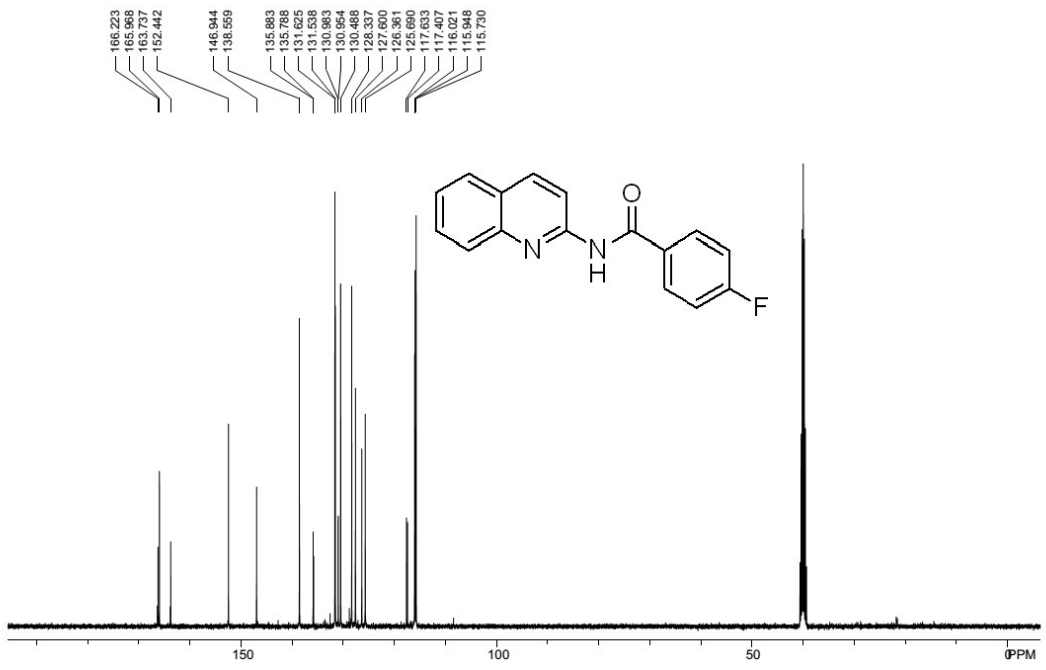
4-methoxy-N-(quinolin-2-yl)benzamide (3p)



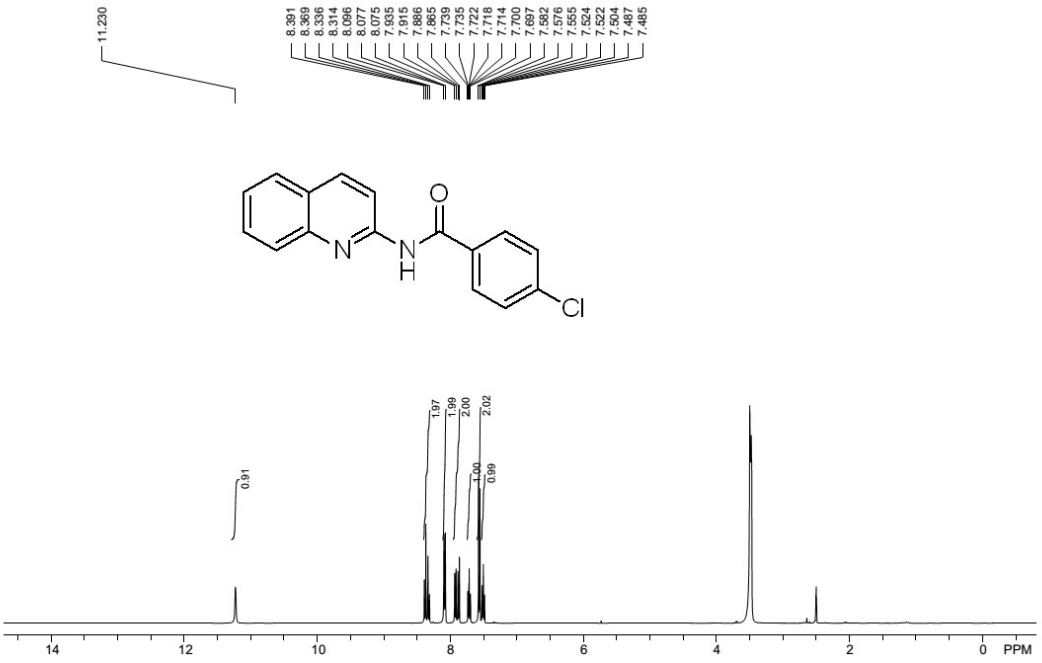


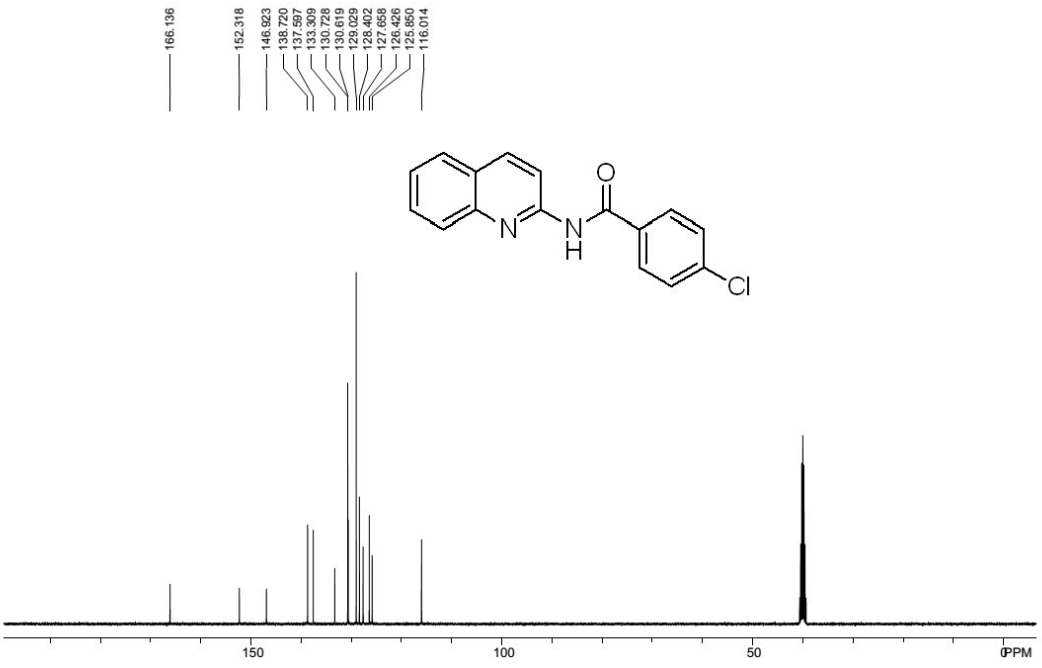
4-fluoro-N-(quinolin-2-yl)benzamide (3q)



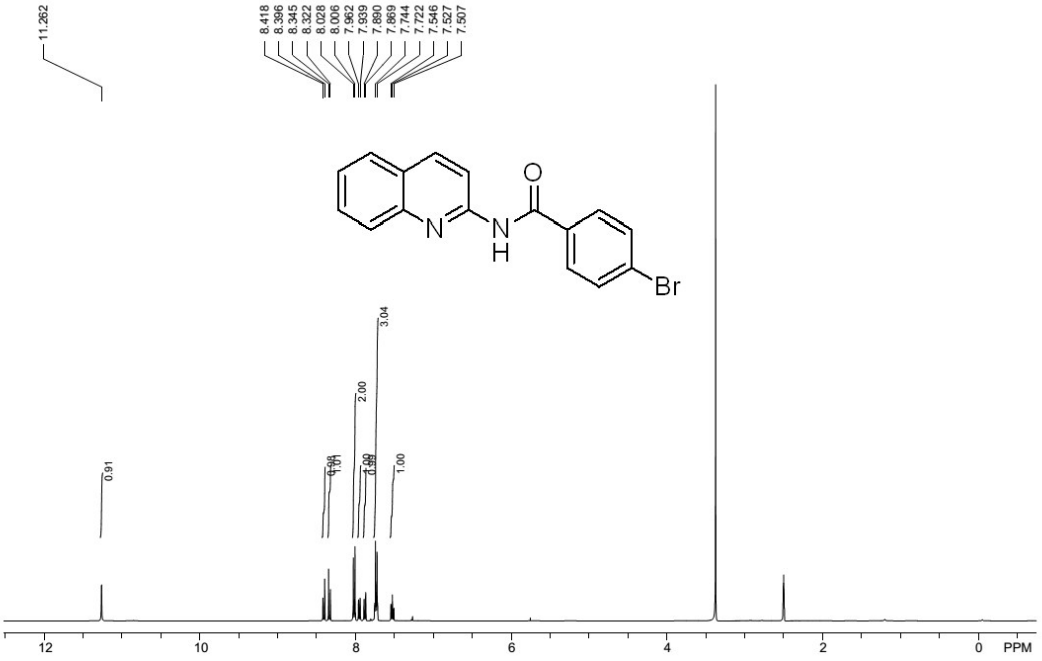


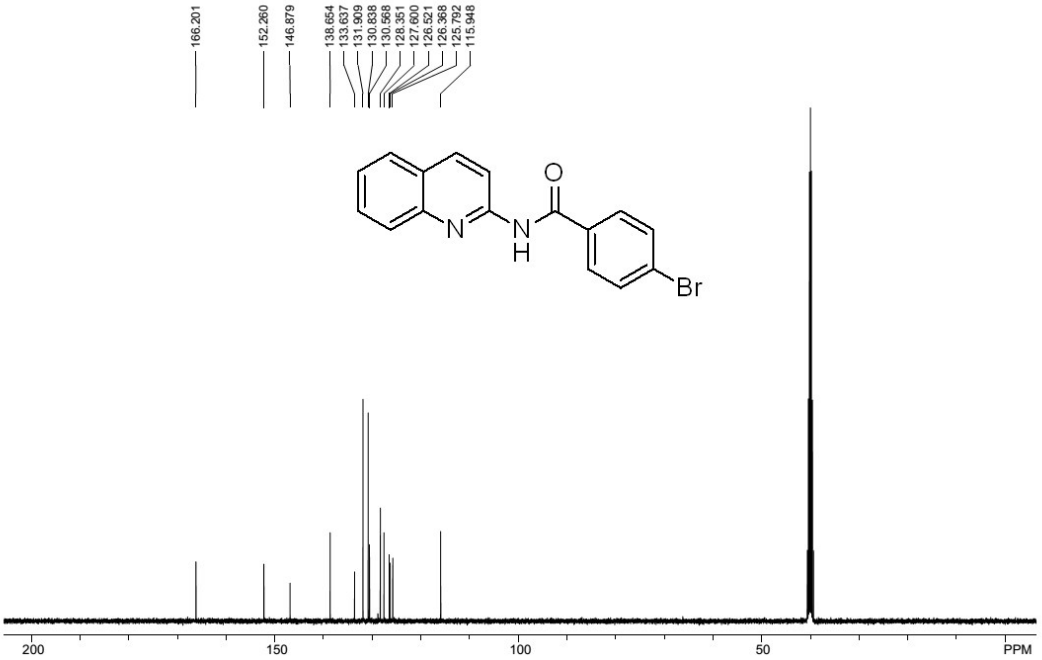
4-chloro-N-(quinolin-2-yl)benzamide (3r)



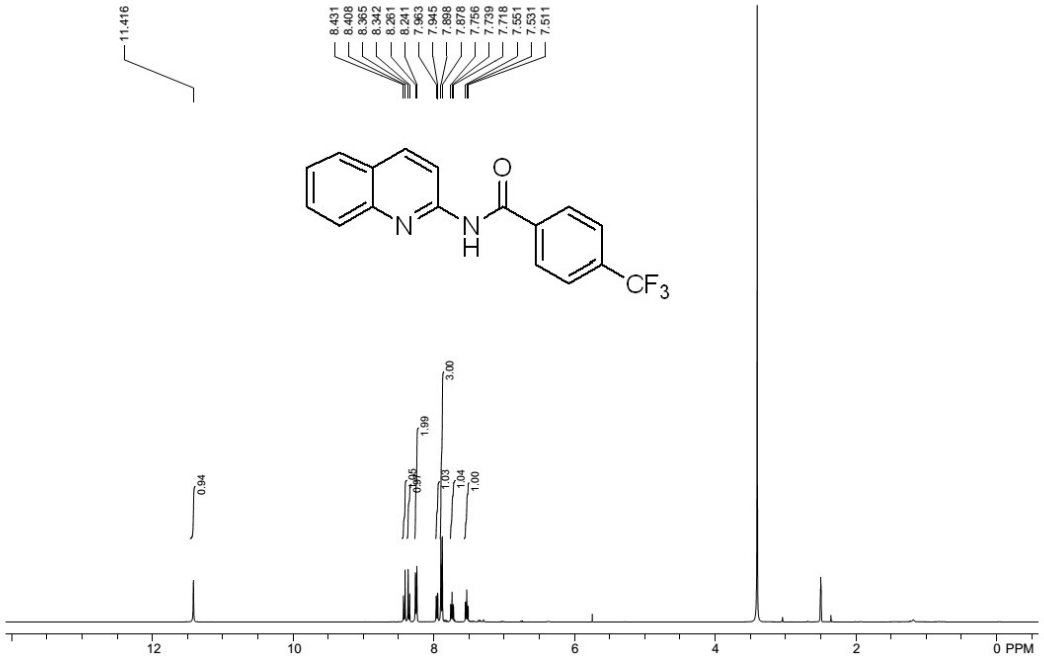


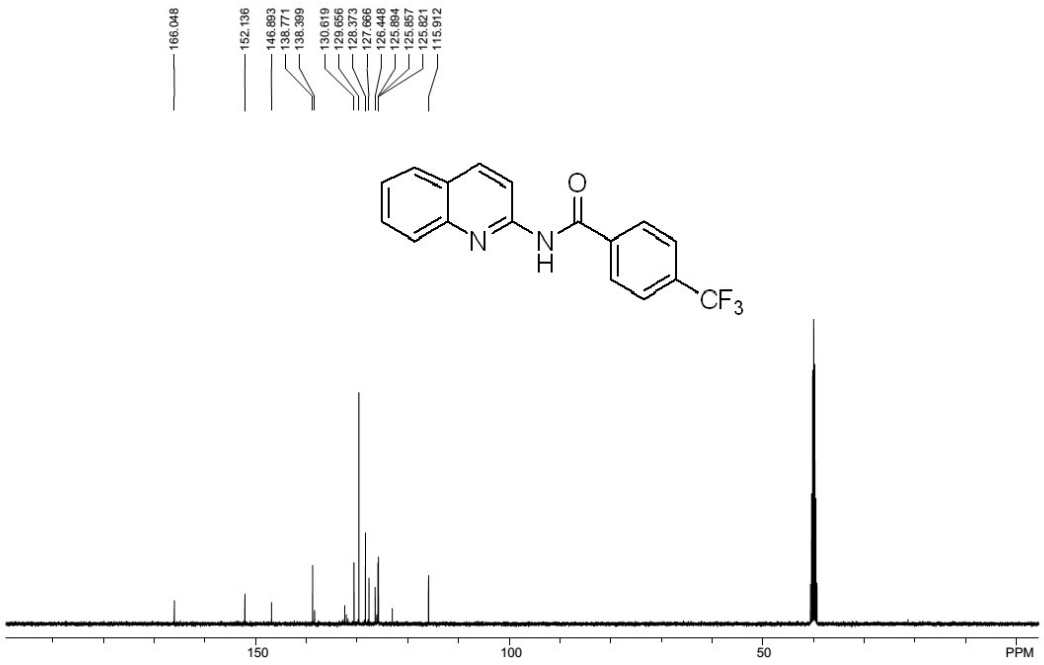
4-bromo-N-(quinolin-2-yl)benzamide(3s)



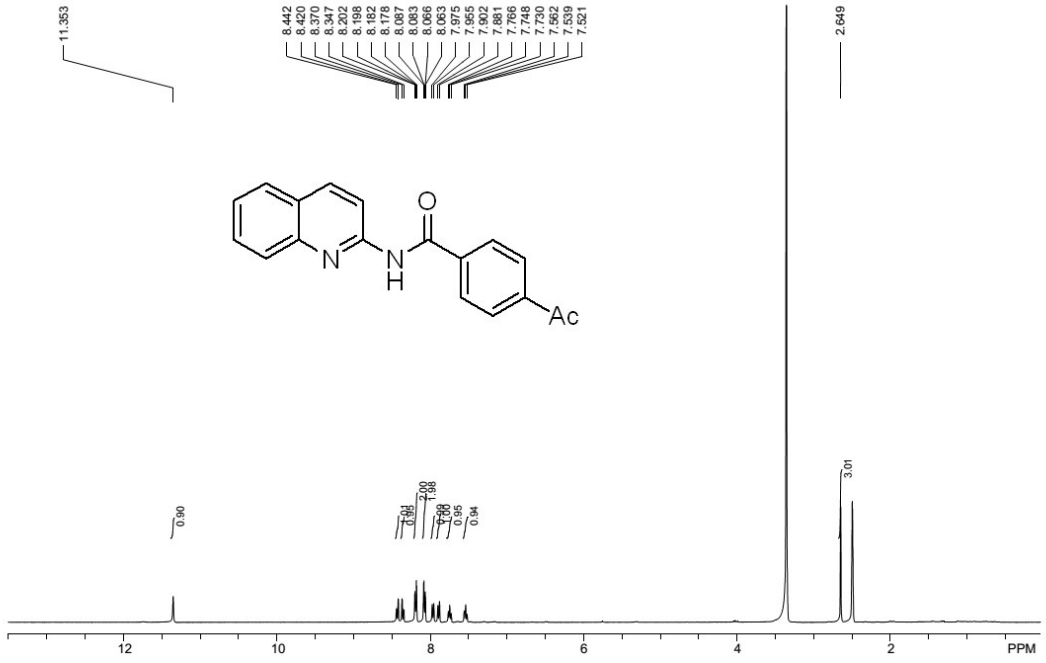


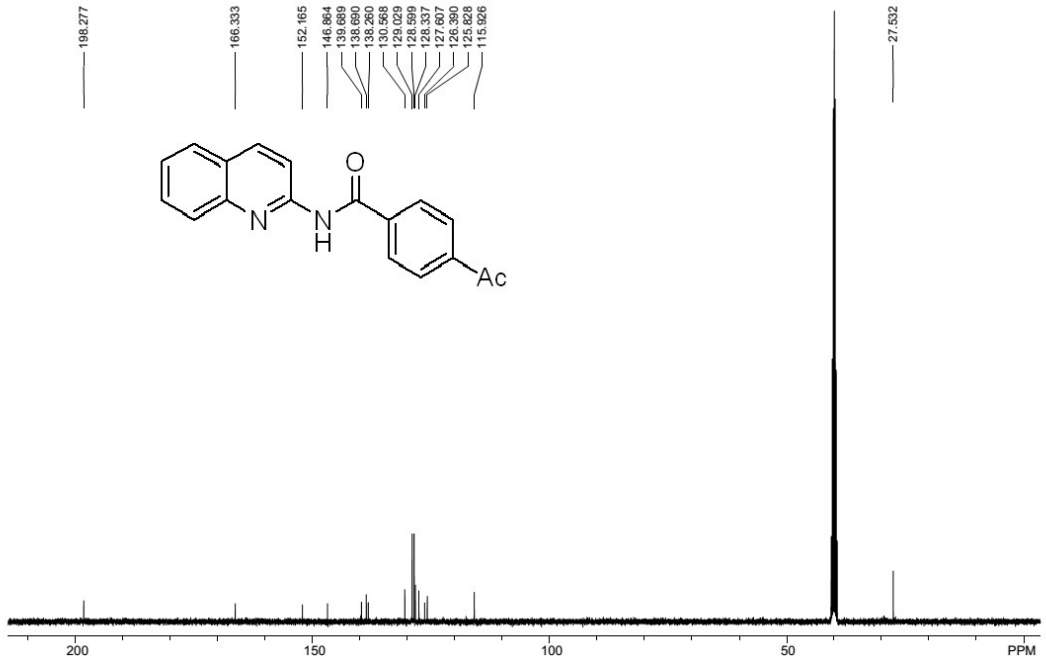
N-(quinolin-2-yl)-4-(trifluoromethyl)benzamide (3t)



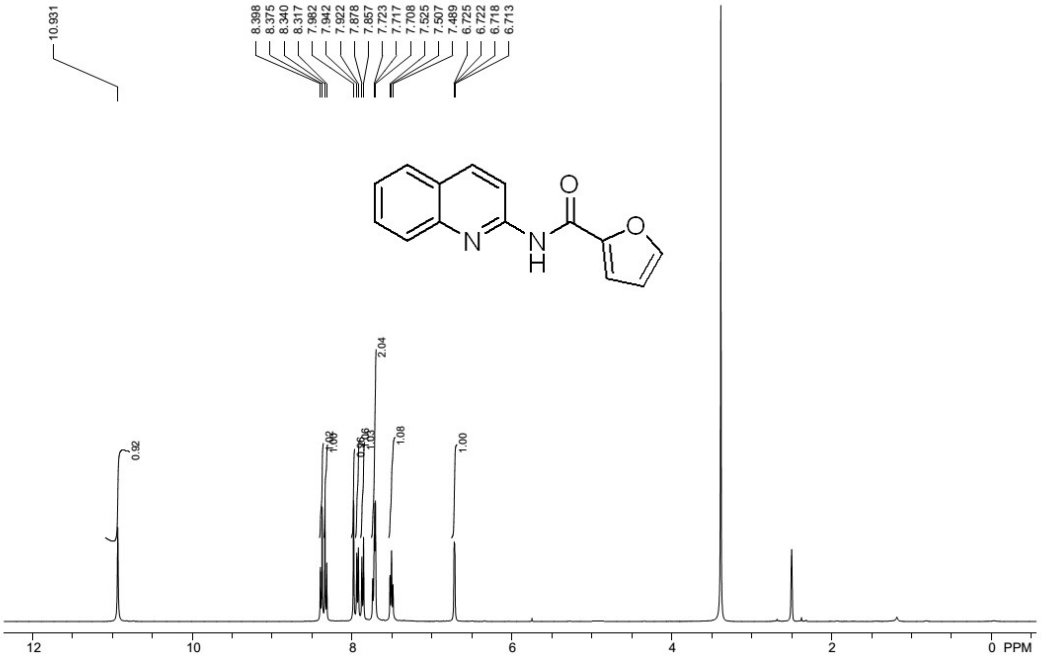


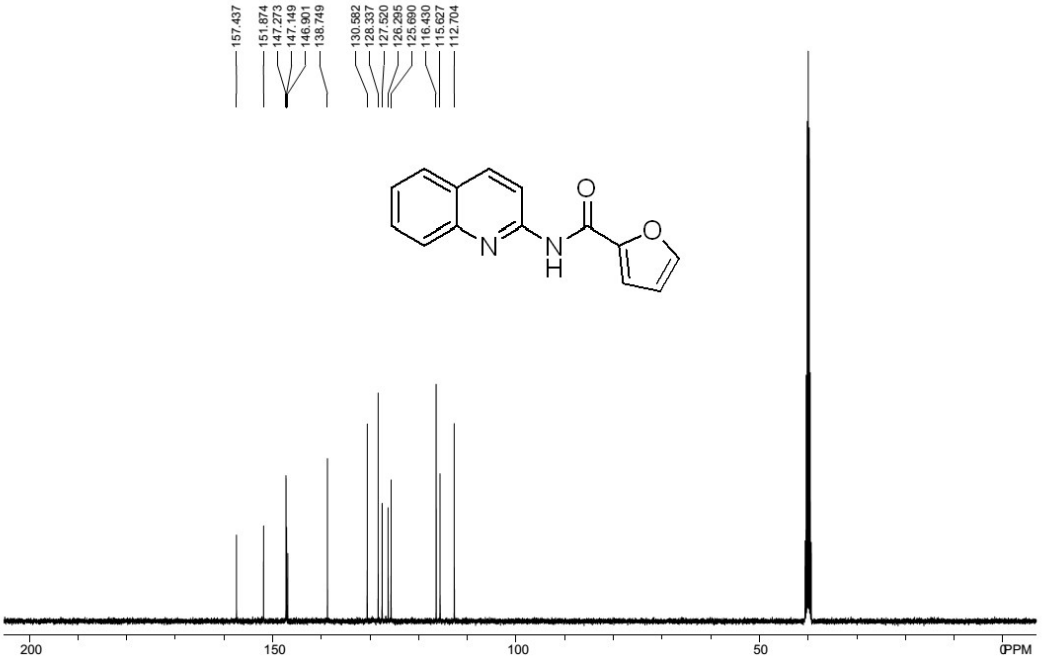
4-acetyl-N-(quinolin-2-yl)benzamide(3u)



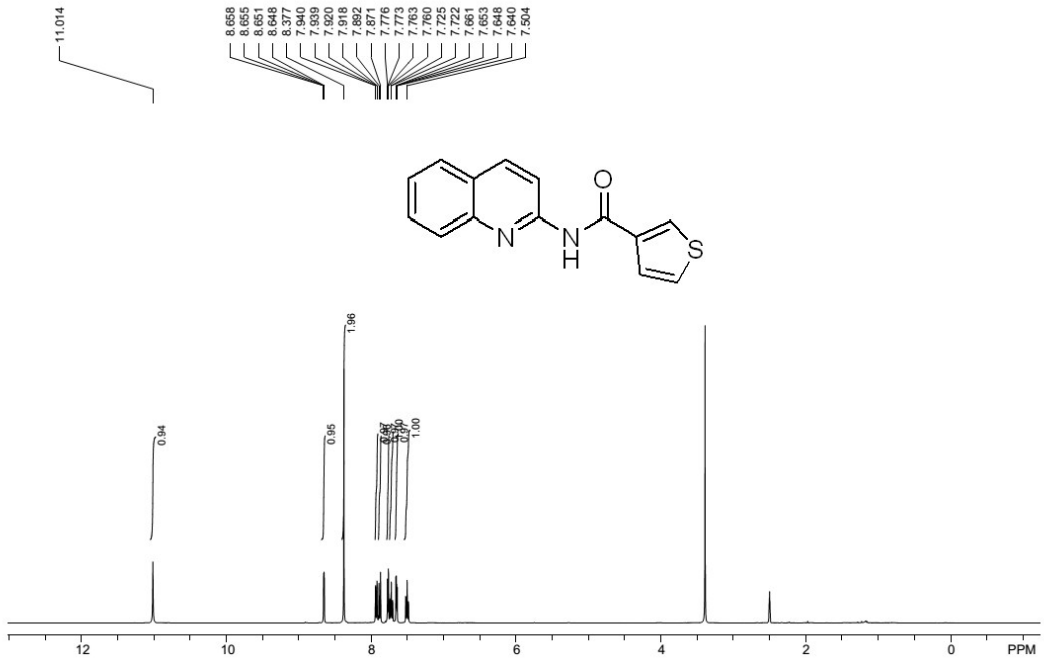


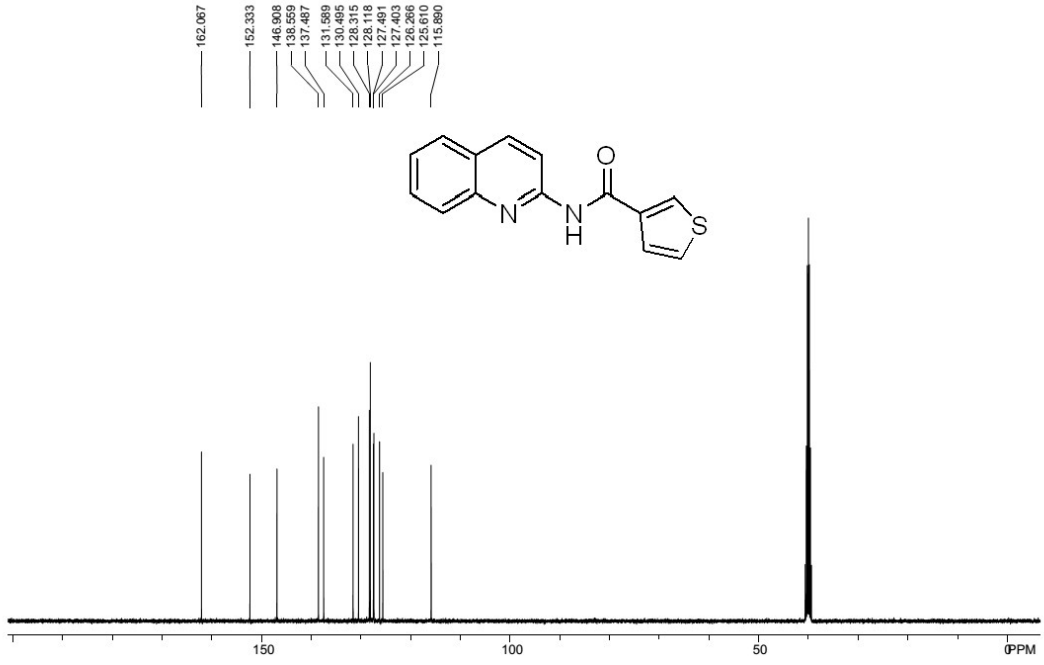
N-(quinolin-2-yl)furan-2-carboxamide(3v)



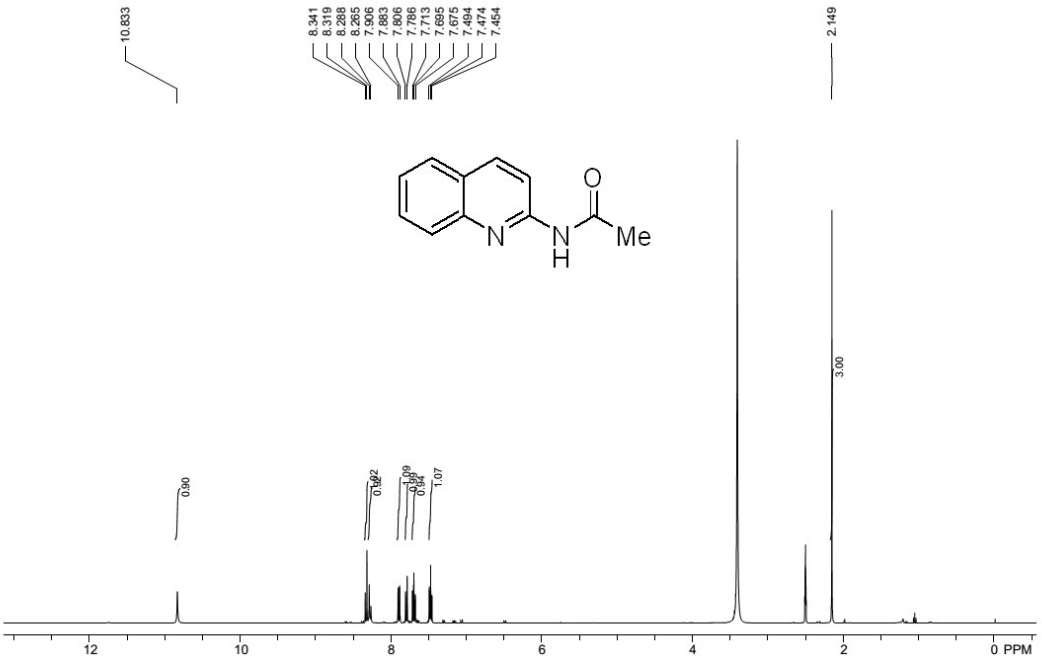


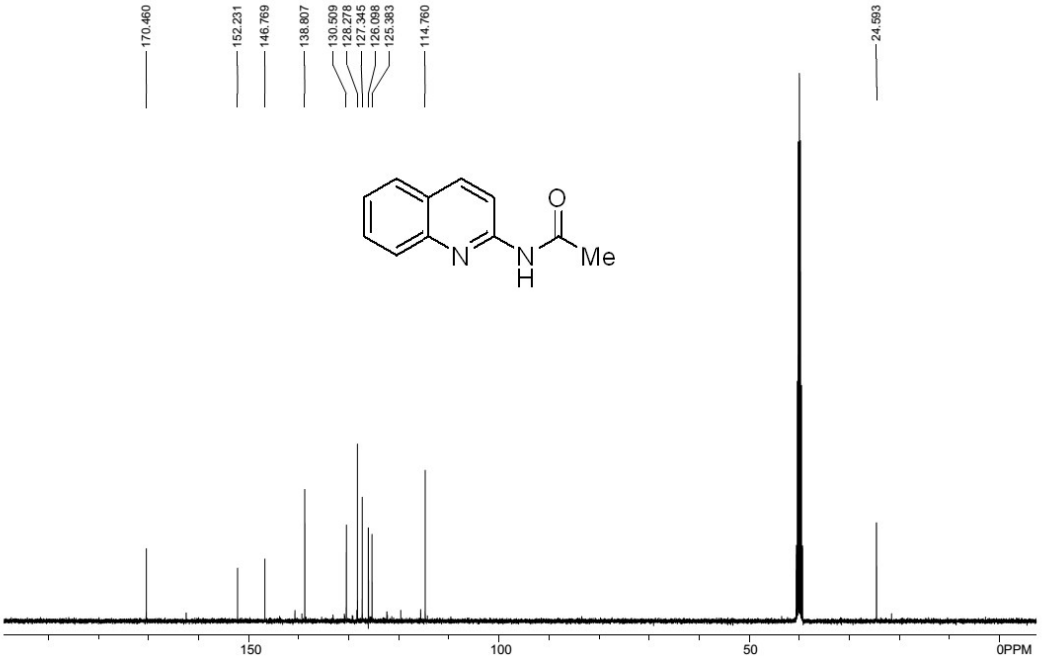
N-(quinolin-2-yl)thiophene-3-carboxamide(3w)



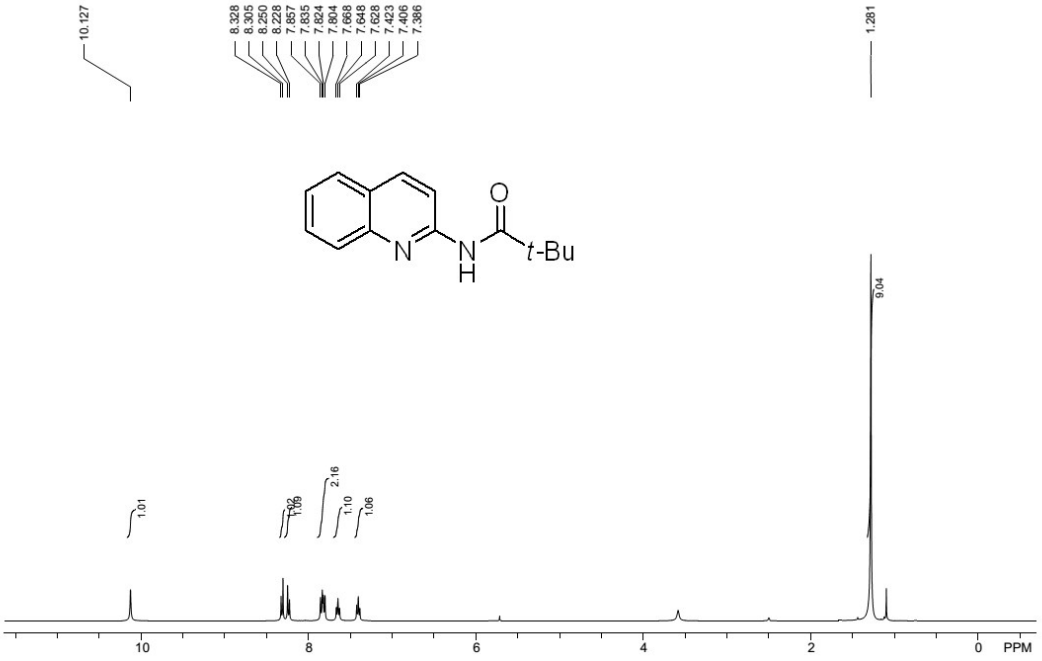


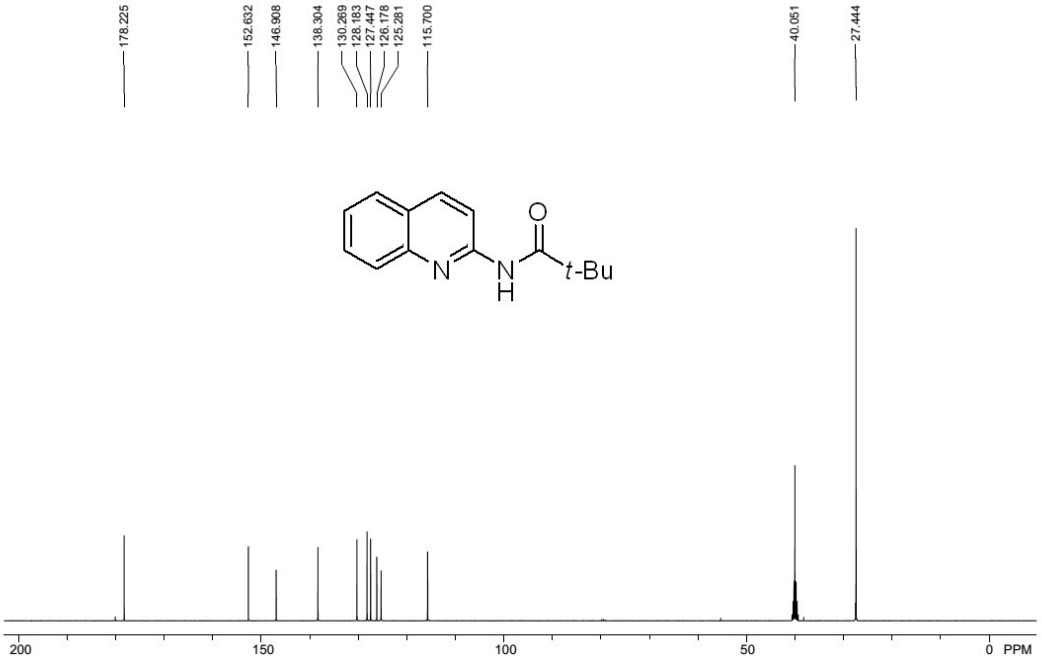
N-(quinolin-2-yl)acetamide (3x)



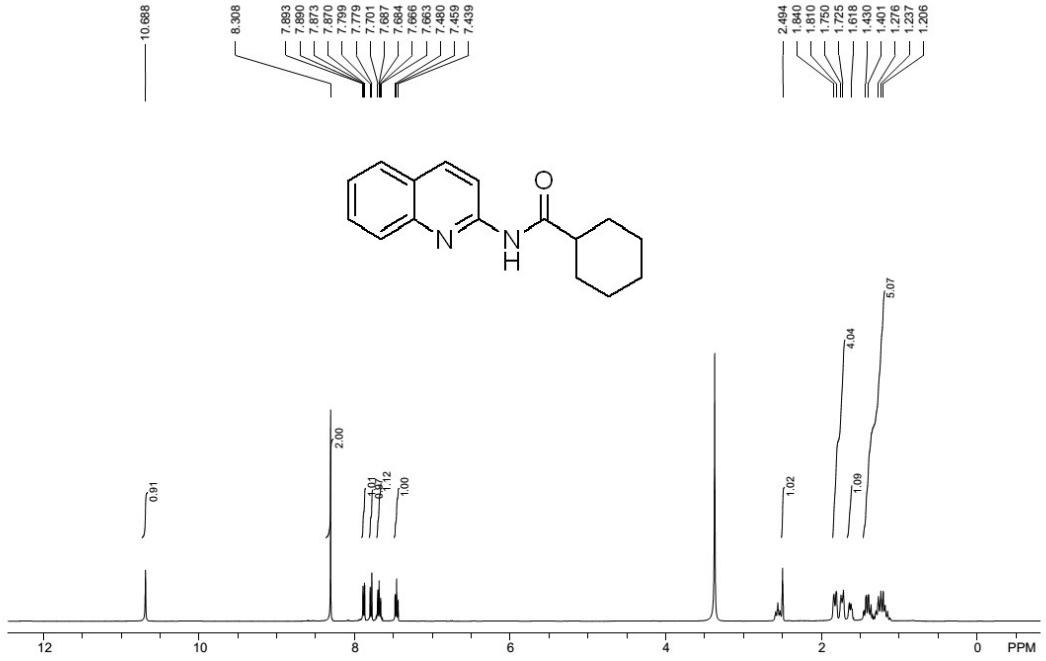


N-(quinolin-2-yl)pivalamide(3y)

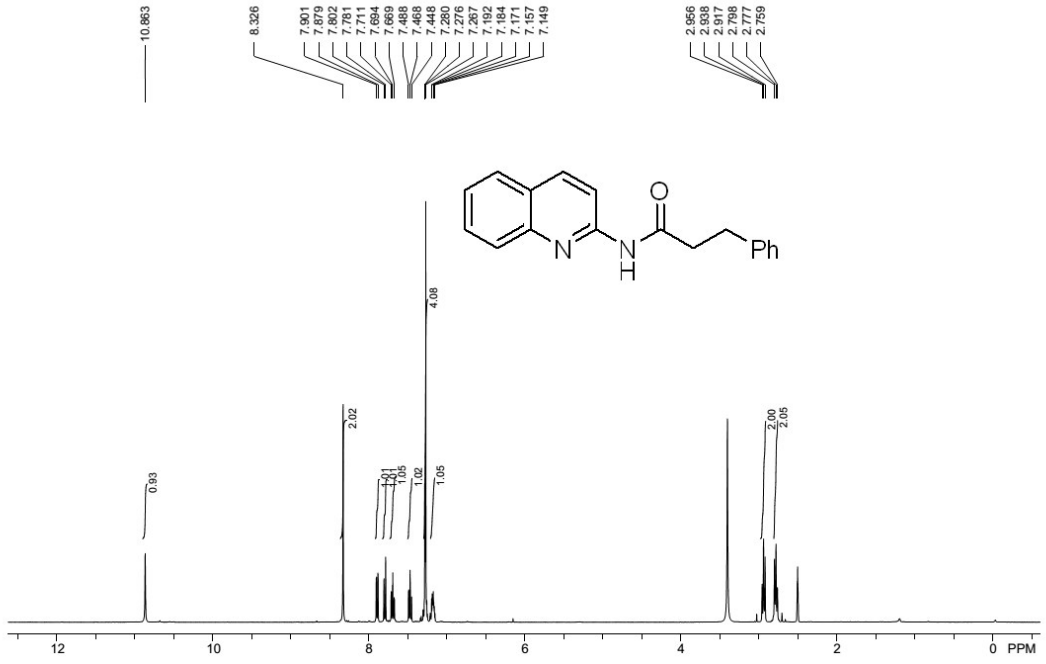


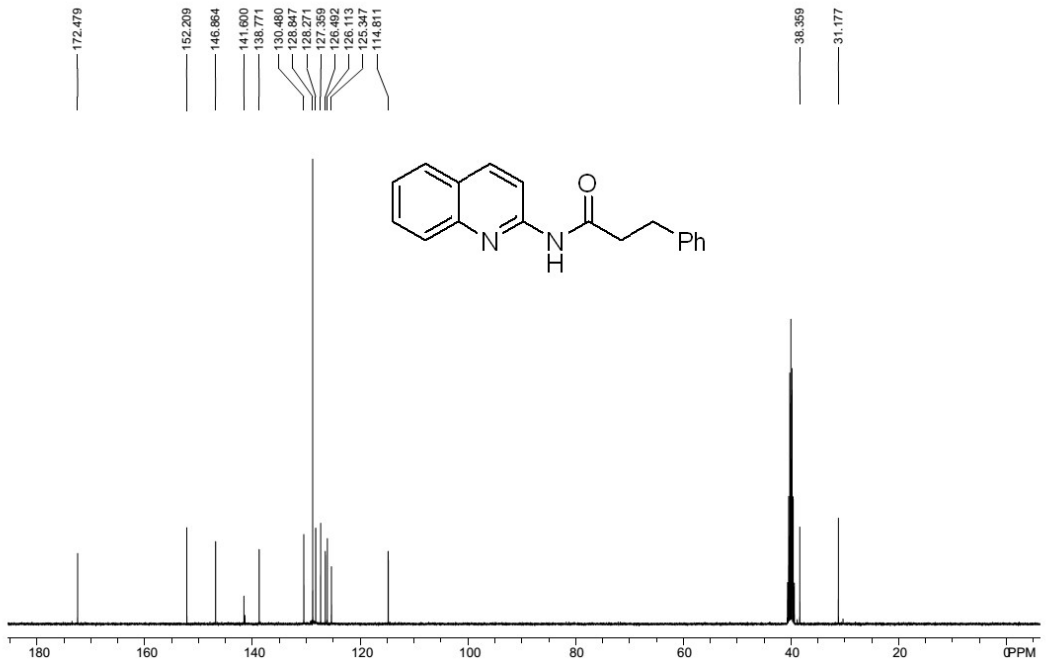


N-(quinolin-2-yl)cyclohexanecarboxamide (3z)



3-phenyl-N-(quinolin-2-yl)propanamide (3aa)





N-(quinolin-2-yl)cinnamamide (3ab)