Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Supporting Information

From Amides to Urea Derivatives or Carbamates with Chemospecific C-C Bond Cleavage at Room Temperature

Cong Lv, Dan Liu, Tegshi Muschin, Chaolumen Bai, Agula Bao and Yong-Sheng Bao*

College of Chemistry and Environmental Science, Inner Mongolia Key Laboratory of Green catalysis, Inner Mongolia Normal University, Hohhot, 010022, China

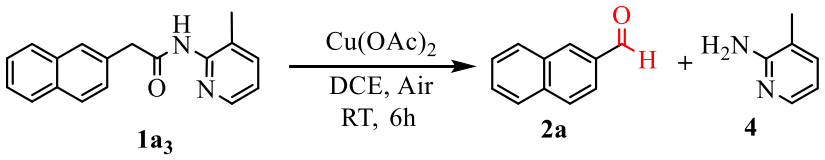
*(Y.B.) E-mail: sbbys197812@163.com.

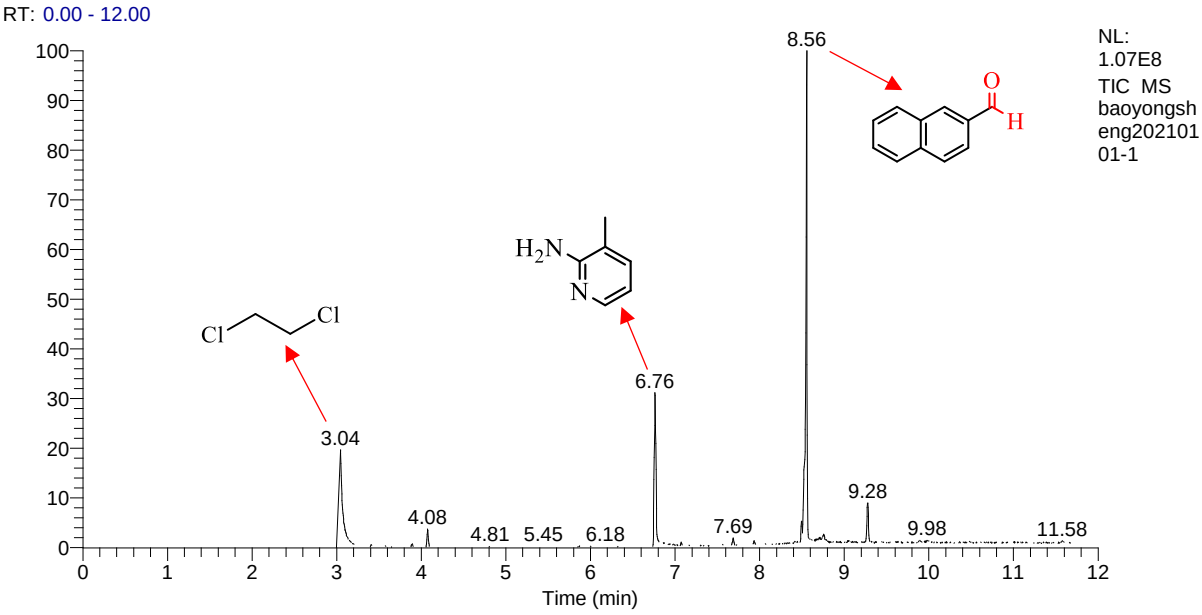
Contents

1. General Information

All the reagents were purchased from Aladdin and Alfa without further purification. Thin layer chromatography (TLC) was performed on pre-coated silica gel GF254 plates. The ^{1}H NMR and ^{13}C NMR spectra were measured on a 600 MHz Bruker Avance III nuclear magnetic resonance spectrometer, using $CDCl_3$ or DMSO as the solvent with tetramethylsilane (TMS) as the internal standard. Chemical shifts (δ) are expressed in ppm. The structures of known compounds were further corroborated by comparing their ^{1}H NMR data with those of literature. The GC-MS analysis was detected on a Thermo DSQ-II with a DB-5 column. The HRMS(ESI) analysis was detected on a Bruker ultrafleXtreme MALDI TOF/TOF. The ESR/EPR analysis was detected on a Bruker EMXnano.

2. GC-MS Analysis of Reaction of $1a_3$





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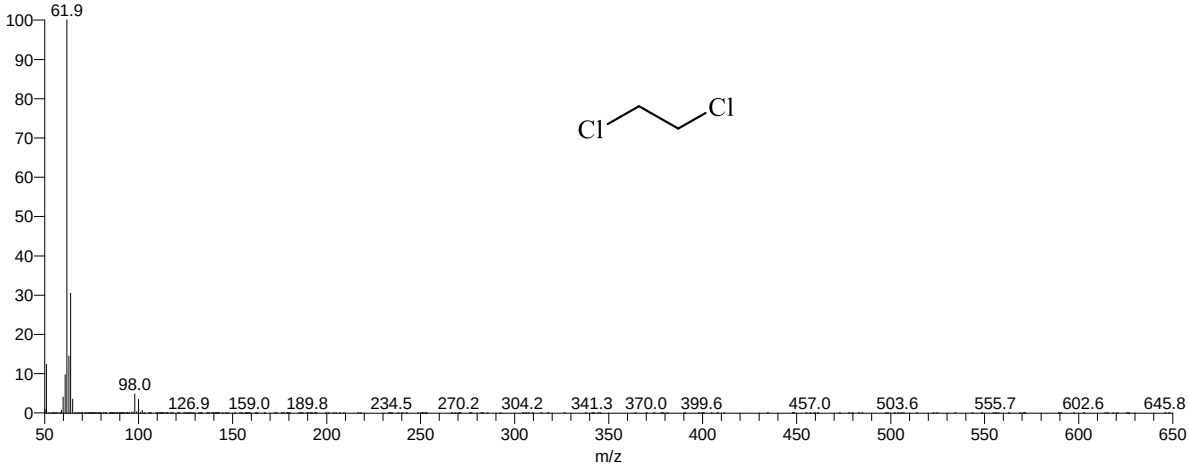

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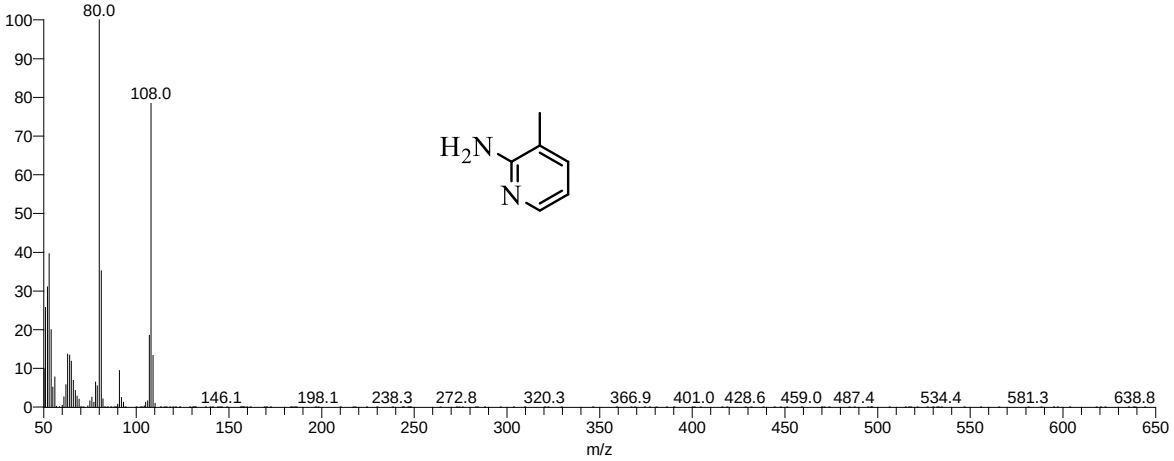

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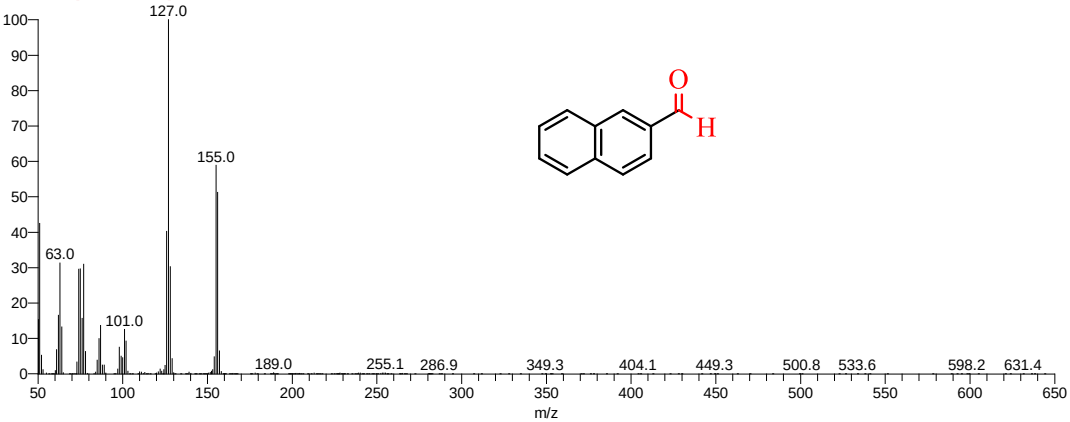
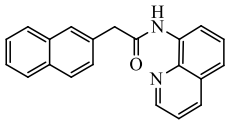


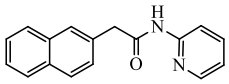
3. Experimental Section and Characterization Data

3.1 Preparation of amides (1a-1z)

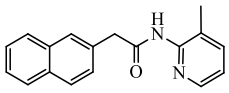
A mixture of carboxylic acid (10 mmol), amine (10 mmol), HOBt (1-Hydroxybenzotriazole, 10 mmol) and 1-ethyl-3-(3-dimethylaminopropyl) carbodiamide hydrochloride (EDC·HCl, 11 mmol) in THF (50 mL) was stirred overnight at 25℃. The resulting mixture was filtered and the filtrate was evaporated in vacuo. The residue was purified by flash column chromatography (silica gel, ethyl ether/petroleum ether = 1:3 as eluent), affording amides **1a-1z**.



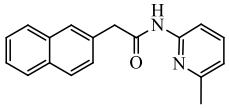
2-(naphthalen-2-yl)-N-(quinolin-8-yl)acetamide **1a$_1$**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.99 (s, 1H), 8.76 (d, *J* = 7.6 Hz, 1H), 8.57 (d, *J* = 2.9 Hz, 1H), 8.07 (d, *J* = 7.4 Hz, 1H), 7.89 (s, 1H), 7.88-7.82 (m, 3H), 7.55 (d, *J* = 7.5 Hz, 1H), 7.51-7.43 (m, 4H), 7.36-7.31 (m, 1H), 4.04 (s, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.4, 148.1, 138.4, 136.2, 134.4, 133.7, 132.6, 132.2, 128.7, 128.3, 127.8, 127.8, 127.7, 127.4, 127.3, 126.2, 125.9, 121.6, 121.5, 116.4, 45.5.



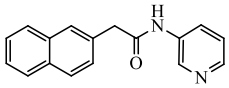
2-(naphthalen-2-yl)-N-(pyridin-2-yl)acetamide **1a$_2$**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.24 (d, *J* = 8.4 Hz, 1H), 8.17 (d, *J* = 4.7 Hz, 1H), 8.13 (s, 1H), 7.87-7.80 (m, 3H), 7.78 (s, 1H), 7.68 (t, *J* = 7.9 Hz, 1H), 7.51-7.47 (m, 2H), 7.43 (d, *J* = 8.4 Hz, 1H), 7.01 – 6.97 (m, 1H), 3.92 (s, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.6, 151.1, 147.5, 138.6, 133.6, 132.7, 131.3, 129.1, 128.5, 127.8, 127.1, 126.5, 126.2, 112.0, 114.0, 45.25.



N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)acetamide **1a$_3$**. ^{1}H NMR (600 MHz, CDCl3) δ 8.62 (s, 1H), 8.05 (s, 1H), 7.72 (d, J = 8.4 Hz, 2H), 7.69 (d, J = 11.9 Hz, 2H), 7.41 (d, J = 7.5 Hz, 1H), 7.37 (t, J = 4.5 Hz, 3H), 6.94 (m, 1H), 3.85 (s, 2H), 2.10 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 170.0, 149.5, 145.5, 139.9, 133.5, 132.5, 132.2, 128.7, 128.3, 127.7, 127.6, 127.3, 126.3, 125.9, 121.72, 44.2, 18.1.

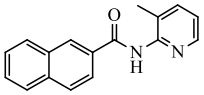


N-(6-methylpyridin-2-yl)-2-(naphthalen-2-yl)acetamide **1a$_4$**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.04 (d, *J* = 8.3 Hz, 1H), 8.00 (s, 1H), 7.88-7.82 (m, 3H), 7.80 (s, 1H), 7.58 (t, *J* = 7.9 Hz, 1H), 7.52-7.47 (m, 2H), 7.45 (d, *J* = 8.4 Hz, 1H), 6.86 (d, *J* = 7.5 Hz, 1H), 3.90 (s, 2H), 2.38 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.4, 156.4, 150.3, 139.0, 133.6, 132.7, 131.4, 129.0, 128.4, 127.8, 127.7, 127.2, 126.4, 126.1, 119.4, 110.8, 45.3, 23.7.

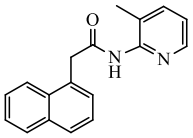


2-(naphthalen-2-yl)-N-(pyridin-3-yl)acetamide **1a$_5$**.. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.46 (d, *J* = 2.3 Hz, 1H), 8.28 – 8.21 (m, 2H), 8.07 (d, *J* = 8.4 Hz, 1H), 7.81 (d, *J* = 8.7 Hz, 2H), 7.77-7.74 (m, 1H), 7.70

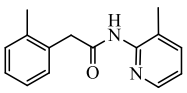
(s, 1H), 7.50-7.44 (m, 2H), 7.38 (d, J = 6.9 Hz, 1H), 7.20-7.14 (m, 1H), 3.84 (s, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.9, 145.0, 141.0, 135.0, 133.5, 132.6, 131.3, 129.0, 128.3, 127.7, 127.7, 127.5, 127.1, 126.5, 126.2, 123.7, 44.6.



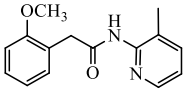
N-(3-methylpyridin-2-yl)-2-naphthamide **1a$_6$**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.14 (s, 1H), 8.49 (s, 1H), 8.24 (d, J = 4.0 Hz, 1H), 7.99 (d, J = 8.5 Hz, 1H), 7.92-7.86 (m, 3H), 7.62 (d, J = 7.5 Hz, 1H), 7.58 (t, J = 7.1 Hz, 1H), 7.54 (t, J = 7.4 Hz, 1H), 7.16-7.10 (m, 1H), 2.37 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 166.3, 150.0, 145.3, 140.2, 135.1, 132.6, 131.3, 129.5, 129.1, 128.6, 128.5, 127.9, 127.8, 126.8, 124.0, 121.8, 18.5.



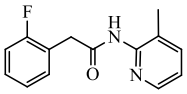
N-(3-methylpyridin-2-yl)-2-(naphthalen-1-yl)acetamide **1b**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.58 (s, 1H), 8.09 (d, J = 8.3 Hz, 1H), 7.99 (d, J = 3.9 Hz, 1H), 7.83 (d, J = 7.9 Hz, 1H), 7.75 (d, J = 8.1 Hz, 1H), 7.51 (t, J = 7.5 Hz, 1H), 7.47 (t, J = 7.4 Hz, 1H), 7.41-7.34 (m, 3H), 6.96-6.91 (m, 1H), 4.19 (s, 2H), 2.03 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.7, 149.3, 145.4, 139.7, 133.9, 132.2, 131.0, 128.7, 128.5, 128.4, 126.6, 126.0, 125.6, 123.9, 121.6, 42.0, 17.9.



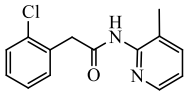
N-(3-methylpyridin-2-yl)-2-(o-tolyl)acetamide **1c**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.19 (d, J = 4.4 Hz, 1H), 7.82 (s, 1H), 7.51 (d, J = 7.5 Hz, 1H), 7.29 (d, J = 6.6 Hz, 1H), 7.26-7.19 (m, 3H), 7.09-7.03 (m, 1H), 3.82 (s, 2H), 2.38 (s, 3H), 2.18 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.5, 149.2, 145.7, 139.9, 137.3, 133.1, 130.9, 130.6, 128.3, 128.0, 126.7, 121.7, 42.2, 19.7, 18.1.



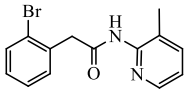
2-(2-methoxyphenyl)-N-(3-methylpyridin-2-yl)acetamide **1d**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.20 (d, J = 4.5 Hz, 1H), 8.06 (s, 1H), 7.49 (d, J = 7.4 Hz, 1H), 7.33-7.27 (m, 2H), 7.03 (t, 1H), 6.96 (t, J = 7.4 Hz, 1H), 6.92 (d, J = 8.2 Hz, 1H), 3.88 (s, 3H), 3.77 (s, 2H), 2.16 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.7, 157.2, 149.5, 145.8, 139.7, 131.4, 129.0, 128.1, 123.4, 121.5, 121.1, 110.8, 55.5, 39.3, 17.9.



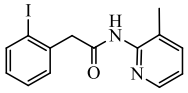
2-(2-fluorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1e**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.87 (s, 1H), 8.10 (s, 1H), 7.45 (d, J = 7.4 Hz, 1H), 7.27 (t, J = 7.3 Hz, 1H), 7.18 (d, J = 9.3 Hz, 1H), 7.05-6.96 (m, 3H), 3.75 (s, 2H), 2.14 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 167.90, 160.07 (d, J = 246.1 Hz, 1C), 148.51, 144.39, 139.00, 130.75 (d, J = 4.0 Hz, 1C), 128.21 (d, J = 8.0 Hz, 1C), 127.81, 123.45 (d, J = 3.4 Hz, 1C), 121.04 (d, J = 15.8 Hz, 1C), 120.72, 114.50 (d, J = 21.7 Hz, 1C), 36.02, 17.01.



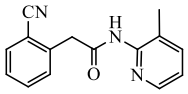
2-(2-chlorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1f**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.83 (s, 1H), 8.18 (d, *J* = 4.3 Hz, 1H), 7.52 (d, *J* = 7.4 Hz, 1H), 7.42-7.36 (m, 2H), 7.25-7.17 (m, 2H), 7.10-7.04 (m, 1H), 3.93 (s, 2H), 2.23 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.7, 149.5, 145.5, 140.0, 134.6, 133.0, 131.9, 129.7, 129.0, 127.3, 121.7, 41.6, 18.2.



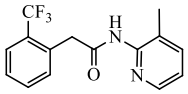
2-(2-bromophenyl)-N-(3-methylpyridin-2-yl)acetamide **1g**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.76 (s, 1H), 8.18 (d, *J* = 4.0 Hz, 1H), 7.58 (d, *J* = 7.9 Hz, 1H), 7.52 (d, *J* = 7.3 Hz, 1H), 7.39 (d, *J* = 7.5 Hz, 1H), 7.28 (s, 1H), 7.13 (d, *J* = 1.0 Hz, 1H), 7.10-7.03 (m, 1H), 3.95 (s, 2H), 2.25 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.5, 149.5, 145.5, 140.0, 134.7, 133.0, 131.9, 129.1, 127.9, 125.1, 121.70, 44.1, 18.3.



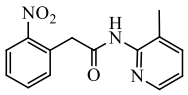
2-(2-iodophenyl)-N-(3-methylpyridin-2-yl)acetamide **1h**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.22 (d, *J* = 4.4 Hz, 1H), 7.89 (d, *J* = 7.9 Hz, 2H), 7.56 (d, *J* = 7.4 Hz, 1H), 7.44 (d, *J* = 7.5 Hz, 1H), 7.37 (t, *J* = 7.4 Hz, 1H), 7.12-7.06 (m, 1H), 7.00 (t, *J* = 7.6 Hz, 1H), 4.02 (s, 2H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.4, 149.3, 145.5, 140.0, 139.7 138.2, 131.1, 129.2, 128.9, 121.7, 101.35, 48.7, 18.4.



2-(2-cyanophenyl)-N-(3-methylpyridin-2-yl)acetamide **1i**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.16 (s, 1H), 8.24 (d, *J* = 4.6 Hz, 1H), 7.67 (d, *J* = 7.7 Hz, 1H), 7.64 (d, *J* = 7.1 Hz, 1H), 7.56 (t, *J* = 7.6 Hz, 1H), 7.51 (d, *J* = 7.8 Hz, 1H), 7.38 (t, *J* = 7.6 Hz, 1H), 7.19-7.11 (m, 1H), 4.11 (s, 2H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 167.7, 149.4, 145.5, 140.1, 138.6, 133.1, 132.8, 131.0, 127.7, 121.8, 117.9, 113.3, 41.7, 18.1.

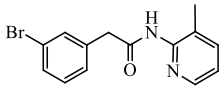


N-(3-methylpyridin-2-yl)-2-(2-(trifluoromethyl)phenyl)acetamide **1j**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.82 (s, 1H), 8.20 (d, *J* = 4.4 Hz, 1H), 7.67 (d, *J* = 7.8 Hz, 1H), 7.57-7.48 (m, 3H), 7.38 (t, *J* = 7.2 Hz, 1H), 7.10-7.05 (m, 1H), 4.01 (s, 2H), 2.22 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.8, 149.5, 145.4, 140.1, 133.0, 132.9, 132.2, 129.0 (q, *J* = 29.9 Hz, 1C), 127.5, 126.2 (q, *J* = 5.4 Hz, 1C), 124.4 (q, *J* = 272.1 Hz, 1C), 121.8, 40.4, 18.0.

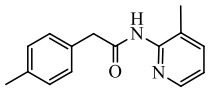


N-(3-methylpyridin-2-yl)-2-(2-nitrophenyl)acetamide **1k**. ^{1}H NMR (600 MHz, DMSO) δ 10.28 (s, 1H), 8.25 (d, *J* = 4.4 Hz, 1H), 8.05 (d, *J* = 8.1 Hz, 1H), 7.71 (t, *J* = 7.5 Hz, 1H), 7.67 (d, *J* = 7.5 Hz, 1H), 7.59 (d, *J* = 7.6 Hz, 1H), 7.56 (t, *J* = 7.8 Hz, 1H), 7.22-7.18 (m, 1H), 4.18 (s, 2H), 2.14 (s, 3H); ^{13}C NMR (151 MHz, DMSO) δ 168.5, 150.4, 149.7, 146.1, 140.1, 134.3, 134.1, 131.2, 129.3, 129.0, 125.2, 122.3,

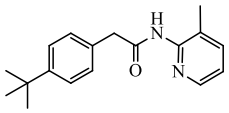
40.7, 18.1.



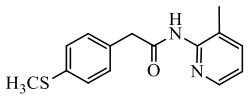
2-(3-bromophenyl)-N-(3-methylpyridin-2-yl)acetamide **1l**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.59 (s, 1H), 8.17 (d, *J* = 3.9 Hz, 1H), 7.54 (d, *J* = 7.3 Hz, 1H), 7.48 (s, 1H), 7.36 (d, *J* = 7.9 Hz, 1H), 7.22 (d, *J* = 7.6 Hz, 1H), 7.15 (t, *J* = 7.8 Hz, 1H), 7.12-7.06 (m, 1H), 3.73 (s, 2H), 2.20 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.5, 149.6, 145.3, 140.2, 137.1, 132.4, 130.3, 130.2, 128.0, 122.7, 121.9, 43.0, 18.1.



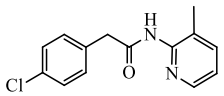
N-(3-methylpyridin-2-yl)-2-(p-tolyl)acetamide **1m**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.19 (d, *J* = 4.5 Hz, 2H), 7.52 (d, *J* = 7.5 Hz, 1H), 7.23 (d, *J* = 7.7 Hz, 2H), 7.16 (d, *J* = 7.7 Hz, 2H), 7.09-7.04 (m, 1H), 3.75 (s, 2H), 2.33 (s, 3H), 2.18 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 170.1, 149.4, 145.6, 139.9, 137.1, 131.5, 129.8, 129.4, 121.1, 43.7, 21.1, 18.1.



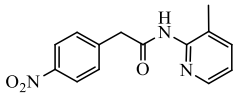
2-(4-(tert-butyl)phenyl)-N-(3-methylpyridin-2-yl)acetamide **1n**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.52 (s, 1H), 8.17 (d, *J* = 4.4 Hz, 1H), 7.52 (d, *J* = 7.4 Hz, 1H), 7.37 (d, *J* = 7.6 Hz, 2H), 7.27 (d, *J* = 7.7 Hz, 2H), 7.08-7.04 (m, 1H), 3.76 (s, 2H), 2.19 (s, 3H), 1.31 (s, 9H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 170.1, 150.3, 149.5, 145.5, 139.9, 131.6, 129.2, 125.9, 121.7, 43.5, 34.5, 31.3, 18.1.



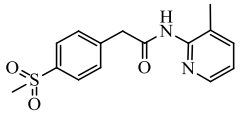
N-(3-methylpyridin-2-yl)-2-(4-(methylthio)phenyl)acetamide **1o**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.72 (s, 1H), 8.17 (d, *J* = 4.1 Hz, 1H), 7.54 (d, *J* = 7.5 Hz, 1H), 7.25-7.20 (m, 4H), 7.08 (dd, *J* = 7.5, 4.8 Hz, 1H), 3.73 (s, 2H), 2.46 (s, 3H), 2.20 (s, 3H). ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.9, 149.5, 145.5, 140.0, 137.6, 131.4, 129.9, 127.1, 121.8, 43.3, 18.1, 15.8.



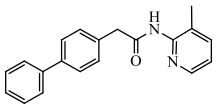
2-(4-chlorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1p**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.38 (s, 1H), 8.20 (d, *J* = 4.4 Hz, 1H), 7.56 (d, *J* = 7.4 Hz, 1H), 7.30 (d, *J* = 8.3 Hz, 2H), 7.27 (d, *J* = 6.1 Hz, 2H), 7.12-7.06 (m, 1H), 3.78 (s, 2H), 2.21 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.7, 149.5, 145.5, 140.0, 134.6, 133.0, 131.9, 129.7, 129.0, 127.3, 121.7, 41.6, 18.2.



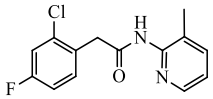
N-(3-methylpyridin-2-yl)-2-(4-nitrophenyl)acetamide **1q**. ^{1}H NMR (600 MHz, DMSO) δ 10.36 (s, 1H), 8.26 (d, *J* = 4.2 Hz, 1H), 8.22 (d, *J* = 8.6 Hz, 2H), 7.66 (d, *J* = 7.5 Hz, 1H), 7.63 (d, *J* = 8.5 Hz, 2H), 7.23-7.19 (m, 1H), 3.88 (s, 2H), 2.09 (s, 3H); ^{13}C NMR (151 MHz, DMSO) δ 168.6, 150.2, 146.8, 146.2, 144.5, 139.9, 131.0, 129.2, 123.8, 122.3, 42.4, 18.0.



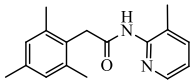
N-(3-methylpyridin-2-yl)-2-(4-(methylsulfonyl)phenyl)acetamide **1r**. ^{1}H NMR (600 MHz, DMSO) δ 10.33 (s, 1H), 8.25 (d, *J* = 4.2 Hz, 1H), 7.90 (d, *J* = 8.2 Hz, 2H), 7.66 (d, *J* = 7.4 Hz, 1H), 7.61 (d, *J* = 8.1 Hz, 2H), 7.27-7.17 (m, 1H), 3.83 (s, 2H), 3.21 (s, 3H), 2.10 (s, 3H); ^{13}C NMR (151 MHz, DMSO) δ 173.6, 155.0, 151.0, 147.2, 144.7, 144.4, 144.3, 135.4, 134.0, 132.2, 127.1, 48.8, 47.2, 22.8.



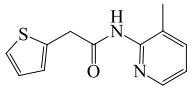
2-([1,1'-biphenyl]-4-yl)-N-(3-methylpyridin-2-yl)acetamide **1s**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.63 (s, 1H), 8.19 (d, *J* = 4.2 Hz, 1H), 7.56 (d, *J* = 6.9 Hz, 4H), 7.53 (d, *J* = 7.4 Hz, 1H), 7.44-7.39 (m, 4H), 7.34 (t, *J* = 7.3 Hz, 1H), 7.10-7.05 (m, 1H), 3.84 (s, 2H), 2.22 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.9, 149.5, 145.4, 140.6, 140.2, 140.1, 133.7, 129.9, 128.8, 127.7, 127.3, 127.0, 121.8, 43.53, 18.2.



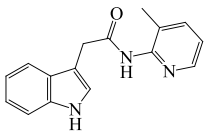
2-(2-chloro-4-fluorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1t**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.31 (s, 1H), 8.18 (d, *J* = 4.1 Hz, 1H), 7.55 (d, *J* = 7.5 Hz, 1H), 7.34-7.31 (m, 1H), 7.16-7.11 (m, 1H), 7.10-7.05 (m, 1H), 6.96-6.90 (m, 1H), 3.89 (s, 2H), 2.25 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.6, 161.79 (d, *J* = 249.5 Hz, 1C), 149.6, 145.3, 140.2, 135.1 (d, *J* = 10.3 Hz, 1C), 132.8 (d, *J* = 8.7 Hz, 1C), 129.0, 121.8, 117.0 (d, *J* = 24.8 Hz, 1C), 114.4 (d, *J* = 21.0 Hz, 1C), 40.6, 18.2.



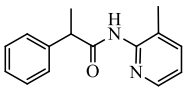
2-mesityl-N-(3-methylpyridin-2-yl)acetamide **1u**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.22 (d, *J* = 4.3 Hz, 1H), 7.52 (d, *J* = 7.4 Hz, 1H), 7.45 (s, 1H), 7.08-7.04 (m, 1H), 6.94 (s, 2H), 3.82 (s, 2H), 2.36 (s, 6H), 2.29 (s, 3H), 2.18 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.5, 149.2, 145.7, 139.9, 137.4, 137.3, 129.6, 128.5, 121.7, 38.0, 21.0, 20.3, 18.1.



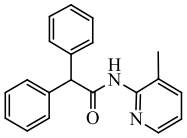
N-(3-methylpyridin-2-yl)-2-(thiophen-2-yl)acetamide **1v**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.30 (s, 1H), 8.19 (d, *J* = 4.4 Hz, 1H), 7.53 (d, *J* = 7.5 Hz, 1H), 7.21 (d, *J* = 5.0 Hz, 1H), 7.11-7.06 (m, 1H), 7.00-6.91 (m, 2H), 3.98 (s, 2H), 2.22 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 168.9, 149.6, 145.4, 140.1, 136.1, 127.2, 127.1, 125.3, 121.8, 37.7, 18.0.



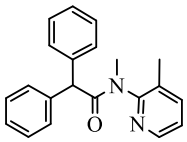
2-(1H-indol-3-yl)-N-(3-methylpyridin-2-yl)acetamide **1w**. ^{1}H NMR (600 MHz, DMSO) δ 10.89 (s, 1H), 10.07 (s, 1H), 8.23 (d, *J* = 4.5 Hz, 1H), 7.65 – 7.57 (m, 2H), 7.35 (d, *J* = 8.1 Hz, 1H), 7.25 (s, 1H), 7.20-7.15 (m, 1H), 7.07 (t, *J* = 7.5 Hz, 1H), 6.99 (t, *J* = 7.4 Hz, 1H), 3.76 (s, 2H), 2.05 (s, 3H); ^{13}C NMR (151 MHz, DMSO) δ 170.1, 150.5, 146.0, 139.5, 136.4, 129.1, 127.5, 124.2, 121.9, 121.3, 119.0, 118.6, 111.6, 108.8, 33.02, 17.9.



N-(3-methylpyridin-2-yl)-2-phenylpropanamide **1x**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.11 (s, 1H), 8.12 (d, *J* = 3.9 Hz, 1H), 7.51 (d, *J* = 7.4 Hz, 1H), 7.38-7.31 (m, 4H), 7.25 (t, *J* = 7.0 Hz, 1H), 7.05 (dd, *J* = 7.2, 5.0 Hz, 1H), 3.83 (d, *J* = 4.1 Hz, 1H), 2.13 (s, 3H), 1.54 (d, *J* = 7.1 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 172.9, 149.8, 145.3, 141.3, 140.0, 129.2, 128.9, 127.7, 127.2, 121.7, 47.0, 18.6, 18.0.



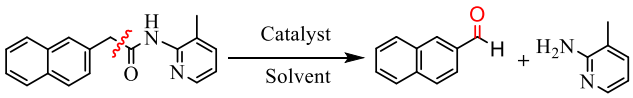
N-(3-methylpyridin-2-yl)-2,2-diphenylacetamide **1y**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.58 (s, 1H), 8.17 (d, *J* = 4.0 Hz, 1H), 7.54 (d, *J* = 7.3 Hz, 1H), 7.42-7.28 (m, 8H), 7.28-7.24 (m, 2H), 7.08 (dd, *J* = 7.4, 4.9 Hz, 1H), 5.22 (s, 1H), 2.21 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 170.7, 149.4, 145.5, 140.1, 139.0, 129.0, 128.8, 127.4, 121.8, 59.0, 18.3.



N-methyl-N-(3-methylpyridin-2-yl)-2,2-diphenylacetamide **1z**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.41 (d, *J* = 3.7 Hz, 1H), 7.52 (d, *J* = 7.4 Hz, 1H), 7.25 – 7.06 (m, 11H), 4.83 (s, 1H), 3.24 (s, 3H), 1.80 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 172.1, 154.8, 147.3, 140.3, 139.1 (d, *J* = 197.3 Hz, 1C), 131.4, 128.9, 128.3 (d, *J* = 38.1 Hz, 1C), 126.9 (d, *J* = 56.9 Hz, 1C), 123.8, 55.0, 34.8, 16.7.

3.2 The C-C bond Activation of Amides to Aldehydes or ketones

Table S1. Screening of reaction conditions[a]

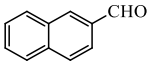


1a$_3$ **2a** **4**

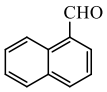
Entry	Catalyst	Solvent	Yield/%[b]
1	$Cu(OAc)_2$	DCE	81
2	$CuCl_2$	DCE	75
3	$CuSO_4$	DCE	62
4	CuO	DCE	67
5	CuBr	DCE	79
6	CuI	DCE	55

7	CuCN	DCE	66
8	-	DCE	n.r
9	$Cu(OAc)_2$	HFIP	29
10	$Cu(OAc)_2$	CH_3CN	72
11	$Cu(OAc)_2$	$CHCl_3$	71
12	$Cu(OAc)_2$	AcOH	30
13	$Cu(OAc)_2$	*p*-xylene	58

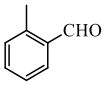
[a] Reaction conditions: **1a₃** (0.1 mmol), 10 mol % of catalyst, solvent (1mL), RT, air, 6 h; [b]Isolated yield.



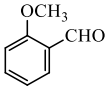
2-naphthaldehyde **2a**.[1] Yield: 81% (M=156.18, 12.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.17 (s, 1H), 8.34 (s, 1H), 8.01 (d, *J* = 8.1 Hz, 1H), 7.98-7.92 (m, 2H), 7.91 (d, *J* = 8.1 Hz, 1H), 7.65 (t, *J* = 7.5 Hz, 1H), 7.59 (t, *J* = 7.5 Hz, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.2, 136.4, 134.5, 134.1, 132.6, 129.5, 129.1, 129.1, 128.1, 127.1, 122.7.



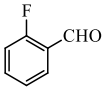
1-naphthaldehyde **2b**.[1] Yield: 55% (M=156.18, 8.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.34 (s, 1H), 9.18 (d, *J* = 8.6 Hz, 1H), 8.03 (d, *J* = 8.2 Hz, 1H), 7.93 (d, *J* = 7.0 Hz, 1H), 7.86 (d, *J* = 8.2 Hz, 1H), 7.63 (t, *J* = 7.7 Hz, 1H), 7.57 (t, *J* = 7.6 Hz, 1H), 7.53 (t, *J* = 7.5 Hz, 1H); ^{13}C NMR (151 MHz, CDCl3) δ 193.6, 136.7, 135.3, 133.8, 131.5, 130.6, 129.1, 128.5, 126.98, 124.9, 124.9.



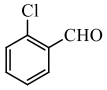
2-methylbenzaldehyde **2c**.[2] Yield: 59% (M=120.15, 7.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.26 (s, 1H), 7.79 (d, J = 7.6 Hz, 1H), 7.47 (t, J = 7.5 Hz, 1H), 7.35 (t, J = 7.5 Hz, 1H), 7.25 (d, J = 7.6 Hz, 1H), 2.67 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.8, 140.6, 134.2, 133.7, 132.1, 131.8, 126.3, 19.6.



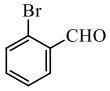
2-methoxybenzaldehyde **2d**.[2] Yield: 77% (M=136.15, 10.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.48 (s, 1H), 7.83 (d, *J* = 7.7 Hz, 1H), 7.56 (dd, *J* = 8.3, 7.4 Hz, 1H), 7.03 (t, *J* = 7.5 Hz, 1H), 6.99 (d, *J* = 8.4 Hz, 1H), 3.94 (s, 3H); ^{13}C NMR (151 MHz, CDCl3) δ 193.6, 136.7, 135.3, 133.8, 131.5, 130.6, 129.1, 128.5, 126.98, 124.9, 124.9.



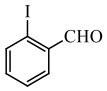
2-fluorobenzaldehyde **2e**.[2] Yield: 32% (M=124.03, 4.0 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.38 (s, 1H), 7.88 (t, *J* = 7.3 Hz, 1H), 7.64-7.59 (m, 1H), 7.28 (t, *J* = 8.3 Hz, 1H), 7.20-7.16 (m, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 187.2 (t, *J* = 6.4 Hz, 1C), 164.7 (d, *J* = 258.7 Hz, 1C), 136.4 (d, *J* = 9.1 Hz, 1C), 128.7 (d, *J* = 1.7 Hz, 1C), 124.7 (d, *J* = 3.7 Hz, 1C), 124.2 (d, *J* = 8.0 Hz, 1C), 116.5 (d, *J* = 20.5 Hz, 1C).



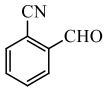
2-chlorobenzaldehyde **2f**.[2] Yield: 84% (M=140.57, 11.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.47 (s, 1H), 7.90 (d, *J* = 7.7 Hz, 1H), 7.52 (t, *J* = 7.7 Hz, 1H), 7.44 (d, *J* = 8.0 Hz, 1H), 7.38 (t, *J* = 7.4 Hz, 1H); ^{13}C NMR (151 MHz, CDCl3) δ 189.9, 137.9, 135.1, 132.4, 130.6, 129.3, 127.3.



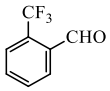
2-bromobenzaldehyde **2g**.[2] Yield: 58% (M=185.02, 10.8 mg). ^{1}H NMR (600 MHz, CDCl3) δ 10.47 (s, 1H), 7.91 (d, J = 7.7 Hz, 1H), 7.52 (t, J = 7.7 Hz, 1H), 7.44 (d, J = 8.1 Hz, 1H), 7.38 (t, J = 7.5 Hz, 1H); ^{13}C NMR (151 MHz, CDCl3) δ 189.8, 137.9, 135.1, 132.4, 130.6, 129.4, 127.3.



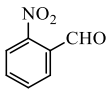
2-iodobenzaldehyde **2h**.[3] Yield: 63% (M=232.02, 14.7 mg). ^{1}H NMR (600 MHz, CDCl3) δ 10.31 (s, 1H), 7.85 (d, J = 6.7 Hz, 1H), 7.59 (d, J = 7.6 Hz, 1H), 7.41-7.34 (m, 2H); ^{13}C NMR (151 MHz, CDCl3) δ 195.8, 140.7, 135.5, 135.1, 130.3, 128.7, 100.7.



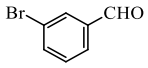
2-Cyanobenzaldehyde **2i**.[4] Yield: 74% (M=131.13, 9.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.37 (s, 1H), 8.06 (d, *J* = 7.6 Hz, 1H), 7.85 (d, *J* = 7.4 Hz, 1H), 7.80 (t, *J* = 7.5 Hz, 1H), 7.76 (t, *J* = 7.5 Hz, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 188.7, 136.8, 134.2, 134.1, 133.2, 129.6, 116.0, 113.9.



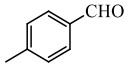
2-(trifluoromethyl)benzaldehyde **2j**.[5] Yield: 28% (M=174.03, 4.9 mg). ^{1}H NMR (600 MHz, CDCl3) ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.41 (s, 1H), 8.18-8.11 (m, 1H), 7.82-7.77 (m, 1H), 7.75-7.69 (m, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 189.0 (q, *J* = 4.2 Hz, 1C), 133.7, 133.6, 132.4, 131.1 (q, *J* = 32.3 Hz, 1C), 129.11, 126.12 (d, *J* = 5.6 Hz, 1C), 123.7 (d, *J* = 272.7 Hz, 1C).



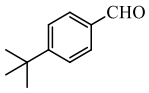
2-nitrobenzaldehyde **2k**.[2] Yield: 77% (M=151.12, 11.7 mg). ^{1}H NMR (600 MHz, CDCl3) δ 10.44 (s, 1H), 8.13 (d, J = 8.0 Hz, 1H), 7.96 (d, J = 7.5 Hz, 1H), 7.81 (t, J = 7.4 Hz, 1H), 7.76 (t, J = 7.7 Hz, 1H); ^{13}C NMR (151 MHz, CDCl3) δ 188.1, 149.6, 134.1, 133.7, 131.4, 129.7, 124.5.



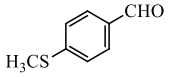
3-bromobenzaldehyde **2l**.[2] Yield: 76% (M=185.02, 14.1 mg). ^{1}H NMR (600 MHz, CDCl3) δ 9.97 (s, 1H), 8.02 (s, J = 1.0 Hz, 1H), 7.82 (d, J = 7.6 Hz, 1H), 7.76 (d, J = 7.9 Hz, 1H), 7.43 (t, J = 7.7 Hz, 1H); ^{13}C NMR (151 MHz, CDCl3) δ 190.7, 138.0, 137.3, 132.3, 130.6, 128.4, 123.4.



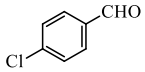
4-methylbenzaldehyde **2m**.[1] Yield: 60% (M=120.15, 7.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.95 (s, 1H), 7.77 (d, *J* = 8.0 Hz, 2H), 7.32 (d, *J* = 7.8 Hz, 2H), 2.43 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.0, 145.6, 134.2, 129.9, 129.7, 77.3, 77.1, 76.9, 21.9.



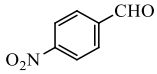
4-(tert-butyl)benzaldehyde **2n**.[6] Yield: 53% (M=162.10, 8.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.98 (s, 1H), 7.82 (d, *J* = 7.7 Hz, 2H), 7.55 (d, *J* = 7.9 Hz, 2H), 1.36 (s, 9H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.1, 158.5, 134.1, 129.7, 126.0, 35.4, 31.1.



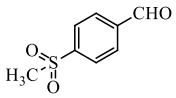
4-(methylthio)benzaldehyde **2o**.[7] Yield: 63% (M=152.03, 9.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.93 (s, 1H), 7.78 (d, *J* = 8.2 Hz, 2H), 7.33 (d, *J* = 8.2 Hz, 2H), 2.54 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.2, 147.9, 133.0, 130.0, 125.2, 14.7.



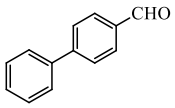
4-chlorobenzaldehyde **2p**.[3] Yield: 56% (M=140.57, 7.9 mg). ^{1}H NMR (600 MHz, CDCl3) δ 9.99 (s, 1H), 7.83 (d, J = 8.0 Hz, 2H), 7.52 (d, J = 7.7 Hz, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.9, 141.0, 134.7, 130.9, 129.5, 77.2, 77.0, 76.8.



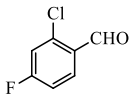
4-nitrobenzaldehyde **2q**.[8] Yield: 73% (M=151.12, 11.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.17 (s, 1H), 8.40 (d, *J* = 8.5 Hz, 2H), 8.08 (d, *J* = 8.6 Hz, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.3, 151.2, 140.1, 130.5, 124.3.



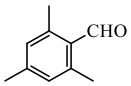
4-(methylsulfonyl)benzaldehyde **2r**.[2] Yield: 55% (M=184.02, 10.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.15 (s, 1H), 8.14 (d, *J* = 7.9 Hz, 2H), 8.09 (d, *J* = 7.7 Hz, 2H), 3.11 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.6, 145.4, 139.7, 130.4, 128.2, 44.3.



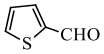
4-Biphenylcarboxaldehyde **2s**.[5] Yield: 63% (M=182.07, 11.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.99 (s, 1H), 7.88 (d, *J* = 7.8 Hz, 2H), 7.68 (d, *J* = 7.9 Hz, 2H), 7.57 (d, *J* = 8.0 Hz, 2H), 7.41 (t, *J* = 7.5 Hz, 2H), 7.35 (t, *J* = 7.3 Hz, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 190.9, 146.2, 138.7, 134.2, 129.3, 128.0, 127.5, 126.7, 126.4.



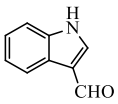
2-chloro-4-fluorobenzaldehyde **2t**.[9] Yield: 45% (M=157.99, 7.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.41 (s, 1H), 8.00-7.96 (m, 1H), 7.23-7.19 (m, 1H), 7.13-7.09 (m, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 188.2 (d, *J* = 4.6 Hz, 1C), 165.9 (d, *J* = 260.0 Hz, 1C), 139.5 (d, *J* = 11.2 Hz, 1C), 131.6 (d, *J* = 10.2 Hz, 1C), 129.3 (d, *J* = 3.2 Hz, 1C), 118.0 (d, *J* = 25.0 Hz, 1C), 115.2 (d, *J* = 21.7 Hz, 1C).



2,4,6-trimethylbenzaldehyde **2u**.[10] Yield: 51% (M=148.09, 7.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.55 (s, 1H), 6.88 (s, 2H), 2.57 (s, 6H), 2.30 (s, 3H) ; ^{13}C NMR (151 MHz, $CDCl_3$) δ 192.9, 143.8, 141.5, 130.5, 129.9, 21.5, 20.5.

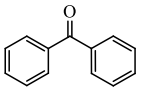


thiophene-2-carbaldehyde **2v**.[9] Yield: 71% (M=112.00, 8.0 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.94 (s, 1H), 7.79 (d, *J* = 3.7 Hz, 1H), 7.77 (d, *J* = 4.8 Hz, 1H), 7.22 (t, *J* = 4.3 Hz, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 183.0, 144.0, 136.4, 135.2, 128.4.

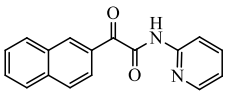


Indole-3-carboxaldehyde **2w**.[11] Yield: 51% (M=145.05, 7.4 mg). ^{1}H NMR (600 MHz, DMSO) δ 9.96 (s, 1H), 8.30 (s, 1H), 8.12 (d, *J* = 7.7 Hz, 1H), 7.53 (d, *J* = 7.9 Hz, 1H), 7.27 (t, *J* = 7.5 Hz, 1H), 7.23 (t, *J* = 7.3 Hz, 1H); ^{13}C NMR (151 MHz, DMSO) δ 190.4, 143.7, 142.2, 129.5, 128.8, 127.3, 126.0, 123.4, 117.7.

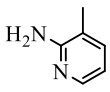
acetophenone **2x**.[12] Yield: 84% (M=120.06, 10.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.89 (d, *J* = 7.5 Hz, 2H), 7.49 (t, *J* = 7.3 Hz, 1H), 7.40 (t, *J* = 7.6 Hz, 2H), 2.54 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 197.1, 136.1, 132.1, 127.6, 127.3, 25.6.



benzophenone **2y**.[9] Yield: >99%. (M=182.07, 18.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.73 (d, *J* = 7.2 Hz, 2H), 7.51 (t, *J* = 7.4 Hz, 1H), 7.41 (t, *J* = 7.7 Hz, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 196.8, 137.6, 132.4, 130.1, 128.3.



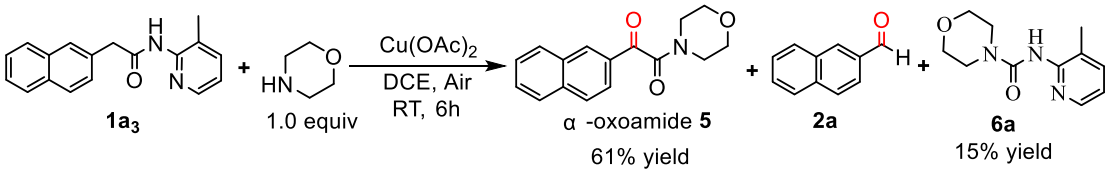
2-(naphthalen-2-yl)-2-oxo-N-(pyridin-2-yl)acetamide **3a$_2$** (by-product).[13] (M=276.09). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.58 (s, 1H), 9.22 (s, 1H), 8.40 (d, *J* = 4.4 Hz, 1H), 8.38 (d, *J* = 8.3 Hz, 1H), 8.25 (d, *J* = 8.6 Hz, 1H), 8.03 (d, *J* = 8.1 Hz, 1H), 7.93 (d, *J* = 8.6 Hz, 1H), 7.89 (d, *J* = 8.1 Hz, 1H), 7.81 (t, *J* = 7.8 Hz, 1H), 7.65 (t, *J* = 7.5 Hz, 1H), 7.58 (t, *J* = 7.5 Hz, 1H), 7.15 (s, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 185.2, 158.6, 149.3, 147.4, 137.5, 135.2, 134.0, 131.3, 131.3, 129.4, 129.1, 128.5, 127.5, 126.8, 125.9, 124.4, 119.7, 113.2.

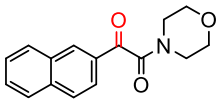


3-methylpyridin-2-amine **4**.[14] Yield:96% (M=108.07, 10.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.97-7.91 (m, 1H), 7.26 (dd, *J* = 7.2, 0.8 Hz, 1H), 6.60 (dd, *J* = 7.2, 5.1 Hz, 1H), 4.43 (s, 2H), 2.12 (s, 3H).

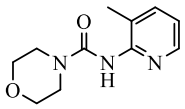
3.3 The C-C bond Activation of Amides to Urea Derivatives

When **1a$_3$** and morpholine were used as reaction partner, only 15% yield of *N*-(3-methylpyridin-2-yl)morpholine-4-carboxamide **6a** was isolated and the competitive C-N bond activation product α-oxoamide **5** was isolated as major product.

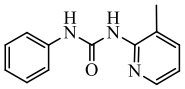




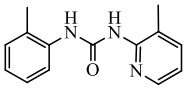
α-oxoamide **5**.[15] Yield: 61% (M=269.1, 16.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.47 (s, 1H), 8.03 (dd, *J* = 8.6, 1.7 Hz, 1H), 7.99 (d, *J* = 8.1 Hz, 1H), 7.96 (d, *J* = 8.6 Hz, 1H), 7.91 (d, *J* = 8.2 Hz, 1H), 7.71-7.63 (m, 1H), 7.62-7.56 (m, 1H), 3.90-3.80 (m, 4H), 3.71-3.63 (m, 2H), 3.46-3.37 (m, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 191.2, 165.6, 136.5, 133.1, 132.5, 130.5, 129.9, 129.6, 129.2, 128.0, 127.3, 123.6, 66.8, 66.7, 46.4, 41.8.



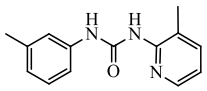
N-(3-methylpyridin-2-yl)morpholine-4-carboxamide **6a**.[16] Yield: 92% (M=221.1, 20.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.78 (s, 1H), 8.17 (d, *J* = 3.5 Hz, 1H), 7.58 (d, *J* = 7.3 Hz, 1H), 7.10 (dd, *J* = 7.2, 4.9 Hz, 1H), 3.64 – 3.56 (m, 4H), 3.47 – 3.38 (m, 4H), 2.12 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.3, 152.0, 145.1 (d, *J* = 9.2 Hz, 1C), 138.7 (d, *J* = 8.0 Hz, 1C), 128.0, 120.3 (d, *J* = 18.9 Hz, 1C), 66.0, 44.3, 17.6.



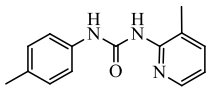
1-(3-methylpyridin-2-yl)-3-phenylurea **6b**.[17] Yield: >99%. (M=227.11, 22.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.20 (s, 1H), 8.13 (d, *J* = 4.4 Hz, 1H), 7.61 (d, *J* = 7.9 Hz, 2H), 7.47 (d, *J* = 7.2 Hz, 1H), 7.34 (t, *J* = 7.8 Hz, 2H), 7.11 (d, *J* = 13.9 Hz, 1H), 7.08 (t, *J* = 7.4 Hz, 1H), 6.88 (dd, *J* = 7.2, 5.1 Hz, 1H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.8, 151.3, 143.5, 139.4, 138.5, 128.9, 123.4, 120.3, 119.2, 117.2, 17.0.



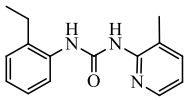
1-(3-methylpyridin-2-yl)-3-(o-tolyl)urea **6c**.[18] Yield: 85% (M=241.12, 20.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.12 (s, 1H), 8.14 (d, *J* = 8.0 Hz, 1H), 8.11 (d, *J* = 4.4 Hz, 1H), 7.49 (d, *J* = 7.2 Hz, 1H), 7.24 (d, *J* = 7.6 Hz, 1H), 7.20 (d, *J* = 7.4 Hz, 1H), 7.02 (t, *J* = 7.3 Hz, 2H), 6.89 (dd, *J* = 7.2, 5.1 Hz, 1H), 2.42 (s, 3H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.9, 151.4, 143.4, 139.3, 137.2, 130.2, 127.9, 126.7, 123.5, 121.4, 119.1, 117.1, 18.5, 17.0.



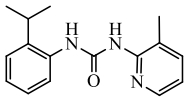
1-(3-methylpyridin-2-yl)-3-(m-tolyl)urea **6d**.[18] Yield: 83% (M=241.12, 19.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.11 (s, 1H), 8.14 (d, *J* = 4.4 Hz, 1H), 7.48 (d, *J* = 7.1 Hz, 1H), 7.44 (s, 1H), 7.41 (d, *J* = 8.1 Hz, 1H), 7.23 (t, *J* = 7.8 Hz, 1H), 6.97-6.88 (m, 3H), 2.37 (s, 3H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.9, 151.3, 143.4, 139.4, 138.7, 138.4, 128.7, 124.3, 120.9, 119.3, 117.4, 117.2, 21.5, 17.0.



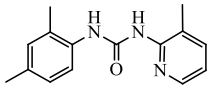
N-(3-methylpyridin-2-yl)-2-(p-tolyl)acetamide **6e**.[18] Yield: 97% (M=241.12, 23.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.05 (s, 1H), 8.13 (d, *J* = 4.2 Hz, 1H), 7.48 (t, *J* = 9.3 Hz, 3H), 7.14 (d, *J* = 8.2 Hz, 2H), 6.92 (s, 1H), 6.88 (dd, *J* = 7.3, 5.1 Hz, 1H), 2.33 (s, 3H), 2.27 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.8, 151.33, 143.6, 139.2, 135.9, 133.0, 129.4, 120.4, 119.1, 117.1, 20.9, 17.0.



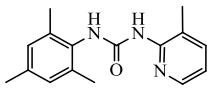
1-(2-ethylphenyl)-3-(3-methylpyridin-2-yl)urea **6f**. [17] Yield: 96% (M=255.14, 24.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.14 (s, 1H), 8.14 (d, *J* = 7.9 Hz, 1H), 8.10 (d, *J* = 4.4 Hz, 1H), 7.49 (d, *J* = 7.1 Hz, 1H), 7.26-7.20 (m, 2H), 7.07 (d, *J* = 6.9 Hz, 1H), 7.05 (d, *J* = 7.3 Hz, 1H), 6.89 (dd, *J* = 7.1, 5.2 Hz, 1H), 2.79 (q, *J* = 7.6 Hz, 2H), 2.30 (s, 3H), 1.32 (t, *J* = 7.6 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.1, 151.5, 143.2, 139.3, 136.4, 134.0, 128.7, 126.6, 123.8, 121.9, 119.3, 117.1, 25.3, 17.0, 14.3.



1-(2-isopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6g**. [20] Yield: 86% (M=269.15, 23.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.08 (s, 1H), 8.08 (d, *J* = 2.8 Hz, 1H), 8.02 (d, *J* = 6.3 Hz, 1H), 7.49 (d, *J* = 5.2 Hz, 1H), 7.31 (d, *J* = 6.8 Hz, 1H), 7.23 (t, *J* = 7.2 Hz, 1H), 7.13 (t, *J* = 7.4 Hz, 1H), 6.99 (s, 1H), 6.92-6.87 (m, 1H), 3.34-3.28 (m, 1H), 2.29 (s, 3H), 1.33 (d, *J* = 6.8 Hz, 6H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.2, 151.4, 143.4, 139.3, 139.0, 135.5, 126.3, 125.2, 124.4, 123.0, 119.1, 117.1, 28.2, 23.0, 17.0.

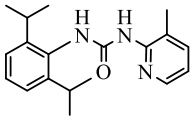


1-(2,4-dimethylphenyl)-3-(3-methylpyridin-2-yl)urea **6h**.[21] Yield: 91% (M=255.1, 23.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 11.98 (s, 1H), 8.10 (d, *J* = 4.4 Hz, 1H), 7.95 (d, *J* = 7.9 Hz, 1H), 7.47 (d, *J* = 7.1 Hz, 1H), 7.03 (d, *J* = 11.1 Hz, 2H), 7.00 (s, 1H), 6.87 (dd, *J* = 7.2, 5.2 Hz, 1H), 2.37 (s, 3H), 2.30 (s, 3H), 2.28 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.0, 151.4, 143.4, 139.2, 134.5, 133.2, 130.9, 128.2, 127.1, 121.7, 119.0, 117.0, 20.8, 18.4, 17.0.

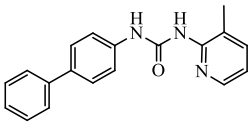


1-mesityl-3-(3-methylpyridin-2-yl)urea **6i**.[22] Yield: 74% (M=269.2, 19.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 11.28 (s, 1H), 8.06 (d, *J* = 4.1 Hz, 1H), 7.48 (d, *J* = 7.2 Hz, 1H), 6.93 (s, 2H), 6.91-6.85 (m,

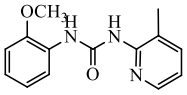
2H), 2.29 (s, 9H), 2.26 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.6, 151.6, 143.7, 139.1, 136.4, 135.3, 131.9, 128.8, 118.8, 117.0, 20.9, 18.6, 17.0.



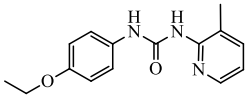
1-(2,6-diisopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6j**. Yield: 30% (M=311.2, 9.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 11.34 (s, 1H), 11.34 (s, 1H), 8.06 (d, *J* = 4.5 Hz, 1H), 7.49 (d, *J* = 7.2 Hz, 1H), 7.32-7.28 (m, 1H), 7.21 (d, *J* = 7.7 Hz, 2H), 6.88 (t, *J* = 6.1 Hz, 2H), 3.27-3.21 (m, 2H), 2.28 (s, 3H), 1.29-1.20 (m, 12H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.3, 151.6, 146.2, 143.7, 139.2, 131.8, 127.8, 123.4, 118.8, 117.0, 28.9, 24.2, 23.0, 17.0; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{25}N_3O$ 312.2070, found 312.2130.



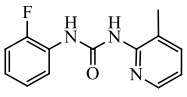
1-([1,1'-biphenyl]-4-yl)-3-(3-methylpyridin-2-yl)urea **6k**.[23] Yield: >99%. (M=303.1, 30.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.01 (s, 1H), 8.45 (d, *J* = 8.3 Hz, 1H), 7.46 (d, *J* = 4.5 Hz, 4H), 7.45-7.42 (m, 1H), 7.38 (t, *J* = 7.1 Hz, 1H), 7.33 (d, *J* = 7.2 Hz, 1H), 7.23-7.19 (m, 2H), 7.12 (t, *J* = 7.3 Hz, 1H), 6.85 (s, 1H), 6.65 (dd, *J* = 7.1, 5.2 Hz, 1H), 2.19 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.8, 150.6, 143.2, 139.6, 138.9, 136.6, 132.7, 130.3, 130.0, 128.6, 128.3, 127.4, 123.0, 121.0, 118.4, 116.7, 16.8.



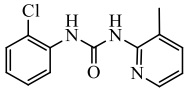
1-(2-methoxyphenyl)-3-(3-methylpyridin-2-yl)urea **6l**.[18] Yield: 91% (M=257.12, 23.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.48 (s, 1H), 8.35 (d, *J* = 6.7 Hz, 1H), 8.16 (d, *J* = 4.2 Hz, 1H), 7.46 (d, *J* = 7.2 Hz, 1H), 7.05-6.97 (m, 3H), 6.92 (d, *J* = 7.9 Hz, 1H), 6.88 (dd, *J* = 7.3, 5.1 Hz, 1H), 3.96 (s, 3H), 2.28 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 151.7, 150.2, 147.9, 142.6, 138.1, 127.7, 121.9, 120.12, 119.1, 117.9, 116.1, 109.4, 55.1, 15.9.



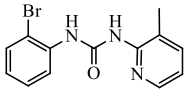
1-(4-ethoxyphenyl)-3-(3-methylpyridin-2-yl)urea **6m**.[24] Yield: 93% (M=271.13, 25.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 11.97 (s, 1H), 8.11 (d, *J* = 4.2 Hz, 1H), 7.49 (d, *J* = 8.9 Hz, 2H), 7.46 (d, *J* = 7.0 Hz, 1H), 7.04 (s, 1H), 6.90-6.85 (m, 3H), 4.02 (q, *J* = 7.0 Hz, 2H), 2.27 (s, 3H), 1.41 (t, *J* = 7.0 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.3, 153.0, 151.4, 143.5, 139.2, 131.5, 122.1, 119.1, 117.1, 114.9, 63.7, 17.0, 14.9.



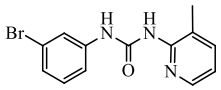
1-(2-fluorophenyl)-3-(3-methylpyridin-2-yl)urea **6n**.[18] Yield: 74% (M=245.10, 18.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.57 (s, 1H), 8.33 (t, *J* = 7.7 Hz, 1H), 8.17 (d, *J* = 4.5 Hz, 1H), 7.49 (d, *J* = 7.0 Hz, 1H), 7.15-7.10 (m, 2H), 7.07-6.98 (m, 2H), 6.91 (dd, *J* = 7.0, 5.3 Hz, 1H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.9, 152.7, 151.0, 143.7, 139.4, 127.2 (d, *J* = 9.9 Hz, 1C), 124.4 (d, *J* = 3.5 Hz, 1C), 123.3 (d, *J* = 6.9 Hz, 1C), 121.7, 119.0, 117.4, 114.78 (d, *J* = 19.0 Hz, 1C), 16.9.



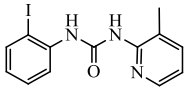
1-(2-chlorophenyl)-3-(3-methylpyridin-2-yl)urea **6o**.[25] Yield: 64% (M=261.07, 16.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.85 (s, 1H), 8.43 (d, *J* = 6.8 Hz, 1H), 8.17 (d, *J* = 4.3 Hz, 1H), 7.49 (d, *J* = 6.5 Hz, 1H), 7.40 (d, *J* = 7.5 Hz, 1H), 7.29-7.26 (m, 1H), 7.01 (t, *J* = 7.4 Hz, 2H), 6.93-6.88 (m, 1H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.7, 150.8, 143.7, 139.4, 136.2, 129.2, 127.4, 123.7, 121.8, 119.7, 117.5, 16.9.



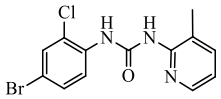
1-(2-bromophenyl)-3-(3-methylpyridin-2-yl)urea **6p**.[26] Yield: 66% (M=305.02, 20.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.78 (s, 1H), 8.39 (d, *J* = 5.9 Hz, 1H), 8.19 (s, 1H), 7.58 (d, *J* = 6.7 Hz, 1H), 7.50 (d, *J* = 5.4 Hz, 1H), 7.32 (t, *J* = 7.2 Hz, 1H), 6.99-6.88 (m, 3H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.8, 150.7, 143.8, 139.4, 137.7, 132.6, 128.0, 124.2, 122.3, 118.8, 117.5, 16.9.



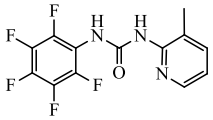
1-(3-bromophenyl)-3-(3-methylpyridin-2-yl)urea **6q**.[27] Yield: 83% (M=305.02, 25.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.31 (s, 1H), 8.14 (d, *J* = 3.9 Hz, 1H), 7.84 (s, 1H), 7.55 (d, *J* = 6.6 Hz, 1H), 7.51 (s, 1H), 7.24-7.17 (m, 2H), 6.93 (d, *J* = 4.6 Hz, 2H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.7, 151.1, 143.3, 139.9, 139.6, 130.2, 126.3, 123.0, 122.5, 119.5, 118.6, 117. 5, 17.0.



1-(2-iodophenyl)-3-(3-methylpyridin-2-yl)urea **6r**.[28] Yield: 55% (M=353.00, 19.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.58 (s, 1H), 8.24 (d, *J* = 7.3 Hz, 1H), 8.21 (d, *J* = 4.2 Hz, 1H), 7.84 (d, *J* = 6.6 Hz, 1H), 7.49 (d, *J* = 6.8 Hz, 1H), 7.36 (t, *J* = 7.2 Hz, 1H), 7.03 (s, 1H), 6.95-6.90 (m, 1H), 6.82 (t, *J* = 7.0 Hz, 1H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.0, 150.7, 143.8, 140.7, 139.3, 128.8, 125.1, 122.8, 117.4, 89.4, 16.8.

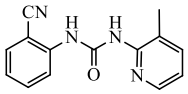


1-(4-bromo-2-chlorophenyl)-3-(3-methylpyridin-2-yl)urea **6s**.[29] Yield: 39% (M=339.0, 13.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.93 (s, 1H), 8.36 (d, *J* = 7.5 Hz, 1H), 8.16 (s, 1H), 7.55 (d, *J* = 2.0 Hz, 1H), 7.51 (s, 1H), 7.39 (d, *J* = 8.9 Hz, 1H), 6.91 (d, *J* = 28.7 Hz, 2H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.6, 150.7, 143.7, 139.5, 135.6, 131.6, 130.5, 124.1, 122.6, 118.9, 117.7, 115.2, 16.8.

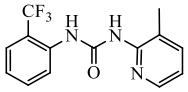


1-(3-methylpyridin-2-yl)-3-(perfluorophenyl)urea **6t**. Yield: 27% (M=317.1, 8.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 11.96 (s, 1H), 8.11 (d, *J* = 4.5 Hz, 1H), 7.53 (d, *J* = 7.1 Hz, 1H), 7.13 (s, 1H), 6.98 - 6.92 (m, 1H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.9, 150.6, 144.3-143.9 (m, 1C), 143.5, 142.8-142.1 (m, 1C), 140.8-140.3 (m, 1C), 139.8, 139.0-138.4 (m, 1C), 137.4-136. 8 (m, 1C), 119.6, 117.9,

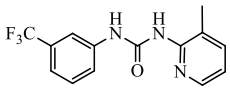
113.0-112.5 (m, 1C), 16.8; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{13}H_8F_5N_3O$ 318.0664, found 318.0634.



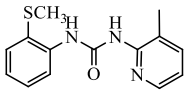
1-(2-cyanophenyl)-3-(3-methylpyridin-2-yl)urea **6u**.[30] Yield: 33% (M=252.1, 8.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 13.66 (s, 1H), 8.54 (d, *J* = 8.5 Hz, 1H), 8.30 (d, *J* = 4.4 Hz, 1H), 7.62-7.56 (m, 2H), 7.51 (d, *J* = 7.2 Hz, 1H), 7.11 (t, *J* = 7.5 Hz, 1H), 6.99-6.90 (m, 2H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.6, 150.4, 143.8, 142.7, 139.6, 134.0, 132.6, 122.8, 120.6, 118.7, 117.8, 117.4, 102.0, 16.6.



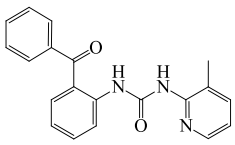
1-(3-methylpyridin-2-yl)-3-(2-(trifluoromethyl)phenyl)urea **6v**.[31] Yield: 38% (M=295.09, 11.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.86 (s, 1H), 8.34 (d, *J* = 7.3 Hz, 1H), 8.13 (s, 1H), 7.64 (d, *J* = 7.8 Hz, 1H), 7.56 (t, *J* = 7.8 Hz, 1H), 7.49 (d, *J* = 5.8 Hz, 1H), 7.18 (t, *J* = 7.1 Hz, 1H), 6.91 (M, 2H), 2.28 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.0, 151.1, 143.5, 139.4, 136.4, 132.7, 126.0 (q, *J* = 5.6 Hz, 1C), 125.1, 124.0, 123.2, 120.3 (q, *J* = 27.6 Hz, 1C), 118.7, 117.6, 117.5, 16.7.



1-(3-methylpyridin-2-yl)-3-(3-(trifluoromethyl)phenyl)urea **6w**.[32] Yield: 77% (M=295.1, 22.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.51 (s, 1H), 8.16 (d, *J* = 4.2 Hz, 1H), 7.93 (s, 1H), 7.80 (d, *J* = 8.0 Hz, 1H), 7.51 (d, *J* = 7.2 Hz, 1H), 7.44 (t, *J* = 7.9 Hz, 1H), 7.33 (d, *J* = 7.7 Hz, 2H), 6.92 (dd, *J* = 7.2, 5.2 Hz, 1H), 2.33 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.9, 151.1, 143.5, 139.6, 139.2, 131.3 (q, *J* = 32.1 Hz, 1C), 129.4, 124.1 (q, *J* = 271.5 Hz, 1C), 119.8 (q, *J* = 3.8 Hz, 1C), 119.6, 117.5, 116.8 (q, *J* = 4.1 Hz, 1C), 17.0.

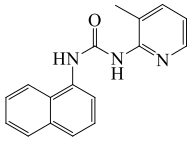


1-(3-methylpyridin-2-yl)-3-(2-(methylthio)phenyl)urea **6x**. Yield: 78% (M=273.09, 21.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.74 (s, 1H), 8.32 (s, 1H), 8.18 (d, *J* = 3.9 Hz, 1H), 7.49 (d, *J* = 6.5 Hz, 1H), 7.47 (d, *J* = 7.8 Hz, 1H), 7.29 (t, *J* = 7.7 Hz, 1H), 7.05 (t, *J* = 7.4 Hz, 1H), 6.97 (s, 1H), 6.93-6.87 (m, 1H), 2.43 (s, 3H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.0, 151.0, 143.7, 139.3, 131.81, 128.1, 126.6, 123.7, 121.4, 118.8, 117.3, 17.8, 16.9; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{14}H_{15}N_3OS$ 274.1011, found 274.1000.

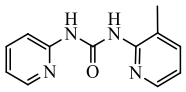


1-(2-benzoylphenyl)-3-(3-methylpyridin-2-yl)urea **6y**. Yield: 70% (M=331.1, 23.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 13.01 (s, 1H), 8.36 (d, *J* = 8.2 Hz, 1H), 8.28 (d, *J* = 4.0 Hz, 1H), 7.85 (d, *J* = 7.2 Hz, 2H), 7.57-7.52 (m, 2H), 7.47-7.41 (m, 4H), 7.11 (t, *J* = 7.4 Hz, 1H), 6.87 (dd, *J* = 7.2, 5.1 Hz, 2H), 2.23 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 196.9, 153.2, 150.6, 144.0, 139.1, 138.2, 138.0, 132.7, 132.1, 130.7, 130.3, 128.8, 128.3, 123.3, 122.2, 118.5, 117.4, 16.7; HRMS (ESI): m/z $[M+Na]^+$ calcd for

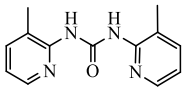
$C_{20}H_{17}N_3O_2$ 354.1215, found 354.1271.



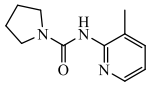
1-(3-methylpyridin-2-yl)-3-(naphthalen-1-yl)urea **6z**.[33] Yield: 68% (M=277.3, 18.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.77 (s, 1H), 8.23 (d, *J* = 8.3 Hz, 3H), 7.88 (d, *J* = 8.1 Hz, 1H), 7.65 (d, *J* = 8.1 Hz, 1H), 7.56 (t, *J* = 7.2 Hz, 1H), 7.51 (t, *J* = 7.6 Hz, 3H), 7.14 (s, 1H), 6.94 (dd, *J* = 7.1, 5.2 Hz, 1H), 2.32 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.3, 151.4, 143.6, 139.5, 134.2, 133.9, 128.7, 126.8, 126.1, 126.0, 125.8, 124.1, 121.5, 119.3, 118.6, 117.3, 17.0.



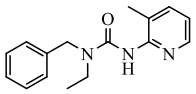
1-(3-methylpyridin-2-yl)-3-(pyridin-2-yl)urea **6A**.[34] Yield: 57% (M=228.3, 13.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.62 (s, 1H), 8.35 (d, *J* = 4.0 Hz, 1H), 8.27 (d, *J* = 4.5 Hz, 1H), 8.19 (s, 1H), 7.70 (t, *J* = 7.8 Hz, 1H), 7.49 (d, *J* = 7.3 Hz, 1H), 7.04-6.98 (m, 1H), 6.91 (dd, *J* = 7.2, 5.2 Hz, 2H), 2.29 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.5, 152.3, 150.8, 148.0, 144.2, 139.3, 138.1, 118.9, 117.6, 114.2, 16.9.



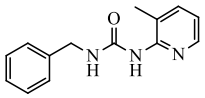
1,3-bis(3-methylpyridin-2-yl)urea **6B**.[35] Yield: 56% (M=242.1, 13.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 12.39 (s, 2H), 8.25 (s, 2H), 7.53 (d, *J* = 7.2 Hz, 2H), 6.98 (s, 2H), 2.36 (s, 6H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.2, 150.7, 144.8, 139.4, 118.8, 17.6.



N-(3-methylpyridin-2-yl)pyrrolidine-1-carboxamide **6C**.[36] Yield: 55% (M=205.1, 11.3 mg).^{1}H NMR (600 MHz, $CDCl_3$) δ 8.17 (d, *J* = 4.3 Hz, 1H), 7.51 (d, *J* = 5.6 Hz, 1H), 7.09-6.96 (m, 1H), 6.73 (s, 1H), 3.54-3.44 (m, 4H), 2.31 (s, 3H), 2.02-1.91 (m, 4H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.1, 151.2, 145.4, 139.5, 128.2, 120.6, 46.1, 25.6, 18.4.

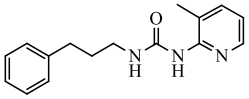


1-benzyl-1-ethyl-3-(3-methylpyridin-2-yl)urea **6D**.[37] Yield: 72% (M=269.2, 19.5 mg). ^{1}H NMR (600 MHz, DMSO) δ 8.62 (s, 1H), 8.19 (s, 1H), 7.59 (d, *J* = 6.8 Hz, 1H), 7.35 (t, *J* = 7.4 Hz, 2H), 7.31 (d, *J* = 7.3 Hz, 2H), 7.26 (t, *J* = 7.0 Hz, 1H), 7.12 (s, 1H), 4.56 (s, 2H), 3.37-3.35 (m, 2H), 2.14 (s, 3H), 1.07 (t, *J* = 6.9 Hz, 3H); ^{13}C NMR (151 MHz, DMSO) δ 155.3, 152.1, 145.1, 138.9, 138.7, 128.6, 128.3, 127.2, 126.8, 120.4, 48.7, 40.9, 17.7, 13.2.

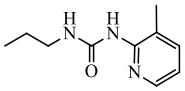


1-benzyl-3-(3-methylpyridin-2-yl)urea **6E**.[38] Yield: 86% (M=241.1, 20.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 10.19 (s, 1H), 8.01 (d, *J* = 4.7 Hz, 1H), 7.42 (d, *J* = 7.2 Hz, 1H), 7.38 (d, *J* = 7.5 Hz, 2H), 7.34 (t, *J* = 7.6 Hz, 2H), 7.26 (t, *J* = 7.2 Hz, 1H), 6.87 (s, 1H), 6.81 (dd, *J* = 7.2, 5.2 Hz, 1H), 4.63 (d, *J* = 5.8 Hz, 2H), 2.23 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.6, 151.6, 143.8, 139.3, 138.9, 128.6, 127.3,

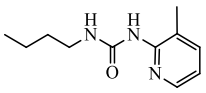
127.0, 118.7, 116.9, 43.8, 17.0.



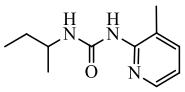
1-(3-methylpyridin-2-yl)-3-(3-phenylpropyl)urea **6F**.[39] Yield: 88% (M=269.2, 23.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.82 (s, 1H), 8.05 (d, *J* = 4.3 Hz, 1H), 7.42 (d, *J* = 7.2 Hz, 1H), 7.28 (t, *J* = 7.5 Hz, 2H), 7.22 (d, *J* = 7.3 Hz, 2H), 7.18 (t, *J* = 7.3 Hz, 1H), 6.82 (dd, *J* = 7.2, 5.1 Hz, 2H), 3.45-3.38 (m, 2H), 2.77-2.70 (m, 2H), 2.22 (s, 3H), 1.99-1.94 (m, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.5, 151.6, 143.6, 141.7, 138.9, 128.5, 128.4, 125.9, 118.8, 116.8, 39.4, 33.3, 31.5, 17.0.



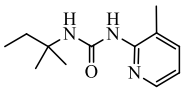
1-(3-methylpyridin-2-yl)-3-propylurea **6G**.[40] Yield: >99% (M=193.1, 19.3 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.76 (s, 1H), 8.05 (d, *J* = 4.7 Hz, 1H), 7.41 (d, *J* = 7.3 Hz, 1H), 6.81 (dd, *J* = 7.2, 5.2 Hz, 1H), 6.77 (s, 1H), 3.37-3.33 (m, 2H), 2.22 (s, 3H), 1.70-1.61 (m, 2H), 0.99 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.5, 151.7, 143.8, 138.8, 118.7, 116.7, 41.7, 23.2, 17.0, 11.6.



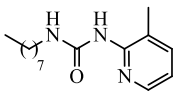
1-butyl-3-(3-methylpyridin-2-yl)urea **6H**.[41] Yield: 81% (M=207.1, 16.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.72 (s, 1H), 8.05 (d, *J* = 4.5 Hz, 1H), 7.42 (d, *J* = 7.2 Hz, 1H), 6.81 (dd, *J* = 7.2, 5.2 Hz, 1H), 6.67 (s, 1H), 3.44-3.35 (m, 2H), 2.21 (s, 3H), 1.63-1.56 (m, 2H), 1.48-1.39 (m, 2H), 0.96 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.4, 151.7, 143.8, 138.8, 118.6, 116.7, 39.7, 32.1, 20.3, 17.0, 13.8.



1-(sec-butyl)-3-(3-methylpyridin-2-yl)urea **6I**.[42] Yield: 80% (M=207.1, 16.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.63 (s, 1H), 8.05 (d, *J* = 4.2 Hz, 1H), 7.41 (d, *J* = 7.2 Hz, 1H), 6.81 (dd, *J* = 7.2, 5.1 Hz, 1H), 6.66 (s, 1H), 3.99-3.87 (m, 1H), 2.21 (s, 3H), 1.66-1.54 (m, 2H), 1.24 (d, *J* = 6.6 Hz, 3H), 0.98 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.8, 151.8, 143.8, 138.8, 118.6, 116.6, 47.3, 29.9, 20.8, 17.0, 10.3.

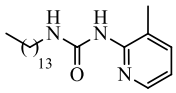


1-(3-methylpyridin-2-yl)-3-(tert-pentyl)urea **6J**.[43] Yield: 98% (M=221.2, 21.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.76 (s, 1H), 8.02 (d, *J* = 4.5 Hz, 1H), 7.40 (d, *J* = 7.1 Hz, 1H), 6.79 (dd, *J* = 7.1, 5.2 Hz, 1H), 6.75 (s, 1H), 2.22 (s, 3H), 1.78 (q, *J* = 7.5 Hz, 2H), 1.40 (s, 6H), 0.94 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.1, 152.0, 143.5, 1387, 118.7, 116.4, 53.2, 33.7, 26.7, 17.0, 8.5.

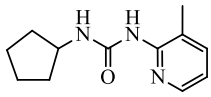


1-ethyl-3-(3-methylpyridin-2-yl)urea **6K**. Yield: 93% (M=263.2, 24.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.73 (s, 1H), 8.04 (d, *J* = 4.3 Hz, 1H), 7.42 (d, *J* = 7.2 Hz, 1H), 6.81 (dd, *J* = 7.2, 5.2 Hz, 1H), 6.78 (s, 1H), 3.42-3.35 (m, 2H), 2.22 (s, 3H), 1.66-1.57 (m, 2H), 1.42-1.36 (m, 2H), 1.35-1.25 (m, 8H),

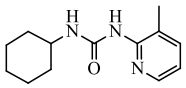
0.88 (t, J = 6.9 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.4, 151.8, 143.7, 138.8, 118.7, 116.7, 40.0 31.8, 30.0, 29.3, 29.3, 27.1, 22.7, 17.0, 14.1; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{15}H_{25}N_3O$ 264.2070, found 264.2060.



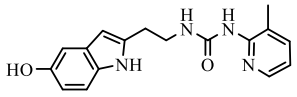
1-(3-methylpyridin-2-yl)-3-tetradecylurea **6L**. Yield: 78% (M=347.3, 27.0 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.77 (d, J = 44.7 Hz, 1H), 8.04 (d, J = 3.9 Hz, 1H), 7.41 (d, J = 6.9 Hz, 1H), 6.81 (dd, J = 7.3, 5.1 Hz, 1H), 6.76 (s, 1H), 3.41-3.35 (m, 2H), 2.22 (s, 3H), 1.64-1.58 (m, 2H), 1.41-1.36 (m, 2H), 1.35-1.24 (m, 22H), 0.88 (t, J = 7.0 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 155.4, 151.7, 143.7, 138.8, 118.7, 116.7, 40.0, 31.9, 30.0, 29.7, 29.7, 29.7, 29.7, 29.6, 29.4, 29.4, 27.1, 22.7, 17.0, 14.1; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{37}N_3O$ 348.3006, found 348.2982.



1-cyclopentyl-3-(3-methylpyridin-2-yl)urea **6M**.[44] Yield: 95% (M=219.1, 20.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.76 (d, J = 5.4 Hz, 1H), 8.04 (d, J = 3.9 Hz, 1H), 7.41 (d, J = 7.2 Hz, 1H), 6.81 (dd, J = 7.3, 5.1 Hz, 1H), 6.74 (s, 1H), 4.29-4.19 (m, 1H), 2.21 (s, 3H), 2.05-1.98 (m, 2H), 1.81-1.70 (m, 2H), 1.68-1.61 (m, 2H), 1.61-1.55 (m, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.9, 151.8, 143.7, 138.8, 118.7, 116.6, 51.7, 33.4, 23.7, 17.0.

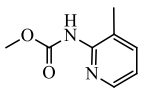


1-cyclohexyl-3-(3-methylpyridin-2-yl)urea **6N**.[45] Yield: 91% (M=233.2, 21.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 9.74 (s, 1H), 8.05 (d, J = 4.3 Hz, 1H), 7.41 (d, J = 7.2 Hz, 1H), 6.81 (dd, J = 7.2, 5.2 Hz, 1H), 6.63 (s, 1H), 3.88-3.76 (m, 1H), 2.21 (s, 3H), 1.99 (d, J = 9.1 Hz, 2H), 1.77-1.70 (m, 2H), 1.64-1.58 (m, 1H), 1.46-1.33 (m, 4H), 1.31-1.25 (m, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.5, 151.8, 143.8, 138.8, 118.6, 116.6, 48.5, 33.3, 25.8, 24.7, 17.0.

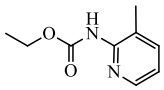


1-(2-(5-hydroxy-*1H*-indol-2-yl)ethyl)-3-(3-methylpyridin-2-yl)urea **6O**. Yield: 45% (M=310.1, 13.9 mg). ^{1}H NMR (600 MHz, DMSO) δ 10.47 (s, 1H), 9.44 (s, 1H), 8.51 (s, 1H), 8.00 (s, 1H), 7.91 (d, J = 4.1 Hz, 1H), 7.51 (d, J = 7.0 Hz, 1H), 7.13 (d, J = 8.6 Hz, 1H), 7.09 (d, J = 1.9 Hz, 1H), 6.90 – 6.82 (m, 2H), 6.60 (dd, J = 8.6, 2.2 Hz, 1H), 3.54 – 3.45 (m, 2H), 2.84 (t, J = 7.0 Hz, 2H), 2.20 (s, 3H); ^{13}C NMR (151 MHz, DMSO) δ 155.3, 152.2, 150.7, 143.6, 139.6, 131.4, 128.3, 123.9, 120.7, 117.3, 112.1, 111.8, 111.2, 102.8, 40.4 26.0, 17.4 ; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{17}H_{18}N_4O_2$ 311.1504, found 311.1491.

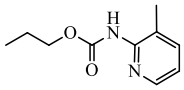
3.4 The C-C bond Activation of Amides to carbamates



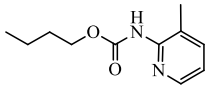
methyl (3-methylpyridin-2-yl)carbamate **7a**.[46] Yield: 98% (M=166.07, 15.8 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.26 (d, *J* = 4.1 Hz, 1H), 7.54 (d, *J* = 7.5 Hz, 1H), 7.37 (s, 1H), 7.07 (dd, *J* = 7.4, 4.9 Hz, 1H), 3.78 (s, 3H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.3, 149.4, 145.8, 139.9, 127.0, 121.1, 52.6, 17.9.



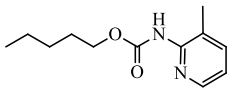
ethyl (3-methylpyridin-2-yl)carbamate **7b**.[47] Yield: >99%. (M=180.09, 18.0 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 2H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.22 (q, *J* = 7.1 Hz, 2H), 2.30 (s, 3H), 1.31 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.9, 149.6, 145.8, 139.9, 127.1, 121.0, 61.5, 18.0, 14.5.



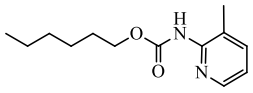
propyl (3-methylpyridin-2-yl)carbamate **7c**.[48] Yield: 96% (M=194.11, 18.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 2H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.12 (t, *J* = 6.7 Hz, 2H), 2.30 (s, 3H), 1.74-1.65 (m, 2H), 0.96 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.0, 149.6, 145.8, 139.8, 127.2 121.0, 67.1, 22.3, 18.0, 10.3.



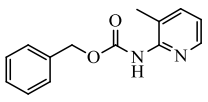
butyl (3-methylpyridin-2-yl)carbamate **7d**.[49] Yield: 90% (M=208.12, 18.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.26 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 2H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.17 (t, *J* = 6.7 Hz, 2H), 2.30 (s, 3H), 1.69-1.63 (m, 2H), 1.44-1.37 (m, 2H), 0.94 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.0, 149.6, 145.8, 139.8, 127.1, 121.0, 65.4, 31.0, 19.0, 18.0, 13.7.



pentyl (3-methylpyridin-2-yl)carbamate **7e**.[50] Yield: >99%. (M=222.14, 22.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.1 Hz, 1H), 7.54 (d, *J* = 6.8 Hz, 2H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.16 (t, *J* = 6.8 Hz, 2H), 2.30 (s, 3H), 1.71-1.65 (m, 2H), 1.38-1.32 (m, 4H), 0.91 (t, *J* = 7.1 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.0, 149.6, 145.8, 139.8, 127.1, 121.1, 65.7, 28.6, 28.0, 22.3, 18.0, 14.0.

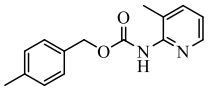


hexyl (3-methylpyridin-2-yl)carbamate **7f**.[51] Yield: >99%. (M=236.15, 23.6 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 2H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.16 (t, *J* = 6.8 Hz, 2H), 2.30 (s, 3H), 1.69-1.61 (m, 2H), 1.41-1.34 (m, 2H), 1.33-1.27 (m, 4H), 0.89 (t, *J* = 6.8 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.0, 149.6, 145.8, 139.8, 127.1, 121.0, 65.7, 31.5, 28.9, 25.5, 22.6, 18.0, 14.0.

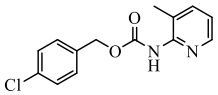


benzyl (3-methylpyridin-2-yl)carbamate **7g**.[52] Yield: 95% (M=242.11, 22.9 mg). ^{1}H NMR (600 MHz,

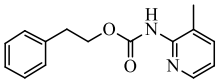
$CDCl_3$) δ 8.23 (d, *J* = 3.4 Hz, 1H), 7.65 (s, 1H), 7.52 (d, *J* = 7.5 Hz, 1H), 7.41-7.31 (m, 5H), 7.03 (dd, *J* = 7.4, 4.7 Hz, 1H), 5.20 (s, 2H), 2.28 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.6, 149.4, 145.9, 139.9, 136.1, 128.6, 128.3, 128.3, 127.0, 121.1, 67.3, 18.0.



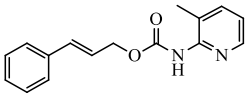
4-methylbenzyl (3-methylpyridin-2-yl)carbamate **7h**.[53] Yield: 77% (M=256.12, 19.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.24 (d, *J* = 4.0 Hz, 1H), 7.52 (d, *J* = 7.5 Hz, 1H), 7.49 (s, 1H), 7.29 (d, *J* = 7.9 Hz, 2H), 7.17 (d, *J* = 7.8 Hz, 2H), 7.03 (dd, *J* = 7.4, 4.9 Hz, 1H), 5.16 (s, 2H), 2.35 (s, 3H), 2.28 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.6, 149.4, 145.9, 139.8, 138.2, 133.0, 129.2, 128.5, 126.8, 121.1, 67.2, 21.2, 17.9.



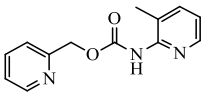
4-chlorobenzyl (3-methylpyridin-2-yl)carbamate **7i**.[54] Yield: 77% (M=276.07, 21.3mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.23 (s, 1H), 7.84 (s, 1H), 7.54 (d, *J* = 7.1 Hz, 1H), 7.36 --7.28 (m, 4H), 7.05 (dd, *J* = 7.2, 5.0 Hz, 1H), 5.15 (s, 2H), 2.28 (s, 3H);^{13}C NMR (151 MHz, $CDCl_3$) δ 153.5, 149.3, 145.8, 139.9, 134.6, 134.2, 129.7, 128.7, 127.1, 121.2, 66.4, 18.0.



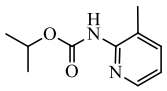
phenethyl (3-methylpyridin-2-yl)carbamate **7j**.[55] Yield: 96% (M=256.12, 24.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.24 (d, *J* = 4.2 Hz, 1H), 7.53 (d, *J* = 7.4 Hz, 1H), 7.43-7.26 (m, 3H), 7.26-7.19 (m, 3H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.39 (t, *J* = 7.1 Hz, 2H), 2.99 (t, *J* = 7.0 Hz, 2H), 2.26 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.7, 149.4, 145.8, 139.9, 137.8, 129.0, 128.5, 127.1, 126.6, 121.1, 65.9, 35.4, 17.9.



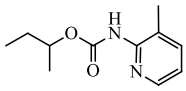
cinnamyl (3-methylpyridin-2-yl)carbamate **7k**. Yield: 87% (M=268.12, 23.2 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.28 (s, 1H), 7.53 (d, *J* = 7.5 Hz, 2H), 7.39 (d, *J* = 7.4 Hz, 2H), 7.32 (t, *J* = 7.6 Hz, 2H), 7.26 (t, *J* = 7.3 Hz, 1H), 7.06 (dd, *J* = 7.3, 4.9 Hz, 1H), 6.68 (d, *J* = 15.9 Hz, 1H), 6.36-6.29 (m, 1H), 4.83 (d, *J* = 6.4 Hz, 2H), 2.30 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.6, 149.4, 145.9, 139.9, 136.3, 134.20, 128.6, 128.1, 127.0, 126.7, 123.4, 121.1, 66.0, 18.0; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{16}H_{16}N_2O_2$ 269.1286, found 269.1265.



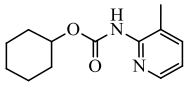
pyridin-2-ylmethyl (3-methylpyridin-2-yl)carbamate **7l**. Yield: 60% (M=243.10, 14.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.60 (d, *J* = 4.6 Hz, 1H), 8.27 (d, *J* = 4.1 Hz, 1H), 7.70 (t, *J* = 6.9 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 1H), 7.41 (d, *J* = 7.8 Hz, 1H), 7.24 (dd, *J* = 7.3, 5.0 Hz, 1H), 7.06 (dd, *J* = 7.5, 4.9 Hz, 1H), 5.33 (s, 2H), 2.31 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 156.0, 153.4, 149.4, 149.3, 145.9, 139.8, 136.8, 126.9, 122.9, 121.9, 121.2, 67.7, 17.9; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{13}H_{13}N_3O_2$ 244.1083, found 244.1073.



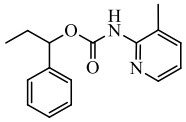
isopropyl (3-methylpyridin-2-yl)carbamate **7m**.[56] Yield: >99%. (M=194.11, 19.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.3 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 1H), 7.41 (s, 1H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 5.06-4.96 (m, 1H), 2.30 (s, 3H), 1.29 (d, *J* = 6.3 Hz, 6H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.4, 149.6, 145.8, 139.8, 127.0, 120.9, 69.0, 22.1, 18.0.



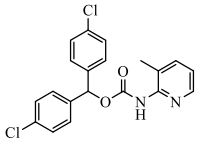
sec-butyl (3-methylpyridin-2-yl)carbamate **7n**.[57] Yield: 96% (M=208.12, 19.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 1H), 7.36 (s, 1H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.88-4.80 (m, 1H), 2.30 (s, 3H), 1.70-1.62 (m, 1H), 1.61-1.53 (m, 1H), 1.27 (d, *J* = 6.3 Hz, 3H), 0.93 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (151 MHz, CDCl3) δ 153.6, 149.6, 145.8, 139.8, 127.0, 121.0, 73.6, 29.0, 20.0, 18.0, 9.7.



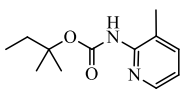
cyclohexyl (3-methylpyridin-2-yl)carbamate **7o**.[58] Yield: >99%. (M=234.14, 23.4 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.27 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 1H), 7.48 (s, *J* = 65.9 Hz, 1H), 7.06 (dd, *J* = 7.5, 4.9 Hz, 1H), 4.78-4.69 (m, 1H), 2.30 (s, 3H), 1.97-1.91 (m, 2H), 1.76-1.70 (m, 2H), 1.58-1.52 (m, 1H), 1.49-1.42 (m, 2H), 1.41-1.34 (m, 2H), 1.29-1.22 (m, 1H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.4, 149.7, 145.7, 139.9, 127.2, 121.0, 74.0, 31.9, 25.4, 23.8, 18.0.



1-phenylpropyl (3-methylpyridin-2-yl)carbamate **7p**. Yield: 85% (M=270.14, 22.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.24 (d, *J* = 4.1 Hz, 1H), 7.52 (d, *J* = 7.4 Hz, 1H), 7.39-7.31 (m, 4H), 7.30-7.25 (m, 1H), 7.05 (dd, *J* = 7.4, 4.9 Hz, 1H), 5.67 (t, *J* = 6.9 Hz, 1H), 2.25 (s, 3H), 2.04-1.96 (m, 1H), 1.91-1.83 (m, 1H), 0.92 (t, *J* = 7.4 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.2, 149.4, 145.7, 140.5, 139.8, 128.4, 127.8, 127.1, 126.6, 121.1, 78.7, 29.4, 18.0, 9.9; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{16}H_{18}N_2O_2$ 271.1442, found 271.1384.

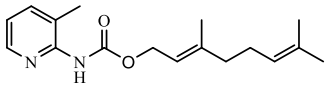


bis(4-chlorophenyl)methyl (3-methylpyridin-2-yl)carbamate **7q**. Yield: 64% (M=386.06, 24.8mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.24 (d, *J* = 3.3 Hz, 1H), 7.94 (s, 1H), 7.55 (d, *J* = 6.9 Hz, 1H), 7.29 (d, *J* = 8.5 Hz, 4H), 7.24 (d, *J* = 8.5 Hz, 4H), 7.07 (dd, *J* = 7.3, 4.9 Hz, 1H), 6.80 (s, 1H), 2.26 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.6, 149.2, 145.8, 140.0, 138.3, 134.0, 128.8, 128.7, 128.5, 127.9, 127.3, 121.4, 76.7, 17.9; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{16}Cl_2N_2O_2$ 387.0652, found 387.0649.

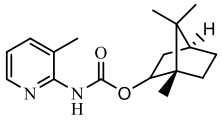


tert-pentyl (3-methylpyridin-2-yl)carbamate **7r**. Yield: 80% (M=222.14, 17.8 mg). ^{1}H NMR (600

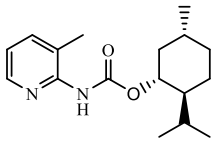
MHz, $CDCl_3$) δ 8.26 (d, *J* = 4.0 Hz, 1H), 7.52 (d, *J* = 7.4 Hz, 1H), 7.03 (dd, *J* = 7.4, 4.9 Hz, 1H), 6.99 (s, *J* = 38.8 Hz, 1H), 2.29 (s, 3H), 1.83 (q, *J* = 7.5 Hz, 2H), 1.48 (s, 6H), 0.92 (t, *J* = 7.5 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 152.6, 149.8, 145.9, 139.6, 126.6, 120.8, 83.1, 33.6, 25.7, 18.0, 8.3; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{12}H_{18}N_2O_2$ 223.1442, found 223.1431.



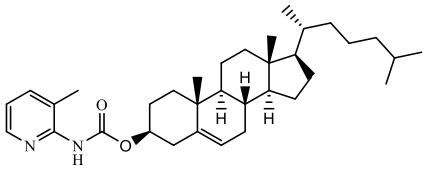
(*E*)-3,7-dimethylocta-2,6-dien-1-yl (3-methylpyridin-2-yl)carbamate **7s**. Yield: 61% (M=288.18, 17.5 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.26 (d, *J* = 4.1 Hz, 1H), 7.54 (d, *J* = 7.4 Hz, 1H), 7.06 (dd, *J* = 7.3, 4.9 Hz, 1H), 5.41 (t, *J* = 7.1 Hz, 1H), 5.10 (t, *J* = 6.8 Hz, 1H), 4.66 (d, *J* = 7.2 Hz, 2H), 2.29 (s, 3H), 2.17 – 2.11 (m, 2H), 2.11 – 2.05 (m, 2H), 1.78 (s, 3H), 1.68 (s, 3H), 1.60 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.7, 149.5, 145.8, 142.7, 139.8, 132.2, 126.8, 123.6, 121.0, 119.3, 62.1, 32.2, 26.7, 25.7, 23.5, 18.0, 17.7; HRMS (ESI): m/z $[M-H]^+$ calcd for $C_{17}H_{24}N_2O_2$ 287.1754, found 287.1768.



(*1S,4S*)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-yl (3-methylpyridin-2-yl)carbamate **7t**. Yield: 70% (M=288.18, 20.1 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.26 (d, *J* = 4.2 Hz, 1H), 7.55 (d, *J* = 7.4 Hz, 1H), 7.07 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.93 (d, *J* = 9.5 Hz, 1H), 2.41-2.34 (m, 1H), 2.32 (s, 3H), 1.93-1.86 (m, 1H), 1.79-1.71 (m, 1H), 1.68 (t, *J* = 4.4 Hz, 1H), 1.33-1.22 (m, 2H), 1.11 (dd, *J* = 13.8, 3.3 Hz, 1H), 0.91 (s, 3H), 0.88 (s, 6H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 154.2, 149.5, 145.6, 139.9, 127.4, 121.1, 81.2, 48.9, 47.9, 44.9, 36.7, 28.1, 27.1, 19.8, 18.9, 18.1, 13.6; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{17}H_{24}N_2O_2$ 289.1910, found 289.1899.

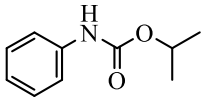


(*1R,2S,5R*)-2-isopropyl-5-methylcyclohexyl (3-methylpyridin-2-yl)carbamate **7u**. Yield: 55% (M=290.20, 15.9 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.25 (d, *J* = 4.2 Hz, 1H), 7.54 (d, *J* = 7.3 Hz, 1H), 7.06 (dd, *J* = 7.4, 4.9 Hz, 1H), 4.66 (td, *J* = 10.9, 4.4 Hz, 1H), 2.30 (s, 3H), 2.11 (d, *J* = 11.9 Hz, 1H), 2.02-1.91 (m, 1H), 1.74-1.62 (m, 2H), 1.55-1.43 (m, 1H), 1.42-1.32 (m, 1H), 1.12-1.00 (m, 2H), 0.95-0.88 (m, 7H), 0.80 (d, *J* = 6.9 Hz, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.4, 149.6, 145.7, 139.9, 127.1, 121.0, 75.5, 47.4, 41.3, 34.3, 31.4, 26.3, 23.6, 22.1, 20.8, 18.0, 16.5; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{17}H_{26}N_2O_2$ 291.2066, found 291.2051.

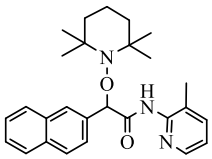


(*3S,8S,9S,10R,13R,14S,17R*)-10,13-dimethyl-17-((*R*)-6-methylheptan-2-yl)-2,3,4,7,8,9,10,11,12, 13,14,15,16,17-tetradecahydro-1H-cyclopenta[a]phenanthren-3-yl (3-methylpyridin-2-yl)carbamate **7v**. Yield: 49% (M=520.40, 25.7 mg). ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.25 (d, *J* = 3.5 Hz, 1H), 7.55 (d, *J* = 7.2 Hz, 1H), 7.10-7.01 (m, 1H), 5.39 (s, 1H), 4.65-4.55 (m, 1H), 2.48-2.40 (m, 1H), 2.39-2.32 (m, 1H), 2.31 (s, 3H), 2.04-1.92 (m, 3H), 1.91-1.79 (m, 2H), 1.67-1.41 (m, 8H), 1.40-1.30 (m, 3H), 1.29-

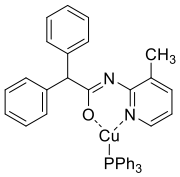
1.22 (m, 2H), 1.18-1.05 (m, 7H), 1.03 (s, 3H), 1.01-0.95 (m, 2H), 0.92 (d, J = 6.4 Hz, 3H), 0.86 (dd, J = 6.5, 2.4 Hz, 6H), 0.68 (s, 3H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.1, 149.5, 145.6, 139.9, 139.7, 127.0, 122.7, 121.0, 75.4, 56.7, 56.2, 50.1, 42.3, 39.8, 39.5, 38.4, 37.0, 36.6, 36.2, 35.8, 31.9, 31.9, 28.2, 28.0, 24.3, 23.9, 22.8, 22.6, 21.1, 19.4, 18.7, 18.0, 11.9; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{34}H_{52}N_2O_2$ 521.4094, found 521.4067.



isopropyl phenylcarbamate **8**.[59] ^{1}H NMR (600 MHz, $CDCl_3$) δ 7.38 (d, J = 7.5 Hz, 2H), 7.30 (t, J = 7.9 Hz, 2H), 7.05 (t, J = 7.4 Hz, 1H), 6.53 (s, 1H), 5.08 – 4.96 (m, 1H), 1.30 (d, J = 6.3 Hz, 7H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 153.2, 138.1, 129.0, 123.3, 118.6, 68.8, 22.1.



N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)-2-((2,2,6,6-tetramethylpiperidin-1-yl)oxy)acetamide **9**. ^{1}H NMR (600 MHz, $CDCl_3$) δ 8.68 (s, 1H), 8.27 (d, J = 3.9 Hz, 1H), 7.96 (s, 1H), 7.92-7.75 (m, 3H), 7.64 (d, J = 8.5 Hz, 1H), 7.55-7.42 (m, 3H), 7.06 (dd, J = 7.2, 5.0 Hz, 1H), 5.43 (s, 1H), 2.05 (s, 3H), 1.62-1.11 (m, 16H), 0.63-0.52 (m, 2H); ^{13}C NMR (151 MHz, $CDCl_3$) δ 169.8, 148.8, 146.1, 139.7, 136.5, 133.2, 133.2, 128.3, 128.2, 128.2, 127.7, 126.8, 126.1, 126.1, 124.4, 121.6, 91.0, 60.6, 59.9, 40.5, 34.1, 33.2, 20.9, 20.5, 18.1, 17.0; HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{27}H_{33}N_3O_2$ 432.2643, found 432.2614.



The copper-cycle intermediate. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{38}H_{33}CuN_2OP$ 627.1627, found 627.1549.

References:

[1] Qiao, H. H., Sun, B., Yu, Q. Q., Huang, Y. Y., Zhou, Y. R., Zhang, F. L. *Organic Letters.* **2019**, *21*, 6914-6918.

[2] Liu, X. H., Park, H., Hu, J. H., Yan, H., Yu, J. Q. *Journal of the American Chemical Society.* 2**017**, *139*, 888-896.

[3] Wang, D. Y., Guo, S. H., Pan, G. F., Zhu, X. Q., Gao, Y. R., Wang, Y.Q. *Organic Letters.* **2018**, *20*, 1794-1797.

[4] Wang, S. J., Wang, Z., Tang, Y., Chen, J., Zhou, L. *Organic Letters.* **2020**, *22*, 8894-8898.

[5] Li, F., Zhou, Y. R., Yang, H., Liu, D. D., Sun, B., Zhang, F. L. *Organic Letters.* **2018**, *20, 1*, 146-149.

[6] Chen, L., Huo, J. Q., Si H L., Xu, X. Y., Kou, S., Mao, J. Y., Zhang, J. L. *Organic Letters.* **2021**, *23*, 4348-4352.

[7] Lu, X. Y., Xia, Z. J., Gao, A., Liu, Q. L., Jiang, R. C., Liu, C. C. *Journal of Organic Chemistry*. **2021**, *86*, 8829–8842.

[8] Pan, H. M., Lu, T., Wu, X. D., Gu, C. W., Tao, N. L., Zhang, B., Wang, A., Chen, G. M., Zhang, K. H., Cheng, J., Jin, J. *Natural Product Research.* **2021**, *35*, 2360-2364.

[9] Xiao, S. H., Liu, C., Song, B., Wang, L., Qi, Y., Liu, Y. j. *Chemical Communications.* **2021**, *57*, 6169-6172.

[10] Wang, S. S.; Wang, Z. L.; Gao, H.; Jiang, L.; Liu, H.; Wu, F.; Zhao, Y.; Chan, K. S.; Shen, Z. *Chemical Communications.* **2021**, *57*, 1758-1761.

[11] Wang, C., Rui, X. Y., Si, D. J., Dai, R. P., Zhu, Y. Y., Wen H. M., Li W., Liu J. *Advanced Synthesis & Catalysis.* **2021**. *363.* 2825-2833.

[12] Zhang, J. j., Tang, J. h., Chen, Z. k., Wu, X. F. *Advanced Synthesis & Catalysis.* **2021**, *363*, 3060-3069.

[13] Deng, L. L., Huang, B., Liu, Y. Y. *Organic & Biomolecular Chemistry*. **2018**, *16*, 1552-1556.

[14] Gui, Q. Wen., Wang, B. B., Zhu, S., Li, F. L., Zhu, M. X., Yi, M., Yu, J. L., Wu, Z. L., He, W. M. *Green Chemistry.* **2021**. *23.* 4430-4434.

[15] Liu, X.-X.; Wu, Z.-Y.; He, Y.-Q.; Zhou, X.-Q.; Hu, T.; Ma, C.-W.; Huang, G.-S. *Adv. Syn. & Cat.* **2016**, *358*, 2385-2391.

[16] CAS Number: 349119-13-7.

[17] Saroj., Om P. S. P., Krishnan, R., Anil, K. *Tetrahedron Letters.* **2019**, *60*, 150939.

[18] Pamela, V. S. N., Nathalie, C. S., Martin, A. Organometallics. 2021, 40, 1538-1550.

[19] CAS Number: 890339-52-3.

[20] CAS Number: 2205559-59-5.

[21] CAS Number: 94322-83-9.

[22] CAS Number: 2203161-96-8.

[23] CAS Number: 1898737-74-0.

[24] CAS Number: 899015-12-4.

[25] CAS Number: 309284-05-7.

[26] CAS Number: 932812-78-7.

[27] CAS Number: 1901317-99-4.

[28] CAS Number: 1905227-64-6.

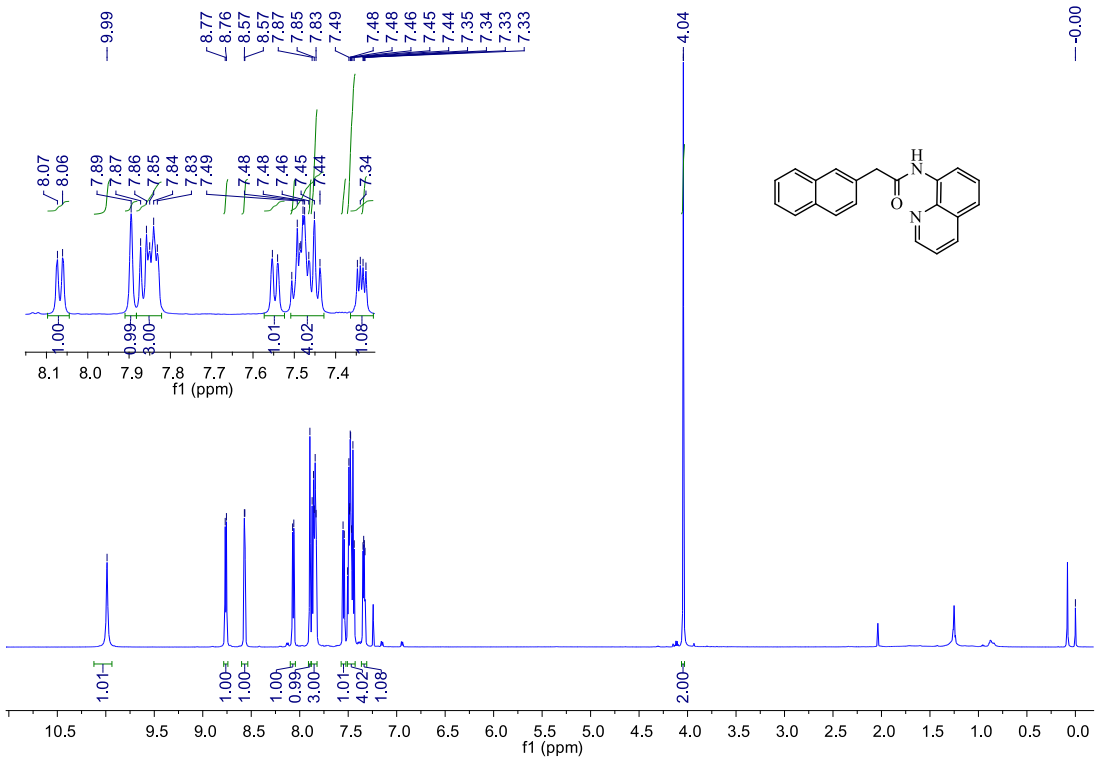
[29] CAS Number: 708220-77-3.

[30] CAS Number: 2203095-00-3.

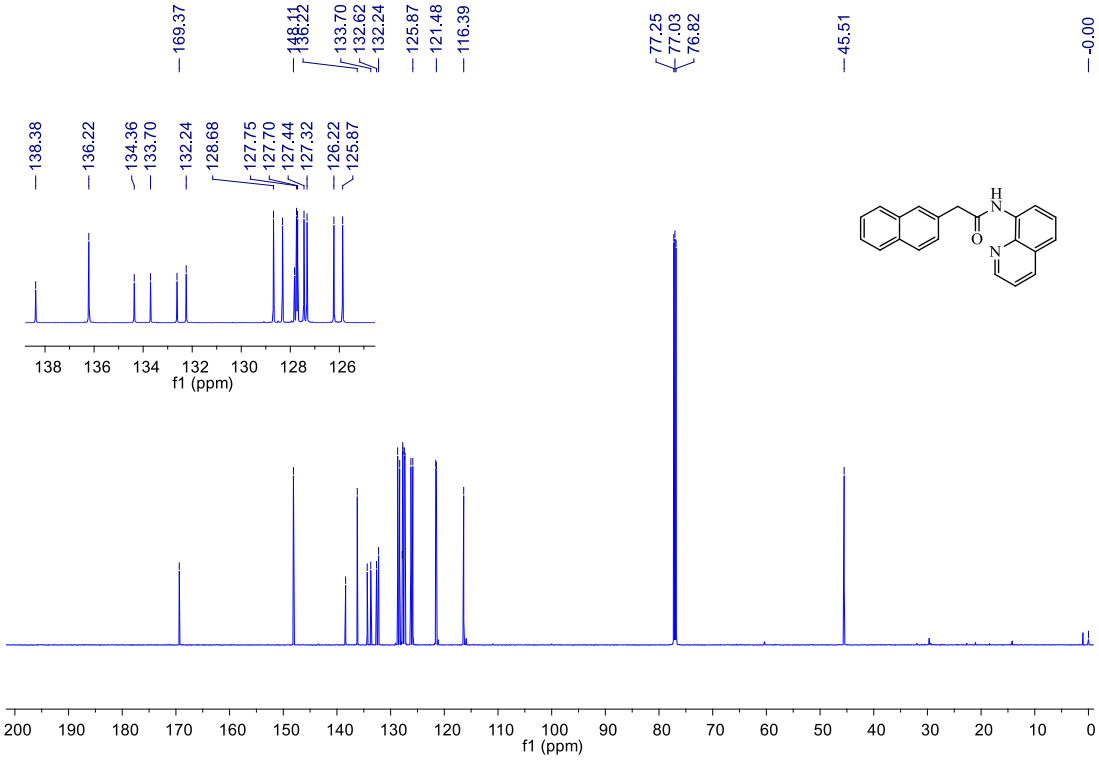
[31] CAS Number: 1905227-64-6.
[32] CAS Number: 701952-44-5.
[33] CAS Number: 202056-65-3.
[34] CAS Number: 1904841-39-9.
[35] Charris, J. E., Dominguez, J. N., Lopez, S. E. *Heterocyclic Communications.* **2001**, *7*, 233.
[36] CAS Number: 2001475-37-0.
[37] CAS Number: 2205759-43-7.
[38] CAS Number: 924836-87-3.
[39] CAS Number: 200913-68-2.
[40] CAS Number: 905627-75-0.
[41] CAS Number: 905649-35-6.
[42] CAS Number: 1071420-97-7.
[43] CAS Number: 2024514-25-6.
[44] CAS Number: 908351-23-4.
[45] CAS Number: 34959-95-0.
[46] Dmitry, M. B., Egor, S. Z., Leonid, L. F., Anna, A. R., Ivan, V. A., Nina, N. M. *Advanced Synthesis & Catalysis.* **2018**. *360.* 3157-3163.
[47] CAS Number: 41322-69-4.
[48] CAS Number: 997655-94-3.
[49] CAS Number: 2200526-92-5.
[50] CAS Number: 2206803-10-1.
[51] CAS Number: 2206747-54-6.
[52] CAS Number: 1260651-73-7.
[53] CAS Number: 2199825-80-2.
[54] CAS Number: 2200164-09-4.
[55] CAS Number: 2201599-52-0.
[56] CAS Number: 90873-38-4.
[57] CAS Number: 2200898-63-9.
[58] CAS Number: 2200915-71-3.
[59] Dindarloo Inaloo, I.; Esmaeilpour, M.; Majnooni, S.; Reza Oveisi, A. *ChemCatChem* **2020**, *12*, 5486-5491.

4. ^{1}H NMR, ^{13}C NMR Spectra and HRMS of the Products

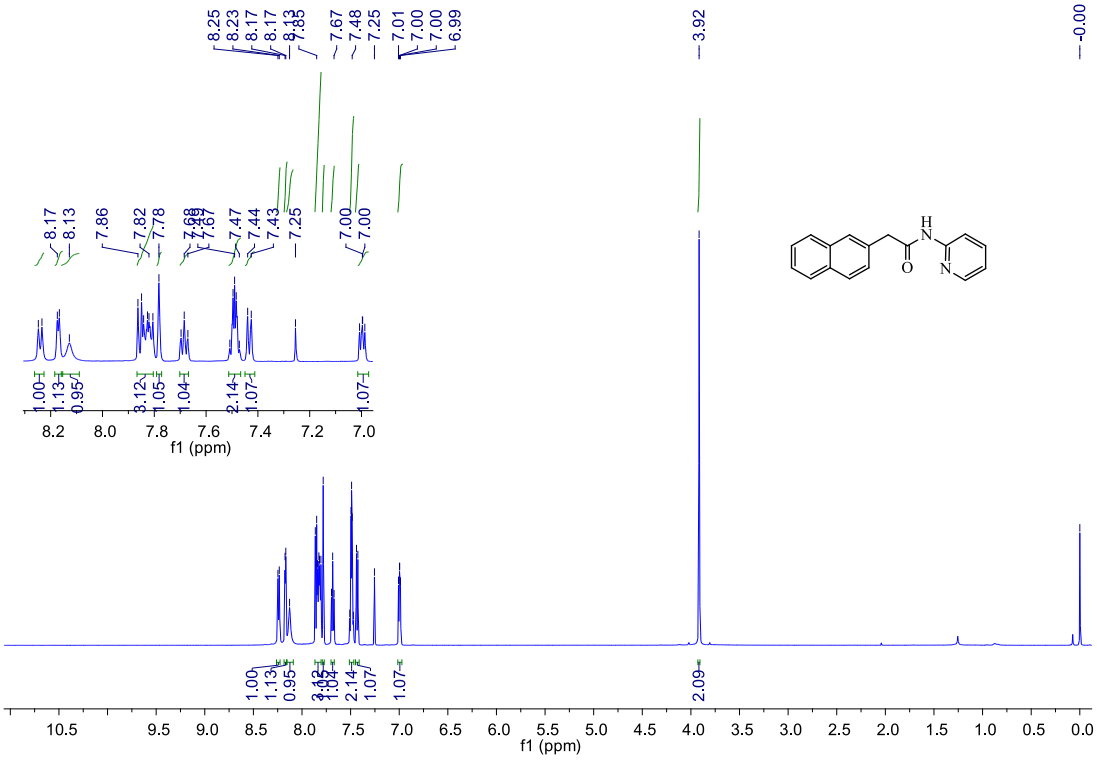
^{1}H NMR of 2-(naphthalen-2-yl)-N-(quinolin-8-yl)acetamide **1a$_1$**



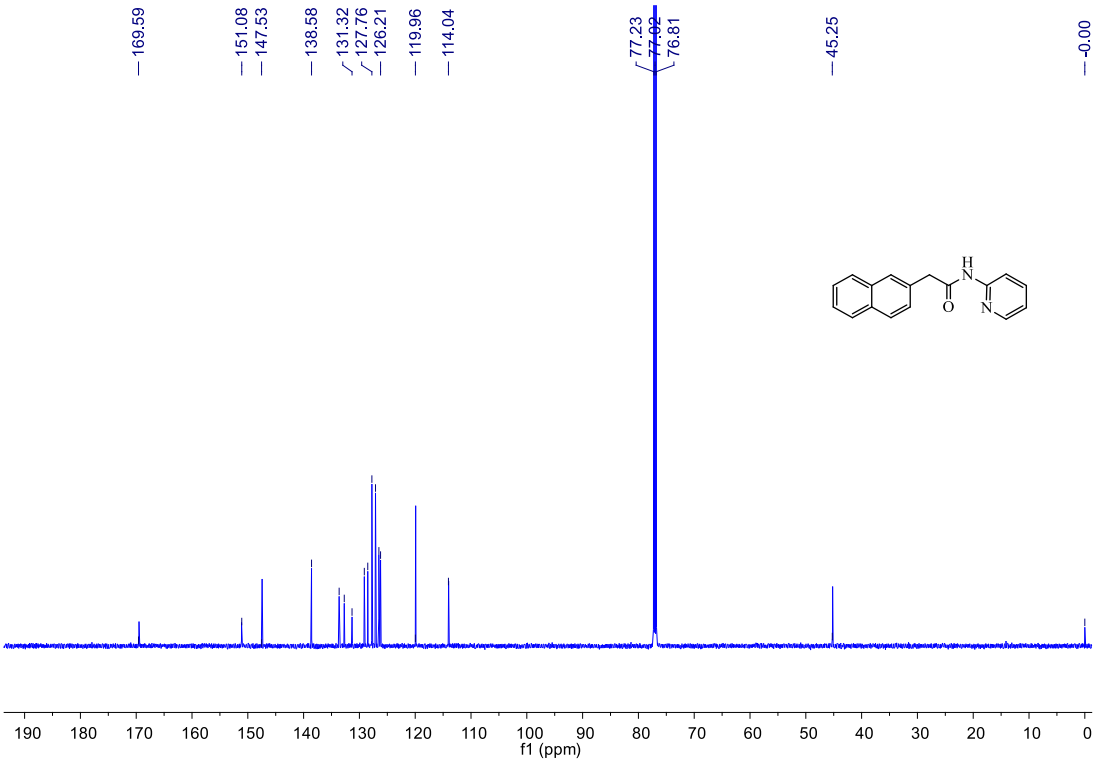
^{13}C NMR of 2-(naphthalen-2-yl)-N-(quinolin-8-yl)acetamide **1a$_1$**



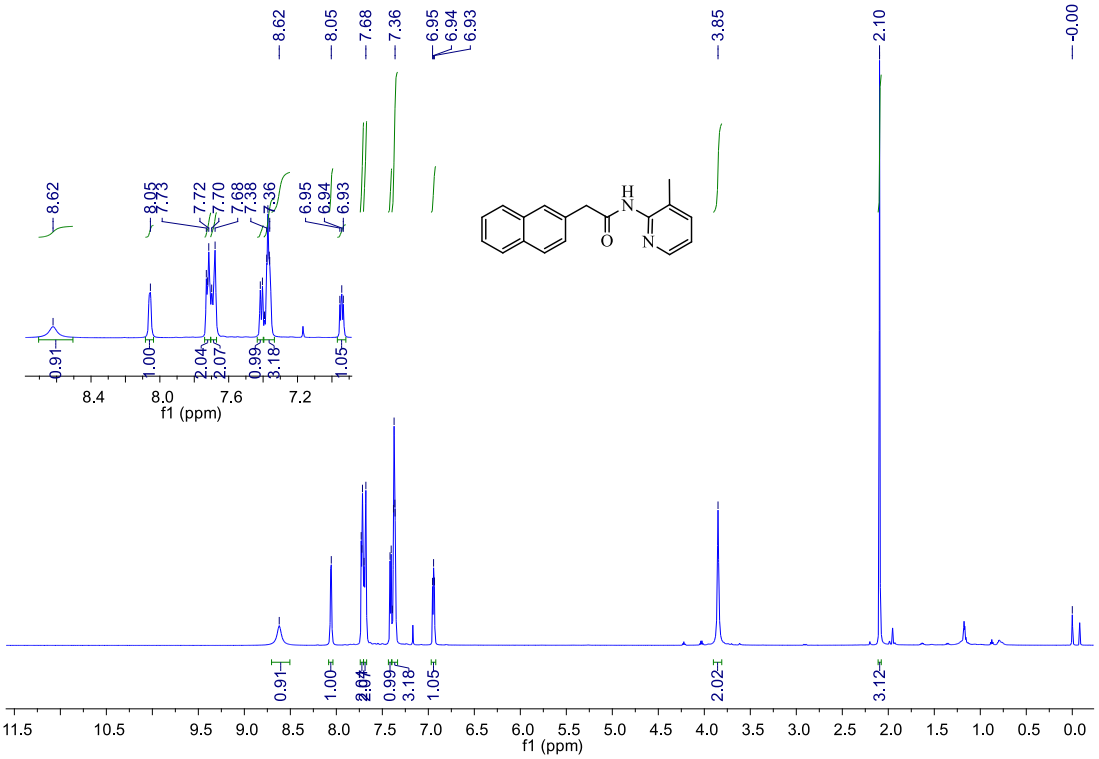
^{1}H NMR of 2-(naphthalen-2-yl)-N-(pyridin-2-yl)acetamide **1a$_2$**



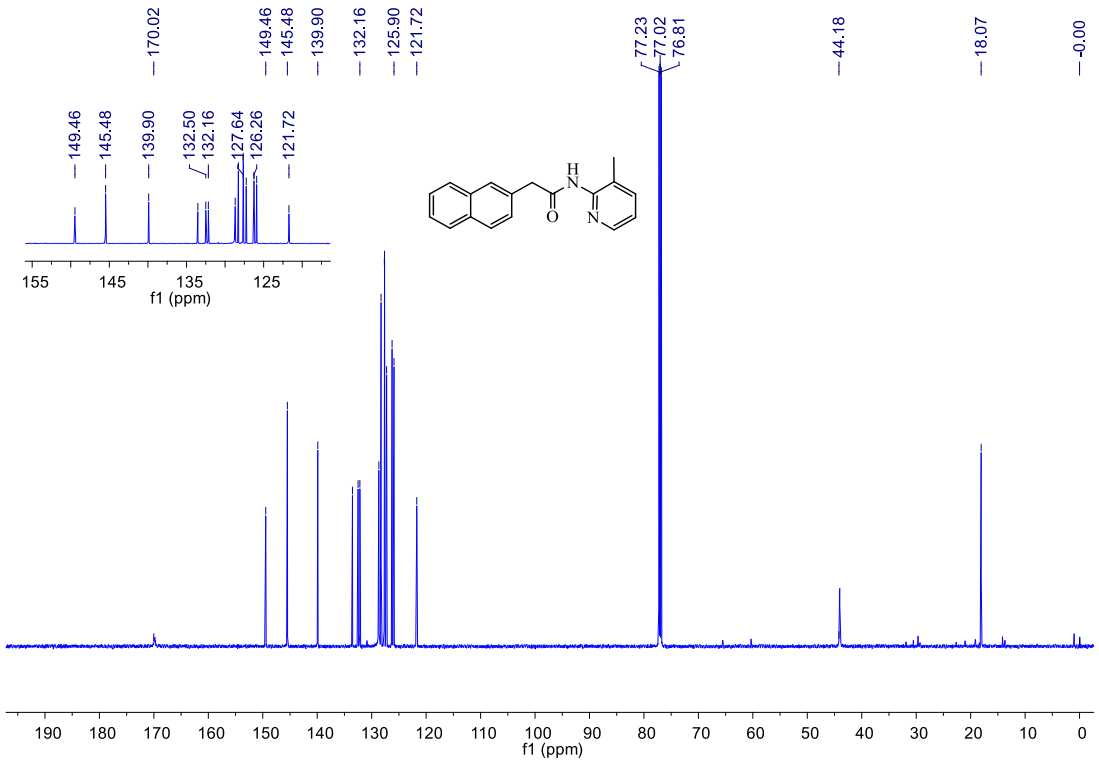
^{13}C NMR of 2-(naphthalen-2-yl)-N-(pyridin-2-yl)acetamide **1a$_2$**



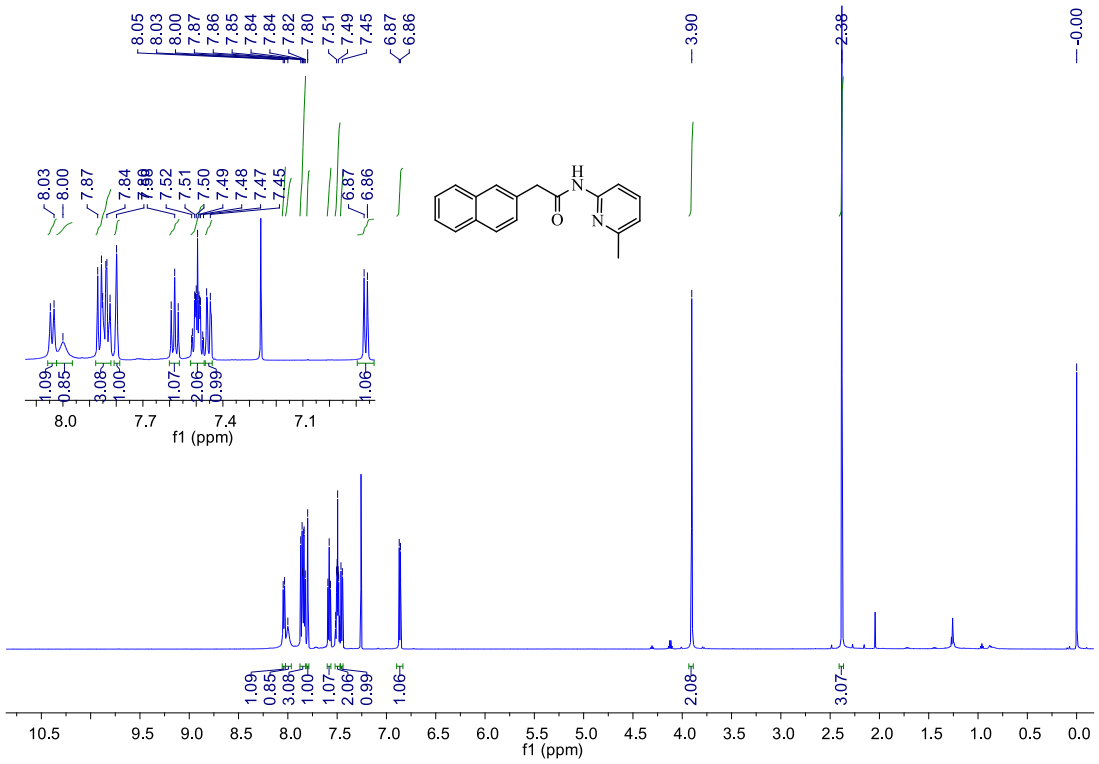
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)acetamide **1a$_3$**



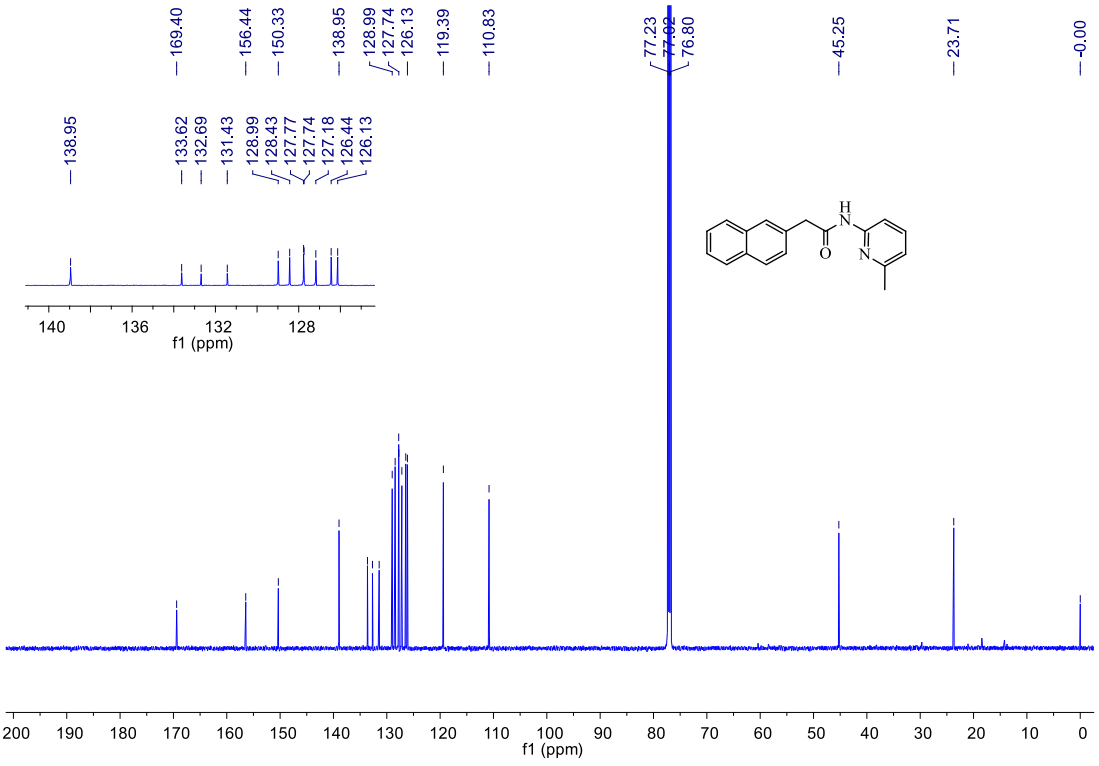
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)acetamide **1a$_3$**



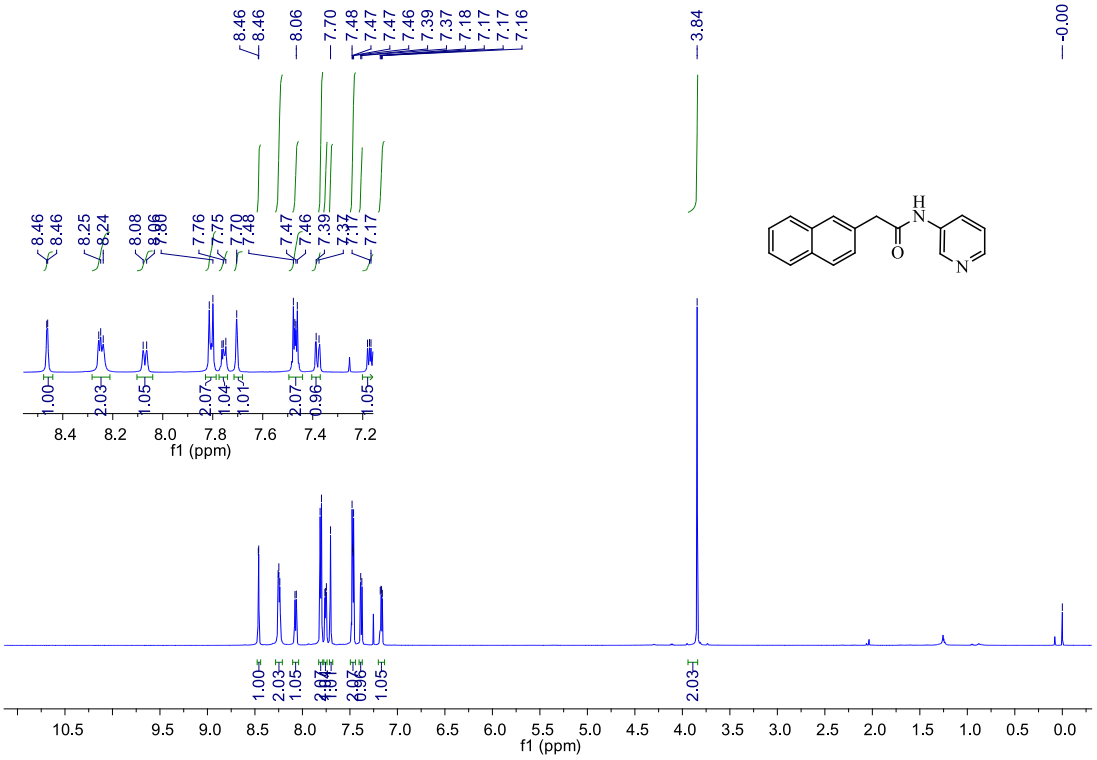
^{1}H NMR of N-(6-methylpyridin-2-yl)-2-(naphthalen-2-yl)acetamide **1a$_4$**



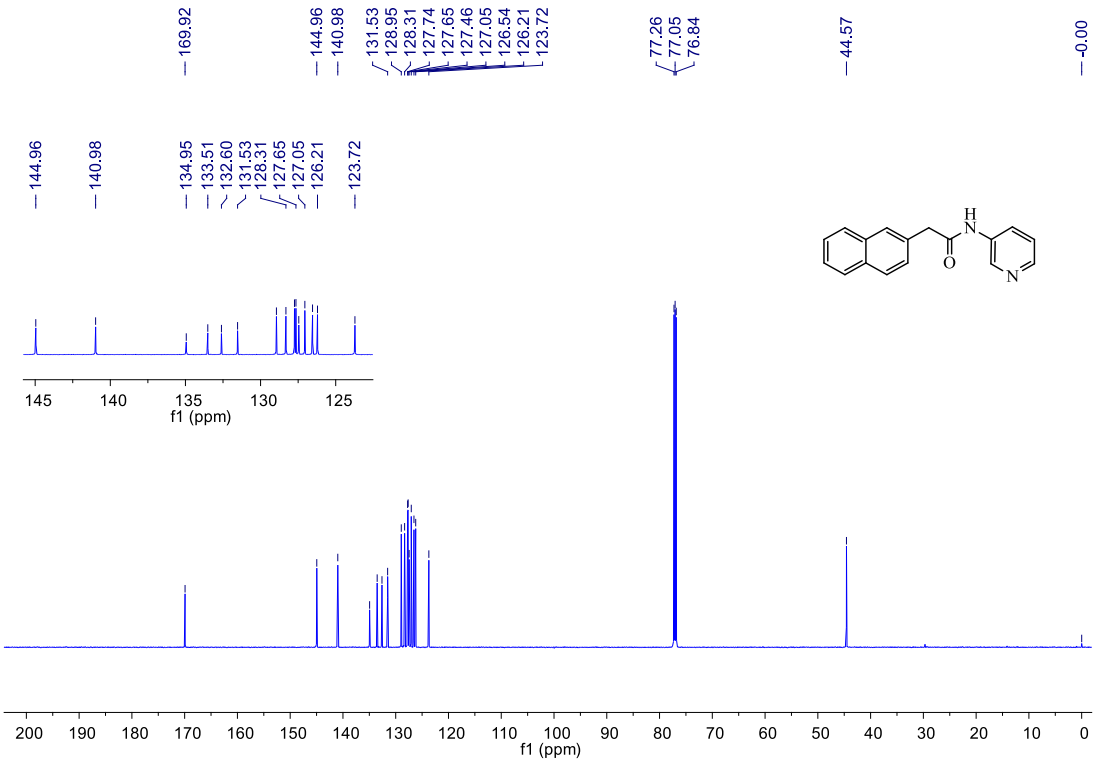
^{13}C NMR of N-(6-methylpyridin-2-yl)-2-(naphthalen-2-yl)acetamide **1a$_4$**



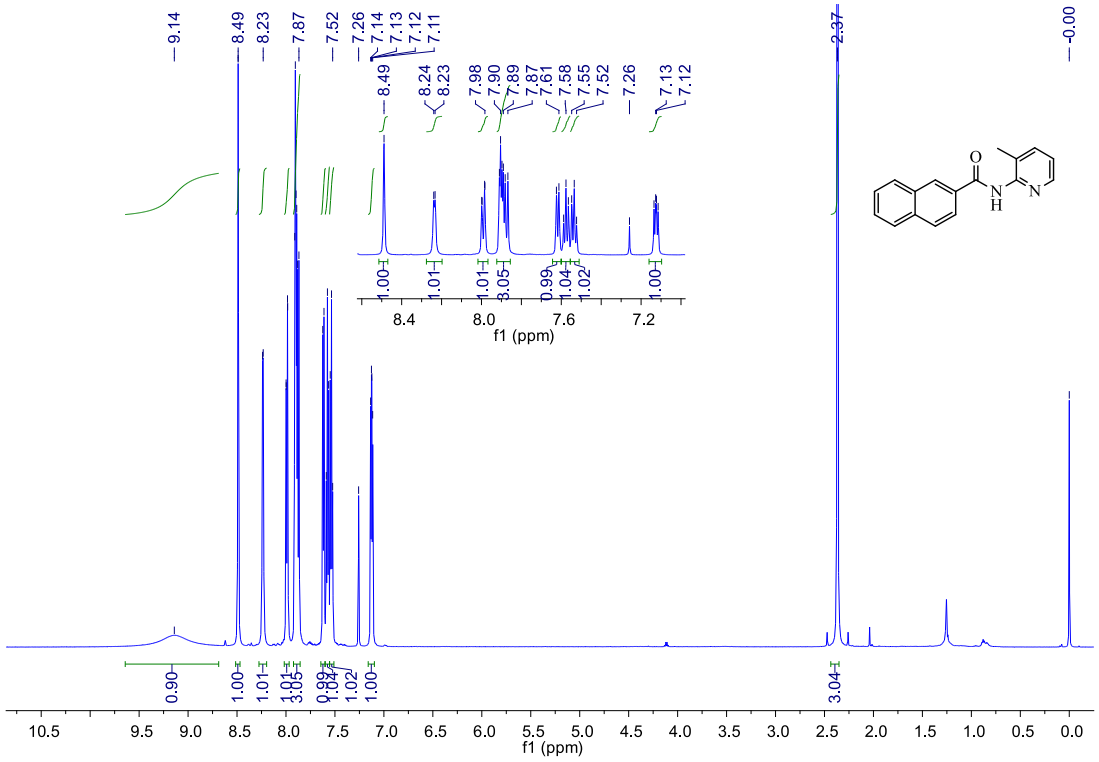
^{1}H NMR of 2-(naphthalen-2-yl)-N-(pyridin-3-yl)acetamide **1a$_5$**



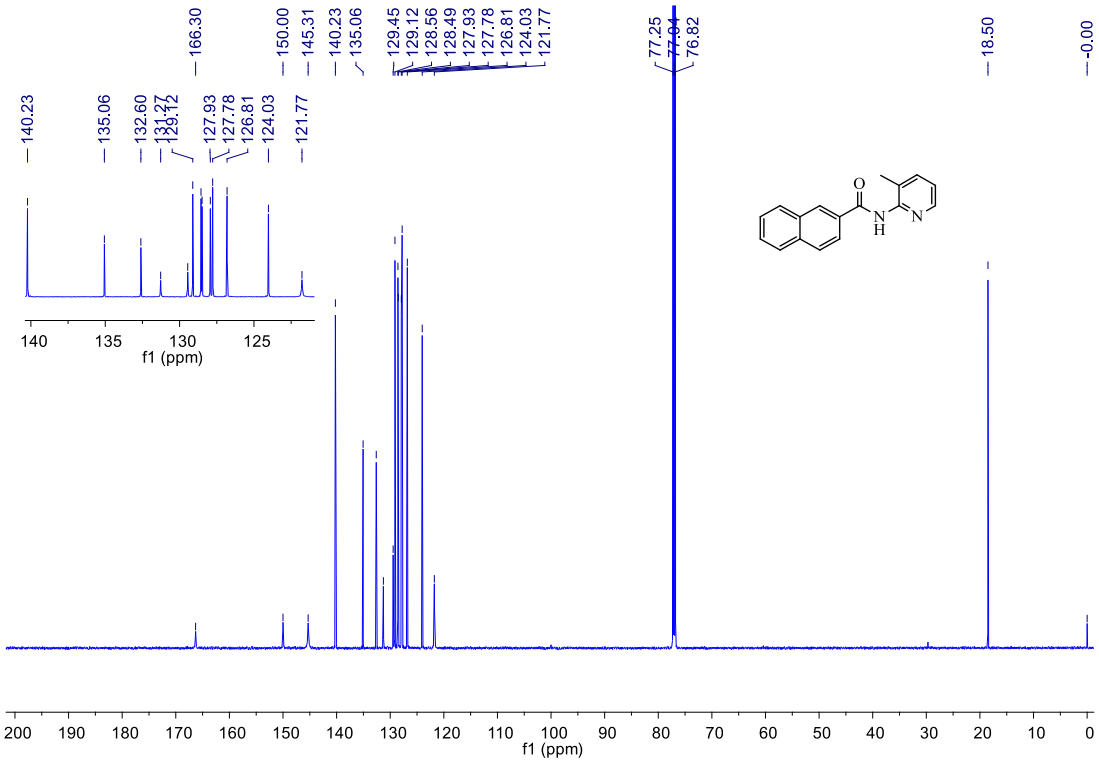
^{13}C NMR of 2-(naphthalen-2-yl)-N-(pyridin-3-yl)acetamide **1a$_5$**



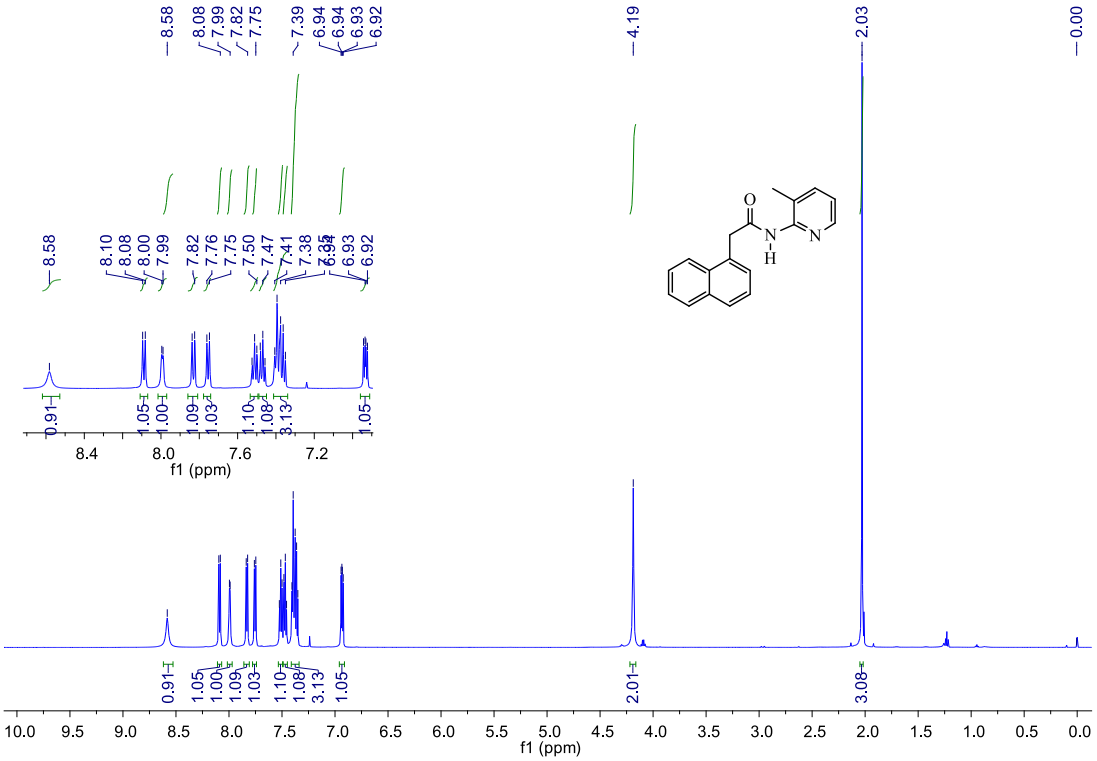
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-naphthamide **1a$_6$**



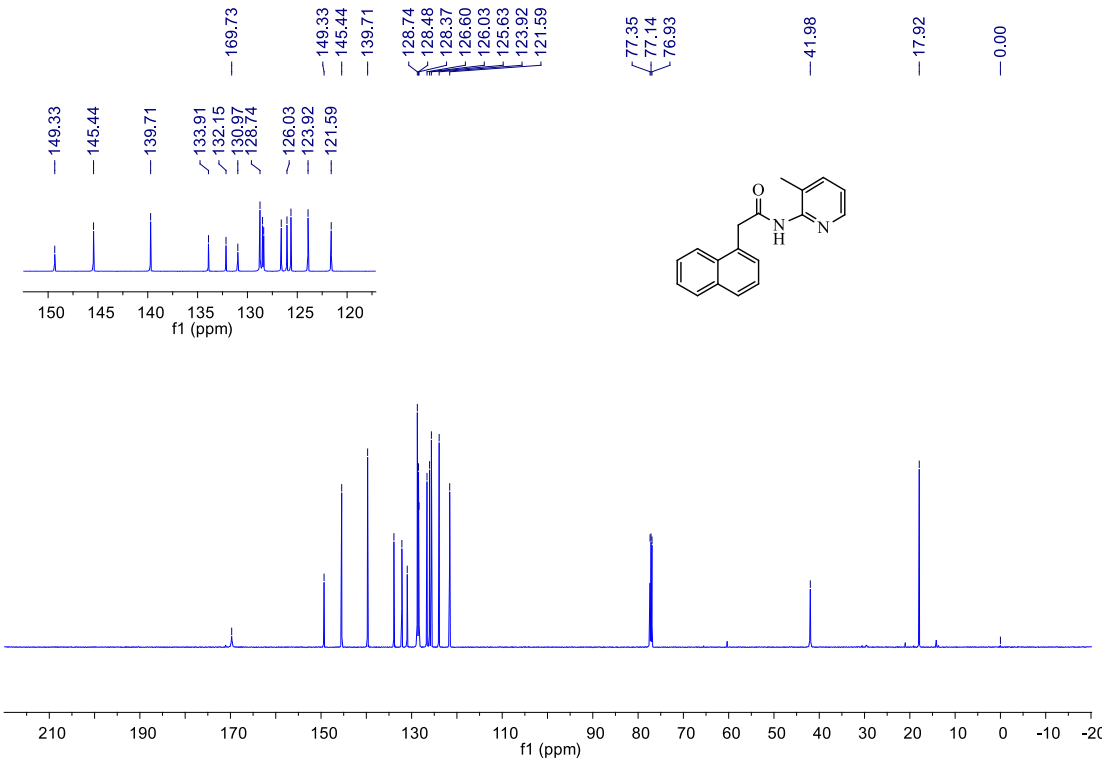
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-naphthamide **1a$_6$**



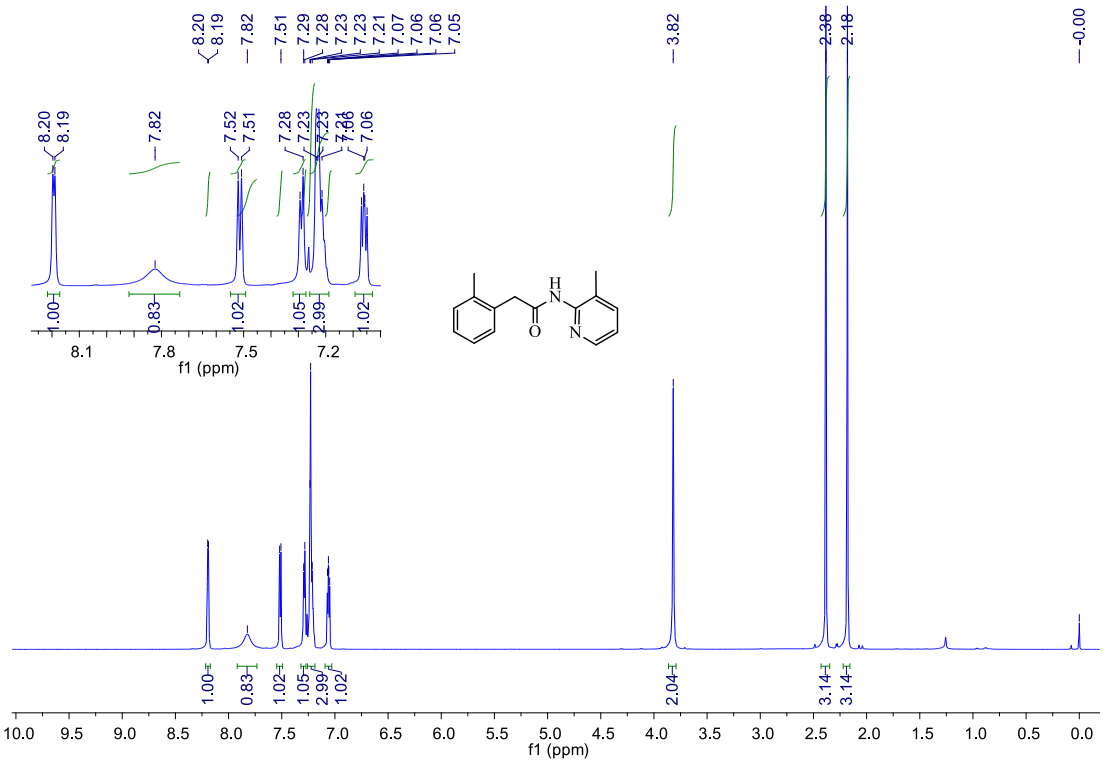
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(naphthalen-1-yl)acetamide **1b**



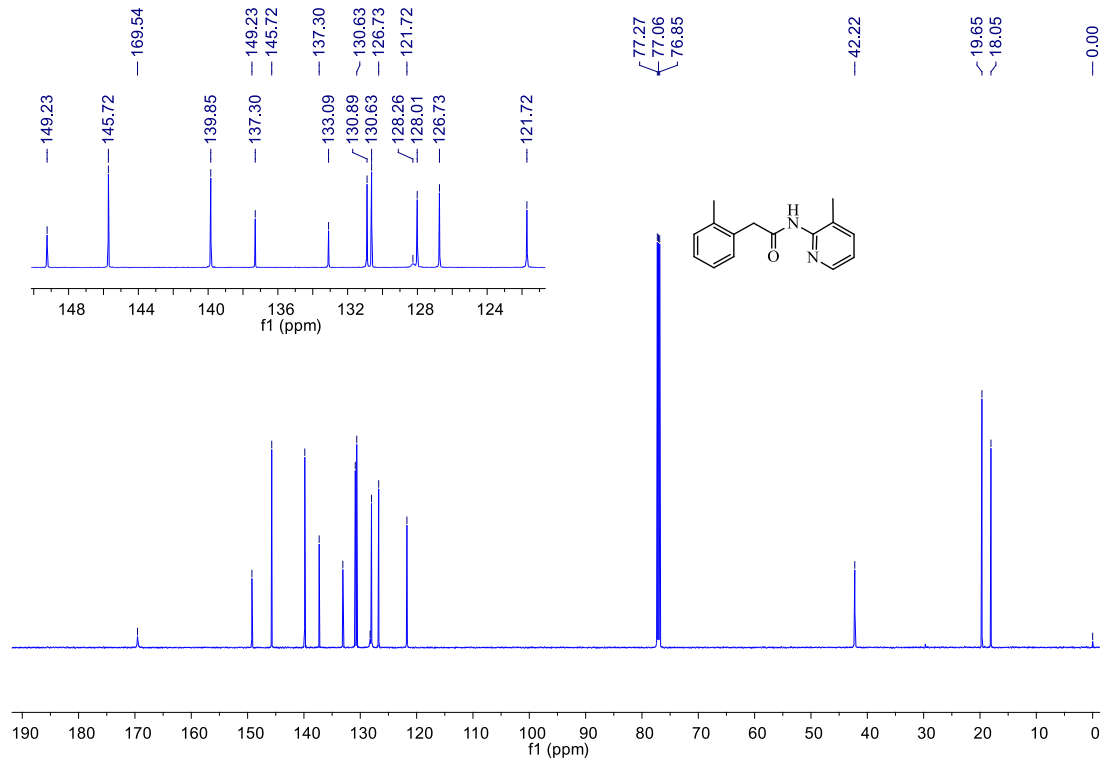
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(naphthalen-1-yl)acetamide **1b**



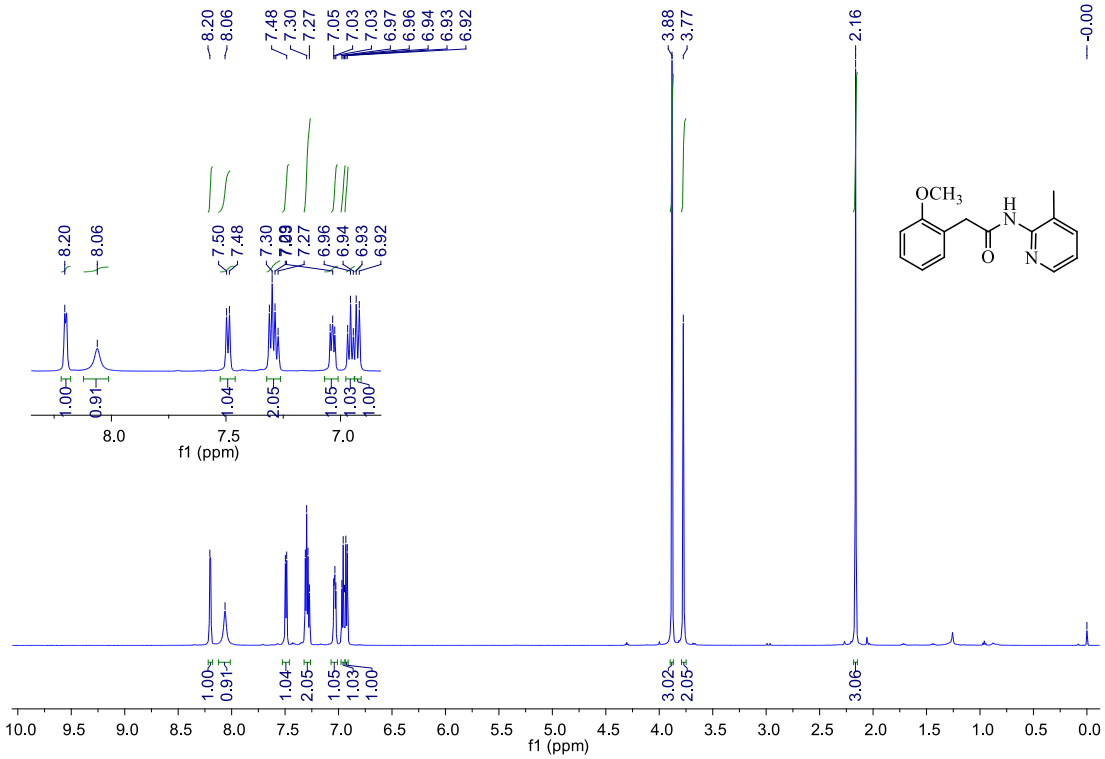
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(o-tolyl)acetamide **1c**



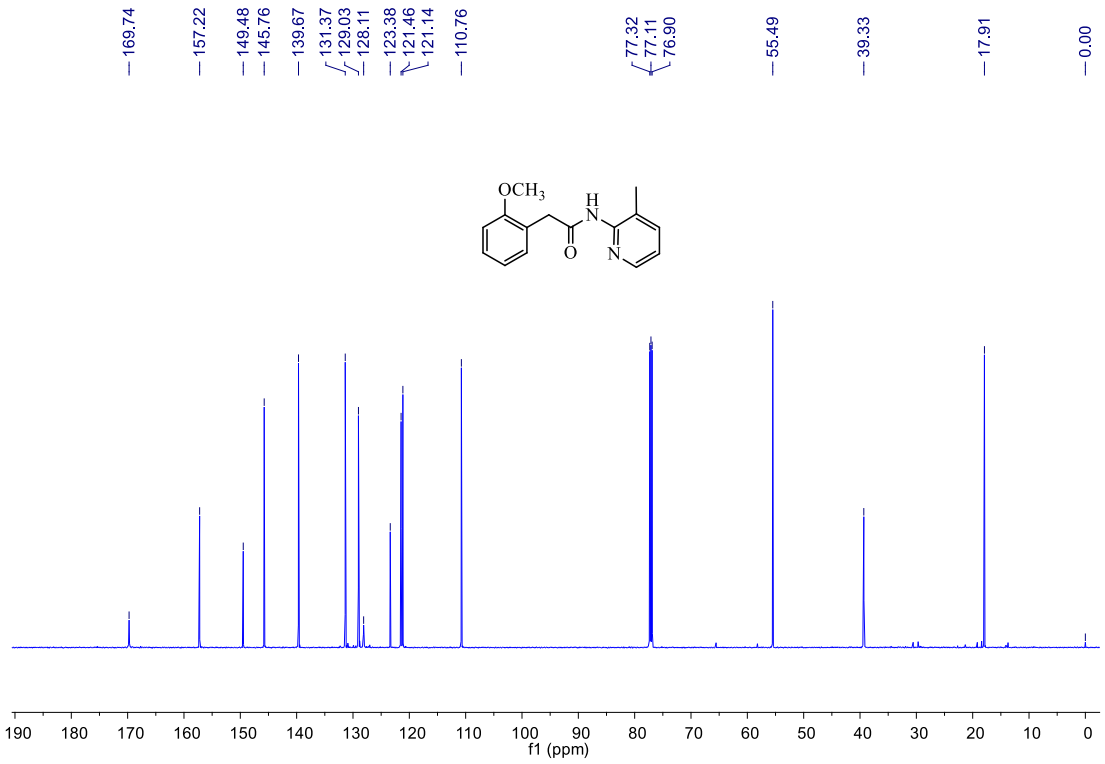
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(o-tolyl)acetamide **1c**



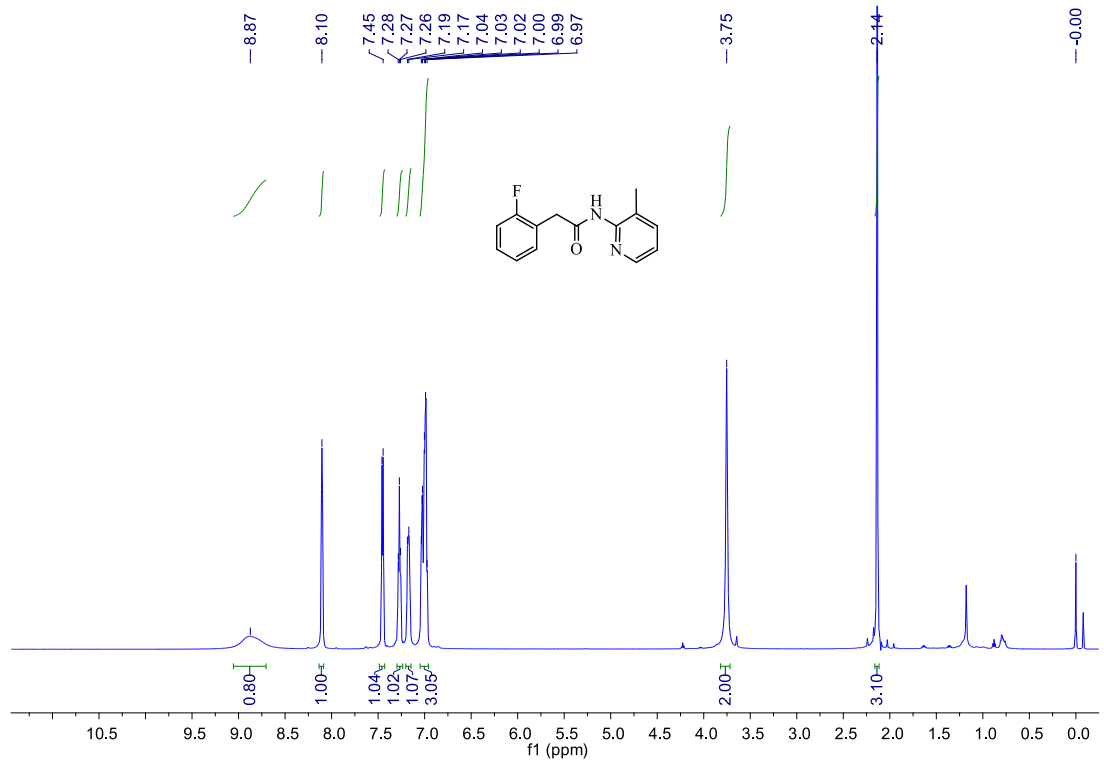
^{1}H NMR of 2-(2-methoxyphenyl)-N-(3-methylpyridin-2-yl)acetamide **1d**



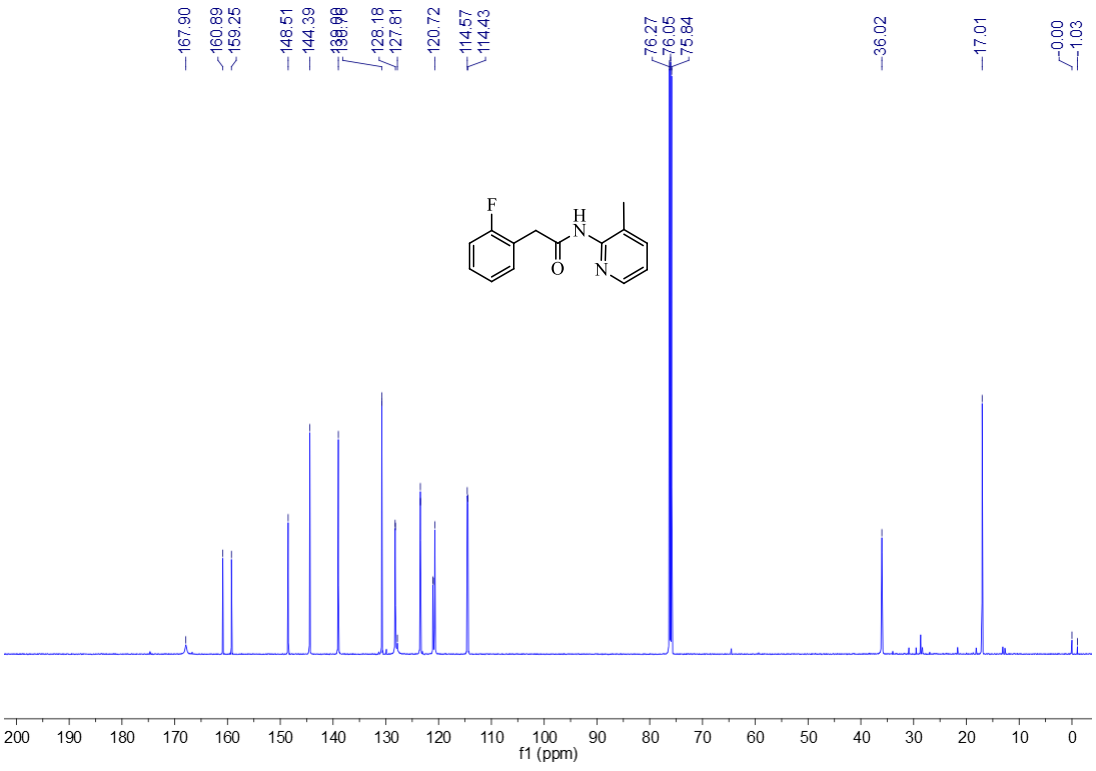
^{13}C NMR of 2-(2-methoxyphenyl)-N-(3-methylpyridin-2-yl)acetamide **1d**



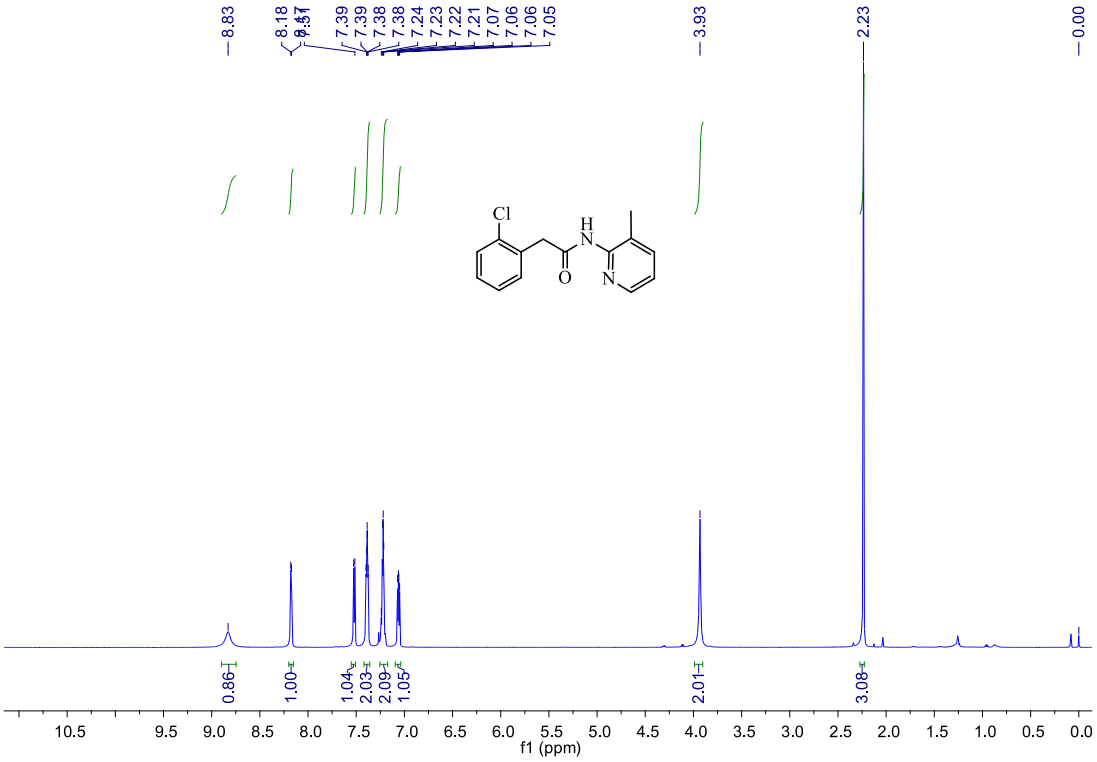
^{1}H NMR of 2-(2-fluorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1e**



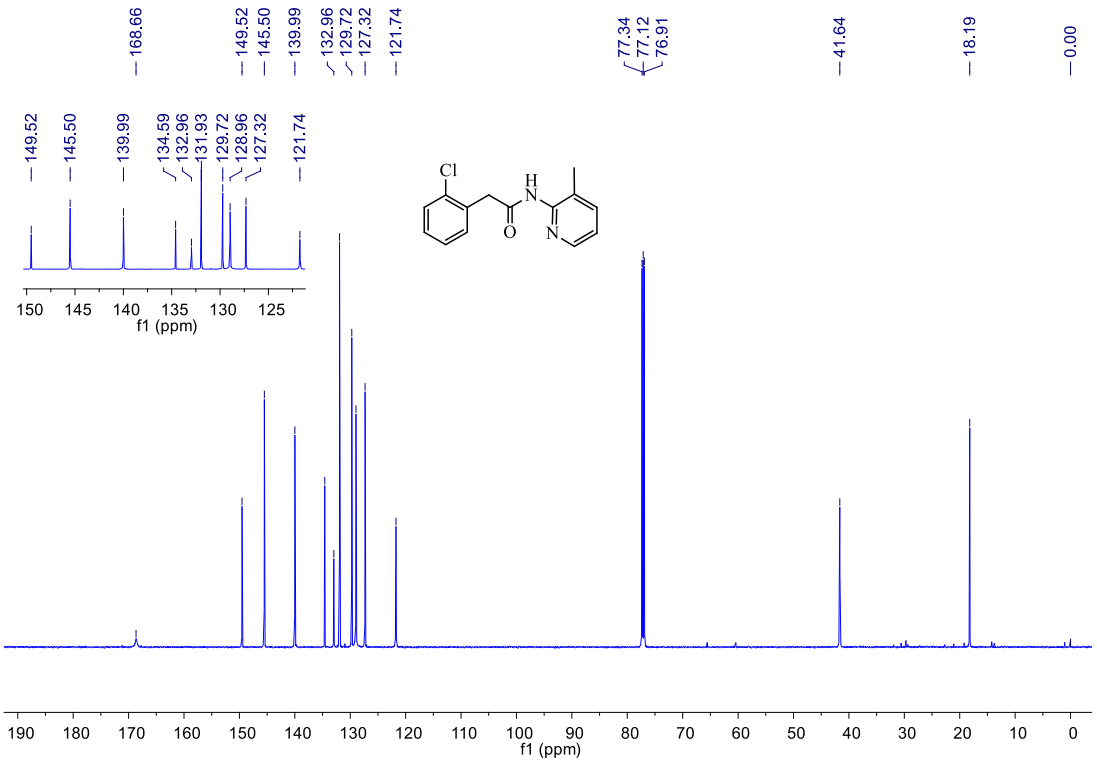
^{13}C NMR of 2-(2-fluorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1e**



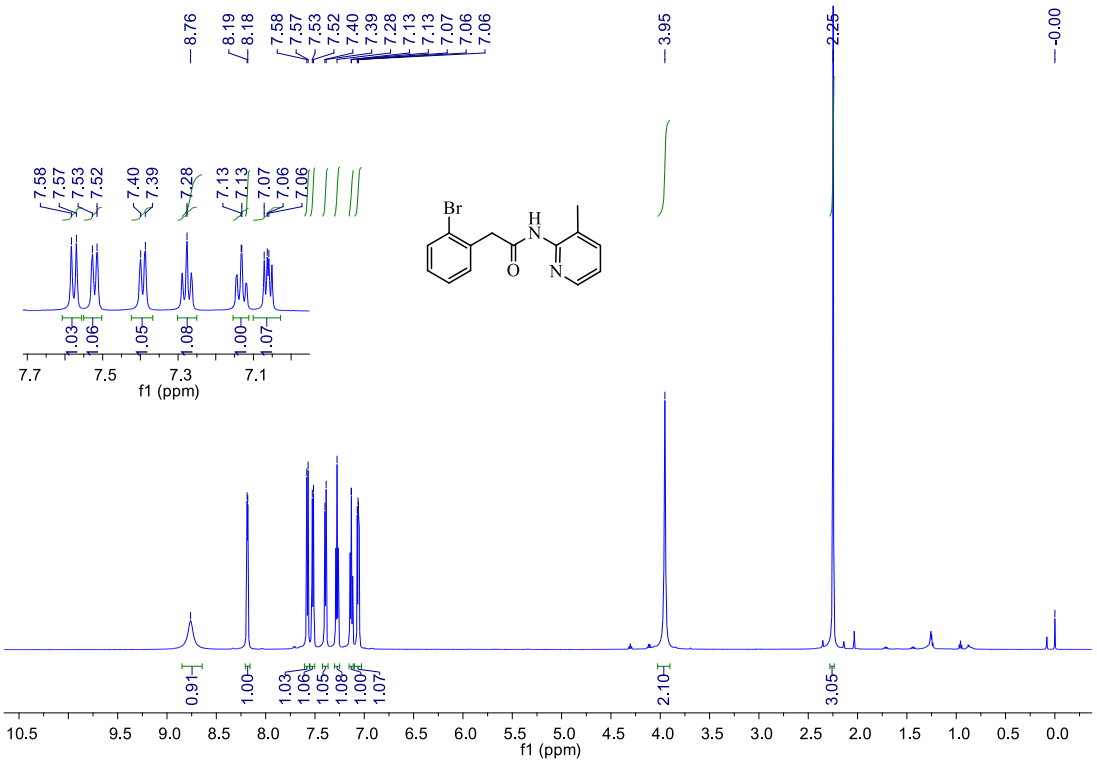
^{1}H NMR of 2-(2-methoxyphenyl)-N-(3-methylpyridin-2-yl)acetamide **1f**



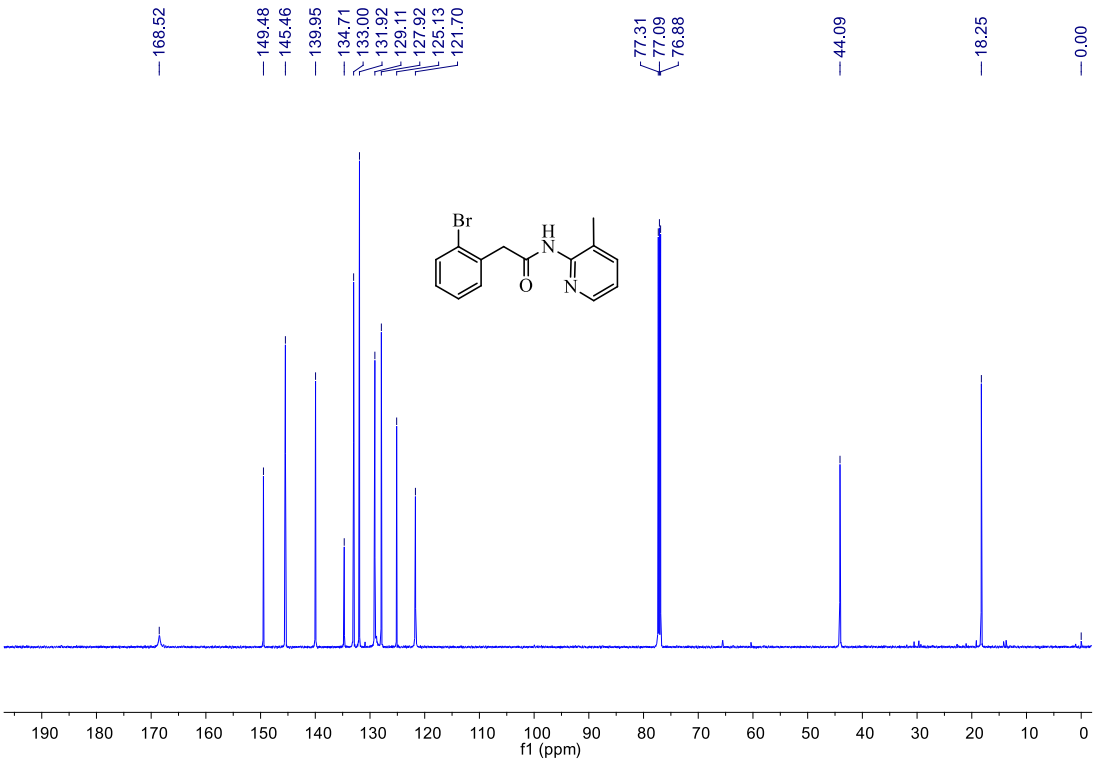
^{13}C NMR of 2-(2-methoxyphenyl)-N-(3-methylpyridin-2-yl)acetamide **1f**



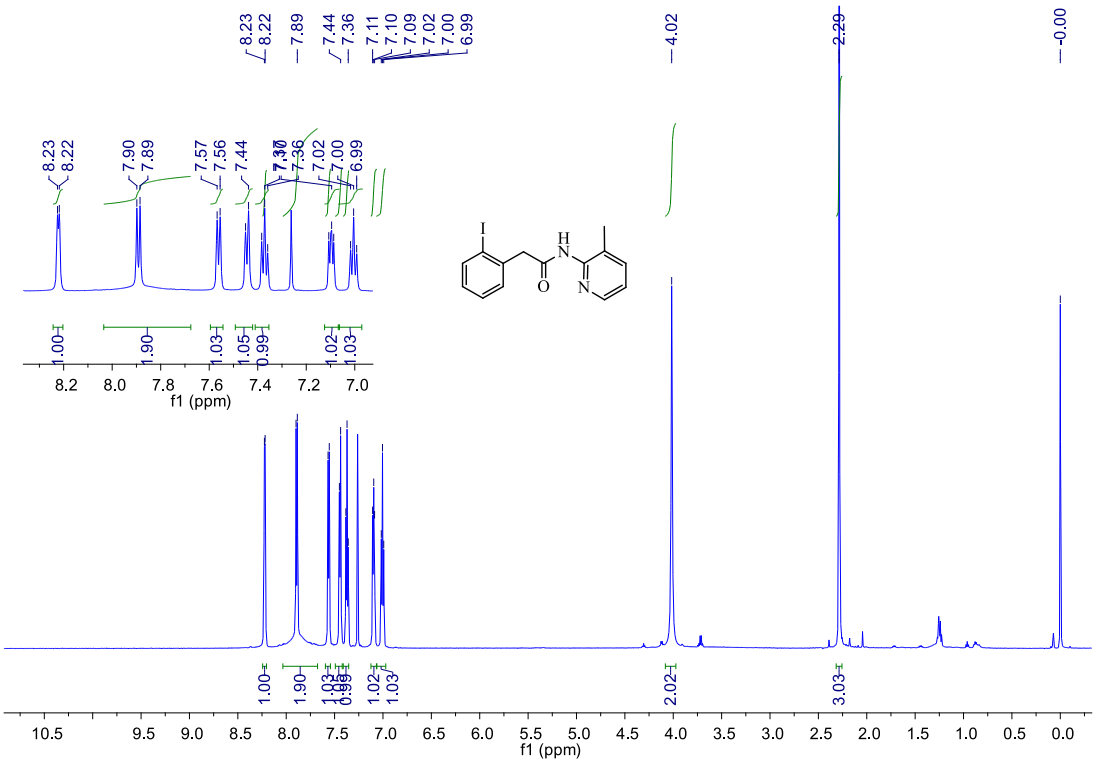
^{1}H NMR of 2-(2-bromophenyl)-N-(3-methylpyridin-2-yl)acetamide **1g**



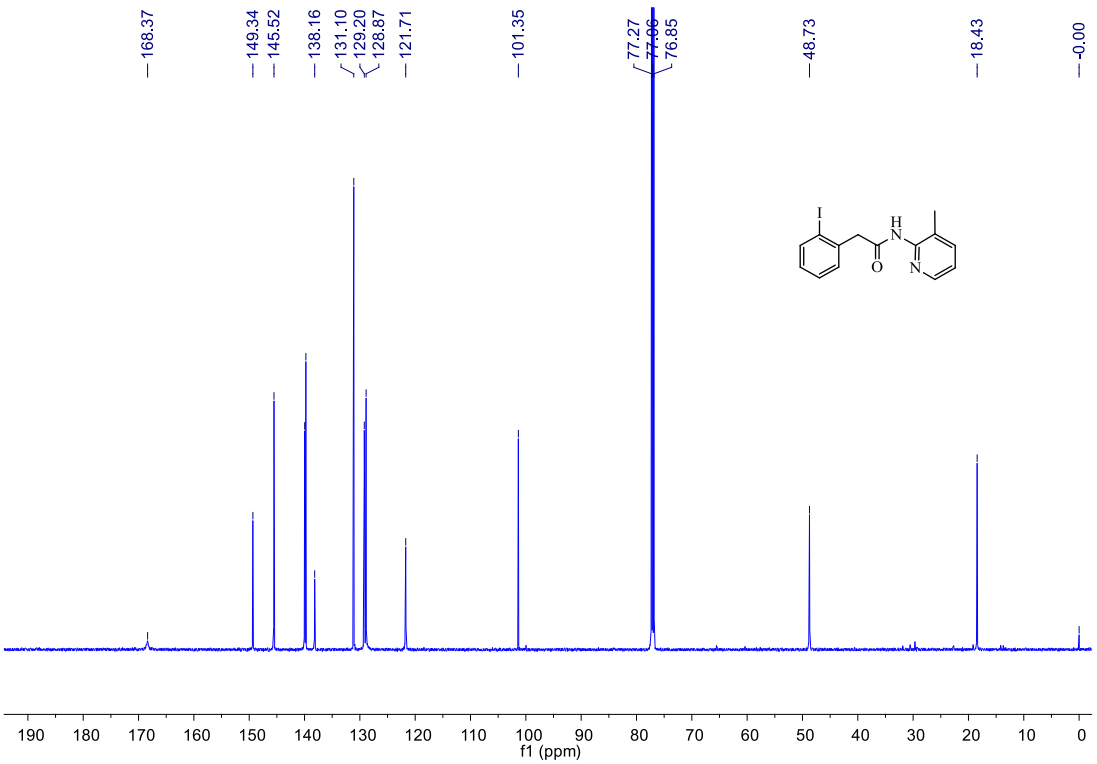
^{13}C NMR of 2-(2-bromophenyl)-N-(3-methylpyridin-2-yl)acetamide **1g**



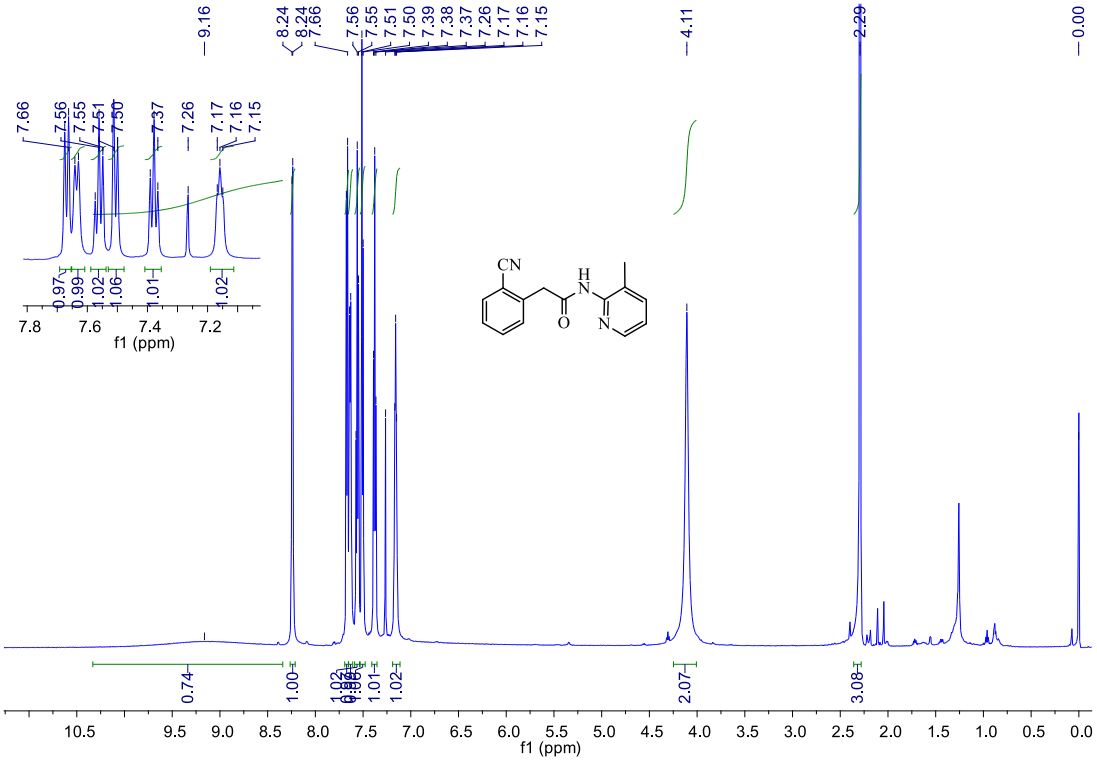
^{1}H NMR of 2-(2-iodophenyl)-N-(3-methylpyridin-2-yl)acetamide **1h**



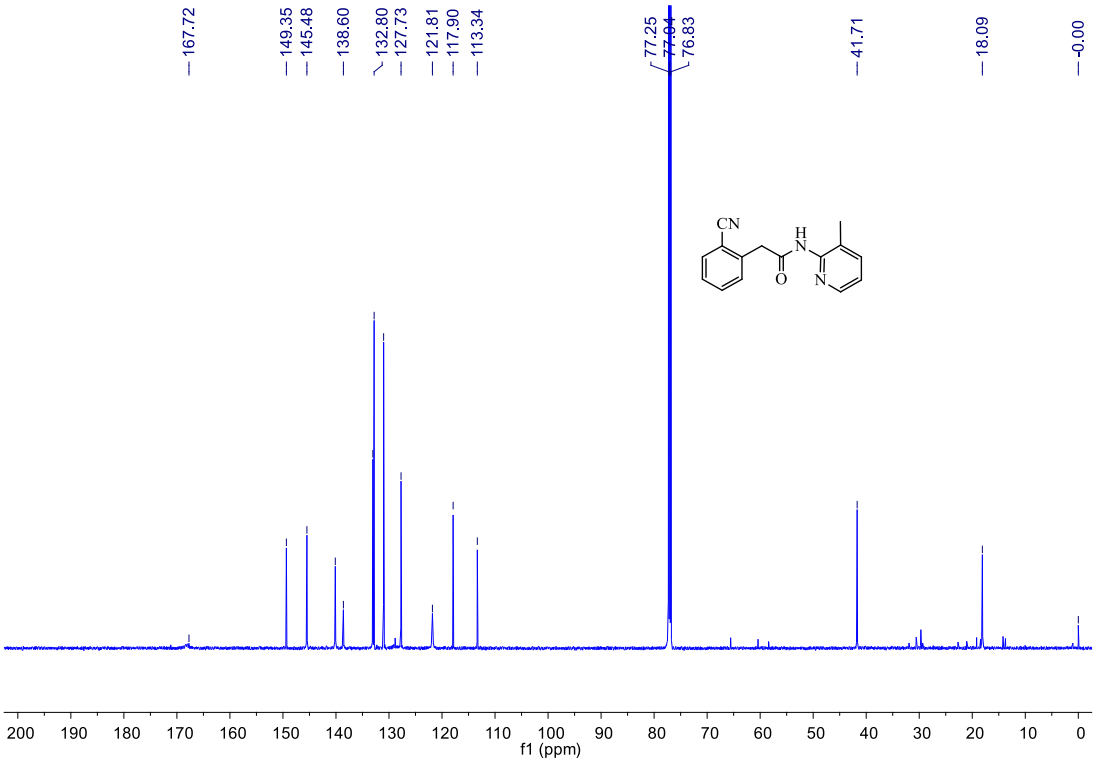
^{13}C NMR of 2-(2-iodophenyl)-N-(3-methylpyridin-2-yl)acetamide **1h**



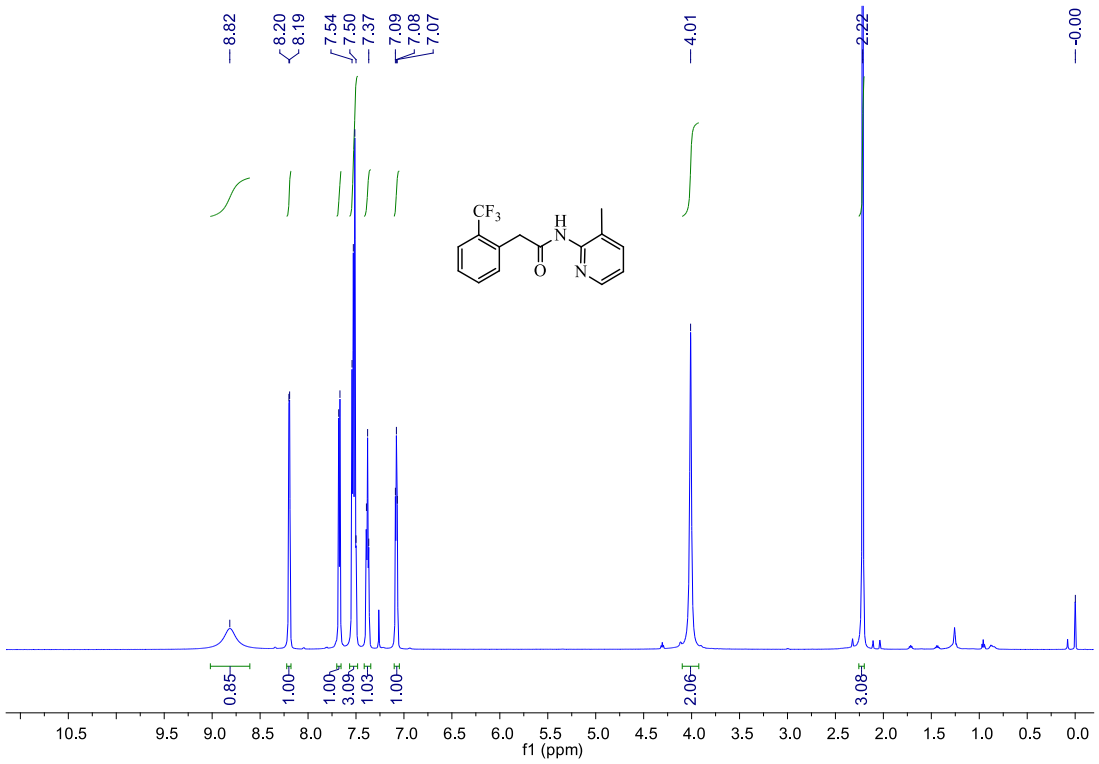
^{1}H NMR of 2-(2-cyanophenyl)-N-(3-methylpyridin-2-yl)acetamide **1i**



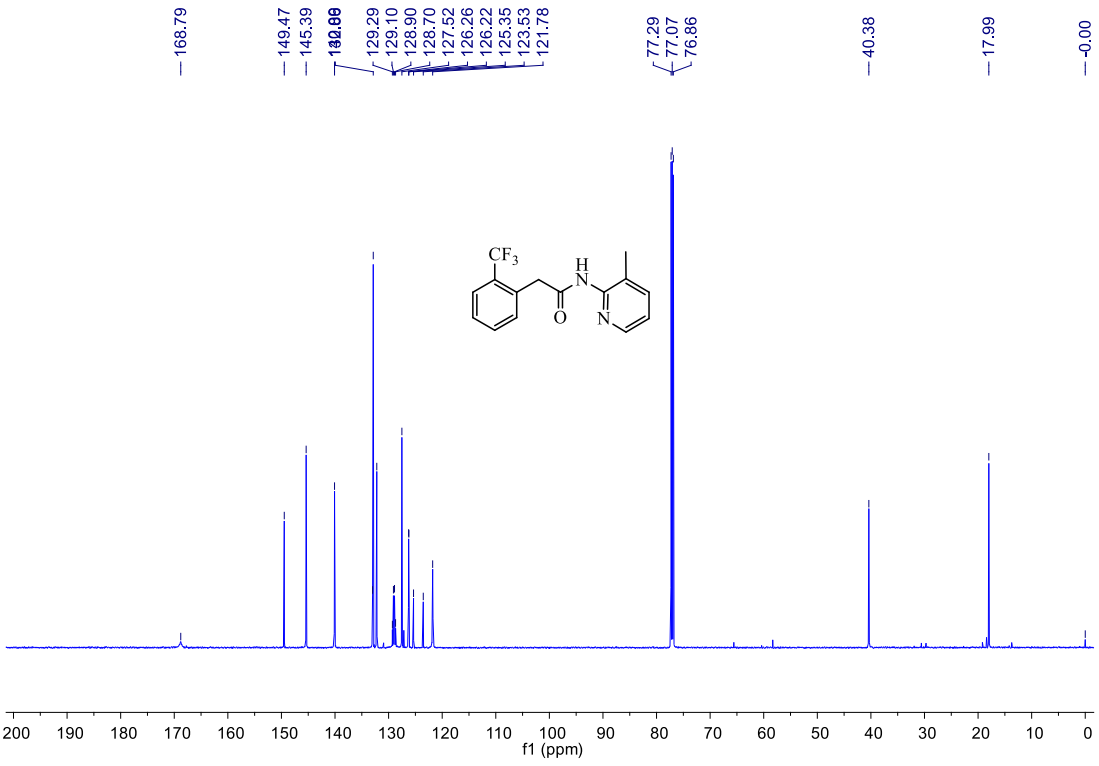
^{13}C NMR of 2-(2-cyanophenyl)-N-(3-methylpyridin-2-yl)acetamide **1i**



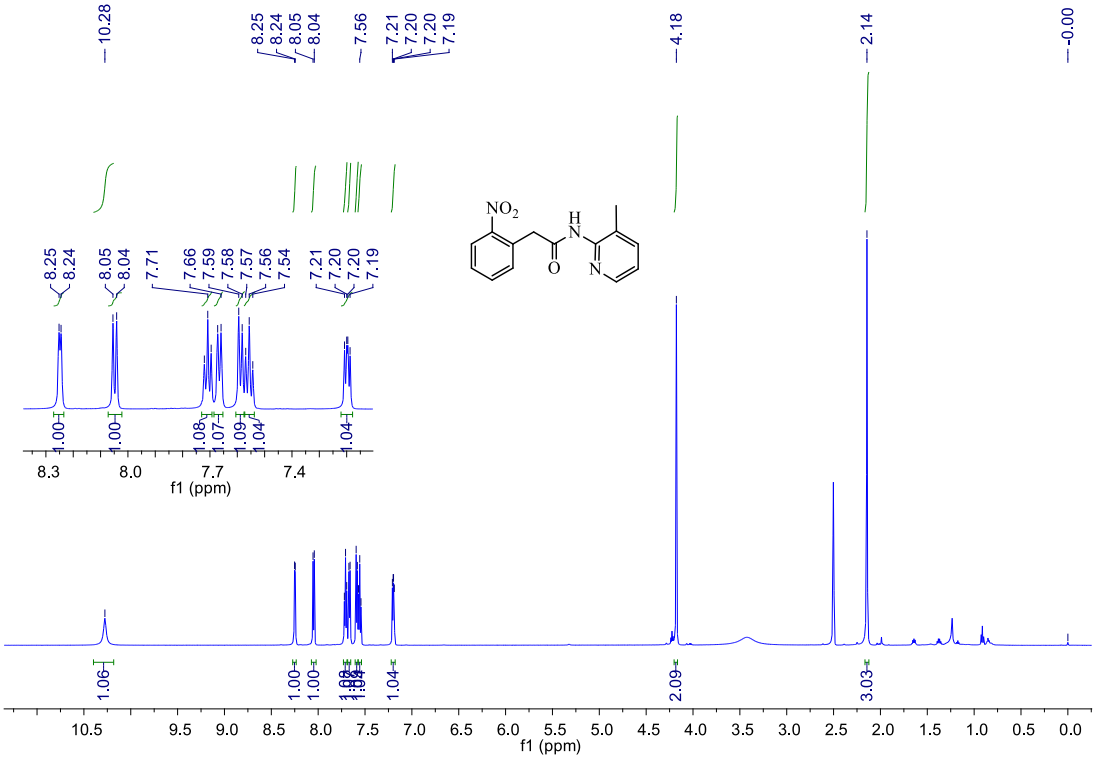
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(2-(trifluoromethyl)phenyl)acetamide **1j**



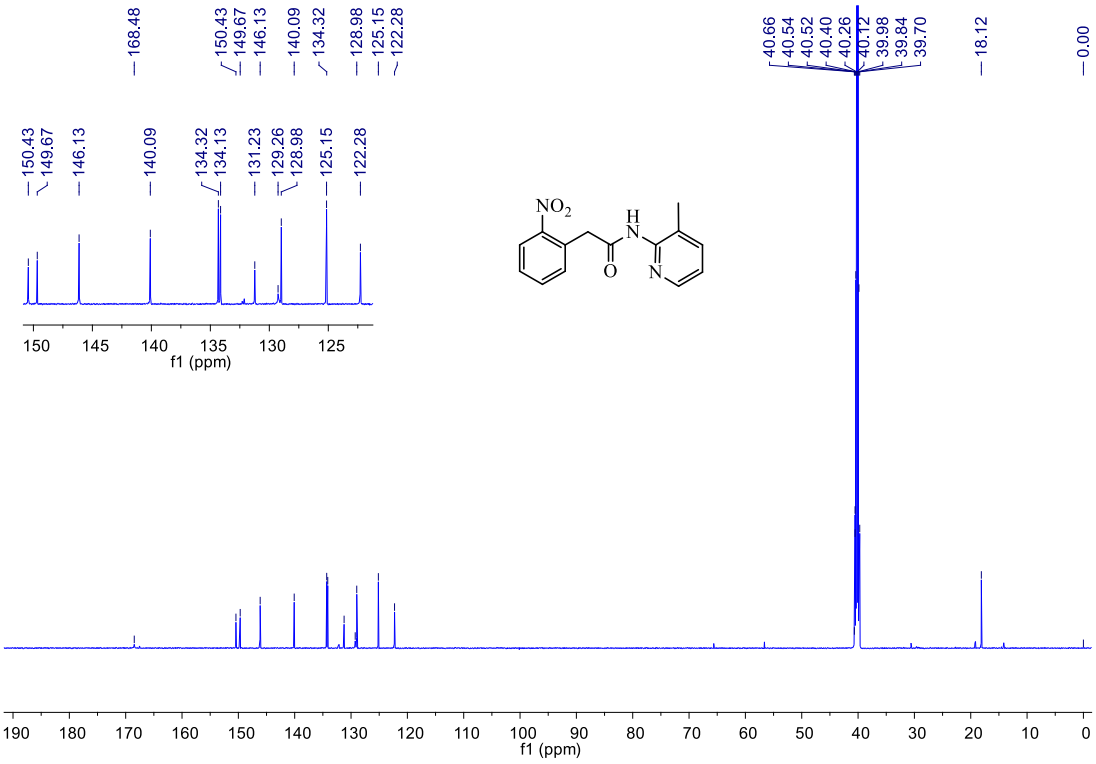
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(2-(trifluoromethyl)phenyl)acetamide **1j**



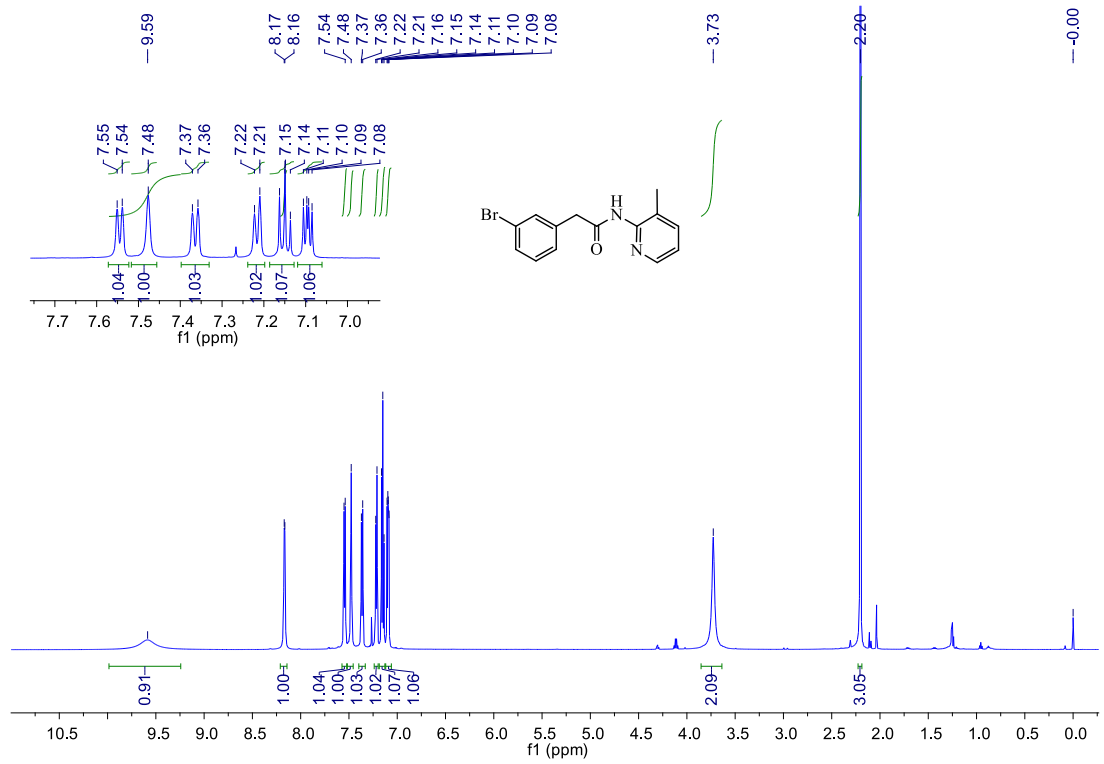
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(2-nitrophenyl)acetamide **1k**



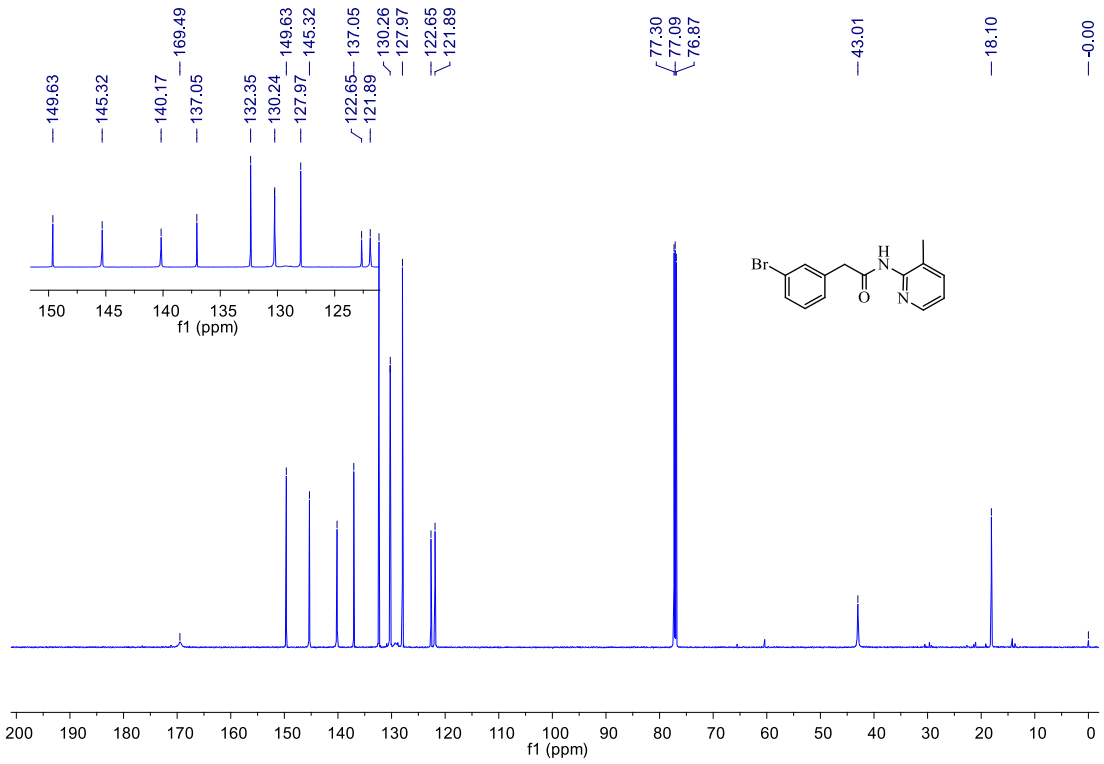
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(2-nitrophenyl)acetamide **1k**



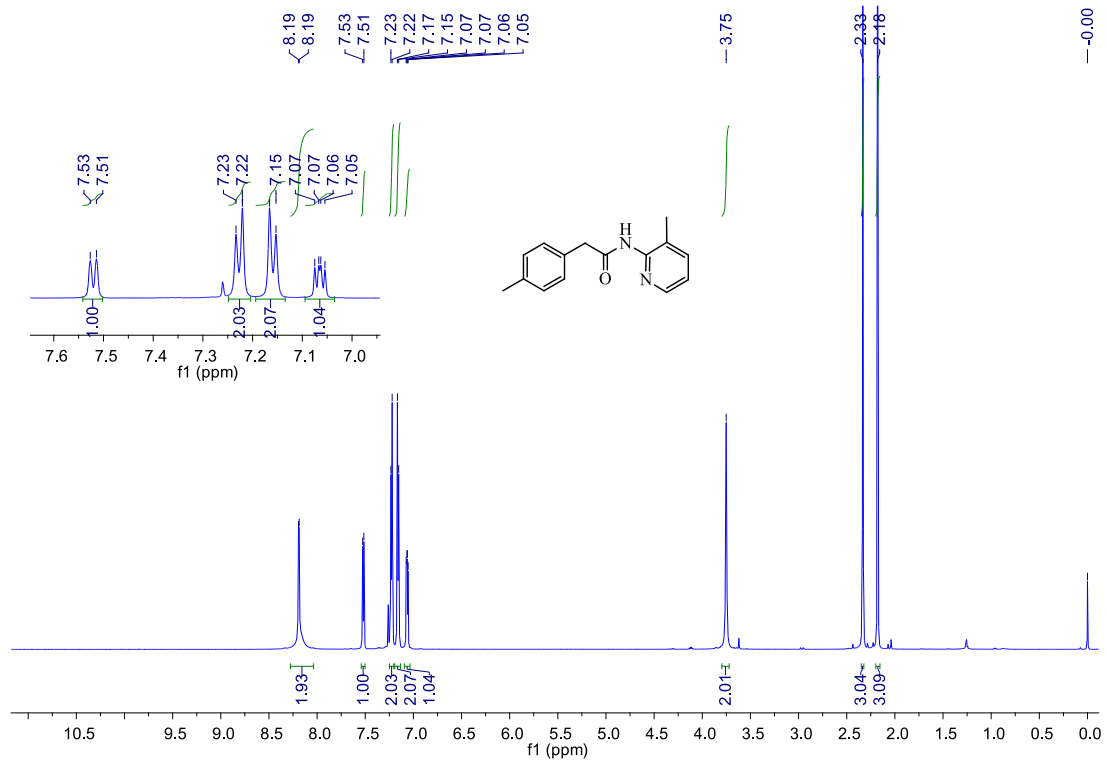
^{1}H NMR of 2-(3-bromophenyl)-N-(3-methylpyridin-2-yl)acetamide **1l**



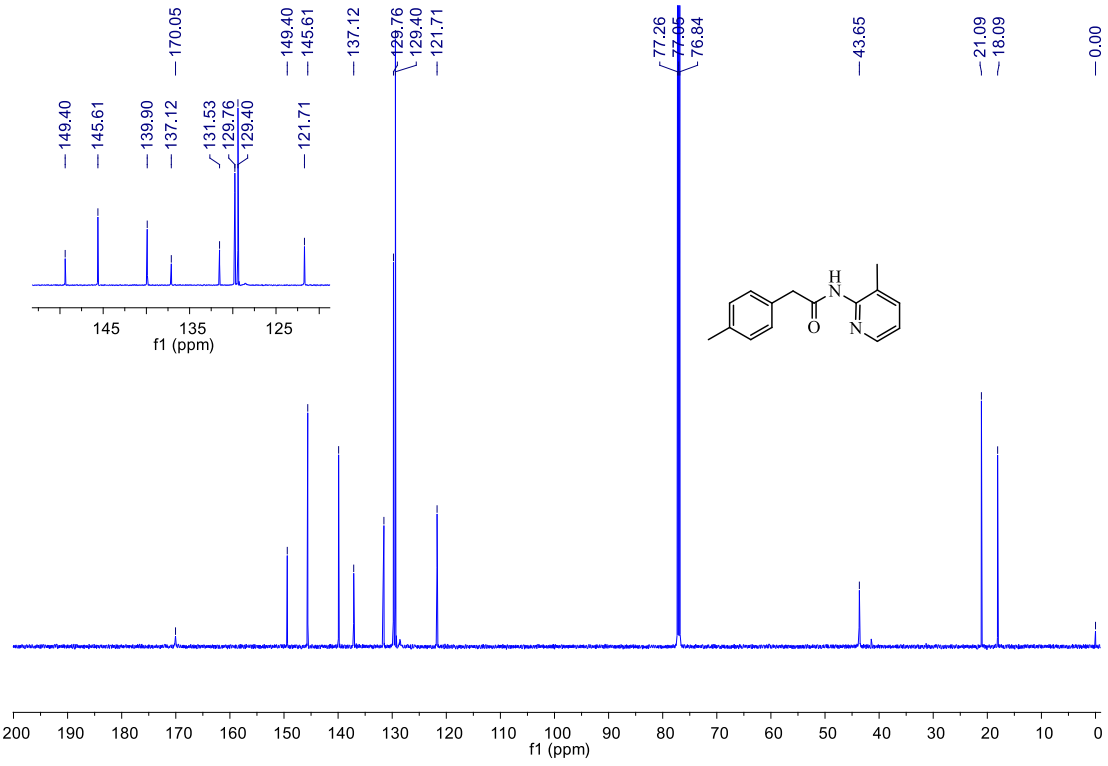
^{13}C NMR of 2-(3-bromophenyl)-N-(3-methylpyridin-2-yl)acetamide **1l**



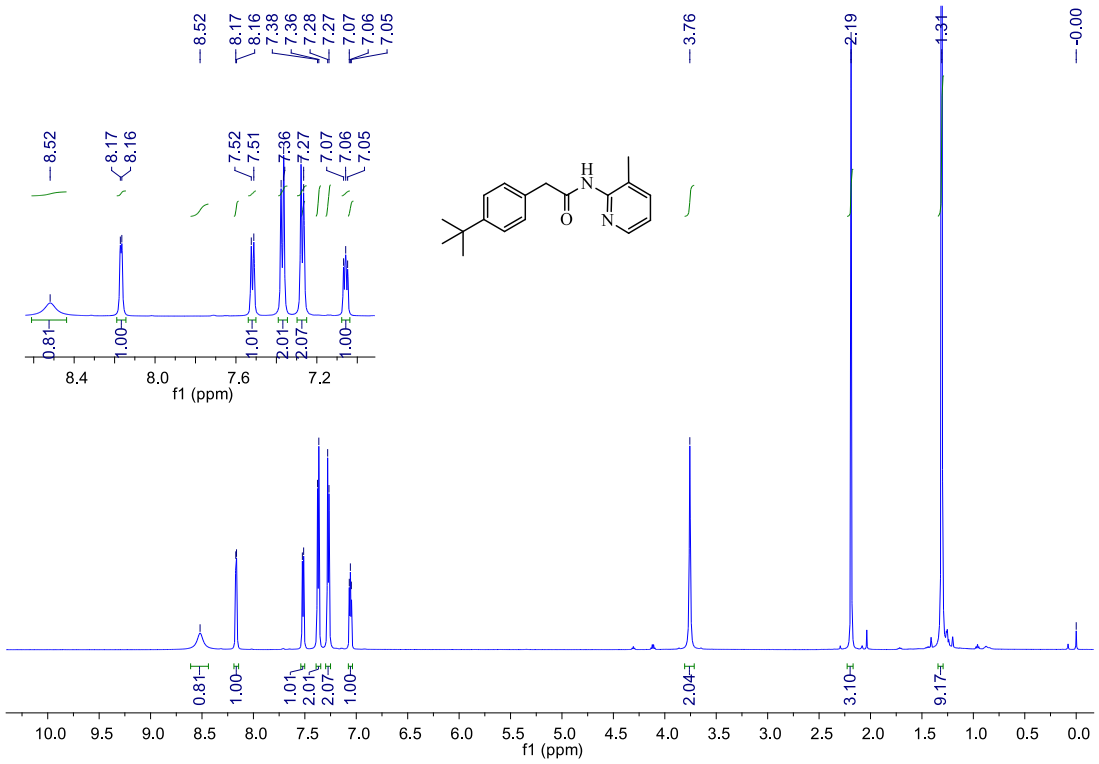
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(p-tolyl)acetamide **1m**



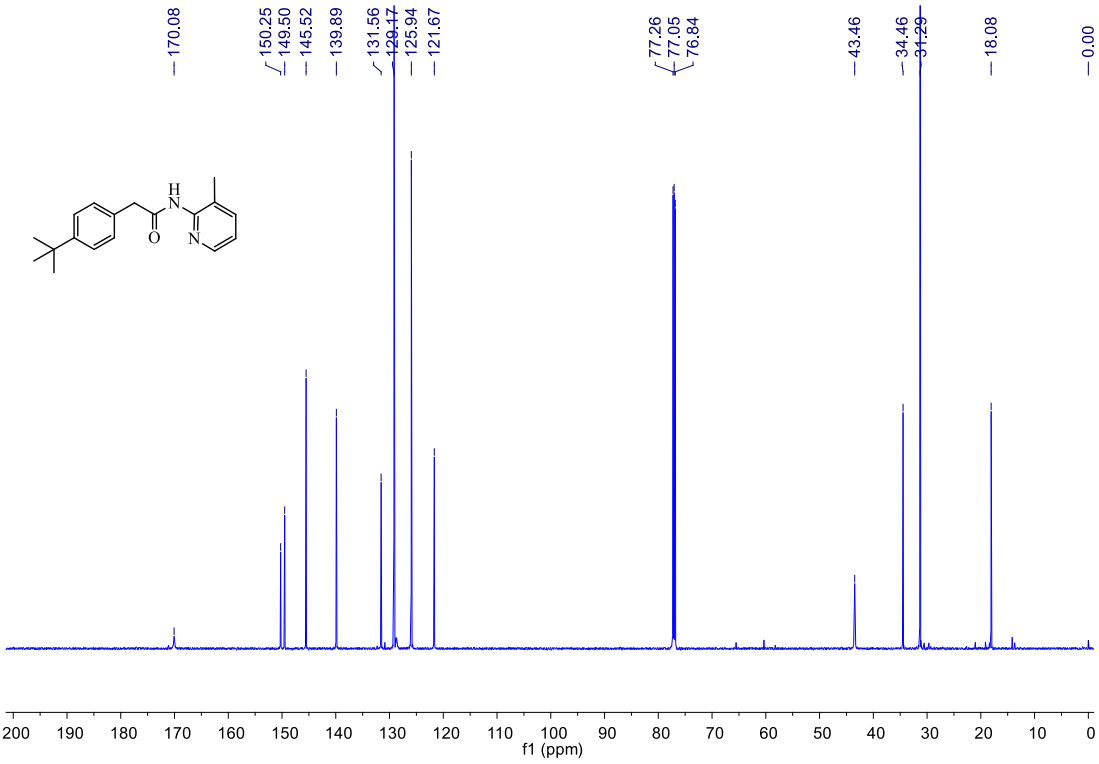
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(p-tolyl)acetamide **1m**



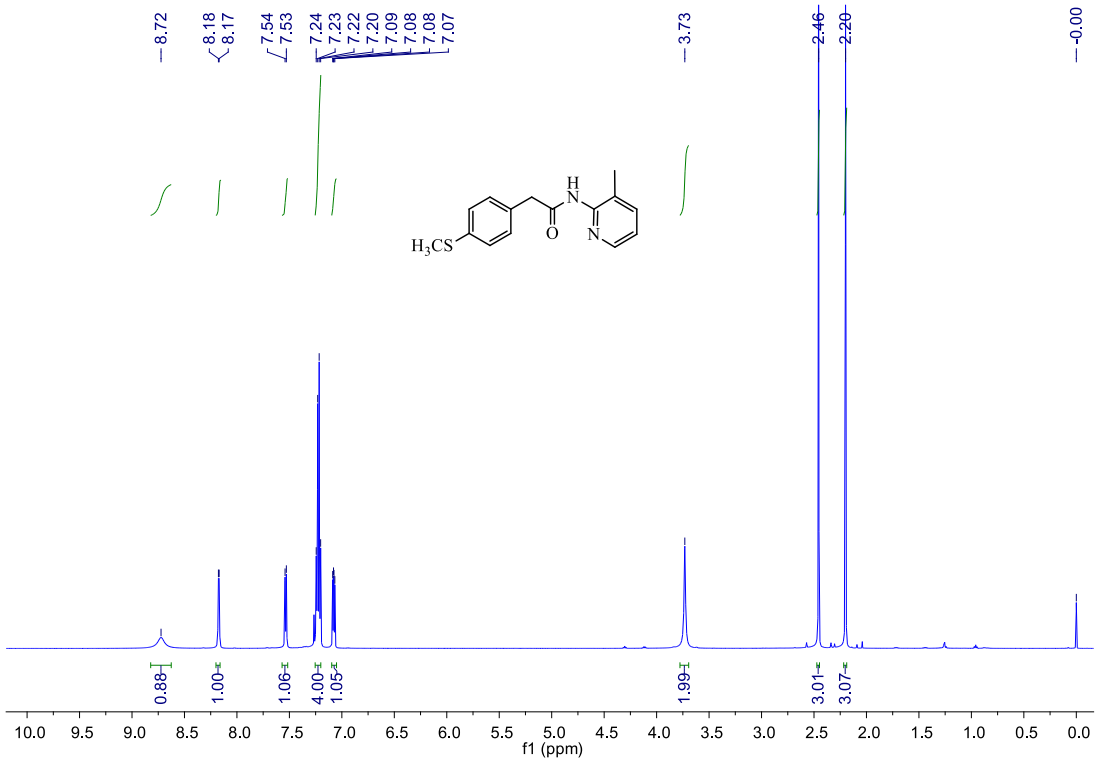
^{1}H NMR of 2-(4-(tert-butyl)phenyl)-N-(3-methylpyridin-2-yl)acetamide **1n**



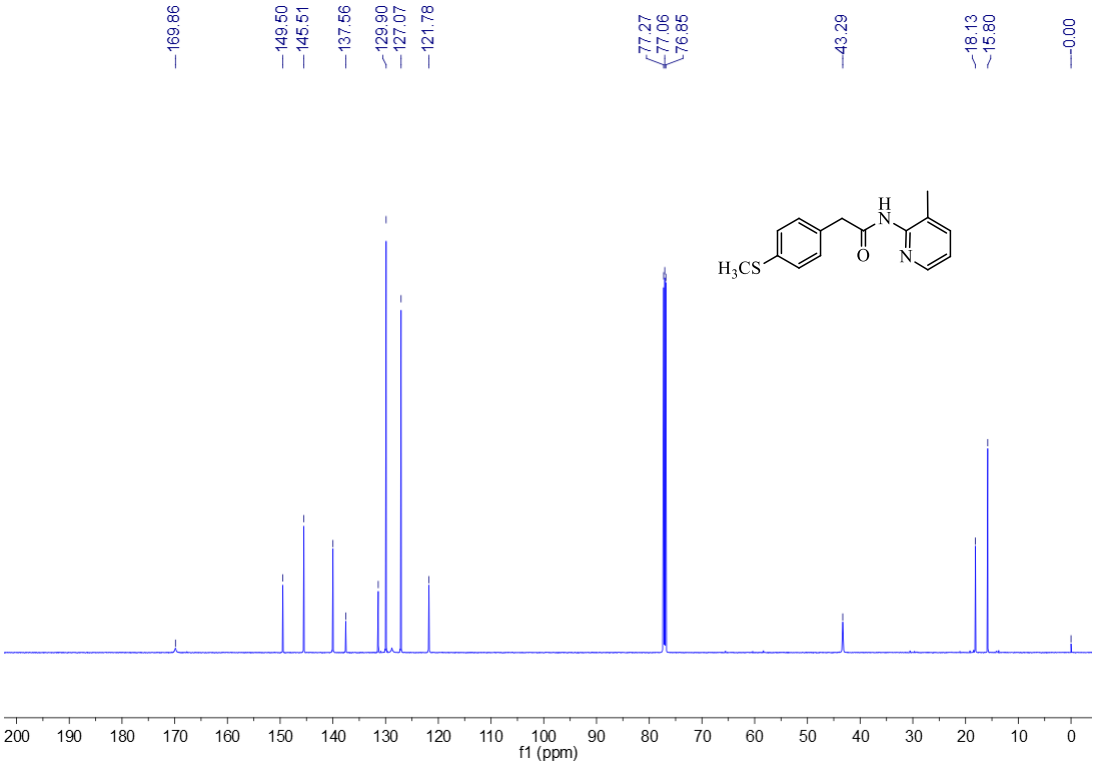
^{13}C NMR of 2-(4-(tert-butyl)phenyl)-N-(3-methylpyridin-2-yl)acetamide **1n**



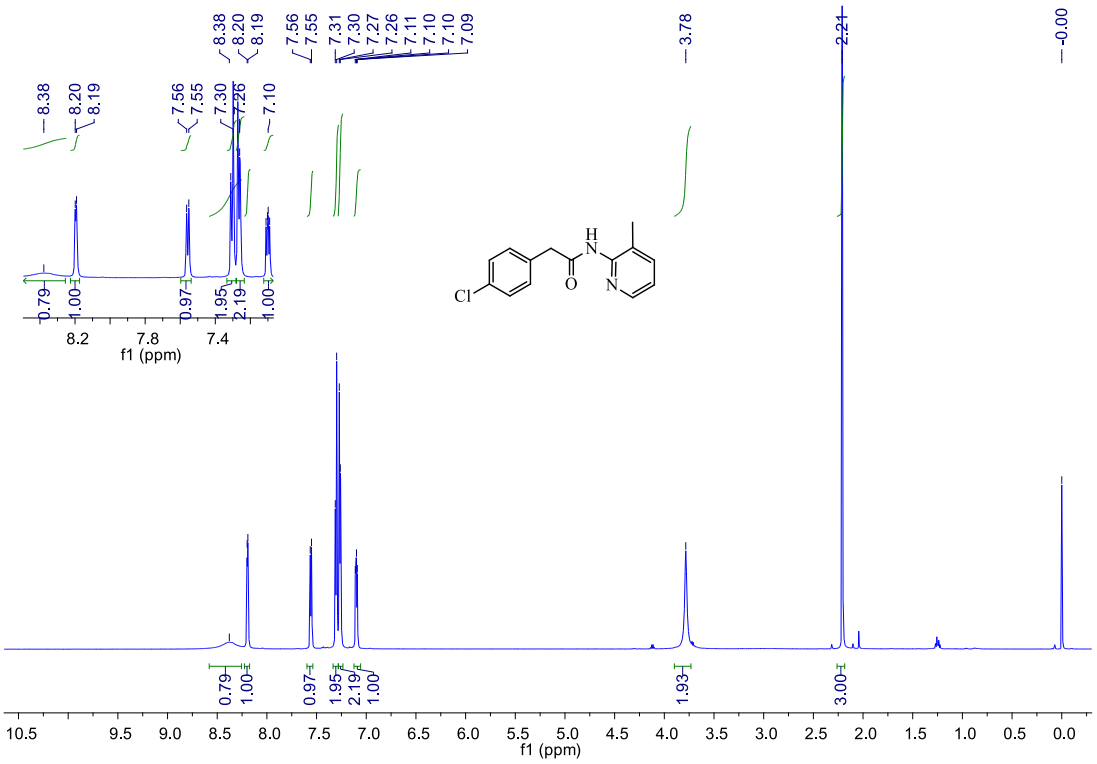
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(4-(methylthio)phenyl)acetamide **1o**



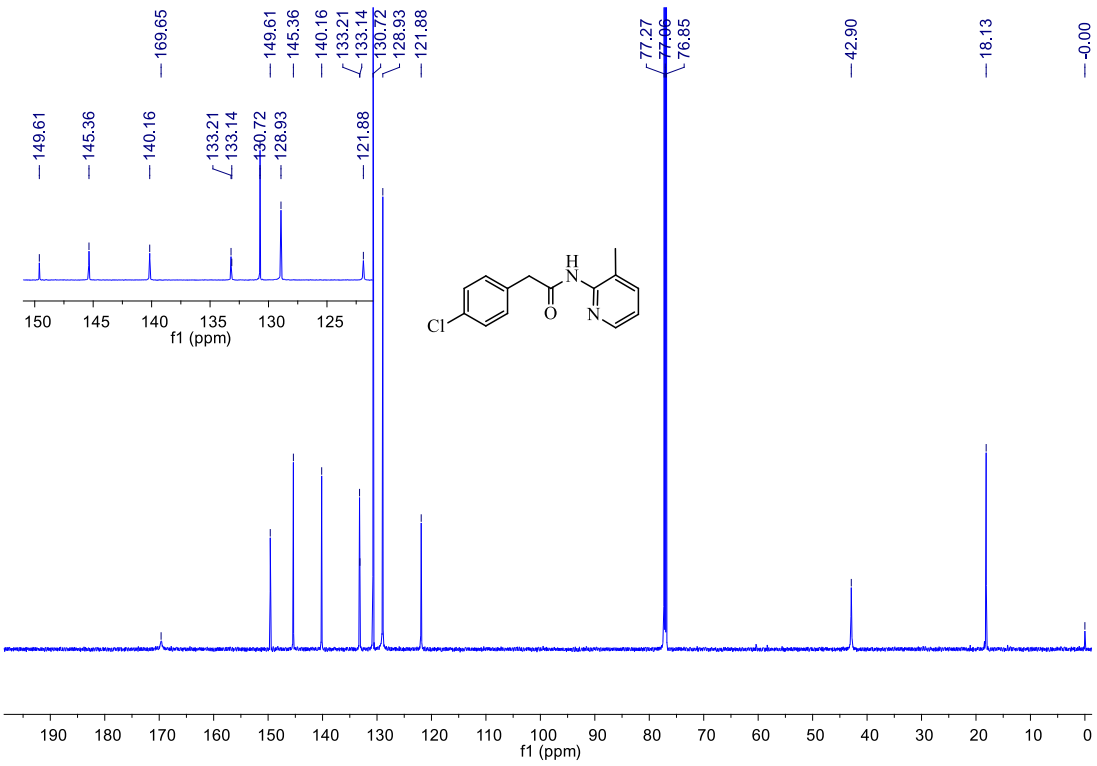
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(4-(methylthio)phenyl)acetamide **1o**



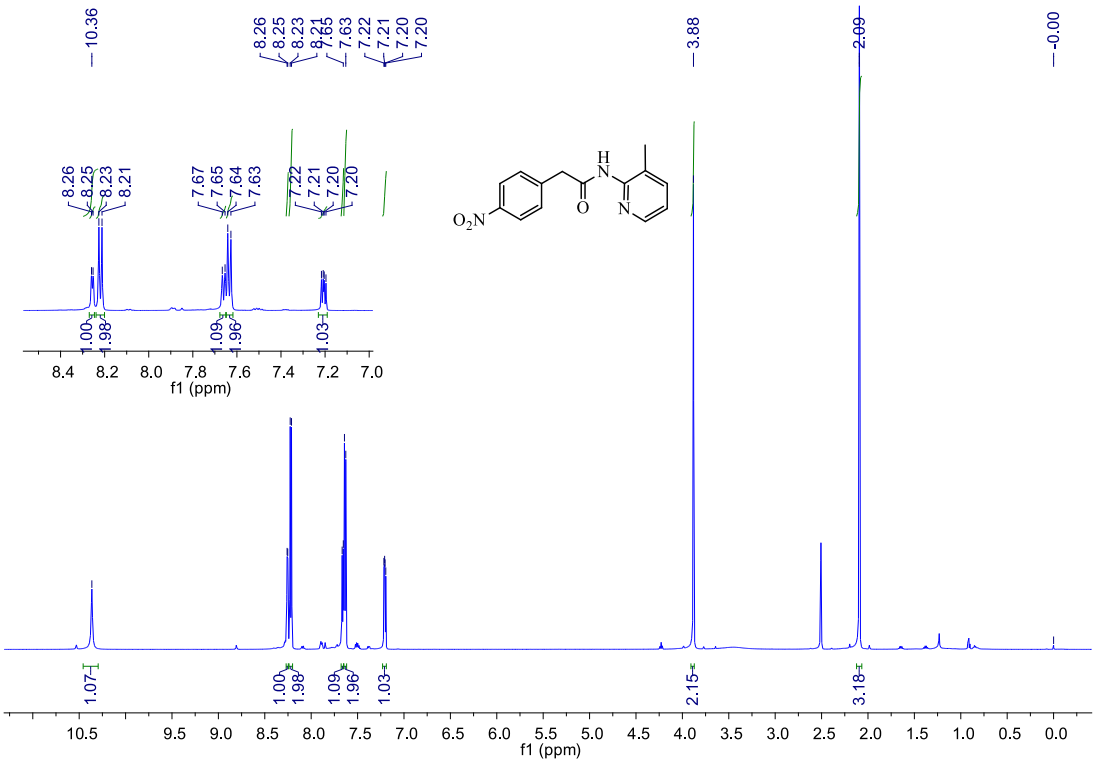
^{1}H NMR of 2-(4-chlorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1p**



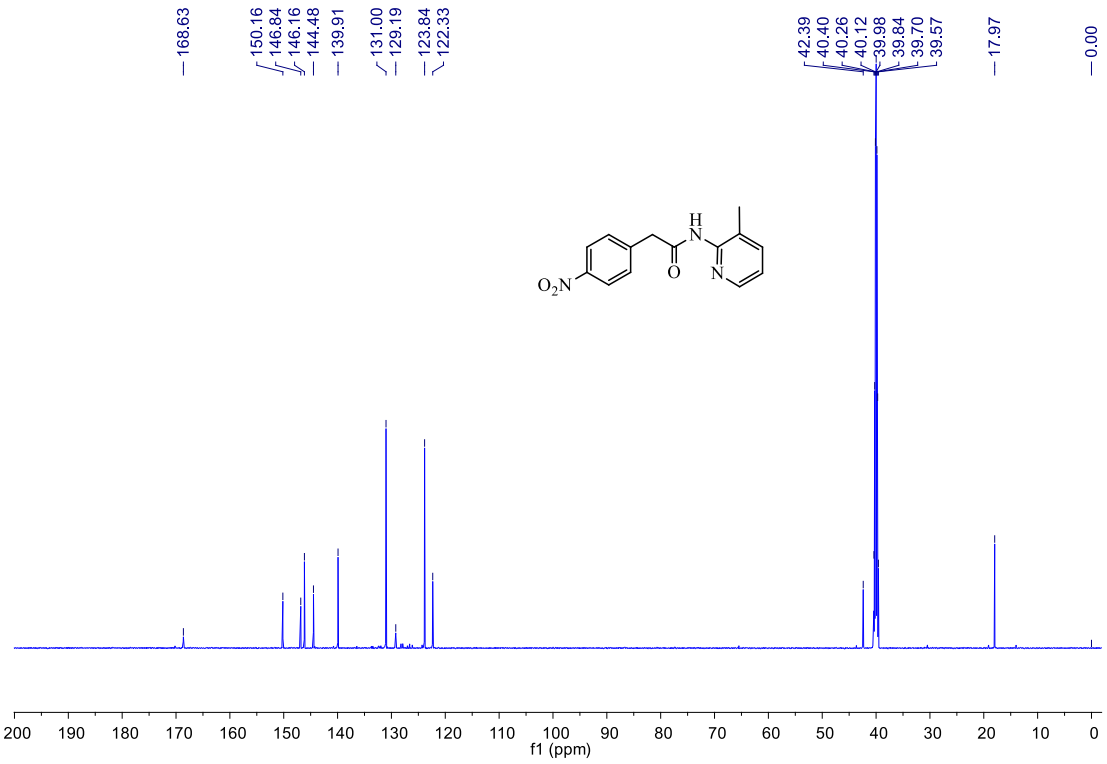
^{13}C NMR of 2-(4-chlorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1p**



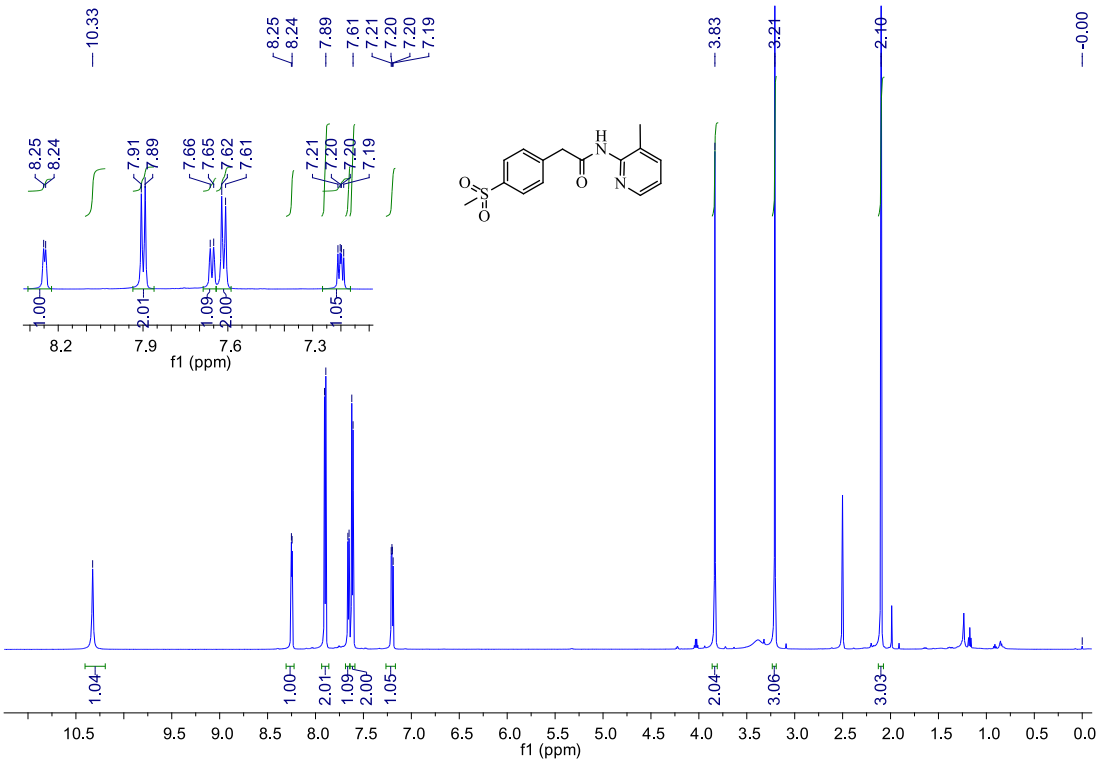
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(4-nitrophenyl)acetamide **1q**



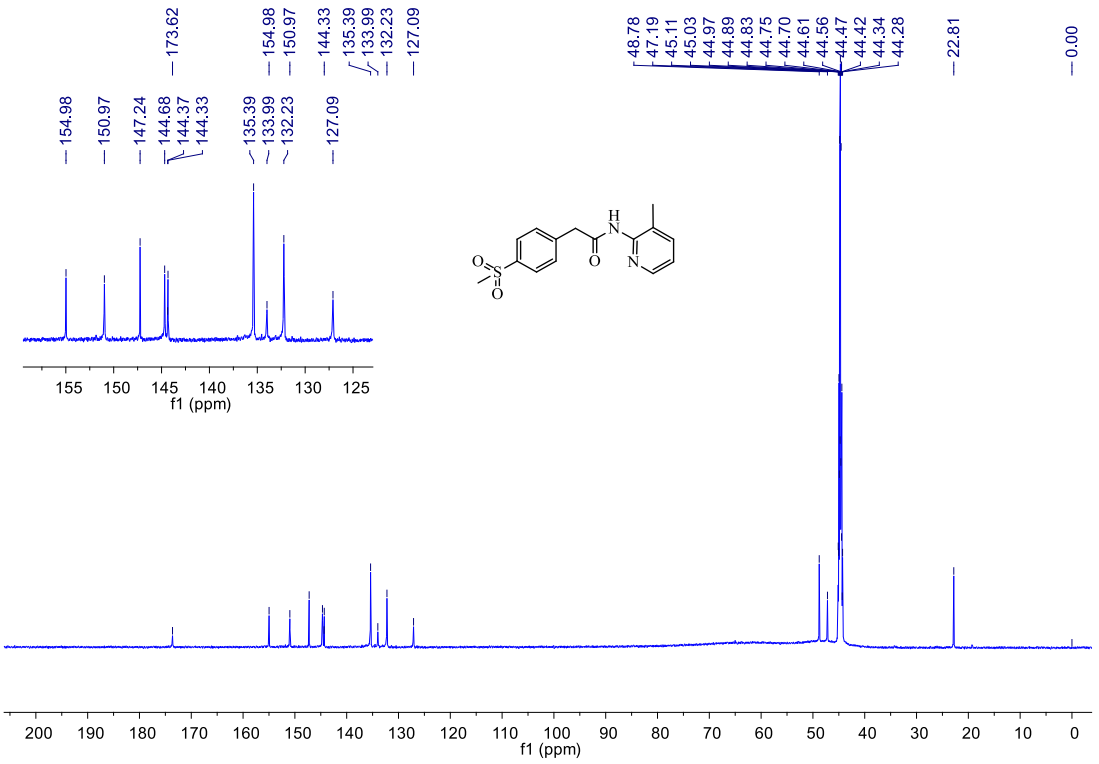
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(4-nitrophenyl)acetamide **1q**



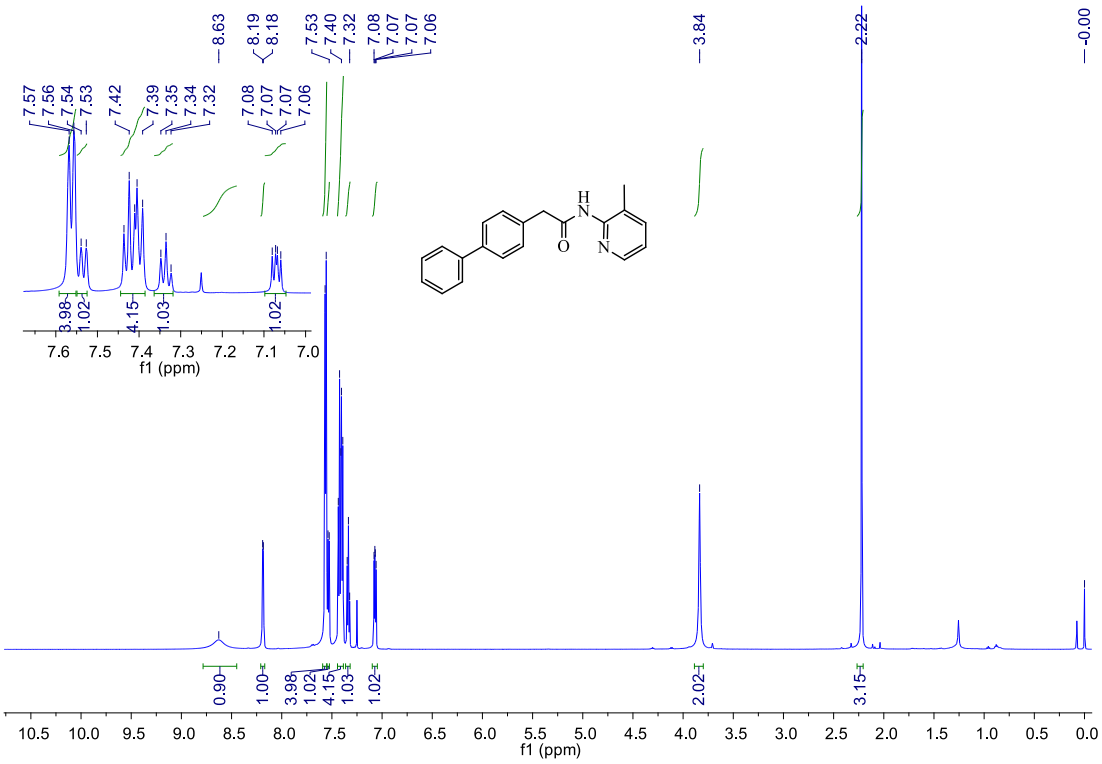
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(4-(methylsulfonyl)phenyl)acetamide **1r**



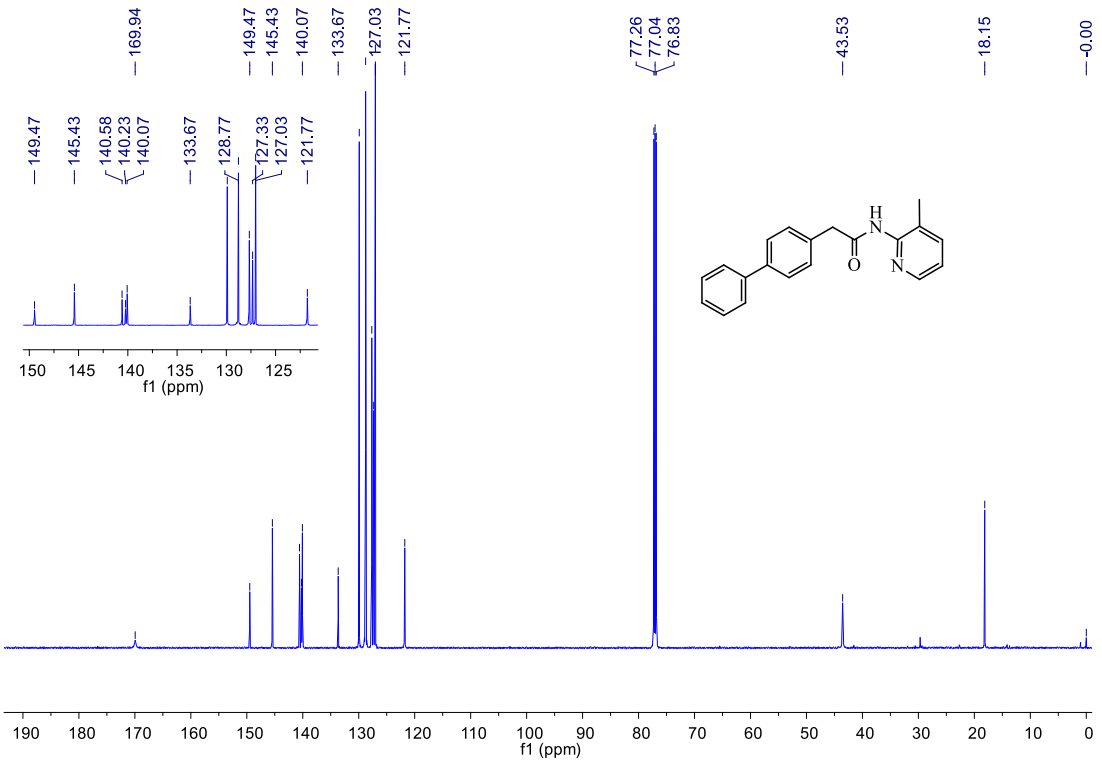
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(4-(methylsulfonyl)phenyl)acetamide **1r**



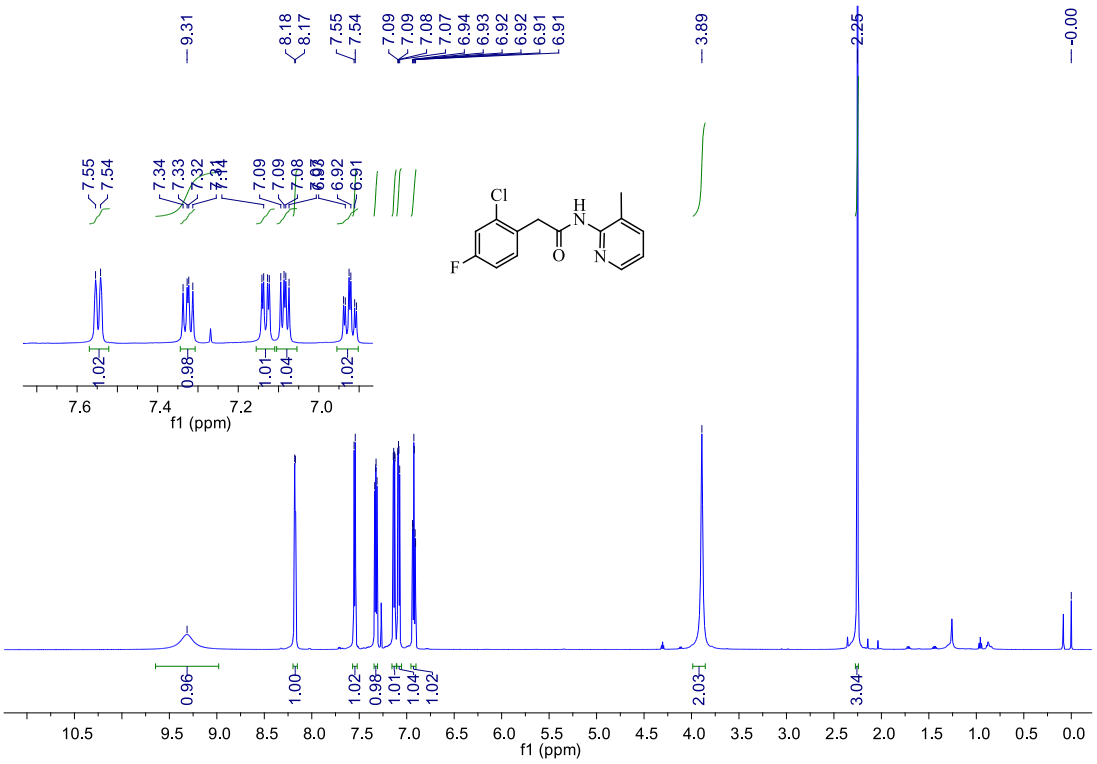
^{1}H NMR of 2-([1,1'-biphenyl]-4-yl)-N-(3-methylpyridin-2-yl)acetamide **1s**



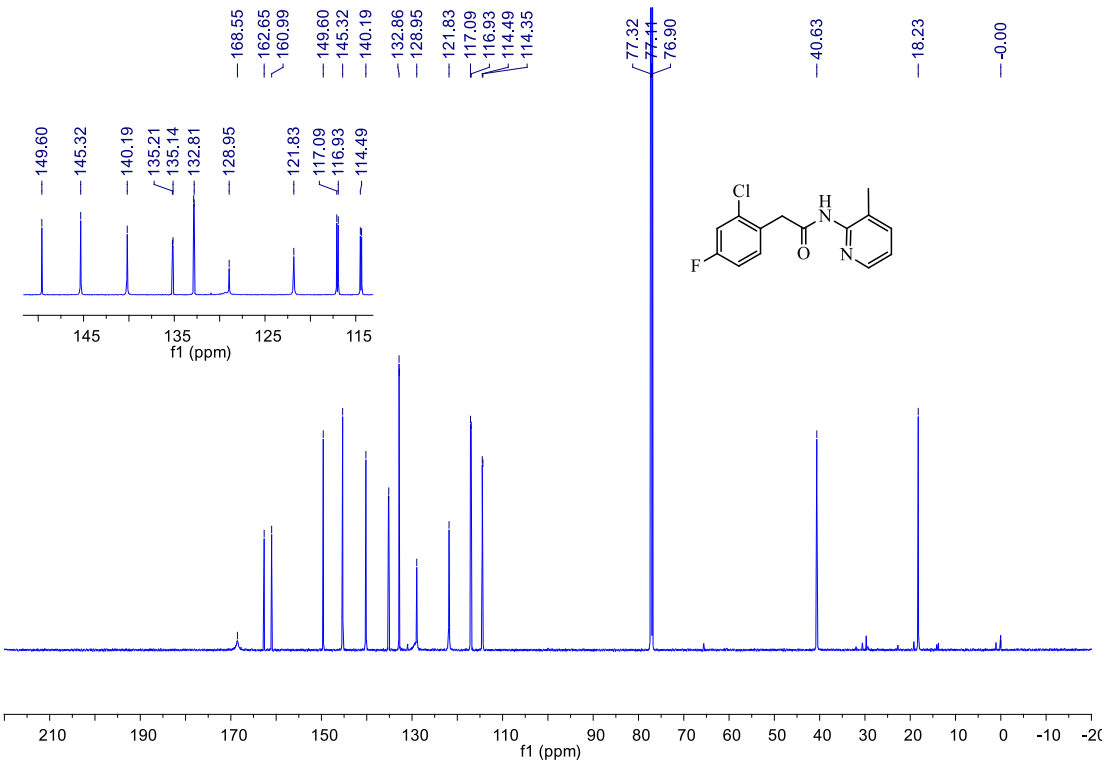
^{13}C NMR of 2-([1,1'-biphenyl]-4-yl)-N-(3-methylpyridin-2-yl)acetamide **1s**



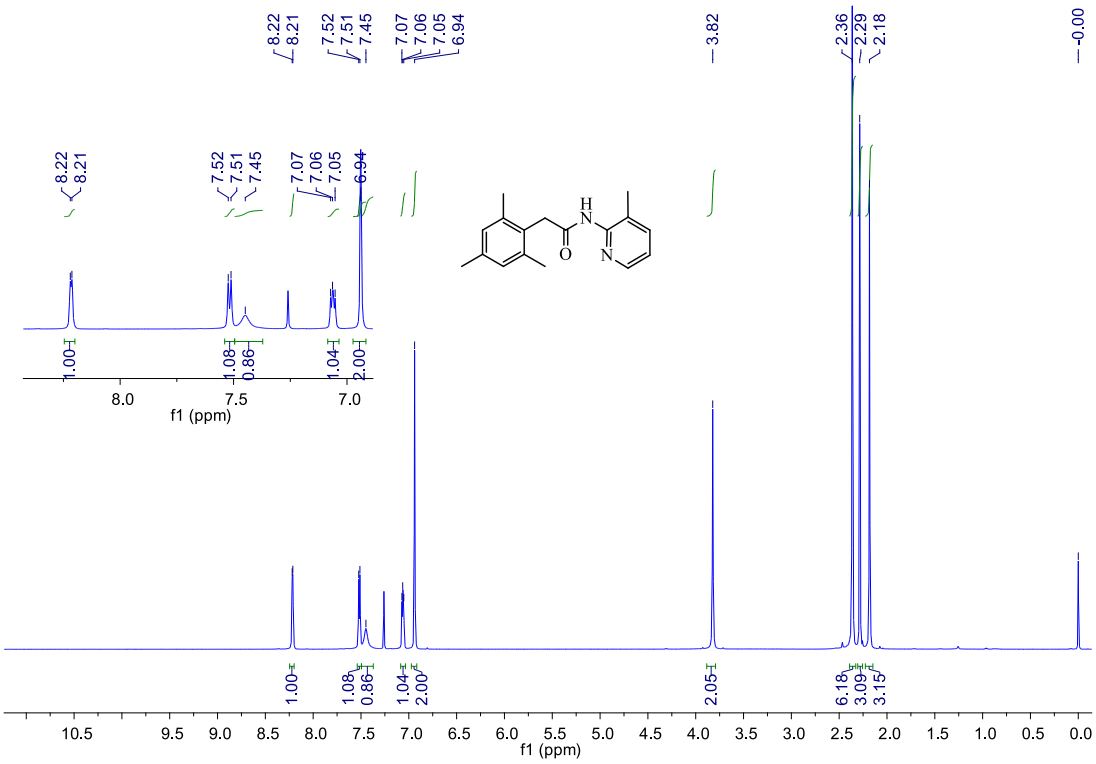
^{1}H NMR of 2-(2-chloro-4-fluorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1t**



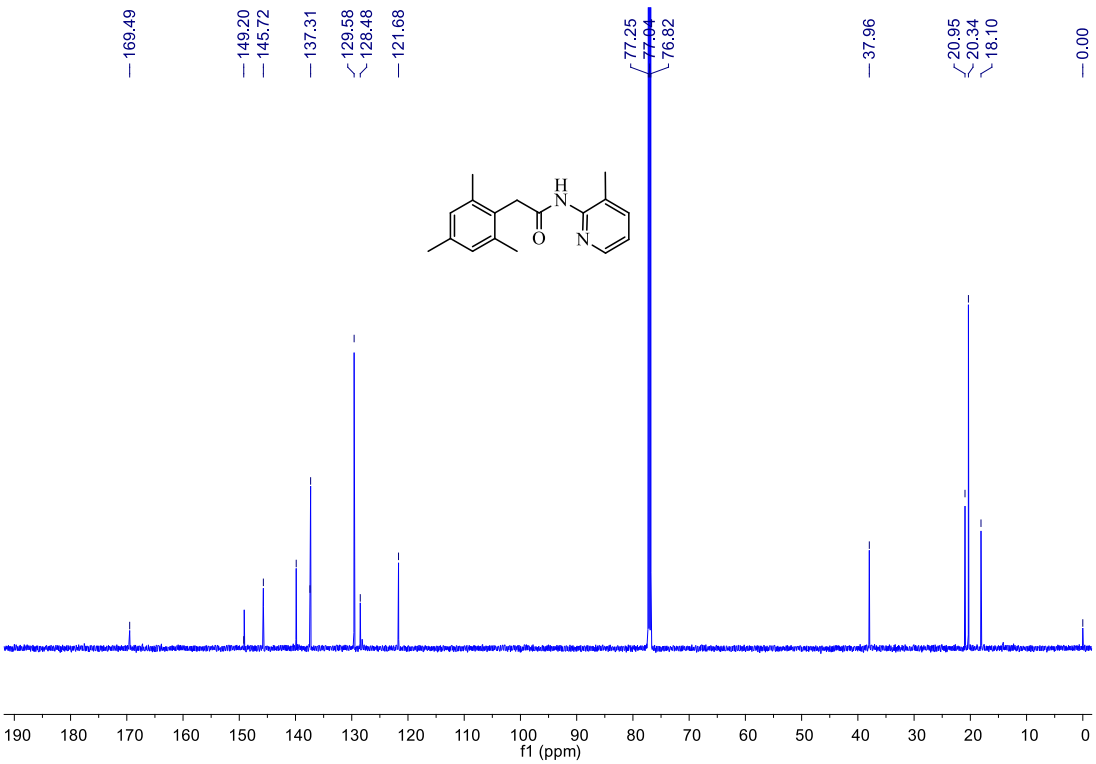
^{13}C NMR of 2-(2-chloro-4-fluorophenyl)-N-(3-methylpyridin-2-yl)acetamide **1t**



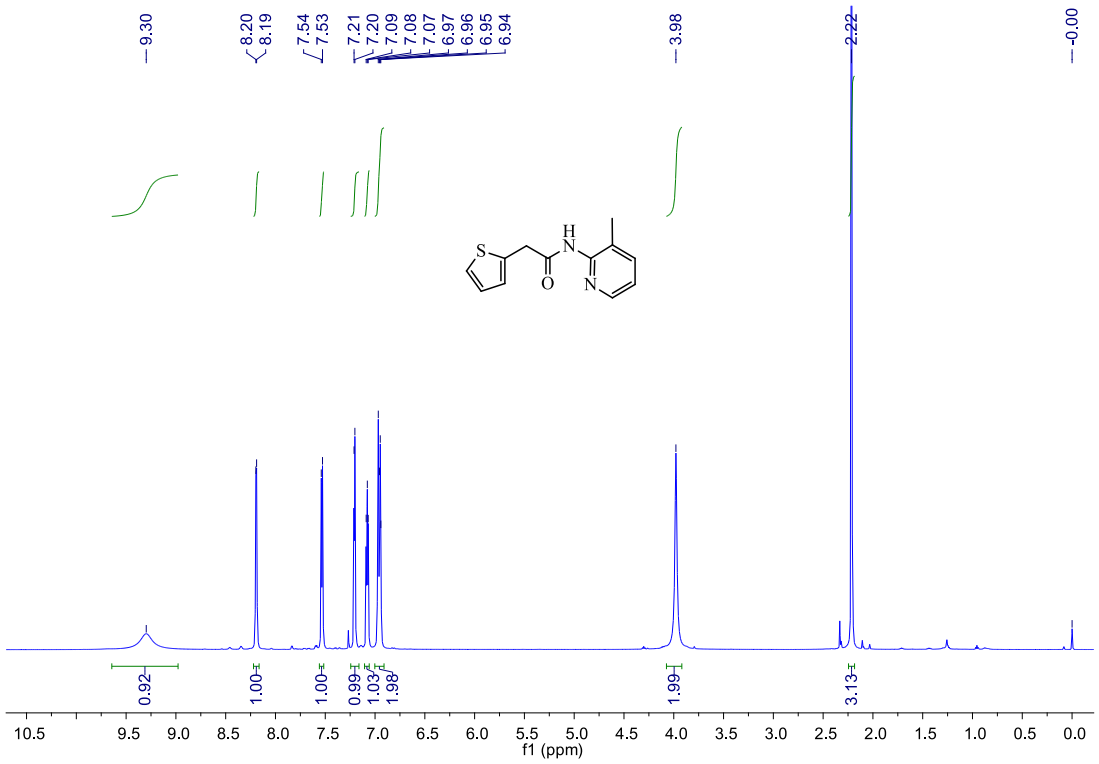
^{1}H NMR of 2-mesityl-N-(3-methylpyridin-2-yl)acetamide **1u**



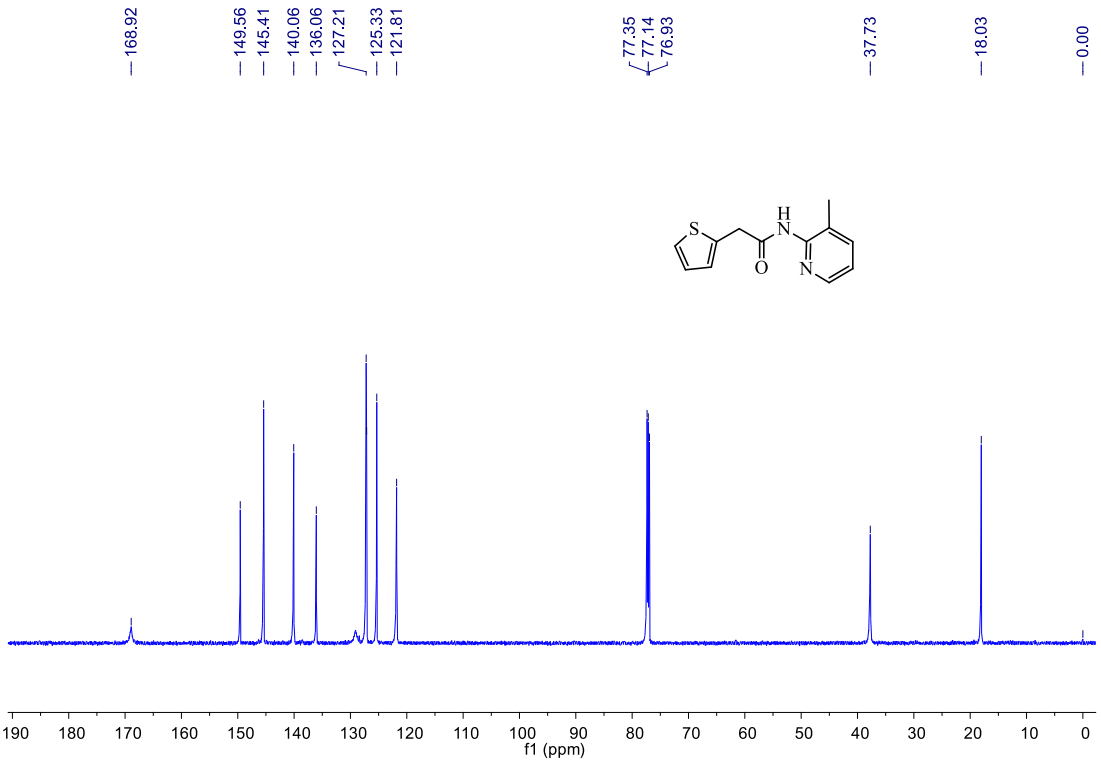
^{13}C NMR of 2-mesityl-N-(3-methylpyridin-2-yl)acetamide **1u**



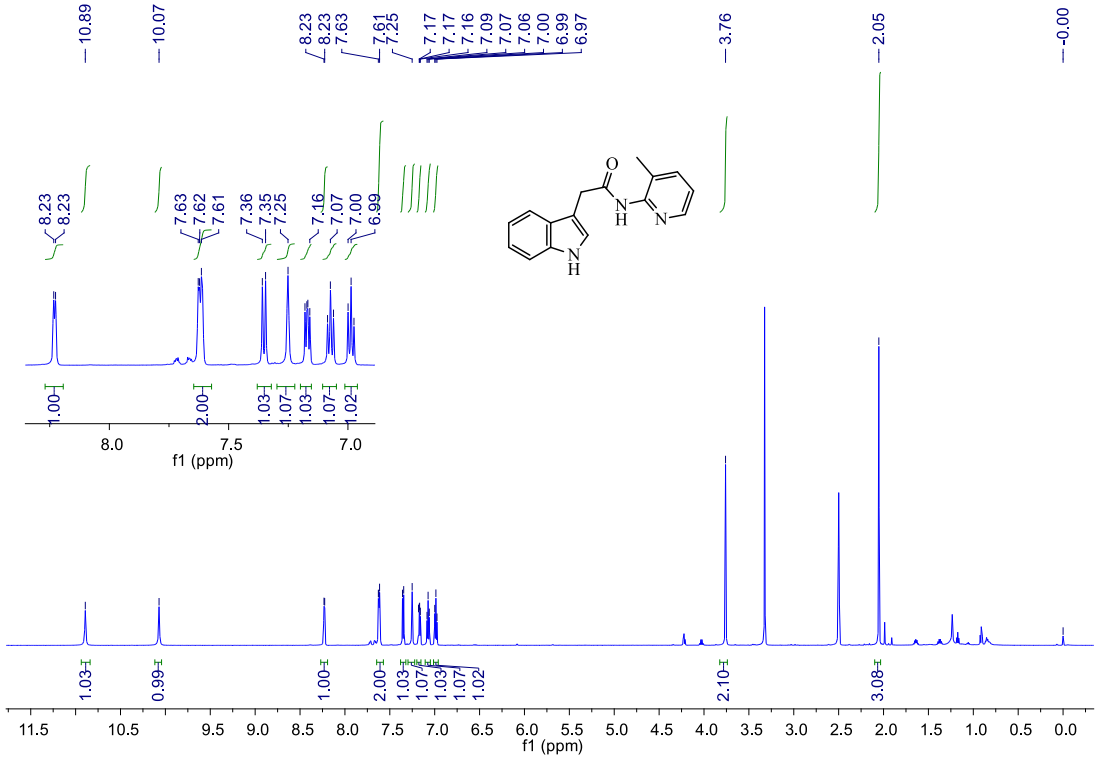
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(thiophen-2-yl)acetamide **1v**



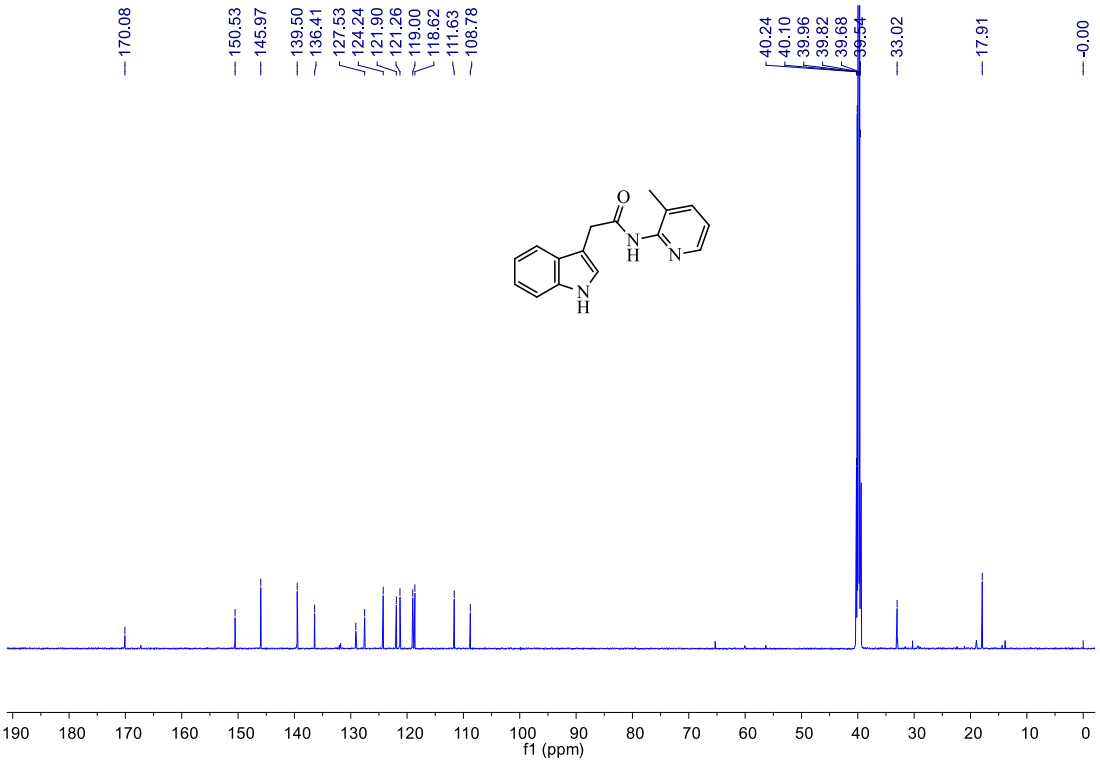
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(thiophen-2-yl)acetamide **1v**



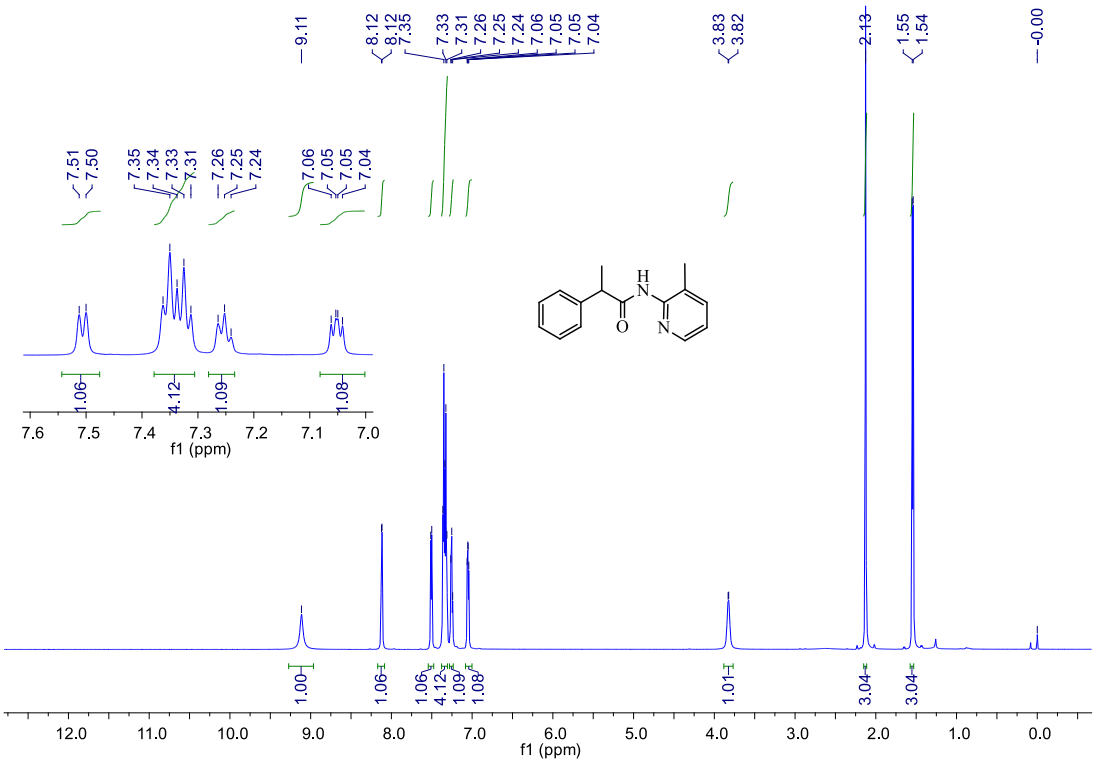
^{1}H NMR of 2-(1H-indol-3-yl)-N-(3-methylpyridin-2-yl)acetamide **1w**



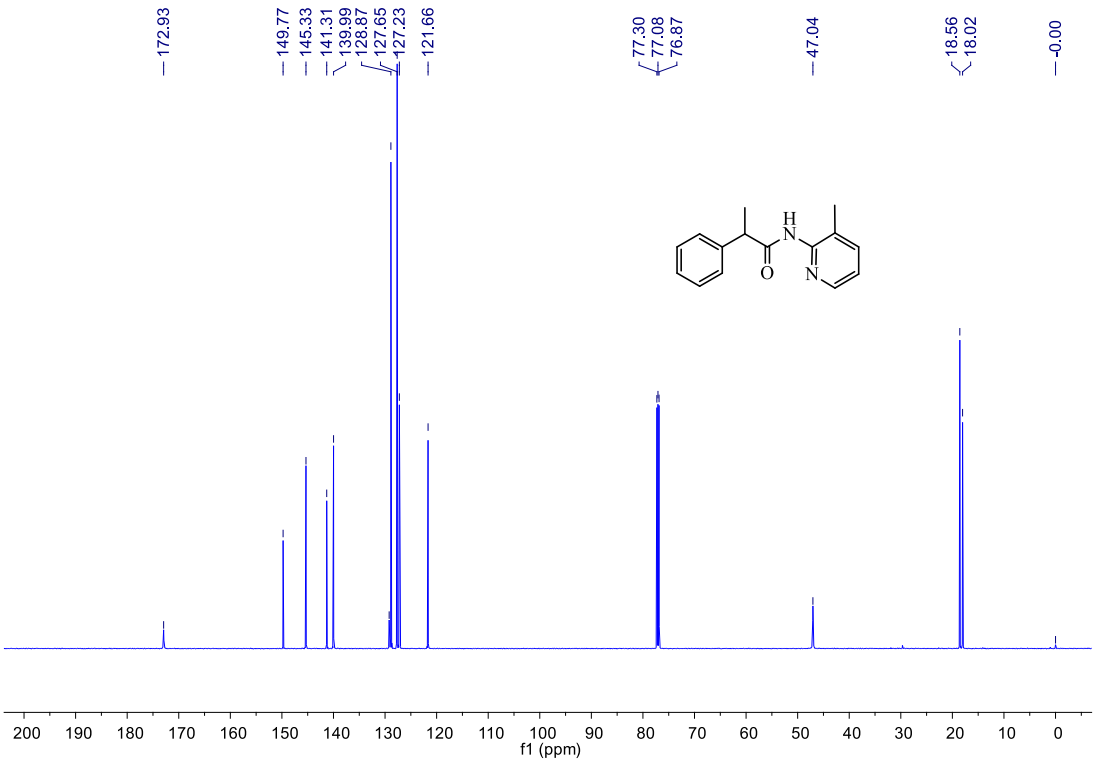
^{13}C NMR of 2-(1H-indol-3-yl)-N-(3-methylpyridin-2-yl)acetamide **1w**



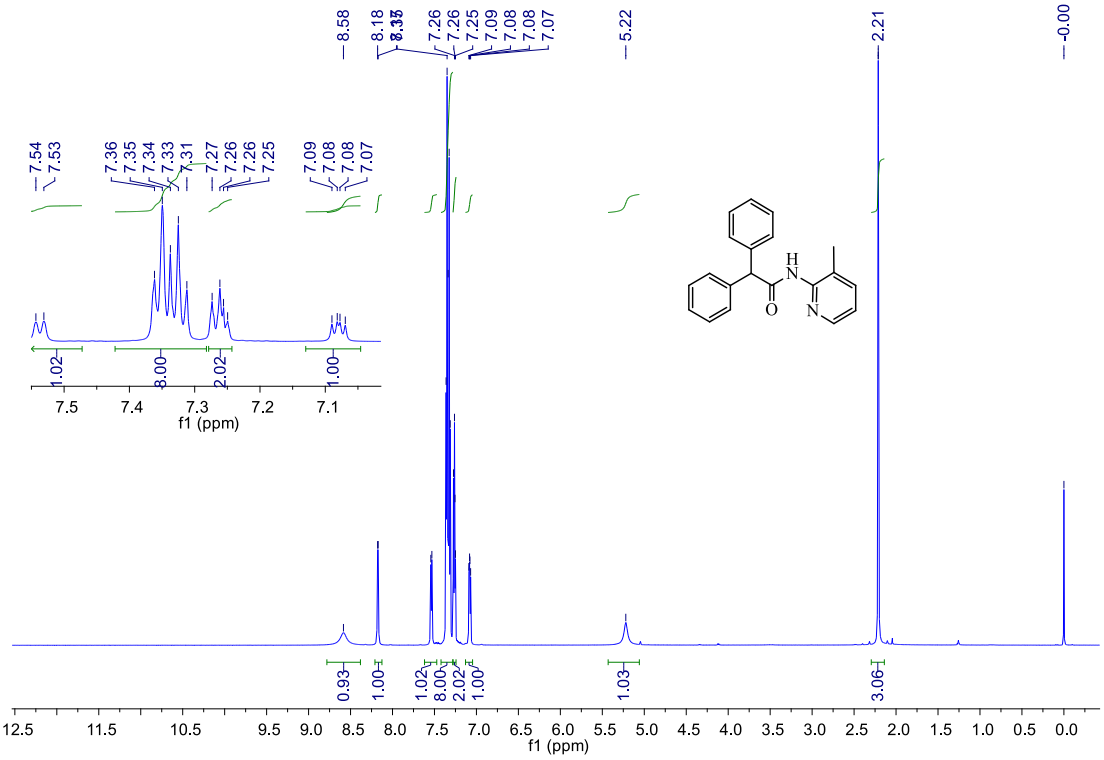
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-phenylpropanamide **1x**



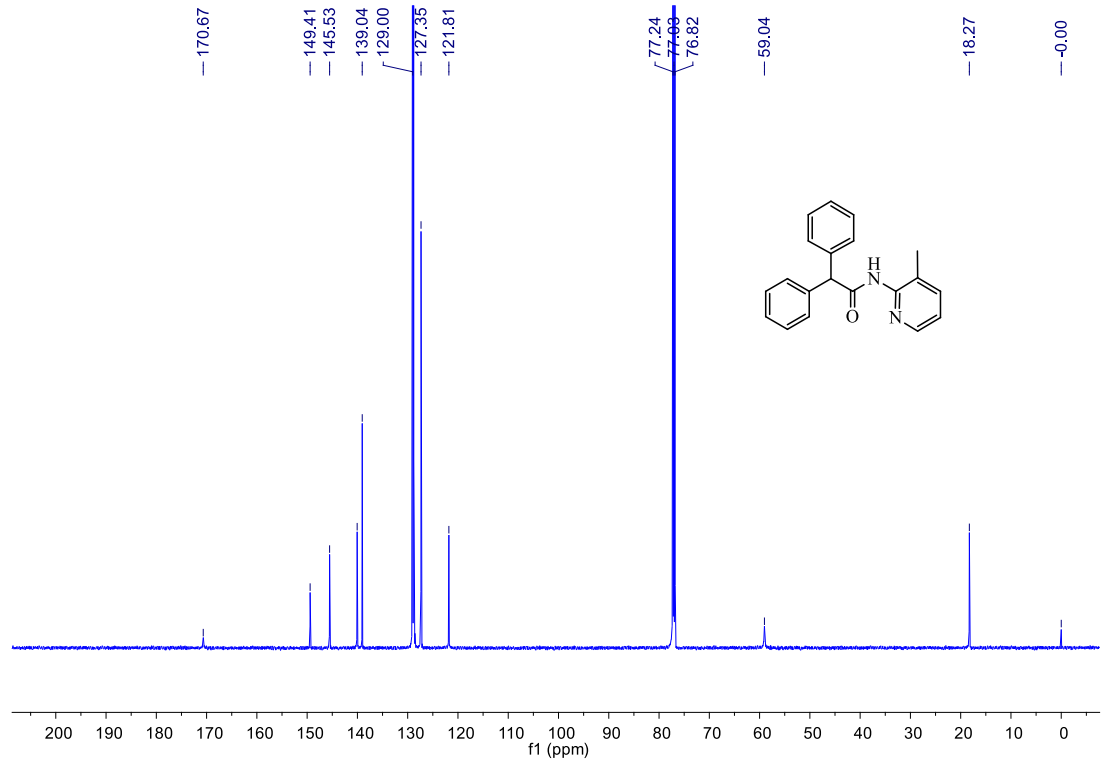
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-phenylpropanamide **1x**



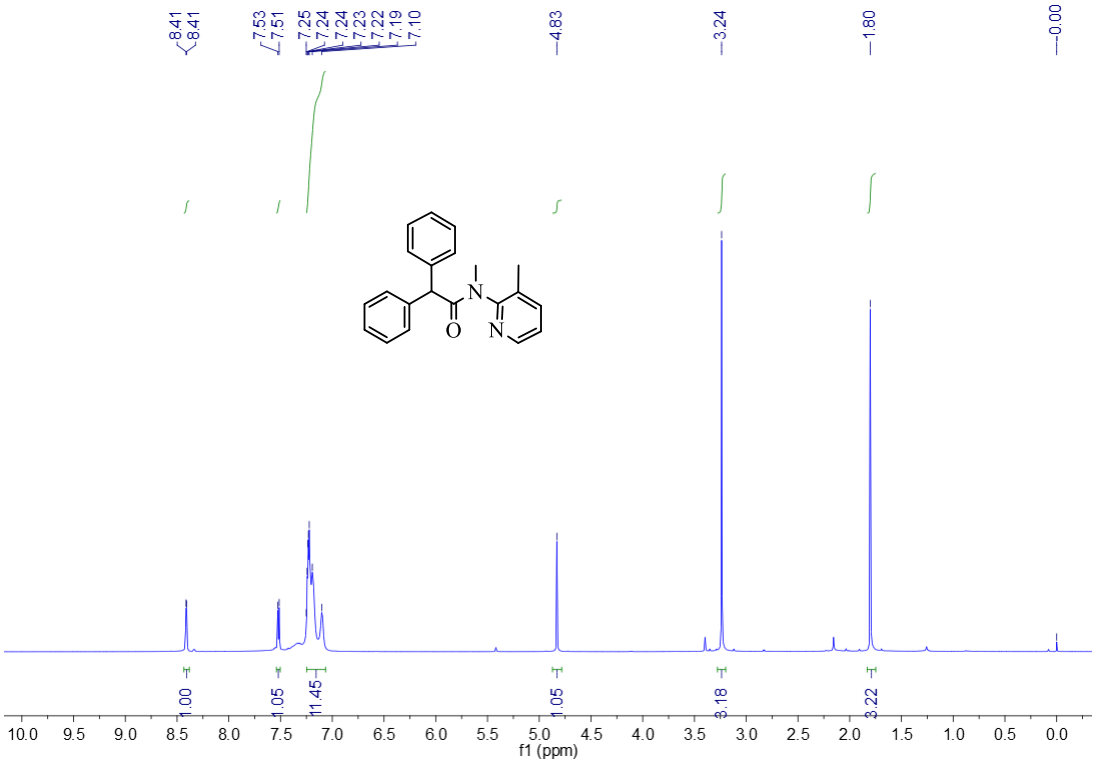
^{1}H NMR of N-(3-methylpyridin-2-yl)-2,2-diphenylacetamide **1y**



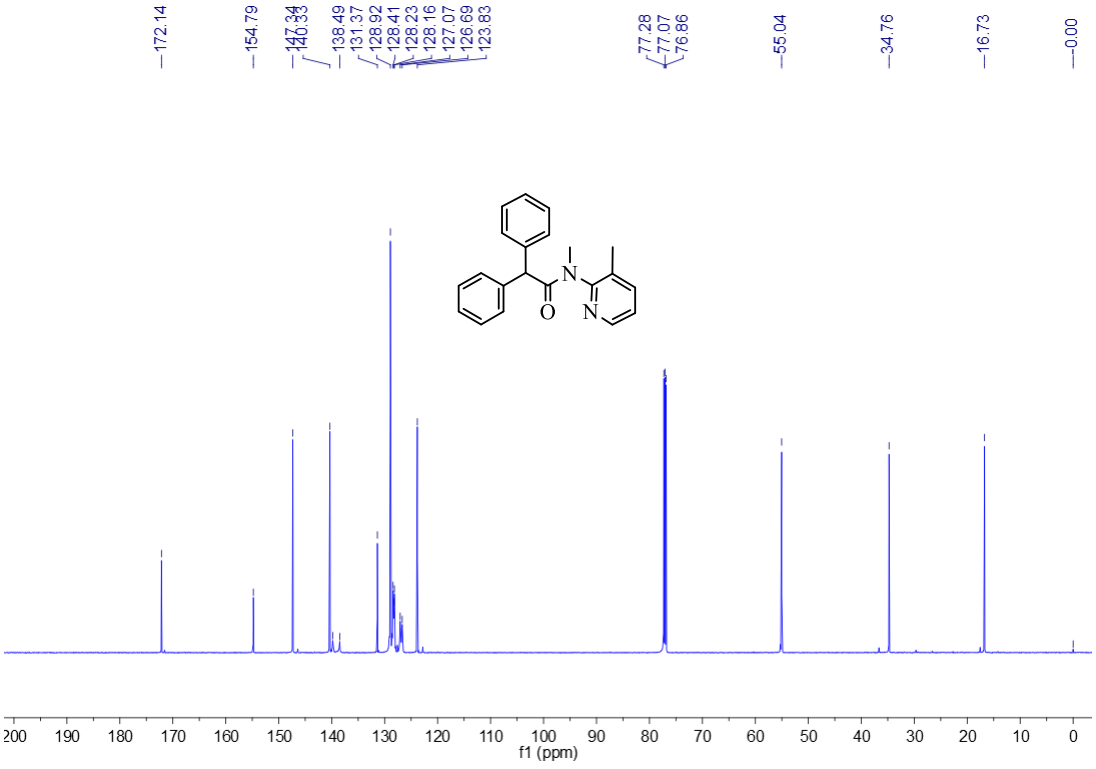
^{13}C NMR of N-(3-methylpyridin-2-yl)-2,2-diphenylacetamide **1y**



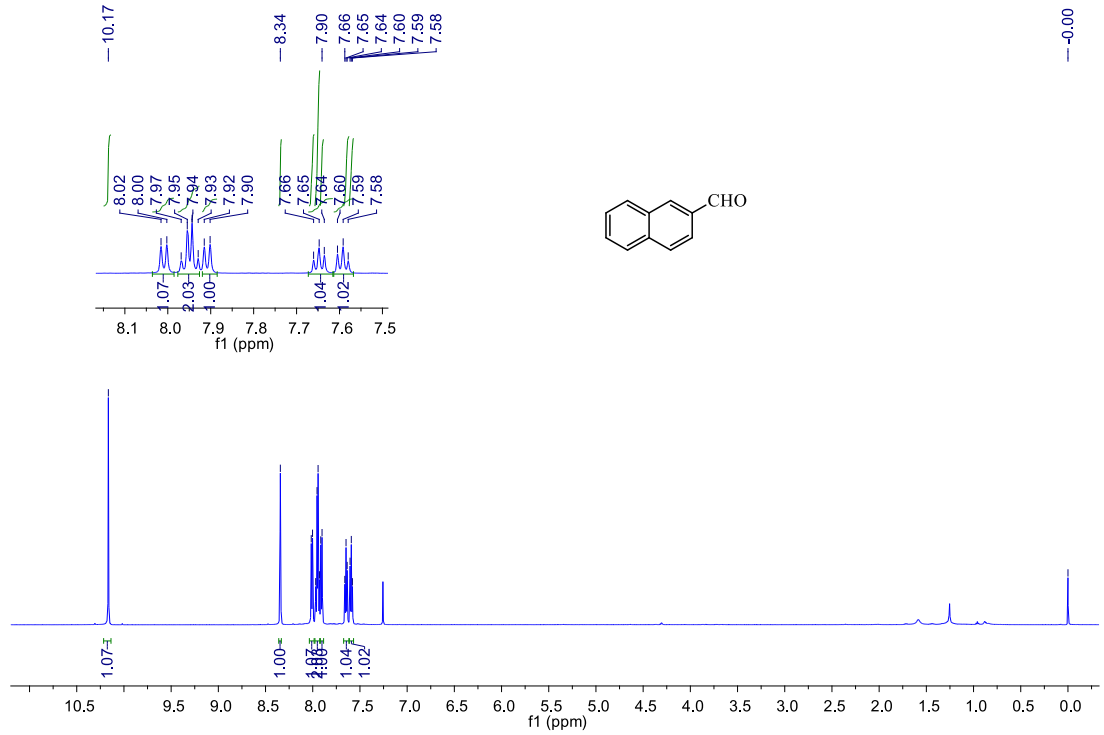
^{1}H NMR of N-methyl-N-(3-methylpyridin-2-yl)-2,2-diphenylacetamide **1z**



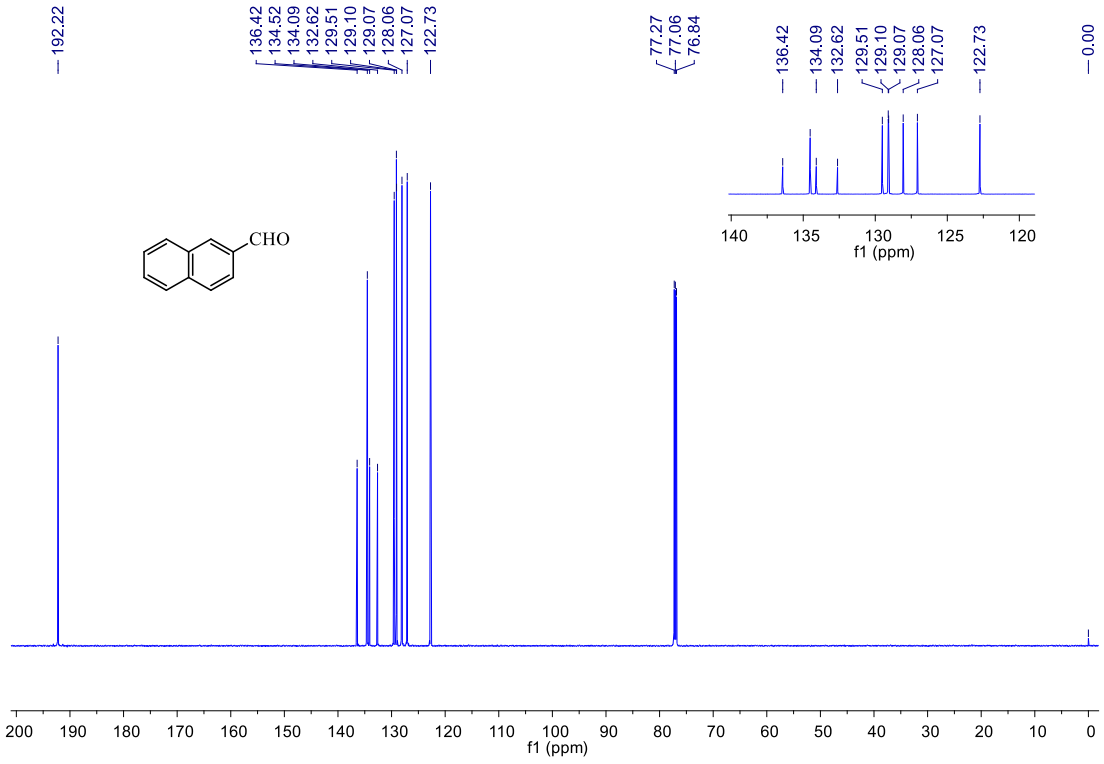
^{13}C NMR of N-methyl-N-(3-methylpyridin-2-yl)-2,2-diphenylacetamide **1z**



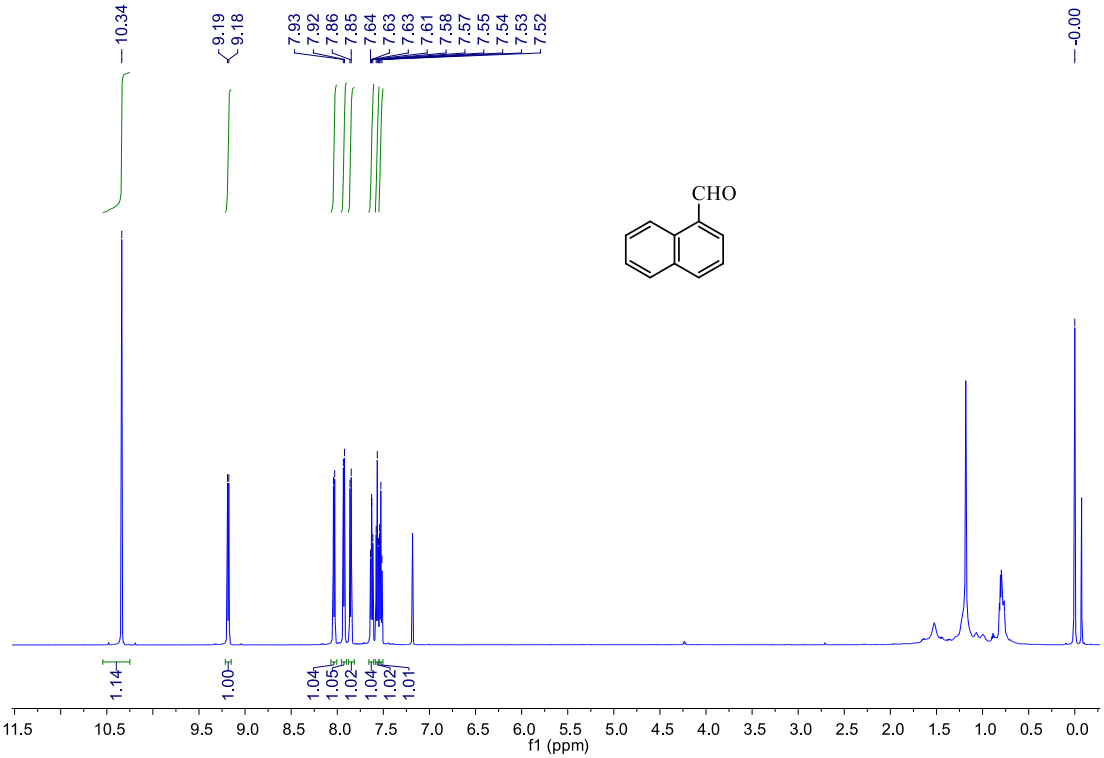
^{1}H NMR of 2-naphthaldehyde **2a**



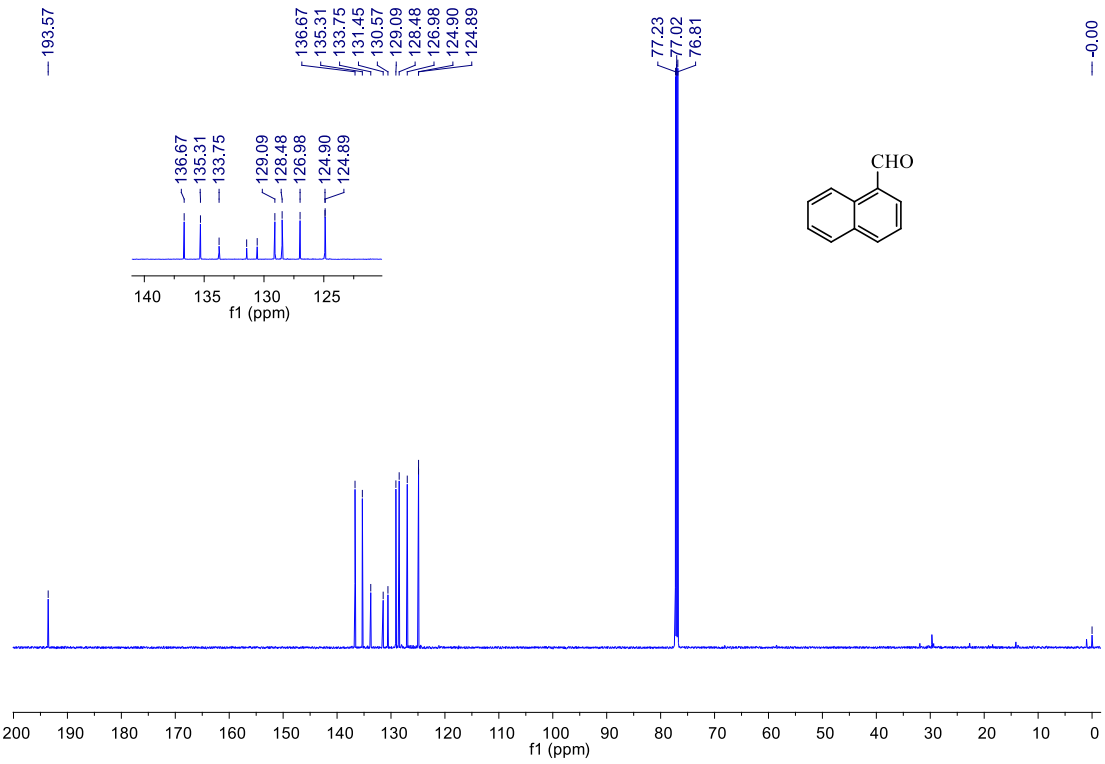
^{13}C NMR of 2-naphthaldehyde **2a**



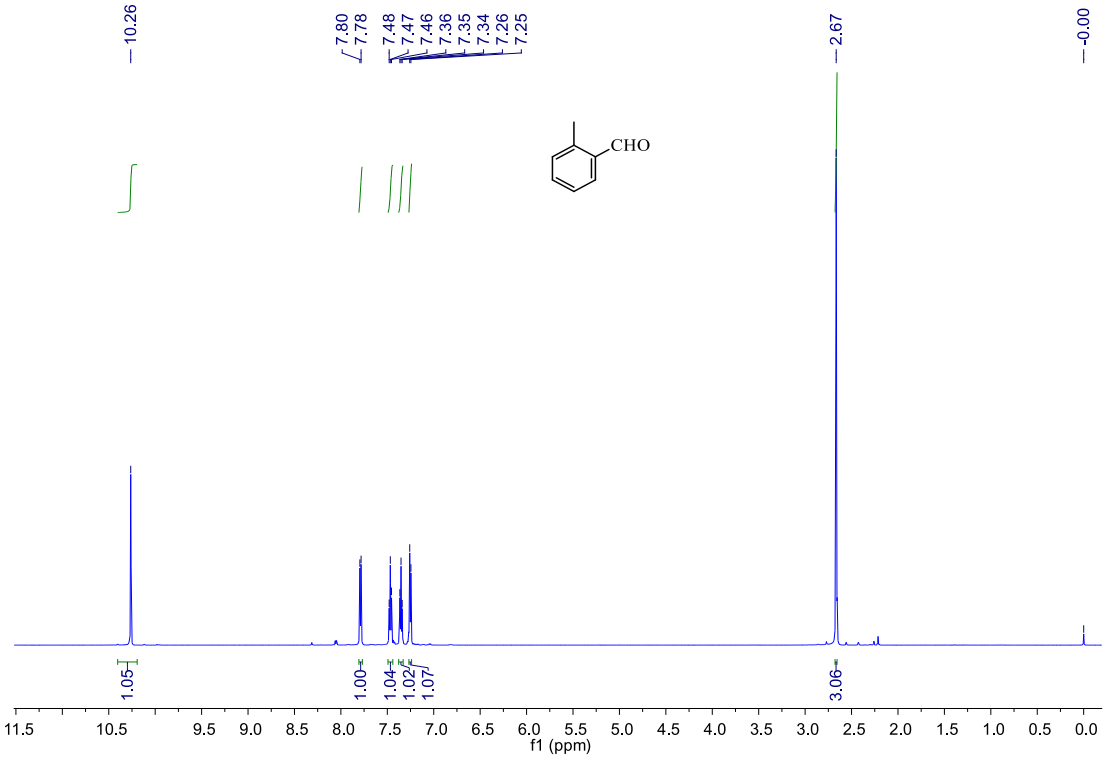
^{1}H NMR of 1-naphthaldehyde **2b**



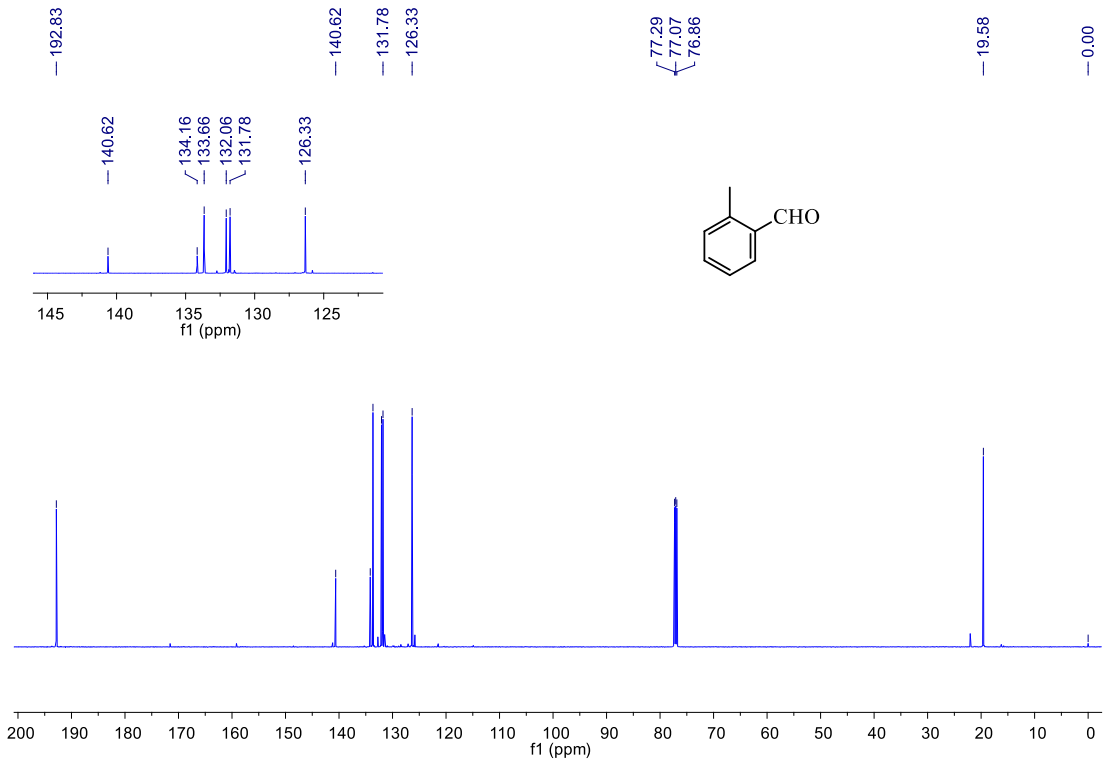
^{13}C NMR of 1-naphthaldehyde **2b**



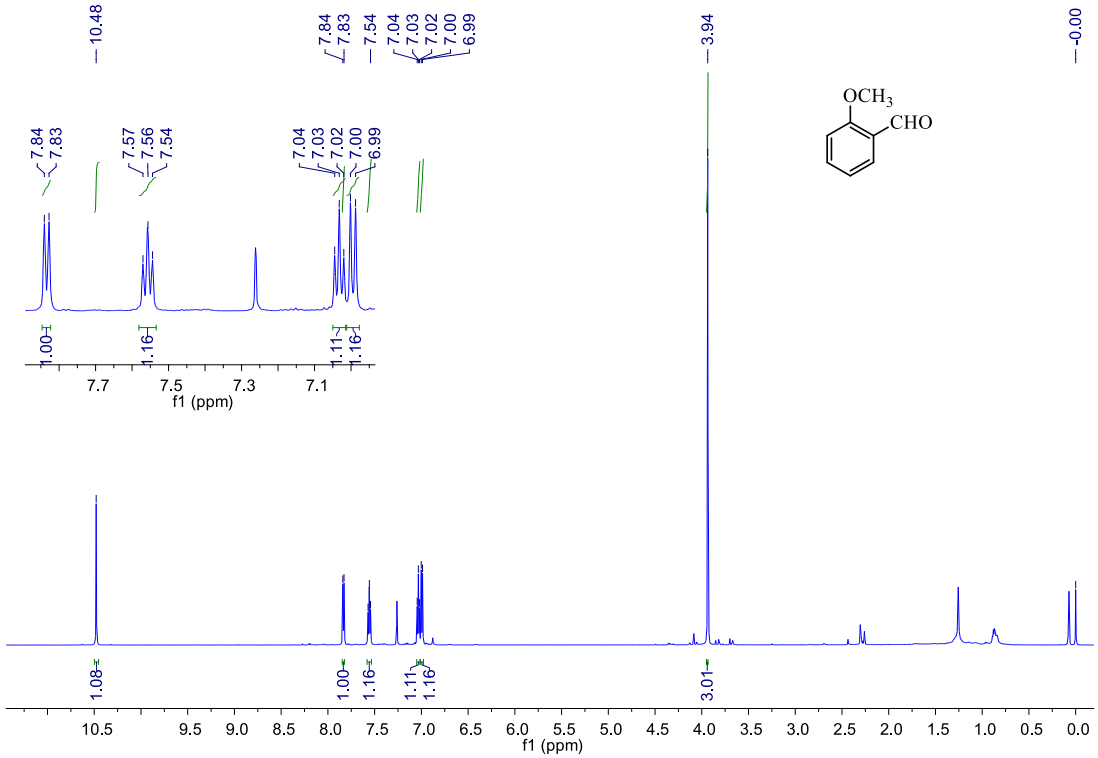
^{1}H NMR of 2-methylbenzaldehyde **2c**



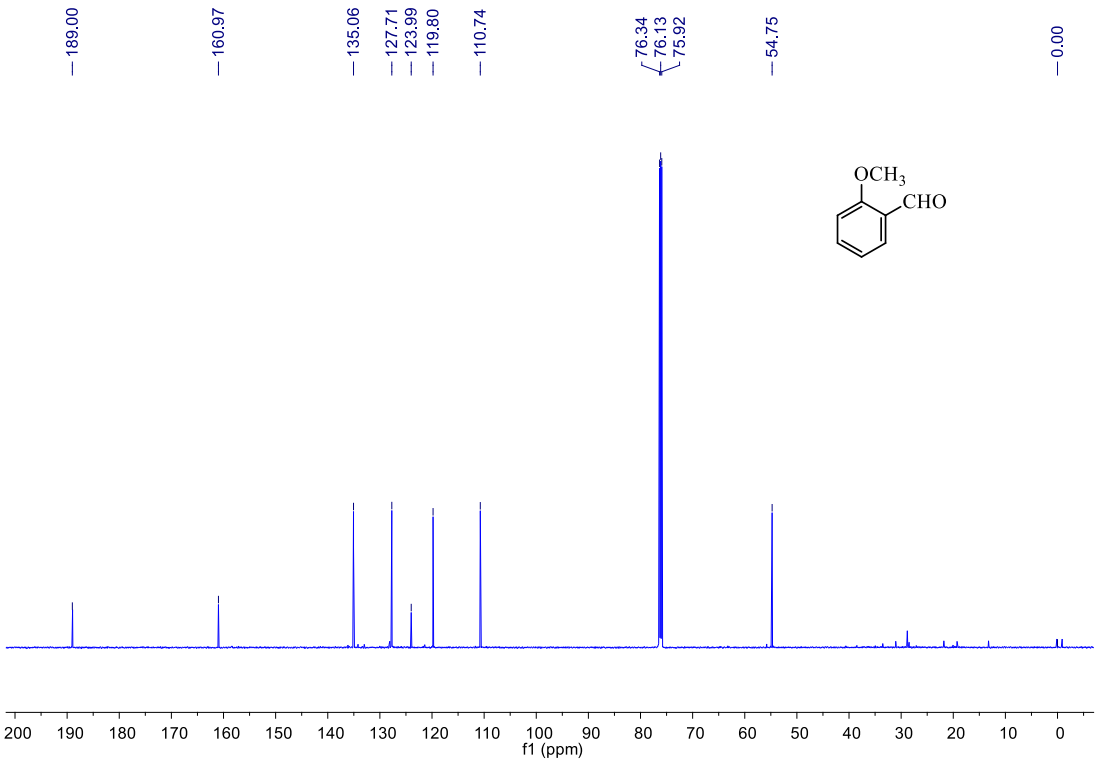
^{13}C NMR of 2-methylbenzaldehyde **2c**



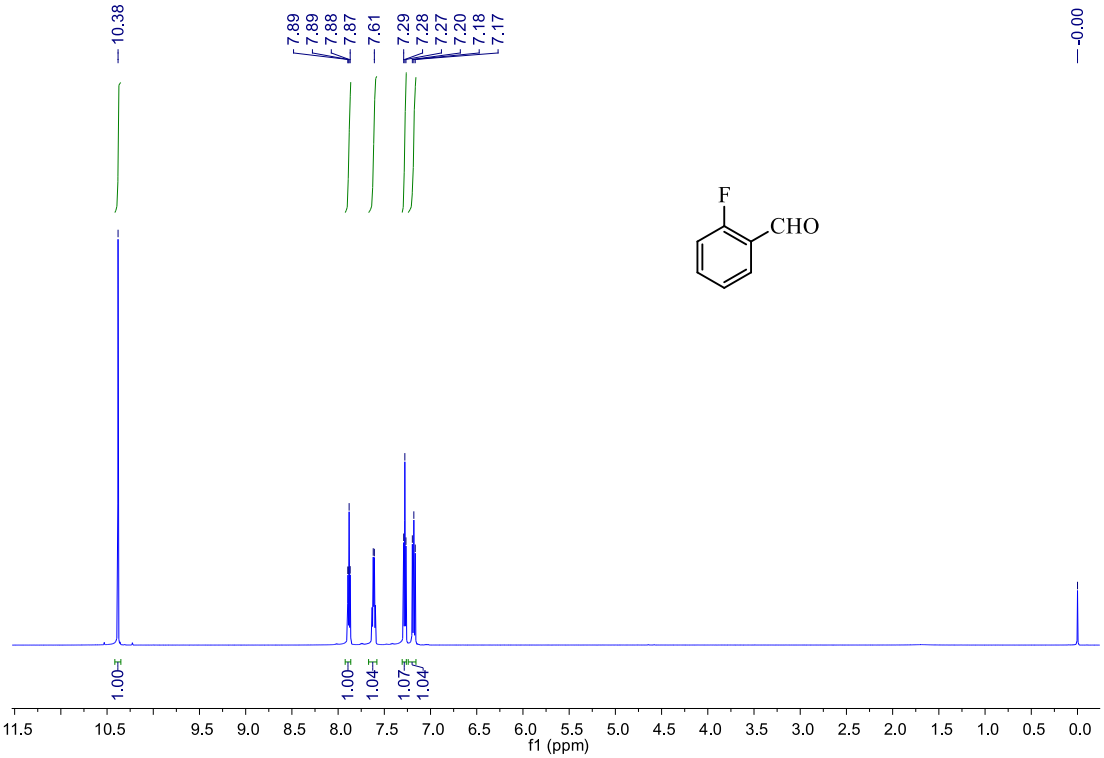
^{1}H NMR of 2-methoxybenzaldehyde **2d**



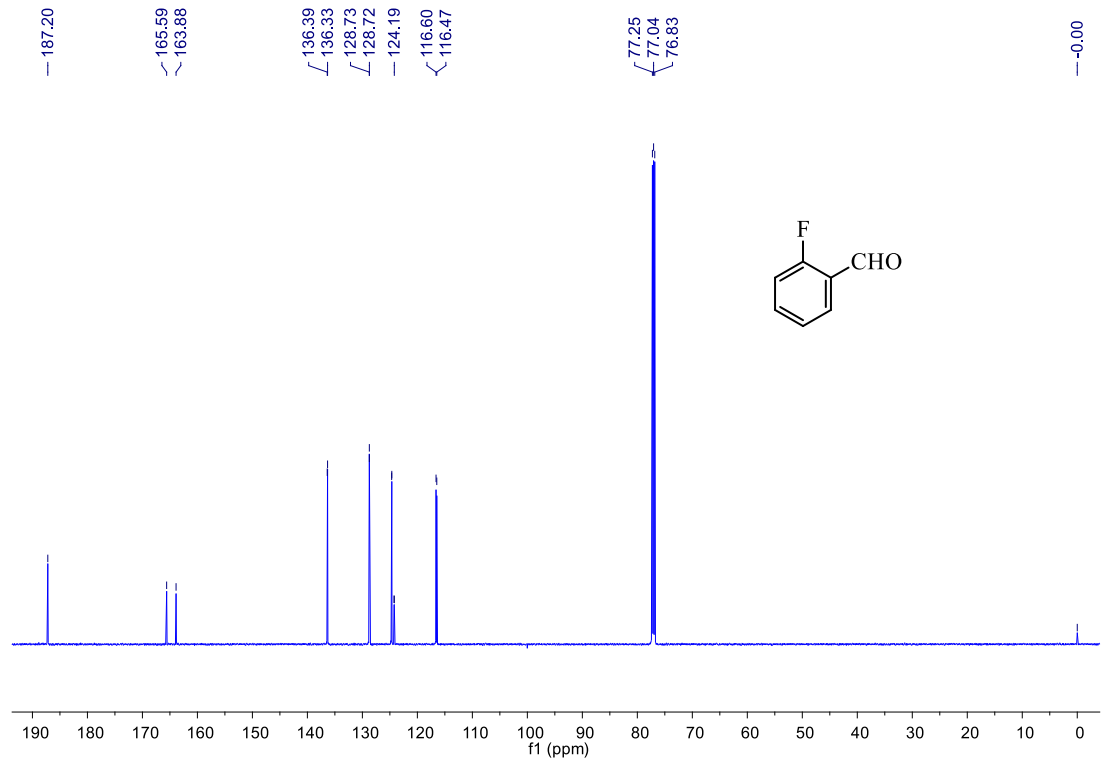
^{13}C NMR of 2-methoxybenzaldehyde **2d**



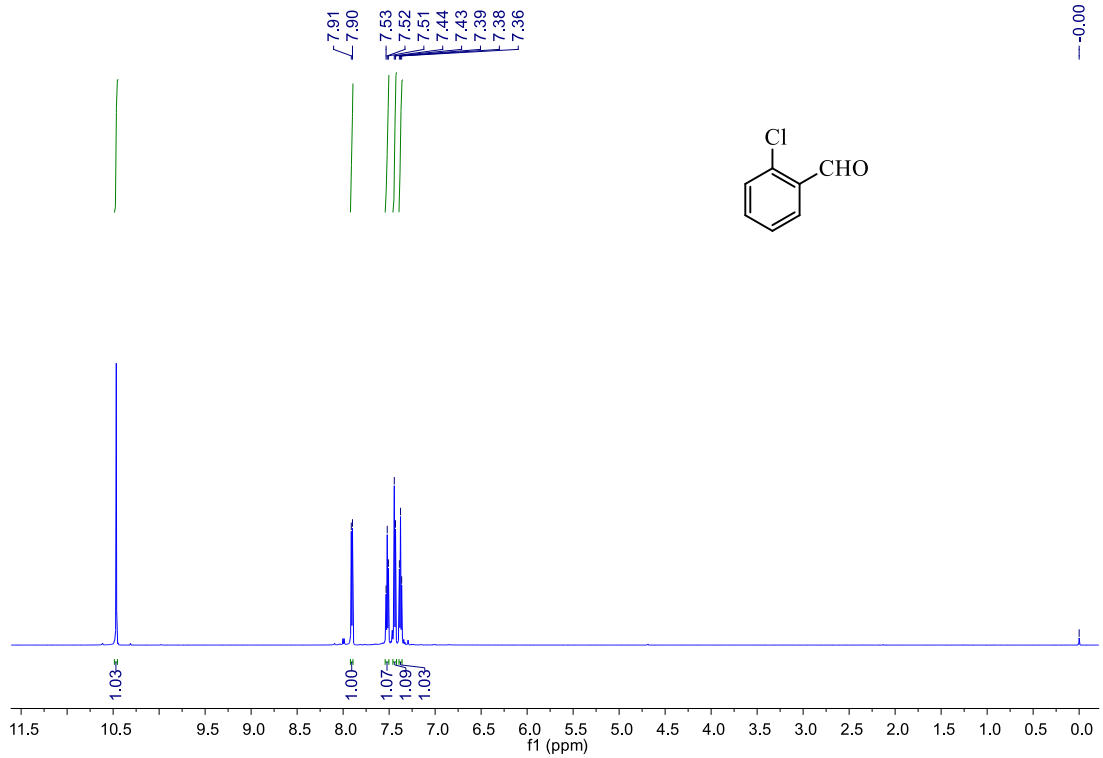
^{1}H NMR of 2-fluorobenzaldehyde **2e**



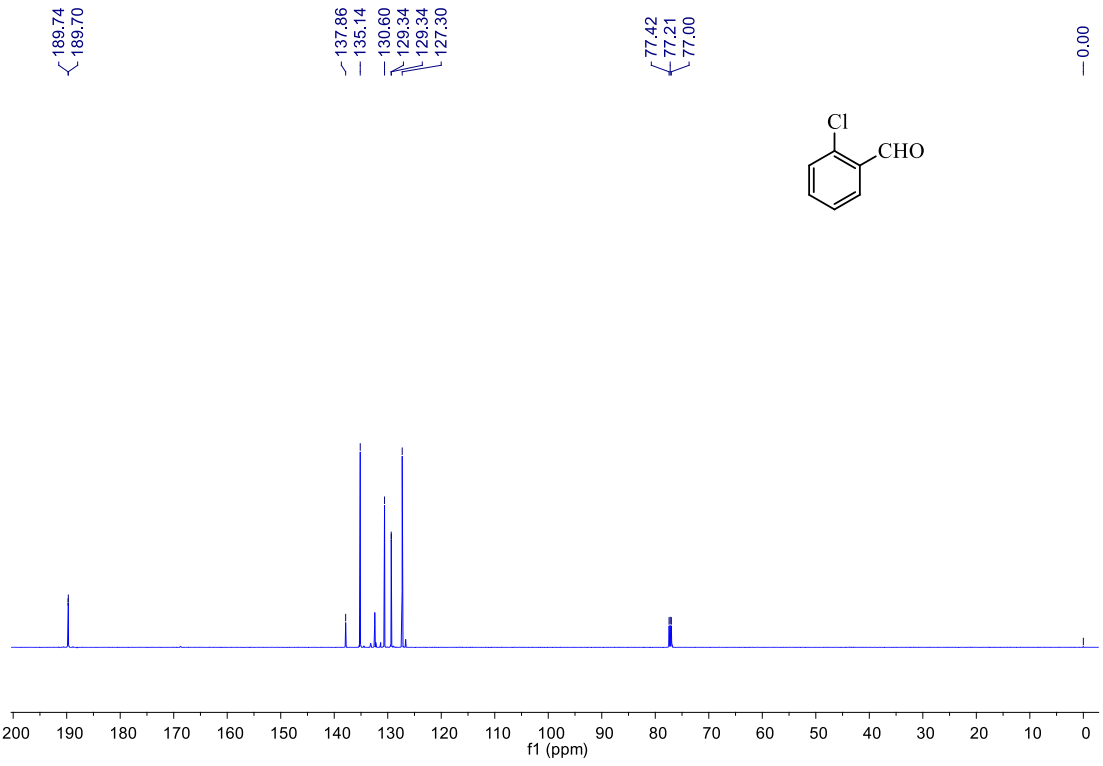
^{13}C NMR of 2-fluorobenzaldehyde **2e**



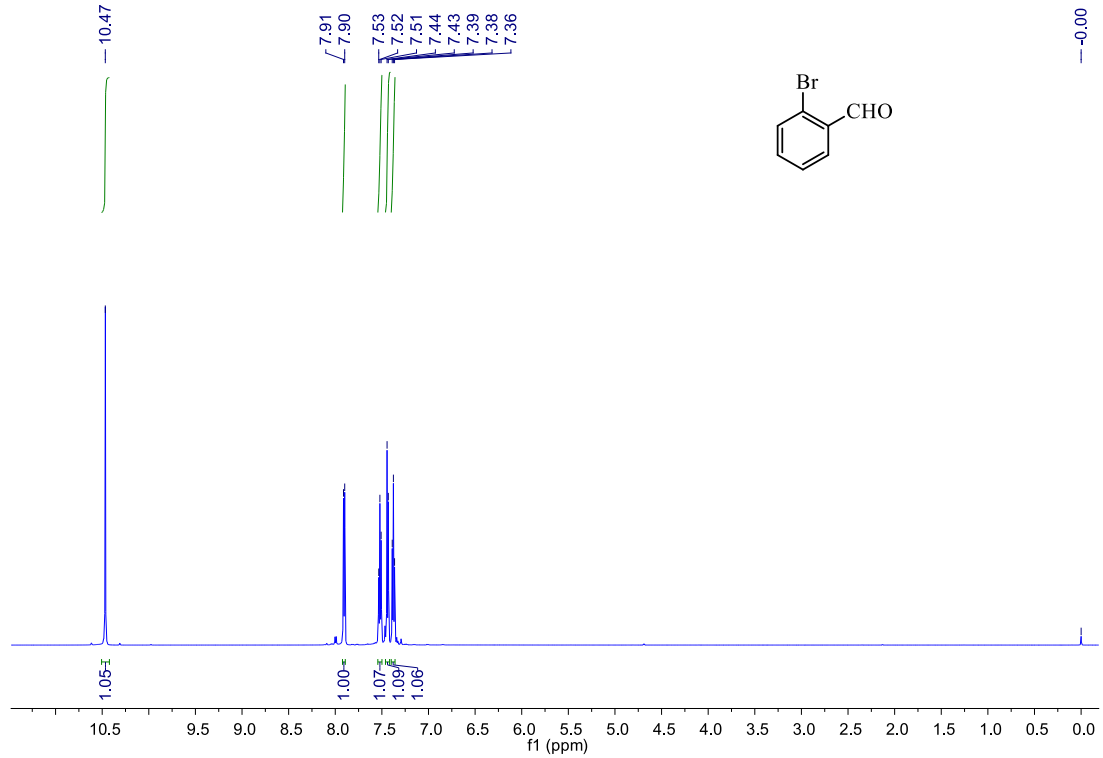
^{1}H NMR of 2-chlorobenzaldehyde **2f**



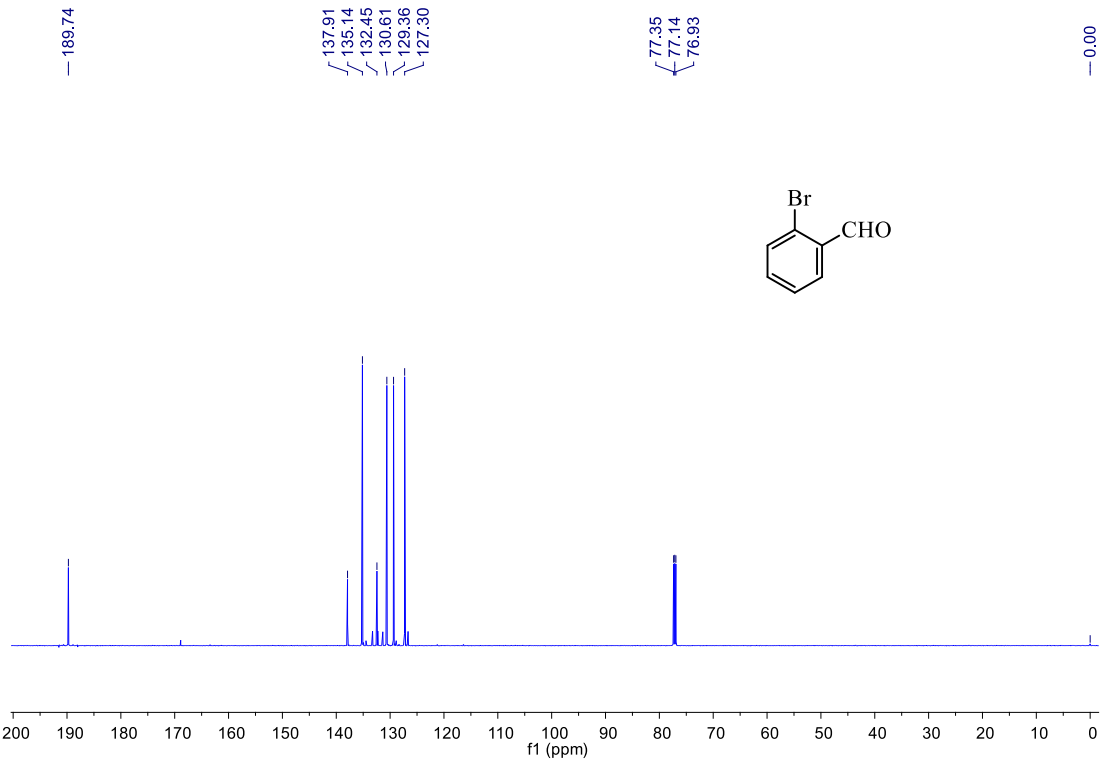
^{13}C NMR of 2-chlorobenzaldehyde **2f**



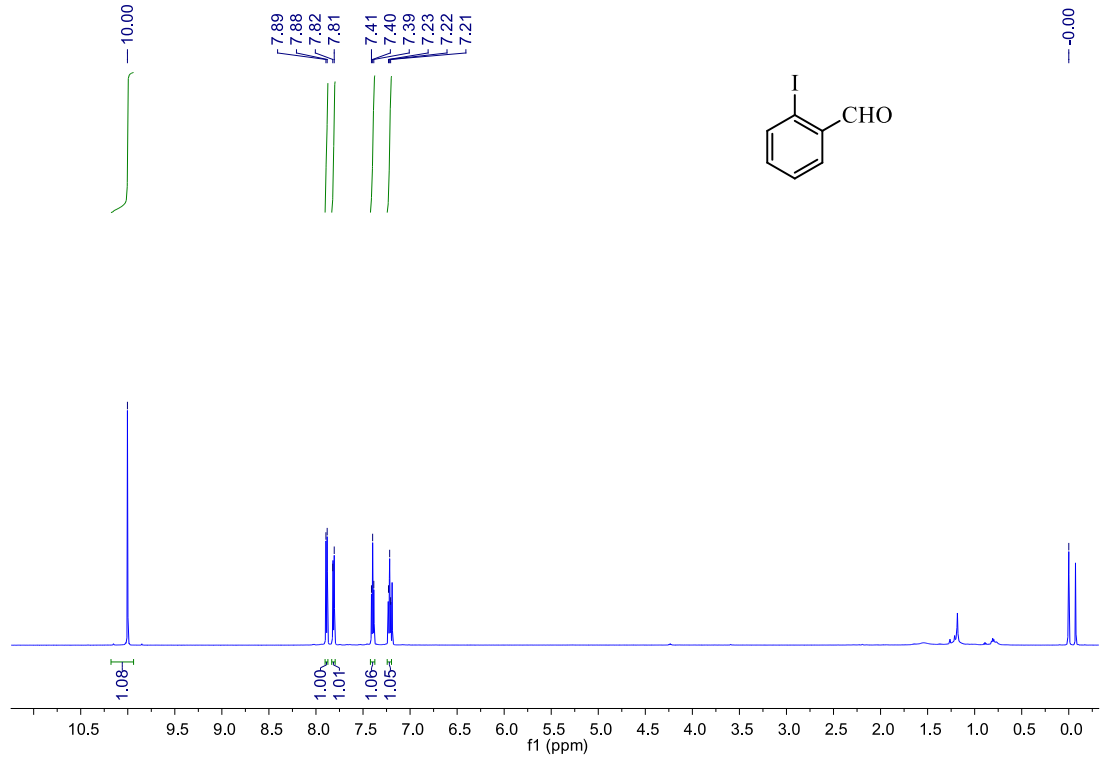
^{1}H NMR of 2-bromobenzaldehyde **2g**



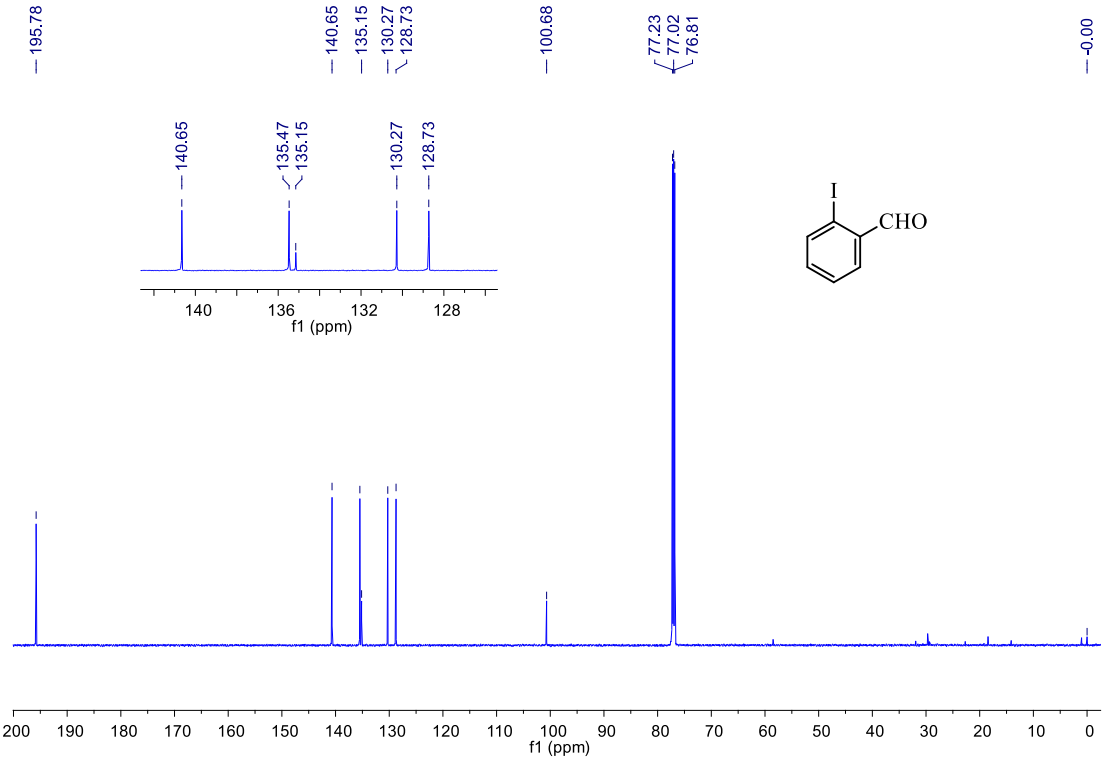
^{13}C NMR of 2-bromobenzaldehyde **2g**



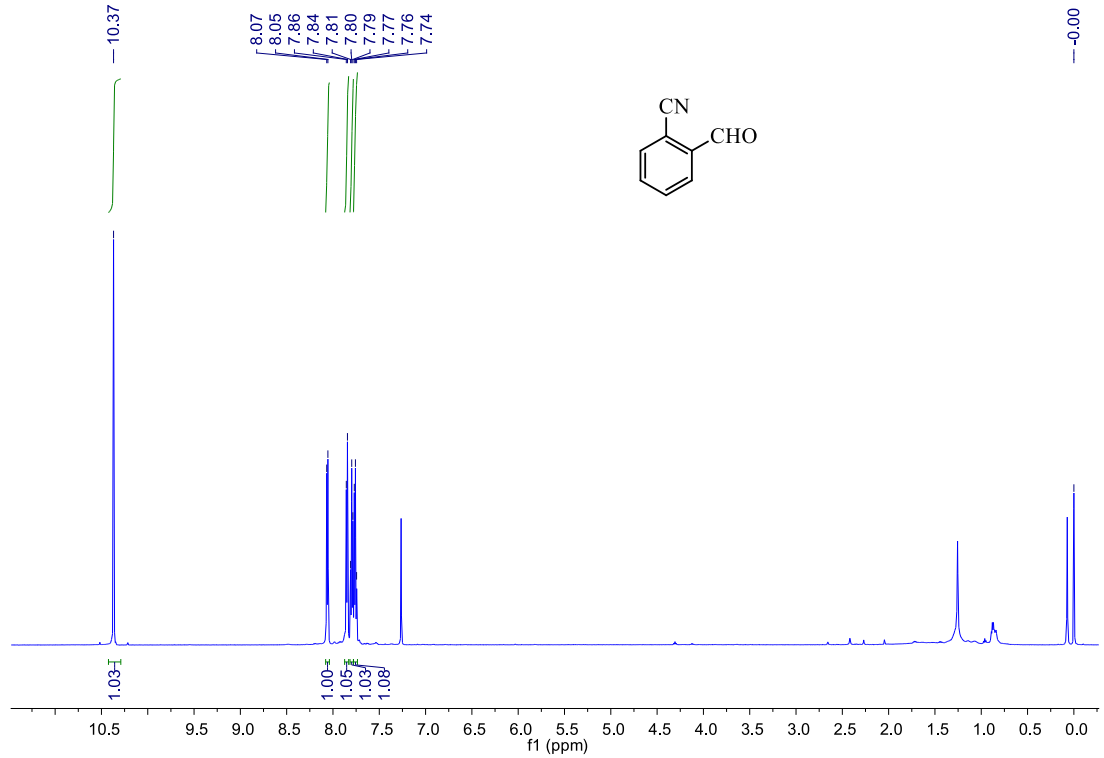
^{1}H NMR of 2-iodobenzaldehyde **2h**



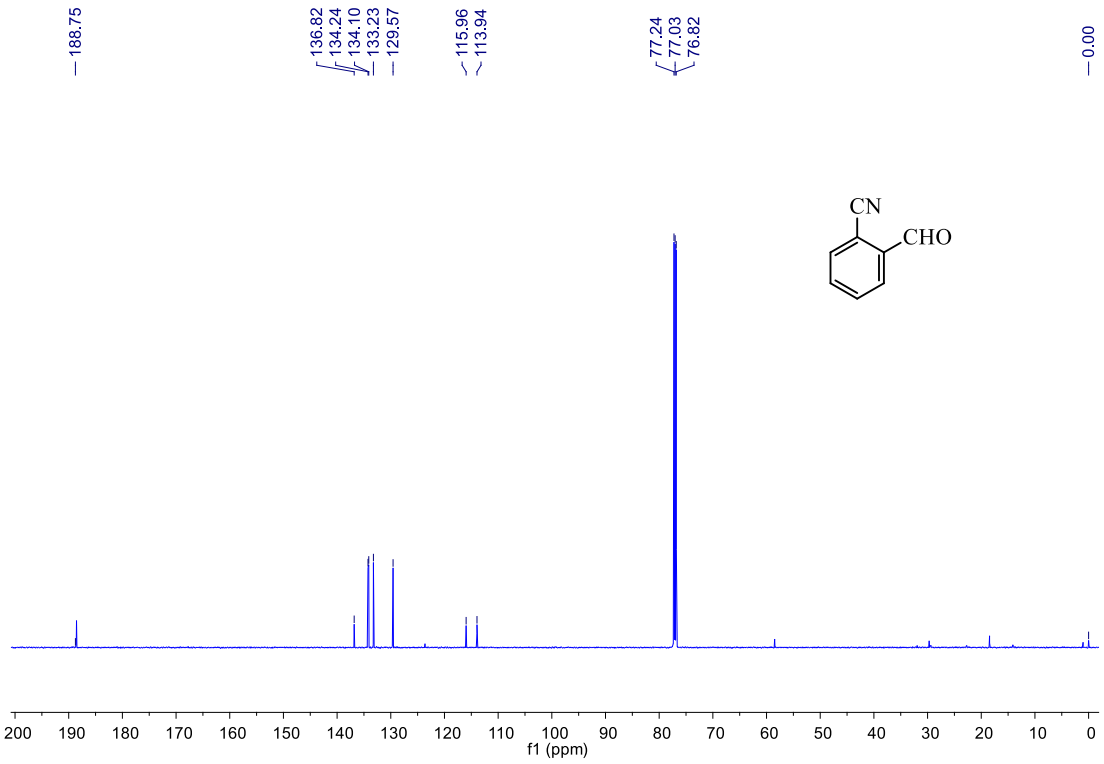
^{13}C NMR of 2-iodobenzaldehyde **2h**



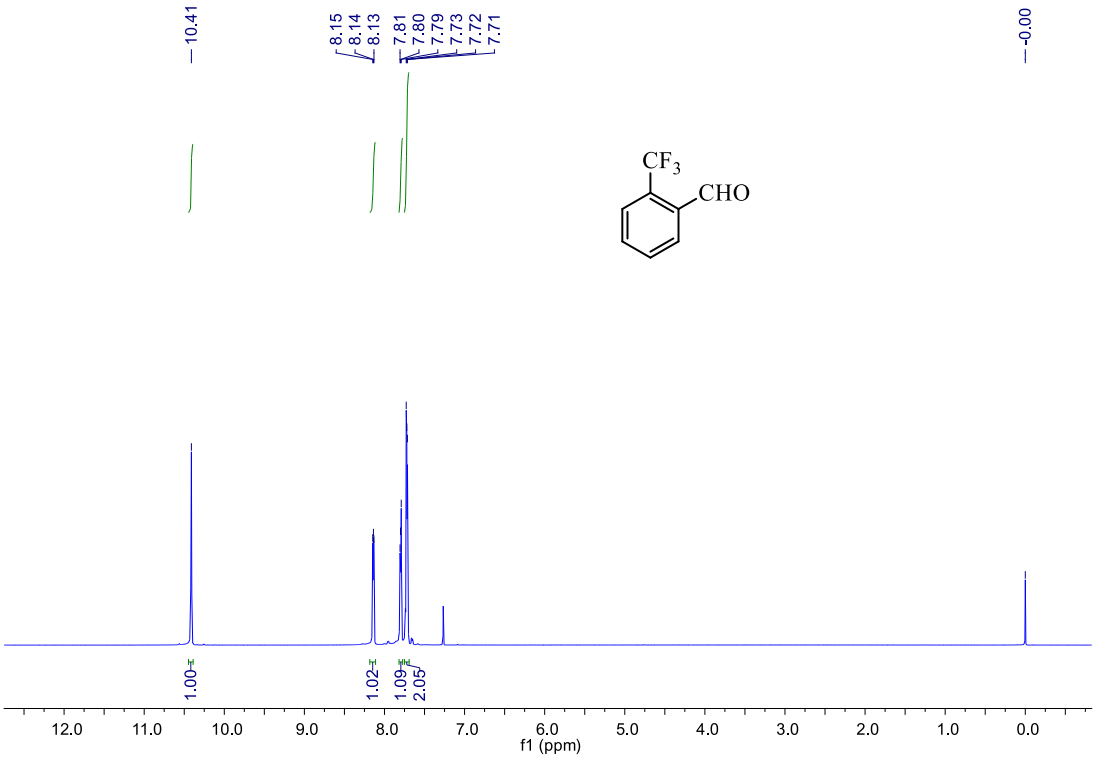
^{1}H NMR of 2-Cyanobenzaldehyde **2i**



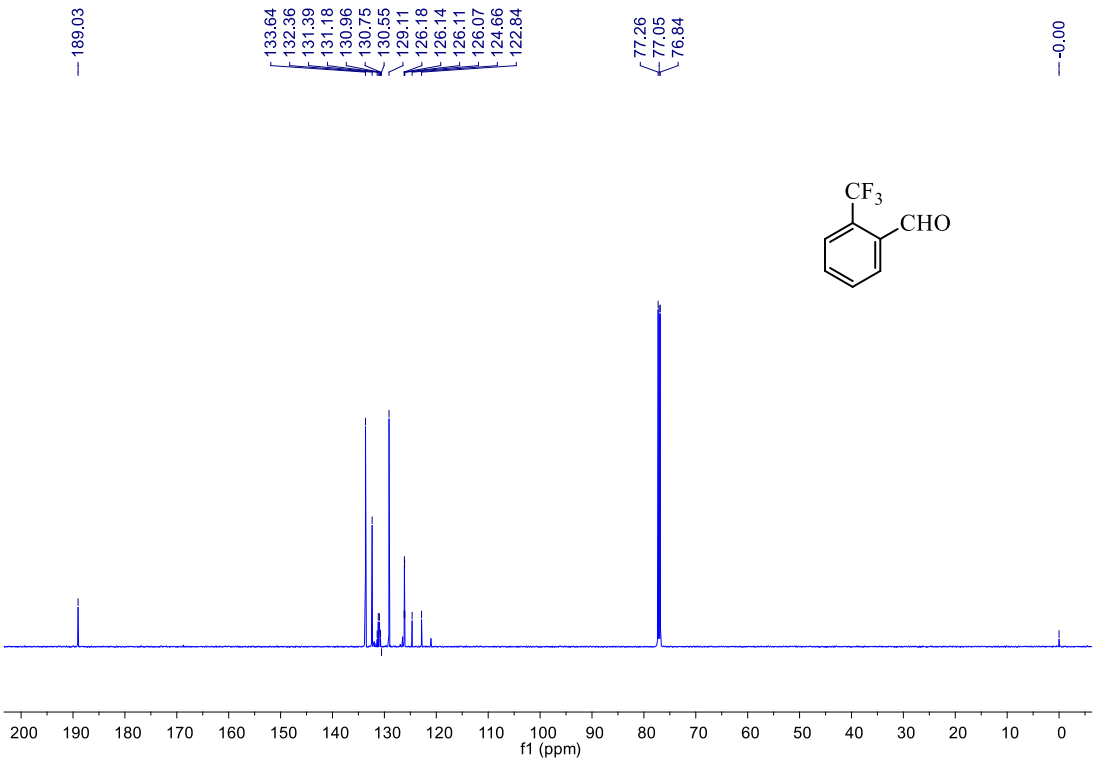
^{13}C NMR of 2-Cyanobenzaldehyde **2i**



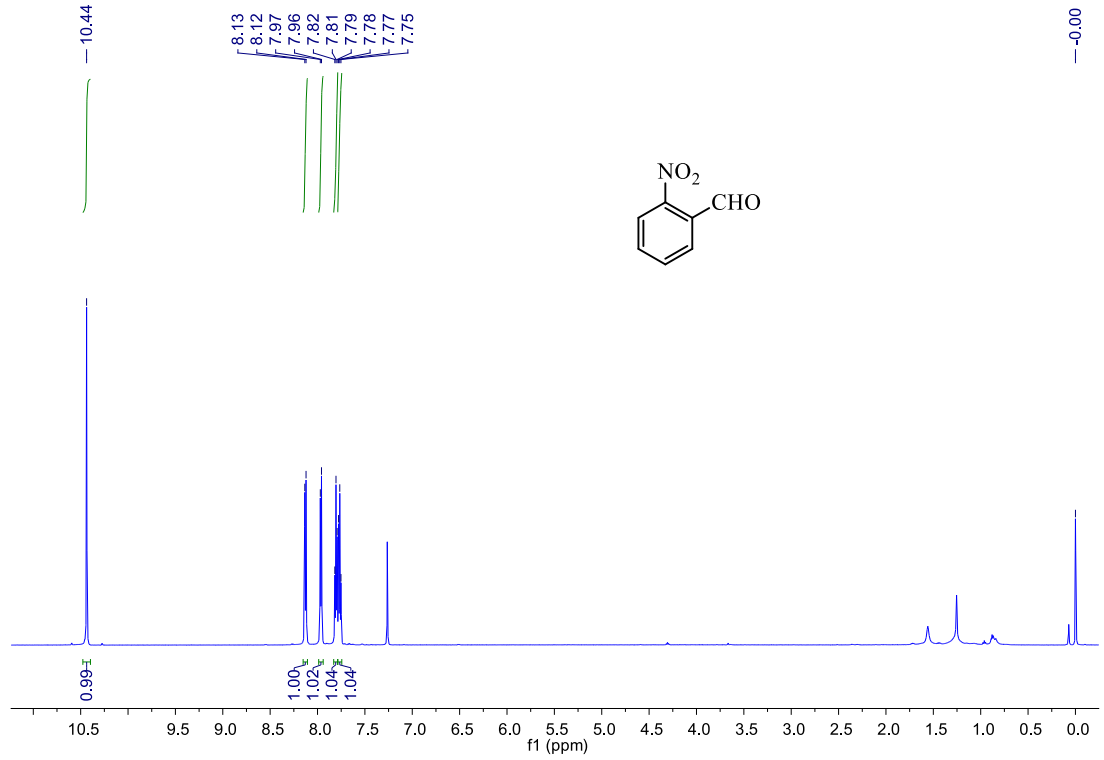
^{1}H NMR of 2-(trifluoromethyl)benzaldehyde **2j**



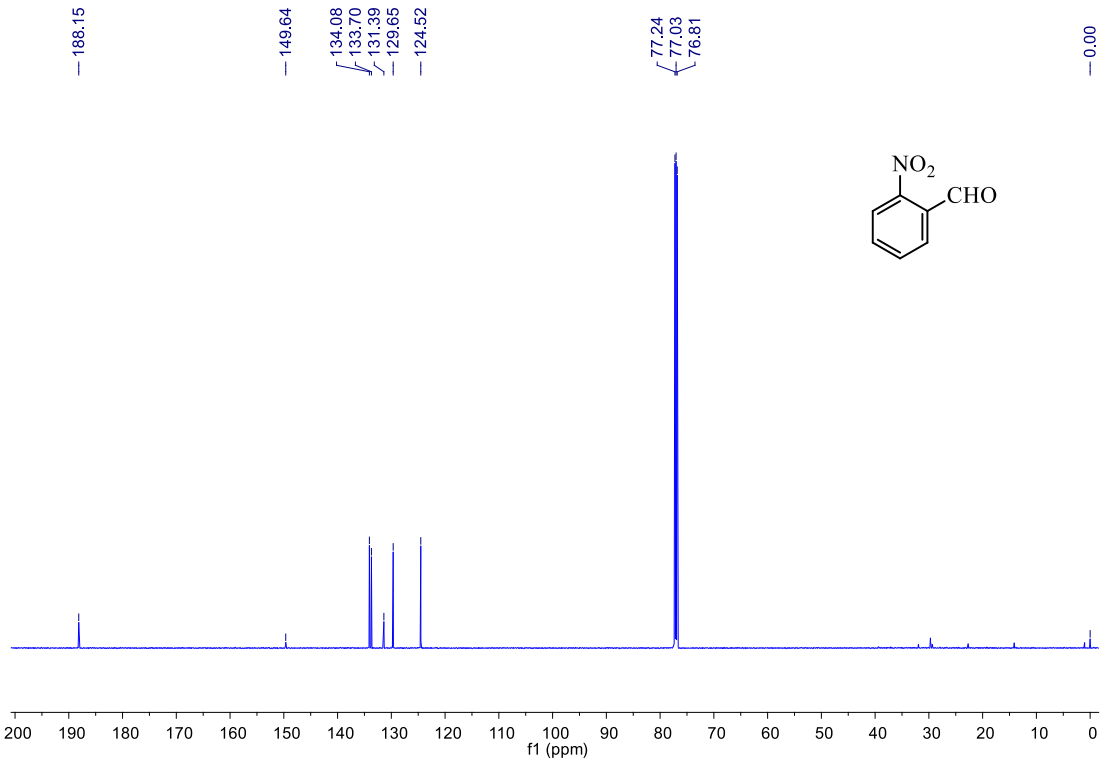
^{13}C NMR of 2-(trifluoromethyl)benzaldehyde **2j**



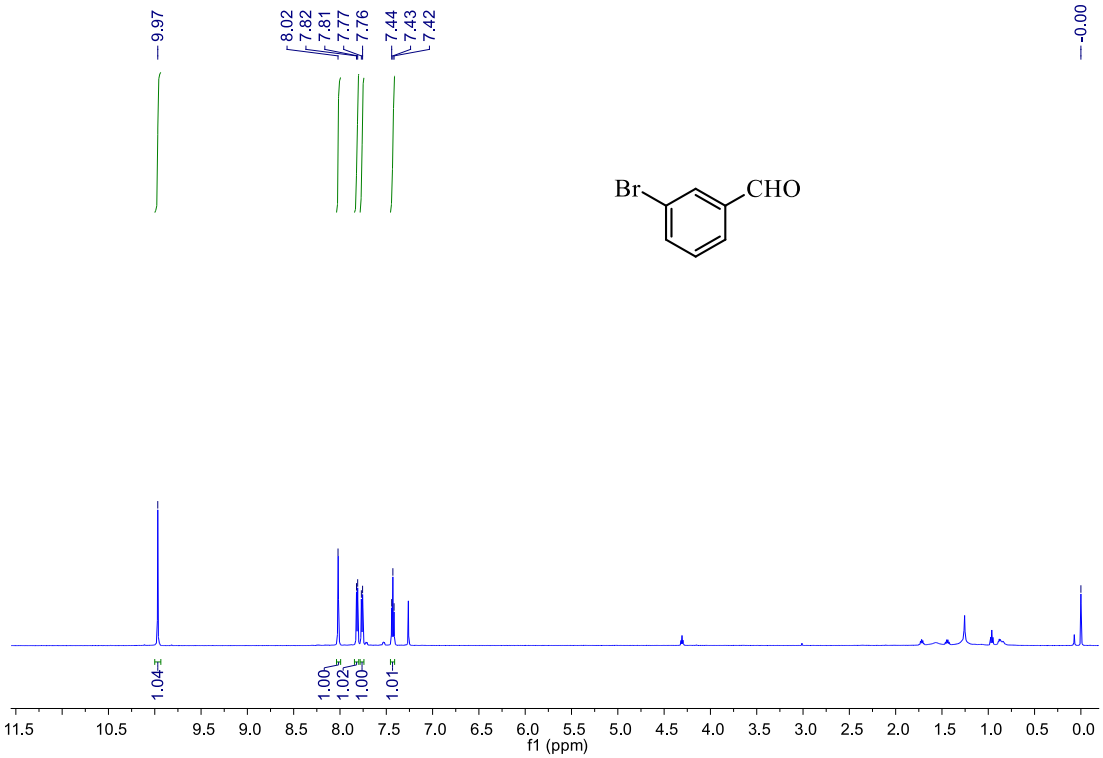
^{1}H NMR of 2-nitrobenzaldehyde **2k**



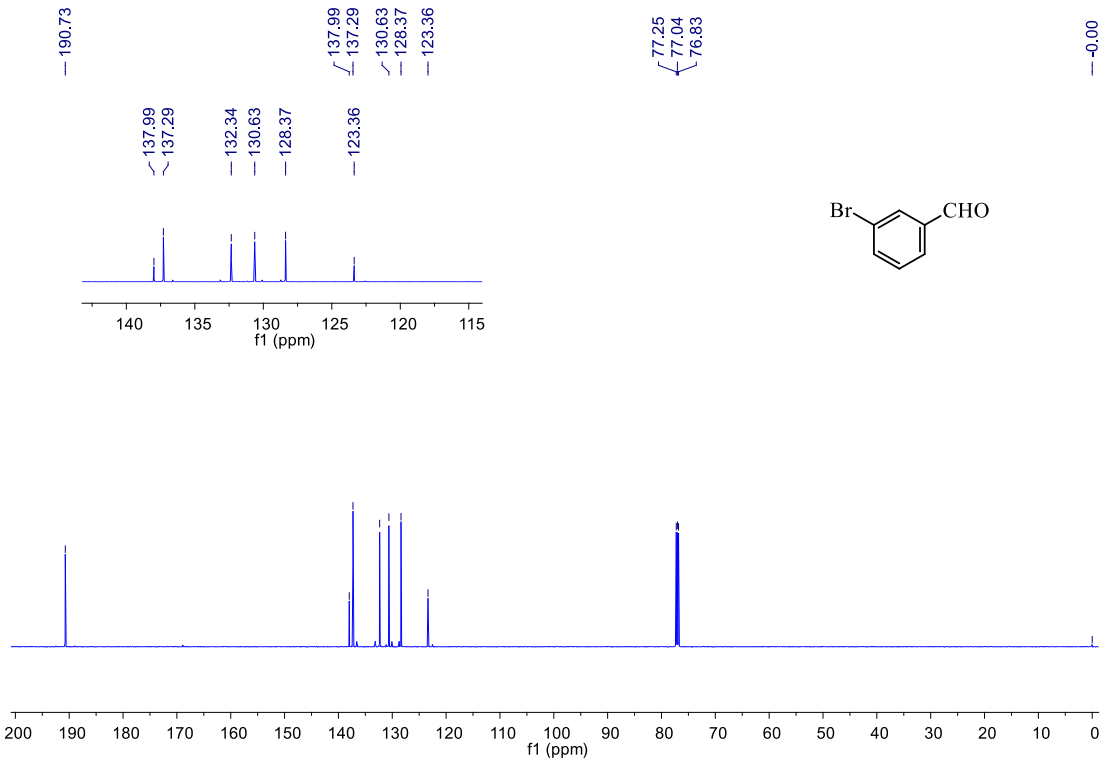
^{13}C NMR of 2-nitrobenzaldehyde **2k**



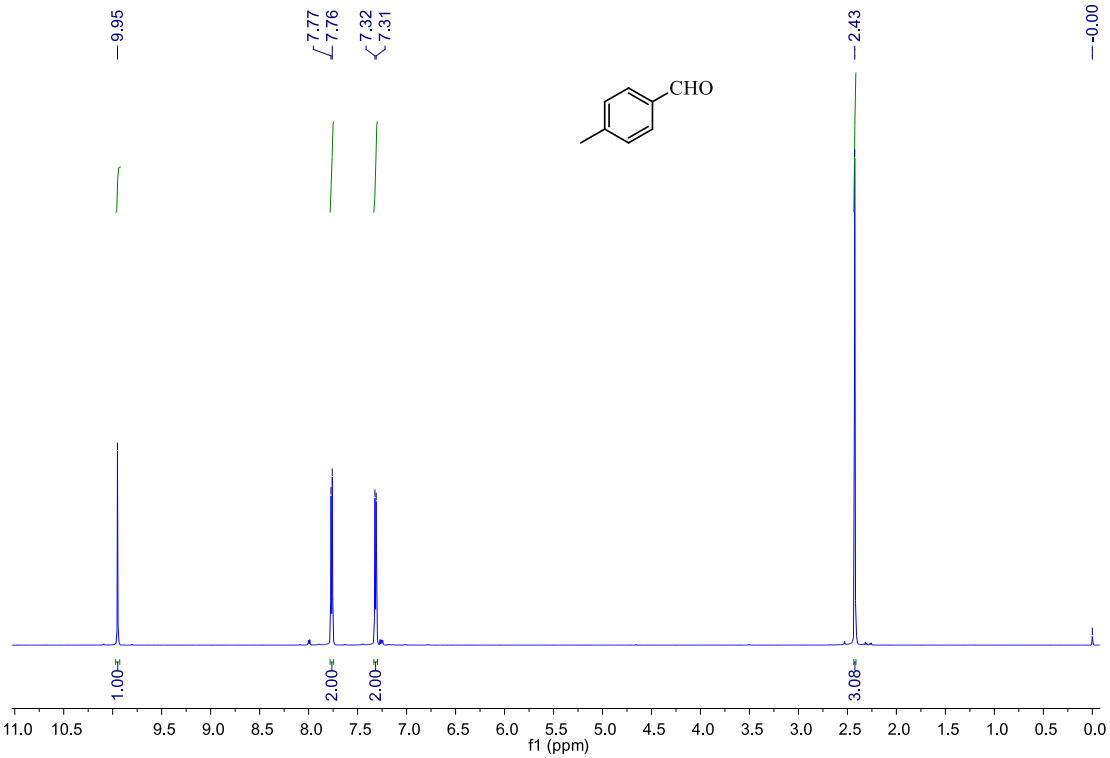
^{1}H NMR of 3-bromobenzaldehyde **2l**



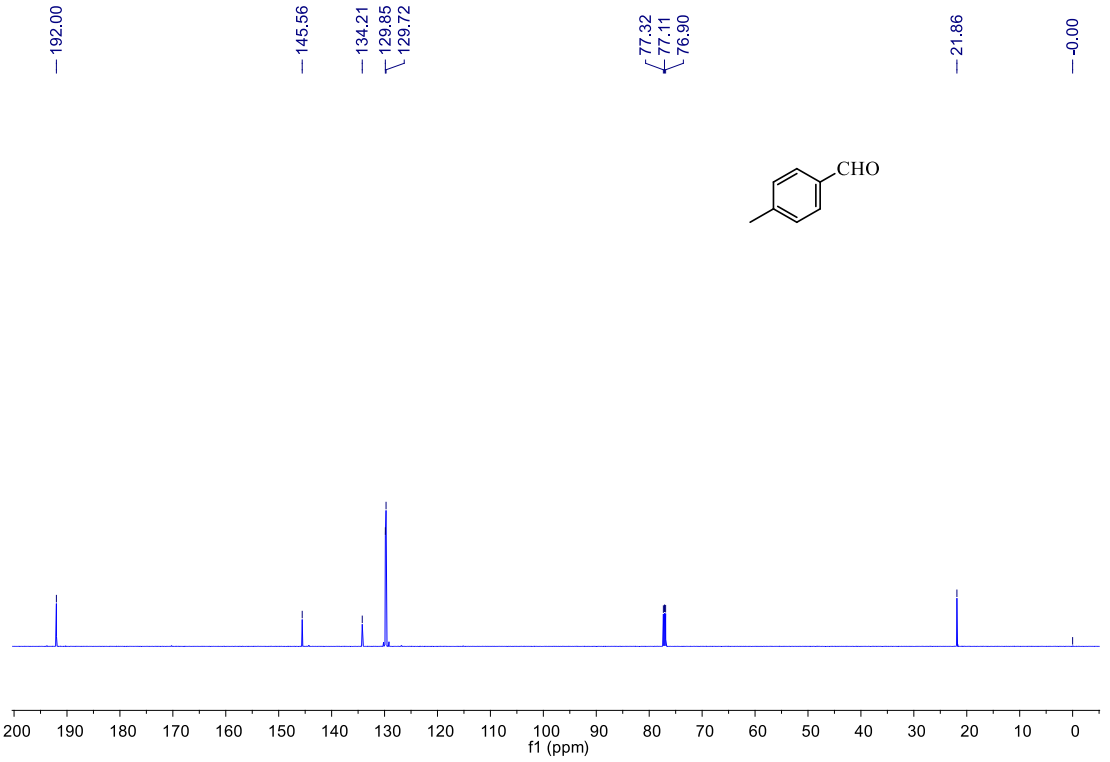
^{13}C NMR of 3-bromobenzaldehyde **2l**



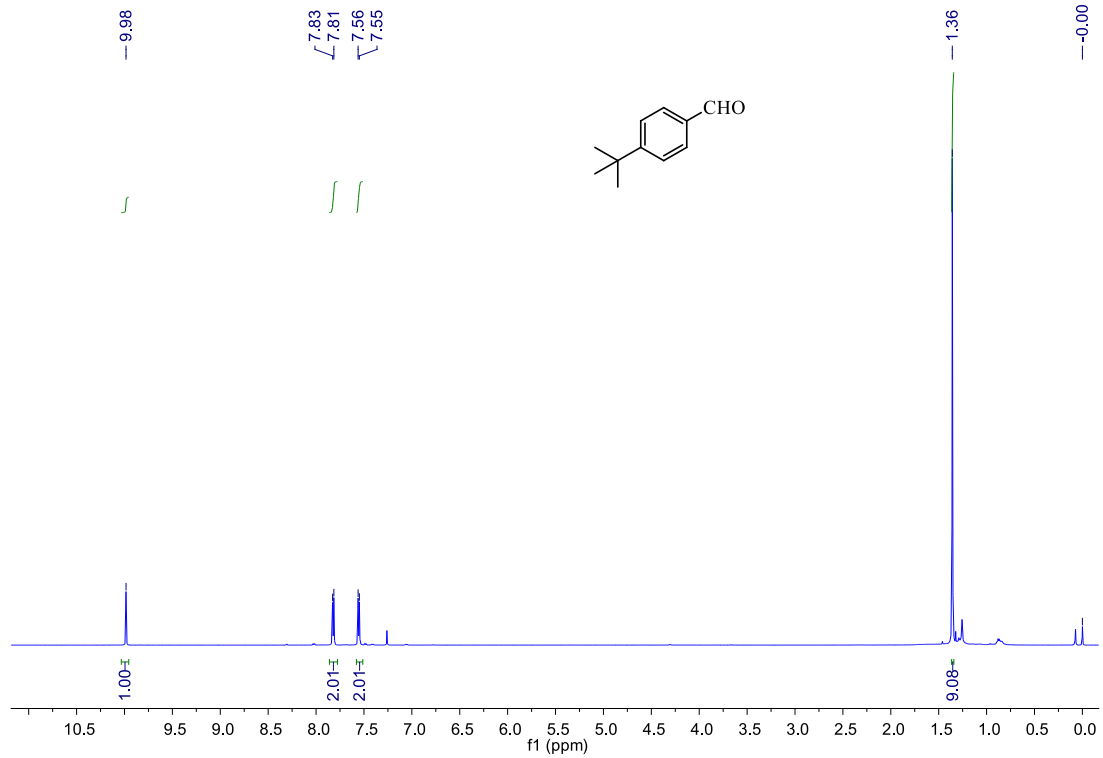
^{1}H NMR of 4-methylbenzaldehyde **2m**



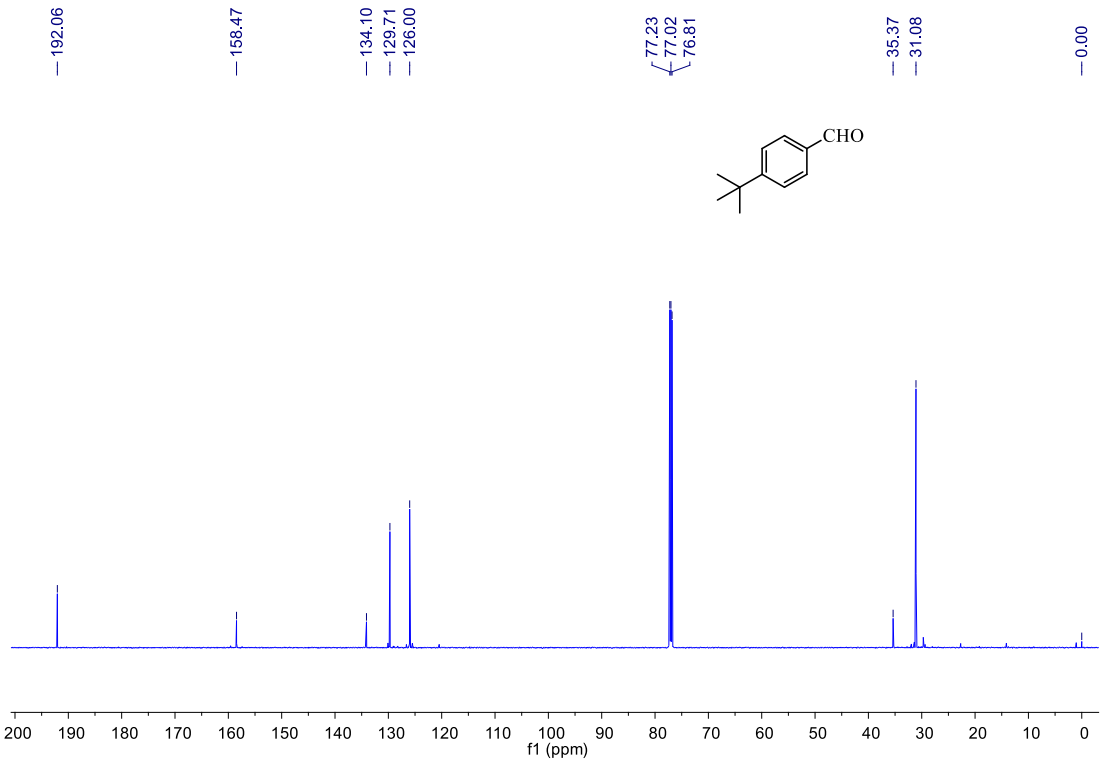
^{13}C NMR of 4-methylbenzaldehyde **2m**



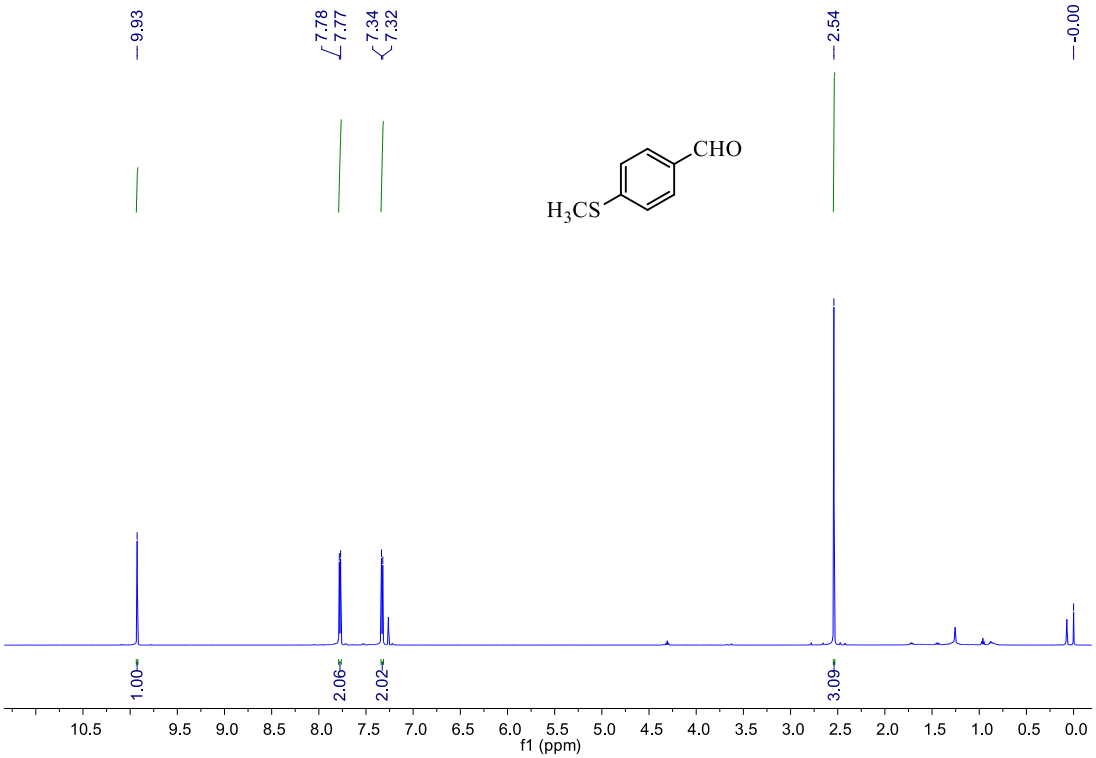
^{1}H NMR of 4-(tert-butyl)benzaldehyde **2n**



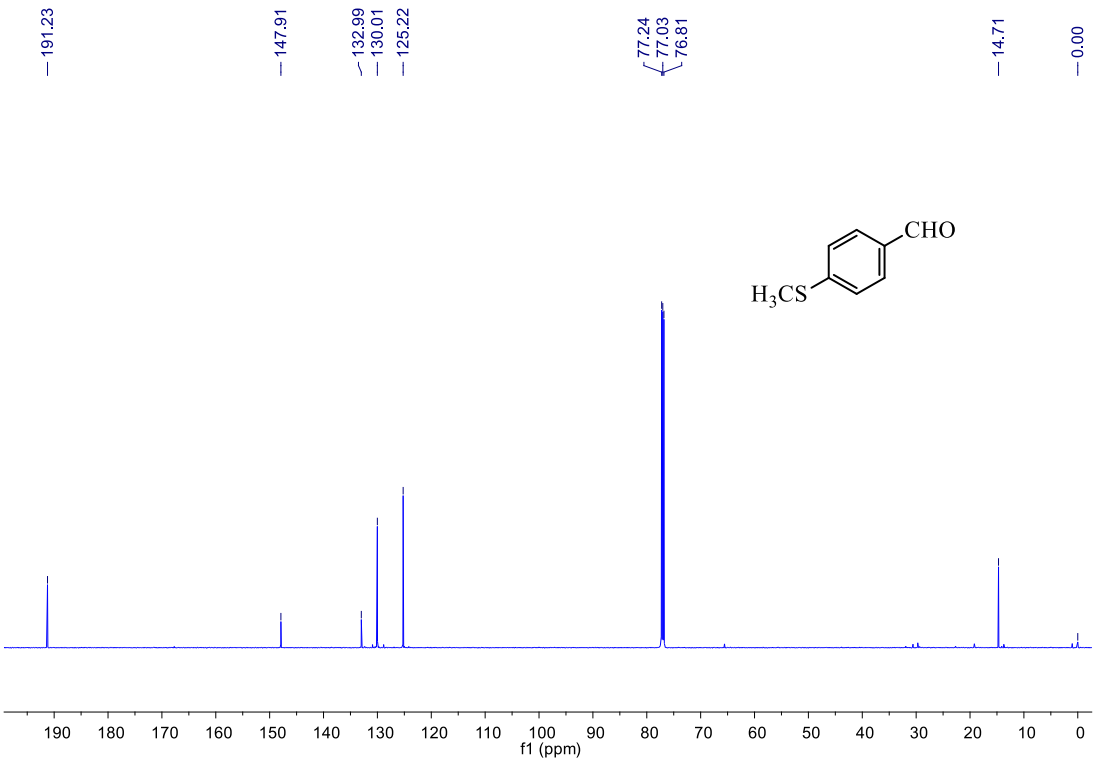
^{13}C NMR of 4-(tert-butyl)benzaldehyde **2n**



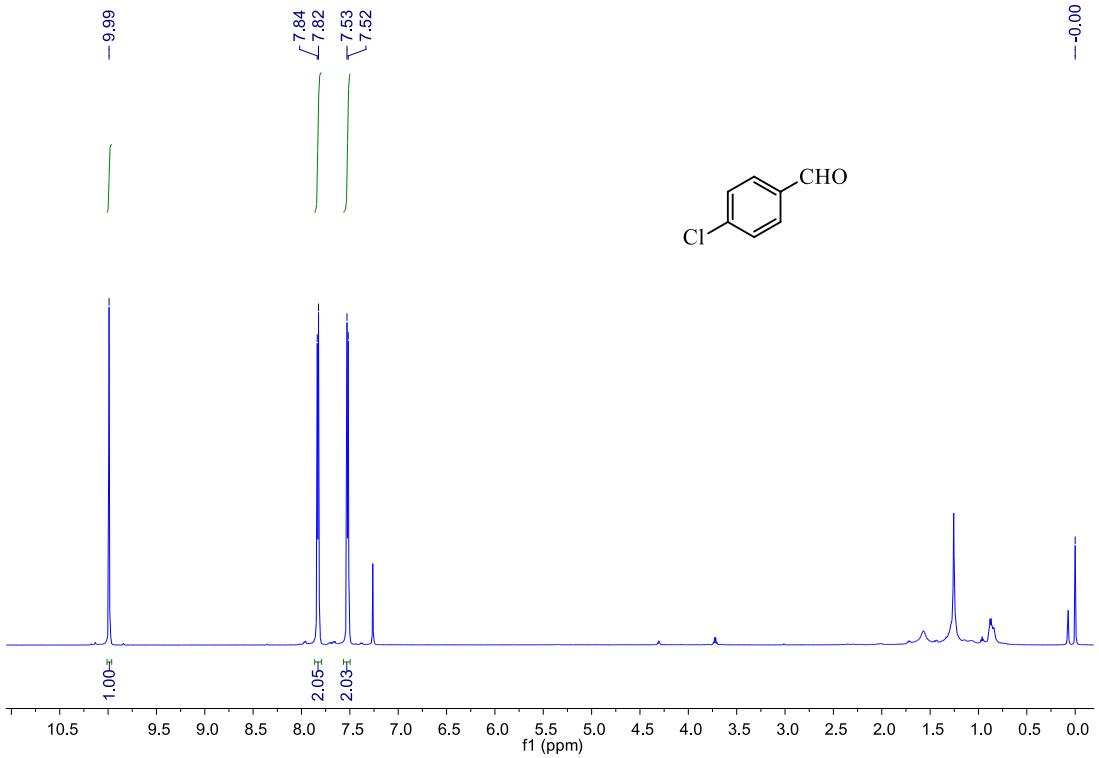
^{1}H NMR of 4-(methylthio)benzaldehyde **2o**



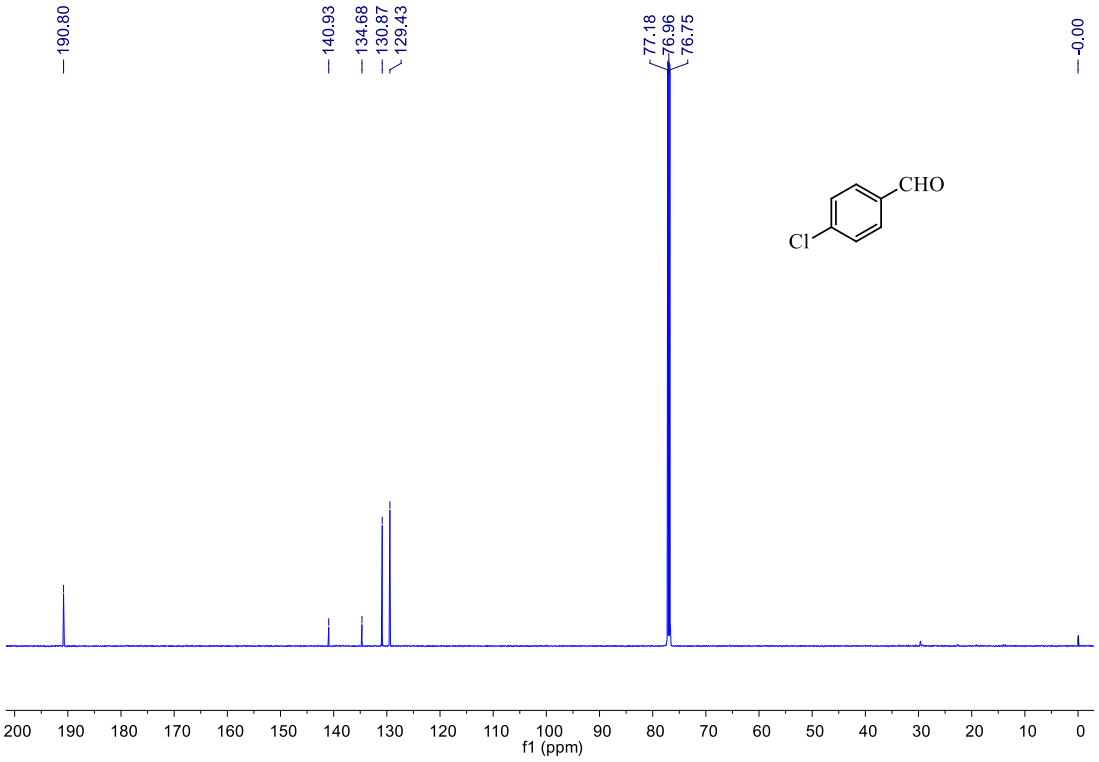
^{13}C NMR of 4-(methylthio)benzaldehyde **2o**



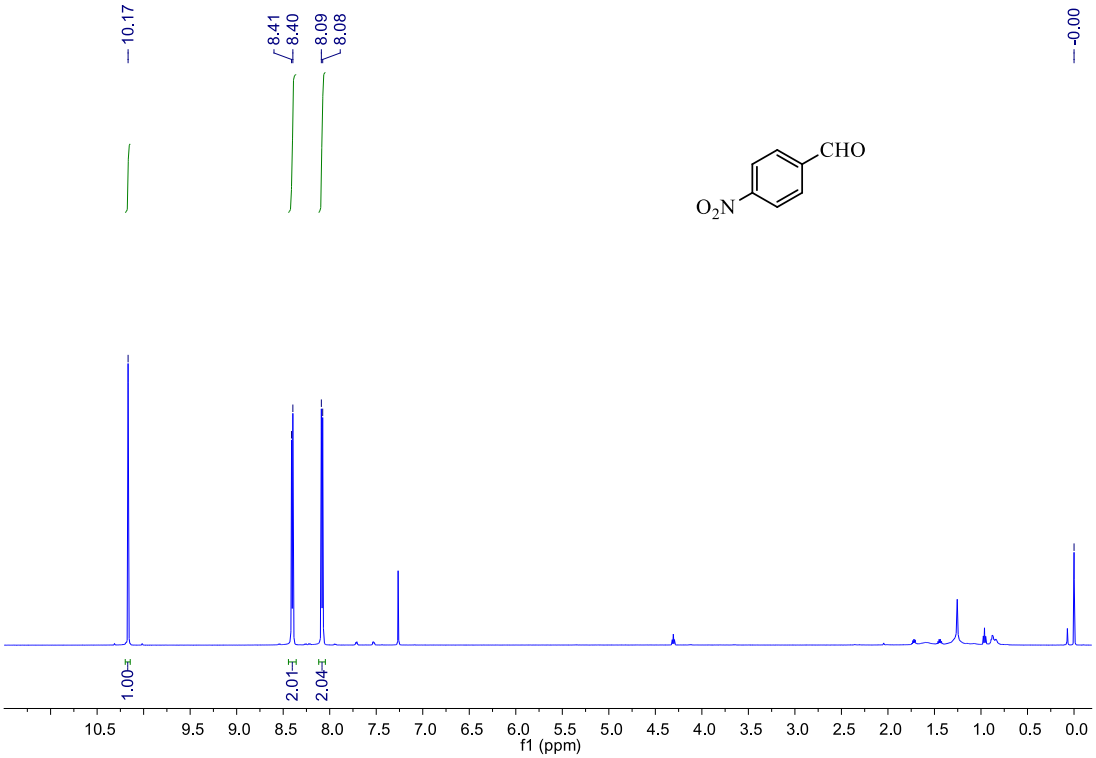
^{1}H NMR of 4-chlorobenzaldehyde **2p**



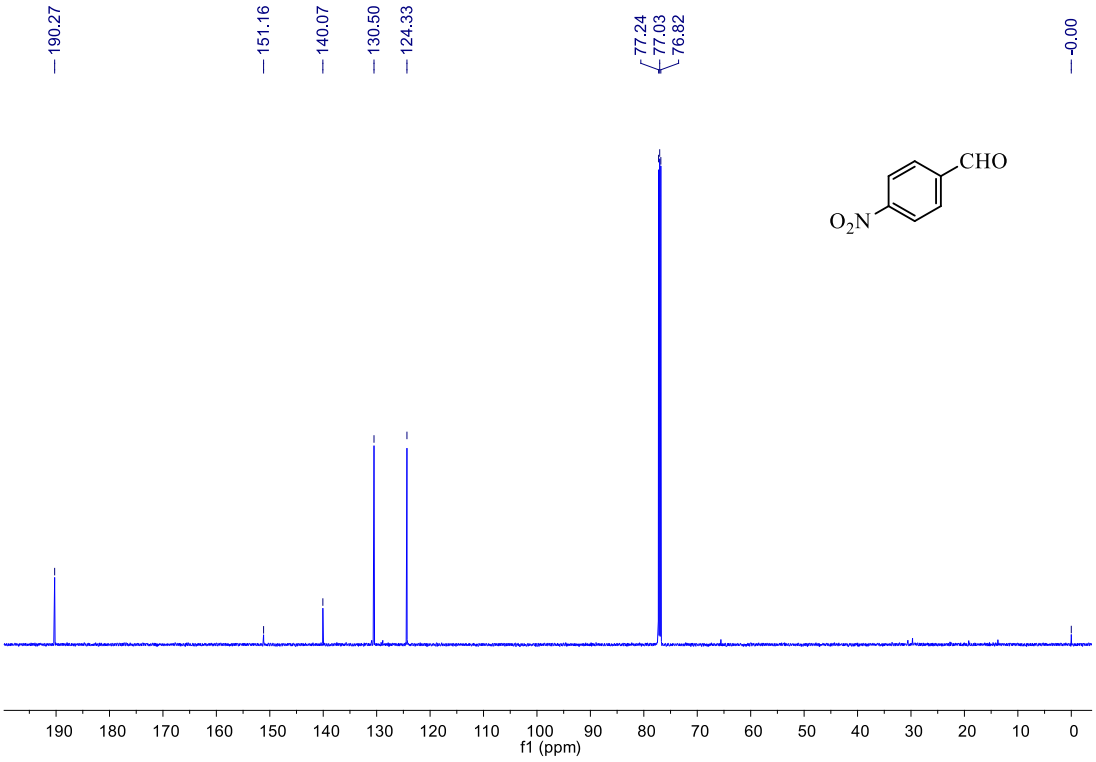
^{13}C NMR of 4-chlorobenzaldehyde **2p**



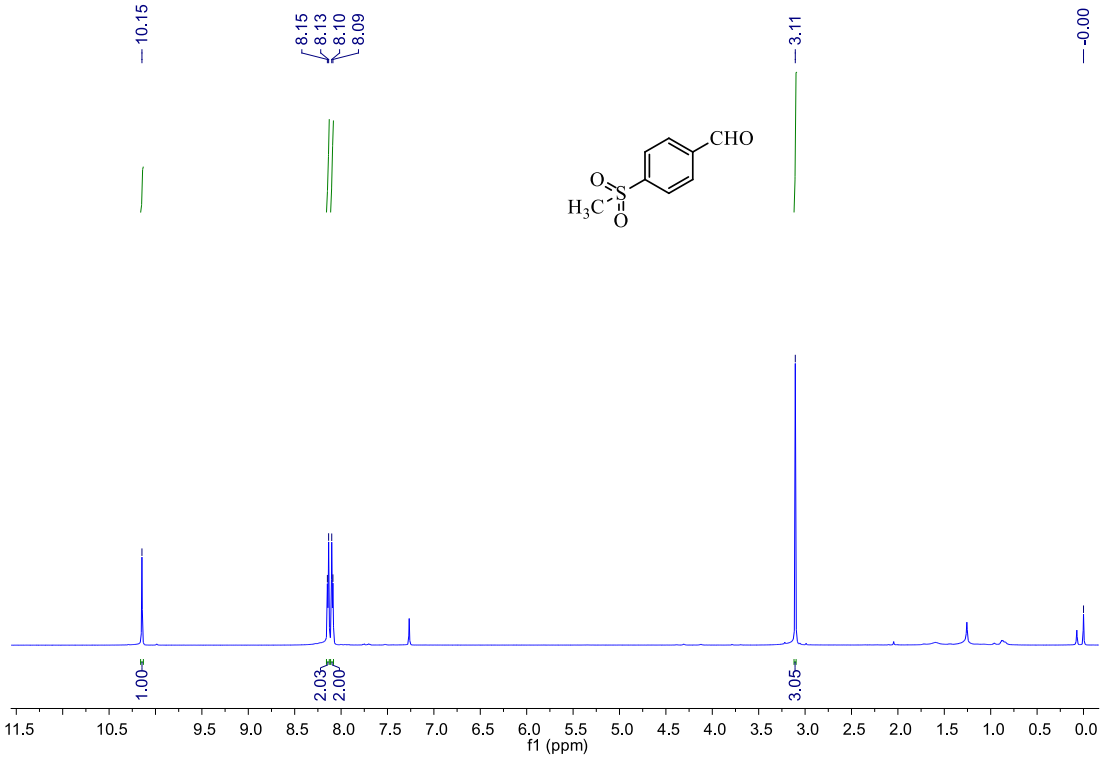
[1]H NMR of 4-nitrobenzaldehyde **2q**



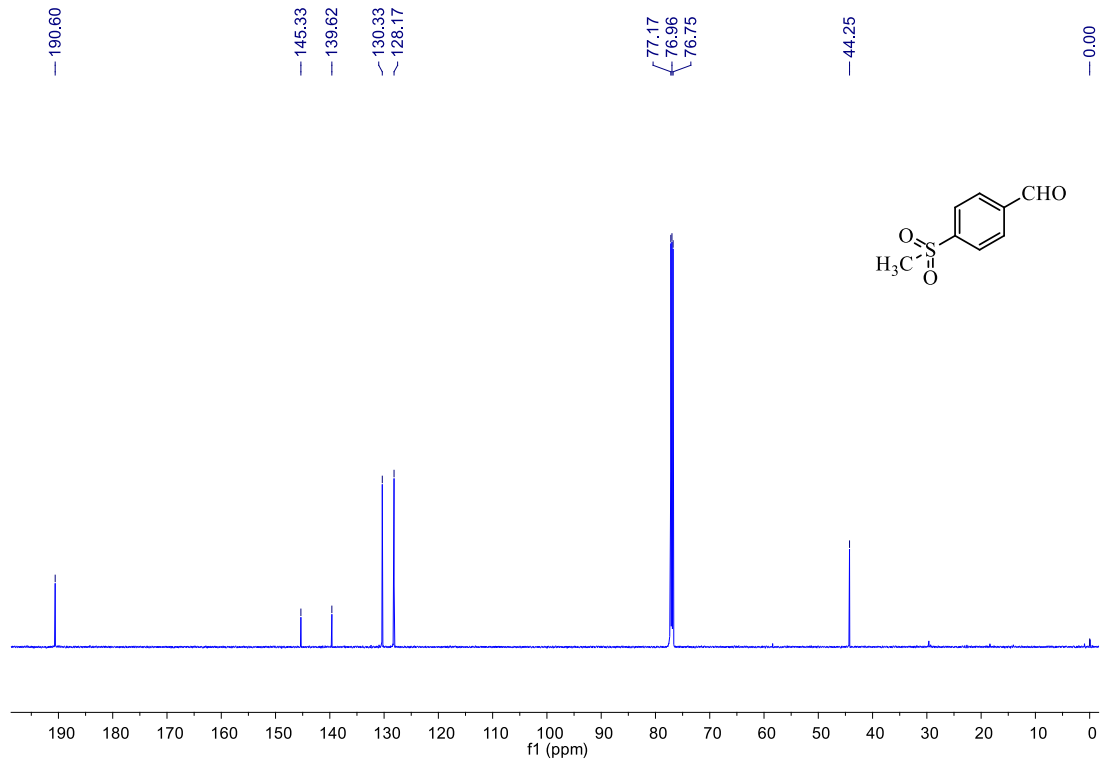
[13]C NMR of 4-nitrobenzaldehyde **2q**



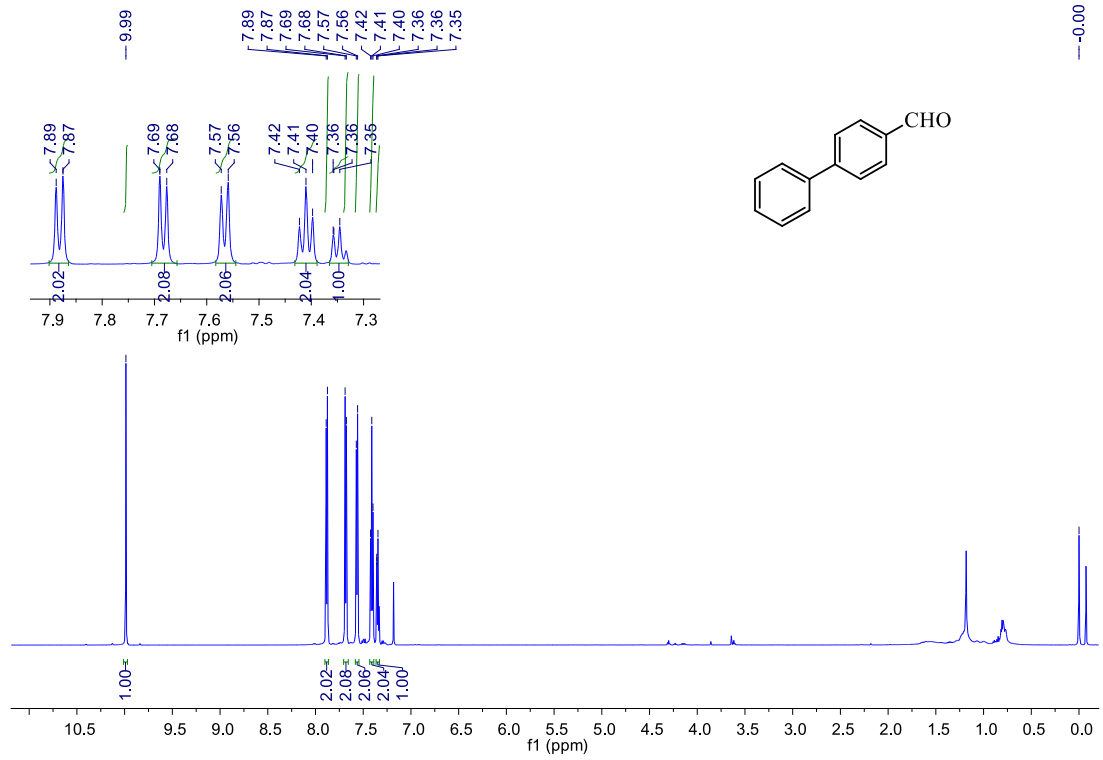
^{1}H NMR of 4-(methylsulfonyl)benzaldehyde **2r**



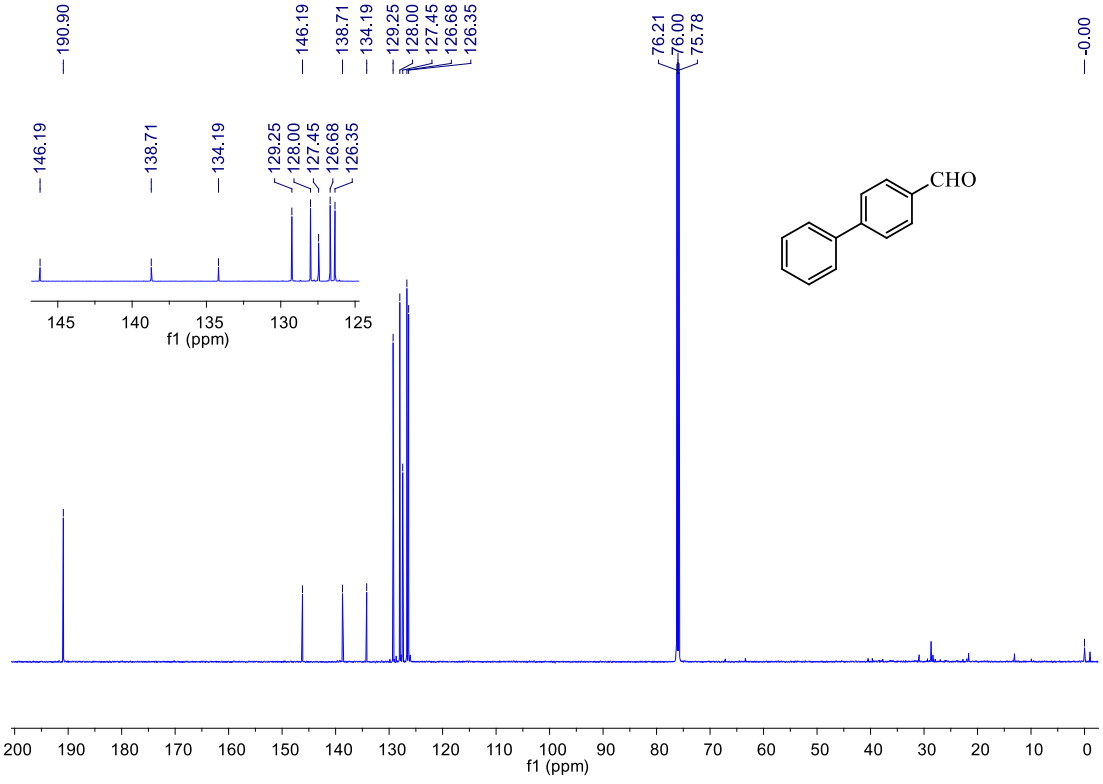
^{13}C NMR of 4-(methylsulfonyl)benzaldehyde **2r**



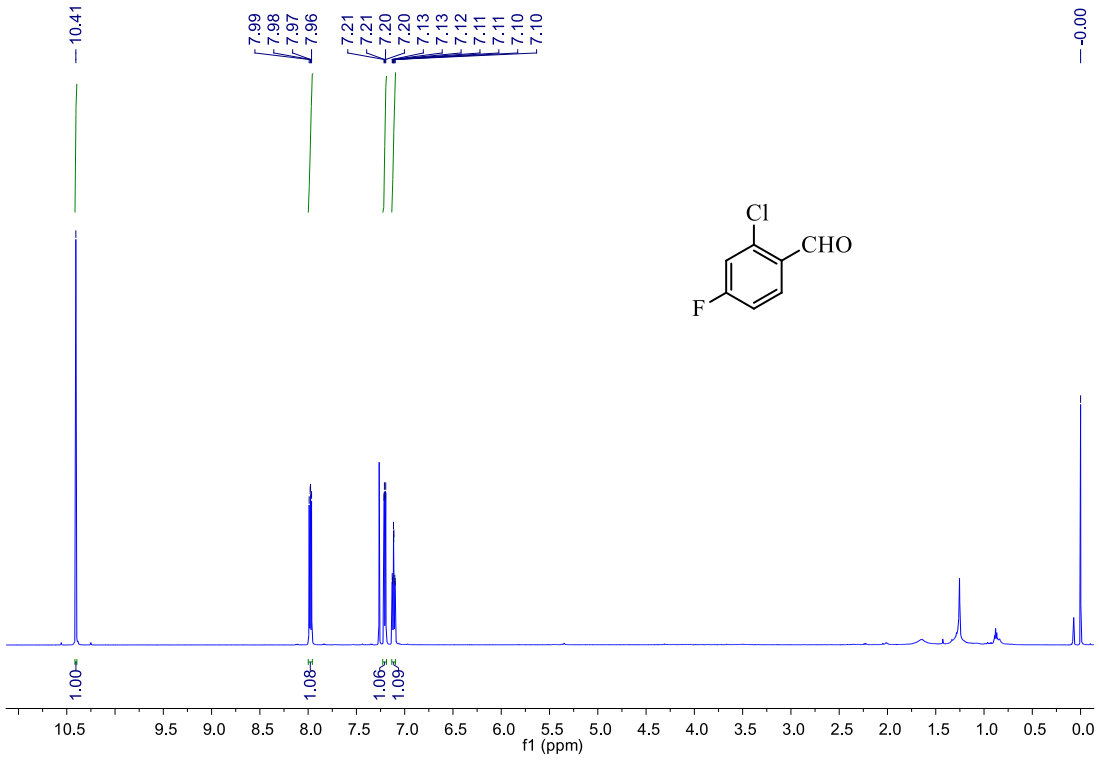
^{1}H NMR of 4-Biphenylcarboxaldehyde **2s**



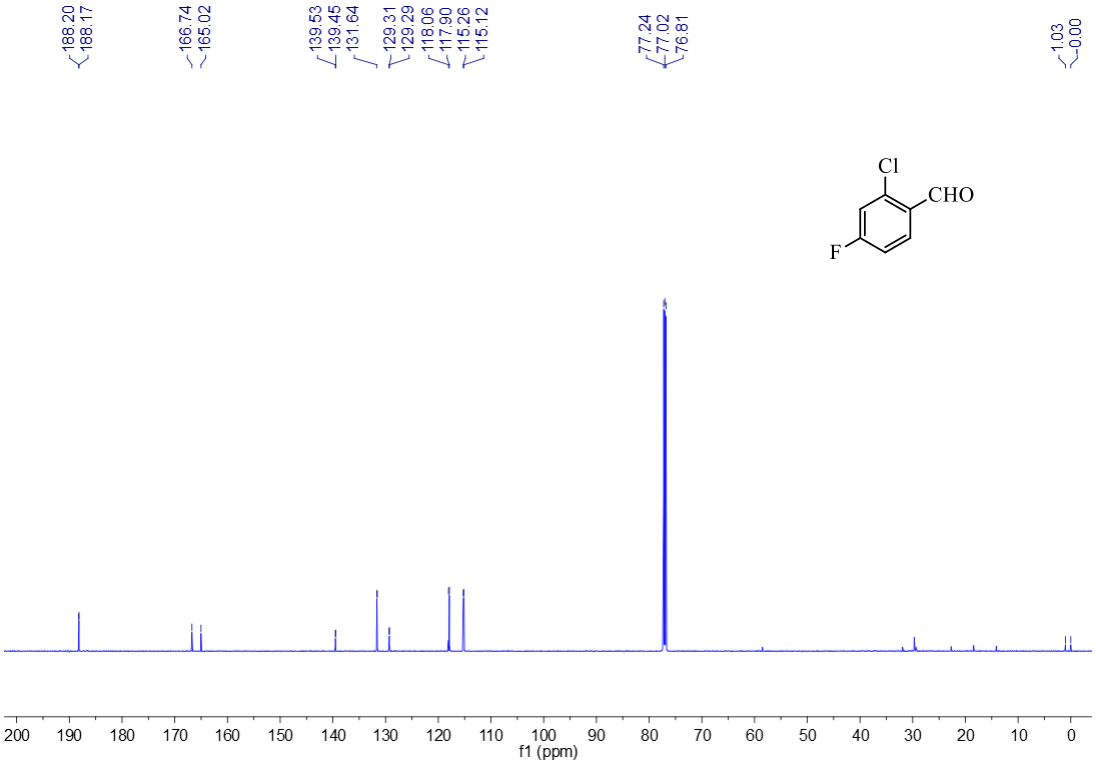
^{13}C NMR of 4-Biphenylcarboxaldehyde **2s**



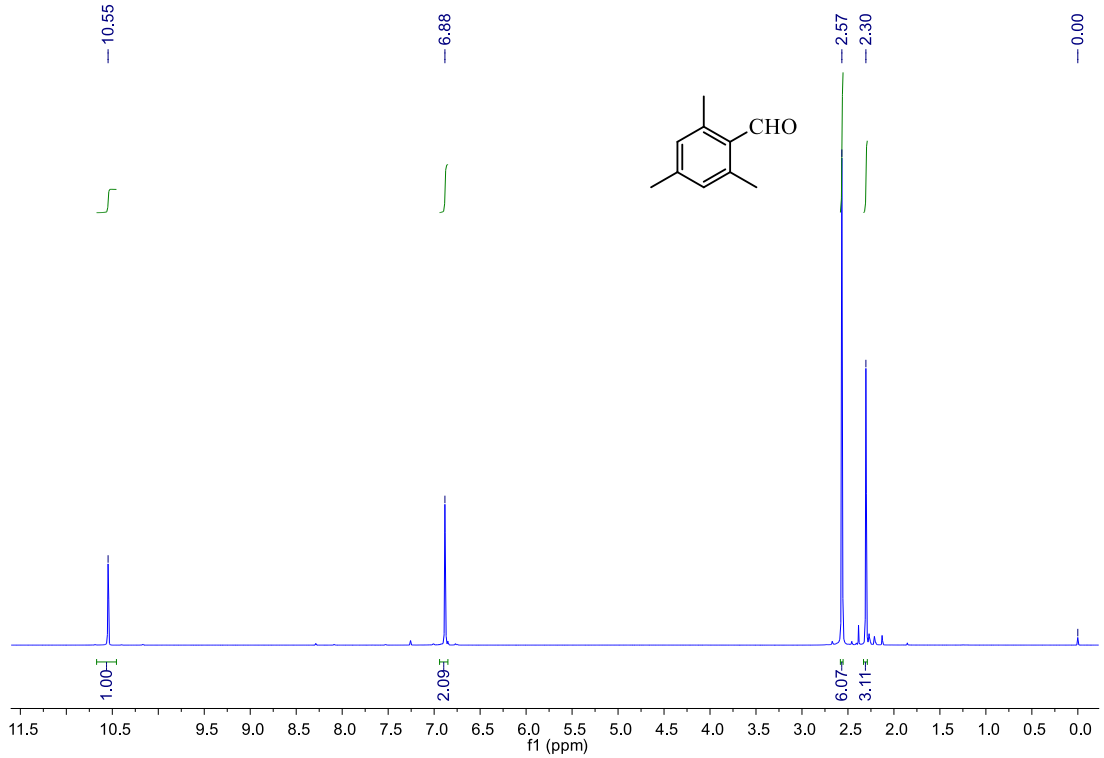
^{1}H NMR of 2-chloro-4-fluorobenzaldehyde **2t**



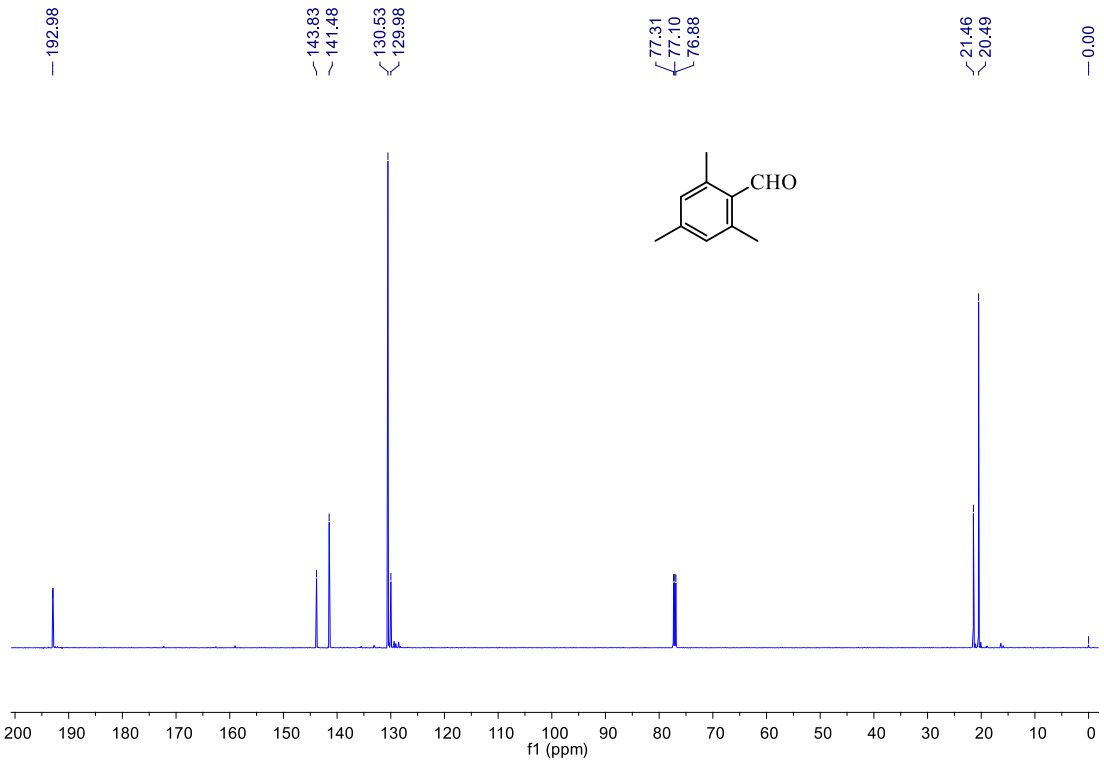
^{13}C NMR of 2-chloro-4-fluorobenzaldehyde **2t**



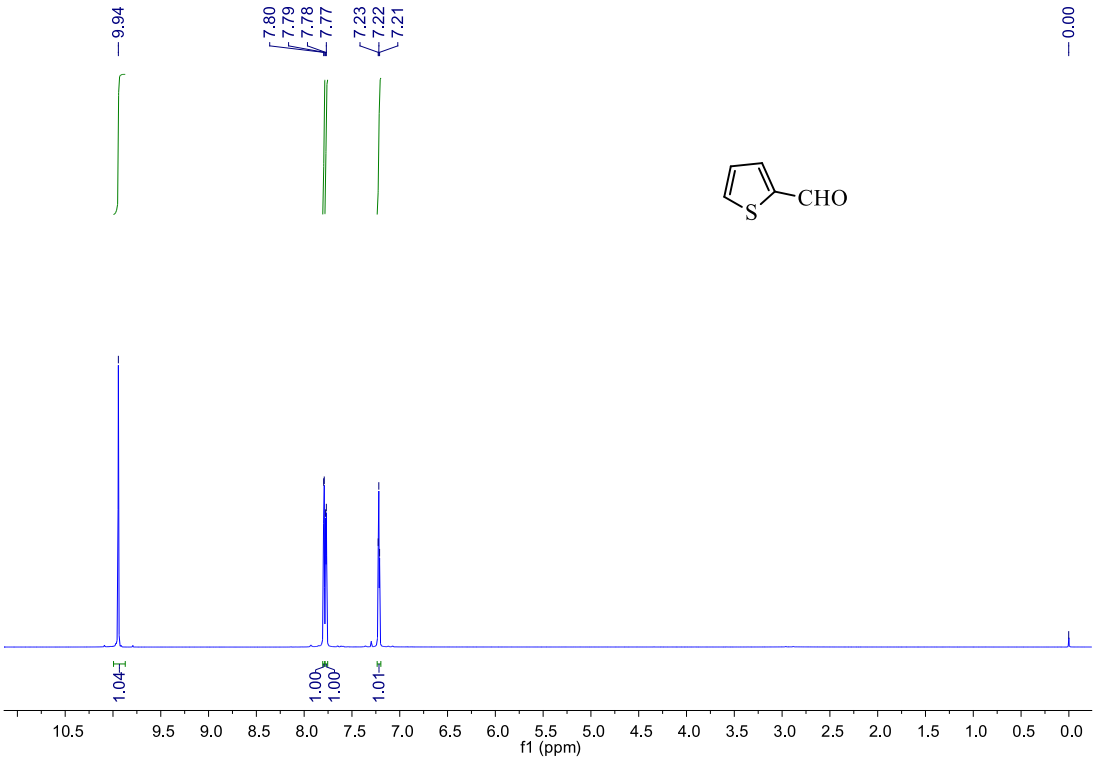
^{1}H NMR of 2,4,6-trimethylbenzaldehyde **2u**



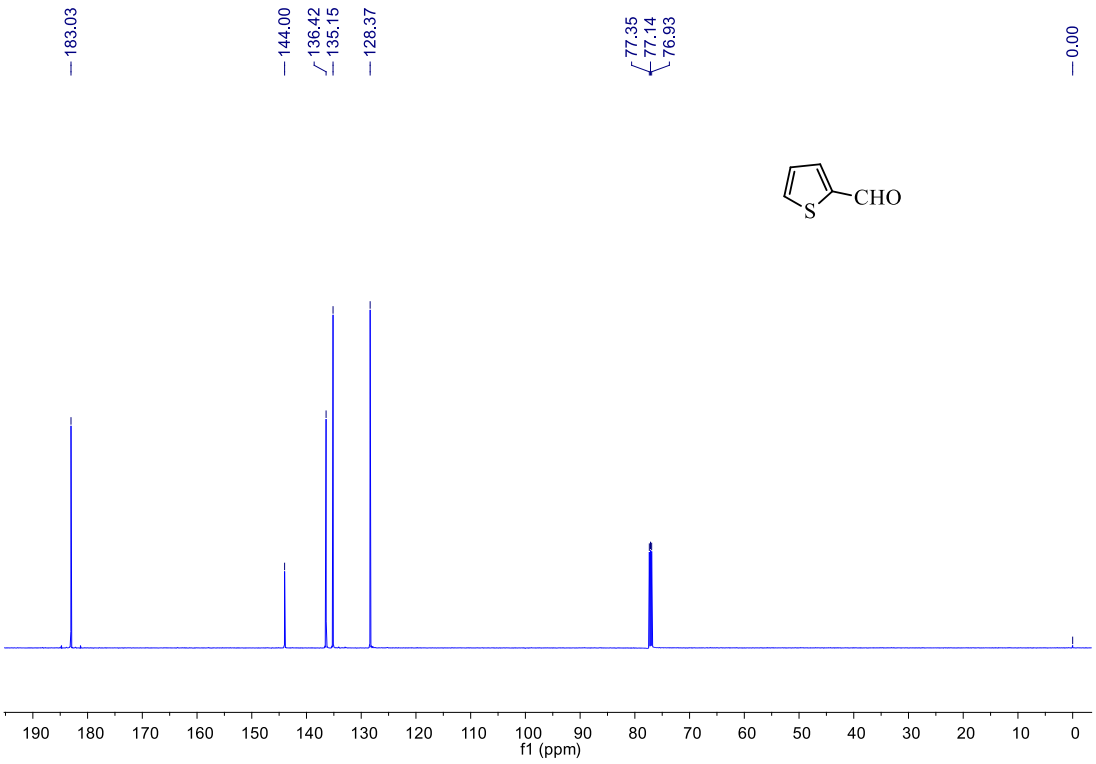
^{13}C NMR of 2,4,6-trimethylbenzaldehyde **2u**



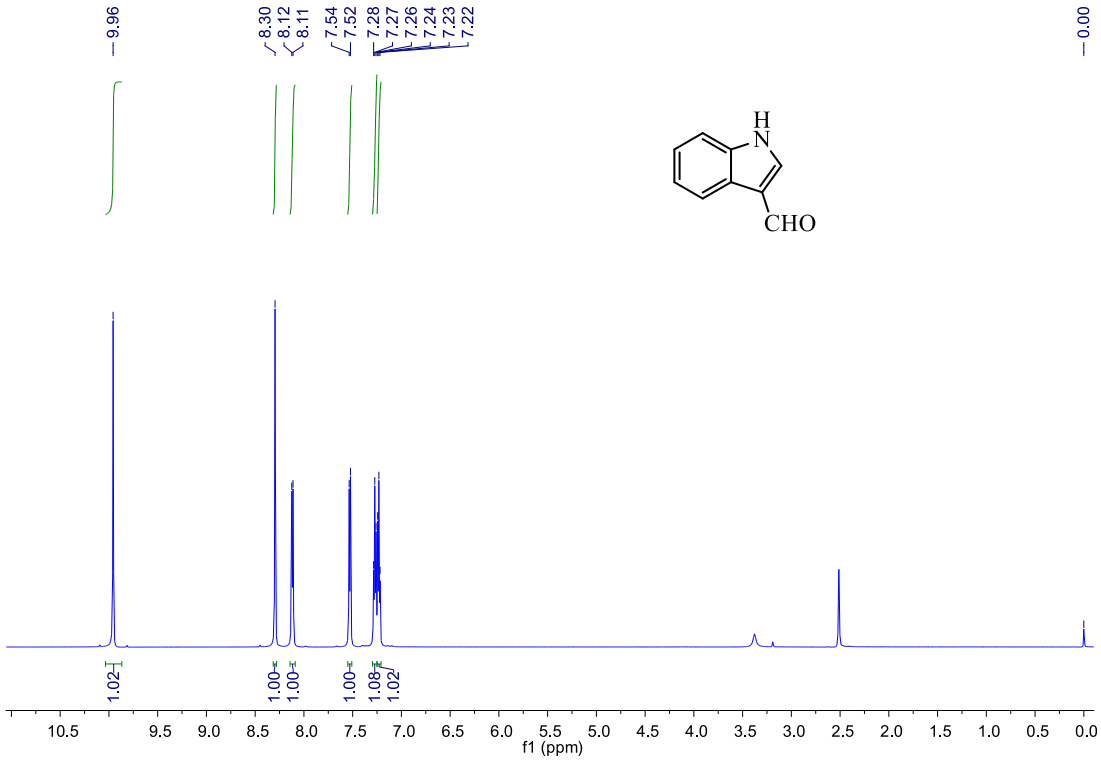
[1]H NMR of thiophene-2-carbaldehyde **2v**



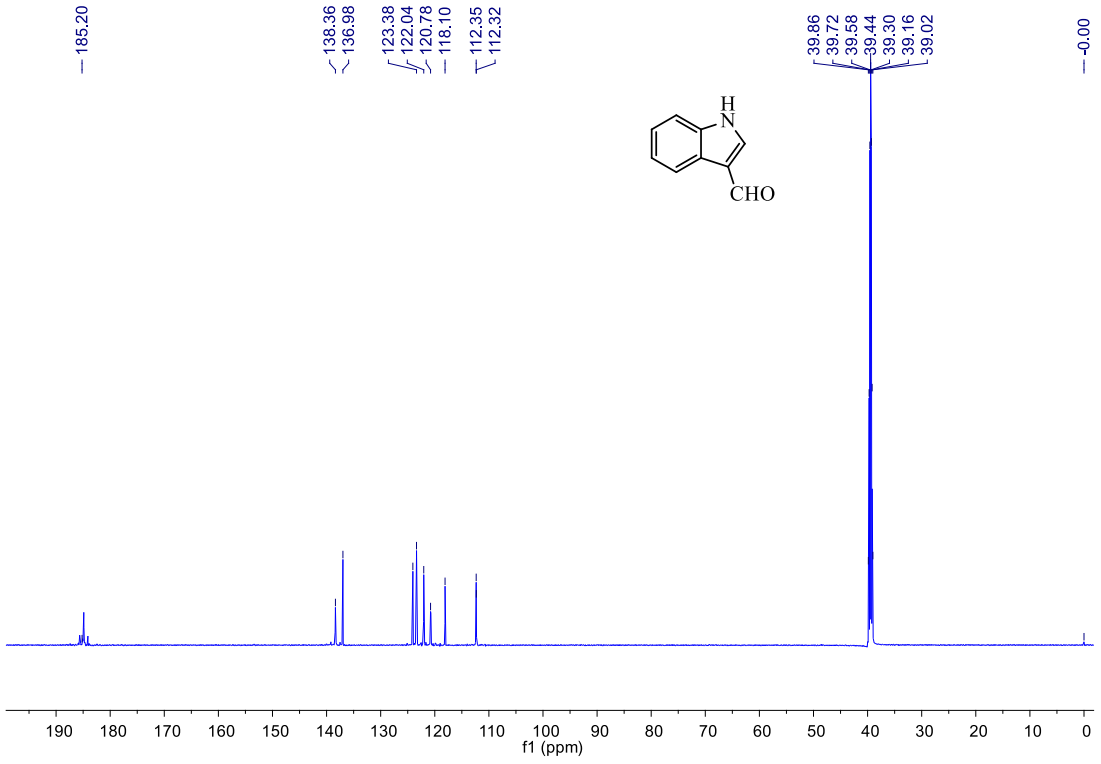
[13]C NMR of thiophene-2-carbaldehyde **2v**



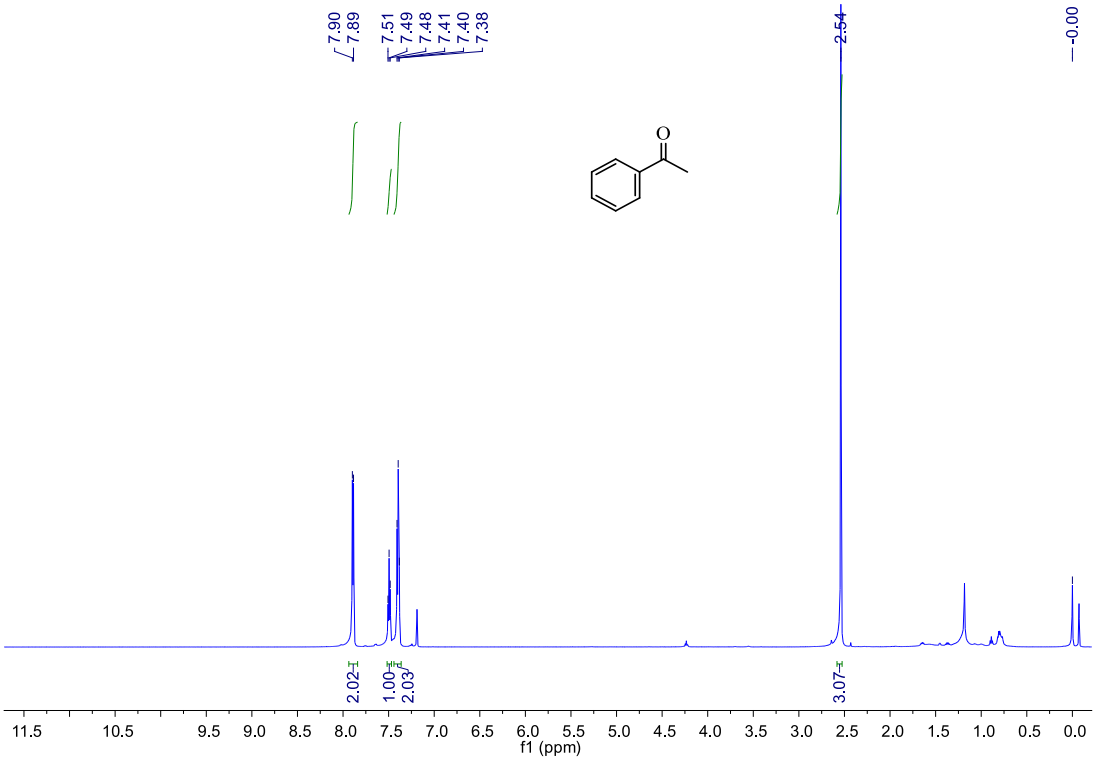
^{1}H NMR of Indole-3-carboxaldehyde **2w**



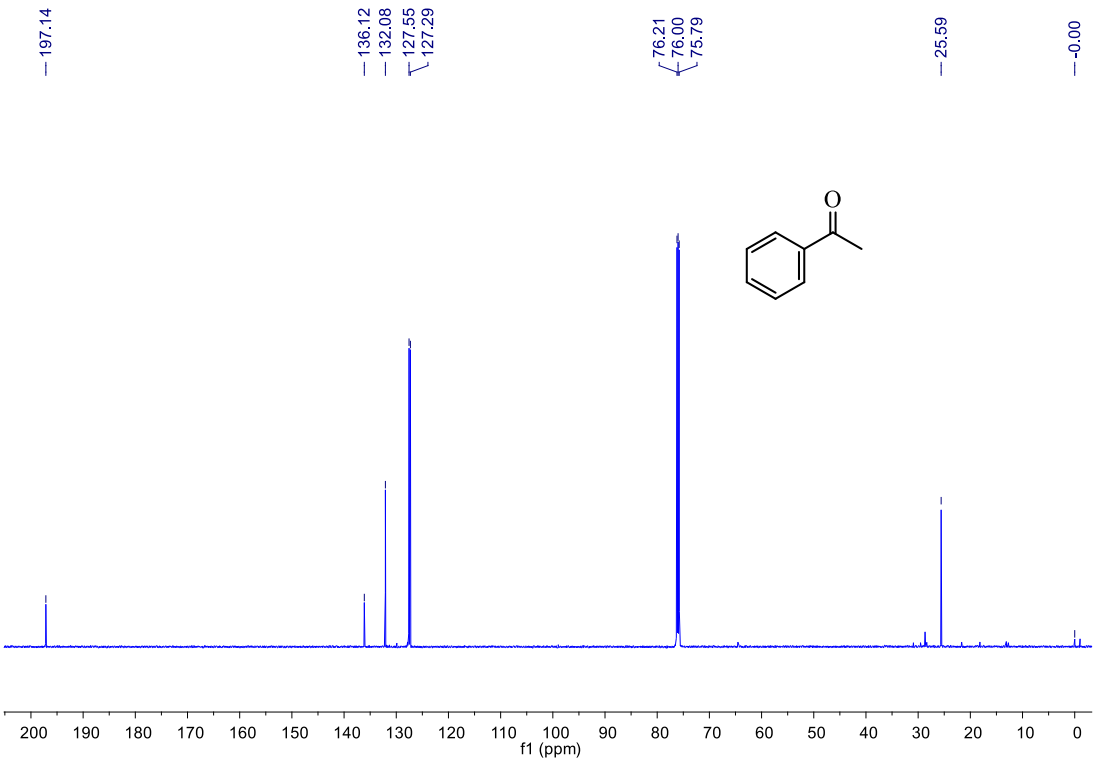
^{13}C NMR of Indole-3-carboxaldehyde **2w**



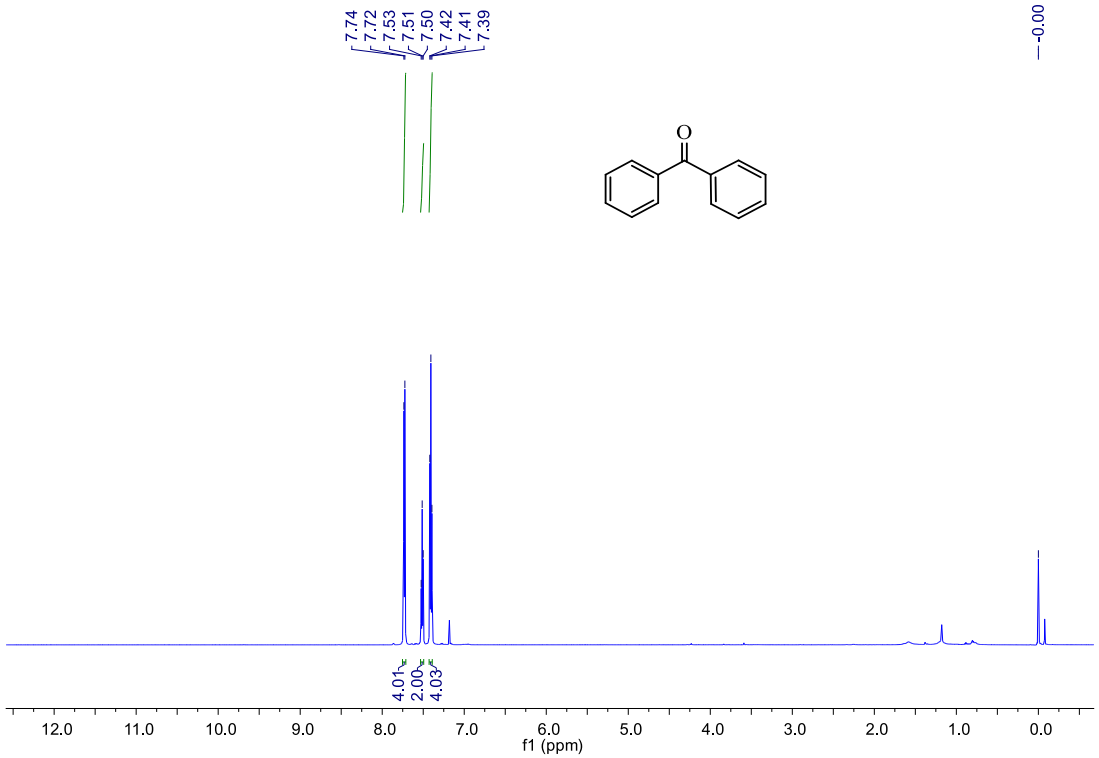
^{1}H NMR of acetophenone **2x**



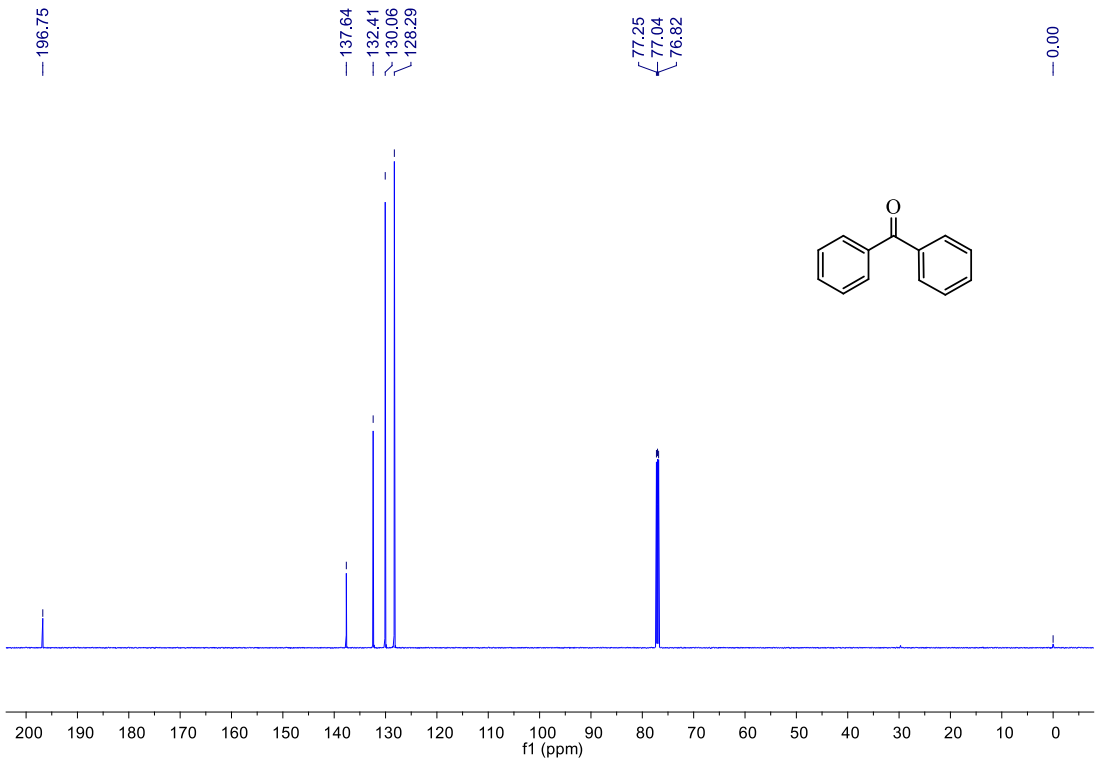
^{13}C NMR of acetophenone **2x**



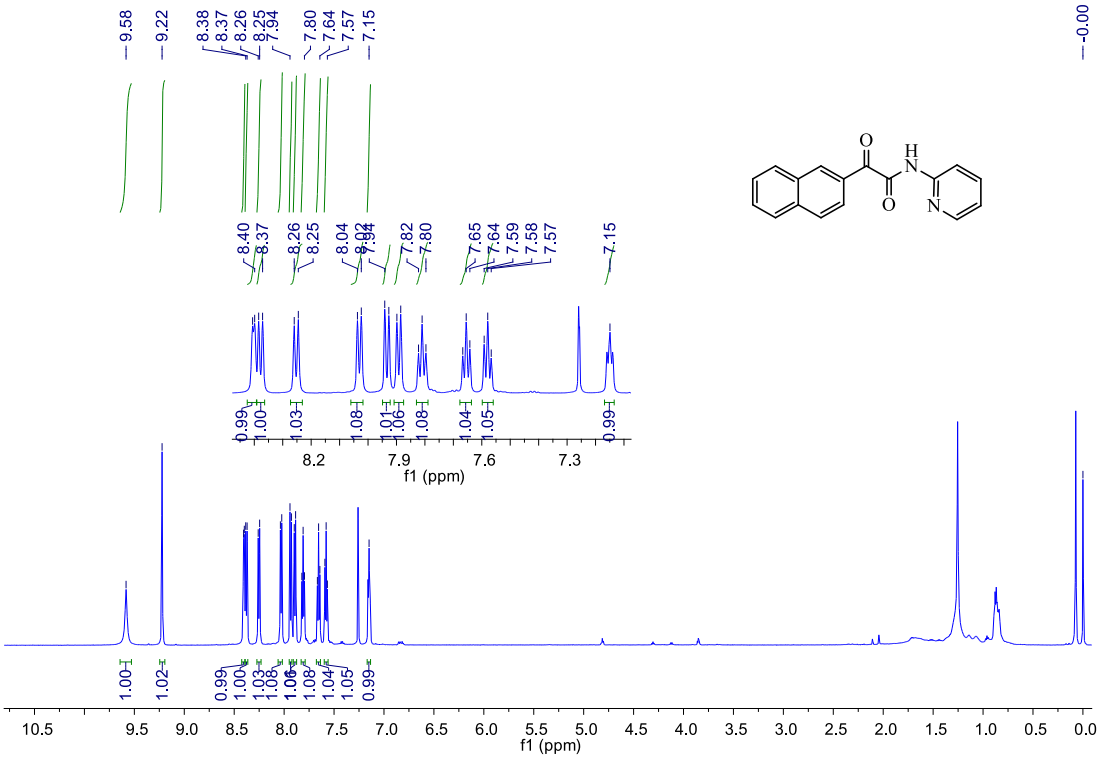
^{1}H NMR of benzophenone **2y**



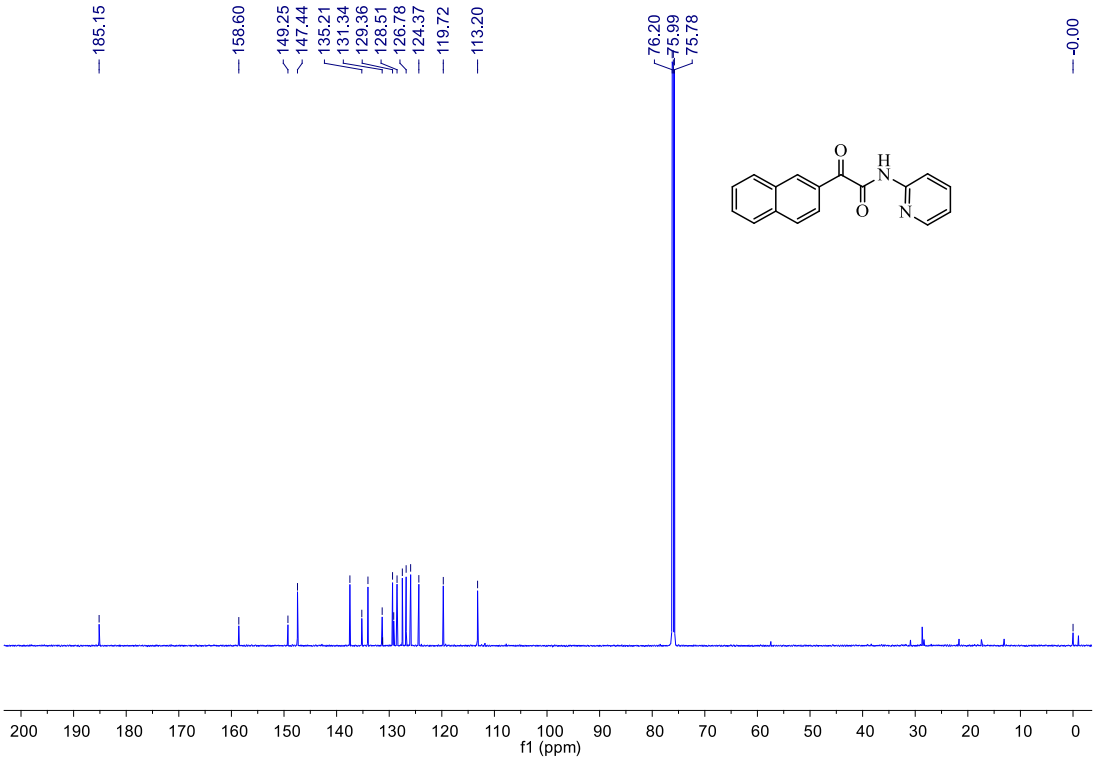
^{13}C NMR of benzophenone **2y**



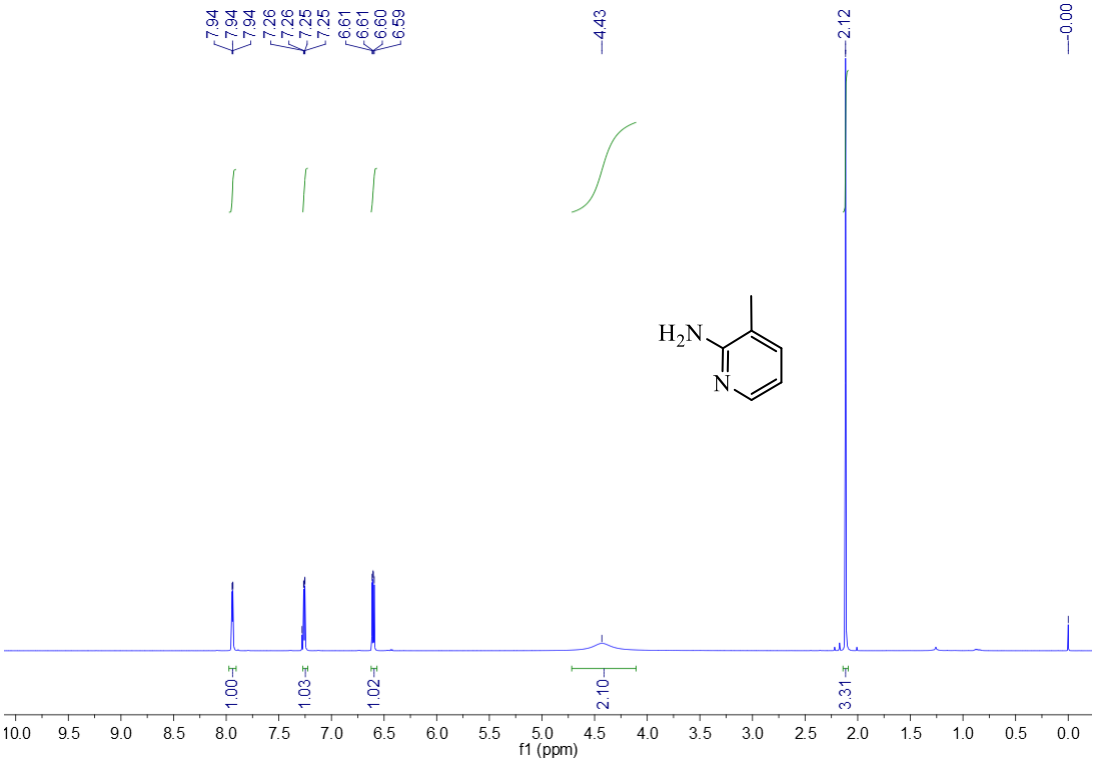
^{1}H NMR of 2-(naphthalen-2-yl)-2-oxo-N-(pyridin-2-yl)acetamide **3a$_2$**



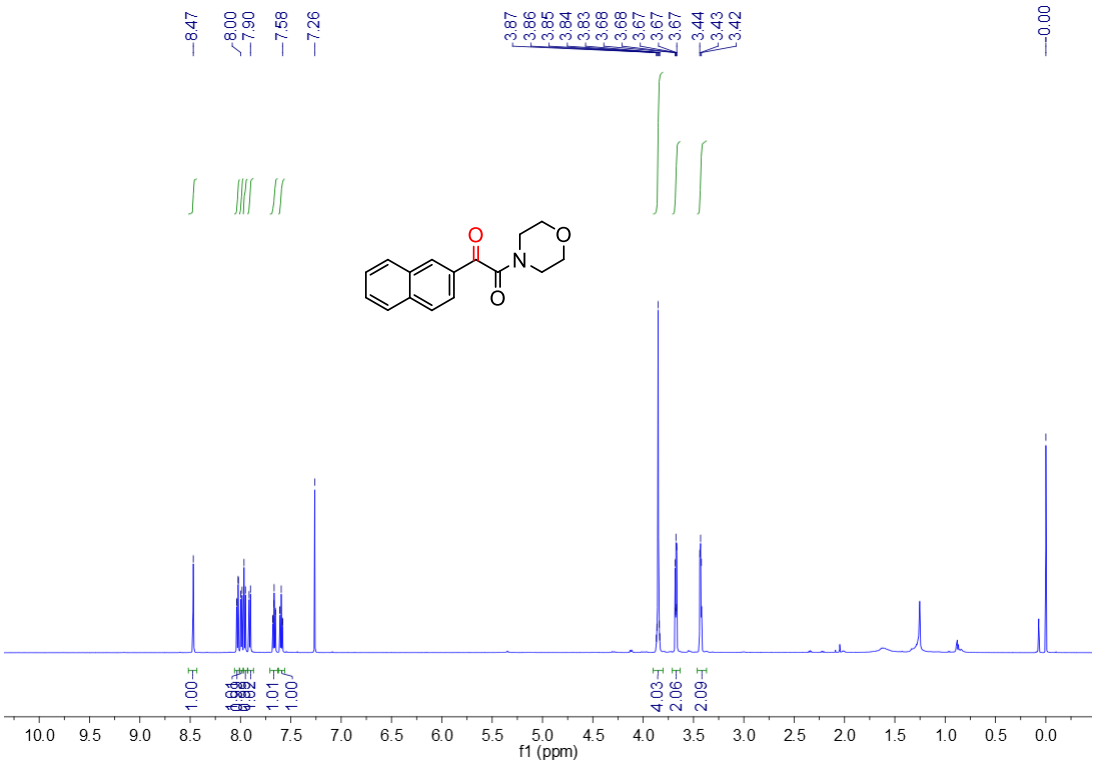
^{13}C NMR of 2-(naphthalen-2-yl)-2-oxo-N-(pyridin-2-yl)acetamide **3a$_2$**



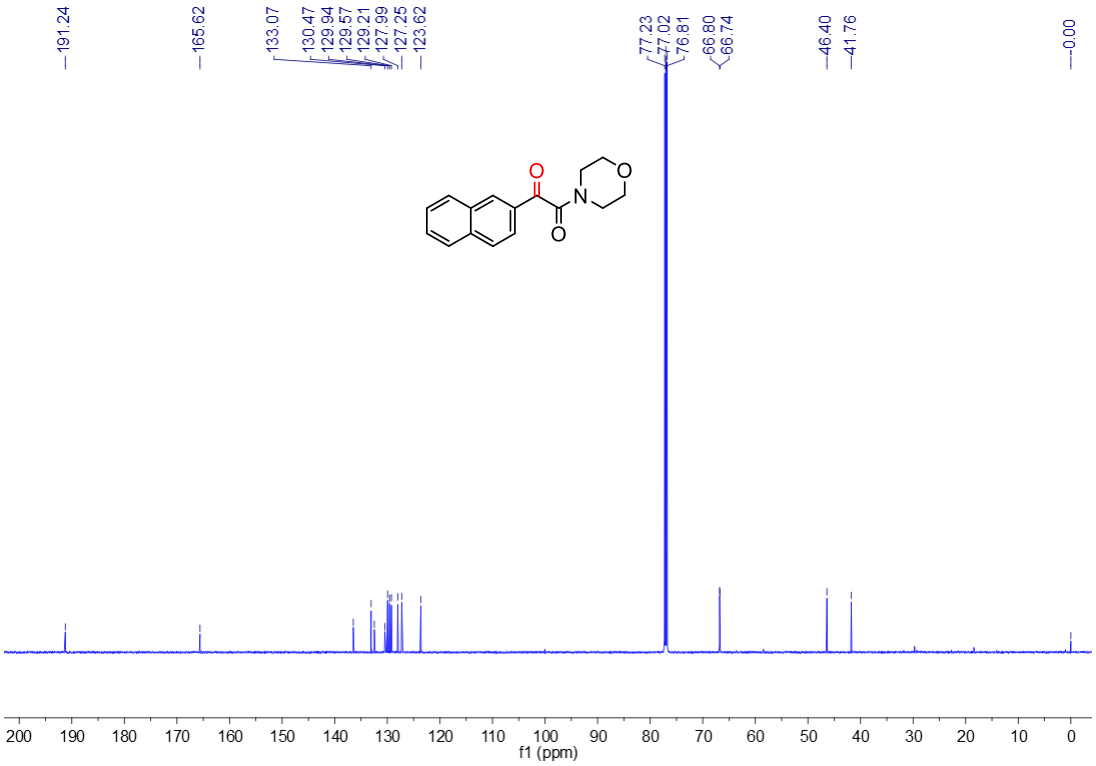
^{1}H NMR of 3-methylpyridin-2-amine **4**



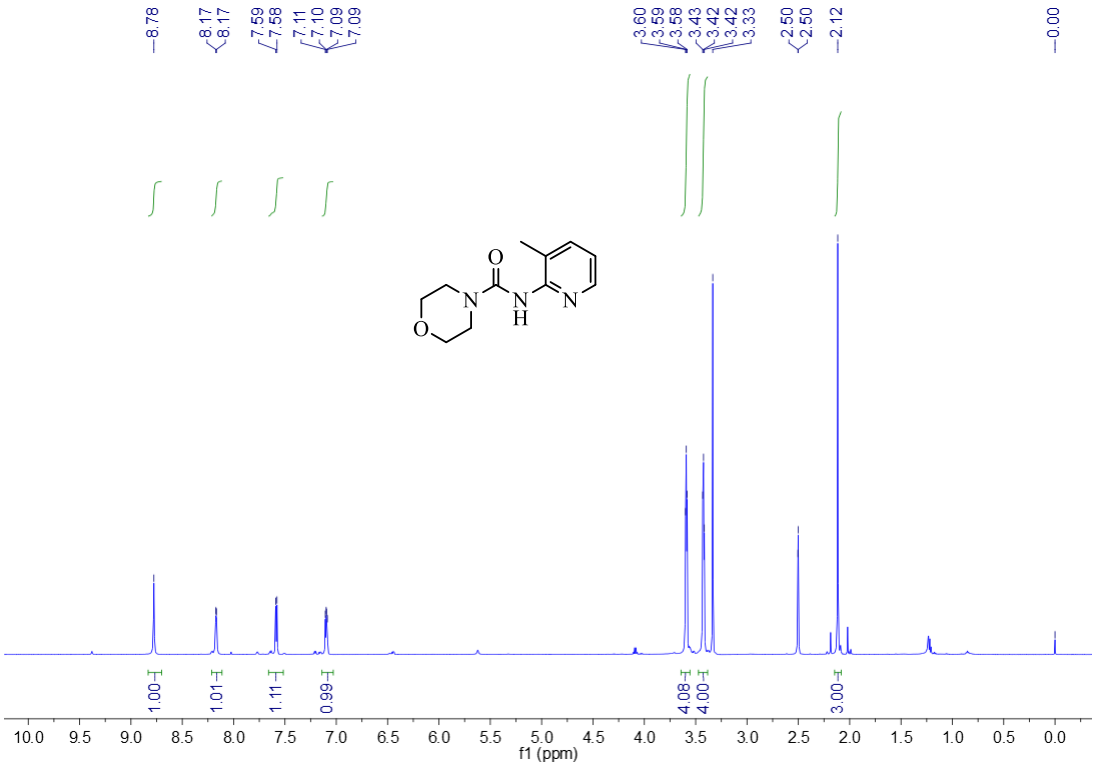
^{1}H NMR of α-oxoamide **5**



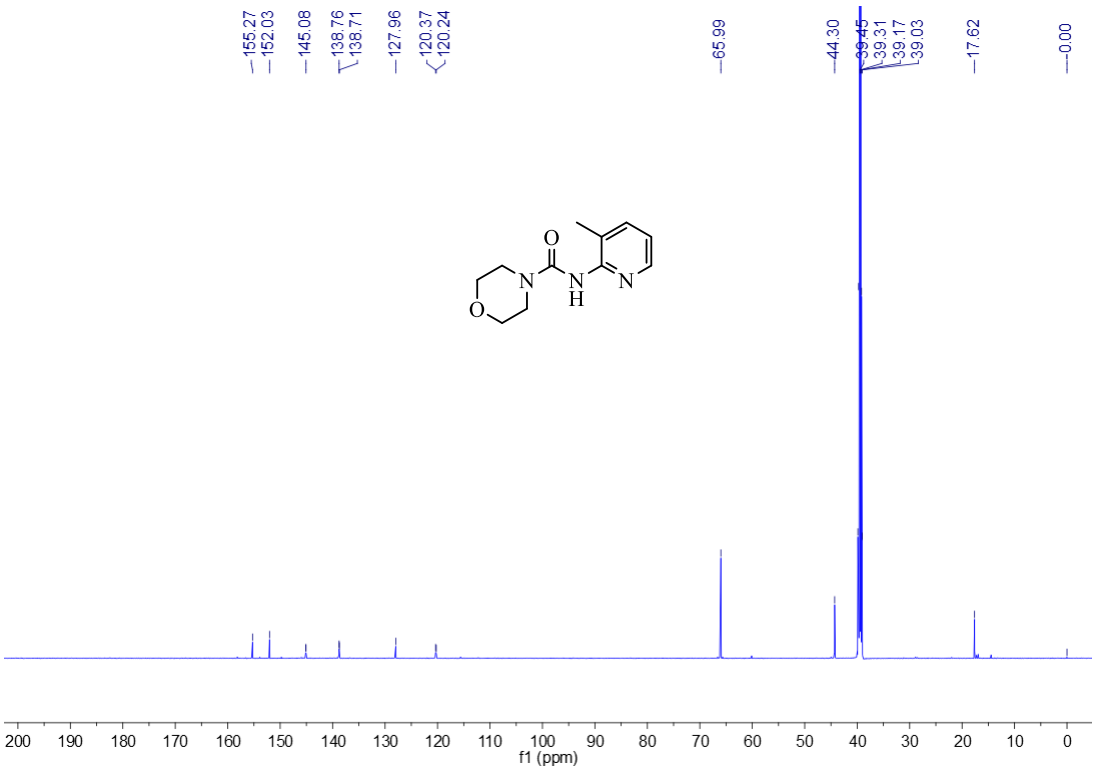
^{13}C NMR of α-oxoamide **5**



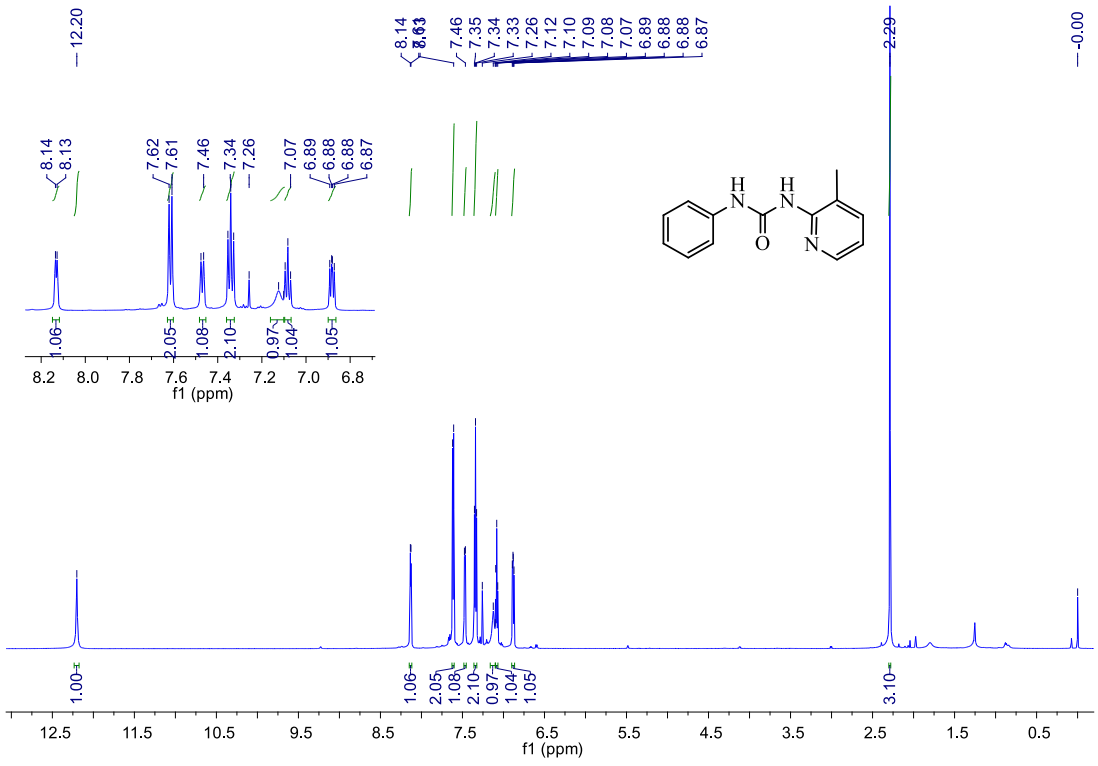
^{1}H NMR of N-(3-methylpyridin-2-yl)morpholine-4-carboxamide **6a**



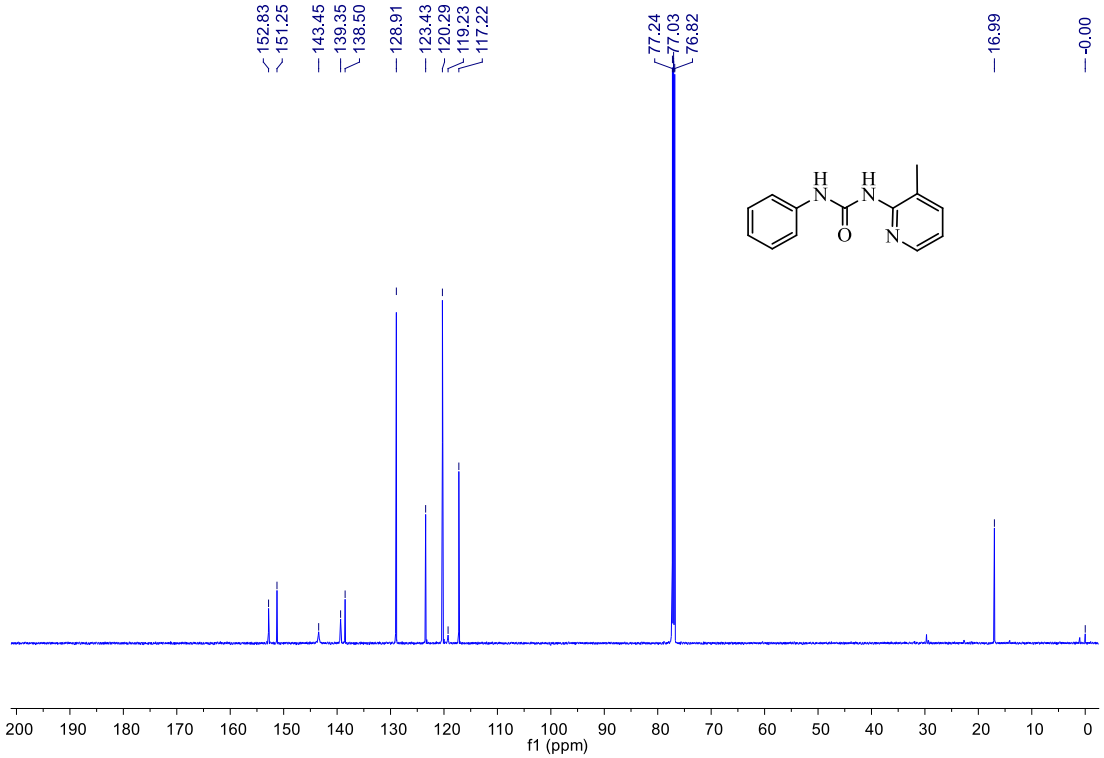
^{13}C NMR of N-(3-methylpyridin-2-yl)morpholine-4-carboxamide **6a**



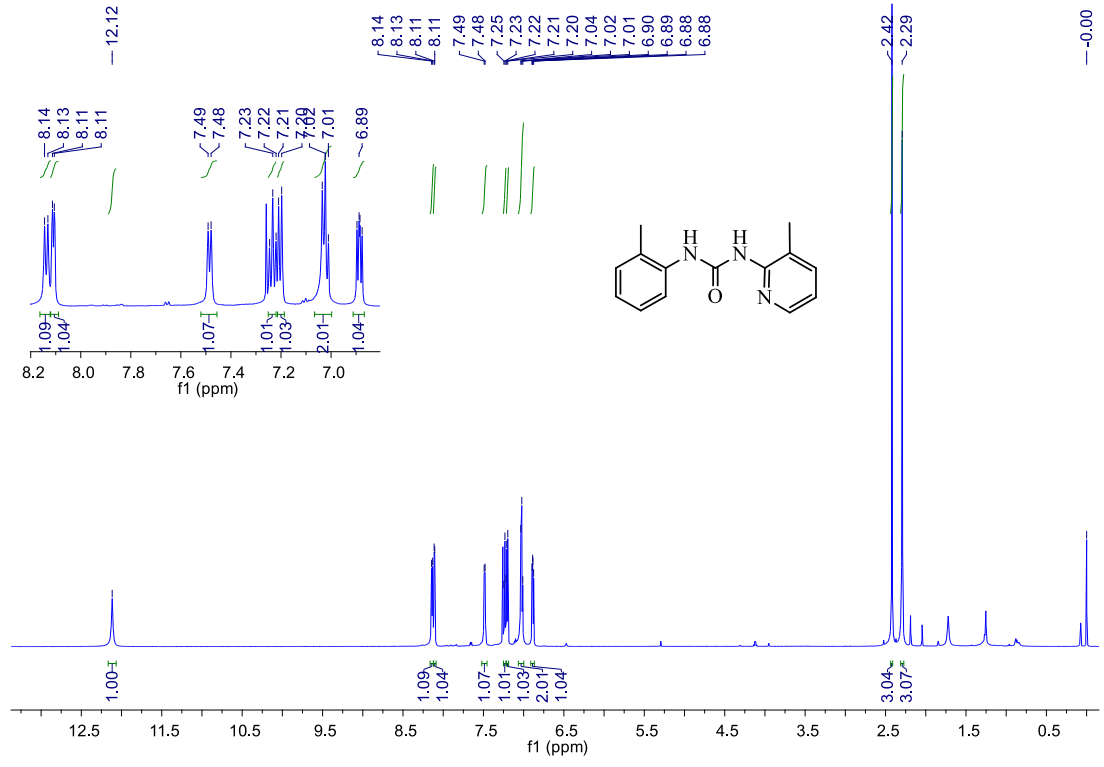
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-phenylurea **6b**



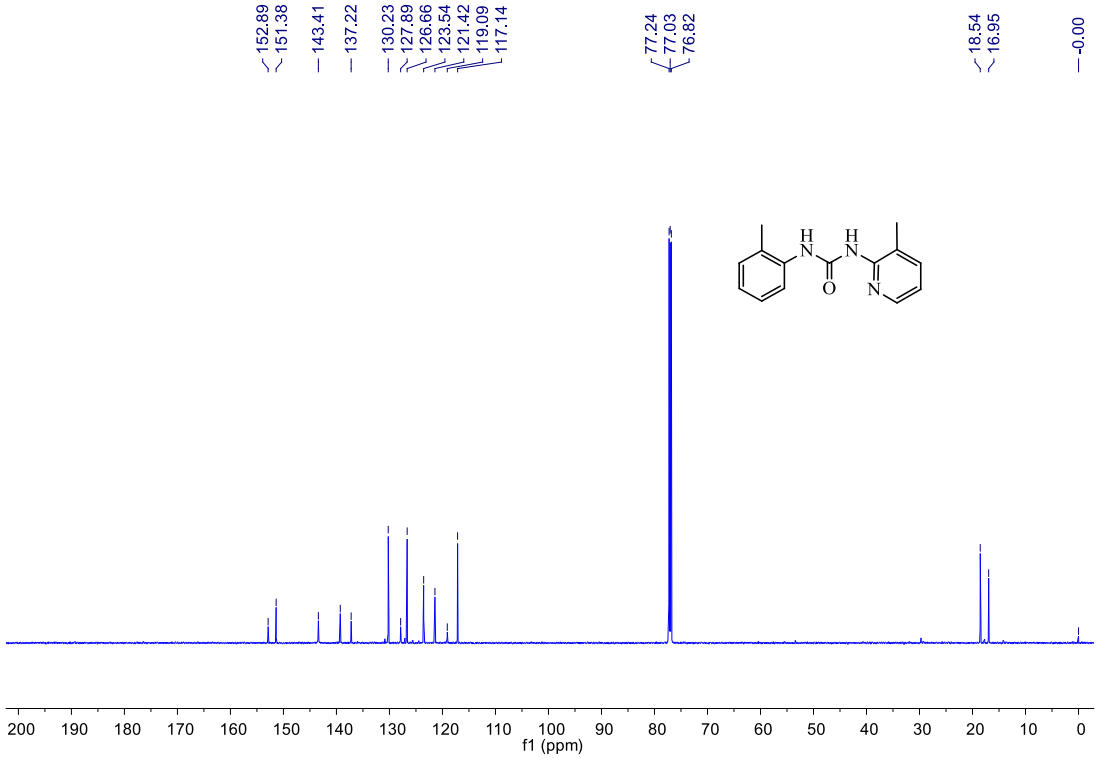
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-phenylurea **6b**



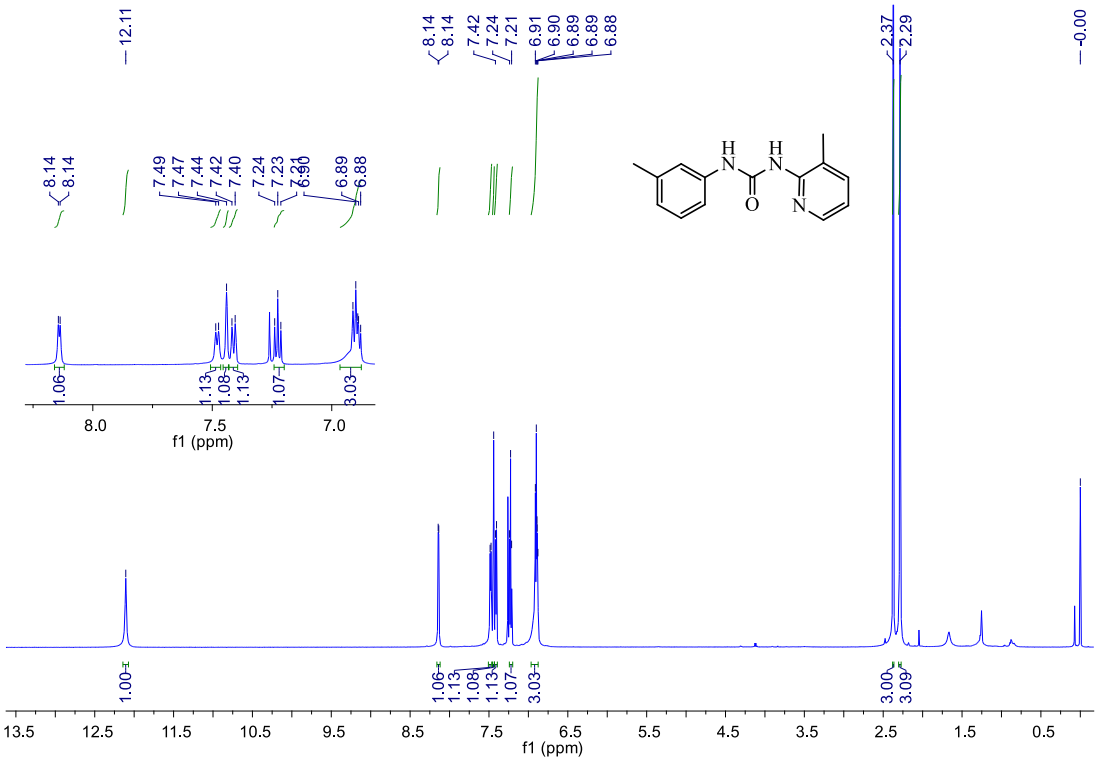
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(o-tolyl)urea **6c**



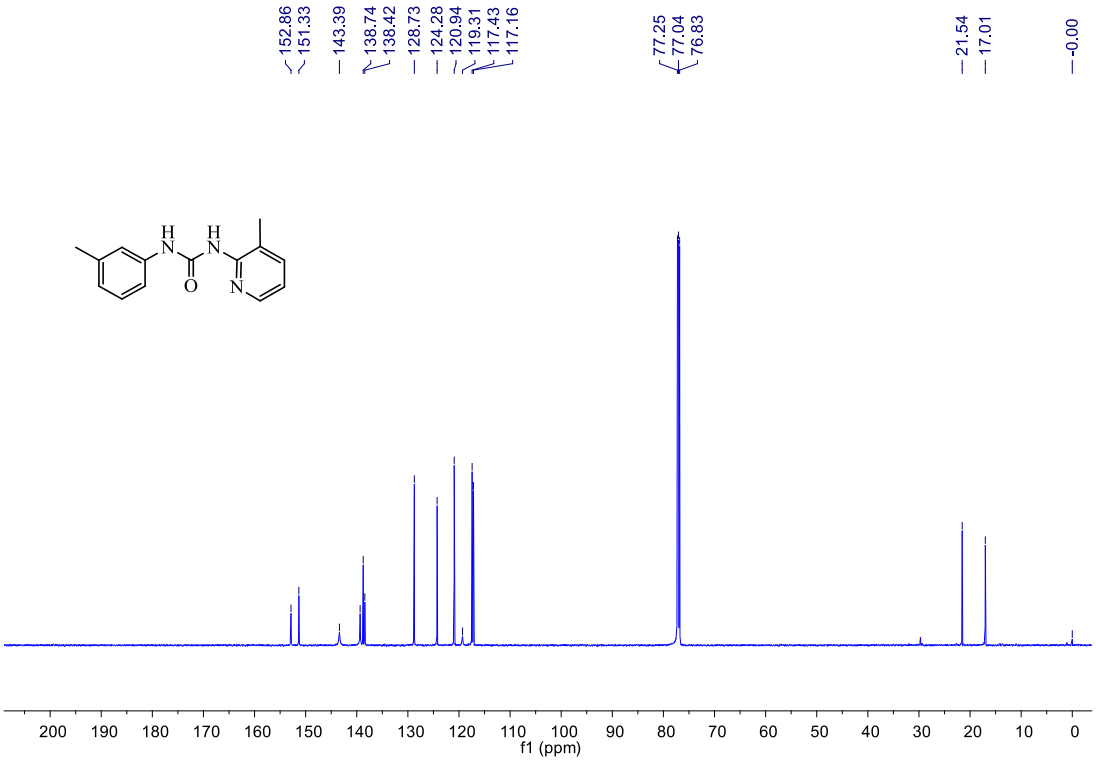
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(o-tolyl)urea **6c**



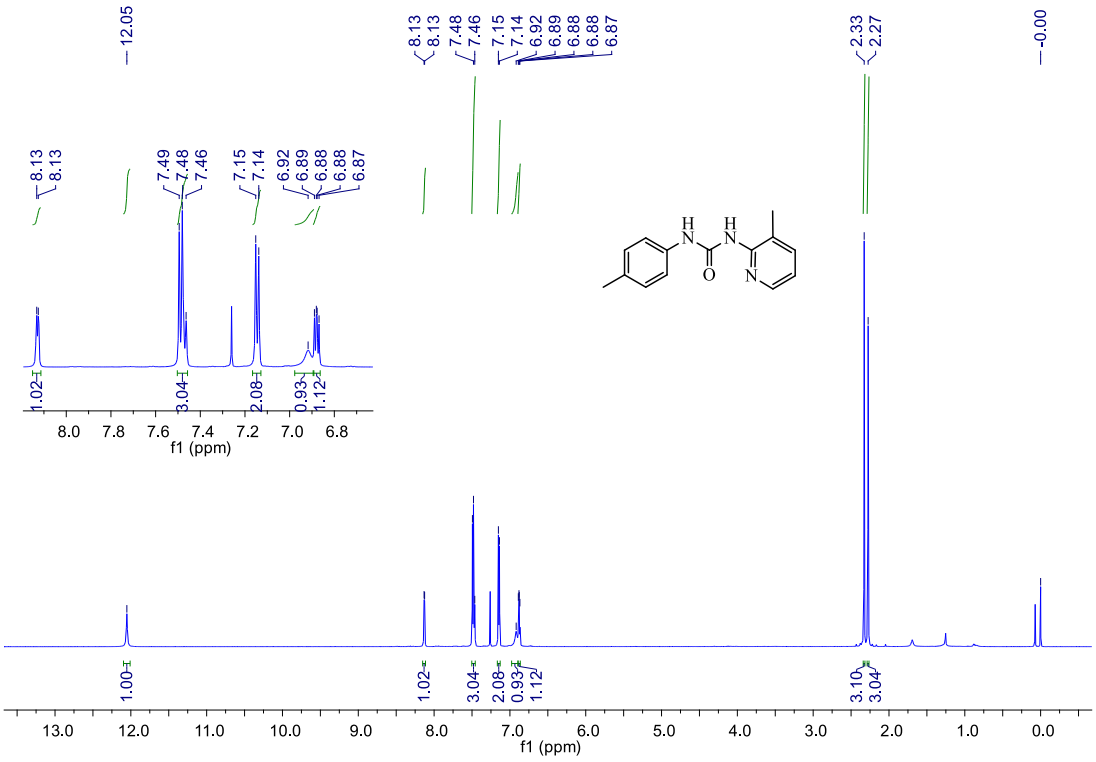
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(m-tolyl)urea **6d**



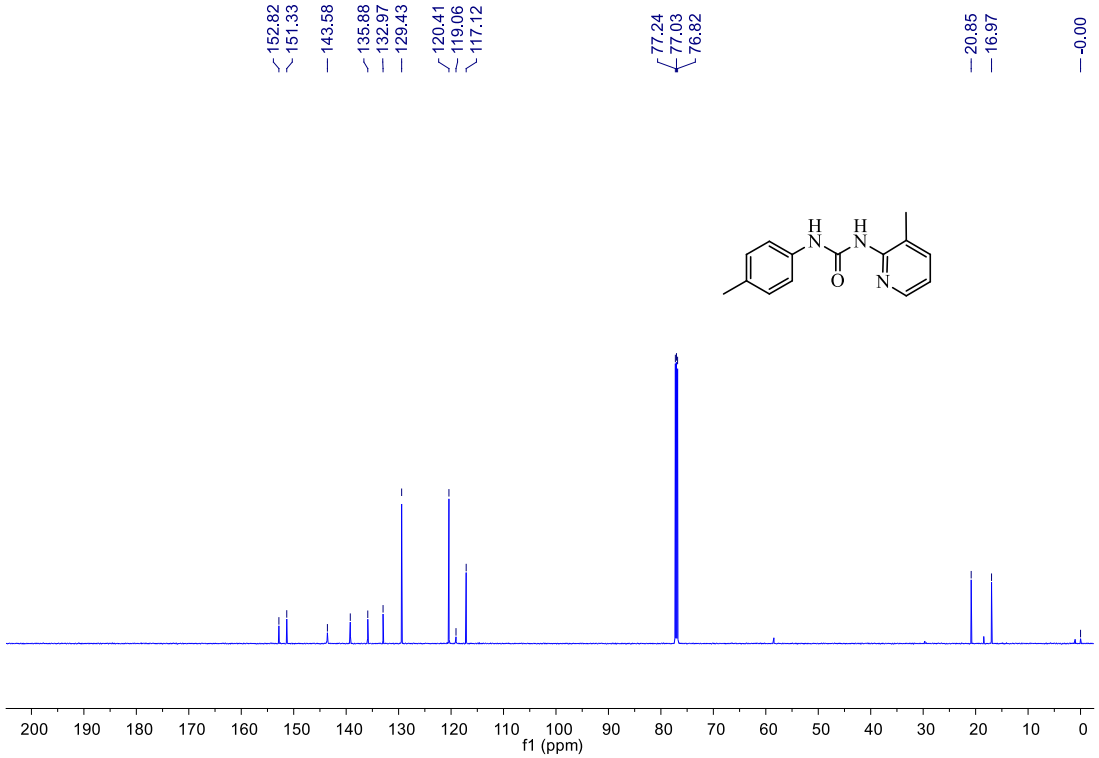
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(m-tolyl)urea **6d**



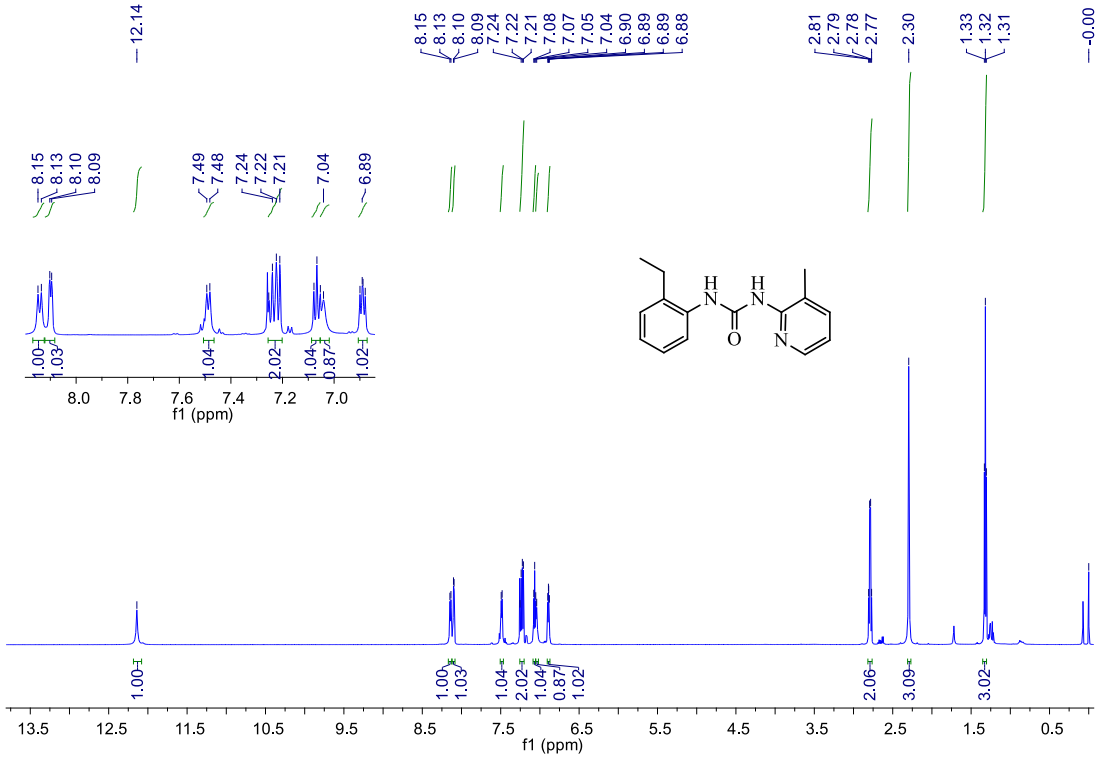
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(p-tolyl)urea **6e**



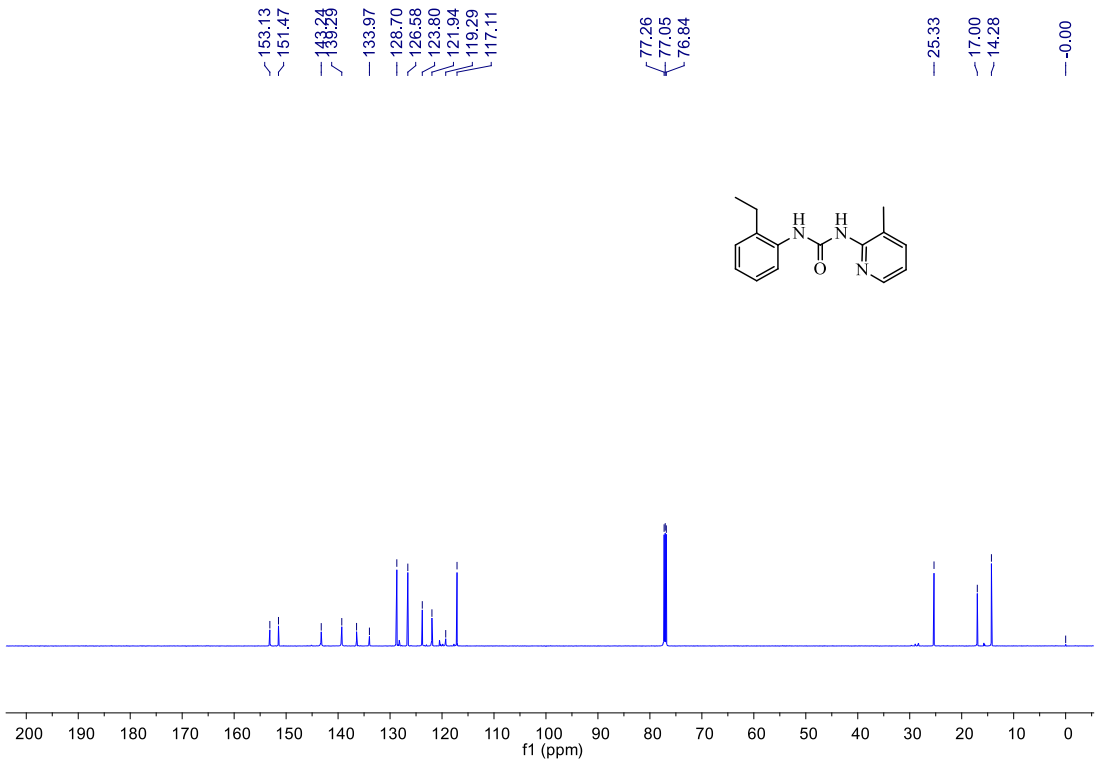
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(p-tolyl)urea **6e**



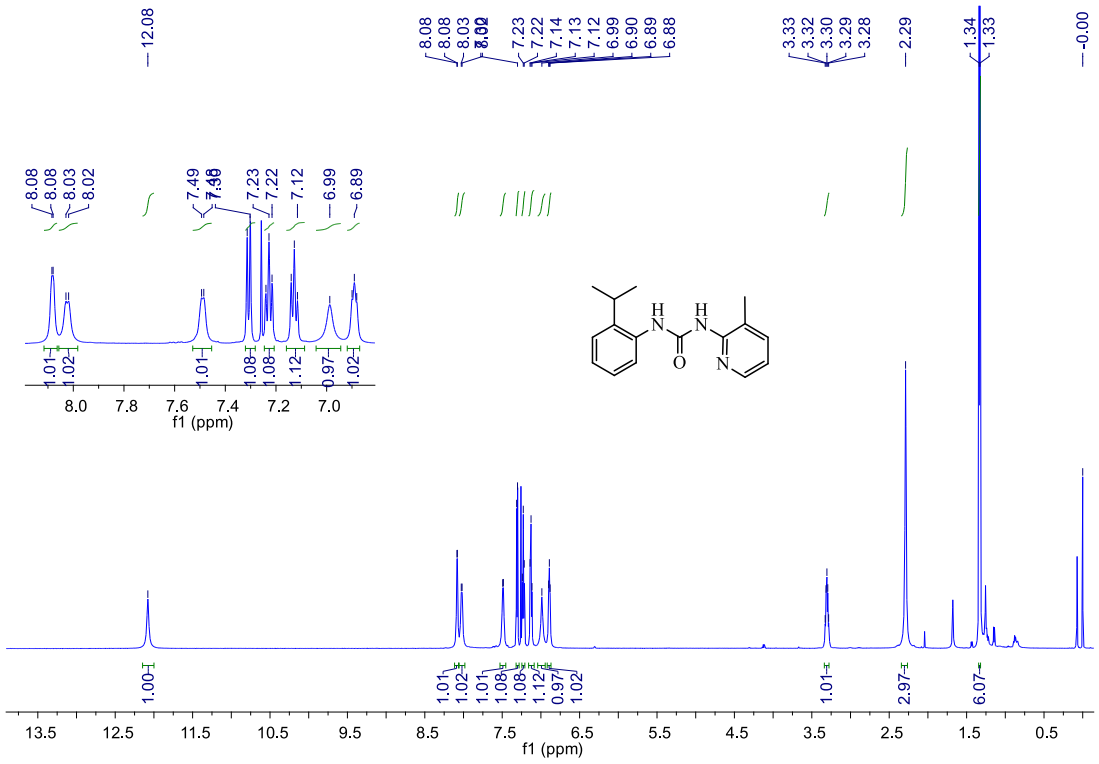
^{1}H NMR of 1-(2-ethylphenyl)-3-(3-methylpyridin-2-yl)urea **6f**



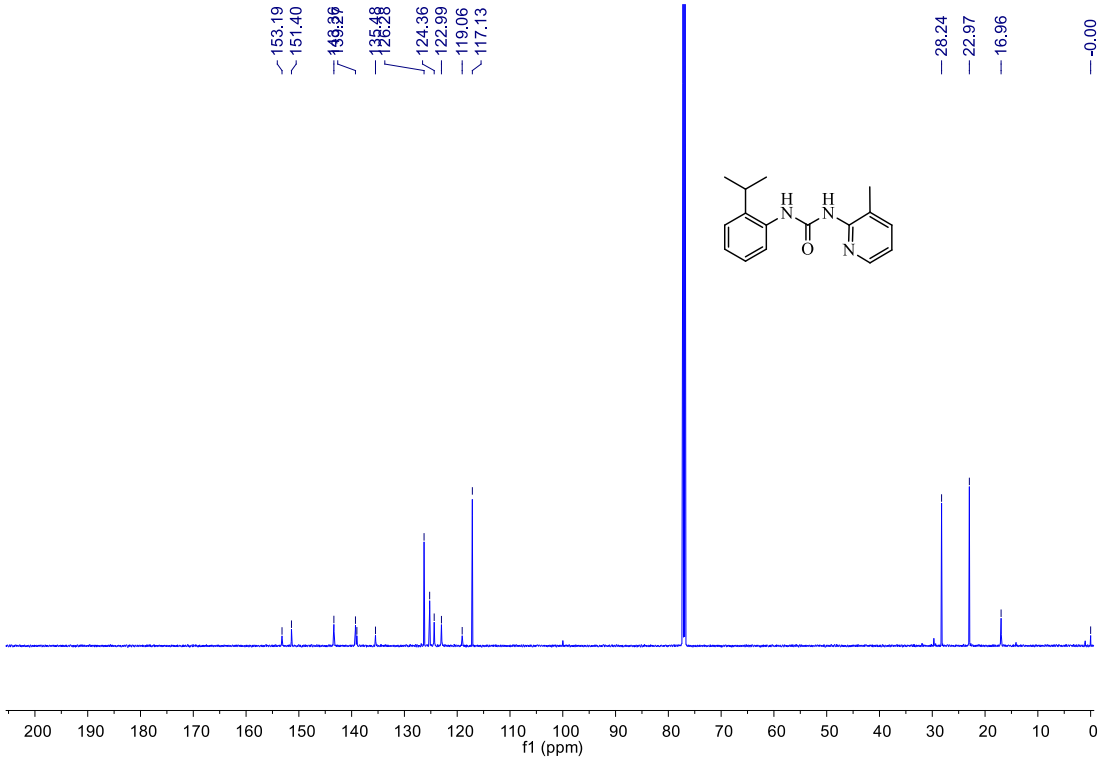
^{13}C NMR of 1-(2-ethylphenyl)-3-(3-methylpyridin-2-yl)urea **6f**



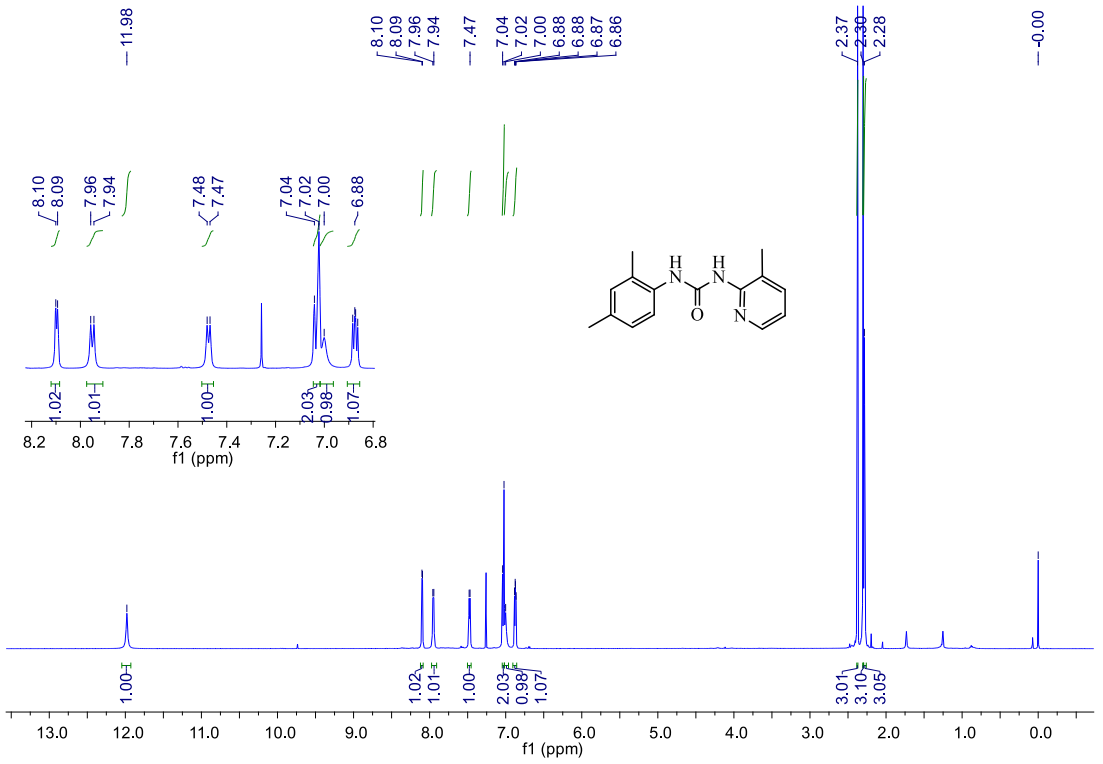
^{1}H NMR of 1-(2-isopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6g**



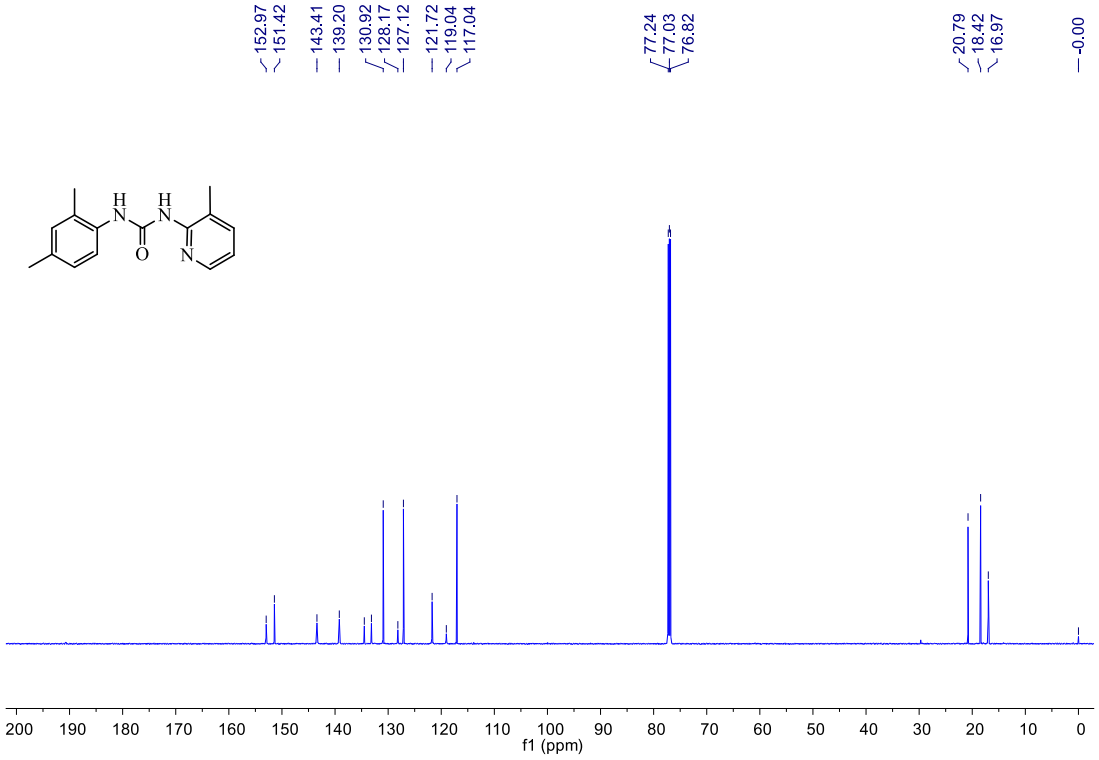
^{13}C NMR of 1-(2-isopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6g**



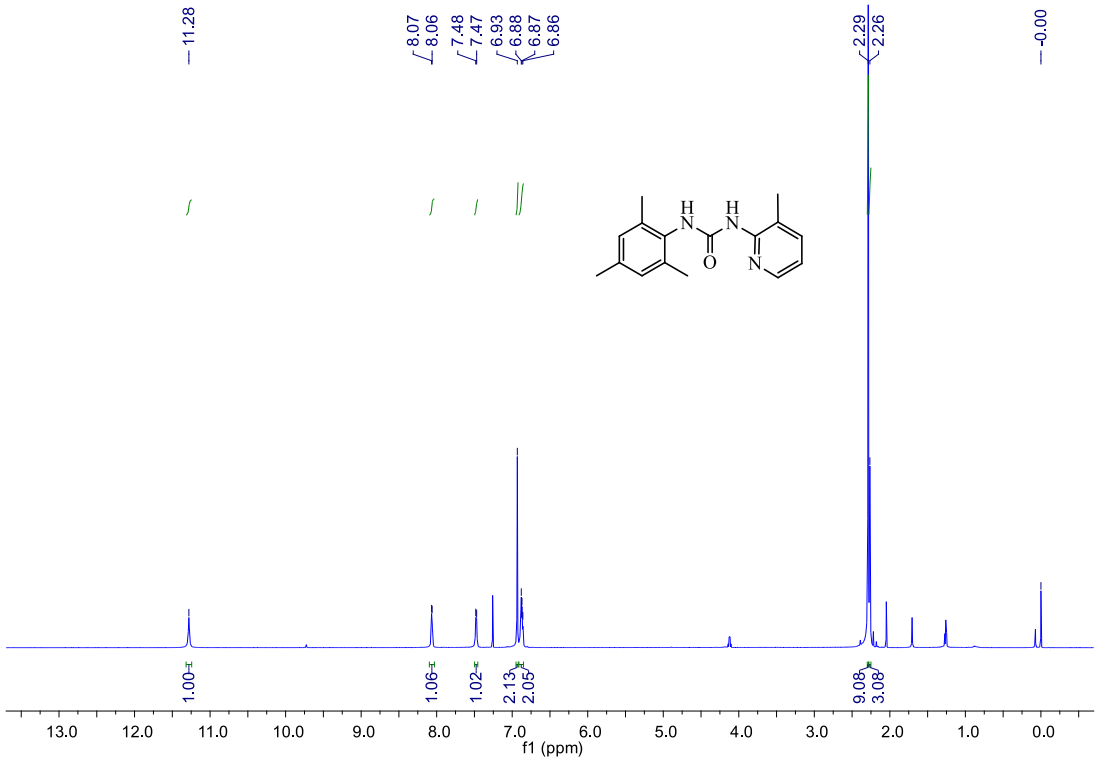
^{1}H NMR of 1-(2,4-dimethylphenyl)-3-(3-methylpyridin-2-yl)urea **6h**



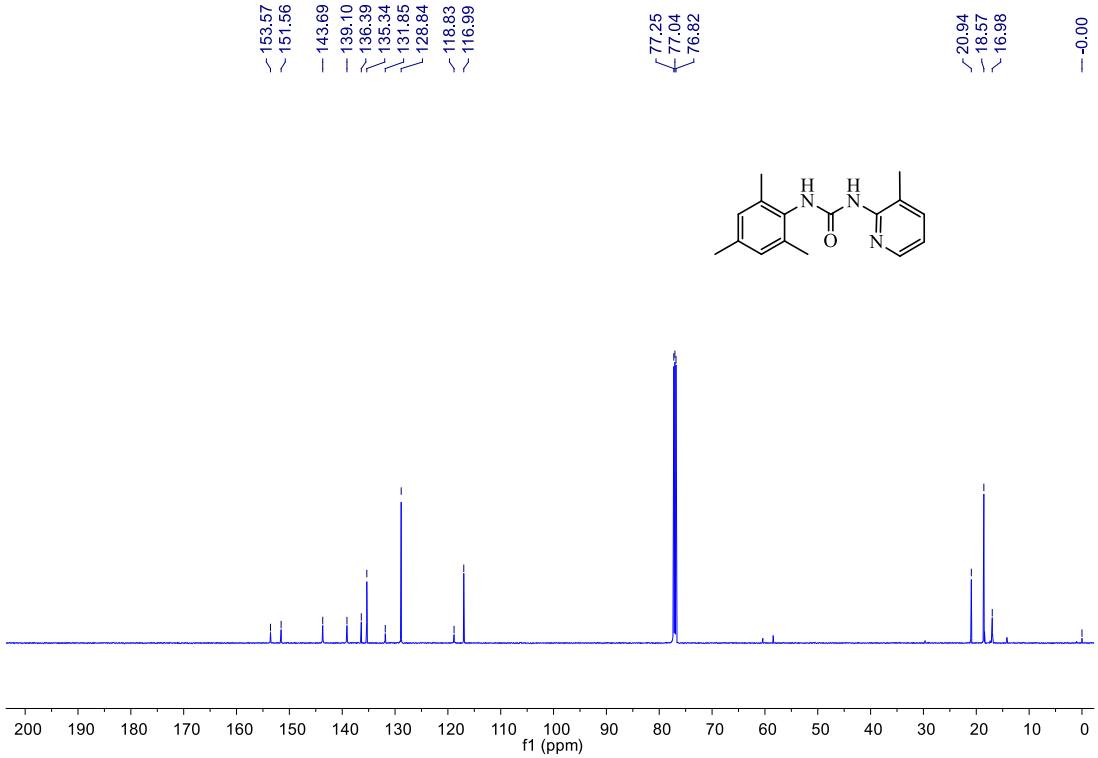
^{13}C NMR of 1-(2,4-dimethylphenyl)-3-(3-methylpyridin-2-yl)urea **6h**



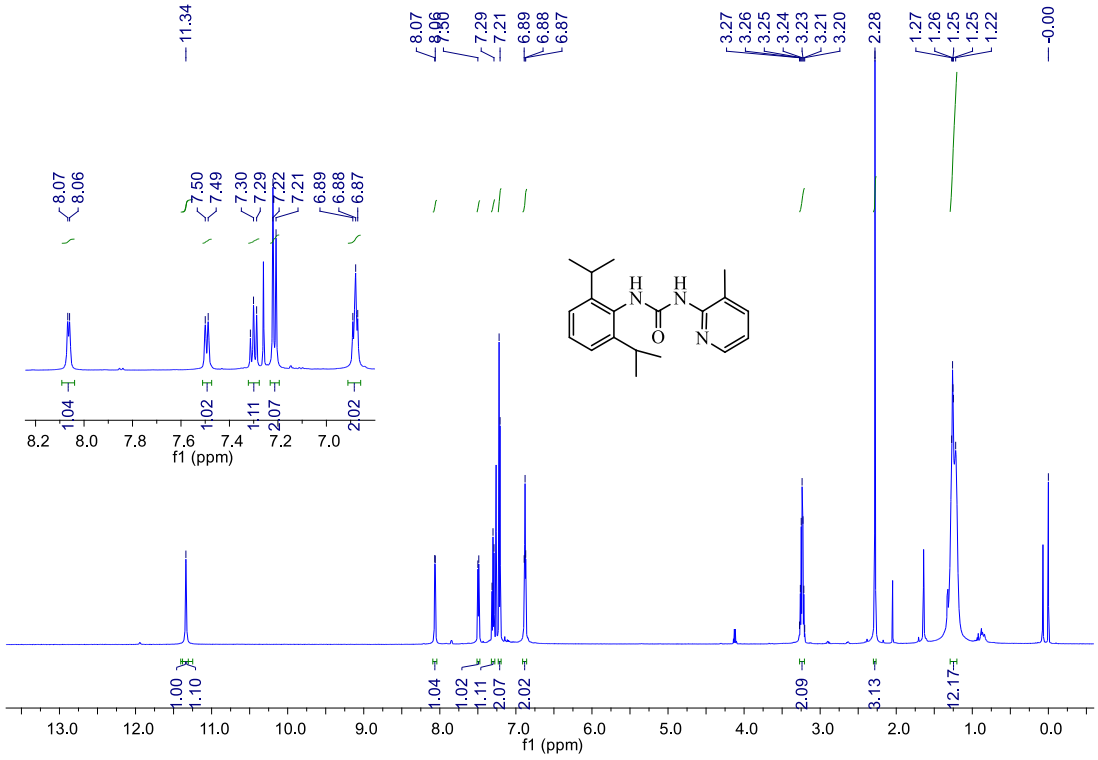
^{1}H NMR of 1-mesityl-3-(3-methylpyridin-2-yl)urea **6i**



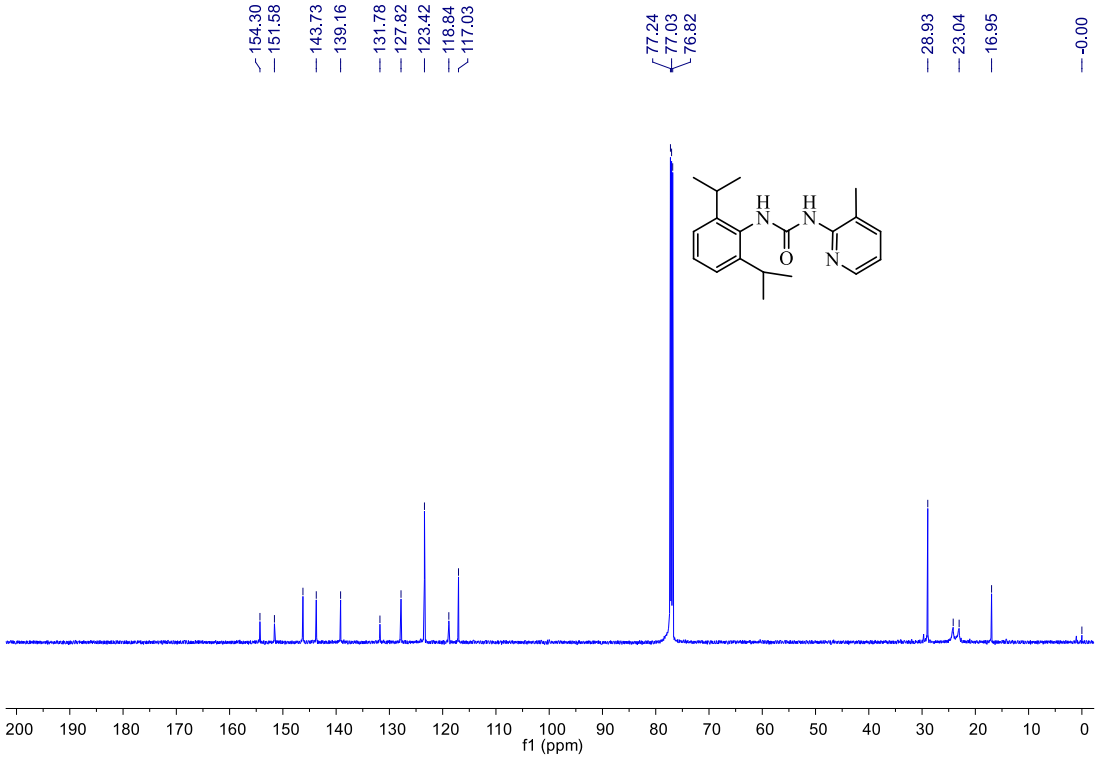
^{13}C NMR of 1-mesityl-3-(3-methylpyridin-2-yl)urea **6i**



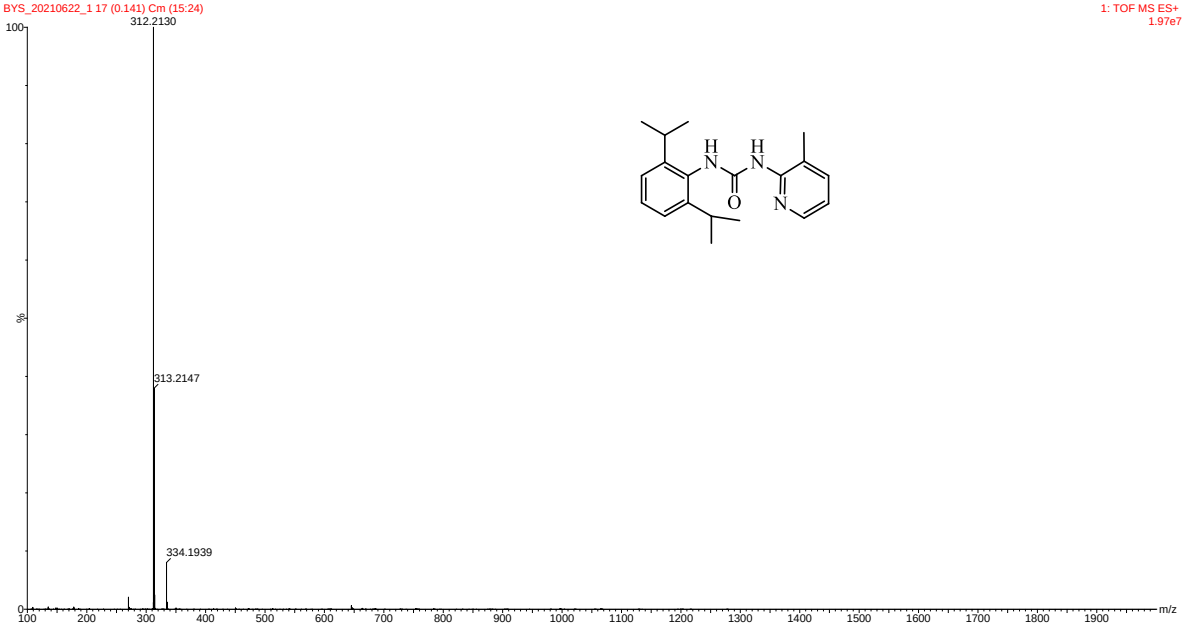
^{1}H NMR of 1-(2,6-diisopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6j**



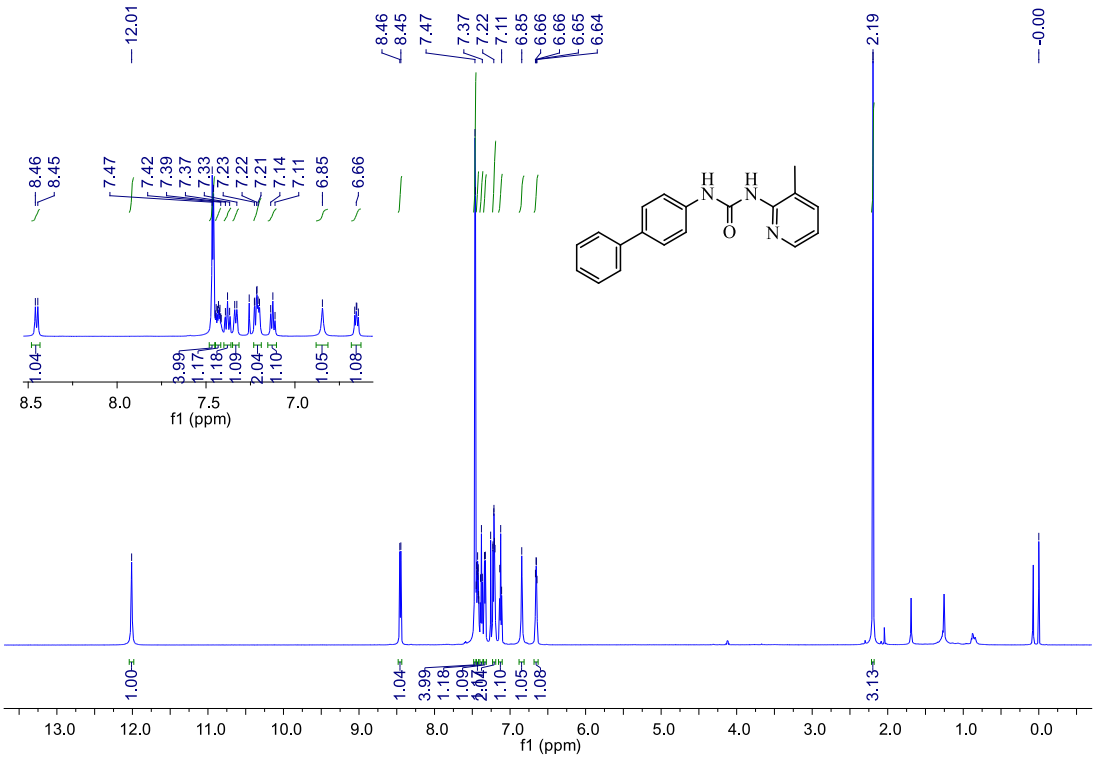
^{13}C NMR of 1-(2,6-diisopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6j**



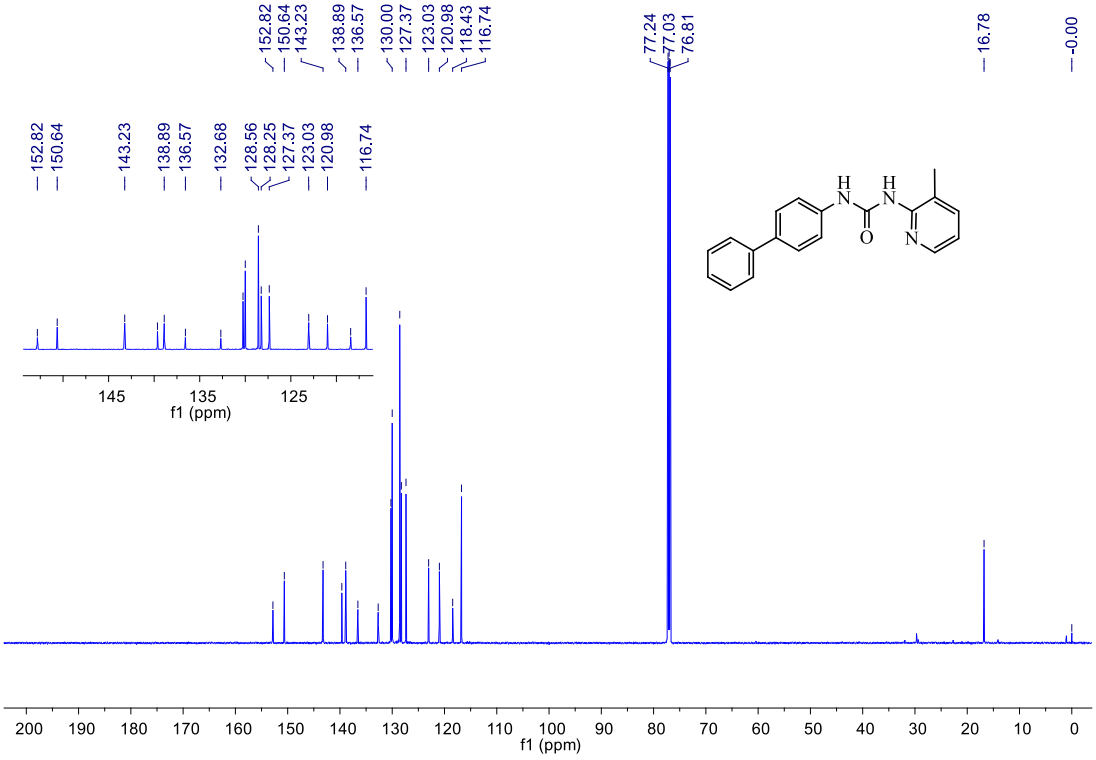
HRMS (ESI) of 1-(2,6-diisopropylphenyl)-3-(3-methylpyridin-2-yl)urea **6j**



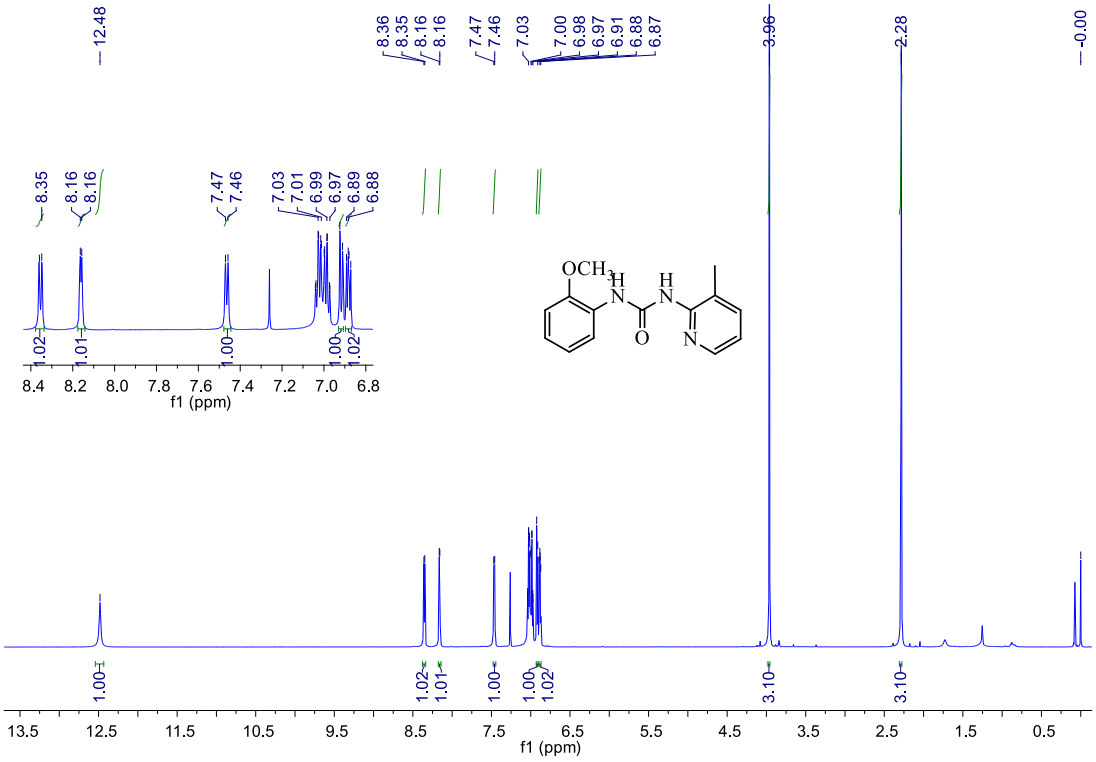
^{1}H NMR of 1-([1,1'-biphenyl]-4-yl)-3-(3-methylpyridin-2-yl)urea **6k**



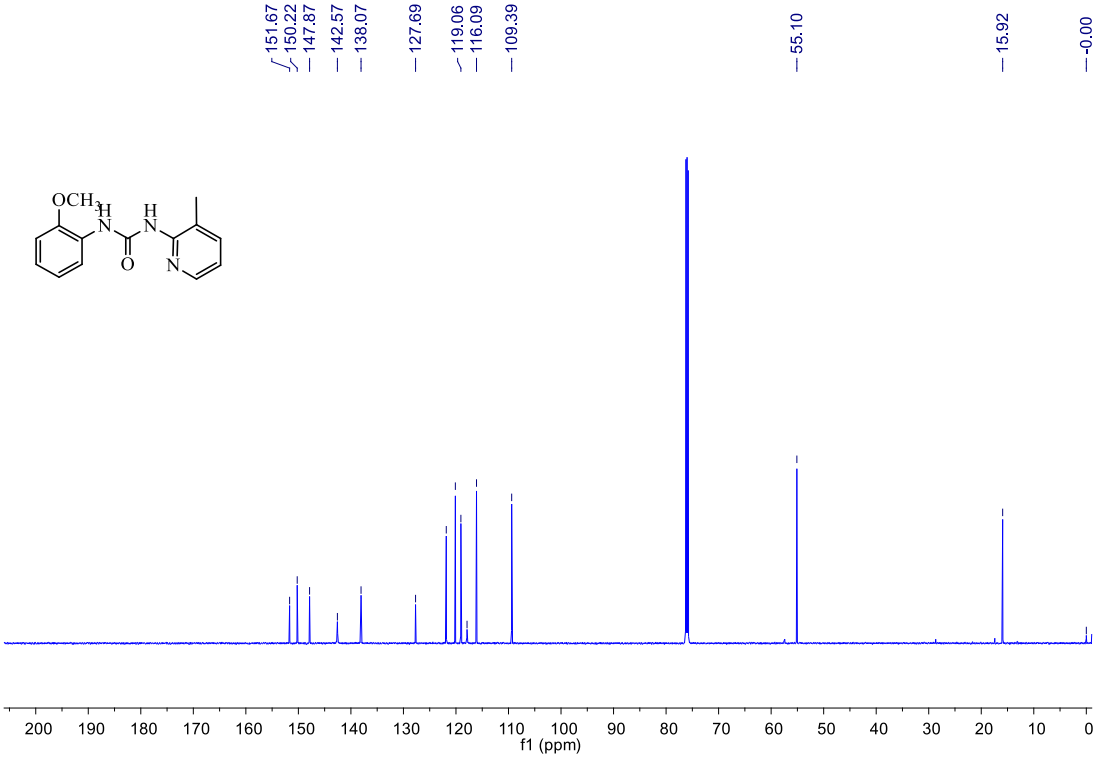
^{13}C NMR of 1-([1,1'-biphenyl]-4-yl)-3-(3-methylpyridin-2-yl)urea **6k**



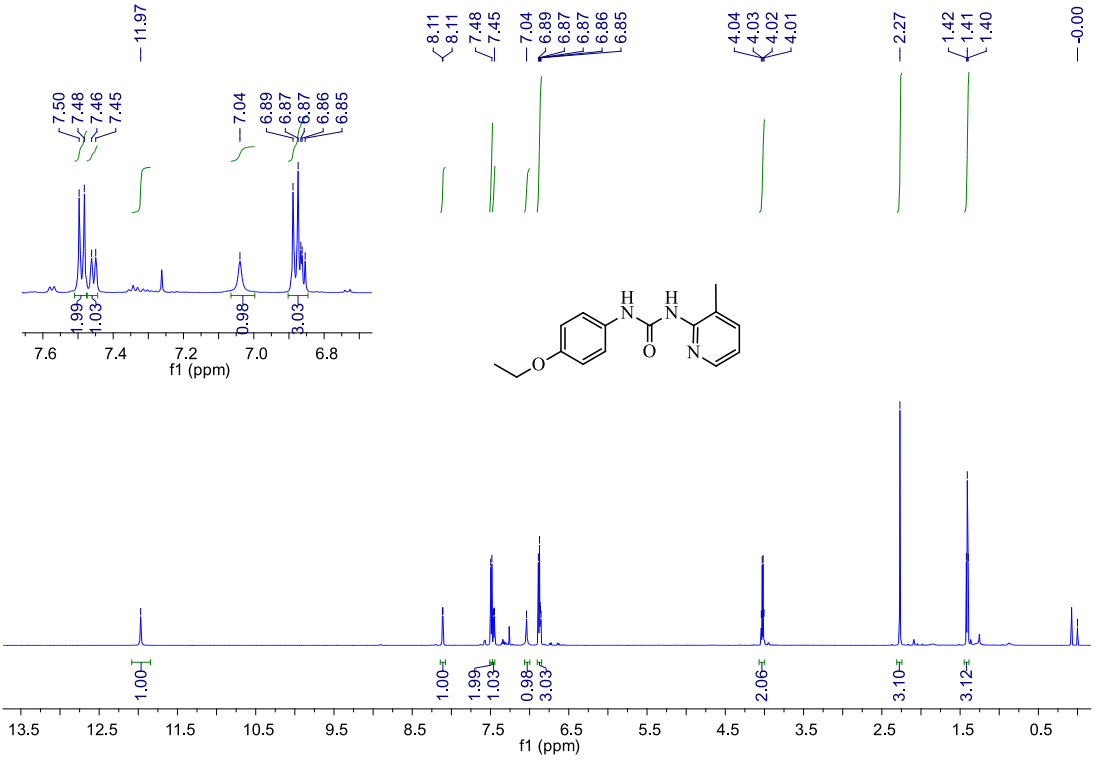
^{1}H NMR of 1-(2-methoxyphenyl)-3-(3-methylpyridin-2-yl)urea **6l**



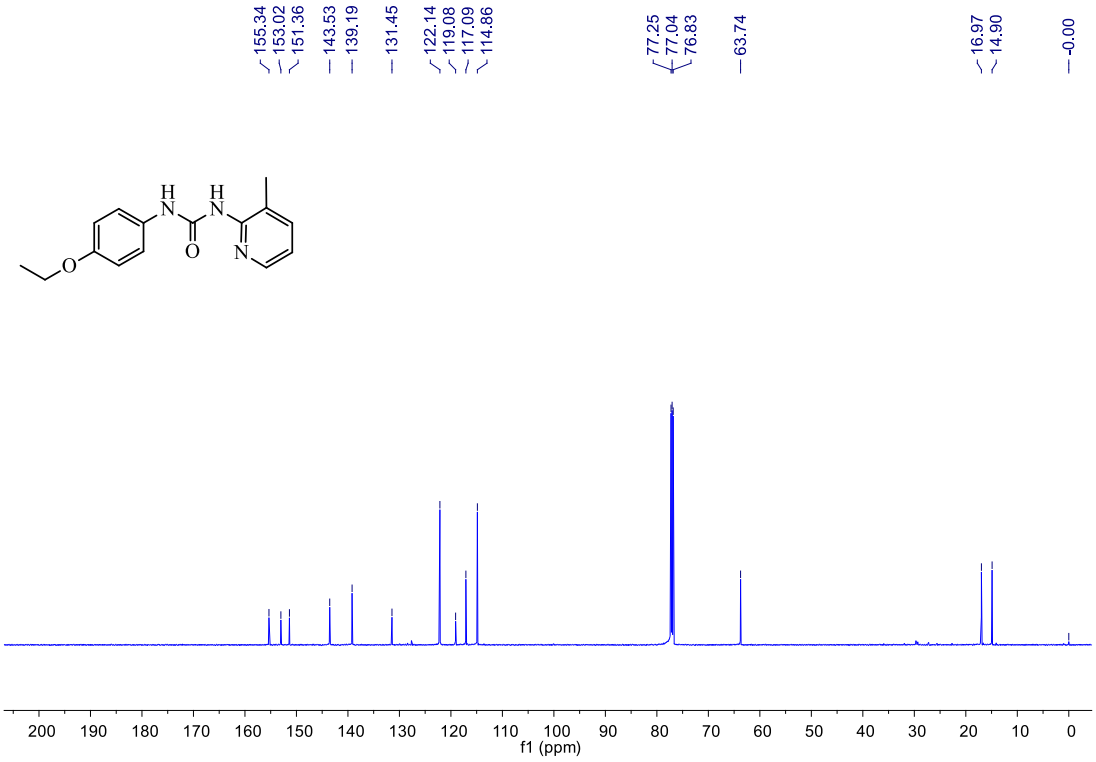
^{13}C NMR of 1-(2-methoxyphenyl)-3-(3-methylpyridin-2-yl)urea **6l**



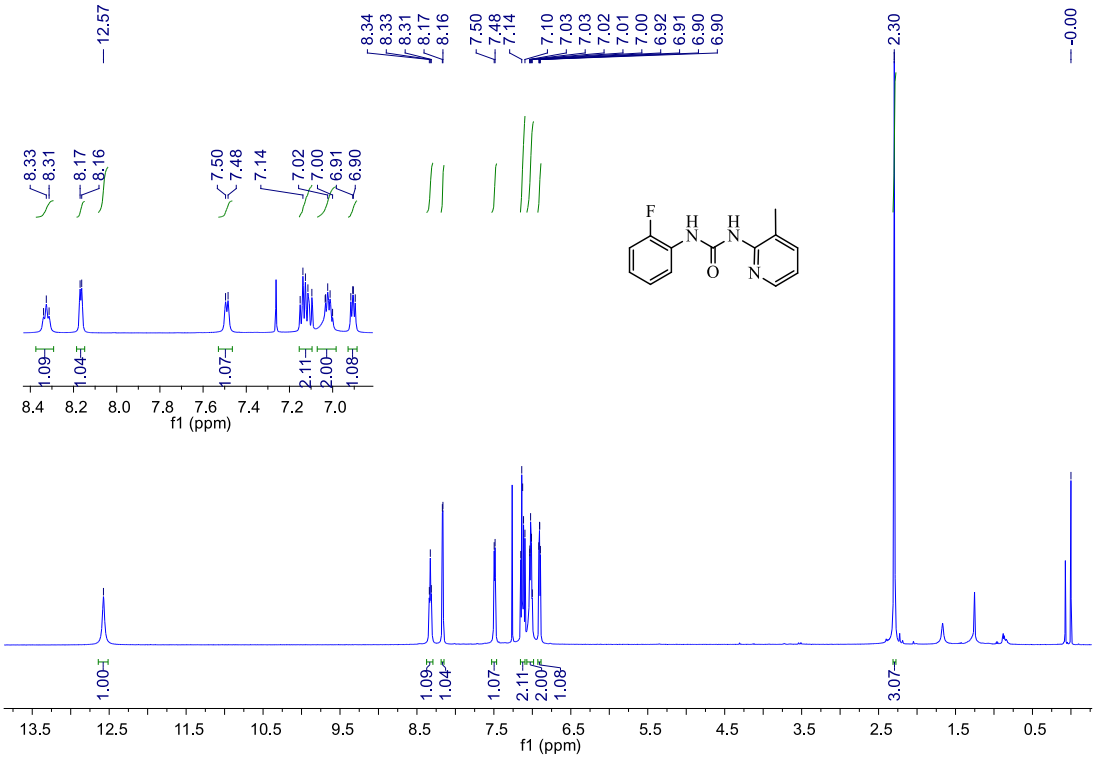
^{1}H NMR of 1-(4-ethoxyphenyl)-3-(3-methylpyridin-2-yl)urea **6m**



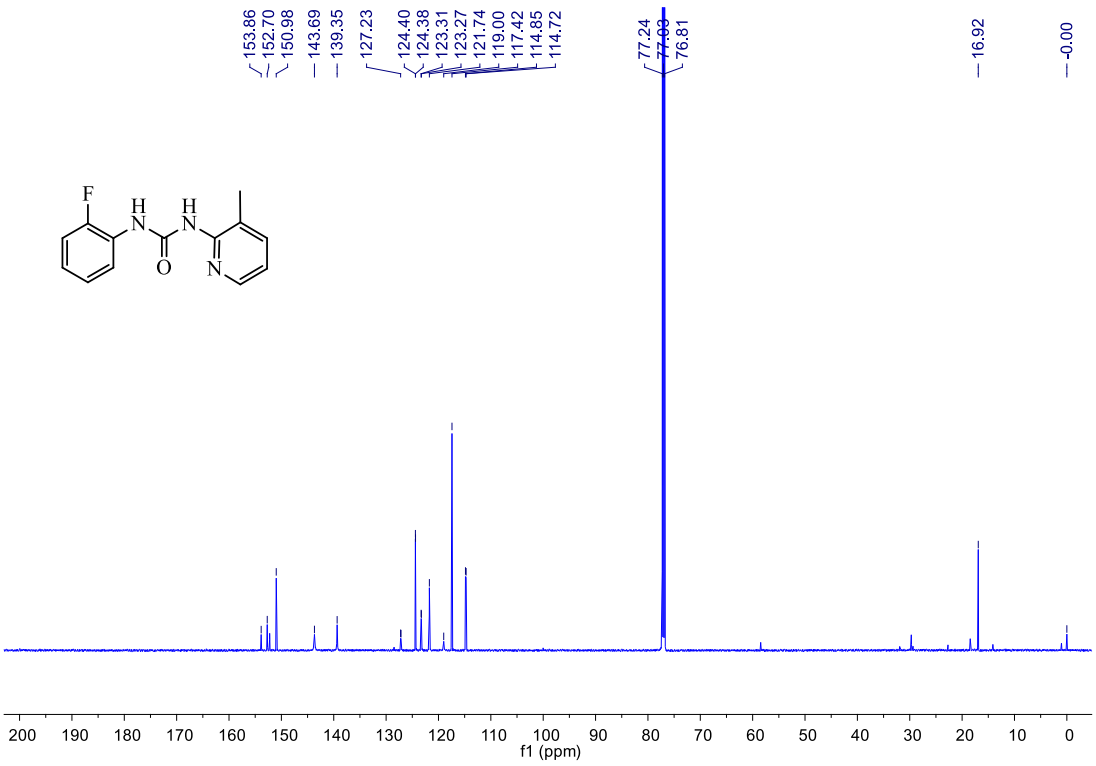
^{13}C NMR of 1-(4-ethoxyphenyl)-3-(3-methylpyridin-2-yl)urea **6m**



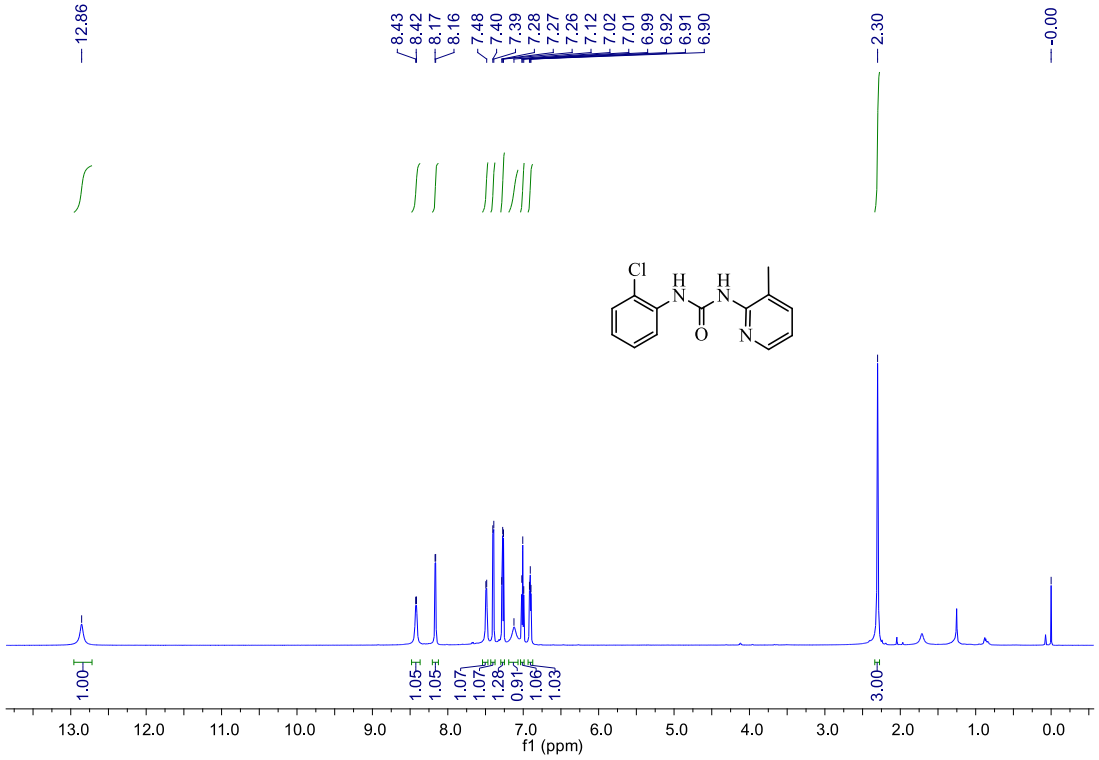
^{1}H NMR of 1-(2-fluorophenyl)-3-(3-methylpyridin-2-yl)urea **6n**



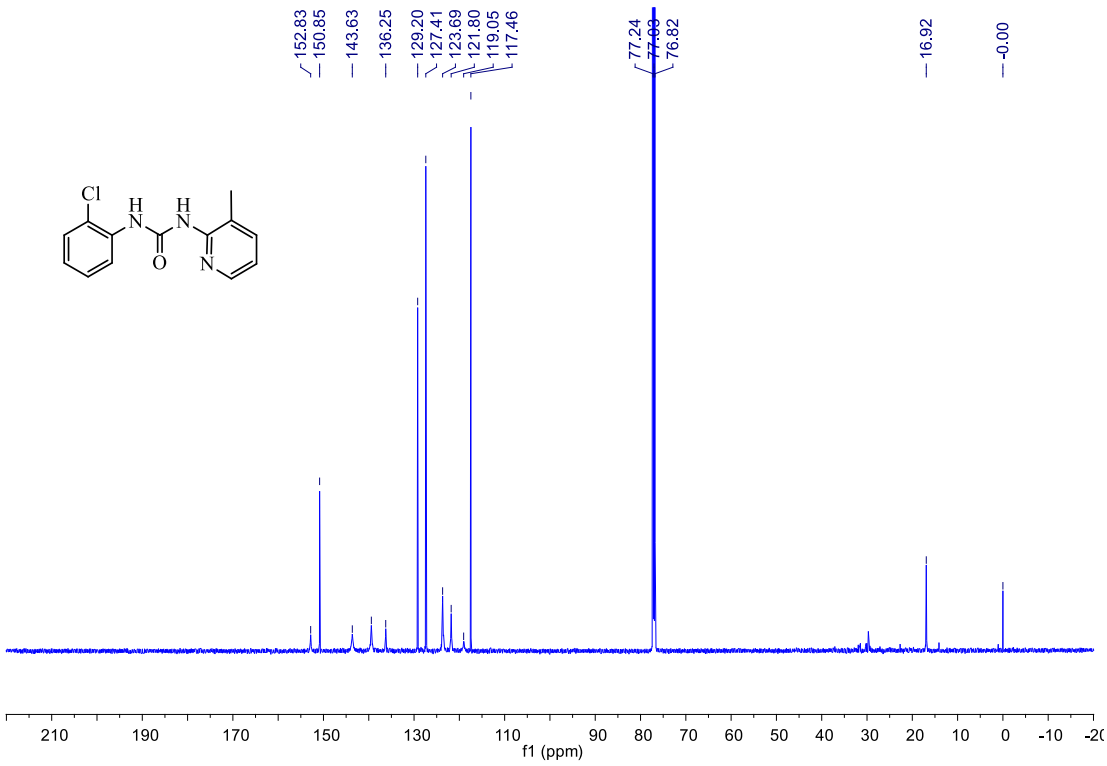
^{13}C NMR of 1-(2-fluorophenyl)-3-(3-methylpyridin-2-yl)urea **6n**



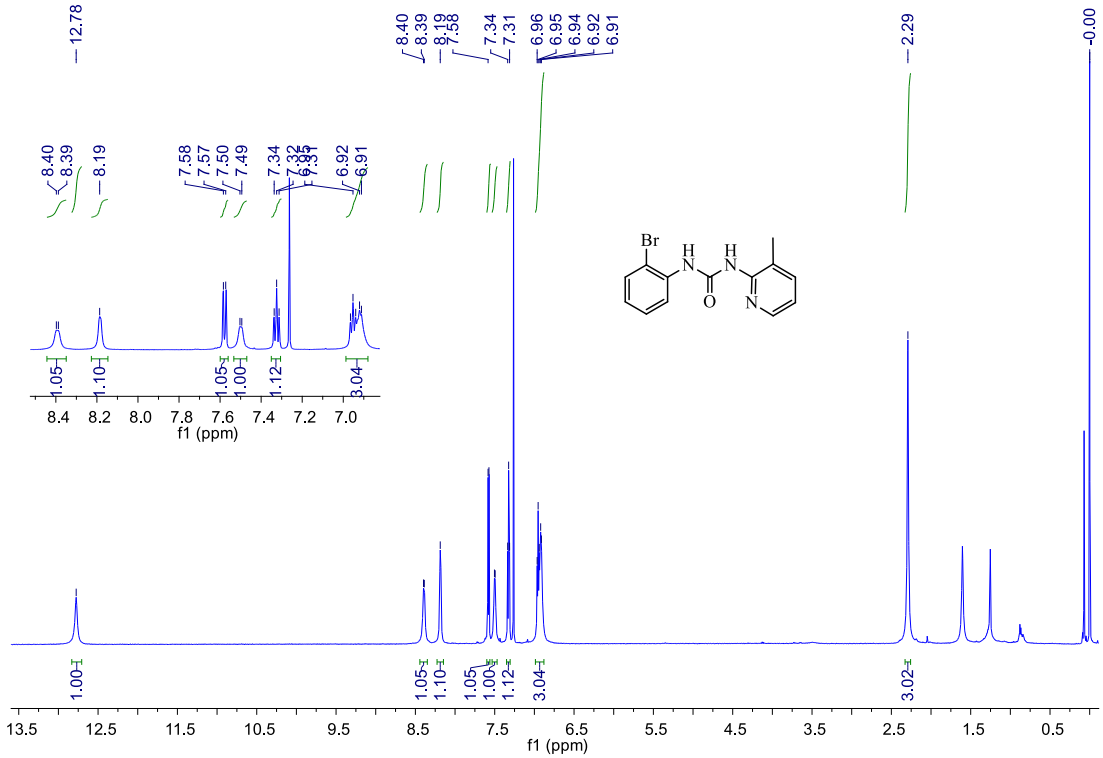
^{1}H NMR of 1-(2-chlorophenyl)-3-(3-methylpyridin-2-yl)urea **6o**



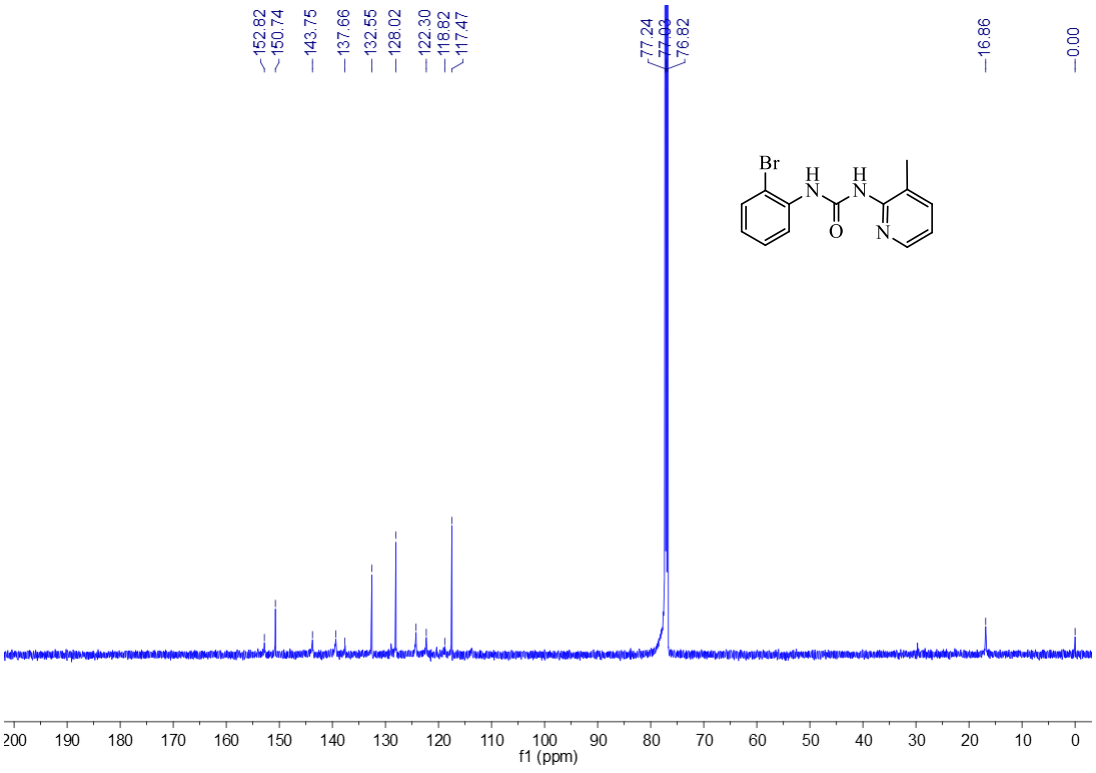
^{13}C NMR of 1-(2-chlorophenyl)-3-(3-methylpyridin-2-yl)urea **6o**



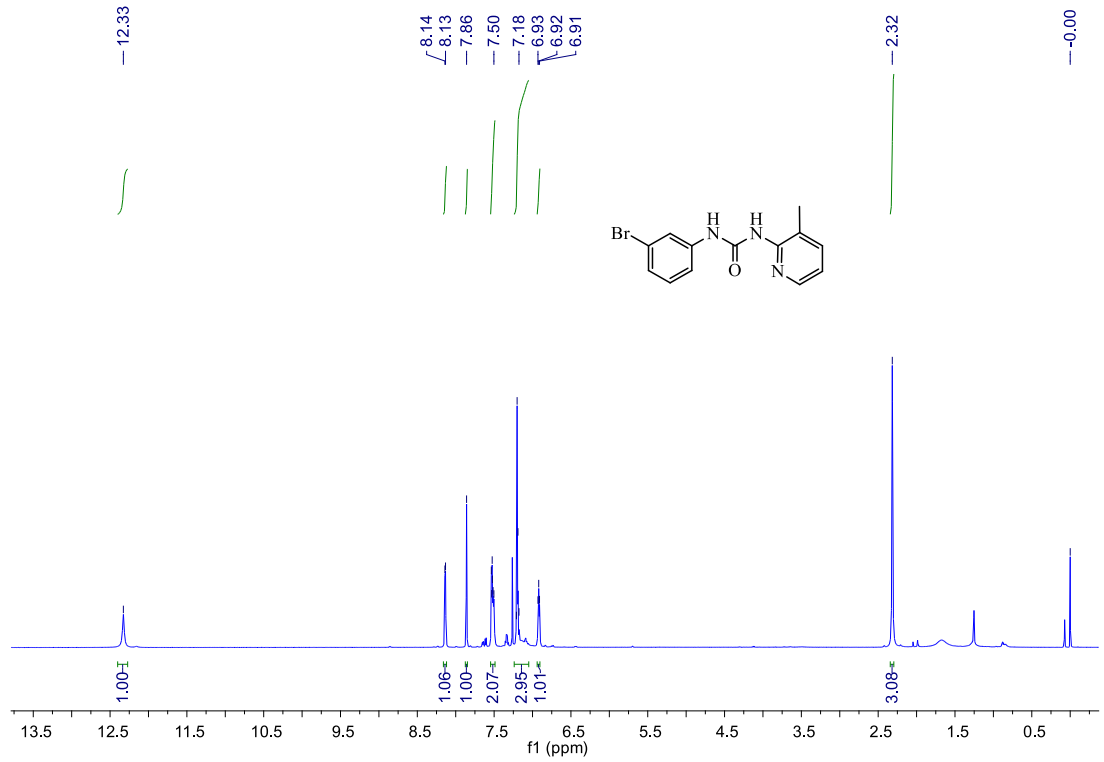
^{1}H NMR of 1-(2-bromophenyl)-3-(3-methylpyridin-2-yl)urea **6p**



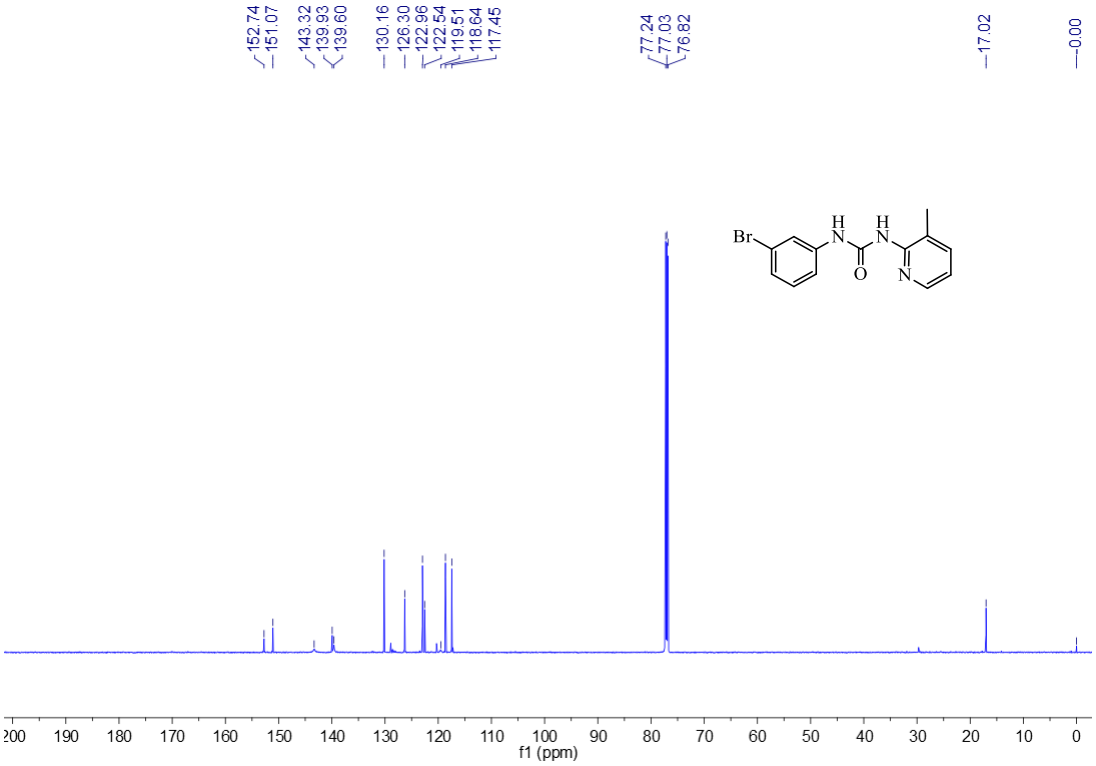
^{13}C NMR of 1-(2-bromophenyl)-3-(3-methylpyridin-2-yl)urea **6p**



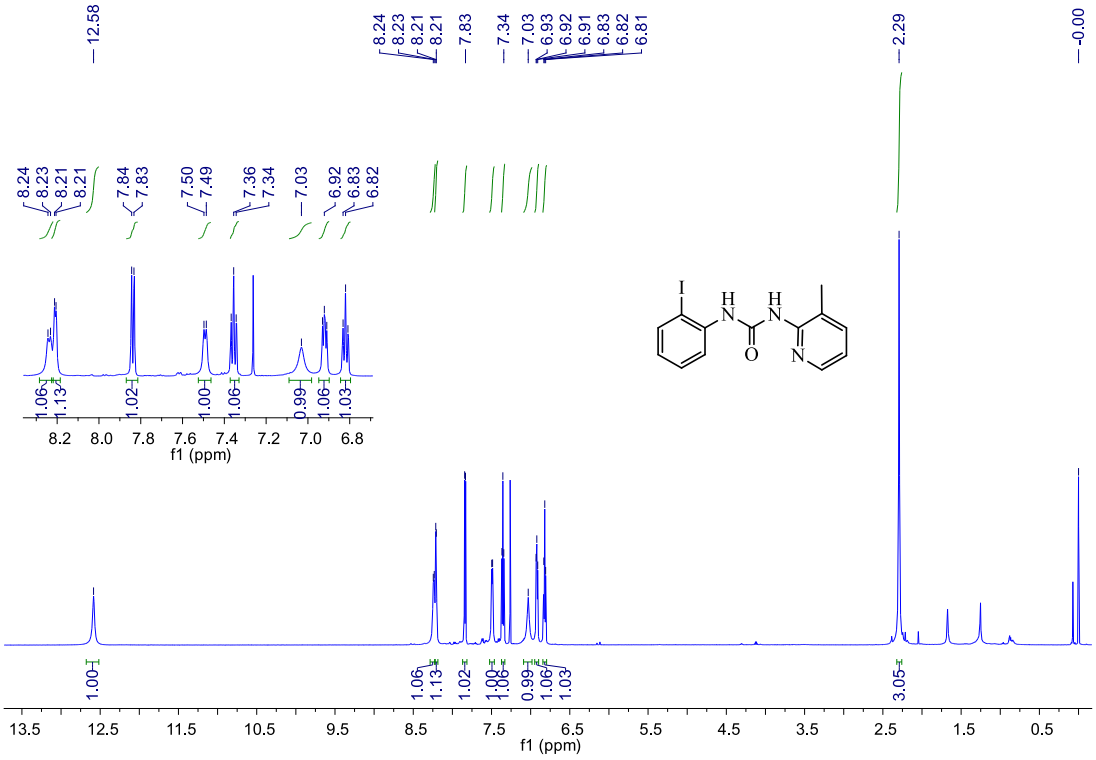
^{1}H NMR of 1-(3-bromophenyl)-3-(3-methylpyridin-2-yl)urea **6q**



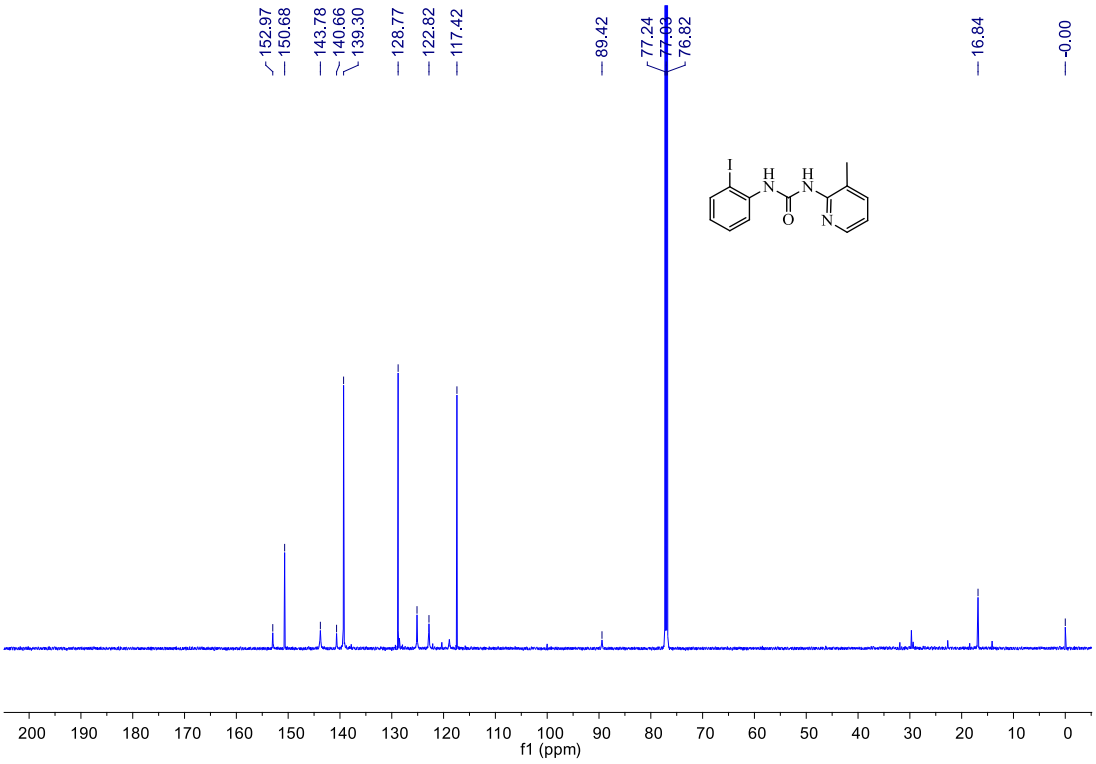
^{13}C NMR of 1-(3-bromophenyl)-3-(3-methylpyridin-2-yl)urea **6q**



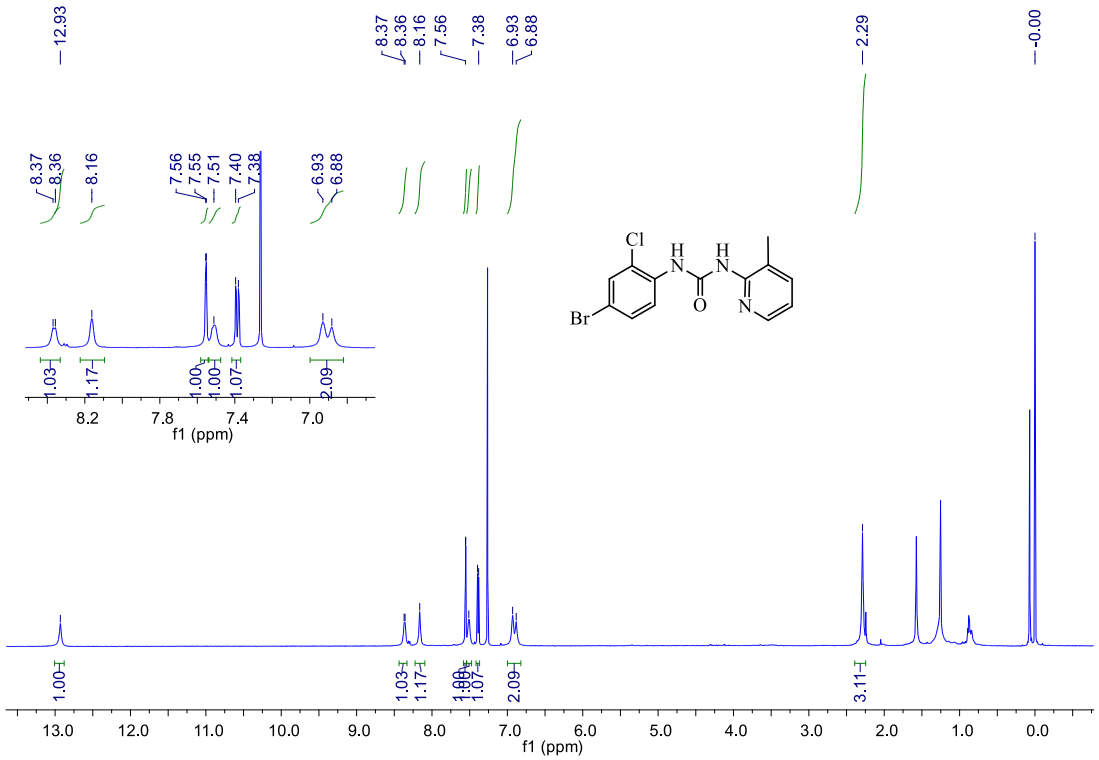
^{1}H NMR of 1-(2-iodophenyl)-3-(3-methylpyridin-2-yl)urea **6r**



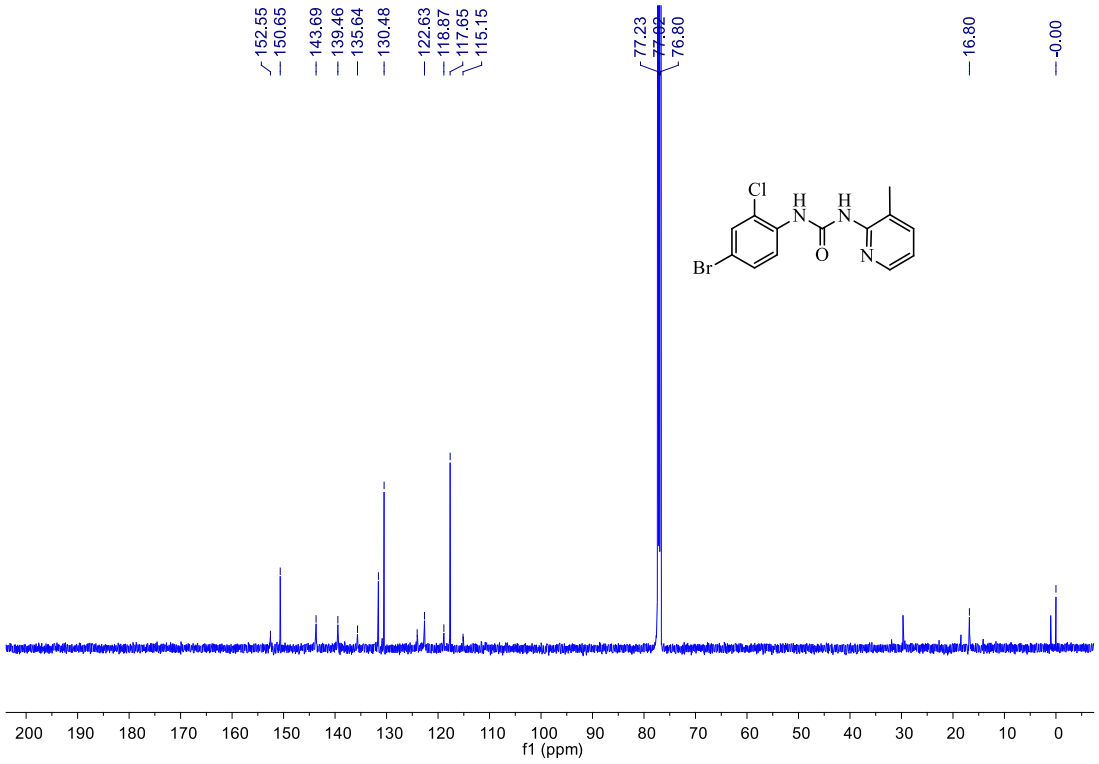
^{13}C NMR of 1-(2-iodophenyl)-3-(3-methylpyridin-2-yl)urea **6r**



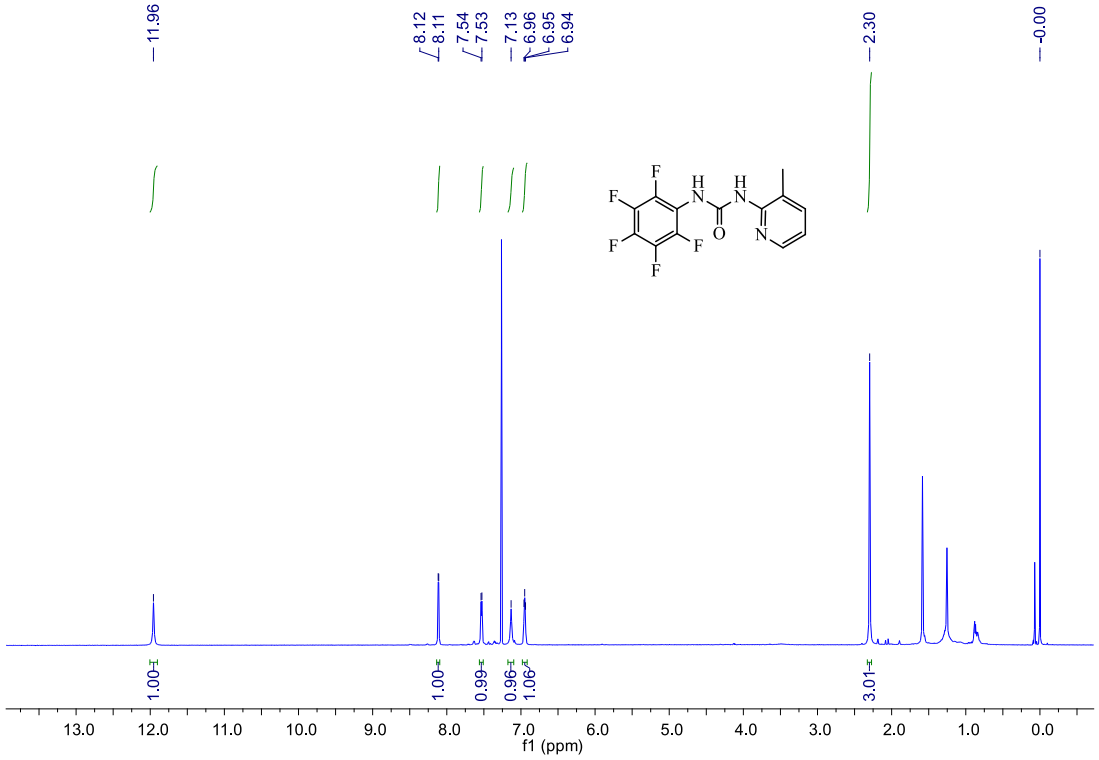
^{1}H NMR of 1-(4-bromo-2-chlorophenyl)-3-(3-methylpyridin-2-yl)urea **6s**



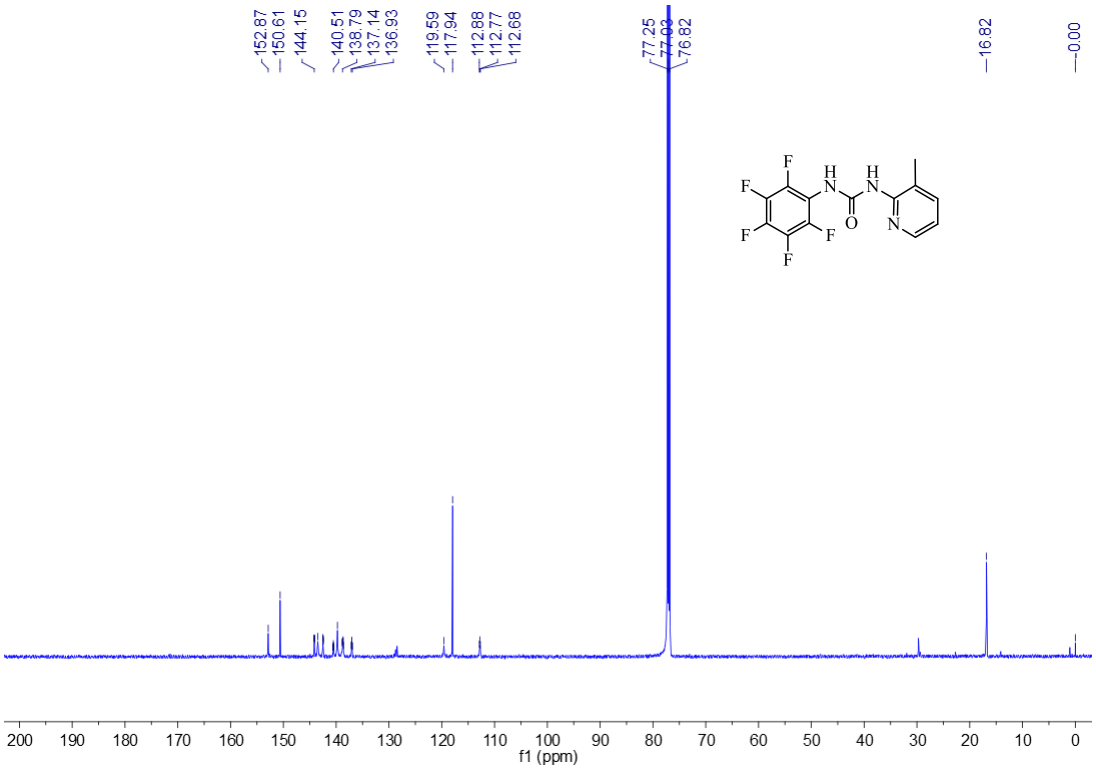
^{13}C NMR of 1-(4-bromo-2-chlorophenyl)-3-(3-methylpyridin-2-yl)urea **6s**



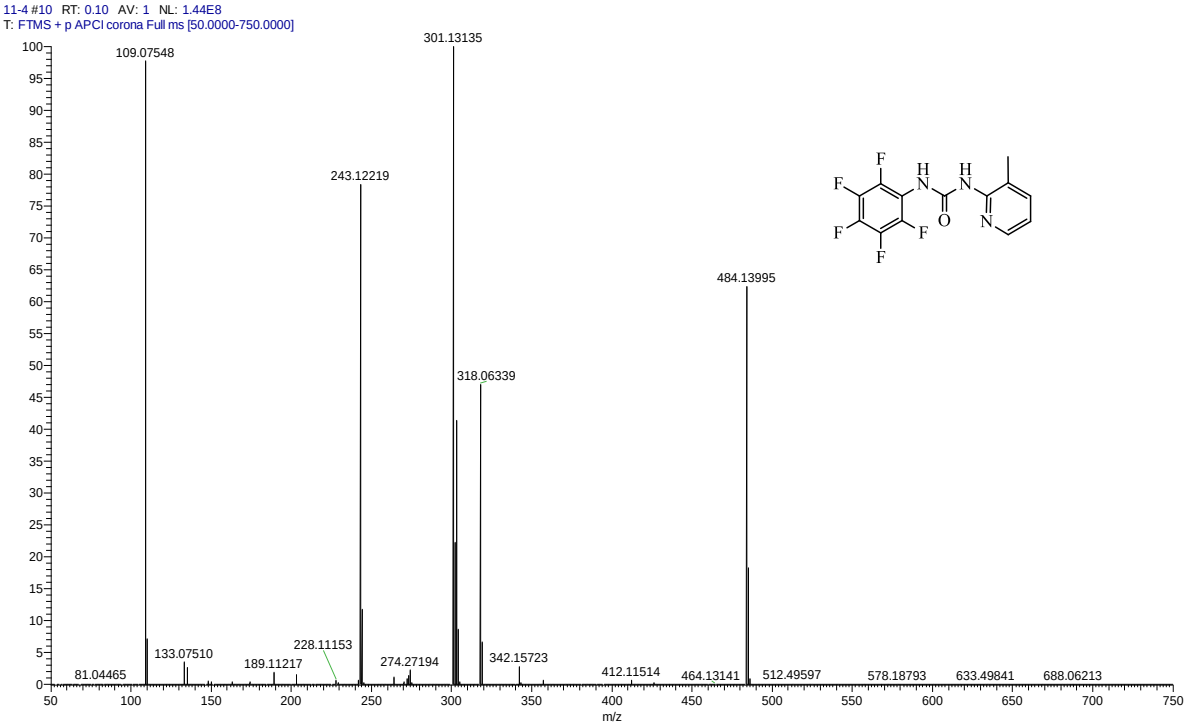
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(perfluorophenyl)urea **6t**



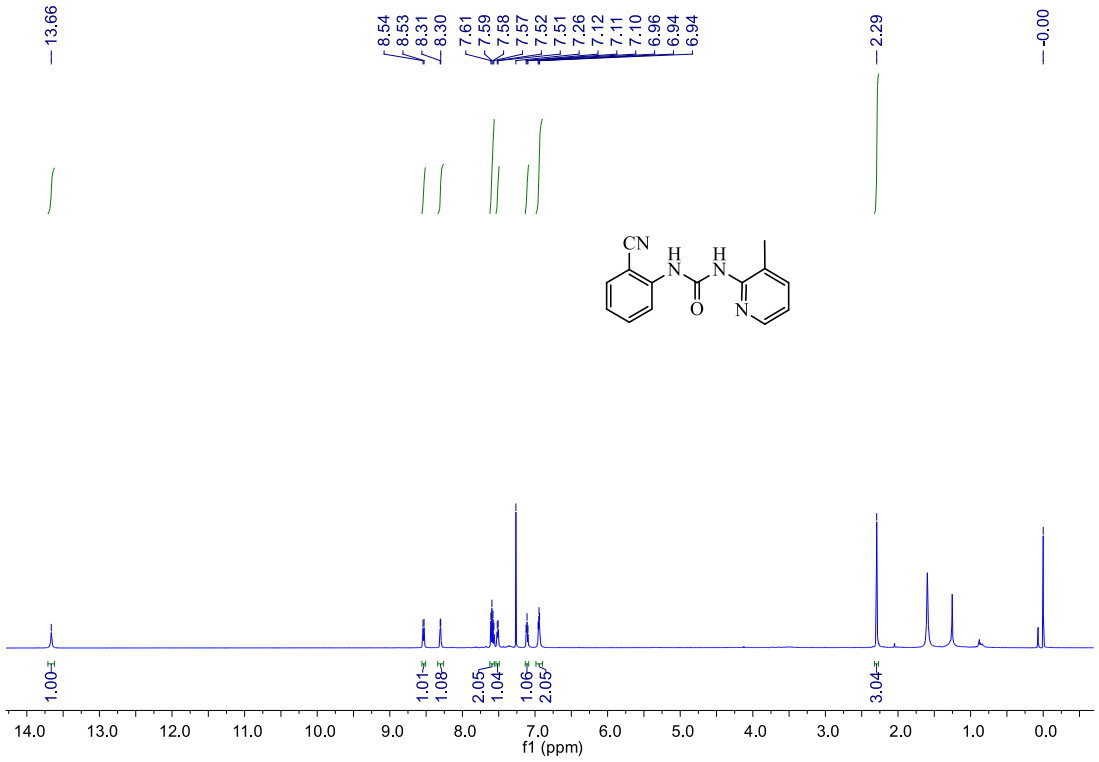
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(perfluorophenyl)urea **6t**



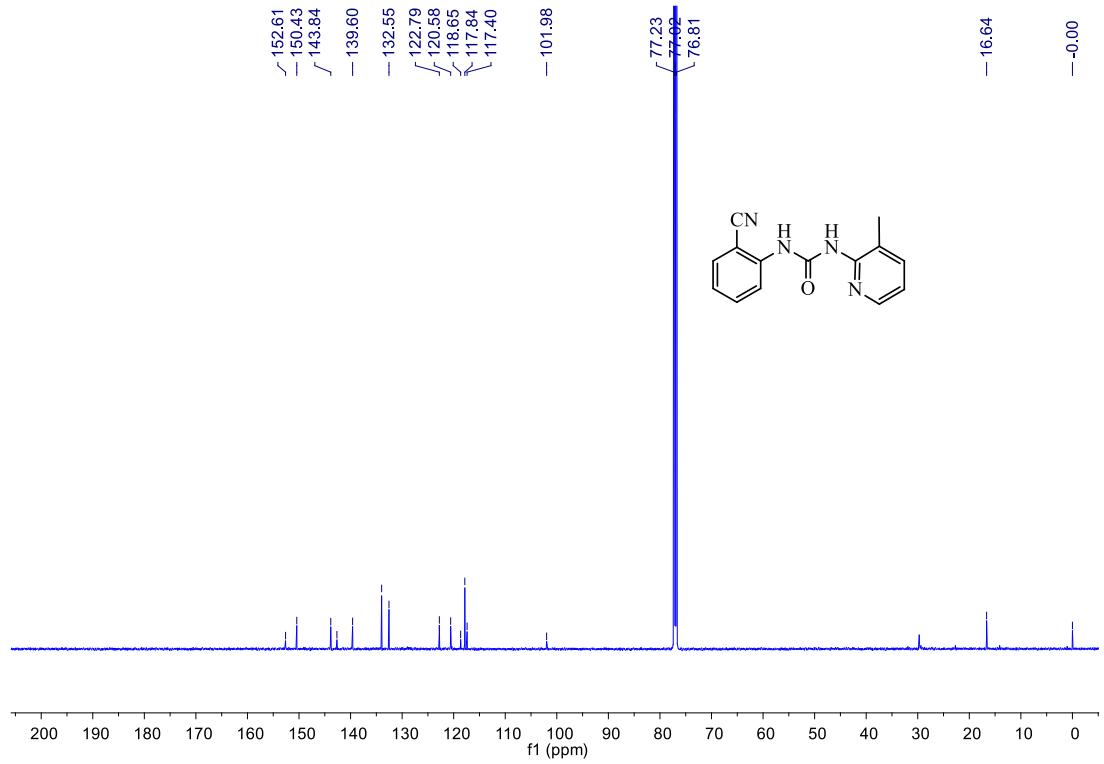
HRMS(ESI) of 1-(3-methylpyridin-2-yl)-3-(perfluorophenyl)urea **6t**



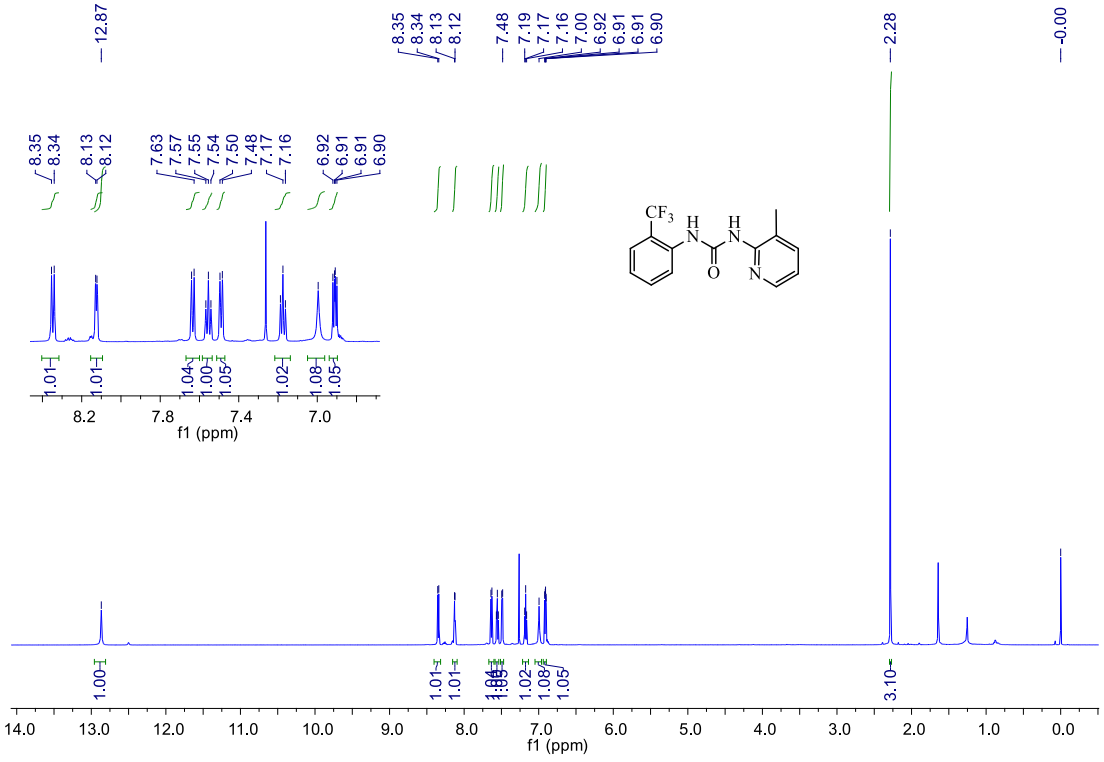
^{1}H NMR of 1-(2-cyanophenyl)-3-(3-methylpyridin-2-yl)urea **6u**



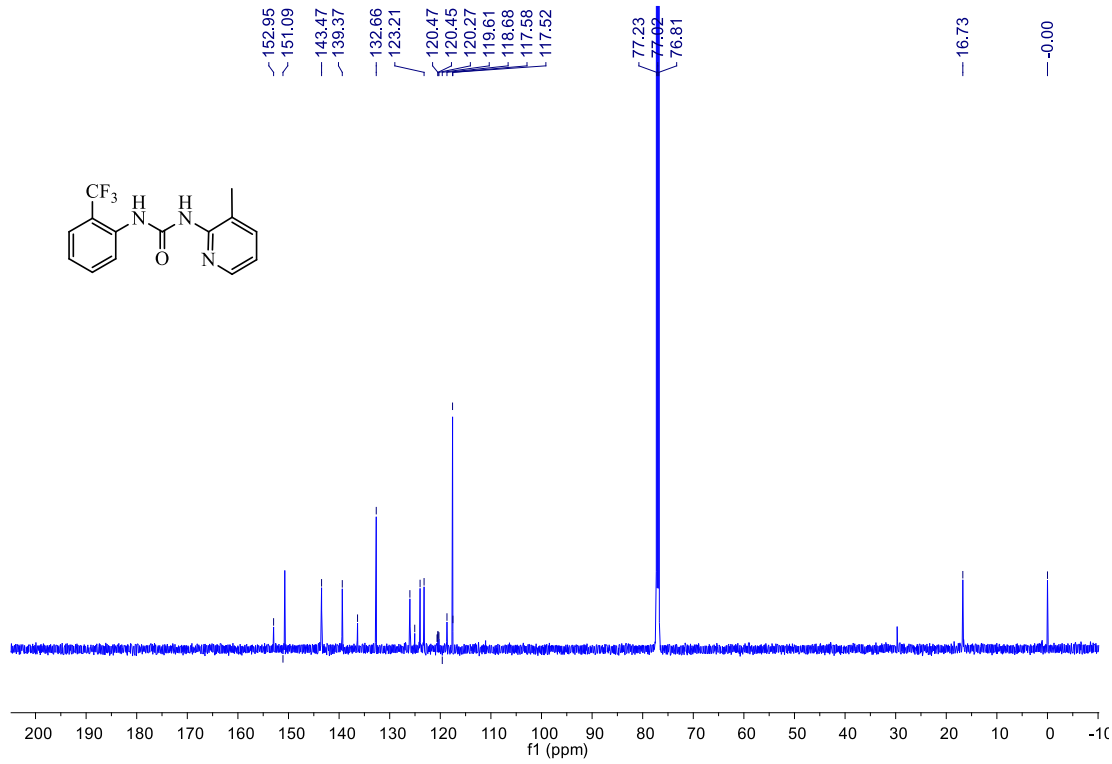
^{13}C NMR of 1-(2-cyanophenyl)-3-(3-methylpyridin-2-yl)urea **6u**



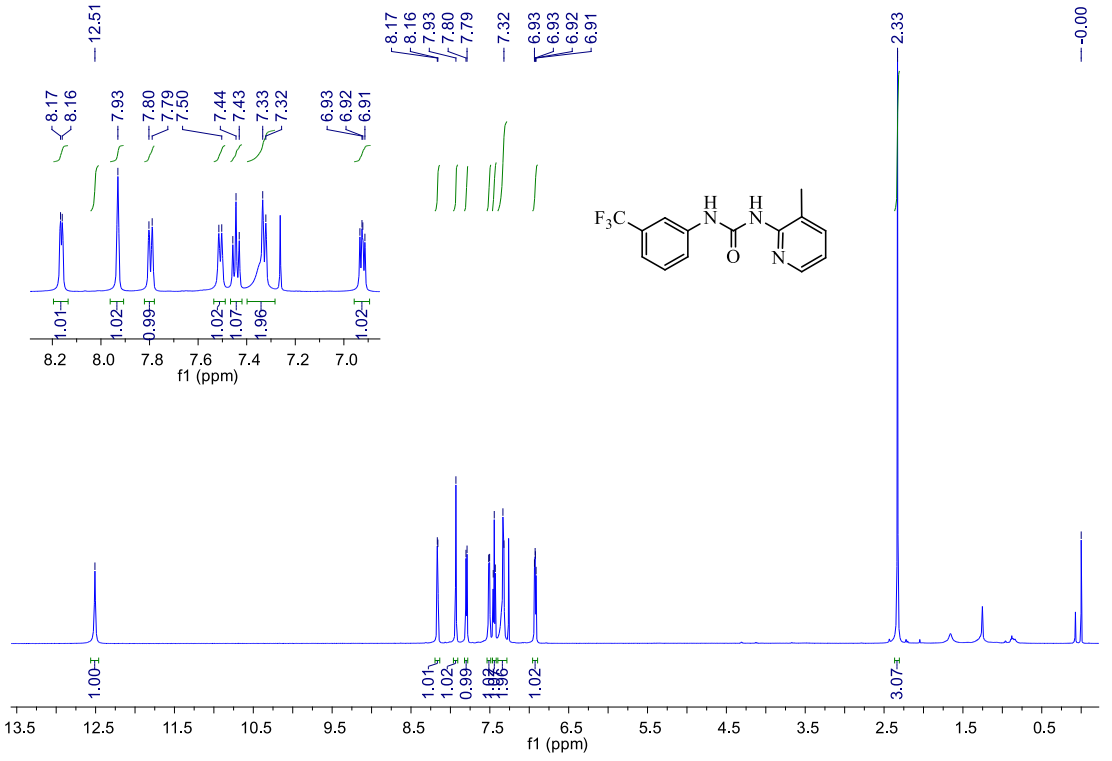
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(2-(trifluoromethyl)phenyl)urea **6v**



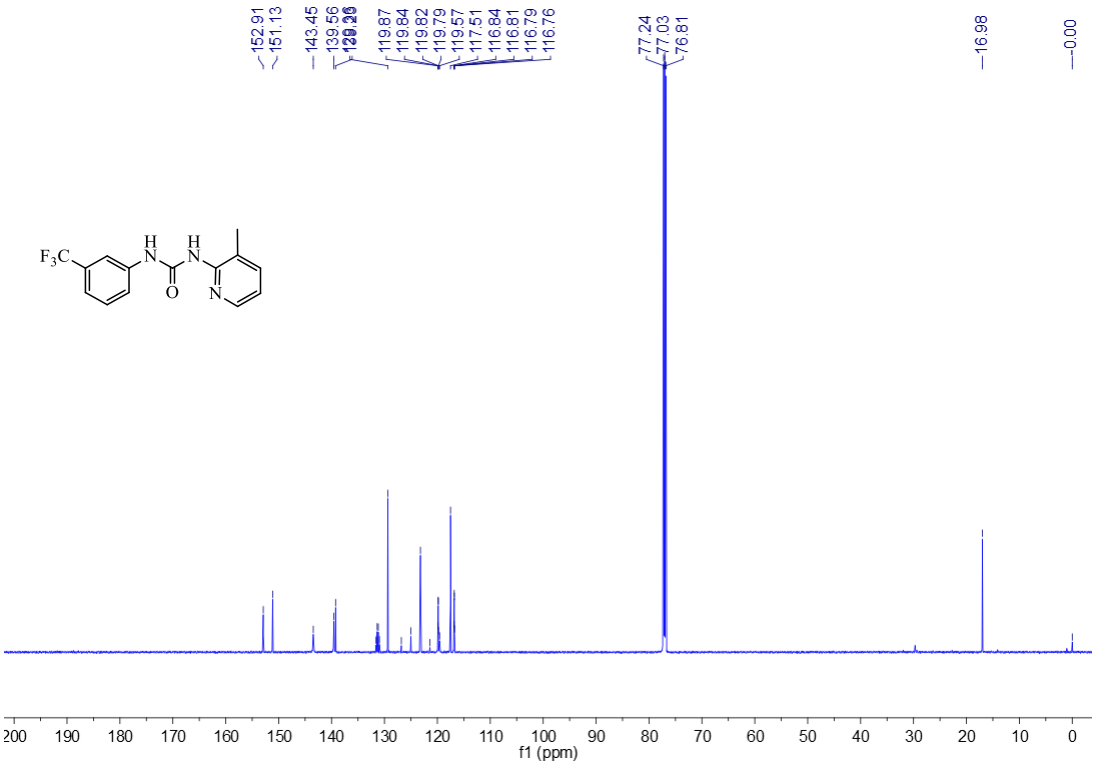
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(2-(trifluoromethyl)phenyl)urea **6v**



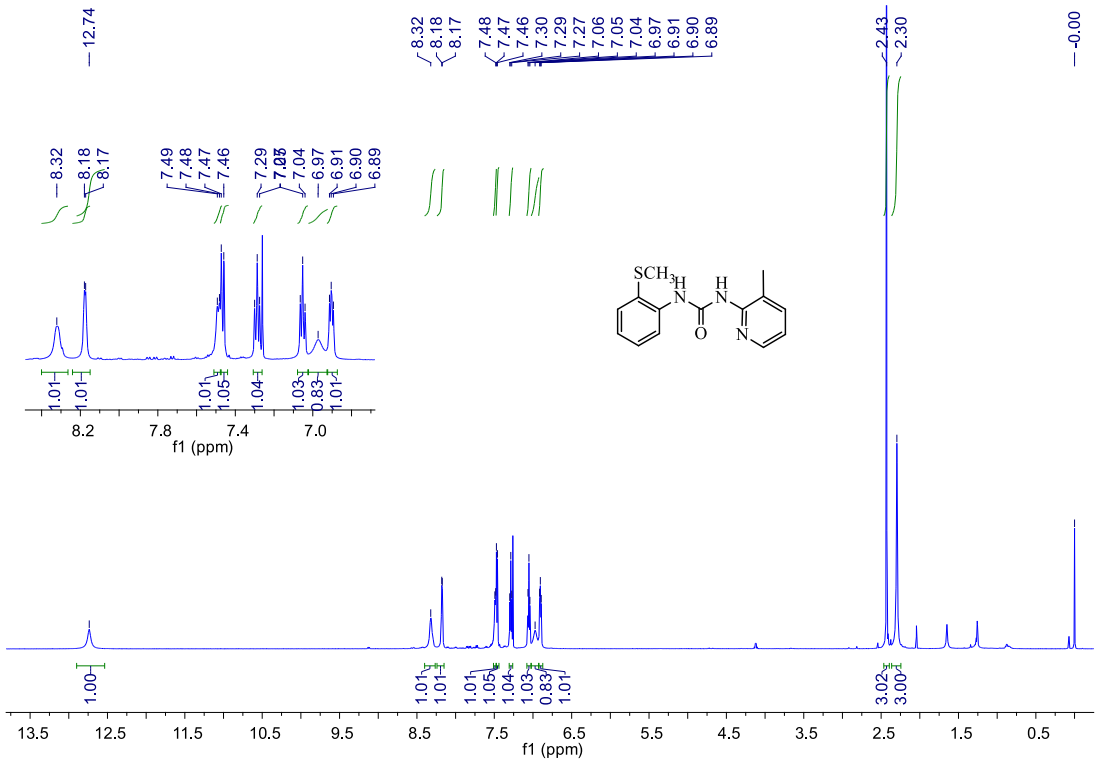
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(3-(trifluoromethyl)phenyl)urea **6w**



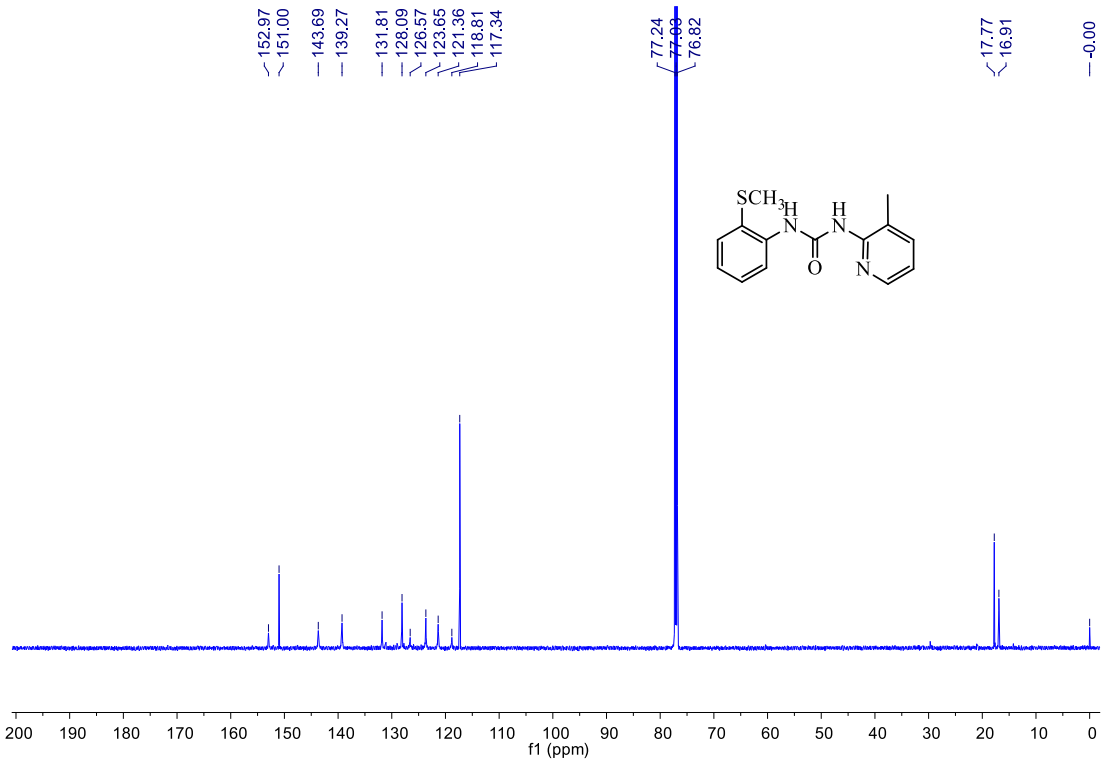
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(3-(trifluoromethyl)phenyl)urea **6w**



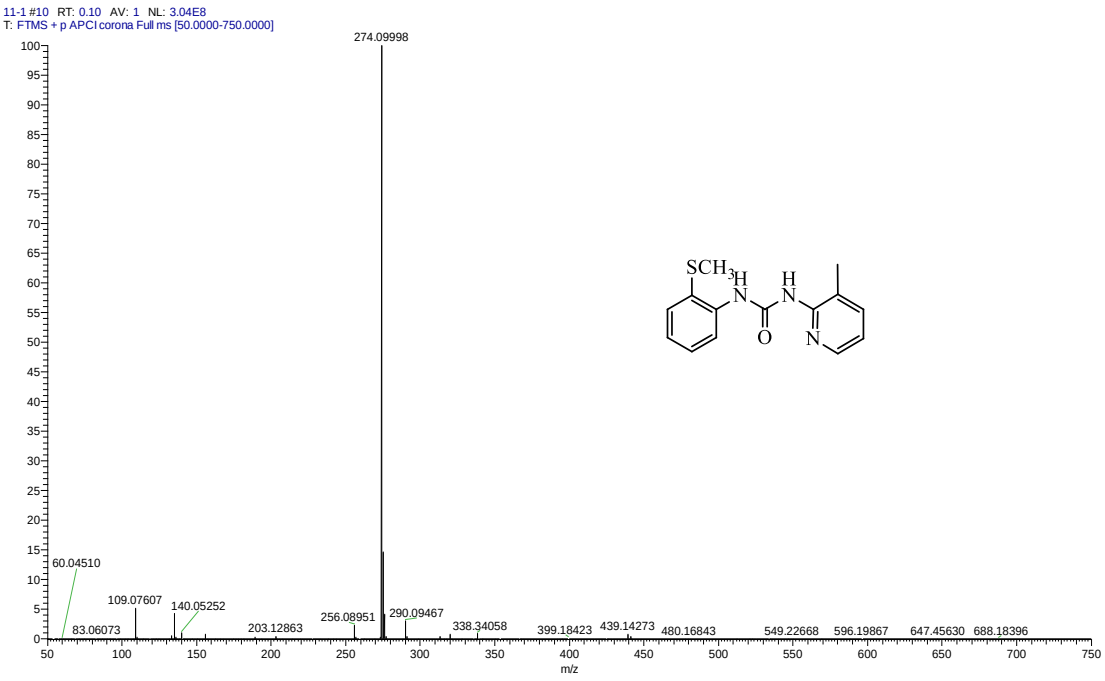
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(2-(methylthio)phenyl)urea **6x**



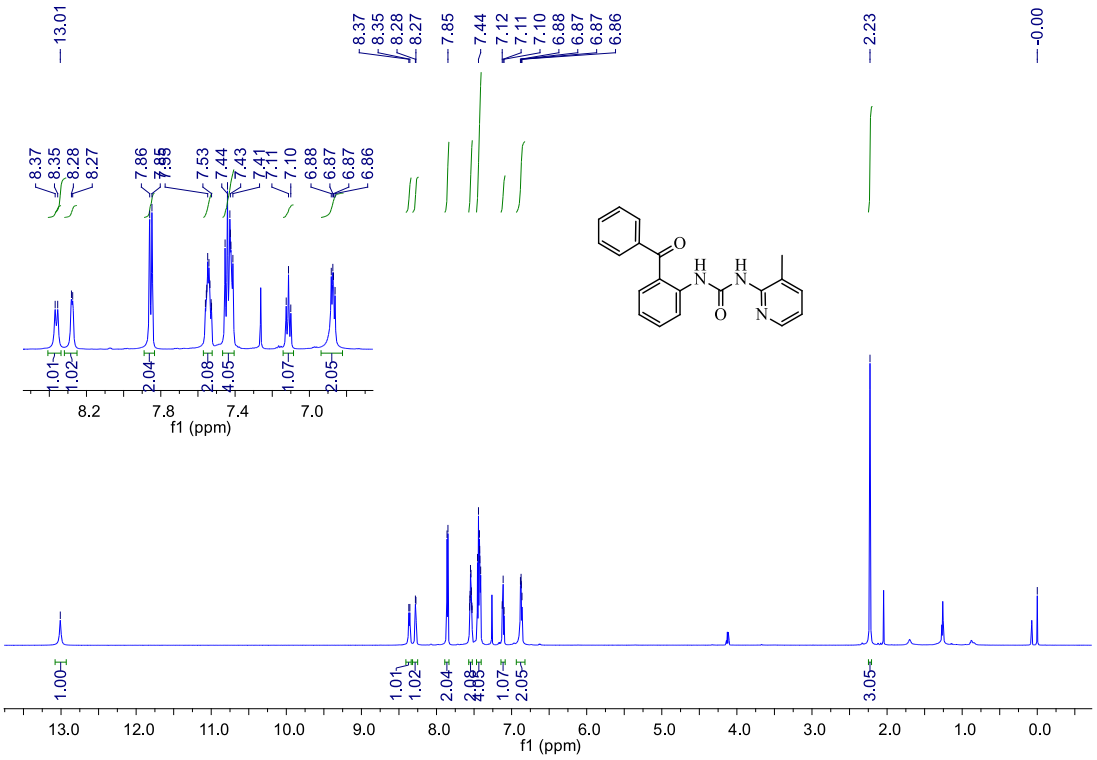
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(2-(methylthio)phenyl)urea **6x**



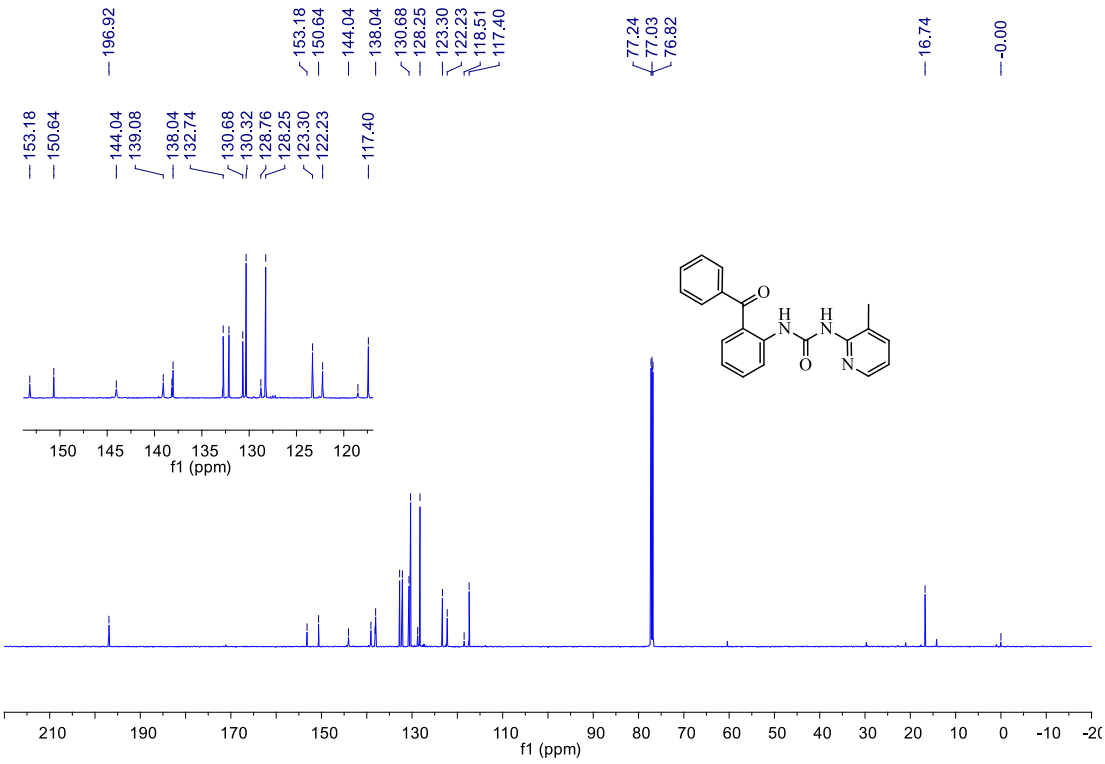
HRMS(ESI) of 1-(3-methylpyridin-2-yl)-3-(2-(methylthio)phenyl)urea **6x**



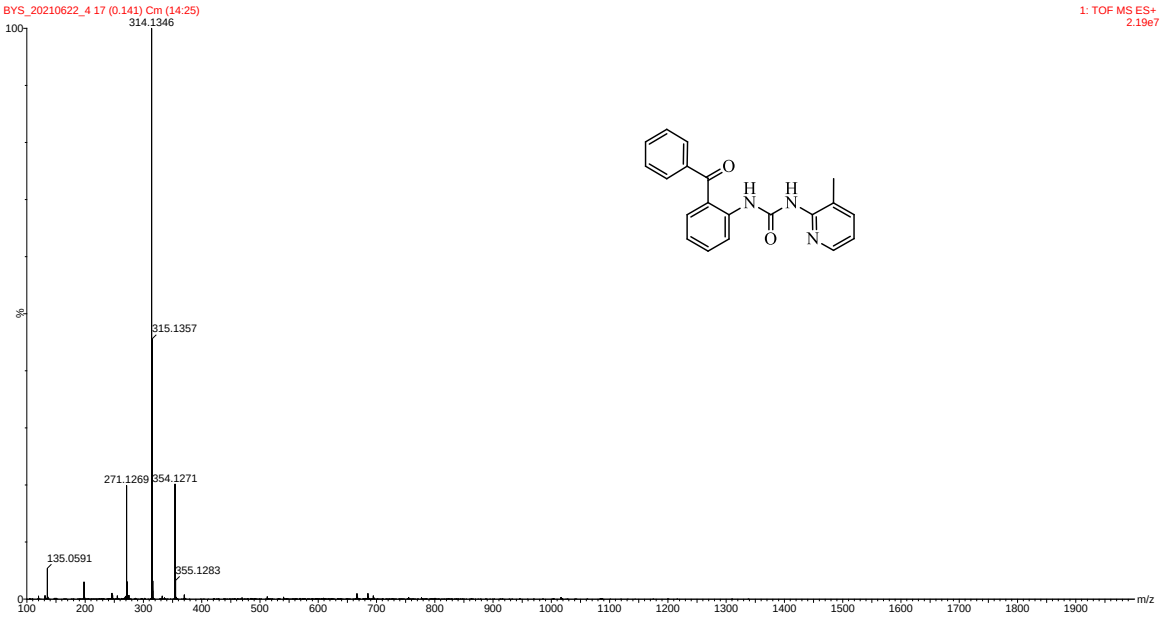
^{1}H NMR of 1-(2-benzoylphenyl)-3-(3-methylpyridin-2-yl)urea **6y**



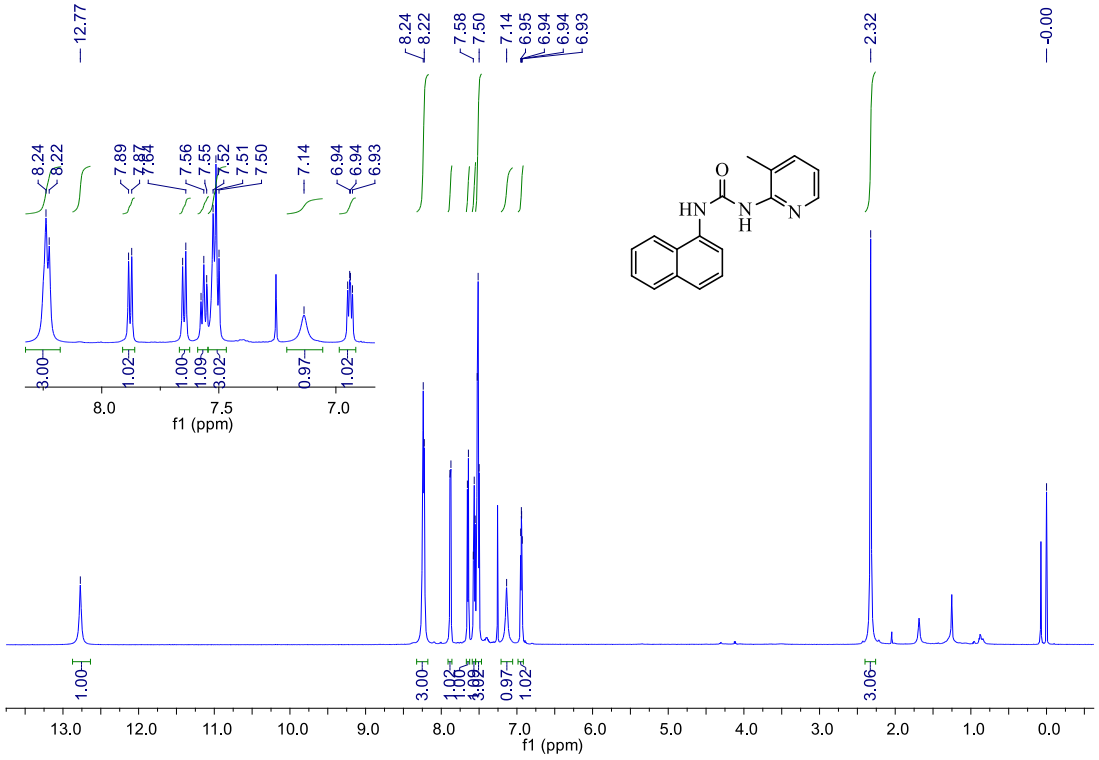
^{13}C NMR of 1-(2-benzoylphenyl)-3-(3-methylpyridin-2-yl)urea **6y**



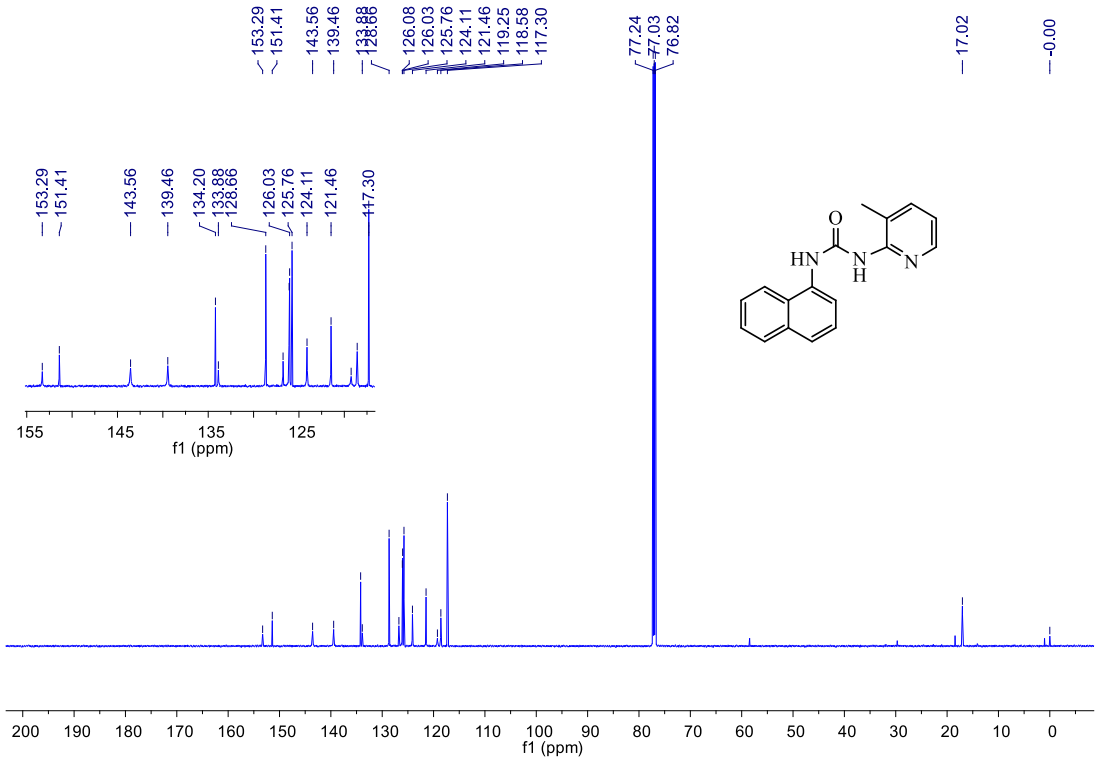
HRMS(ESI) of 1-(2-benzoylphenyl)-3-(3-methylpyridin-2-yl)urea **6y**



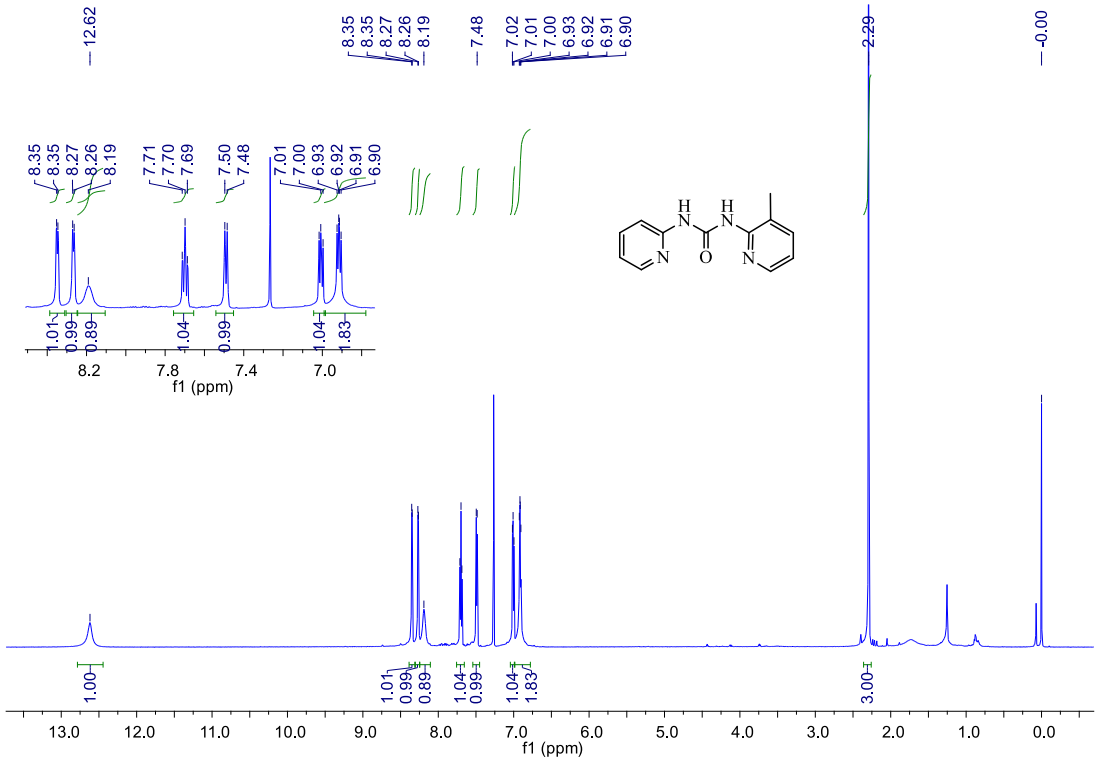
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(naphthalen-1-yl)urea **6z**



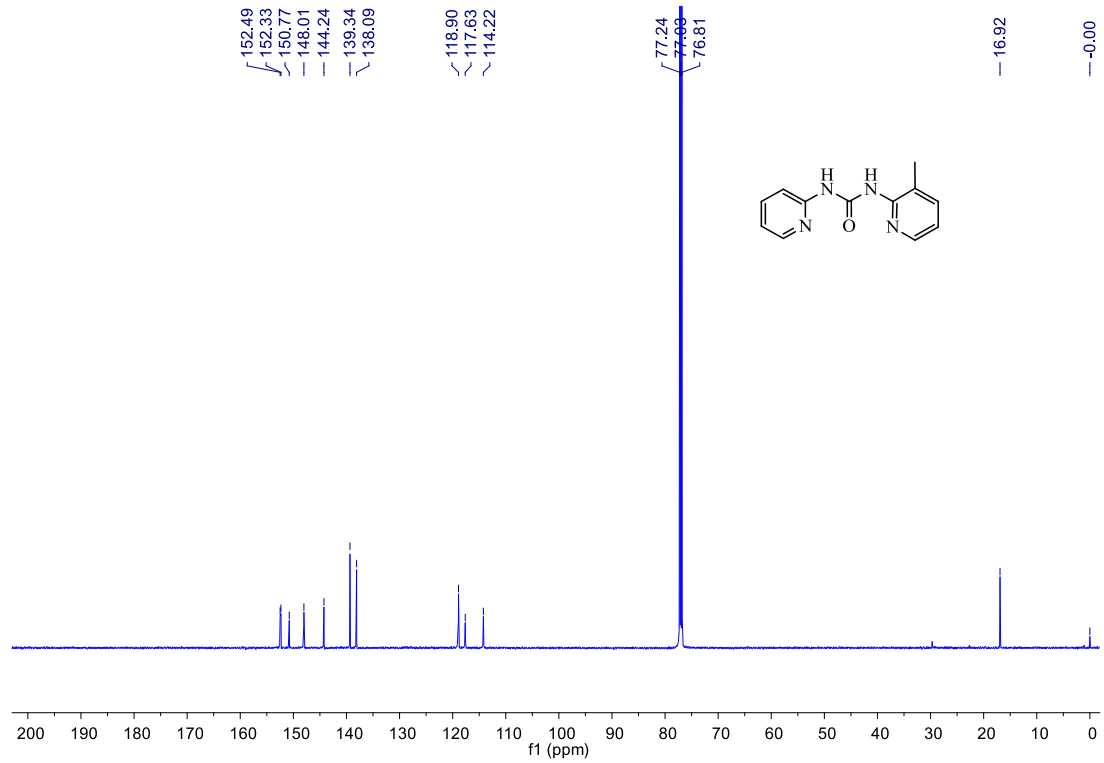
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(naphthalen-1-yl)urea **6z**



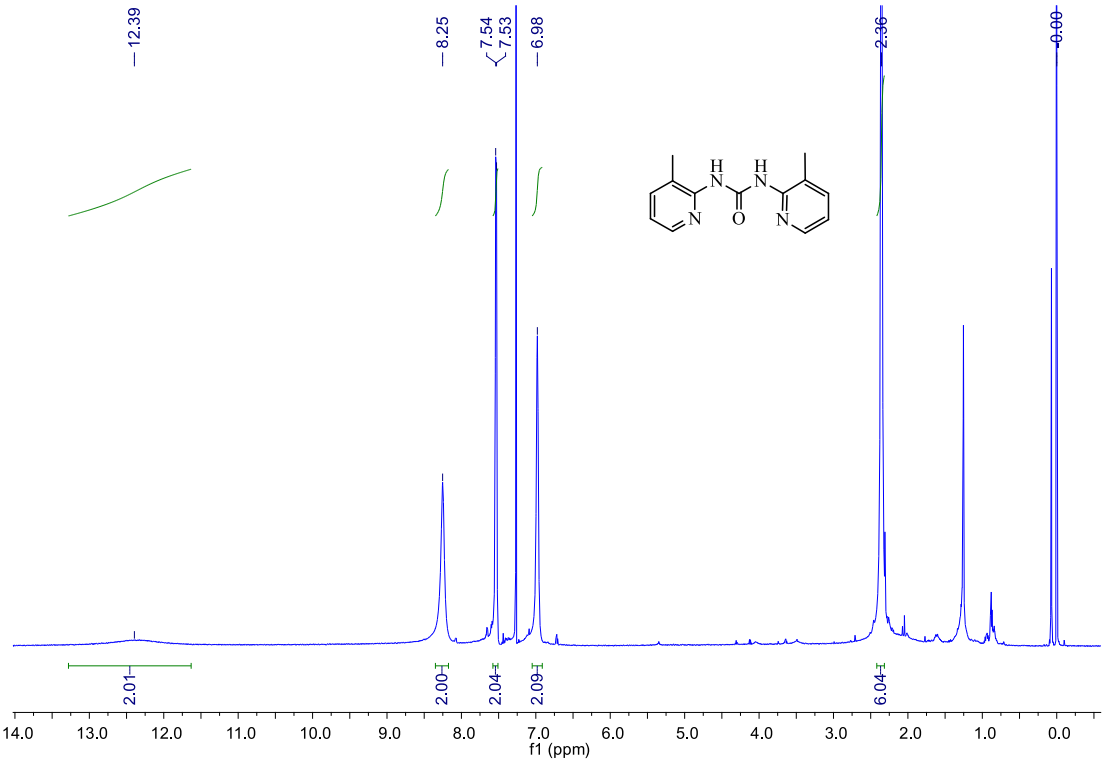
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(pyridin-2-yl)urea **6A**



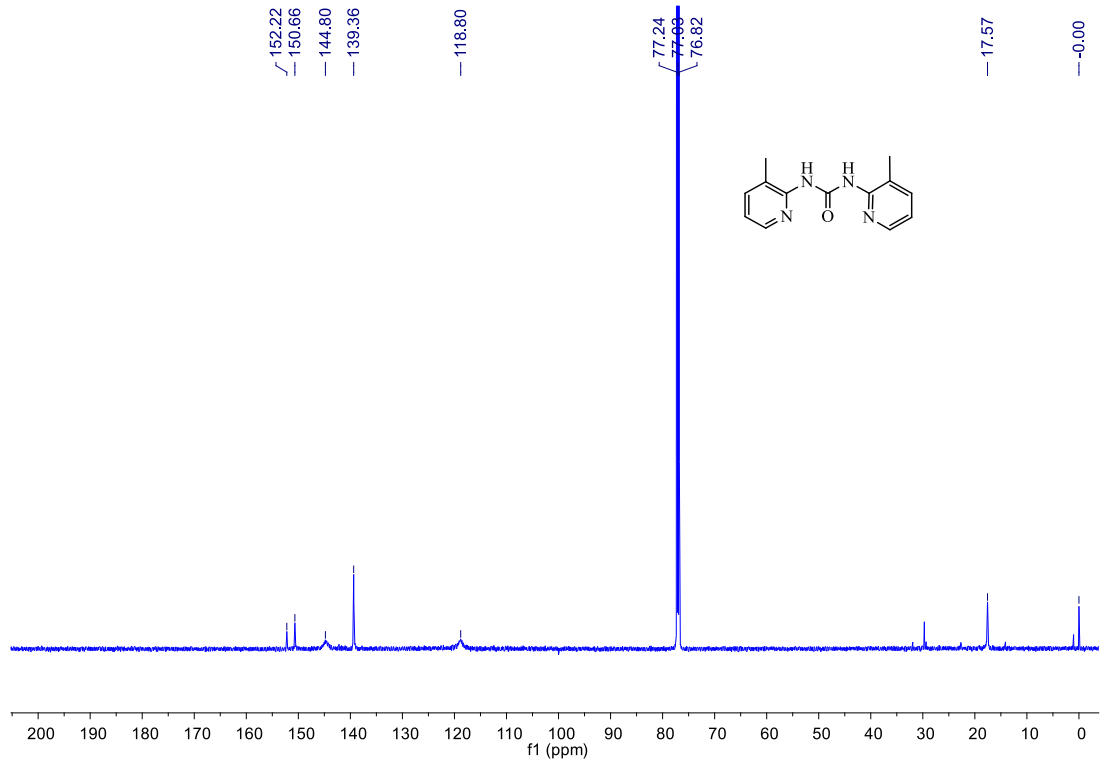
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(pyridin-2-yl)urea **6A**



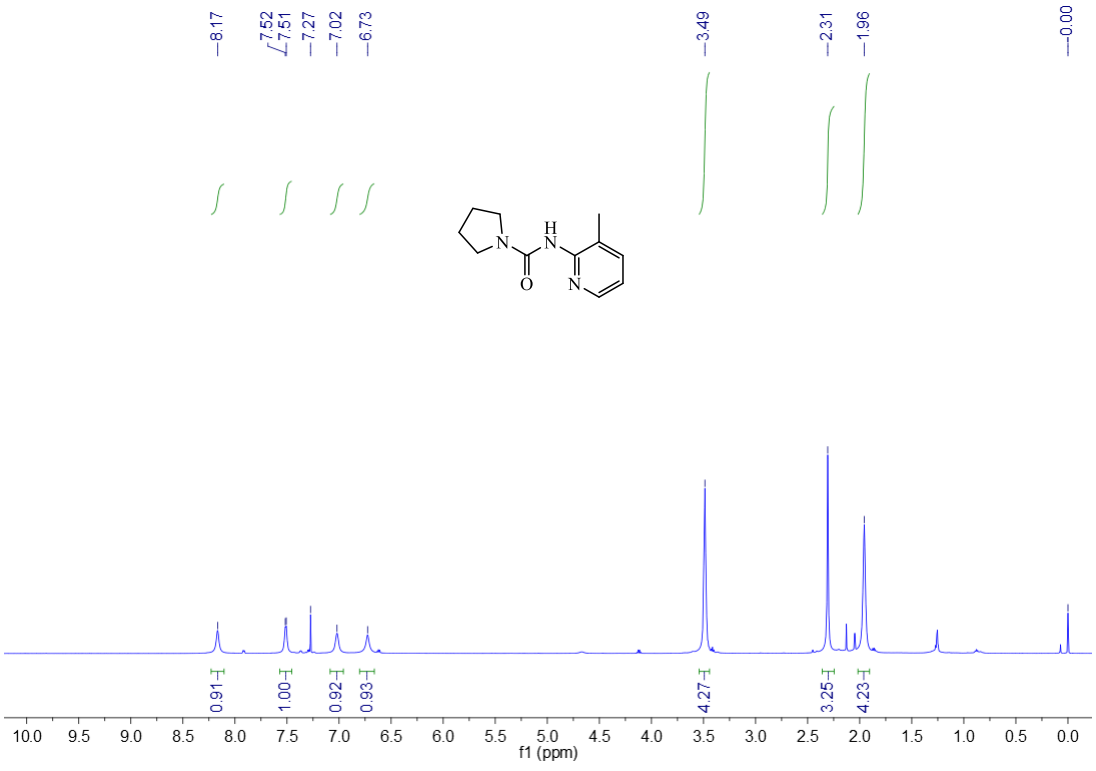
^{1}H NMR of 1,3-bis(3-methylpyridin-2-yl)urea **6B**



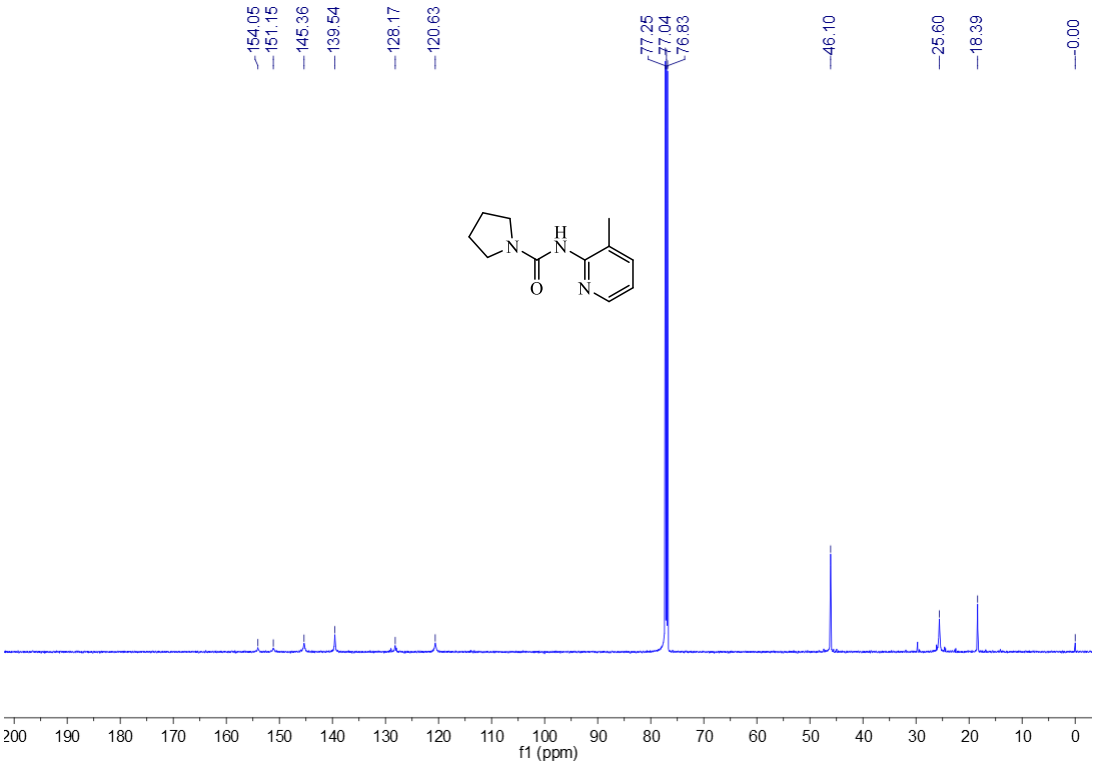
^{13}C NMR of 1,3-bis(3-methylpyridin-2-yl)urea **6B**



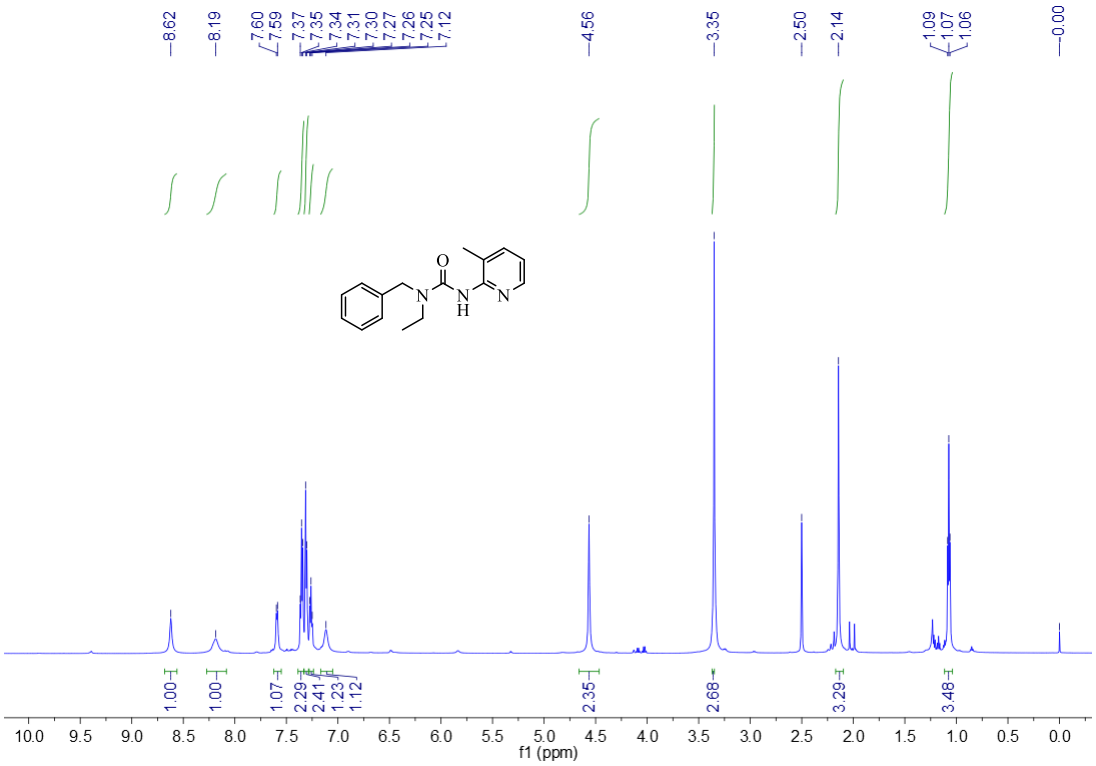
^{1}H NMR of N-(3-methylpyridin-2-yl)pyrrolidine-1-carboxamide **6C**



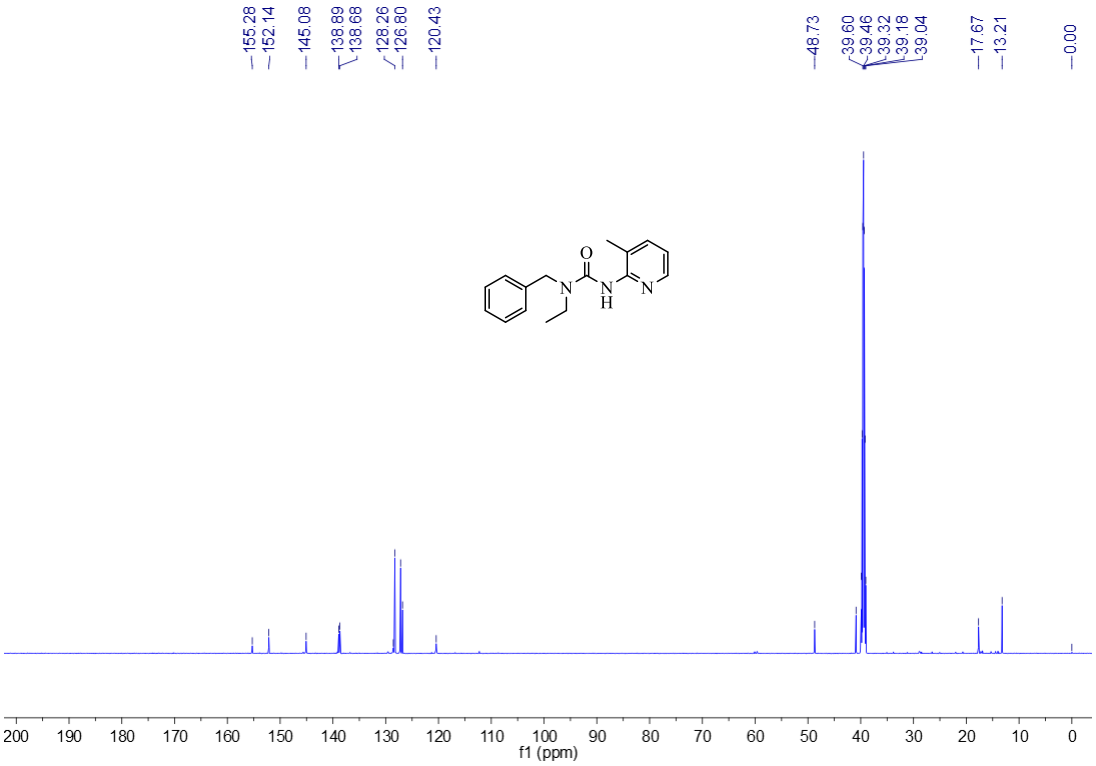
^{13}C NMR of N-(3-methylpyridin-2-yl)pyrrolidine-1-carboxamide **6C**



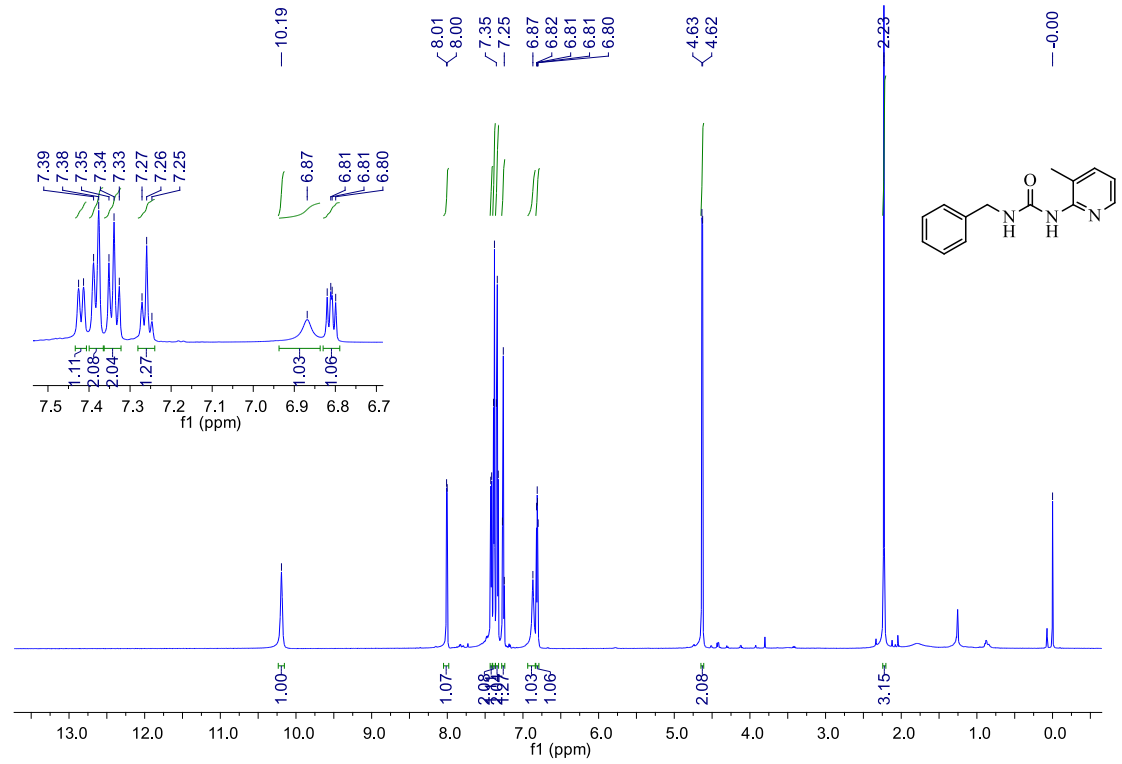
^{1}H NMR of 1-benzyl-1-ethyl-3-(3-methylpyridin-2-yl)urea **6D**



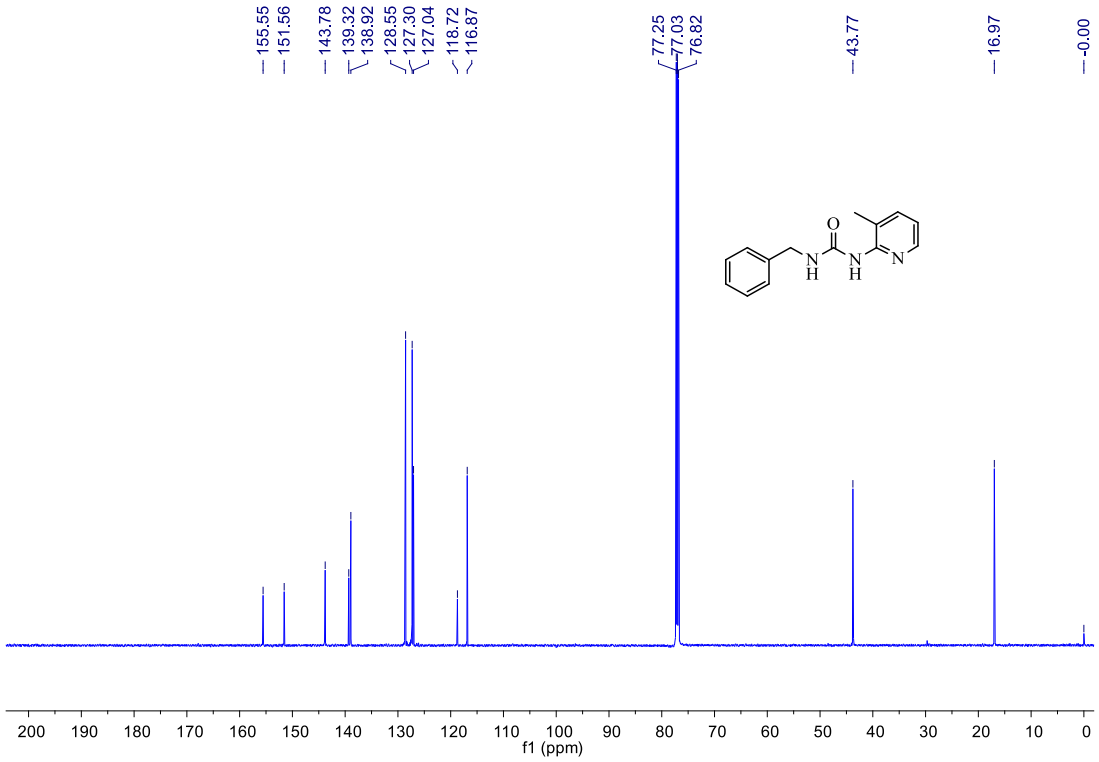
^{13}C NMR of 1-benzyl-1-ethyl-3-(3-methylpyridin-2-yl)urea **6D**



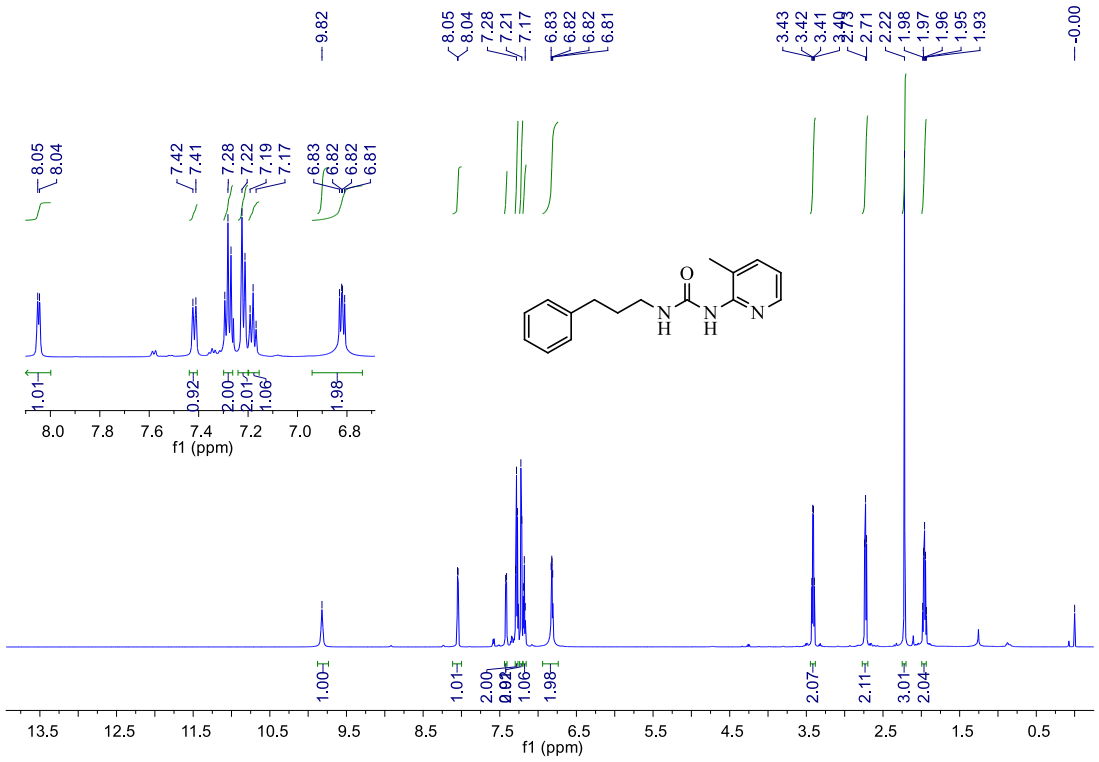
^{1}H NMR of 1-benzyl-3-(3-methylpyridin-2-yl)urea **6E**



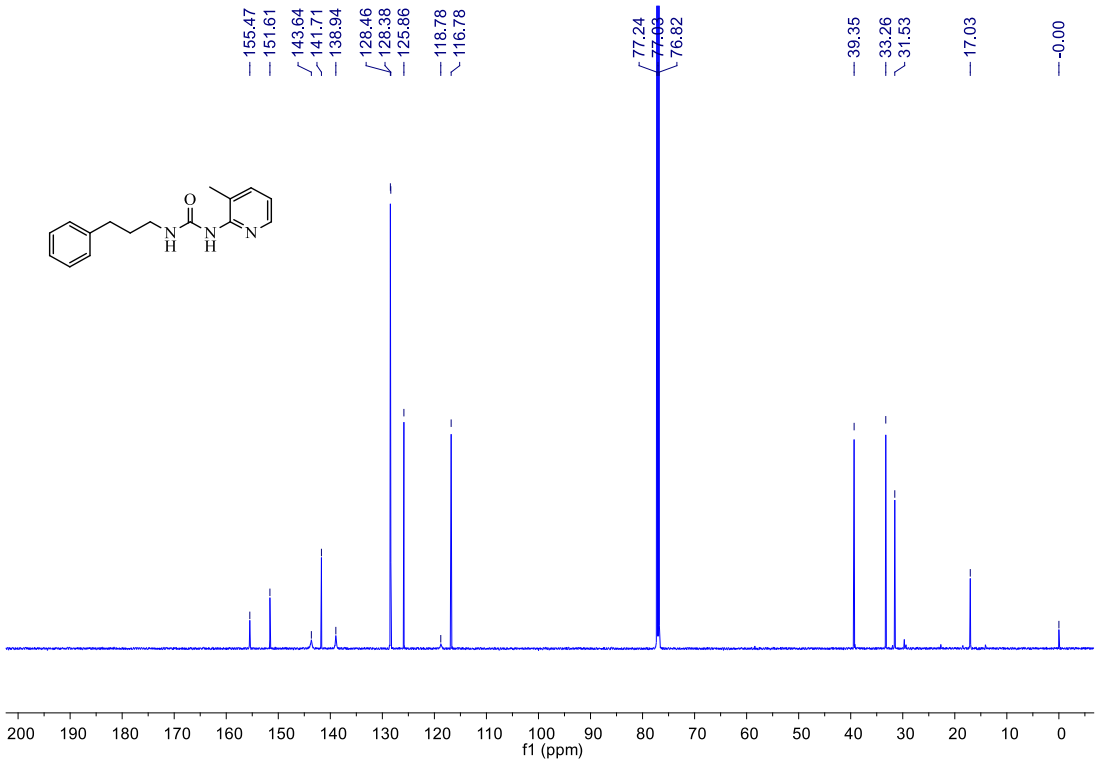
^{13}C NMR of 1-benzyl-3-(3-methylpyridin-2-yl)urea **6E**



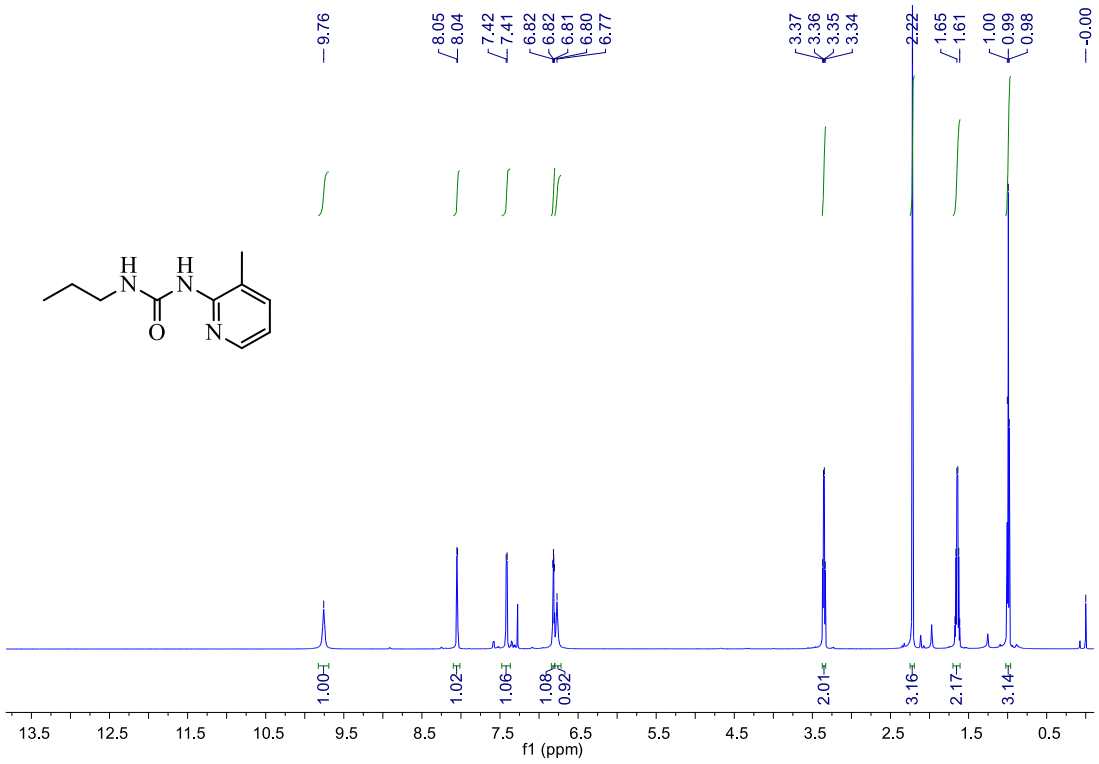
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(3-phenylpropyl)urea **6F**



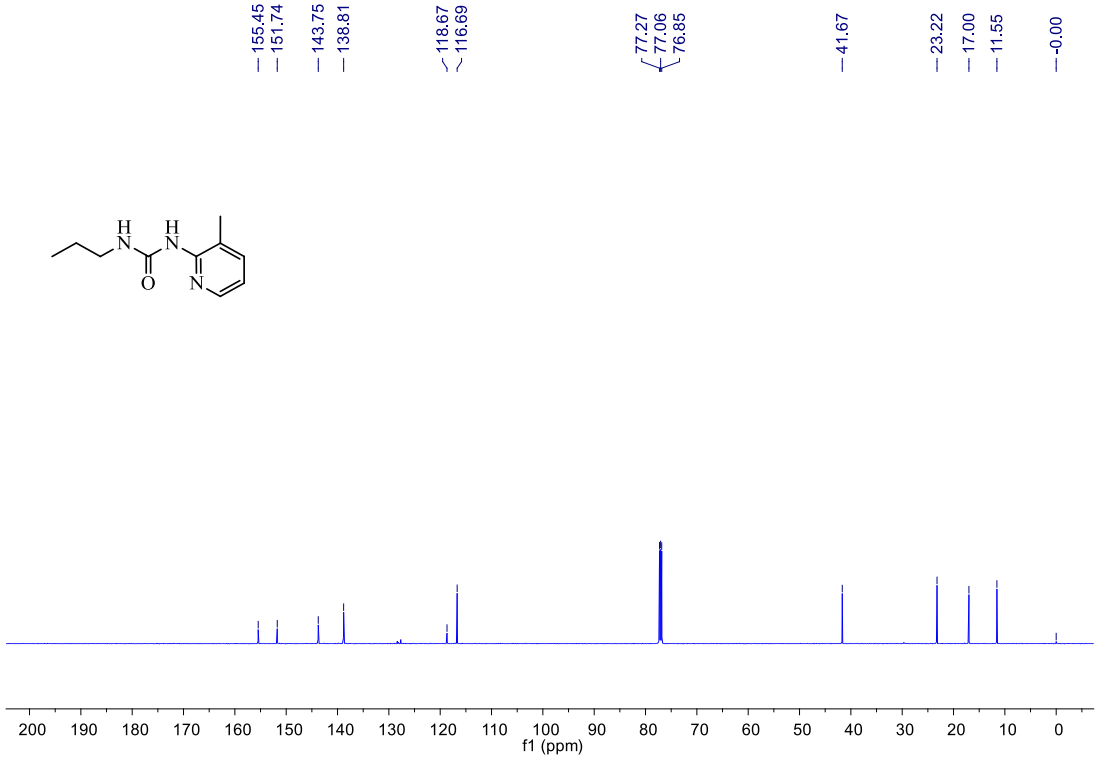
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(3-phenylpropyl)urea **6F**



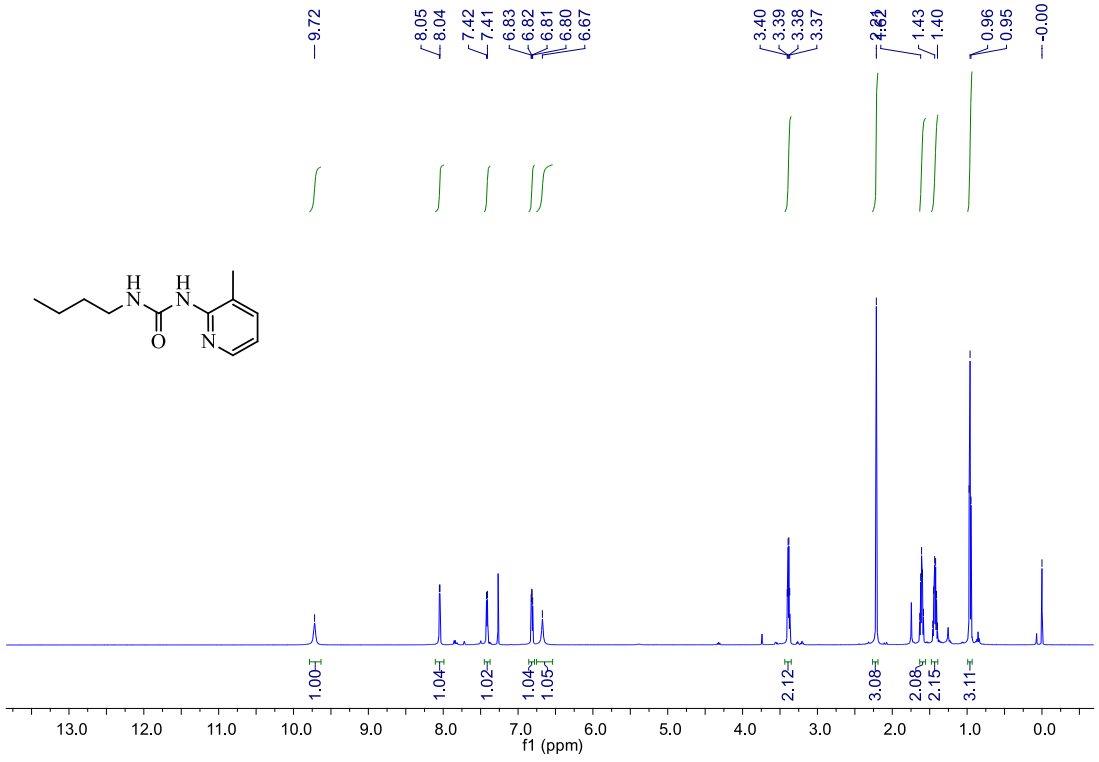
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-propylurea **6G**



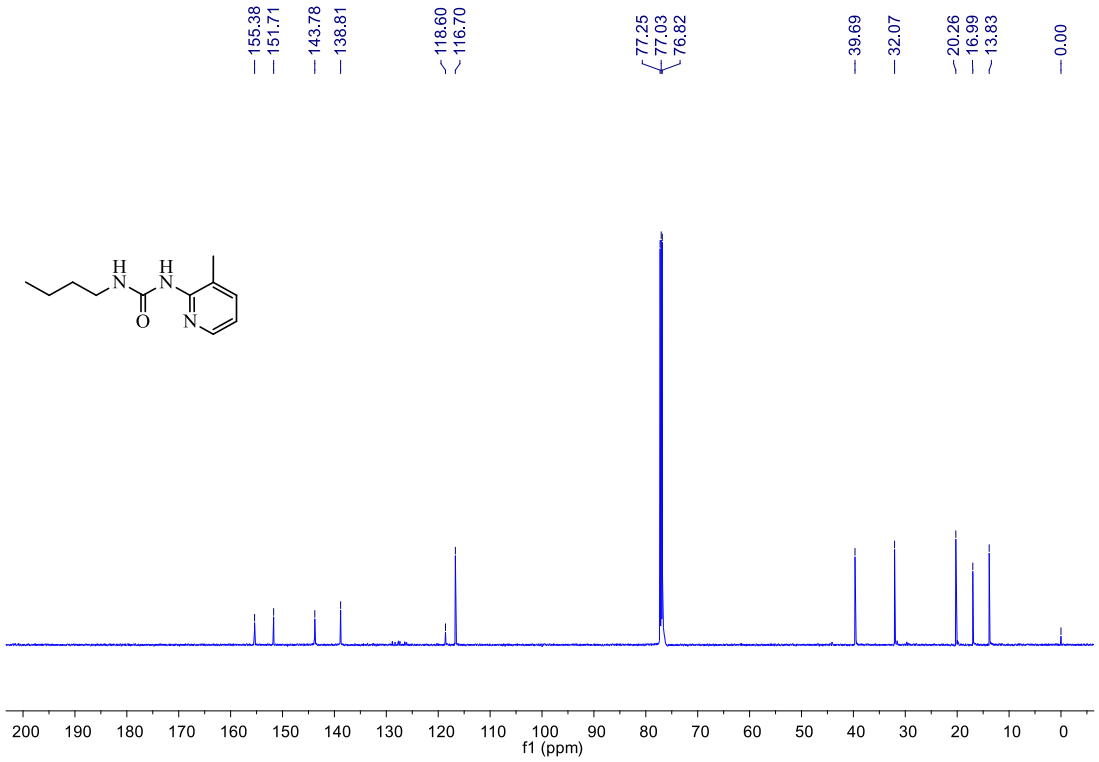
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-propylurea **6G**



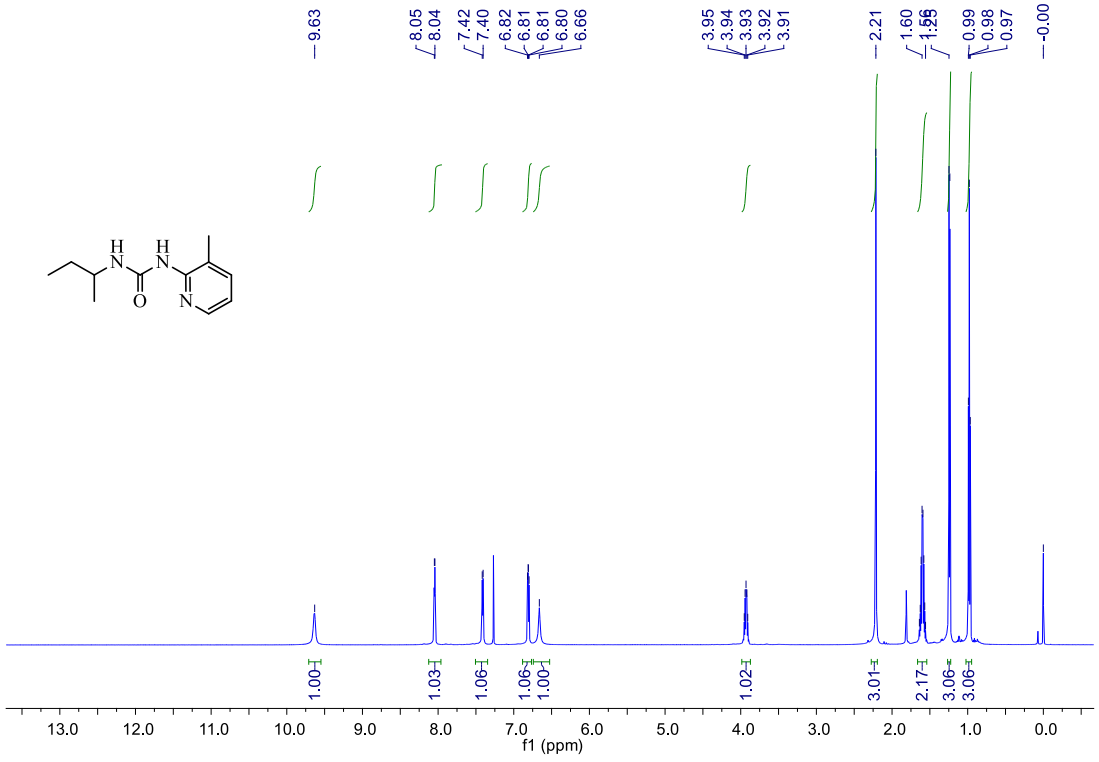
^{1}H NMR of 1-butyl-3-(3-methylpyridin-2-yl)urea **6H**



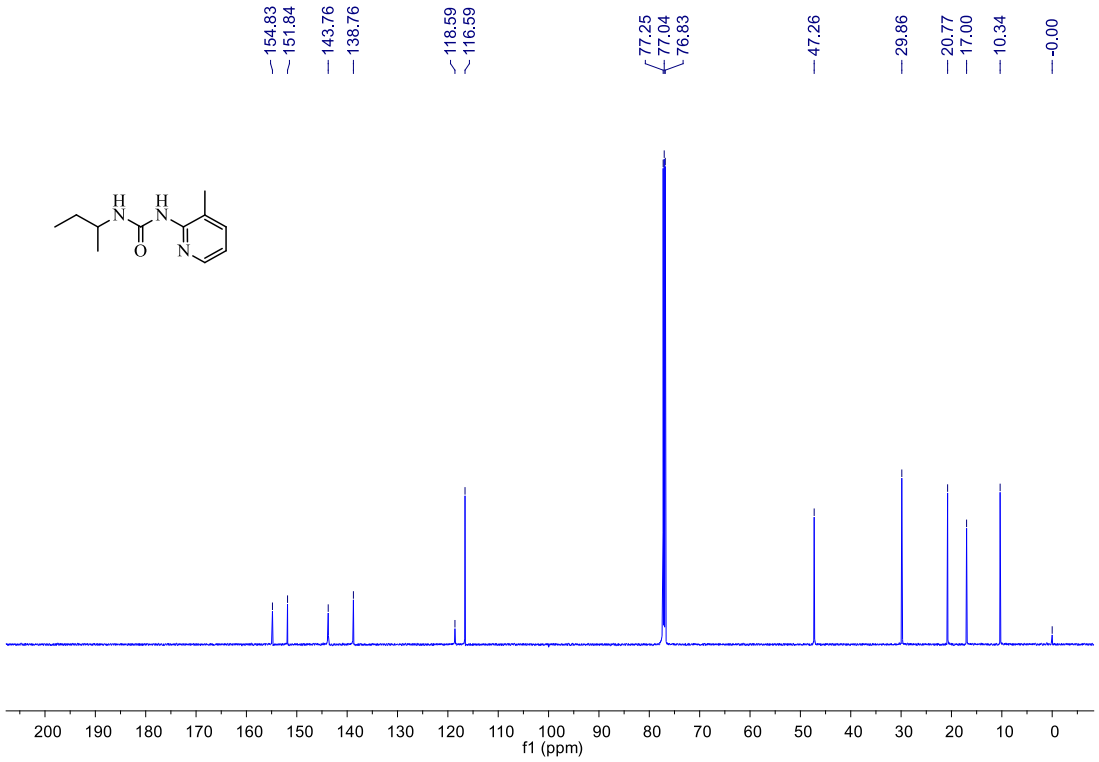
^{13}C NMR of 1-butyl-3-(3-methylpyridin-2-yl)urea **6H**



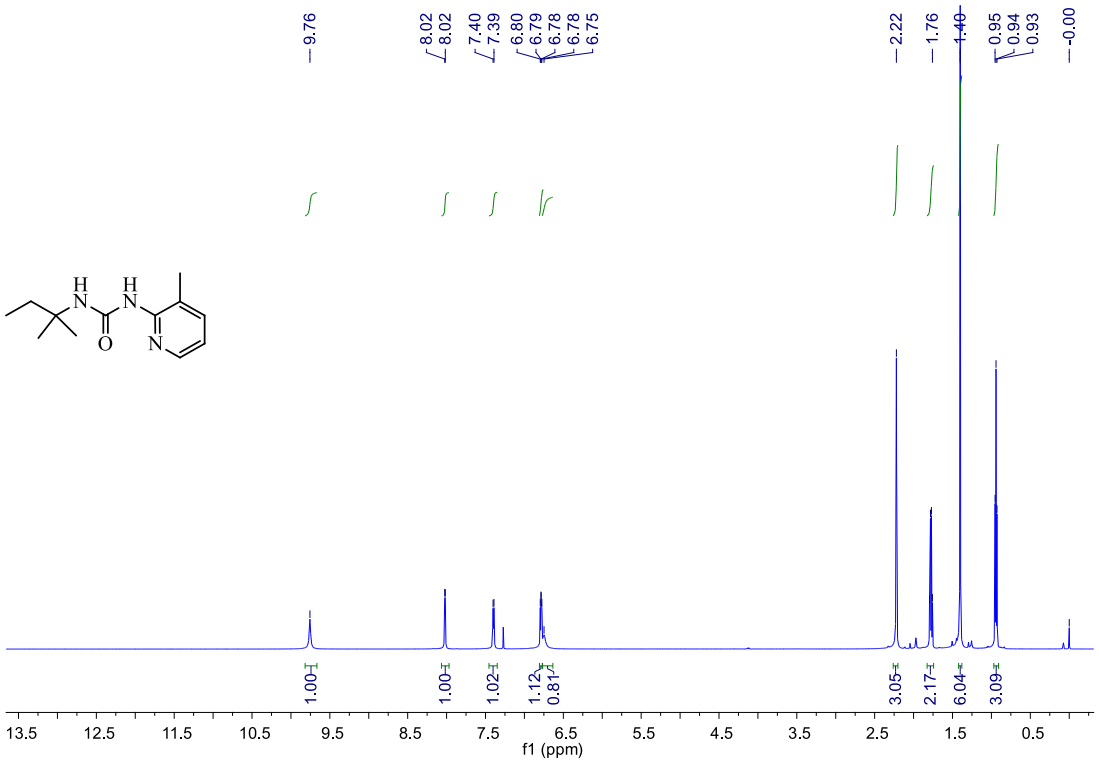
^{1}H NMR of 1-(sec-butyl)-3-(3-methylpyridin-2-yl)urea **6I**



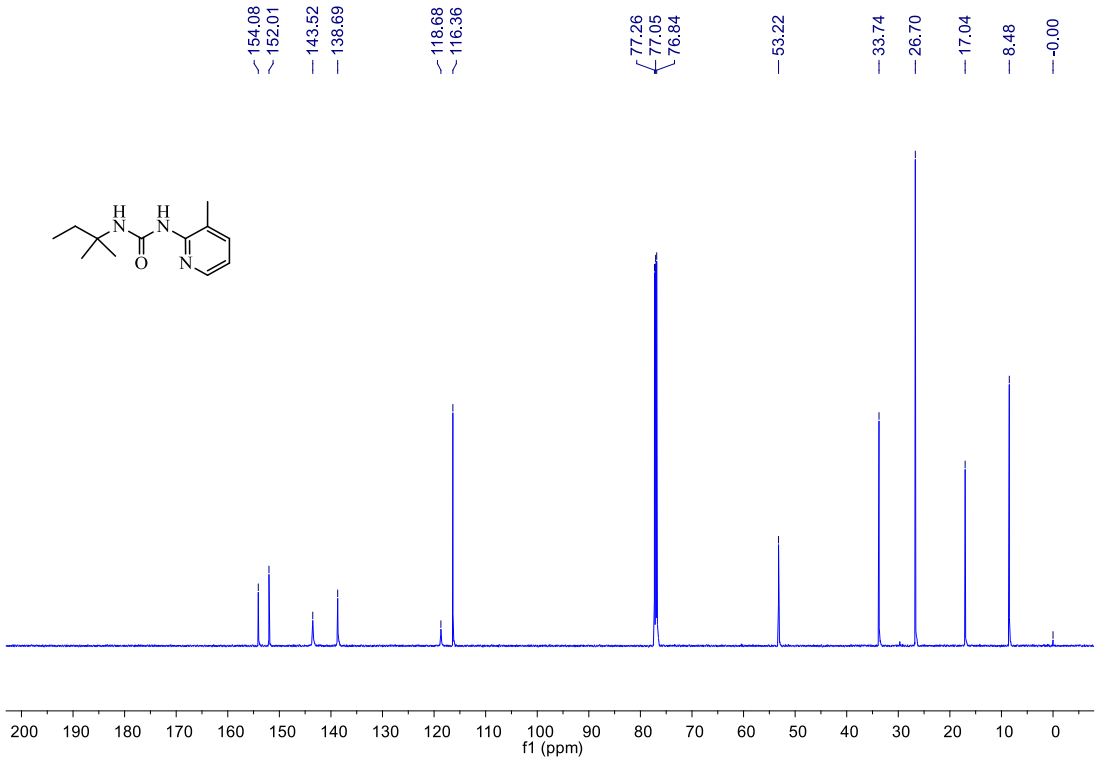
^{13}C NMR of 1-(sec-butyl)-3-(3-methylpyridin-2-yl)urea **6I**



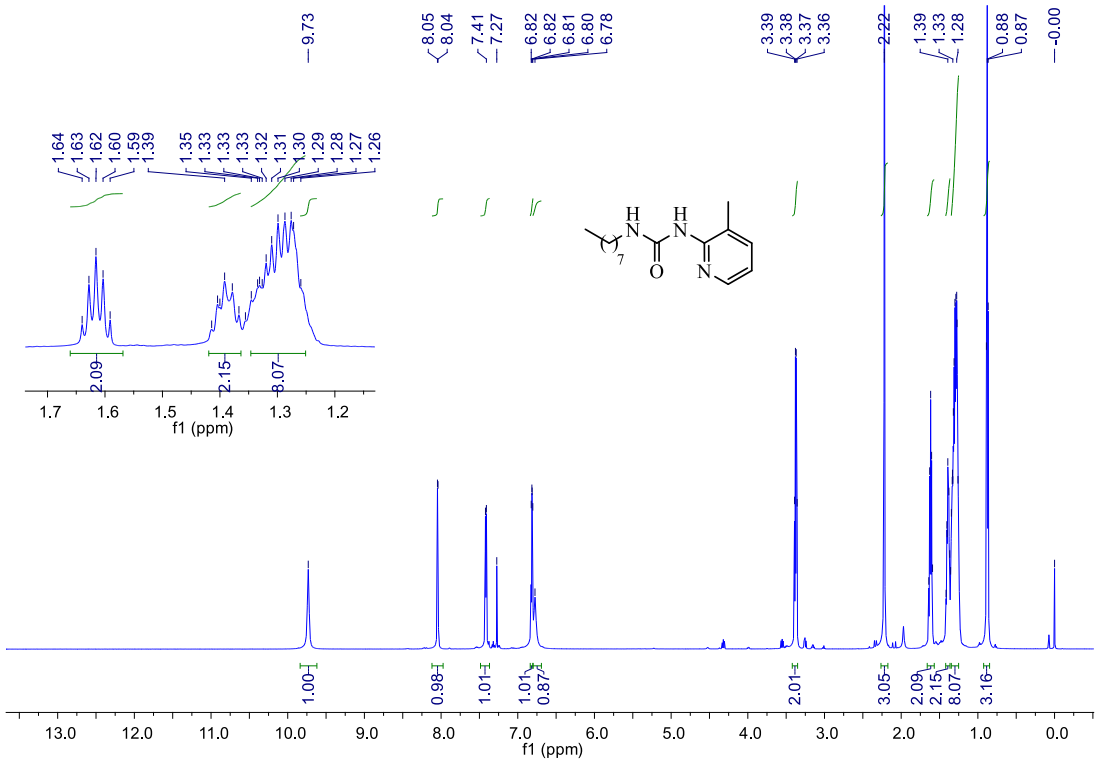
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-(tert-pentyl)urea **6J**



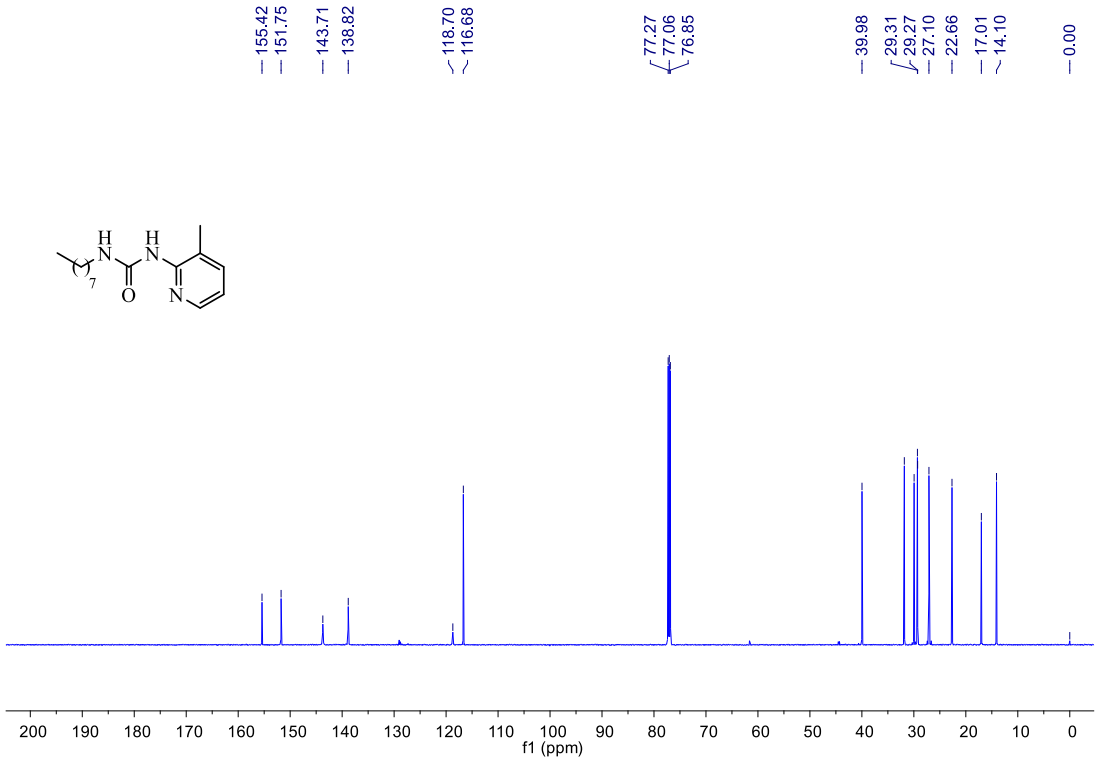
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-(tert-pentyl)urea **6J**



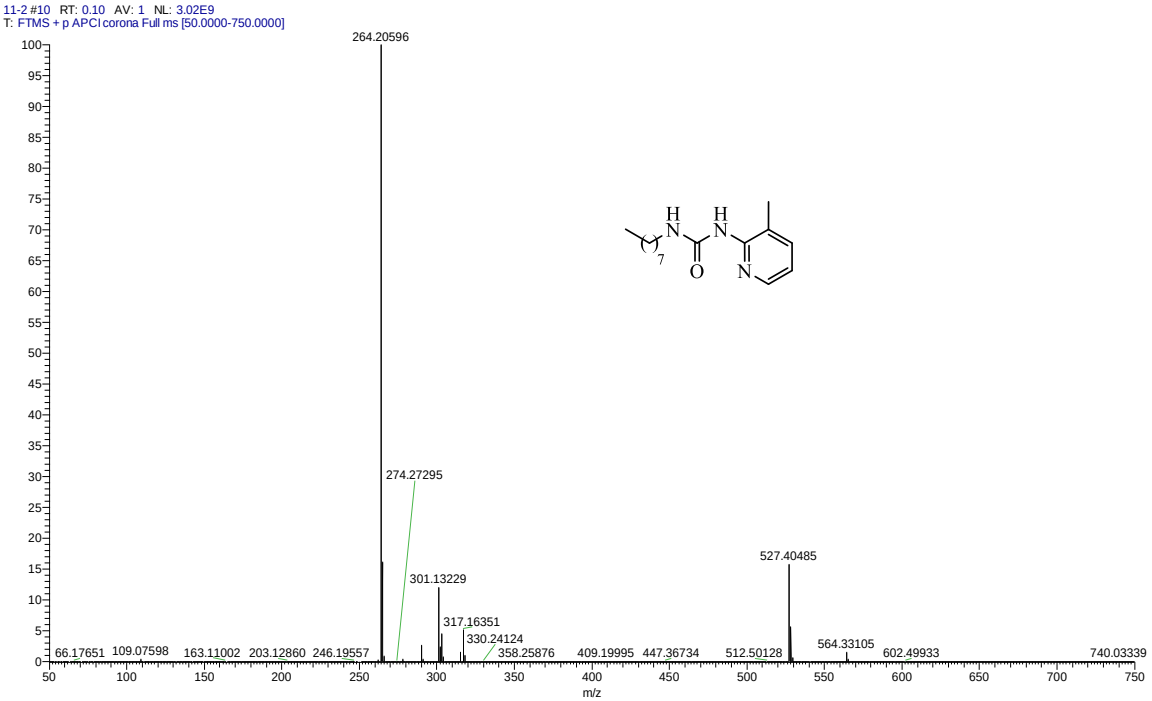
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-octylurea **6K**



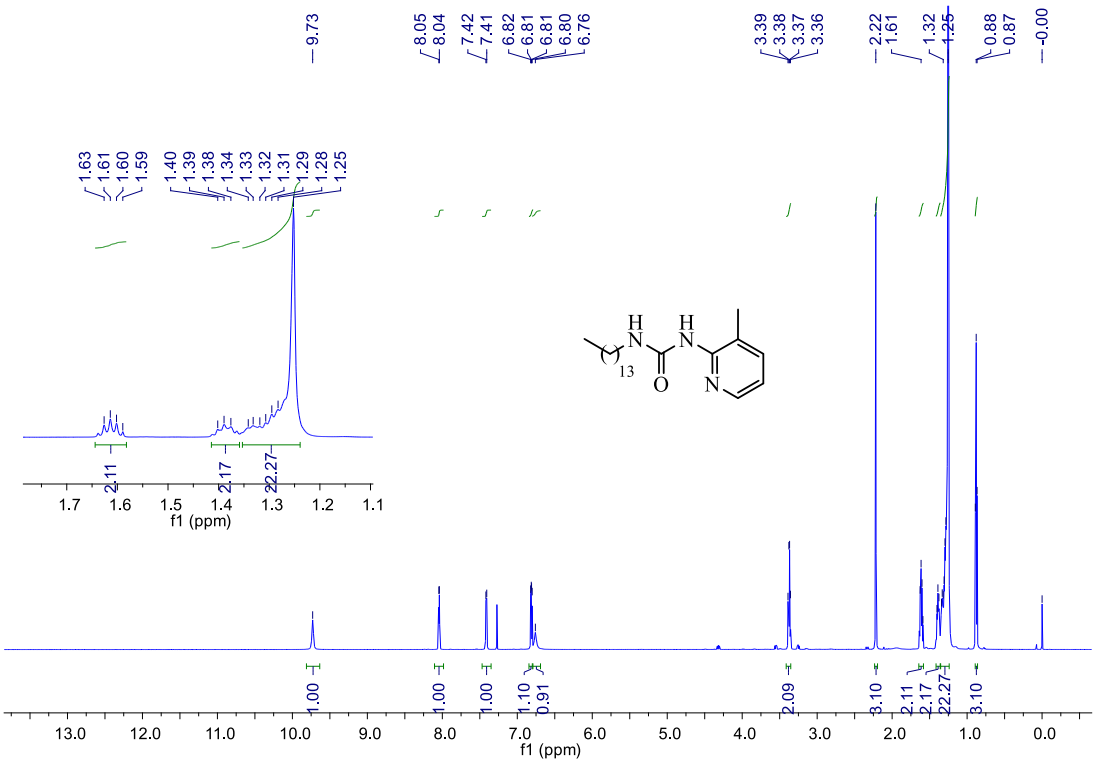
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-octylurea **6K**



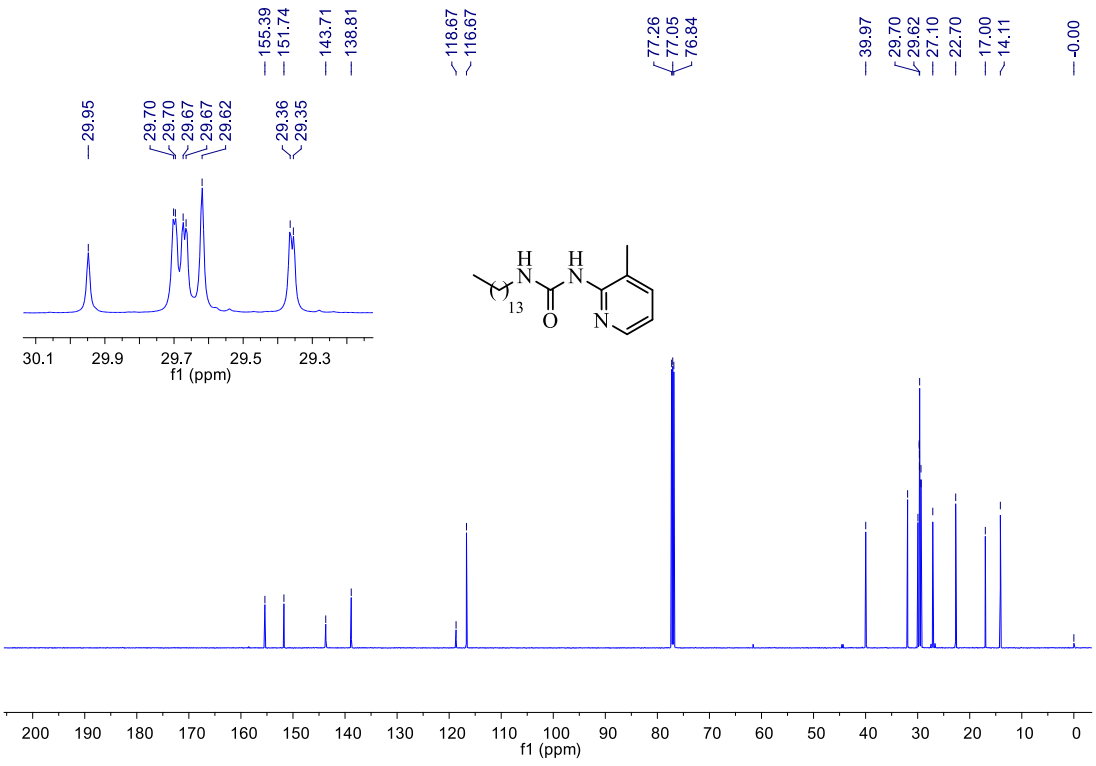
HRMS(ESI) of 1-(3-methylpyridin-2-yl)-3-octylurea **6K**



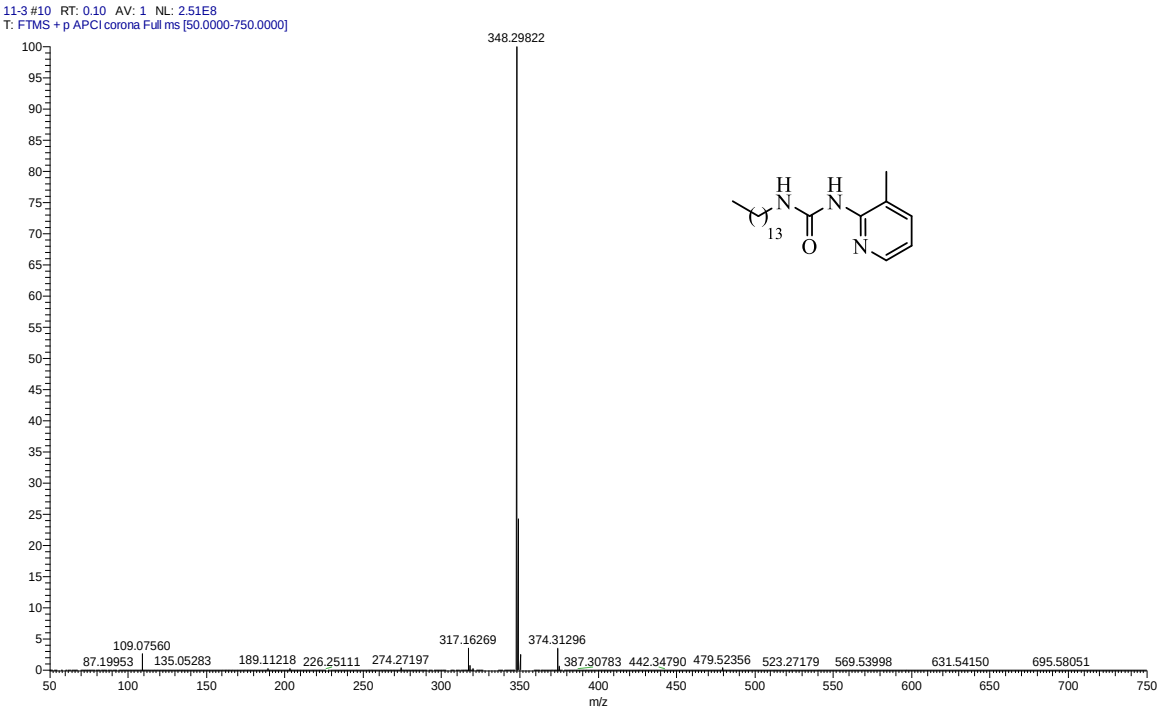
^{1}H NMR of 1-(3-methylpyridin-2-yl)-3-tetradecylurea **6L**



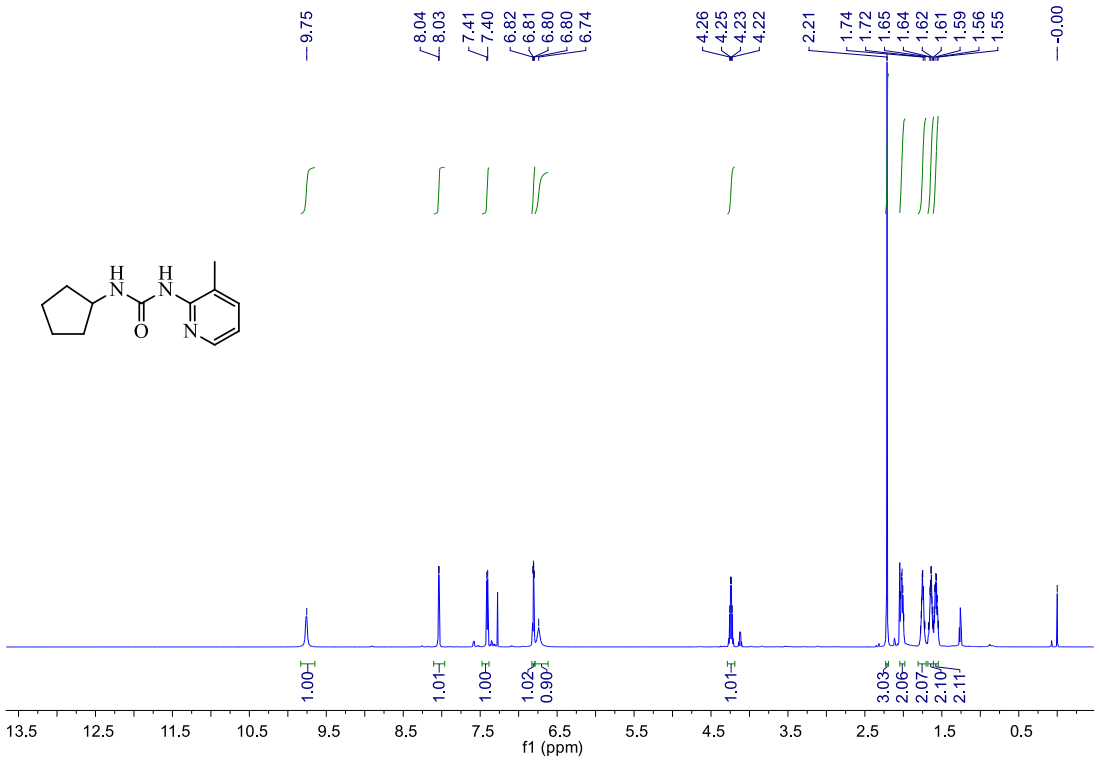
^{13}C NMR of 1-(3-methylpyridin-2-yl)-3-tetradecylurea **6L**



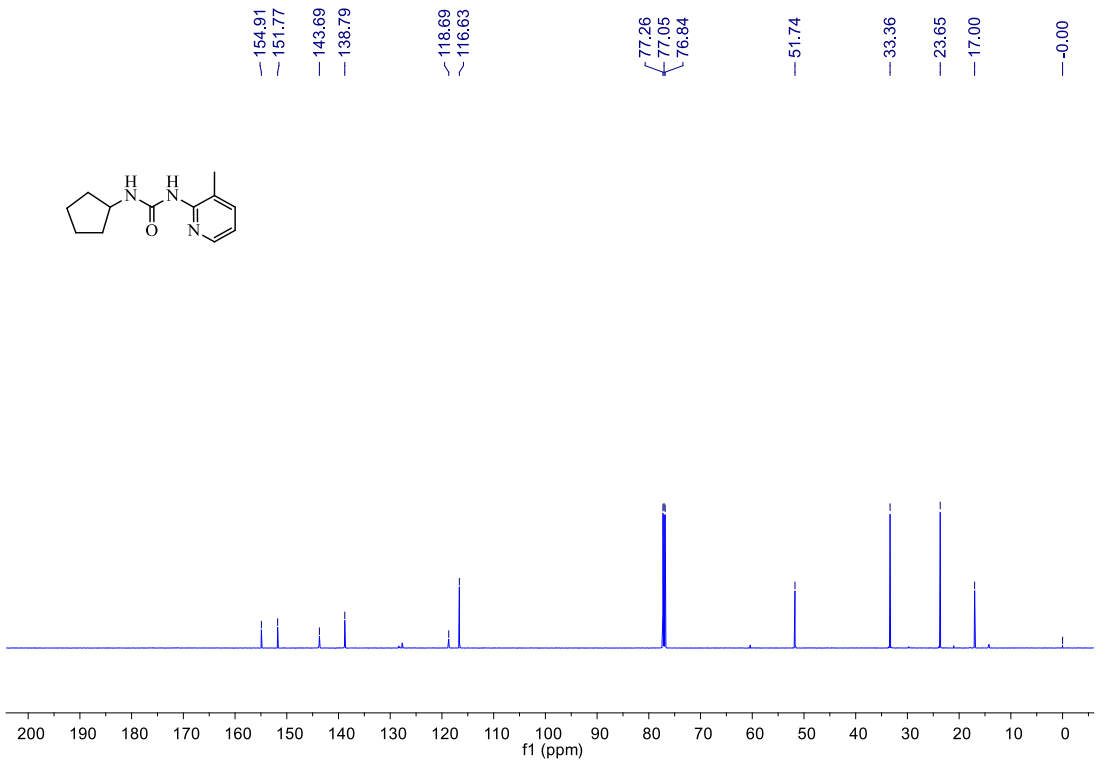
HRMS(ESI) of 1-(3-methylpyridin-2-yl)-3-tetradecylurea **6L**



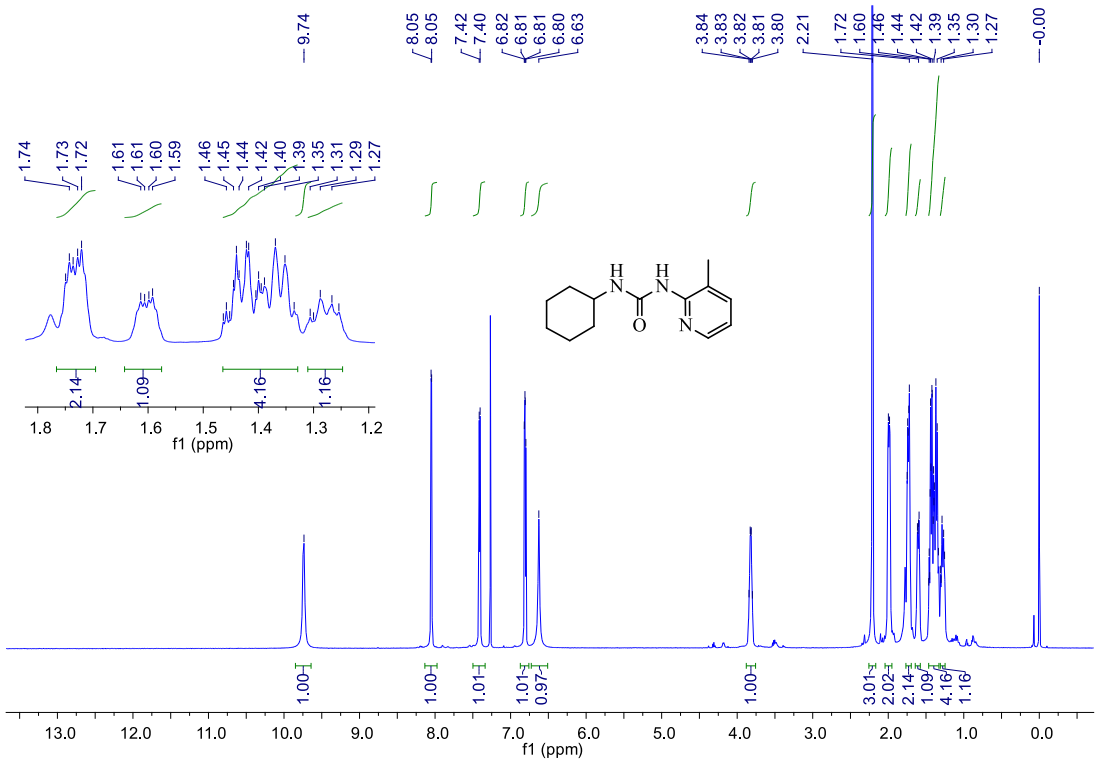
^{1}H NMR of 1-cyclopentyl-3-(3-methylpyridin-2-yl)urea **6M**



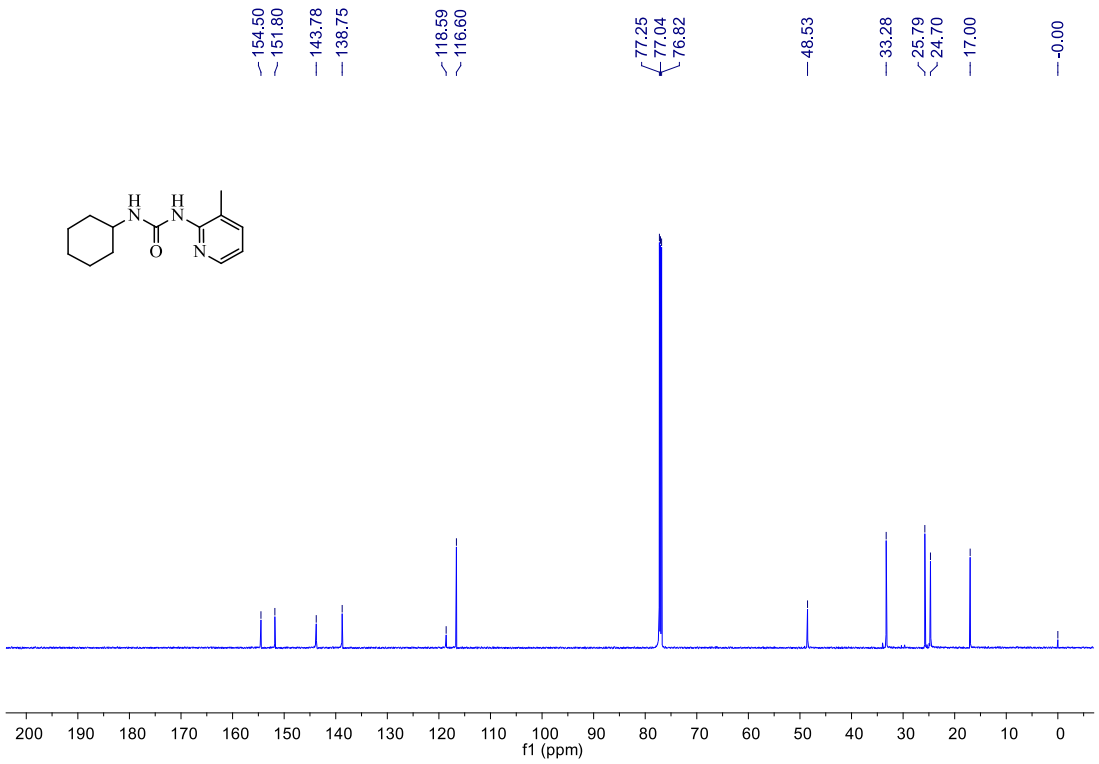
^{13}C NMR of 1-cyclopentyl-3-(3-methylpyridin-2-yl)urea **6M**



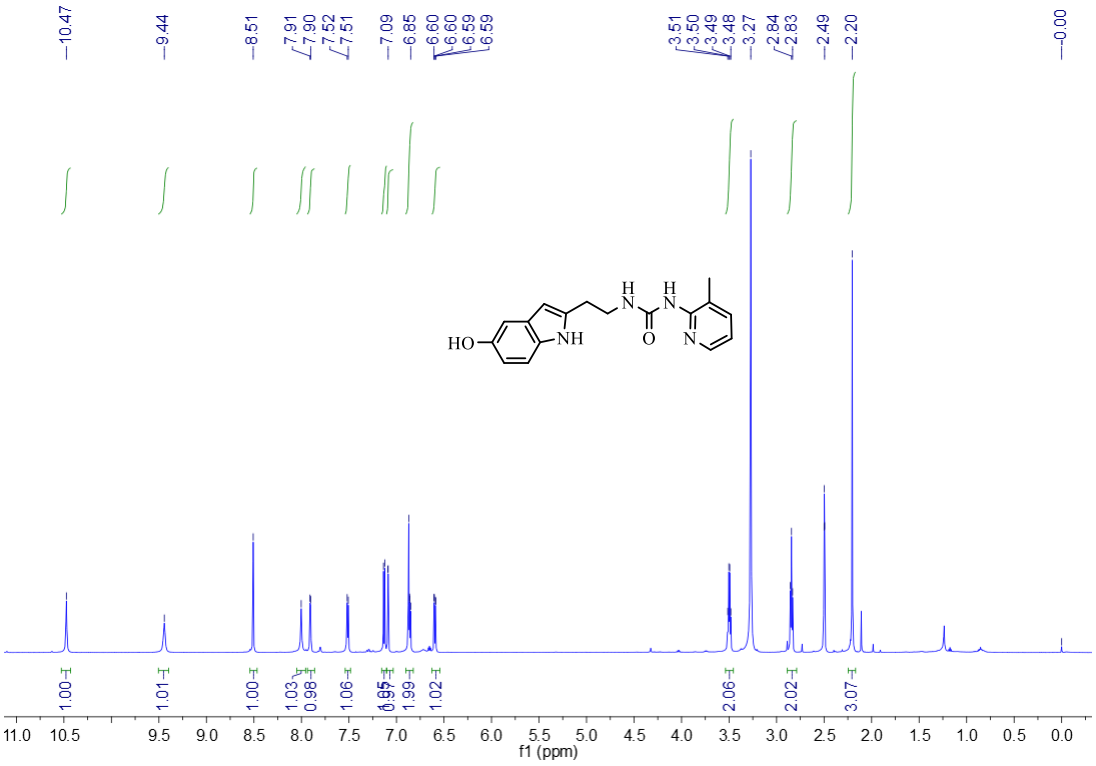
^{1}H NMR of 1-(sec-butyl)-3-(3-methylpyridin-2-yl)urea **6N**



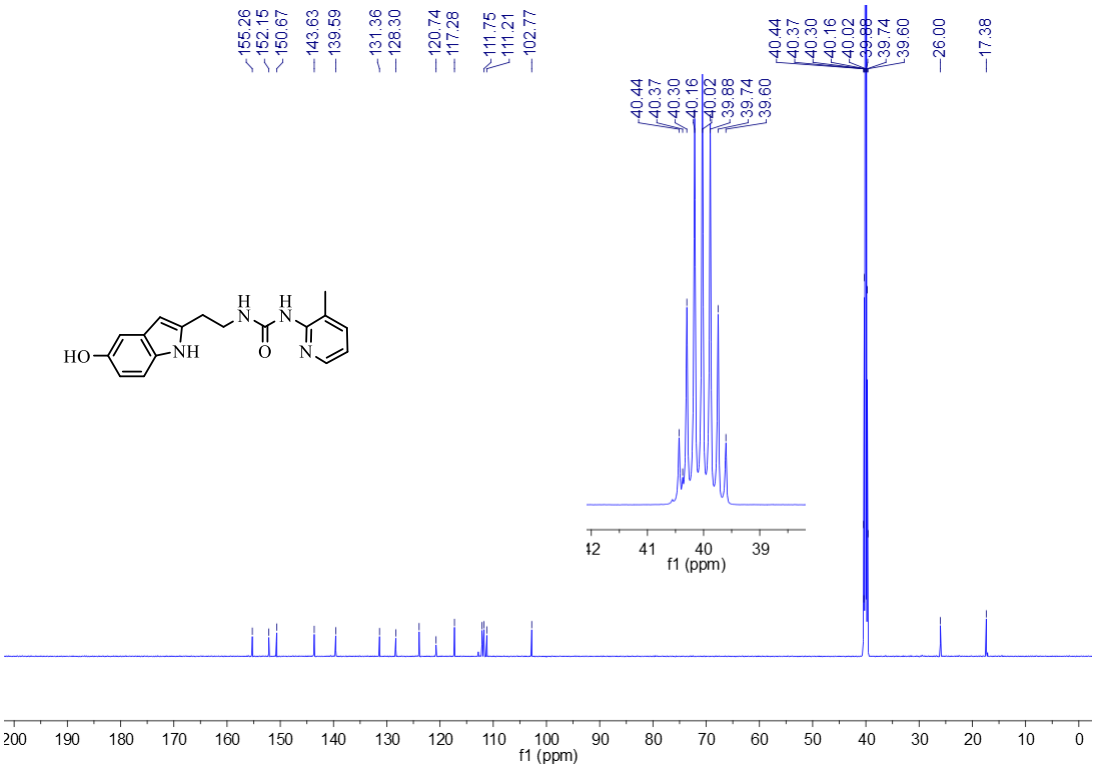
^{13}C NMR of 1-(sec-butyl)-3-(3-methylpyridin-2-yl)urea **6N**



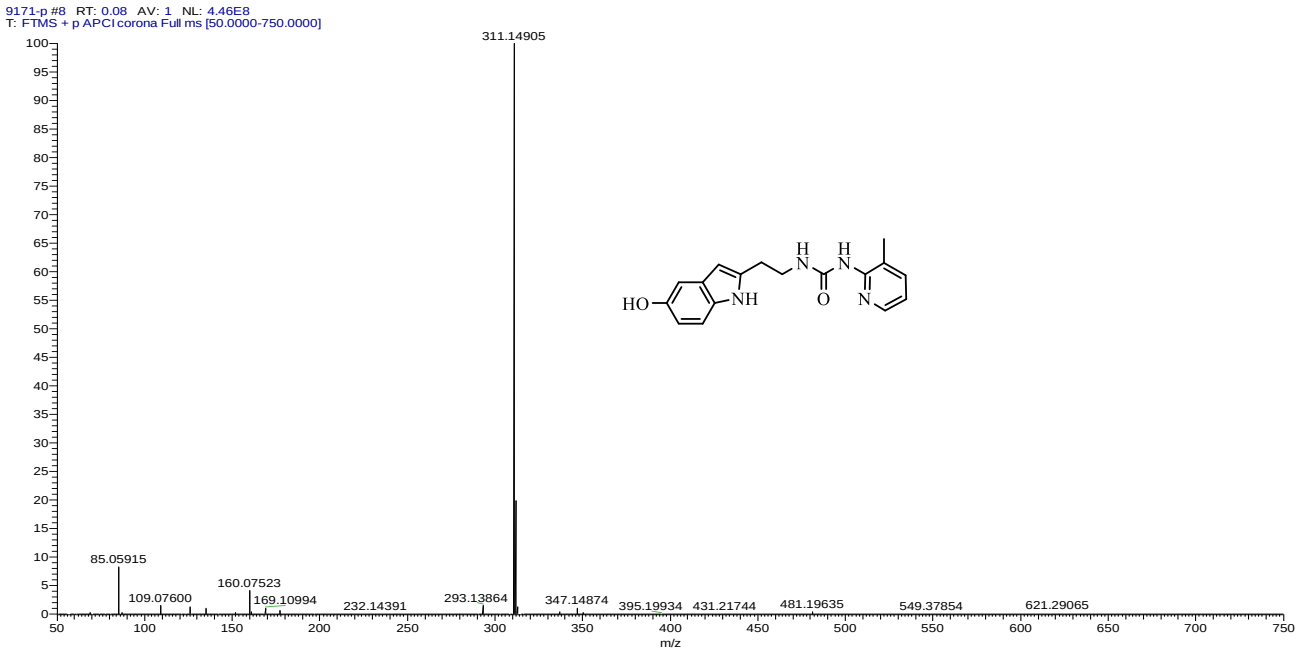
^{1}H NMR of 1-(2-(5-hydroxy-1H-indol-2-yl)ethyl)-3-(3-methylpyridin-2-yl)urea **6O**



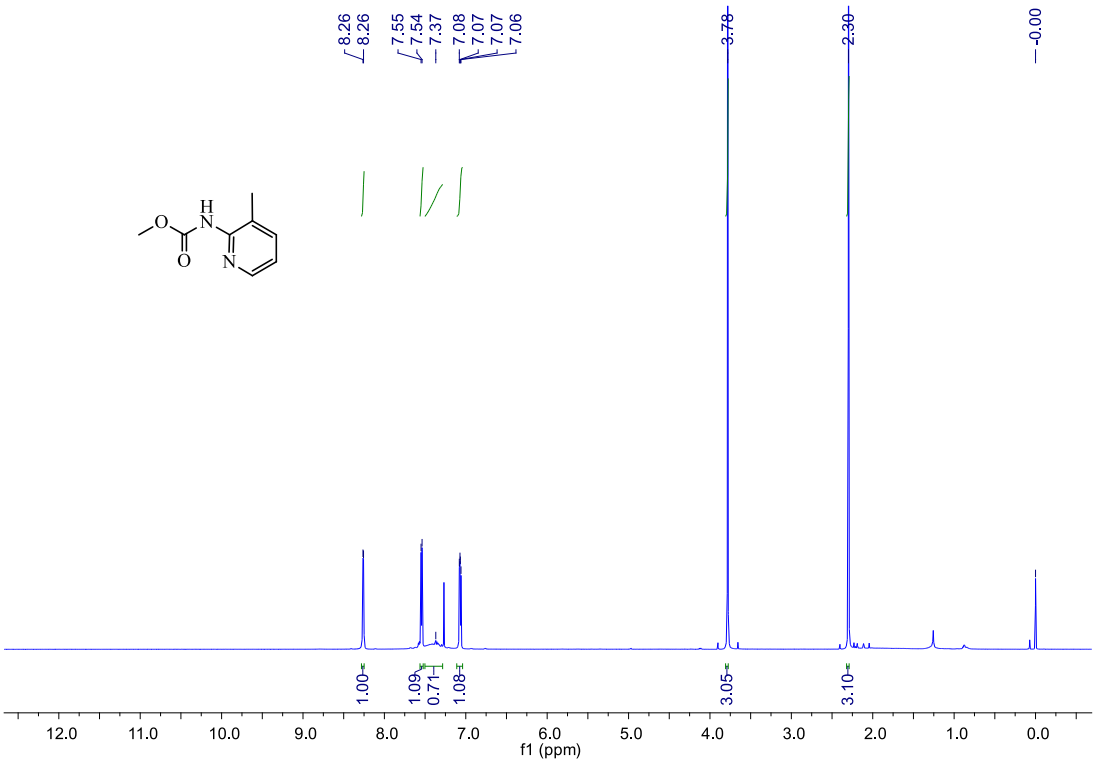
^{13}C NMR of 1-(2-(5-hydroxy-1H-indol-2-yl)ethyl)-3-(3-methylpyridin-2-yl)urea **6O**



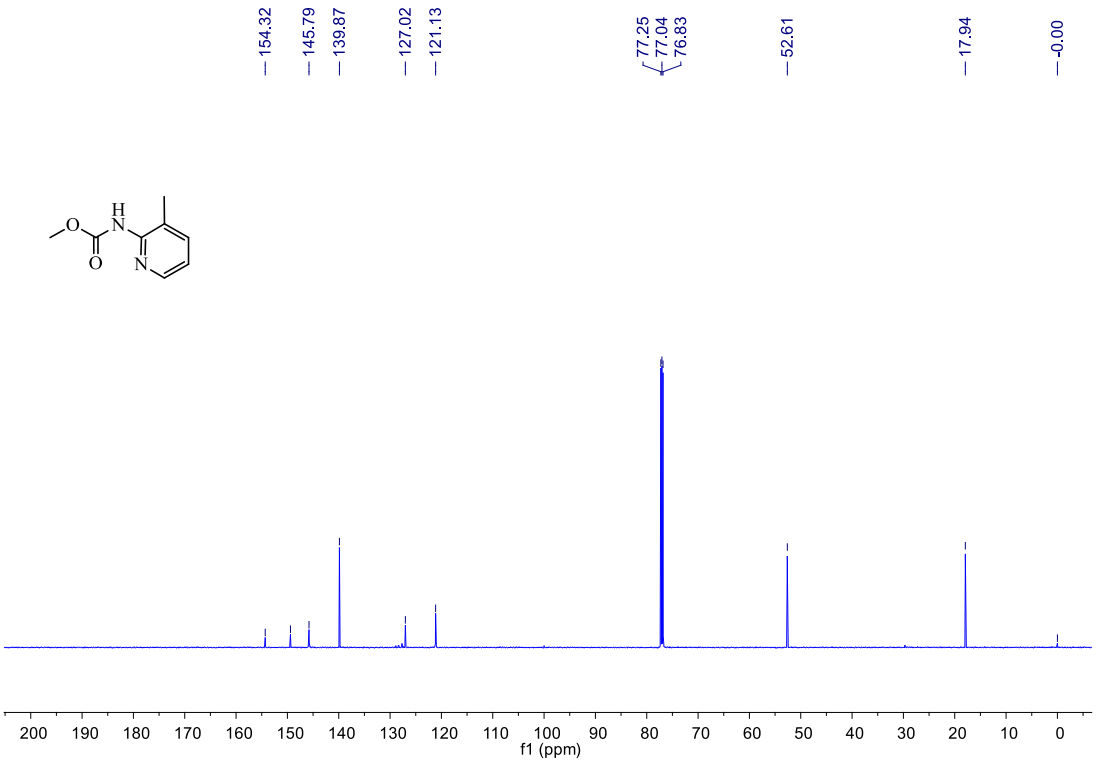
HRMS(ESI) of 1-(2-(5-hydroxy-1H-indol-2-yl)ethyl)-3-(3-methylpyridin-2-yl)urea **6O**



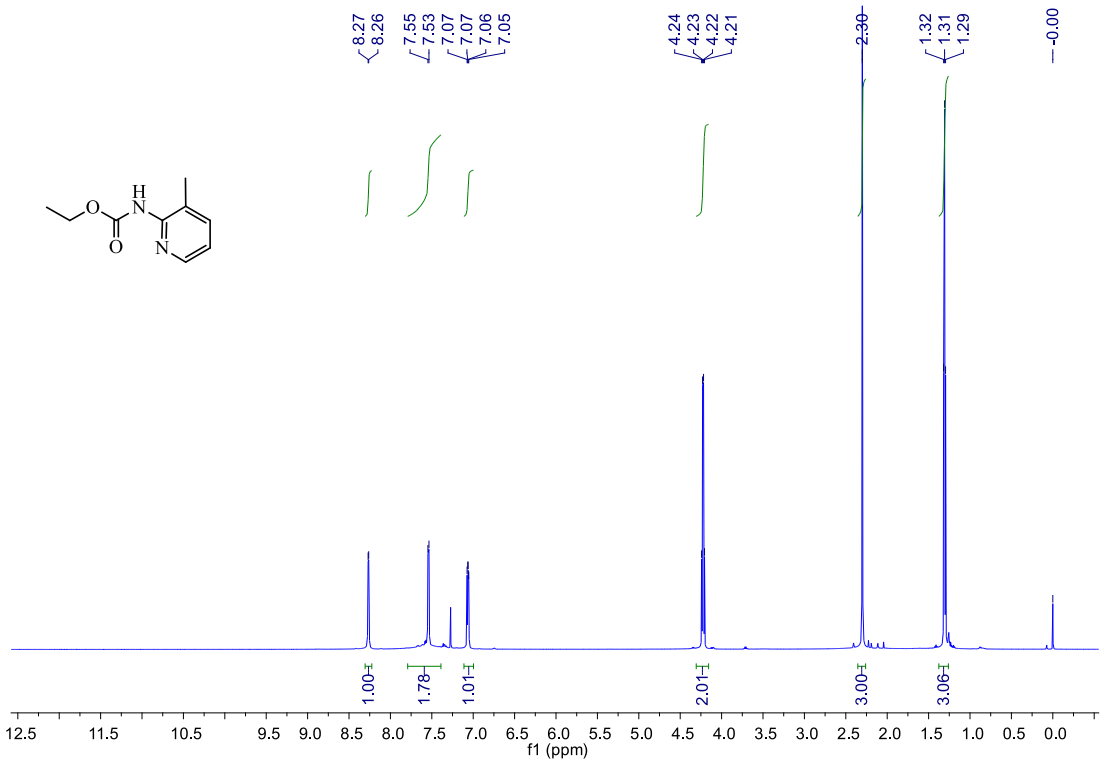
^{1}H NMR of methyl (3-methylpyridin-2-yl)carbamate **7a**



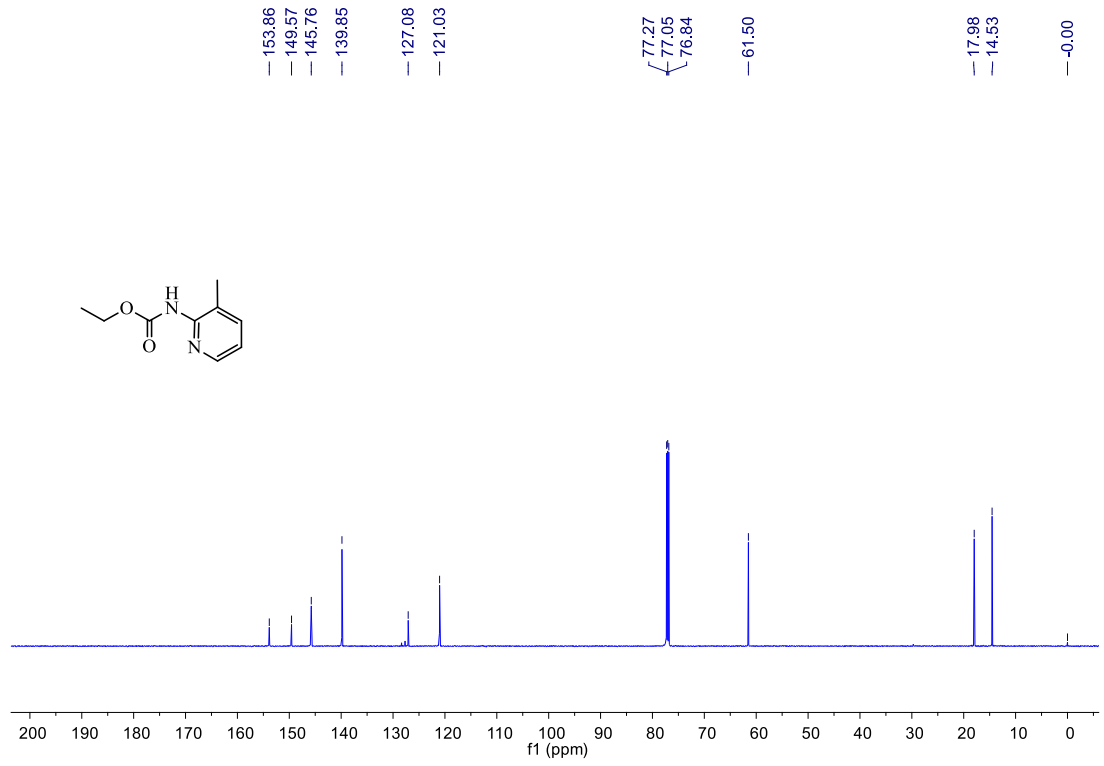
^{13}C NMR of methyl (3-methylpyridin-2-yl)carbamate **7a**



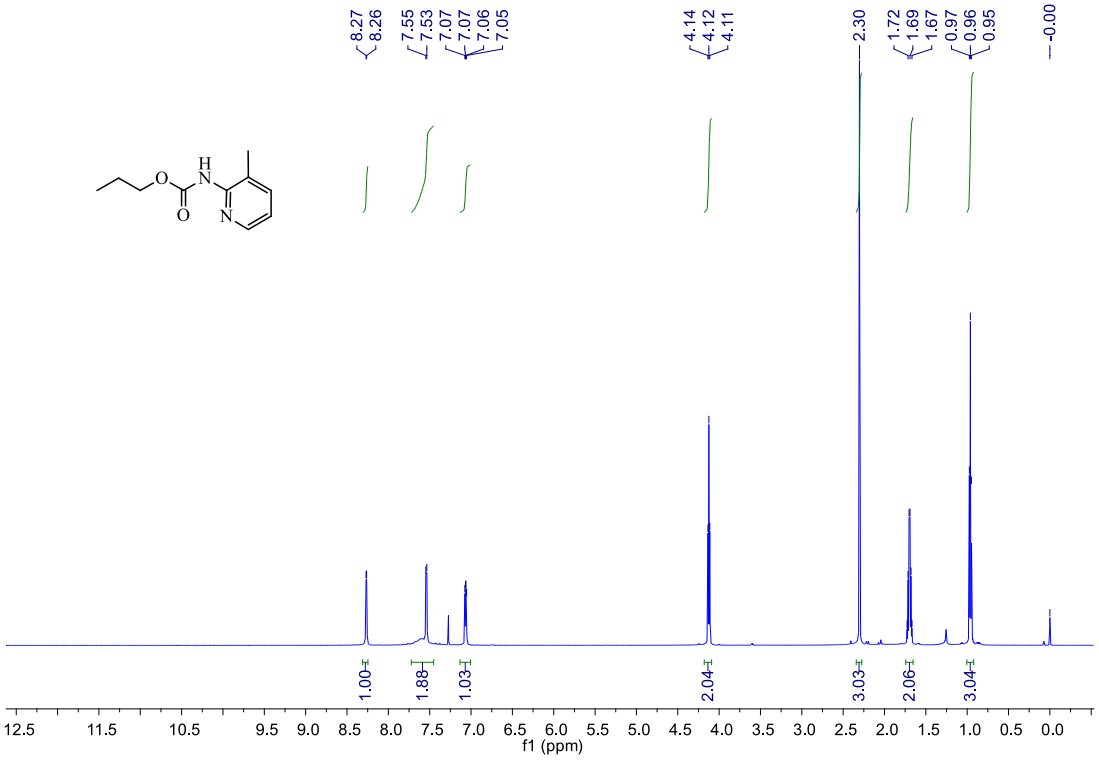
^{1}H NMR of ethyl (3-methylpyridin-2-yl)carbamate **7b**



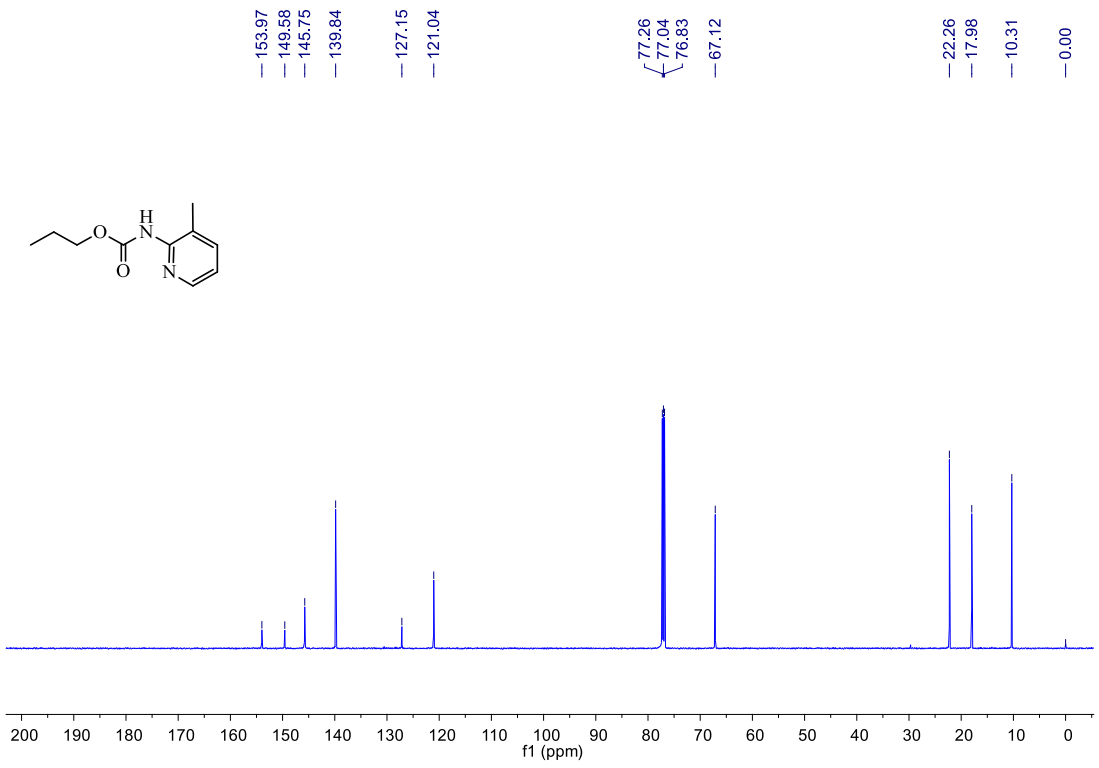
^{13}C NMR of ethyl (3-methylpyridin-2-yl)carbamate **7b**



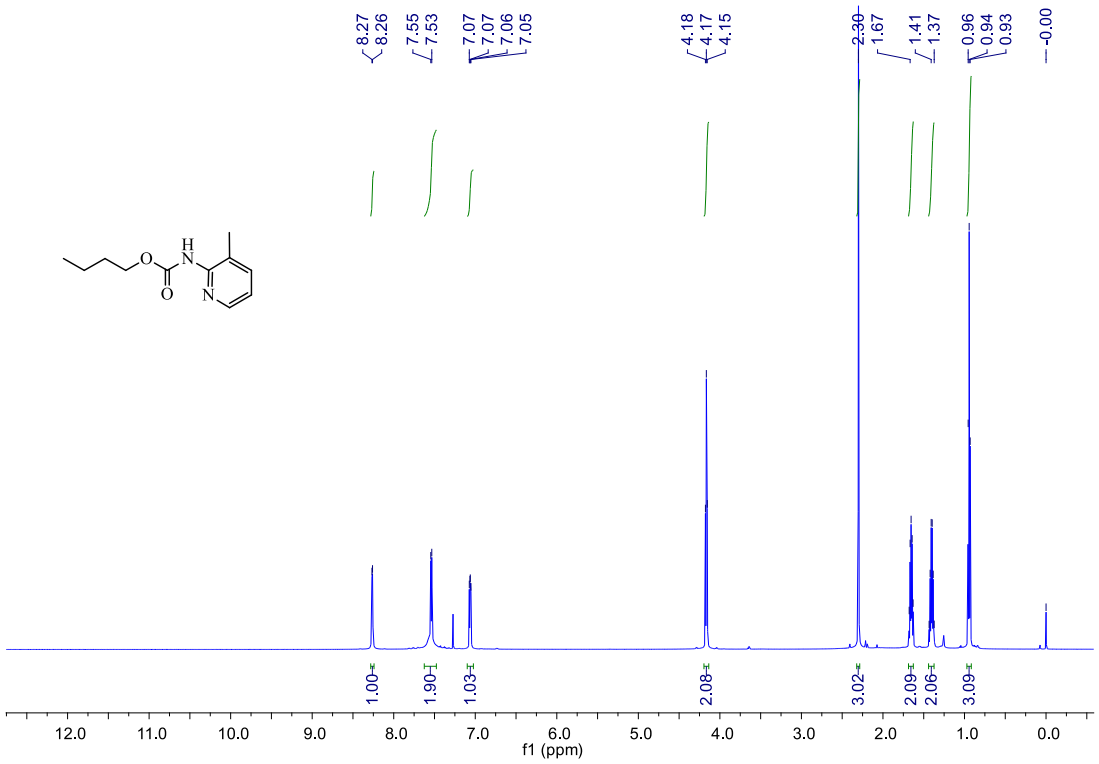
^{1}H NMR of propyl (3-methylpyridin-2-yl)carbamate **7c**



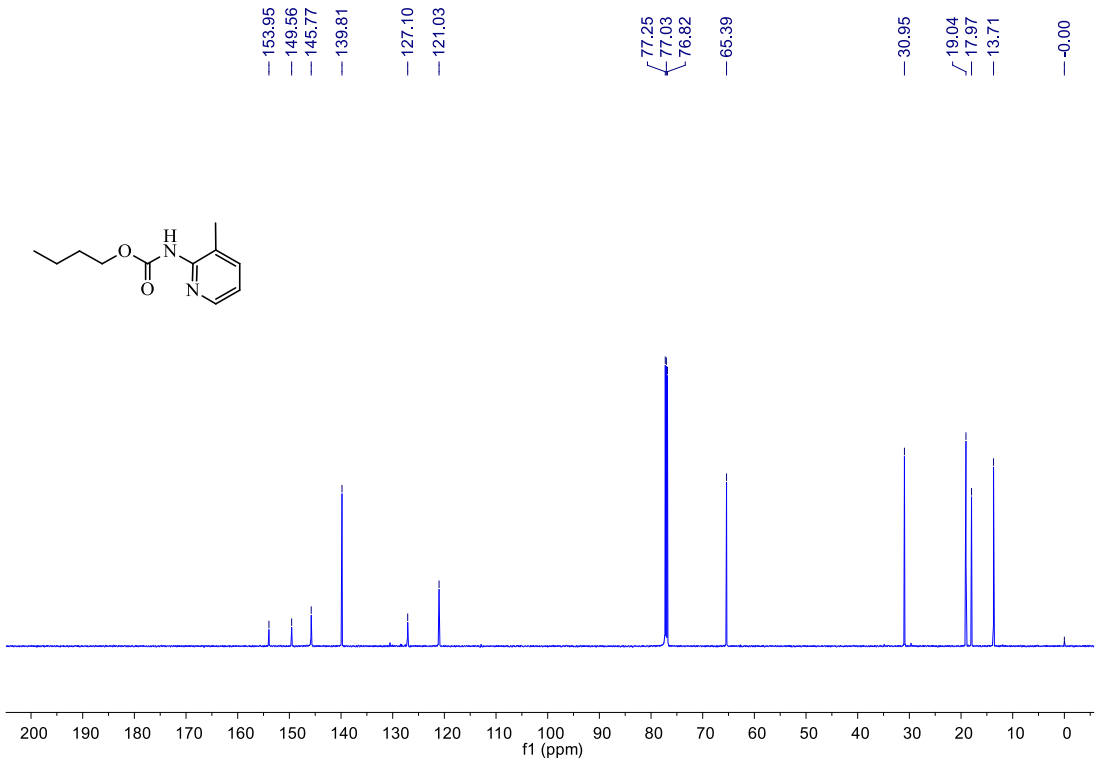
^{13}C NMR of propyl (3-methylpyridin-2-yl)carbamate **7c**



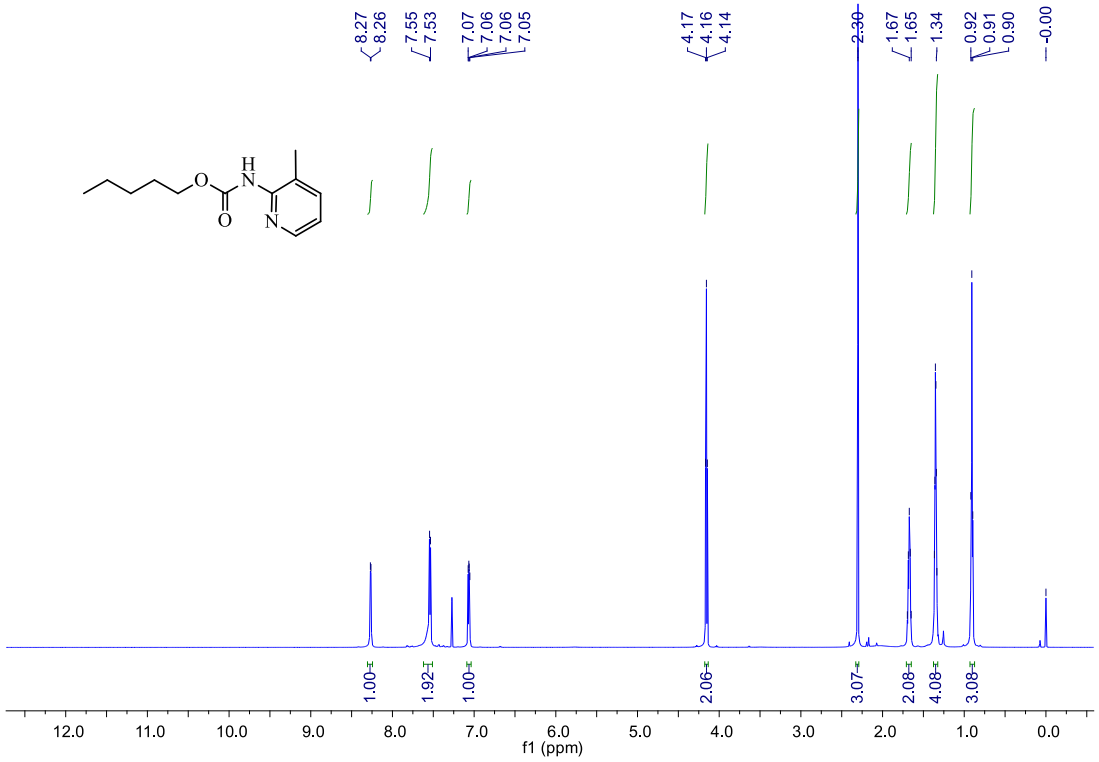
^{1}H NMR of butyl (3-methylpyridin-2-yl)carbamate **7d**



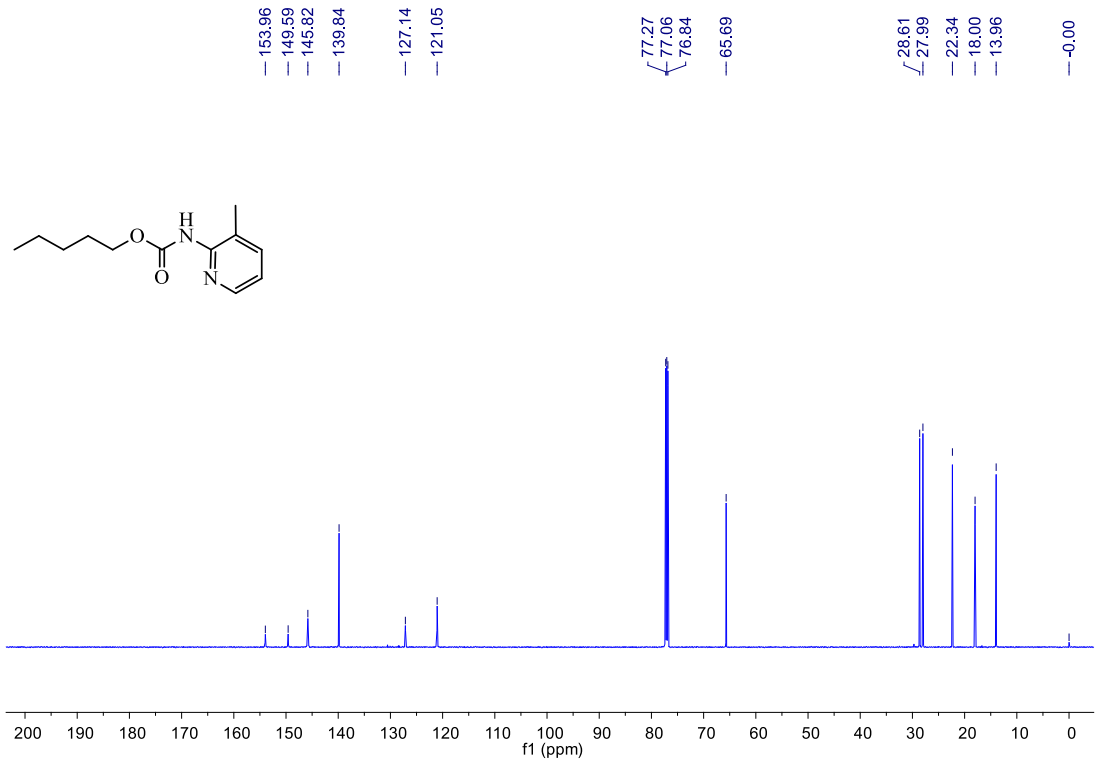
^{13}C NMR of butyl (3-methylpyridin-2-yl)carbamate **7d**



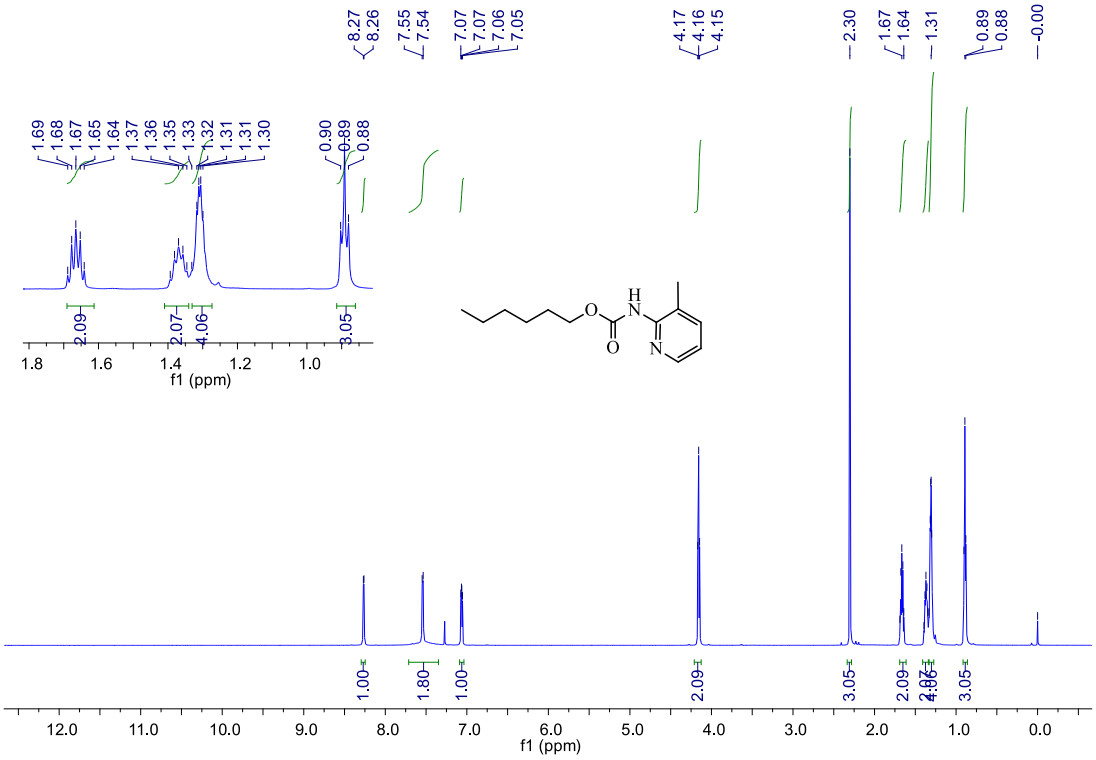
^{1}H NMR of pentyl (3-methylpyridin-2-yl)carbamate **7e**



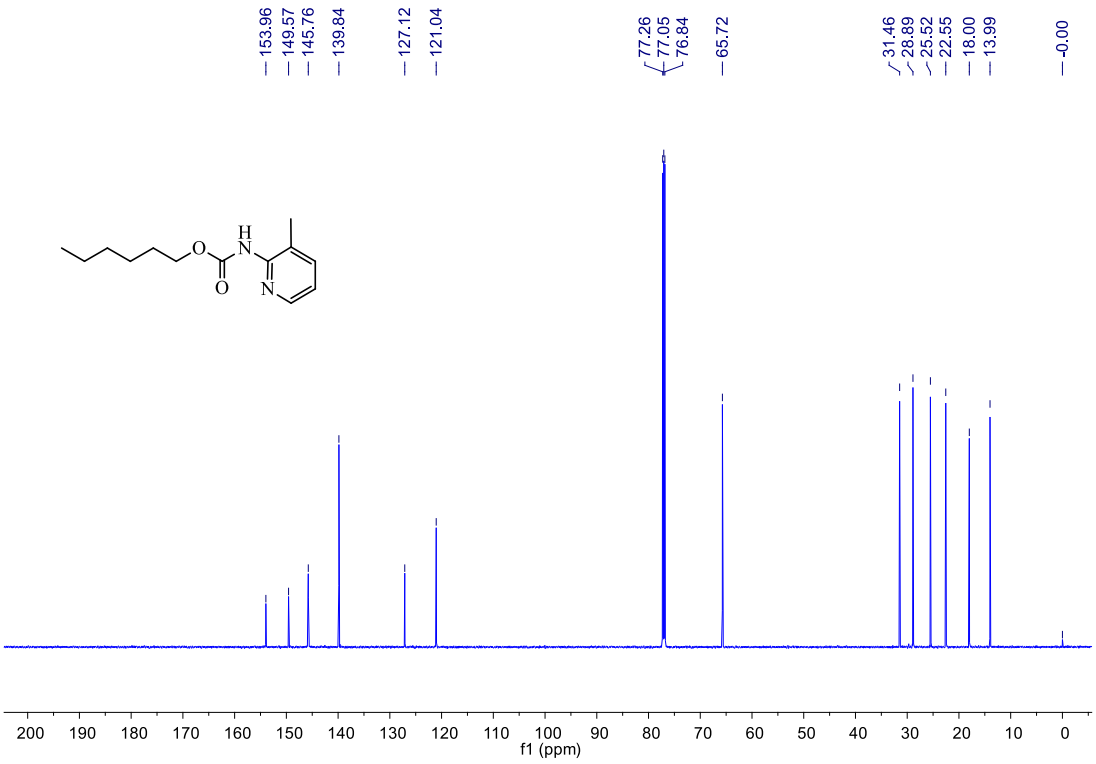
^{13}C NMR of pentyl (3-methylpyridin-2-yl)carbamate **7e**



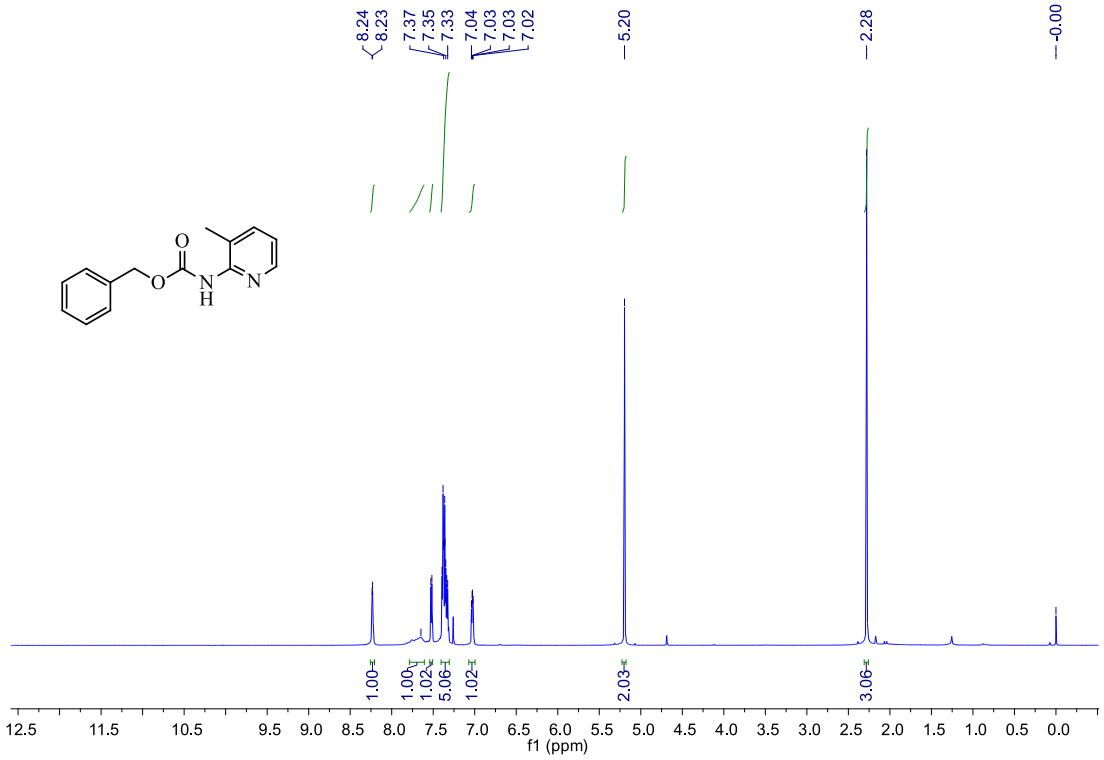
^{1}H NMR of hexyl (3-methylpyridin-2-yl)carbamate **7f**



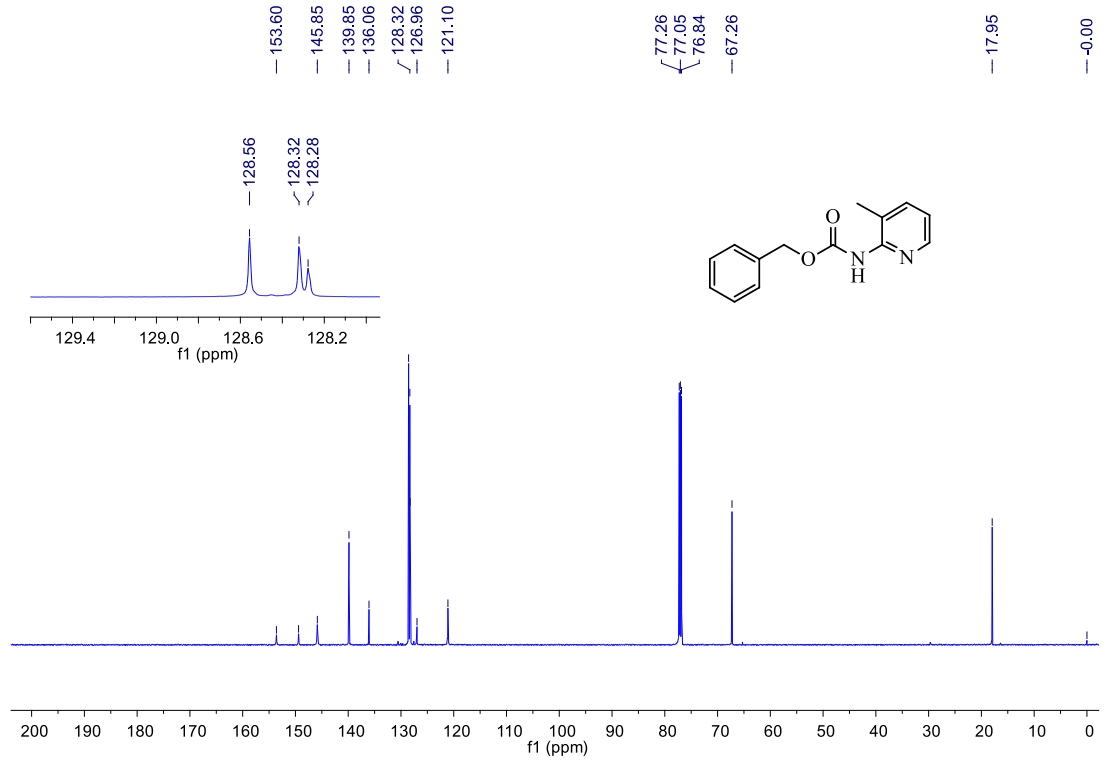
^{13}C NMR of hexyl (3-methylpyridin-2-yl)carbamate **7f**



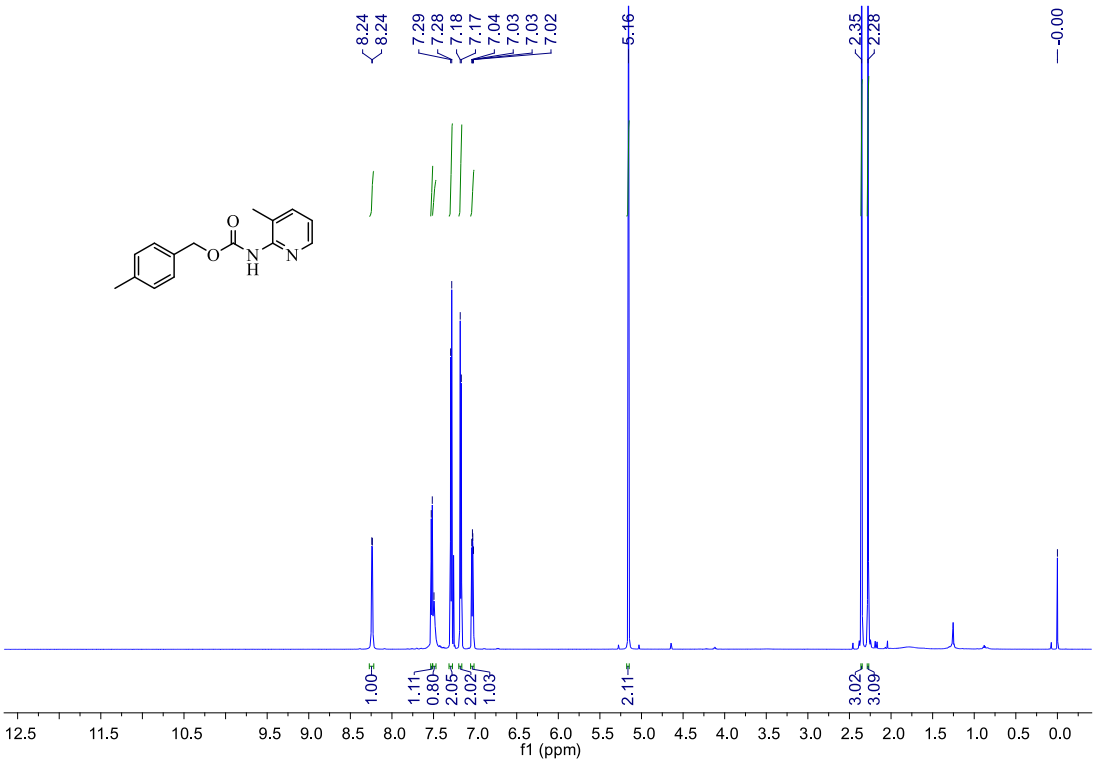
^{1}H NMR of benzyl (3-methylpyridin-2-yl)carbamate **7g**



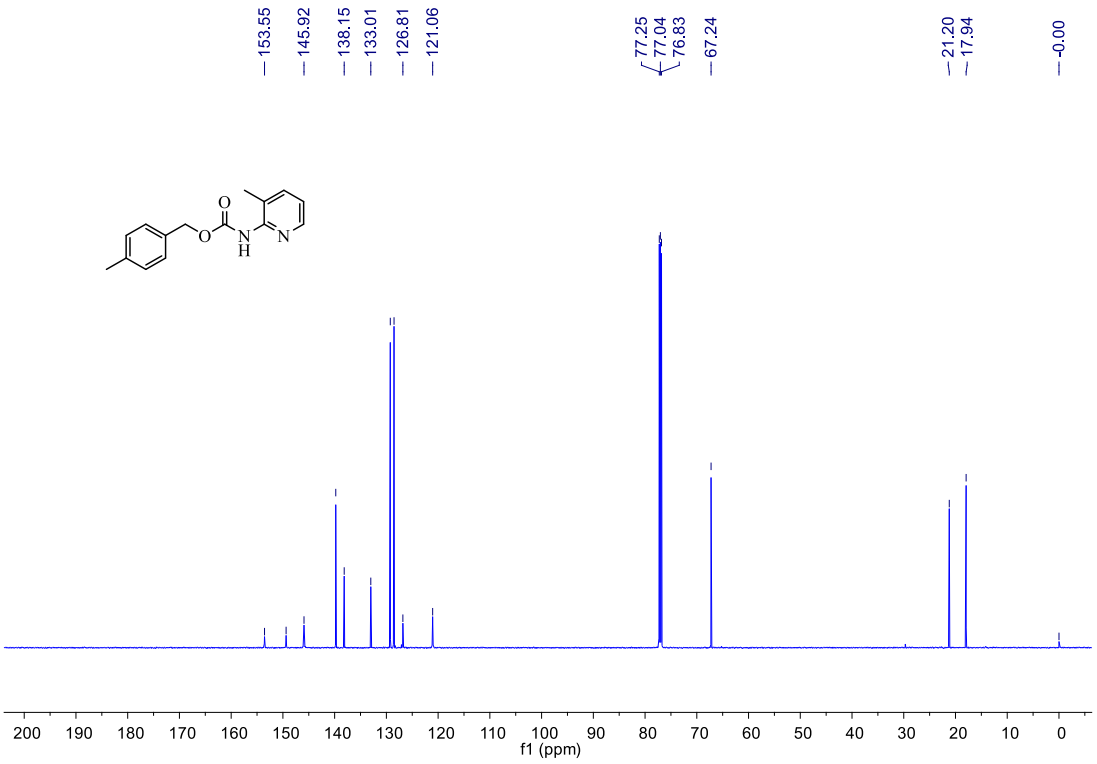
^{13}C NMR of benzyl (3-methylpyridin-2-yl)carbamate **7g**



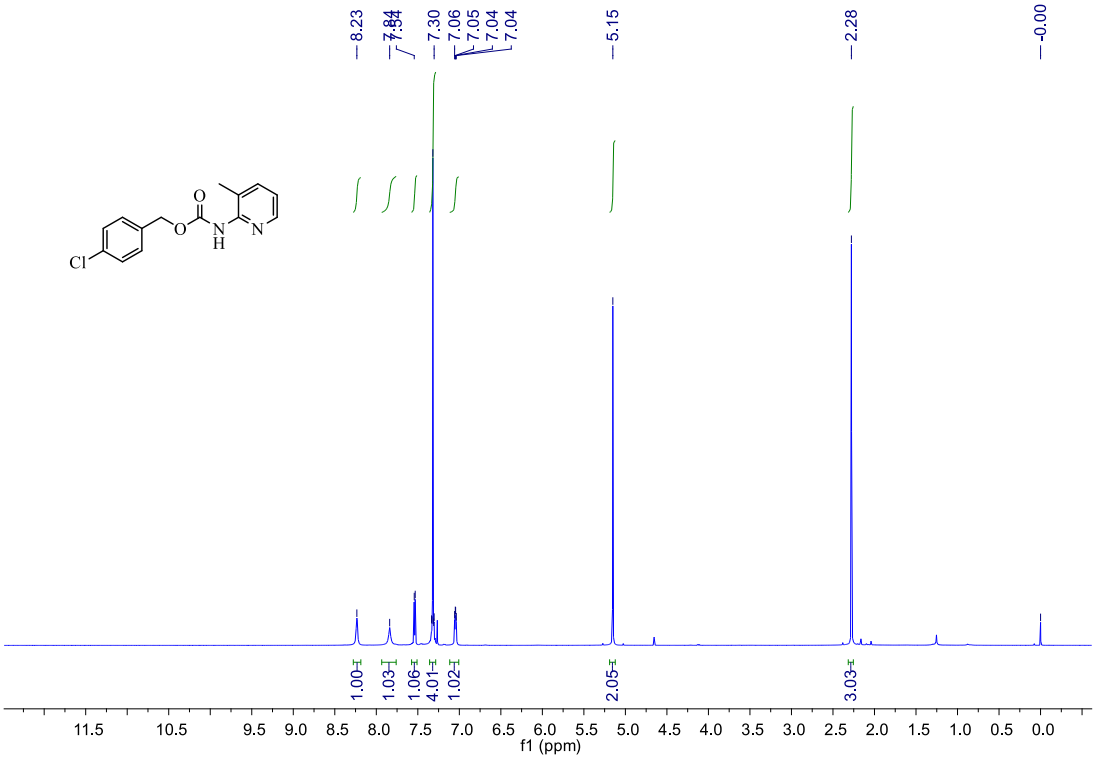
^{1}H NMR of 4-methylbenzyl (3-methylpyridin-2-yl)carbamate **7h**



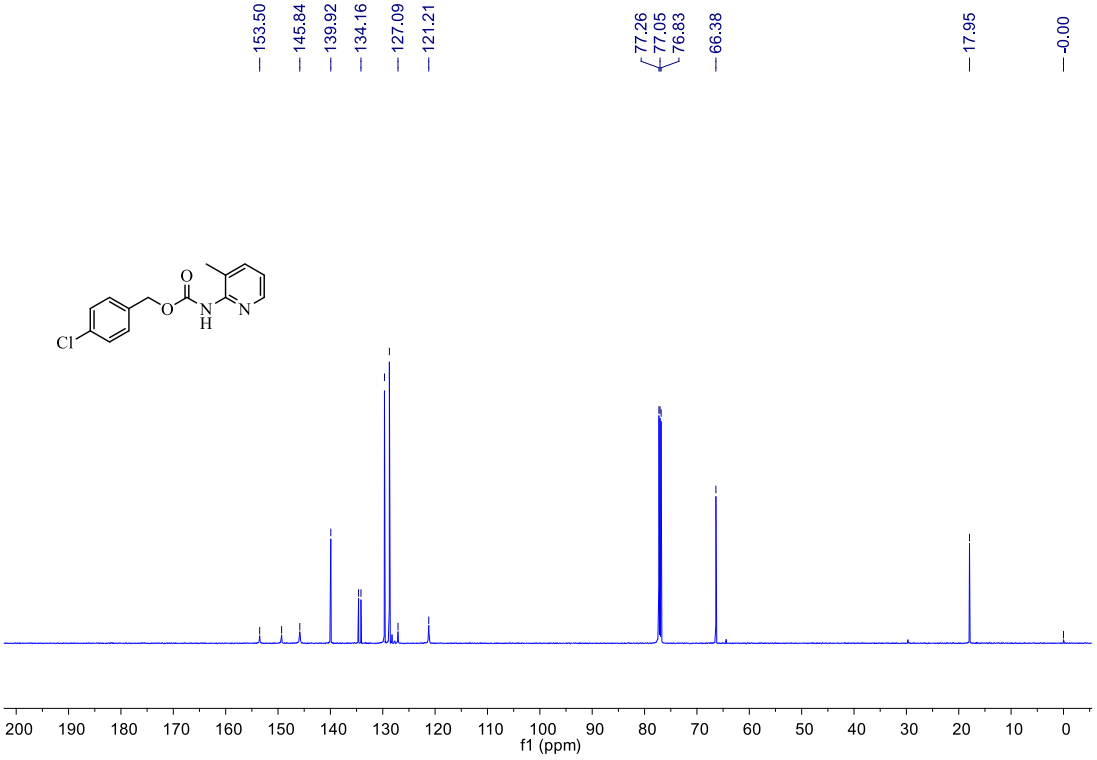
^{13}C NMR of 4-methylbenzyl (3-methylpyridin-2-yl)carbamate **7h**



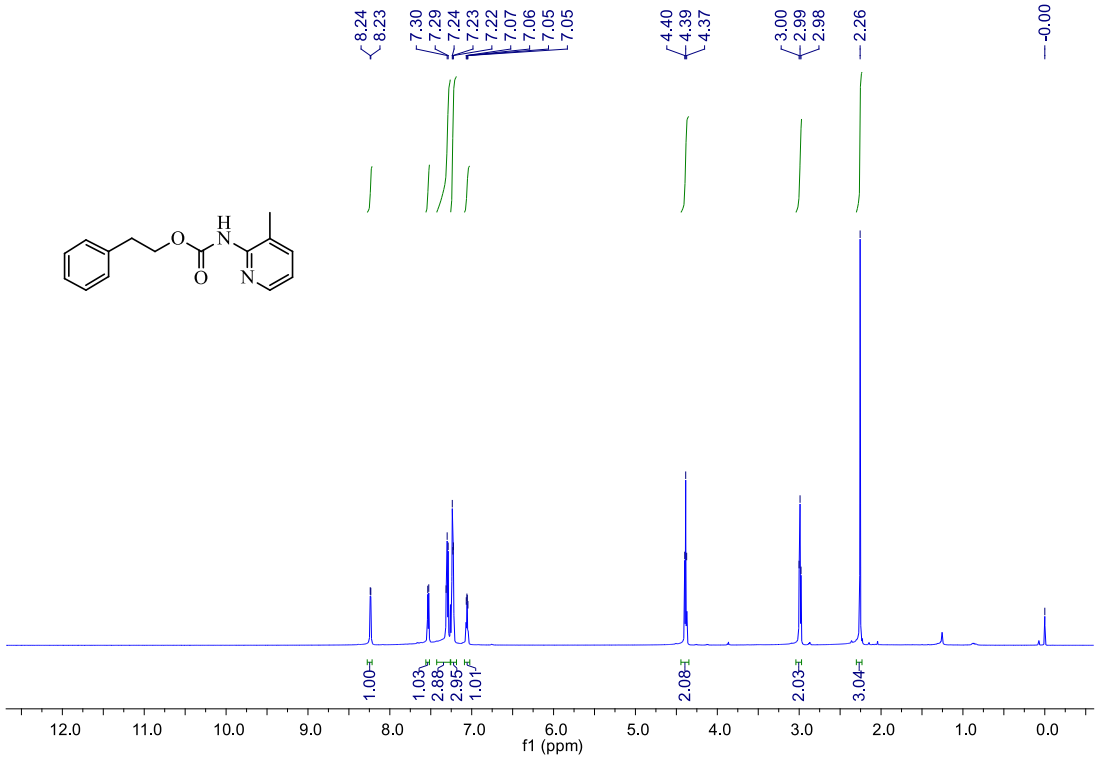
^{1}H NMR of 4-chlorobenzyl (3-methylpyridin-2-yl)carbamate **7i**



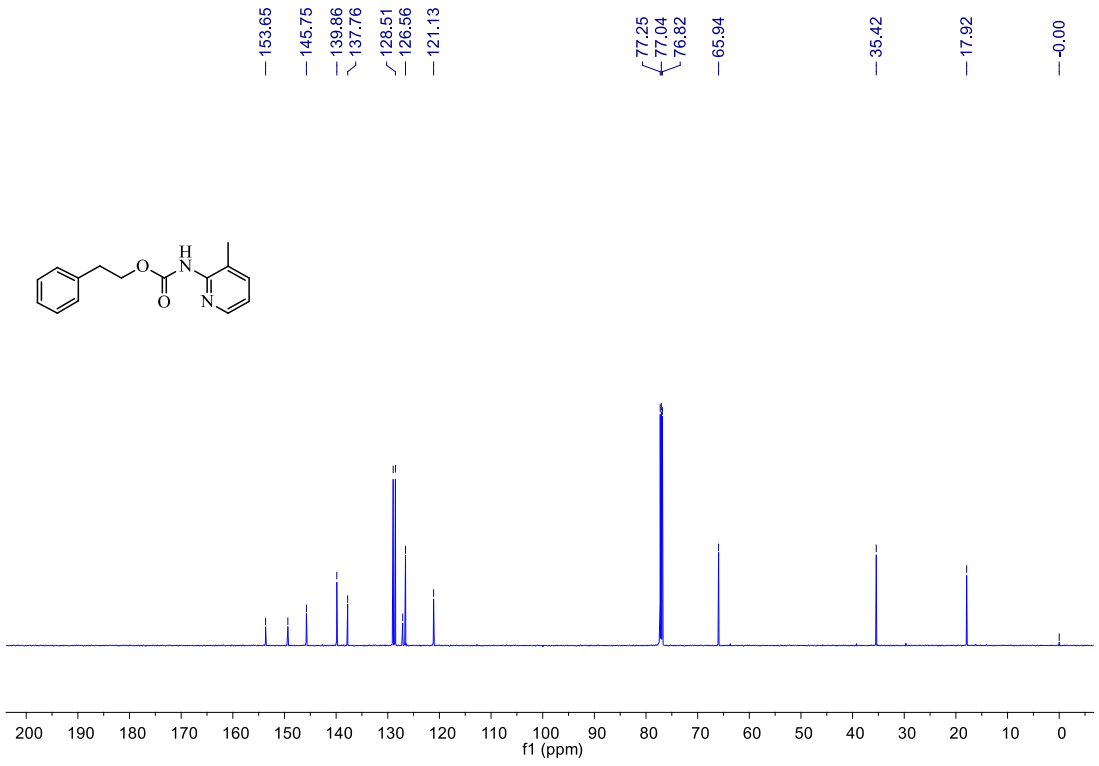
^{13}C NMR of 4-chlorobenzyl (3-methylpyridin-2-yl)carbamate **7i**



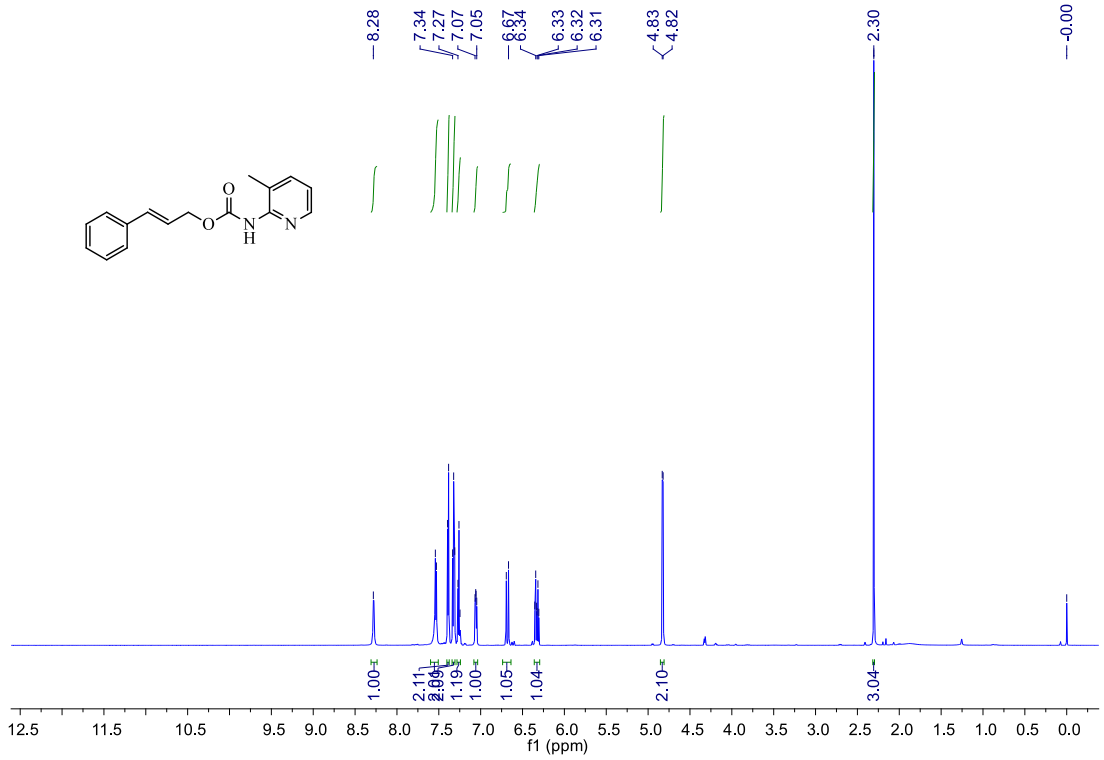
^{1}H NMR of phenethyl (3-methylpyridin-2-yl)carbamate **7j**



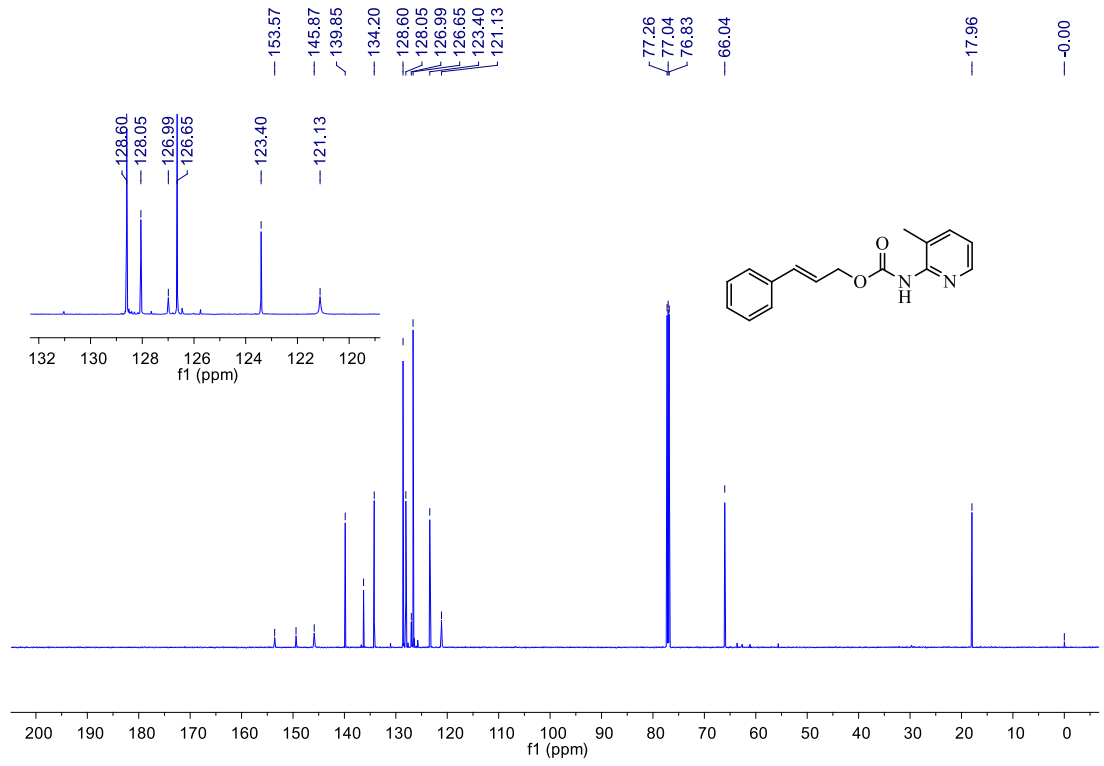
^{13}C NMR of phenethyl (3-methylpyridin-2-yl)carbamate **7j**



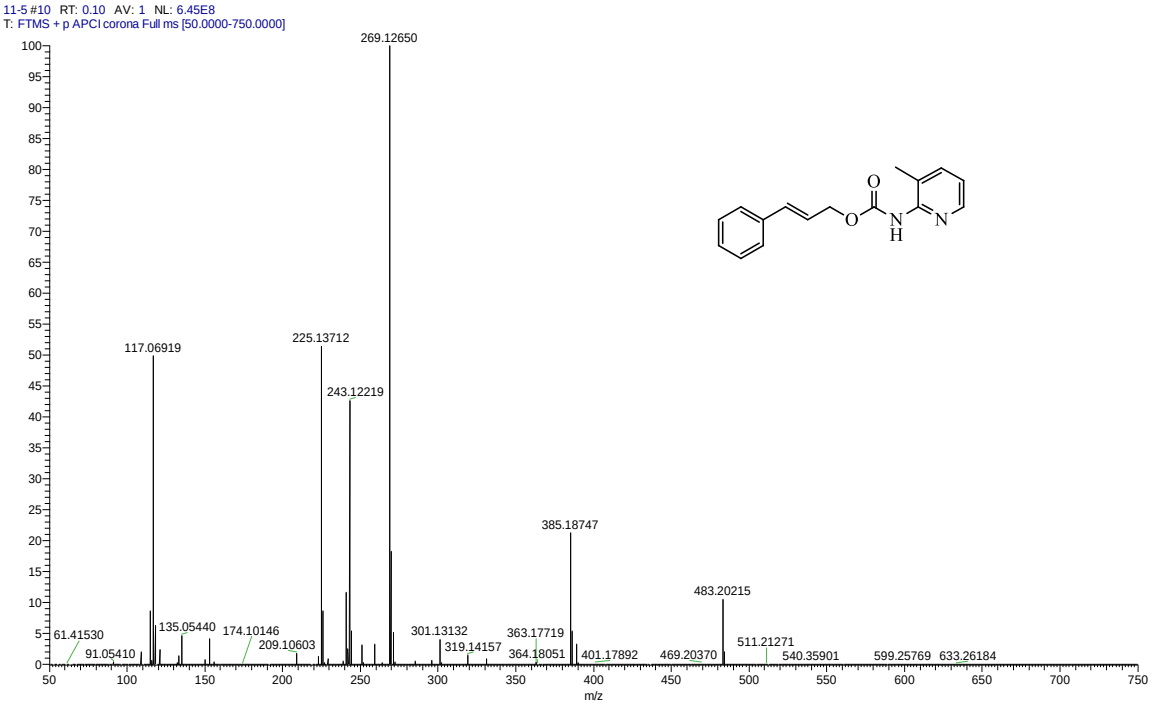
^{1}H NMR of cinnamyl (3-methylpyridin-2-yl)carbamate **7k**



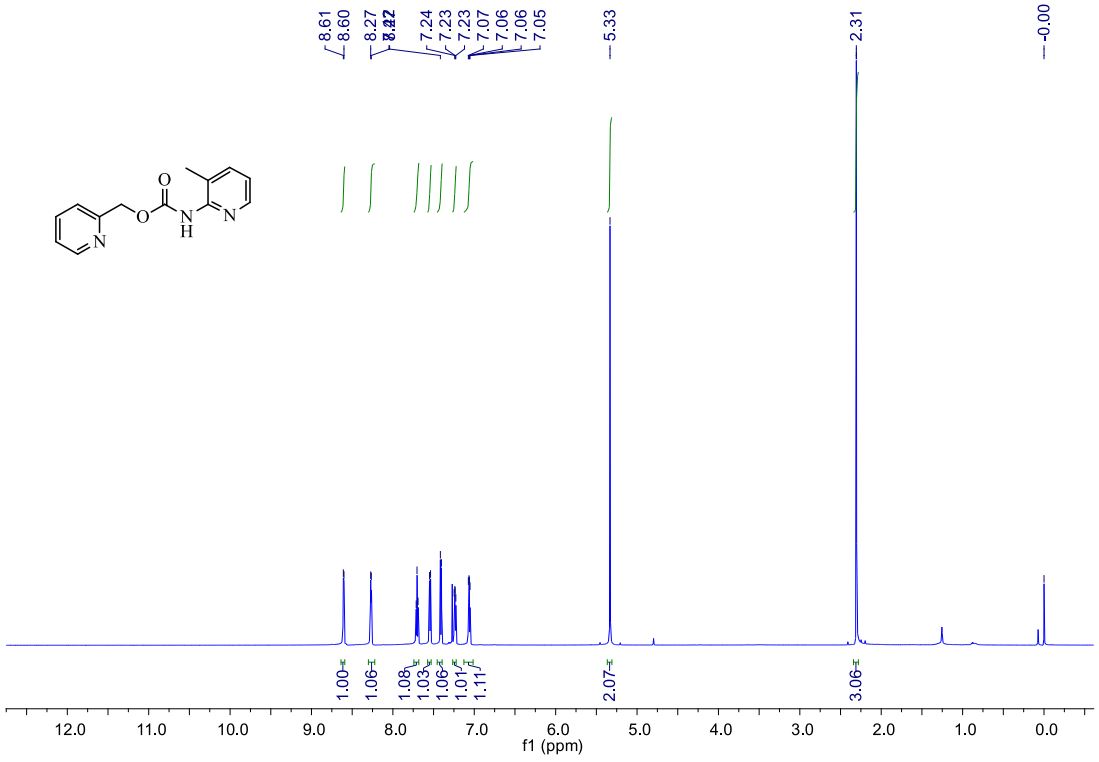
^{13}C NMR of cinnamyl (3-methylpyridin-2-yl)carbamate **7k**



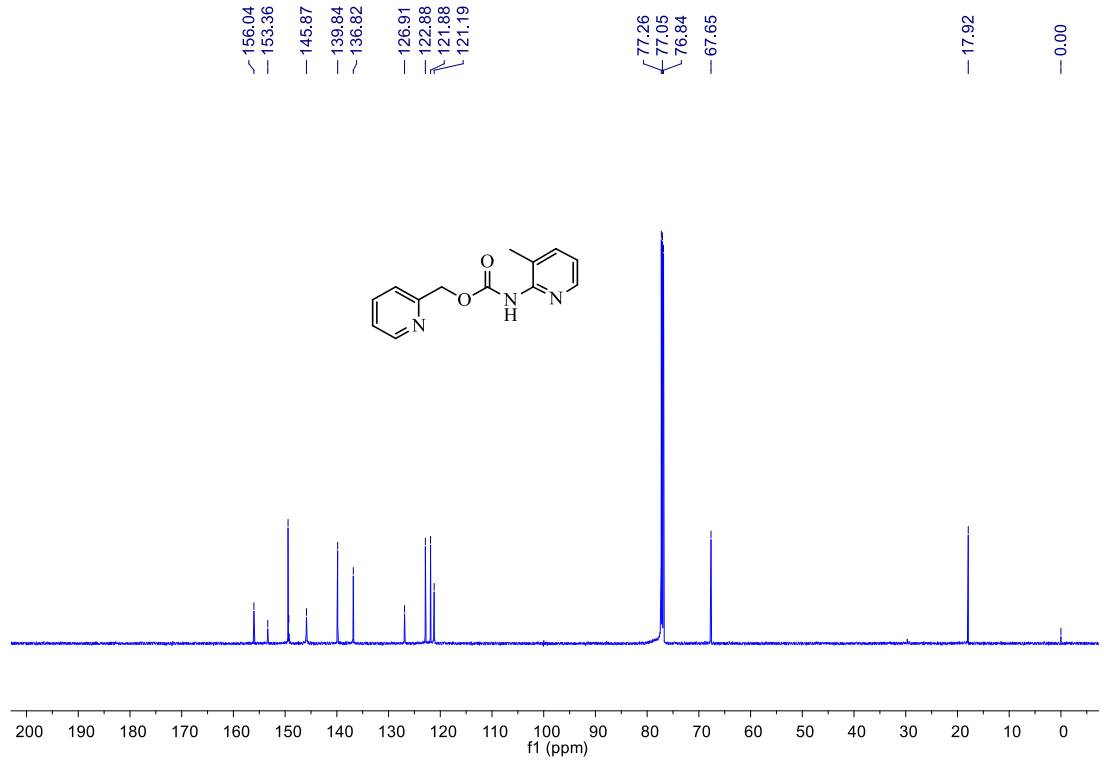
HRMS(ESI) of cinnamyl (3-methylpyridin-2-yl)carbamate **7k**



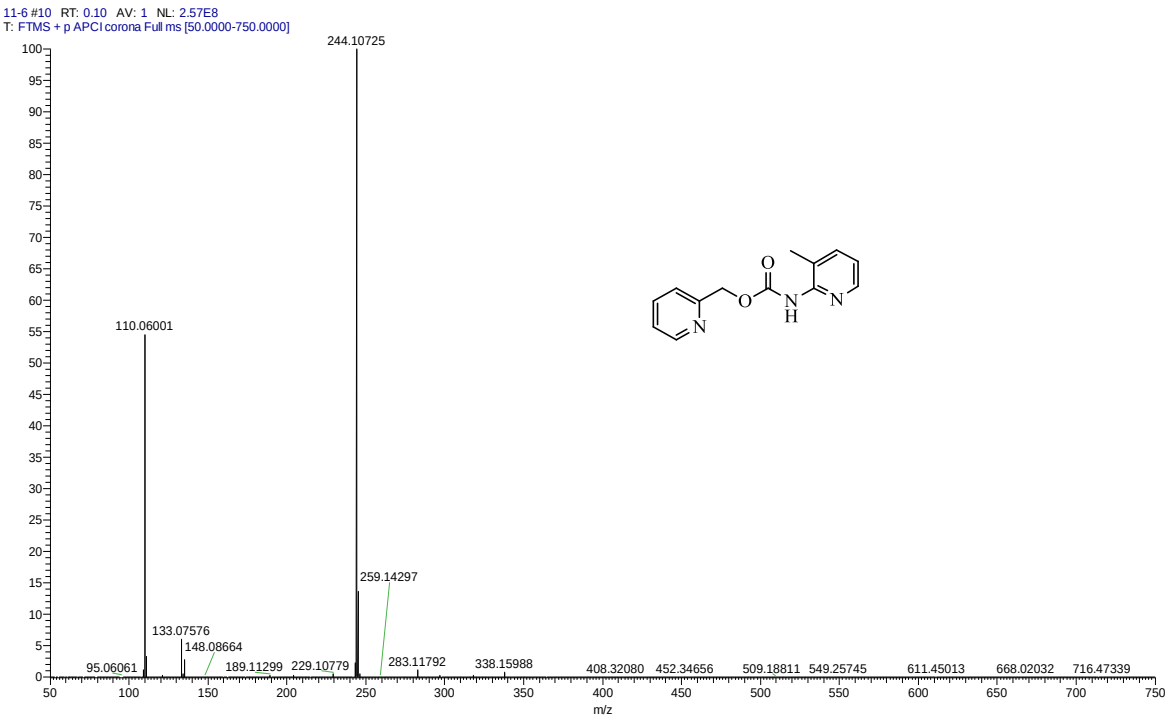
^{1}H NMR of pyridin-2-ylmethyl (3-methylpyridin-2-yl)carbamate **7l**



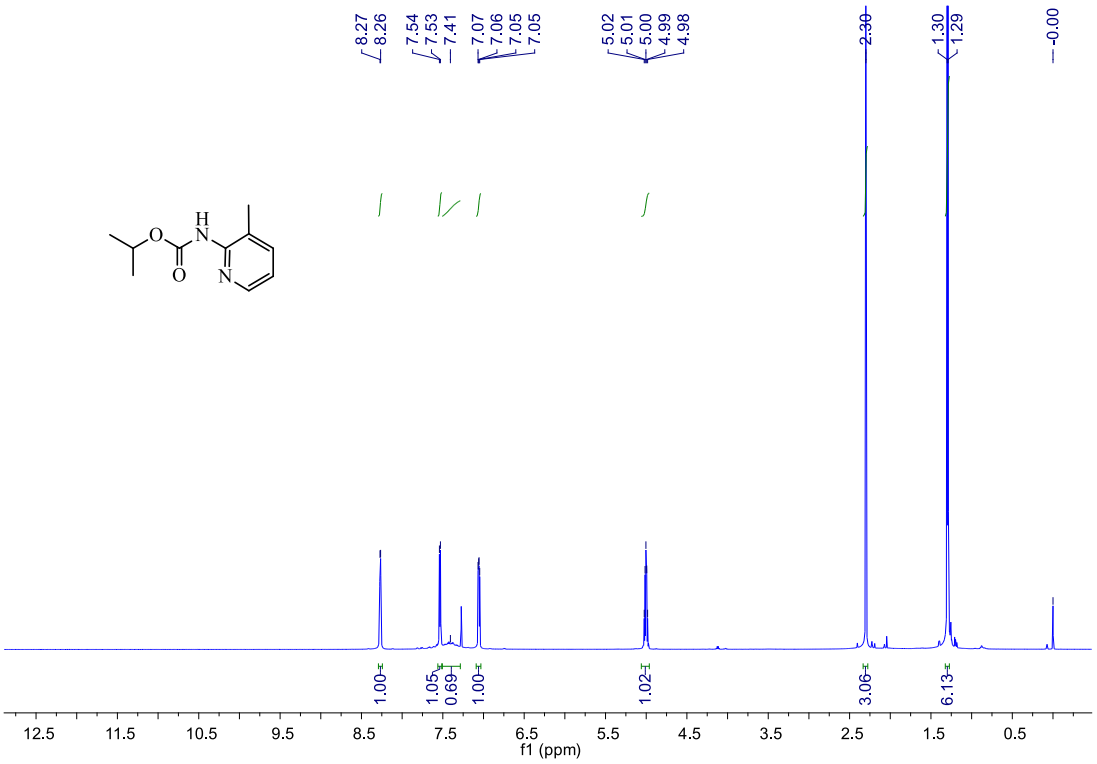
^{13}C NMR of pyridin-2-ylmethyl (3-methylpyridin-2-yl)carbamate **7l**



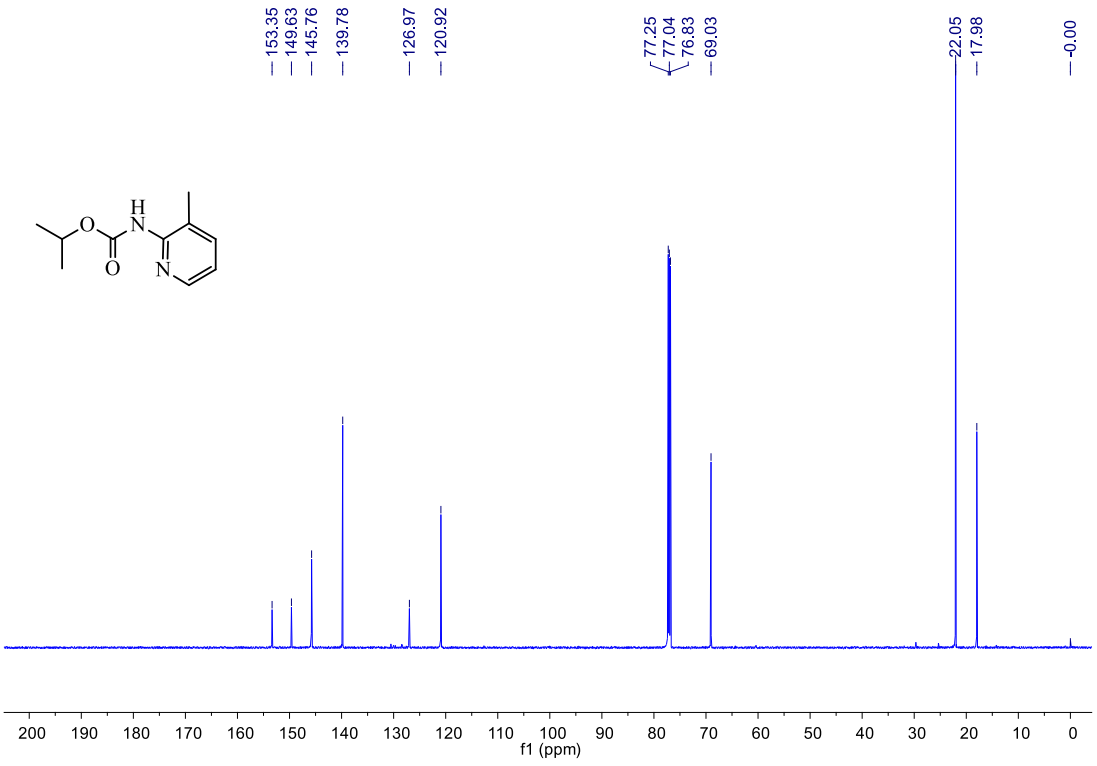
HRMS(ESI) of pyridin-2-ylmethyl (3-methylpyridin-2-yl)carbamate **7l**



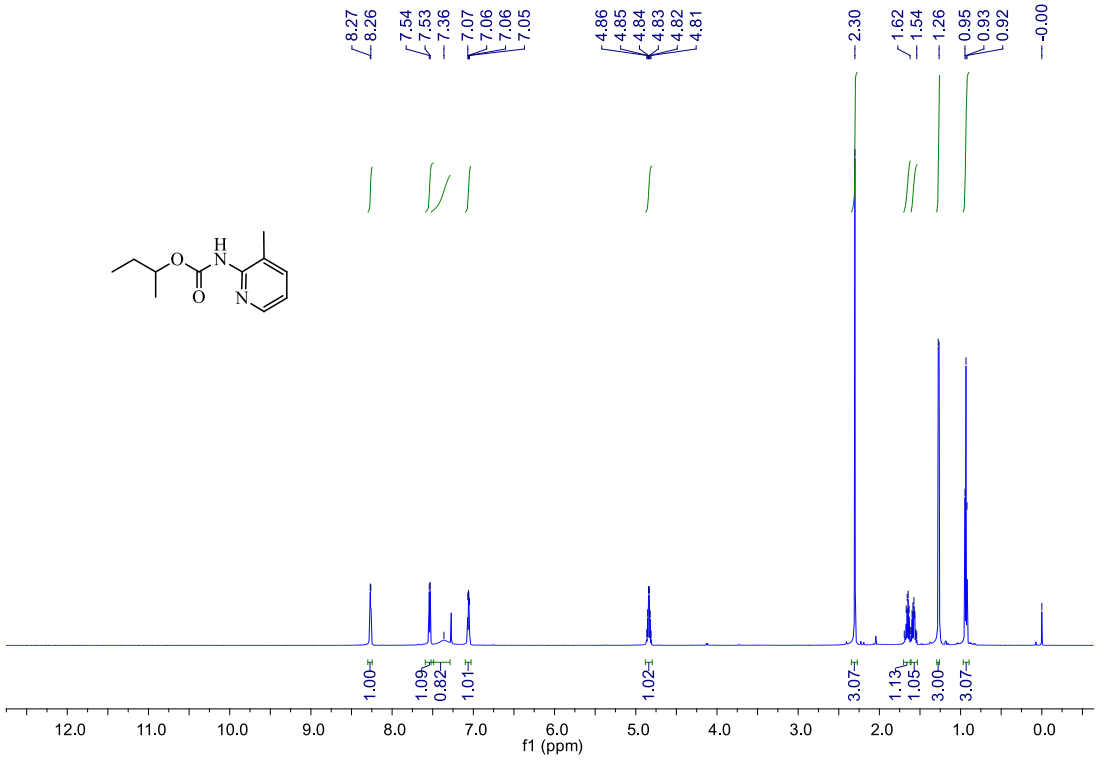
^{1}H NMR of isopropyl (3-methylpyridin-2-yl)carbamate **7m**



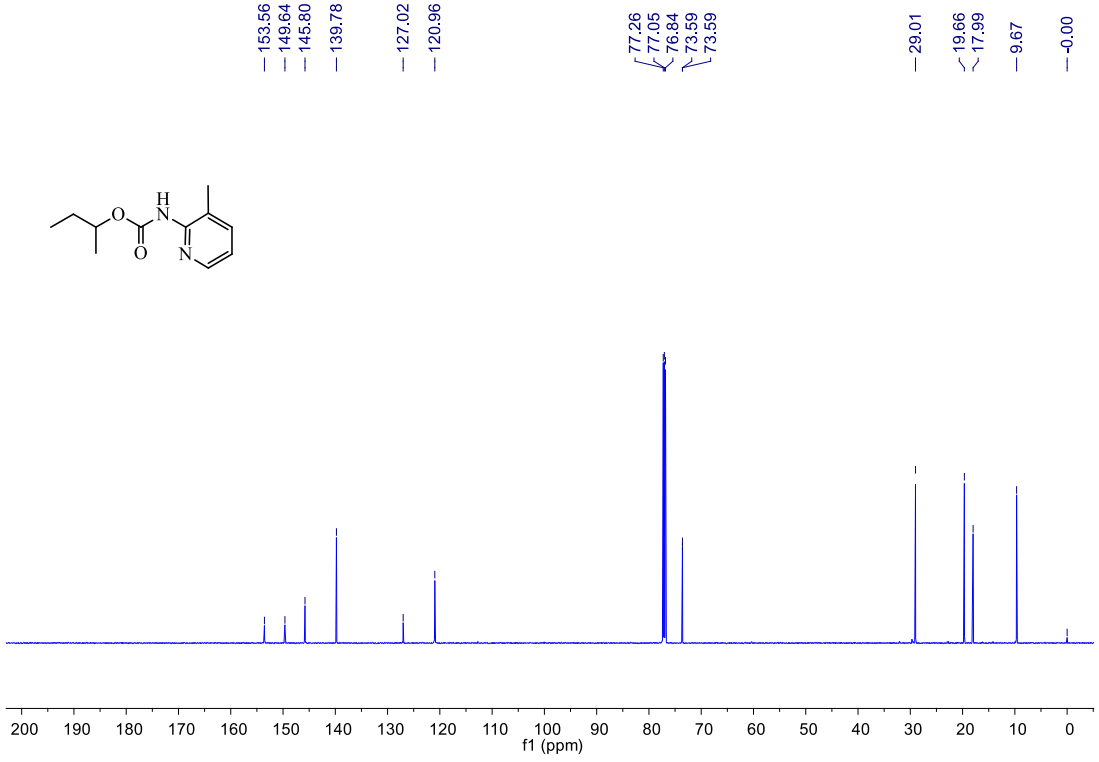
^{13}C NMR of isopropyl (3-methylpyridin-2-yl)carbamate **7m**



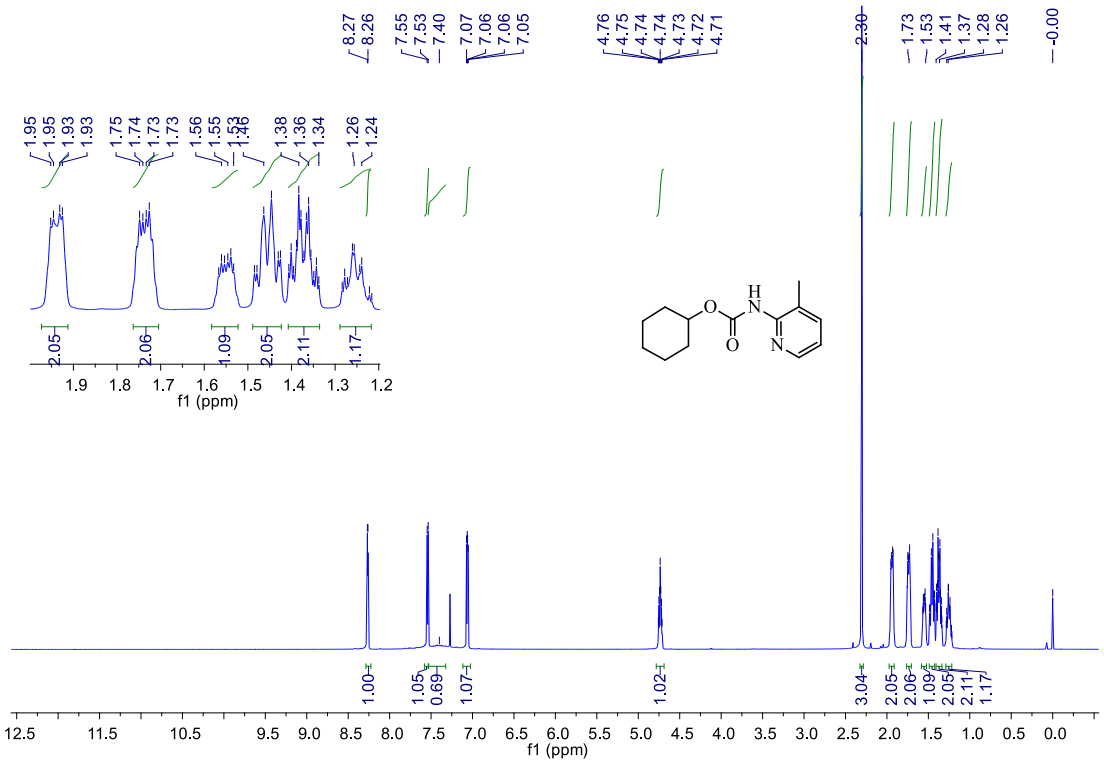
^{1}H NMR of sec-butyl (3-methylpyridin-2-yl)carbamate **7n**



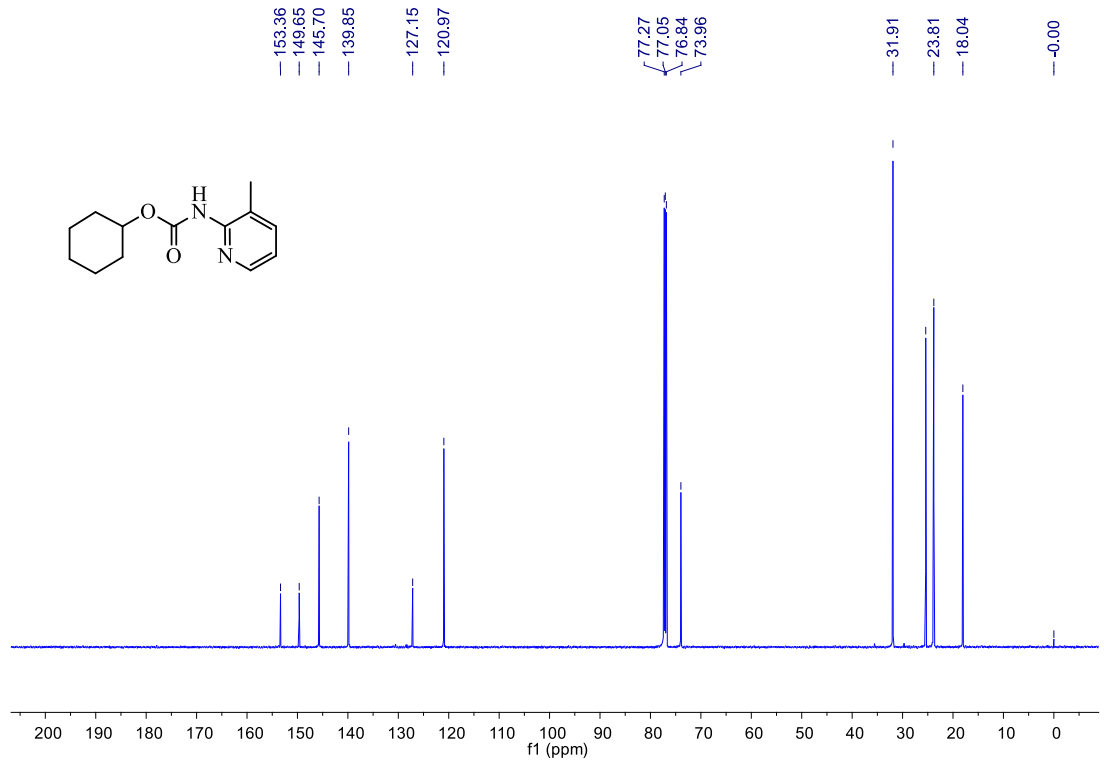
^{13}C NMR of sec-butyl (3-methylpyridin-2-yl)carbamate **7n**



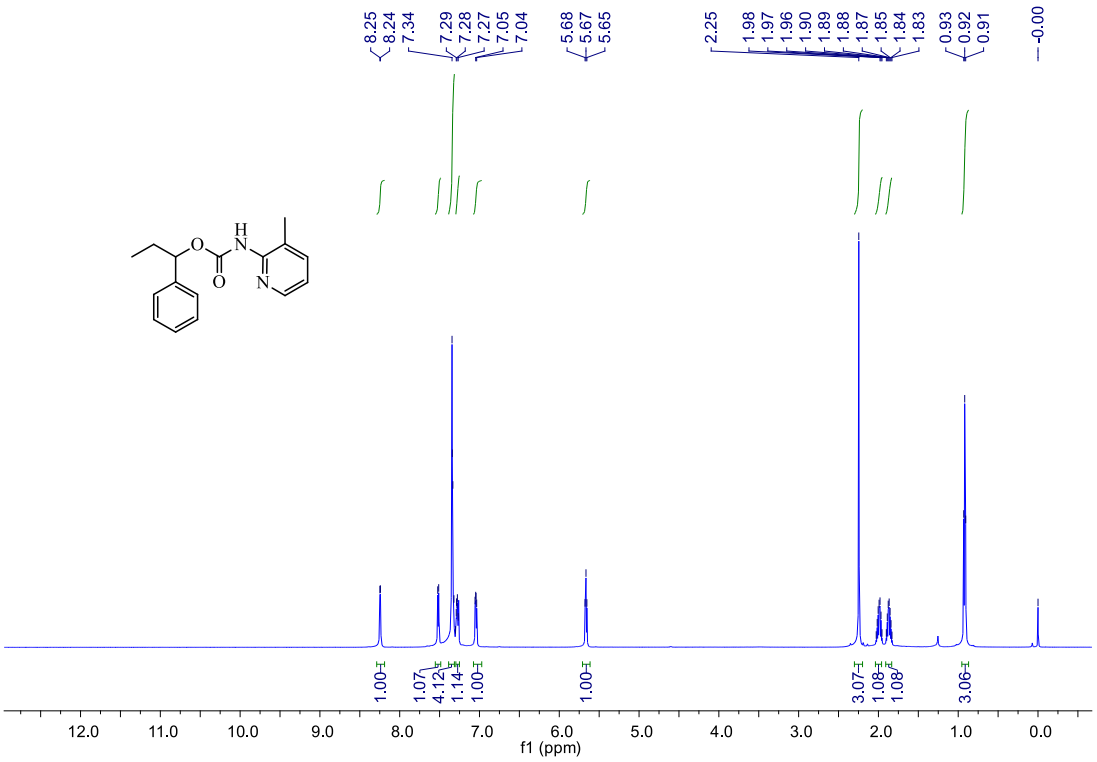
^{1}H NMR of cyclohexyl (3-methylpyridin-2-yl)carbamate **7o**



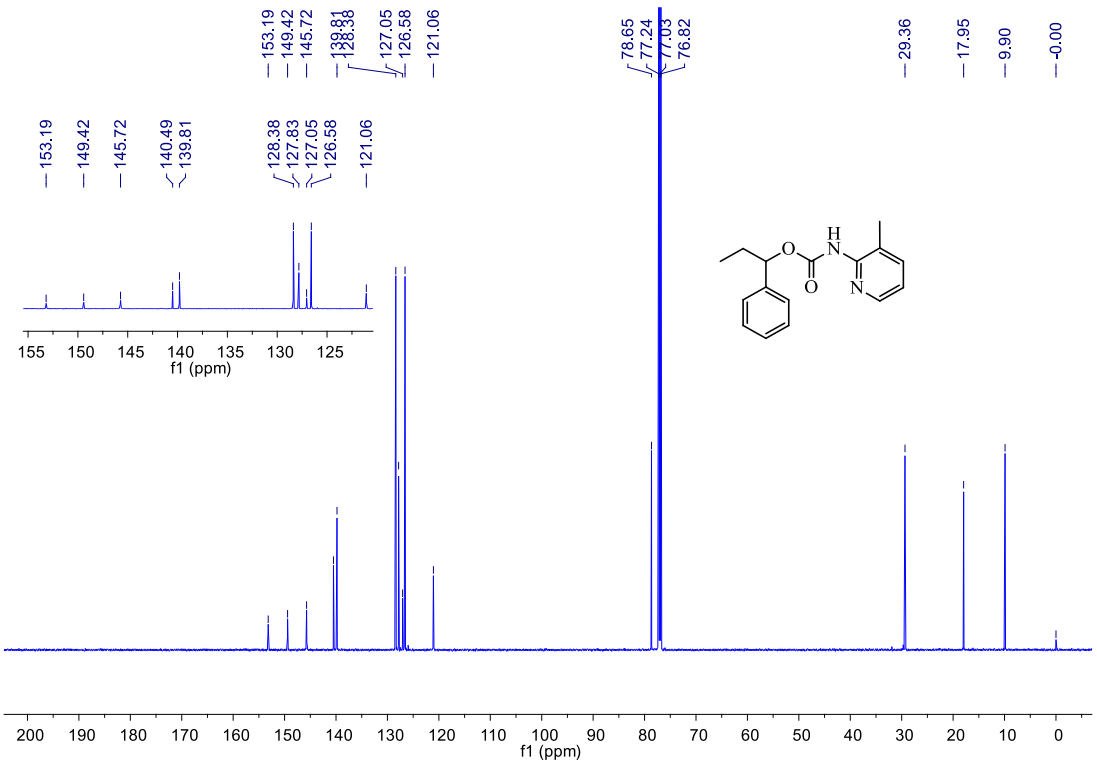
^{13}C NMR of cyclohexyl (3-methylpyridin-2-yl)carbamate **7o**



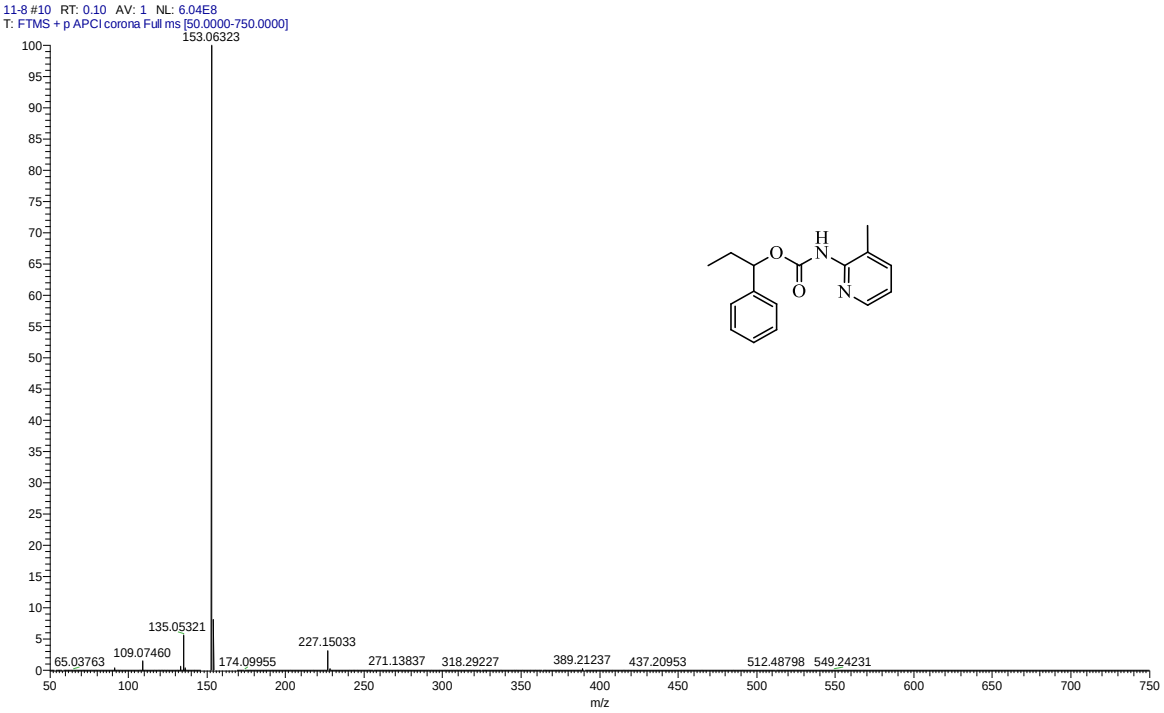
^{1}H NMR of 1-phenylpropyl (3-methylpyridin-2-yl)carbamate **7p**



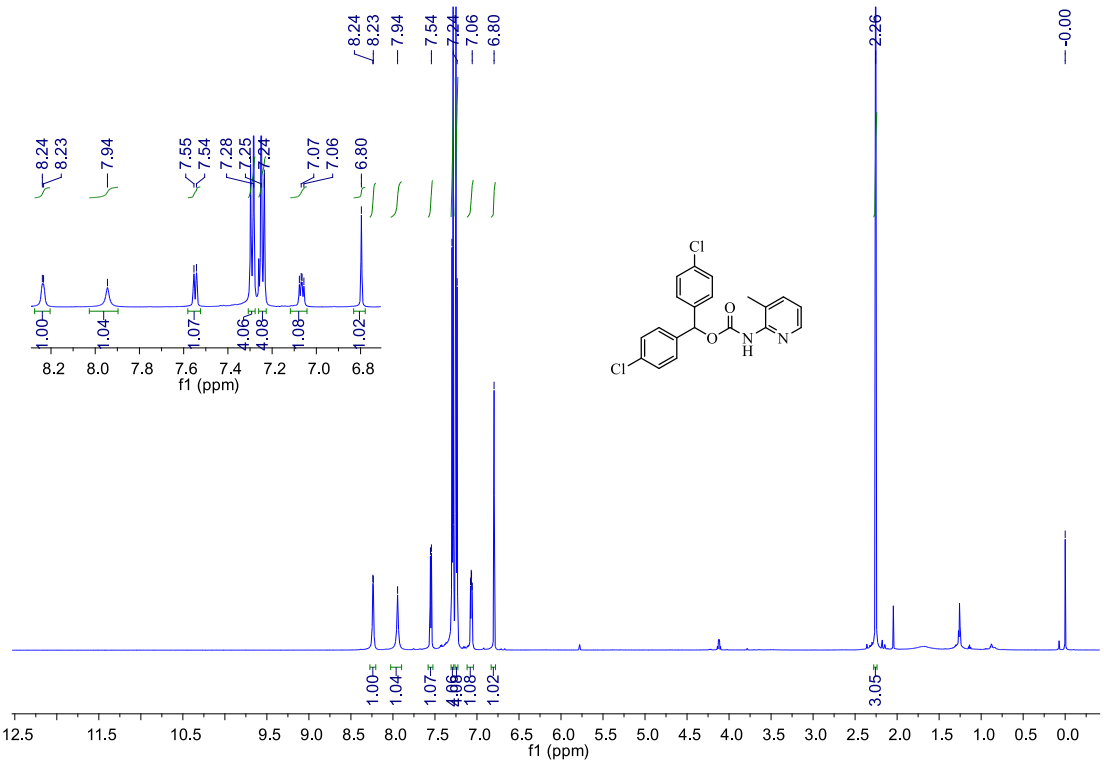
^{13}C NMR of 1-phenylpropyl (3-methylpyridin-2-yl)carbamate **7p**



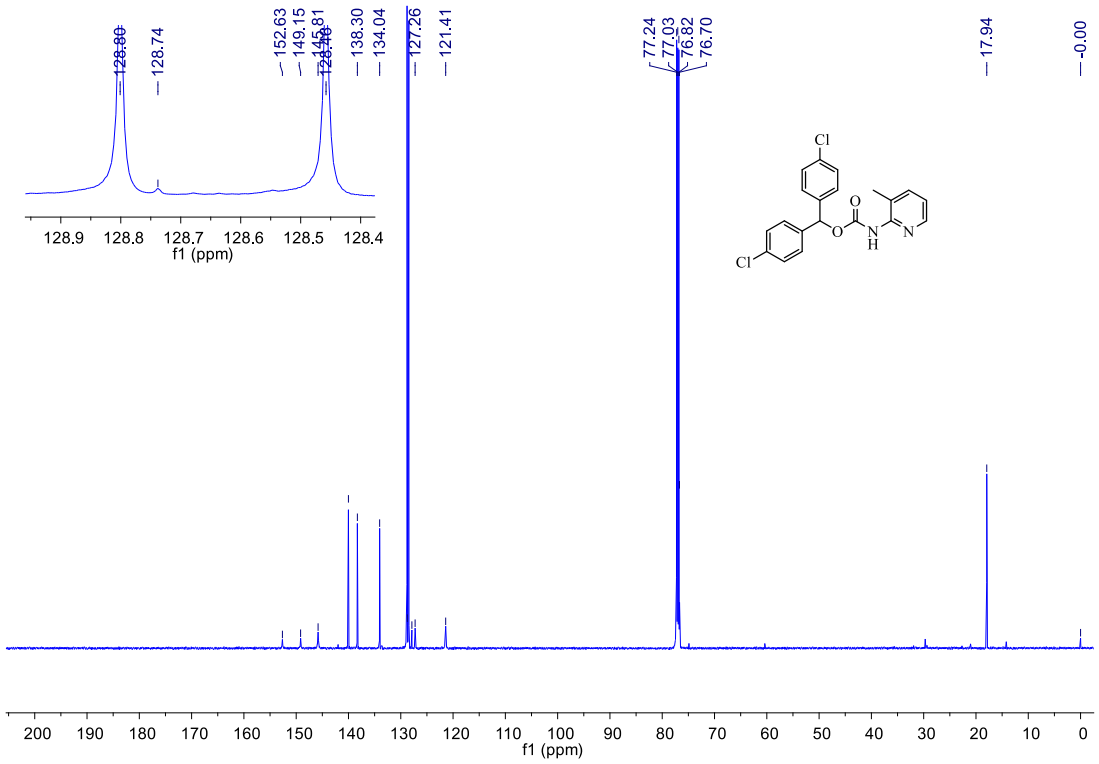
HRMS(ESI) of 1-phenylpropyl (3-methylpyridin-2-yl)carbamate **7p**



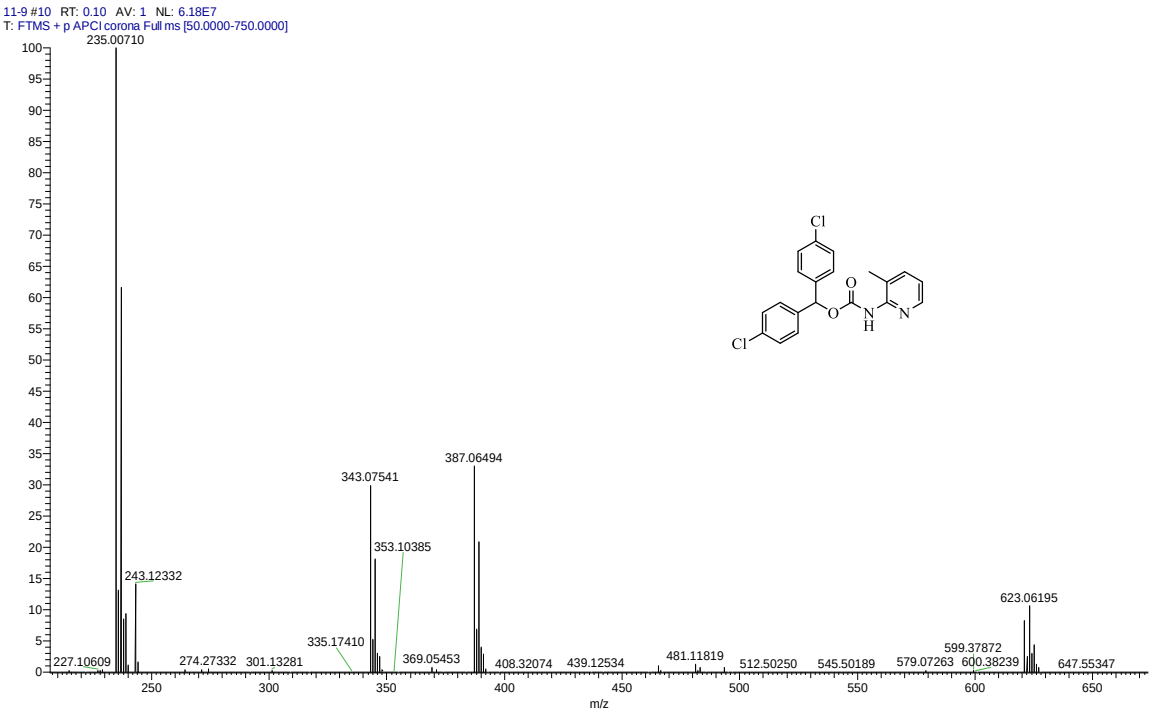
^{1}H NMR of bis(4-chlorophenyl)methyl (3-methylpyridin-2-yl)carbamate **7q**



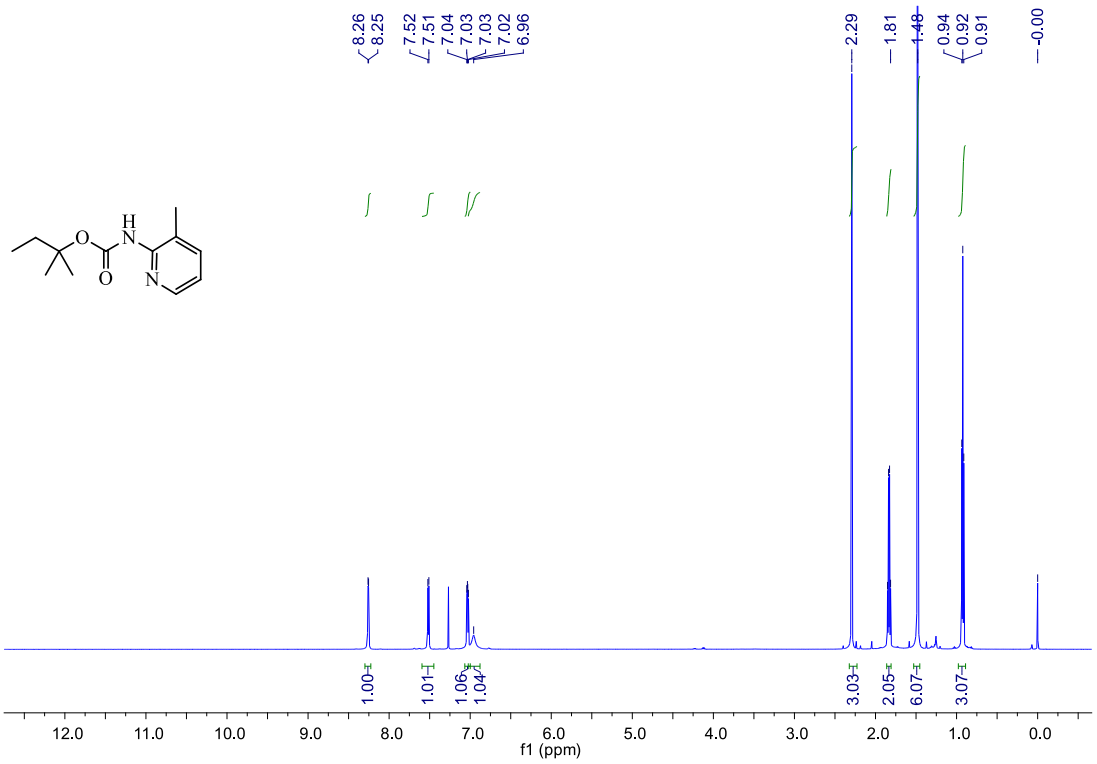
^{13}C NMR of bis(4-chlorophenyl)methyl (3-methylpyridin-2-yl)carbamate **7q**



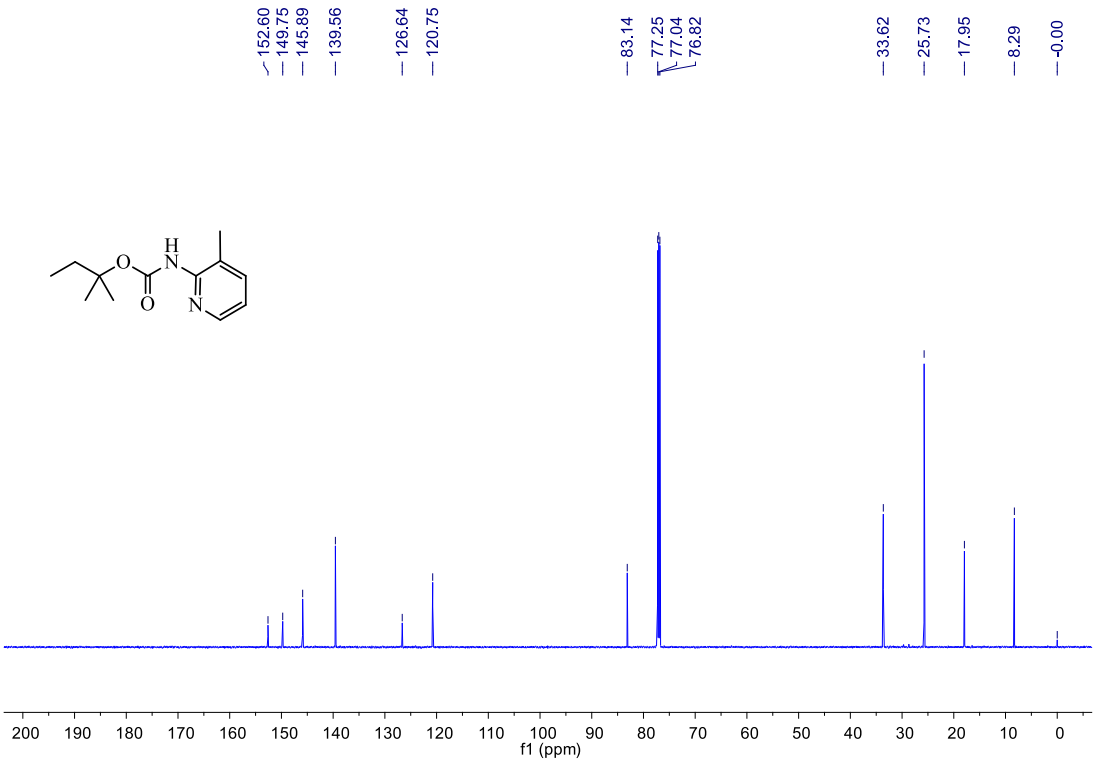
HRMS(ESI) of bis(4-chlorophenyl)methyl (3-methylpyridin-2-yl)carbamate **7q**



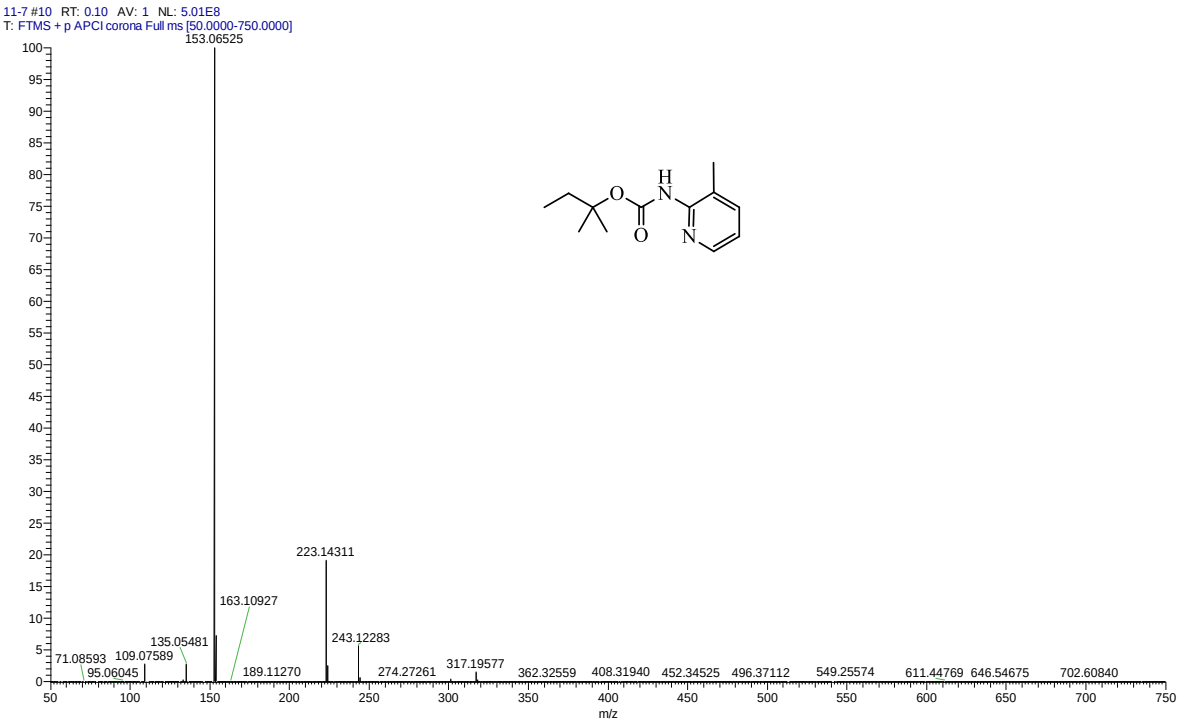
^{1}H NMR of tert-pentyl (3-methylpyridin-2-yl)carbamate **7r**



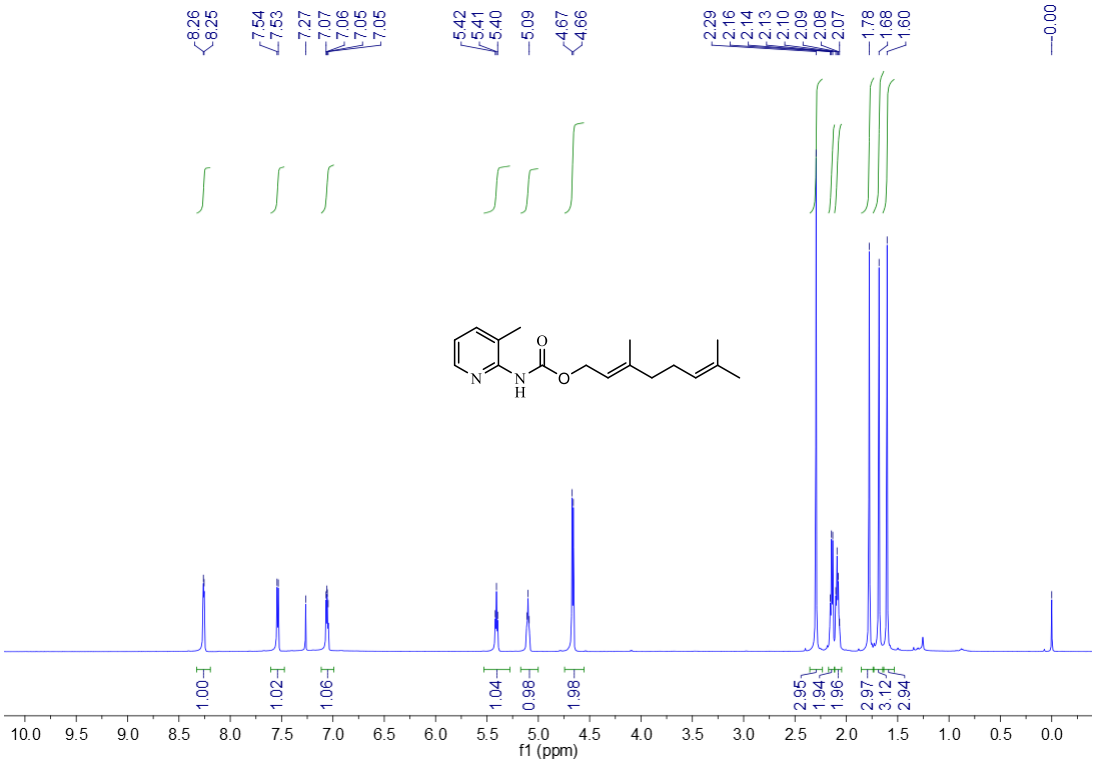
^{13}C NMR of tert-pentyl (3-methylpyridin-2-yl)carbamate **7r**



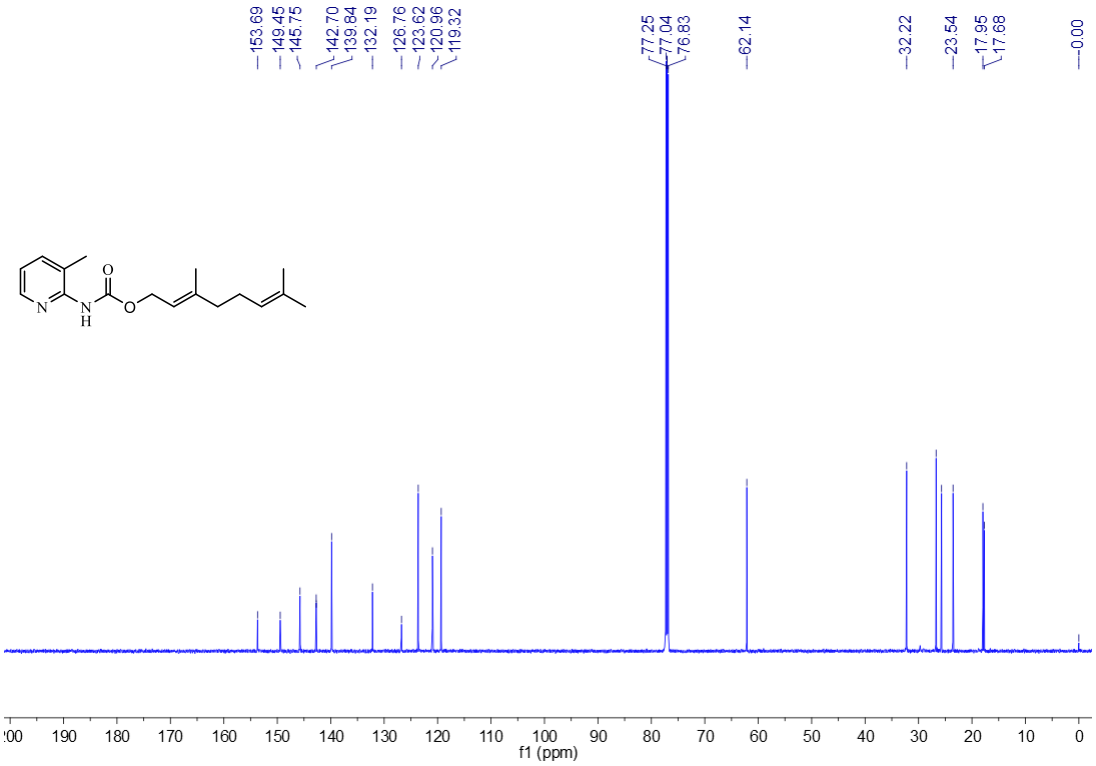
HRMS(ESI) of tert-pentyl (3-methylpyridin-2-yl)carbamate **7r**



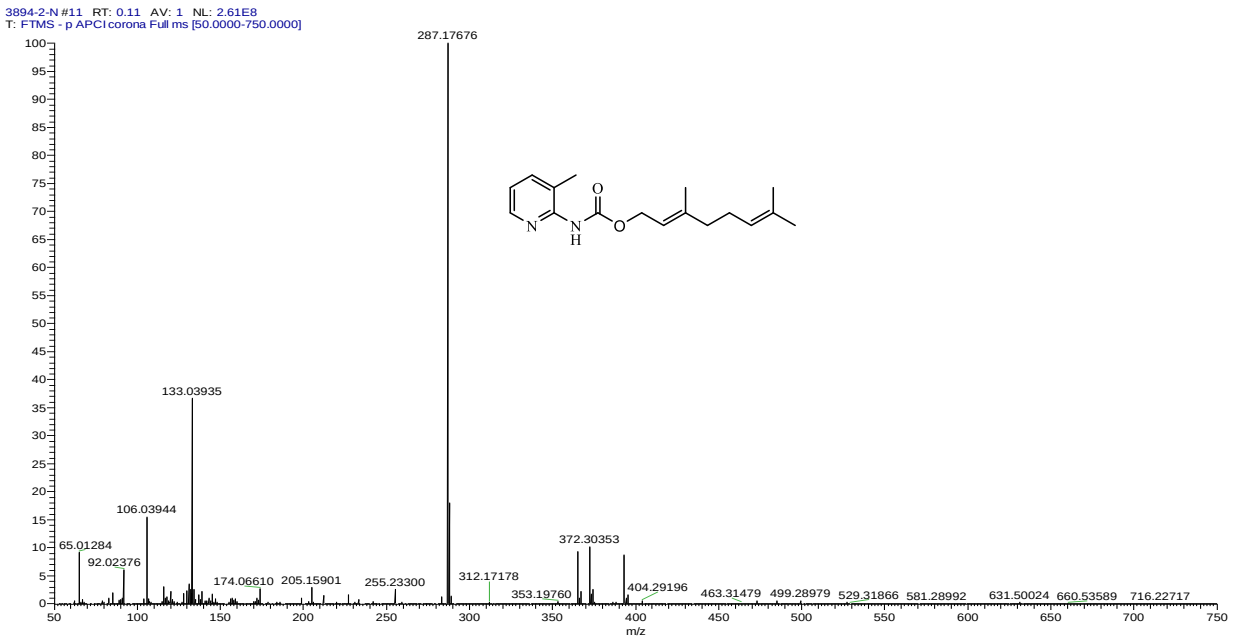
^{1}H NMR of (*E*)-3,7-dimethylocta-2,6-dien-1-yl (3-methylpyridin-2-yl)carbamate **7s**



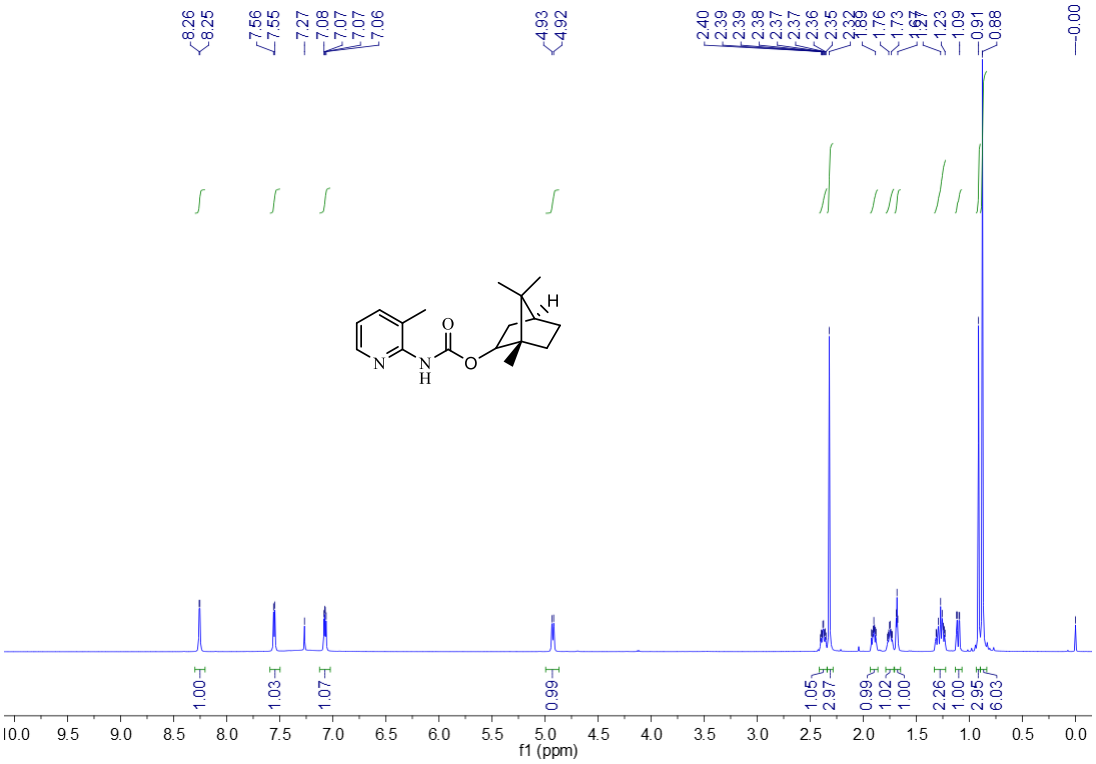
^{13}C NMR of (*E*)-3,7-dimethylocta-2,6-dien-1-yl (3-methylpyridin-2-yl)carbamate **7s**



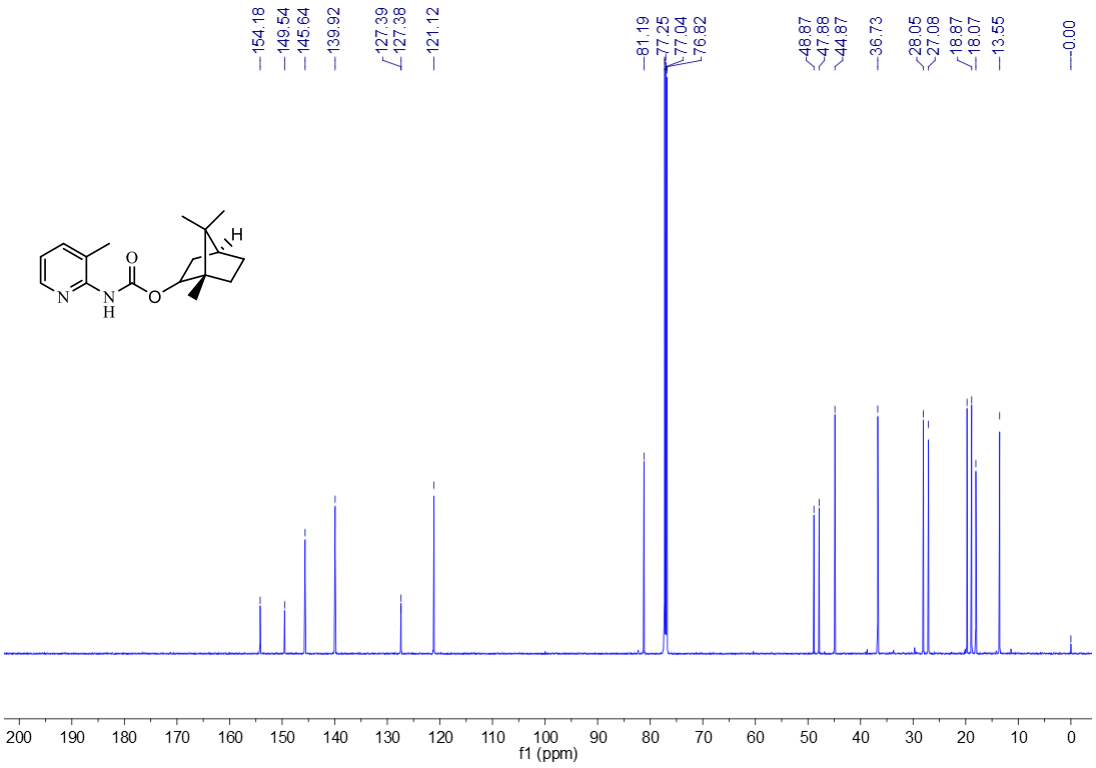
HRMS(ESI) of (*E*)-3,7-dimethylocta-2,6-dien-1-yl (3-methylpyridin-2-yl)carbamate **7s**



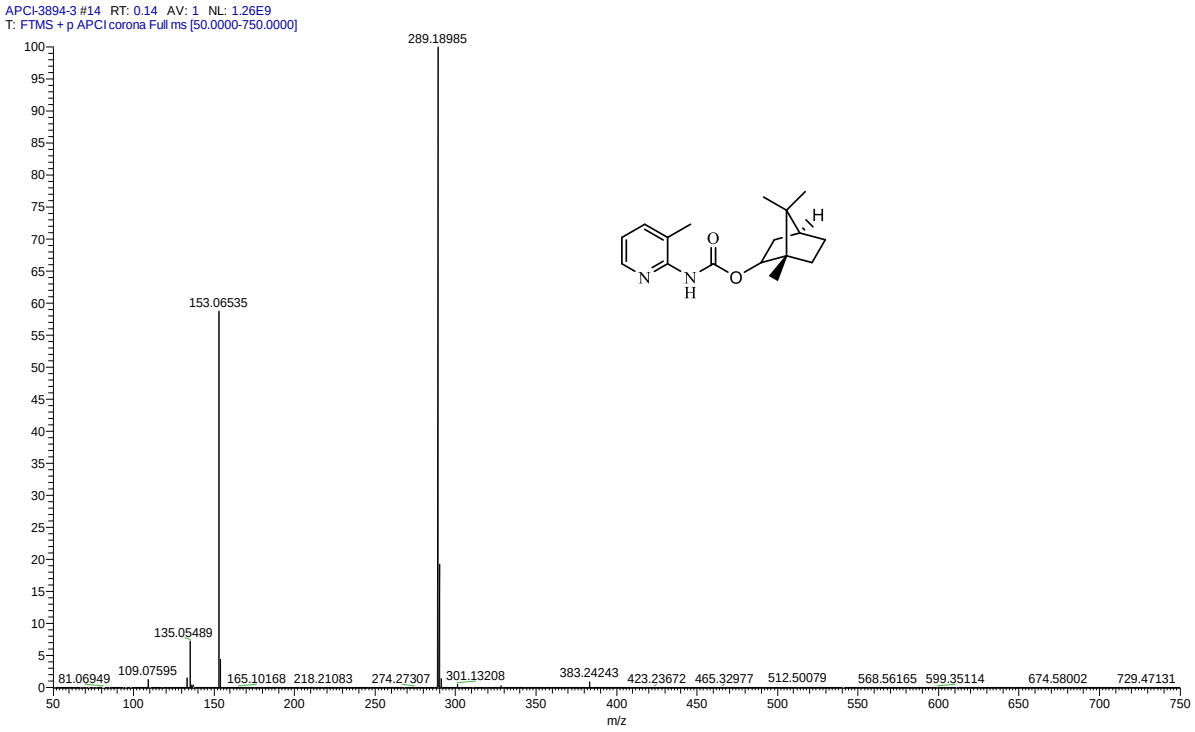
^{1}H NMR of (1S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-yl (3-methylpyridin-2-yl)carbamate **7t**



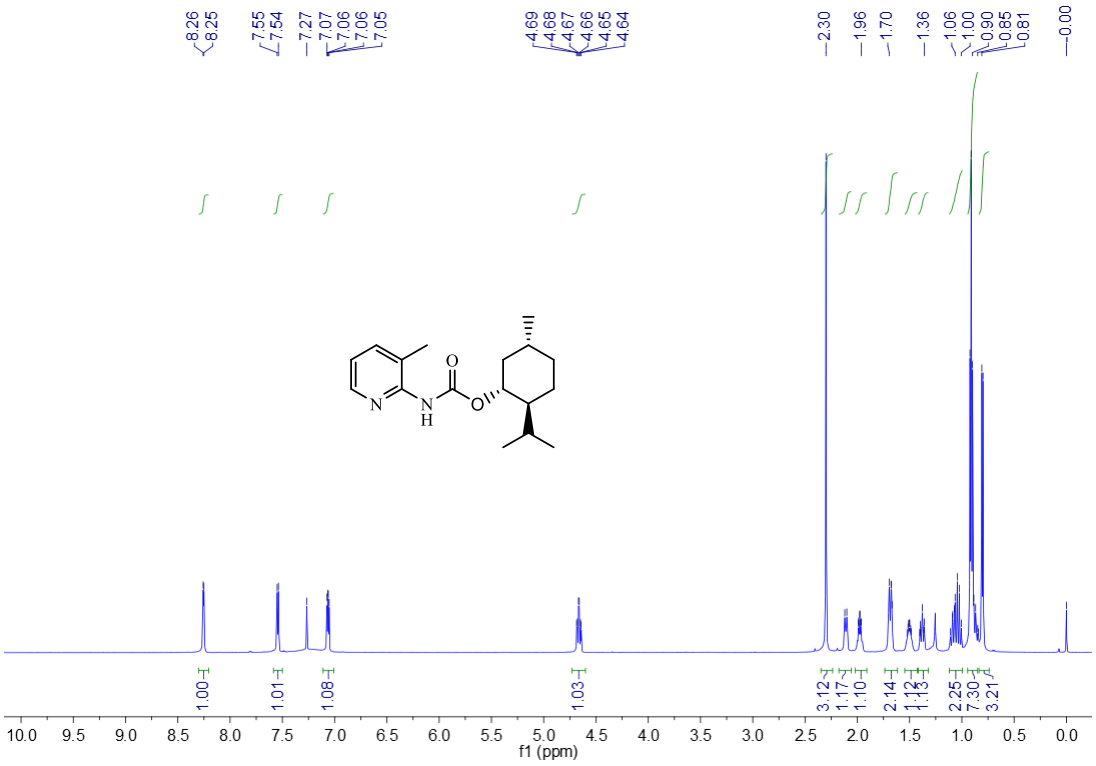
^{13}C NMR of (1S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-yl (3-methylpyridin-2-yl)carbamate **7t**



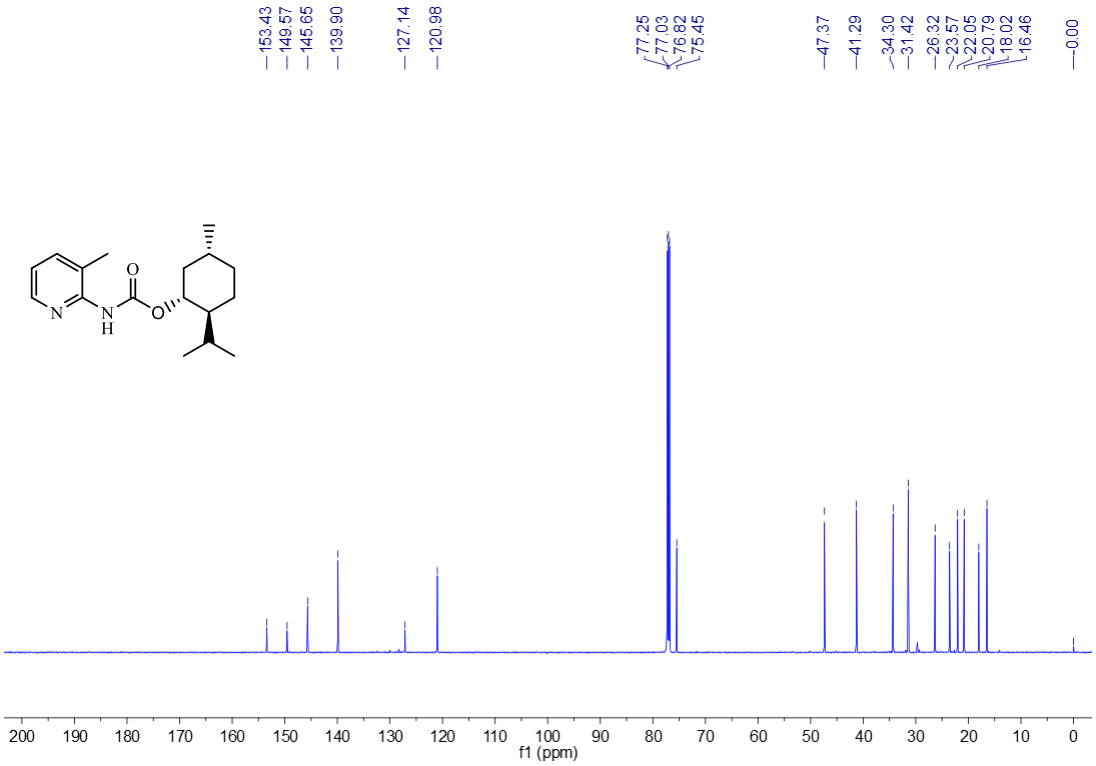
HRMS(ESI) of (1S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-yl (3-methylpyridin-2-yl)carbamate **7t**



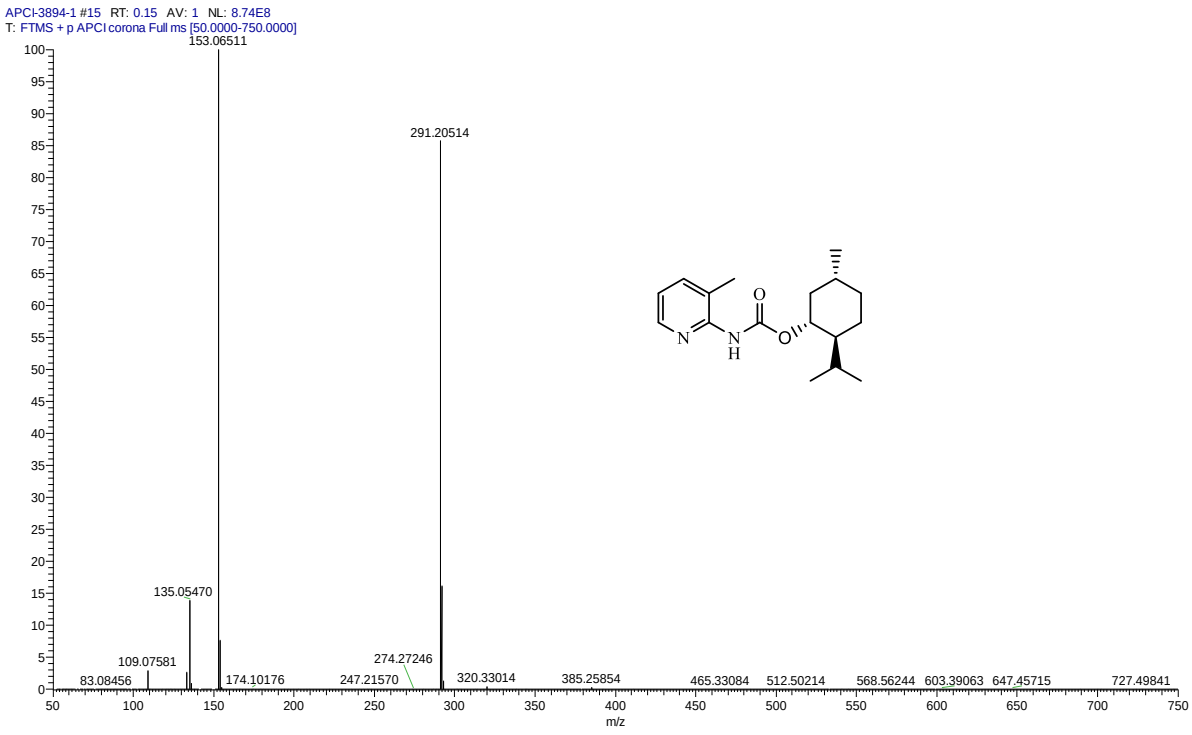
^{1}H NMR of (1R,2S,5R)-2-isopropyl-5-methylcyclohexyl (3-methylpyridin-2-yl)carbamate **7u**



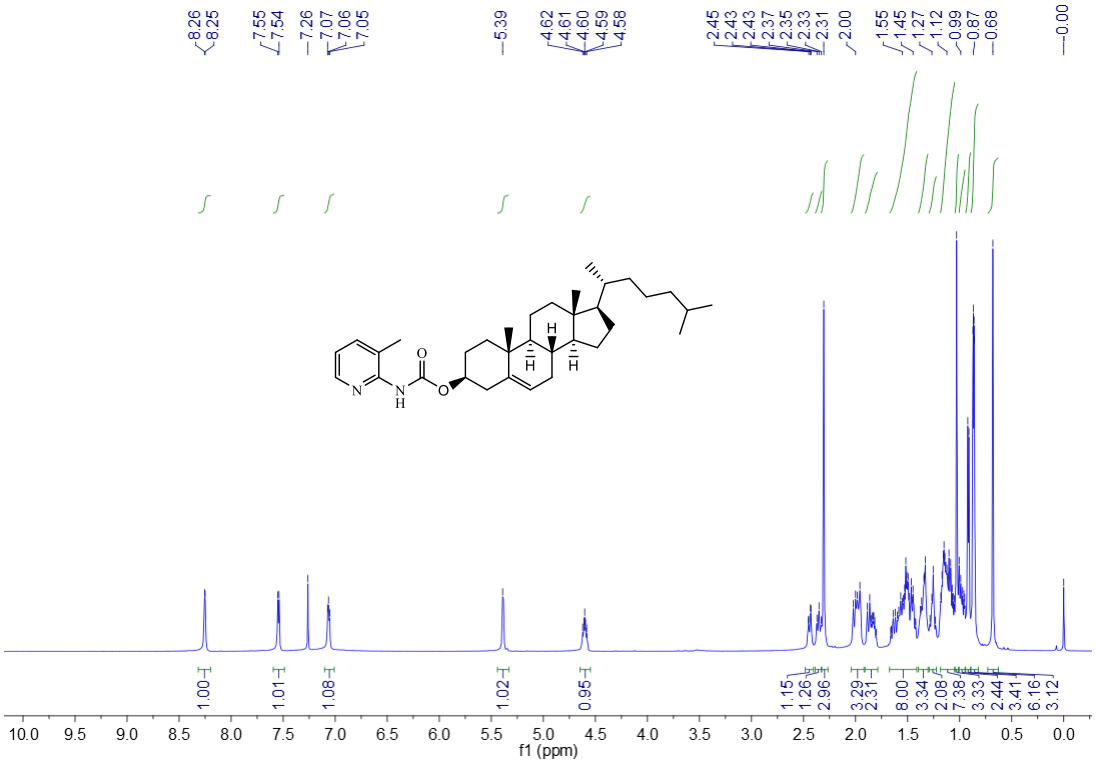
^{13}C NMR of (1R,2S,5R)-2-isopropyl-5-methylcyclohexyl (3-methylpyridin-2-yl)carbamate **7u**



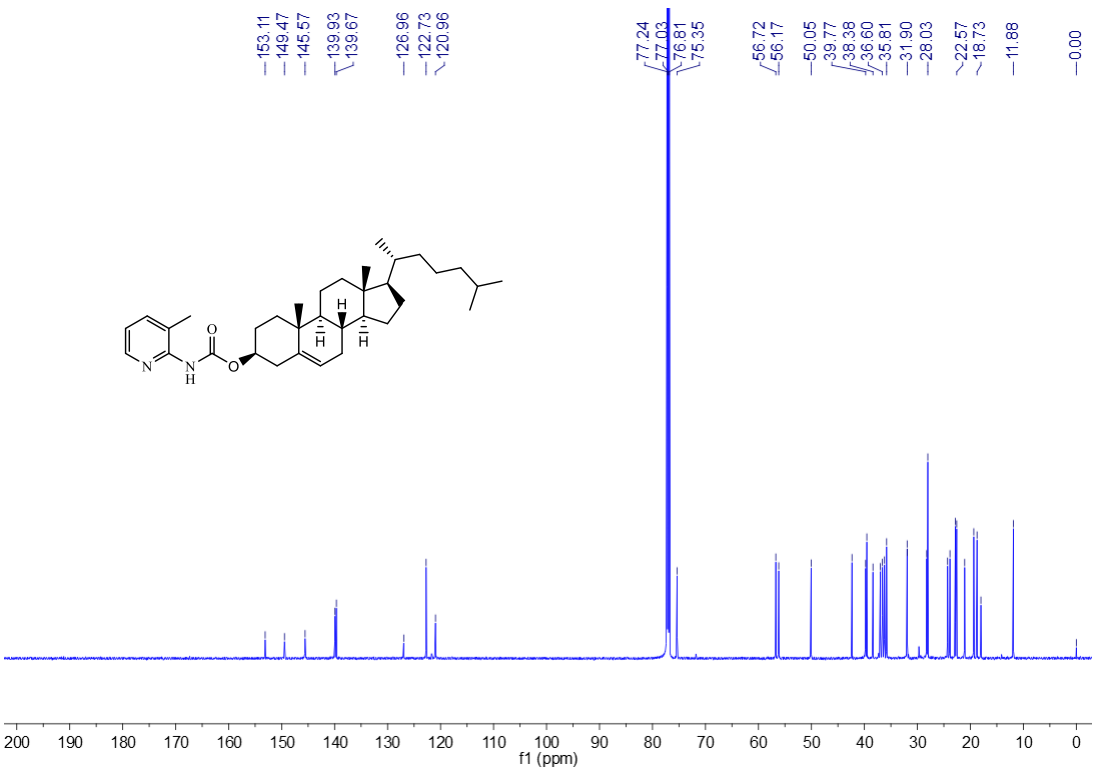
HRMS(ESI) of (1R,2S,5R)-2-isopropyl-5-methylcyclohexyl (3-methylpyridin-2-yl)carbamate **7u**



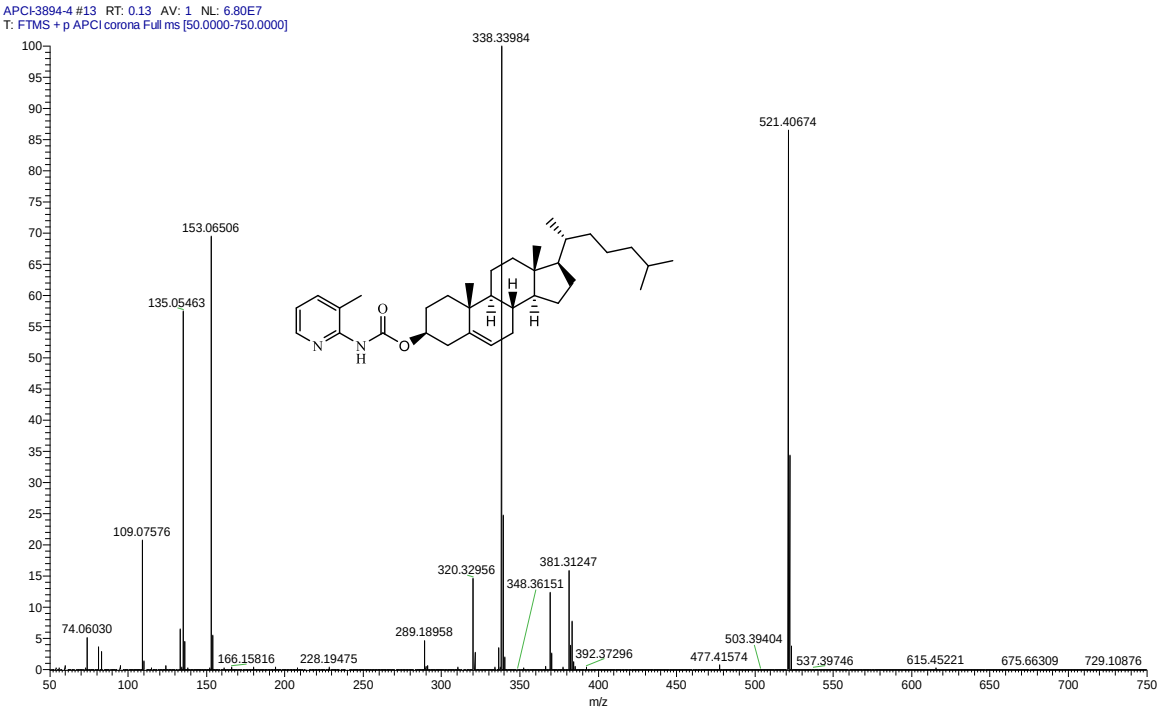
^{1}H NMR of **7v**



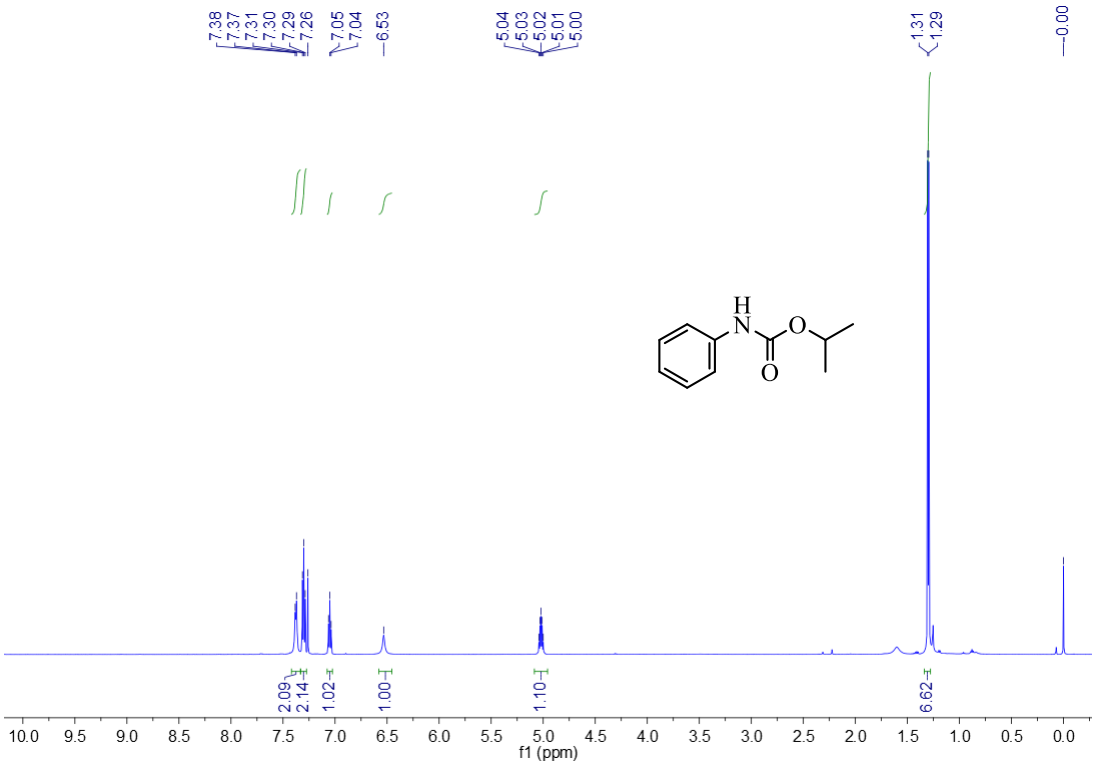
^{13}C NMR of **7v**



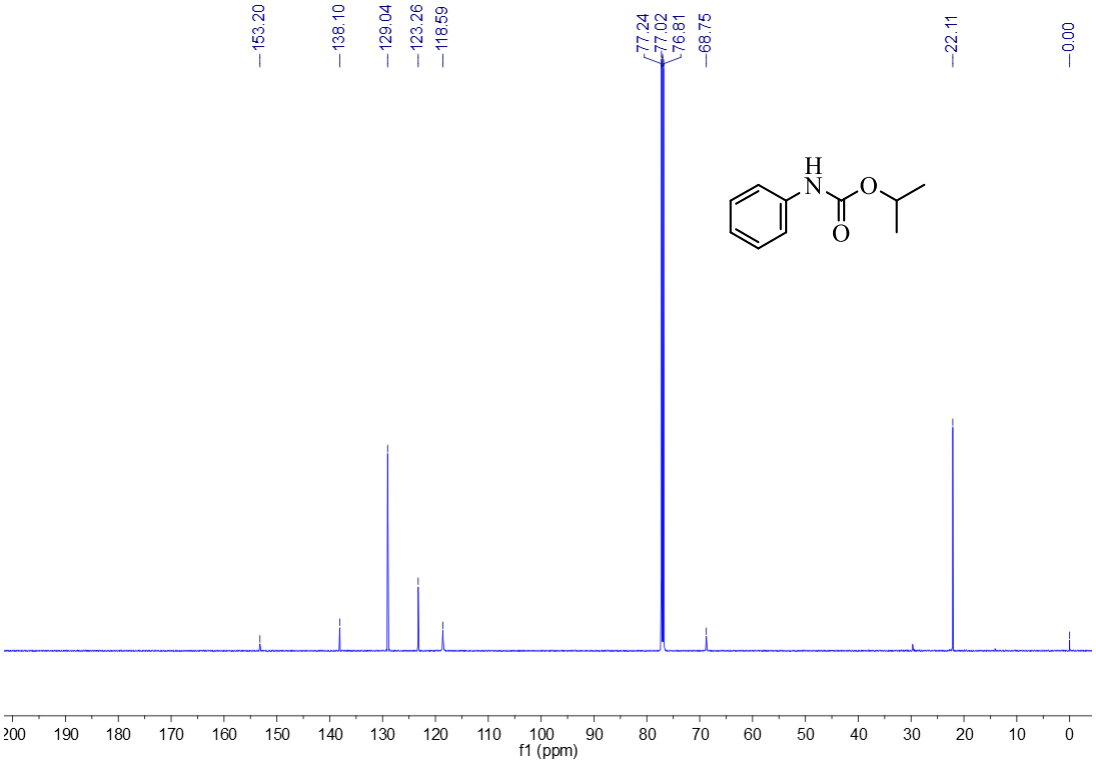
HRMS(ESI) of **7v**



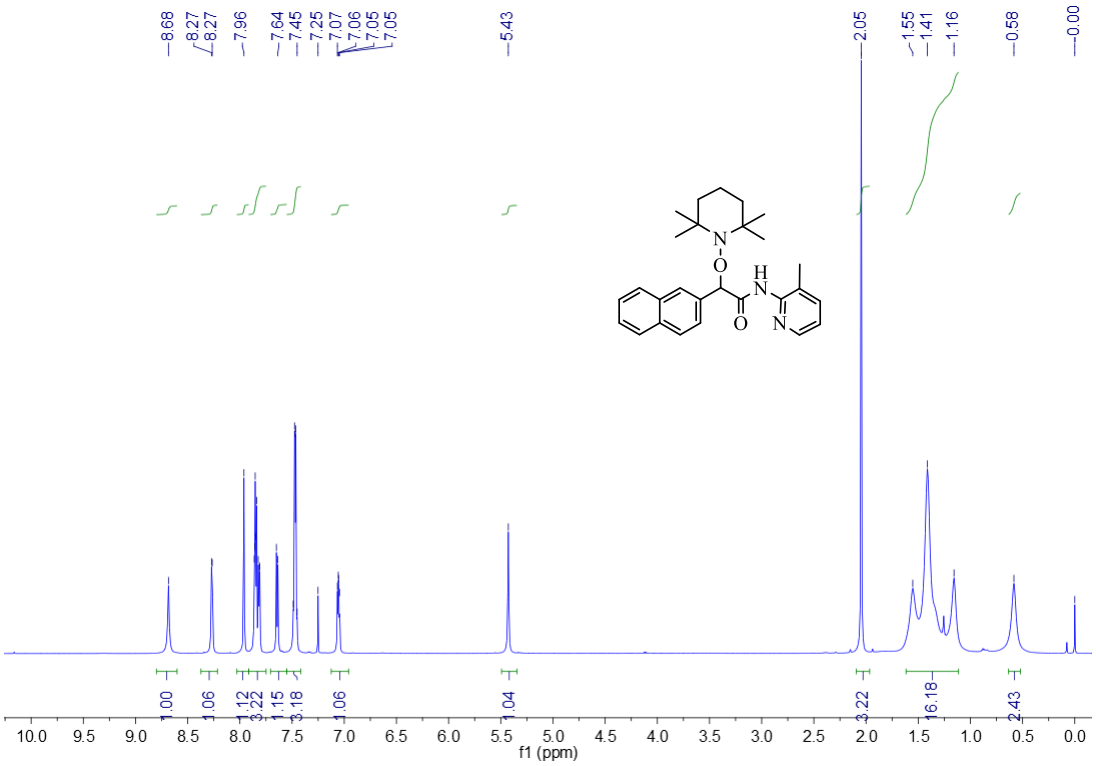
^{1}H NMR of isopropyl phenylcarbamate **8**



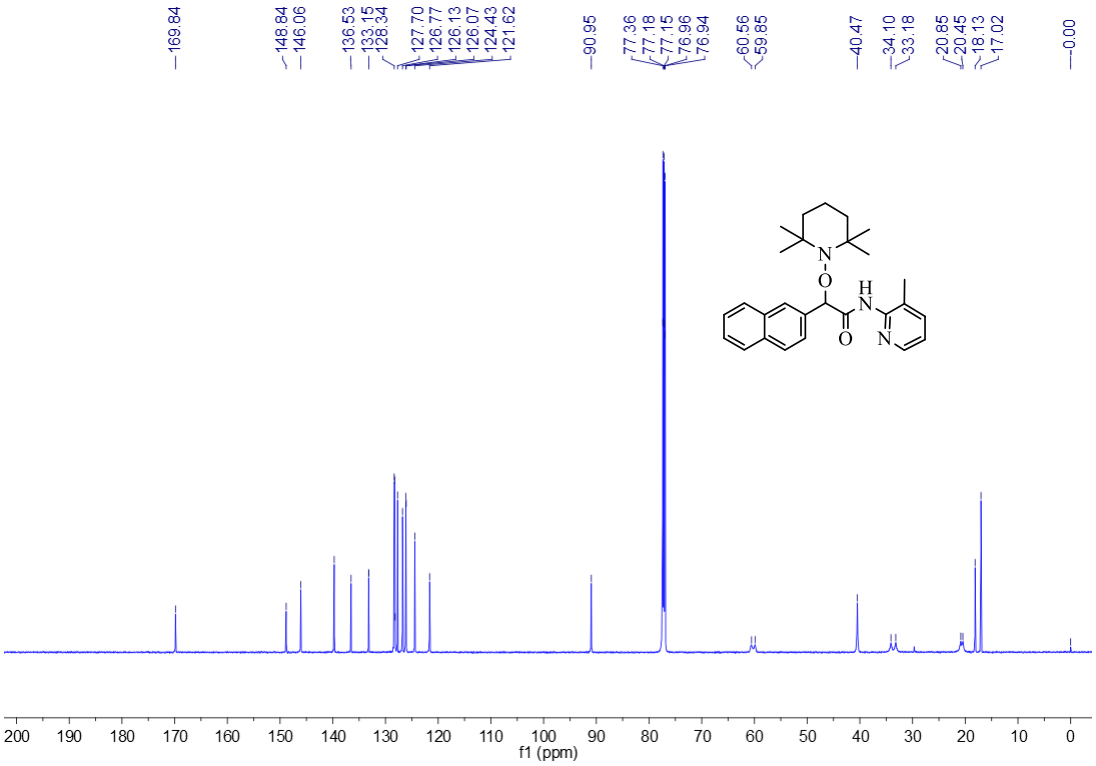
^{13}C NMR of isopropyl phenylcarbamate **8**



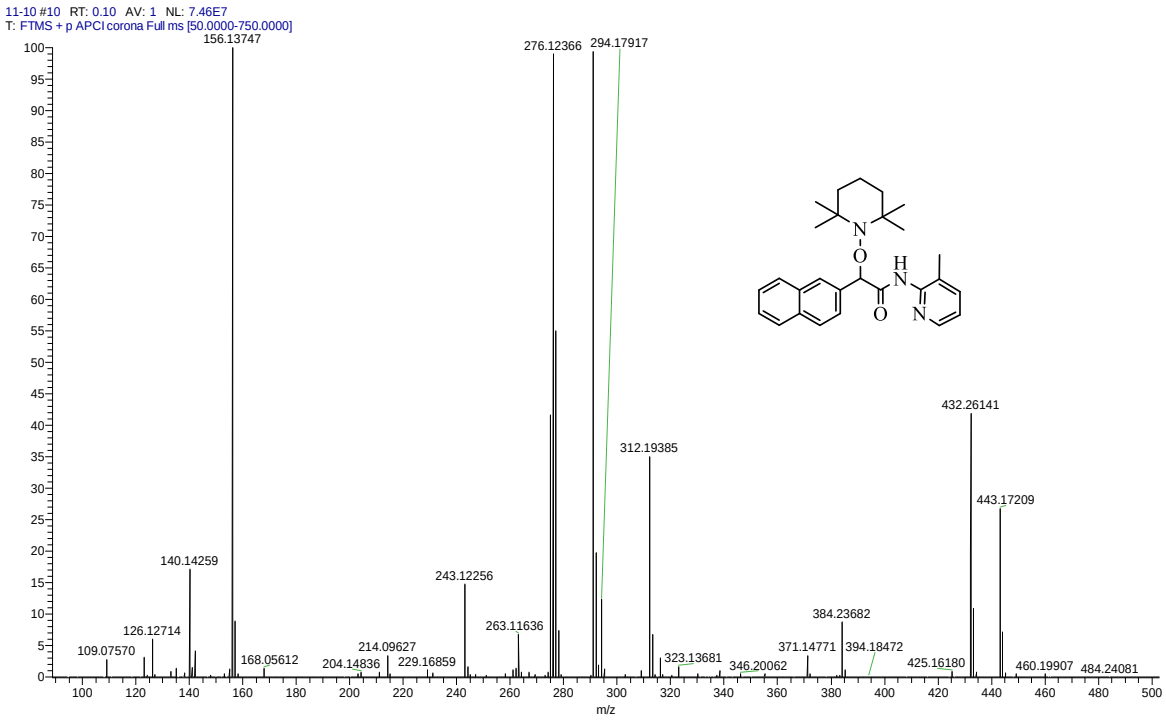
^{1}H NMR of N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)-2-((2,2,6,6-tetramethylpiperidin-1-yl) oxy)acetamide **9**



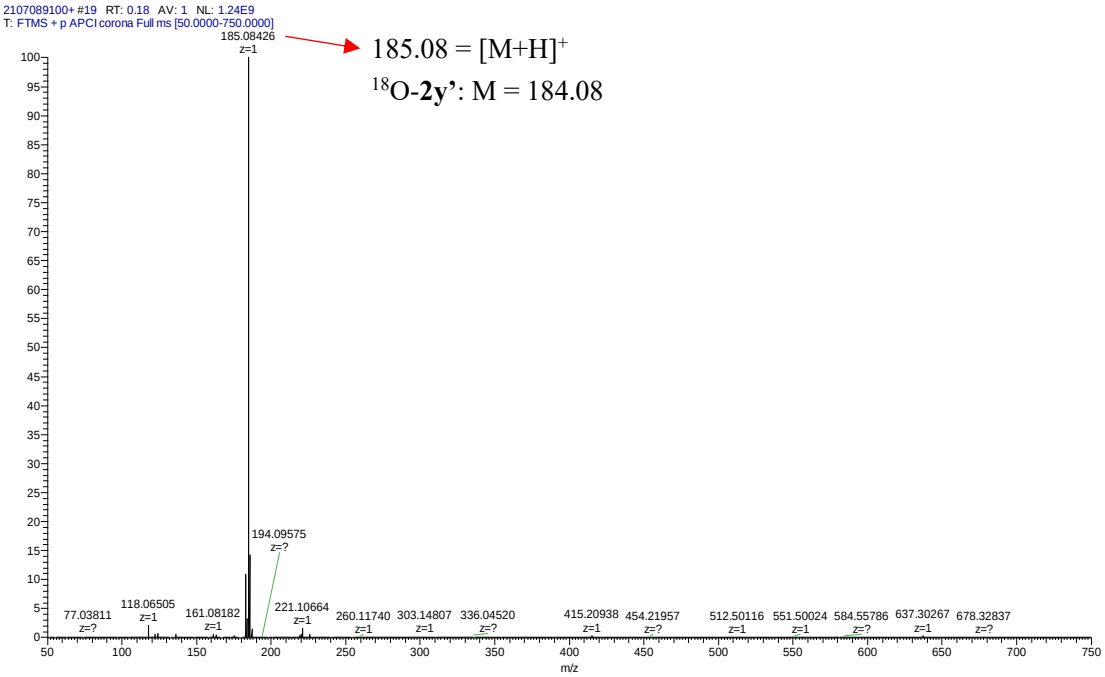
^{13}C NMR of N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)-2-((2,2,6,6-tetramethylpiperidin-1-yl) oxy)acetamide **9**



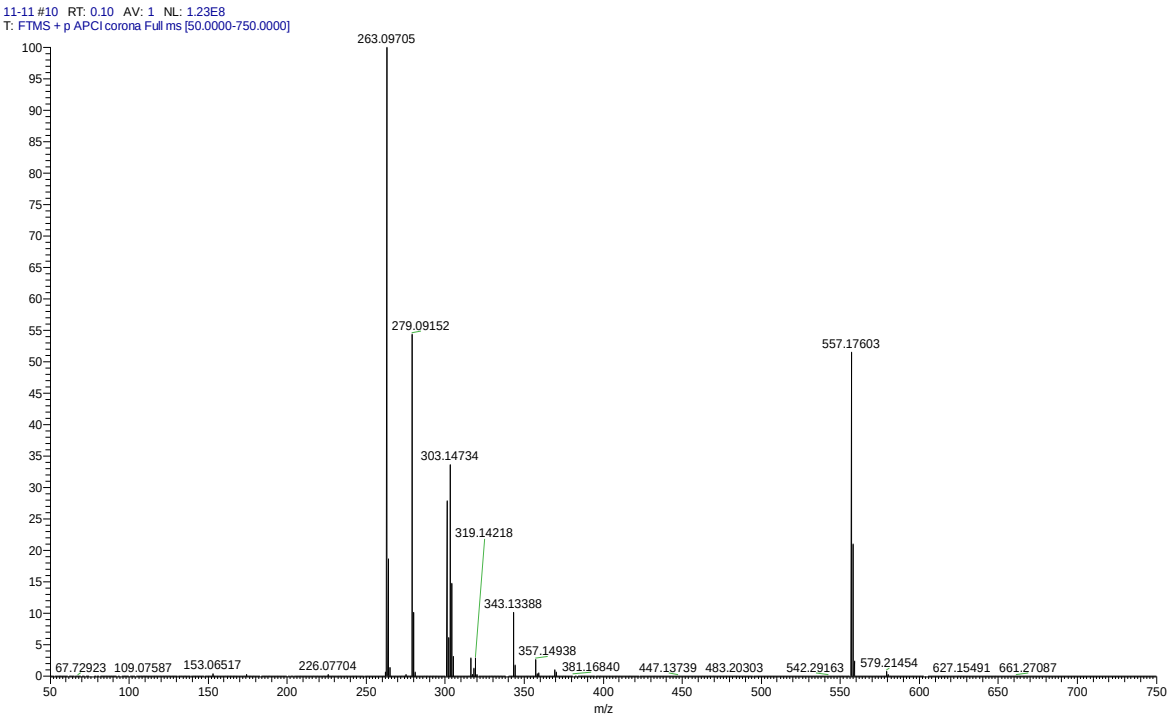
HRMS(ESI) of N-(3-methylpyridin-2-yl)-2-(naphthalen-2-yl)-2-((2,2,6,6-tetramethylpiperidin -1-yl)oxy)acetamide **9**

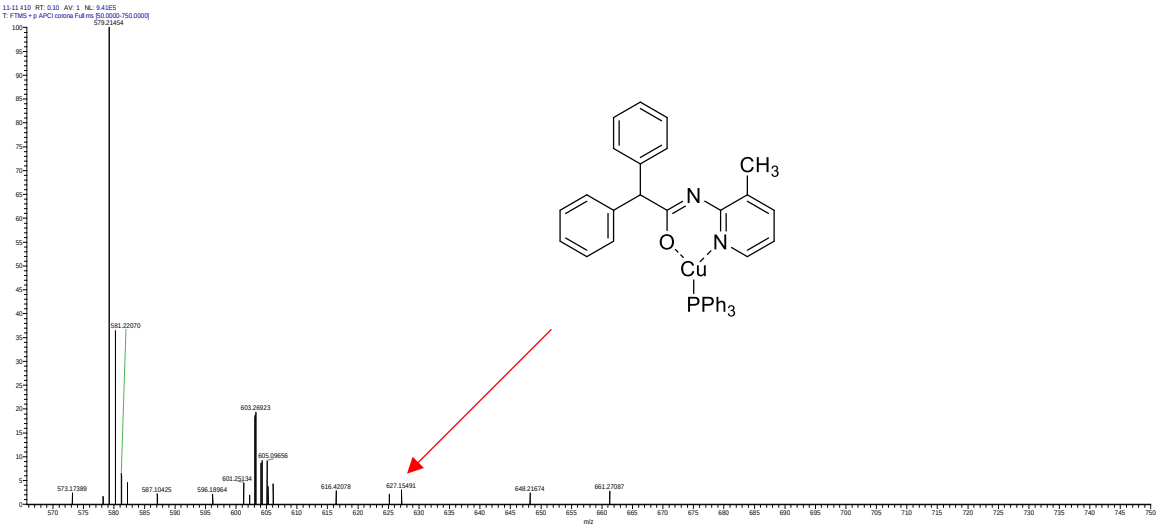


HRMS (ESI) spectrum of ^{18}O- benzophenone **2y'**



HRMS(ESI) of copper-cycle intermediate

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m/z
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Cu
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