Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Supplementary material

A General Synthesis of Aromatic Amides via Palladium-Catalyzed direct Aminocarbonylation of Aryl Chlorides

Peng Wang, Ji Yang, Kangkang Sun, Helfried Neumann,* Matthias Beller*

[a] Leibniz-Institut für Katalyse e. V. Albert-Einstein-Strasse 29a, 18059 Rostock (Germany) Fax: (+49) 381-1281-5000

* Corresponding author e-mail: helfried.neumann@catalysis.de and matthias.beller@catalysis.de.

Table of contents

1. Supplement to the experiments

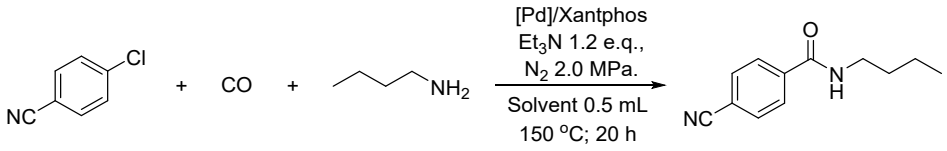
1.1 General considerations

The chemical reagents were purchased from Merck Chemicals, ABCR Chemicals or TCI Chemicals, which were used as received. The ^{1}H NMR and ^{13}C NMR spectra were recorded on a Bruker 300 spectrometer. Conversion and selectivity were determined by Agilent 6890N GC and Agilent 5973 Network GC-MS.

1.2 Supplement to Aminocarbonylation of Aryl Chlorides

All the palladium precursors and solvents in this part are commercially available.

Table S1 Aminocarbonylation of 4-chlorobenzonitrile under different palladium precursors and solvents [a]

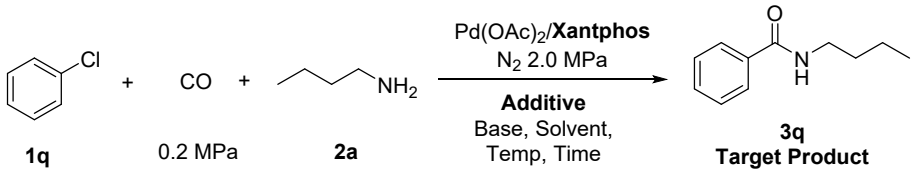


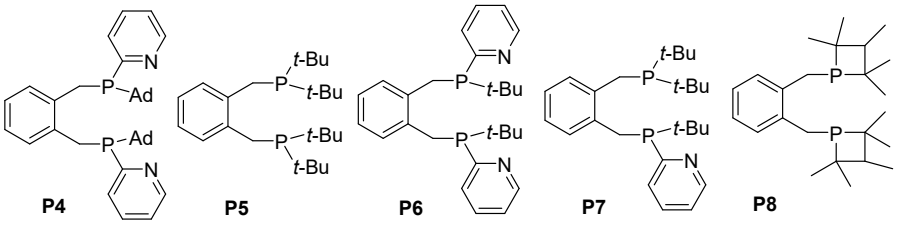
0.2 mmol **1a** | 0.2 MPa | 1.2 e.q. **2a** | Target Product **3a**

Entry	Pd catalyst	P-Ligand	Base	Solvent	Conv. (%) [b]	Sel. $_{3a}$ (%) [b]
1	$Pd(OAc)_2$	**Xantphos**	Et_3N	1,4-dioxane	98	97
2	$Pd(CH_3CN)_2Cl_2$	**Xantphos**	Et_3N	1,4-dioxane	90	90
3	$Pd(PPh_3)_2Cl_2$	**Xantphos**	Et_3N	1,4-dioxane	89	88
4	$Pd(PPh_3)_4$	**Xantphos**	Et_3N	1,4-dioxane	85	91
5	Pd/C (10 %)	**Xantphos**	Et_3N	1,4-dioxane	56	94
6	$Pd(cod)Cl_2$	**Xantphos**	Et_3N	1,4-dioxane	84	89
7	$Pd(PhCN)_2Cl_2$	**Xantphos**	Et_3N	1,4-dioxane	80	96
8	$[Pd(allyl)Cl]_2$	**Xantphos**	Et_3N	1,4-dioxane	85	86
9	$Pd(OAc)_2$	**Xantphos**	Et_3N	THF	83	80
10	$Pd(OAc)_2$	**Xantphos**	Et_3N	DMSO	72	84
11	$Pd(OAc)_2$	**Xantphos**	Et_3N	Toluene	92	90
12	$Pd(OAc)_2$	**Xantphos**	Et_3N	MeCN	85	96
13	$Pd(OAc)_2$	**Xantphos**	Et_3N	DMF	93	5
14	$Pd(OAc)_2$	**Xantphos**	Et_3N	DMAc	95	38

[a] 4-Chlorobenzonitrile (0.2 mmol, 27.5 mg), *n*-butylamine 0.24 mmol (17.52 mg, 1.2 e.q.), Pd precursor 0.004 mmol, S/[Pd] mol ratio = 50, 0.016 mmol Xantphos, Et_3N 0.24 mmol (1.2 e.q.), CO 0.2 MPa, N_2 2.0 MPa,150 °C, solvent 0.5 mL, time 20 h; [b] Determined by GC-MS, dodecane (C_{12}) as internal standard.

Table S2 Aminocarbonylation of chlorobenzene under different ligands, solvents and temperature [a]





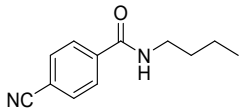
Entry	P-Ligand	Additive	Base	Temp (°C)	Solvent	Conv. (%) [b]	Sel. $_{3q}$ (%) [b]
1	**Xantphos**	CsCl	Et_3N	150	1,4-dioxane	45	94
2	**PPh_3**	CsCl	Et_3N	150	1,4-dioxane	21	8
3	**P4**	CsCl	Et_3N	150	1,4-dioxane	1	Trace
4	**P5**	CsCl	Et_3N	150	1,4-dioxane	20	34
5	**P6**	CsCl	Et_3N	150	1,4-dioxane	18	38
6	**P7**	CsCl	Et_3N	150	1,4-dioxane	23	36
7	**P8**	CsCl	Et_3N	150	1,4-dioxane	14	27
8 [c]	**Xantphos**	CsCl	Et_3N	150	1,4-dioxane	21	94
9 [d]	**Xantphos**	CsCl	Et_3N	150	1,4-dioxane	6	96
10	**Xantphos**	CsCl	Et_3N	150	THF	43	86
11	**Xantphos**	CsCl	Et_3N	150	DMSO	35	56
12	**Xantphos**	CsCl	Et_3N	150	Toluene	23	96
13	**Xantphos**	CsCl	Et_3N	150	MeCN	23	5
14	**Xantphos**	CsCl	Et_3N	150	DMF	53	13
15	**Xantphos**	CsCl	Et_3N	150	DMAc	39	8
16	**Xantphos**	CsCl	Et_3N	140	1,4-dioxane	32	68
17	**Xantphos**	CsCl	Et_3N	100	1,4-dioxane	7	27

[a] Chlorobenzene (0.2 mmol), butylamine 0.24 mmol (1.2 e.q.), $Pd(OAc)_2$ 0.004 mmol, [Pd]/[P] mol ratio = 1/8, base 0.24 mmol, additive 0.2 mmol, CO 0.2 MPa, N_2 2.0 MPa, 150 °C, solvent 0.5 ml, time 20 h; [b] Determined by GC and GC-MS, dodecane (C_{12}) as internal standard; [c] [Pd] 1 % mol, S/[Pd] mol ratio = 100, Xantphos 4 % mol; [d] [Pd] 0.5 % mol, S/[Pd] mol ratio = 200, Xantphos 2 % mol.

2. NMR data of the main products

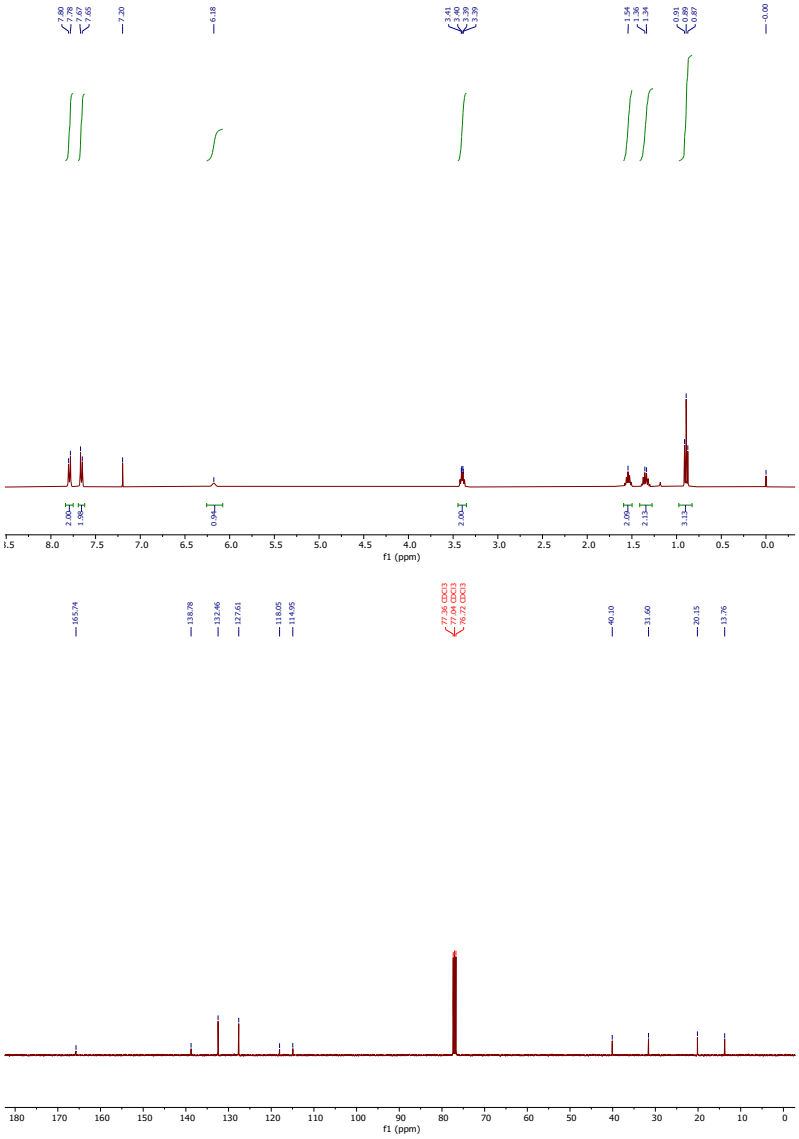
All the products separated are known products. Methods for the separation of all compounds are according to the references [1-5].

N-butyl-4-cyanobenzamide (**3a**)

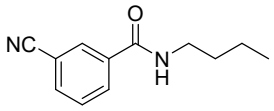


^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.79 (d, *J* = 8.1 Hz, 2H), 7.66 (d, *J* = 8.0 Hz, 2H), 6.18 (s, 1H), 3.45-3.35 (m, 2H), 1.54 (s, 2H), 1.35 (d, *J* = 7.7 Hz, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 165.74, 138.78, 132.46, 127.61, 118.05, 114.95, 40.10, 31.60, 20.15, 13.76.

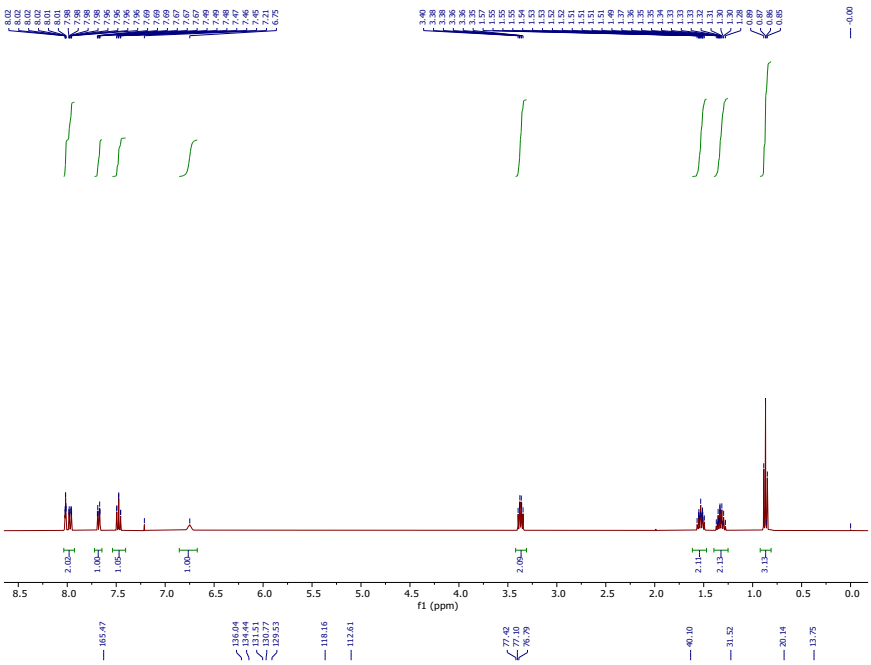


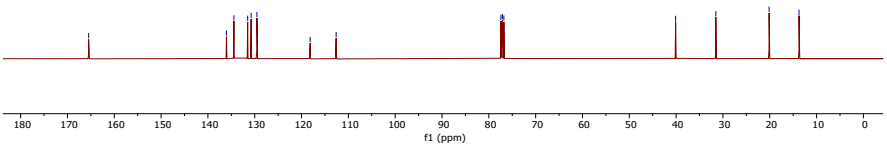
N-butyl-3-cyanobenzamide (**3b**)



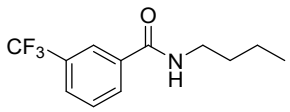
^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.04-7.93 (m, 2H), 7.68 (dt, *J* = 7.7, 1.4 Hz, 1H), 7.47 (td, *J* = 7.8, 0.6 Hz, 1H), 6.75 (s, 1H), 3.37 (td, *J* = 7.2, 5.7 Hz, 2H), 1.62-1.47 (m, 2H), 1.40-1.25 (m, 2H), 0.87 (t, *J* = 7.4 Hz, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 165.47, 136.04, 134.44, 131.51, 130.77, 129.53, 118.16, 112.61, 40.10, 31.52, 20.14, 13.75.



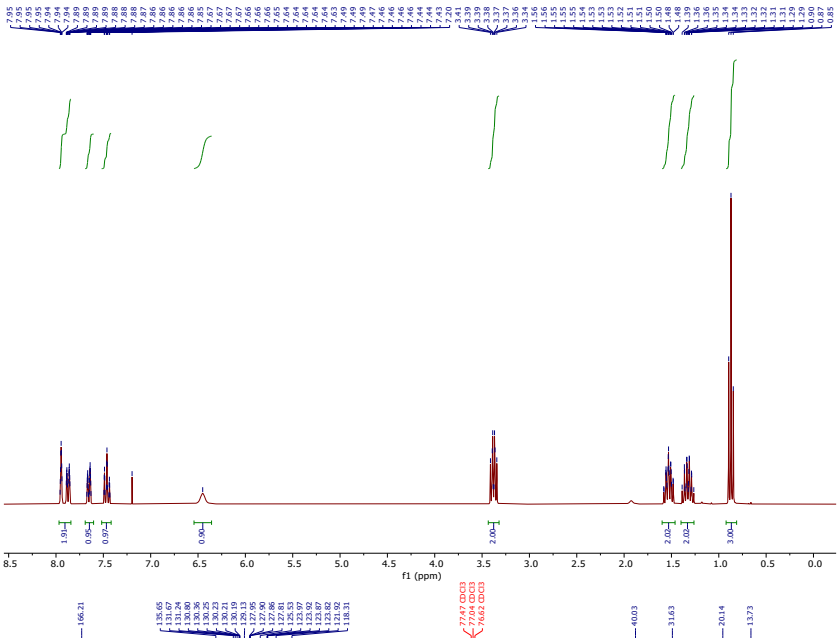


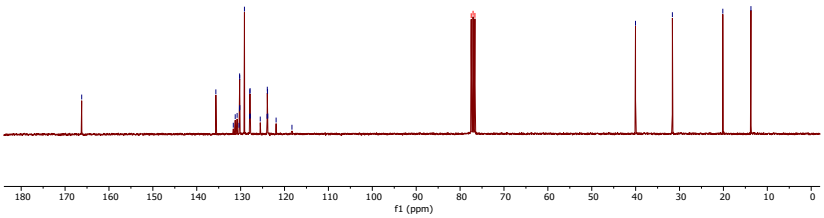
N-butyl-3-(trifluoromethyl)benzamide (**3c**)



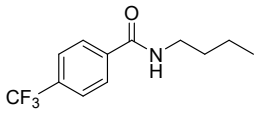
^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.97-7.84 (m, 2H), 7.65 (dddd, *J* = 7.8, 1.9, 1.2, 0.7 Hz, 1H), 7.46 (tp, *J* = 7.8, 0.8 Hz, 1H), 6.45 (s, 1H), 3.38 (td, *J* = 7.2, 5.7 Hz, 2H), 1.60-1.46 (m, 2H), 1.40-1.26 (m, 2H), 0.87 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.21, 135.65, 131.67, 131.24, 130.80, 130.36, 130.25, 130.23, 130.21, 130.19, 129.13, 127.95, 127.90, 127.86, 127.81, 125.53, 123.97, 123.92, 123.87, 123.82, 121.92, 40.03, 31.63, 20.14, 13.73.



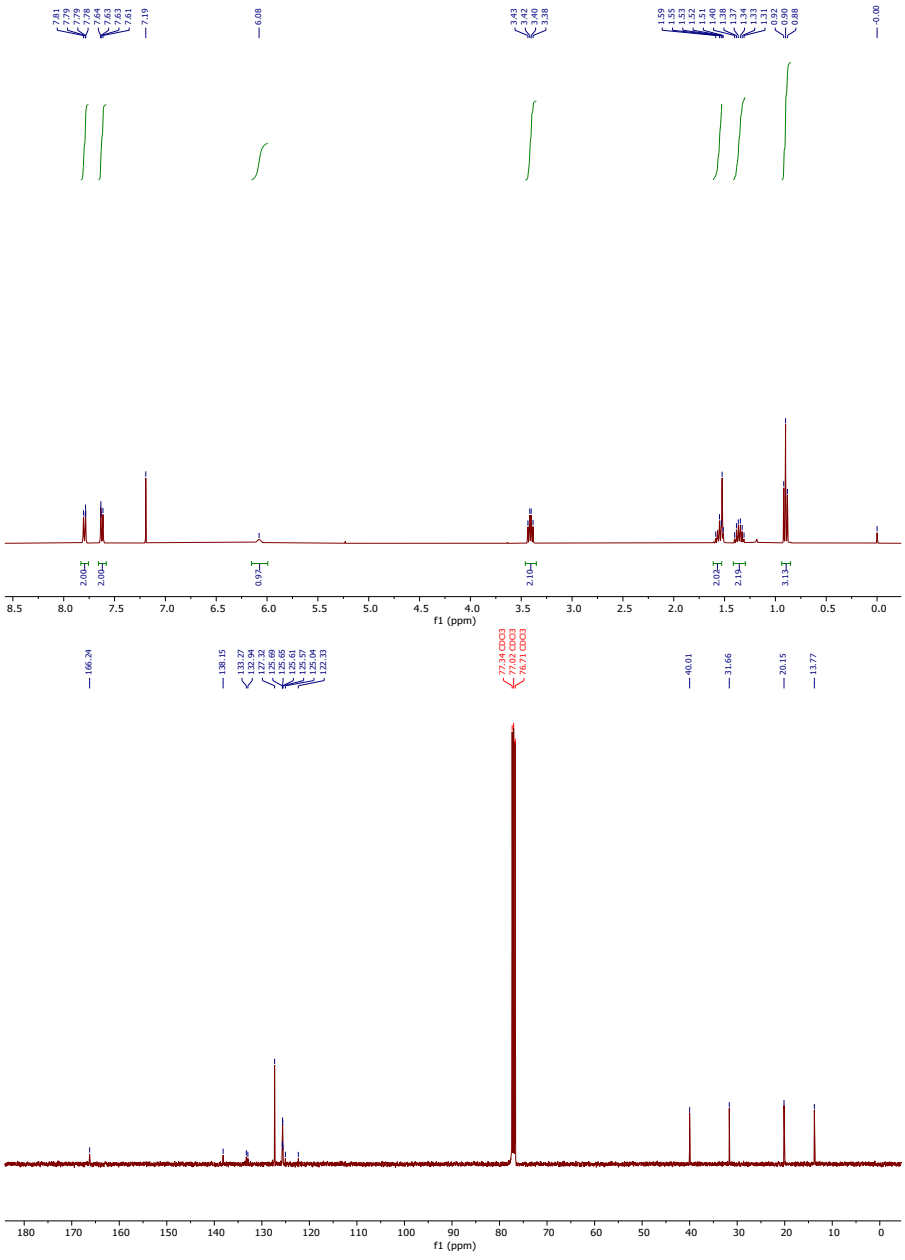


N-butyl-4-(trifluoromethyl)benzamide (**3d**)

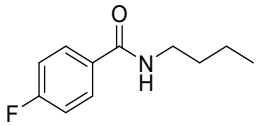


^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.83-7.76 (m, 2H), 7.66-7.58 (m, 2H), 6.08 (s, 1H), 3.46-3.35 (m, 2H), 1.61-1.53 (m, 2H), 1.36 (dq, *J* = 14.4, 7.3 Hz, 2H), 0.90 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 166.24, 138.15, 133.27, 132.94, 127.32, 125.69, 125.65, 125.61, 125.57, 125.04, 122.33, 40.01, 31.66, 20.15, 13.77.

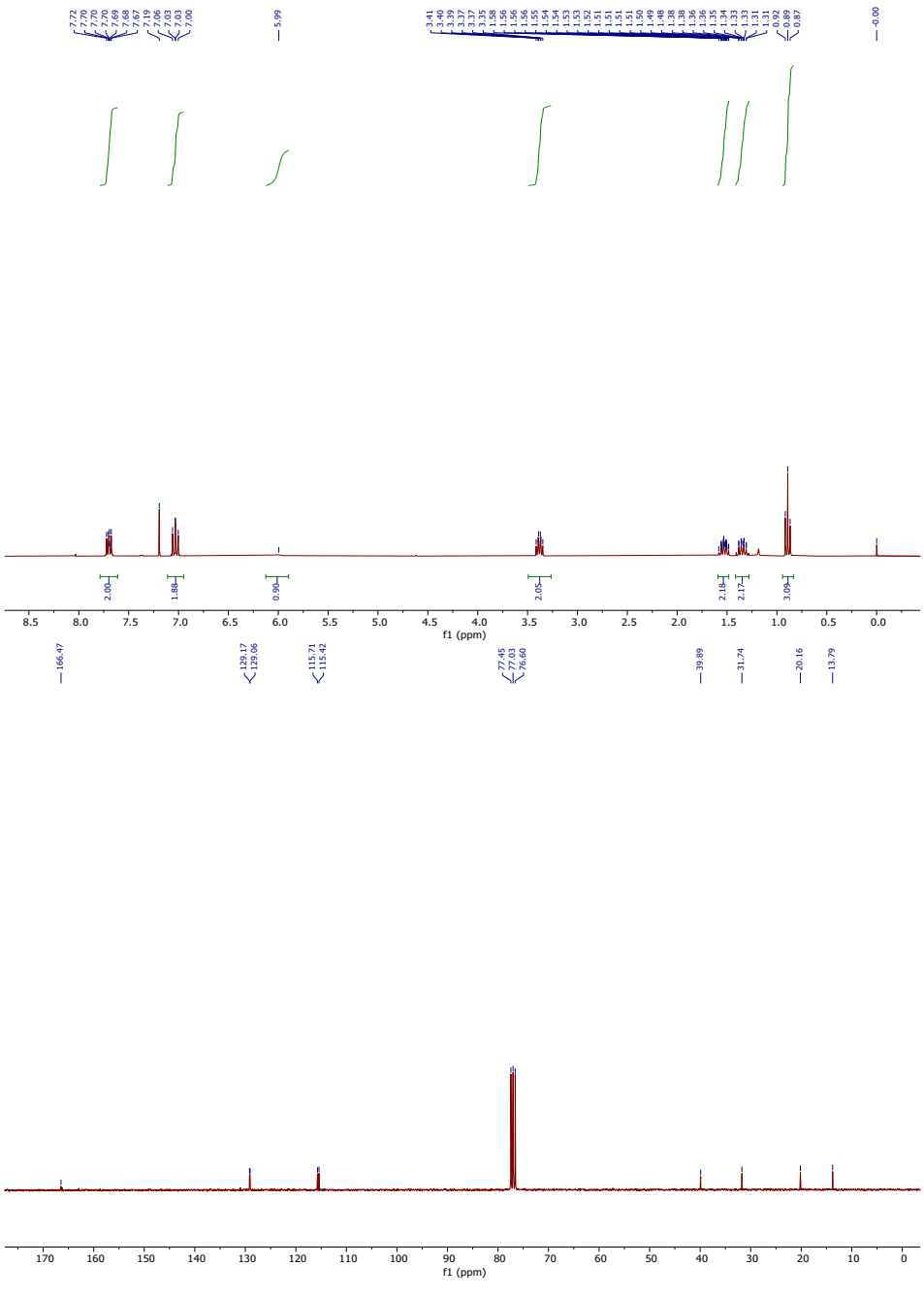


N-butyl-4-fluorobenzamide (**3e**)

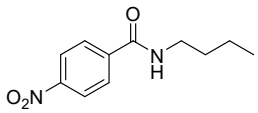


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.79-7.61 (m, 2H), 7.03 (dd, *J* = 8.9, 8.4 Hz, 2H), 5.99 (s, 1H), 3.38 (td, *J* = 7.2, 5.7 Hz, 2H), 1.59-1.48 (m, 2H), 1.42-1.28 (m, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.47, 129.17, 129.06, 115.71, 115.42, 39.89, 31.74, 20.16, 13.79.

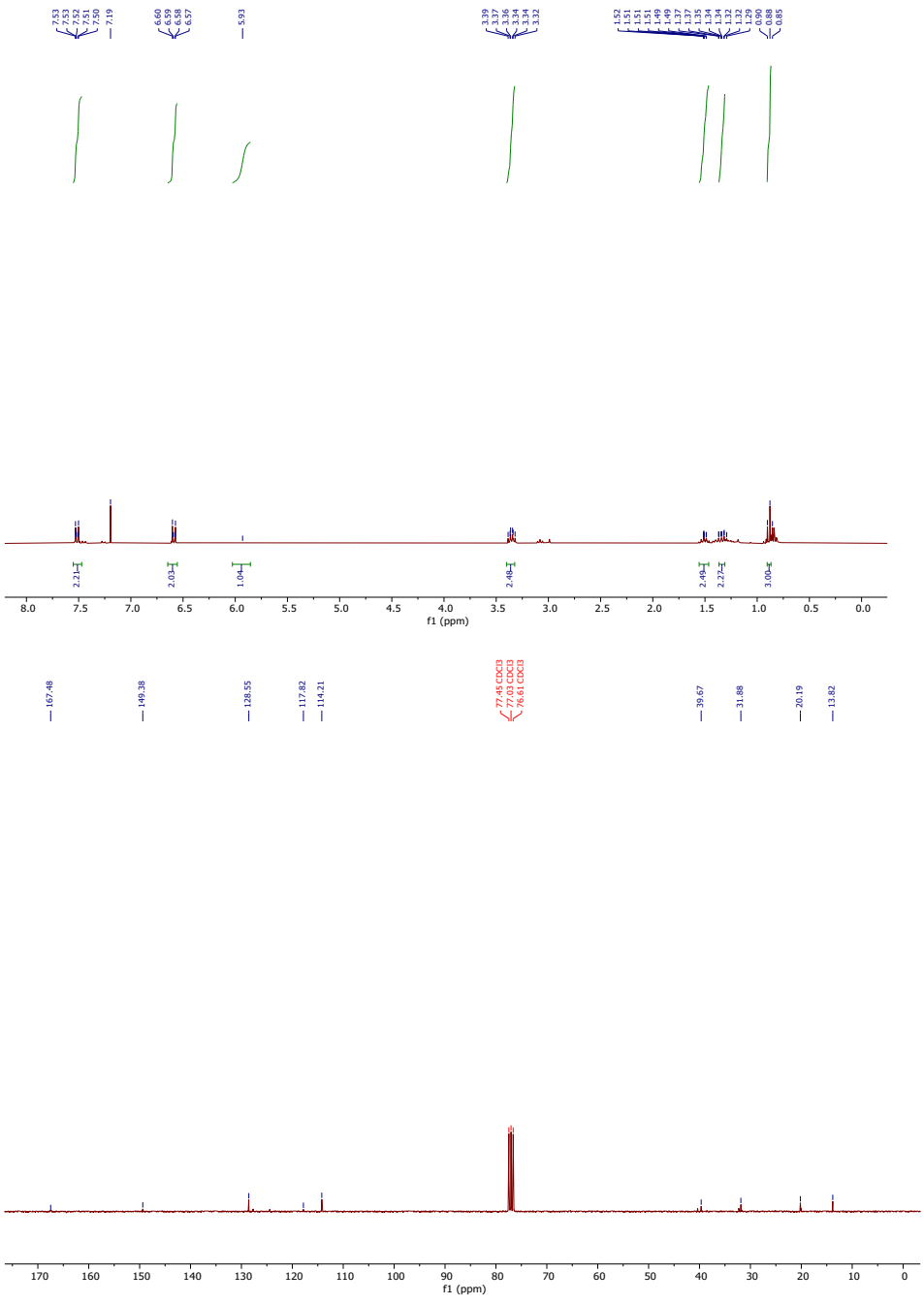


N-butyl-4-nitrobenzamide (**3f**)

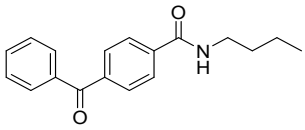


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.55-7.47 (m, 2H), 6.65-6.55 (m, 2H), 5.93 (s, 1H), 3.40-3.32 (m, 2H), 1.56-1.46 (m, 2H), 1.37-1.31 (m, 2H), 0.89 (d, J = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.48, 149.38, 128.55, 117.82, 114.21, 39.67, 31.88, 20.19, 13.82.

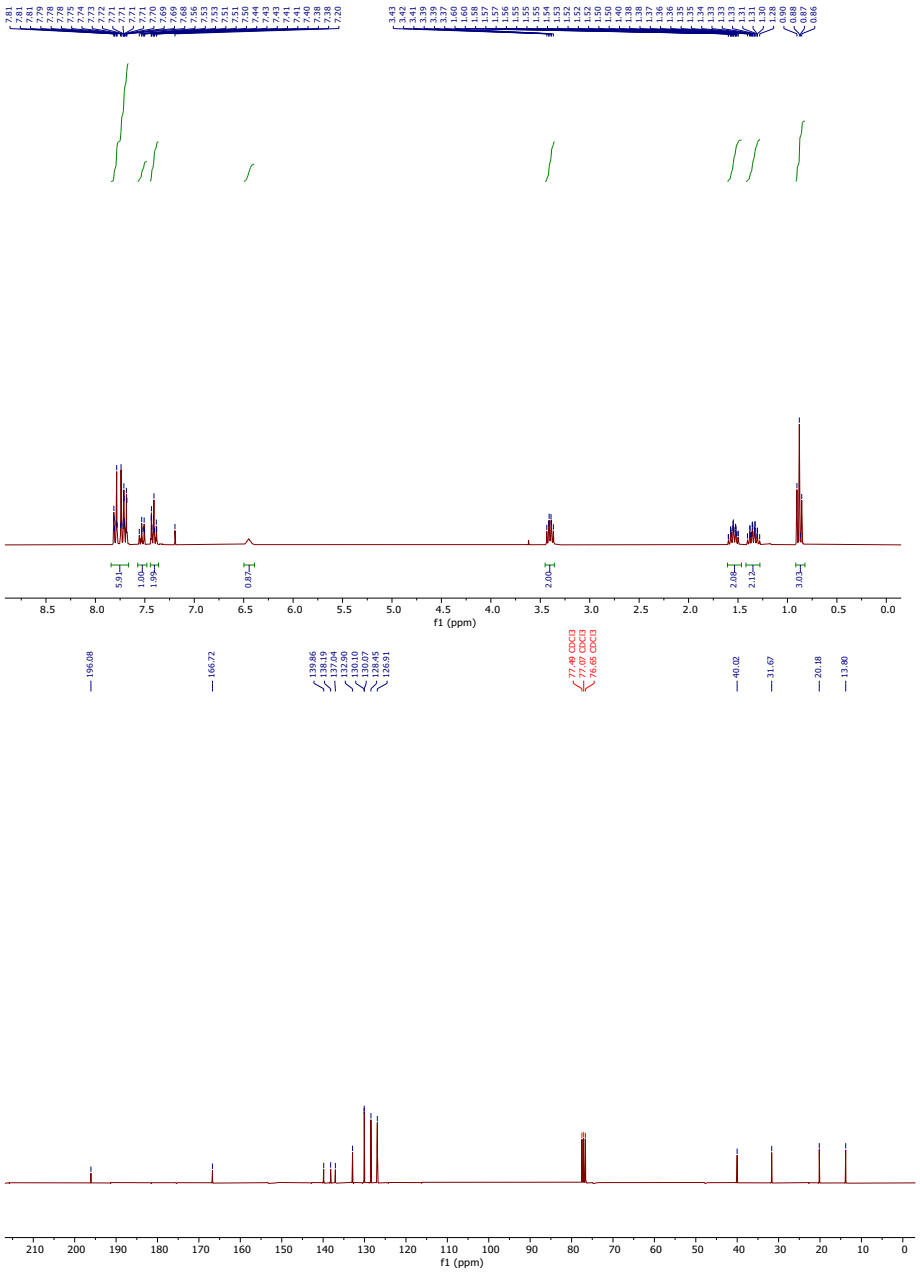


4-benzoyl-N-butylbenzamide (**3g**)

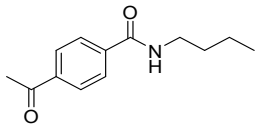


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.84-7.67 (m, 6H), 7.57-7.48 (m, 1H), 7.44-7.36 (m, 2H), 6.45 (t, *J* = 5.7 Hz, 1H), 3.40 (td, *J* = 7.2, 5.7 Hz, 2H), 1.61-1.47 (m, 2H), 1.42-1.28 (m, 2H), 0.88 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 196.08, 166.72, 139.86, 138.19, 137.04, 132.90, 130.10, 130.07, 128.45, 126.91, 40.02, 31.67, 20.18, 13.80.

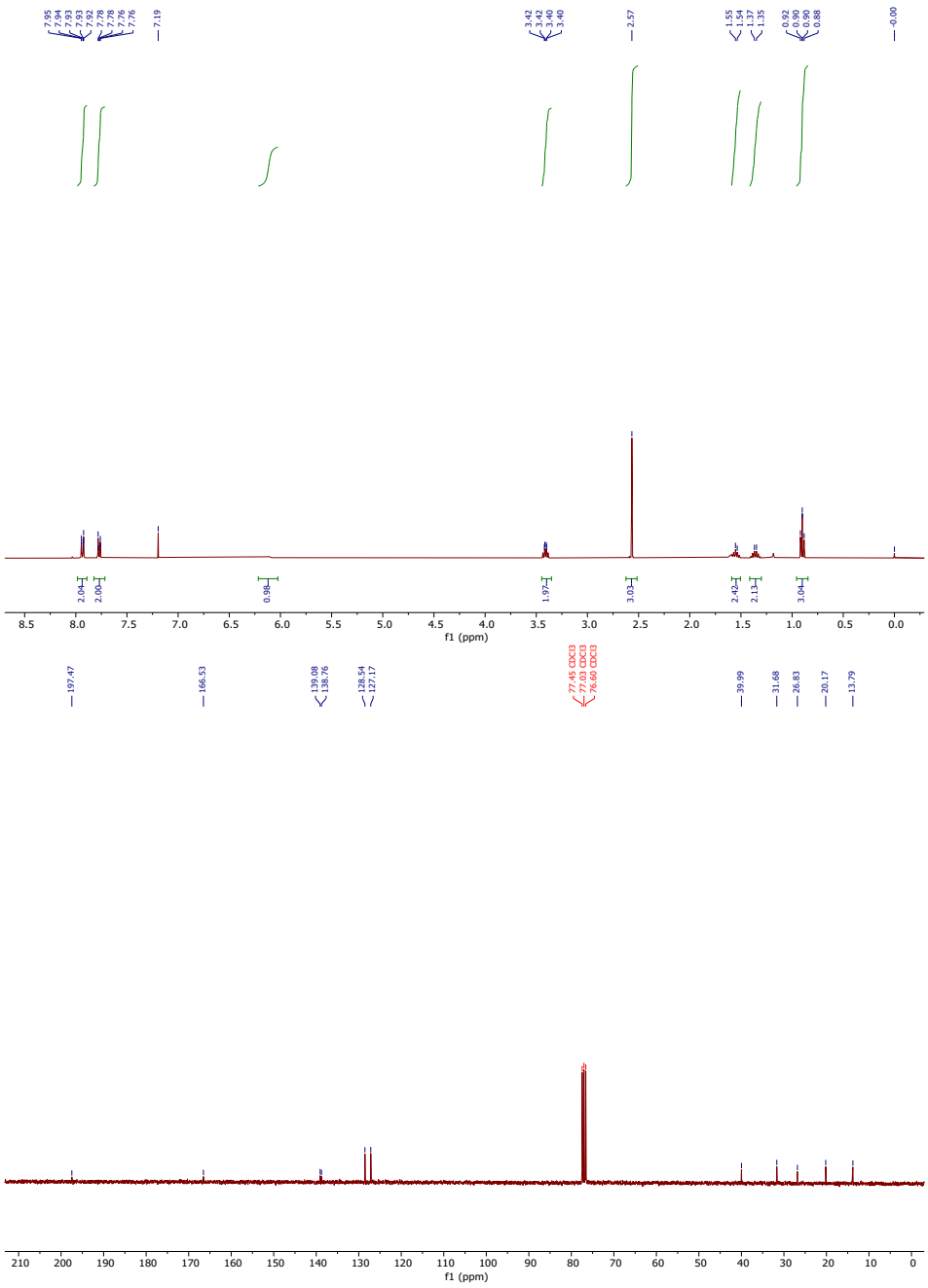


4-acetyl-N-butylbenzamide (**3h**)

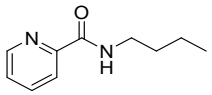


^{1}H NMR (400 MHz, Chloroform-*d*) δ 7.98-7.89 (m, 2H), 7.82-7.72 (m, 2H), 6.11 (s, 1H), 3.45-3.35 (m, 2H), 2.57 (s, 3H), 1.54 (d, *J* = 6.9 Hz, 2H), 1.36 (d, *J* = 8.2 Hz, 2H), 0.90 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 197.47, 166.53, 139.08, 138.76, 128.54, 127.17, 39.99, 31.68, 26.83, 20.17, 13.79.

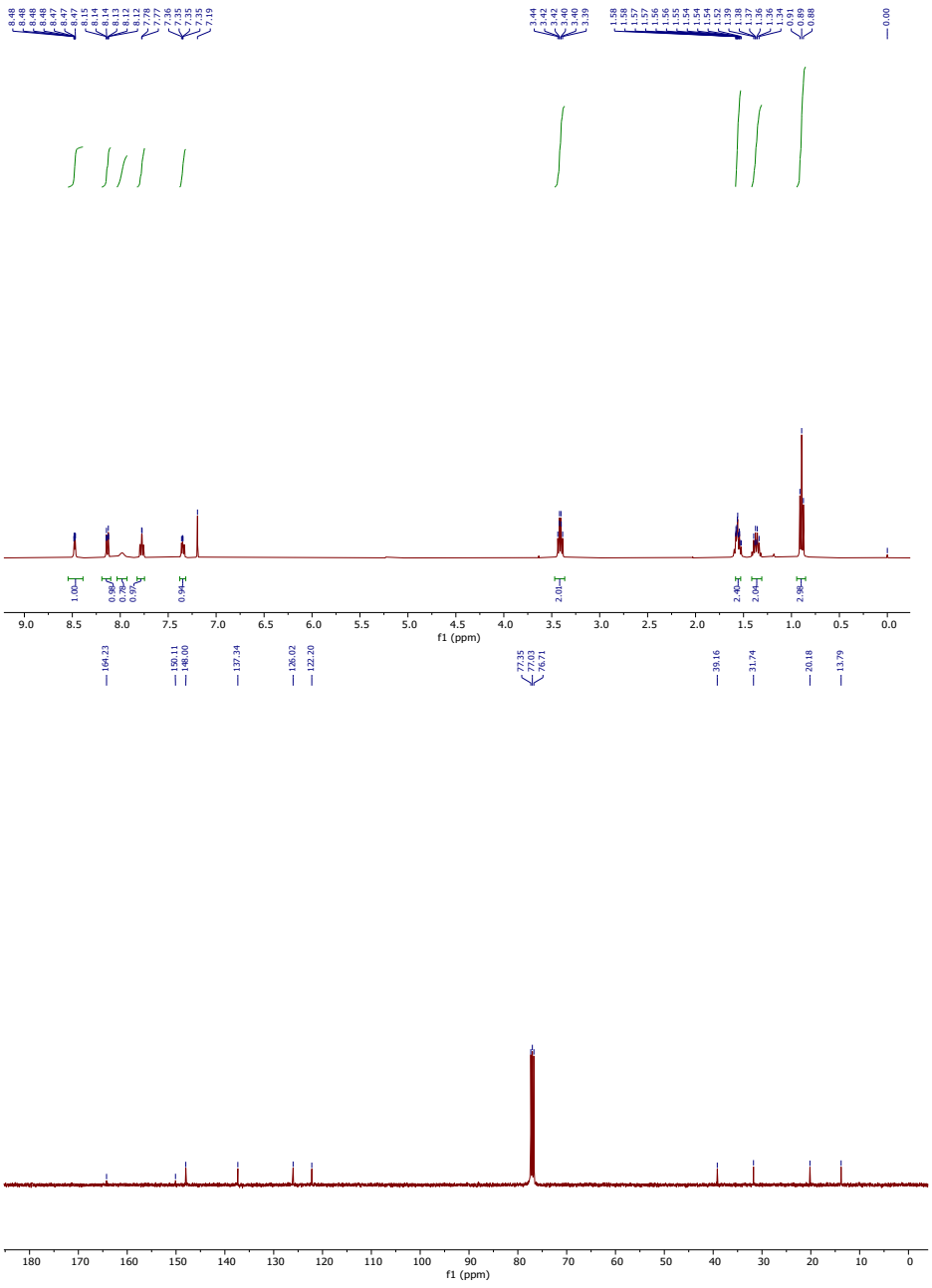


N-butylpicolinamide (**3i**)

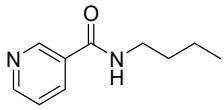


^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.54-8.39 (m, 1H), 8.13 (dt, *J* = 7.8, 1.1 Hz, 1H), 7.98 (s, 1H), 7.77 (d, *J* = 1.7 Hz, 1H), 7.38-7.32 (m, 1H), 3.41 (td, *J* = 7.1, 6.1 Hz, 2H), 1.58-1.53 (m, 2H), 1.41-1.31 (m, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 164.23, 148.00, 137.34, 126.02, 122.20, 39.16, 31.74, 20.18, 13.79.

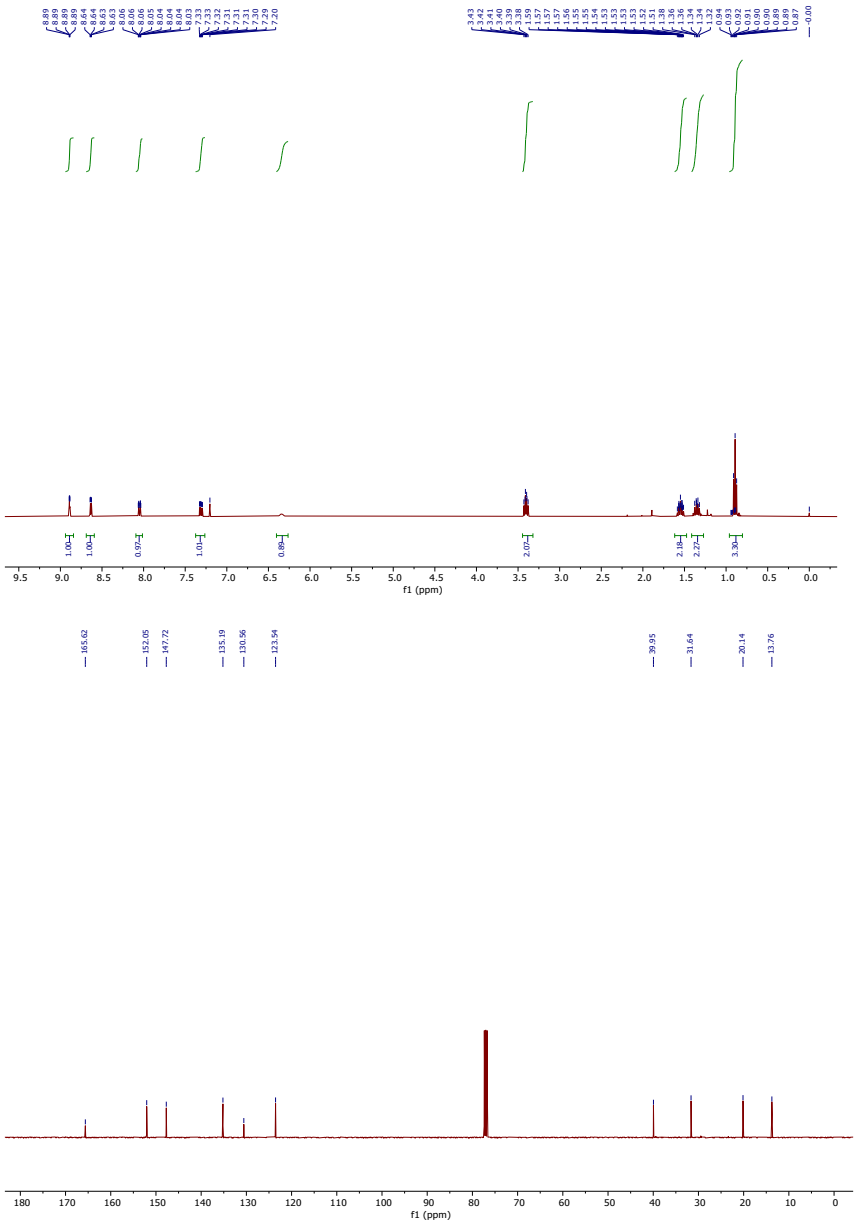


N-butylnicotinamide (**3j**)

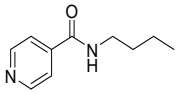


^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.89 (dd, *J* = 2.3, 0.9 Hz, 1H), 8.63 (dd, *J* = 4.9, 1.7 Hz, 1H), 8.05 (ddd, *J* = 7.9, 2.3, 1.7 Hz, 1H), 7.31 (ddd, *J* = 7.9, 4.8, 0.9 Hz, 1H), 6.34 (s, 1H), 3.40 (td, *J* = 7.2, 5.7 Hz, 2H), 1.62-1.47 (m, 2H), 1.35 (dt, *J* = 8.5, 7.2 Hz, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 165.62, 152.05, 147.72, 135.19, 130.56, 123.54, 39.95, 31.64, 20.14, 13.76.

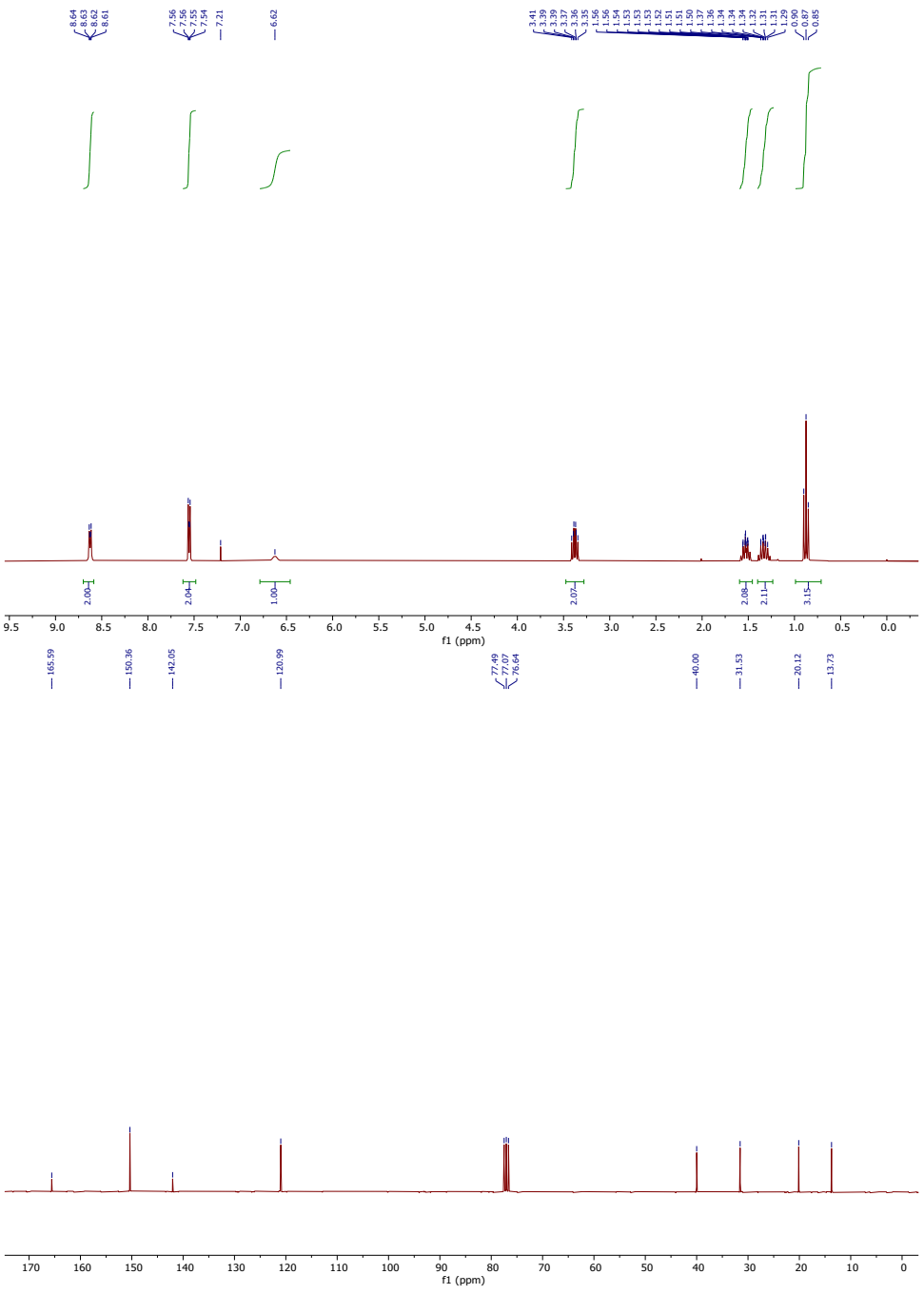


N-butylisonicotinamide (**3k**)

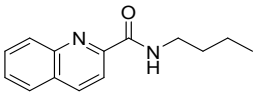


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.70-8.59 (m, 2H), 7.62-7.48 (m, 2H), 6.62 (s, 1H), 3.38 (td, *J* = 7.2, 5.7 Hz, 2H), 1.59-1.46 (m, 2H), 1.40-1.23 (m, 2H), 0.87 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.59, 150.36, 142.05, 120.99, 40.00, 31.53, 20.12, 13.73.

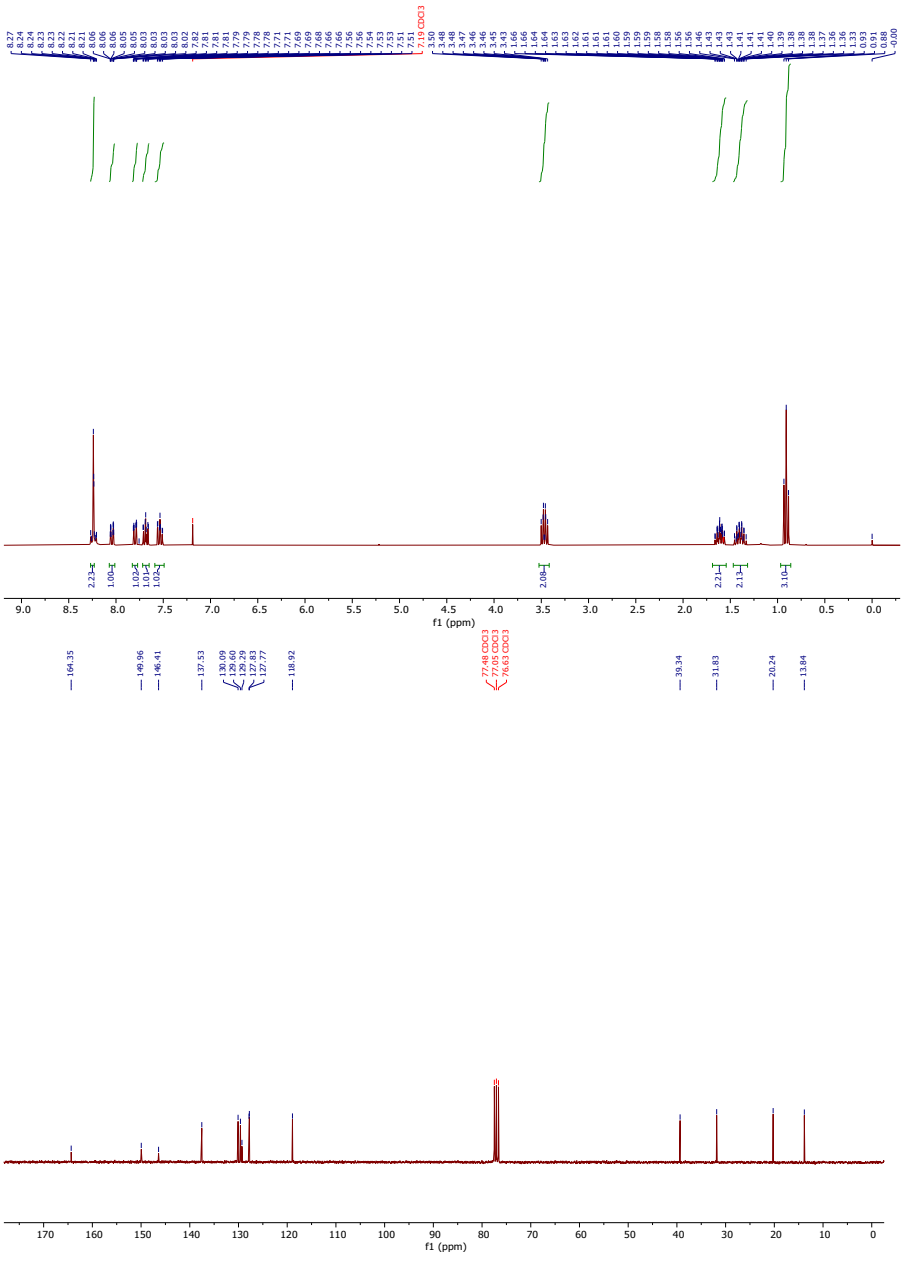


N-butylquinoline-2-carboxamide (**3l**)

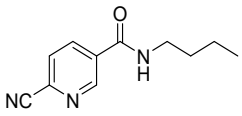


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.27-8.23 (m, 2H), 8.04 (ddt, *J* = 8.4, 1.2, 0.6 Hz, 1H), 7.80 (ddd, *J* = 8.2, 1.5, 0.7 Hz, 1H), 7.69 (ddd, *J* = 8.5, 6.9, 1.5 Hz, 1H), 7.53 (ddd, *J* = 8.1, 6.9, 1.2 Hz, 1H), 3.47 (td, *J* = 7.2, 6.1 Hz, 2H), 1.69-1.54 (m, 2H), 1.47-1.32 (m, 2H), 0.91 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 164.35, 149.96, 146.41, 137.53, 130.09, 129.60, 129.29, 127.83, 127.77, 118.92, 39.34, 31.83, 20.24, 13.84.

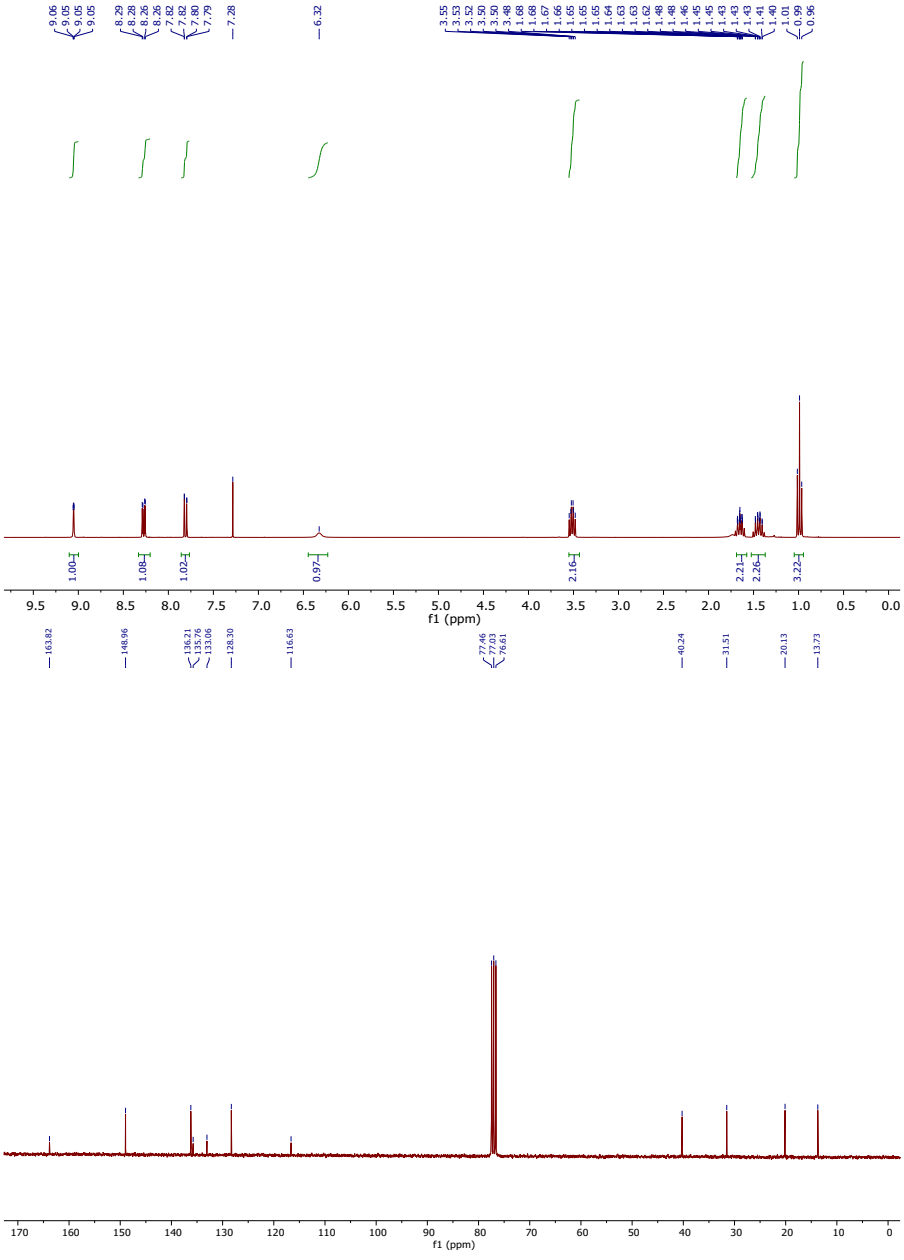


N-butyl-6-cyanonicotinamide (**3m**)

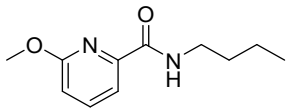


^{1}H NMR (300 MHz, Chloroform-*d*) δ 9.05 (dd, *J* = 2.2, 0.9 Hz, 1H), 8.27 (dd, *J* = 8.0, 2.2 Hz, 1H), 7.81 (dd, *J* = 8.0, 0.9 Hz, 1H), 6.32 (s, 1H), 3.51 (td, *J* = 7.2, 5.7 Hz, 2H), 1.69-1.61 (m, 2H), 1.50-1.40 (m, 2H), 0.99 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 163.82, 148.96, 136.21, 135.76, 133.06, 128.30, 116.63, 40.24, 31.51, 20.13, 13.73.

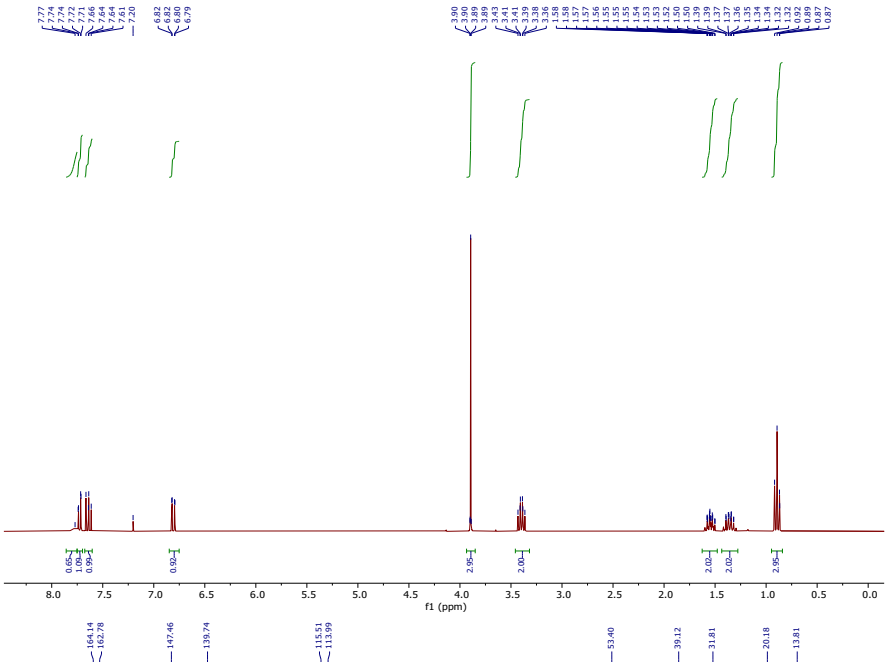


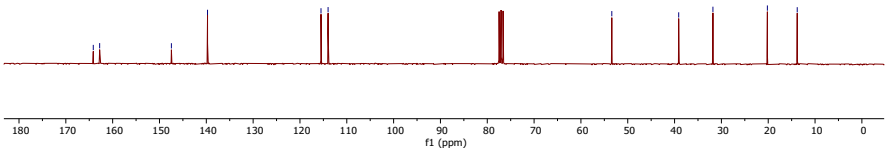
N-butyl-6-methoxypicolinamide (**3n**)



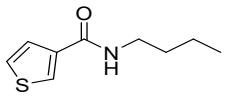
^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.77 (s, 1H), 7.73 (dd, *J* = 7.3, 1.0 Hz, 1H), 7.64 (dd, *J* = 8.2, 7.3 Hz, 1H), 6.81 (dd, *J* = 8.2, 1.0 Hz, 1H), 3.89 (s, 3H), 3.40 (td, *J* = 7.1, 6.1 Hz, 2H), 1.63-1.48 (m, 2H), 1.43-1.28 (m, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 164.14, 162.78, 147.46, 139.74, 115.51, 113.99, 53.40, 39.12, 31.81, 20.18, 13.81.



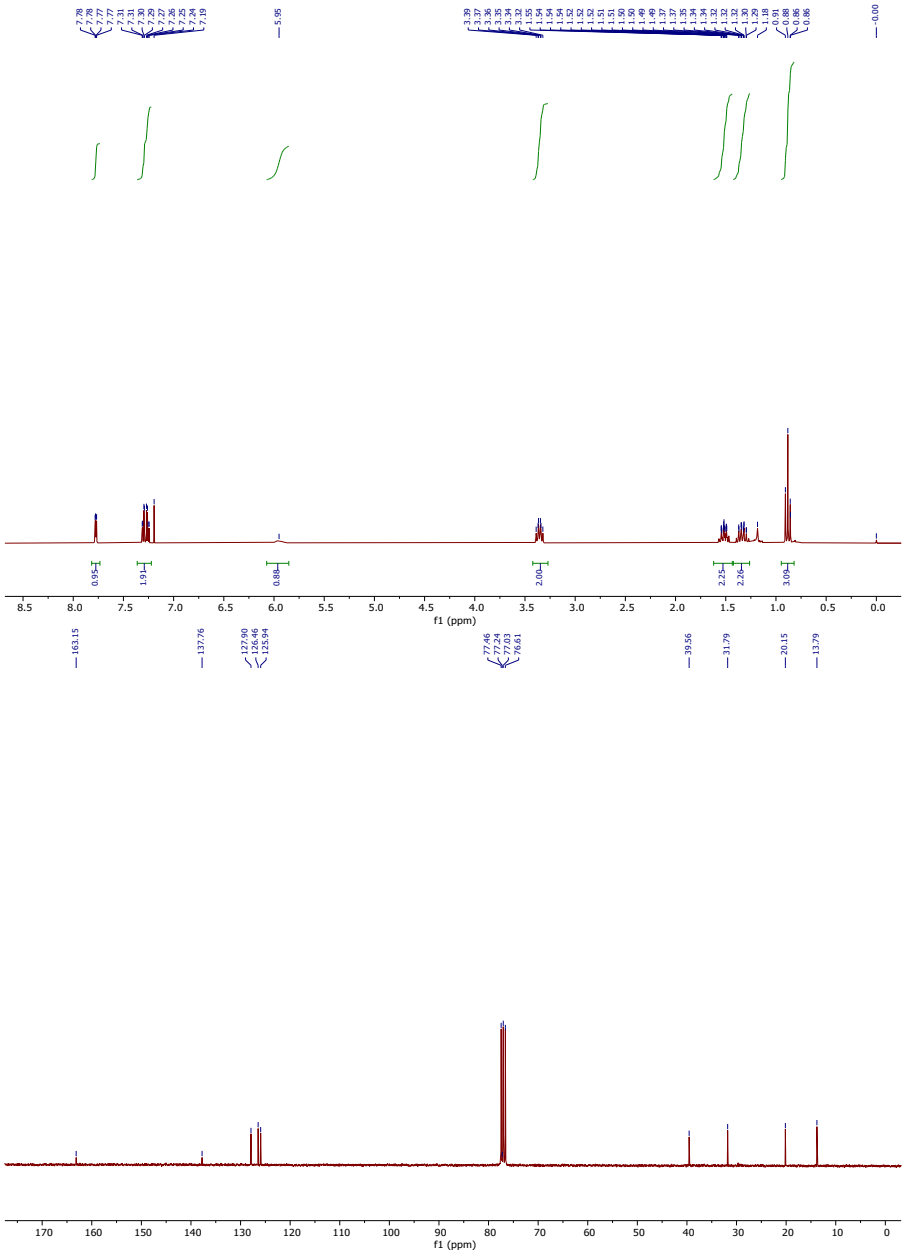


N-butylthiophene-3-carboxamide (**3o**)

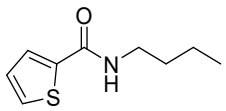


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.77 (dd, *J* = 2.9, 1.4 Hz, 1H), 7.36-7.22 (m, 2H), 5.95 (s, 1H), 3.36 (td, *J* = 7.1, 5.7 Hz, 2H), 1.62-1.43 (m, 2H), 1.42-1.26 (m, 2H), 0.95-0.82 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 163.15, 137.76, 127.90, 126.46, 125.94, 39.56, 31.79, 20.15, 13.79.

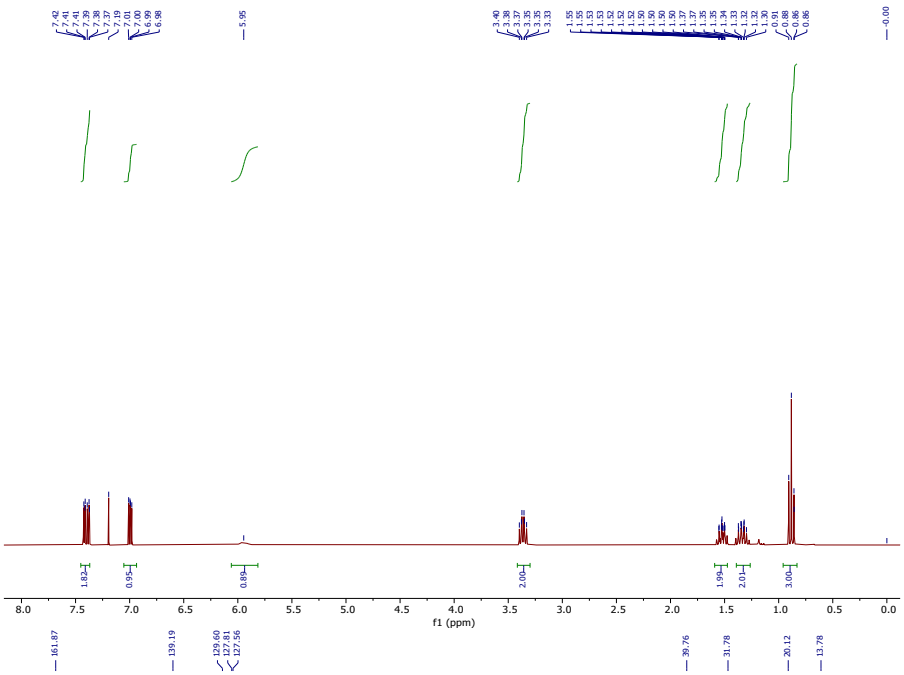


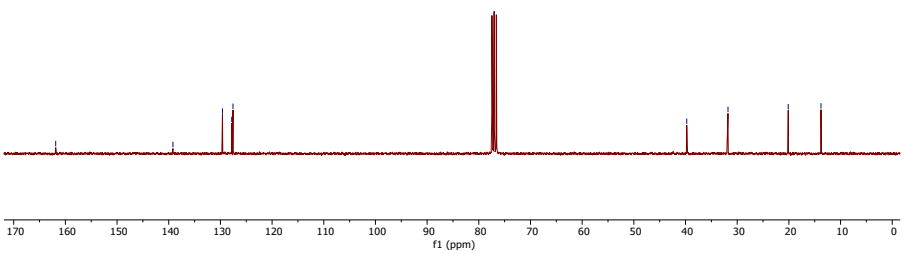
N-butylthiophene-2-carboxamide (**3p**)



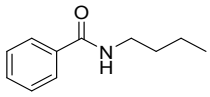
^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.45-7.37 (m, 2H), 6.99 (dd, *J* = 5.0, 3.7 Hz, 1H), 5.95 (s, 1H), 3.36 (td, *J* = 7.2, 5.7 Hz, 2H), 1.59-1.47 (m, 2H), 1.39-1.26 (m, 2H), 0.88 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 161.87, 139.19, 129.60, 127.81, 127.56, 39.76, 31.78, 20.12, 13.78.



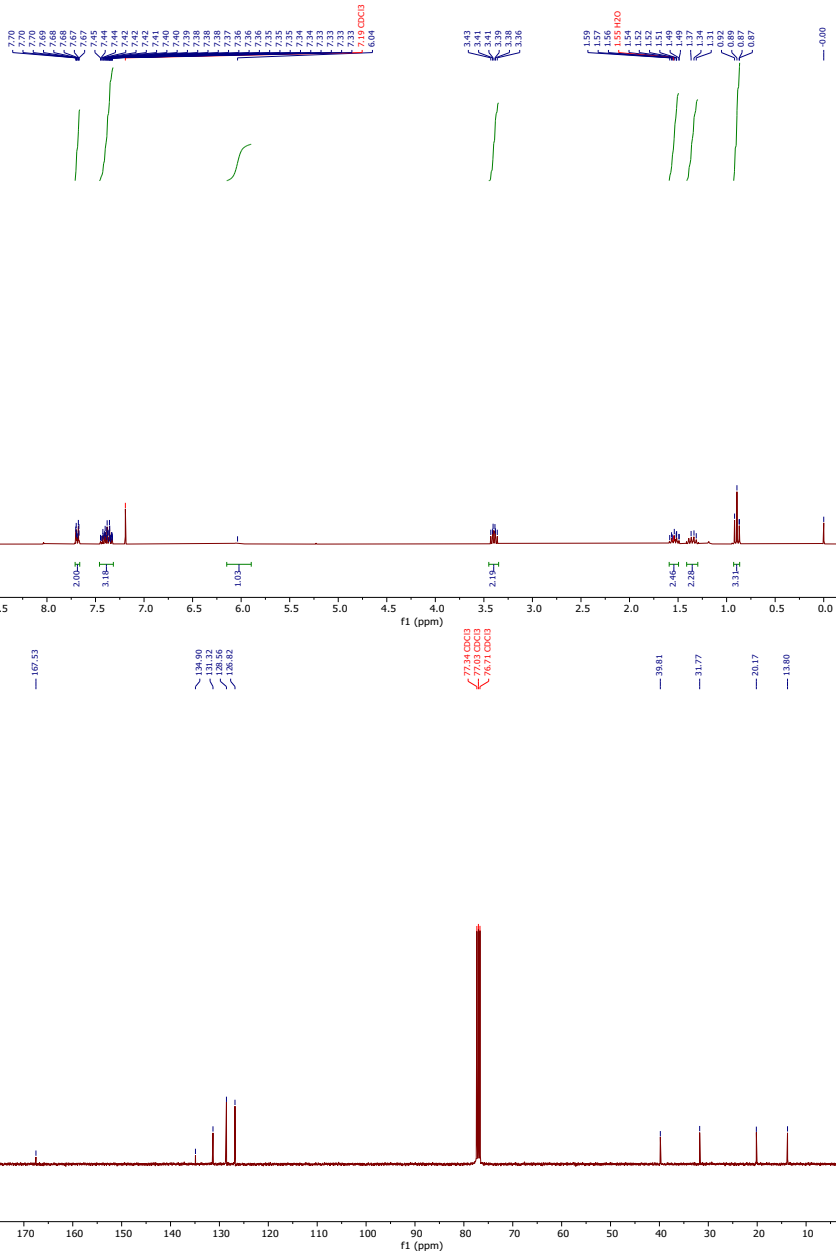


N-butylbenzamide (**3q**)

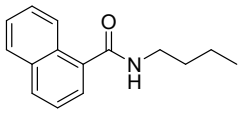


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.71-7.66 (m, 2H), 7.46-7.32 (m, 3H), 6.04 (s, 1H), 3.40 (td, *J* = 7.1, 5.7 Hz, 2H), 1.59-1.50 (m, 2H), 1.41-1.30 (m, 2H), 0.93-0.87 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.53, 134.90, 131.32, 128.56, 126.82, 39.81, 31.77, 20.17, 13.80.

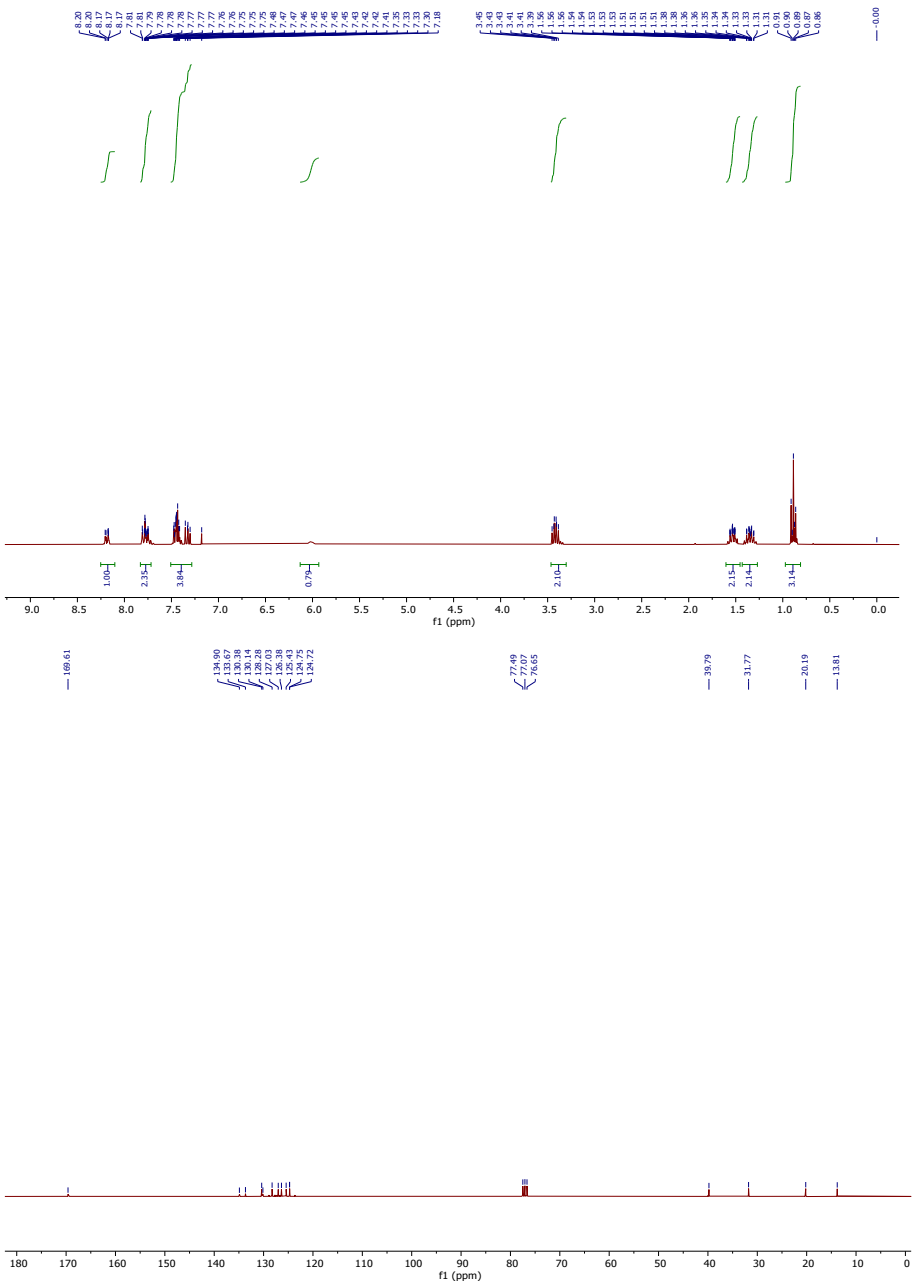


N-butyl-1-naphthamide (**3r**)

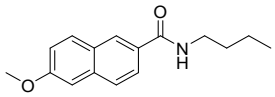


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.25-8.10 (m, 1H), 7.83-7.72 (m, 2H), 7.51-7.28 (m, 4H), 6.02 (s, 1H), 3.42 (td, *J* = 7.2, 5.8 Hz, 2H), 1.60-1.45 (m, 2H), 1.43-1.27 (m, 2H), 0.97-0.81 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 169.61, 134.90, 133.67, 130.38, 130.14, 128.28, 127.03, 126.38, 125.43, 124.75, 124.72, 39.79, 31.77, 20.19, 13.81.

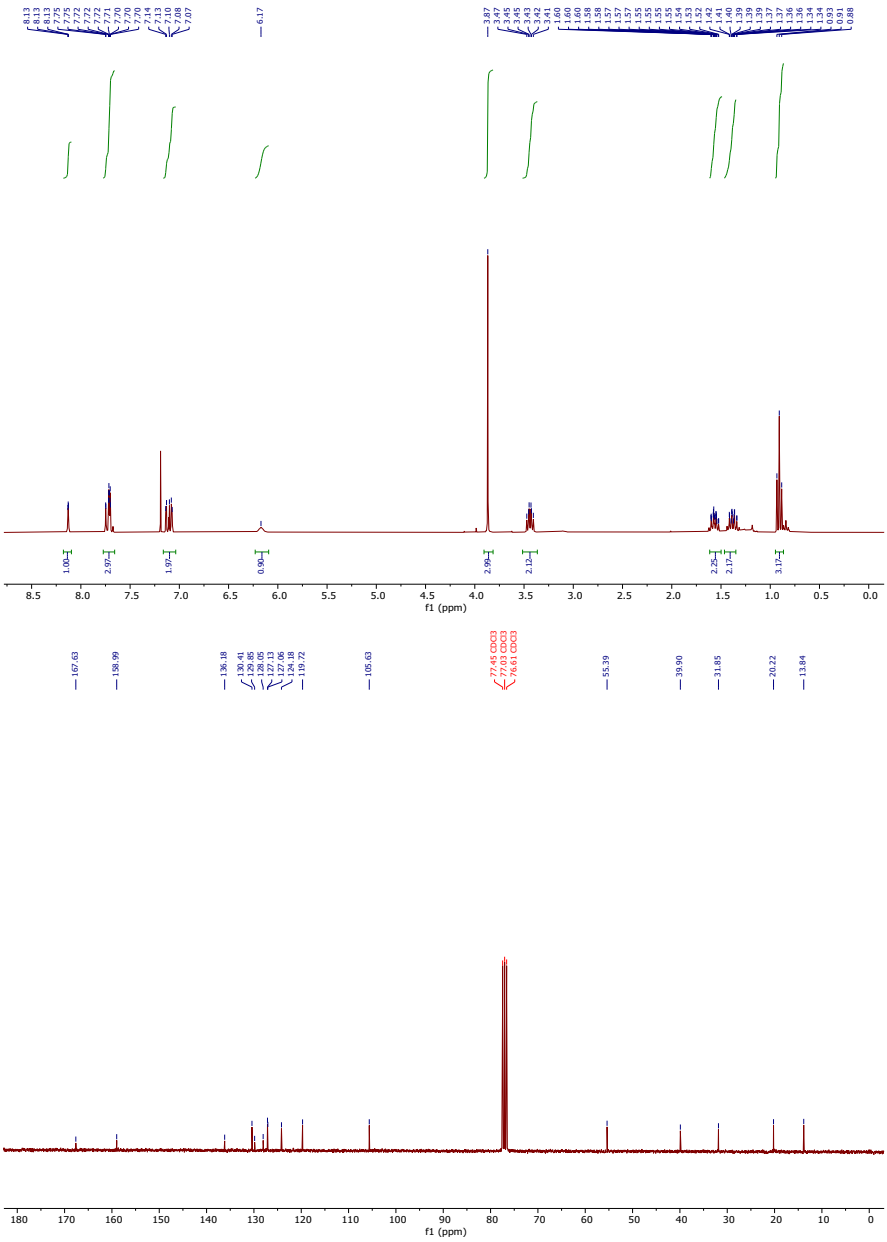


N-butyl-6-methoxy-2-naphthamide (**3s**)

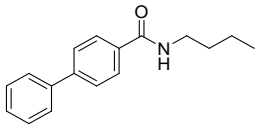


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.18-8.10 (m, 1H), 7.77-7.66 (m, 3H), 7.16-7.04 (m, 2H), 6.17 (s, 1H), 3.87 (s, 3H), 3.44 (td, *J* = 7.2, 5.7 Hz, 2H), 1.61-1.50 (m, 2H), 1.46-1.35 (m, 2H), 0.91 (t, *J* = 7.3 Hz, 3H).

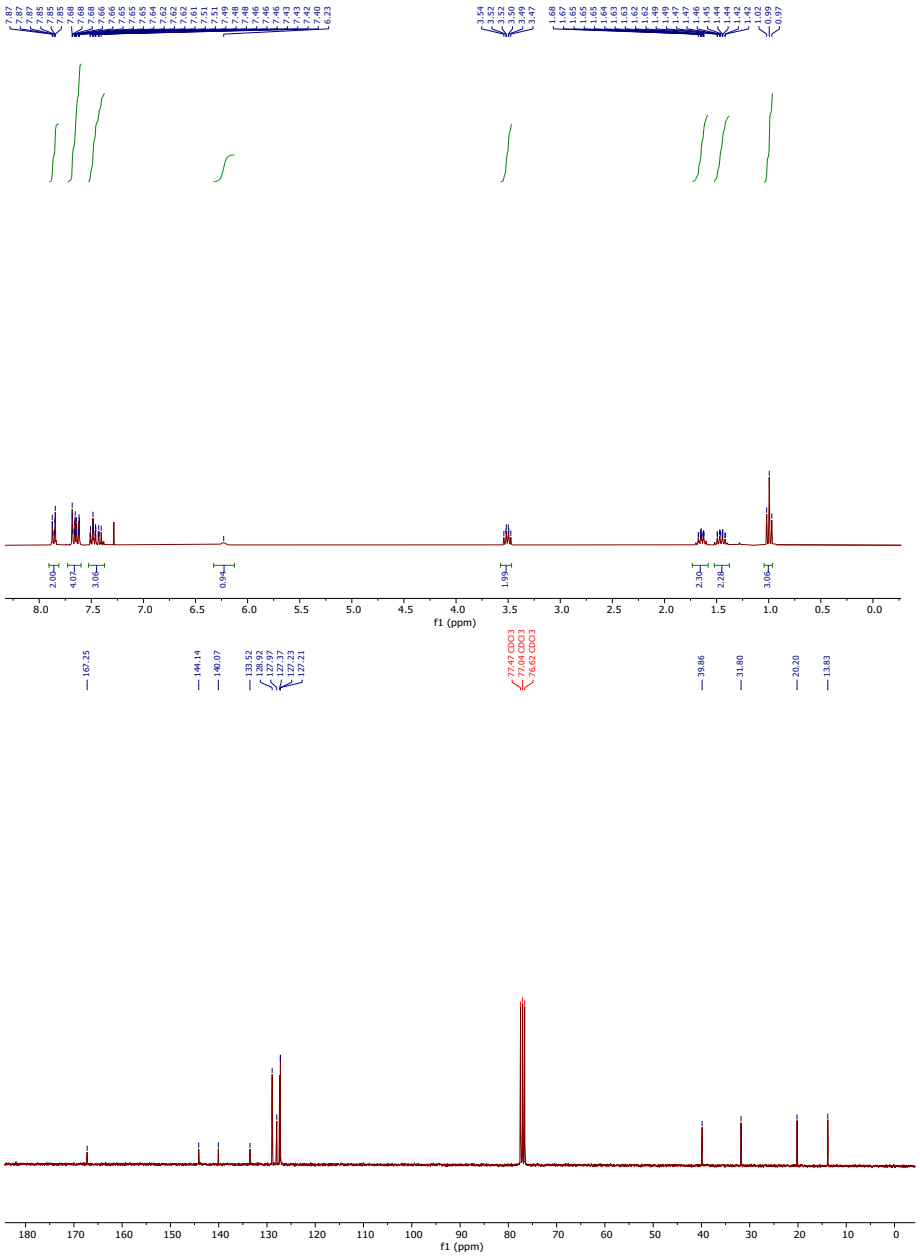
^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.63, 158.99, 136.18, 130.41, 129.85, 128.05, 127.13, 127.06, 124.18, 119.72, 105.63, 55.39, 39.90, 31.85, 20.22, 13.84.



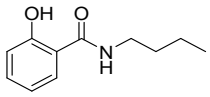
N-butyl-[1,1'-biphenyl]-4-carboxamide (**3t**)



^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.91-7.81 (m, 2H), 7.73-7.60 (m, 4H), 7.53-7.37 (m, 3H), 6.23 (s, 1H), 3.51 (td, *J* = 7.2, 5.7 Hz, 2H), 1.73-1.58 (m, 2H), 1.52-1.38 (m, 2H), 0.99 (t, *J* = 7.3 Hz, 3H).
^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.25, 144.14, 140.07, 133.52, 128.92, 127.97, 127.37, 127.23, 127.21, 39.86, 31.80, 20.20, 13.83.

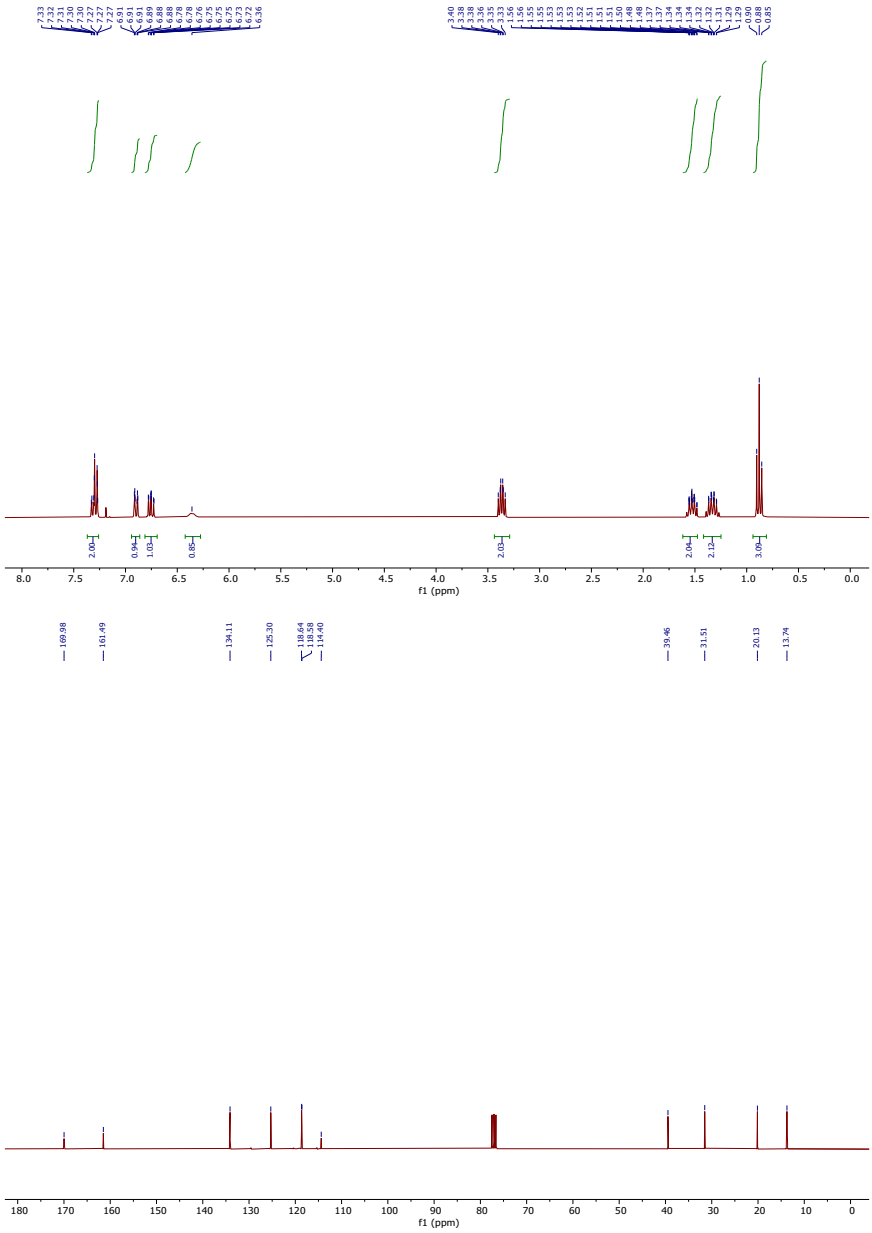


N-butyl-2-hydroxybenzamide (**3u**)

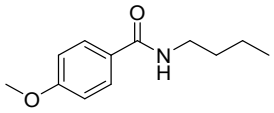


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.37-7.26 (m, 2H), 6.90 (dt, *J* = 8.0, 1.2 Hz, 1H), 6.75 (ddd, *J* = 7.9, 7.2, 1.2 Hz, 1H), 6.36 (s, 1H), 3.37 (td, *J* = 7.2, 5.7 Hz, 2H), 1.62-1.48 (m, 2H), 1.42-1.25 (m, 2H), 0.88 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 169.98, 161.49, 134.11, 125.30, 118.64, 118.58, 114.40, 39.46, 31.51, 20.13, 13.74.

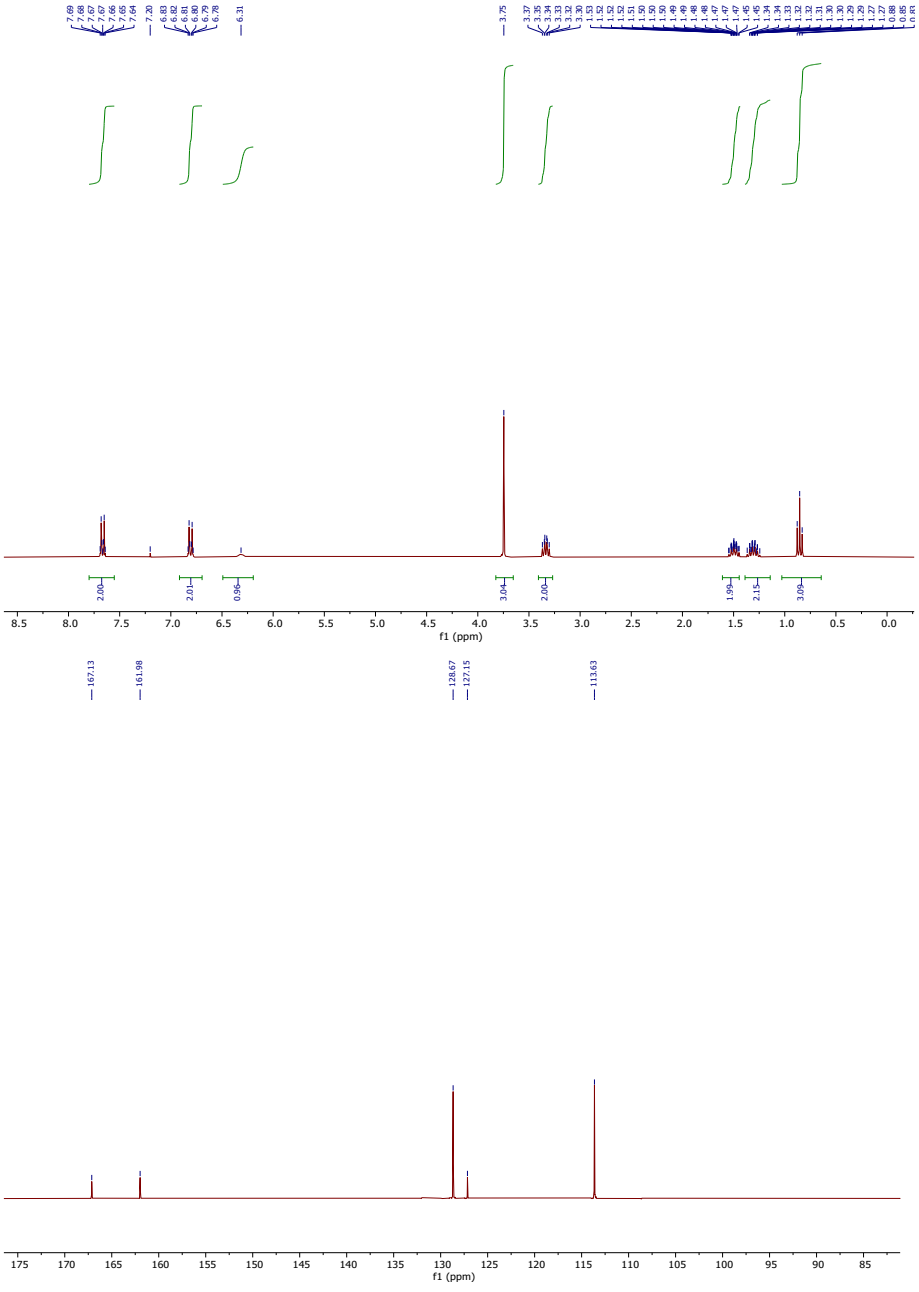


N-butyl-4-methoxybenzamide (**3v**)

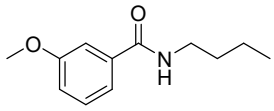


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.80-7.55 (m, 2H), 6.92-6.69 (m, 2H), 6.31 (s, 1H), 3.75 (s, 3H), 3.34 (td, *J* = 7.2, 5.7 Hz, 2H), 1.61-1.45 (m, 2H), 1.39-1.14 (m, 2H), 0.85 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.13, 161.98, 128.67, 127.15, 113.63, 55.36, 39.77, 31.80, 20.18, 13.80.

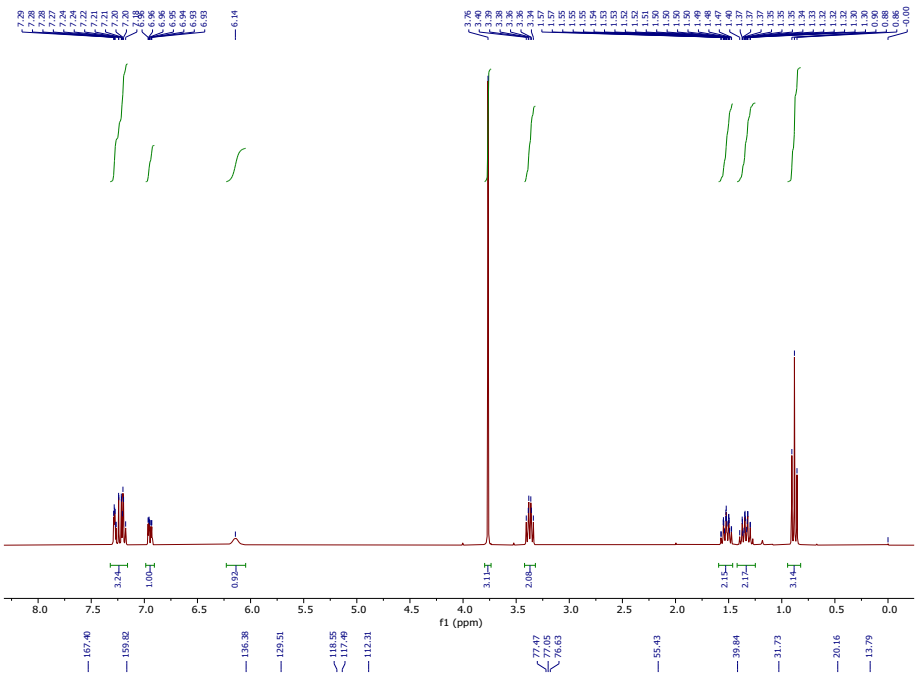


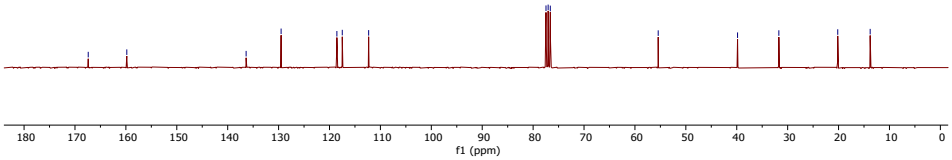
N-butyl-3-methoxybenzamide (**3w**)



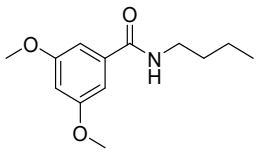
^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.32-7.16 (m, 3H), 6.99-6.91 (m, 1H), 6.14 (s, 1H), 3.76 (s, 3H), 3.37 (td, *J* = 7.1, 5.7 Hz, 2H), 1.59-1.46 (m, 2H), 1.42-1.25 (m, 2H), 0.88 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.40, 159.82, 136.38, 129.51, 118.55, 117.49, 112.31, 55.43, 39.84, 31.73, 20.16, 13.79.



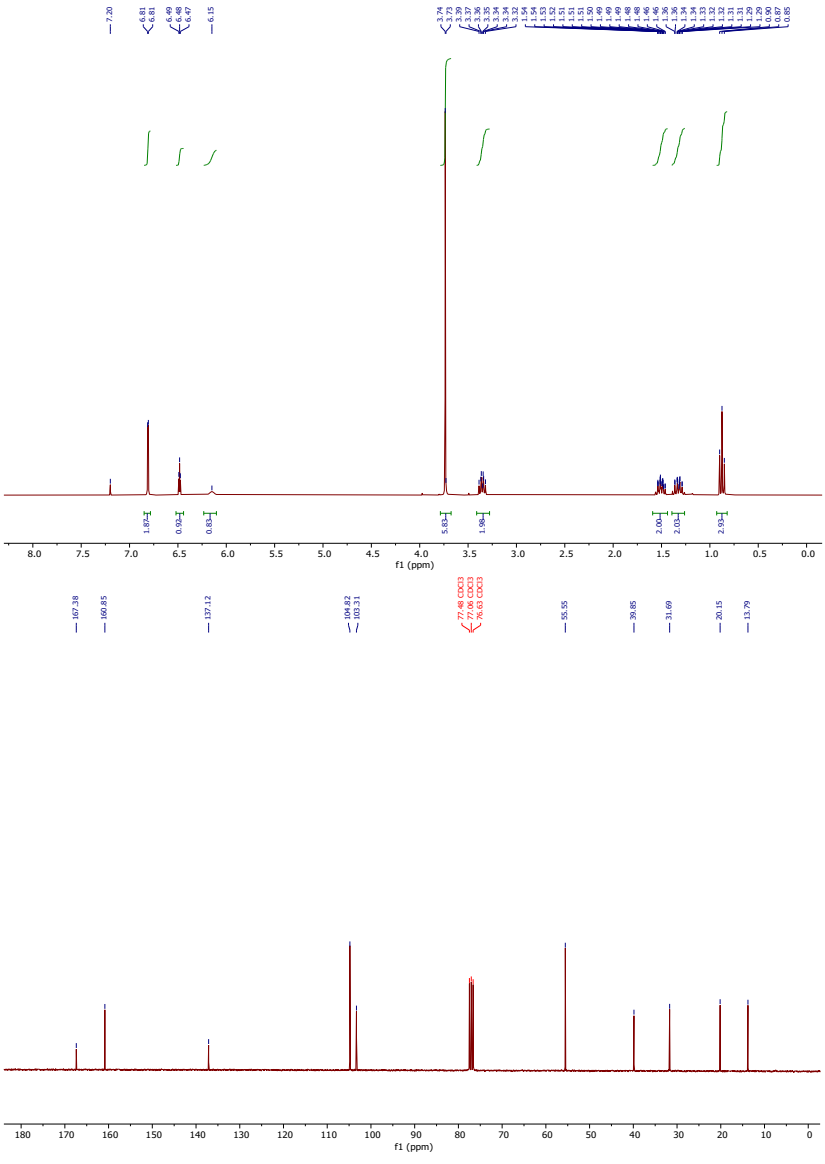


N-butyl-3,5-dimethoxybenzamide (**3x**)

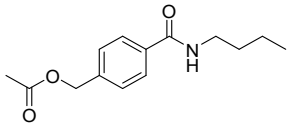


^{1}H NMR (300 MHz, Chloroform-*d*) δ 6.81 (d, *J* = 2.3 Hz, 2H), 6.48 (t, *J* = 2.3 Hz, 1H), 6.15 (s, 1H), 3.74 (s, 6H), 3.35 (td, *J* = 7.1, 5.7 Hz, 2H), 1.59-1.44 (m, 2H), 1.39-1.26 (m, 2H), 0.87 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.38, 160.85, 137.12, 104.82, 103.31, 55.55, 39.85, 31.69, 20.15, 13.79.

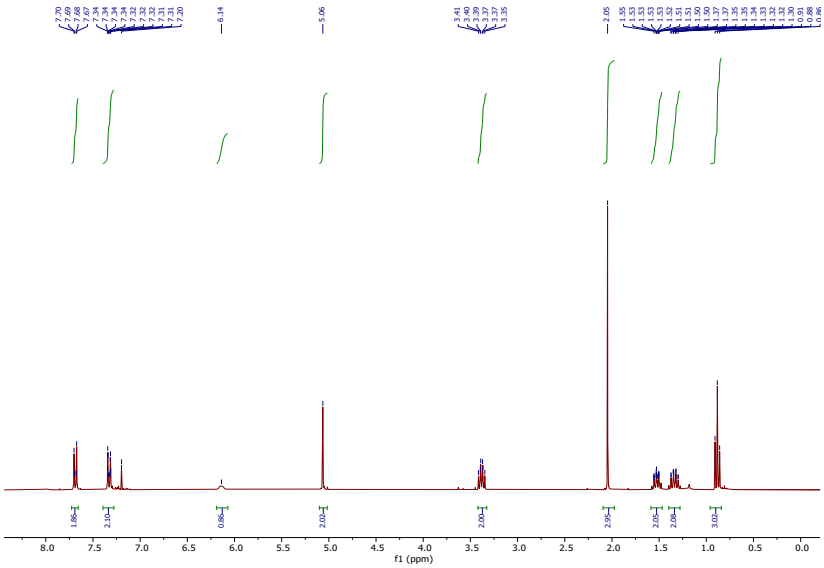


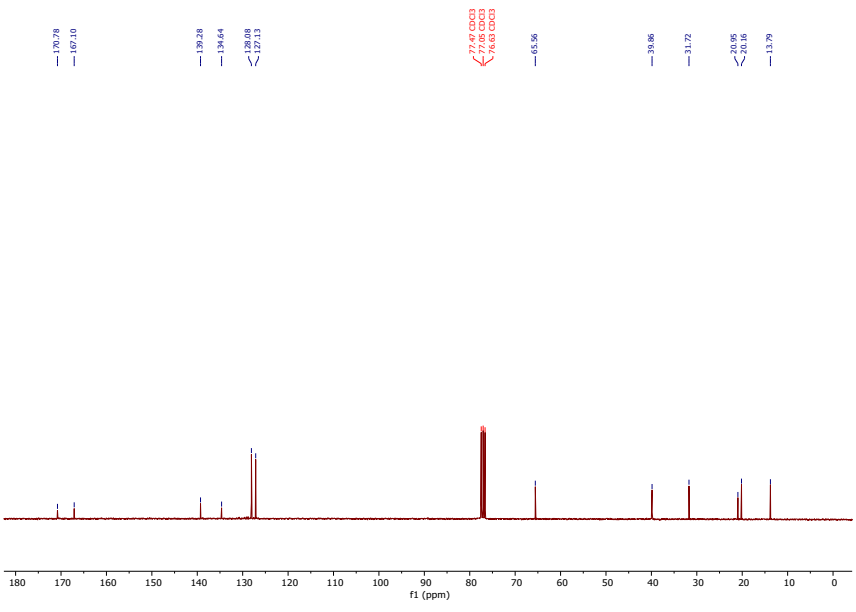
4-(butylcarbamoyl)benzyl acetate (**3y**)



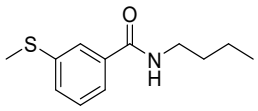
^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.73-7.66 (m, 2H), 7.39-7.28 (m, 2H), 6.14 (s, 1H), 5.06 (s, 2H), 3.38 (td, *J* = 7.1, 5.7 Hz, 2H), 2.05 (s, 3H), 1.59-1.47 (m, 2H), 1.40-1.28 (m, 2H), 0.88 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 170.78, 167.10, 139.28, 134.64, 128.08, 127.13, 65.56, 39.86, 31.72, 20.95, 20.16, 13.79.



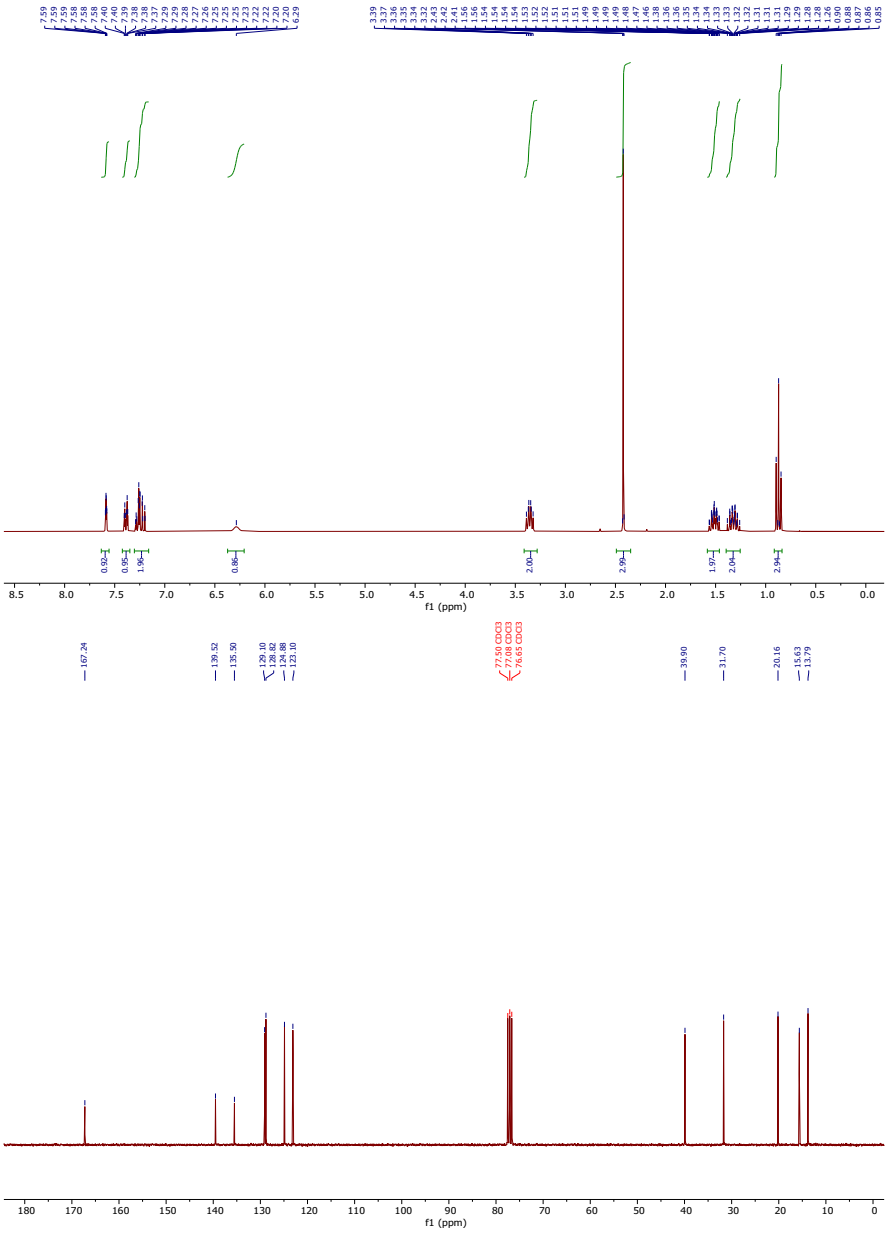


N-butyl-3-(methylthio)benzamide (**3z**)

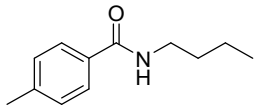


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.59 (td, *J* = 1.8, 0.6 Hz, 1H), 7.39 (dt, *J* = 7.1, 1.7 Hz, 1H), 7.30-7.16 (m, 2H), 6.29 (s, 1H), 3.36 (td, *J* = 7.2, 5.6 Hz, 2H), 2.42 (s, 3H), 1.58-1.46 (m, 2H), 1.39-1.25 (m, 2H), 0.87 (t, *J* = 7.3 Hz, 3H).

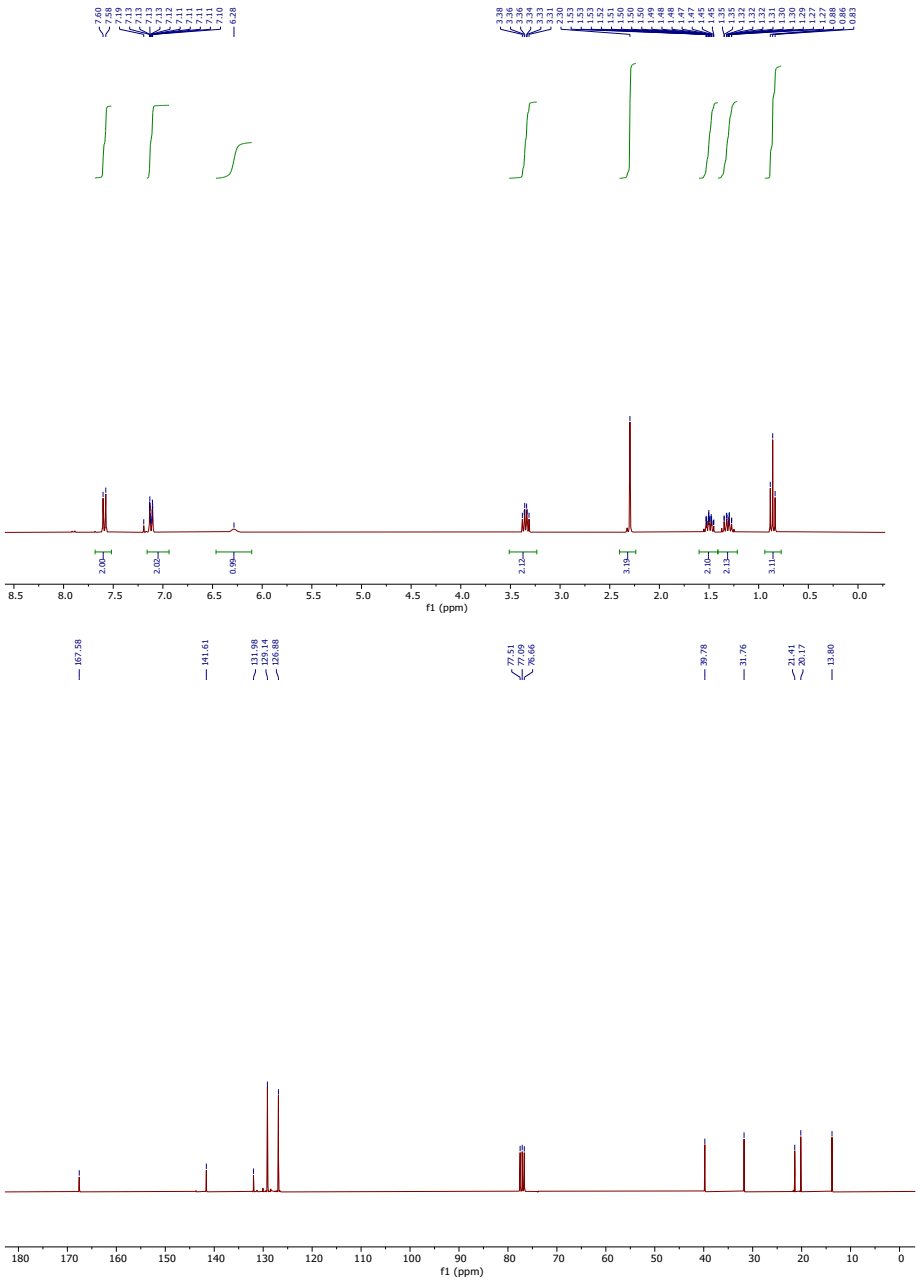
^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.24, 139.52, 135.50, 129.10, 128.82, 124.88, 123.10, 39.90, 31.70, 20.16, 15.63, 13.79.



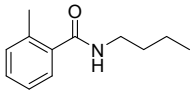
N-butyl-4-methylbenzamide (**3aa**)



^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.59 (d, *J* = 8.2 Hz, 2H), 7.16-6.94 (m, 2H), 6.28 (s, 1H), 3.35 (td, *J* = 7.2, 5.7 Hz, 2H), 2.30 (s, 3H), 1.60-1.41 (m, 2H), 1.41-1.22 (m, 2H), 0.86 (t, *J* = 7.3 Hz, 3H).
^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.58, 141.61, 131.98, 129.14, 126.88, 39.78, 31.76, 21.41, 20.17, 13.80.

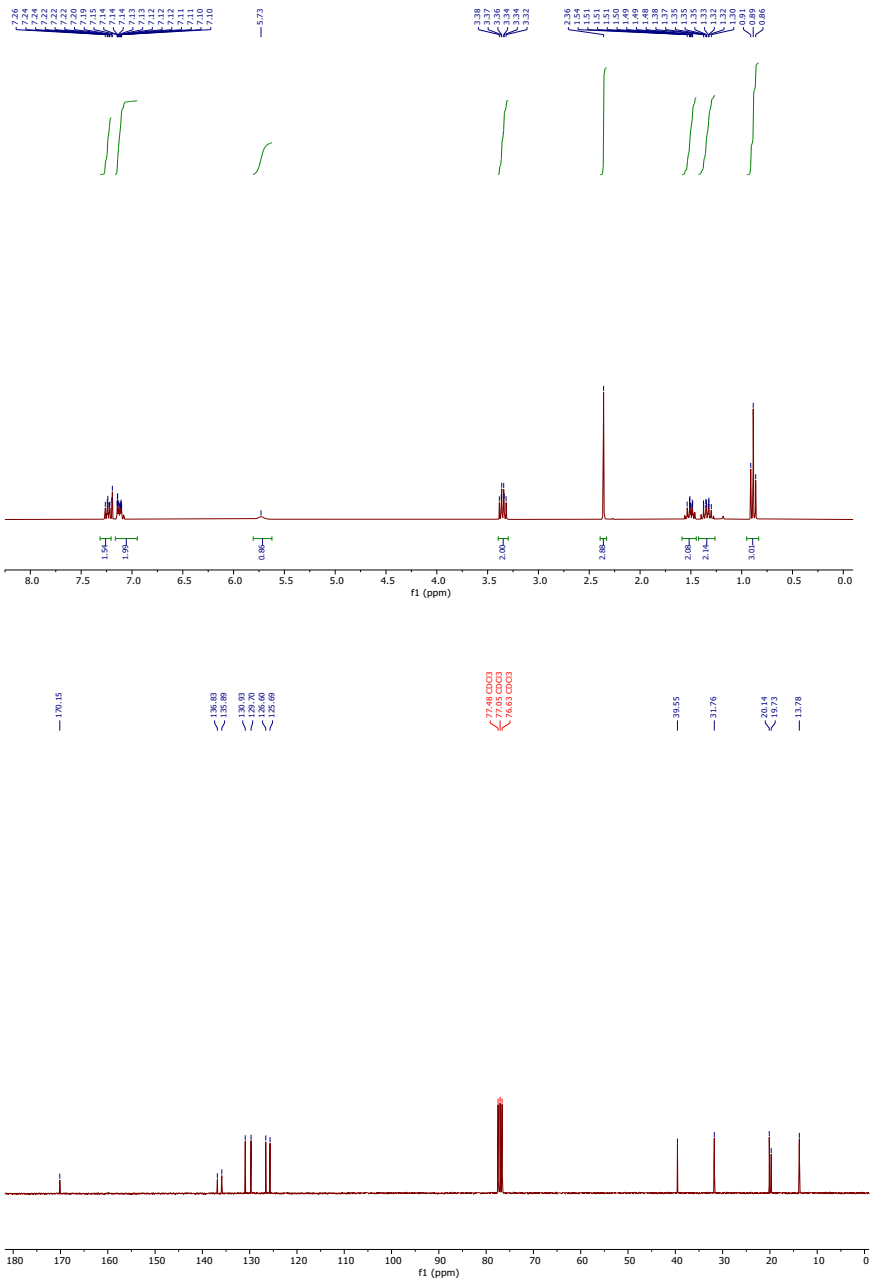


N-butyl-2-methylbenzamide (**3ab**)

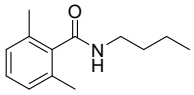


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.31-7.21 (m, 2H), 7.16-6.95 (m, 2H), 5.73 (s, 1H), 3.35 (td, *J* = 7.1, 5.8 Hz, 2H), 2.36 (s, 3H), 1.59-1.45 (m, 2H), 1.42-1.26 (m, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 170.15, 136.83, 135.89, 130.93, 129.70, 126.60, 125.69, 39.55, 31.76, 20.14, 19.73, 13.78.

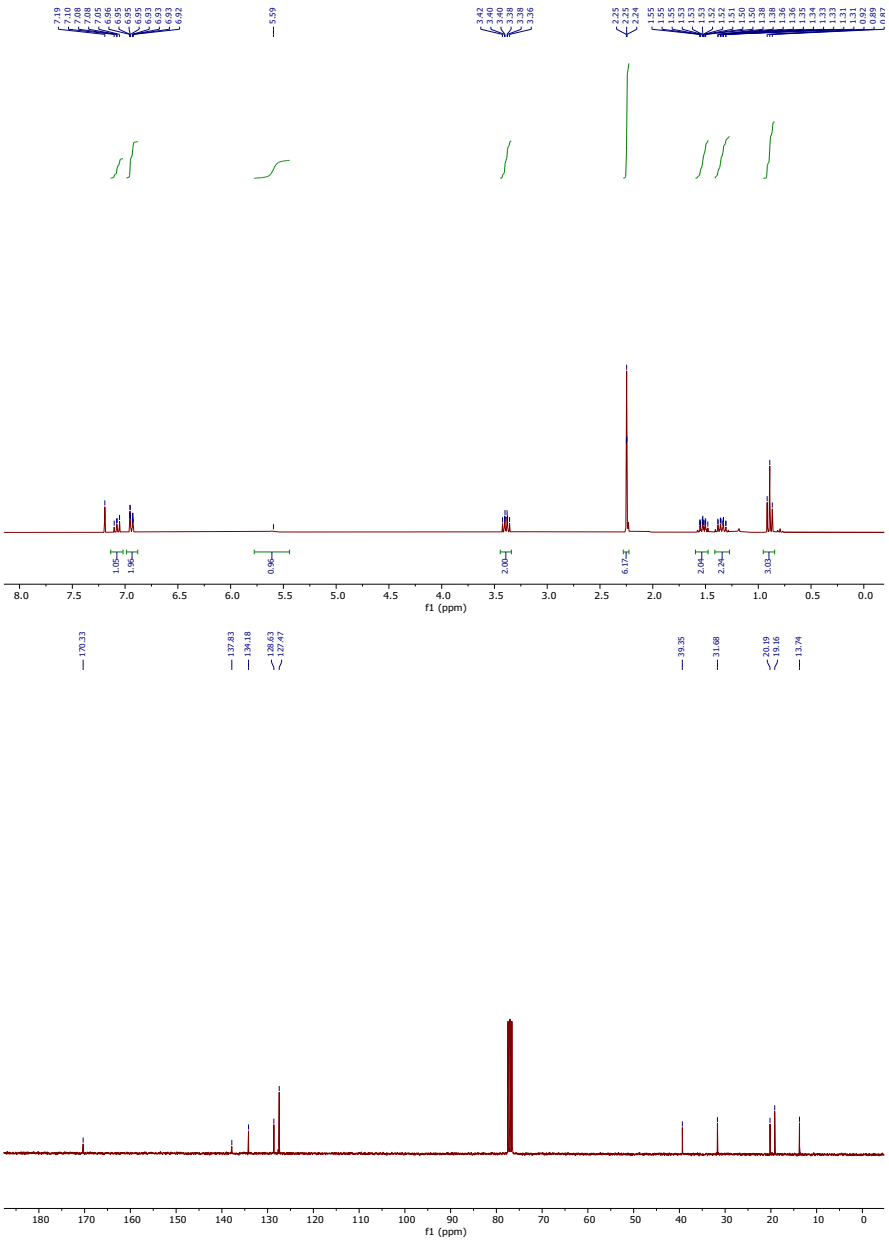


N-butyl-2,6-dimethylbenzamide (**3ac**)

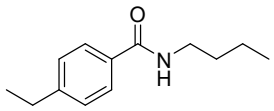


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.08 (dd, *J* = 8.3, 6.9 Hz, 1H), 6.94 (dq, *J* = 7.6, 0.6 Hz, 2H), 5.59 (s, 1H), 3.39 (td, *J* = 7.1, 5.8 Hz, 2H), 2.25 (d, *J* = 0.7 Hz, 6H), 1.60-1.48 (m, 2H), 1.41-1.27 (m, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 170.33, 137.83, 134.18, 128.63, 127.47, 39.35, 31.68, 20.19, 19.16, 13.74.

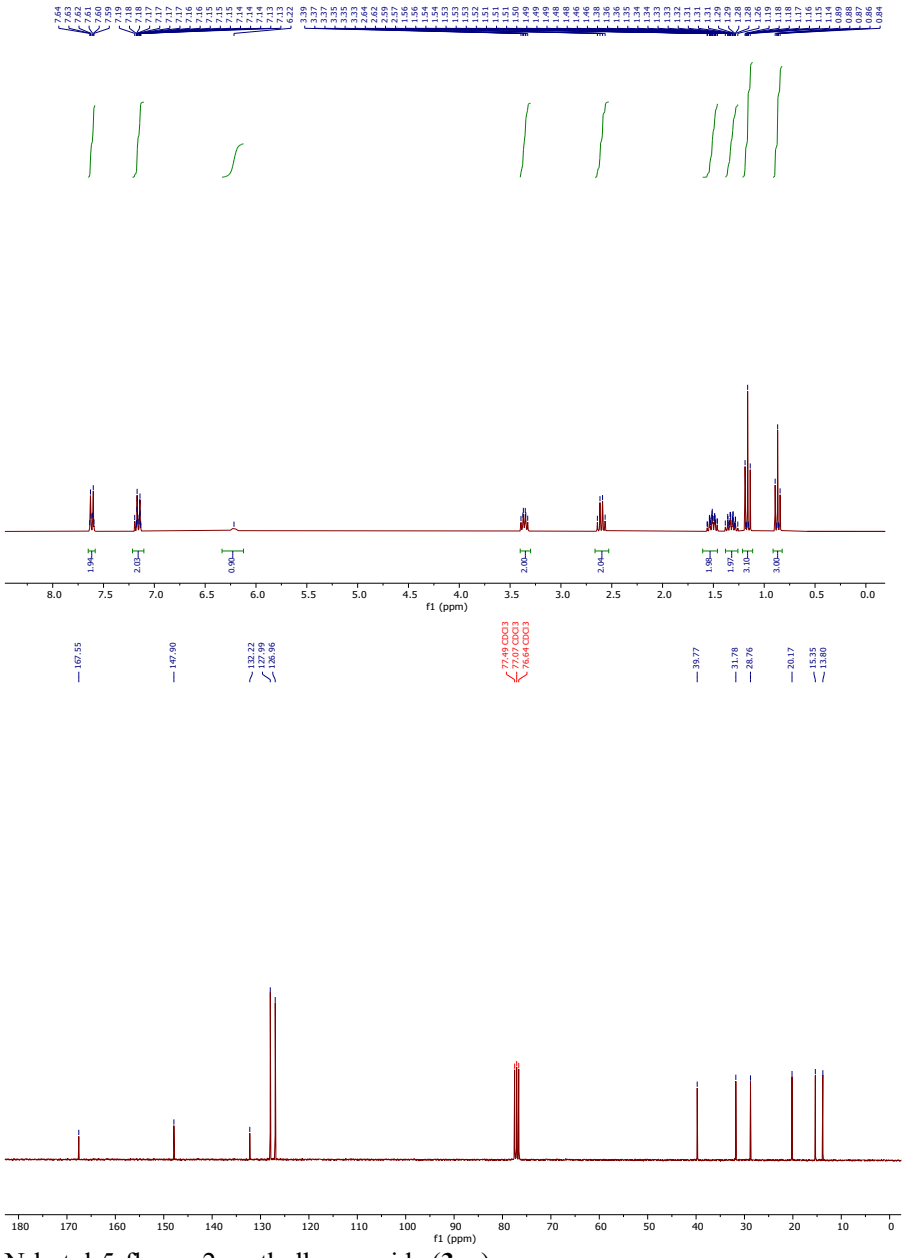


N-butyl-4-ethylbenzamide (**3ad**)

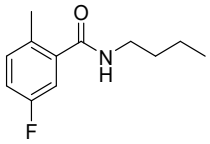


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.65-7.58 (m, 2H), 7.22-7.10 (m, 2H), 6.22 (s, 1H), 3.36 (td, *J* = 7.1, 5.6 Hz, 2H), 2.60 (q, *J* = 7.6 Hz, 2H), 1.61-1.46 (m, 2H), 1.38-1.26 (m, 2H), 1.16 (t, *J* = 7.6 Hz, 3H), 0.87 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.55, 147.90, 132.22, 127.99, 126.96, 39.77, 31.78, 28.76, 20.17, 15.35, 13.80.

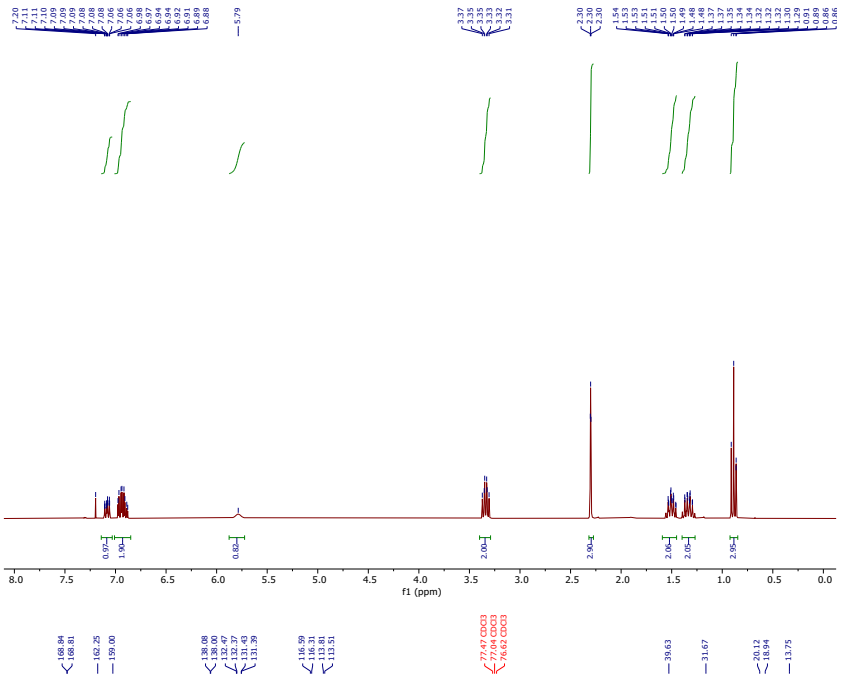


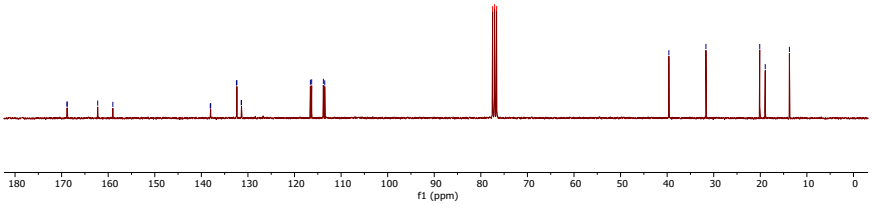
N-butyl-5-fluoro-2-methylbenzamide (**3ae**)



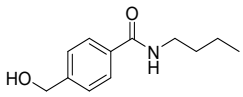
^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.08 (ddt, *J* = 8.4, 5.5, 0.6 Hz, 1H), 7.01-6.85 (m, 2H), 5.79 (s, 1H), 3.34 (td, *J* = 7.1, 5.8 Hz, 2H), 2.30 (t, *J* = 0.9 Hz, 3H), 1.59-1.45 (m, 2H), 1.40-1.27 (m, 2H), 0.89 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 168.84, 168.81, 162.25, 159.00, 138.08, 138.00, 132.47, 132.37, 131.43, 131.39, 116.59, 116.31, 113.81, 113.51, 39.63, 31.67, 20.12, 18.94, 13.75.



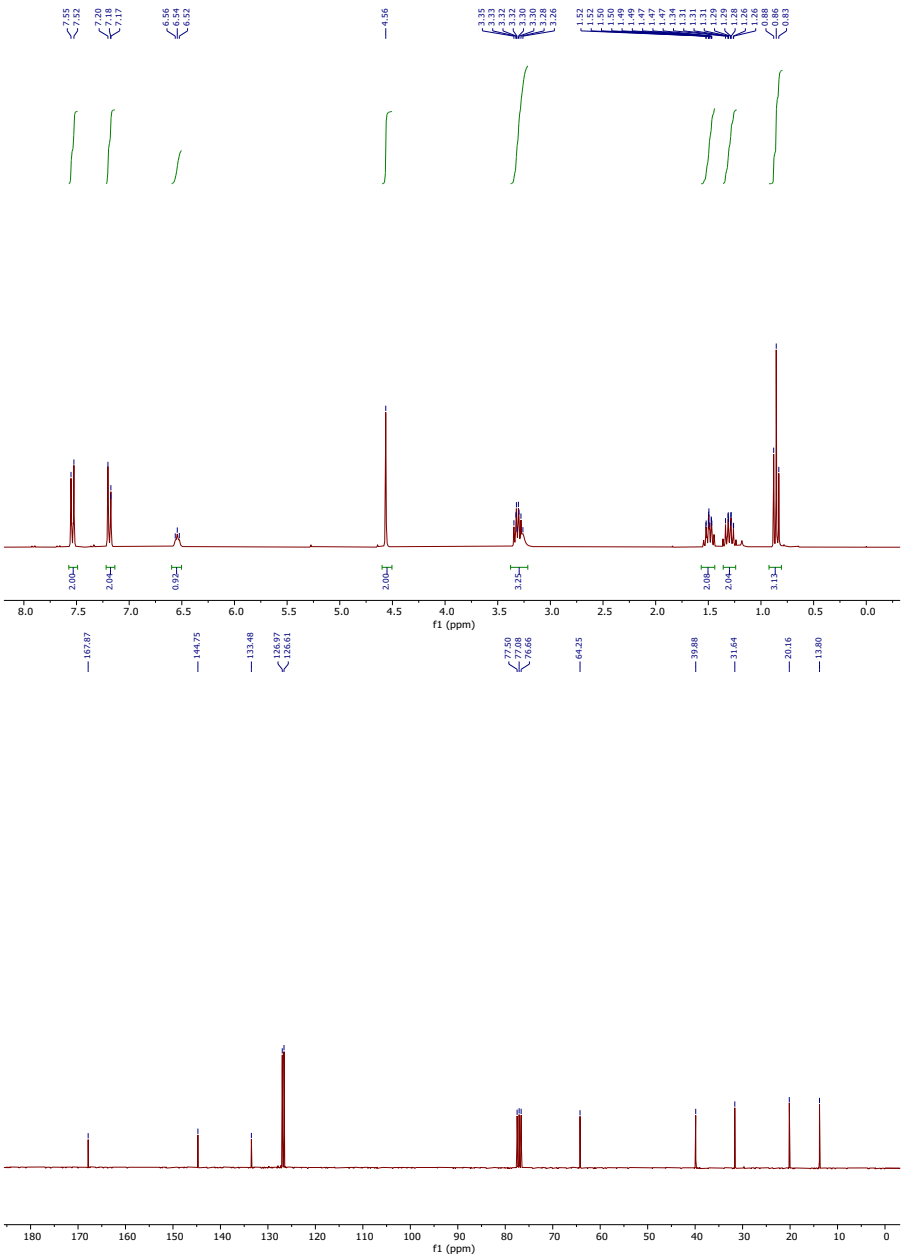


N-butyl-4-(hydroxymethyl)benzamide (**3af**)

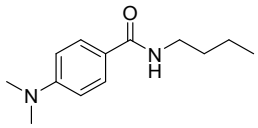


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.54 (d, *J* = 8.3 Hz, 2H), 7.19 (d, *J* = 8.4 Hz, 2H), 6.54 (t, *J* = 5.8 Hz, 1H), 4.56 (s, 2H), 3.38-3.21 (m, 3H), 1.50 (ddd, *J* = 9.2, 6.5, 1.3 Hz, 2H), 1.36-1.24 (m, 2H), 0.86 (t, *J* = 7.3 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.87, 144.75, 133.48, 126.97, 126.61, 64.25, 39.88, 31.64, 20.16, 13.80.

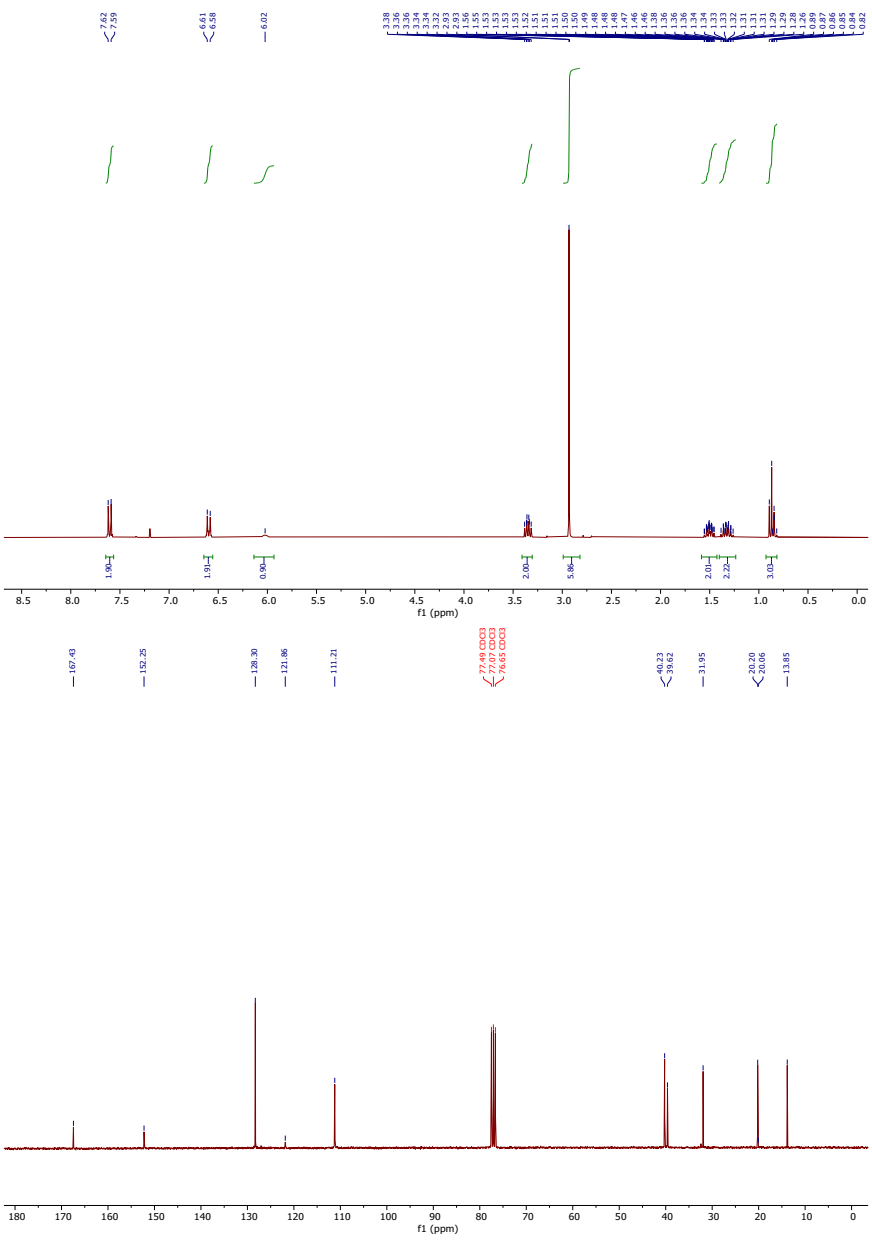


N-butyl-4-(dimethylamino)benzamide (**3ag**)

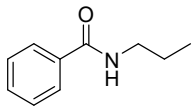


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.60 (d, *J* = 9.0 Hz, 2H), 6.60 (d, *J* = 8.9 Hz, 2H), 6.02 (s, 1H), 3.35 (td, *J* = 7.1, 5.7 Hz, 2H), 2.93 (s, 6H), 1.50 (dtdd, *J* = 8.4, 6.8, 6.0, 0.8 Hz, 2H), 1.40-1.23 (m, 2H), 0.93-0.82 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.43, 152.25, 128.30, 121.86, 111.21, 40.23, 39.62, 31.95, 20.20, 13.85.

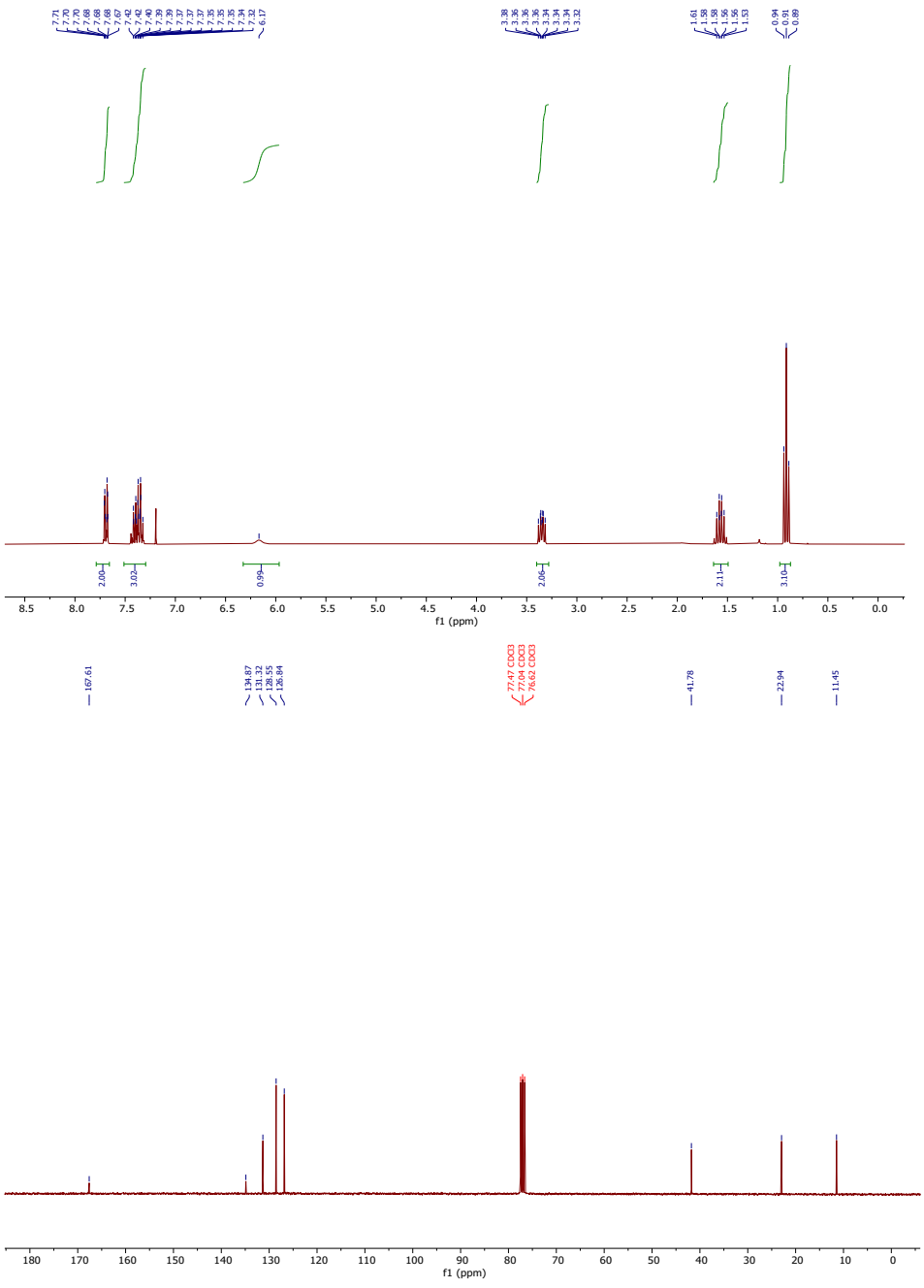


N-propylbenzamide (**3ah**)

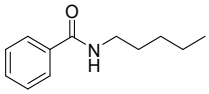


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.79-7.66 (m, 2H), 7.51-7.30 (m, 3H), 6.17 (s, 1H), 3.35 (ddd, *J* = 7.9, 7.1, 5.8 Hz, 2H), 1.64-1.49 (m, 2H), 0.91 (t, *J* = 7.4 Hz, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.61, 134.87, 131.32, 128.55, 126.84, 41.78, 22.94, 11.45.

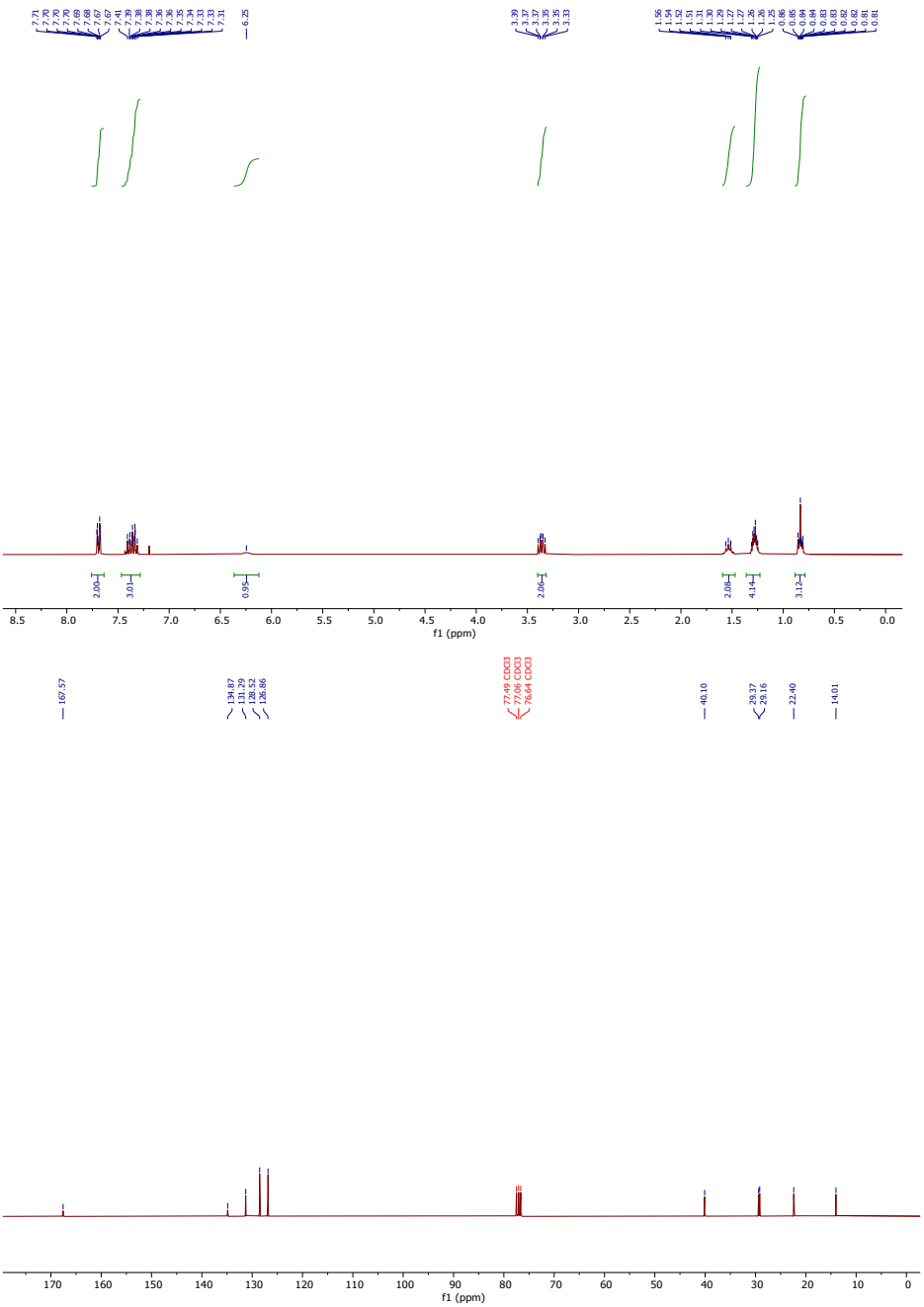


N-pentylbenzamide (**3ai**)

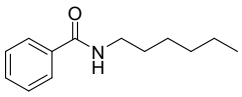


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.76-7.64 (m, 2H), 7.47-7.28 (m, 3H), 6.25 (s, 1H), 3.36 (td, *J* = 7.2, 5.8 Hz, 2H), 1.59-1.47 (m, 2H), 1.28 (dq, *J* = 7.1, 3.5 Hz, 4H), 0.88-0.79 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.57, 134.87, 131.29, 128.52, 126.86, 40.10, 29.37, 29.16, 22.40, 14.01.

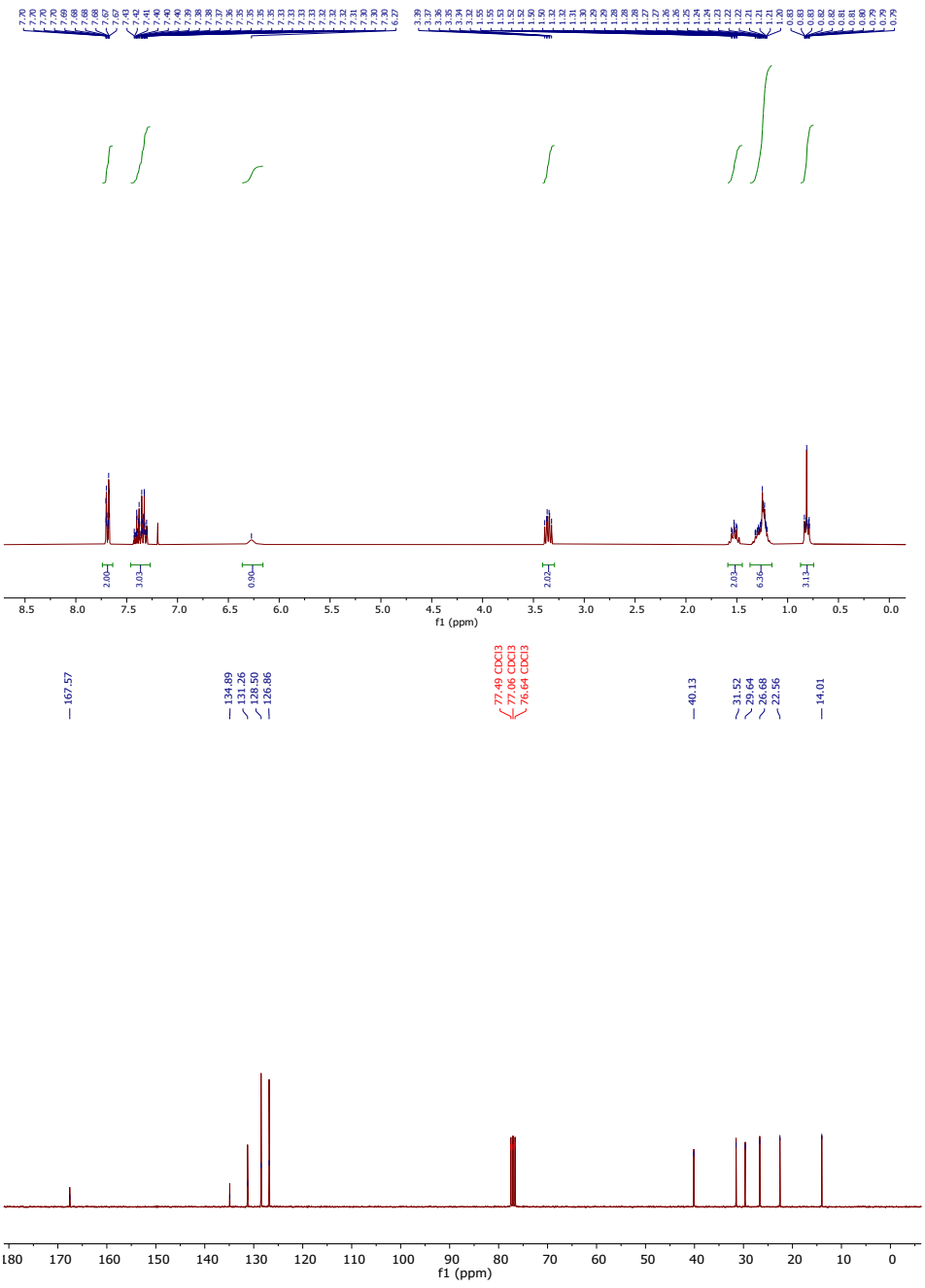


N-hexylbenzamide (**3aj**)

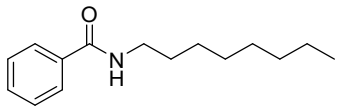


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.74-7.64 (m, 2H), 7.46-7.27 (m, 3H), 6.27 (s, 1H), 3.36 (td, *J* = 7.2, 5.7 Hz, 2H), 1.53 (td, *J* = 7.5, 1.7 Hz, 2H), 1.37-1.15 (m, 6H), 0.87-0.74 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.57, 134.89, 131.26, 128.50, 126.86, 40.13, 31.52, 29.64, 26.68, 22.56, 14.01.

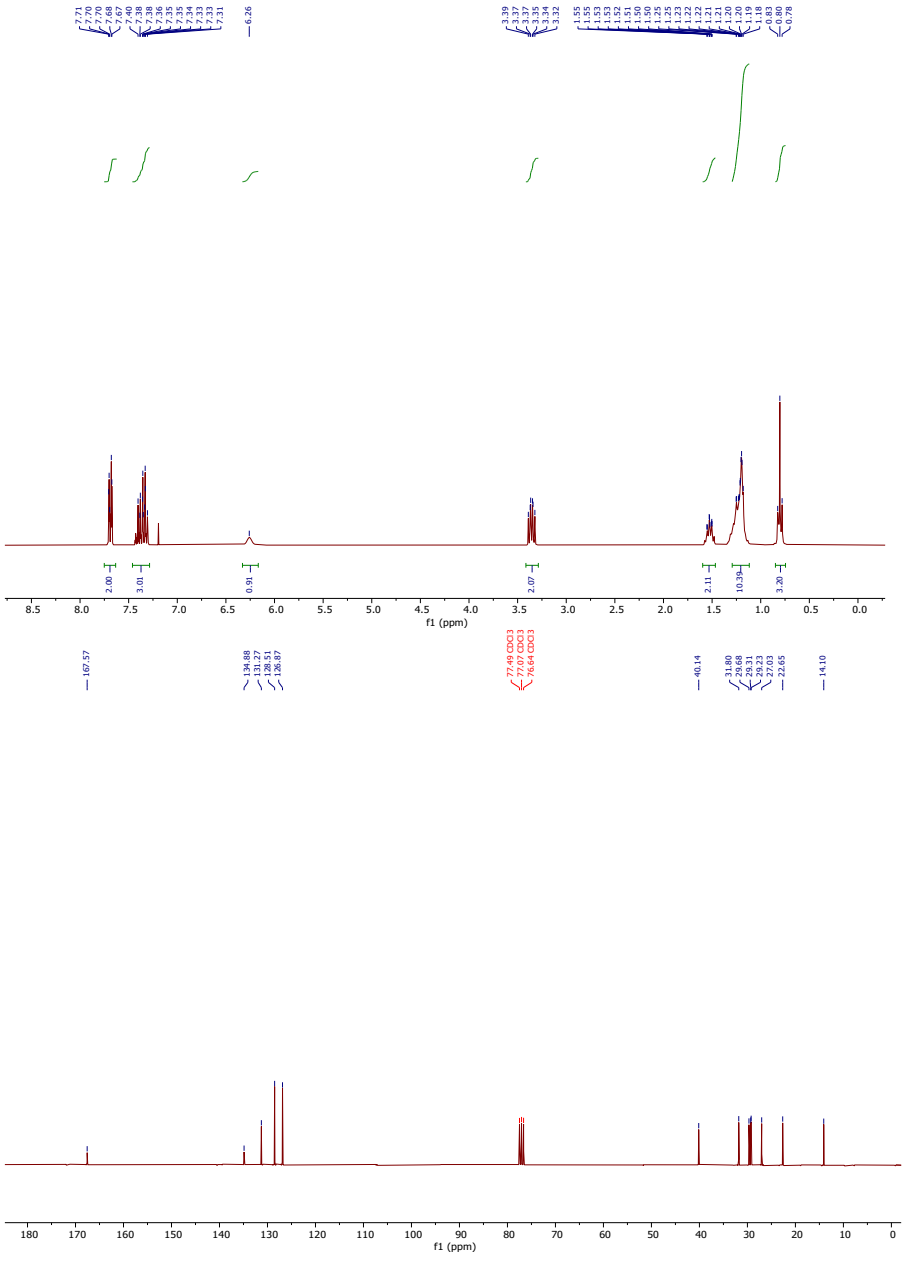


N-octylbenzamide (**3ak**)

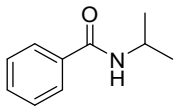


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.75-7.63 (m, 2H), 7.46-7.29 (m, 3H), 6.26 (s, 1H), 3.36 (td, *J* = 7.2, 5.7 Hz, 2H), 1.60-1.47 (m, 2H), 1.29-1.12 (m, 10H), 0.85-0.74 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.57, 134.88, 131.27, 128.51, 126.87, 40.14, 31.80, 29.68, 29.31, 29.23, 27.03, 22.65, 14.10.

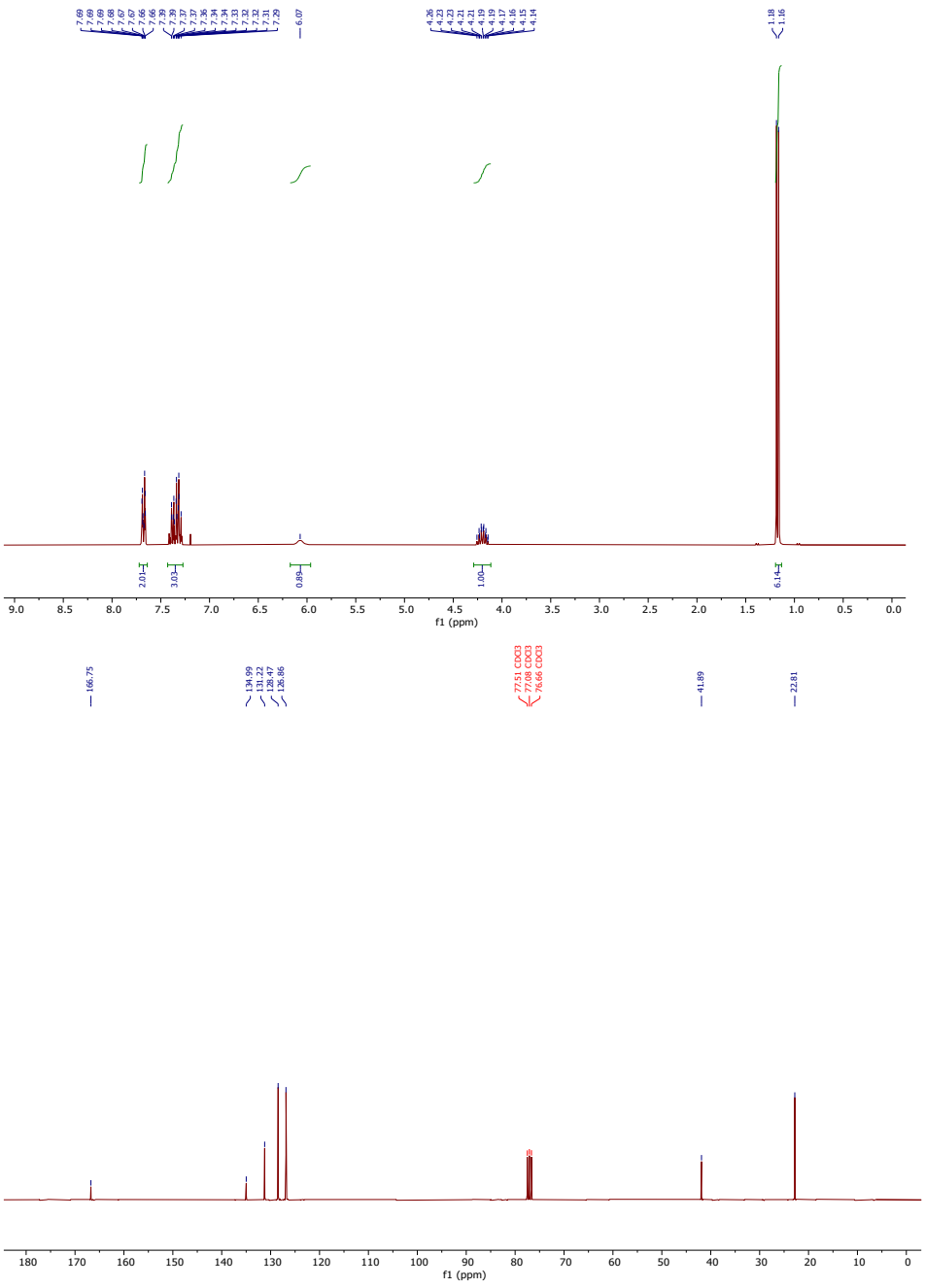


N-isopropylbenzamide (**3al**)

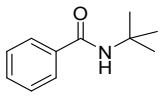


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.72-7.64 (m, 2H), 7.43-7.27 (m, 3H), 6.07 (s, 1H), 4.20 (dp, *J* = 7.9, 6.6 Hz, 1H), 1.17 (d, *J* = 6.5 Hz, 6H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.75, 134.99, 131.22, 128.47, 126.86, 41.89, 22.81.

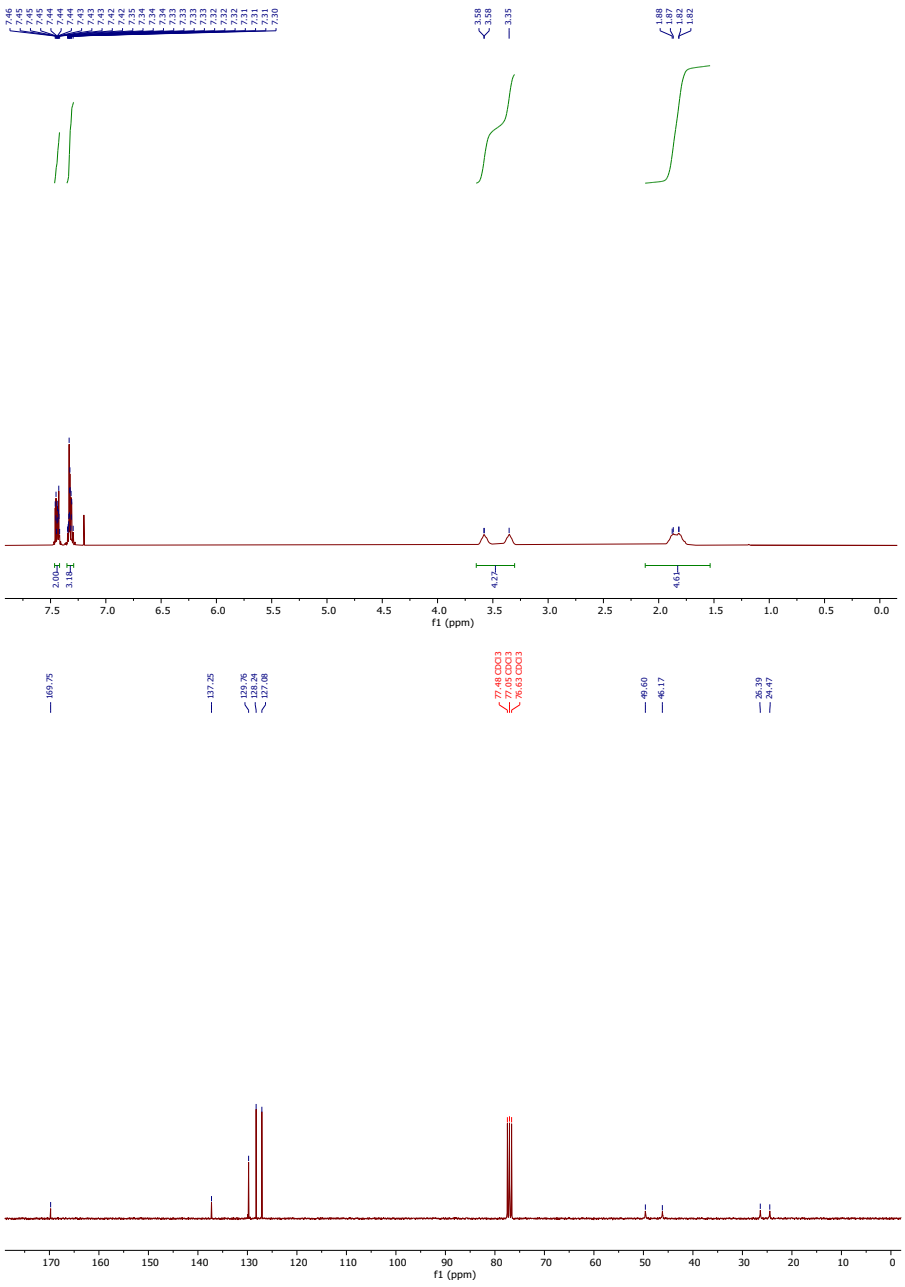


N-(tert-butyl)benzamide (**3am**)

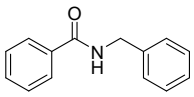


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.46-7.42 (m, 2H), 7.35-7.29 (m, 3H), 3.65-3.30 (m, 4H), 1.85 (d, *J* = 18.0 Hz, 5H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 169.75, 137.25, 129.76, 128.24, 127.08, 49.60, 46.17, 26.39, 24.47.

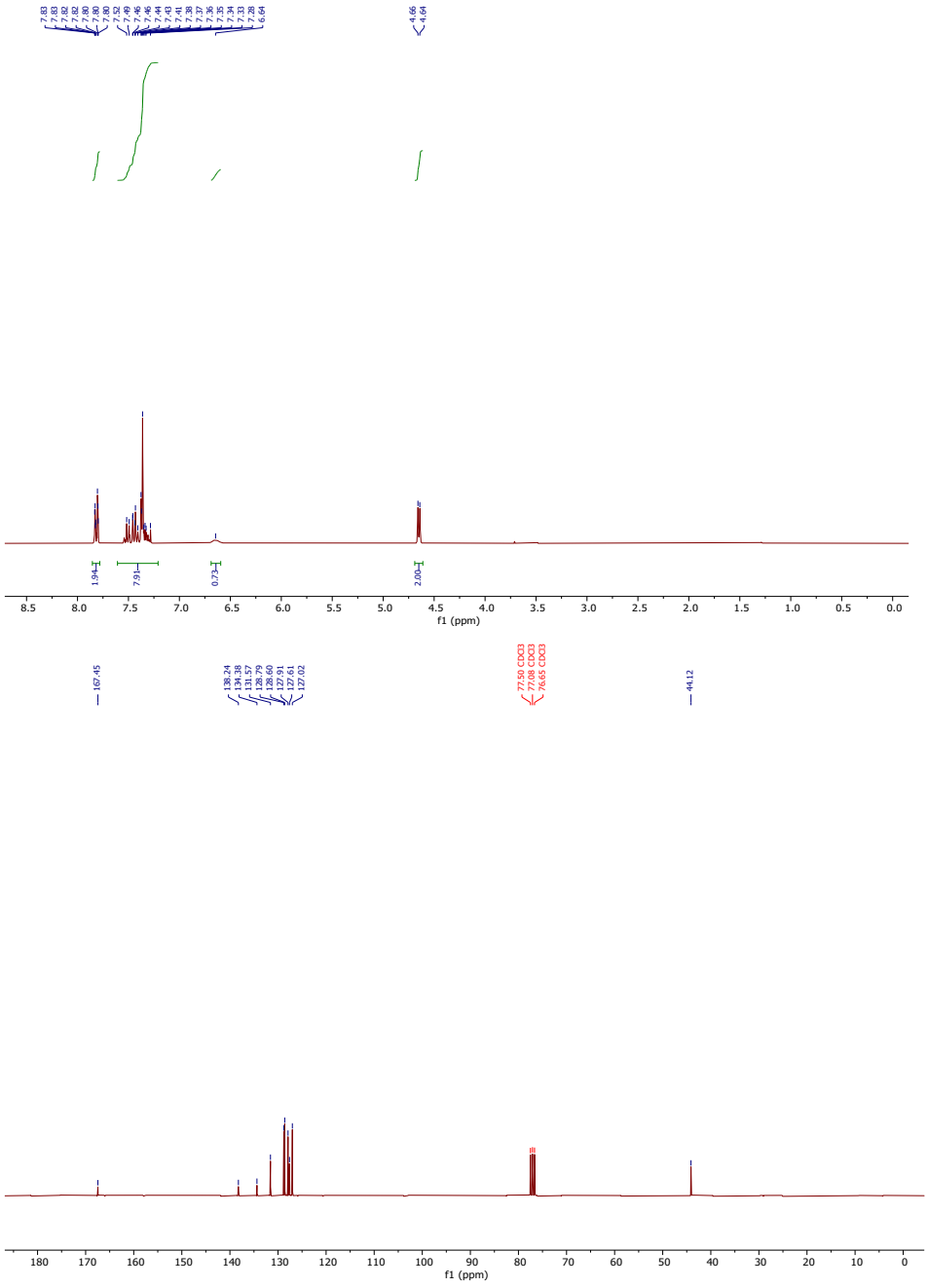


N-benzylbenzamide (**3an**)

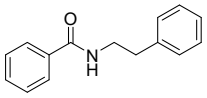


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.85 – 7.78 (m, 2H), 7.61 – 7.21 (m, 8H), 6.64 (s, 1H), 4.65 (d, *J* = 5.6 Hz, 2H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.45, 138.24, 134.38, 131.57, 128.79, 128.60, 127.91, 127.61, 127.02, 44.12.

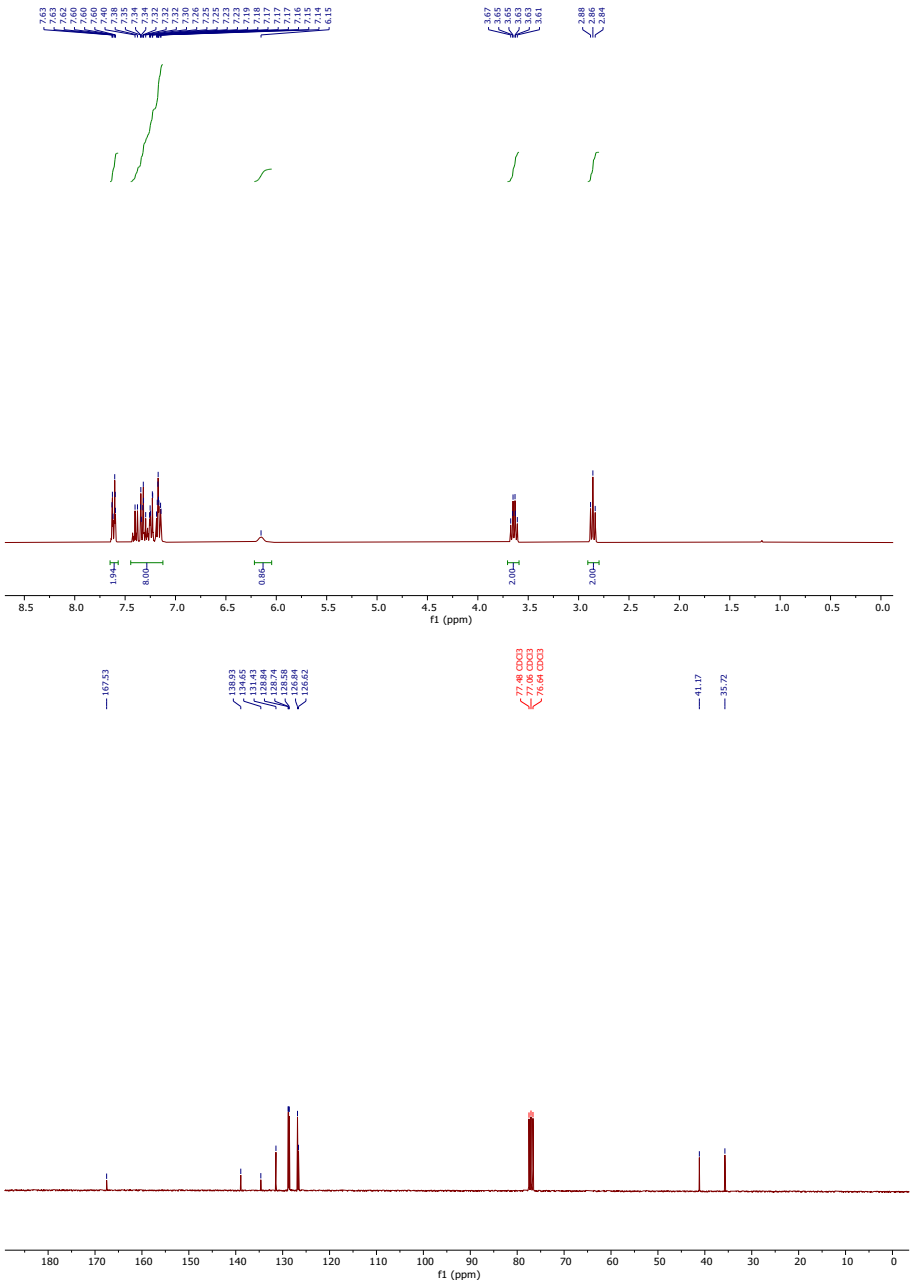


N-phenethylbenzamide (**3ao**)

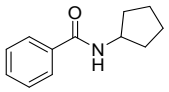


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.65-7.57 (m, 2H), 7.44-7.13 (m, 8H), 6.15 (s, 1H), 3.64 (td, *J* = 6.9, 5.8 Hz, 2H), 2.86 (t, *J* = 6.9 Hz, 2H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.53, 138.93, 134.65, 131.43, 128.84, 128.74, 128.58, 126.84, 126.62, 41.17, 35.72.

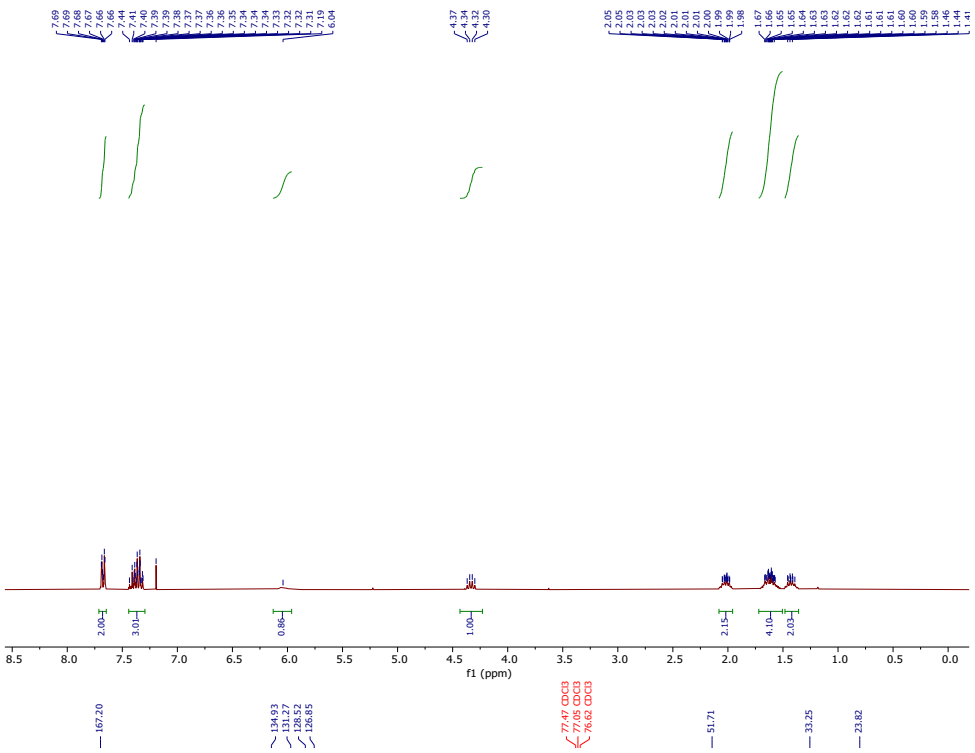


N-cyclopentylbenzamide (**3ap**)

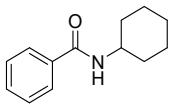


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.71-7.65 (m, 2H), 7.44-7.29 (m, 3H), 6.04 (s, 1H), 4.33 (q, *J* = 6.9 Hz, 1H), 2.08-1.96 (m, 2H), 1.72-1.51 (m, 4H), 1.48-1.36 (m, 2H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 167.20, 134.93, 131.27, 128.52, 126.85, 51.71, 33.25, 23.82.

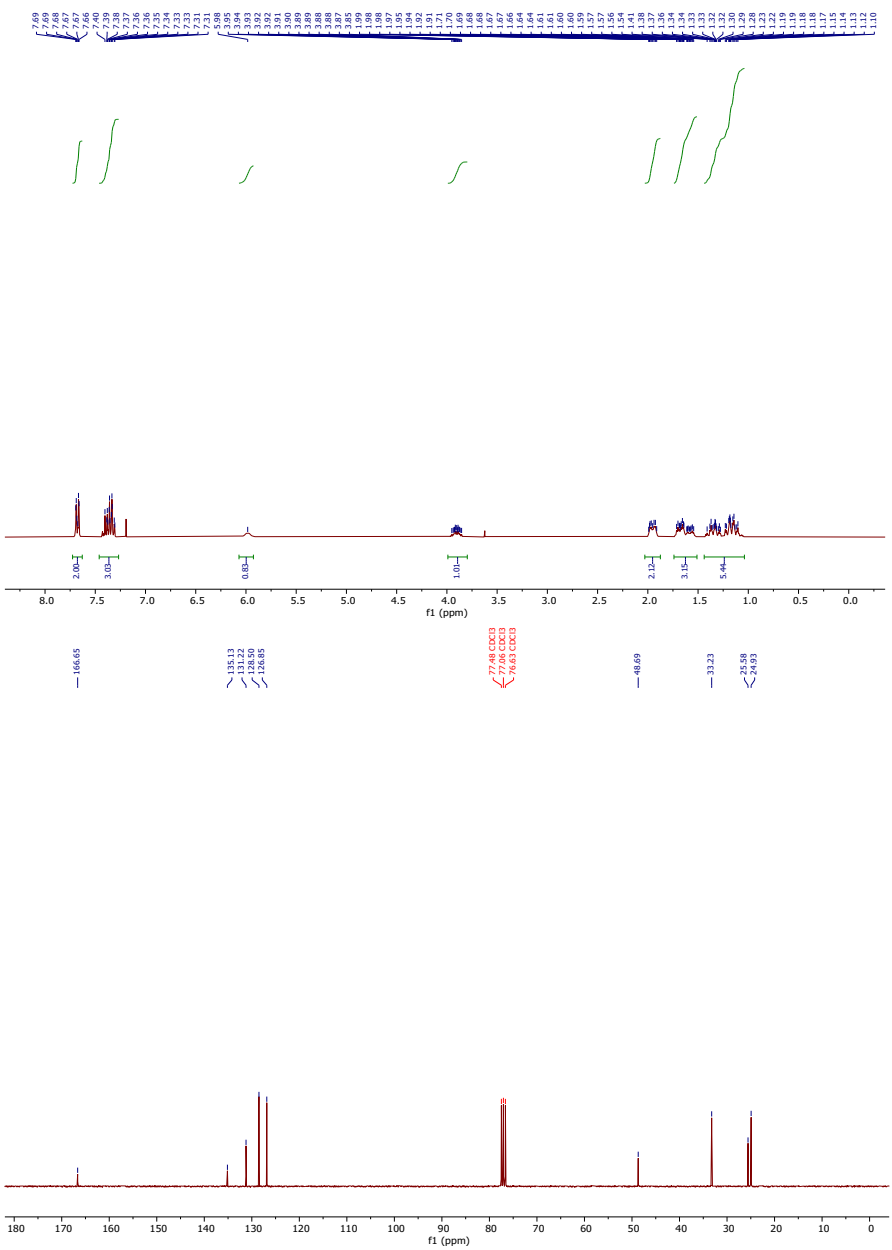


N-cyclohexylbenzamide (**3aq**)

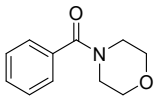


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.73-7.63 (m, 2H), 7.46-7.27 (m, 3H), 5.98 (s, 1H), 3.90 (dddd, *J* = 10.6, 8.1, 6.6, 4.0 Hz, 1H), 1.96 (dp, *J* = 12.0, 3.9, 3.2 Hz, 2H), 1.74-1.51 (m, 3H), 1.44-1.04 (m, 5H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.65, 135.13, 131.22, 128.50, 126.85, 48.69, 33.23, 25.58, 24.93.

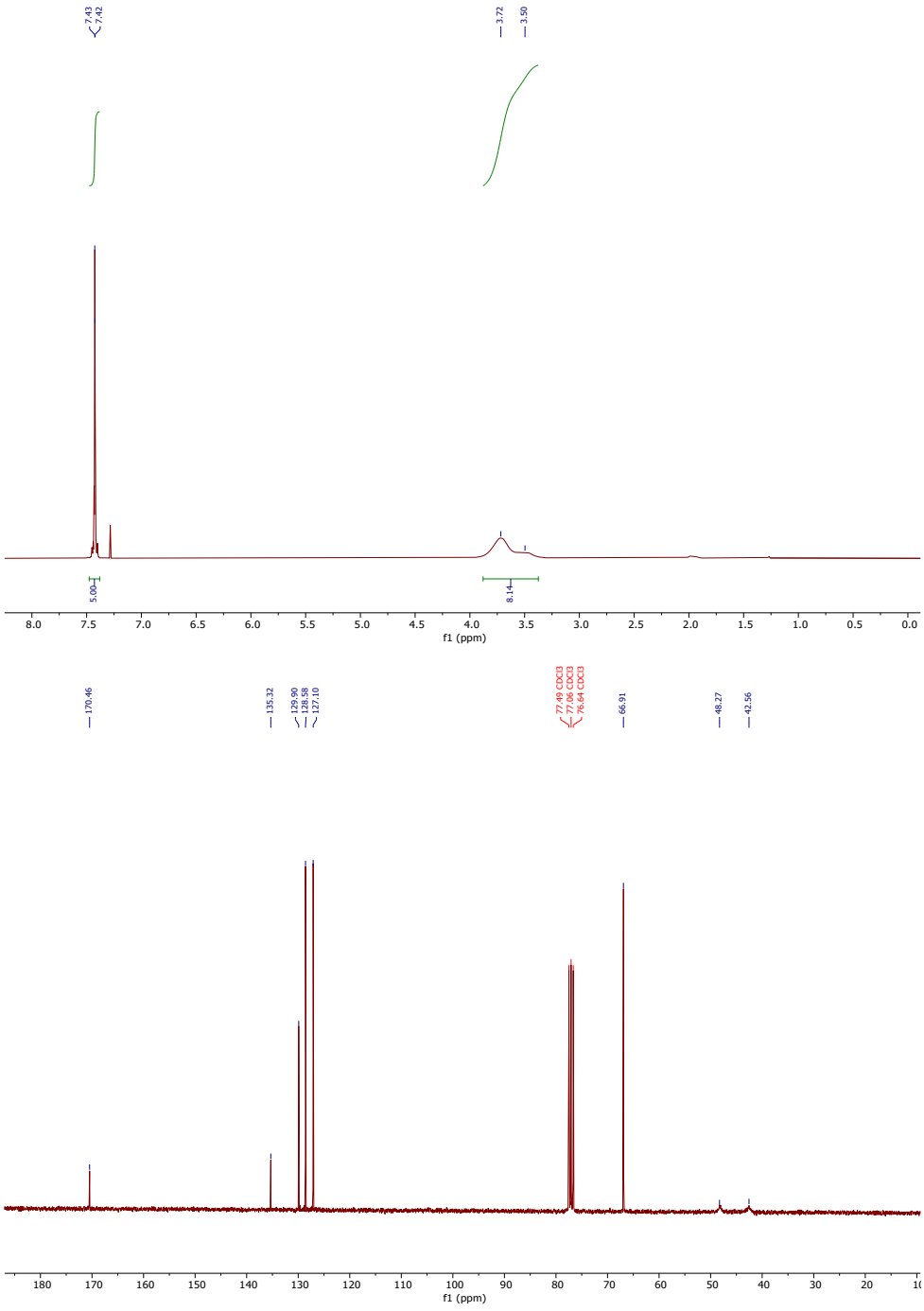


Morpholino(phenyl)methanone (**3ar**)

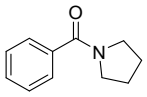


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.42 (d, *J* = 0.8 Hz, 5H), 3.61 (d, *J* = 66.2 Hz, 8H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 170.46, 135.32, 129.90, 128.58, 127.10, 66.91, 48.27, 42.56.

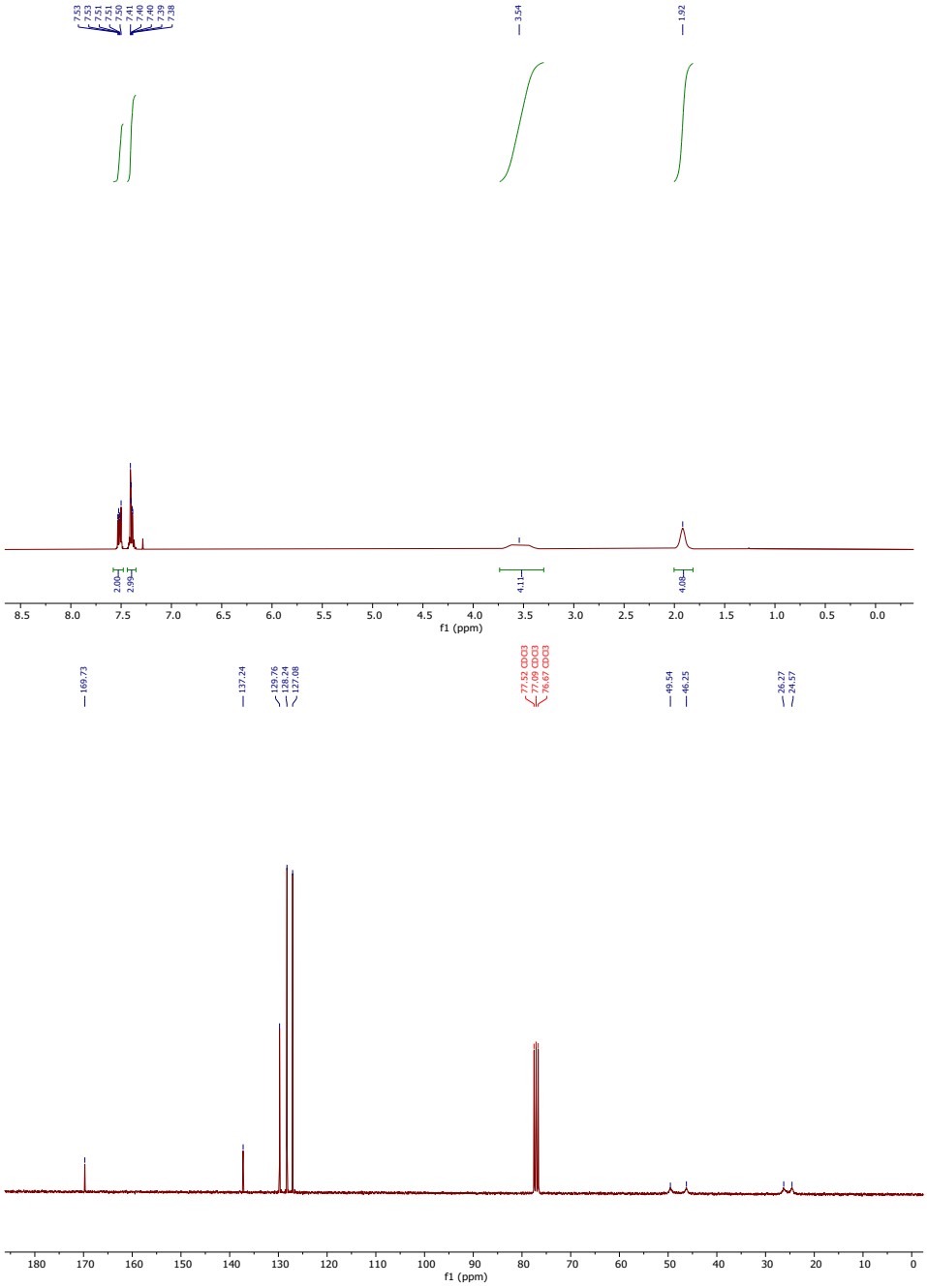


Phenyl(pyrrolidin-1-yl)methanone (**3as**)

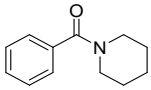


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.58-7.48 (m, 2H), 7.40 (dd, *J* = 5.0, 1.9 Hz, 3H), 3.54 (s, 4H), 1.92 (s, 4H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 169.73, 137.24, 129.76, 128.24, 127.08, 49.54, 46.25, 26.27, 24.57.

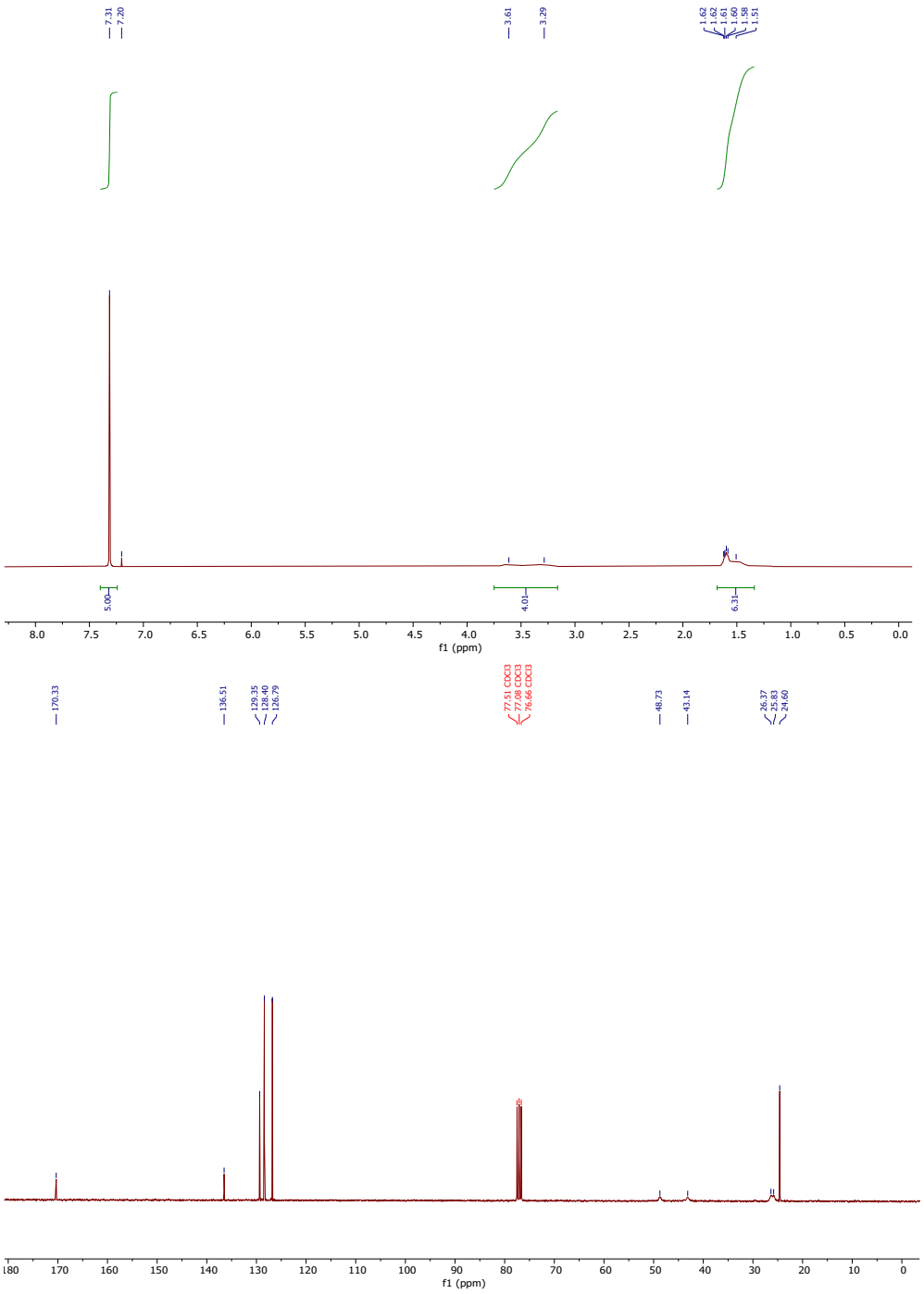


Phenyl(piperidin-1-yl)methanone (**3at**)

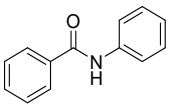


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.31 (s, 5H), 3.45 (d, *J* = 98.4 Hz, 4H), 1.68-1.34 (m, 6H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 170.33, 136.51, 129.35, 128.40, 126.79, 48.73, 43.14, 26.37, 25.83, 24.60.

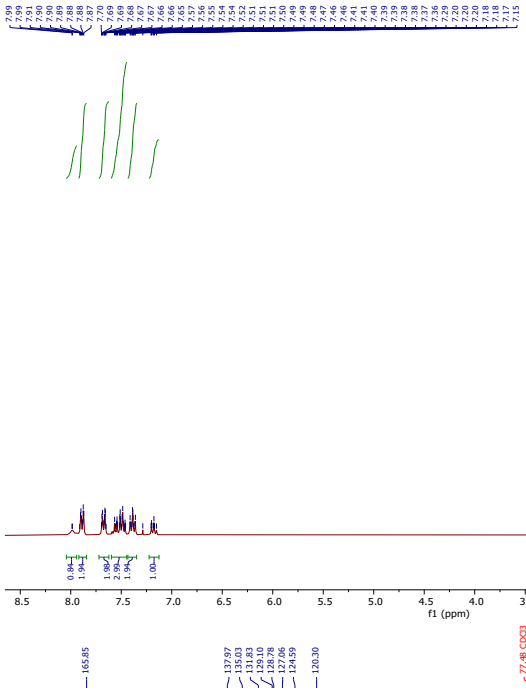


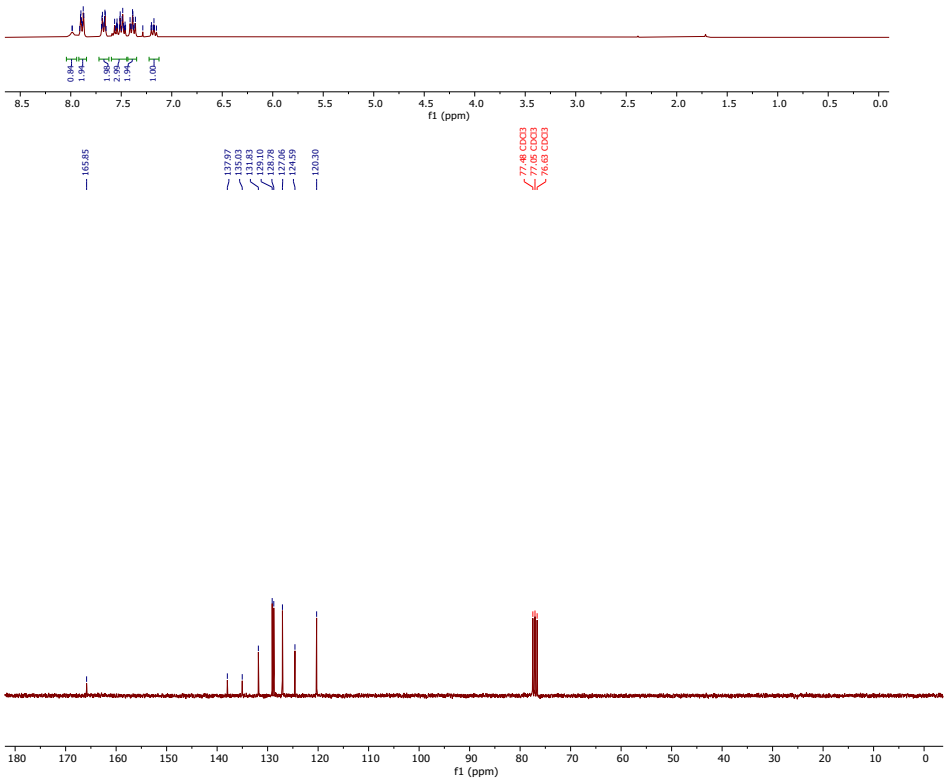
N-phenylbenzamide (**4a**)



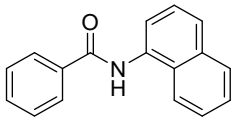
^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.04-7.94 (m, 1H), 7.92-7.84 (m, 2H), 7.72-7.62 (m, 2H), 7.60-7.45 (m, 3H), 7.43-7.35 (m, 2H), 7.22-7.13 (m, 1H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.85, 137.97, 135.03, 131.83, 129.10, 128.78, 127.06, 124.59, 120.30.



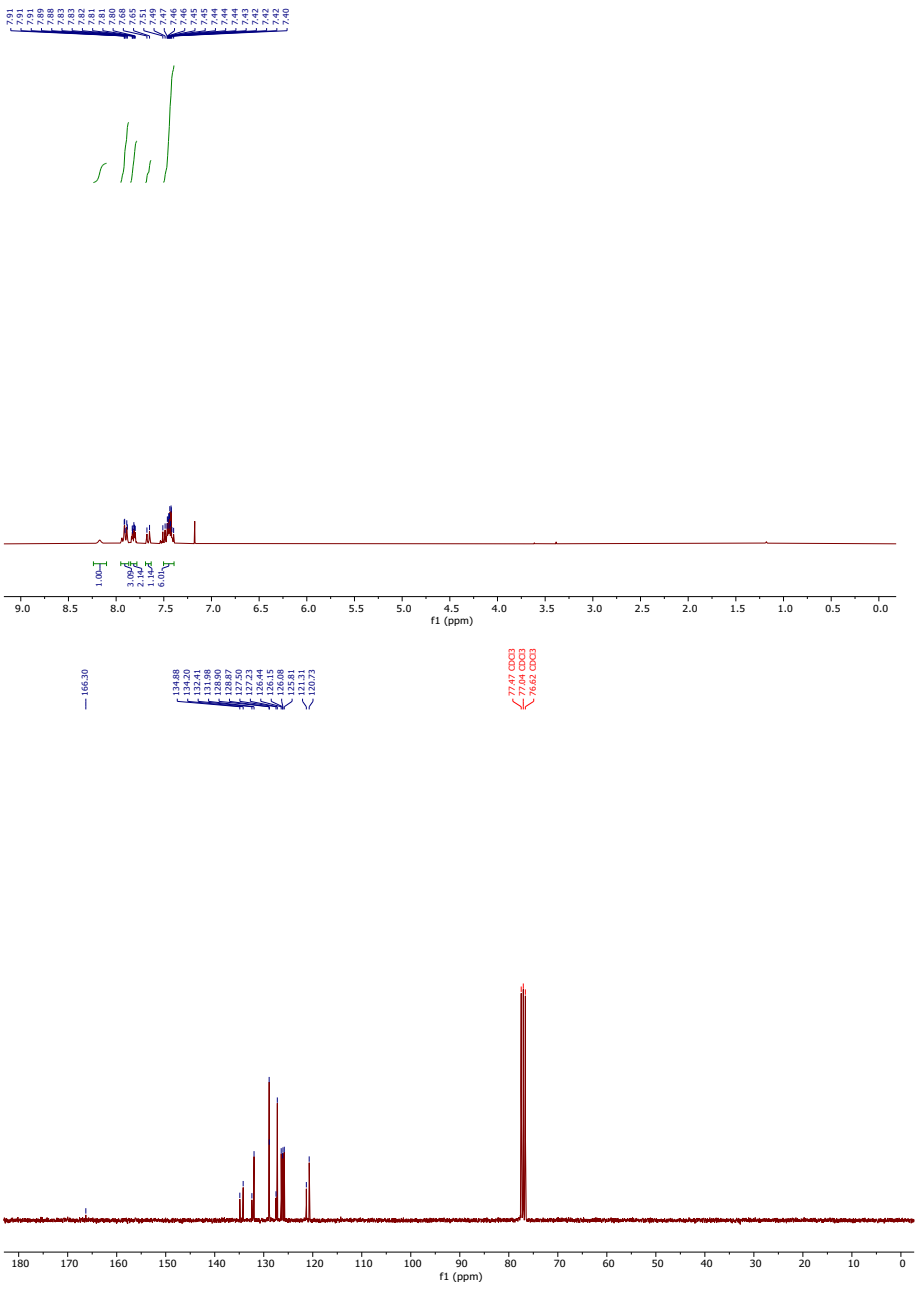


N-(naphthalen-1-yl)benzamide (**4b**)

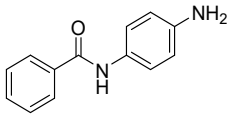


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.17 (s, 1H), 7.90 (dd, *J* = 8.3, 1.5 Hz, 3H), 7.85-7.78 (m, 2H), 7.66 (d, *J* = 8.2 Hz, 1H), 7.50-7.39 (m, 6H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.30, 134.88, 134.20, 132.41, 131.98, 128.90, 128.87, 127.50, 127.23, 126.44, 126.15, 126.08, 125.81, 121.31, 120.73.

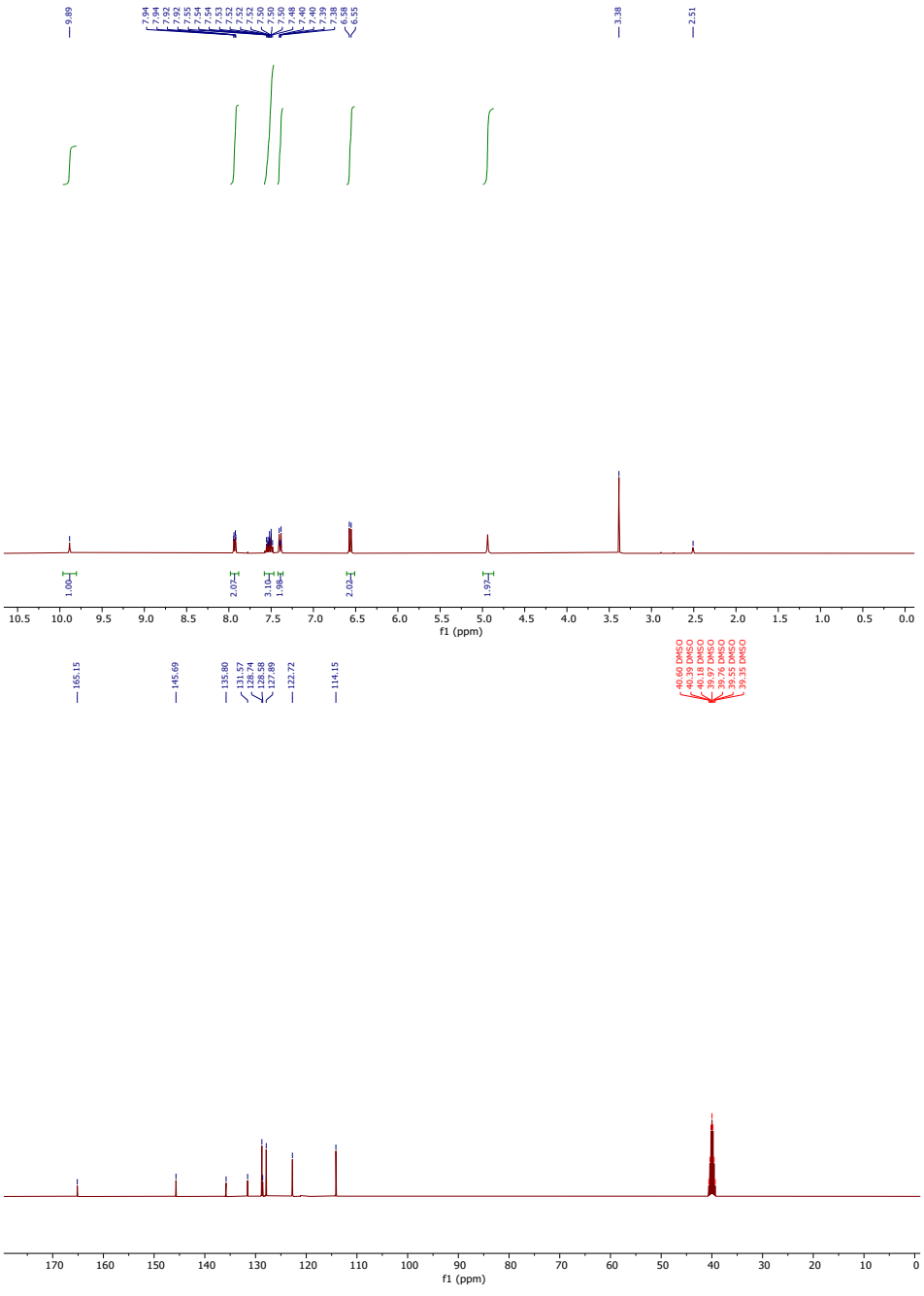


N-(4-aminophenyl)benzamide (**4c**)

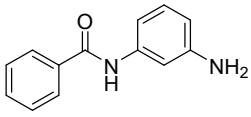


^{1}H NMR (400 MHz, DMSO-d_6) δ 9.89 (s, 1H), 7.98-7.88 (m, 2H), 7.58-7.47 (m, 3H), 7.42-7.36 (m, 2H), 6.56 (d, J = 8.7 Hz, 2H), 4.94 (s, 2H).

^{13}C NMR (101 MHz, DMSO-d_6) δ 165.15, 145.69, 135.80, 131.57, 128.74, 128.58, 127.89, 122.72, 114.15.

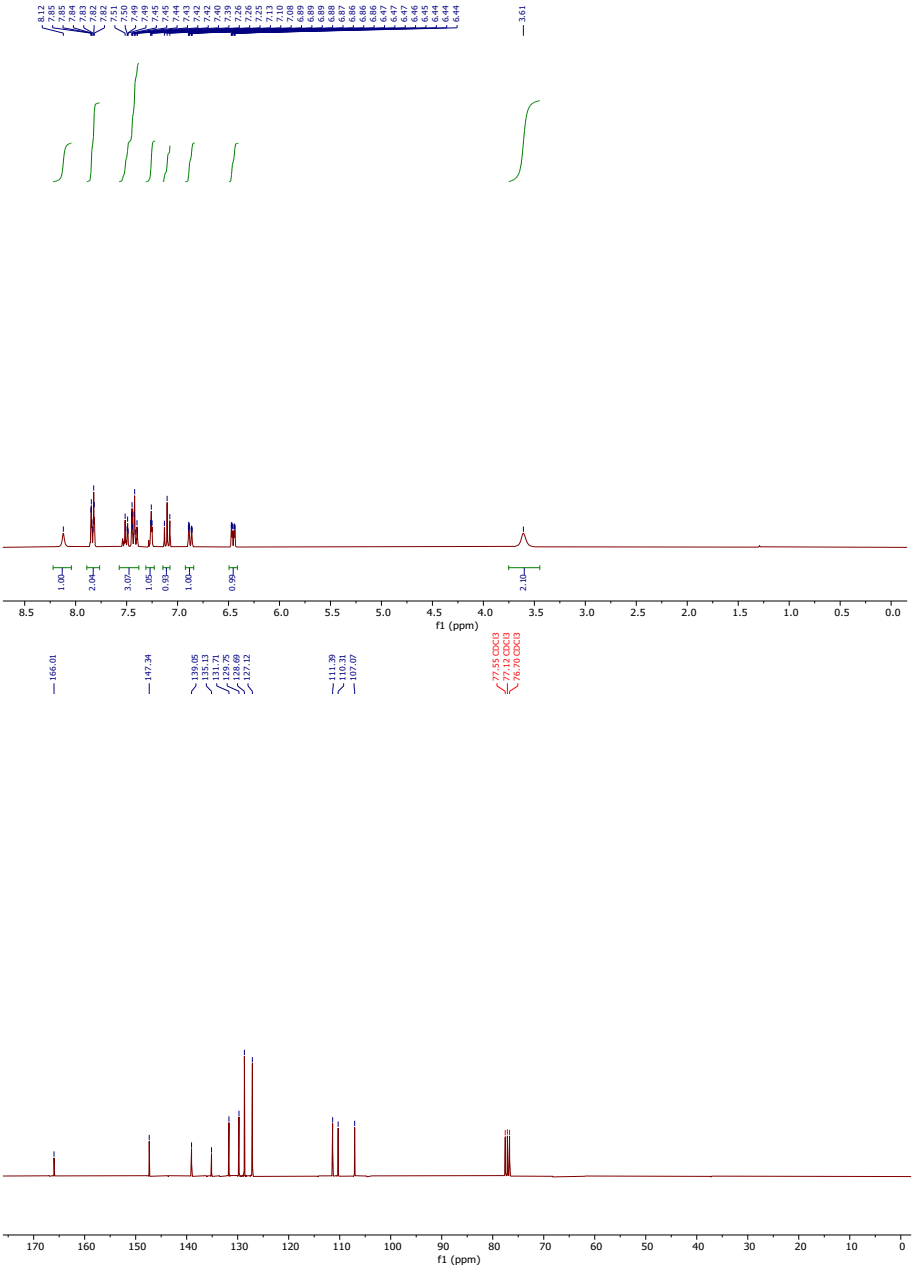


N-(3-aminophenyl)benzamide (**4d**)

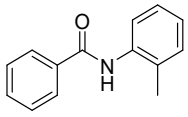


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.12 (s, 1H), 7.89-7.76 (m, 2H), 7.57-7.38 (m, 3H), 7.26 (t, *J* = 2.1 Hz, 1H), 7.10 (t, *J* = 8.0 Hz, 1H), 6.88 (ddd, *J* = 8.0, 2.1, 0.9 Hz, 1H), 6.45 (ddd, *J* = 8.0, 2.3, 1.0 Hz, 1H), 3.61 (s, 2H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.01, 147.34, 139.05, 135.13, 131.71, 129.75, 128.69, 127.12, 111.39, 110.31, 107.07.

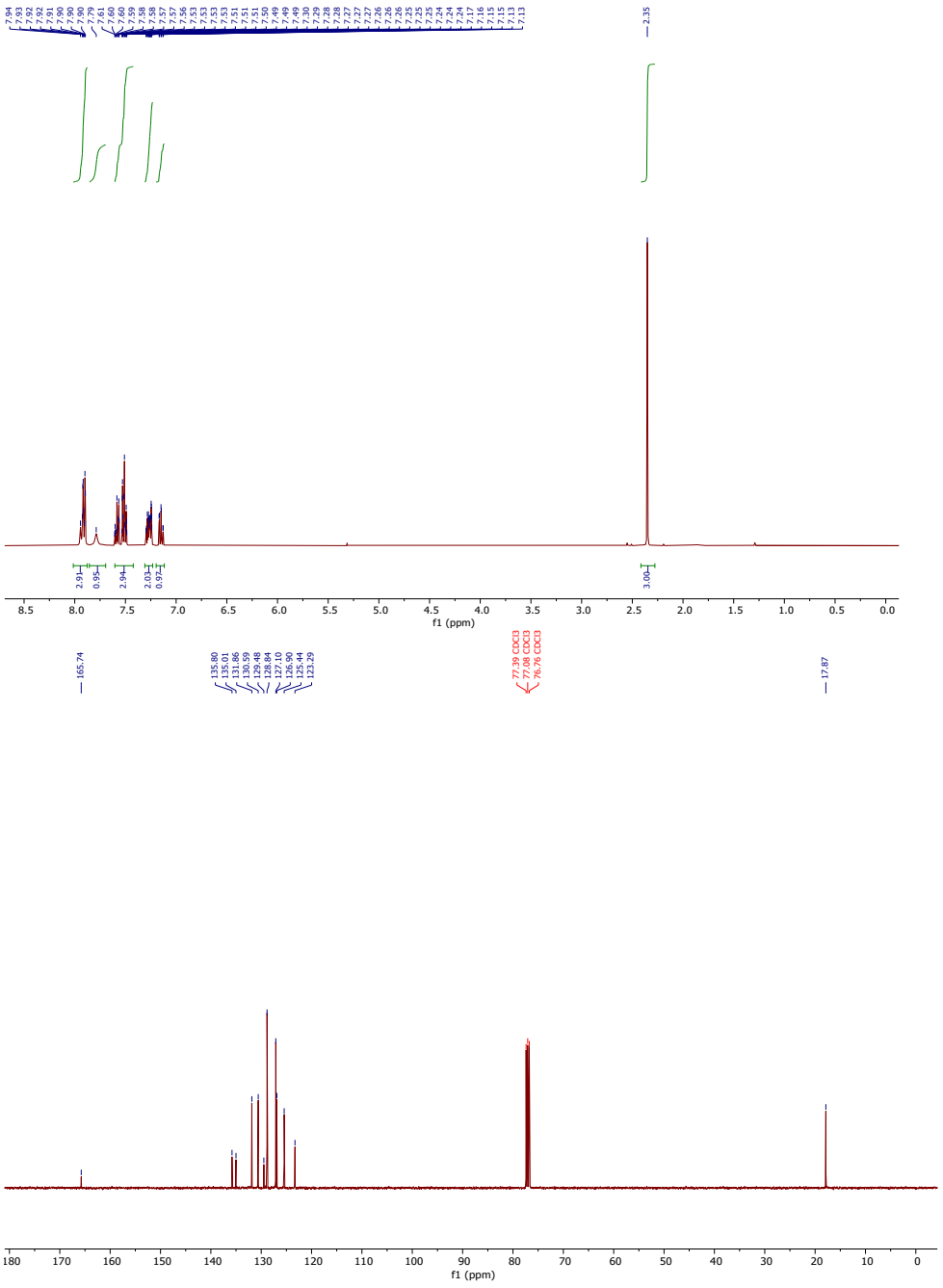


N-(o-tolyl)benzamide (**4e**)

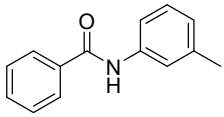


^{1}H NMR (400 MHz, Chloroform-*d*) δ 8.01-7.88 (m, 3H), 7.79 (s, 1H), 7.60-7.42 (m, 3H), 7.31-7.23 (m, 2H), 7.15 (td, *J* = 7.5, 1.3 Hz, 1H), 2.35 (s, 3H).

^{13}C NMR (101 MHz, Chloroform-*d*) δ 165.74, 135.80, 135.01, 131.86, 130.59, 129.48, 128.84, 127.10, 126.90, 125.44, 123.29, 17.87.

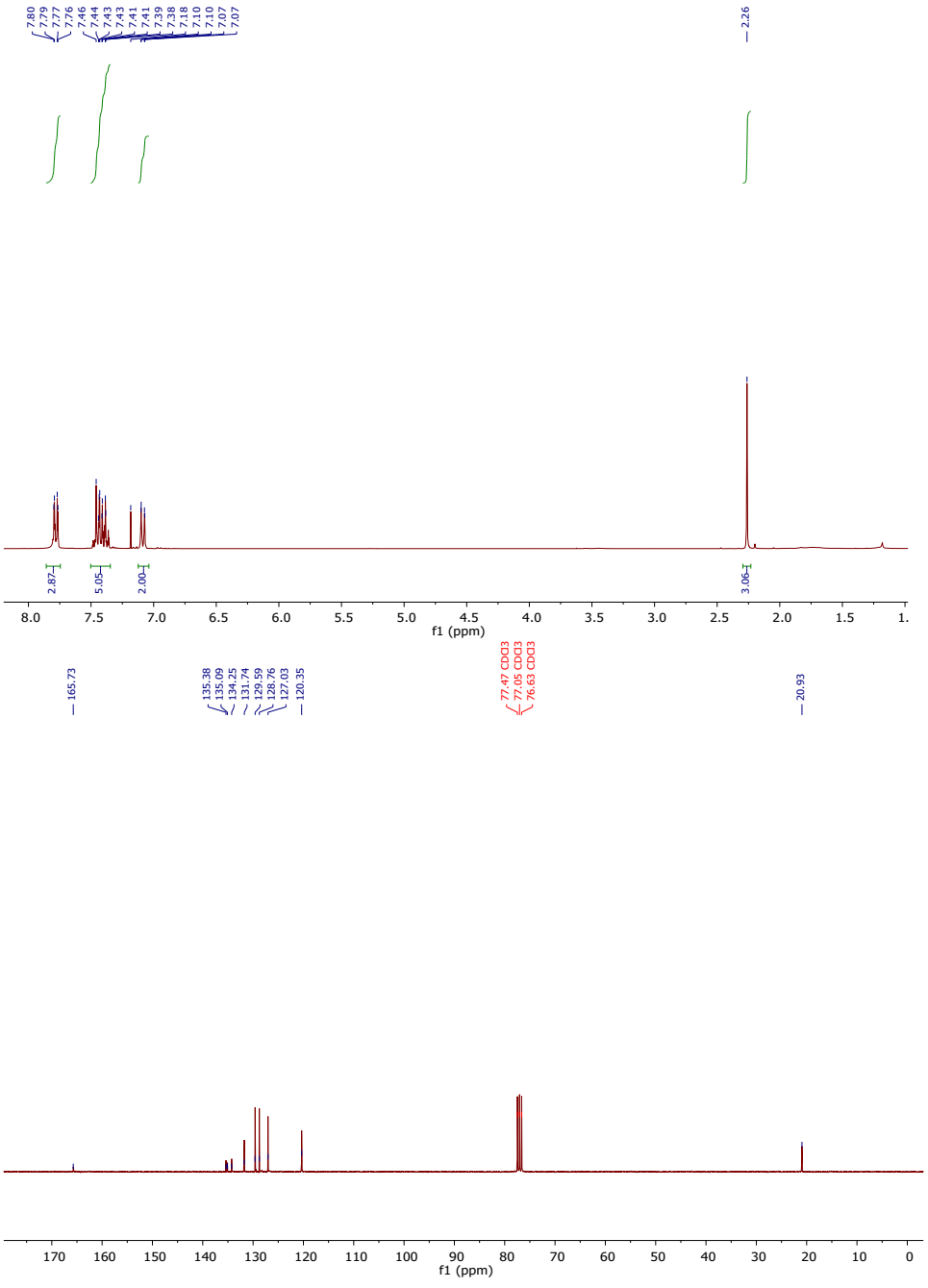


N-(m-tolyl)benzamide (**4f**)

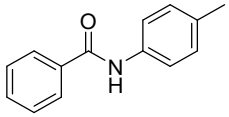


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.78 (dd, *J* = 8.2, 1.4 Hz, 3H), 7.50-7.35 (m, 5H), 7.09 (dd, *J* = 8.7, 0.8 Hz, 2H), 2.26 (s, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.73, 135.38, 135.09, 134.25, 131.74, 129.59, 128.76, 127.03, 120.35, 20.93.

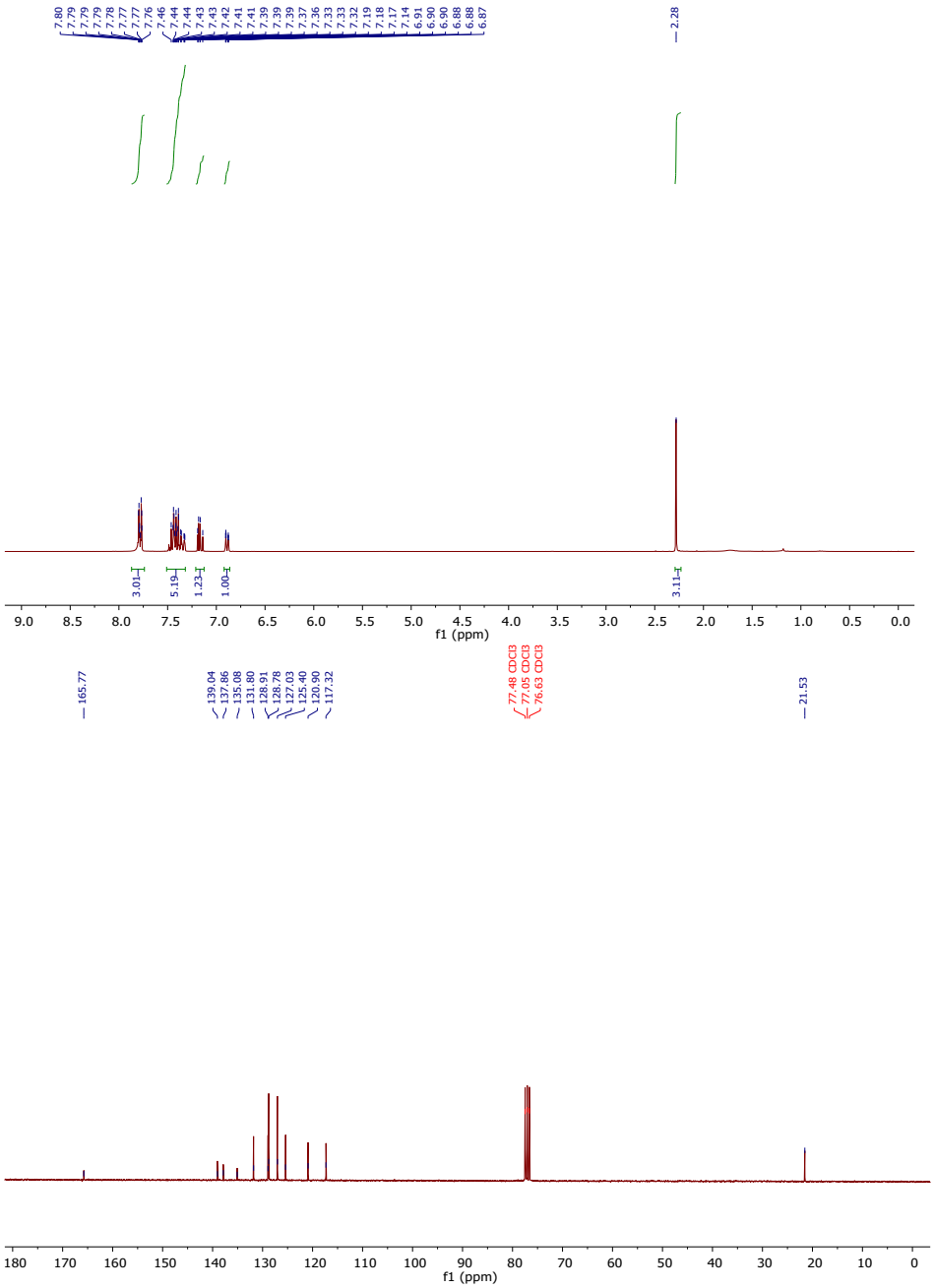


N-(p-tolyl)benzamide (**4g**)

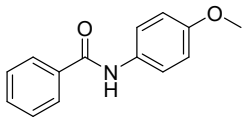


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.87-7.74 (m, 3H), 7.51-7.32 (m, 5H), 7.21-7.13 (m, 1H), 6.89 (dt, *J* = 7.6, 0.9 Hz, 1H), 2.28 (s, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.77, 139.04, 137.86, 131.80, 128.91, 128.78, 127.03, 125.40, 120.90, 117.32, 21.53.

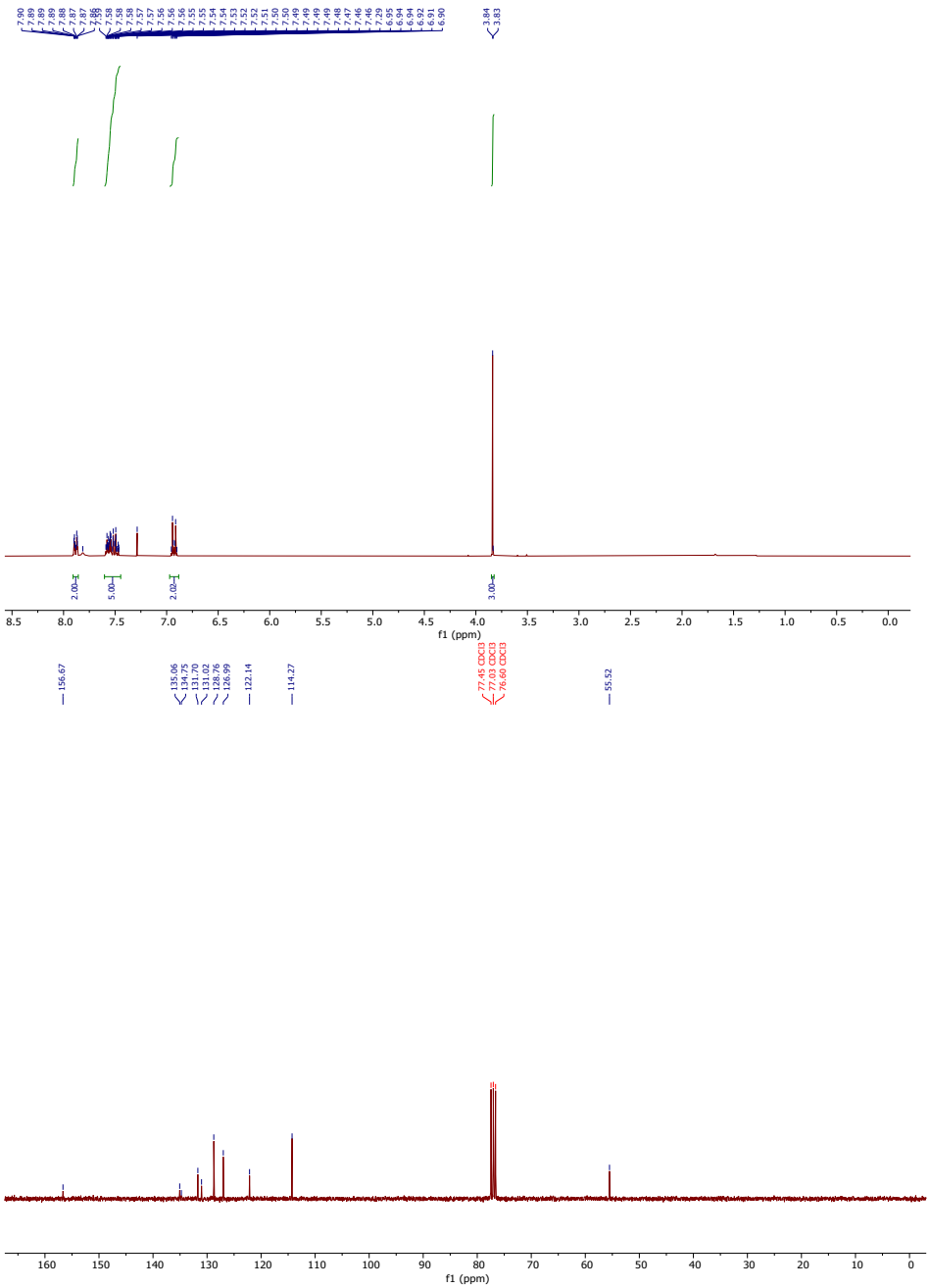


N-(4-methoxyphenyl)benzamide (**4h**)

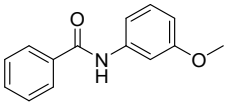


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.91-7.86 (m, 2H), 7.60-7.45 (m, 5H), 6.97-6.88 (m, 2H), 3.84 (s, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 156.67, 135.06, 131.70, 131.02, 128.76, 126.99, 122.14, 114.27, 55.52.

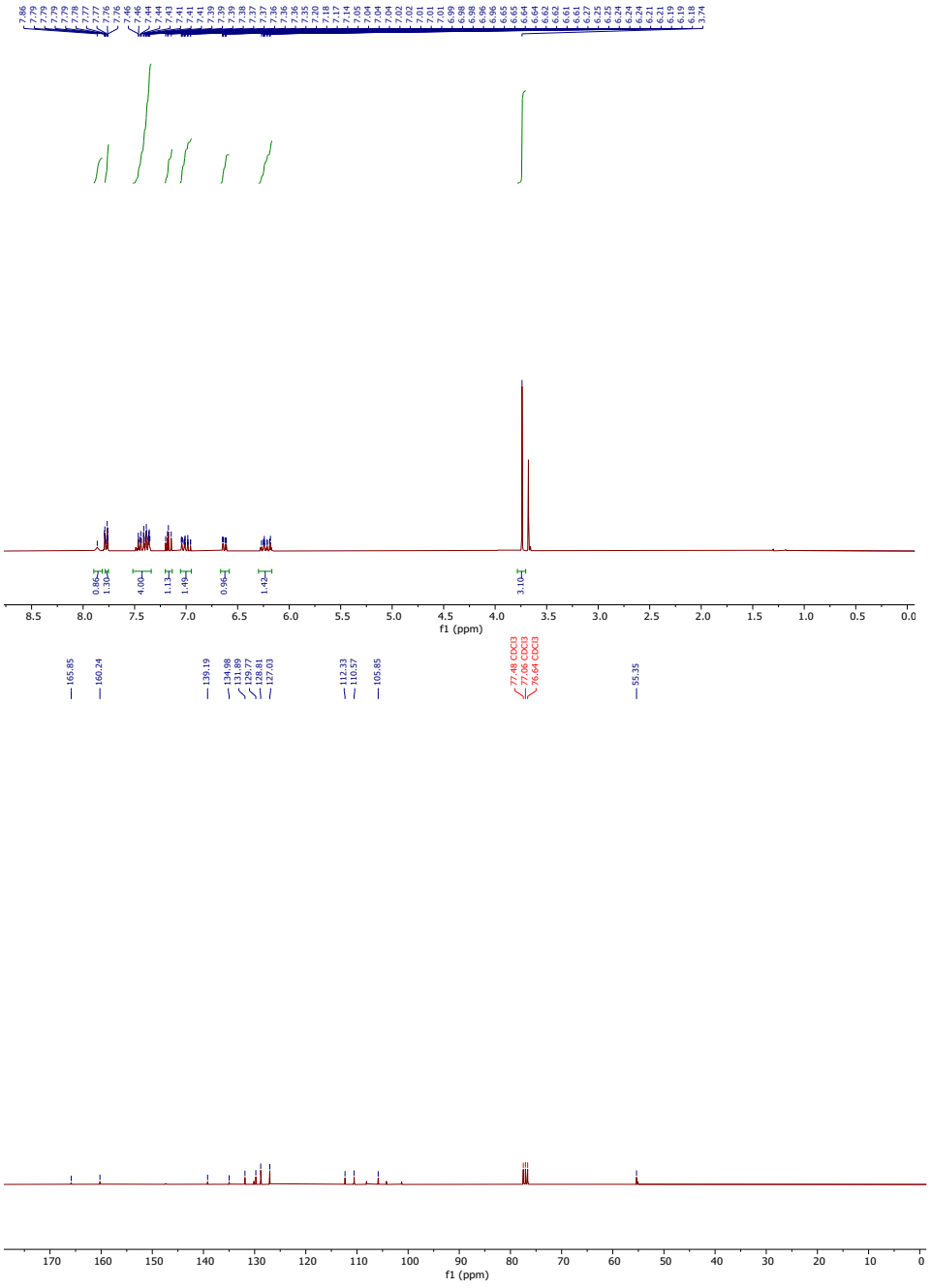


N-(3-methoxyphenyl)benzamide (**4i**)

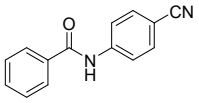


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.86 (s, 1H), 7.79-7.75 (m, 1H), 7.52-7.34 (m, 4H), 7.20-7.13 (m, 1H), 7.05-6.95 (m, 1H), 6.63 (ddd, *J* = 8.2, 2.5, 1.0 Hz, 1H), 6.30-6.17 (m, 1H), 3.74 (s, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.85, 160.24, 139.19, 134.98, 131.89, 129.77, 128.81, 127.03, 112.33, 110.57, 105.85, 55.35.

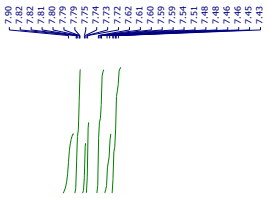


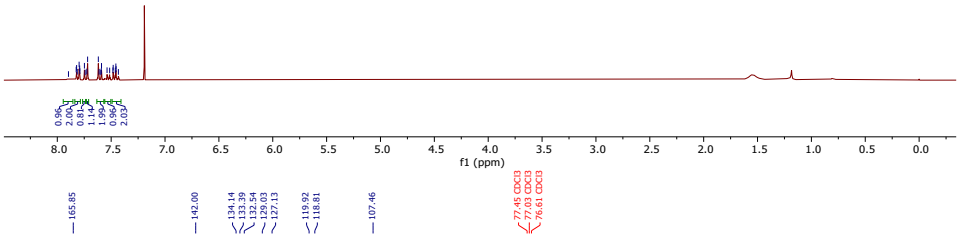
N-(4-cyanophenyl)benzamide (**4j**)

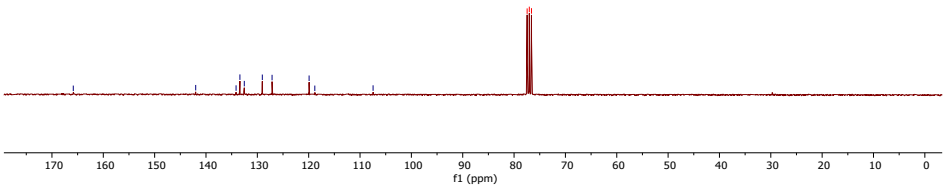


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.90 (s, 1H), 7.84-7.79 (m, 2H), 7.74 (d, *J* = 2.0 Hz, 1H), 7.72 (d, *J* = 2.1 Hz, 1H), 7.63-7.57 (m, 2H), 7.53 (d, *J* = 7.3 Hz, 1H), 7.49-7.41 (m, 2H).

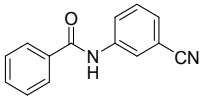
^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.85, 142.00, 134.14, 133.39, 132.54, 129.03, 127.13, 119.92, 118.81, 107.46.





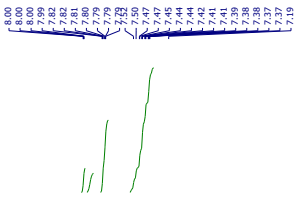


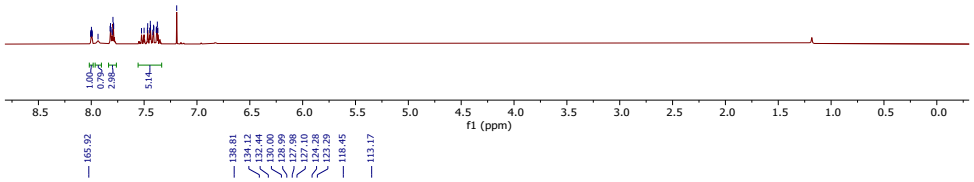
N-(3-cyanophenyl)benzamide (**4k**)

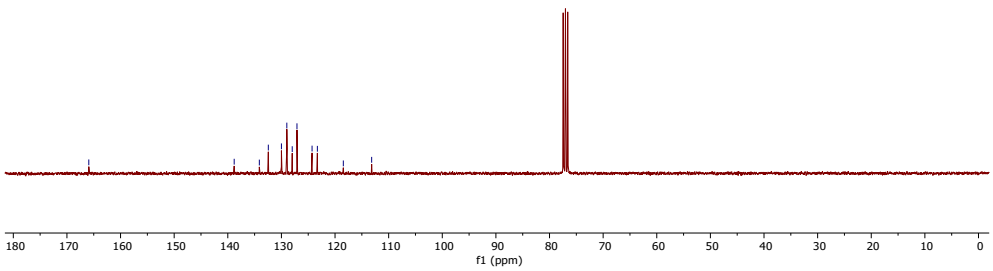


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.00 (ddd, *J* = 2.2, 1.5, 0.6 Hz, 1H), 7.94 (s, 1H), 7.84-7.76 (m, 3H), 7.56-7.33 (m, 5H).

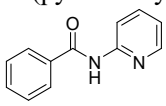
^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.92, 138.81, 134.12, 132.44, 130.00, 128.99, 127.98, 127.10, 124.28, 123.29, 118.45, 113.17.





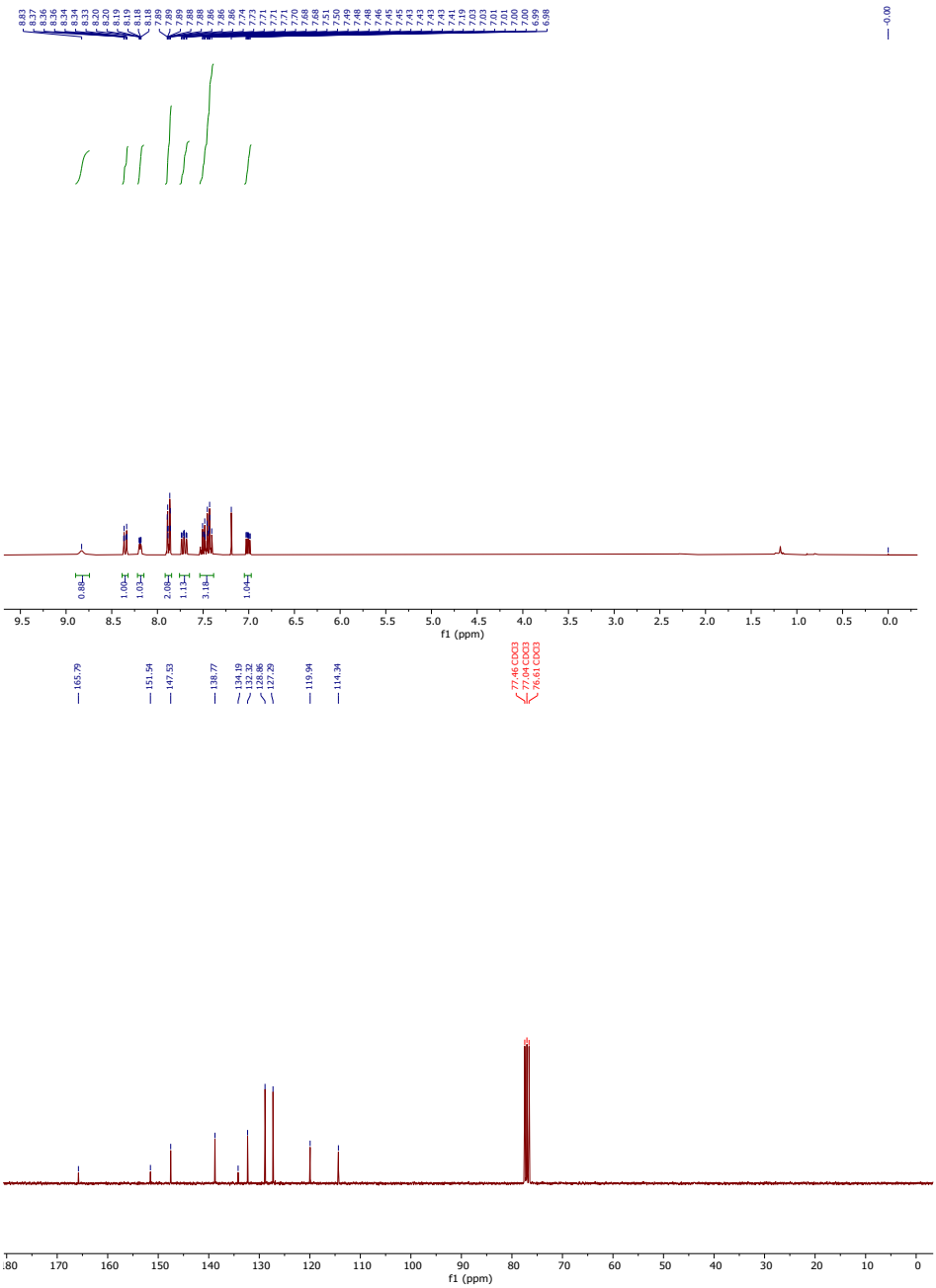


N-(pyridin-2-yl)benzamide (**4l**)

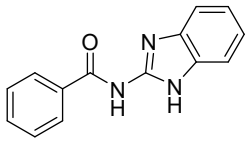


^{1}H NMR (300 MHz, Chloroform-*d*) δ 8.83 (s, 1H), 8.35 (dt, *J* = 8.4, 1.0 Hz, 1H), 8.19 (dt, *J* = 4.1, 1.1 Hz, 1H), 7.92-7.84 (m, 2H), 7.71 (ddd, *J* = 8.4, 7.4, 1.9 Hz, 1H), 7.54-7.38 (m, 3H), 7.01 (ddd, *J* = 7.4, 5.0, 1.0 Hz, 1H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 165.79, 151.54, 147.53, 138.77, 134.19, 132.32, 128.86, 127.29, 119.94, 114.34.

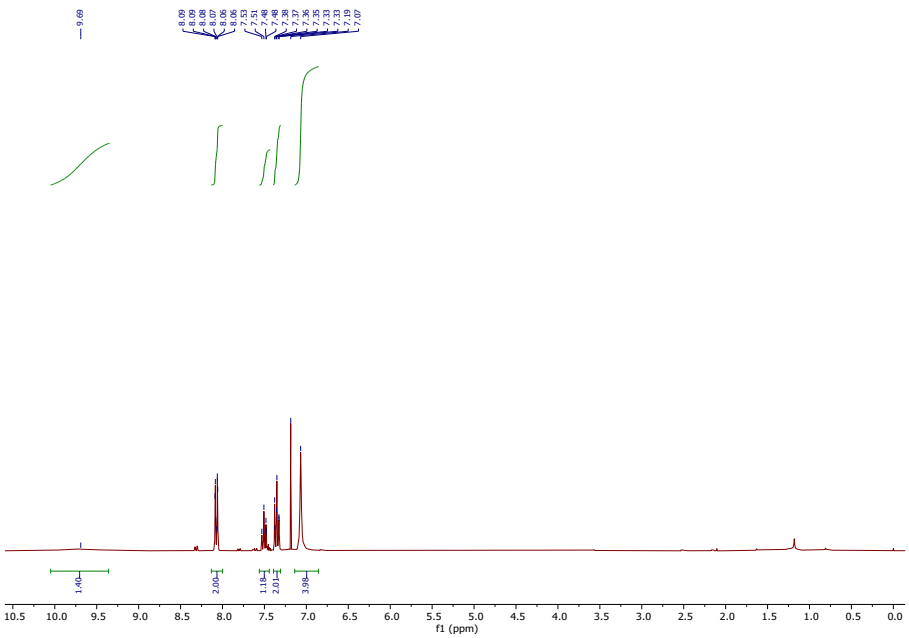


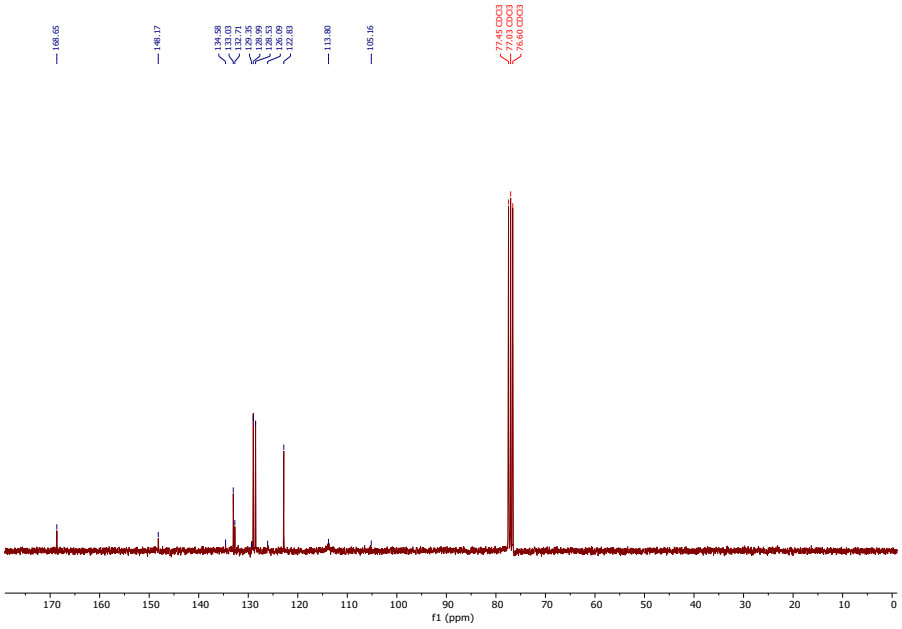
N-(1H-benzo[d]imidazol-2-yl)benzamide (**4m**)



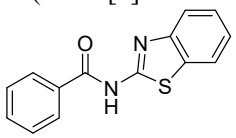
^{1}H NMR (300 MHz, Chloroform-*d*) δ 9.69 (s, 1H), 8.13-8.00 (m, 2H), 7.56-7.44 (m, 1H), 7.39-7.31 (m, 2H), 7.07 (s, 4H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 168.65, 148.17, 134.58, 133.03, 132.71, 129.35, 128.99, 128.53, 126.09, 122.83, 113.80, 105.16.



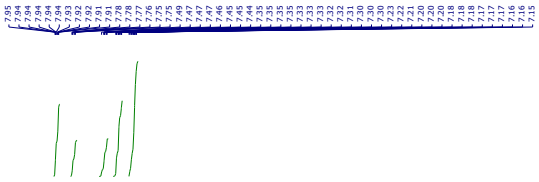


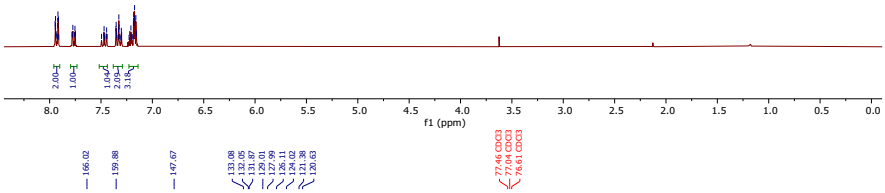
N-(benzo[d]thiazol-2-yl)benzamide (**4n**)

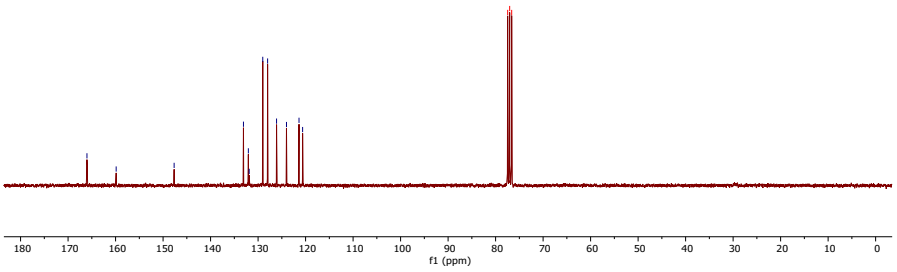


^{1}H NMR (300 MHz, Chloroform-*d*) δ 7.96-7.90 (m, 2H), 7.80-7.73 (m, 1H), 7.52-7.44 (m, 1H), 7.38-7.29 (m, 2H), 7.23-7.14 (m, 3H).

^{13}C NMR (75 MHz, Chloroform-*d*) δ 166.02, 159.88, 147.67, 133.08, 132.05, 131.87, 129.01, 127.99, 126.11, 124.02, 121.38, 120.63.







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