Electronic Supplementary Material (ESI) for Organic Chemistry Frontiers.

Supporting Information

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1. General experiment information.

General experimental. Unless otherwise noted, reactions were carried out insingle-neck or two-neck flask round bottom flasks, with magnetic stirring. Air- or water-sensitive liquids and solutions were transferred *via* syringe. Organic solutions were concentrated by rotary evaporation at 23–40 °C under 40 Torr (house vacuum). Analytical thin layer chromatography (TLC) was performed with Silicycle normal phase glass plates (0.25 mm, 60-A pore size, 230–400 mesh). Visualization was done under a 254 nm UV light source. Purification of reaction products was generally done by flash chromatography with Silicycle 200–300 mesh silica gel.

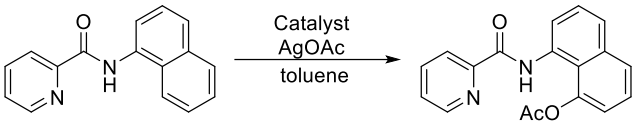
Materials. Unless otherwise indicated, all reagents and solvents were purchased for commercial suppliers and used without additional purification. Distilled water was used in the reactions. Picolinamides **1a**–**1z** and **D-1a** were prepared according to literature procedures.[S1]

Instrumentation. ^{1}H NMR, ^{13}C NMR and ^{19}F NMR spectra were recorded on a 400 MHz spectrometer (400 MHz for ^{1}H; 100 MHz for ^{13}C; 376 MHz for ^{19}F NMR) at room temperature. All chemical shift values are quoted in ppm referenced residual $CHCl_3$ at 7.26 ppm, Pyridine at 8.72 and DMSO at 2.50 ppm for ^{1}H NMR; relative to residual $CHCl_3$ at 77.0 ppm, Pyridine at 123.44 and DMSO at 40.0 ppm for ^{13}C unless otherwise noted. HRMS (ion trap) were obtained from mass spectrometer (ESI). Melting points were recorded on an electrothermal digital melting point apparatus and were uncorrected.

The general procedure for silver carboxylates of 2a-1–2d-16: The substrate carboxylic acid **1** (6 mmol) and silver oxide (2 mmol) were added to 25.0 mL round-bottomed flask, followed by addition of 20.0 mL acetonitrile. The mixture was stirred at room temperature for 12 h. This solid was recovered by filtration and washed with 10 mL of cold acetonitrile (stored in dark). Subsequent drying under vacuum led to the desired product **2**.

The general procedure for new compounds of 3aa-1–3wa: The substrate picolinamides **1** (0.2 mmol), substrate silver carboxylates **2** (0.44 mmol) and $CoCl_2$ (0.02 mmol, 2.6 mg) were added to 5.0 mL round-bottomed flask, followed by addition of 2.0 mL toluene. The mixture was stirred at 110 °C for 12 h. After cooling to room temperature, the reaction mixture was added with 10 mL of water and then extracted by ethyl acetate (10 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the resulting residue was purified by column chromatography (Silica Gel: 200–300 mesh) to afford the desired product **3**.

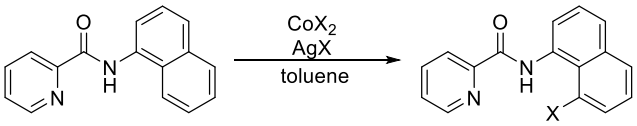
Table S1. Optimization of acyloxylation reaction with metal catalysts[a]



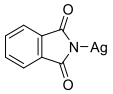
Entry	Catalyst (x mol%)	Yield (%)[b]	r.r. (%)[b],[c]
1	none	N.R.	>95%
2	$CuCl_2 \cdot 2H_2O$ (20)	N.R.	>95%
3	$PdCl_2$ (20)	N.R.	>95%
4	CuI (20)	N.R.	70%
5	$NiCl_2$ (20)	N.R.	>95%
6	$[Rh(COD)Cl]_2$ (20)	N.R.	70%
7	$[Ir(COD)Cl]_2$ (20)	N.R.	60%
8	$Co(acac)_3$ (20)	N.R.	90%
9	**$Co(OAc)_2$ (20)**	**90%**	**8%**

[a] The reaction was carried out with picolinamide **1a** (0.2 mmol, 49.6 mg), **catalyst** (20 mol%) and AgOAc (0.4 mmol, 56.6mg) in 2.0 mL of toluene at 100 °C for 24 h. [b] Determined by ^{1}H-NMR. [c] r.r. = Recovery rate.

Table S2. Optimization of acyloxylation reaction with silver salts[a]

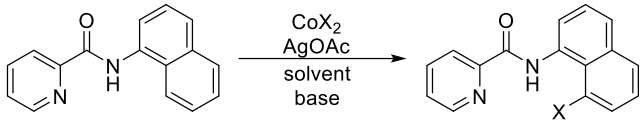


Entry	CoX_2	Ag**X**	Yield (%)[b]	r.r. (%)[b],[c]
1	$CoCl_2$	AgF	N.R.	>95%
2	$CoCl_2$	AgCl	N.R.	90%
3	$CoBr_2$	AgBr	N.R.	>95%
4	CoI_2	AgI	N.R.	90%
5	$Co(OAc)_2$	AgOAc	90	<5%
6[d]	$CoCl_2$	AgOTfa	N.R.	>95%
7[d]	$CoCl_2$	AgOTf	N.R.	>95%
8	$CoCl_2$	AgSCN	N.R.	>95%
9	$CoCl_2$	AgSeCN	N.R.	>95%
10	$CoCl_2$	AgOCN	N.R.	>95%
11	$CoCl_2$	AgOMs	N.R.	90%
12	$CoCl_2$	AgOTs	N.R.	90%
13	$CoCl_2$	Tol-SOOAg	N.R.	95%
15	$CoCl_2$	$AgNBn_2$	N.R.	>95%

20	$CoCl_2$	CH_3COSAg	N.R.	>95%
21	$CoCl_2$		N.R.	>95%
22	$CoCl_2$	$AgNTf_2$	N.R.	>95%
23	$CoCl_2$	$AgBF_4$	N.R.	>95%
24	$CoCl_2$	Ag_2WO_3	N.R.	>95%

[a]The reaction was carried out with picolinamide **1a** (0.2 mmol, 49.6 mg), Co catalyst (20 mol%) and AgX (0.4 mmol, 2.0 eq) in 2.0 mL of toluene at 100 °C for 24 h. [b]Determined by ^{1}H-NMR. [c]r.r. = Recovery rate. [d]Quenched with water before ^{1}H-NMR analysis.

Table S3. Optimization of acyloxylation reaction with other conditions[a]



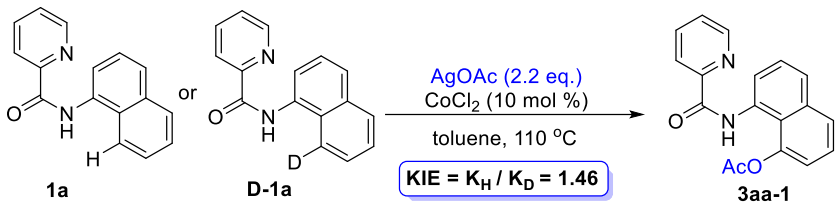
Entry	CoX_2 (x mol%)	AgOAc (x eq.)	solvent	additive (x eq.)	Yield (%)[b]
1	$Co(OAc)_2$ (20)	2.0	DMSO	-	9%
2	$Co(OAc)_2$ (20)	2.0	DME	-	82%
3	$Co(OAc)_2$ (20)	2.0	1,4-dioxane	-	58%
4	$Co(OAc)_2$ (20)	2.0	18-crown-6	-	20%
5	$Co(OAc)_2$ (20)	2.0	toluenen	-	90%
6	$Co(OAc)_2$ (20)	2.0	toluenen	Cs_2CO_3 (2.0)	2%
7	$Co(OAc)_2$ (20)	2.0	toluenen	KOAc (2.0)	50%
8	$Co(OAc)_2$ (20)	2.0	toluenen	DMAP (2.0)	N.R.
9	$Co(OAc)_2$ (20)	2.0	toluenen	H_2O (5.0)	29%
10[c]	$Co(OAc)_2$ (20)	2.0	toluenen	-	91%
11[d]	$Co(OAc)_2$ (20)	2.0	toluenen	-	88%
12[e]	$Co(OAc)_2$ (20)	2.0	toluenen	-	87%
13	CoF_2 (20)	2.0	toluenen	-	3%
14	$CoCl_2$ (20)	2.0	toluenen	-	91%
15	$CoBr_2$ (20)	2.0	toluenen	-	71%
16	CoI_2 (20)	2.0	toluenen	-	74%
17	$CoCO_3$ (20)	2.0	toluenen	-	<1%
18	$Co(SCN)_2$ (20)	2.0	toluenen	-	67%
19	$CoSO_4$ (20)	2.0	toluenen	-	8%
20	$Co(acac)_3$ (20)	2.0	toluenen	-	N.R.
21[f]	$CoCl_2$ (1)	2.0	toluenen	-	12%
22[f]	$CoCl_2$ (5)	2.0	toluenen	-	32%
23[f]	$CoCl_2$ (10)	2.0	toluenen	-	83%

24	$CoCl_2$ (10)	2.0	toluenen	-	60%
25	$CoCl_2$ (10)	0.6	toluenen	-	23%
26	$CoCl_2$ (10)	1.0	toluenen	-	43%
27	$CoCl_2$ (10)	2.2	toluenen	-	82%
28[g],[h]	$CoCl_2$ (10)	2.2	toluenen	-	92%

[a]Unless other notes, the reaction was carried out with picolinamide 1**a** (0.2 mmol, 49.6 mg), Co catalyst (20 mmol%) and AgOAc (0.4 mmol, 66.8 mg, 2.0 eq) in 2.0 mL of solvent at 100 °C for 24 h. [b]Determined by ^{1}H-NMR. [c]Under O_2 atmosphere. [d]Under N_2 atmosphere. [e]Aged $Co(OAc)_2$. [f]For 48 h. [g]For 12 h. [h]At 110 °C.

2. Preliminary mechanistic studies.

2.1 Kinetic isotope effect (KIE) of the transformation



The picolinamides (**2a**, 0.2 mmol, 49.6 mg or **D-2a**, 0.2 mmol, 49.8 mg), AgOAc (**2a-1**, 0.44 mmol, 73.5 mg) and $CoCl_2$ (0.02 mmol, 2.6 mg) were added to 5.0 mL round-bottomed flask, followed by addition of 2.0 mL xylene as solvent. The mixture was stirred at 110 °C. An aliquot of each reaction mixture was taken at 1 h, 2 h, 3 h and 4 h. Afer the solvent of each aliquot (0.5 mL) was removed under reduced pressure conditions and analyzed by ^{1}H NMR spectrum in $CDCl_3$ (see Figure S1 and Figure S2). The relative yield of **1a** and **D-1a** were shown in Table S4. A sample plot of the initial rate data for the reaction of both **1a** and **D-1a** was shown in Figure S3 and Figure S4. The reaction progress in the early stage (0-4 h) indicated a kinetic isotope effect (KIE) of 1.46.

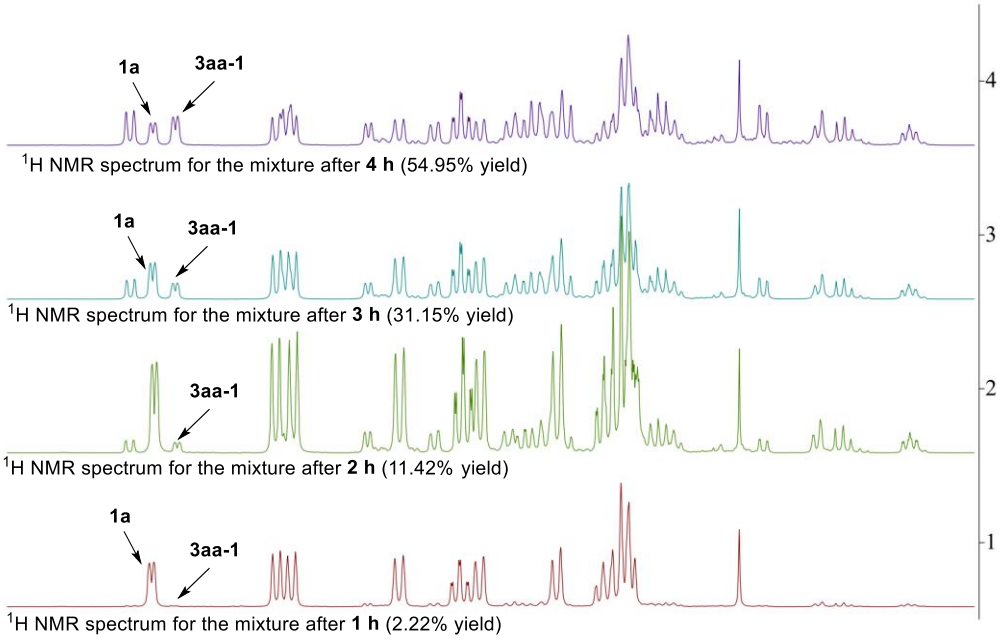


Figure S1. The conversion of **1a** was monitored by ^{1}H NMR method

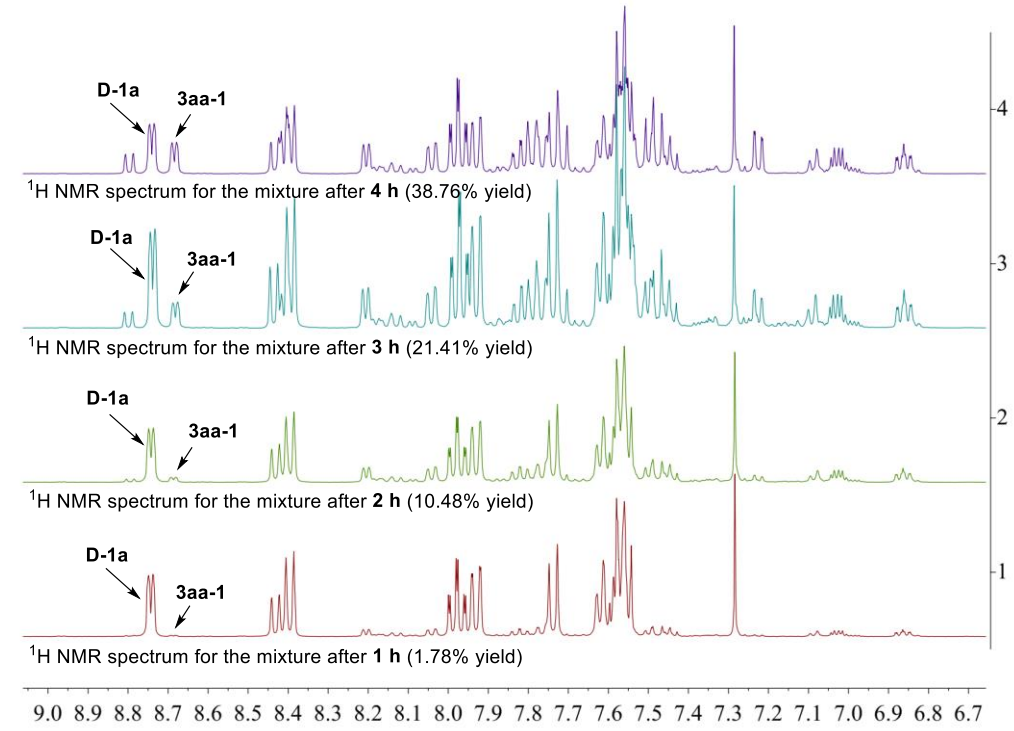


Figure S2. The conversion of **D-1a** was monitored by ^{1}H NMR method

Table S4. The relative yields (%) of 3aa-1 was monitored by ^{1}H NMR method.

Time [h]	1	2	3	4
^{1}H NMR yield of **3aa** from **2a** [%]	2.22	11.42	31.15	54.95
^{1}H NMR yield of **3aa** from **D-2a** [%]	1.78	10.48	21.41	38.76

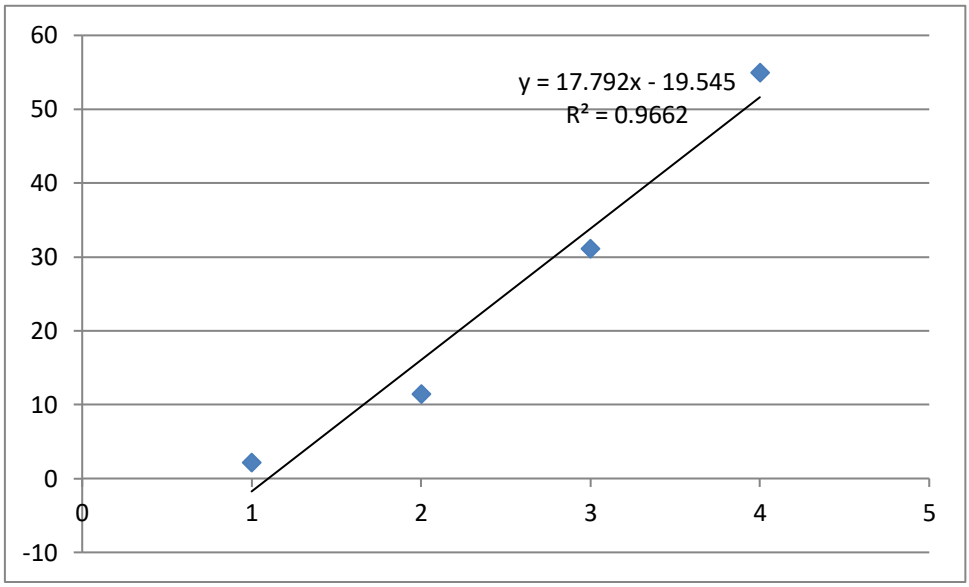


Figure S3. The plot of initial rates for the conversion of **1a**

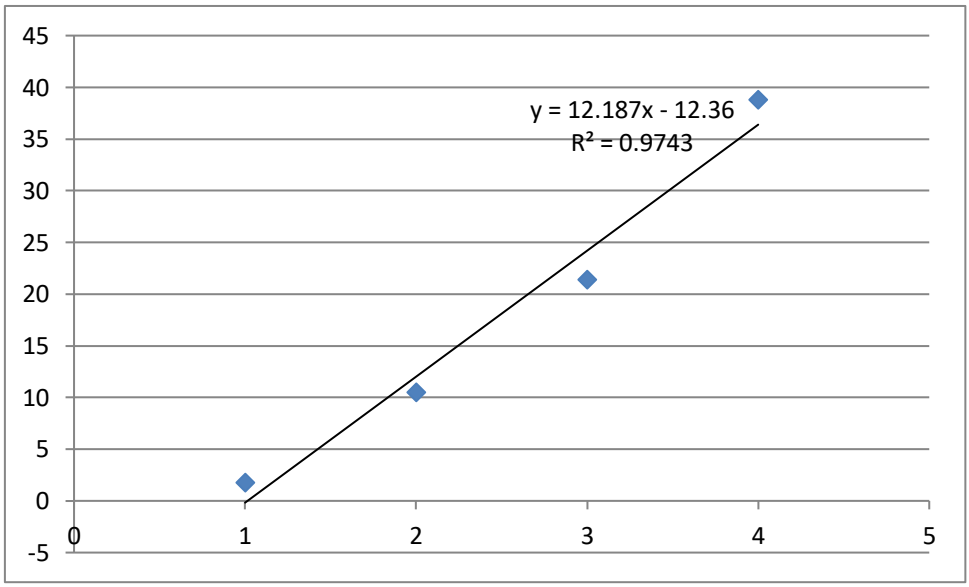
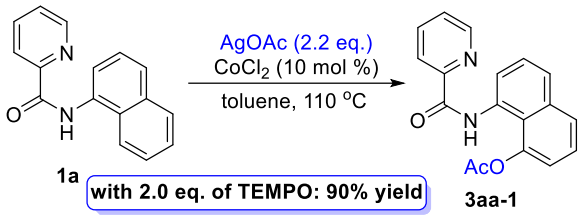
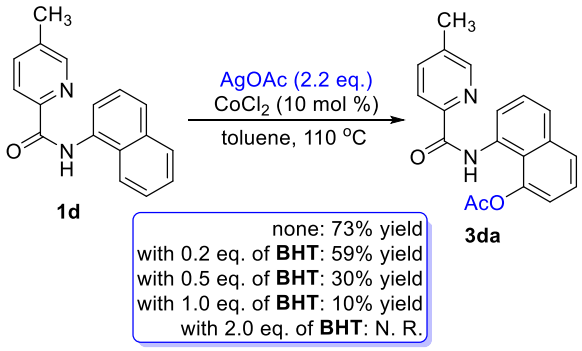


Figure S4. The plot of initial rates for the conversion of **D-1a**

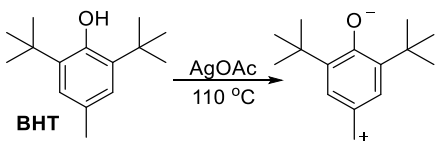
2.2 The effects of addition of radical scavengers of the reaction.



The picolinamides **1a** (0.2 mmol, 49.6 mg), $CoCl_2$ (0.02 mmol, 2.6 mg), AgOAc (0.44 mmol, 73.5 mg) and **TEMPO** (0.4 mmol, 62.5 mg, 2.0 eq.) were added to 5.0 mL round-bottomed flask, followed by addition of 2.0 mL toluene as solvent. The mixture was stirred at 110 °C for 12 h. After cooling to room temperature, the reaction mixture was added with 10 mL of water and then extracted by ethyl acetate (10 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the yield of **3aa-1** was determined by ^{1}H-NMR in $CDCl_3$. (**The result indicated that radical process should not involve in the acyloxylation reaction.**)

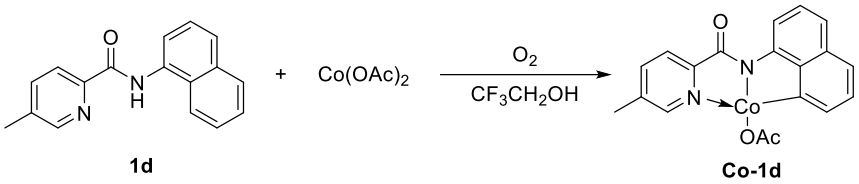


The picolinamides **1a** (0.2 mmol, 49.6 mg), $CoCl_2$ (0.02 mmol, 2.6 mg), AgOAc (0.44 mmol, 73.5 mg) and **BHT** were added to 5.0 mL round-bottomed flask, followed by addition of 2.0 mL toluene as solvent. The mixture was stirred at 110 °C for 12 h. After cooling to room temperature, the reaction mixture was added with 10 mL of water and then extracted by ethyl acetate (10 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the yields of **3da** with different loading amount of BTH was determined by ^{1}H-NMR in $CDCl_3$. (**The result indicated that radical process should not involve in the acyloxylation reaction. BHT might be oxidized by AgOAc.**)

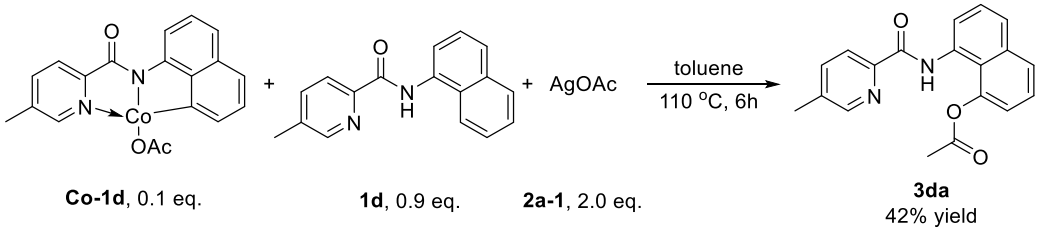


In order to figure out the relationship/reaction between AgOAc and BHT, the following reaction was carried out: AgOAc (0.2 mmol, 53.4 mg) and BHT (0.2 mmol, 44.0 mg) were added to 5.0 mL round-bottomed flask, followed by addition of 2.0 mL toluene as solvent. The mixture was stirred at 110 °C for 12 h. After cooling to room temperature, the reaction mixture was filtered. The filtrate was concentrated under vacuum. A crude ^{1}H-NMR analysis in $CDCl_3$ was tested without further purification. (**The result of the ^{1}H-NMR analysis indicated that BHT could be oxidized by AgOAc. The oxidation reaction is similar to the reaction between BHT and Ag_2O in hexane reported by Prof. Richard Cosstick.**[S2])

2.3 Study of intermediate.

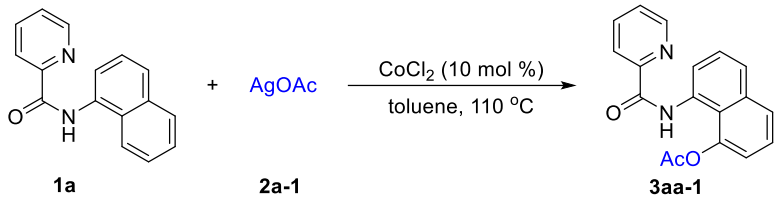


The picolinamides **1a** (0.5 mmol, 124.0 mg) and $Co(OAc)_2$ (0.5 mmol, 88.5 mg) were added to 25.0 mL round-bottomed flask, followed by addition of 5.0 mL CF_3CH_2OH as solvent. The mixture was stirred at 70 °C for 12 h under O_2 atmosphere. After cooling to room temperature, the reaction mixture was concentrated under vacuum to remove CF_3CH_2OH, and the resulting residue was purified by column chromatography (PE:EA=1:1, then 100% of EA) to afford the intermediate **Co-1d**.[S3]



The intermediate **Co-1d** (0.02 mmol, 7.6 mg), picolinamides **1d** (0.18 mmol, 47.2 mg) and AgOAc (0.4 mmol, 66.8 mg) were added to 25.0 mL round-bottomed flask, followed by addition of 5.0 mL toluene as solvent. The mixture was stirred at 110 °C for **6 h**. After cooling to room temperature, the reaction mixture was added with 10 mL of water and then extracted by ethyl acetate (10 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the resulting residue was purified by column chromatography to afford the desired product **3da** in 42% yield (*vs* the 73% yield under the optmized condition for **12 h**). (**The result indicated that complex Co-1d should be the key intermediate for the further acyloxylation reaction to form product 3da.**)

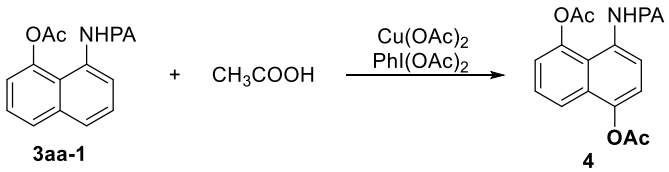
3. Gram-scale experiments



1a **2a-1** **3aa-1**

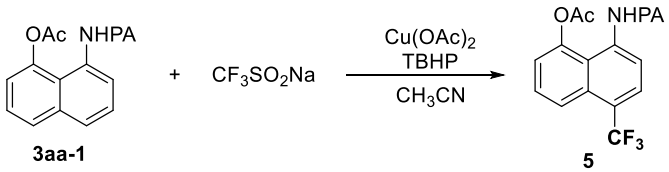
The picolinamides **1a** (0.5 mmol, 1.984 g), $CoCl_2$ (0.8 mmol, 0.104 g) and AgOAc (17.6 mmol, 2.939 g) were added to 100.0 mL round-bottomed flask, followed by addition of 50.0 mL toluene as solvent. The mixture was stirred at 110 °C for 12 h. After cooling to room temperature, the reaction mixture was added with 100 mL of water and then extracted by ethyl acetate (50 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the resulting residue was purified by column chromatography to afford the desired product **3aa-1** in 80% yield.

4. Synthetic transformation.



3aa-1 **4**

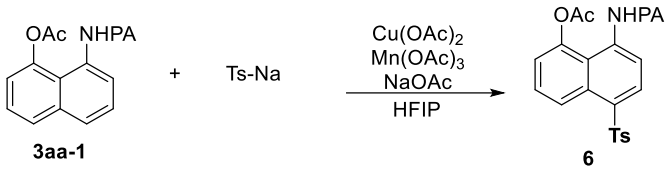
3aa-1 (61.2 mg, 0.2 mmol, 1.0 equiv.), $Cu(OAc)_2$ (8.0 mg, 0.04 mmol, 0.2 equiv.), $PhI(OAc)_2$ (128.8 mg, 0.4 mmol, 2.0 equiv.) and CH_3COOH (2 mL) were successively added into a sealed tube. The mixture was stirred at 80 °C under air for 12 h. After cooling to ambient temperature, the resulting mixture was filtered through a pad of tripolite and washed with ethyl acetate. The filtrate was concentrated under vacuum and purified by column chromatography (Silica Gel: 200–300 mesh) to afford the desired product **4**.



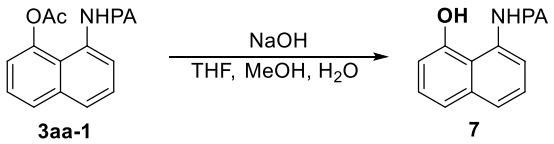
3aa-1 **5**

3aa-1 (61.2 mg, 0.2 mmol, 1.0 equiv.), $Cu(OAc)_2$ (8.0 mg, 0.04 mmol, 0.2 equiv.), TBHP (5.5 mol / L in decane, 0.2 mmol, 1.0 equiv.), CF_3SO_2Na (93.6 mg, 0.6 mmol, 3.0 equiv.), and CH_3CN (2 mL) were successively added into a sealed tube. The mixture was stirred at 80 °C under air for 48 h. After cooling to ambient temperature, the resulting mixture was filtered through a pad of tripolite and washed

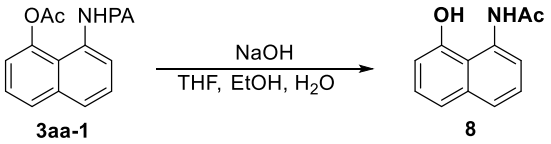
with ethyl acetate. The filtrate was concentrated under vacuum and purified by column chromatography (Silica Gel: 200–300 mesh) to afford the desired product **5**.



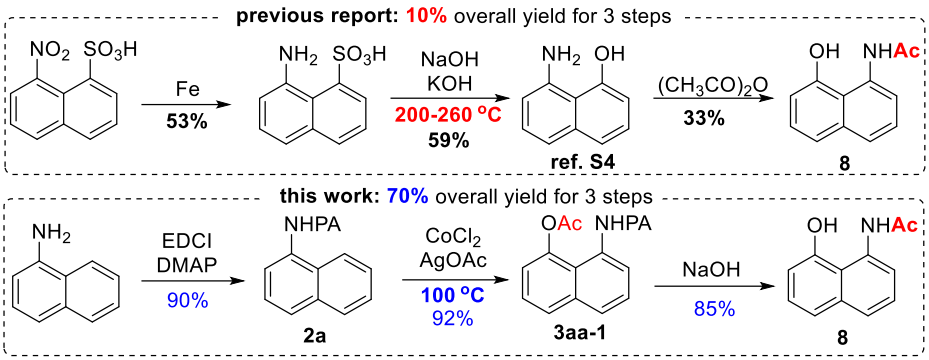
3aa-1 (61.2 mg, 0.2 mmol, 1.0 equiv.), $Cu(OAc)_2$ (8.0 mg, 0.04 mmol, 0.2 equiv.), $Mn(OAc)_3$ (185.6 mg, 0.8 mmol, 4.0 equiv.), NaOAc (49.2 mg, 0.6 mmol, 3.0 equiv.), TsNa (142.4 mg, 0.8 mmol, 4.0 equiv.), and HFIP (2 mL) were added into a sealed tube. The mixture was stirred at 60 °C for 2 h. After cooling to ambient temperature, the resulting mixture was filtered through a pad of tripolite and washed with ethyl acetate. The filtrate was concentrated under vacuum and purified by column chromatography (Silica Gel: 200–300 mesh) to afford the desired product **6**.



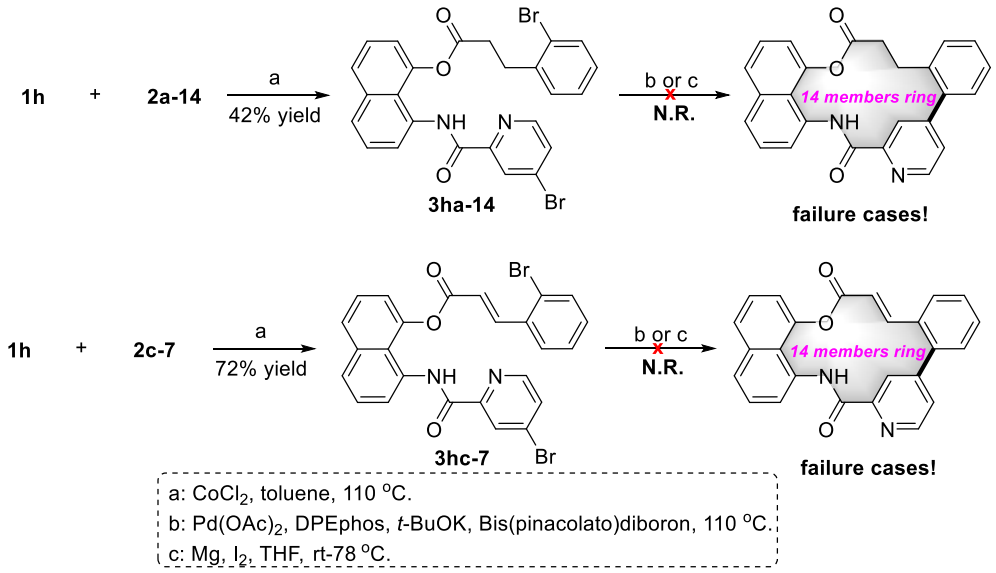
3aa-1 (61.2 mg, 0.2 mmol, 1.0 equiv.), NaOH (16.0 mg, 0.4 mmol, 2.0 equiv.), and solvent (THF/MeOH/H_2O, v:v:v=2:1:1, 2 mL) were successively added into a sealed tube. The mixture was stirred at room temperature for 12 h. The reaction mixture was added with 10 mL of H_2O and then extracted by DCM (10 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the resulting residue was purified by column chromatography to afford the desired product **7**.



3aa-1 (61.2 mg, 0.2 mmol, 1.0 equiv.), NaOH (64.0 mg, 1.6 mmol, 8.0 equiv.), and solvent (THF/EtOH/H_2O, v:v:v=2:1:1, 2 mL) were successively added into a sealed tube. The mixture was stirred at 100 °C for 48 h under N_2 atmosphere. The reaction mixture was added with 10 mL of H_2O and then extracted by ethyl acetate (10 mL×3), the organic layers were combined, dried with anhydrous Na_2SO_4, and then filtered. The filtrate was concentrated under vacuum, and the resulting residue was purified by column chromatography to afford the desired product **8**.



Scheme S1. Pathways to obtain acetamide intermediate **8**



Scheme S2. Failure synthetic strategies to obtain macrocyclic compound

5. Single crystal data of product **3aa-8** (**CCDC 2160352**)

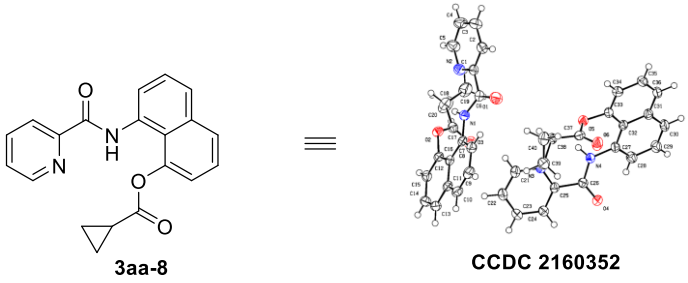


Figure S5. The single crystal structure of **3aa**

Table S3. Crystal data and structure refinement for **3aa-8**

Identification code	0912CHACC3_0m (**3aa-8**)
Empirical formula	C20 H16 N2 O3
Formula weight	332.35
Temperature	150 K
Wavelength	0.71073 A
Space group Crystal system	triclinic
Space group IT number	2
Space group name H-M alt	P -1
Unit cell dimensions	a = 10.6196(8) A alpha = 75.187(2) deg. b = 12.7360(9) A beta = 70.684(2) deg. c = 13.6446(9) A gamma = 69.536(2) deg.
Volume	1611.1(2) A^3
Z, Calculated density	4, 1.370 Mg/m^3
Absorption coefficient	0.094 mm^-1
F(000)	696
Crystal size	0.15 x 0.08 x 0.05 mm
Theta range for data collection	2.124 to 26.436 deg.
Limiting indices	-13<=h<=13, -15<=k<=15, -17<=l<=14
Reflections collected	4253
Completeness to theta = 25.242	99.7%
Absorption correction	SADABS-2016/2 (Bruker,2016/2)
The ratio of min. to max. transmission	0.8704
Refinement method	none
Data / restraints / parameters	6559 / 0 / 451
Goodness-of-fit on F^2	1.048
Final R indices [Fo>4sigma(Fo)]	R1 = 0.0532
R indices (all data)	R1 = 0.0991, wR2 = 0.1295
Absolute structure parameter	n/a
Largest diff. peak and hole	0.21 and -0.26 e.A^-3

Table S4. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters (A^2 x 10^3) for **3aa-8**

Atom	x/a	y/b	z/c	U/eq
O6	0.9303(2)	1.0408(1)	0.8505(1)	0.0453(5)
O5	0.7635(2)	0.9509(1)	0.9163(1)	0.0279(4)
O4	0.5028(2)	1.2659(1)	0.7073(1)	0.0357(4)
O3	0.5618(2)	0.7053(1)	0.6329(1)	0.0406(4)
O2	0.7443(2)	0.5550(1)	0.5824(1)	0.0282(4)
O1	1.0380(2)	0.5891(2)	0.7826(1)	0.0500(5)
N4	0.5673(2)	1.1096(2)	0.8276(1)	0.0274(4)
N3	0.6761(2)	0.9781(2)	0.6807(1)	0.0300(4)
N2	0.8121(2)	0.4237(2)	0.8281(1)	0.0340(5)
N1	0.9361(2)	0.5601(2)	0.6710(1)	0.0281(4)
H9	1.24650	0.73480	0.45410	0.0440
H8	1.14890	0.63650	0.61540	0.0390
H5	0.69610	0.31920	0.88800	0.0510
H4A	0.61160	1.03650	0.83320	0.0330
H40B	1.14390	0.76480	0.72500	0.0460
H40A	1.15520	0.87100	0.76910	0.0460
H4	0.78200	0.22880	1.03300	0.0540
H39B	1.03440	1.00530	0.64770	0.0500
H39A	1.02310	0.89910	0.60370	0.0500
H38	0.89170	0.83510	0.77720	0.0350
H36	0.55160	1.14290	1.24470	0.0370
H35	0.74380	0.98560	1.23490	0.0400
H34	0.84220	0.90160	1.08110	0.0370
H30	0.37150	1.28510	1.16920	0.0400
H3	0.95060	0.28740	1.06310	0.0520
H29	0.26980	1.36390	1.03180	0.0440
H28	0.35980	1.28430	0.87720	0.0390
H24	0.54020	1.20470	0.53270	0.0350
H23	0.62070	1.07740	0.41230	0.0390
H22	0.73560	0.88750	0.46350	0.0400
H21	0.77080	0.83090	0.63010	0.0420
H20B	0.35920	0.47830	0.73550	0.0650
H20A	0.34700	0.61490	0.68860	0.0650
H2	1.03340	0.43200	0.94000	0.0430
H19B	0.42710	0.62630	0.82790	0.0660
H19A	0.43930	0.48970	0.87480	0.0660
H18	0.60750	0.43690	0.71280	0.0400
H15	0.67020	0.63250	0.41500	0.0360

H14	0.76650	0.74180	0.25960	0.0410
H13	0.95990	0.79300	0.24650	0.0390
H10	1.14400	0.78730	0.31800	0.0410
H1	0.87500	0.52800	0.67100	0.0340
C9	1.1644(3)	0.7154(2)	0.4630(2)	0.0364(6)
C8	1.1063(2)	0.6556(2)	0.5595(2)	0.0326(5)
C7	0.9892(2)	0.6242(2)	0.5747(2)	0.0267(5)
C6	0.9679(2)	0.5421(2)	0.7635(2)	0.0312(5)
C5	0.7665(3)	0.3418(2)	0.8984(2)	0.0425(6)
C40	1.1019(2)	0.8442(2)	0.7383(2)	0.0385(6)
C4	0.8161(3)	0.2880(2)	0.9858(2)	0.0448(7)
C39	1.0274(3)	0.9269(2)	0.6636(2)	0.0416(6)
C38	0.9450(2)	0.8883(2)	0.7716(2)	0.0291(5)
C37	0.8843(2)	0.9687(2)	0.8467(2)	0.0296(5)
C36	0.5900(2)	1.1090(2)	1.1828(2)	0.0310(5)
C35	0.7039(3)	1.0164(2)	1.1771(2)	0.0331(5)
C34	0.7624(2)	0.9661(2)	1.0855(2)	0.0312(5)
C33	0.7044(2)	1.0100(2)	1.0029(2)	0.0262(5)
C32	0.5850(2)	1.1059(2)	1.0040(2)	0.0246(5)
C31	0.5278(2)	1.1558(2)	1.0984(2)	0.0282(5)
C30	0.4092(2)	1.2524(2)	1.1066(2)	0.0333(5)
C3	0.9159(3)	0.3217(2)	1.0030(2)	0.0435(6)
C29	0.3490(3)	1.2988(2)	1.0256(2)	0.0365(6)
C28	0.4033(2)	1.2510(2)	0.9329(2)	0.0329(5)
C27	0.5176(2)	1.1576(2)	0.9209(2)	0.0265(5)
C26	0.5540(2)	1.1639(2)	0.7305(2)	0.0257(5)
C25	0.6088(2)	1.0863(2)	0.6504(2)	0.0244(5)
C24	0.5870(2)	1.1270(2)	0.5516(2)	0.0293(5)
C23	0.6348(2)	1.0521(2)	0.4807(2)	0.0329(5)
C22	0.7026(2)	0.9408(2)	0.5105(2)	0.0337(6)
C21	0.7221(2)	0.9078(2)	0.6104(2)	0.0346(6)
C20	0.3951(3)	0.5430(2)	0.7270(3)	0.0545(8)
C2	0.9644(3)	0.4068(2)	0.9308(2)	0.0357(6)
C19	0.4445(3)	0.5499(2)	0.8124(2)	0.0547(8)
C18	0.5495(2)	0.5180(2)	0.7121(2)	0.0334(5)
C17	0.6131(2)	0.6043(2)	0.6417(2)	0.0286(5)
C16	0.8040(2)	0.6249(2)	0.4936(2)	0.0266(5)
C15	0.7486(2)	0.6551(2)	0.4101(2)	0.0299(5)
C14	0.8068(2)	0.7192(2)	0.3171(2)	0.0338(5)
C13	0.9212(2)	0.7491(2)	0.3096(2)	0.0324(5)
C12	0.9235(2)	0.6529(2)	0.4911(2)	0.0265(5)
C11	0.9836(2)	0.7159(2)	0.3940(2)	0.0291(5)

C10	1.1046(2)	0.7458(2)	0.3825(2)	0.0338(6)
C1	0.9102(2)	0.4541(2)	0.8452(2)	0.0285(5)

Table S5. Bond lengths [A] and angles [deg] for **3aa-8**

O2-C17	1.375(3)
O2-C16	1.413(2)
O5-C33	1.410(2)
O5-C37	1.374(3)
O4-C26	1.222(2)
O3-C17	1.201(3)
O6-C37	1.200(3)
O1-C6	1.225(3)
N1-H1	0.8800
N1-C7	1.412(3)
N1-C6	1.355(3)
N4-H4A	0.8800
N4-C26	1.357(3)
N4-C27	1.414(3)
N3-C25	1.341(3)
N3-C21	1.336(3)
N2-C1	1.335(3)
N2-C5	1.333(3)
C33-C32	1.419(3)
C33-C34	1.363(3)
C26-C25	1.496(3)
C25-C24	1.381(3)
C32-C27	1.435(3)
C32-C31	1.436(3)
C11-C12	1.435(3)
C11-C13	1.416(3)
C11-C10	1.413(3)
C12-C7	1.435(3)
C12-C16	1.421(3)
C7-C8	1.373(3)
C17-C18	1.462(3)
C1-C6	1.505(3)
C1-C2	1.377(3)
C37-C38	1.467(3)
C27-C28	1.369(3)
C15-H15	0.9500
C15-C16	1.361(3)
C15-C14	1.401(3)

C31-C36	1.413(3)
C31-C30	1.417(3)
C8-H8	0.9500
C8-C9	1.405(3)
C24-H24	0.9500
C24-C23	1.383(3)
C13-H13	0.9500
C13-C14	1.361(3)
C34-H34	0.9500
C34-C35	1.406(3)
C35-H35	0.9500
C35-C36	1.359(3)
C38-H38	1.0000
C38-C40	1.508(3)
C38-C39	1.502(3)
C23-H23	0.9500
C23-C22	1.370(3)
C14-H14	0.9500
C10-H10	0.9500
C10-C9	1.353(3)
C28-H28	0.9500
C28-C29	1.403(3)
C36-H36	0.9500
C22-H22	0.9500
C22-C21	1.382(3)
C2-H2	0.9500
C2-C3	1.386(3)
C30-H30	0.9500
C30-C29	1.360(3)
C18-H18	1.0000
C18-C20	1.509(3)
C18-C19	1.496(3)
C21-H21	0.9500
C29-H29	0.9500
C9-H9	0.9500
C40-H40A	0.9900
C40-H40B	0.9900
C40-C39	1.475(3)
C39-H39A	0.9900
C39-H39B	0.9900
C3-H3	0.9500
C3-C4	1.377(4)

C5-H5	0.9500
C5-C4	1.384(3)
C4-H4	0.9500
C20-H20A	0.9900
C20-H20B	0.9900
C20-C19	1.459(4)
C19-H19A	0.9900
C19-H19B	0.9900
C17-O2-C16	116.98(16)
C37-O5-C33	117.10(15)
C7-N1-H1	116.100
C6-N1-H1	116.100
C6-N1-C7	127.88(18)
C26-N4-H4A	116.500
C26-N4-C27	127.07(19)
C27-N4-H4A	116.500
C21-N3-C25	116.93(19)
C5-N2-C1	116.9(2)
O5-C33-C32	120.13(18)
C34-C33-O5	116.7(2)
C34-C33-C32	123.0(2)
O4-C26-N4	125.2(2)
O4-C26-C25	121.29(19)
N4-C26-C25	113.49(19)
N3-C25-C26	116.73(19)
N3-C25-C24	123.3(2)
C24-C25-C26	120.0(2)
C33-C32-C27	126.74(19)
C33-C32-C31	115.78(19)
C27-C32-C31	117.5(2)
C13-C11-C12	120.1(2)
C10-C11-C12	120.2(2)
C10-C11-C13	119.7(2)
C7 C12-C11	117.54(19)
C16 C12-C11	115.75(19)
C16 C12-C7	126.71(19)
N1-C7-C12	119.83(18)
C8-C7-N1	120.3(2)
C8-C7-C12	119.9(2)
O2-C17-C18	110.97(18)
O3-C17-O2	122.2(2)
O3-C17-C18	126.8(2)

N2-C1-C6	117.3(2)
N2-C1-C2	123.8(2)
C2-C1-C6	118.8(2)
O5-C37-C38	110.67(18)
O6-C37-O5	122.5(2)
O6-C37-C38	126.8(2)
N4-C27-C32	119.63(19)
C28-C27-N4	120.1(2)
C28-C27-C32	120.2(2)
C16-C15-H15	119.800
C16-C15-C14	120.3(2)
C14-C15-H15	119.800
C36-C31-C32	120.1(2)
C36-C31-C30	120.0(2)
C30-C31-C32	119.9(2)
O2-C16-C12	120.00(19)
C15-C16-O2	116.85(19)
C15-C16-C12	122.95(19)
C7-C8-H8	119.300
C7-C8-C9	121.4(2)
C9-C8-H8	119.300
C25-C24-H24	120.800
C25-C24-C23	118.5(2)
C23-C24-H24	120.800
C11-C13-H13	119.400
C14-C13-C11	121.2(2)
C14-C13-H13	119.400
O1-C6-N1	125.8(2)
O1-C6-C1	120.5(2)
N1-C6-C1	113.64(19)
C33-C34-H34	120.000
C33-C34-C35	120.0(2)
C35-C34-H34	120.000
C34-C35-H35	120.100
C36-C35-C34	119.8(2)
C36-C35-H35	120.100
C37-C38-H38	117.000
C37-C38-C40	116.79(19)
C37-C38-C39	117.44(19)
C40-C38-H38	117.000
C39-C38-H38	117.000
C39-C38-C40	58.70(15)

C24-C23-H23	120.400
C22-C23-C24	119.1(2)
C22-C23-H23	120.400
C15-C14-H14	120.200
C13-C14-C15	119.7(2)
C13-C14-H14	120.200
C11-C10-H10	119.900
C9-C10-C11	120.3(2)
C9-C10-H10	119.900
C27-C28-H28	119.200
C27-C28-C29	121.5(2)
C29-C28-H28	119.200
C31-C36-H36	119.400
C35-C36-C31	121.2(2)
C35-C36-H36	119.400
C23-C22-H22	120.700
C23-C22-C21	118.6(2)
C21-C22-H22	120.700
C1-C2-H2	120.700
C1-C2-C3	118.5(2)
C3-C2-H2	120.700
C31-C30-H30	119.700
C29-C30-C31	120.6(2)
C29-C30-H30	119.700
C17-C18-H18	117.400
C17-C18-C20	115.9(2)
C17-C18-C19	117.5(2)
C20-C18-H18	117.400
C19-C18-H18	117.400
C19-C18-C20	58.07(18)
N3-C21-C22	123.6(2)
N3-C21-H21	118.200
C22-C21-H21	118.200
C28-C29-H29	119.900
C30-C29-C28	120.3(2)
C30-C29-H29	119.900
C8-C9-H9	119.600
C10-C9-C8	120.7(2)
C10-C9-H9	119.600
C38-C40-H40A	117.700
C38-C40-H40B	117.700
H40A-C40-H40B	114.800

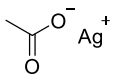
C39-C40-C38	60.45(15)
C39-C40-H40A	117.700
C39-C40-H40B	117.700
C38-C39-H39A	117.700
C38-C39-H39B	117.700
C40-C39-C38	60.84(15)
C40-C39-H39A	117.700
C40-C39-H39B	117.700
H39A-C39-H39B	114.800
C2-C3-H3	120.800
C4-C3-C2	118.4(2)
C4-C3-H3	120.800
N2-C5-H5	118.300
N2-C5-C4	123.5(2)
C4-C5-H5	118.300
C3-C4-C5	118.8(2)
C3-C4-H4	120.600
C5-C4-H4	120.600
C18-C20-H20A	117.700
C18-C20-H20B	117.700
H20A-C20-H20B	114.800
C19-C20-C18	60.52(17)
C19-C20-H20A	117.700
C19-C20-H20B	117.700
C18-C19-H19A	117.600
C18-C19-H19B	117.600
C20-C19-C18	61.41(18)
C20-C19-H19A	117.600
C20-C19-H19B	117.600
H19A-C19-H19B	114.700

Table S6. Anisotropic displacement parameters (A^2 x 10^3) for **3aa-8**

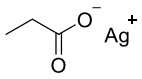
Atom	U11	U22	U33	U12	U13	U23
O2	0.0248(8)	0.0250(8)	0.0319(8)	-0.0072(7)	-0.0052(7)	-0.0025(7)
O5	0.0278(9)	0.0282(8)	0.0264(8)	-0.0085(7)	-0.0029(7)	-0.0074(7)
O4	0.0491(11)	0.0242(9)	0.0324(9)	-0.0062(8)	-0.0139(8)	-0.0047(7)
O3	0.0481(11)	0.0242(9)	0.0395(10)	-0.0064(8)	-0.0016(8)	-0.0070(7)
O6	0.0536(11)	0.0415(10)	0.0433(10)	-0.0287(9)	0.0061(9)	-0.0150(8)
O1	0.0767(14)	0.0540(11)	0.0395(10)	-0.0414(11)	-0.0229(10)	0.0002(9)
N1	0.0300(11)	0.0279(10)	0.029(1)	-0.0109(8)	-0.0087(8)	-0.0040(8)
N4	0.0317(11)	0.0252(10)	0.0249(10)	-0.0053(8)	-0.0085(8)	-0.0062(8)
N3	0.0319(11)	0.0265(10)	0.0295(10)	-0.0063(9)	-0.0070(9)	-0.0056(8)

N2	0.0309(11)	0.0386(11)	0.0306(11)	-0.0122(9)	-0.0040(9)	-0.0047(9)
C33	0.0283(12)	0.0272(12)	0.0245(11)	-0.0121(10)	-0.0018(10)	-0.0074(10)
C26	0.0263(12)	0.0281(12)	0.0253(11)	-0.0107(10)	-0.0074(10)	-0.0039(10)
C25	0.0233(12)	0.0259(11)	0.0268(11)	-0.0101(9)	-0.0055(9)	-0.0061(9)
C32	0.0262(12)	0.0240(11)	0.0246(11)	-0.0114(10)	-0.0021(9)	-0.0057(9)
C11	0.0320(13)	0.0196(11)	0.0314(12)	-0.0052(10)	-0.0049(10)	-0.0047(10)
C12	0.0292(12)	0.0192(11)	0.0281(12)	-0.0033(9)	-0.0055(10)	-0.0066(9)
C7	0.0281(13)	0.0199(11)	0.0295(12)	-0.0061(9)	-0.0037(10)	-0.0058(9)
C17	0.0285(13)	0.0308(13)	0.0283(12)	-0.008(1)	-0.0096(10)	-0.0061(10)
C1	0.0292(13)	0.0268(12)	0.0274(12)	-0.0046(10)	-0.0059(10)	-0.0079(10)
C37	0.0331(13)	0.0252(12)	0.0284(12)	-0.0092(10)	-0.0076(11)	-0.0003(10)
C27	0.0285(13)	0.0275(12)	0.0257(11)	-0.0102(10)	-0.0053(10)	-0.0077(10)
C15	0.0299(13)	0.0272(12)	0.0323(13)	-0.0036(10)	-0.0095(11)	-0.0093(10)
C31	0.0307(13)	0.0298(12)	0.0271(12)	-0.0138(10)	-0.0038(10)	-0.0078(10)
C16	0.0277(12)	0.0205(11)	0.0270(11)	-0.0057(9)	-0.0031(10)	-0.0033(9)
C8	0.0367(14)	0.0296(12)	0.0349(13)	-0.0112(11)	-0.0108(11)	-0.007(1)
C24	0.0304(13)	0.0299(12)	0.0268(12)	-0.0084(10)	-0.0068(10)	-0.0047(10)
C13	0.0356(14)	0.0267(12)	0.0264(12)	-0.0038(10)	-0.0035(10)	-0.0037(10)
C6	0.0371(14)	0.0269(12)	0.0308(12)	-0.0085(11)	-0.0094(11)	-0.0072(10)
C34	0.0335(13)	0.0302(12)	0.0302(12)	-0.009(1)	-0.0104(11)	-0.0031(10)
C35	0.0411(15)	0.0357(13)	0.0269(12)	-0.0148(12)	-0.0121(11)	-0.0033(11)
C38	0.0279(13)	0.0287(12)	0.0293(12)	-0.0074(10)	-0.0044(10)	-0.0076(10)
C23	0.0354(14)	0.0398(14)	0.0250(12)	-0.0114(11)	-0.0086(11)	-0.0064(11)
C14	0.0383(14)	0.0316(13)	0.0263(12)	-0.0033(11)	-0.0094(11)	-0.0042(10)
C10	0.0373(14)	0.0258(12)	0.0354(13)	-0.0121(11)	-0.0051(11)	-0.0018(10)
C28	0.0314(13)	0.0358(13)	0.0313(13)	-0.0061(11)	-0.0105(11)	-0.0074(11)
C36	0.0376(14)	0.0330(13)	0.0261(12)	-0.0150(11)	-0.0047(11)	-0.0093(10)
C22	0.0354(14)	0.0348(13)	0.0312(13)	-0.0083(11)	-0.0048(11)	-0.0135(11)
C2	0.0403(15)	0.0371(14)	0.0318(13)	-0.0101(11)	-0.0119(11)	-0.0076(11)
C30	0.0350(14)	0.0343(13)	0.0297(12)	-0.0084(11)	-0.0025(11)	-0.0142(11)
C18	0.0259(13)	0.0283(12)	0.0437(14)	-0.0079(10)	-0.0057(11)	-0.0067(11)
C21	0.0382(14)	0.0289(12)	0.0346(13)	-0.0042(11)	-0.0082(11)	-0.0111(11)
C29	0.0342(14)	0.0348(13)	0.0357(13)	-0.0016(11)	-0.0073(11)	-0.0123(11)
C9	0.0339(14)	0.0318(13)	0.0452(15)	-0.0158(11)	-0.0062(12)	-0.0060(11)
C40	0.0297(14)	0.0394(14)	0.0461(15)	-0.0089(11)	-0.0045(12)	-0.0155(12)
C39	0.0438(16)	0.0402(15)	0.0324(13)	-0.0110(12)	0.0013(12)	-0.0083(12)
C3	0.0535(17)	0.0423(15)	0.0308(13)	-0.0122(13)	-0.0135(12)	0.0011(12)
C5	0.0414(16)	0.0516(16)	0.0362(14)	-0.0240(13)	-0.0056(12)	-0.0017(13)
C4	0.0495(17)	0.0447(15)	0.0349(14)	-0.0212(14)	-0.0038(13)	0.0035(12)
C20	0.0289(15)	0.0395(15)	0.093(2)	-0.0095(12)	-0.0150(15)	-0.0102(15)
C19	0.0538(18)	0.0462(16)	0.0552(18)	-0.0239(14)	0.0101(15)	-0.0124(14)

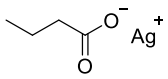
6. Characterization data of silver carboxylates **2a-1–2d-16**


2a-1

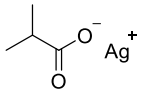
Silver(I) acetate (**2a-1**). Following the general procedure, **2a-1** was obtained as a gray solid (752 mg, 90%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 2.45 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 176.4, 24.6.


2a-2

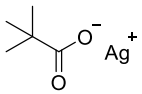
Silver(I) propionate (**2a-2**). Following the general procedure, **2a-2** was obtained as a gray solid (819 mg, 91%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 2.12 (q, J = 7.6 Hz, 2H), 1.01 (t, J = 7.6 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 178.2, 30.2, 11.7.


2a-3

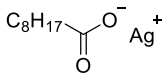
Silver(I) butyrate (**2a-3**). Following the general procedure, **2a-3** was obtained as a gray solid (873 mg, 90%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 2.10 (t, J = 7.4 Hz, 2H), 1.58-1.46 (m, 2H), 0.86 (t, J = 7.4 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 177.4, 39.3, 20.2, 14.6.


2a-4

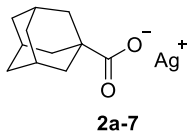
Silver(I) isobutyrate (**2a-4**). Following the general procedure, **2a-4** was obtained as a gray solid (922 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 2.39 (sep, J = 6.8 Hz, 1H), 1.05 (d, J = 6.8 Hz, 6H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 180.9, 36.2, 21.2.


2a-5

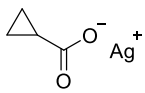
Silver(I) pivalate (**2a-5**). Following the general procedure, **2a-5** was obtained as a gray solid (1009 mg, 97%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 1.10 (s, 9H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 182.3, 39.6, 29.4.


2a-6

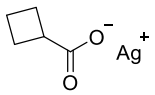
Silver(I) nonanoate (**2a-6**). Following the general procedure, **2a-6** was obtained as a white solid (2124 mg, 80%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 2.82 (t, J = 7.6 Hz, 2H), 2.12-2.04 (m, 2H), 1.57-1.47 (m, 2H), 1.35-1.27 (m, 2H), 1.25-1.11 (m, 6H), 0.79 (t, J = 6.8 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 179.0, 38.5, 32.0, 30.4, 30.0, 29.6, 28.0, 22.8, 14.2.


2a-7

Silver(I) adamantane-1-carboxylate (**2a-7**). Following the general procedure, **2a-7** was obtained as a gray solid (1148 mg, 80%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 2.49-2.43 (m, 6H), 2.03 (s, 3H), 1.81 (s, 1H), 1.78 (s, 2H), 1.73 (s, 2H), 1.70 (s, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 183.2, 42.1, 41.6, 37.5, 39.3.

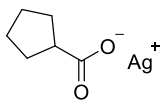

2a-8

Silver(I) cyclopropanecarboxylate (**2a-8**). Following the general procedure, **2a-8** was obtained as a gray solid (682 mg, 71%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 1.51-1.38 (m, 1H), 0.69-0.54 (m, 4H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 178.5, 15.6, 7.3.



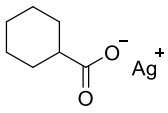
2a-9

Silver(I) cyclobutanecarboxylate (**2a-9**). Following the general procedure, **2a-9** was obtained as a gray solid (618 mg, 60%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 3.03-2.91 (m, 1H), 2.16-2.00 (m, 4H), 1.88-1.68 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 179.4, 40.8, 26.7, 18.2.



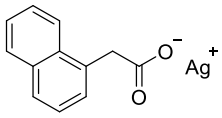
2a-10

Silver(I) cyclopentanecarboxylate (**2a-10**). Following the general procedure, **2a-10** was obtained as a gray solid (880 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 2.63-2.53 (m, 1H), 1.80-1.36 (m, 8H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 180.3, 46.5, 31.2, 25.9.



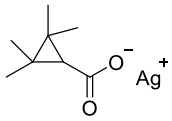
2a-11

Silver(I) cyclohexanecarboxylate (**2a-11**). Following the general procedure, **2a-11** was obtained as a gray solid (995 mg, 85%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 2.14-2.04 (m, 1H), 1.78-1.74 (m, 2H), 1.70-1.60 (m, 2H), 1.59-1.52 (m, 1H), 1.35-1.13 (m, 5H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 179.8, 45.5, 30.9, 26.4, 26.1.



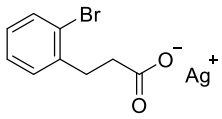
2a-12

Silver(I) 2-(naphthalen-1-yl)acetate (**2a-12**). Following the general procedure, **2a-12** was obtained as a gray solid (1241 mg, 85%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.12-7.99 (m, 1H), 7.94-7.83 (m, 1H), 7.75 (d, J = 8.0 Hz, 1H), 7.51-7.43 (m, 2H), 7.43-7.31 (m, 2H), 3.91 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 175.4, 135.3, 133.8, 132.7, 128.6, 127.9, 126.8, 126.1, 125.9, 125.8, 125.2, 42.3.



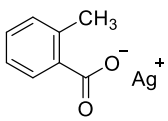
2a-13

Silver(I) 2,2,3,3-tetramethylcyclopropane-1-carboxylate (**2a-13**). Following the general procedure, **2a-13** was obtained as a gray solid (930 mg, 75%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 1.19 (s, 6H), 1.13 (s, 1H), 1.08 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 176.7, 26.3, 24.4, 17.9.



2a-14

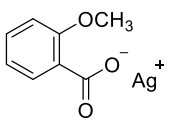
Silver(I) 3-(2-bromophenyl)propanoate (**2a-14**). Following the general procedure, **2a-14** was obtained as a gray solid (1598 mg, 80%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 7.57-7.49 (m, 2H), 7.14 (t, J = 7.2 Hz, 1H), 6.99 (t, J = 7.6 Hz, 1H), 3.54 (t, J = 8.0 Hz, 2H), 3.11 (t, J = 8.0 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 176.3, 141.6, 131.3, 129.5, 126.4, 126.2, 123.4, 36.8, 33.0.



2b-1

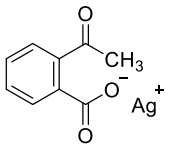
Silver(I) 2-methylbenzoate (**2b-1**). Following the general procedure, **2b-1** was obtained as a gray solid (1150 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.65 (d, J = 8.0 Hz, 1H), 7.24-7.19 (m, 1H), 7.18-7.08 (m, 2H), 2.49 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 173.2, 138.8,

136.9, 130.9, 129.7, 129.0, 125.5, 21.8.



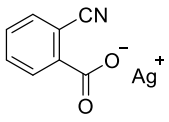
2b-2

Silver(I) 2-methoxybenzoate (**2b-2**). Following the general procedure, **2b-2** was obtained as a gray solid (1226 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.43 (dd, J = 7.6, 2.0 Hz, 1H), 7.31-7.25 (m, 1H), 6.98 (dd, J = 8.4, 1.2 Hz, 1H), 6.89 (dt, J = 7.6, 1.2 Hz, 1H), 3.73 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 171.8, 156.7, 129.9, 129.7, 129.4, 120.2, 112.2, 55.8.



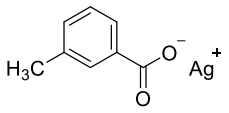
2b-3

Silver(I) 2-acetylbenzoate (**2b-3**). Following the general procedure, **2b-3** was obtained as a gray solid (1283 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.03 (d, J = 8.4 Hz, 2H), 7.95 (d, J = 8.4 Hz, 2H), 2.59 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 198.3, 169.7, 141.8, 138.2, 130.0, 128.2, 27.4.



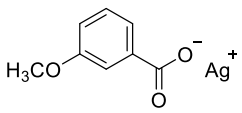
2b-4

Silver(I) 2-cyanobenzoate (**2b-4**). Following the general procedure, **2b-4** was obtained as a gray solid (1201 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.02 (dd, J = 7.6, 1.2 Hz, 1H), 7.77 (dd, J = 7.6, 1.2 Hz, 1H), 7.66 (dt, J = 7.6, 1.2 Hz, 1H), 7.55 (dd, J = 7.6, 1.2 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 168.2, 141.5, 134.3, 132.7, 131.0, 130.4, 119.7, 112.1.



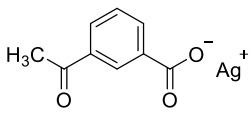
2b-5

Silver(I) 3-methylbenzoate (**2b-5**). Following the general procedure, **2b-5** was obtained as a gray solid (1138 mg, 94%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.78 (s, 1H), 7.75 (d, J = 6.4 Hz, 1H), 7.29-7.21 (m, 2H), 2.34 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.8, 137.21, 137.19, 131.3, 130.7, 128.1, 127.2, 21.5.



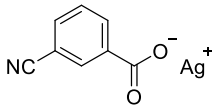
2b-6

Silver(I) 3-methoxybenzoate (**2b-6**). Following the general procedure, **2b-6** was obtained as a gray solid (1226 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.60-7.40 (m, 2H), 7.32-7.23 (m, 1H), 7.05-6.92 (m, 1H), 3.77 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.4, 159.3, 136.2, 129.3, 122.4, 116.6, 114.9, 55.5.



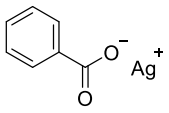
2b-7

Silver(I) 3-acetylbenzoate (**2b-7**). Following the general procedure, **2b-7** was obtained as a gray solid (1242 mg, 92%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.51 (s, 1H), 8.18 (d, J = 7.6 Hz, 1H), 8.02 (d, J = 7.6 Hz, 1H), 7.54 (t, J = 7.6 Hz, 1H), 2.60 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 198.3, 169.7, 137.9, 137.0, 134.4, 130.3, 129.5, 128.7, 27.3.



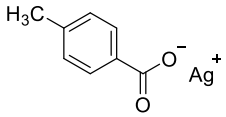
2b-8

Silver(I) 3-cyanobenzoate (**2b-8**). Following the general procedure, **2b-8** was obtained as a gray solid (1213 mg, 96%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.24-8.18 (m, 2H), 7.90-7.85 (m, 1H), 7.60 (t, J = 8.0 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 168.5, 139.0, 134.4, 133.9, 133.2, 129.7, 129.3, 111.3.



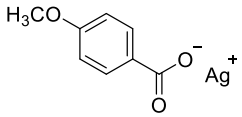
2b-9

Silver(I) benzoate (**2b-9**). Following the general procedure, **2b-9** was obtained as a gray solid (1053 mg, 93%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.85 (d, J = 8.0 Hz, 2H), 7.49-7.38 (m, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 171.8, 140.2, 130.6, 129.5, 127.8.



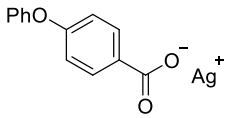
2b-10

Silver(I) 4-methylbenzoate (**2b-10**). Following the general procedure, **2b-10** was obtained as a gray solid (1150 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.85 (d, J = 8.0 Hz, 2H), 7.17 (d, J = 8.0 Hz, 2H), 2.33 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.7, 140.3, 134.5, 130.1, 128.8, 21.5.



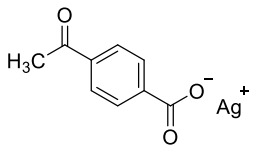
2b-11

Silver(I) 4-methoxybenzoate (**2b-11**). Following the general procedure, **2b-11** was obtained as a gray solid (1225 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.89 (d, J = 9.0 Hz, 2H), 6.89 (d, J = 9.0 Hz, 2H), 3.78 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.5, 161.4, 131.8, 129.7, 113.4, 55.6.



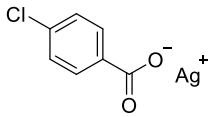
2b-12

Silver(I) 4-phenoxybenzoate (**2b-12**). Following the general procedure, **2b-12** was obtained as a gray solid (1225 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.96 (d, J = 8.8 Hz, 2H), 7.42 (dd, J = 8.8, 7.2 Hz, 2H), 7.18 (t, J = 7.2 Hz, 1H), 7.07 (d, J = 7.2 Hz, 2H), 6.95 (d, J = 8.8 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.0, 159.2, 156.4, 132.2, 132.1, 130.6, 124.4, 119.8, 117.4.



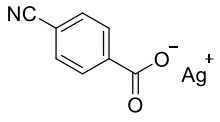
2b-13

Silver(I) 4-acetylbenzoate (**2b-13**). Following the general procedure, **2b-13** was obtained as a gray solid (1245 mg, 92%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.04 (d, J = 8.2 Hz, 2H), 7.98 (d, J = 8.2 Hz, 2H), 2.60 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 198.3, 168.8, 139.6, 138.9, 130.0, 128.4, 27.4.



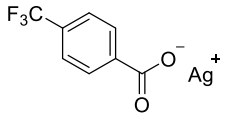
2b-14

Silver(I) 4-chlorobenzoate (**2b-14**). Following the general procedure, **2b-14** was obtained as a gray solid (1179 mg, 90%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.95 (d, J = 8.4 Hz, 2H), 7.45 (d, J = 8.4 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 169.1, 136.0, 135.1, 131.8, 128.5.



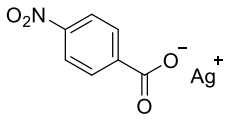
2b-15

Silver(I) 4-cyanobenzoate (**2b-15**). Following the general procedure, **2b-15** was obtained as a gray solid (1175 mg, 93%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.06 (d, J = 8.0 Hz, 2H), 7.84 (d, J = 8.0 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 169.0, 142.0, 132.4, 130.5, 119.3, 112.8.



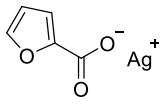
2b-16

Silver(I) 4-(trifluoromethyl)benzoate (**2b-16**). Following the general procedure, **2b-16** was obtained as a gray solid (1406 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.13 (d, J = 8.0 Hz, 2H), 7.73 (d, J = 8.0 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 169.3, 141.4, 130.7 (q, $J_{C\text{-}F}$ = 31.3 Hz), 130.6, 125.2 (q, $J_{C\text{-}F}$ = 14.0 Hz), 124.7 (q, $J_{C\text{-}F}$ = 270.6 Hz). ^{19}F NMR (376 MHz, DMSO-d_6) δ -61.1.



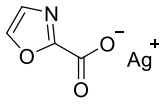
2b-17

Silver(I) 4-nitrobenzoate (**2b-17**). Following the general procedure, **2b-17** was obtained as a gray solid (1256 mg, 92%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.21 (d, J = 8.8 Hz, 2H), 8.12 (d, J = 8.8 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 168.6, 148.8, 144.2, 130.9, 123.4.



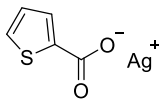
2b-18

Silver(I) furan-2-carboxylate (**2b-18**). Following the general procedure, **2b-18** was obtained as a gray solid (872 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.65 (dd, J = 1.6, 0.8 Hz, 1H), 6.81 (dd, J = 3.2, 0.8 Hz, 1H), 6.48 (dd, J = 3.2, 1.6 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 163.2, 151.7, 144.2, 113.8, 111.6.



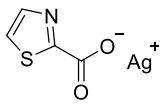
2b-19

Silver(I) oxazole-2-carboxylate (**2b-19**). Following the general procedure, **2b-19** was obtained as a gray solid (876 mg, 80%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 7.97 (s, 1H), 7.24 (s, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 162.9, 159.6, 139.9, 127.5.



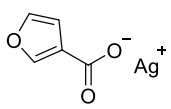
2b-20

Silver(I) thiophene-2-carboxylate (**2b-20**). Following the general procedure, **2b-20** was obtained as a gray solid (936 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.58 (dd, J = 4.8 ,1.2 Hz, 1H), 7.47 (dd, J = 3.6, 1.2 Hz, 1H), 7.05 (dd, J = 4.8, 3.6 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 166.2, 143.0, 130.6, 130.3, 127.9.



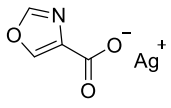
2b-21

Silver(I) thiazole-2-carboxylate (**2b-21**). Following the general procedure, **2b-21** was obtained as a gray solid (940 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.91 (d, J = 3.2 Hz, 1H), 7.88 (d, J = 3.2 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 172.4, 160.8, 143.0, 125.5.



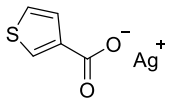
2b-22

Silver(I) furan-3-carboxylate (**2b-22**). Following the general procedure, **2b-22** was obtained as a gray solid (894 mg, 83%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.94 (dd, J = 1.6, 0.8 Hz, 1H), 7.60 (t, J = 1.6 Hz, 1H), 6.60 (dd, J = 1.6, 0.8 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 167.3, 146.1, 143.6, 125.5, 111.7.



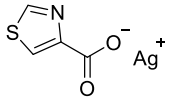
2b-23

Silver(I) oxazole-4-carboxylate (**2b-23**). Following the general procedure, **2b-23** was obtained as a gray solid (876 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.52 (d, J = 0.8 Hz, 1H), 8.45 (d, J = 0.8 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 163.1, 152.7, 143.5, 136.3.



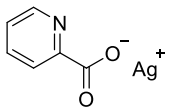
2b-24

Silver(I) thiophene-3-carboxylate (**2b-24**). Following the general procedure, **2b-24** was obtained as a gray solid (937 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.91 (dd, J = 3.2, 0.8 Hz, 1H), 7.44 (dd, J = 4.8, 3.2 Hz, 1H), 7.37 (dd, J = 4.8, 0.8 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 167.3, 141.3, 129.9, 129.5, 125.8.



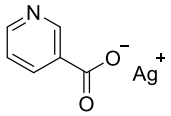
2b-25

Silver(I) thiazole-4-carboxylate (**2b-25**). Following the general procedure, **2b-25** was obtained as a gray solid (942 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 9.20 (d, J = 2.0 Hz, 1H), 8.39 (d, J = 2.0 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 163.6, 156.7, 150.8, 127.0.



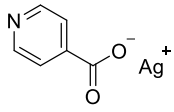
2b-26

Silver(I) picolinate (**2b-26**). Following the general procedure, **2b-26** was obtained as a gray solid (1031 mg, 91%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.69 (d, J = 4.4 Hz, 1H), 8.06 (d, J = 7.6 Hz, 1H), 7.99 (dt, J = 7.6, 1.6 Hz, 1H), 7.66-7.59 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 166.6, 150.0, 149.3, 138.1, 127.4, 125.1.



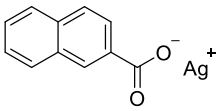
2b-27

Silver(I) nicotinate (**2b-27**). Following the general procedure, **2b-27** was obtained as a gray solid (912 mg, 80%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 10.10 (d, J = 2.0 Hz, 1H), 8.91 (dt, J = 7.6, 2.0 Hz, 1H), 8.72 (dd, J = 4.8, 2.0 Hz, 1H), 7.27 (dd, J = 7.6, 4.8 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 170.1, 152.4, 150.4, 137.5, 123.0.



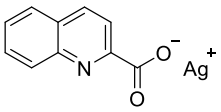
2b-28

Silver(I) isonicotinate (**2b-28**). Following the general procedure, **2b-28** was obtained as a gray solid (1005 mg, 88%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.85 (dt, J = 4.0, 2.0 Hz, 2H), 8.52 (dt, J = 4.0, 2.0 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 169.9, 150.2, 147.8, 124.7.



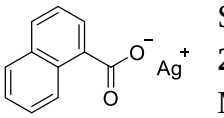
2b-29

Silver(I) 2-naphthoate (**2b-29**). Following the general procedure, **2b-29** was obtained as a gray solid (1181 mg, 85%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.55 (s, 1H), 8.07 (dd, J = 8.4, 1.4 Hz, 1H), 8.05-8.00 (m, 1H), 7.96-7.92 (m, 1H), 7.90 (d, J = 8.8 Hz, 1H), 7.60-7.50 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.5, 134.5, 134.3, 132.9, 130.0, 129.4, 127.9, 127.6, 127.5, 127.3, 126.6.



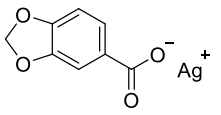
2b-30

Silver(I) quinoline-2-carboxylate (**2b-30**). Following the general procedure, **2b-30** was obtained as a gray solid (1173 mg, 84%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 9.03 (d, J = 8.8 Hz, 1H), 8.64 (d, J = 8.4 Hz, 1H), 8.32 (d, J = 8.4 Hz, 1H), 7.86 (d, J = 8.0 Hz, 1H), 7.70-7.64 (m, 1H), 7.53-7.47 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 168.2, 156.6, 146.1, 137.8, 130.4, 130.3, 129.3, 128.1, 127.6, 123.0.



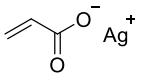
2b-31

Silver(I) 1-naphthoate (**2b-31**). Following the general procedure, **2b-31** was obtained as a gray solid (1188 mg, 86%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.97-8.88 (m, 1H), 7.98-7.87 (m, 3H), 7.55-7.44 (m, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 172.7, 136.9, 133.9, 131.2, 129.7, 128.4, 127.8, 127.7, 126.3, 125.9, 125.5.



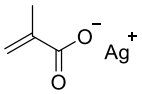
2b-32

Silver(I) benzo[d][1,3]dioxole-5-carboxylate (**2b-32**). Following the general procedure, **2b-32** was obtained as a gray solid (1292 mg, 95%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.54 (dd, J = 8.0, 1.6 Hz, 1H), 7.38 (d, J = 1.6 Hz, 1H), 6.89 (d, J = 8.0 Hz, 1H), 6.05 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 169.7, 149.6, 147.3, 131.1, 124.8, 109.9, 107.9, 101.7.



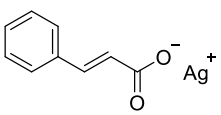
2c-1

Silver(I) acrylate (**2c-1**). Following the general procedure, **2c-1** was obtained as a gray solid (712 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 6.15 (dd, J = 17.2, 10.0 Hz, 1H), 5.97 (dd, J = 17.2, 2.8 Hz, 1H), 5.52 (dd, J = 10.0, 2.8, 1H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.7, 135.7, 125.4.



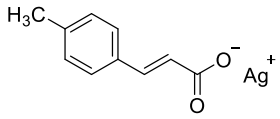
2c-2

Silver(I) methacrylate (**2c-2**). Following the general procedure, **2c-2** was obtained as a gray solid (772 mg, 81%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 5.76 (dd, J = 7.2, 4.8, 1H), 5.26-5.22 (m, 1H), 1.86 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 172.0, 143.6, 120.6, 20.8.



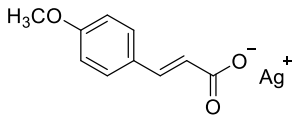
2c-3

Silver(I) cinnamate (**2c-3**). Following the general procedure, **2c-3** was obtained as a gray solid (1143 mg, 90%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.17 (d, J = 16.0 Hz, 1H), 7.59 (d, J = 7.2 Hz, 2H), 7.43 (d, J = 16.0 Hz, 1H), 7.29-7.18 (m, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 172.6, 138.1, 137.5, 129.3, 128.9, 128.3, 127.5.



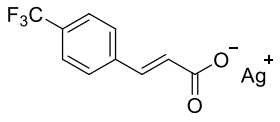
2c-4

Silver(I) 3-(*p*-tolyl)acrylate (**2c-4**). Following the general procedure, **2c-4** was obtained as a gray solid (1206 mg, 90%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.17 (d, J = 15.6 Hz, 1H), 7.52 (d, J = 8.0 Hz, 2H), 7.39 (d, J = 15.6 Hz, 1H), 7.07 (d, J = 8.0 Hz, 2H), 2.15 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 172.5, 138.5, 138.2, 134.6, 129.6, 127.63, 127.59, 21.0.



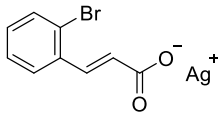
2c-5

Silver(I) 3-(4-methoxyphenyl)acrylate (**2c-5**). Following the general procedure, **2c-5** was obtained as a gray solid (1278 mg, 90%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 7.60 (d, J = 8.8 Hz, 2H), 7.46 (d, J = 16.0 Hz, 1H), 7.00 (d, J = 8.8 Hz, 2H), 6.38 (d, J = 16.0 Hz, 1H), 3.79 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 168.9, 161.1, 142.8, 130.1, 127.7, 118.8, 114.8, 55.7.



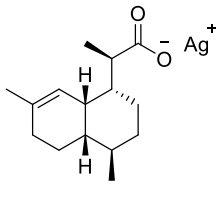
2c-6

Silver(I) 3-(4-(trifluoromethyl)phenyl)acrylate (**2c-6**). Following the general procedure, **2c-6** was obtained as a gray solid (1450 mg, 90%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.09 (d, J = 16.0 Hz, 1H), 7.65 (d, J = 8.0 Hz, 2H), 7.55 (d, J = 8.0 Hz, 2H), 7.47 (d, J = 16.0 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 171.5, 141.2, 136.9, 131.3, 129.3 (q, $J_{C\text{-}F}$ = 31.8 Hz), 127.9, 125.7 (q, $J_{C\text{-}F}$ = 3.8 Hz), 124.8 (q, $J_{C\text{-}F}$ = 270.2 Hz). ^{19}F NMR (376 MHz, Pyridine-d_5) δ -61.9.



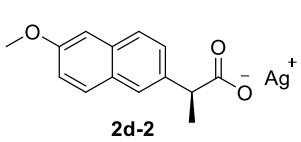
2c-7

Silver(I) 3-(2-bromophenyl)acrylate (**2c-7**). Following the general procedure, **2c-7** was obtained as a gray solid (1560 mg, 92%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.49 (d, J = 15.6 Hz, 1H), 7.75 (dd, J = 8.0, 1.6 Hz, 1H), 7.55 (dd, J = 8.0, 1.2 Hz, 1H), 7.28 (d, J = 15.6 Hz, 1H), 7.19 (t, J = 7.6 Hz, 1H), 7.06 (dt, J = 7.6, 1.6 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 171.2, 137.5, 136.6, 133.3, 130.4, 130.0, 128.00, 127.98, 124.7.



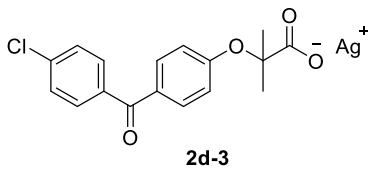
2d-1

Silver(I) (*R*)-2-((1*R*,4*R*,4a*S*,8a*S*)-4,7-dimethyl-1,2,3,4,4a,5,6,8a-octahydronaphthalen-1-yl)propanoate (**2d-1**). Following the general procedure, **2d-1** was obtained as a gray solid (1368 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 5.17 (s, 1H), 2.45-2.30 (m, 2H), 1.92-1.71 (m, 3H), 1.60 (s, 3H), 1.54-1.43 (m, 3H), 1.40-1.29 (m, 2H), 1.21-1.14 (m, 1H), 1.02-0.95 (m, 3H), 0.89-0.73 (m, 5H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 180.6, 134.9, 120.7, 44.7, 44.4, 41.8, 36.6, 35.6, 28.0, 27.9, 26.7, 25.9, 24.2, 20.2, 16.6.



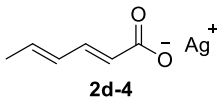
2d-2

Silver(I) (*S*)-2-(6-methoxynaphthalen-2-yl)propanoate (**2d-2**). Following the general procedure, **2d-2** was obtained as a gray solid (1182 mg, 83%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.19 (s, 1H), 8.12 (dd, J = 8.4, 1.2 Hz, 1H), 7.83 (d, J = 8.4 Hz, 1H), 7.74 (d, J = 8.8 Hz, 1H), 7.30 (d, J = 2.4 Hz, 1H), 7.24 (dd, J = 8.8, 2.4 Hz, 1H), 4.43 (q, J = 7.2 Hz, 1H), 3.76 (s, 3H), 1.97 (d, J = 7.2 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 179.3, 157.4, 142.2, 133.7, 126.7, 129.5, 128.5, 126.6, 126.1, 118.6, 106.1, 55.1, 49.5, 21.1.



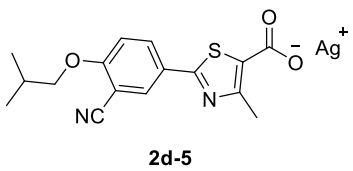
2d-3

Silver(I) 2-(4-(4-chlorobenzoyl)phenoxy)-2-methylpropanoate (**2d-3**). Following the general procedure, **2d-3** was obtained as a gray solid (1950 mg, 92%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 7.73 (d, J = 9.2 Hz, 2H), 7.66 (d, J = 8.4 Hz, 2H), 7.49-7.41 (m, 4H), 2.07 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 193.7, 177.1, 162.8, 137.54, 137.50, 132.1, 131.3, 128.6, 128.4, 117.6, 82.8, 27.2.



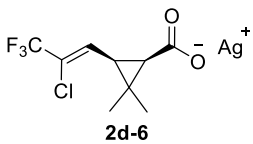
2d-4

Silver(I) hexa-2,4-dienoate (**2d-4**). Following the general procedure, **2d-4** was obtained as a gray solid (937 mg, 86%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 7.73 (dd, J = 15.2, 10.8 Hz, 1H), 6.73 (d, J = 15.2 Hz, 1H), 6.33-6.23 (m, 1H), 5.86-5.75 (m, 1H), 1.58 (d, J = 6.8 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 171.2, 146.7, 140.0, 134.7, 131.1, 13.7.



2d-5

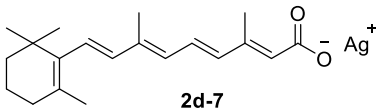
Silver(I) 2-(3-cyano-4-isobutoxyphenyl)-4-methylthiazole-5-carb oxylate (**2d-5**). Following the general procedure, **2d-5** was obtained as a gray solid (1730 mg, 82%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.47 (d, J = 2.0 Hz, 1H), 8.23 (dd, J = 8.8, 2.0 Hz, 1H), 7.03 (d, J = 8.8 Hz, 1H), 3.76 (d, J = 6.8 Hz, 2H), 3.25 (s, 3H), 2.07-1.95 (m, 1H), 0.96 (d, J = 6.8 Hz, 6H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 166.8, 163.2, 161.7, 155.0, 132.5, 131.6, 127.8, 116.3, 113.3, 102.6, 75.5, 28.2, 18.9, 17.3.



2d-6

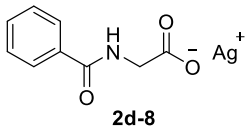
Silver(I) (1*R*,3*R*)-3-((*Z*)-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dime thylcyclopropane-1-carboxylate (**2d-6**). Following the general procedure, **2d-6** was obtained as a gray solid (1566 mg, 90%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.30 (d, J = 9.6 Hz, 1H), 2.64 (d, J = 8.0 Hz, 1H), 2.10 (t, J = 9.2 Hz, 1H), 1.60 (s, 3H), 1.20 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 174.9, 137.1 (q, $J_{C\text{-}F}$ = 4.4 Hz), 121.8 (q, $J_{C\text{-}F}$ = 274.4 Hz), 116.9 (q,

$J_{C\text{-}F}$ = 36.5 Hz), 39.5, 30.3, 28.9, 27.3, 16.3. ^{19}F NMR (376 MHz, Pyridine-d_5) δ -67.2.



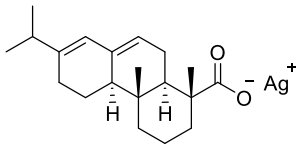
2d-7

Silver(I) 3,7-dimethyl-9-(2,6,6-trimethylcyclohex-1-en-1-yl)nona-2,4,6,8-tetraenoate (**2d-7**). Following the general procedure, **2d-7** was obtained as a gray solid (1624 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 6.90 (dd, J = 15.2 ,11.6 Hz, 1H), 6.37 (d, J = 15.2 Hz, 1H), 6.26-6.11 (m, 3H), 5.82 (s, 1H), 2.24 (s, 3H), 2.00 (t, J = 6.0 Hz, 2H), 1.96 (s, 3H), 1.68 (s, 3H), 1.60-1.54 (m, 2H), 1.46-1.41 (m, 2H), 1.01 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 170.1, 138.2, 137.8, 137.6, 136.9, 130.6, 129.7, 129.63, 129.62, 127.7, 39.7, 34.4, 33.1, 29.3, 22.0, 19.2, 13.9, 13.1.



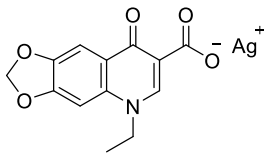
2d-8

Silver(I) benzoylglycinate (**2d-8**). Following the general procedure, **2d-8** was obtained as a gray solid (1182 mg, 83%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.47 (t, J = 5.6 Hz, 1H), 7.88-7.82 (m, 2H), 7.53-7.41 (m, 3H), 3.81 (d, J = 5.6 Hz, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 173.6, 166.1, 135.1, 131.5, 128.7, 127.6, 44.0.



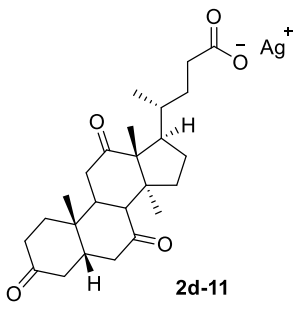
3d-9

Silver(I) (1*R*,4a*R*,4b*R*,10a*R*)-7-isopropyl-1,4a-dimethyl-1,2,3,4,4a,4b,5,6,10,10a-decahydrophenanthrene-1-carboxylate (**2d-9**). Following the general procedure, **2d-9** was obtained as a gray solid (1773 mg, 90%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 5.74 (s, 1H), 5.35 (s, 1H), 2.34-2.12 (m, 2H), 2.09-2.01 (m, 3H), 1.84-1.70 (m, 6H), 1.51-1.43 (m, 4H), 1.54 (s, 3H), 0.97 (dd, J = 6.8, 1.2 Hz, 6H), 0.74 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 182.0, 144.4, 135.2, 123.0, 121.7, 51.1, 47.1, 46.1, 38.8, 38.5, 34.7, 34.6, 27.3, 25.9, 22.5, 21.8, 21.2, 19.0, 18.8, 14.3.



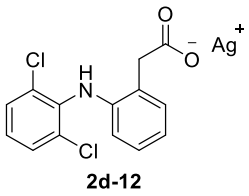
3d-10

Silver(I) 5-ethyl-8-oxo-5,8-dihydro-[1,3]dioxolo[4,5-g]quinoline-7-carboxylate (**2d-10**). Following the general procedure, **2d-10** was obtained as a gray solid (1508 mg, 82%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 9.07 (s, 1H), 8.26 (s, 1H), 7.14 (s, 1H), 6.08 (s, 2H), 4.17-3.91 (m, 2H), 1.14 (t, J = 6.8 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 175.2, 170.8, 152.0, 146.7, 145.7, 136.3, 125.2, 104.5, 102.5, 95.8, 48.5, 14.3.



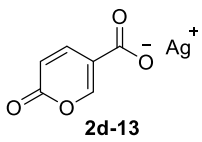
2d-11

Silver(I) (*R*)-4-((5*S*,8*R*,9*S*,10*S*,13*R*,14*S*,17*R*)-10,13-dimethyl-3,7,12-trioxohexadecahydro-1*H*-cyclopenta[a]phenanthren-17-yl)pentanoate (**2d-11**). Following the general procedure, **2d-11** was obtained as a gray solid (2088 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 3.07-2.94 (m, 2H), 2.83 (t, J = 12.6 Hz, 1H), 2.43 (dt, J = 12.4, 5.2 Hz, 1H), 2.34-1.92 (m, 9H), 1.87-1.63 (m, 6H), 1.49 (dt, J = 14.4, 4.0 Hz, 1H), 1.32 (s, 3H), 1.29-1.19 (m, 4H), 1.00 (s, 3H), 0.75 (d, J = 5.6 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 212.8, 210.4, 210.3, 178.2, 55.8, 51.8, 48.6, 46.6, 46.2, 45.1, 44.7, 43.1, 39.0, 36.7, 36.2, 35.9, 35.1, 34.5, 32.9, 27.9, 25.2, 21.7, 19.5, 12.1.



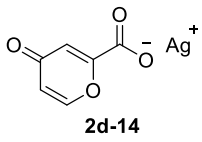
2d-12

Silver(I) 2-(2-((2,6-dichlorophenyl)amino)phenyl)acetate (**2d-12**). Following the general procedure, **2d-12** was obtained as a gray solid (1602 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.98 (s, 1H), 7.47 (d, J = 8.0 Hz, 2H), 7.15-7.07 (m, 2H), 6.98 (dt, J = 8.0, 1.6 Hz, 1H), 6.79 (dt, J = 7.2, 1.6 Hz, 1H), 6.28 (dd, J = 8.0, 1.2 Hz, 1H), 3.56 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 176.0, 143.3, 138.1, 130.7, 129.6, 129.4, 127.6, 126.8, 124.8, 120.9, 116.4, 42.6.



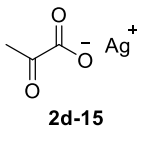
2d-13

Silver(I) 2-oxo-2H-pyran-5-carboxylate (**2d-13**). Following the general procedure, **2d-13** was obtained as a gray solid (984 mg, 80%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 8.26 (dd, J = 2.6, 1.0 Hz, 1H), 7.88 (dd, J = 9.6, 2.6 Hz, 1H), 6.28 (dd, J = 9.6, 1.0 Hz). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 166.4, 161.4, 156.7, 145.7, 117.4, 114.0.



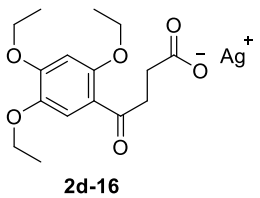
2d-14

Silver(I) 4-oxo-4H-pyran-2-carboxylate (**2d-14**). Following the general procedure, **2d-14** was obtained as a gray solid (1082 mg, 88%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 8.04 (d, J = 5.6 Hz, 1H), 7.62 (d, J = 2.8 Hz, 1H), 6.45 (dd, J = 5.6, 2.8 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, Pyridine-d_5) δ 179.9, 163.5, 161.0, 155.8, 117.7, 117.5.



2d-15

Silver(I) 2-oxopropanoate (**2d-15**). Following the general procedure, **2d-15** was obtained as a gray solid (873 mg, 90%). ^{1}H NMR (400 MHz, DMSO-d_6) δ 2.20 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 203.0, 169.5, 27.8.

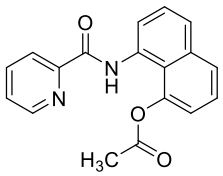


2d-16

Silver(I) 4-oxo-4-(2,4,5-triethoxyphenyl)butanoate (**2d-16**). Following the general procedure, **2d-16** was obtained as a gray solid (1893 mg, 91%). ^{1}H NMR (400 MHz, Pyridine-d_5) δ 7.80 (s, 1H), 6.65 (s, 1H), 4.06 (q, J = 6.8 Hz, 2H), 4.01 (q, J = 6.8

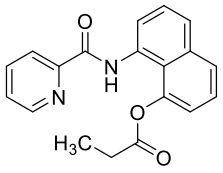
Hz, 2H), 3.92-3.85 (m, 4H), 3.37 (t, *J* = 6.8 Hz, 2H), 1.37 (t, *J* = 6.8 Hz, 3H), 1.32 (t, *J* = 6.8 Hz, 3H), 1.23 (t, *J* = 6.8 Hz, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, Pyridine-d_5) δ 200.5, 178.1, 154.8, 153.7, 142.9, 120.7, 115.8, 99.5, 65.0, 64.9, 64.5, 42.3, 33.1, 15.0, 14.83, 14.76.

7. Characterization data of products **3aa-1**–**3wa**



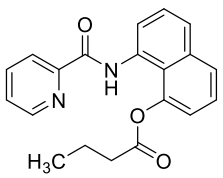
3aa-1

8-(Picolinamido)naphthalen-1-yl acetate (**3aa-1**). Following the general procedure, **3aa-1** was obtained as a colorless solid (56.4 mg, 92%). R_f = 0.40 (n-hexane/EtOAc 3:1). m.p. 160.0–162.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.52 (s, 1H), 8.77 (d, *J* = 7.6 Hz, 1H), 8.68-8.62 (m, 1H), 8.38 (d, *J* = 8.0 Hz, 1H), 7.97-7.10 (m, 1H), 7.76 (d, *J* = 8.0 Hz, 1H), 7.69 (d, *J* = 8.0 Hz, 1H), 7.56-7.49 (m, 2H), 7.46 (t, *J* = 8.0 Hz, 1H), 7.20 (d, *J* = 7.6 Hz, 1H), 2.46 (s, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 169.6, 162.3, 150.3, 147.6, 145.8, 137.8, 136.4, 132.4, 127.2, 126.6, 126.4, 125.2, 125.0, 122.9, 120.4, 119.5, 119.2, 21.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{18}H_{15}N_2O_3$: 307.1083; found: 307.1077. FT-IR (neat, cm^{-1}) υ 3338, 2920, 1759, 1673, 1529, 1495, 1182, 724.



3aa-2

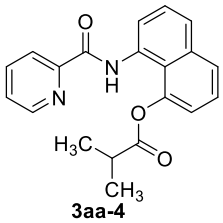
8-(Picolinamido)naphthalen-1-yl propionate (**3aa-2**). Following the general procedure, **3aa-2** was obtained as a colorless solid (49.9 mg, 78%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 136.0–138.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.51 (s, 1H), 8.77 (d, *J* = 8.0 Hz, 1H), 8.64 (d, *J* = 4.4 Hz, 1H), 8.38 (d, *J* = 8.0 Hz, 1H), 7.95 (dd, *J* = 8.0, 1.6 Hz, 1H), 7.76 (d, *J* = 8.0 Hz, 1H), 7.68 (d, *J* = 8.0 Hz, 1H), 7.55-7.50 (m, 2H), 7.46 (t, *J* = 8.0 Hz, 1H), 7.18 (dd, *J* = 7.6, 1.2 Hz, 1H), 2.84 (q, *J* = 7.6 Hz, 2H), 1.19 (t, *J* = 7.6 Hz, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 173.2, 162.2, 150.3, 147.5, 126.0, 137.8, 136.4, 132.5, 127.1, 126.6, 126.4, 125.3, 125.0, 123.0, 120.3, 119.4, 119.3, 28.0, 8.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_3$: 321.1239; found: 321.1234. FT-IR (neat, cm^{-1}) υ 3343, 2925, 1761, 1674, 1530, 1496, 1108, 748.



3aa-3

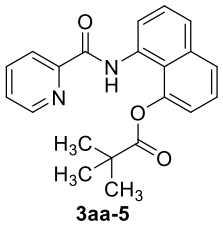
8-(Picolinamido)naphthalen-1-yl butyrate (**3aa-3**). Following the general procedure, **3aa-3** was obtained as a yellow solid (34.7 mg, 52%). R_f = 0.52 (n-hexane/EtOAc 3:1). m.p. 104.0–106.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.50 (s, 1H), 8.76 (d, *J* = 7.6 Hz, 1H), 8.66 (d, *J* = 4.4 Hz, 1H), 8.38 (d, *J* = 8.0 Hz, 1H), 7.95 (t, *J* = 7.6 Hz, 1H), 7.75 (d, *J* = 7.6 Hz, 1H), 7.68 (d, *J* = 8.0 Hz, 1H), 7.56-7.50 (m, 2H), 7.46 (t, *J* = 7.6 Hz, 1H), 7.17 (dd, *J* = 7.6, 0.8 Hz, 1H), 2.77 (t, *J* = 7.6 Hz, 2H), 1.77-1.67 (m, 2H), 0.92 (t, *J* = 7.6 Hz, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 172.3, 162.2, 150.4, 147.6, 146.0, 137.8, 136.4, 132.5, 127.1, 126.6, 126.4, 125.3, 125.0, 123.0, 120.3,

119.4, 119.3, 36.3, 18.2, 13.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{19}N_2O_3$: 335.1396; found: 335.1390. FT-IR (neat, cm^{-1}) υ 3338, 2925, 1759, 1677, 1529, 1496, 748.



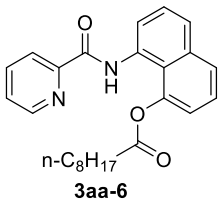
3aa-4

8-(Picolinamido)naphthalen-1-yl isobutyrate (**3aa-4**). Following the general procedure, **3aa-4** was obtained as a yellow solid (24.7 mg, 37%). R_f = 0.52 (n-hexane/EtOAc 3:1). m.p. 100.0–102.0 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 11.52 (s, 1H), 8.78 (d, *J* = 7.6 Hz, 1H), 8.63 (d, *J* = 4.8 Hz, 1H), 8.38 (d, *J* = 7.6 Hz, 1H), 7.95 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.75 (d, *J* = 8.4 Hz, 1H), 7.68 (d, *J* = 8.0 Hz, 1H), 7.55-7.50 (m, 2H), 7.45 (t, *J* = 8.0 Hz, 1H), 7.13 (dd, *J* = 7.6, 0.8 Hz, 1H), 3.29-3.20 (m, 1H), 1.27 (d, *J* = 7.2 Hz, 6H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 176.1, 162.3, 150.4, 147.5, 146.3, 137.8, 136.4, 132.6, 127.0, 126.5, 126.4, 125.3, 125.0, 123.0, 120.1, 119.3, 33.9, 18.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{19}N_2O_3$: 335.1396; found: 335.1390. FT-IR (neat, cm^{-1}) υ 3346, 2923, 1763, 1684, 1530, 1497, 1075, 754.



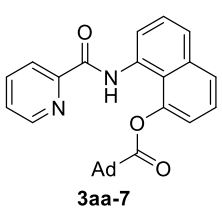
3aa-5

8-(Picolinamido)naphthalen-1-yl pivalate (**3aa-5**). Following the general procedure, **3aa-5** was obtained as a yellow oil (45.2 mg, 65%). R_f = 0.52 (n-hexane/EtOAc 3:1). ^1H NMR (400 MHz, $CDCl_3$) δ 10.72 (s, 1H), 8.66 (d, *J* = 4.0 Hz, 1H), 8.47 (d, *J* = 7.6 Hz, 1H), 8.35 (d, *J* = 8.0 Hz, 1H), 7.93 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.76 (d, *J* = 7.6 Hz, 1H), 7.72 (d, *J* = 8.0 Hz, 1H), 7.55-7.48 (m, 2H), 7.45 (t, *J* = 7.6 Hz, 1H), 7.04 (dd, *J* = 7.6, 1.2 Hz, 1H), 1.26 (s, 9H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 178.1, 162.7, 150.3, 147.9, 147.3, 137.7, 136.4, 132.1, 127.0, 126.5, 126.3, 125.6, 125.4, 123.0, 121.0, 120.9, 120.0, 39.5, 26.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{21}N_2O_3$: 349.1552; found: 349.1547. FT-IR (neat, cm^{-1}) υ 3349, 2925, 1752, 1683, 1528, 1495, 1086, 752.



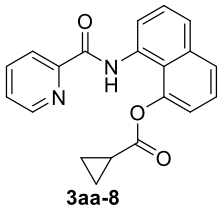
3aa-6

8-(Picolinamido)naphthalen-1-yl nonanoate (**3aa-6**). Following the general procedure, **3aa-6** was obtained as a colorless solid (38.8 mg, 48%). R_f = 0.75 (n-hexane/EtOAc 3:1). m.p. 94.0–96.0 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 11.50 (s, 1H), 8.76 (dd, *J* = 7.6, 0.8 Hz, 1H), 8.65 (d, *J* = 4.8 Hz, 1H), 8.38 (d, *J* = 8.0 Hz, 1H), 7.95 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.76 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.68 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.56-7.50 (m, 2H), 7.46 (t, *J* = 8.0 Hz, 1H), 7.17 (dd, *J* = 7.6, 0.8 Hz, 1H), 2.77 (t, *J* = 7.6 Hz, 2H), 1.70-1.64 (m, 2H), 1.32-1.21 (m, 10H), 0.88 (t, *J* = 6.8 Hz, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 172.5, 162.2, 150.4, 147.6, 146.0, 137.8, 136.4, 132.5, 127.1, 126.5, 126.4, 125.3, 125.0, 123.0, 120.3, 119.4, 119.3, 34.5, 31.7, 29.2, 29.1, 24.7, 22.6, 14.1. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{29}N_2O_3$: 405.2178; found: 405.2173. FT-IR (neat, cm^{-1}) υ 3361, 2922, 1766, 1683, 1529, 1496, 1091, 750.



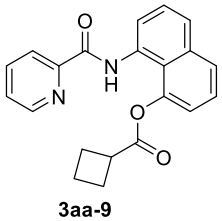
3aa-7

8-(picolinamido)naphthalen-1-yl adamantane-1-carboxylate (**3aa-7**). Following the general procedure, **3aa-7** was obtained as a yellow solid (50.3 mg, 59%). R_f = 0.52 (n-hexane/EtOAc 3:1). m.p. 204.0–206.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.53 (s, 1H), 8.69 (d, *J* = 4.4 Hz, 1H), 8.36 (d, *J* = 7.6 Hz, 2H), 7.93 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.78-7.68 (m, 2H), 7.55-7.47 (m , 2H), 7.44 (t, *J* = 8.0 Hz, 1H), 7.00 (dd, *J* = 7.6, 1.2 Hz, 1H), 2.10-1.96 (m, 1H), 1.94-1.86 (m, 8H), 1.66-1.60 (m, 3H), 1.52-1.46 (m, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 177.1, 162.7, 150.5, 148.0, 147.3, 137.7, 136.4, 132.0, 126.9, 126.5, 126.2, 125.8, 125.5, 123.1, 121.4, 121.2, 120.2, 41.4, 38.3, 36.2, 27.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{27}H_{27}N_2O_3$: 427.2022; found: 427.2016. FT-IR (neat, cm^{-1}) υ 3365, 2914, 1746, 1684, 1527, 1496, 1198, 1032, 752.



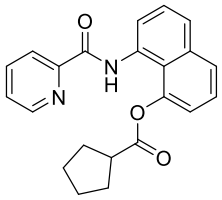
3aa-8

8-(Picolinamido)naphthalen-1-yl cyclopropanecarboxylate (**3aa-8**). Following the general procedure, **3aa-8** was obtained as a colorless solid (39.9 mg, 60%). R_f = 0.46 (n-hexane/EtOAc 3:1). m.p. 148.0–150.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.55 (s, 1H), 8.68 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.60 (d, *J* = 4.4 Hz, 1H), 8.38 (d, *J* = 8.0 Hz, 1H), 7.94 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.76 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.69 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.53 (t, *J* = 8.0 Hz, 1H), 7.51-7.47 (m, 1H), 7.45 (t, *J* = 8.0 Hz, 1H), 7.19 (dd, *J* = 7.6, 1.2 Hz, 1H), 2.19-2.12 (m, 1H), 1.04-0.98 (m, 2H), 0.73-0.67 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 173.8, 162.3, 150.5, 147.6, 146.2, 137.6, 136.4, 132.4, 127.1, 126.41, 126.31, 125.5, 125.1, 122.8, 120.4, 119.8, 119.6, 13.5, 9.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{17}N_2O_3$: 333.1239; found: 333.1234. FT-IR (neat, cm^{-1}) υ 3357, 2923, 1752, 1683, 1530, 1498, 1125, 1086, 752.



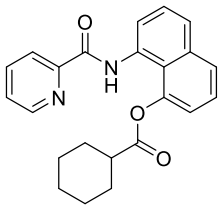
3aa-9

8-(Picolinamido)naphthalen-1-yl cyclobutanecarboxylate (**3aa-9**). Following the general procedure, **3aa-9** was obtained as a colorless solid (33.2 mg, 48%). R_f = 0.52 (n-hexane/EtOAc 3:1). m.p. 127.0–129.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.46 (s, 1H), 8.77-8.69 (m, 2H), 8.37 (d, *J* = 8.0 Hz, 1H), 7.95 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.76 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.68 (dd, *J* = 8.0, 1.2 Hz, 1H), 7.57-7.50 (m, 2H), 7.46 (t, *J* = 8.0 Hz, 1H), 7.17 (dd, *J* = 7.6, 1.2 Hz, 1H), 3.81-3.70 (m, 1H), 2.43-2.32 (m, 2H), 2.18-2.08 (m, 2H), 2.00-1.92 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 174.3, 162.2, 150.5, 147.5, 146.1, 137.8, 136.4, 132.5, 127.0, 126.6, 126.4, 125.3, 125.0, 123.0, 120.2, 119.4, 119.3, 38.2, 25.3, 18.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{19}N_2O_3$: 347.1396; found: 347.1390. FT-IR (neat, cm^{-1}) υ 3345, 2924, 1758, 1682, 1529, 1496, 1108, 1032, 753.



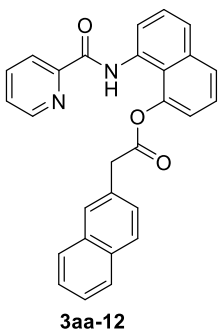
3aa-10

8-(Picolinamido)naphthalen-1-yl cyclopentanecarboxylate (**3aa-10**). Following the general procedure, **3aa-10** was obtained as a yellow solid (30.2 mg, 42%). R_f = 0.60 (n-hexane/EtOAc 3:1). m.p. 116.0–118.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.53 (s, 1H), 8.76 (d, *J* = 7.6 Hz, 1H), 8.62 (d, *J* = 3.6 Hz, 1H), 8.38 (d, *J* = 7.6 Hz, 1H), 7.95 (t, *J* = 7.6 Hz, 1H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.68 (d, *J* = 8.0 Hz, 1H), 7.57-7.49 (m, 2H), 7.45 (t, *J* = 8.0 Hz, 1H), 7.15 (d, *J* = 7.6 Hz, 1H), 3.46-3.35 (m, 1H), 1.94-1.82 (m, 4H), 1.79-1.71 (m, 2H), 1.61-1.53 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 175.7, 162.2, 150.5, 147.4, 146.2, 137.8, 136.4, 132.6, 127.0, 126.5, 126.4, 125.3, 125.0, 123.0, 120.2, 119.4, 119.3, 43.8, 30.2, 25.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{22}H_{21}N_2O_3$: 361.1552; found: 361.1547. FT-IR (neat, cm^{-1}) υ 3339, 2928, 1760, 1682, 1529, 1496, 1105, 752.



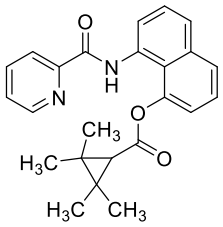
3aa-11

8-(Picolinamido)naphthalen-1-yl cyclohexanecarboxylate (**3aa-11**). Following the general procedure, **3aa-11** was obtained as a colorless solid (56.1 mg, 75%). R_f = 0.65 (n-hexane/EtOAc 3:1). m.p. 148.0–150.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.42 (s, 1H), 8.74-8.67 (m, 2H), 8.38 (d, *J* = 8.0 Hz, 1H), 7.96 (dt, *J* = 8.0, 1.6 Hz, 1H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.69 (d, *J* = 8.0 Hz, 1H), 7.56-7.50 (m, 2H), 7.45 (t, *J* = 7.6 Hz, 1H), 7.10 (dd, *J* = 7.6, 1.2 Hz, 1H), 2.95-2.86 (m, 1H), 1.97-1.90 (m, 2H), 1.83-1.68 (m, 3H), 1.66-1.61 (m, 1H), 1.59-1.50 (m, 2H), 1.20-1.12 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 175.0, 162.2, 150.5, 147.7, 146.3, 137.8, 136.4, 132.5, 127.0, 126.5, 126.4, 125.3, 125.1, 123.0, 120.2, 119.6, 119.5, 42.7, 28.8, 25.6, 25.3. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{23}H_{23}N_2O_3$: 375.1709; found: 375.1703. FT-IR (neat, cm^{-1}) υ 3344, 2928, 1761, 1684, 1531, 1497, 1106, 1023, 751.



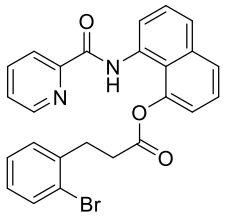
3aa-12

8-(Picolinamido)naphthalen-1-yl 2-(naphthalen-2-yl)acetate (**3aa-12**). Following the general procedure, **3aa-12** was obtained as a colorless solid (78.6 mg, 91%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 178.0–180.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.67 (s, 1H), 8.81 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.68 (d, *J* = 4.4 Hz, 1H), 8.42 (d, *J* = 7.6 Hz, 1H), 8.10-8.04 (m, 1H), 7.93 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.90-7.85 (m, 1H), 7.82 (d, *J* = 8.0 Hz, 1H), 7.73 (d, *J* = 7.6 Hz, 1H), 7.69 (d, *J* = 8.0 Hz, 1H), 7.58-7.41 (m, 6H), 7.36 (t, *J* = 8.0 Hz, 1H), 6.99 (dd, *J* = 7.6, 1.2 Hz, 1H), 4.58 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 170.2, 162.3, 150.4, 147.7, 146.0, 137.9, 136.4, 133.9, 132.4, 132.0, 129.7, 128.8, 128.4, 127.9, 127.2, 126.7, 126.6, 126.5, 125.9, 125.5, 125.2, 125.1, 123.6, 123.1, 120.2, 119.6, 119.2, 39.1. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{28}H_{21}N_2O_3$: 433.1552; found: 433.1547. FT-IR (neat, cm^{-1}) υ 3349, 2923, 1766, 1682, 1530, 1497, 1101, 753.



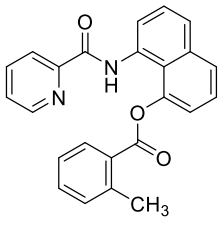
3aa-13

8-(Picolinamido)naphthalen-1-yl 2,2,3,3-tetramethylcyclopropane-1-carboxylate (**3aa-13**). Following the general procedure, **3aa-13** was obtained as a white solid (38.1 mg, 49%). R_f = 0.70 (n-hexane/EtOAc 3:1). m.p. 172.0–174.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.70 (s, 1H), 8.77 (d, *J* = 7.2 Hz, 1H), 8.67 (d, *J* = 4.8 Hz, 1H), 8.40 (d, *J* = 8.0 Hz, 1H), 7.93 (dt, *J* = 8.0, 1.6 Hz, 1H), 7.74 (d, *J* = 8.0 Hz, 1H), 7.66 (d, *J* = 7.6 Hz, 1H), 7.54-7.43 (m, 3H), 7.18 (dd, *J* = 7.6, 0.8 Hz, 1H), 1.79 (s, 1H), 1.16 (s, 6H), 0.90 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 170.1, 162.0, 150.5, 147.9, 145.9, 137.7, 136.3, 132.8, 126.7, 126.4, 126.3, 125.2, 124.7, 122.9, 121.0, 119.5, 118.6, 35.2, 32.0, 22.9, 16.3. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{25}N_2O_3$: 389.1865; found: 389.1860. FT-IR (neat, cm^{-1}) υ 3336, 2923, 1750, 1685, 1533, 1499, 1098, 1030, 752.



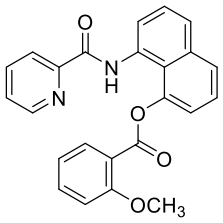
3aa-14

8-(picolinamido)naphthalen-1-yl 3-(2-bromophenyl)propanoate (**3aa-14**). Following the general procedure, **3aa-14** was obtained as a white solid (59.9 mg, 63%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 124.0–126.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.48 (s, 1H), 8.78 (d, *J* = 7.6 Hz, 1H), 8.46 (d, *J* = 4.4 Hz, 1H), 8.34 (d, *J* = 8.0 Hz, 1H), 7.91 (t, *J* = 7.2 Hz, 1H), 7.76 (d, *J* = 8.0 Hz, 1H), 7.68 (d, *J* = 8.4 Hz, 1H), 7.57-7.49 (m, 2H), 7.47-7.38 (m, 2H), 7.24-7.14 (m, 2H), 7.13-7.07 (m, 2H), 3.19-3.09 (m, 4H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 171.4, 162.2, 150.2, 147.7, 145.8, 139.3, 137.7, 136.4, 132.9, 132.5, 130.5, 128.3, 127.6, 127.2, 126.51, 126.45, 125.2, 125.0, 124.3, 122.9, 120.3, 119.4, 119.1, 34.3, 31.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{20}BrN_2O_3$: 475.0657; found: 475.0652. FT-IR (neat, cm^{-1}) υ 3344, 2921, 1765, 1682, 1529, 1496, 1100, 750.



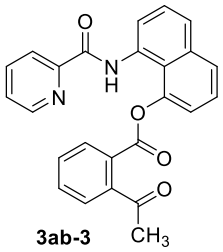
3ab-1

8-(Picolinamido)naphthalen-1-yl 2-methylbenzoate (**3ab-1**). Following the general procedure, **3ab-1** was obtained as a yellow solid (64.9 mg, 85%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 128.0–130.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.43 (s, 1H), 8.66 (d, *J* = 7.6 Hz, 1H), 8.26 (dd, *J* = 7.6, 0.8 Hz, 1H), 8.16 (d, *J* = 7.6 Hz, 1H), 7.81 (d, *J* = 8.0 Hz, 1H), 7.75-7.68 (m, 2H), 7.56 (t, *J* = 8.0 Hz, 1H), 7.50 (t, *J* = 8.0 Hz, 1H), 7.43 (dt, *J* = 7.6, 1.2 Hz, 1H), 7.30-7.22 (m, 3H), 7.18 (d, *J* = 7.6 Hz, 1H), 7.13-7.07 (m, 1H), 2.47 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 166.3, 162.4, 149.6, 147.1, 146.9, 141.7, 137.1, 136.5, 132.7, 132.4, 131.8, 131.7, 129.0, 127.3, 126.5, 125.81, 125.80, 125.5, 125.2, 122.0, 120.2, 120.1, 120.0, 21.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{19}N_2O_3$: 383.1396; found: 383.1390. FT-IR (neat, cm^{-1}) υ 3334, 2922, 1741, 1685, 1531, 1497, 1218, 1031, 737.



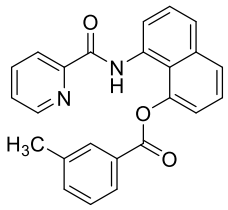
3ab-2

8-(Picolinamido)naphthalen-1-yl 2-methoxybenzoate (**3ab-2**). Following the general procedure, **3ab-2** was obtained as a yellow solid (39.8 mg, 50%). R_f = 0.20 (n-hexane/EtOAc 3:1). m.p. 144.0–146.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.54 (s, 1H), 8.69 (d, *J* = 7.6 Hz, 1H), 8.18 (d, *J* = 7.6 Hz, 1H), 8.06 (dd, *J* = 7.6, 1.6 Hz, 1H), 7.78 (d, *J* = 8.0 Hz, 1H), 7.75-7.68 (m, 2H), 7.55 (t, *J* = 8.0 Hz, 1H), 7.52-7.45 (m, 2H), 7.38 (d, *J* = 7.6 Hz, 1H), 7.29 (d, *J* = 7.2 Hz, 1H), 7.15-7.08 (m, 1H), 6.98 (t, *J* = 7.6 Hz, 1H), 6.87 (d, *J* = 8.4 Hz, 1H), 3.72 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 164.7, 162.4, 159.9, 149.8, 147.2, 146.9, 137.0, 136.4, 134.3, 132.7, 132.6, 127.0, 126.4, 125.7, 125.4, 125.0, 122.0, 120.0, 119.9, 119.7, 119.5, 111.9, 55.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{19}N_2O_4$: 399.1345; found: 399.1339. FT-IR (neat, cm^{-1}) υ 3336, 2925, 1750, 1684, 1531, 1495, 1214, 1025, 754.



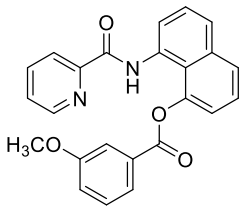
3ab-3

8-(Picolinamido)naphthalen-1-yl 2-acetylbenzoate (**3ab-3**). Following the general procedure, **3ab-3** was obtained as a yellow solid (50.0 mg, 61%). R_f = 0.20 (n-hexane/EtOAc 3:1). m.p. 176.0–178.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.02 (s, 1H), 8.46 (d, *J* = 7.6 Hz, 1H), 8.25 (d, *J* = 8.0 Hz, 2H), 8.14 (d, *J* = 6.8 Hz, 1H), 7.91 (d, *J* = 8.0 Hz, 2H), 7.83 (d, *J* = 7.6 Hz, 1H), 7.77 (d, *J* = 8.4 Hz, 1H), 7.69 (t, *J* = 6.0 Hz, 1H), 7.56 (t, *J* = 7.6 Hz, 1H), 7.49 (t, *J* = 7.6 Hz, 1H), 7.44 (d, *J* = 4.0 Hz, 1H), 7.24 (d, *J* = 7.2 Hz, 1H), 7.15-7.03 (m, 1H), 2.64 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 197.3, 164.9, 162.4, 149.5, 147.0, 146.5, 140.4, 137.2, 136.5, 133.4, 131.8, 130.8, 128.0, 127.6, 126.5, 125.9, 125.8, 125.5, 122.3, 121.4, 120.6, 120.1, 26.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{19}N_2O_4$: 411.1345; found: 411.1339. FT-IR (neat, cm^{-1}) υ 3351, 2922, 1742, 1685, 1529, 1496, 1226, 1055, 754.



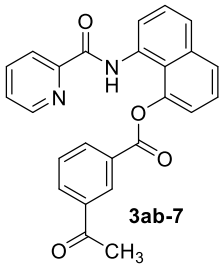
3ab-5

8-(picolinamido)naphthalen-1-yl 3-methylbenzoate (**3ab-5**). Following the general procedure, **3ab-5** was obtained as a yellow solid (63.1 mg, 71%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 156.0–158.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.31 (s, 1H), 8.59 (d, *J* = 7.6 Hz, 1H), 8.17 (d, J = 7.6 Hz, 1H), 8.04 (d, *J* = 7.6 Hz, 1H), 8.00 (s, 1H), 7.81 (d, *J* = 8.0 Hz, 1H), 7.77-7.69 (m, 2H), 7.56 (t, *J* = 8.0 Hs, 1H), 7.49 (t, *J* = 8.0 Hz, 1H), 7.40 (d, *J* = 7.6 Hz, 1H), 7.35-7.30 (m, 2H), 7.23 (dd, *J* = 7.6, 0.4 Hz. 1H), 7.15-7.09 (m, 1H), 2.37 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 166.1, 162.6, 149.7, 147.2, 147.1, 138.2, 137.0, 136.5, 134.3, 132.3, 131.2, 129.8, 128.3, 128.0, 127.3, 126.5, 125.8, 125.5, 125.4, 122.1, 120.5, 120.4, 120.1, 21.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{19}N_2O_3$: 383.1396; found: 383.1390. FT-IR (neat, cm^{-1}) υ 3344, 2920, 1739, 1684, 1530, 1496, 1260, 1177, 1050, 748.



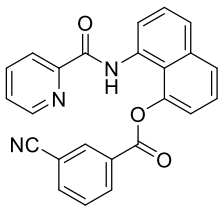
3ab-6

8-(Picolinamido)naphthalen-1-yl 3-methoxybenzoate (**3ab-6**). Following the general procedure, **3ab-6** was obtained as a yellow solid (50.9 mg, 64%). R_f = 0.30 (n-hexane/EtOAc 3:1). m.p. 142.0–144.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.26 (s, 1H), 8.57 (d, *J* = 7.6 Hz, 1H), 8.16 (d, *J* = 7.6 Hz, 1H), 7.84 (d, *J* = 7.6 Hz, 1H), 7.81 (d, *J* = 8.0 Hz, 1H), 7.77-7.65 (m, 3H), 7.56 (t, *J* = 7.6 Hz, 1H), 7.49 (t, *J* = 7.6 Hz, 1H), 7.44 (d, *J* = 4.4 Hz, 1H), 7.33 (t, *J* = 8.0 Hz, 1H), 7.23 (dd, *J* = 7.6, 0.8 Hz, 1H), 7.16-7.08 (m, 2H), 3.80 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.7, 162.5, 159.4, 149.6, 147.2, 146.9, 137.0, 136.4, 132.2, 131.0, 129.3, 127.3, 126.5, 125.9, 125.5, 125.4, 123.2, 122.1, 120.7, 120.4, 120.3, 120.0, 114.7, 55.4. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{19}N_2O_4$: 399.1345; found: 399.1339. FT-IR (neat, cm^{-1}) υ 3351, 2916, 1737, 1683, 1529, 1492, 1263, 1206, 1032, 748.



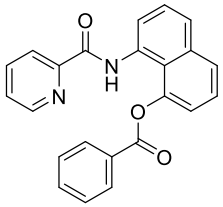
3ab-7

8-(Picolinamido)naphthalen-1-yl 3-acetylbenzoate (**3ab-7**). Following the general procedure, **3ab-7** was obtained as a yellow solid (49.2 mg, 60%). R_f = 0.20 (n-hexane/EtOAc 3:1). m.p. 147.0–149.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.00 (s, 1H), 8.67 (s, 1H), 8.43 (d, *J* = 7.6 Hz, 1H), 8.38 (d, *J* = 7.6 Hz, 1H), 8.16-8.10 (m, 2H), 7.83 (d, *J* = 8.0 Hz, 1H), 7.76 (d, *J* = 7.6 Hz, 1H), 7.67 (dt, *J* = 7.6, 1.2 Hz, 1H), 7.56 (t, *J* = 7.6 Hz, 1H), 7.50 (dt, *J* = 7.6, 2.4 Hz, 2H), 7.40 (d, *J* = 4.4 Hz, 1H), 7.24 (dd, *J* = 7.6, 0.8 Hz, 1H), 7.08 (dd, *J* = 7.6, 4.4 Hz, 1H), 2.59 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 196.9, 164.9, 162.3, 149.4, 147.0, 146.5, 137.1, 136.4, 134.8, 132.6, 131.7, 130.5, 130.2, 128.8, 127.5, 126.5, 125.9, 125.8, 125.5, 122.2, 121.6, 120.7, 120.1, 26.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{19}N_2O_4$: 411.1345; found: 411.1339. FT-IR (neat, cm^{-1}) υ 3344, 2920, 1743, 1686, 1529, 1496, 1211, 749.



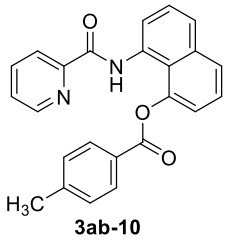
3ab-8

8-(Picolinamido)naphthalen-1-yl 3-cyanobenzoate (**3ab-8**). Following the general procedure, **3ab-8** was obtained as a yellow solid (35.4 mg, 45%). R_f = 0.20 (n-hexane/EtOAc 3:1). m.p. 176.0–178.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.8 (s, 1H), 8.45 (s, 1H), 8.35 (dt, *J* = 8.8, 1.6 Hz, 1H), 8.31(d, *J* = 7.6 Hz, 1H), 8.17 (d, *J* = 8.0 Hz, 1H), 7.86 (dd, *J* = 8.4, 1.2 Hz, 1H), 7.82-7.74 (m, 3H), 7.72 (d, *J* = 4.8 Hz, 1H), 7.57 (t, *J* = 8.0 Hz, 1H), 7.53-7.46 (m, 2H), 7.25-7.20 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.8, 162.4, 149.5, 147.2, 146.2, 137.4, 136.5, 136.3, 134.5, 134.0, 131.4, 130.9, 129.3, 127.9, 126.6, 126.21, 126.18, 125.5, 122.5, 122.3, 121.0, 120.1, 117.5, 112.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{16}N_3O_3$: 394.1192; found: 394.1186. FT-IR (neat, cm^{-1}) υ 3362, 2918, 1745, 1684, 1529, 1495, 1258, 1166, 749.



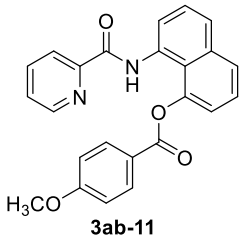
3ab-9

8-(Picolinamido)naphthalen-1-yl benzoate (**3ab-9**). Following the general procedure, **3ab-9** was obtained as a yellow solid (62.6 mg, 85%). m.p. 148.0–150.0 °C. R_f = 0.38 (n-hexane/EtOAc 3:1). ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.34 (s, 1H), 8.63 (d, J = 7.6 Hz, 1H), 8.23 (d, J = 7.2 Hz, 2H), 8.16 (d, J = 7.6 Hz, 1H), 7.81 (d, J = 8.0 Hz, 1H), 7.76-7.67 (m, 2H), 7.63-7.54 (m, 2H), 7.49 (t, J = 8.0 Hz, 1H), 7.44 (t, J = 8.0 Hz, 2H), 7.31 (t, J = 4.4 Hz, 1H), 7.23 (dd, J = 7.6, 0.8 Hz, 1H), 7.13-7.08 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.9, 162.5, 149.6, 147.2, 147.0, 137.1, 136.5, 133.5, 132.3, 130.7, 129.9, 128.4, 127.3, 126.5, 125.8, 125.5, 125.4, 122.1, 120.4, 120.3, 120.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{23}H_{17}N_2O_3$: 369.1239; found: 369.1234. FT-IR (neat, cm^{-1}) υ 3345, 2921, 1740, 1683, 1529, 1495, 1220, 1049, 752.



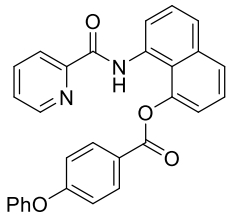
3ab-10

8-(Picolinamido)naphthalen-1-yl 4-methylbenzoate (**3ab-10**). Following the general procedure, **3ab-10** was obtained as a yellow solid (71.8 mg, 94%). R_f = 0.38 (n-hexane/EtOAc 3:1). m.p. 159.0–161.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.33 (s, 1H), 8.62 (d, J = 7.6 Hz, 1H), 8.15 (d, J = 7.6 Hz, 1H), 8.10 (d, J = 7.6 Hz, 2H), 7.80 (d, J = 8.4 Hz, 1H), 7.75-7.68 (m, 2H), 7.56 (t, J = 8.0 Hz, 1H), 7.48 (t, J = 8.0 Hz, 1H), 7.37 (d, J = 4.4 Hz, 1H), 7.24-7.18 (m, 3H), 7.15-7.09 (m, 1H), 2.43 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.6, 162.5, 149.6, 147.2, 147.0, 144.3, 137.0, 136.4, 132.3, 130.8, 129.0, 127.2, 127.1, 126.4, 125.6, 125.5, 125.3, 122.1, 120.31, 120.29, 120.0, 21.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{19}N_2O_3$: 383.1396; found: 383.1390. FT-IR (neat, cm^{-1}) υ 3345, 2920, 1737, 1683, 1529, 1496, 1219, 1049, 748.



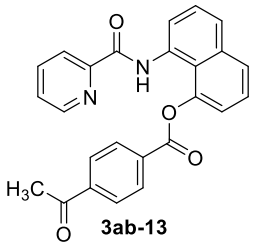
3ab-11

8-(Picolinamido)naphthalen-1-yl 4-methoxybenzoate (**3ab-11**). Following the general procedure, **3ab-11** was obtained as a white solid (54.1 mg, 68%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 209.0–211.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.36 (s, 1H), 8.59 (dd, J = 7.6, 0.8 Hz, 1H), 8.22-8.14 (m, 3H), 7.80 (dd, J = 8.4, 1.2 Hz, 1H), 7.77-7.72 (m, 2H), 7.56 (t, J = 8.0 Hz, 1H), 7.52-7.46 (m, 2H), 7.22 (dd, J = 7.6, 1.2 Hz, 1H), 7.20-7.15 (m, 1H), 6.92-6.86 (m, 2H), 3.90 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.6, 163.8, 162.4, 149.7, 147.2, 147.1, 137.3, 136.5, 133.0, 132.3, 127.1, 126.5, 125.8, 125.5, 125.4, 122.3, 122.2, 120.5, 120.4, 120.1, 113.6, 55.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{19}N_2O_4$: 399.1345; found: 399.1339. FT-IR (neat, cm^{-1}) υ 3337, 2922, 1731, 1680, 1527, 1496, 1247, 1028, 754.



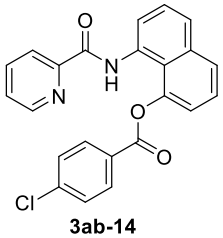
3ab-12

8-(Picolinamido)naphthalen-1-yl 4-phenoxybenzoate (**3ab-12**). Following the general procedure, **3ab-12** was obtained as a white solid (88.3 mg, 96%). R_f = 0.38 (n-hexane/EtOAc 3:1). m.p. 137.0–139.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.31 (s, 1H), 8.62 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.24-8.17 (m, 3H), 7.84-7.74 (m, 3H), 7.65-7.61 (m, 1H), 7.58 (t, *J* = 8.0 Hz, 1H), 7.53-7.43 (m, 3H), 7.29-7.22 (m, 3H), 7.13-7.07 (m, 2H), 7.00-7.95 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.2, 162.4, 162.2, 155.3, 149.7, 147.2, 146.9, 137.1, 136.4, 132.9, 132.2, 130.1, 127.2, 126.4, 125.8, 125.5, 125.4, 124.7, 123.8, 122.2, 120.5, 120.3, 120.1, 120.0, 117.1. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{29}H_{21}N_2O_4$: 461.1501; found: 461.1496. FT-IR (neat, cm^{-1}) υ 3344, 2922, 1737, 1684, 1530, 1494, 1240, 1048, 751.



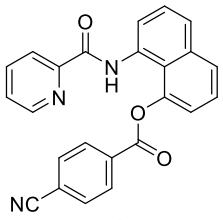
3ab-13

8-(Picolinamido)naphthalen-1-yl 4-acetylbenzoate (**3ab-13**). Following the general procedure, **3ab-13** was obtained as a yellow solid (25.4 mg, 31%). R_f = 0.20 (n-hexane/EtOAc 3:1). m.p. 173.0–175.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.01 (s, 1H), 8.46 (d, *J* = 8.0 Hz, 1H), 8.26 (d, *J* = 8.0 Hz, 2H), 8.14 (d, *J* = 8.0 Hz, 1H), 7.93 (d, *J* = 8.0 Hz, 2H), 7.84 (d, *J* = 8.0 Hz, 1H), 7.78 (d, *J* = 8.0 Hz, 1H), 7.71 (t, *J* = 7.2 Hz, 1H), 7.57 (t, *J* = 8.0 Hz, 1H), 7.51 (t, *J* = 8.0 Hz, 1H), 7.46 (d, *J* = 4.8 Hz, 1H), 7.25 (d, *J* = 8.0 Hz, 1H), 7.13-7.07 (m, 1H), 2.65 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 197.3, 164.9, 162.5, 149.6, 147.1, 146.6, 140.5, 137.2, 136.5, 133.4, 131.8, 130.9, 128.0, 127.6, 126.6, 125.9, 125.8, 125.5, 122.3, 121.5, 120.6, 120.1, 26.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{19}N_2O_4$: 411.1345; found: 411.1339. FT-IR (neat, cm^{-1}) υ 3355, 2917, 1741, 1684, 1529, 1496, 1228, 1053, 754.



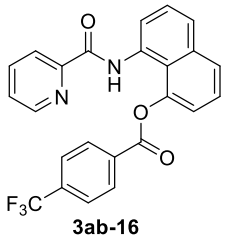
3ab-14

8-(Picolinamido)naphthalen-1-yl 4-chlorobenzoate (**3ab-14**). Following the general procedure, **3ab-14** was obtained as a yellow solid (70.8 mg, 88%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 143.0–145.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.00 (s, 1H), 8.45 (d, *J* = 7.6 Hz, 1H), 8.16 (d, *J* = 7.6 Hz, 1H), 8.09 (d, *J* = 7.6 Hz, 2H), 7.82 (d, *J* = 8.4 Hz, 1H), 7.78-7.71 (m, 2H), 7.59-7.53 (m, 2H), 7.48 (t, *J* = 7.6 Hz, 1H), 7.32 (d, *J* = 7.6 Hz, 2H), 7.24-7.18 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 146.9, 162.4, 149.5, 147.1, 146.6, 139.9, 137.2, 136.4, 131.9, 131.8, 128.6, 128.1, 127.5, 126.5, 125.9, 125.8, 125.5, 122.3, 121.5, 120.7, 120.1. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{23}H_{16}ClN_2O_3$: 403.0849; found: 403.0844. FT-IR (neat, cm^{-1}) υ 3349, 2926, 1740, 1683, 1528, 1492, 1219, 1051, 750.



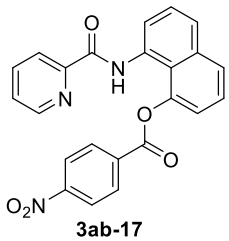
3ab-15

8-(Picolinamido)naphthalen-1-yl 4-cyanobenzoate (**3ab-15**). Following the general procedure, **3ab-15** was obtained as a white solid (55.0 mg, 70%). R_f = 0.25 (n-hexane/EtOAc 3:1). m.p. 163.0–165.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.78 (s, 1H), 8.35 (d, J = 7.2 Hz, 1H), 8.25 (d, J = 8.0 Hz, 2H), 8.15 (d, J = 7.2 Hz, 1H), 7.85 (d, J = 7.6 Hz, 1H), 7.82-7.72 (m, 2H), 7.63 (d, J = 8.0 Hz, 2H), 7.60-7.54 (m, 2H), 7.51 (t, J = 8.0 Hz, 1H), 7.25-7.19 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 164.1, 162.4, 149.5, 147.0, 146.2, 137.4, 136.5, 133.4, 132.0, 131.4, 131.0, 127.9, 126.6, 126.2, 126.1, 125.5, 122.5, 122.3, 120.8, 120.1, 117.7, 116.7. HRMS (ESI): m/z [M+H]$^+$ calcd for $C_{24}H_{16}N_3O_3$: 394.1192; found: 394.1186. FT-IR (neat, cm^{-1}) υ 3352, 2921, 1745, 1685, 1530, 1496, 1251, 1222, 1061, 754.



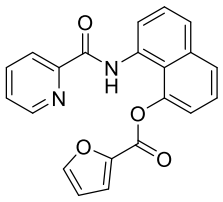
3ab-16

8-(Picolinamido)naphthalen-1-yl 4-(trifluoromethyl)benzoate (**3ab-16**). Following the general procedure, **3ab-16** was obtained as a yellow solid (49.7 mg, 57%). R_f = 0.52 (n-hexane/EtOAc 3:1). m.p. 150.0–152.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.80 (s, 1H), 8.33 (d, J = 7.6 Hz, 1H), 8.24 (d, J = 8.0 Hz, 2H), 8.13 (d, J = 8.0 Hz, 1H), 7.85 (d, J = 8.0 Hz, 1H), 7.79 (d, J = 8.0 Hz, 1H), 7.71 (dt, J = 7.6, 1.6 Hz, 1H), 7.61-7.48 (m, 5H), 7.25 (dd, J = 7.6, 0.8 Hz, 1H), 7.17-7.11 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 164.5, 162.5, 149.5, 147.1, 146.4, 137.3, 136.6, 134.7 (q, $J_{C\text{-}F}$ = 32.6 Hz), 132.9, 131.6, 130.9, 127.8, 126.6, 126.2, 126.1, 125.3, 125.2 (q, $J_{C\text{-}F}$ = 3.7 Hz), 123.5 (q, $J_{C\text{-}F}$ = 271.1 Hz), 122.4, 121.0, 120.2. ^{19}F NMR (376 MHz, $CDCl_3$) δ -63.2. HRMS (ESI): m/z [M+H]$^+$ calcd for $C_{24}H_{16}F_3N_2O_3$: 437.1113; found: 437.1108. FT-IR (neat, cm^{-1}) υ 3345, 2920, 1744, 1684, 1528, 1494, 1321, 1063, 752.



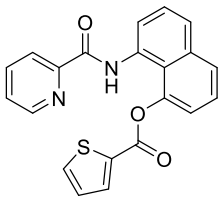
3ab-17

8-(Picolinamido)naphthalen-1-yl 4-nitrobenzoate (**3ab-17**). Following the general procedure, **3ab-17** was obtained as a yellow solid (57.8 mg, 70%). R_f = 0.28 (n-hexane/EtOAc 3:1). m.p. 187.0–189.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.72 (s, 1H), 8.30 (d, J = 8.8 Hz, 3H), 8.13 (d, J = 8.8 Hz, 3H), 7.86 (dd, J = 8.0, 1.2 Hz, 1H), 7.80 (dd, J = 8.0, 1.2 Hz, 1H), 7.72 (dt, J = 7.6, 1.6 Hz, 1H), 7.63-7.60 (m, 1H), 7.57 (t, J = 8.0 Hz, 1H), 7.52 (t, J = 8.0 Hz, 1H), 7.25 (dd, J = 7.6, 1.2 Hz, 1H), 7.18-7.13 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 163.8, 162.4, 150.5, 149.5, 147.0, 146.1, 137.4, 136.5, 134.9, 131.6, 131.3, 127.9, 126.6, 126.3, 126.1, 125.5, 123.2, 122.6, 122.5, 120.9, 120.1. HRMS (ESI): m/z [M+H]$^+$ calcd for $C_{23}H_{16}N_3O_5$: 414.1090; found: 414.1084. FT-IR (neat, cm^{-1}) υ 3342, 2923, 1742, 1673, 1523, 1496, 1240, 1063, 753.



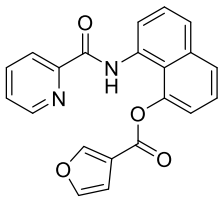
3ab-18

8-(Picolinamido)naphthalen-1-yl furan-2-carboxylate (**3ab-18**). Following the general procedure, **3ab-18** was obtained as a white solid (40.1 mg, 56%). R_f = 0.25 (n-hexane/EtOAc 3:1). m.p. 167.0–169.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.19 (s, 1H), 8.51 (d, *J* = 7.6 Hz, 1H), 8.22 (d, *J* = 8.0 Hz, 1H), 7.92 (d, *J* = 4.0 Hz, 1H), 7.83-7.72 (m, 3H), 7.59-7.52 (m, 2H), 7.48 (t, *J* = 7.6 Hz, 1H), 7.37 (d, *J* = 7.6 Hz, 1H), 7.29-7.21 (m, 2H), 6.50-6.42 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.5, 157.2, 149.8, 147.4, 147.1, 146.0, 144.2, 137.3, 136.4, 132.0, 127.5, 126.5, 125.9, 125.6, 125.4, 122.3, 121.1, 120.4, 120.2, 120.0, 112.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{15}N_2O_4$: 359.1032; found: 359.1026. FT-IR (neat, cm^{-1}) υ 3347, 2921, 1741, 1683, 1530, 1496, 1066, 753.



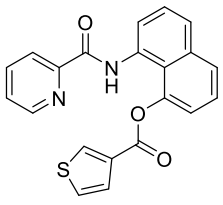
3ab-20

8-(Picolinamido)naphthalen-1-yl thiophene-2-carboxylate (**3ab-20**). Following the general procedure, **3ab-20** was obtained as a white solid (66.6 mg, 89%). R_f = 0.30 (n-hexane/EtOAc 3:1). m.p. 180.0–182.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.34 (s, 1H), 8.62 (d, *J* = 7.6 Hz, 1H), 8.20 (d, *J* = 7.6 Hz, 1H), 8.00 (d, *J* = 3.6 Hz, 1H), 7.82 (d, *J* = 8.0 Hz, 1H), 7.78-7.72 (m, 2H), 7.63 (d, *J* = 4.4 Hz, 2H), 7.58 (t, *J* = 7.6 Hz, 1H), 7.49 (t, *J* = 7.6 Hz, 1H), 7.29-7.24 (m, 1H), 7.22-7.17 (m, 1H), 7.10 (t, *J* = 4.4 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.5, 161.1, 149.6, 147.1, 146.5, 137.1, 136.4, 135.2, 133.9, 133.3, 132.1, 127.8, 127.4, 126.4, 125.9, 125.40, 125.36, 122.1, 120.6, 120.3, 120.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{15}N_2O_3S$: 375.0803; found: 375.0798. FT-IR (neat, cm^{-1}) υ 3333, 2917, 1717, 1679, 1490, 1420, 1252, 1218, 736.



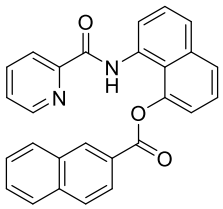
3ab-22

8-(Picolinamido)naphthalen-1-yl furan-3-carboxylate (**3ab-22**). Following the general procedure, **3ab-22** was obtained as a white solid (55.5 mg, 72%). R_f = 0.30 (n-hexane/EtOAc 3:1). m.p. 147.0–149.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.25 (s, 1H), 8.60 (d, *J* = 8.0 Hz, 1H), 8.30-8.21 (m, 2H), 7.95 (d, *J* = 4.4 Hz, 1H), 7.84-7.78 (m, 2H), 7.75 (d, *J* = 7.8 Hz, 1H), 7.58 (t, *J* = 8.0 Hz, 1H), 7.50 (t, *J* = 8.0 Hz, 1H), 7.42 (t, *J* = 1.6 Hz, 1H), 7.35-7.30 (m, 1H), 7.24 (dd, *J* = 7.8, 0.8 Hz, 1H), 6.85 (d, *J* = 1.6 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.5, 161.7, 149.8, 149.5, 147.2, 146.2, 143.6, 137.3, 136.4, 132.1, 127.3, 126.4, 126.1, 125.5, 125.4, 122.4, 120.7, 120.3, 120.1, 118.9, 110.4. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{15}N_2O_4$: 359.1032; found: 359.1026. FT-IR (neat, cm^{-1}) υ 3333, 2921, 1735, 1680, 1491, 1428, 1114, 750.



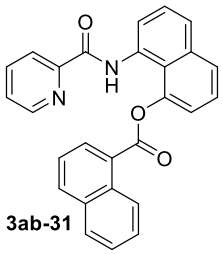
3ab-24

8-(picolinamido)naphthalen-1-yl thiophene-3-carboxylate (**3ab-24**). Following the general procedure, **3ab-24** was obtained as a white solid (68.1 mg, 91%). R_f = 0.30 (n-hexane/EtOAc 3:1). m.p. 162.0–164.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.29 (s, 1H), 8.58 (d, J = 7.8 Hz, 1H), 8.32 (d, J = 1.6 Hz, 1H), 8.18 (d, J = 8.0 Hz, 1H), 7.82-7.71 (m, 3H), 7.65 (t, J = 4.4 Hz, 2H), 7.55 (t, J = 8.0 Hz, 1H), 7.47 (t, J = 8.0 Hz, 1H), 7.30-7.26 (m, 1H), 7.24-7.16 (m, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 162.5, 161.5, 149.6, 147.3, 146.6, 137.1, 136.4, 134.8, 133.0, 132.2, 128.7, 127.3, 126.4, 126.0, 125.9, 125.4, 125.3, 122.2, 120.5, 120.3, 120.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{21}H_{15}N_2O_3S$: 375.0803; found: 375.0798. FT-IR (neat, cm^{-1}) υ 3328, 2916, 1728, 1678, 1529, 1494, 1238, 1188, 746.



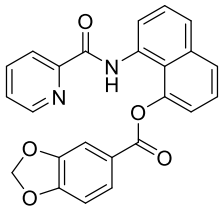
3ab-29

8-(Picolinamido)naphthalen-1-yl 2-naphthoate (**3ab-29**). Following the general procedure, **3ab-29** was obtained as a white solid (62.7 mg, 75%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 191.0–193.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.16 (s, 1H), 8.76 (s, 1H), 8.48 (d, J = 7.6 Hz, 1H), 8.17 (d, J = 7.6 Hz, 1H), 8.07 (d, J = 7.6 Hz, 1H), 7.89 (t, J = 7.2 Hz, 2H), 7.83 (t, J = 8.0 Hz, 2H), 7.78 (d, J = 8.0 Hz, 1H), 7.64 (t, J = 7.6 Hz, 1H), 7.60-7.45 (m, 4H), 7.30 (d, J = 7.2 Hz, 1H), 7.09 (d, J = 4.4 Hz, 1H), 6.73-6.65 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 166.0, 162.6, 149.4, 146.92, 146.89, 136.8, 136.5, 135.6, 132.4, 132.2, 132.0, 129.4, 128.7, 128.1, 127.7, 127.3, 126.9, 126.8, 126.4, 125.8, 125.7, 125.6, 125.4, 122.0, 121.3, 120.8, 120.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{27}H_{19}N_2O_3$: 419.1396; found: 419.1390. FT-IR (neat, cm^{-1}) υ 3349, 2924, 1737, 1684, 1530, 1497, 1217, 1186, 755.



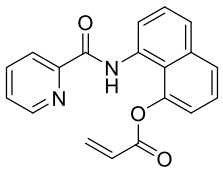
3ab-31

8-(Picolinamido)naphthalen-1-yl 1-naphthoate (**3ab-31**). Following the general procedure, **3ab-31** was obtained as a yellow solid (66.8 mg, 80%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 172.0–174.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.28 (s, 1H), 8.77-8.69 (m, 1H), 8.56 (d, J = 7.6 Hz, 1H), 8.52 (d, J = 7.2 Hz, 1H), 7.99 (d. J = 8.0 Hz, 1H), 7.90 (d, J = 8.0 Hz, 1H), 7.85 (d, J = 8.0 Hz, 1H), 7.82-7.75 (m, 2H), 7.61-7.45 (m, 5H), 7.41 (t, J = 7.6 Hz, 1H), 7.35 (dd, J = 7.6, 1.2 Hz, 1H), 6.91 (d, J = 4.4 Hz, 1H), 6.78-6.71 (m, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 166.1, 162.3, 149.2, 146.7, 146.5, 136.5, 136.4, 134.1, 133.5, 132.2, 131.5, 131.4, 128.22, 128.19, 127.4, 126.5, 126.4, 126.3, 125.54, 125.51, 125.4, 125.3, 124.3, 121.7, 120.7, 120.5, 120.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{27}H_{19}N_2O_3$: 419.1396; found: 419.1390. FT-IR (neat, cm^{-1}) υ 3343, 2917, 1735, 1684, 1530, 1497, 1108, 752.



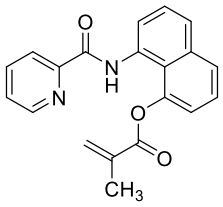
3ab-32

8-(Picolinamido)naphthalen-1-yl benzo[d][1,3]dioxole-5-carboxylate (**3ab-32**). Following the general procedure, **3ab-32** was obtained as a white solid (61.8 mg, 75%). R_f = 0.25 (n-hexane/EtOAc 3:1). m.p. 181.0–183.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.6 (s, 1H), 8.51 (d, *J* = 7.6 Hz, 1H), 8.18 (d, *J* = 7.6 Hz, 1H), 7.85-7.73 (m, 5H), 7.61 (d, *J* = 1.6 Hz, 1H), 7.55 (t, *J* = 8.0 Hz, 1H), 7.48 (t, *J* = 8.0 Hz, 1H), 7.25-7.18 (m, 2H), 6.79 (d, *J* = 8.0 Hz, 1H), 6.04 (s, 2H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.1, 162.5, 152.0, 149.8, 147.5, 147.3, 146.9, 137.1, 136.5, 132.1, 127.2, 126.9, 126.4, 125.8, 125.6, 125.5, 123.6, 122.3, 120.9, 120.6, 120.1, 110.5, 107.9, 101.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{17}N_2O_5$: 413.1137; found: 413.1132. FT-IR (neat, cm^{-1}) υ 3340, 2924, 1733, 1684, 1531, 1495, 1258, 1034, 753.



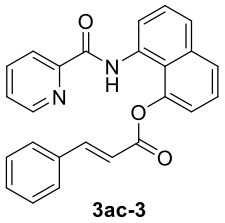
3ac-1

8-(picolinamido)naphthalen-1-yl acrylate (**3ac-1**). Following the general procedure, **3ac-1** was obtained as a white solid (24.8 mg, 39%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 159.0–161.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.48 (s, 1H), 8.73 (d, *J* = 7.6 Hz, 1H), 8.61 (d, *J* = 4.4 Hz, 1H), 8.33 (d, *J* = 7.6 Hz, 1H), 7.91 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.78 (d, *J* = 8.0 Hz, 1H), 7.70 (d, *J* = 8.0 Hz, 1H), 7.54 (t, *J* = 8.0 Hz, 1H), 7.51-7.44 (m, 2H), 7.23 (d, *J* = 7.2 Hz, 1H), 6.60 (d, *J* = 5.2 Hz, 1H), 6.59 (s, 1H), 5.91 (dd, J = 7.6, 4.0 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 164.8, 162.3, 150.2, 147.6, 145.9, 137.6, 136.4, 132.7, 132.4, 128.0, 127.3, 126.5, 126.4, 125.3, 125.1, 122.8, 120.1, 120.0, 119.4. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{15}N_2O_3$: 319.1083; found: 319.1077. FT-IR (neat, cm^{-1}) υ 3340, 2921, 1745, 1675, 1533, 1497, 1121, 757.



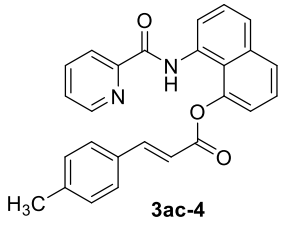
3ac-2

8-(picolinamido)naphthalen-1-yl methacrylate (**3ac-2**). Following the general procedure, **3ac-2** was obtained as a white solid (27.9 mg, 42%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 169.0–171.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.21 (s, 1H), 8.60 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.48 (d, *J* = 4.8 Hz, 1H), 8.30 (dt, *J* = 8.0, 1.2 Hz, 1H), 7.88 (dt, *J* = 7.6, 1.2 Hz, 1H), 7.77 (dd, *J* = 8.4, 1.2 Hz, 1H), 7.72 (dd, *J* = 8.4, 1.2 Hz, 1H), 7.54 (t, *J* = 7.6 Hz, 1H), 7.48-7.42 (m, 2H), 7.13 (dd, *J* = 7.6, 1.2 Hz, 1H), 6.42 (s, 1H), 5.70 (t, *J* = 1.2 Hz, 1H), 1.99 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 166.5, 162.4, 150.2, 147.4, 146.9, 137.5, 136.4, 135.9, 132.2, 127.9, 127.2, 126.4, 126.3, 125.4, 125.3, 122.5, 120.4, 120.3, 120.0, 18.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{17}N_2O_3$: 333.1239; found: 333.1234. FT-IR (neat, cm^{-1}) υ 3324, 2924, 1730, 1675, 1533, 1494, 1104, 759.



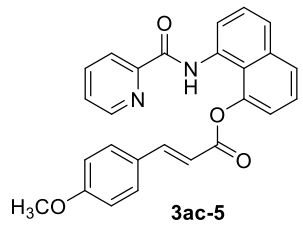
3ac-3

8-(picolinamido)naphthalen-1-yl cinnamate (**3ac-3**). Following the general procedure, **3ac-3** was obtained as a yellow solid (63.0 mg, 80%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 131.0–133.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.44 (s, 1H), 8.63 (d, *J* = 7.6 Hz, 1H), 8.41 (d, *J* = 4.4 Hz, 1H), 8.28 (d, *J* = 7.6 Hz, 1H), 7.83-7.70 (m, 4H), 7.55 (t, *J* = 8.0 Hz, 1H), 7.49 (t, *J* = 8.0 Hz, 1H), 7.44-7.35 (m, 5H), 7.27 (d, *J* = 8.0 Hz, 1H), 7.22-7.17 (m, 1H), 6.79 (d, *J* = 15.6 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.6, 162.2, 150.1, 147.6, 146.9, 146.2, 137.5, 136.4, 134.0, 132.3, 130.8, 128.9, 128.2, 127.1, 126.4, 126.1, 125.4, 125.3, 122.7, 122.6, 120.2, 119.8, 117.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{19}N_2O_3$: 395.1396; found: 395.1390. FT-IR (neat, cm^{-1}) υ 3342, 2925, 1736, 1683, 1530, 1496, 1113, 753.



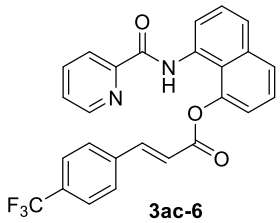
3ac-4

8-(picolinamido)naphthalen-1-yl 3-(p-tolyl)acrylate (**3ac-4**). Following the general procedure, **3ac-4** was obtained as a white solid (67.7 mg, 83%). R_f = 0.60 (n-hexane/EtOAc 3:1). m.p. 171.0–173.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.49 (s, 1H), 8.66 (d, *J* = 7.6 Hz, 1H), 8.41 (d, *J* = 4.4 Hz, 1H), 8.26 (d, *J* = 8.0 Hz, 1H), 7.82-7.73 (m, 3H), 7.69 (d, *J* = 8.4 Hz, 1H), 7.53 (t, *J* = 8.0 Hz, 1H), 7.47 (t, *J* = 8.0 Hz, 1H), 7.32 (d, *J* = 8.0 Hz, 2H), 7.27-7.21 (m, 2H), 7.18 (d, *J* = 8.0 Hz, 2H), 6.75 (d, *J* = 16.0 Hz, 1H), 2.39 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.8, 162.3, 150.2, 147.7, 147.0, 146.3, 141.4, 137.5, 136.4, 132.4, 131.3, 129.6, 128.3, 127.0, 126.4, 126.1, 125.4, 125.2, 122.7, 120.2, 119.9, 119.7, 116.4, 21.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{26}H_{21}N_2O_3$: 409.1552; found: 409.1547. FT-IR (neat, cm^{-1}) υ 3343, 2925, 1737, 1684, 1531, 1498, 1110, 753.



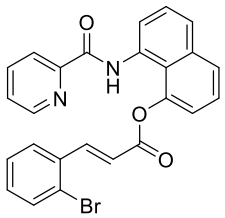
3ac-5

8-(picolinamido)naphthalen-1-yl 3-(4-methoxyphenyl)acrylate (**3ac-5**). Following the general procedure, **3ac-5** was obtained as a yellow solid (67.8 mg, 80%). R_f = 0.30 (n-hexane/EtOAc 3:1). m.p. 149.0–151.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.51 (s, 1H), 8.67 (d, *J* = 8.0 Hz, 1H), 8.42 (d, *J* = 4.8 Hz, 1H), 8.27 (d, *J* = 7.6 Hz, 1H), 7.81-7.73 (m, 3H), 7.70 (d, *J* = 8.0 Hz, 1H), 7.54 (t, *J* = 8.0 Hz, 1H), 7.48 (t, *J* = 8.0 Hz, 1H), 7.39 (d, *J* = 8.4 Hz, 2H), 7.27-7.21 (m, 2H), 6.90 (d, *J* = 8.4 Hz, 2H), 6.66 (d, *J* = 15.6 Hz, 1H), 3.86 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.9, 162.3, 161.8, 150.2, 147.7, 146.6, 146.3, 137.4, 136.4, 132.4, 130.0, 127.0, 126.7, 126.4, 126.1, 125.4, 125.1, 122.6, 120.2, 119.9, 119.7, 114.9, 114.3, 55.4. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{26}H_{21}N_2O_4$: 425.1501; found: 425.1496. FT-IR (neat, cm^{-1}) υ 3341, 2927, 1735, 1684, 1600, 1532, 1510, 1108, 757.



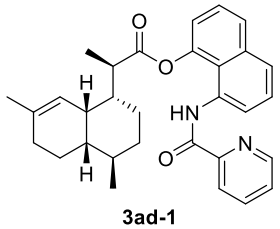
3ac-6

8-(picolinamido)naphthalen-1-yl 3-(4-(trifluoromethyl)phenyl)acrylate (**3ac-6**). Following the general procedure, **3ac-6** was obtained as a white solid (42.5 mg, 46%). R_f = 0.70 (n-hexane/EtOAc 3:1). m.p. 209.0–211.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.30 (s, 1H), 8.59 (d, J = 7.6 Hz, 1H), 8.41 (d, J = 4.8 Hz, 1H), 8.29 (d, J = 7.6 Hz, 1H), 7.82-7.71 (m, 4H), 7.63 (d, J = 8.0 Hz, 2H), 7.55 (t, J = 8.0 Hz, 1H), 7.52-7.46 (m, 3H), 7.27 (d, J = 8.0 Hz, 1H), 7.25-7.21 (m, 1H), 6.84 (d, J = 16.0 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.0, 162.2, 150.2, 147.6, 146.0, 144.8, 137.6, 137.4, 137.3, 136.5, 132.2 (q, J_{C-F} = 32.5 Hz), 132.1, 128.3, 127.3, 126.5, 126.1, 125.8 (q, J_{C-F} = 3.8 Hz), 125.5, 125.4, 123.7 (q, J_{C-F} = 270.5 Hz), 122.8, 120.6, 120.2, 119.8. ^{19}F NMR (376 MHz, $CDCl_3$) δ -62.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{26}H_{18}F_3N_2O_3$: 463.1270; found: 463.1264. FT-IR (neat, cm^{-1}) υ 3350, 2922, 1737, 1683, 1532, 1500, 1324, 1114, 750.



3ac-7

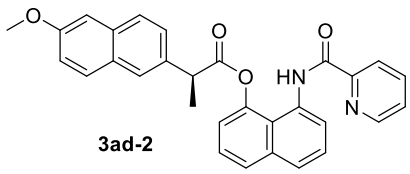
8-(picolinamido)naphthalen-1-yl 3-(2-bromophenyl)acrylate (**3ac-7**). Following the general procedure, **3ac-7** was obtained as a yellow solid (62.3 mg, 66%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 151.0–153.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.35 (s, 1H), 8.61 (d, J = 7.6 Hz, 1H), 8.38 (d, J = 4.4 Hz, 1H), 8.30 (d, J = 7.6 Hz, 1H), 8.15 (d, J = 15.6 Hz, 1H), 7.82-7.71 (m, 3H), 7.64-7.59 (m, 1H), 7.55 (t, J = 8.0 Hz, 1H), 7.49 (t, J = 8.0 Hz, 1H), 7.39-7.34 (m, 1H), 7.31-7.25 (m, 3H), 7.21-7.15 (m, 1H), 6.73 (d, J = 16.0 Hz, 1H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 164.9, 162.3, 150.2, 147.6, 146.1, 145.1, 137.5, 136.4, 134.1, 133.6, 132.2, 131.6, 127.7, 127.6, 127.2, 126.4, 126.0, 125.6, 125.37, 125.36, 122.8, 120.4, 120.3, 120.2, 119.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{18}BrN_2O_3$: 473.0501; found: 473.0495. FT-IR (neat, cm^{-1}) υ 3341, 2922, 1735, 1680, 1527, 1494, 1114, 750.



3ad-1

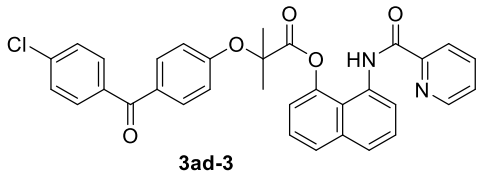
8-(picolinamido)naphthalen-1-yl (*R*)-2-((*1R,4R,4aS,8aS*)-4,7-dimethyl-1,2,3,4,4a,5,6,8a-octahydronaphthalen-1-yl)propanoate (**3ad-1**). Following the general procedure, **3ad-1** was obtained as a white solid (74.2 mg, 77%). R_f = 0.84 (n-hexane/EtOAc 3:1). m.p. 154.0–156.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.6 (s, 1H), 8.79 (d, J = 7.6 Hz, 1H), 8.77 (d, J = 4.4 Hz, 1H), 8.38 (d, J = 7.6 Hz, 1H), 7.95 (dt, J = 7.6, 1.2 Hz, 1H), 7.75 (d, J = 7.6 Hz, 1H), 7.67 (d, J = 8.0 Hz, 1H), 7.57-7.49 (m, 2H), 7.46 (t, J = 8.0 Hz, 1H), 7.20 (dd, J = 7.6, 0.8 Hz, 1H), 5.03 (s, 1H), 3.16-3.06 (m, 1H), 2.45 (s, 1H), 1.97-1.72 (m, 4H), 1.68 (s, 3H), 1.58-1.44 (m, 3H), 1.38-1.29 (m, 1H), 1.24-1.19 (m, 1H), 1.09 (d, J = 7.2 Hz, 3H), 0.97-0.87 (m, 2H), 0.84 (d, J = 6.4 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 176.3, 162.1, 150.6, 147.8, 145.8, 137.8, 136.4, 136.0, 132.6, 127.0, 126.5, 126.4, 125.2, 124.8, 123.0, 120.5, 119.5, 119.2, 119.0, 44.1, 41.8, 41.5, 36.5, 35.1, 27.6, 27.4, 26.5, 25.6, 23.9, 19.6, 15.0. HRMS (ESI): m/z $[M+H]^+$

calcd for $C_{31}H_{35}N_2O_3$: 483.2648; found: 483.2642. FT-IR (neat, cm^{-1}) υ 3342, 2918, 1764, 1686, 1532, 1498, 1105, 1040, 753.



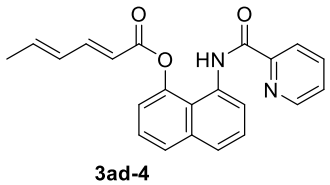
3ad-2

8-(picolinamido)naphthalen-1-yl (*S*)-2-(6-methoxynaphthalen-2-yl)propanoate (**3ad-2**). Following the general procedure, **3ad-2** was obtained as a white solid (87.6 mg, 92%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 146.0–148.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.58 (s, 1H), 8.84-8.71 (m, 2H), 8.41 (d, *J* = 7.6 Hz, 1H), 7.97 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.79-7.64 (m, 5H), 7.59-7.51 (m, 3H), 7.31 (t, *J* = 8.0 Hz, 1H), 7.21-7.12 (m, 2H), 6.77 (dd, *J* = 7.6, 1.2 Hz, 1H), 4.67 (q, *J* = 7.2 Hz, 1H), 3.93 (s, 3H), 1.53 (d, *J* = 7.2 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 173.4, 162.2, 157.8, 150.5, 147.6, 146.3, 137.9, 136.3, 134.6, 133.9, 132.4, 129.3, 129.0, 127.5, 127.1, 126.7, 126.4, 126.2, 126.1, 125.2, 125.0, 123.1, 119.7, 119.5, 119.3, 119.2, 105.6, 55.3, 45.1, 18.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{30}H_{25}N_2O_4$: 477.1814; found: 477.1809. FT-IR (neat, cm^{-1}) υ 3355, 2933, 1763, 1685, 1531, 1497, 1109, 753.



3ad-3

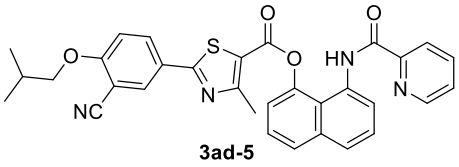
8-(picolinamido)naphthalen-1-yl 2-(4-(4-chlorobenzoyl)phenoxy)-2-methylpropanoate (**3ad-3**). Following the general procedure, **3ad-3** was obtained as a yellow solid (83.5 mg, 74%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 163.0–165.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.82 (s, 1H), 8.67 (d, *J* = 4.4 Hz, 1H), 8.51 (d, *J* = 7.6 Hz, 1H), 8.27 (d, *J* = 7.6 Hz, 1H), 7.91 (t, *J* = 7.6 Hz, 1H), 7.79 (d, *J* = 8.0 Hz, 1H), 7.72-7.65 (m, 5H), 7.55-7.43 (m, 5H), 7.14 (d, *J* = 7.2 Hz, 1H), 6.86 (d, *J* = 8.8 Hz, 2H), 1.68 (s, 6H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 194.2, 172.8, 162.6, 159.0, 150.1, 147.9, 146.0, 138.5, 137.7, 136.5, 136.2, 132.0, 131.9, 131.2, 131.1, 128.6, 127.6, 126.6, 126.5, 125.5, 125.2, 122.9, 120.4, 120.2, 120.0, 118.5, 79.9, 25.2. HRMS (ESI): m/z $[M-H]^-$ calcd for $C_{33}H_{24}ClN_2O_5$: 563.1374; found: 563.1379. FT-IR (neat, cm^{-1}) υ 3341, 2923, 1737, 1652, 1594, 1543, 1504, 1251, 1145, 758.



3ad-4

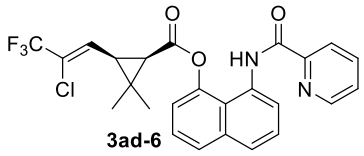
8-(Picolinamido)naphthalen-1-yl (*2E*, *4E*)-hexa-2,4-dienoate (**3ad-4**). Following the general procedure, **3ad-4** was obtained as a yellow solid (27.2 mg, 38%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 145.0–147.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.56 (s, 1H), 8.74 (d, *J* = 7.6 Hz, 1H), 8.56 (d, *J* = 4.0 Hz, 1H), 8.31 (d, *J* = 7.6 Hz, 1H), 7.87 (t, *J* = 7.6 Hz, 1H), 7.75 (d, *J* = 8.0 Hz, 1H), 7.68 (d, *J* = 8.0 Hz, 1H), 7.53 (t, *J* = 8.0 Hz, 1H), 7.48-7.36 (m, 3H), 7.21 (d, *J* = 7.6 Hz, 1H), 6.26-6.10 (m, 3H), 1.87 (d, *J* = 4.8 Hz, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 165.9, 162.3, 150.3, 147.6, 147.3, 146.3,

141.3, 137.5, 136.4, 132.6, 129.4, 126.9, 126.4, 126.2, 125.3, 125.0, 122.7, 120.1, 119.50, 119.46, 118.4, 18.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{22}H_{19}N_2O_3$: 359.1396; found: 359.1390. FT-IR (neat, cm^{-1}) υ 3332, 2923, 1724, 1677, 1526, 1494, 1111, 1000, 740.



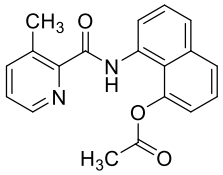
3ad-5

8-(Picolinamido)naphthalen-1-yl 2-(3-cyano-4-isobutoxyphenyl)-4-methylthiazole-5-carboxylate (**3ad-5**). Following the general procedure, **3ad-5** was obtained as a yellow solid (30.7 mg, 28%). R_f = 0.23 (n-hexane/EtOAc 3:1). m.p. 190.0–192.0 °C. ^{1}H NMR (400 MHz, DMSO-d_6) δ 10.7 (s, 1H), 8.19 (d, J = 2.4 Hz, 1H), 8.10 (dd, J = 8.8, 2.4 Hz, 1H), 8.08-8.04 (m, 1H), 8.02-7.94 (m, 3H), 7.87 (d, J = 7.2 Hz, 1H), 7.78 (dt, J = 7.8, 1.6 Hz, 1H), 7.65-7.56 (m, 2H), 7.14 (dd, J = 7.2, 1.2 Hz, 1H), 7.37 (d, J = 8.8, 1H), 7.26-7.21 (m, 1H), 4.02 (d, J = 6.8 Hz, 2H), 2.55 (s, 3H), 2.16-2.06 (m, 1H), 1.04 (d, J = 6.8 Hz, 6H). ^{13}C{^{1}H} NMR (100 MHz, DMSO-d_6) δ 168.1, 163.0, 162.7, 162.1, 160.8, 149.6, 147.9, 145.9, 138.0, 136.4, 133.7, 132.1, 132.0, 128.0, 127.1, 126.8, 126.7, 126.3, 125.4, 125.0, 122.6, 122.3, 121.3, 121.2, 115.8, 114.4, 102.1, 75.6, 28.1, 19.2, 17.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{32}H_{27}N_4O_4S$: 563.1753; found: 563.1748. FT-IR (neat, cm^{-1}) υ 3356, 2928, 1731, 1686, 1531, 1500, 1430, 1289, 1246, 1030, 753.



3ad-6

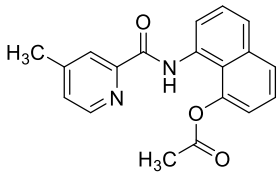
8-(picolinamido)naphthalen-1-yl (1*R*,3*R*)-3-((*Z*)-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane-1-carboxylate (**3ad-6**). Following the general procedure, **3ad-6** was obtained as a white solid (76.1 mg, 78%). R_f = 0.64 (n-hexane/EtOAc 3:1). m.p. 123.0–125.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.46 (s, 1H), 8.69 (d, J = 7.6 Hz, 1H), 8.64 (d, J = 4.4 Hz, 1H), 8.40 (d, J = 7.6 Hz, 1H), 7.96 (t, J = 7.6 Hz, 1H), 7.78 (d, J = 8.4 Hz, 1H), 7.70 (d, J = 8.4 Hz, 1H), 7.57-7.51 (m, 2H), 7.47 (t, J = 8.4 Hz, 1H), 7.18 (d, J = 7.6 Hz, 1H), 6.76 (d, J = 9.2 Hz, 1H), 2.57 (d, J = 8.0 Hz, 1H), 1.96 (t, J = 8.4 Hz, 1H), 1.22 (s, 3H), 1.04 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 168.9, 161.9, 150.3, 147.7, 145.6, 137.9, 136.4, 132.3, 128.9 (q, J_{C-F} = 4.4 Hz), 127.3, 126.6, 126.5, 125.2, 125.1, 123.1, 122.4 (q, J_{C-F} = 37.6 Hz), 120.6, 120.1 (q, J_{C-F} = 269.8 Hz), 119.7, 119.4, 32.6, 31.8, 29.9, 27.9, 14.6. ^{19}F NMR (376 MHz, $CDCl_3$) δ -68.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{21}ClF_3N_2O_3$: 489.1193; found: 489.1187. FT-IR (neat, cm^{-1}) υ 3348, 2932, 1751, 1687, 1532, 1499, 1275, 1115, 1059, 753.



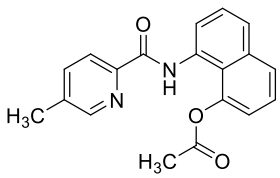
3ba

8-(3-methylpicolinamido)naphthalen-1-yl acetate (**3ba**). Following the general procedure, **3ba** was obtained as a white solid (31.4 mg, 49%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 147.0–149.0 °C. ^{1}H

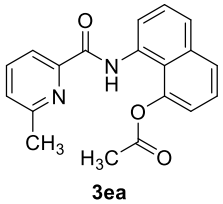
NMR (400 MHz, $CDCl_3$) δ 11.49 (s, 1H), 8.65 (d, J = 7.6 Hz, 1H), 8.50 (d, J = 4.0 Hz, 1H), 7.75 (d, J = 8.0 Hz, 1H), 7.67 (d, J = 8.0 Hz, 2H), 7.52 (t, J = 8.0 Hz, 1H), 7.45 (t, J = 8.0 Hz, 1H), 7.39 (dd, J = 7.6, 4.8 Hz, 1H), 7.17 (dd, J = 7.6, 0.8 Hz, 1H), 2.85 (s, 3H), 2.33 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 169.5, 163.8, 147.4, 145.9, 145.1, 141.4, 136.5, 136.4, 132.6, 127.2, 126.4, 126.1, 125.2, 124.9, 120.3, 119.63, 119.57, 21.5, 21.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_3$: 321.1239; found: 321.1234. FT-IR (neat, cm^{-1}) υ 3346, 2924, 1769, 1682, 1524, 1494, 1430, 1081, 759.


3ca

8-(4-methylpicolinamido)naphthalen-1-yl acetate (**3ca**). Following the general procedure, **3ca** was obtained as a white solid (39.7 mg, 62%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 159.0–161.0 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 11.51 (s, 1H), 8.76 (dd, J = 8.0, 0.8 Hz, 1H), 8.49 (d, J = 4.8 Hz, 1H), 8.19 (s, 1H), 7.75 (d, J = 8.0 Hz, 1H), 7.68 (d, J = 8.0 Hz, 1H), 7.53 (t, J = 8.0 Hz, 1H), 7.45 (t, J = 8.0 Hz, 1H), 7.31 (d, J = 4.8 Hz, 1H), 7.19 (dd, J = 7.6, 1.2 Hz, 1H), 2.48 (s, 3H), 2.45 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 169.6, 162.5, 150.0, 149.3, 147.4, 145.9, 136.4, 132.5, 127.4, 127.2, 126.4, 125.2, 124.9, 123.7, 120.4, 119.4, 119.2, 21.6, 21.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_3$: 321.1239; found: 321.1234. FT-IR (neat, cm^{-1}) υ 3337, 2934, 1763, 1671, 1528, 1496, 1432, 1179, 1024, 759.

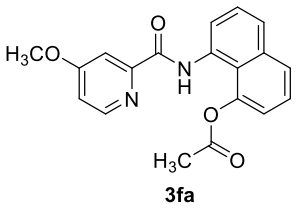

3da

8-(5-methylpicolinamido)naphthalen-1-yl acetate (**3da**). Following the general procedure, **3da** was obtained as a white solid (46.7 mg, 73%). R_f = 0.46 (n-hexane/EtOAc 3:1). m.p. 155.0–157.0 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 11.46 (s, 1H), 8.77 (d, J = 7.6 Hz, 1H), 8.45 (s, 1H), 8.25 (d, J = 8.0 Hz, 1H), 7.75 (d, J = 8.0 Hz, 1H), 7.72 (dd, J = 8.0, 1.2 Hz, 1H), 7.67 (d, J = 8.0 Hz, 1H), 7.52 (t, J = 8.0 Hz, 1H), 7.45 (t, J = 8.0 Hz, 1H), 7.19 (d, J = 7.6 Hz, 1H), 2.46 (s, 3H), 2.44 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 169.6, 162.5, 148.1, 147.9, 145.9, 138.1, 136.9, 136.4, 132.6, 127.2, 126.4, 125.2, 124.9, 122.5, 120.3, 119.3, 119.1, 21.7, 18.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_3$: 321.1239; found: 321.1234. FT-IR (neat, cm^{-1}) υ 3331, 2922, 1766, 1673, 1530, 1499, 1185, 757.


3ea

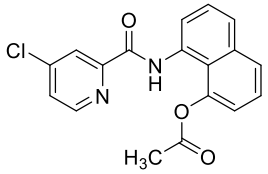
8-(6-methylpicolinamido)naphthalen-1-yl acetate (**3ea**). Following the general procedure, **3ea** was obtained as a gray solid (14.7 mg, 23%). R_f = 0.46 (n-hexane/EtOAc 3:1). m.p. 168.0–170.0 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 11.19 (s, 1H), 8.53 (d, J = 7.6 Hz, 1H), 8.19 (d, J = 7.6 Hz, 1H), 7.83 (t, J = 7.6 Hz, 1H), 7.78 (d, J = 7.6 Hz, 1H), 7.70 (d, J = 8.0 Hz, 1H), 7.53 (t, J = 8.0 Hz, 1H), 7.47 (t, J = 8.0 Hz, 1H), 7.38 (d, J = 7.6 Hz, 1H), 7.19 (dd, J = 7.2, 0.8 Hz, 1H), 2.69 (s, 3H),

2.22 (s, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 169.4, 162.5, 157.0, 149.6, 145.8, 138.0, 136.4, 132.0, 127.3, 126.4, 125.4, 125.3, 120.6, 120.5, 120.2, 120.0, 24.2, 21.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_3$: 321.1239; found: 321.1234. FT-IR (neat, cm^{-1}) υ 3362, 2924, 1772, 1687, 1530, 1497, 1179, 746.



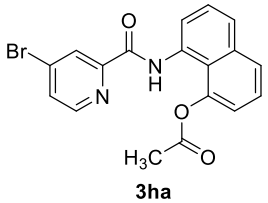
3fa

8-(4-methoxypicolinamido)naphthalen-1-yl acetate (**3fa**). Following the general procedure, **3fa** was obtained as a yellow solid (52.4 mg, 78%). R_f = 0.40 (n-hexane/EtOAc 3:1). m.p. 157.0–159.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.53 (s, 1H), 8.75 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.43 (d, *J* = 5.6 Hz, 1H), 7.90 (d, *J* = 2.8 Hz, 1H), 7.76 (dd, *J* = 8.0, 0.8 Hz, 1H), 7.68 (d, *J* = 8.0, 0.8 Hz, 1H), 7.53 (t, *J* = 8.0 Hz, 1H), 7.45 (t, *J* = 8.0 Hz, 1H), 7.19 (dd, *J* = 7.6, 1.2 Hz, 1H), 7.00 (dd, *J* = 5.6, 2.8 Hz, 1H), 3.95 (s, 3H), 2.45 (s, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 169.6, 167.3, 162.2, 152.3, 148.8, 145.9, 136.4, 132.4, 127.2, 126.4, 125.2, 125.0, 120.4, 119.4, 119.2, 113.4, 107.9, 55.6, 21.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_4$: 337.1188; found: 337.1183. FT-IR (neat, cm^{-1}) υ 3342, 2927, 1772, 1682, 1529, 1496, 1180, 1030, 758.



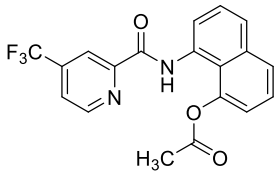
3ga

8-(4-chloropicolinamido)naphthalen-1-yl acetate (**3ga**). Following the general procedure, **3ga** was obtained as a yellow solid (48.3 mg, 71%). R_f = 0.72 (n-hexane/EtOAc 3:1). m.p. 184.0–186.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.44 (s, 1H), 8.75 (d, *J* = 7.6 Hz, 1H), 8.53 (d, *J* = 5.2 Hz, 1H), 8.37 (d, *J* = 2.0 Hz, 1H), 7.76 (d, *J* = 8.0 Hz, 1H), 7.69 (d, *J* = 8.0 Hz, 1H), 7.55-7.50 (m, 2H), 7.46 (t, *J* = 8.0 Hz, 1H), 7.20 (dd, *J* = 7.6, 0.8 Hz, 1H), 2.44 (s, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 169.4, 161.1, 151.8, 148.6, 146.5, 145.8, 136.4, 132.2, 127.3, 126.8, 126.5, 125.4, 125.3, 123.6, 120.5, 119.5, 119.1, 21.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{18}H_{14}ClN_2O_3$: 341.0693; found: 341.0687. FT-IR (neat, cm^{-1}) υ 3350, 2930, 1763, 1672, 1542, 1501, 1194, 1027, 754.



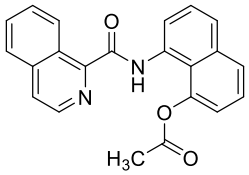
3ha

8-(4-bromopicolinamido)naphthalen-1-yl acetate (**3ha**). Following the general procedure, **3ha** was obtained as a yellow solid (55.4 mg, 72%). R_f = 0.72 (n-hexane/EtOAc 3:1). m.p. 178.0–180.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.42 (s, 1H), 8.74 (d, *J* = 7.6 Hz, 1H), 8.53 (d, *J* = 1.6 Hz, 1H), 8.44 (d, *J* = 4.8 Hz, 1H), 7.76 (d, *J* = 8.4 Hz, 1H), 7.71-7.65 (m, 2H), 7.53 (t, *J* = 8.0 Hz, 1H), 7.46 (t, *J* = 8.0 Hz, 1H), 7.19 (d, *J* = 7.6 Hz, 1H), 2.44 (s, 3H). $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) δ 169.4, 160.9, 151.4, 148.3, 145.7, 136.3, 135.0, 132.1, 129.8, 127.2, 126.6, 126.4, 125.32, 125.30, 120.5, 119.5, 119.0, 21.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{18}H_{14}BrN_2O_3$: 385.0188; found: 385.0182. FT-IR (neat, cm^{-1}) υ 3346, 2952, 1759, 1668, 1538, 1497, 1189, 1024, 753.



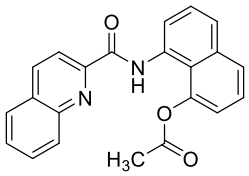
3ia

8-(4-(trifluoromethyl)picolinamido)naphthalen-1-yl acetate (**3ia**). Following the general procedure, **3ia** was obtained as a gray solid (53.2 mg, 78%). R_f = 0.75 (n-hexane/EtOAc 3:1). m.p. 170.0–172.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.47 (s, 1H), 8.84-8.80 (m, 1H), 8.78 (dd, *J* = 8.0, 1.2 Hz, 1H), 6.62 (s, 1H), 7.78-7.73 (m, 2H), 7.70 (d, *J* = 8.0 Hz, 1H), 7.54 (t, *J* = 8.0 Hz, 1H), 7.47 (t, *J* = 8.0 Hz, 1H), 7.21 (d, *J* = 7.6 Hz, 1H), 2.45 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.3, 160.8, 151.9, 148.7, 145.7, 140.4 (q, *J* = 34.8 Hz), 136.4, 132.0, 127.3, 126.4, 125.45, 125.36, 122.4 (q, *J* = 271.9 Hz), 122.2 (q, *J* = 3.4 Hz), 125.5, 119.5, 119.1 (q, J = 3.5 Hz), 119.0, 21.7. ^{19}F NMR (376 MHz, $CDCl_3$) δ -64.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{14}F_3N_2O_3$: 375.0957; found: 375.0951. FT-IR (neat, cm^{-1}) υ 3348, 2924, 1774, 1685, 1534, 1501, 1408, 1330, 1174, 1139, 757.



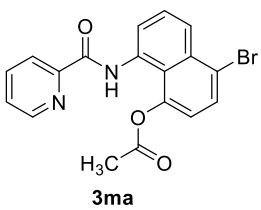
3ja

8-(isoquinoline-1-carboxamido)naphthalen-1-yl acetate (**3ja**). Following the general procedure, **3ja** was obtained as a yellow solid (62.7 mg, 88%). R_f = 0.70 (n-hexane/EtOAc 3:1). m.p. 159.0–161.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.64 (s, 1H), 9.80-9.70 (m, 1H), 8.73 (dd, *J* = 8.0, 1.2, 1H), 8.58 (d, *J* = 5.6 Hz, 1H), 7.94-7.87 (m, 2H), 7.80-7.69 (m, 4H), 7.57 (t, *J* = 8.0 Hz, 1H), 7.47 (t, *J* = 8.0 Hz, 1H), 7.20 (dd, *J* = 7.8, 1.2 Hz, 1H), 2.30 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.5, 163.9, 148.2, 145.9, 139.6, 137.6, 136.4, 132.5, 130.8, 129.1, 127.9, 127.33, 127.25, 127.0, 126.4, 125.3, 125.15, 125.08, 120.4, 119.8, 119.6, 21.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{22}H_{17}N_2O_3$: 357.1239; found: 357.1234. FT-IR (neat, cm^{-1}) υ 3338, 2928, 1768, 1676, 1524, 1491, 1181, 754.



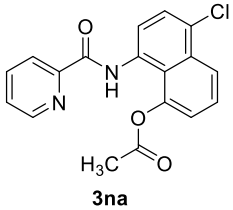
3ka

8-(quinoline-2-carboxamido)naphthalen-1-yl acetate (**3ka**). Following the general procedure, **3ka** was obtained as a white solid (14.2 mg, 20%). R_f = 0.68 (n-hexane/EtOAc 3:1). m.p. 184.0–186.0 ºC. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.51 (s, 1H), 8.66 (d, *J* = 7.6 Hz, 1H), 8.49 (d, *J* = 8.4 Hz, 1H), 8.42 (d, *J* = 8.4 Hz, 1H), 8.26 (d, *J* = 8.4 Hz, 1H), 7.96 (d, *J* = 8.4 Hz, 1H), 7.87-7.82 (m, 1H), 7.80 (d, *J* = 8.0 Hz, 1H), 7.73-7.66 (m, 2H), 7.56 (t, *J* = 8.0 Hz, 1H), 7.49 (t, *J* = 8.0 Hz, 1H), 7.22 (dd, *J* = 7.2, 0.8, 1H), 2.21 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.5, 162.3, 150.2, 146.1, 145.9, 138.0, 136.4, 132.2, 130.6, 129.5, 129.4, 128.2, 128.1, 127.3, 126.5, 125.4, 125.3, 120.6, 120.2, 119.8, 119.2, 21.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{22}H_{17}N_2O_3$: 357.1239; found: 357.1234. FT-IR (neat, cm^{-1}) υ 3325, 2924, 1768, 1682, 1529, 1493, 1184, 758.



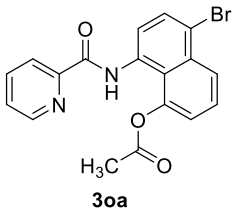
3ma

4-bromo-8-(picolinamido)naphthalen-1-yl acetate (**3ma**). Following the general procedure, **3ma** was obtained as a white solid (62.4 mg, 81%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 161.0–163.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.51 (s, 1H), 8.82 (dd, *J* = 8.0, 1.2 Hz, 1H), 8.67-8.62 (m, 1H), 8.37 (d, *J* = 7.6 Hz, 1H), 8.14 (dd, *J* = 8.4, 0.8 Hz, 1H), 7.95 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.79 (d, *J* = 8.4 Hz, 1H), 7.65 (t, *J* = 8.0 Hz, 1H), 7.55-7.50 (m, 1H), 7.06 (d, *J* = 8.0 Hz, 1H), 2.43 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.2, 162.3, 150.1, 147.7, 145.6, 137.9, 134.1, 132.9, 129.5, 127.9, 126.7, 124.5, 123.0, 121.0, 120.6, 120.5, 120.4, 21.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{18}H_{14}BrN_2O_3$: 385.0188; found: 385.0182. FT-IR (neat, cm^{-1}) υ 3337, 2923, 1770, 1685, 1533, 1493, 1174, 741.



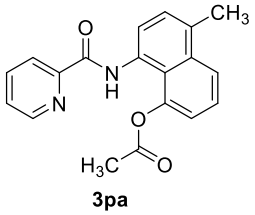
3na

5-chloro-8-(picolinamido)naphthalen-1-yl acetate (**3na**). Following the general procedure, **3na** was obtained as a white solid (37.4 mg, 55%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 169.0–171.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.54 (s, 1H), 8.73 (d, *J* = 8.4 Hz, 1H), 8.64 (d, *J* = 4.8 Hz, 1H), 8.35 (d, *J* = 8.0 Hz, 1H), 8.26 (d, *J* = 8.4 Hz, 1H), 7.94 (dt, *J* = 7.6, 1.2 Hz, 1H), 7.63 (d, *J* = 8.4 Hz, 1H), 7.58 (t, *J* = 8.4 Hz, 1H), 7.54-7.49 (m, 1H), 7.26 (d, *J* = 7.6 Hz, 1H), 2.45 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.3, 162.2, 150.0, 147.6, 146.1, 137.9, 133.1, 131.9, 127.8, 126.9, 126.7, 126.3, 123.6, 123.0, 121.4, 120.3, 119.0, 21.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{18}H_{14}ClN_2O_3$: 341.0693; found: 341.0687. FT-IR (neat, cm^{-1}) υ 3348, 2922, 1755, 1686, 1531, 1499, 1198, 750.



3oa

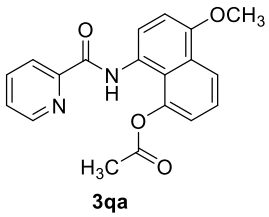
5-bromo-8-(picolinamido)naphthalen-1-yl acetate (**3oa**). Following the general procedure, **3oa** was obtained as a white solid (67.0 mg, 87%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 177.0–179.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.58 (s, 1H), 8.69 (d, *J* = 8.4 Hz, 1H), 8.66 (d, *J* = 4.4 Hz, 1H), 8.36 (d, *J* = 8.0 Hz, 1H), 8.26 (dd, *J* = 8.4, 0.8 Hz, 1H), 7.96 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.84 (d, *J* = 8.4 Hz, 1H), 7.58 (t, *J* = 7.6 Hz, 1H), 7.55-7.51 (m, 1H), 7.27 (dd, *J* = 7.6, 0.8 Hz, 1H), 2.46 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.3, 162.2, 150.0, 147.7, 146.0, 137.9, 134.1, 132.6, 130.7, 126.8, 126.6, 126.5, 123.0, 121.4, 120.4, 119.5, 118.4, 21.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{18}H_{14}BrN_2O_3$: 385.0188; found: 385.0182. FT-IR (neat, cm^{-1}) υ 3339, 2927, 1771, 1683, 1522, 1493, 1176, 750.



3pa

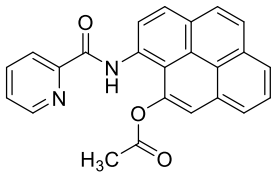
5-methyl-8-(picolinamido)naphthalen-1-yl acetate (**3pa**). Following the general procedure, **3pa** was obtained as a white

solid (55.0 mg, 86%). R_f = 0.48 (n-hexane/EtOAc 3:1). m.p. 154.0–156.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.40 (s, 1H), 8.64 (d, J = 4.4 Hz, 1H), 8.60 (d, J = 7.6 Hz, 1H), 8.36 (d, J = 8.0 Hz, 1H), 8.00-7.89 (m, 2H), 7.53-7.47 (m, 2H), 7.39 (d, J = 8.0 Hz, 1H), 7.20 (d, J = 8.0 Hz, 1H), 2.67 (s, 3H), 2.41 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.6, 162.1, 150.3, 147.6, 146.3, 137.7, 135.2, 131.1, 130.7, 127.3, 126.5, 125.0, 123.2, 122.8, 120.2, 119.6, 119.5, 21.6, 20.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_3$: 321.1239; found: 321.1234. FT-IR (neat, cm^{-1}) υ 3335, 2925, 1764, 1676, 1528, 1505, 1181, 747.



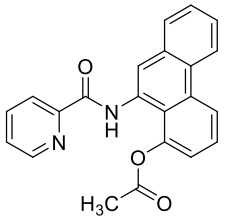
3qa

5-methoxy-8-(picolinamido)naphthalen-1-yl acetate (**3qa**). Following the general procedure, **3qa** was obtained as a yellow solid (55.1 mg, 82%). R_f = 0.37 (n-hexane/EtOAc 3:1). m.p. 138.0–140.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.14 (s, 1H), 8.66-8.59 (m, 1H), 8.51 (d, J = 8.8 Hz, 1H), 8.35 (d, J = 7.6 Hz, 1H), 8.26 (dd, J = 8.8, 1.6 Hz, 1H), 7.91 (dd, J = 7.6, 1.6 HZ, 1H), 7.51-7.42 (m, 2H), 7.22 (d, J = 7.6, 1.2 Hz, 1H), 6.88 (d, J = 8.4 Hz, 1H), 4.00 (s, 3H), 2.36 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.6, 162.1, 152.6, 150.4, 147.6, 145.7, 137.7, 128.0, 126.4, 124.9, 124.7, 122.7, 121.2, 120.92, 120.87, 120.7, 104.2, 55.7, 21.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{17}N_2O_4$: 337.1188; found: 337.1183. FT-IR (neat, cm^{-1}) υ 3350, 2933, 1763, 1670, 1538, 1506, 1185, 1038, 749.



3ra

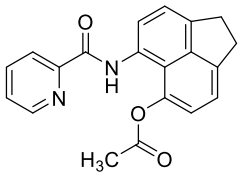
3-(picolinamido)pyren-4-yl acetate (**3ra**). Following the general procedure, **3ra** was obtained as a yellow solid (62.3 mg, 82%). R_f = 0.26 (n-hexane/EtOAc 3:1). m.p. 214.0–216.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.75 (s, 1H), 9.25 (d, J = 8.8 Hz, 1H), 8.70 (d, J = 4.4 Hz, 1H), 8.42 (d, J = 7.6 Hz, 1H), 8.24 (d, J = 8.8 Hz, 1H), 8.13 (d, J = 7.6 Hz, 1H), 8.07 (d, J = 7.2 Hz, 1H), 8.04-7.92 (m, 4H), 7.76 (s, 1H), 7.56-7.09 (m, 1H), 2.49 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.6, 162.3, 150.3, 147.8, 145.0, 137.9, 131.6, 131.3, 130.4, 128.5, 127.6, 127.1, 126.7, 126.6, 126.5, 125.3, 124.4, 123.6, 123.1, 120.8, 120.5, 116.1, 21.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{17}N_2O_3$: 381.1239; found: 381.1234. FT-IR (neat, cm^{-1}) υ 3340, 2927, 1770, 1682, 1517, 1492, 1180, 746.



3sa

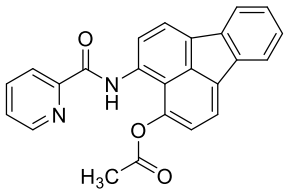
10-(picolinamido)phenanthren-1-yl acetate (**3sa**). Following the general procedure, **3sa** was obtained as a white solid (57.0 mg, 80%). R_f = 0.27 (n-hexane/EtOAc 3:1). m.p. 191.0–193.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.58 (s, 1H), 9.11 (s, 1H), 8.71-8.65 (m, 2H), 8.62-8.56 (m, 1H), 8.40 (d, J = 8.0 Hz, 1H), 7.95 (dt, J = 8.0, 1.2 Hz, 1H), 7.92-7.87 (m, 1H), 7.66 (t, J = 8.0 Hz, 1H), 7.63-7.57 (m, 2H), 7.55-7.50 (m, 1H), 7.32 (d, J = 7.6 Hz, 1H), 2.46 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.6, 162.5, 150.3, 147.7, 146.5, 137.9, 133.6, 131.9,

130.0, 128.6, 127.7, 127.5, 126.6, 126.4, 126.2, 122.9, 122.7, 121.7, 121.6, 119.3, 119.2, 21.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{22}H_{17}N_2O_3$: 357.1239; found: 357.1234. FT-IR (neat, cm^{-1}) υ 3347, 2940, 1771, 1683, 1523, 1169, 755.



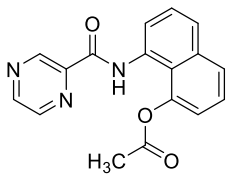
3ta

6-(picolinamido)-1,2-dihydroacenaphthylen-5-yl acetate (**3ta**). Following the general procedure, **3ta** was obtained as a white solid (35.5 mg, 53%). R_f = 0.30 (n-hexane/EtOAc 3:1). m.p. 161.0–163.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.28 (s, 1H), 8.74 (d, *J* = 8.0 Hz, 1H), 8.64 (d, *J* = 4.4 Hz, 1H), 8.37 (d, *J* = 8.0 Hz, 1H), 7.94 (dt, *J* = 7.6, 1.6 Hz, 1H), 7.53-7.49 (m, 1H), 7.33 (d, *J* = 8.0 Hz, 1H), 7.25 (d, *J* = 7.26 Hz, 1H), 7.16 (d, *J* = 7.6 Hz, 1H), 3.39 (s, 4H), 2.52 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.9, 162.1, 150.4, 147.6, 144.4, 142.6, 142.1, 141.5, 137.8, 129.1, 126.4, 122.8, 121.4, 120.4, 120.1, 119.1, 117.3, 30.3, 30.1, 21.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{17}N_2O_3$: 333.1239; found: 333.1234. FT-IR (neat, cm^{-1}) υ 3335, 2929, 1767, 1671, 1528, 1498, 1179, 753.



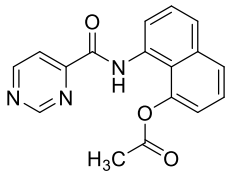
3ua

4-(picolinamido)fluoranthen-3-yl acetate (**3ua**). Following the general procedure, **3ua** was obtained as a yellow solid (31.9 mg, 42%). R_f = 0.27 (n-hexane/EtOAc 3:1). m.p. 225.0–227.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.62 (s, 1H), 9.05 (d, *J* = 8.0 Hz, 1H), 8.64 (d, *J* = 4.8 Hz, 1H), 8.40 (d, *J* = 8.0 Hz, 1H), 8.00-7.83 (m, 5H), 7.56-7.51 (m, 1H), 7.40-7.31 (m, 3H), 2.64 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.3, 162.3, 150.2, 147.6, 146.1, 139.1, 138.4, 137.9, 135.1, 134.1, 133.8, 132.6, 127.5, 127.1, 126.7, 123.0, 121.7, 121.3, 121.2, 121.1, 120.0, 119.0, 115.8, 21.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{24}H_{17}N_2O_3$: 381.1239; found: 381.1234. FT-IR (neat, cm^{-1}) υ 3333, 2924, 1762, 1676, 1529, 1443, 1187, 1039, 750.



3va

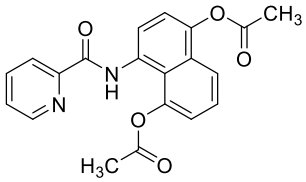
8-(pyrazine-2-carboxamido)naphthalen-1-yl acetate (**3va**). Following the general procedure, **3va** was obtained as a white solid (17.8 mg, 29%). R_f = 0.22 (n-hexane/EtOAc 3:1). m.p. 171.0–173.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.32 (s, 1H), 9.60 (s, 1H), 8.85 (d, *J* = 2.0 Hz, 1H), 8.78 (d, *J* = 8.0 Hz, 1H), 8.61 (s, 1H), 7.77 (d, *J* = 8.4 Hz, 1H), 7.71 (d, *J* = 8.4 Hz, 1H), 7.54 (t, *J* = 8.0 Hz, 1H), 7.47 (t, *J* = 8.0 Hz, 1H), 7.21 (d, *J* = 7.2 Hz, 1H), 2.46 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.2, 160.8, 147.6, 145.7, 145.3, 144.9, 141.9, 136.4, 132.0, 127.3, 126.4, 125.5, 125.4, 120.6, 119.5, 118.9, 21.7. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{17}H_{14}N_3O_3$: 308.1035; found: 308.1030. FT-IR (neat, cm^{-1}) υ 3337, 2925, 1764, 1680, 1534, 1498, 1174, 1020, 754.



3wa

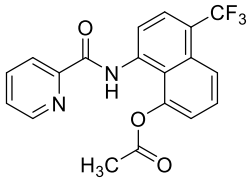
8-(pyrimidine-4-carboxamido)naphthalen-1-yl acetate (**3wa**). Following the general procedure, **3wa** was obtained as a yellow solid (35.6 mg, 58%). R_f = 0.22 (n-hexane/EtOAc 3:1). m.p.

189.0–191.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.50 (s, 1H), 9.34 (s, 1H), 9.06 (d, J = 4.8 Hz, 1H), 8.77 (d, J = 8.0 Hz, 1H), 8.29 (dd, J = 4.8, 1.6 Hz, 1H), 7.77 (d, J = 8.0 Hz, 1H), 7.71 (d, J = 8.0 Hz, 1H), 7.53 (t, J = 7.6 Hz, 1H), 7.47 (t, J = 8.0 Hz, 1H), 7.22 (dd, J = 7.8, 1.6 Hz, 1H), 2.50 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.3, 160.4, 159.7, 157.4, 157.8, 145.7, 136.3, 131.8, 124.3, 126.4, 125.7, 125.5, 120.7, 119.5, 119.1, 118.9, 21.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{17}H_{14}N_3O_3$: 308.1035; found: 308.1030. FT-IR (neat, cm^{-1}) υ 3328, 2922, 1761, 1676, 1529, 1493, 1180, 756.



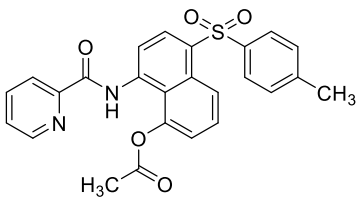
4

4-(picolinamido)naphthalene-1,5-diyl diacetate (**4**). Following the general procedure, **4** was obtained as a gray solid (29.8 mg, 41%). R_f = 0.23 (n-hexane/EtOAc 3:1). m.p. 163.0–165.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 11.51 (s, 1H), 8.78 (d, J = 8.4 Hz, 1H), 8.65 (d, J = 4.4 Hz, 1H), 8.37 (d, J = 7.6 Hz, 1H), 7.95 (t, J = 7.6 Hz, 1H), 7.83 (d, J = 8.4 Hz, 1H), 7.56-7.48 (m, 2H), 7.33 (d, J = 8.4 Hz, 1H), 7.25 (d, J = 7.2 Hz, 1H), 2.47 (s, 3H), 2.46 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 169.4, 169.3, 162.2, 150.2, 147.7, 146.2, 143.0, 137.9, 130.7, 129.4, 126.7, 125.9, 123.0, 121.1, 120.2, 120.0, 119.0, 118.9, 21.6, 21.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{20}H_{17}N_2O_5$: 365.1137; found: 365.1132. FT-IR (neat, cm^{-1}) υ 3345, 2926, 1761, 1678, 1530, 1502, 1177, 749.



5

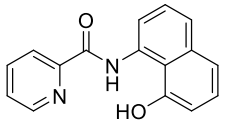
8-(picolinamido)-5-(trifluoromethyl)naphthalen-1-yl acetate (**5**). Following the general procedure, **5** was obtained as a gray solid (33.6 mg, 45%). R_f = 0.25 (n-hexane/EtOAc 3:1). m.p. 144.0–146.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$) δ 10.05 (s, 1H), 8.71 (d, J = 4.4 Hz, 1H), 8.35 (d, J = 7.6 Hz, 1H), 8.01-7.92 (m, 2H), 7.86 (d, J = 8.0 Hz, 1H), 7.78 (d, J = 8.8 Hz, 1H), 7.62-7.53 (m, 2H), 7.22 (d, J = 7.6 Hz, 1H), 1.79 (s, 3H). ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) δ 170.1, 164.2, 149.0, 148.4, 146.7, 137.7, 137.6, 130.7 (q, J = 2.1 Hz), 129.0, 128.0, 127.4, 127.0, 126.3 (q, J = 28.9 Hz), 124.9, 123.7 (q, J = 272.3 Hz), 122.9, 122.2, 122.1 (q, J = 5.0 Hz), 20.6. ^{19}F NMR (376 MHz, $CDCl_3$) δ -60.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{14}F_3N_2O_3$: 375.0957; found: 375.0951. FT-IR (neat, cm^{-1}) υ 3342, 2936, 1765, 1695, 1495, 1181, 1130, 752.



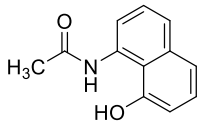
6

8-(picolinamido)-5-tosylnaphthalen-1-yl acetate (**6**). Following the general procedure, **6** was obtained as a gray solid (50.2 mg, 51%). R_f = 0.13 (n-hexane/EtOAc 3:1). m.p. 215.0–217.0 °C. ^{1}H NMR (400 MHz, $CDCl_3$)

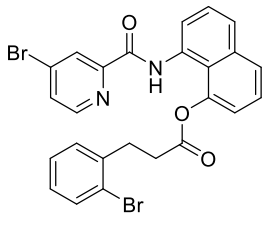
δ 11.95 (s, 1H), 9.06 (d, J = 8.8 Hz, 1H), 8.68-8.54 (m, 3H), 8.35 (d, J = 7.6 Hz, 1H), 7.95 (t, J = 7.6 Hz, 1H), 7.82 (d, J = 8.0 Hz, 2H), 7.58-7.49 (m, 2H), 7.27-7.18 (m, 3H), 2.49 (s, 3H), 2.35 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 169.1, 162.7, 149.5, 147.7, 146.4, 144.0, 138.8, 138.7, 138.0, 131.5, 131.4, 131.3, 129.7, 127.5, 127.4, 127.1, 123.25, 123.19, 121.5, 119.2, 116.0, 21.6, 21.5. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{21}N_2O_5S$: 461.1171; found: 461.1166. FT-IR (neat, cm^{-1}) υ 3335, 2925, 1778, 1693, 1521, 1174, 1146, 750.


7

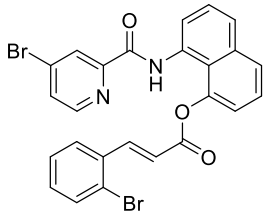
N-(8-hydroxynaphthalen-1-yl)picolinamide (**7**). Following the general procedure, **7** was obtained as a gray solid (42.2 mg, 80%). R_f = 0.20 (n-hexane/EtOAc 3:1). m.p. 226.0–228.0 °C. ^1H NMR (400 MHz, DMSO-*d6*) δ 13.26 (s, 1H), 11.44 (s, 1H), 8.86 (d, J = 7.6 Hz, 1H), 8.74 (d, J = 4.8 Hz, 1H), 8.23 (d, J = 7.6 Hz, 1H), 8.10 (t, J = 7.6 Hz, 1H), 7.68 (dd, J = 7.6, 4.8 Hz, 1H), 7.57 (d, J = 8.4 Hz, 1H), 7.46 (t, J = 8.0 Hz, 1H), 7.37 (d, J = 8.0 Hz, 1H), 7.32 (t, J = 8.0 Hz, 1H), 6.95 (d, J = 7.6 Hz, 1H). $^{13}C\{^1H\}$ NMR (100 MHz, DMSO-*d6*) δ 126.7, 154.0, 150.8, 149.1, 138.7, 136.7, 135.7, 127.4, 127.0, 126.6, 124.0, 122.8, 120.3, 115.8, 115.3, 110.6. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{16}H_{13}N_2O_2$: 265.0977; found: 265.0972. FT-IR (neat, cm^{-1}) υ 2922, 2852, 1655, 1545, 817, 751.


8

N-(8-hydroxynaphthalen-1-yl)acetamide (**8**). Following the general procedure, **8** was obtained as a white solid (44.8 mg, 85%). R_f = 0.10 (n-hexane/EtOAc 3:1). m.p. 156.0–158.0 °C. ^1H NMR (400 MHz, DMSO-*d6*) δ 11.25 (s, 1H), 11.08 (s, 1H), 8.40 (d, J = 7.6 Hz, 1H), 7.49 (dd, J = 8.0, 0.8 Hz, 1H), 7.38-7.32 (m, 2H), 7.28 (t, J = 7.8 Hz, 1H), 6.89 (dd, J = 7.8, 1.2 Hz, 1H), 2.15 (s, 3H). $^{13}C\{^1H\}$ NMR (100 MHz, DMSO-*d6*) δ 168.1, 153.8, 136.6, 136.1, 126.8, 126.5, 123.3, 120.4, 115.6, 115.1, 110.6, 25.8. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{12}H_{12}NO_2$: 202.0868; found: 202.0863. FT-IR (neat, cm^{-1}) υ 2926, 2854, 1659, 1554, 1433, 1300, 818, 759.

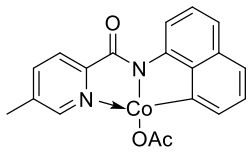

3ha-14

8-(4-bromopicolinamido)naphthalen-1-yl 3-(2-bromophenyl)propanoate (**3ha-14**). Following the general procedure, **3ha-14** was obtained as a white solid (33.7 mg, 42%). R_f = 0.70 (n-hexane/EtOAc 3:1). m.p. 134.0–136.0 °C. ^1H NMR (400 MHz, $CDCl_3$) δ 11.36 (s, 1H), 8.73 (d, J = 7.6 Hz, 1H), 8.48 (d, J = 1.6 Hz, 1H), 8.24 (d, J = 5.2 Hz, 1H), 7.76 (d, J = 8.4 Hz, 1H), 7.69 (d, J = 8.0 Hz, 1H), 7.58-7.49 (m, 3H), 7.45 (t, J = 7.6 Hz, 1H), 7.25-7.08 (m, 4H), 3.12 (s, 4H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 171.3, 160.8, 151.3, 148.4, 145.7, 139.3, 136.4, 134.9, 132.9, 132.2, 123.5, 129.7, 128.3, 127.7, 127.3, 126.6, 126.5, 125.31, 125.27, 124.2, 120.5, 119.5, 119.0, 34.4, 31.0. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{19}Br_2N_2O_3$: 552.9762; found: 552.9757. FT-IR (neat, cm^{-1}) υ 3347, 2926, 1766, 1685, 1529, 1499, 1101, 753.



3hc-7

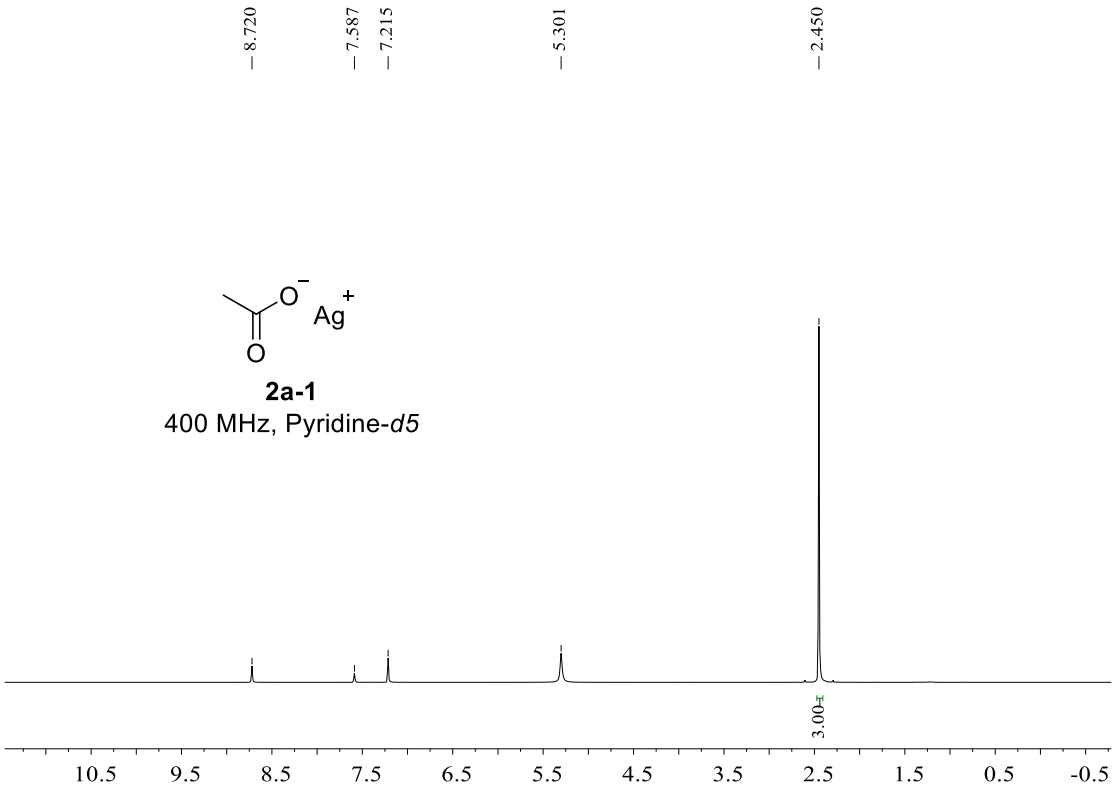
8-(4-bromopicolinamido)naphthalen-1-yl-3-(2-bromophenyl)acrylate (**3hc-7**). Following the general procedure, **3hc-7** was obtained as a yellow solid (79.5 mg, 72%). R_f = 0.50 (n-hexane/EtOAc 3:1). m.p. 157.0–159.0 ^oC. ^1H NMR (400 MHz, $CDCl_3$) δ 11.16 (s, 1H), 8.53 (d, J = 7.6 Hz, 1H), 8.45 (d, J = 1.2 Hz, 1H), 8.18-8.07 (m, 2H), 7.80 (d, J = 8.0 Hz, 1H), 7.74 (d, J = 8.4 Hz, 1H), 7.64 (d, J = 7.6 Hz, 1H), 7.55 (t, J = 8.0 Hz, 1H), 7.50 (t, J= 8.0 Hz, 1H), 7.41-7.38 (m, 1H), 7.35-7.27 (m, 4H), 6.66 (d, J = 16.0 Hz, 1H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 164.8, 161.0, 151.3, 148.2, 146.0, 145.1, 136.4, 134.6, 134.0, 133.7, 131.77, 131.75, 129.2, 127.7, 127.5, 127.3, 126.4, 125.7, 125.6, 125.5, 120.8, 120.3, 120.2, 119.9. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{25}H_{17}Br_2N_2O_3$: 550.9606; found: 550.9600. FT-IR (neat, cm^{-1}) υ 3349, 2924, 1741, 1685, 1530, 1497, 1118, 756.

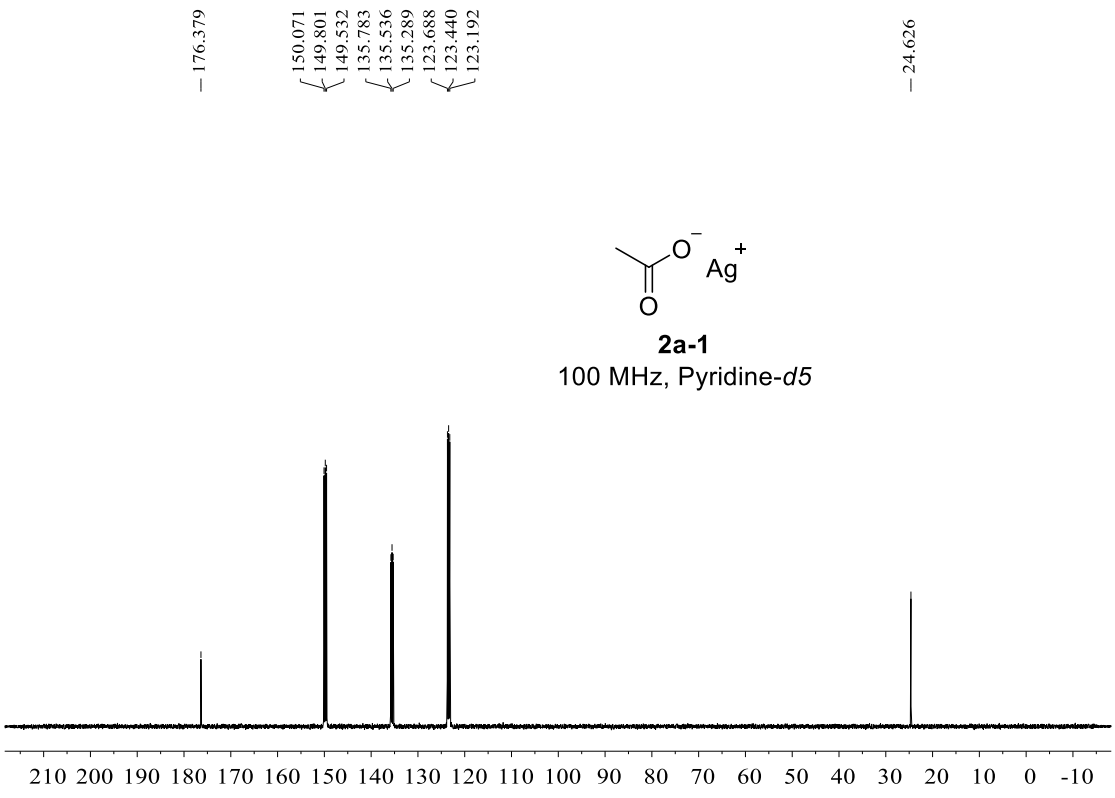


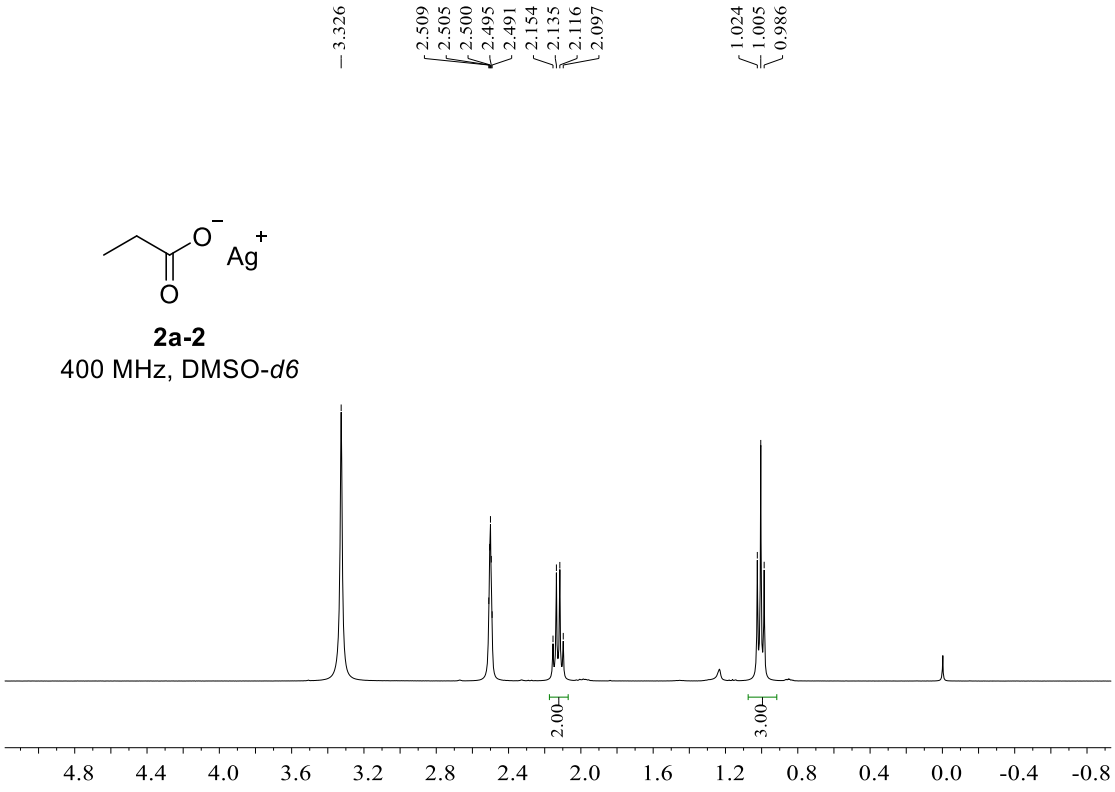
Co-1d

Co-1d was obtained as a red oil. R_f = 0.50 (EtOAc). ^1H NMR (400 MHz, $CDCl_3$) δ 7.90 (s, 1H), 7.87-7.82 (m, 1H), 7.77 (d, J = 7.6 Hz, 1H), 7.58-7.51 (m, 2H), 7.41 (t, J = 7.2 Hz, 1H), 7.33-7.17 (m, 1H), 7.04-6.89 (m, 2H), 1.93-1.64 (m, 6H). $^{13}C\{^1H\}$ NMR (100 MHz, $CDCl_3$) δ 192.1, 169.6, 154.3, 150.1, 141.5, 139.8, 137.1, 134.1, 131.7, 127.7, 126.4, 125.9, 125.5, 124.9, 124.7, 124.2, 23.8, 18.2. HRMS (ESI): m/z $[M+H]^+$ calcd for $C_{19}H_{16}CoN_2O_3$: 379.0493; found: 379.0487. FT-IR (neat, cm^{-1}) υ 3048, 2923, 1634, 1606, 1475, 1398, 796, 773.

8. Copies of ^{1}H, ^{13}C and ^{19}F NMR spectra of silver carboxylates **2a-1**–**2d-16**



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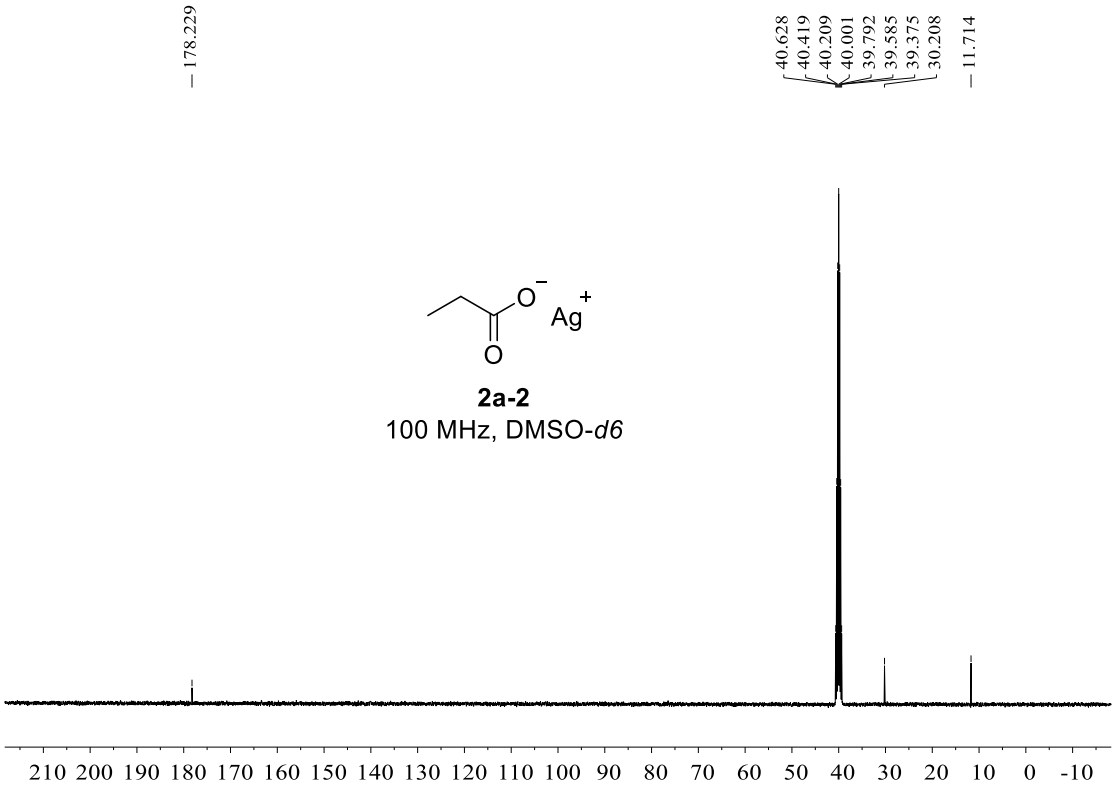
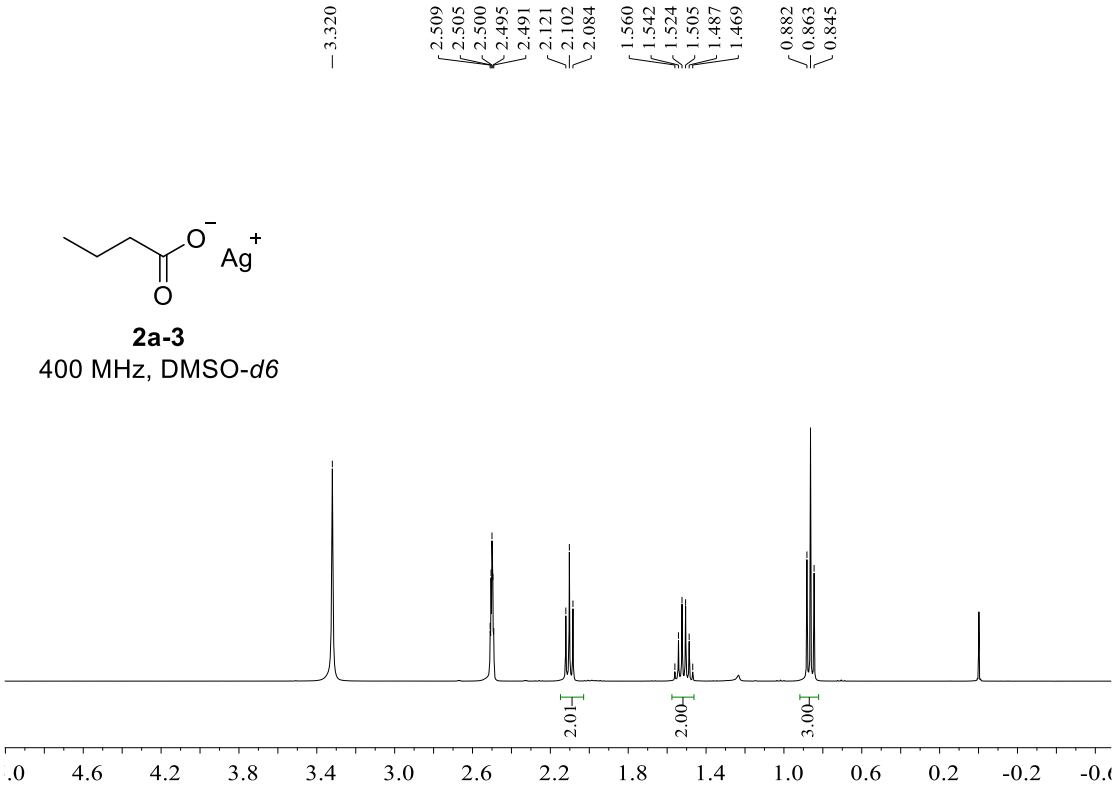
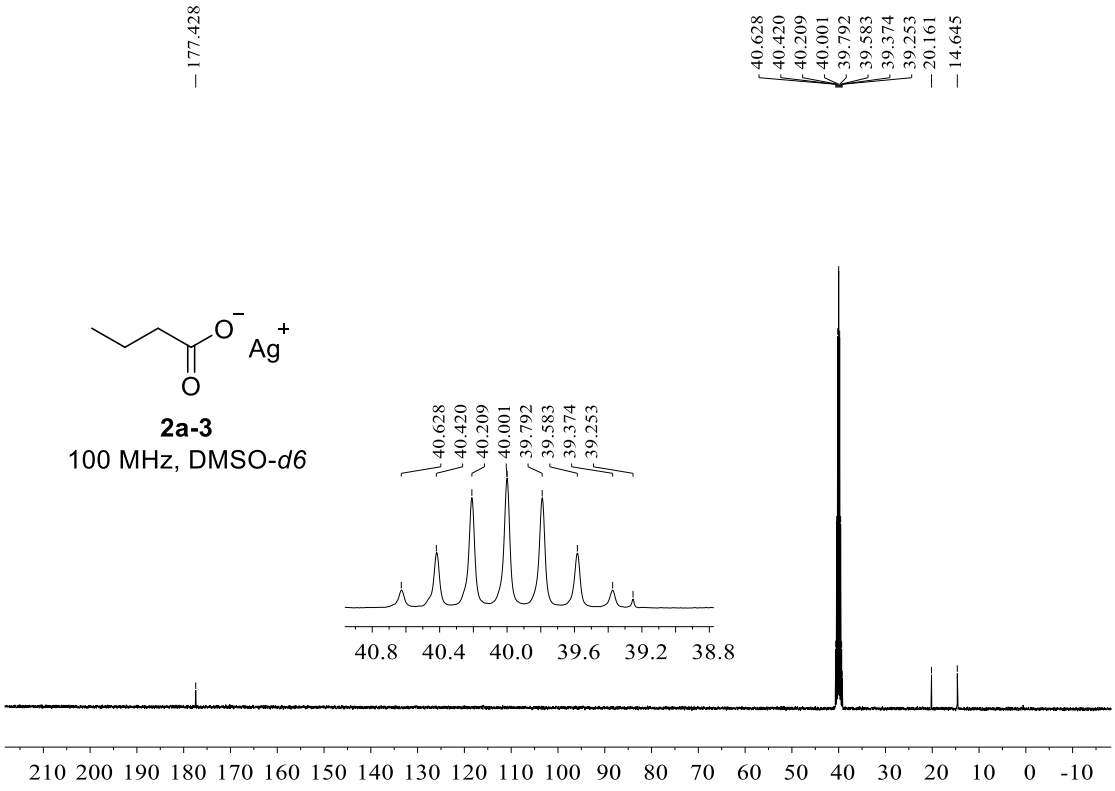
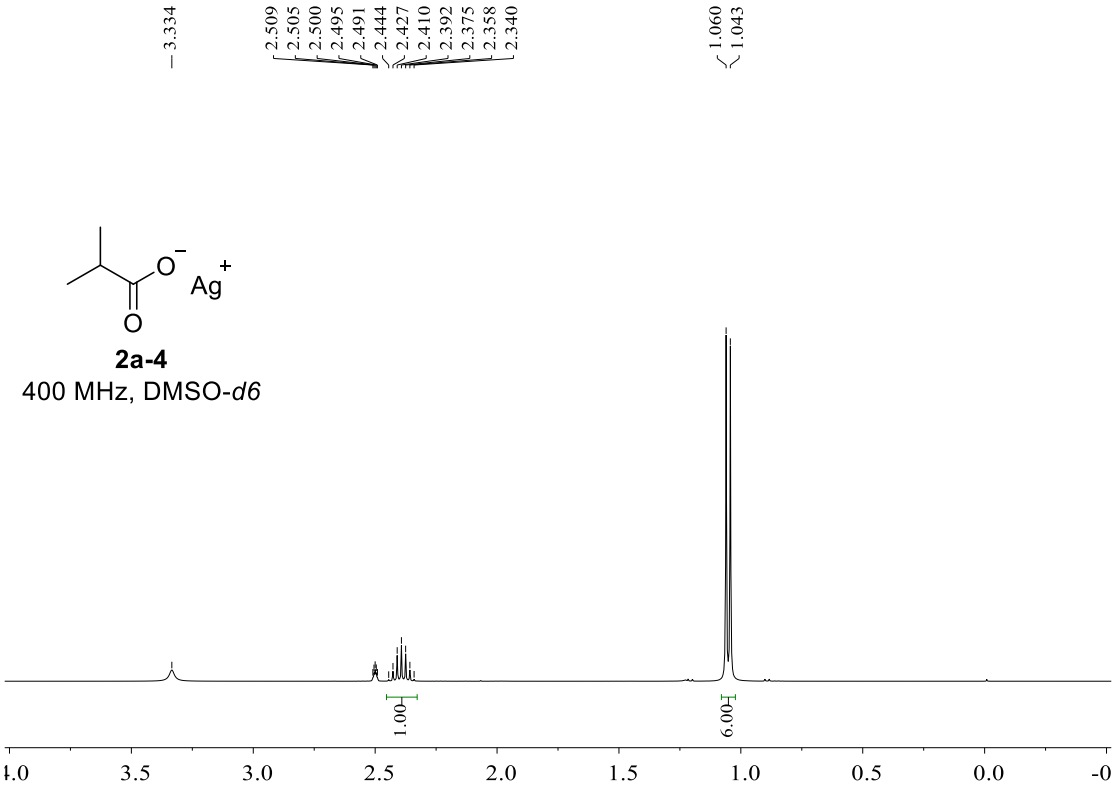
2.509
2.505
2.500
2.495
2.491
2.154
2.135
2.116
2.097
1.024
1.005
0.986
O
Ag
2a-2
400 MHz, DMSO-d6
2.00
3.00
4.8 4.4 4.0 3.6 3.2 2.8 2.4 2.0 1.6 1.2 0.8 0.4 0.0 -0.4 -0.8


178.229
40.628
40.419
40.209
40.001
39.792
39.585
39.375
30.208
11.714
O
Ag
2a-2
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


3.320
2.509
2.505
2.500
2.495
2.491
2.121
2.102
2.084
1.560
1.542
1.524
1.505
1.487
1.469
0.882
0.863
0.845
O
Ag
2a-3
400 MHz, DMSO-d6
2.01
2.00
3.00
.0 4.6 4.2 3.8 3.4 3.0 2.6 2.2 1.8 1.4 1.0 0.6 0.2 -0.2


177.428
40.628
40.420
40.209
40.001
39.792
39.583
39.374
39.253
20.161
14.645
O
Ag
2a-3
100 MHz, DMSO-d6
40.8 40.4 40.0 39.6 39.2 38.8
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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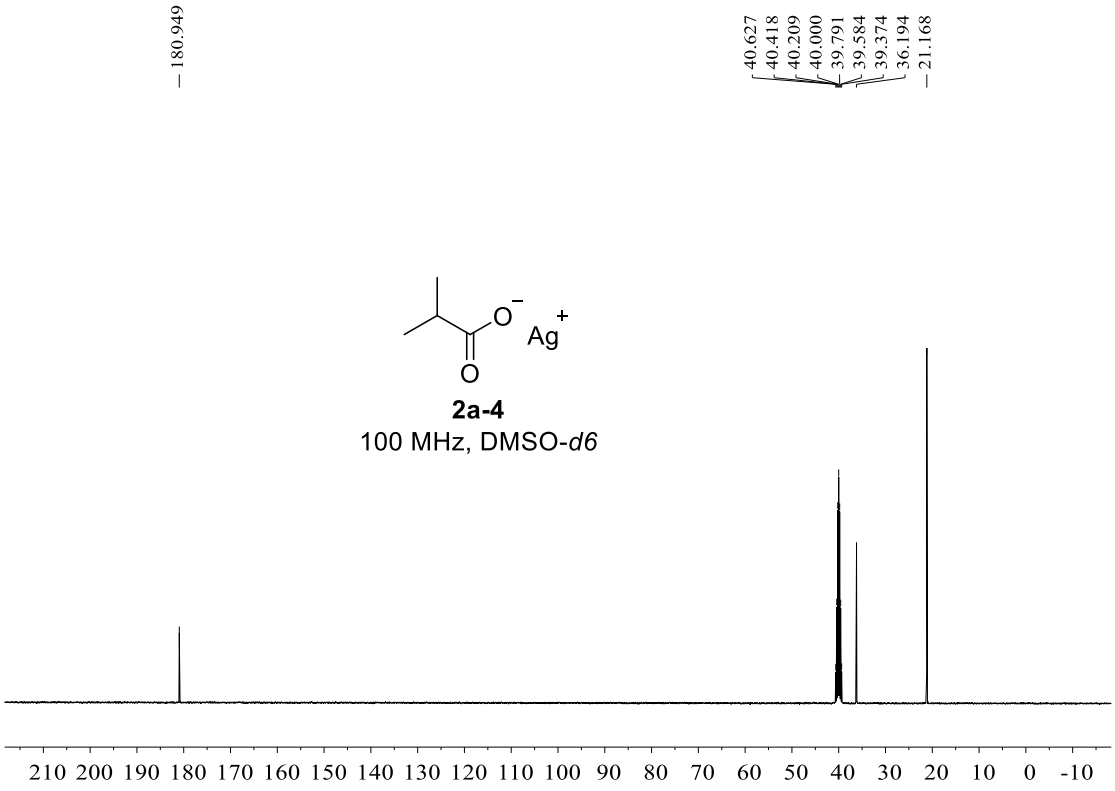
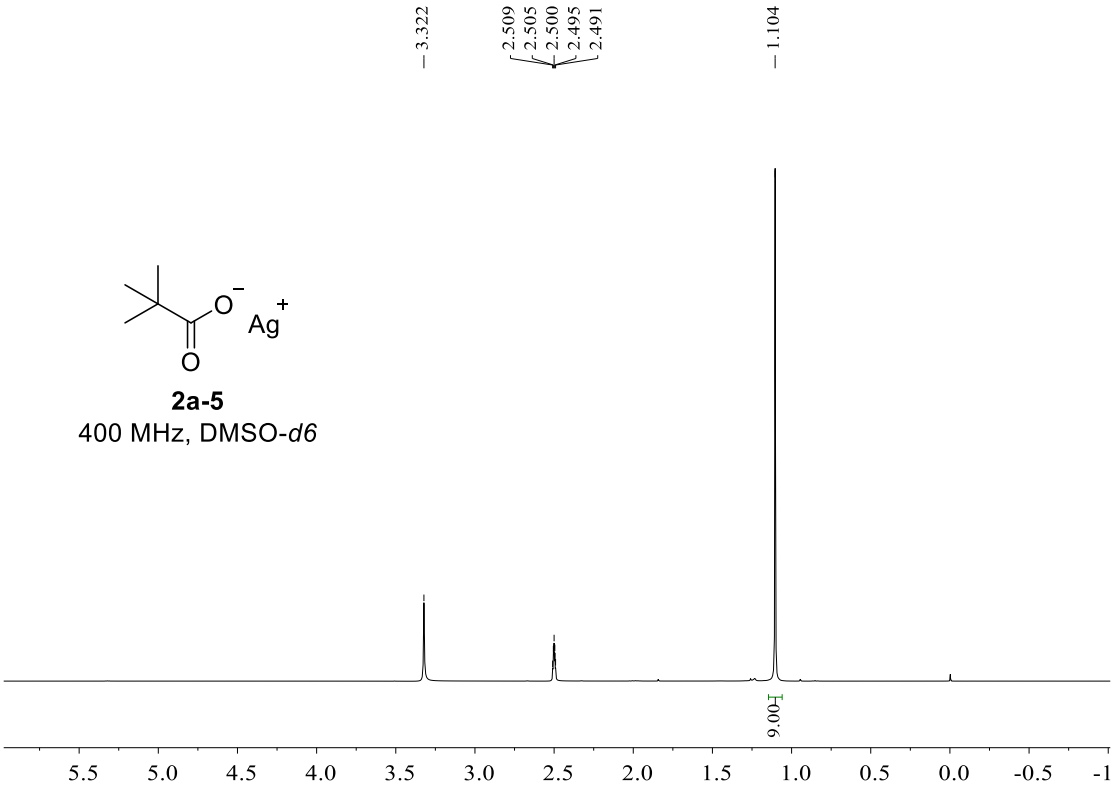
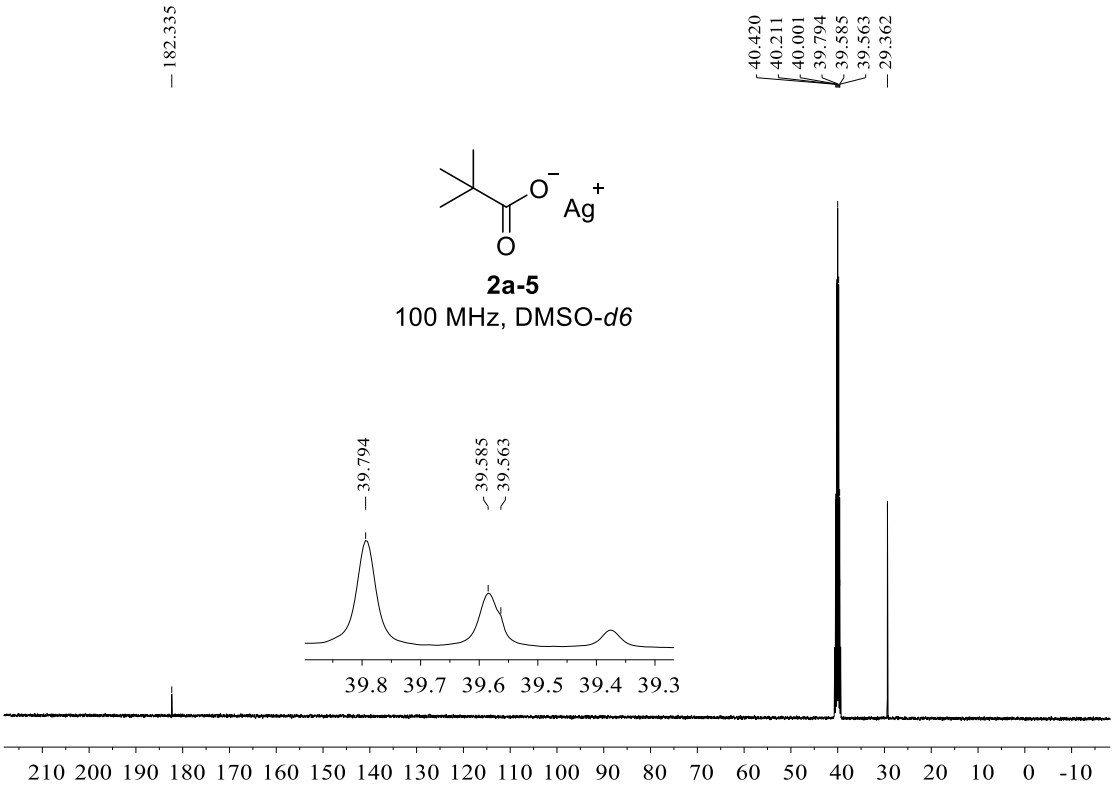
2.509
2.505
2.500
2.495
2.491
2.444
2.427
2.410
2.392
2.375
2.358
2.340
1.060
1.043
O
Ag
2a-4
400 MHz, DMSO-d6
1.00
6.00
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0

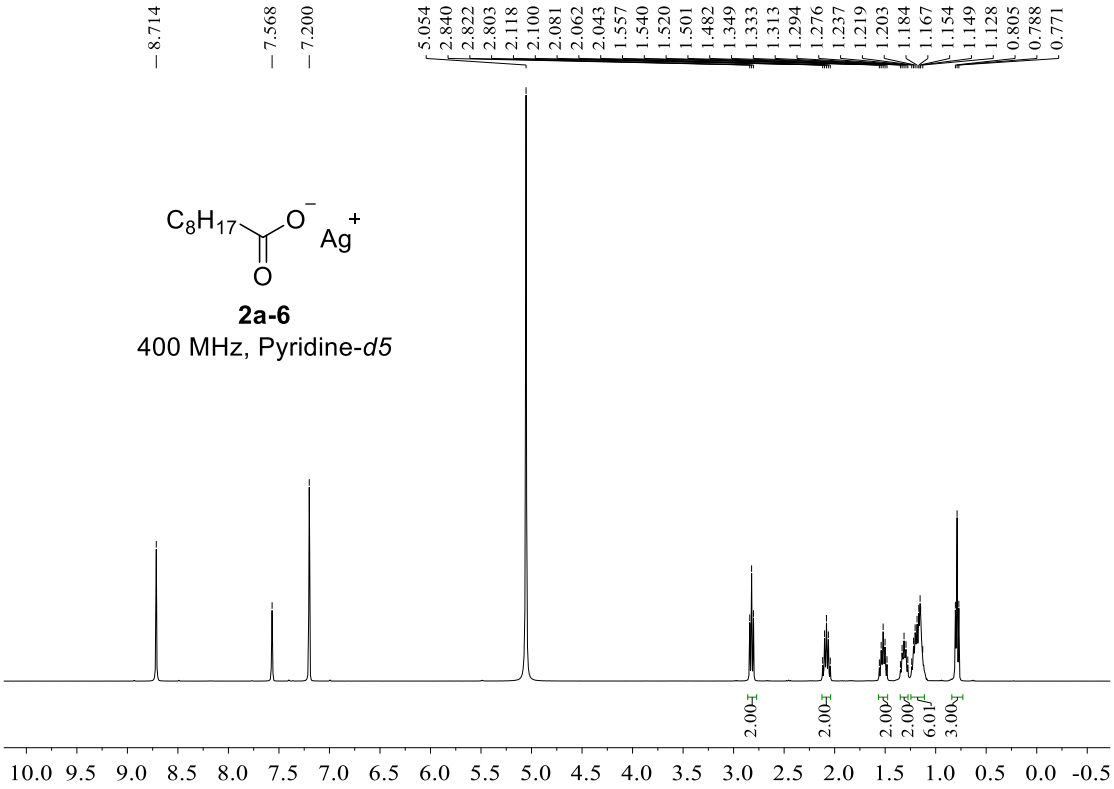

180.949
40.627
40.418
40.209
40.000
39.791
39.584
39.374
36.194
21.168
O
Ag
2a-4
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10



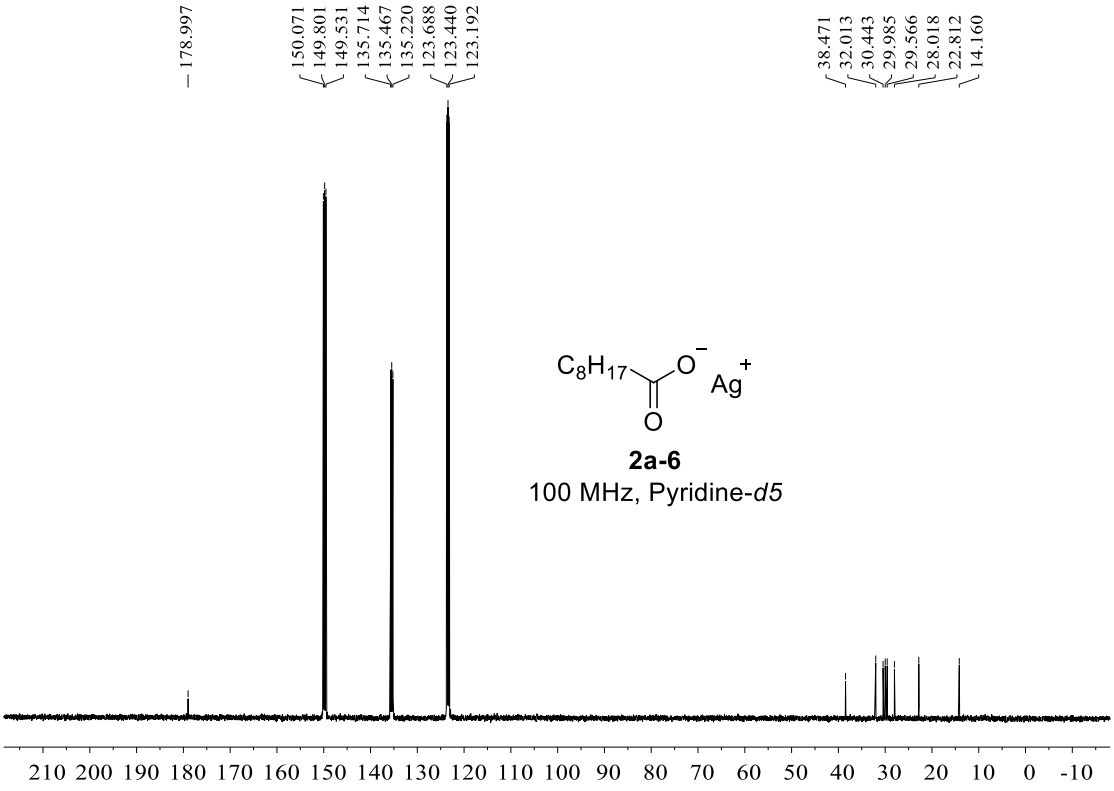
2a-5
400 MHz, DMSO-*d6*



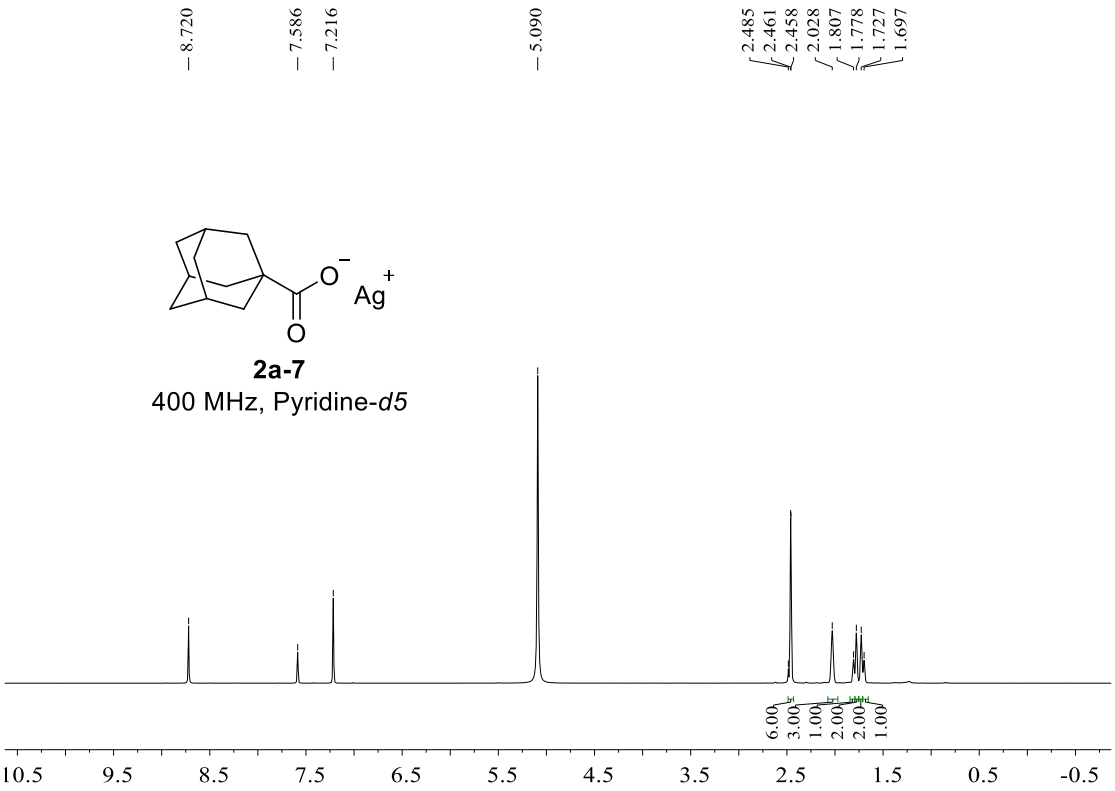
2a-5
100 MHz, DMSO-*d6*

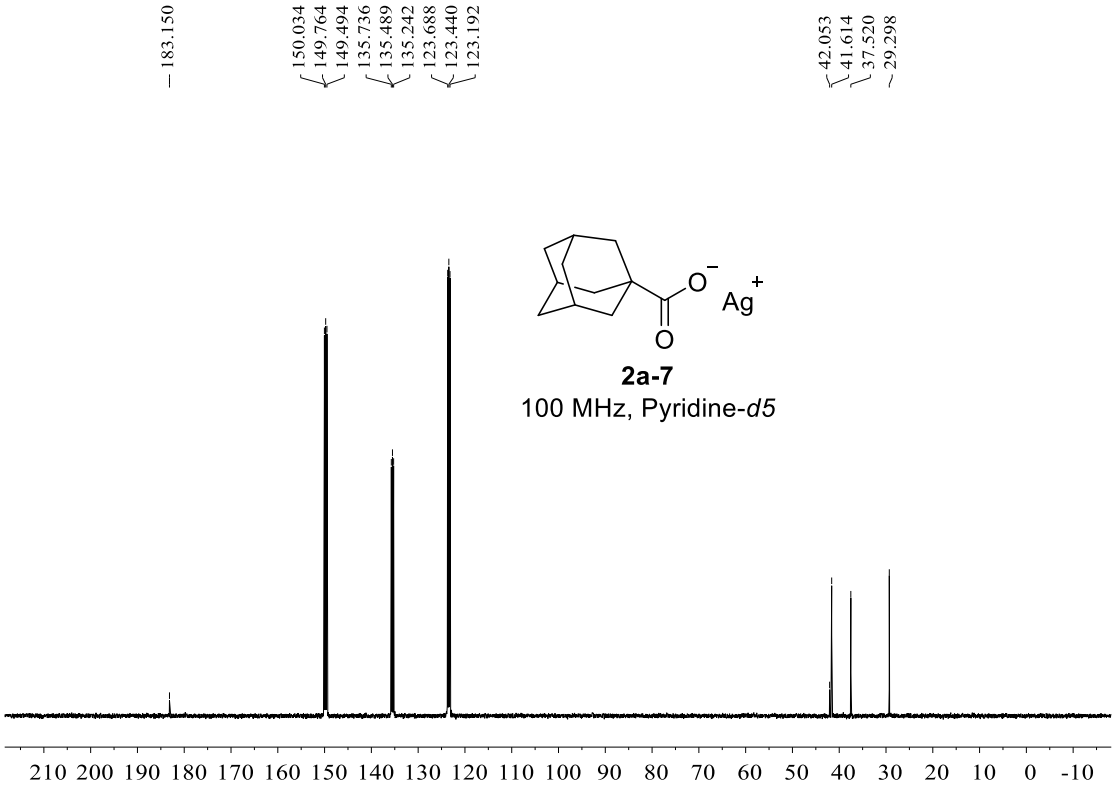


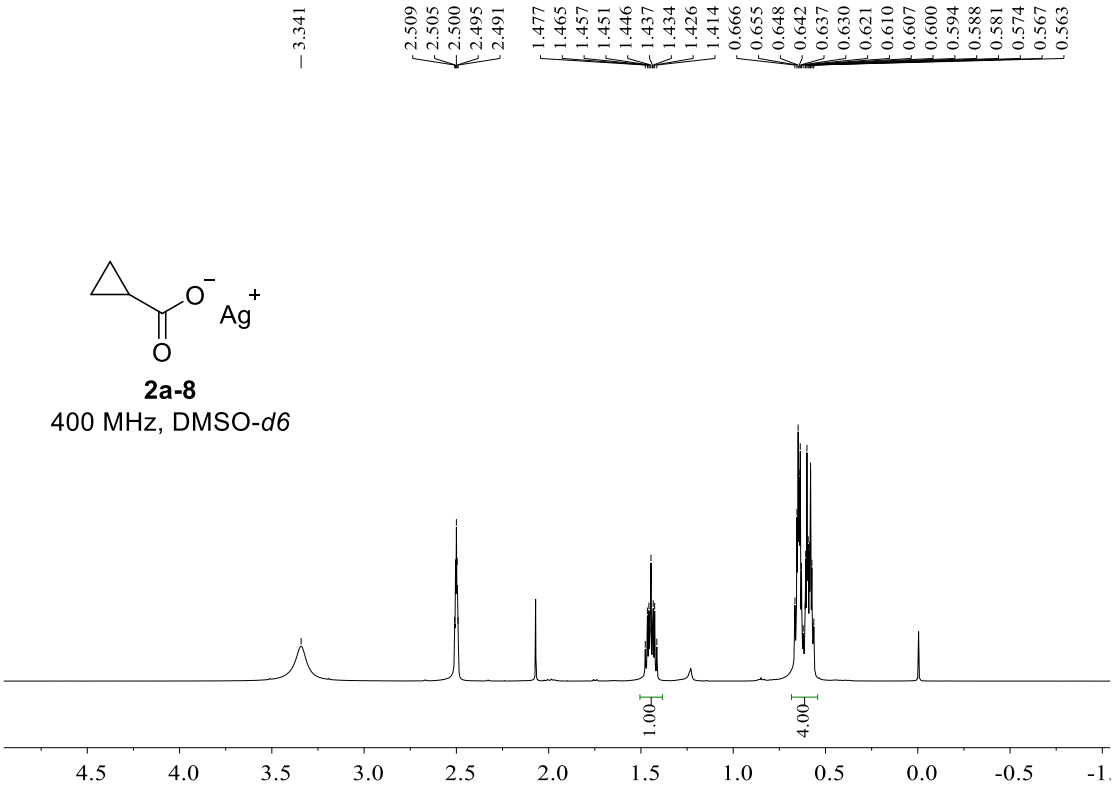
2a-6
400 MHz, Pyridine-*d5*



2a-6
100 MHz, Pyridine-*d5*


8.720
7.586
7.216
5.090
2.485
2.461
2.458
2.028
1.807
1.778
1.727
1.697
O
Ag
2a-7
400 MHz, Pyridine-d5
6.00
3.00
1.00
2.00
2.00
1.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


183.150
150.034
149.764
149.494
135.736
135.489
135.242
123.688
123.440
123.192
42.053
41.614
37.520
29.298
O
Ag
2a-7
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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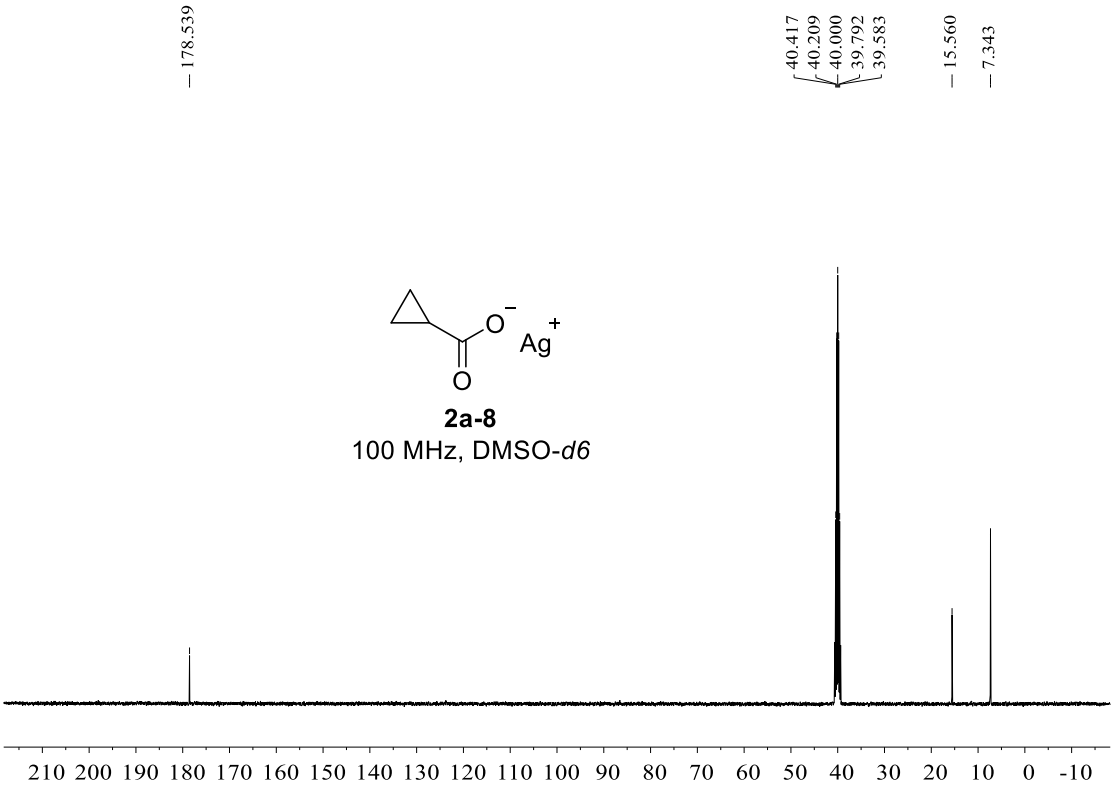
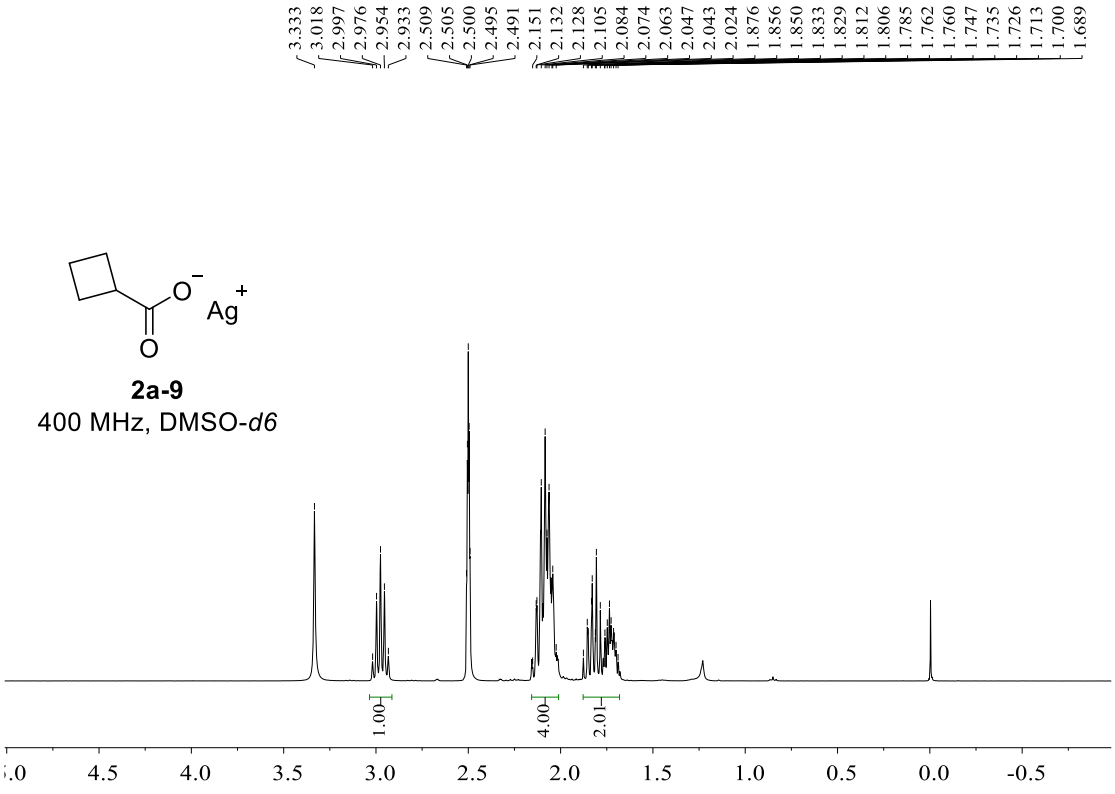
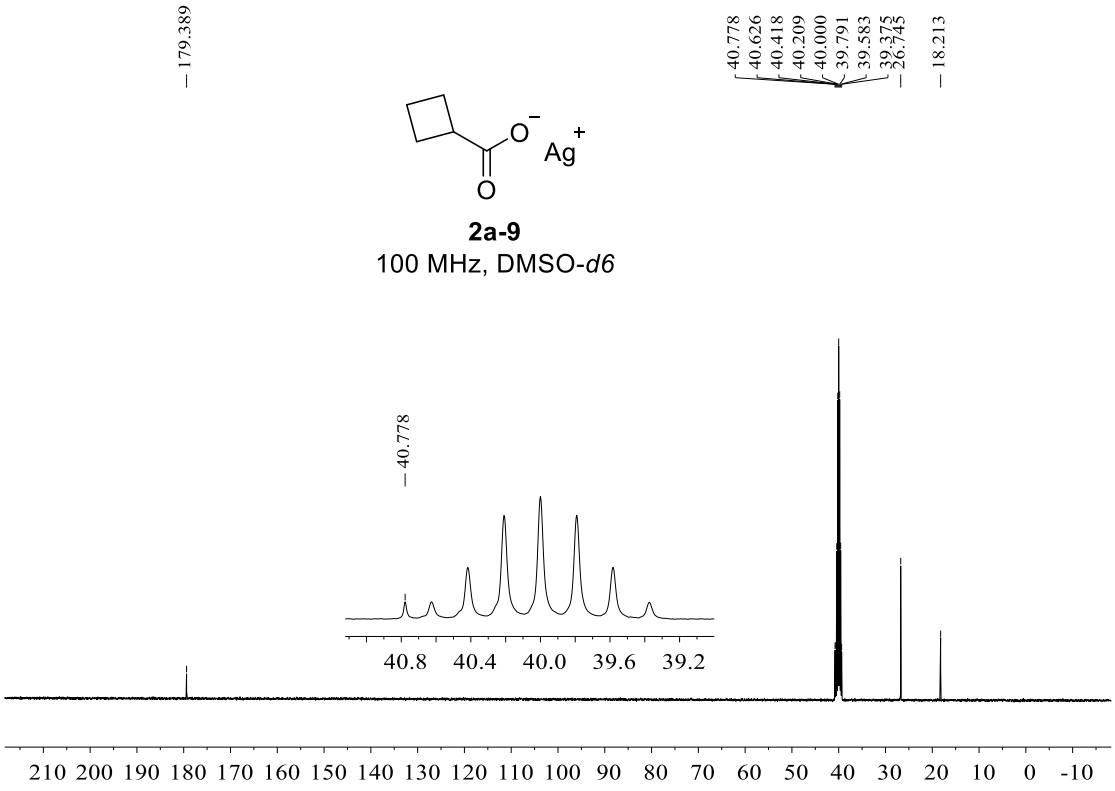
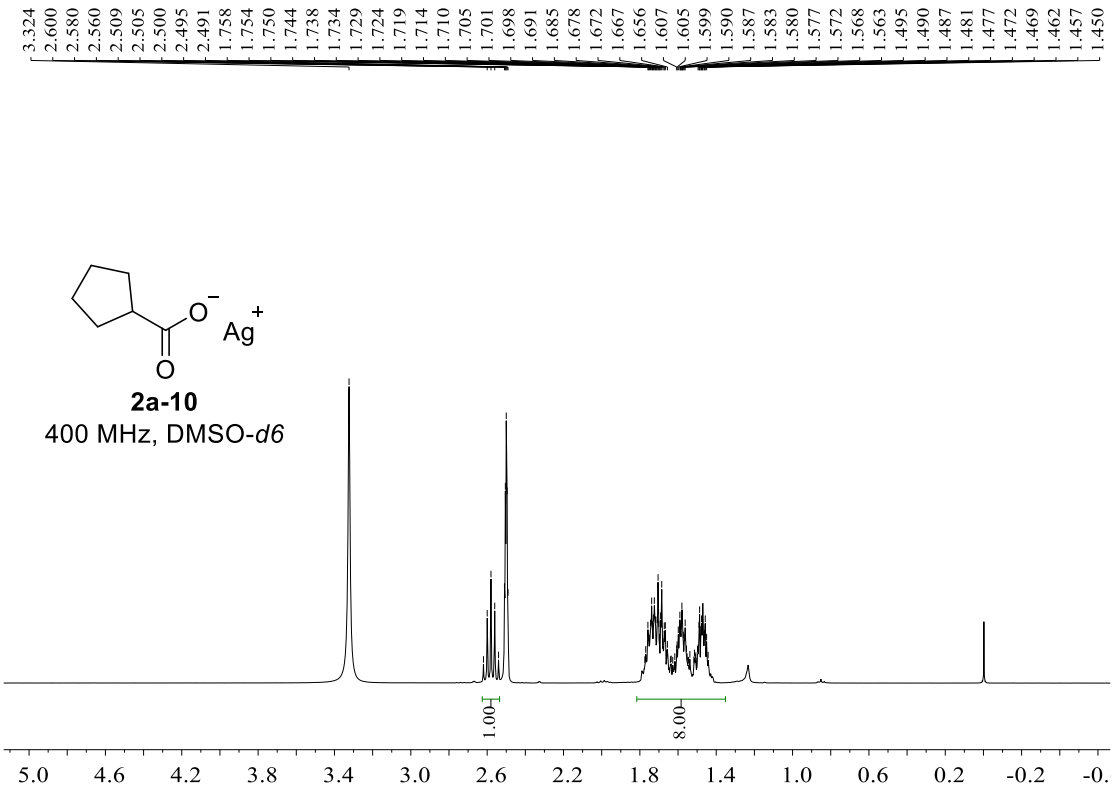
2.505
2.500
2.495
2.491
1.477
1.465
1.457
1.451
1.446
1.437
1.434
1.426
1.414
0.666
0.655
0.648
0.642
0.637
0.630
0.621
0.610
0.607
0.600
0.594
0.588
0.581
0.574
0.567
0.563
O
Ag
2a-8
400 MHz, DMSO-d6
1.00
4.00
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5


178.539
40.417
40.209
40.000
39.792
39.583
15.560
7.343
O
Ag
2a-8
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


3.333
3.018
2.997
2.976
2.954
2.933
2.509
2.505
2.500
2.495
2.491
2.151
2.132
2.128
2.105
2.084
2.074
2.063
2.047
2.043
2.024
1.876
1.856
1.850
1.833
1.829
1.812
1.806
1.785
1.762
1.760
1.747
1.735
1.726
1.713
1.700
1.689
O
Ag
2a-9
400 MHz, DMSO-d6
1.00
4.00
2.01
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5


179.389
40.778
40.626
40.418
40.209
40.000
39.791
39.583
39.375
26.745
18.213
O
Ag
2a-9
100 MHz, DMSO-d6
40.778
40.8
40.4
40.0
39.6
39.2
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


3.324
2.600
2.580
2.560
2.509
2.505
2.500
2.495
2.491
1.758
1.754
1.750
1.744
1.738
1.734
1.729
1.724
1.719
1.714
1.710
1.705
1.701
1.698
1.691
1.685
1.678
1.672
1.667
1.656
1.607
1.605
1.599
1.590
1.587
1.583
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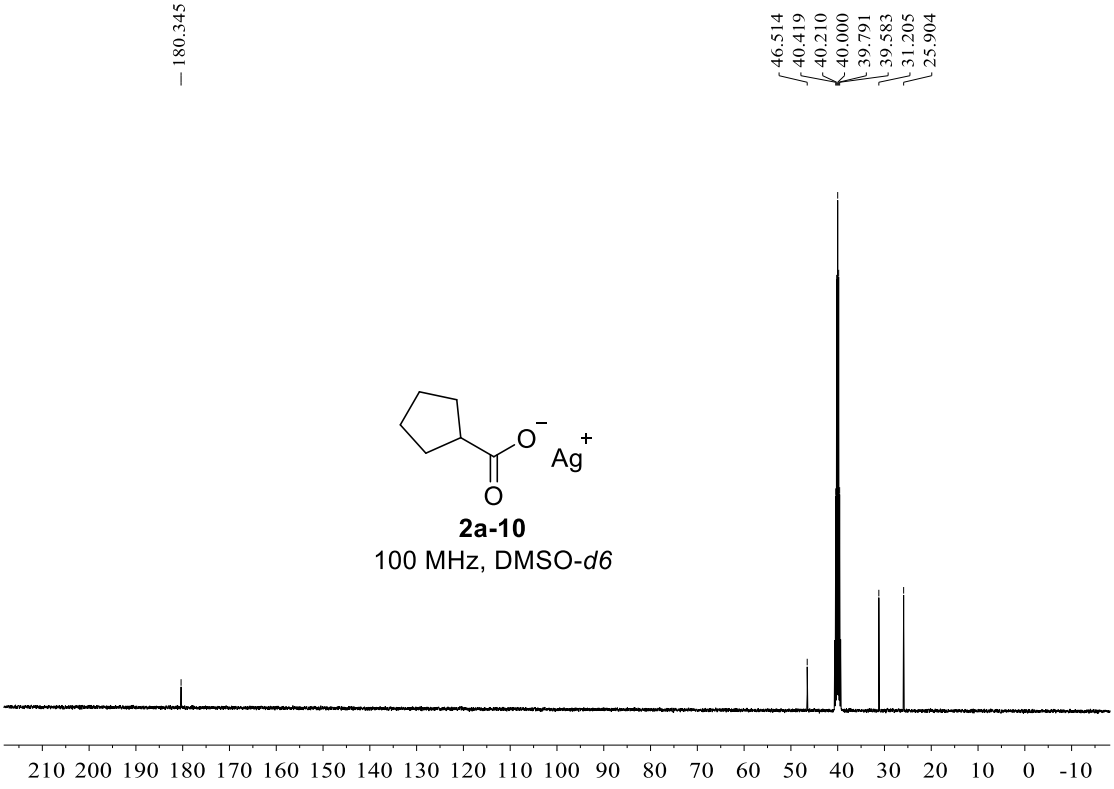
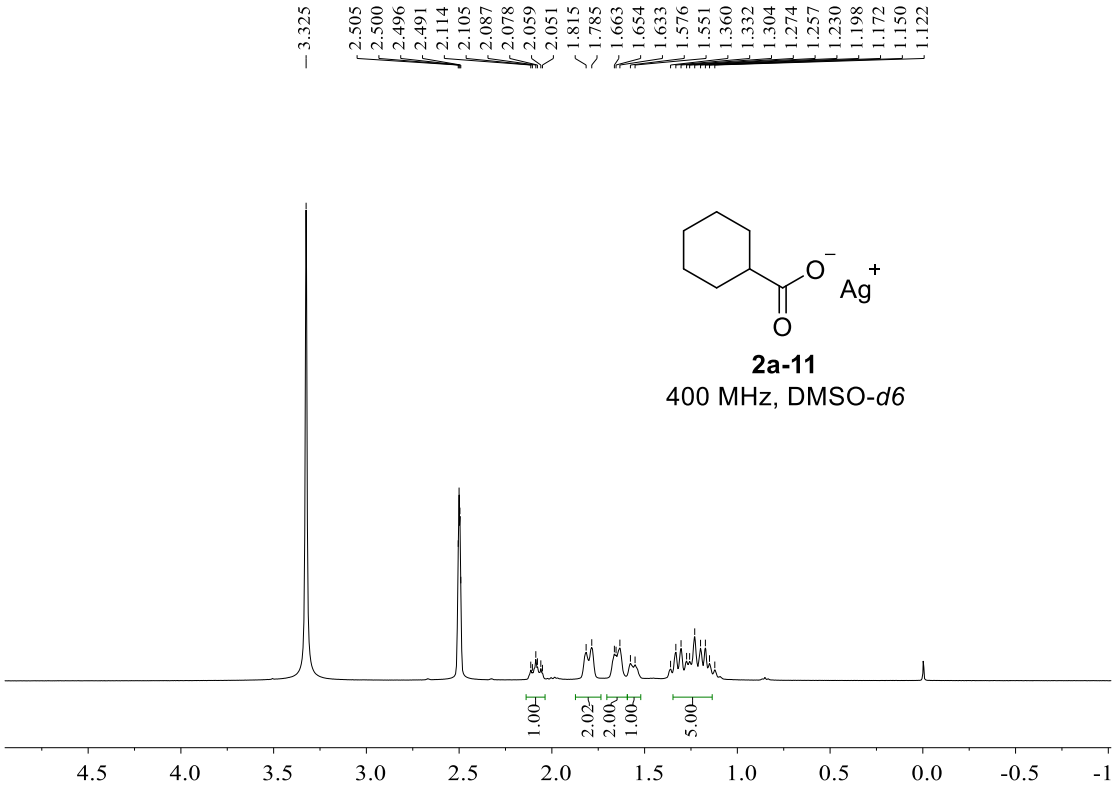
1.572
1.568
1.563
1.495
1.490
1.487
1.481
1.477
1.472
1.469
1.462
1.457
1.450
O
Ag
2a-10
400 MHz, DMSO-d6
1.00
8.00
5.0
4.6
4.2
3.8
3.4
3.0
2.6
2.2
1.8
1.4
1.0
0.6
0.2
-0.2


180.345
46.514
40.419
40.210
40.000
39.791
39.583
31.205
25.904
O
Ag
2a-10
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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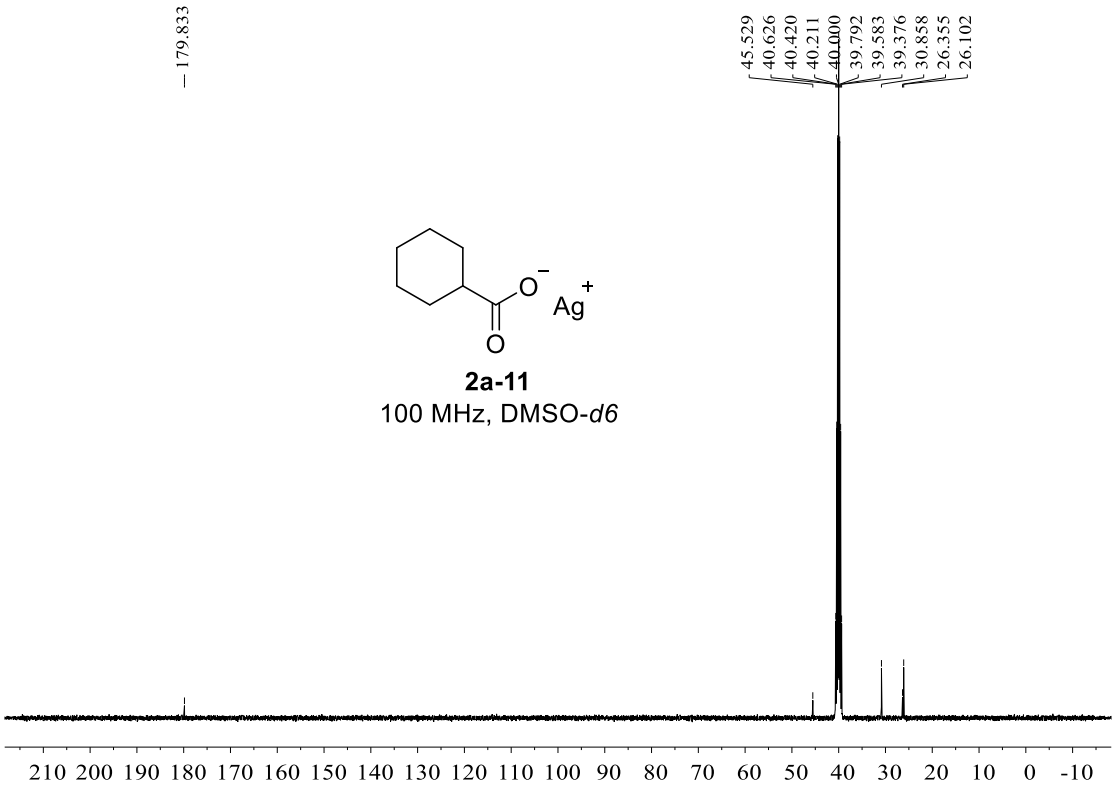
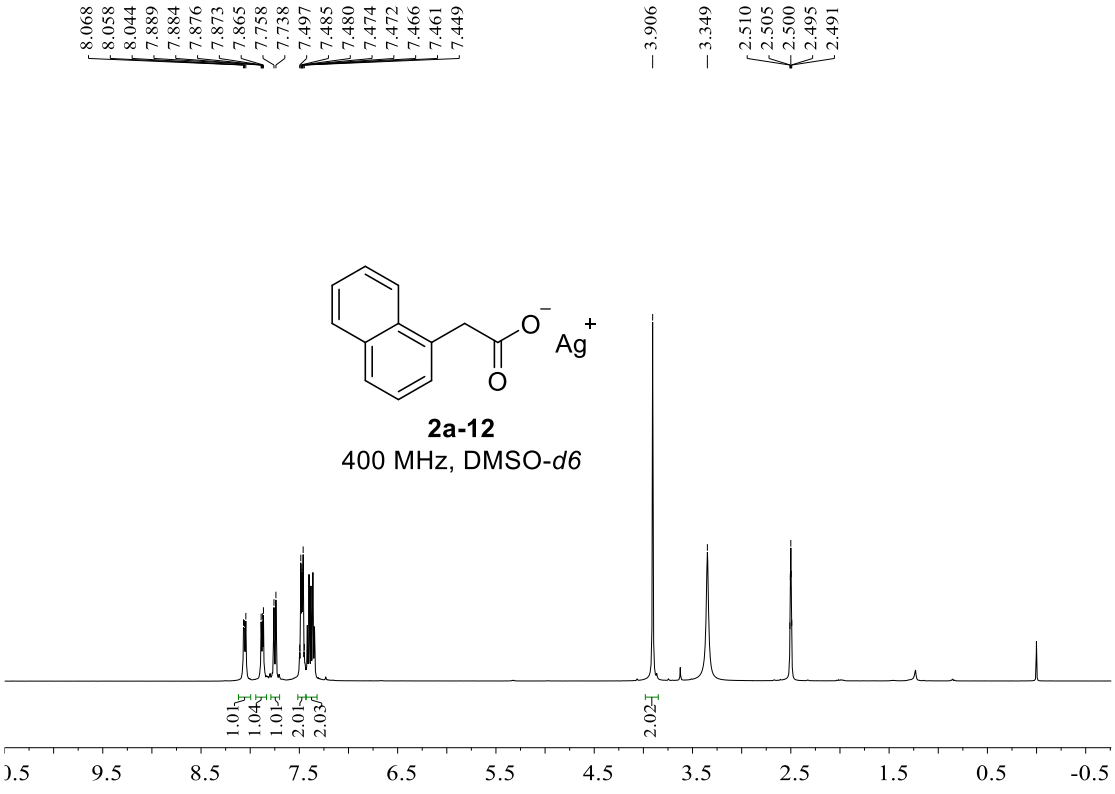
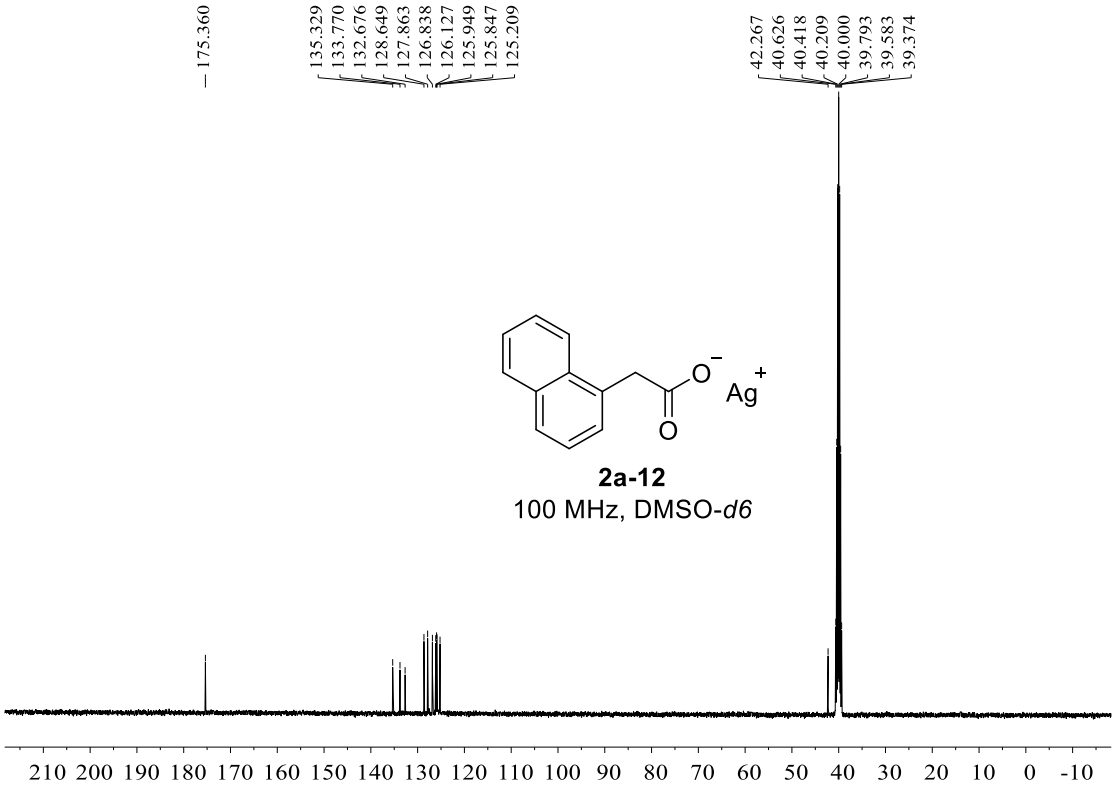
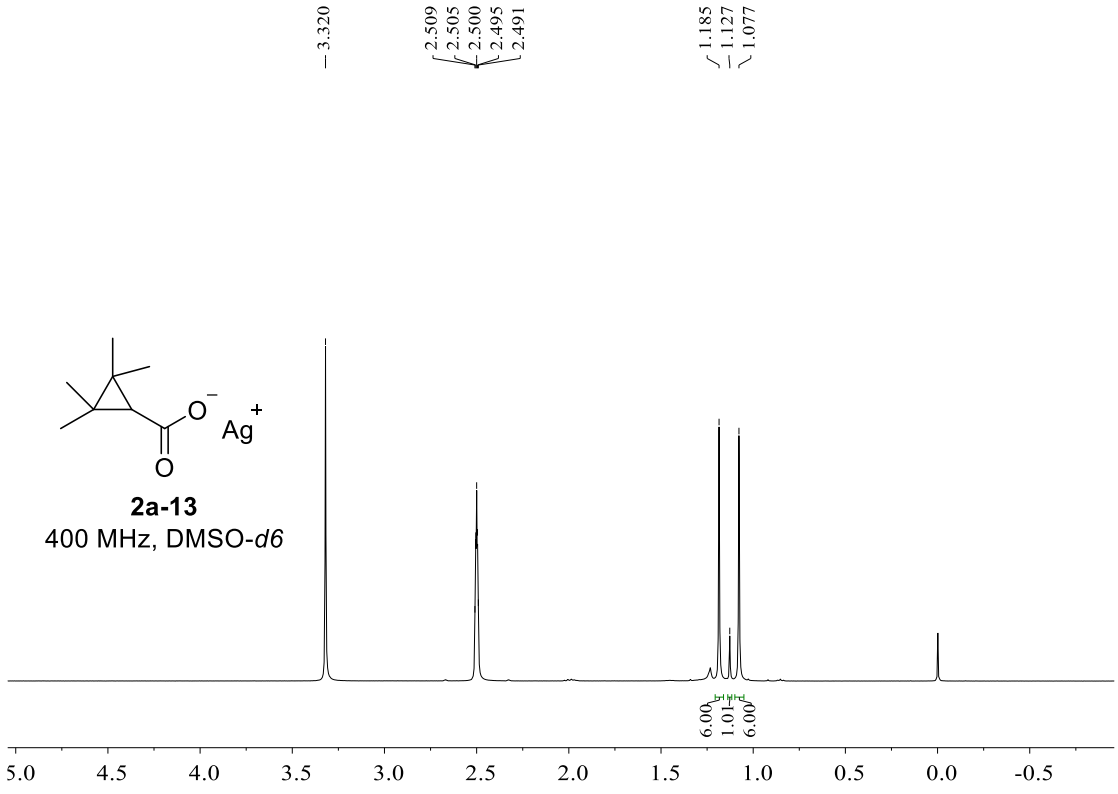
2.500
2.496
2.491
2.114
2.105
2.087
2.078
2.059
2.051
1.815
1.785
1.663
1.654
1.633
1.576
1.551
1.360
1.332
1.304
1.274
1.257
1.230
1.198
1.172
1.150
1.122
O
Ag
2a-11
400 MHz, DMSO-d6
1.00
2.02
2.00
1.00
5.00
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1


179.833
45.529
40.626
40.420
40.211
40.000
39.792
39.583
39.376
30.858
26.355
26.102
O
Ag
2a-11
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


8.068
8.058
8.044
7.889
7.884
7.876
7.873
7.865
7.758
7.738
7.497
7.485
7.480
7.474
7.472
7.466
7.461
7.449
3.906
3.349
2.510
2.505
2.500
2.495
2.491
O
Ag
2a-12
400 MHz, DMSO-d6
1.01
1.04
1.01
2.01
2.03
2.02
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


175.360
135.329
133.770
132.676
128.649
127.863
126.838
126.127
125.949
125.847
125.209
42.267
40.626
40.418
40.209
40.000
39.793
39.583
39.374
O
Ag
2a-12
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


3.320
2.509
2.505
2.500
2.495
2.491
1.185
1.127
1.077
O
Ag
2a-13
400 MHz, DMSO-d6
6.00
1.01
6.00
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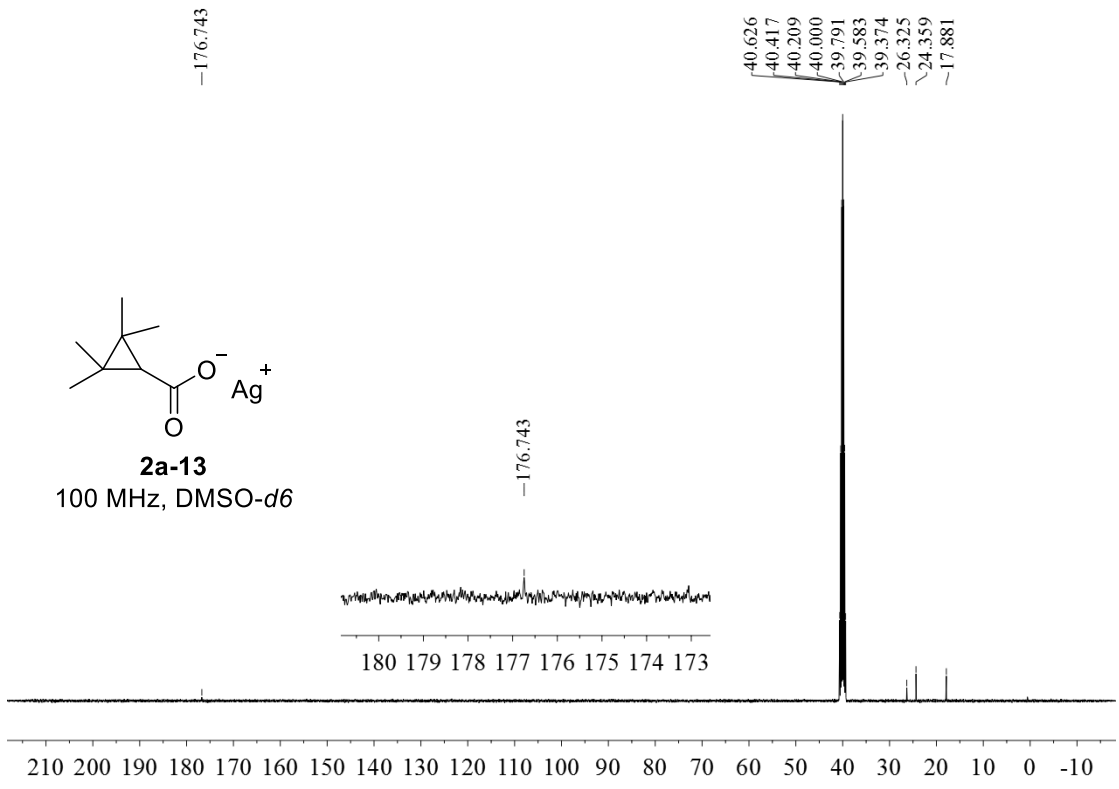
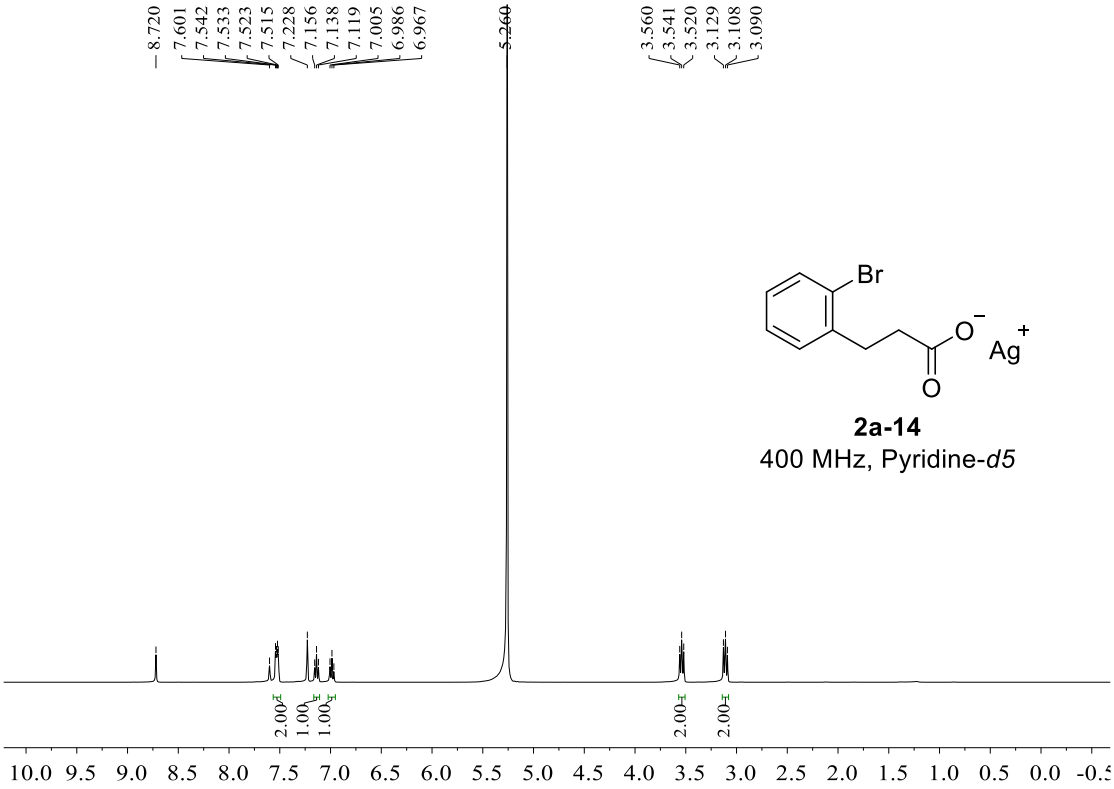

176.743
40.626
40.417
40.209
40.000
39.791
39.583
39.374
26.325
24.359
17.881
O
Ag
2a-13
100 MHz, DMSO-d6
176.743
180 179 178 177 176 175 174 173
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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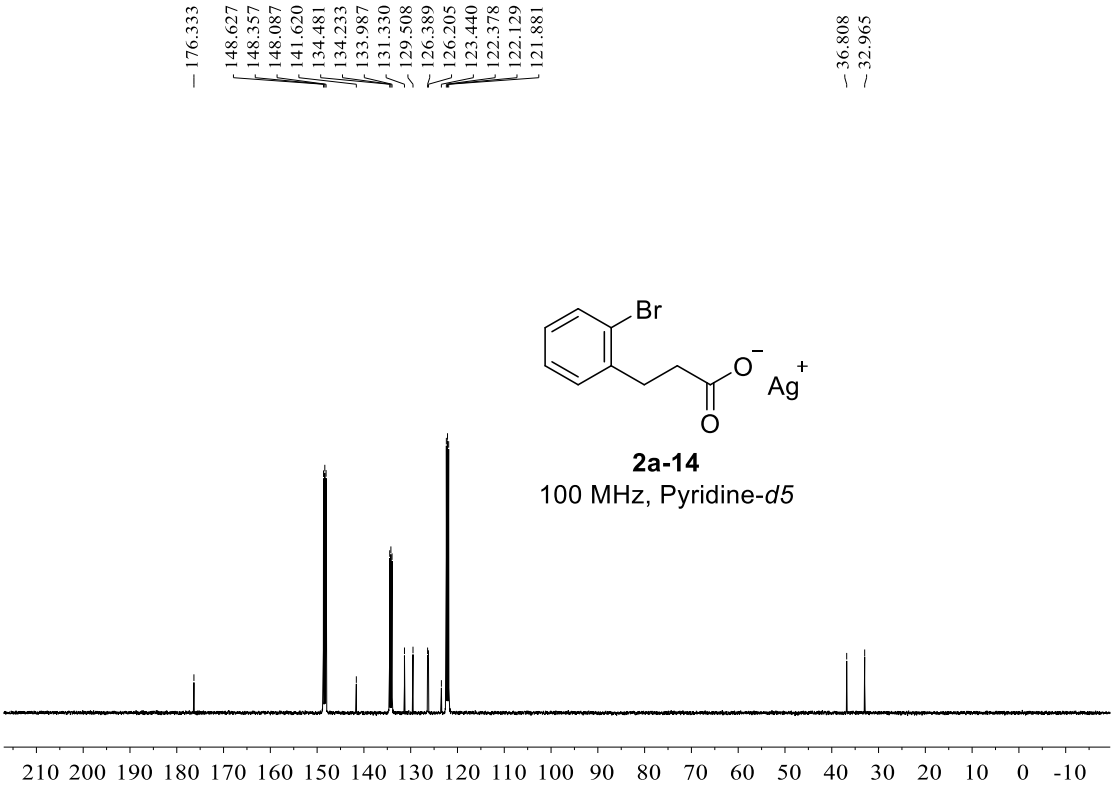
7.601
7.542
7.533
7.523
7.515
7.228
7.156
7.138
7.119
7.005
6.986
6.967
5.260
3.560
3.541
3.520
3.129
3.108
3.090
Br
O
Ag
2a-14
400 MHz, Pyridine-d5
2.00
1.00
1.00
2.00
2.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0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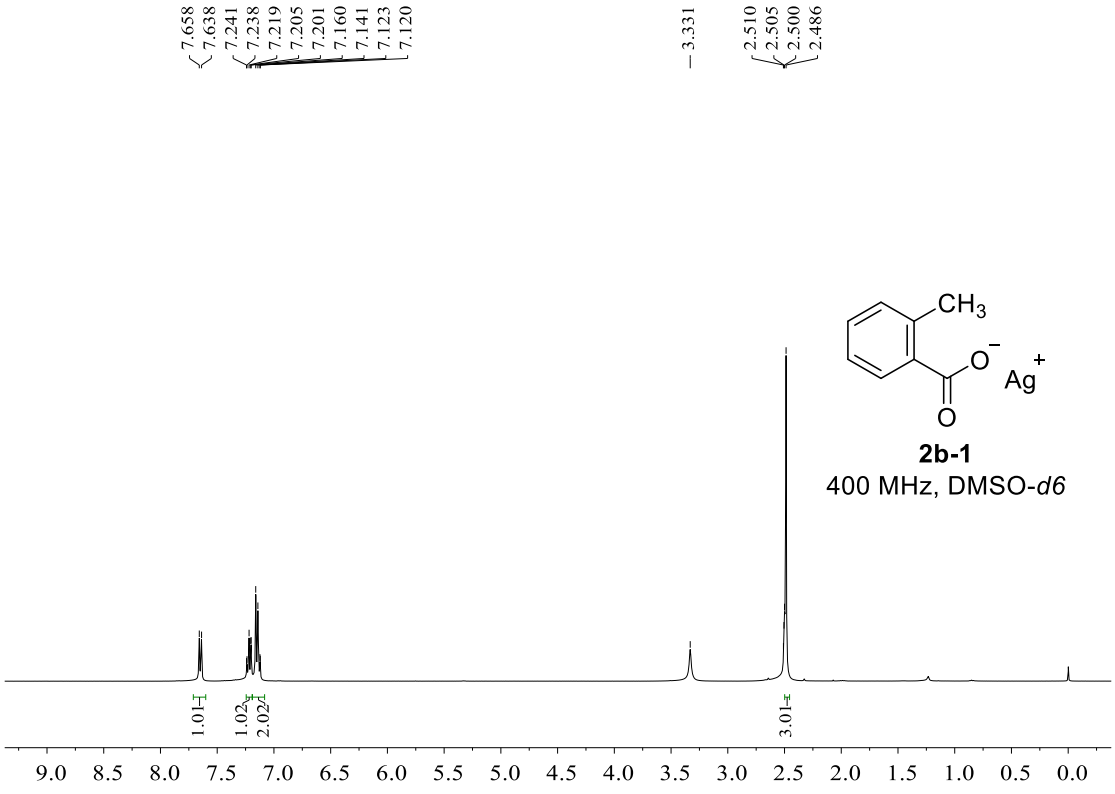
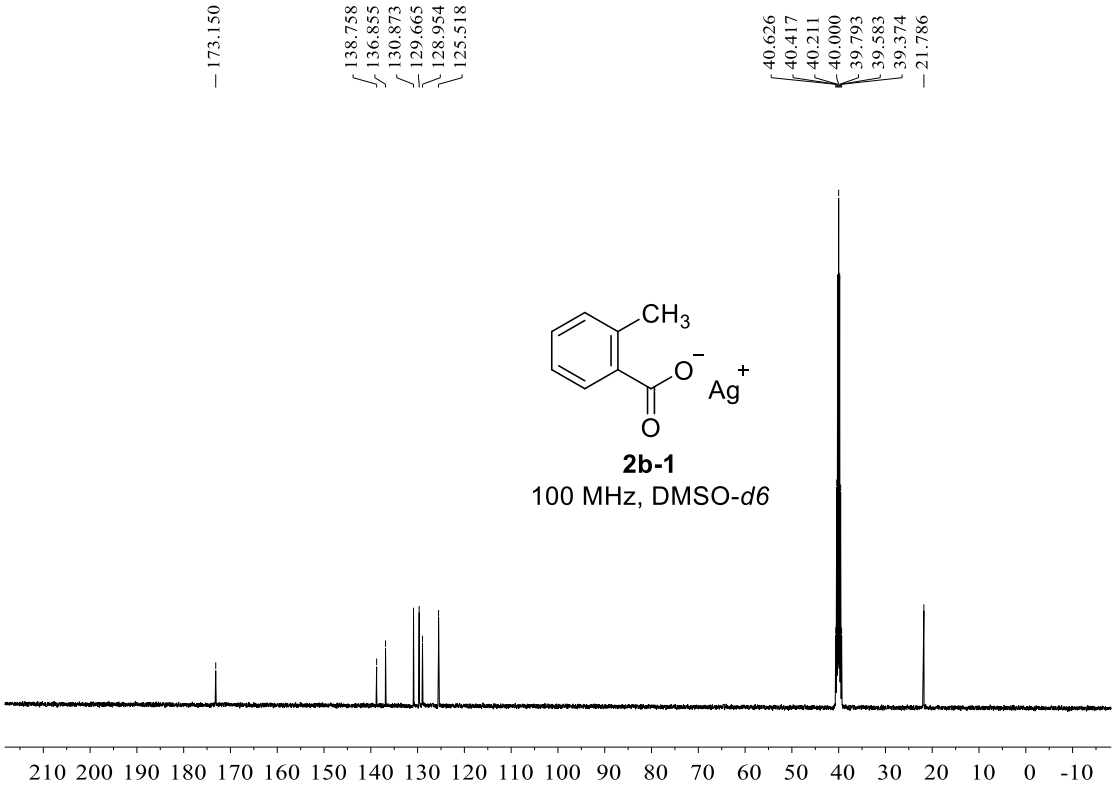
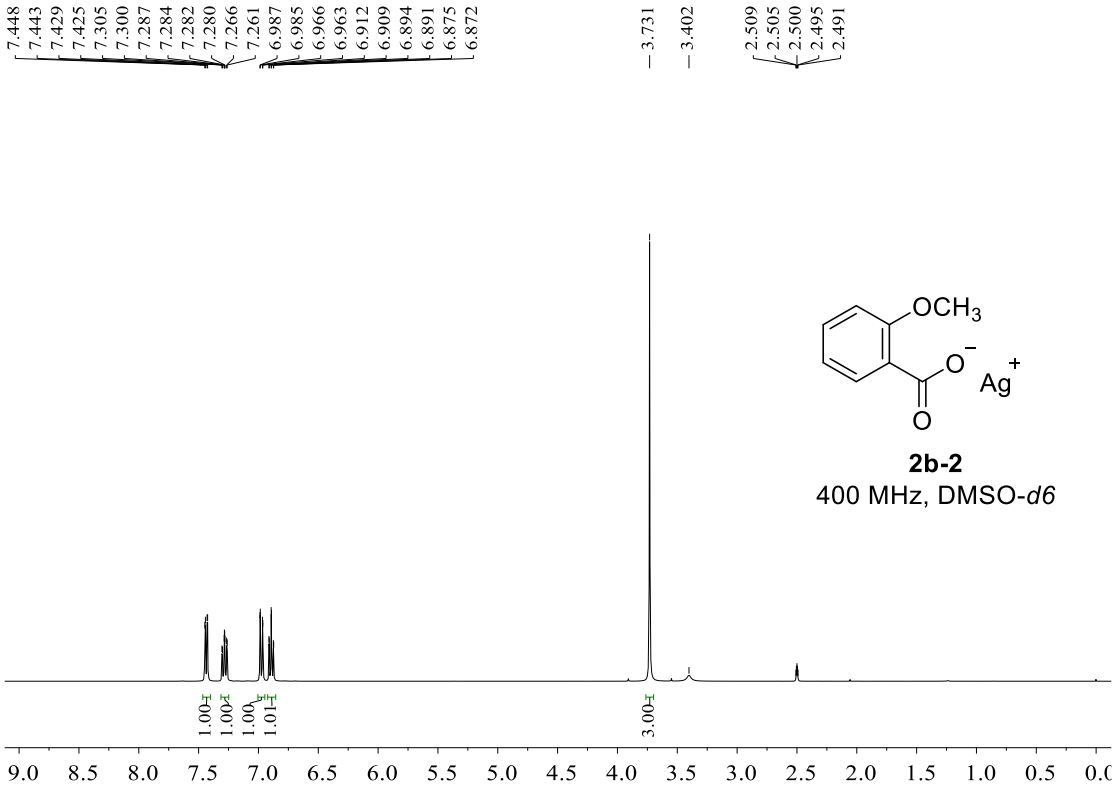
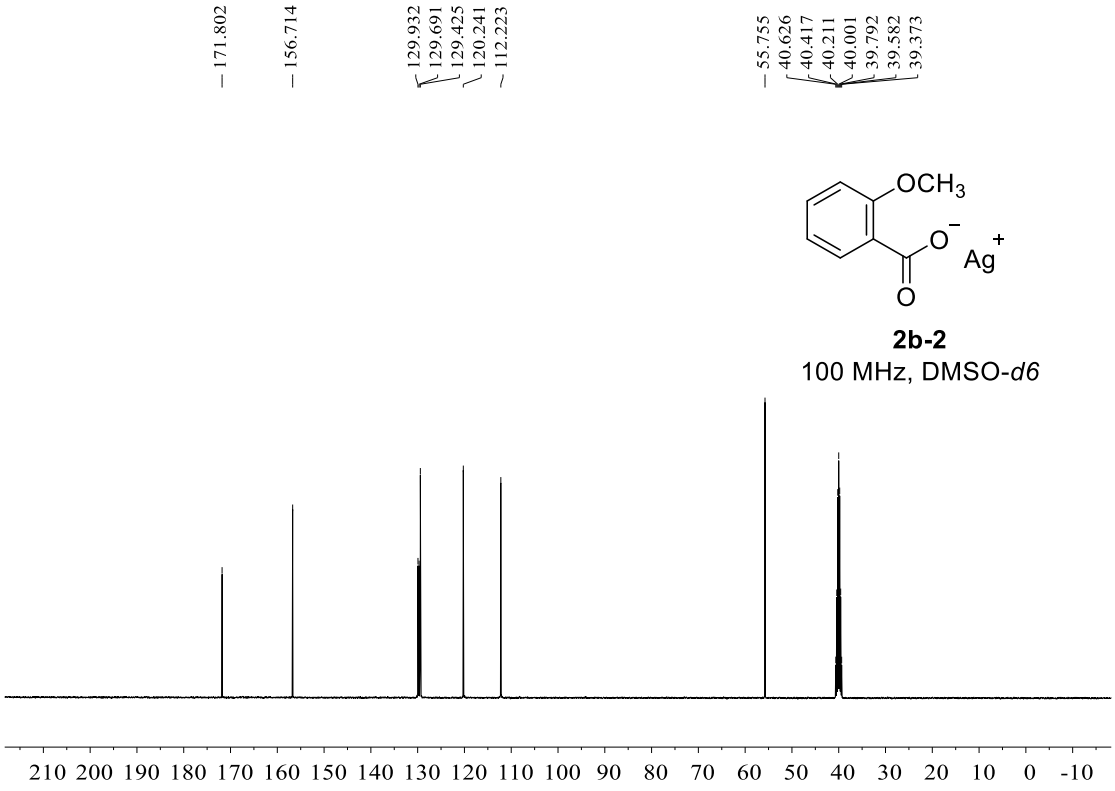
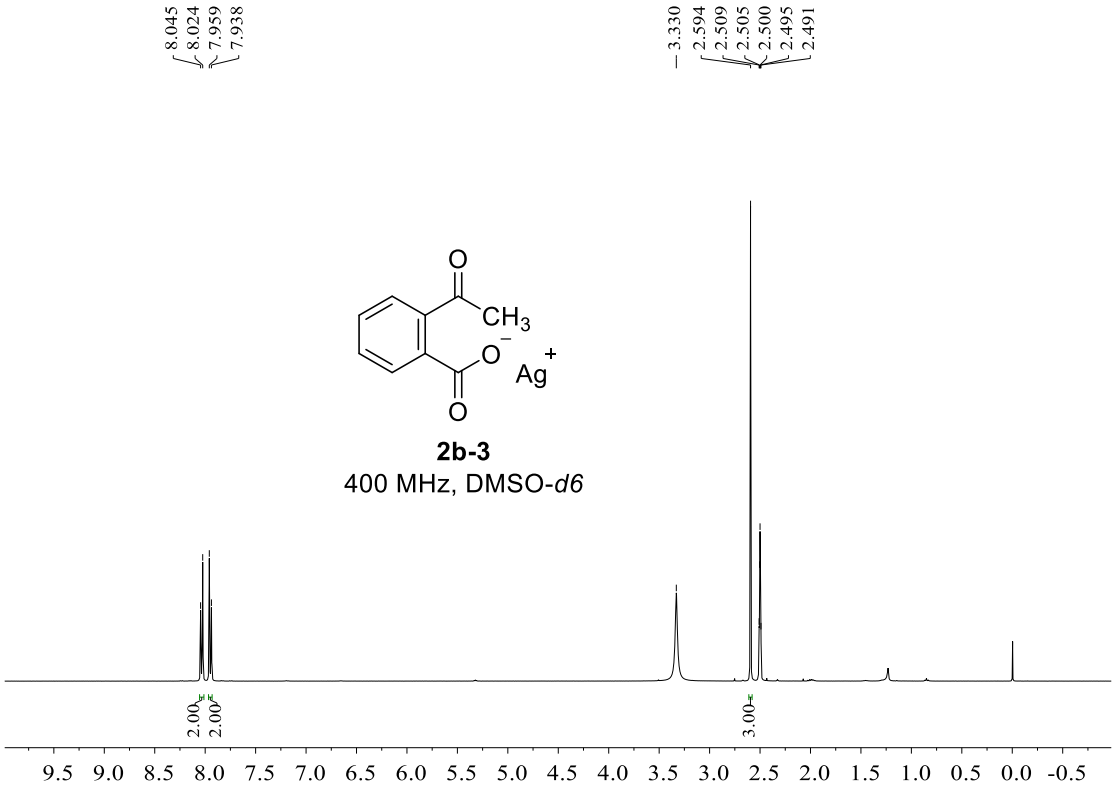
148.627
148.357
148.087
141.620
134.481
134.233
133.987
131.330
129.508
126.389
126.205
123.440
122.378
122.129
121.881
36.808
32.965
Br
O
Ag
2a-14
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

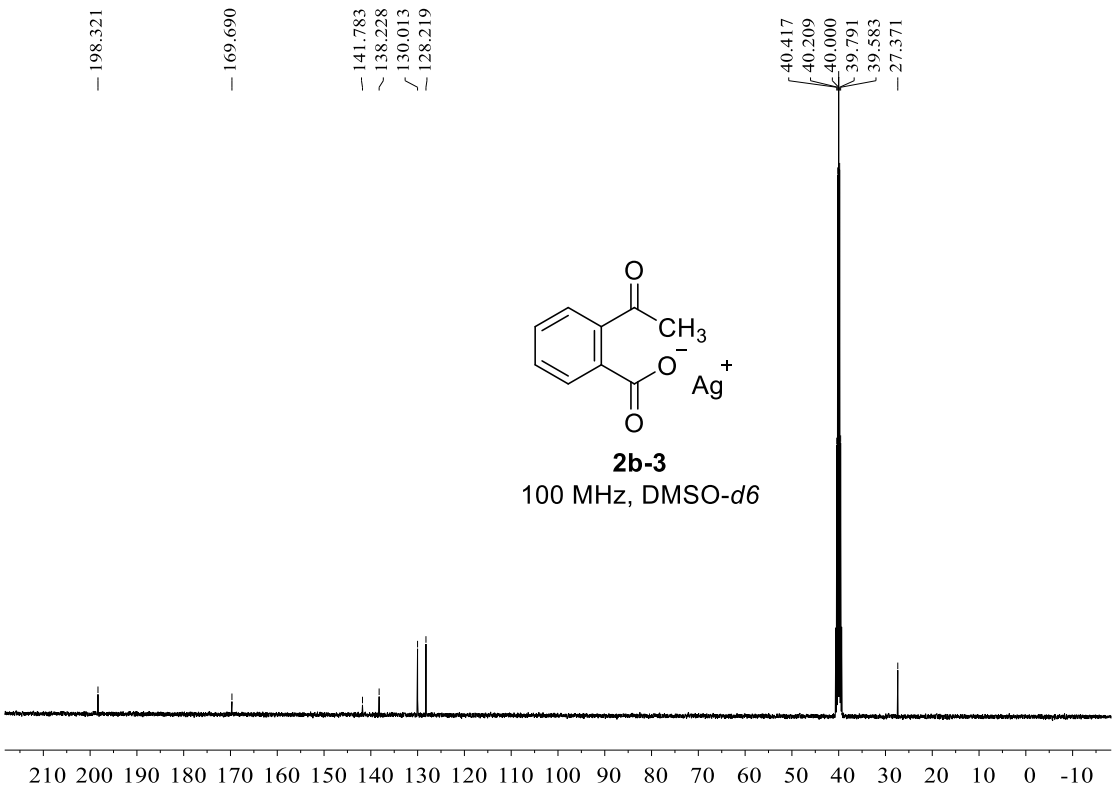

7.658
7.638
7.241
7.238
7.219
7.205
7.201
7.160
7.141
7.123
7.120
3.331
2.510
2.505
2.500
2.486
CH3
O
Ag
O
2b-1
400 MHz, DMSO-d6
1.01
1.02
2.02
3.01
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

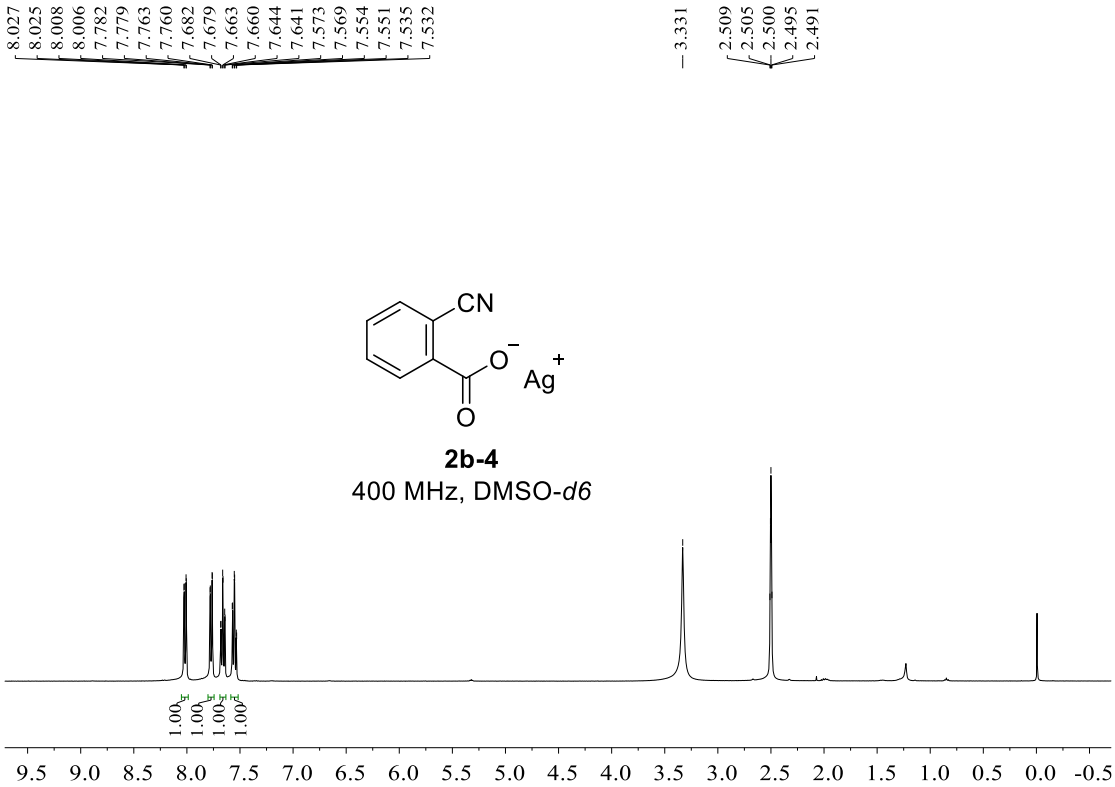

173.150
138.758
136.855
130.873
129.665
128.954
125.518
40.626
40.417
40.211
40.000
39.793
39.583
39.374
21.786
CH3
O
Ag
O
2b-1
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

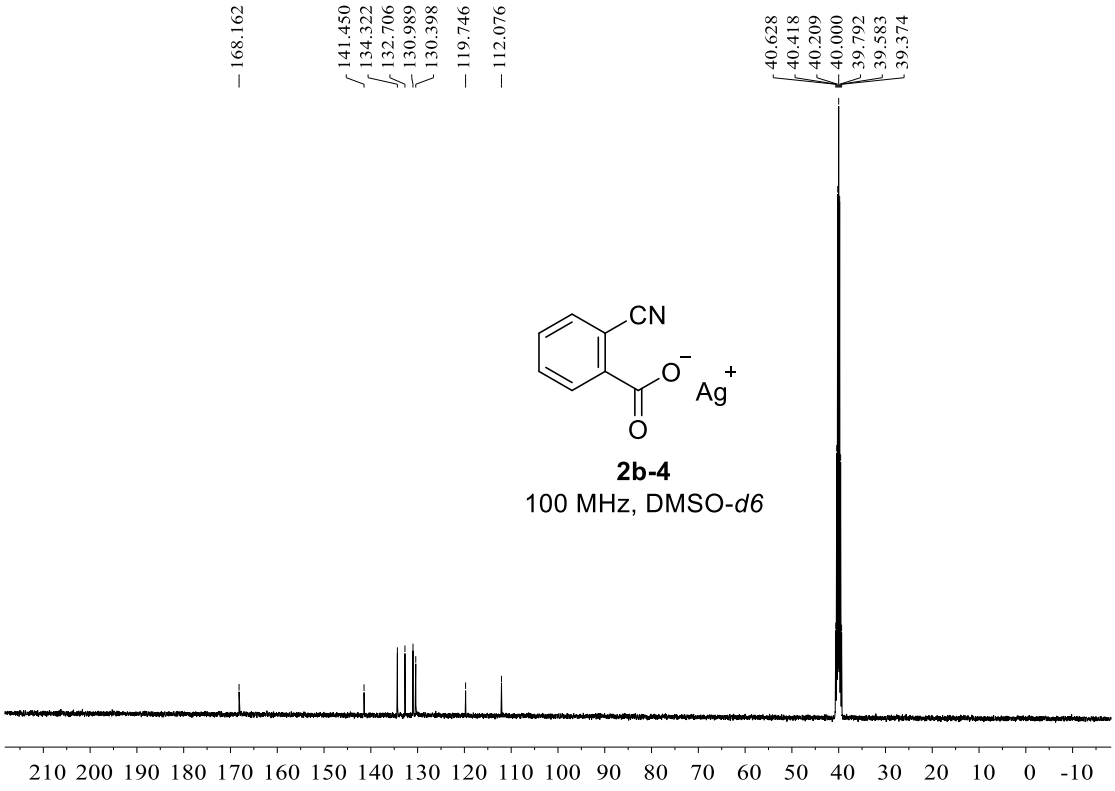

7.448
7.443
7.429
7.425
7.305
7.300
7.287
7.284
7.282
7.280
7.266
7.261
6.987
6.985
6.966
6.963
6.912
6.909
6.894
6.891
6.875
6.872
3.731
3.402
2.509
2.505
2.500
2.495
2.491
OCH3
O
Ag
+
O
2b-2
400 MHz, DMSO-d6
1.00
1.00
1.00
1.01
3.00
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

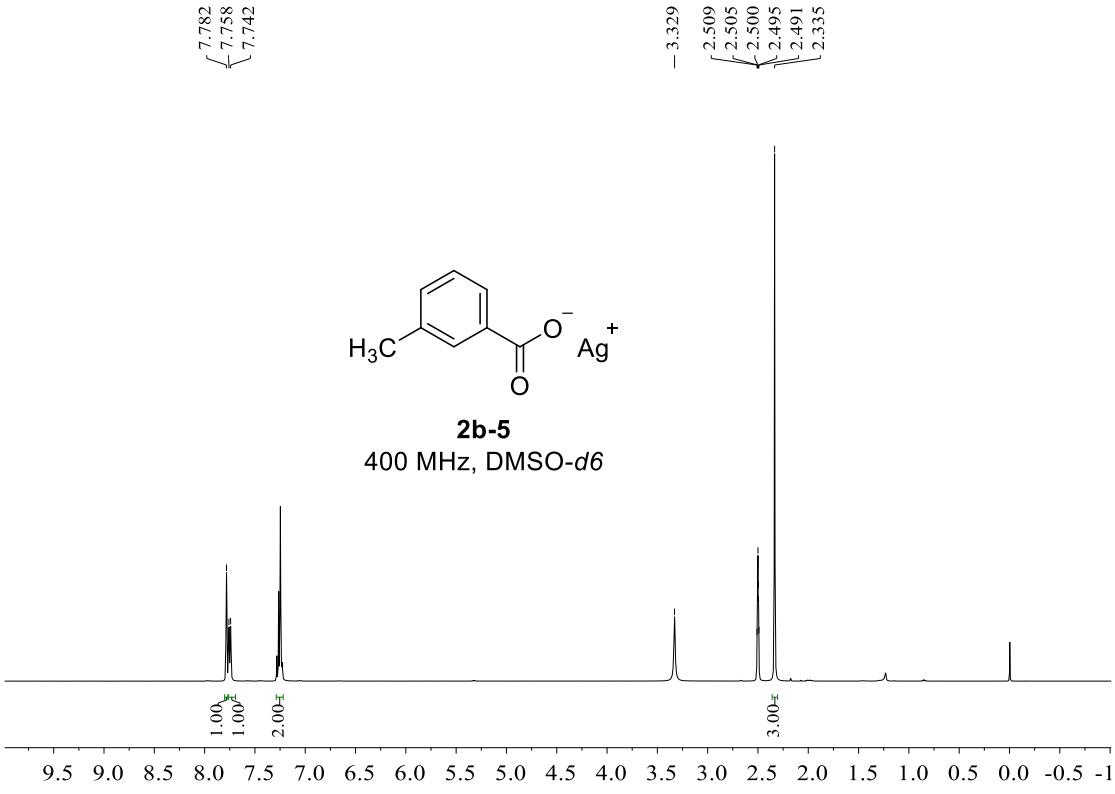

171.802
156.714
129.932
129.691
129.425
120.241
112.223
55.755
40.626
40.417
40.211
40.001
39.792
39.582
39.373
OCH3
O
Ag
+
O
2b-2
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

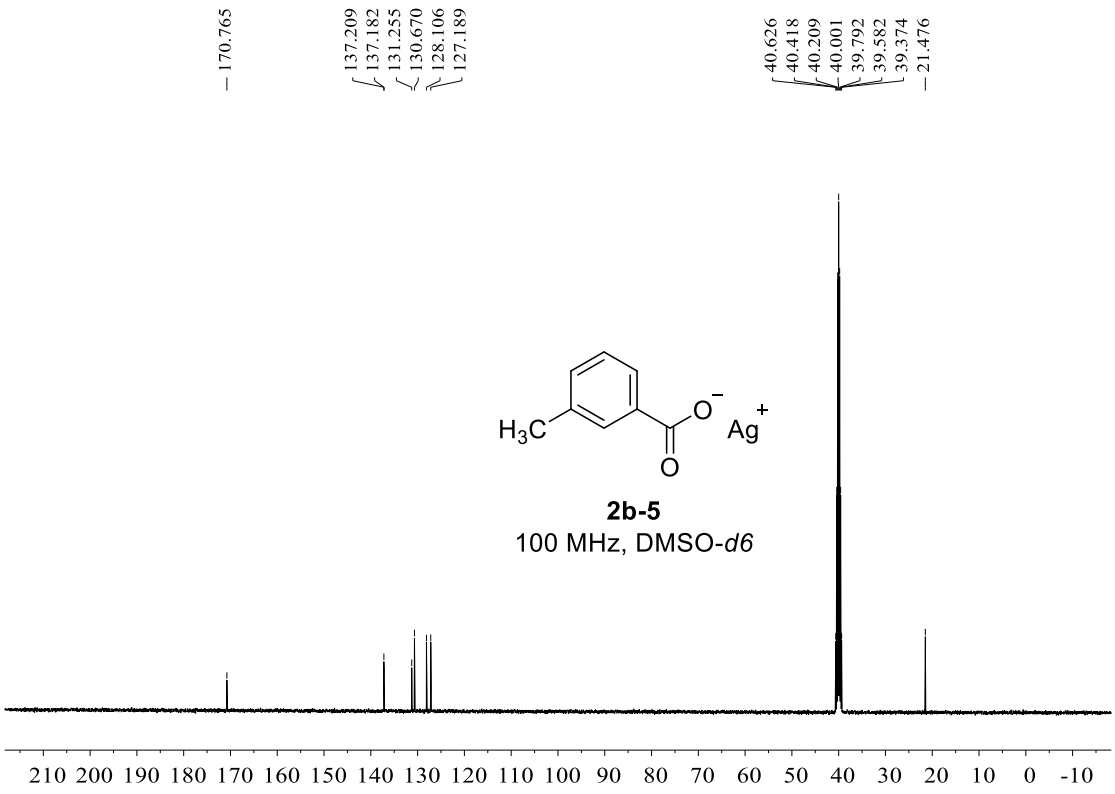

8.045
8.024
7.959
7.938
3.330
2.594
2.509
2.505
2.500
2.495
2.491
O
CH3
O−
Ag+
O
2b-3
400 MHz, DMSO-d6
2.00
2.00
3.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5


198.321
169.690
141.783
138.228
130.013
128.219
40.417
40.209
40.000
39.791
39.583
27.371
O
CH3
O−
Ag+
O
2b-3
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


8.027
8.025
8.008
8.006
7.782
7.779
7.763
7.760
7.682
7.679
7.663
7.660
7.644
7.641
7.573
7.569
7.554
7.551
7.535
7.532
3.331
2.509
2.505
2.500
2.495
2.491
CN
O
Ag
2b-4
400 MHz, DMSO-d6
1.00
1.00
1.00
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5


168.162
141.450
134.322
132.706
130.989
130.398
119.746
112.076
40.628
40.418
40.209
40.000
39.792
39.583
39.374
CN
O
Ag
2b-4
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


7.782
7.758
7.742
3.329
2.509
2.505
2.500
2.495
2.491
2.335
H3C
O
O
Ag+
2b-5
400 MHz, DMSO-d6
1.00
1.00
2.00
3.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1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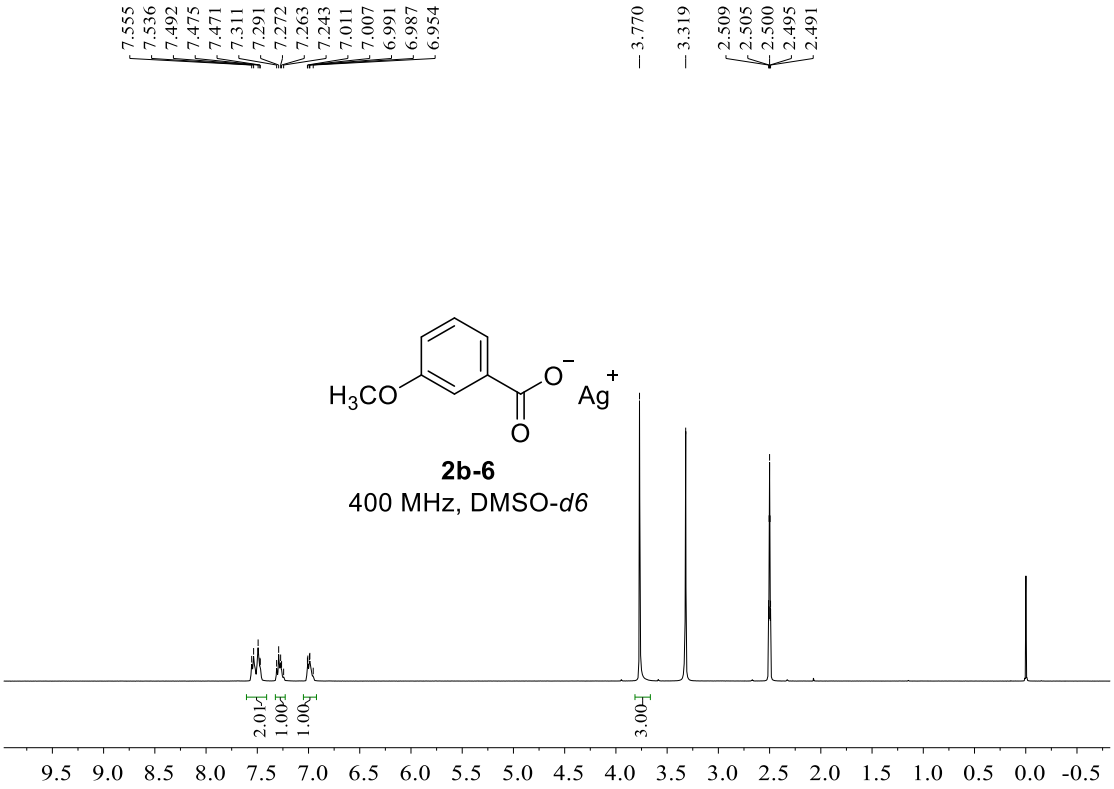
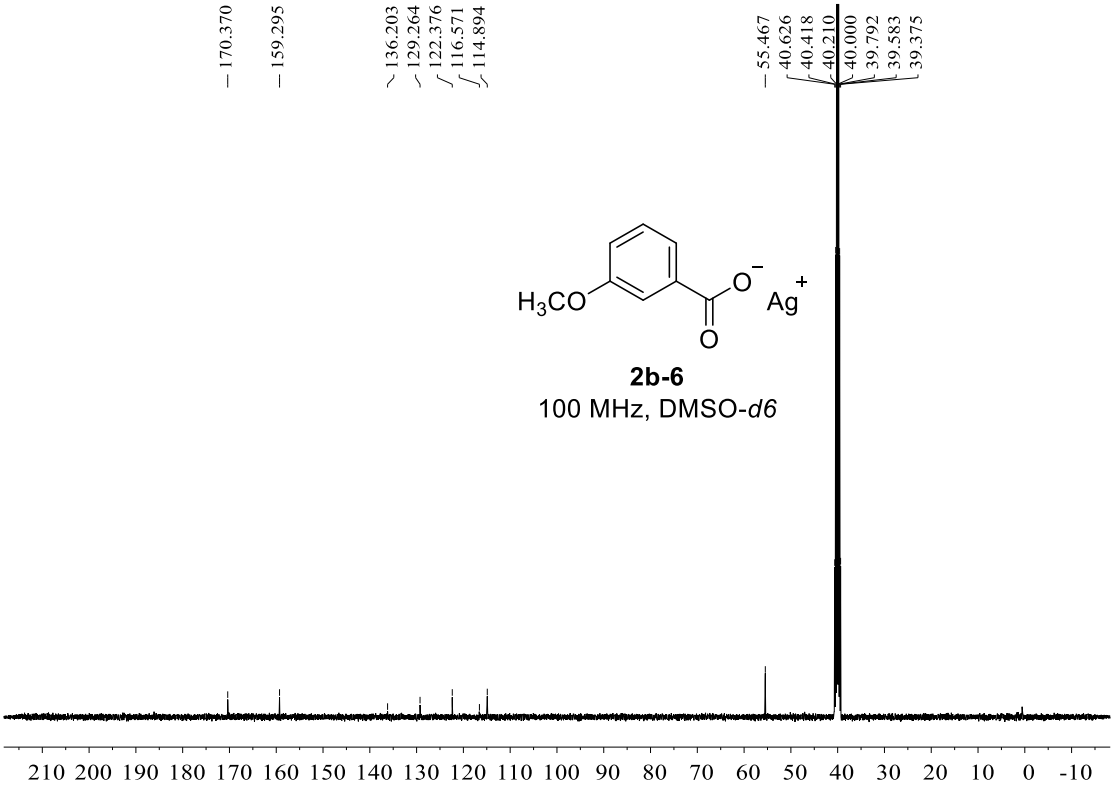
137.209
137.182
131.255
130.670
128.106
127.189
40.626
40.418
40.209
40.001
39.792
39.582
39.374
21.476
H3C
O
O
Ag+
2b-5
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


7.555
7.536
7.492
7.475
7.471
7.311
7.291
7.272
7.263
7.243
7.011
7.007
6.991
6.987
6.954
3.770
3.319
2.509
2.505
2.500
2.495
2.491
H3CO
O
Ag
2b-6
400 MHz, DMSO-d6
2.01
1.00
1.00
3.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5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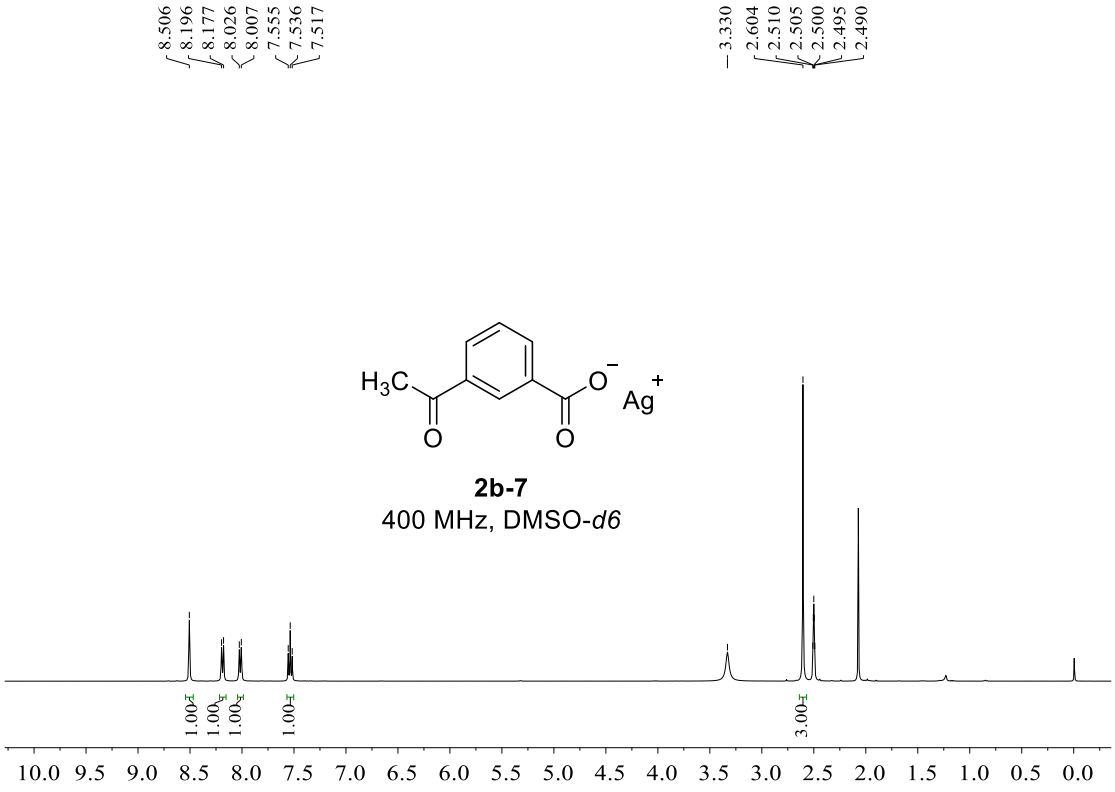
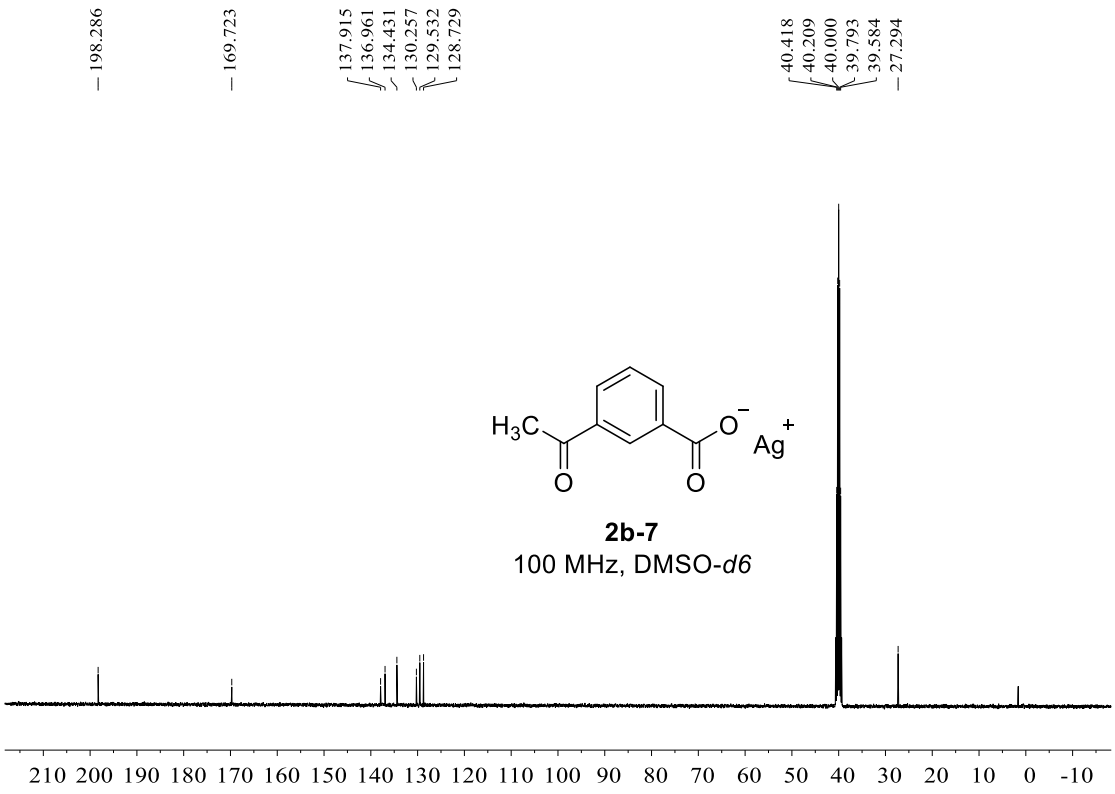
159.295
136.203
129.264
122.376
116.571
114.894
55.467
40.626
40.418
40.210
40.000
39.792
39.583
39.375
H3CO
O
Ag
2b-6
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


8.506
8.196
8.177
8.026
8.007
7.555
7.536
7.517
3.330
2.604
2.510
2.505
2.500
2.495
2.490
H3C
O
O
O
Ag+
2b-7
400 MHz, DMSO-d6
1.00
1.00
1.00
1.00
3.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0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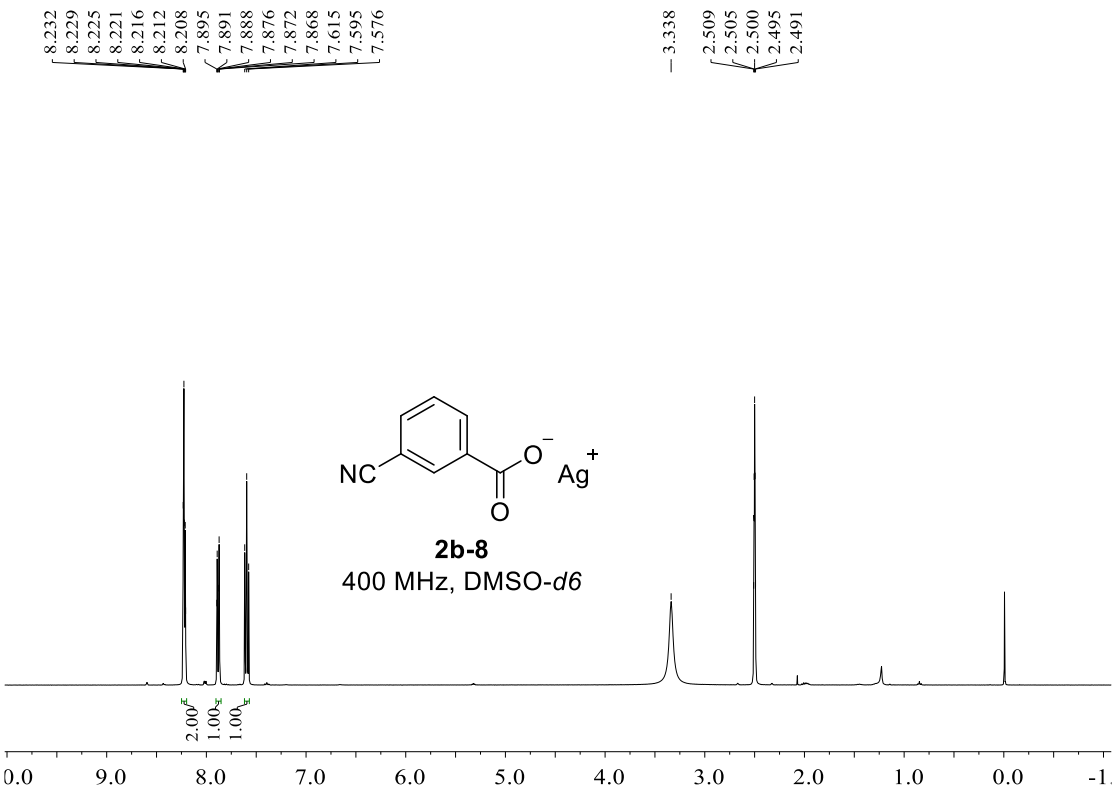
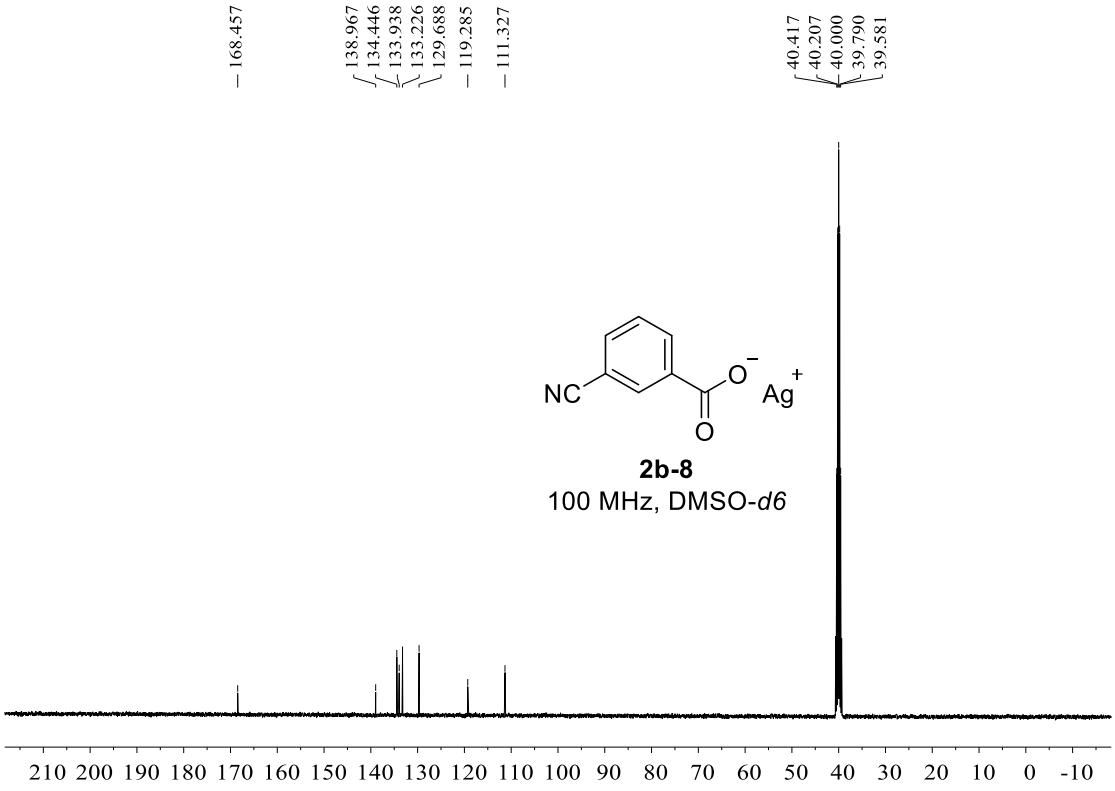
137.915
136.961
134.431
130.257
129.532
128.729
40.418
40.209
40.000
39.793
39.584
27.294
H3C
O
O
O
Ag+
2b-7
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


8.232
8.229
8.225
8.221
8.216
8.212
8.208
7.895
7.891
7.888
7.876
7.872
7.868
7.615
7.595
7.576
3.338
2.509
2.505
2.500
2.495
2.491
NC
O
O
Ag
+
2b-8
400 MHz, DMSO-d6
2.00
1.00
1.00
0.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0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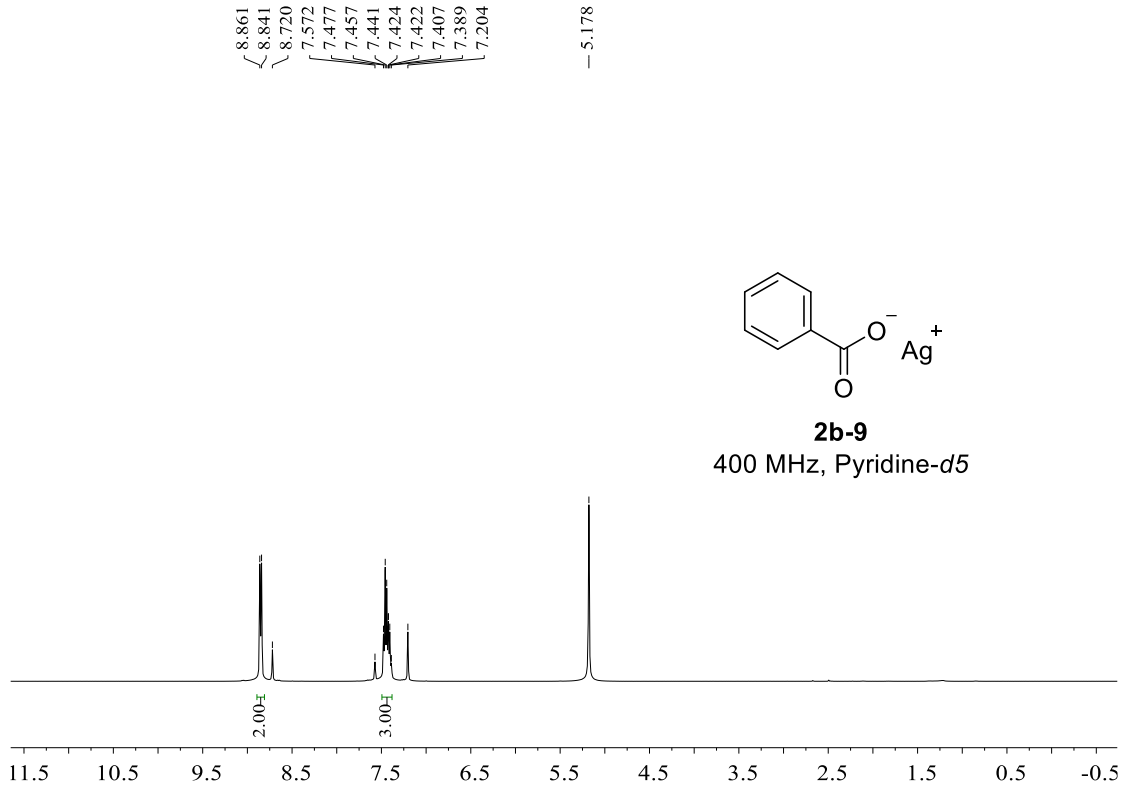
138.967
134.446
133.938
133.226
129.688
119.285
111.327
40.417
40.207
40.000
39.790
39.581
NC
O
O
Ag
+
2b-8
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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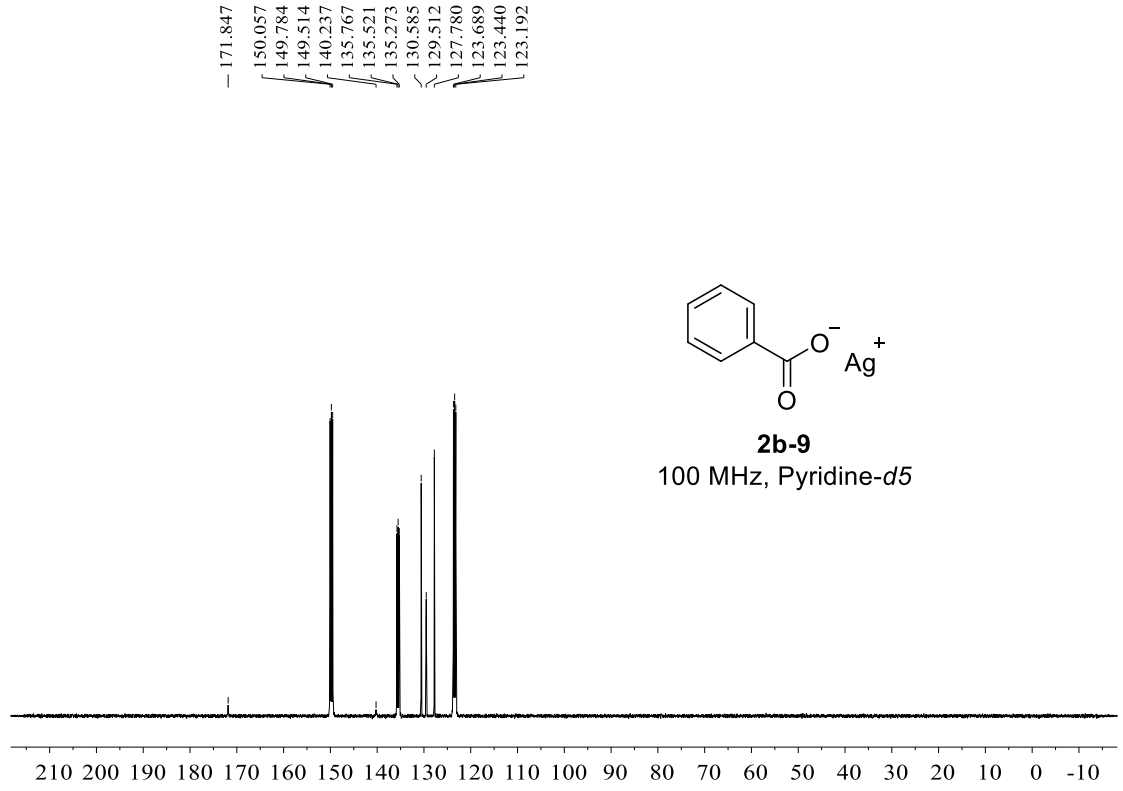
8.841
8.720
7.572
7.477
7.457
7.441
7.424
7.422
7.407
7.389
7.204
5.178
O
Ag
2b-9
400 MHz, Pyridine-d5
2.00
3.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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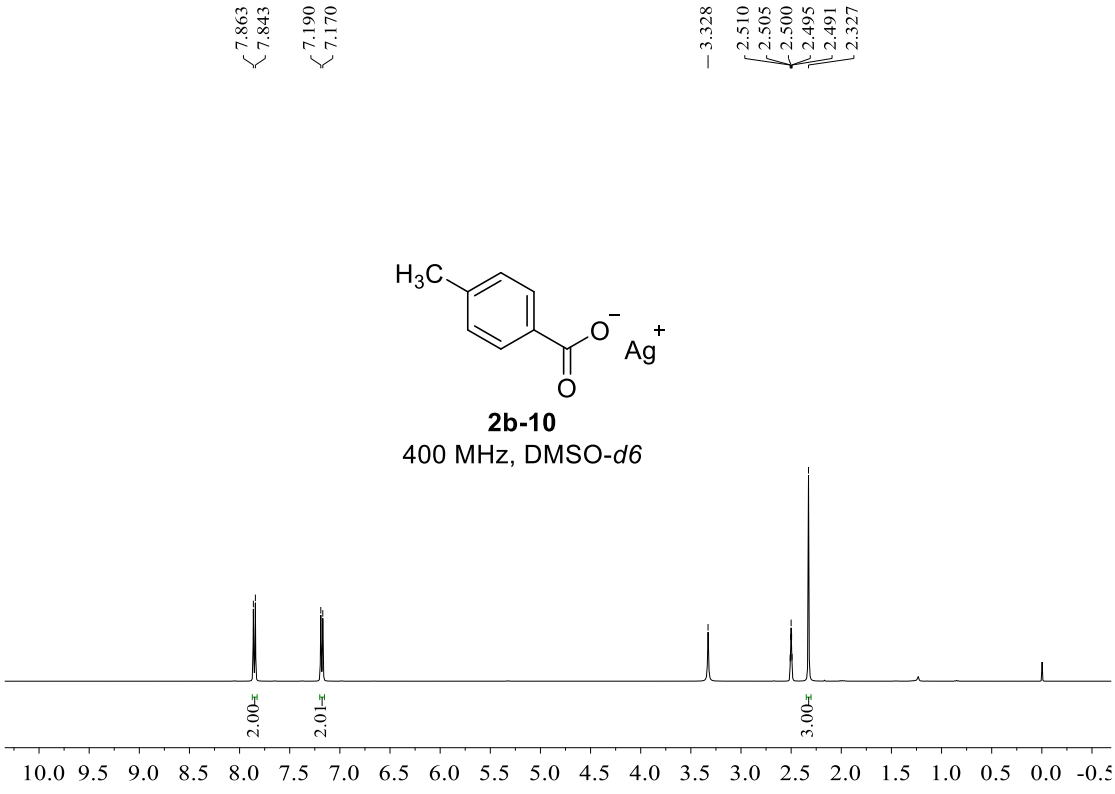
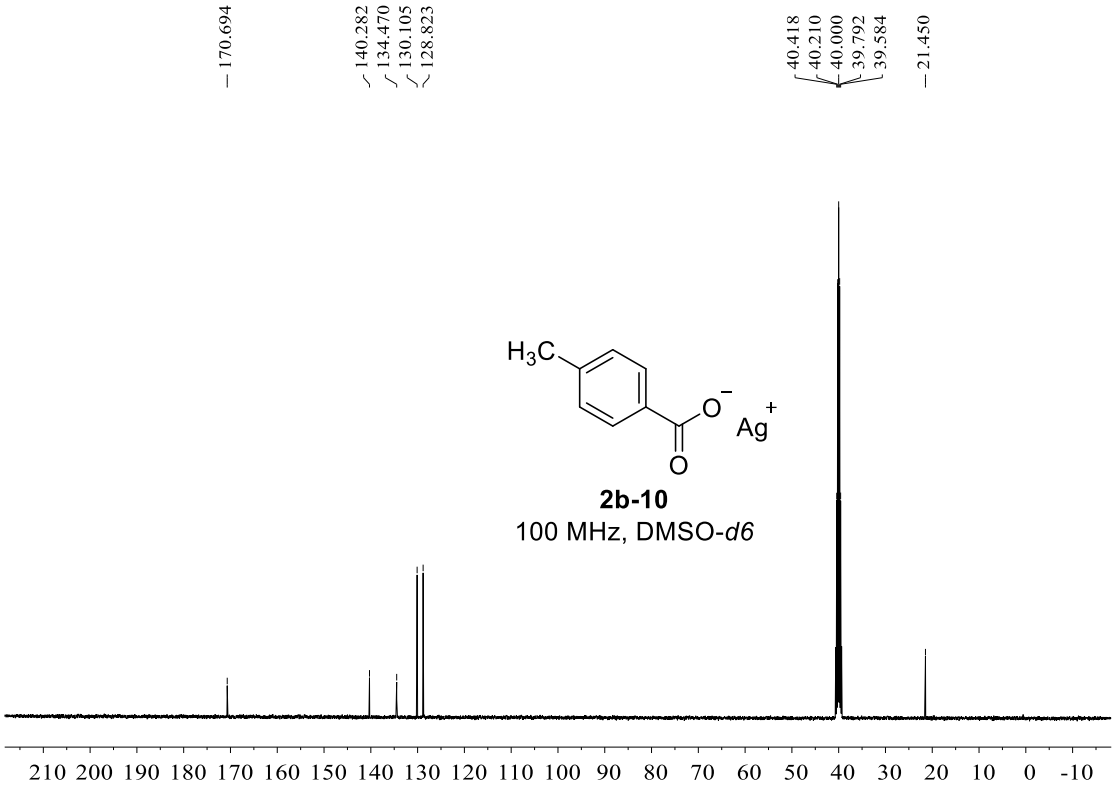
150.057
149.784
149.514
140.237
135.767
135.521
135.273
130.585
129.512
127.780
123.689
123.440
123.192
O
Ag
2b-9
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


7.863
7.843
7.190
7.170
3.328
2.510
2.505
2.500
2.495
2.491
2.327
H3C
O
Ag
2b-10
400 MHz, DMSO-d6
2.00
2.01
3.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5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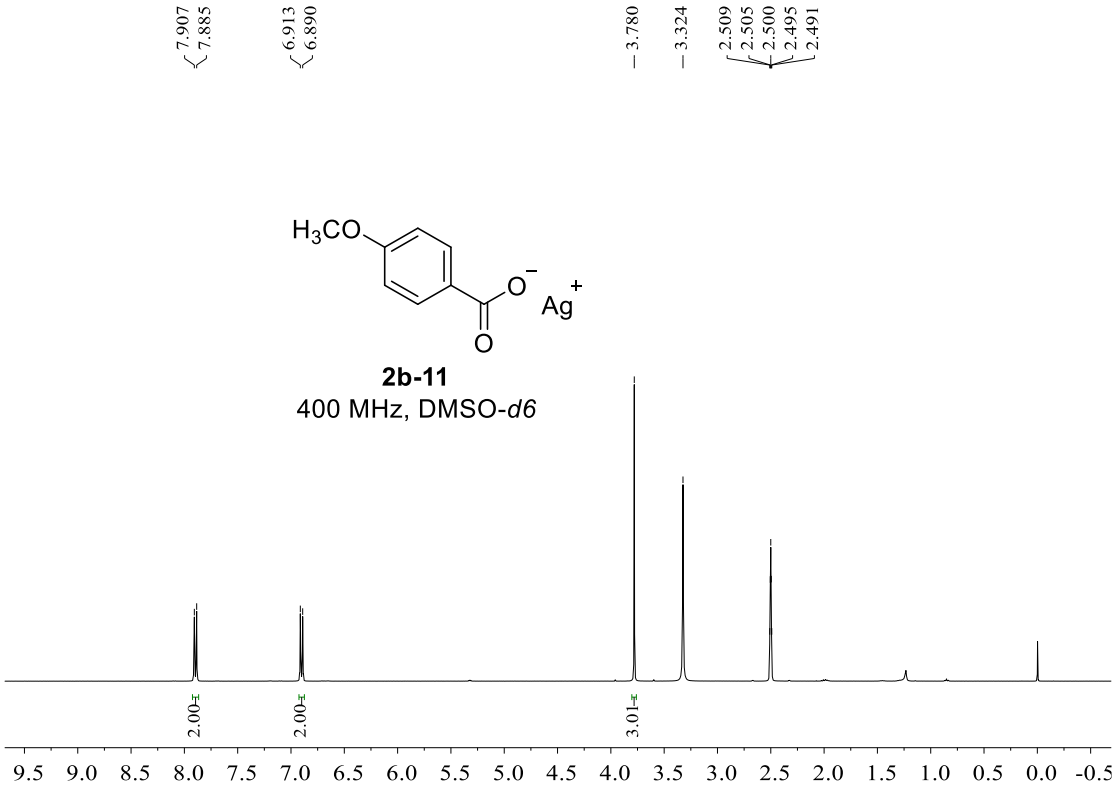
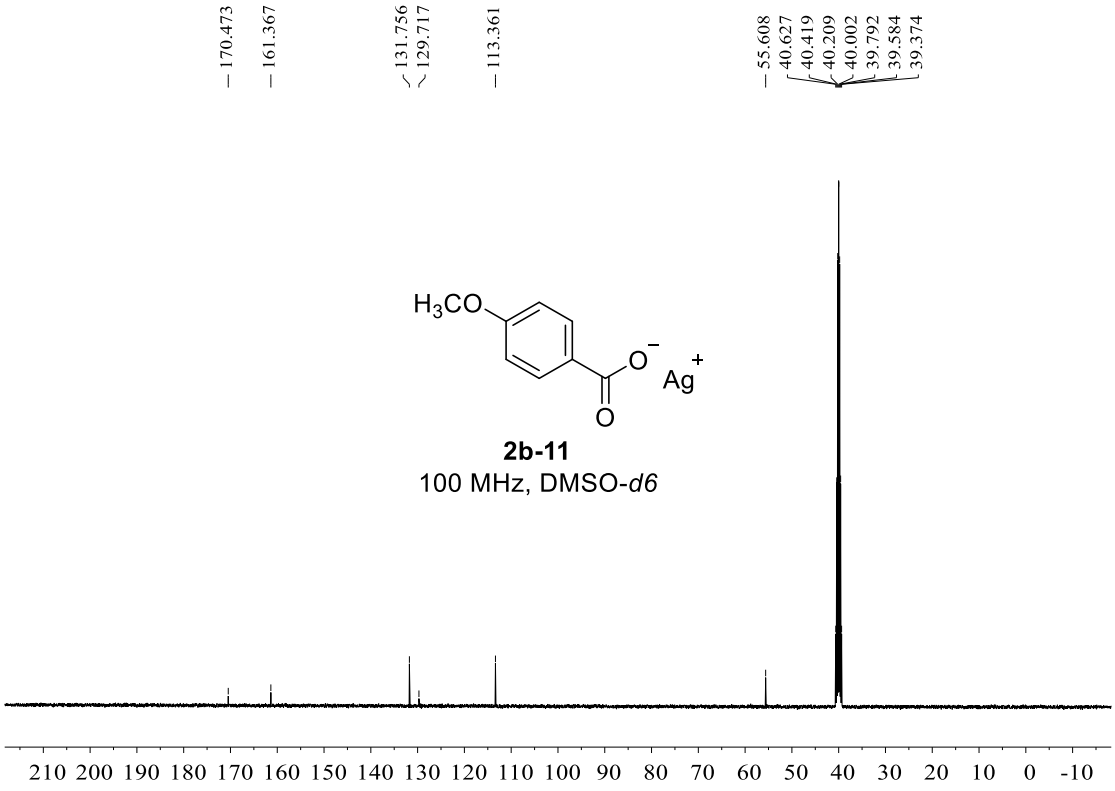
140.282
134.470
130.105
128.823
40.418
40.210
40.000
39.792
39.584
21.450
H3C
O
Ag
2b-10
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


7.907
7.885
6.913
6.890
3.780
3.324
2.509
2.505
2.500
2.495
2.491
H3CO
O
Ag
2b-11
400 MHz, DMSO-d6
2.00
2.00
3.01
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5


170.473
161.367
131.756
129.717
113.361
55.608
40.627
40.419
40.209
40.002
39.792
39.584
39.374
H3CO
O
Ag
2b-11
100 MHz, DMSO-d6
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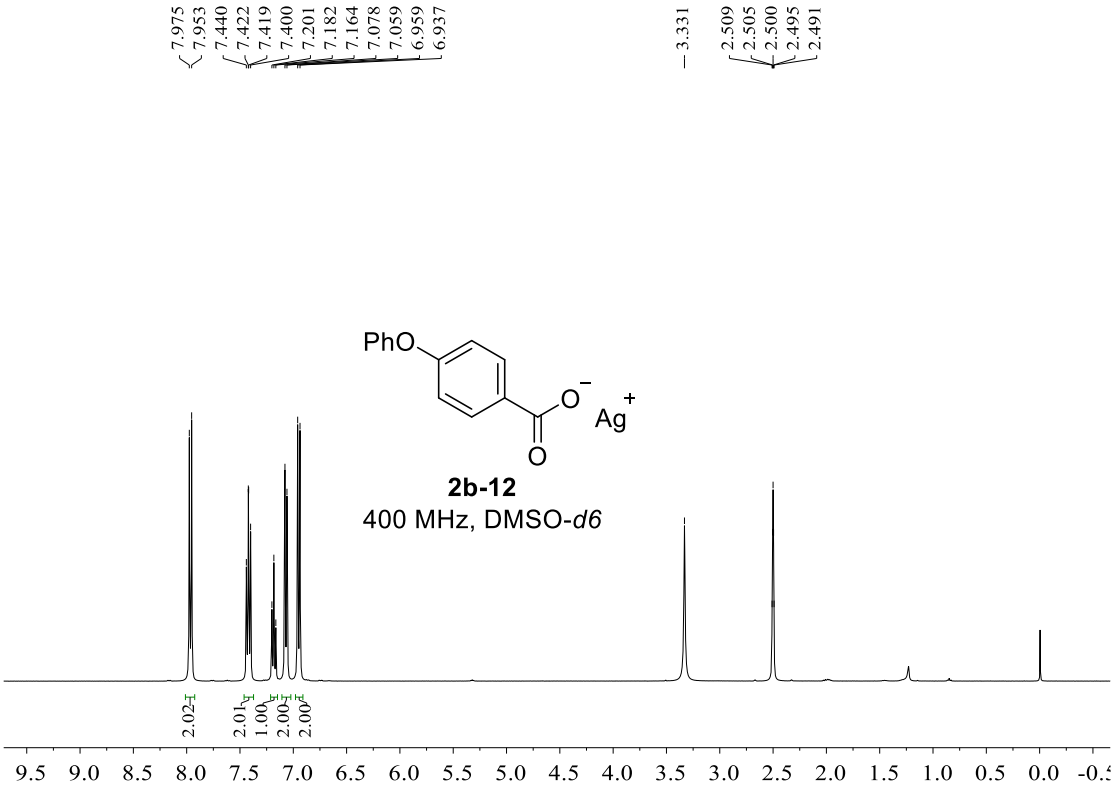
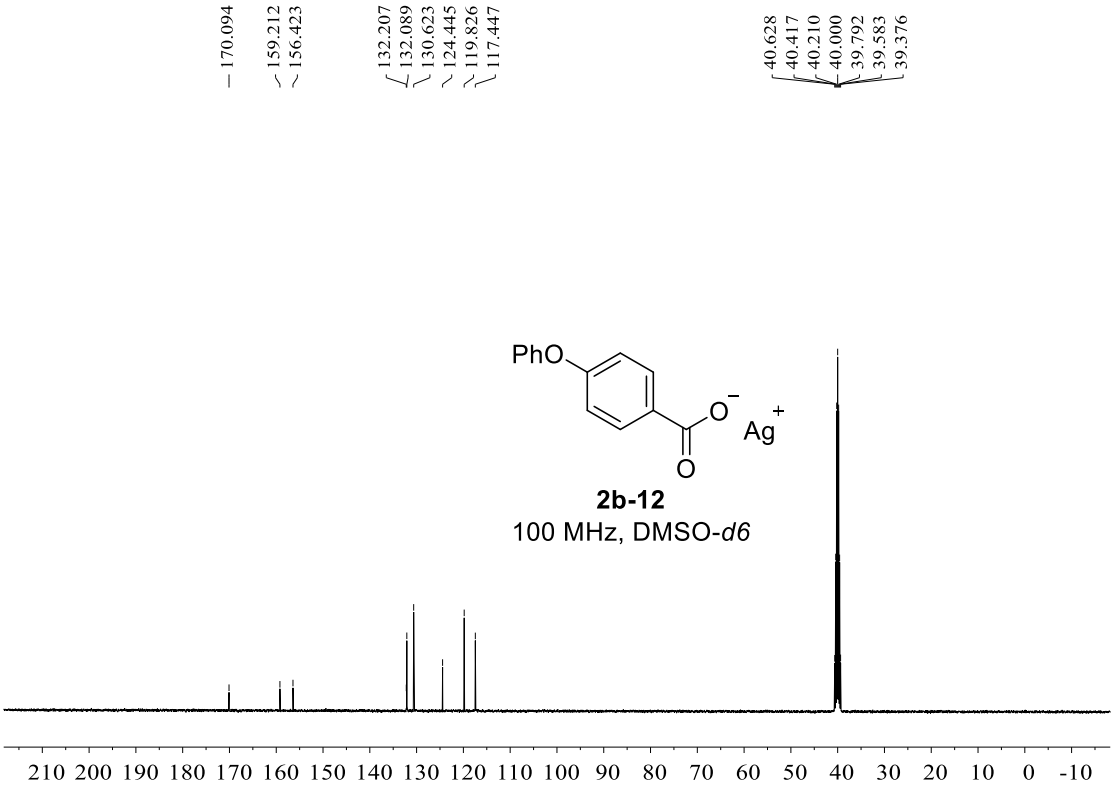
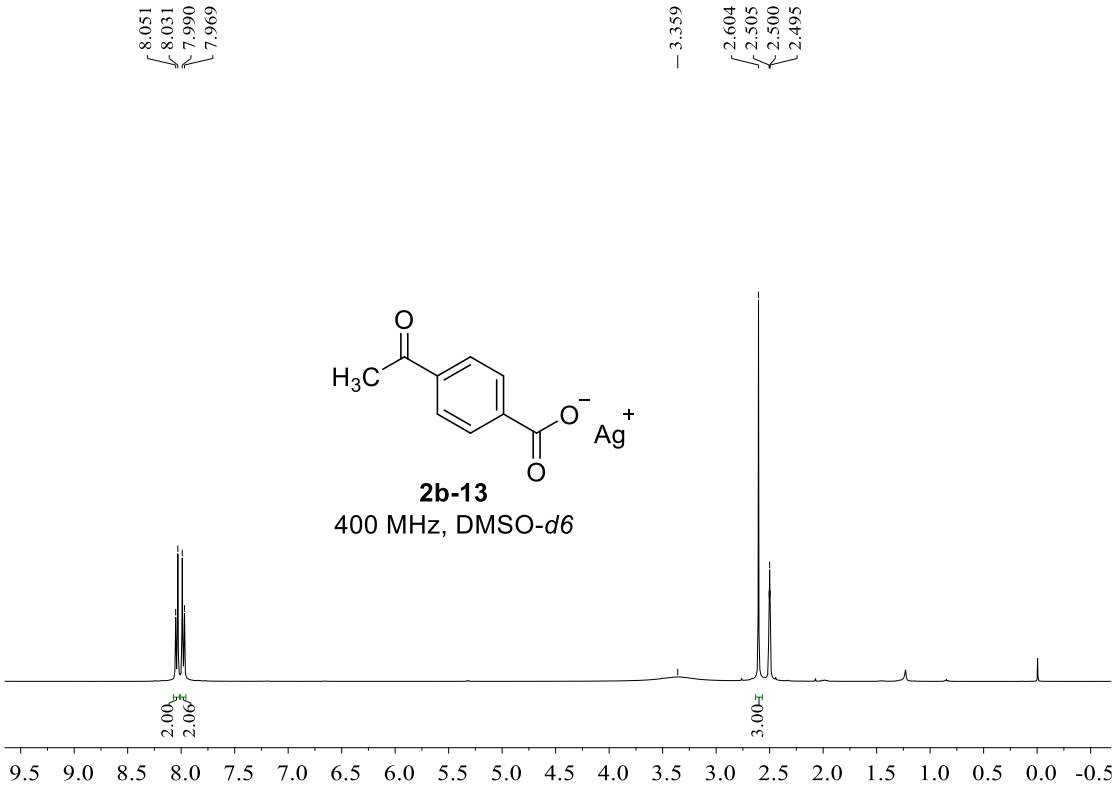
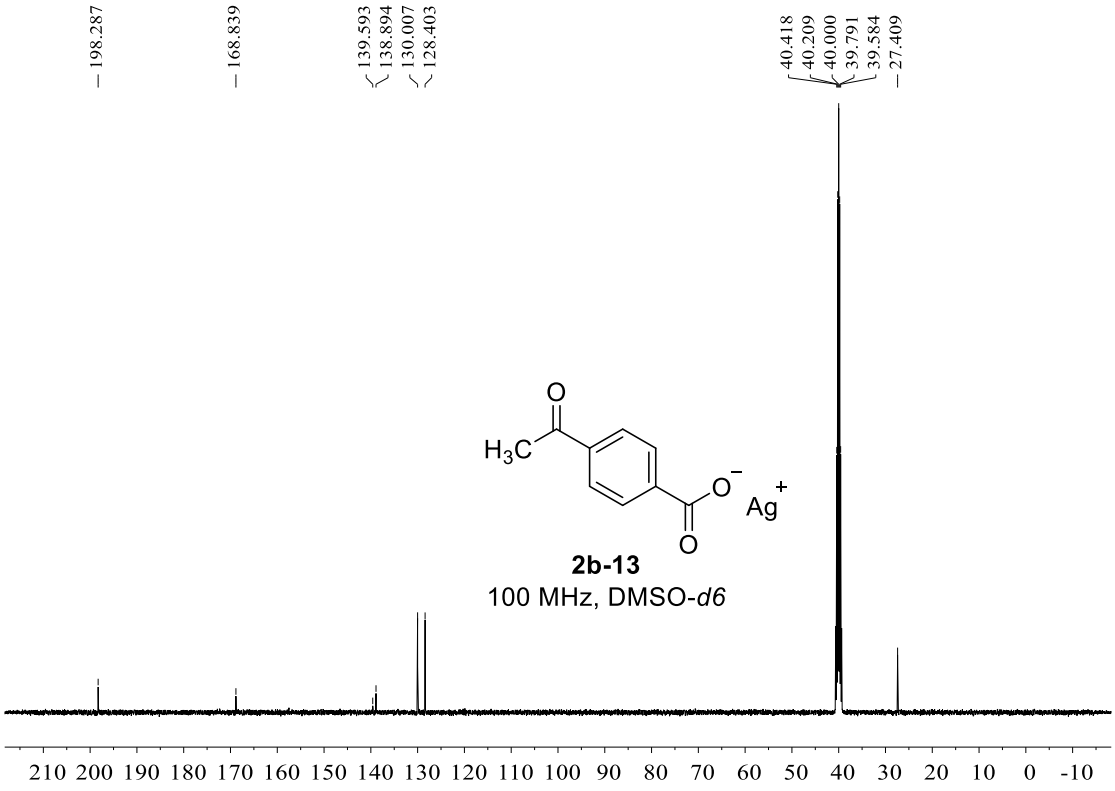
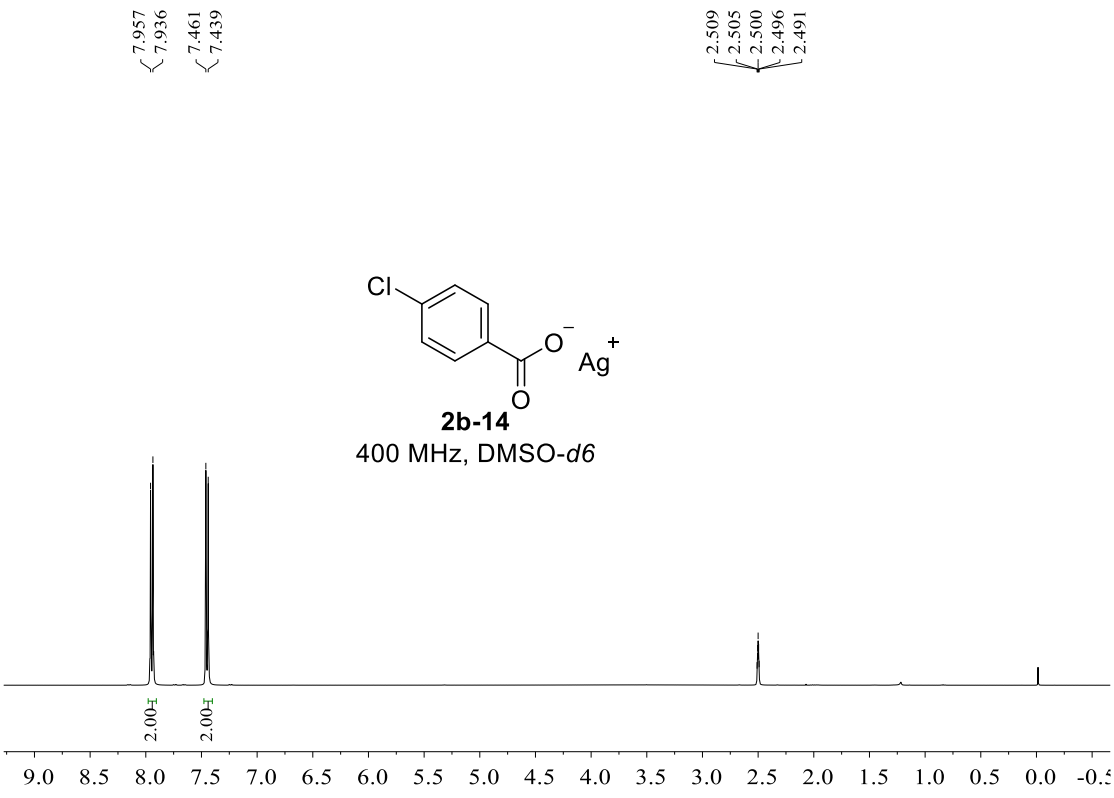
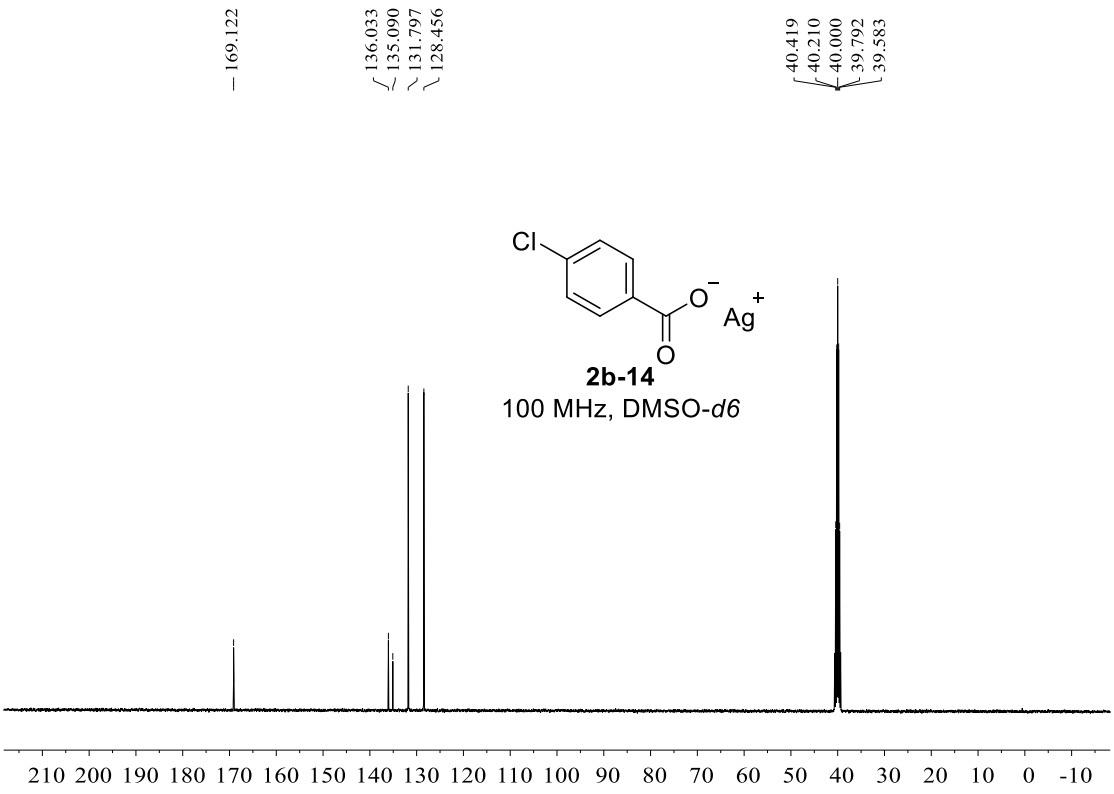

7.975
7.953
7.440
7.422
7.419
7.400
7.201
7.182
7.164
7.078
7.059
6.959
6.937
3.331
2.509
2.505
2.500
2.495
2.491
PhO
O
Ag
2b-12
400 MHz, DMSO-d6
2.02
2.01
1.00
2.00
2.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

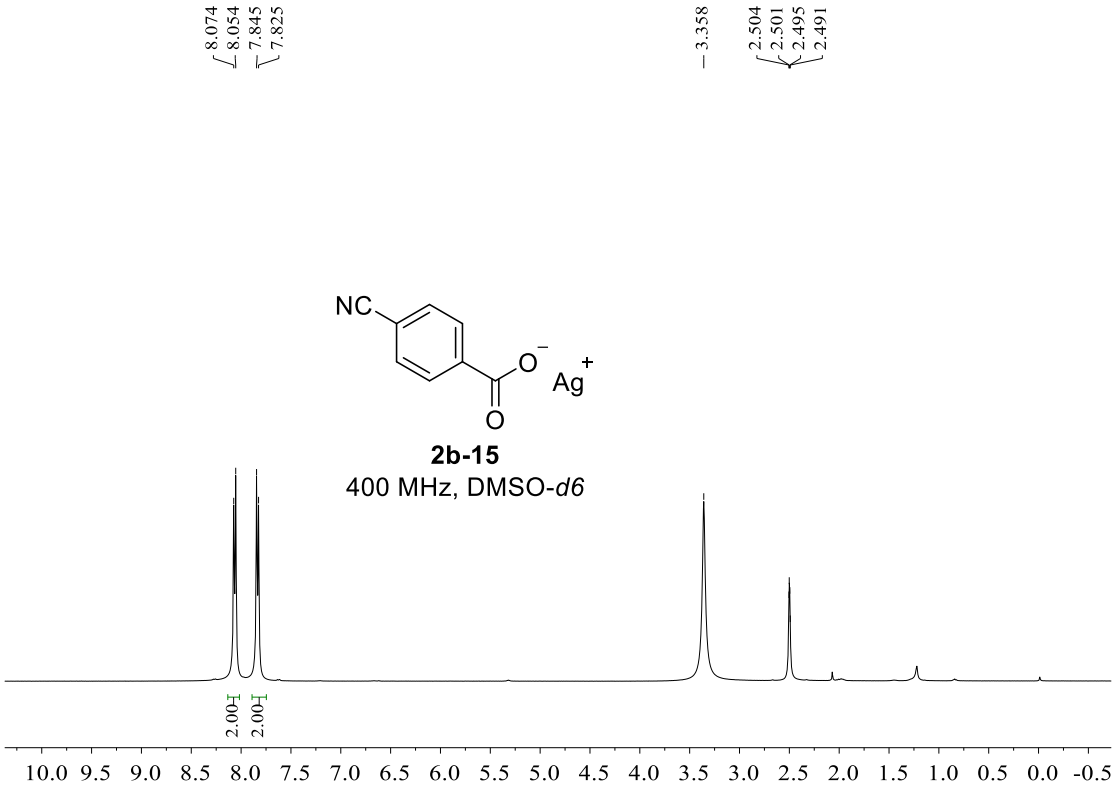

170.094
159.212
156.423
132.207
132.089
130.623
124.445
119.826
117.447
40.628
40.417
40.210
40.000
39.792
39.583
39.376
PhO
O
Ag
2b-12
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

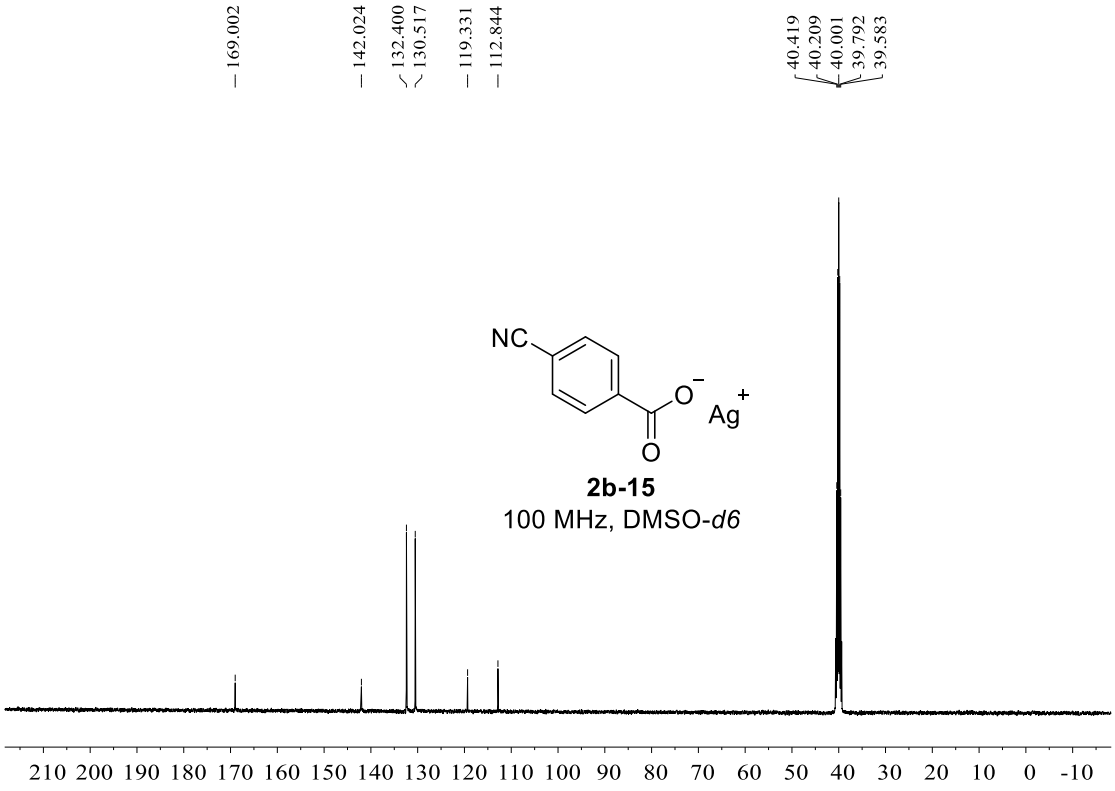

8.051
8.031
7.990
7.969
3.359
2.604
2.505
2.500
2.495
O
H3C
O−
Ag+
O
2b-13
400 MHz, DMSO-d6
2.00
2.06
3.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

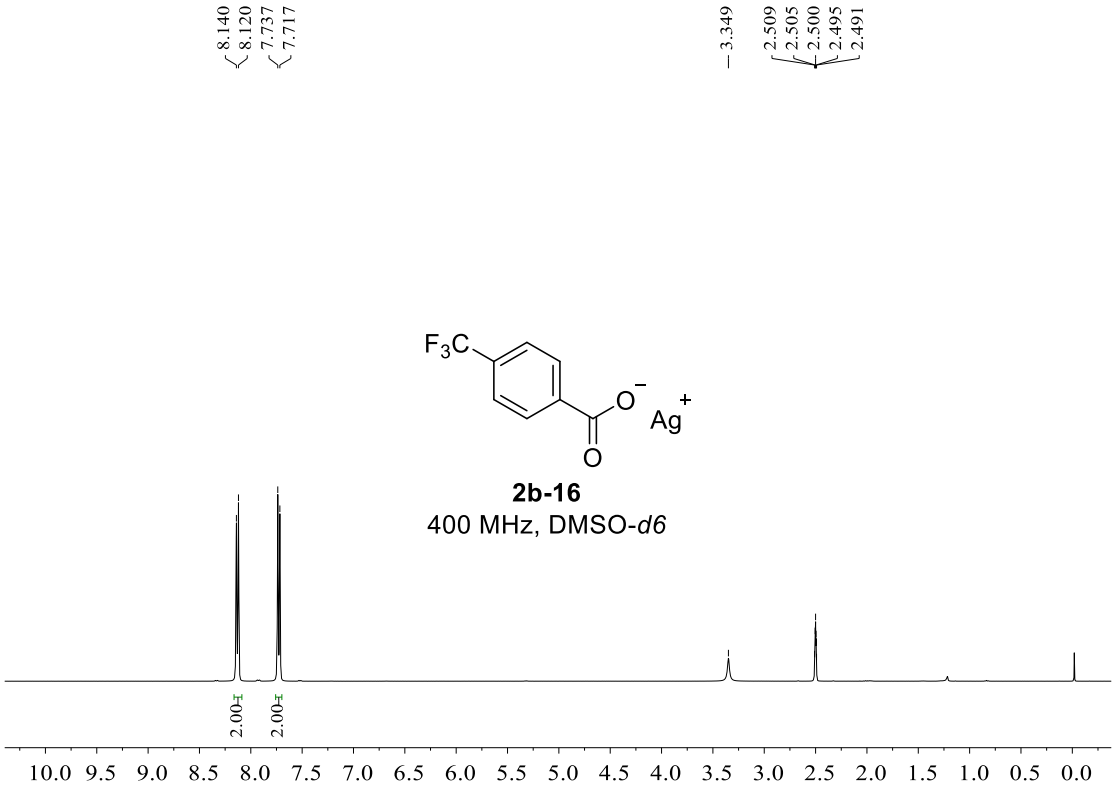

198.287
168.839
139.593
138.894
130.007
128.403
40.418
40.209
40.000
39.791
39.584
27.409
O
H3C
O−
Ag+
O
2b-13
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

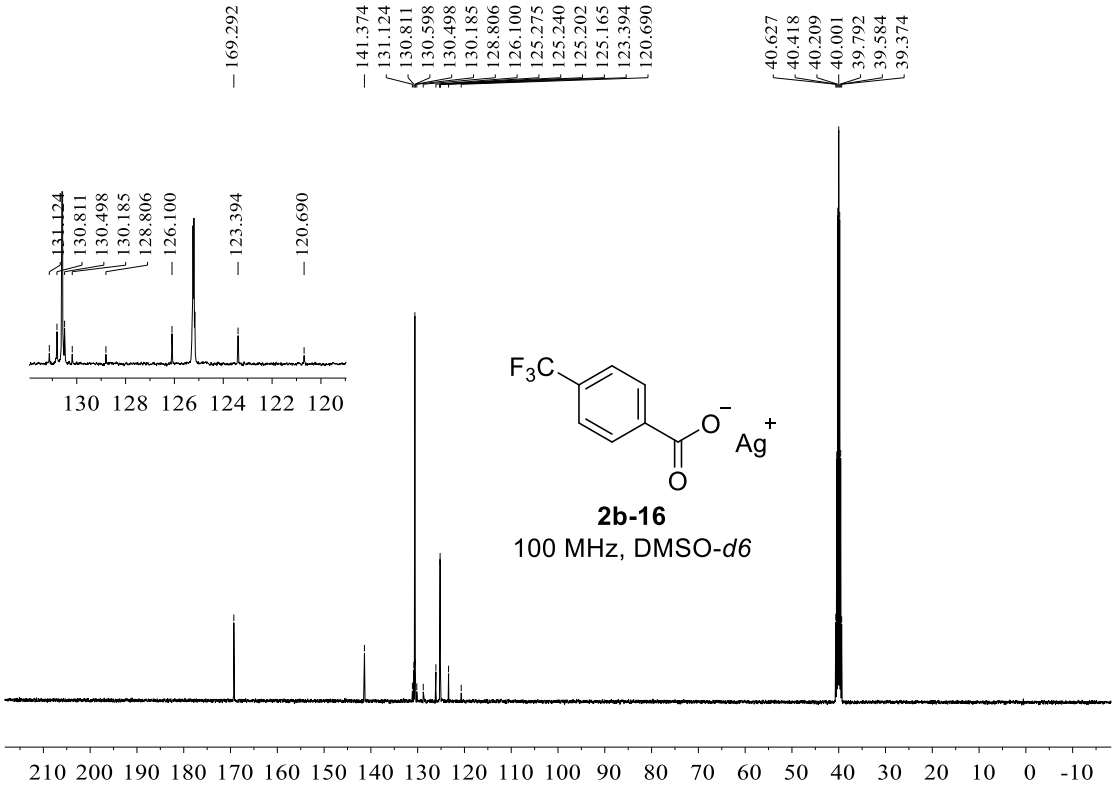

7.957
7.936
7.461
7.439
2.509
2.505
2.500
2.496
2.491
Cl
O
Ag
2b-14
400 MHz, DMSO-d6
2.00
2.00
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

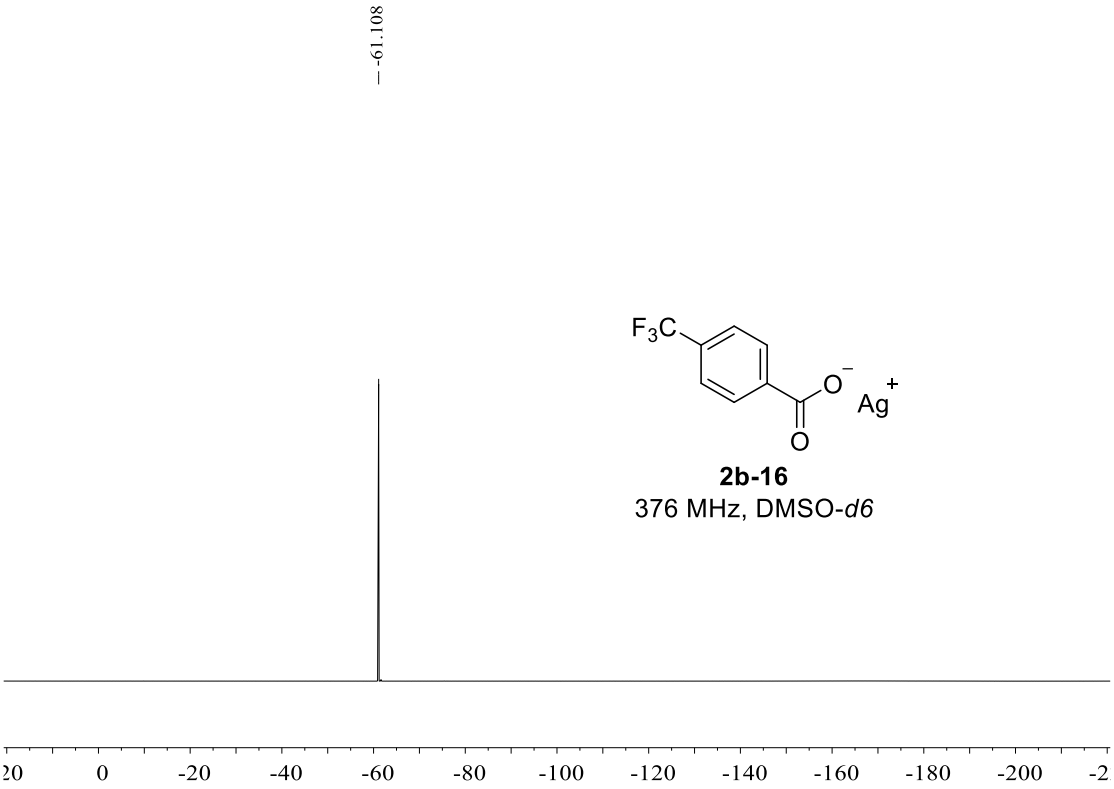

169.122
136.033
135.090
131.797
128.456
40.419
40.210
40.000
39.792
39.583
Cl
O
Ag
2b-14
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

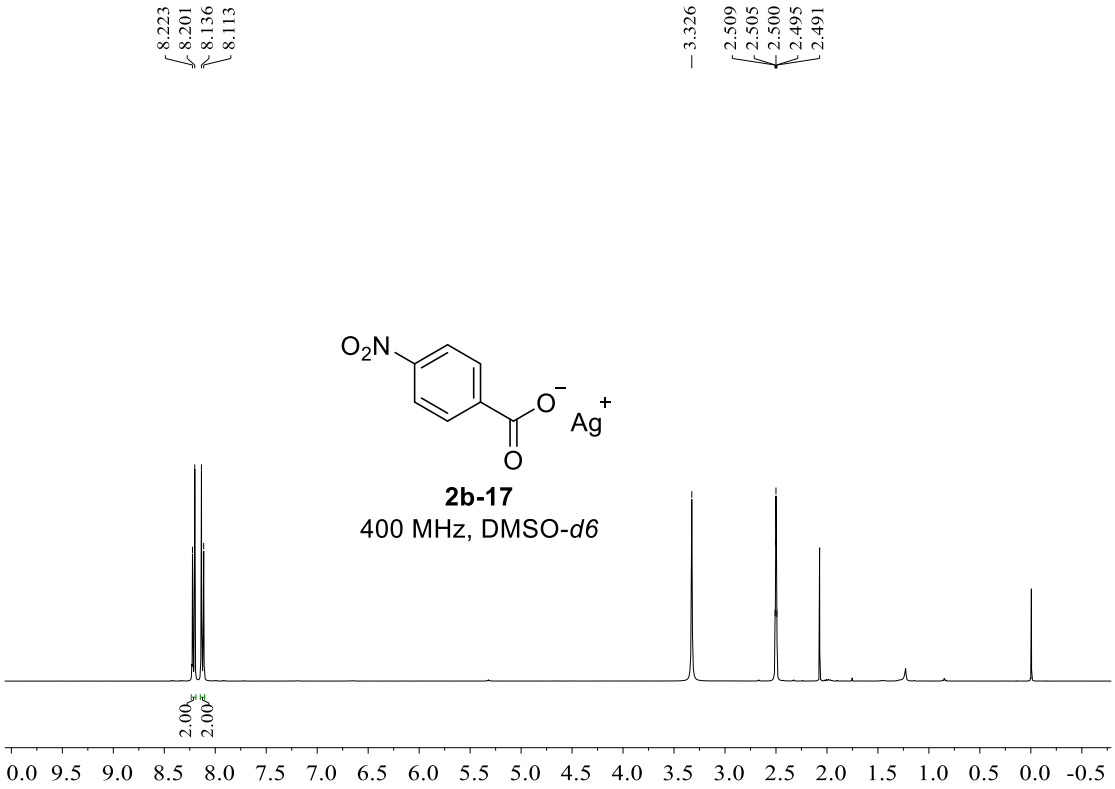

8.074
8.054
7.845
7.825
3.358
2.504
2.501
2.495
2.491
NC
O
Ag
2b-15
400 MHz, DMSO-d6
2.00
2.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

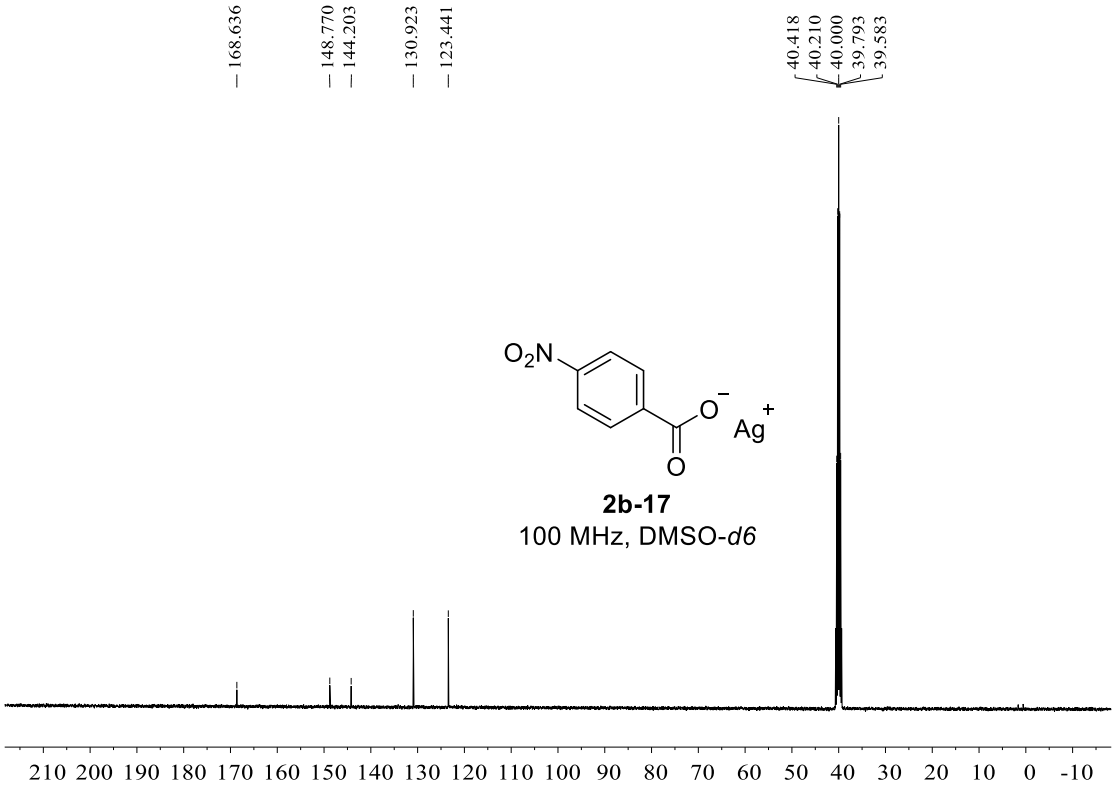

169.002
142.024
132.400
130.517
119.331
112.844
40.419
40.209
40.001
39.792
39.583
NC
O
Ag
2b-15
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

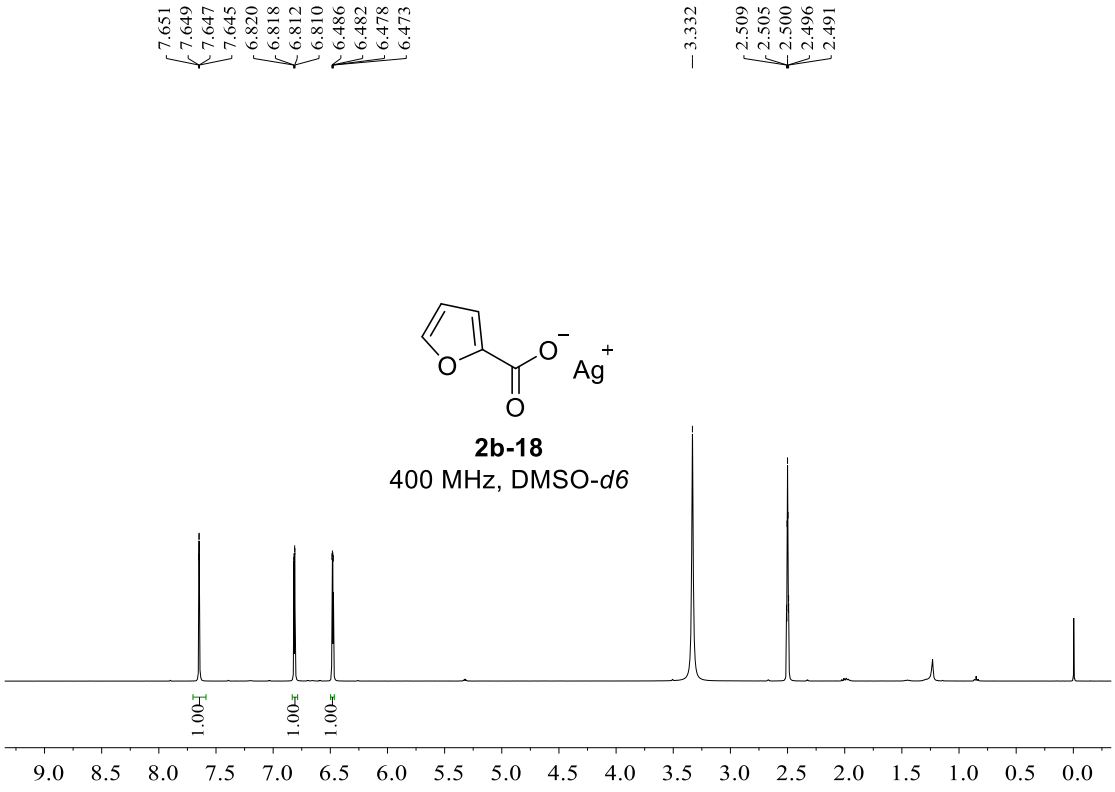

8.140
8.120
7.737
7.717
3.349
2.509
2.505
2.500
2.495
2.491
F3C
O
Ag
2b-16
400 MHz, DMSO-d6
2.00
2.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

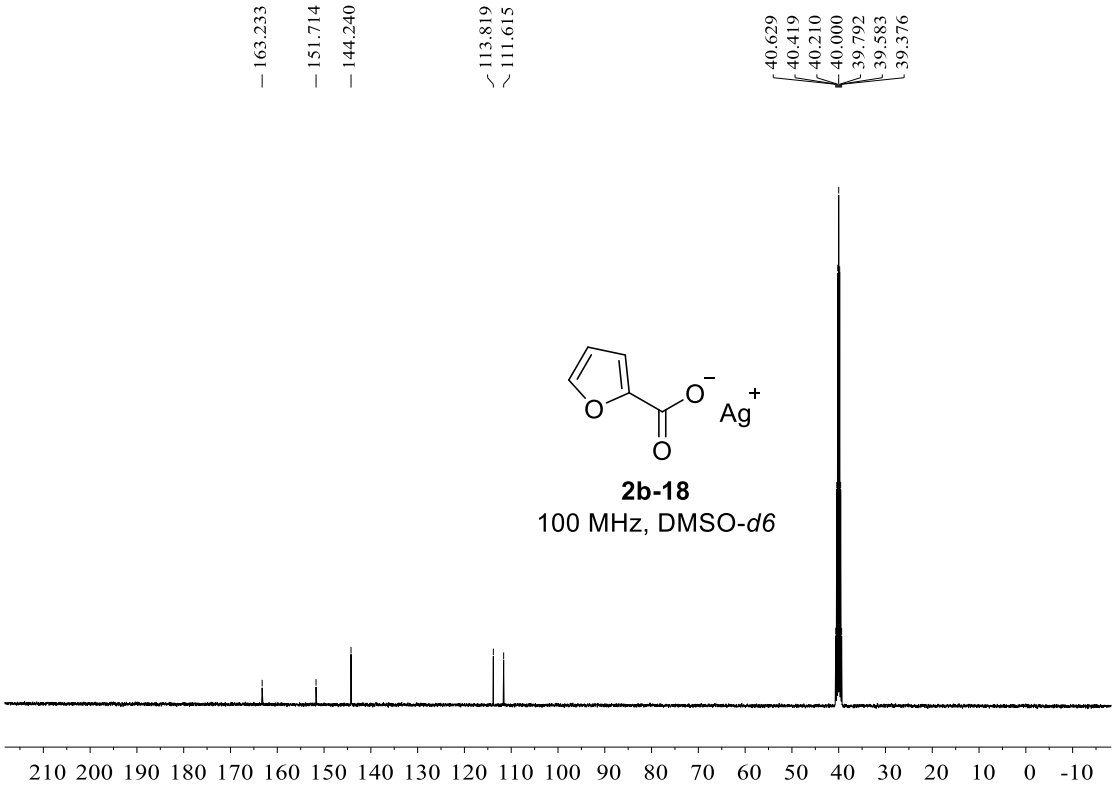

169.292
141.374
131.124
130.811
130.598
130.498
130.185
128.806
126.100
125.275
125.240
125.202
125.165
123.394
120.690
40.627
40.418
40.209
40.001
39.792
39.584
39.374
130 128 126 124 122 120
F3C
O
Ag
2b-16
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

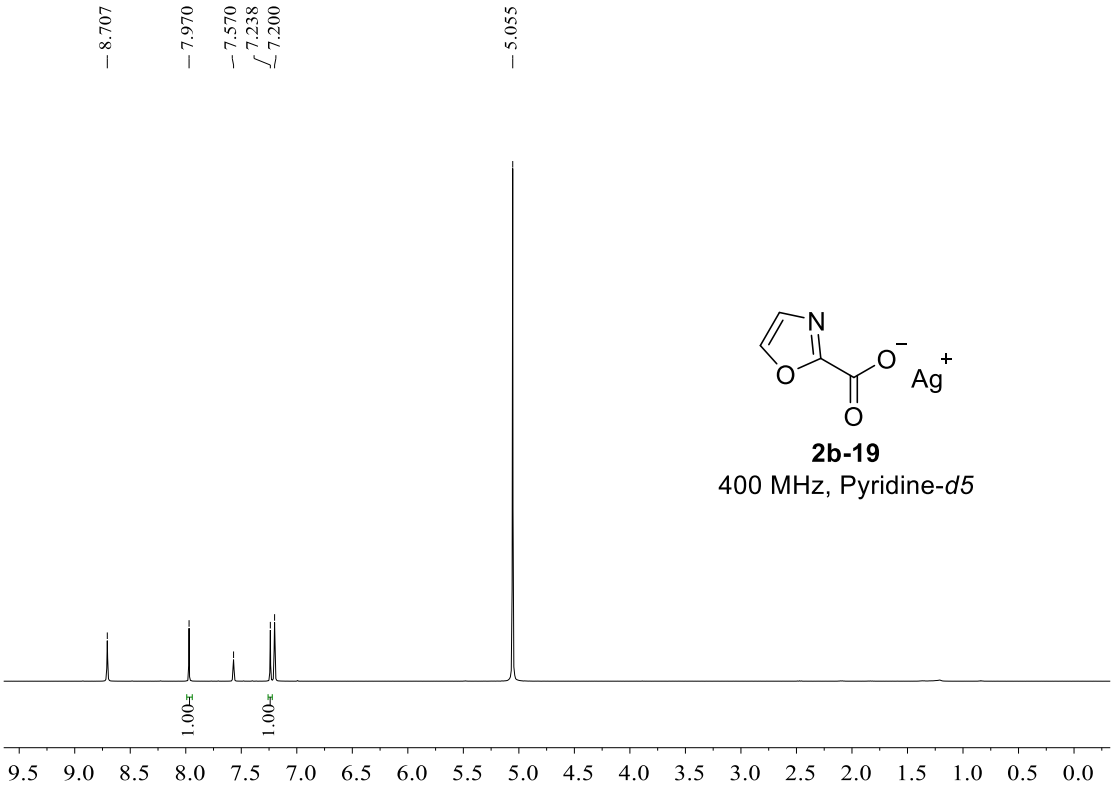

-61.108
F3C
O
Ag+
O
2b-16
376 MHz, DMSO-d6
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-2


8.223
8.201
8.136
8.113
3.326
2.509
2.505
2.500
2.495
2.491
O2N
O
Ag
2b-17
400 MHz, DMSO-d6
2.00
2.00
0.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

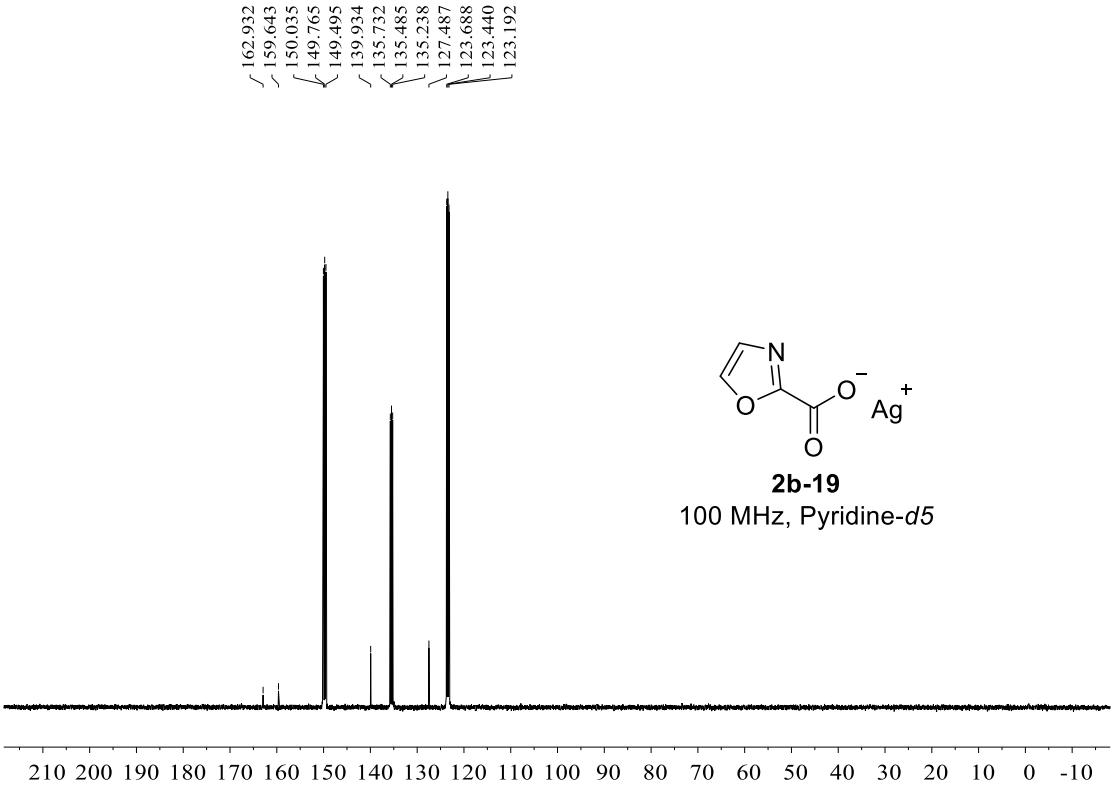

168.636
148.770
144.203
130.923
123.441
40.418
40.210
40.000
39.793
39.583
O2N
O
Ag
2b-17
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


7.651
7.649
7.647
7.645
6.820
6.818
6.812
6.810
6.486
6.482
6.478
6.473
3.332
2.509
2.505
2.500
2.496
2.491
O
O
Ag+
2b-18
400 MHz, DMSO-d6
1.00
1.00
1.00
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

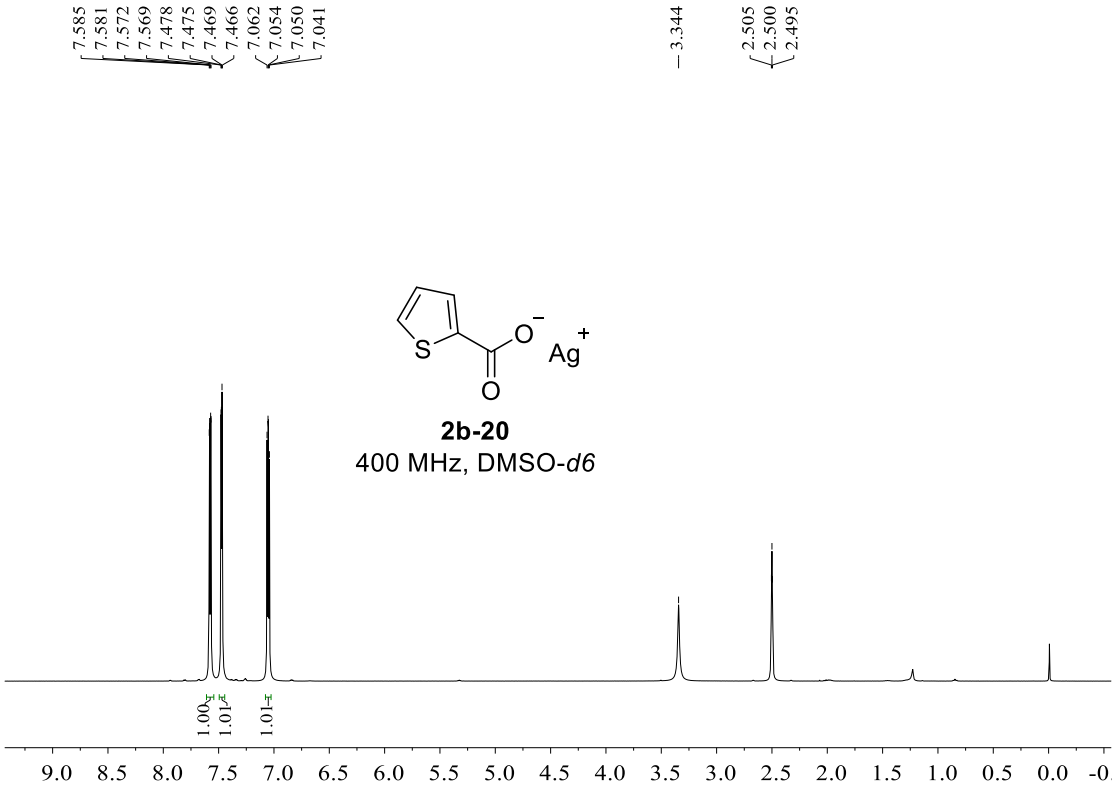

163.233
151.714
144.240
113.819
111.615
40.629
40.419
40.210
40.000
39.792
39.583
39.376
O
O
Ag+
2b-18
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

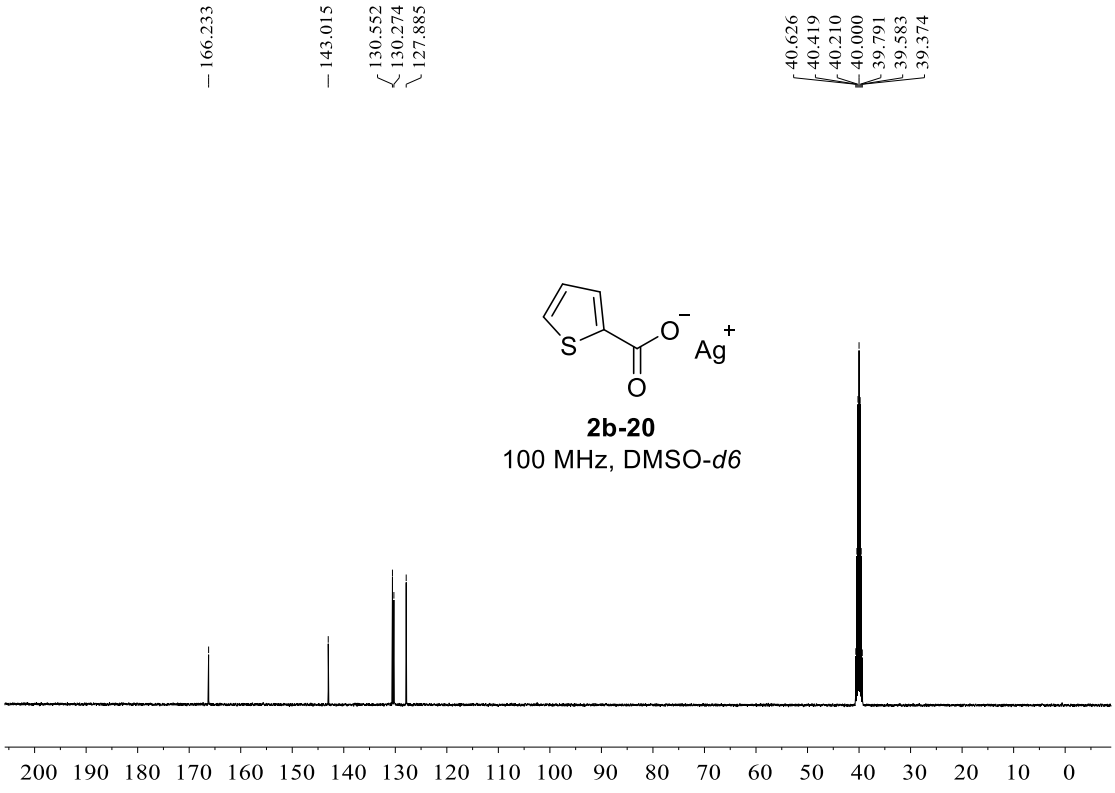


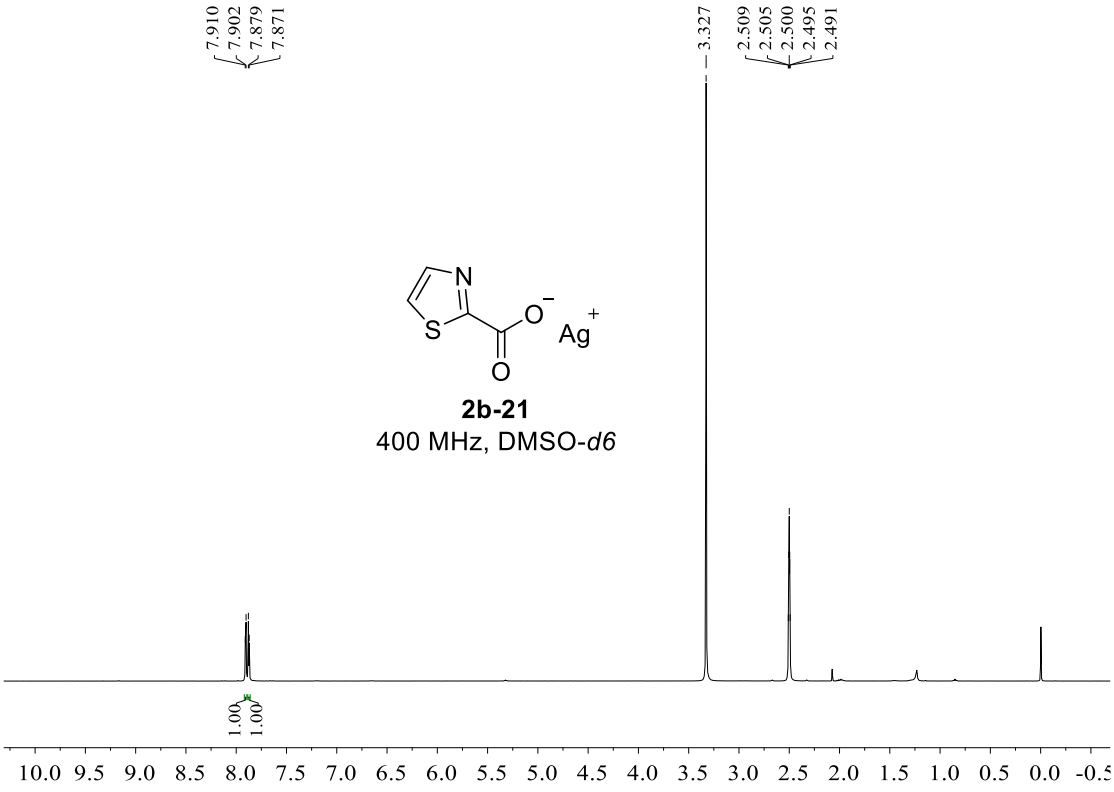
2b-19
400 MHz, Pyridine-*d5*

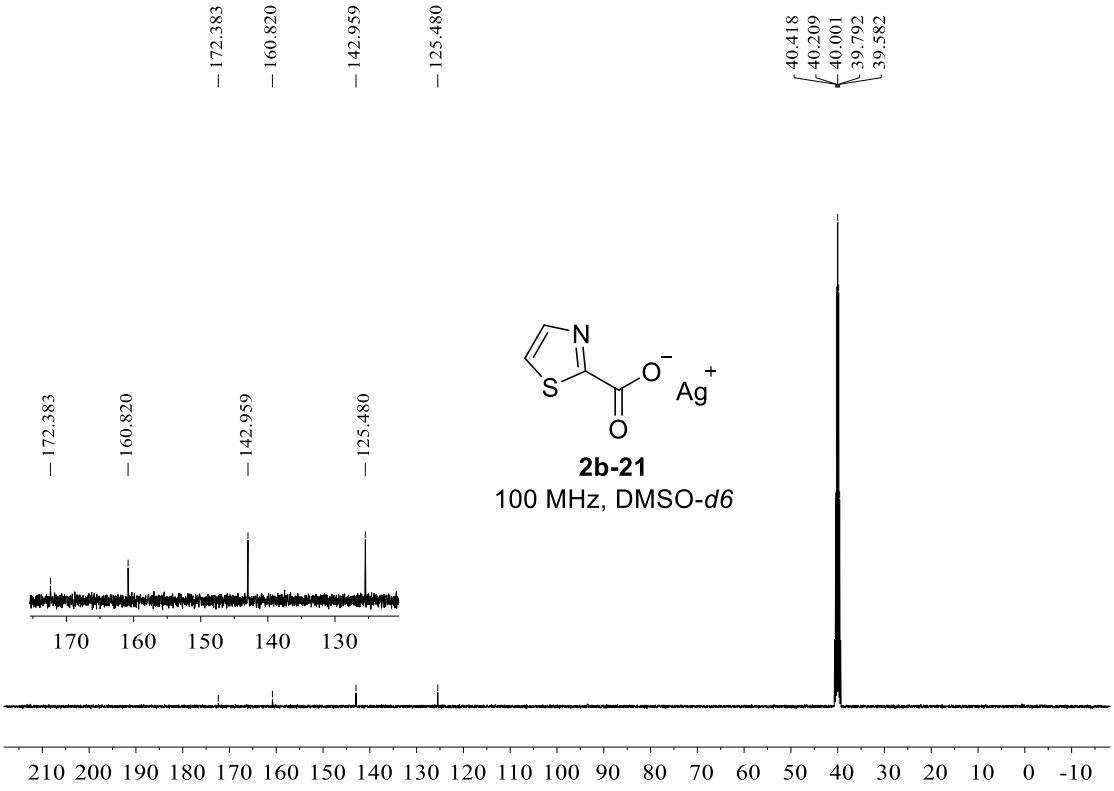


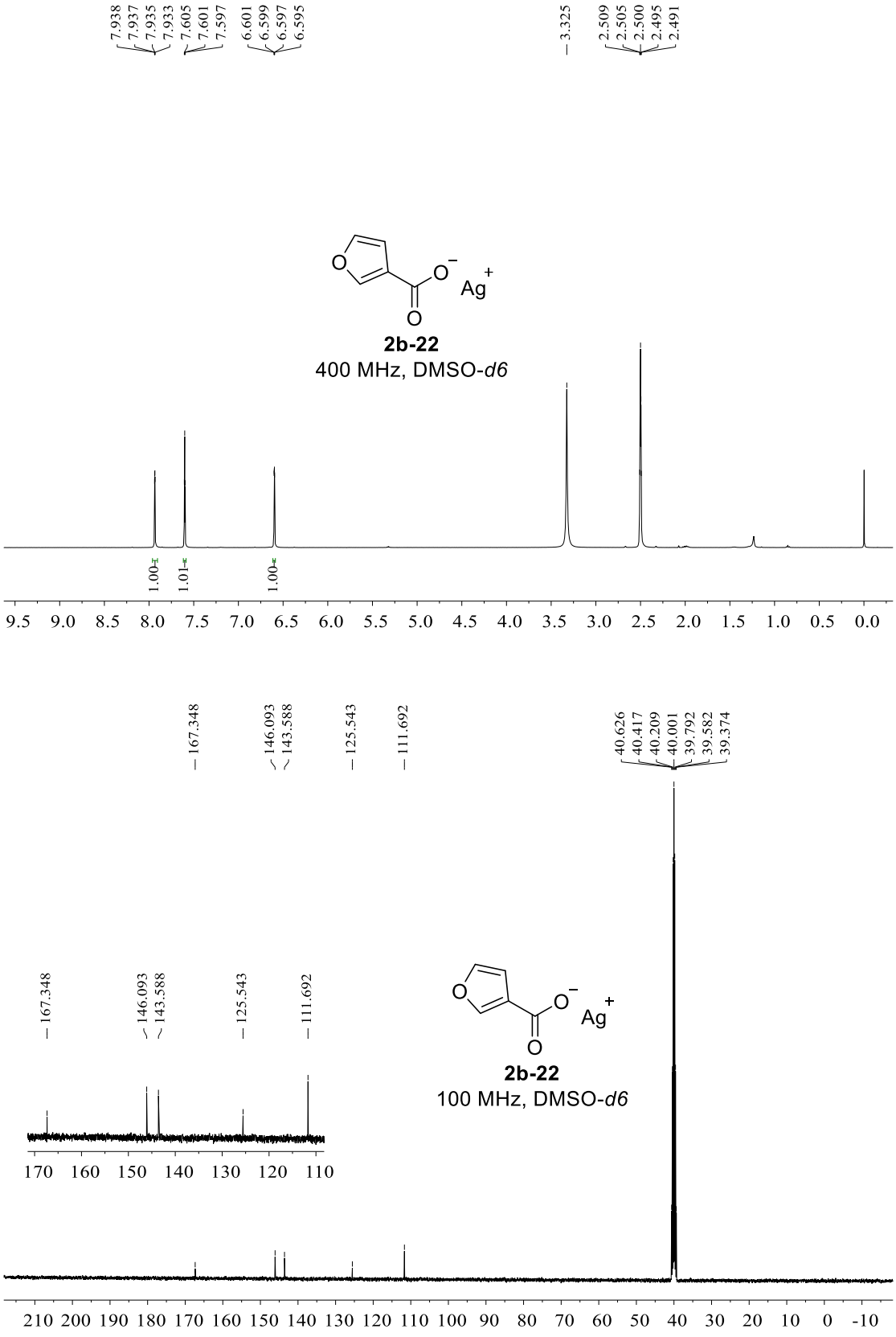
2b-19
100 MHz, Pyridine-*d5*

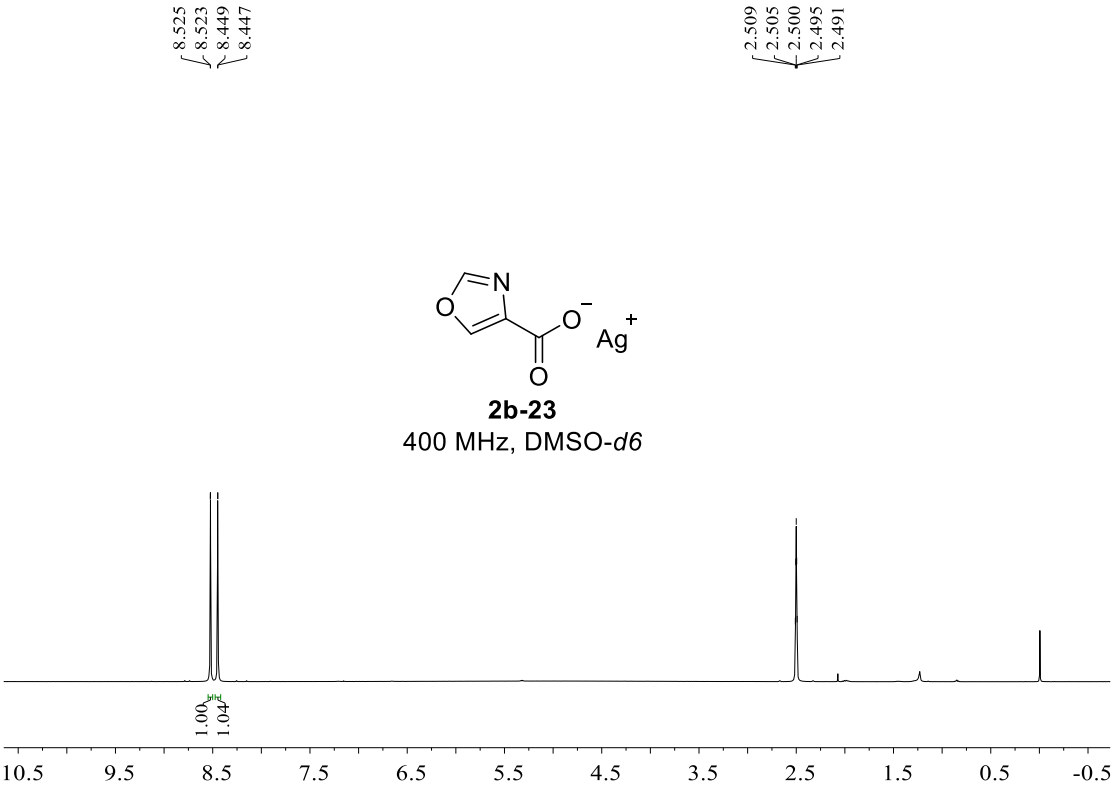

7.585
7.581
7.572
7.569
7.478
7.475
7.469
7.466
7.062
7.054
7.050
7.041
3.344
2.505
2.500
2.495
O
S
O
Ag
2b-20
400 MHz, DMSO-d6
1.00
1.01
1.01
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

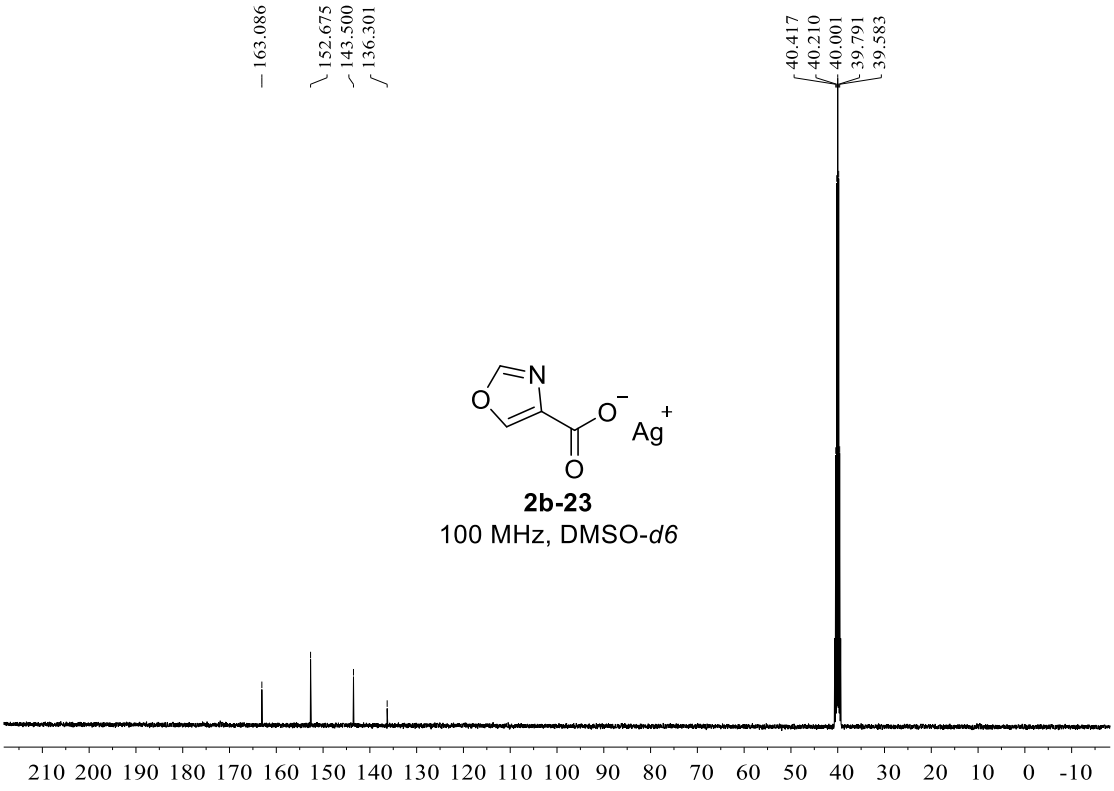

166.233
143.015
130.552
130.274
127.885
40.626
40.419
40.210
40.000
39.791
39.583
39.374
O
S
O
Ag
2b-20
100 MHz, DMSO-d6
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

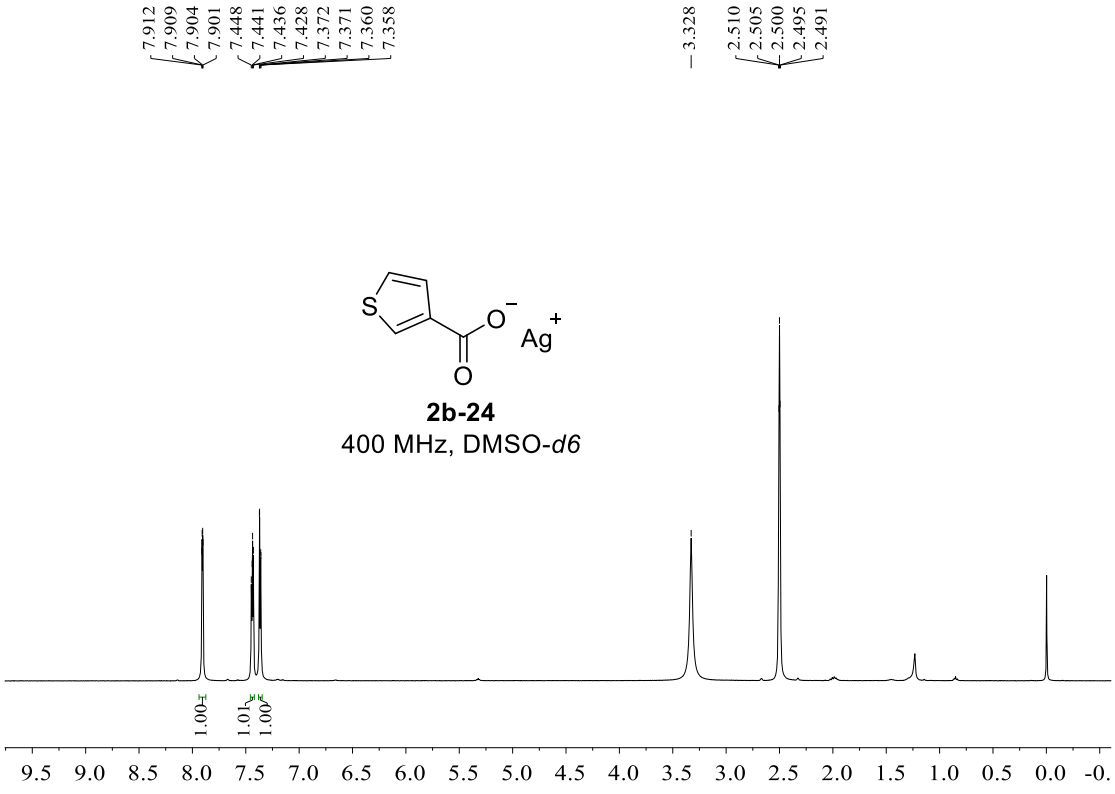

7.910
7.902
7.879
7.871
3.327
2.509
2.505
2.500
2.495
2.491
N
S
O
O
Ag+
2b-21
400 MHz, DMSO-d6
1.00
1.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

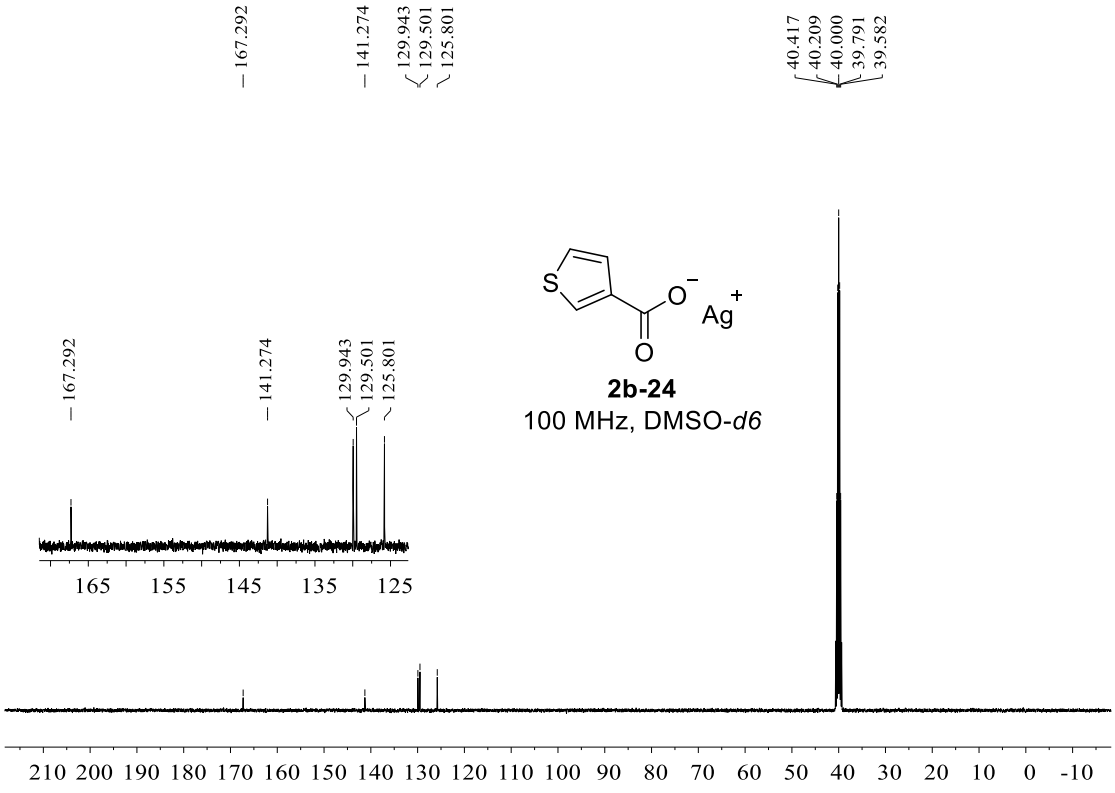

172.383
160.820
142.959
125.480
40.418
40.209
40.001
39.792
39.582
N
S
O
O
Ag+
2b-21
100 MHz, DMSO-d6
170 160 150 140 130
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

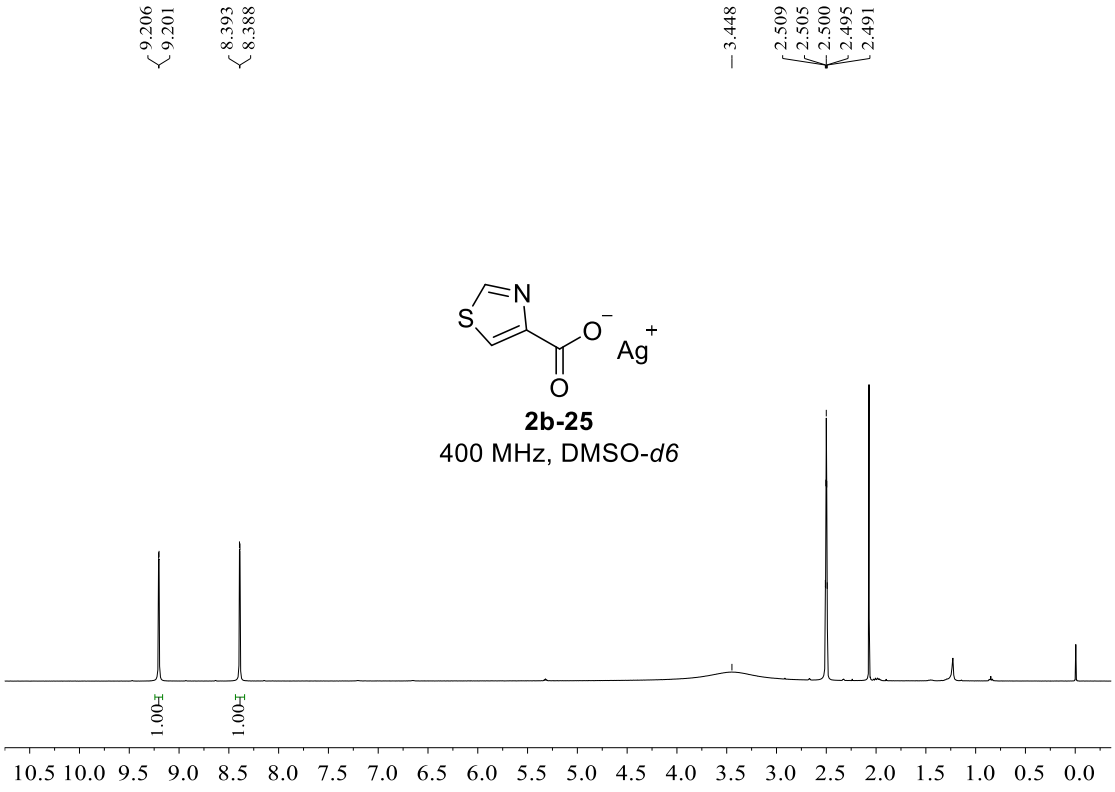

7.938
7.937
7.935
7.933
7.605
7.601
7.597
6.601
6.599
6.597
6.595
3.325
2.509
2.505
2.500
2.495
2.491
Ag+
2b-22
400 MHz, DMSO-d6
1.00
1.01
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0
167.348
146.093
143.588
125.543
111.692
40.626
40.417
40.209
40.001
39.792
39.582
39.374
2b-22
100 MHz, DMSO-d6
170 160 150 140 130 120 110
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

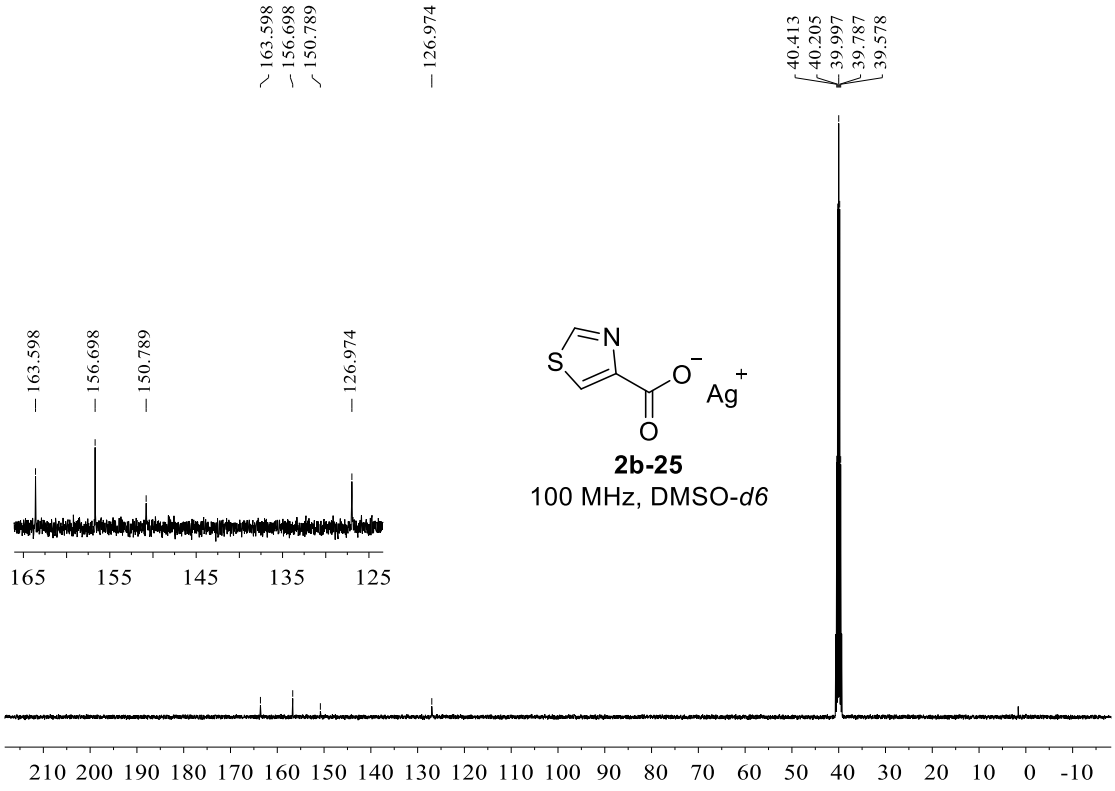

8.525
8.523
8.449
8.447
2.509
2.505
2.500
2.495
2.491
N
O
O
Ag
O
2b-23
400 MHz, DMSO-d6
1.00
1.04
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

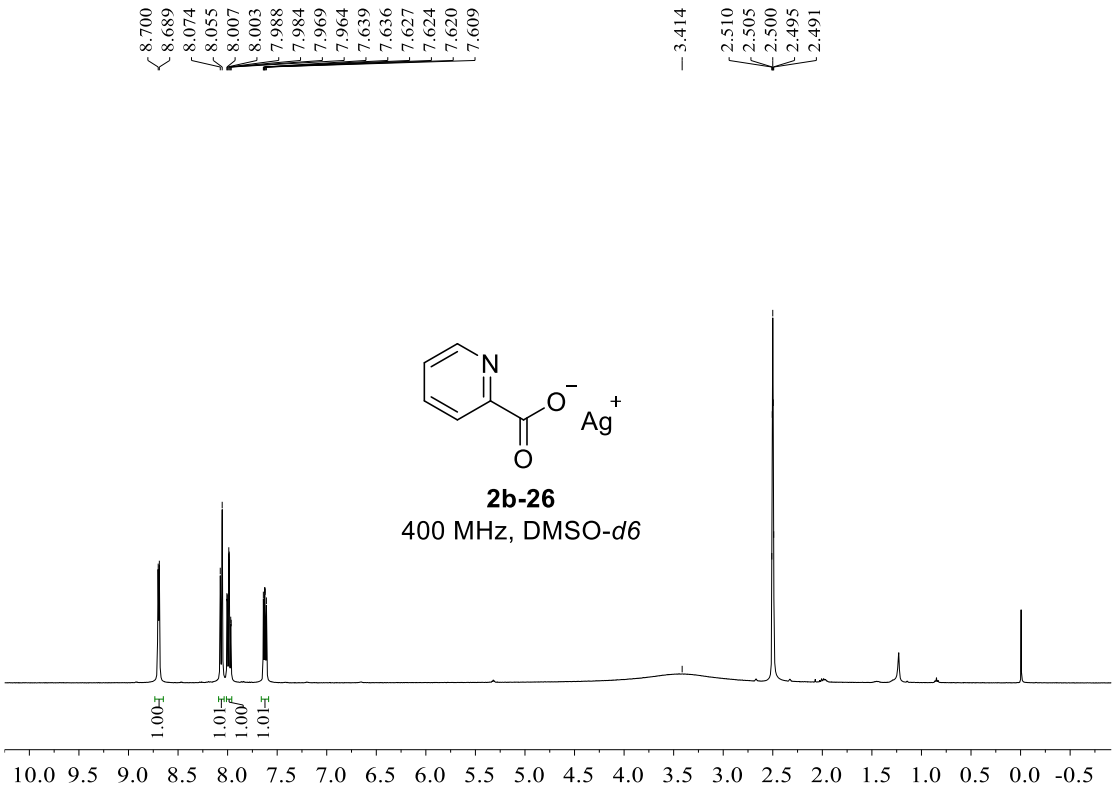

163.086
152.675
143.500
136.301
40.417
40.210
40.001
39.791
39.583
N
O
O
Ag
O
2b-23
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

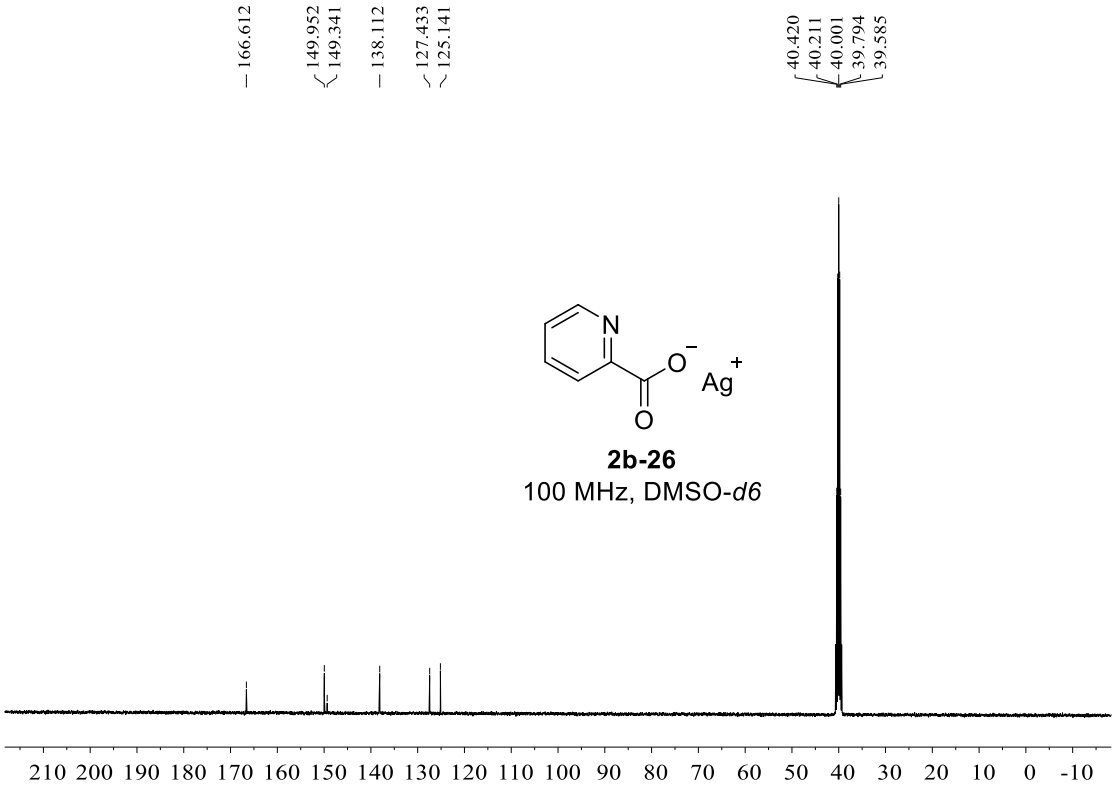

7.912
7.909
7.904
7.901
7.448
7.441
7.436
7.428
7.372
7.371
7.360
7.358
3.328
2.510
2.505
2.500
2.495
2.491
S
O
O
Ag
2b-24
400 MHz, DMSO-d6
1.00
1.01
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.

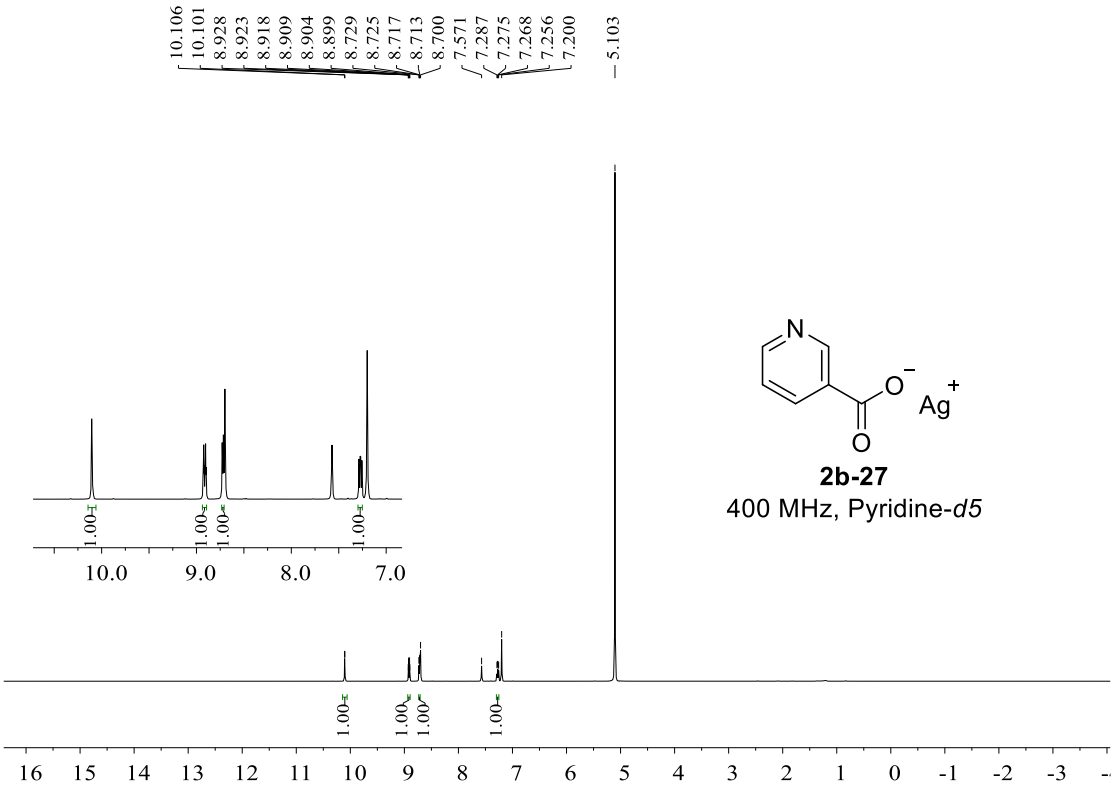

167.292
141.274
129.943
129.501
125.801
40.417
40.209
40.000
39.791
39.582
S
O
O
Ag
2b-24
100 MHz, DMSO-d6
165 155 145 135 125
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


9.206
9.201
8.393
8.388
3.448
2.509
2.505
2.500
2.495
2.491
N
S
O
O
Ag
2b-25
400 MHz, DMSO-d6
1.00
1.00
10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

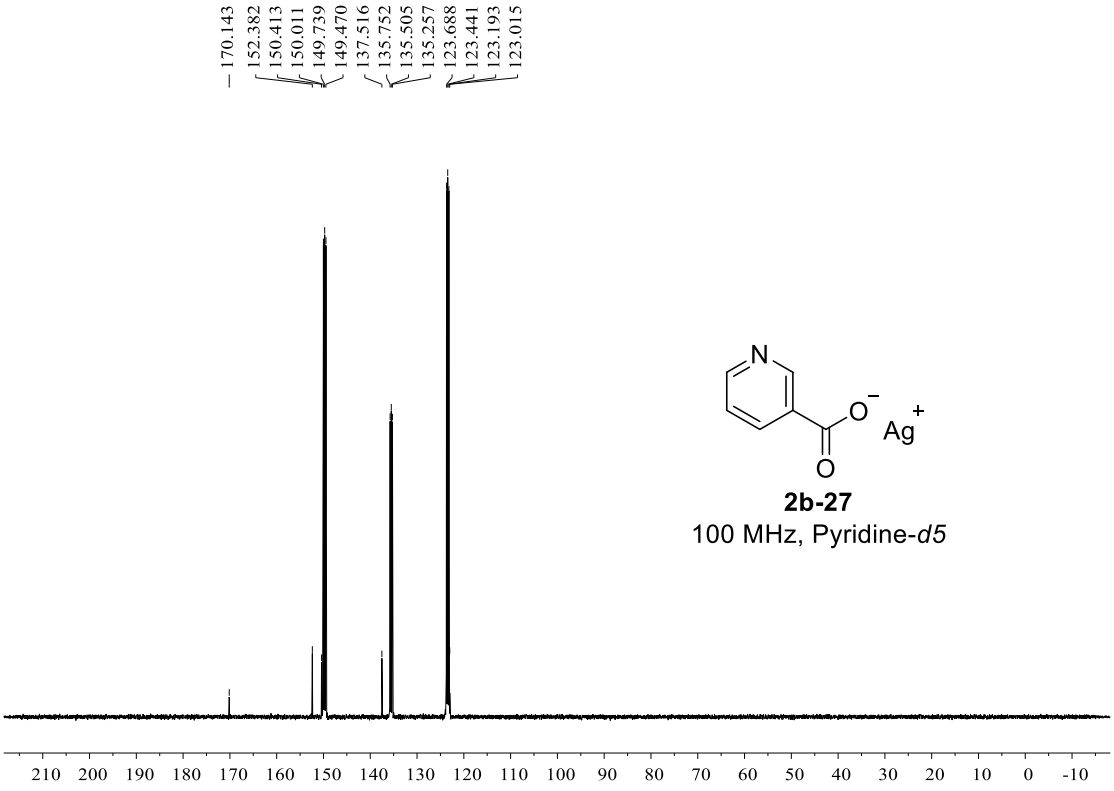

163.598
156.698
150.789
126.974
40.413
40.205
39.997
39.787
39.578
N
S
O
O
Ag
2b-25
100 MHz, DMSO-d6
165 155 145 135 125
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


8.700
8.689
8.074
8.055
8.007
8.003
7.988
7.984
7.969
7.964
7.639
7.636
7.627
7.624
7.620
7.609
3.414
2.510
2.505
2.500
2.495
2.491
N
O
O
Ag
+
2b-26
400 MHz, DMSO-d6
1.00
1.01
1.00
1.01
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

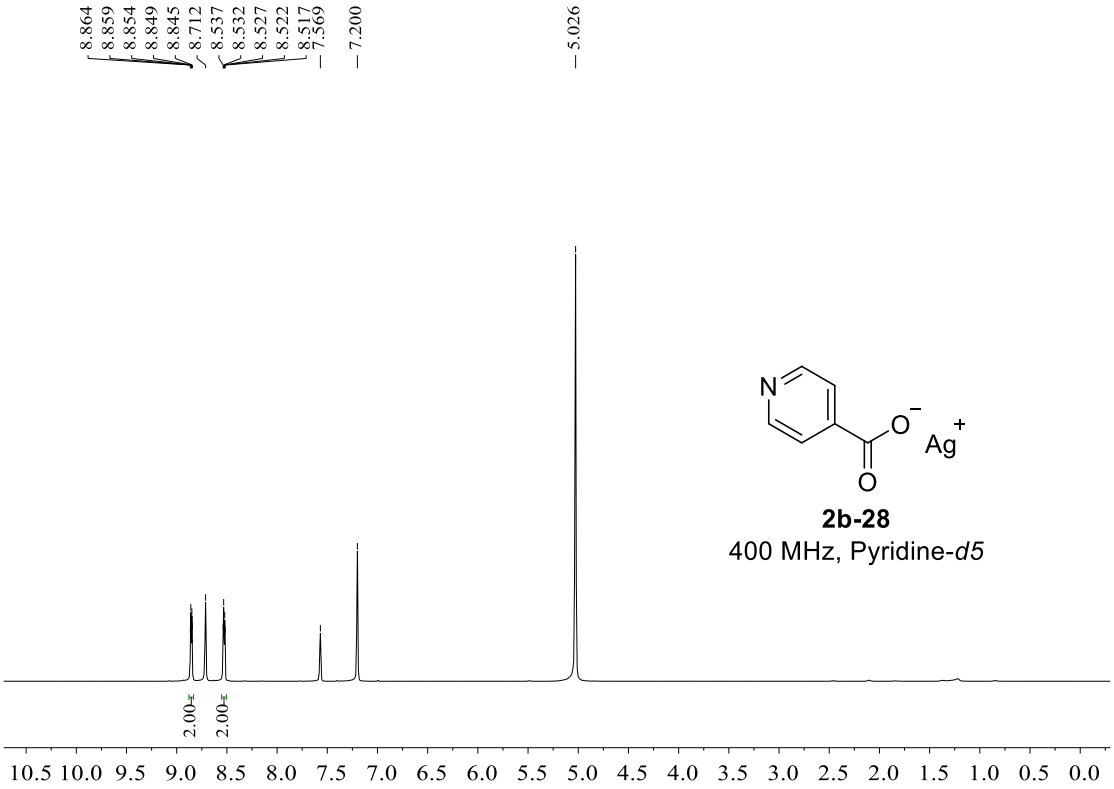

166.612
149.952
149.341
138.112
127.433
125.141
40.420
40.211
40.001
39.794
39.585
N
O
O
Ag
+
2b-26
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10



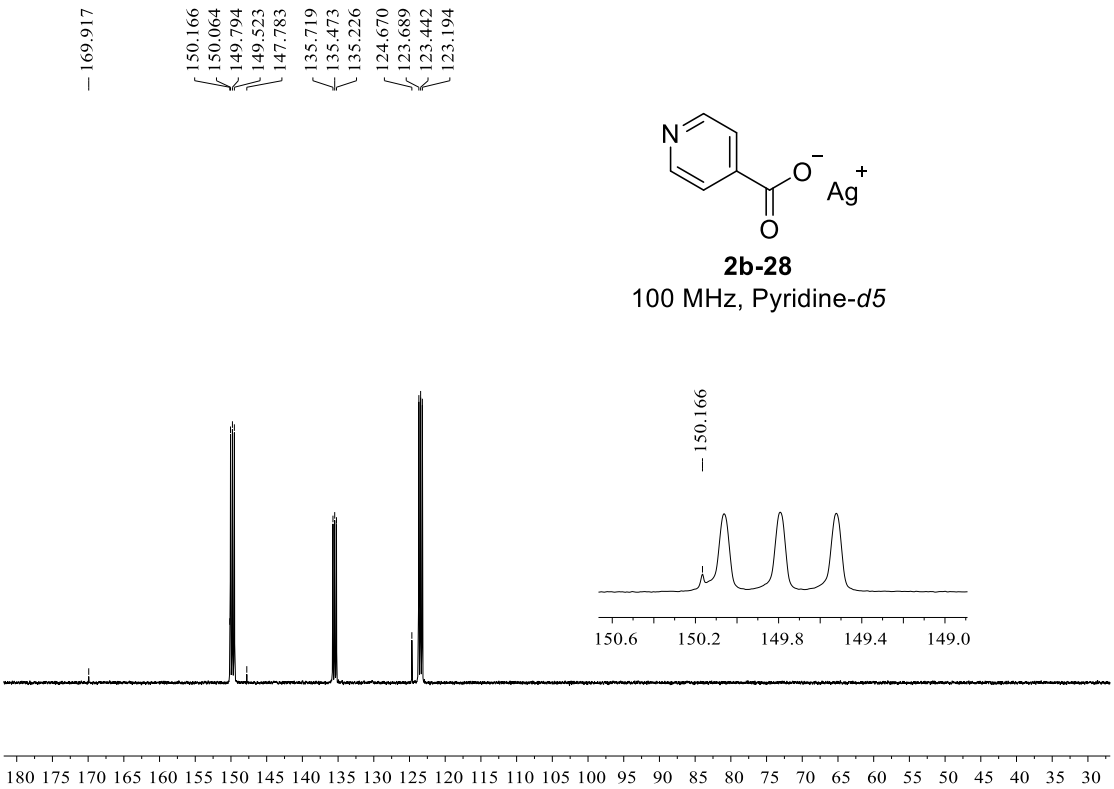
2b-27
400 MHz, Pyridine-*d5*



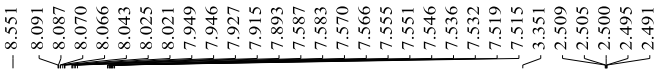
2b-27
100 MHz, Pyridine-*d5*

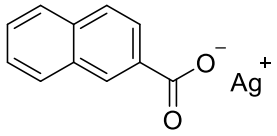


2b-28
400 MHz, Pyridine-*d5*



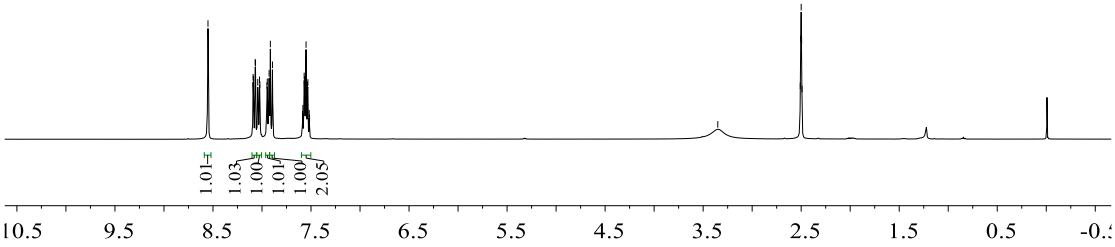
2b-28
100 MHz, Pyridine-*d5*

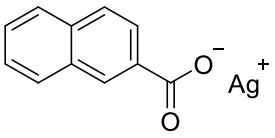




2b-29

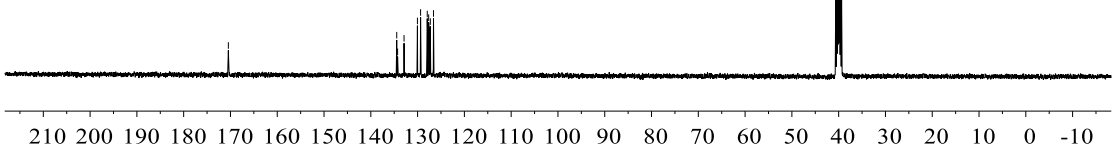
400 MHz, DMSO-*d6*

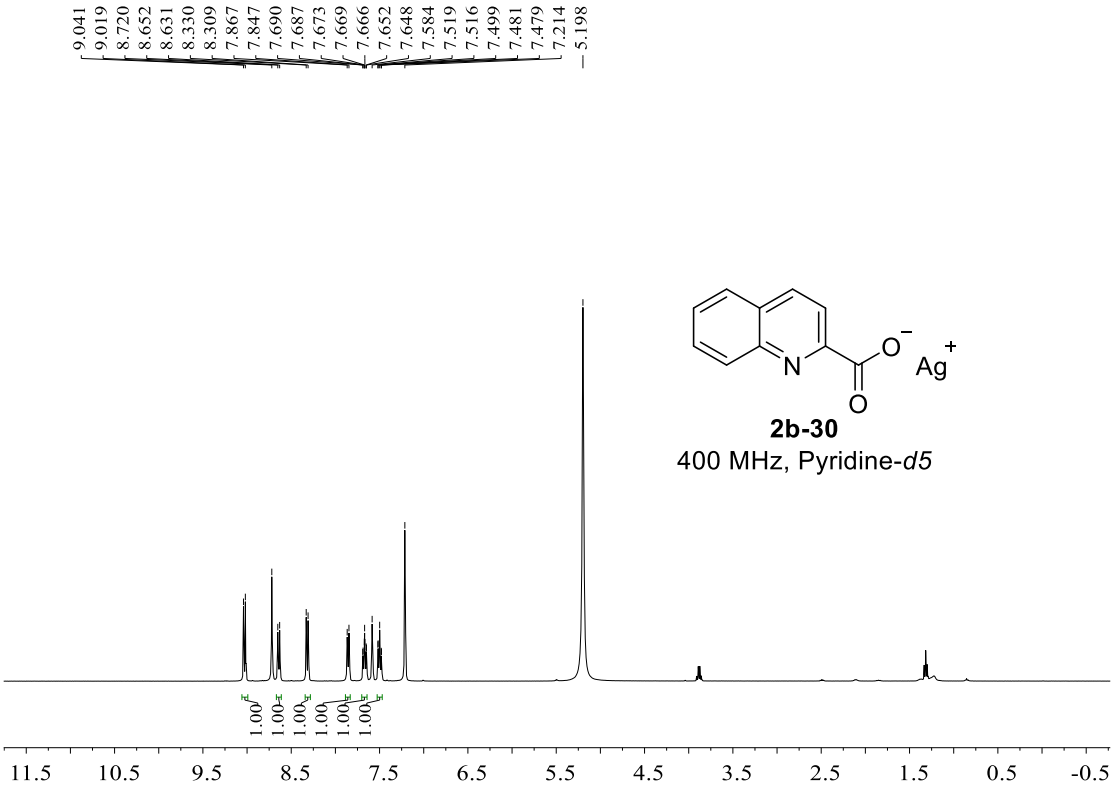


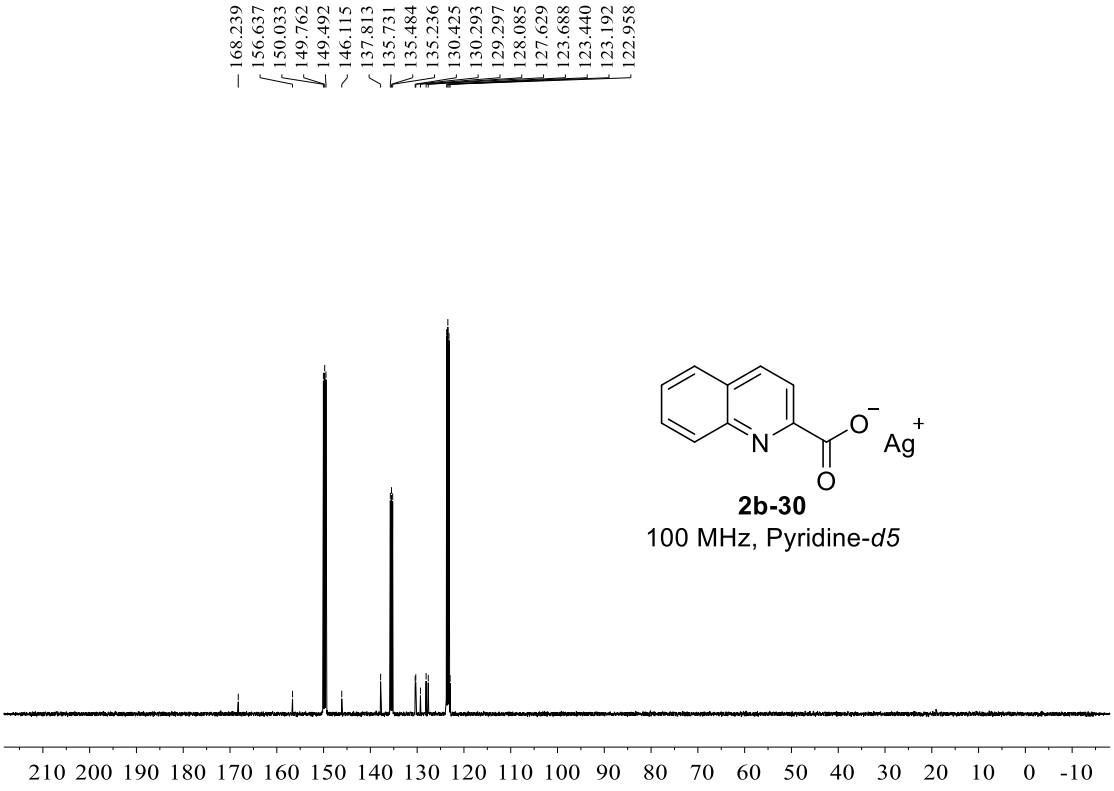


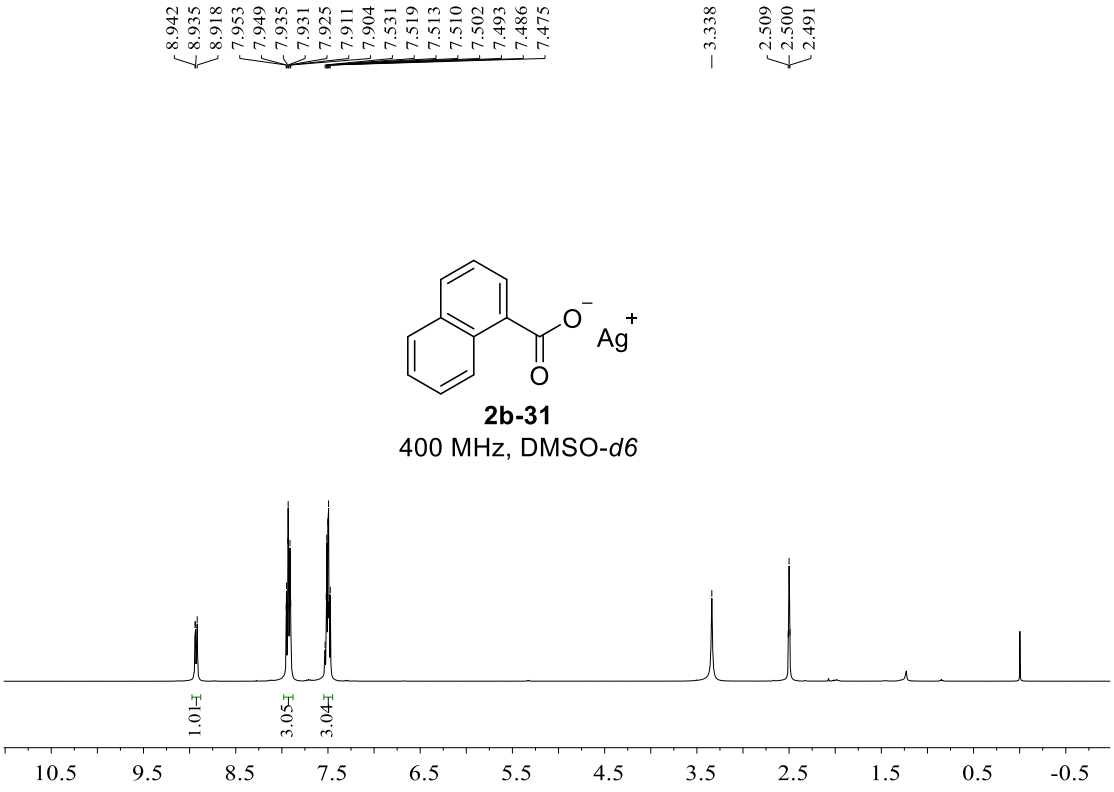
2b-29

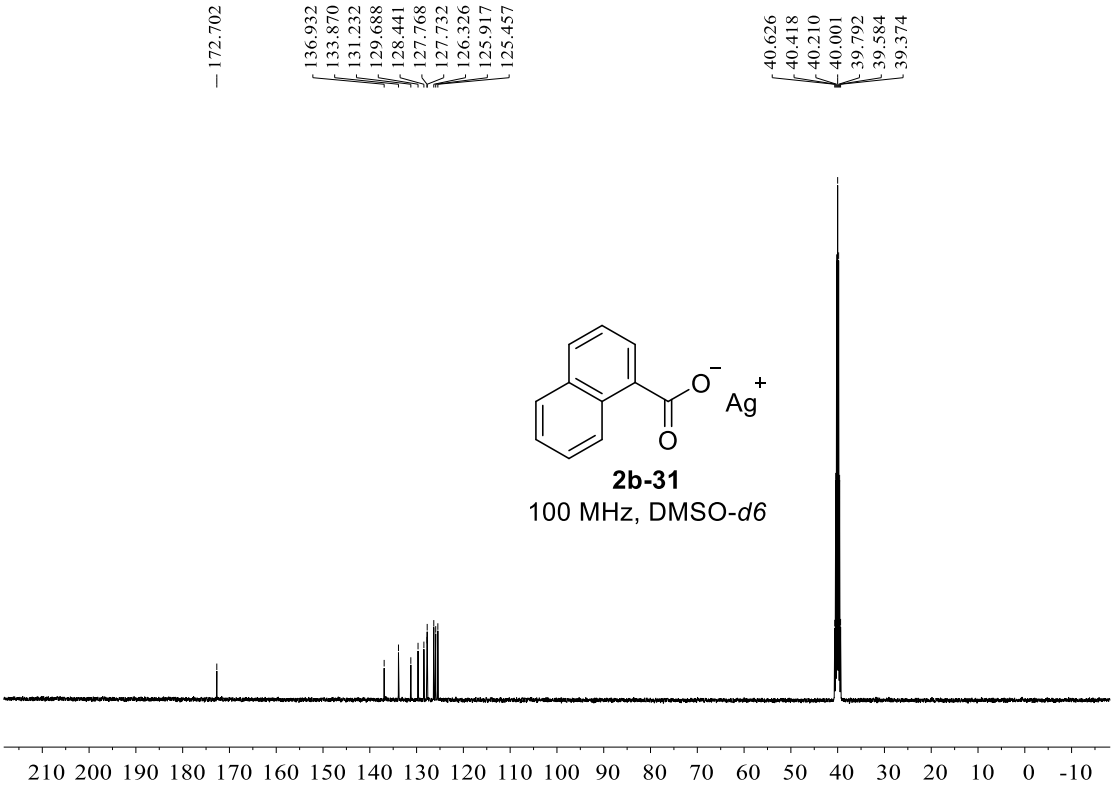
100 MHz, DMSO-*d6*

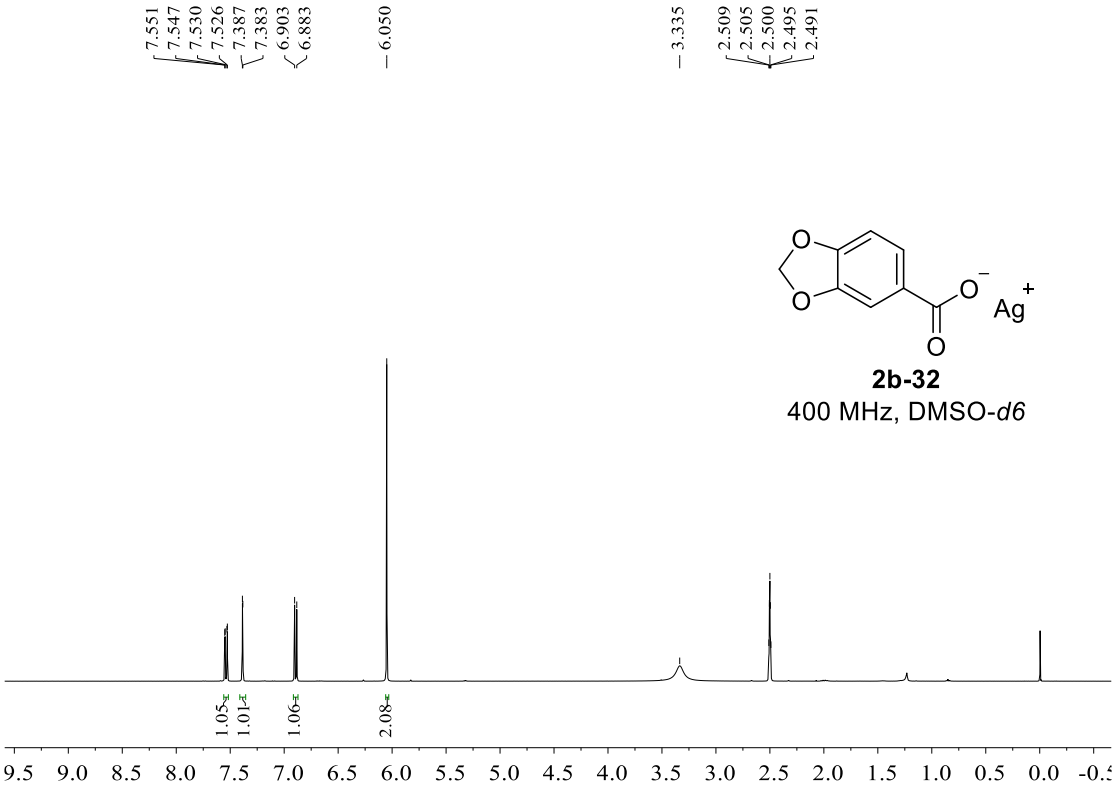


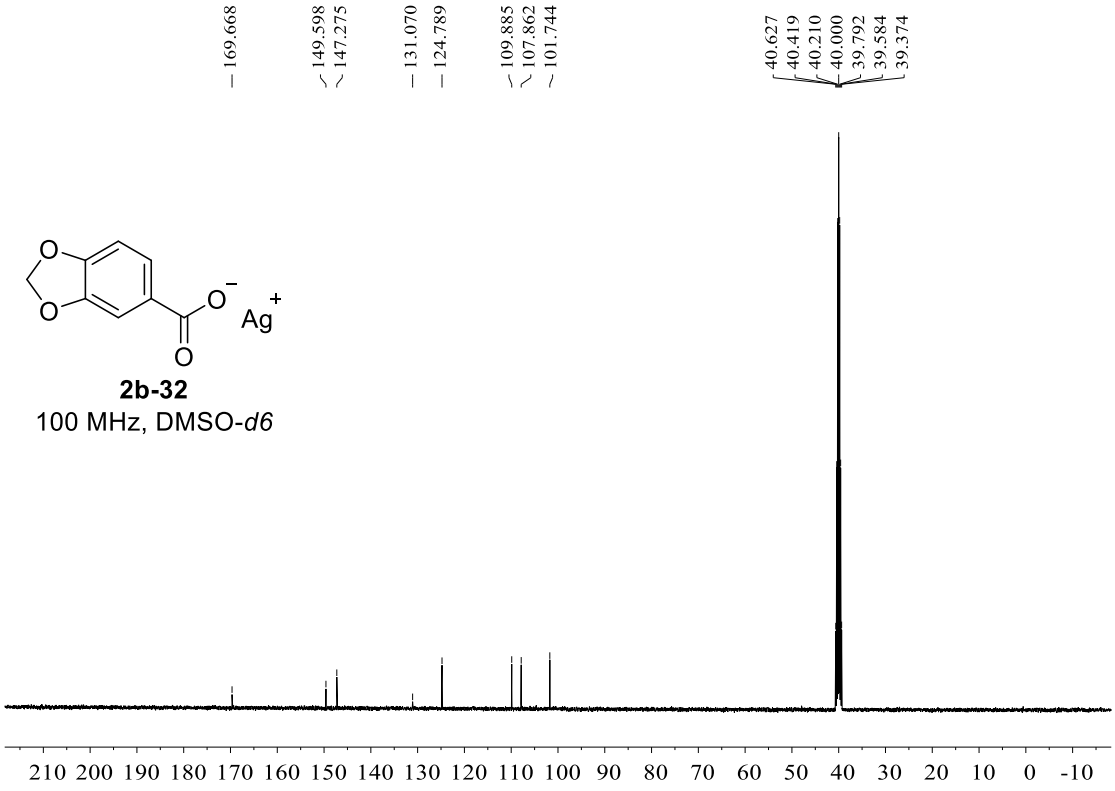

9.041
9.019
8.720
8.652
8.631
8.330
8.309
7.867
7.847
7.690
7.687
7.673
7.669
7.666
7.652
7.648
7.584
7.519
7.516
7.499
7.481
7.479
7.214
5.198
2b-30
400 MHz, Pyridine-d5
1.00
1.00
1.00
1.00
1.00
1.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

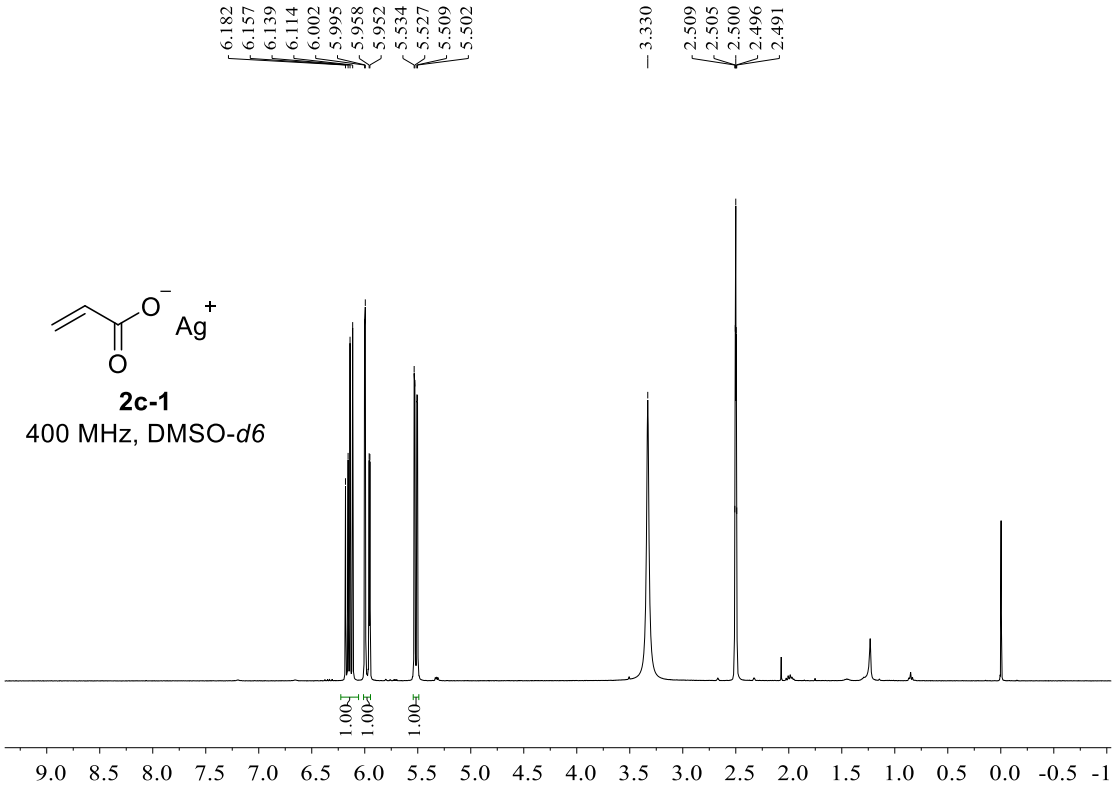

168.239
156.637
150.033
149.762
149.492
146.115
137.813
135.731
135.484
135.236
130.425
130.293
129.297
128.085
127.629
123.688
123.440
123.192
122.958
2b-30
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

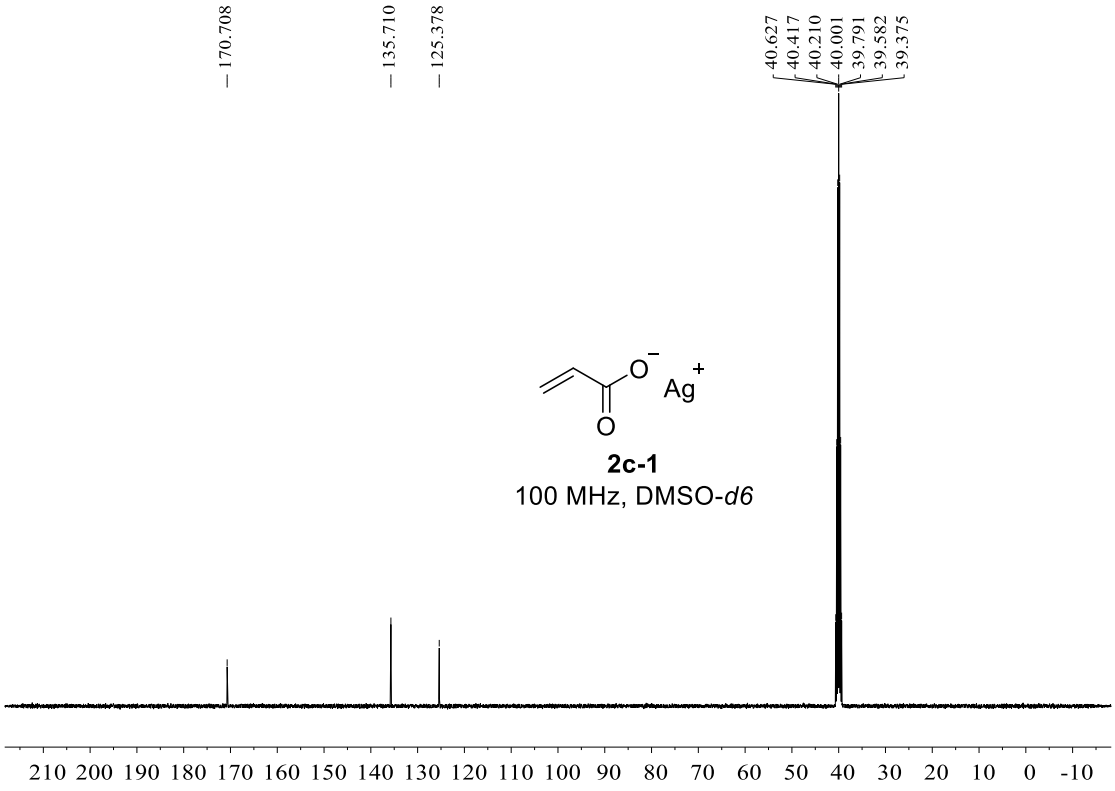

8.942
8.935
8.918
7.953
7.949
7.935
7.931
7.925
7.911
7.904
7.531
7.519
7.513
7.510
7.502
7.493
7.486
7.475
3.338
2.509
2.500
2.491
O
Ag
O
2b-31
400 MHz, DMSO-d6
1.01
3.05
3.04
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

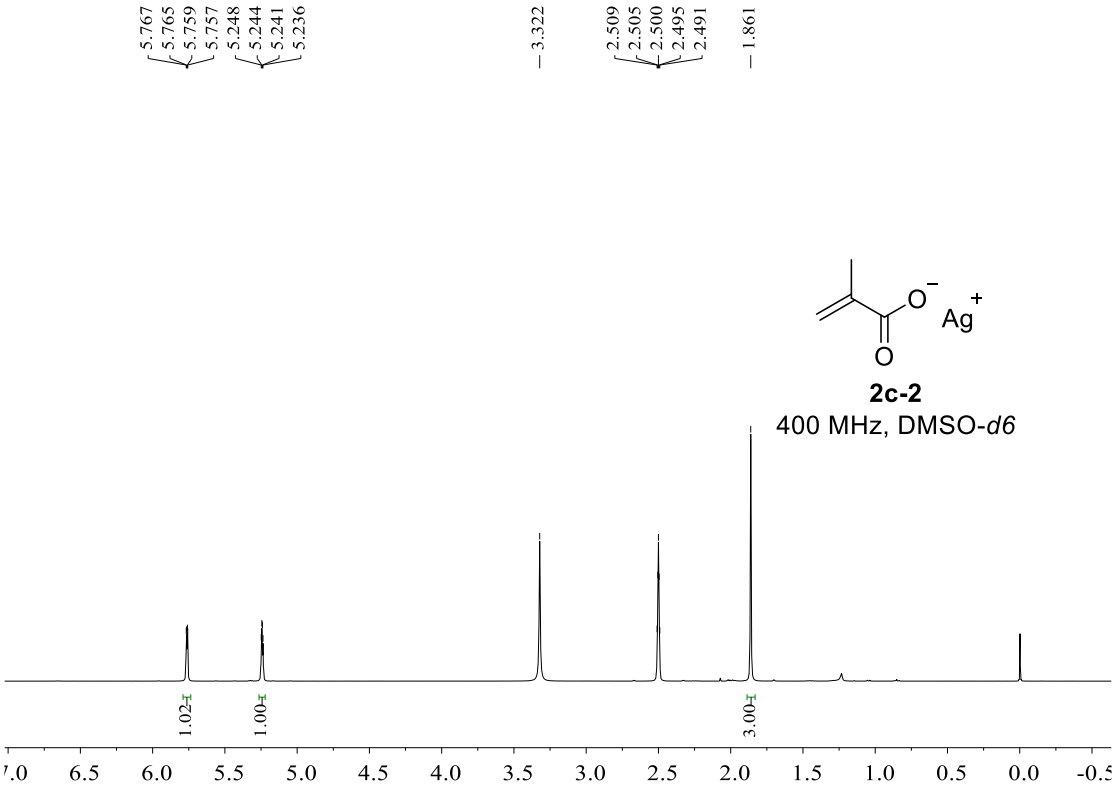

172.702
136.932
133.870
131.232
129.688
128.441
127.768
127.732
126.326
125.917
125.457
40.626
40.418
40.210
40.001
39.792
39.584
39.374
O
Ag
O
2b-31
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

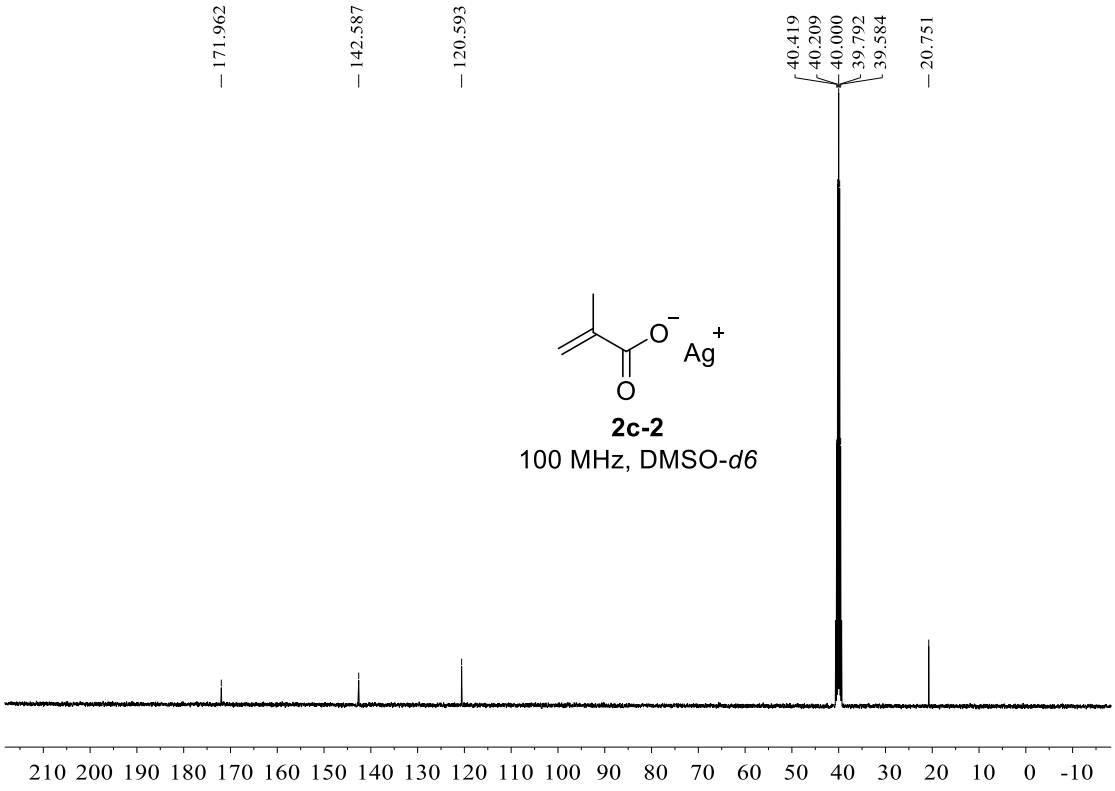

7.551
7.547
7.530
7.526
7.387
7.383
6.903
6.883
6.050
3.335
2.509
2.505
2.500
2.495
2.491
O
O
O
O
Ag+
2b-32
400 MHz, DMSO-d6
1.05
1.01
1.06
2.08
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

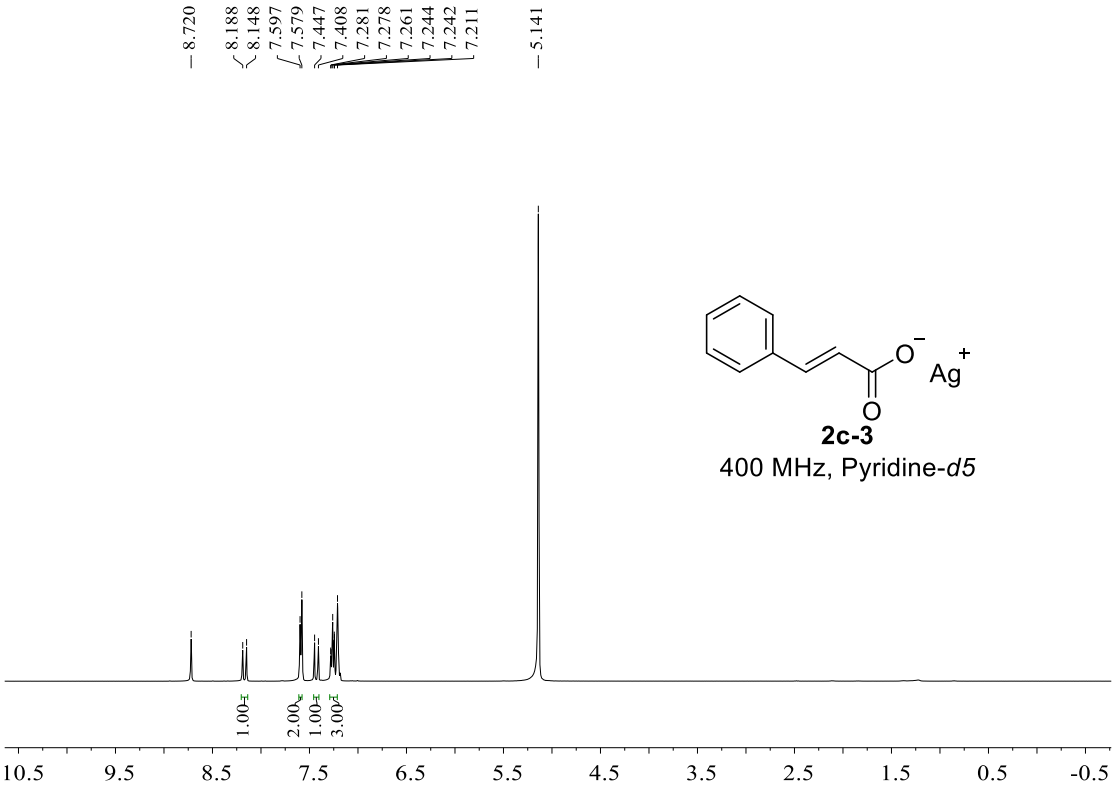

169.668
149.598
147.275
131.070
124.789
109.885
107.862
101.744
40.627
40.419
40.210
40.000
39.792
39.584
39.374
O
O
O
O
Ag+
2b-32
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

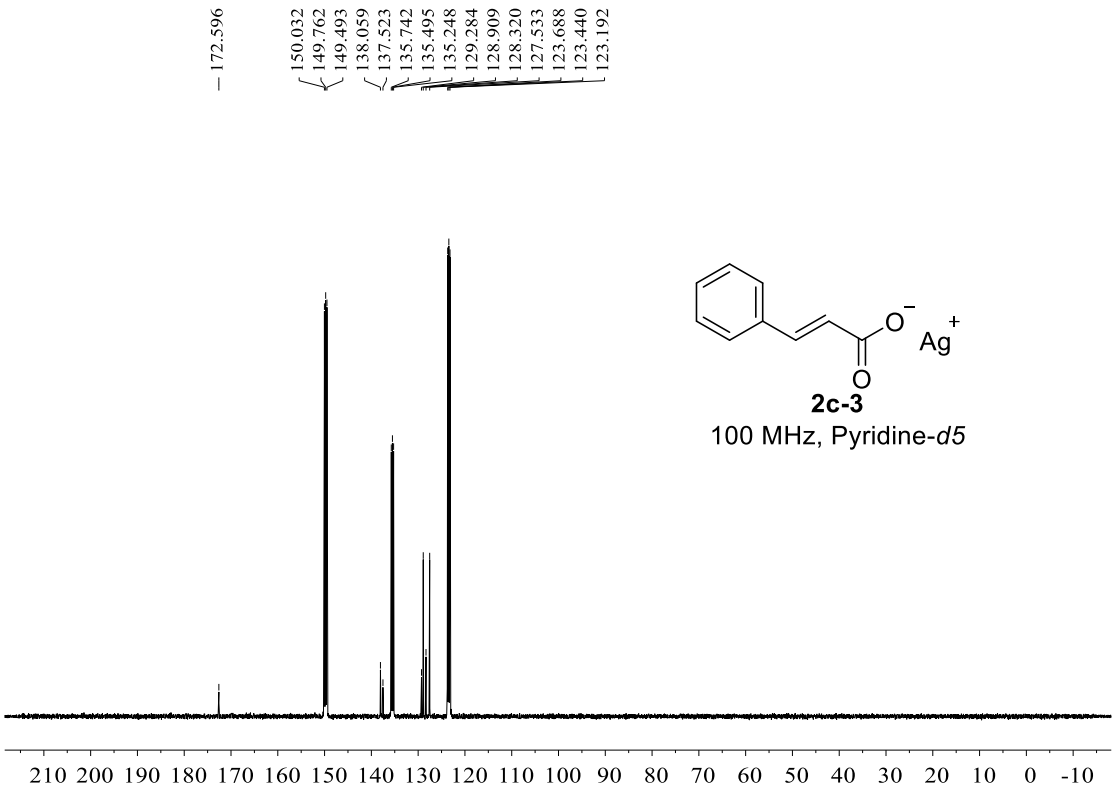

6.182
6.157
6.139
6.114
6.002
5.995
5.958
5.952
5.534
5.527
5.509
5.502
3.330
2.509
2.505
2.500
2.496
2.491
O
Ag
2c-1
400 MHz, DMSO-d6
1.00
1.00
1.00
9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5 -1

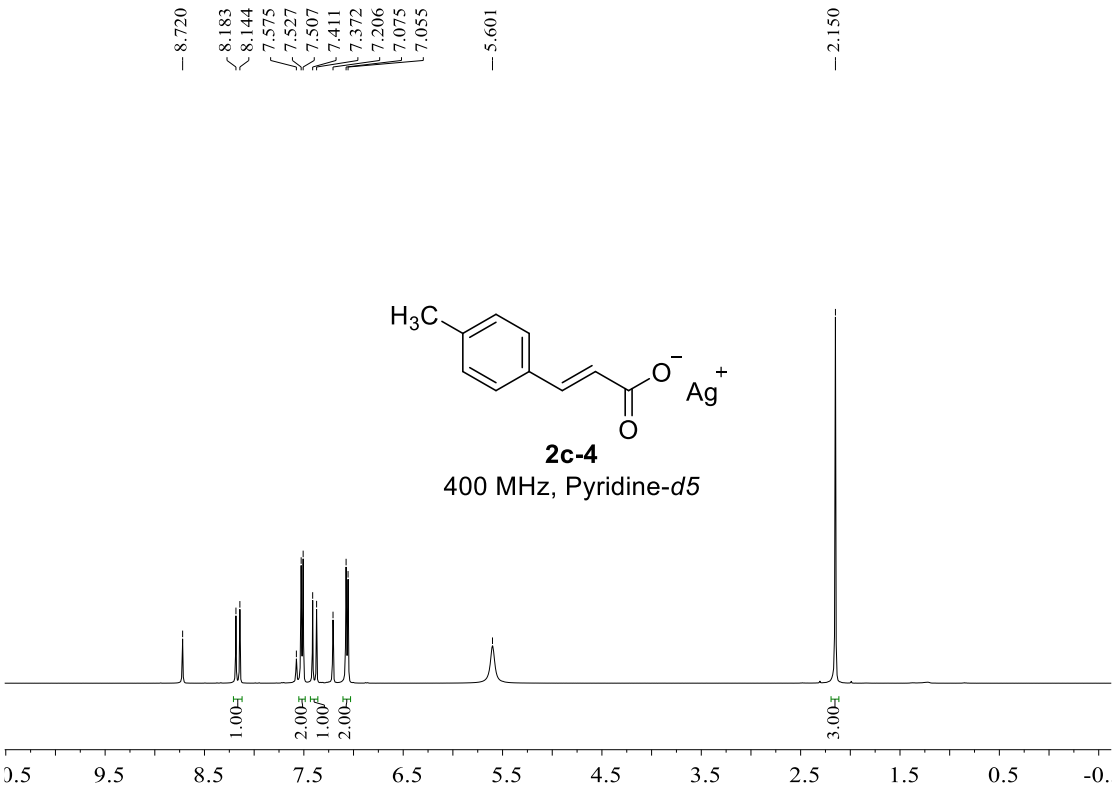

170.708
135.710
125.378
40.627
40.417
40.210
40.001
39.791
39.582
39.375
O
Ag
2c-1
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

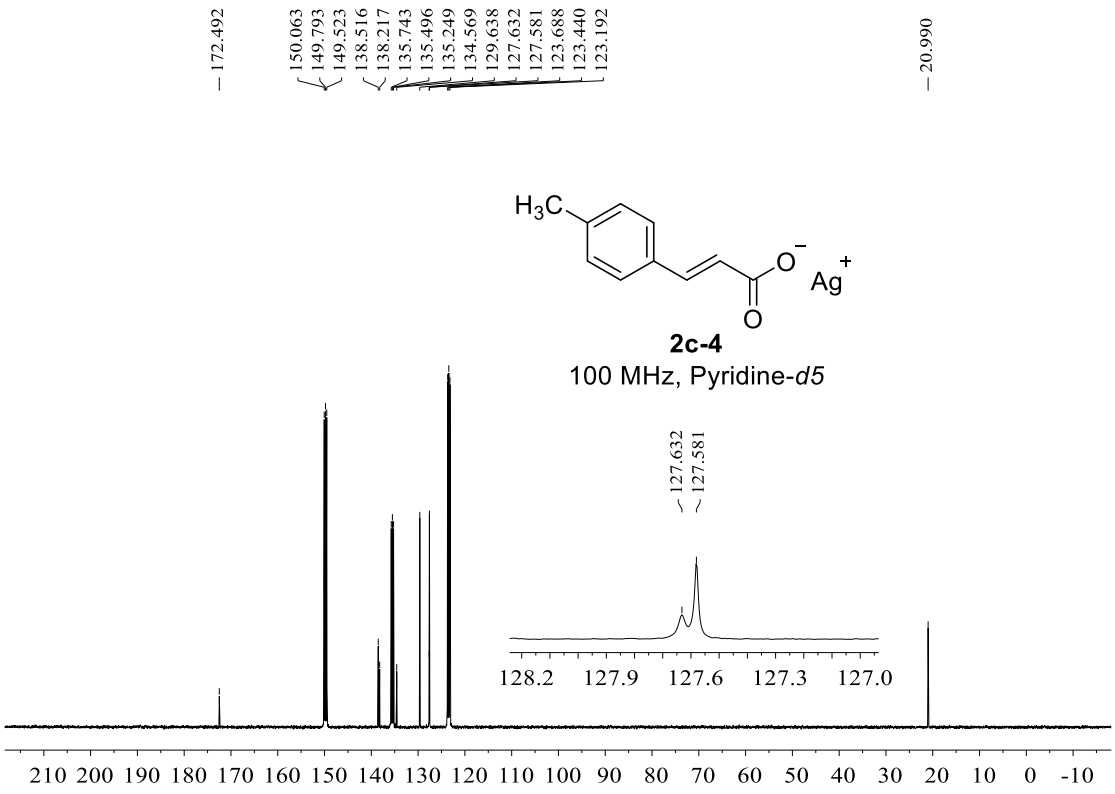

5.767
5.765
5.759
5.757
5.248
5.244
5.241
5.236
3.322
2.509
2.505
2.500
2.495
2.491
1.861
O
Ag
2c-2
400 MHz, DMSO-d6
1.02
1.00
3.00
7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

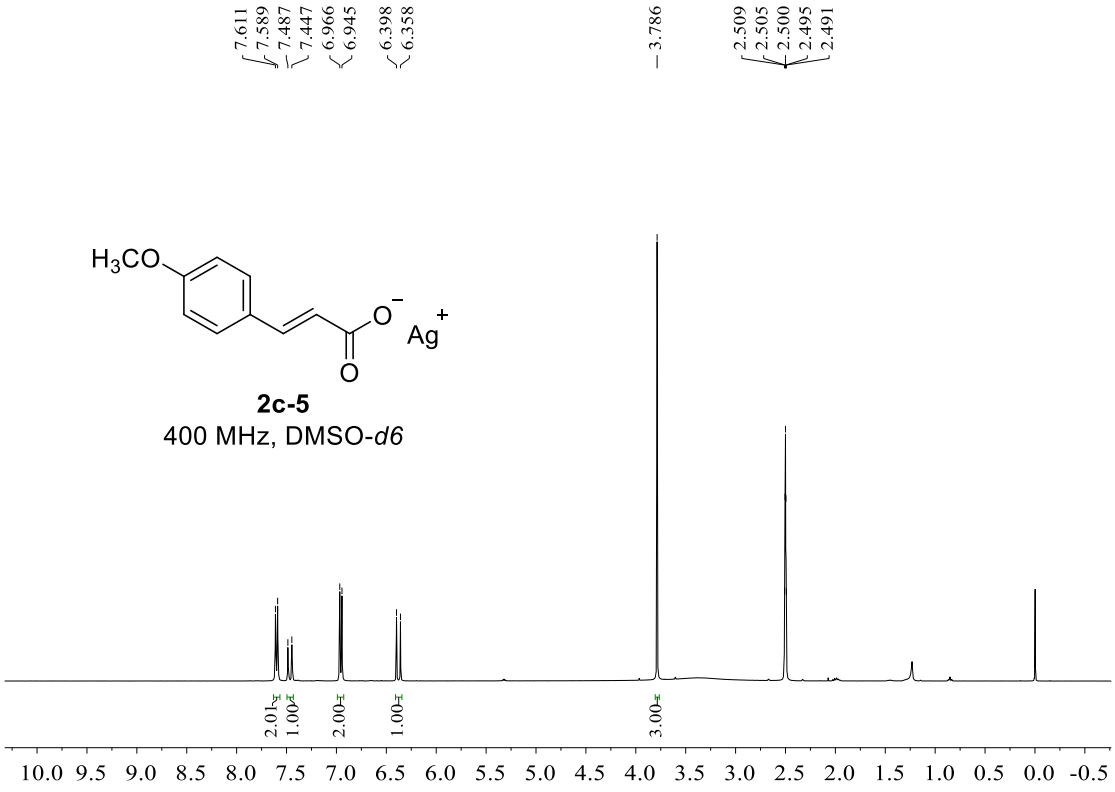

171.962
142.587
120.593
40.419
40.209
40.000
39.792
39.584
20.751
O
Ag
2c-2
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

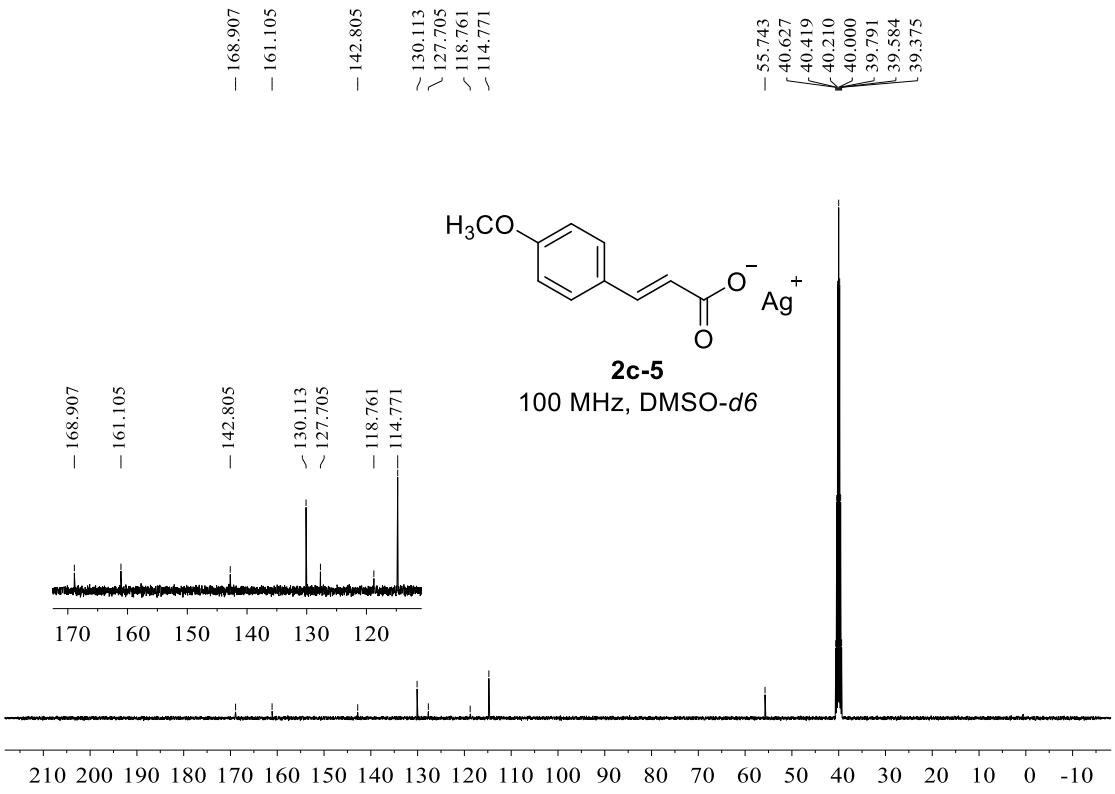

8.720
8.188
8.148
7.597
7.579
7.447
7.408
7.281
7.278
7.261
7.244
7.242
7.211
5.141
1.00
2.00
1.00
3.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
O
Ag
O
2c-3
400 MHz, Pyridine-d5

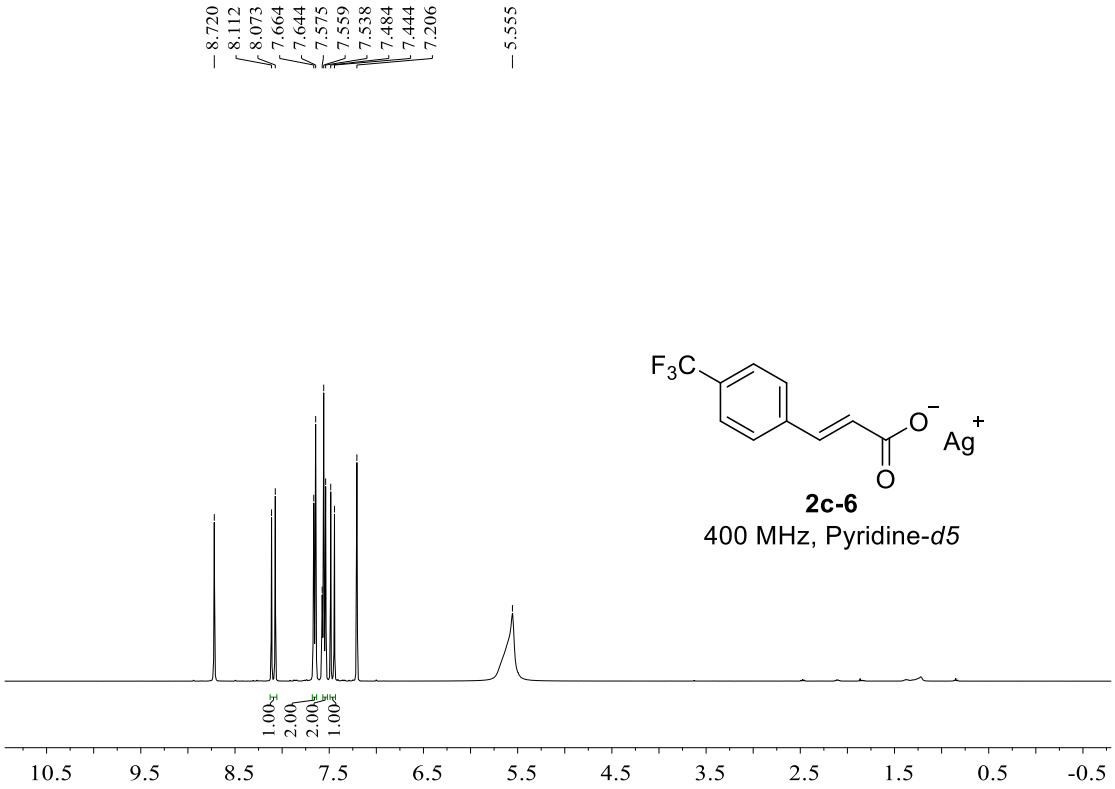

172.596
150.032
149.762
149.493
138.059
137.523
135.742
135.495
135.248
129.284
128.909
128.320
127.533
123.688
123.440
123.192
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
O
Ag
O
2c-3
100 MHz, Pyridine-d5

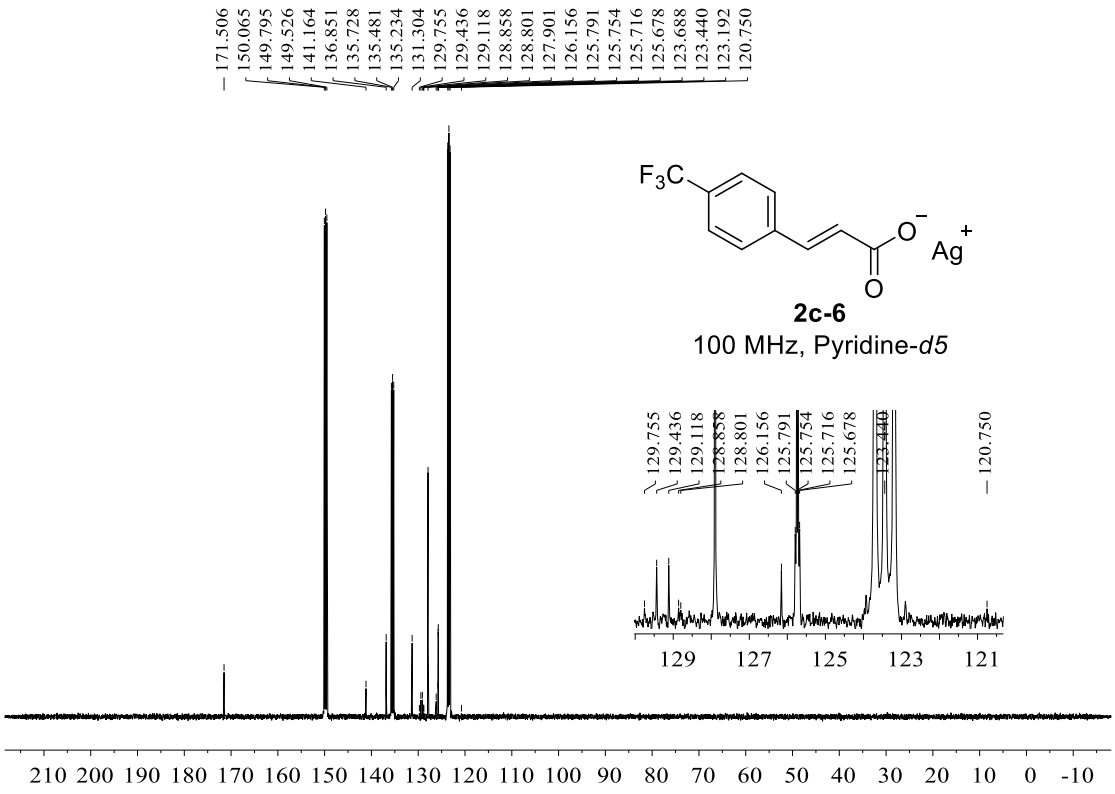

8.720
8.183
8.144
7.575
7.527
7.507
7.411
7.372
7.206
7.075
7.055
5.601
2.150
H3C
O
Ag+
2c-4
400 MHz, Pyridine-d5
1.00
2.00
1.00
2.00
3.00
0.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.

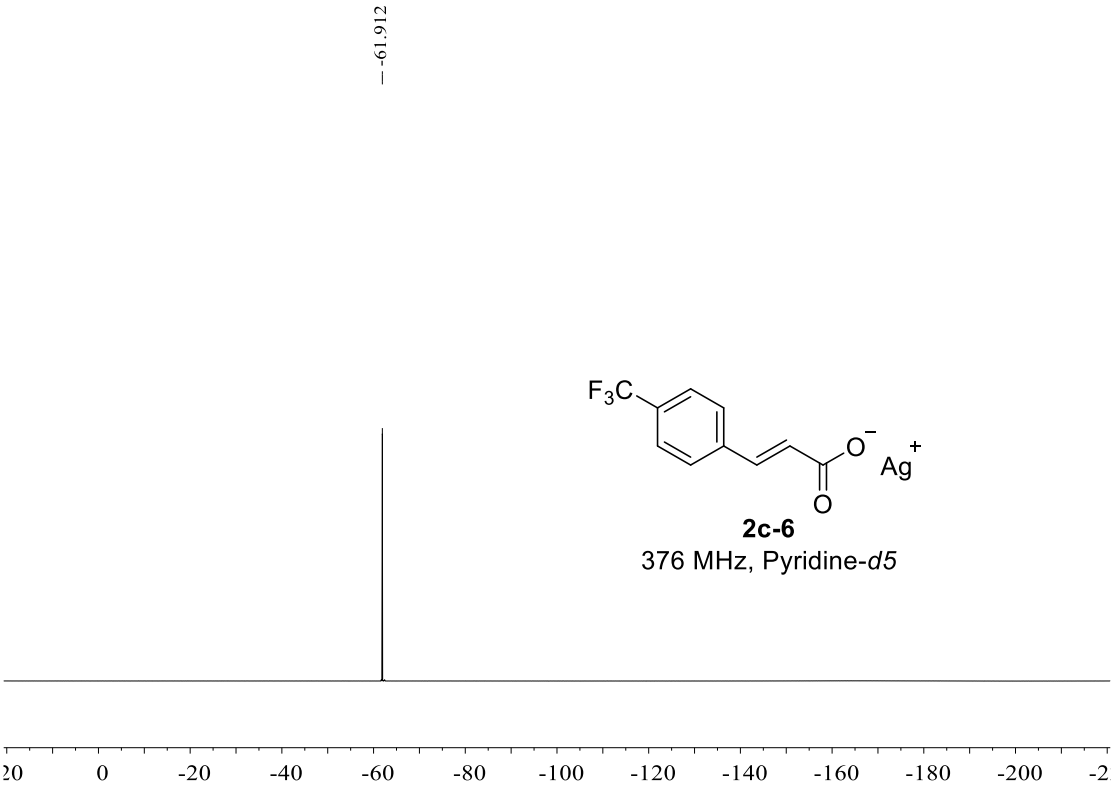

172.492
150.063
149.793
149.523
138.516
138.217
135.743
135.496
135.249
134.569
129.638
127.632
127.581
123.688
123.440
123.192
20.990
H3C
O
Ag+
2c-4
100 MHz, Pyridine-d5
127.632
127.581
128.2
127.9
127.6
127.3
127.0
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

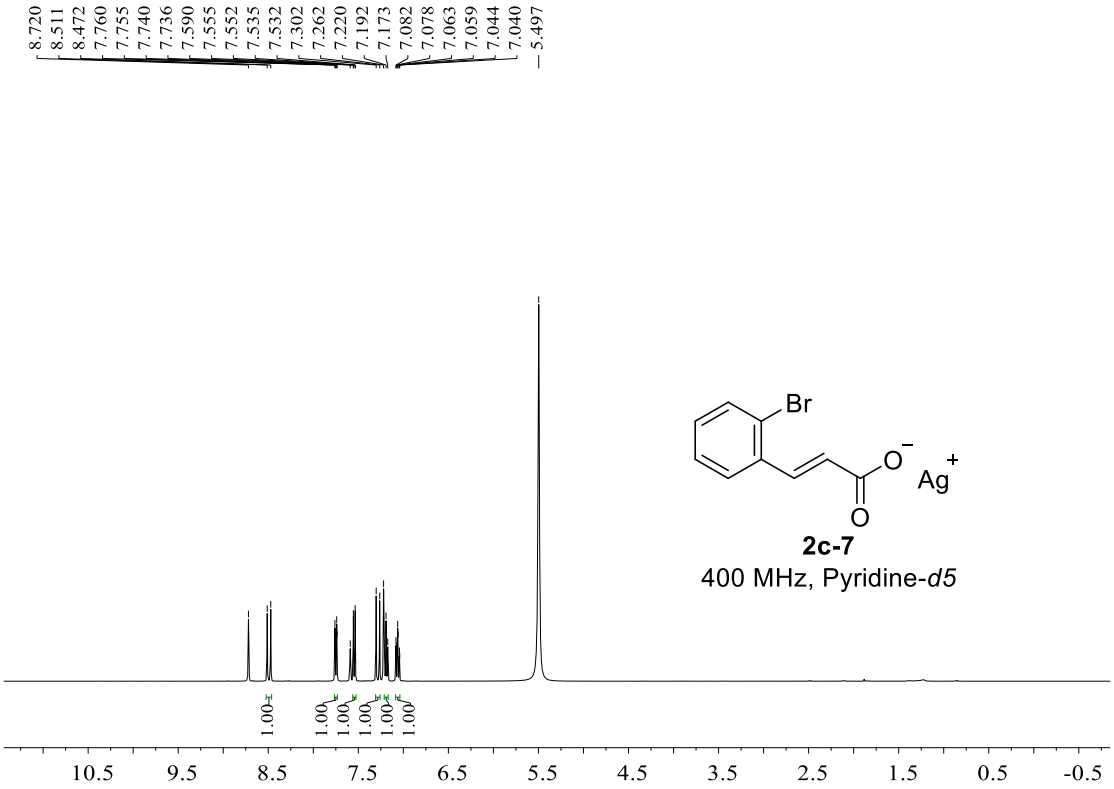

7.611
7.589
7.487
7.447
6.966
6.945
6.398
6.358
3.786
2.509
2.505
2.500
2.495
2.491
H3CO
O
Ag+
2c-5
400 MHz, DMSO-d6
2.01
1.00
2.00
1.00
3.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0 -0.5

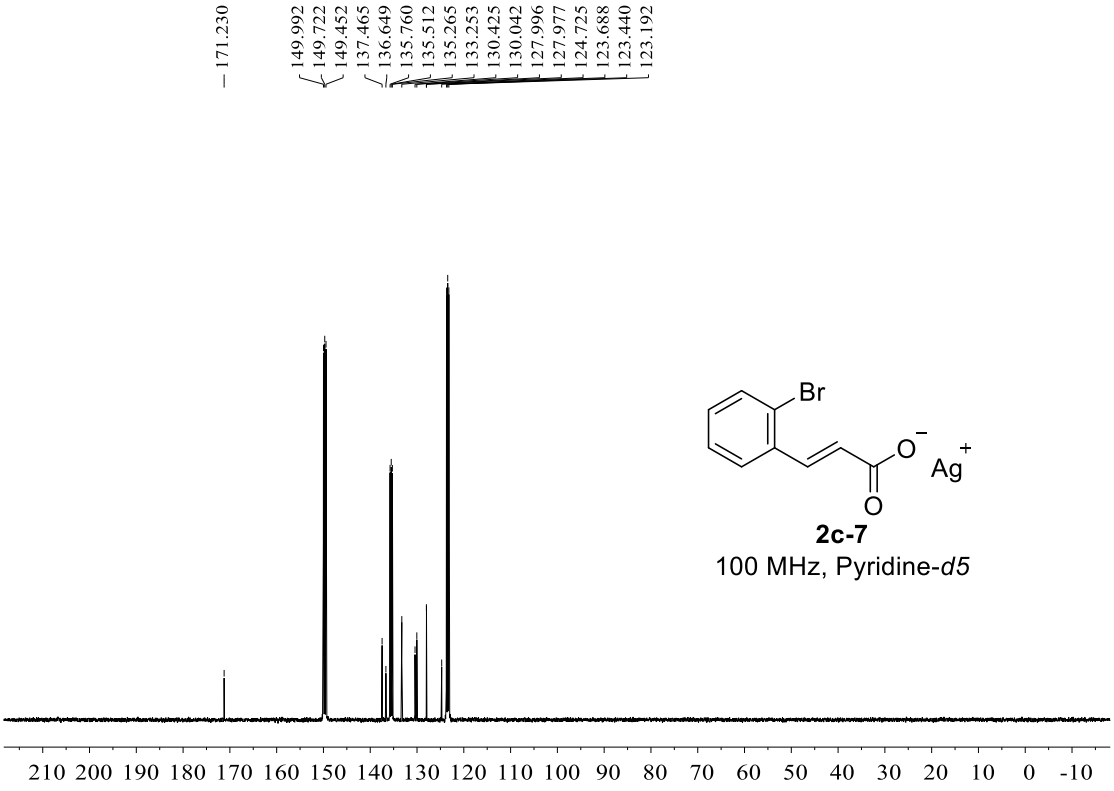

168.907
161.105
142.805
130.113
127.705
118.761
114.771
55.743
40.627
40.419
40.210
40.000
39.791
39.584
39.375
H3CO
O
Ag+
2c-5
100 MHz, DMSO-d6
170 160 150 140 130 120
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

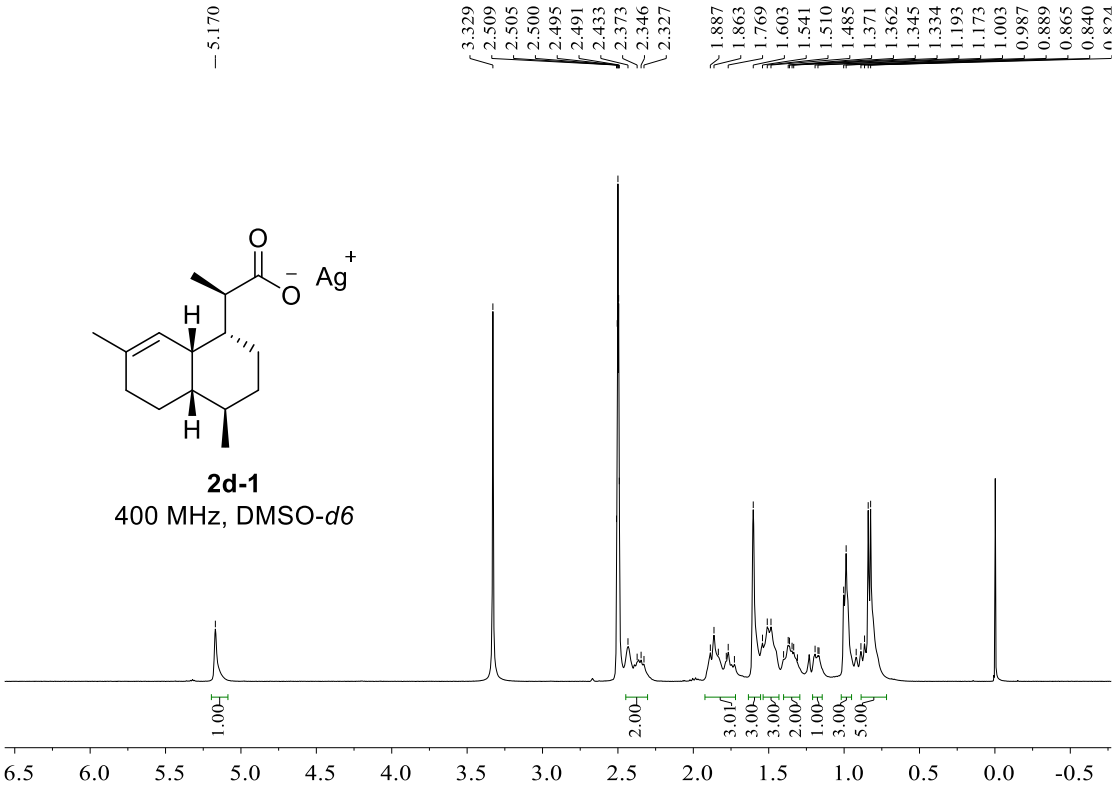

8.720
8.112
8.073
7.664
7.644
7.575
7.559
7.538
7.484
7.444
7.206
5.555
F3C
O
Ag+
2c-6
400 MHz, Pyridine-d5
1.00
2.00
2.00
1.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


171.506
150.065
149.795
149.526
141.164
136.851
135.728
135.481
135.234
131.304
129.755
129.436
129.118
128.858
128.801
127.901
126.156
125.791
125.754
125.716
125.678
123.688
123.440
123.192
120.750
F3C
O
Ag+
2c-6
100 MHz, Pyridine-d5
129.755
129.436
129.118
128.858
128.801
126.156
125.791
125.754
125.716
125.678
123.440
120.750
129
127
125
123
121
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

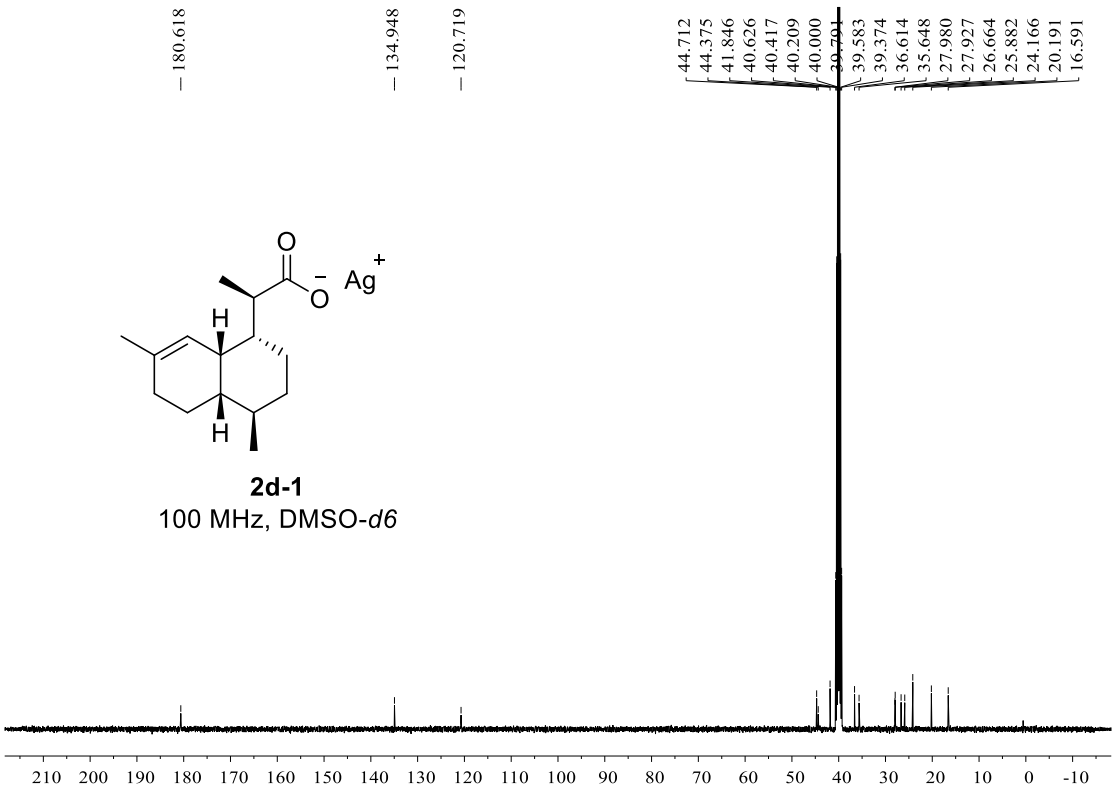

-61.912
F3C
O
Ag
O
2c-6
376 MHz, Pyridine-d5
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-2


8.720
8.511
8.472
7.760
7.755
7.740
7.736
7.590
7.555
7.552
7.535
7.532
7.302
7.262
7.220
7.192
7.173
7.082
7.078
7.063
7.059
7.044
7.040
5.497
Br
O
Ag
O
2c-7
400 MHz, Pyridine-d5
1.00
1.00
1.00
1.00
1.00
1.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

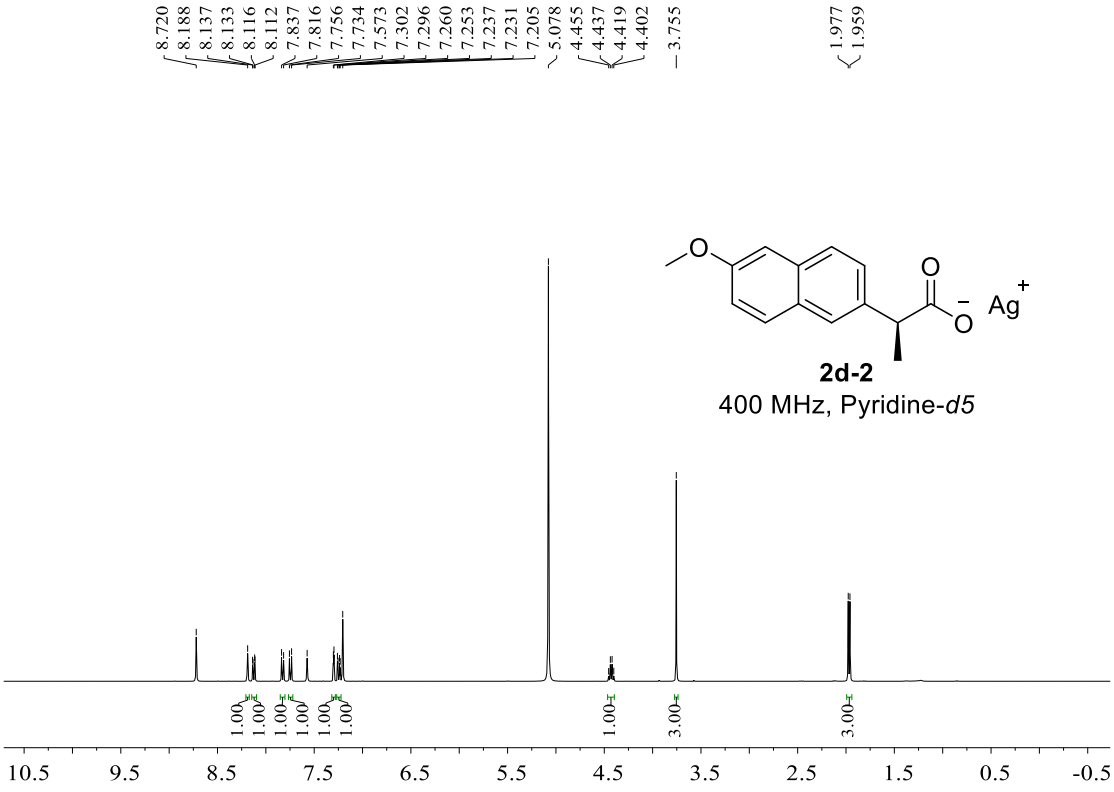

171.230
149.992
149.722
149.452
137.465
136.649
135.760
135.512
135.265
133.253
130.425
130.042
127.996
127.977
124.725
123.688
123.440
123.192
Br
O
Ag
O
2c-7
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

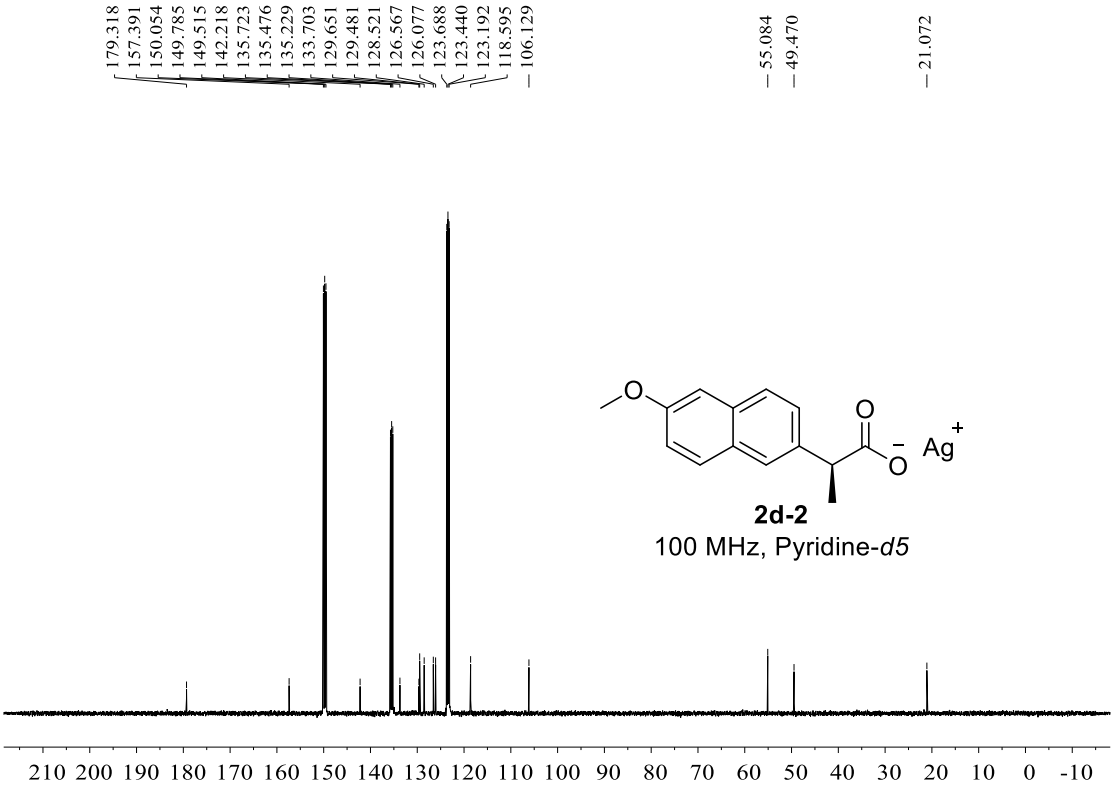


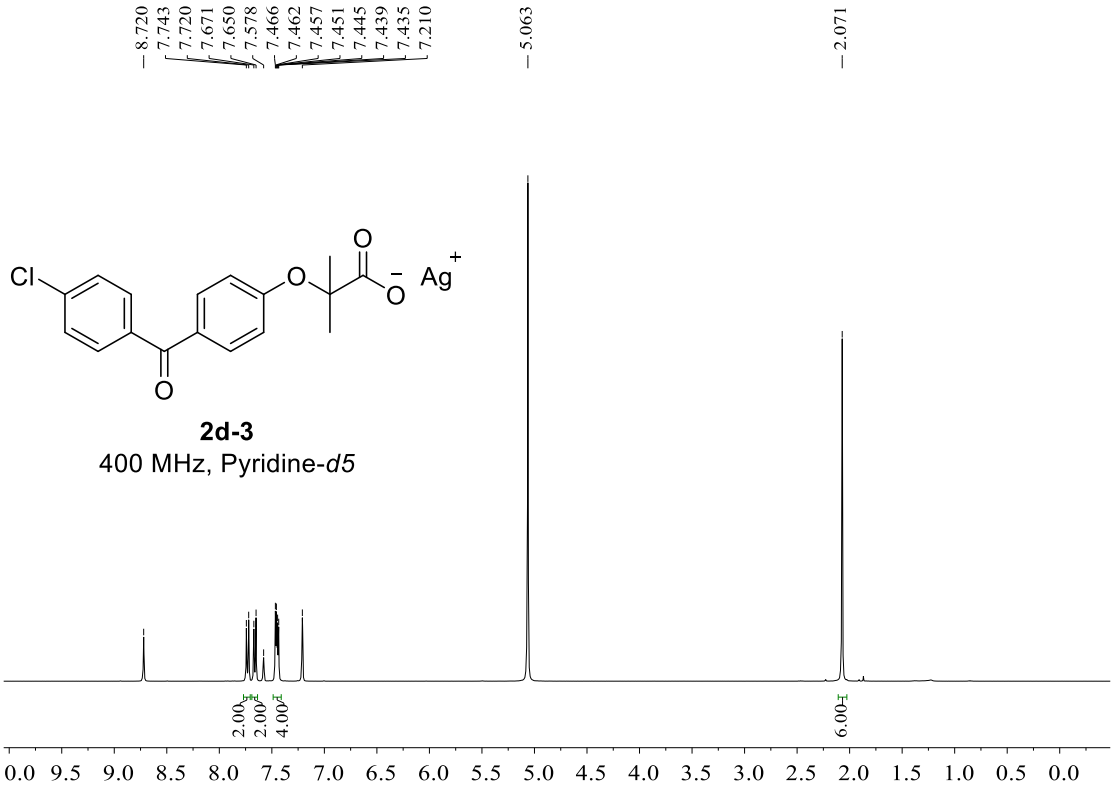
2d-1
400 MHz, DMSO-*d6*



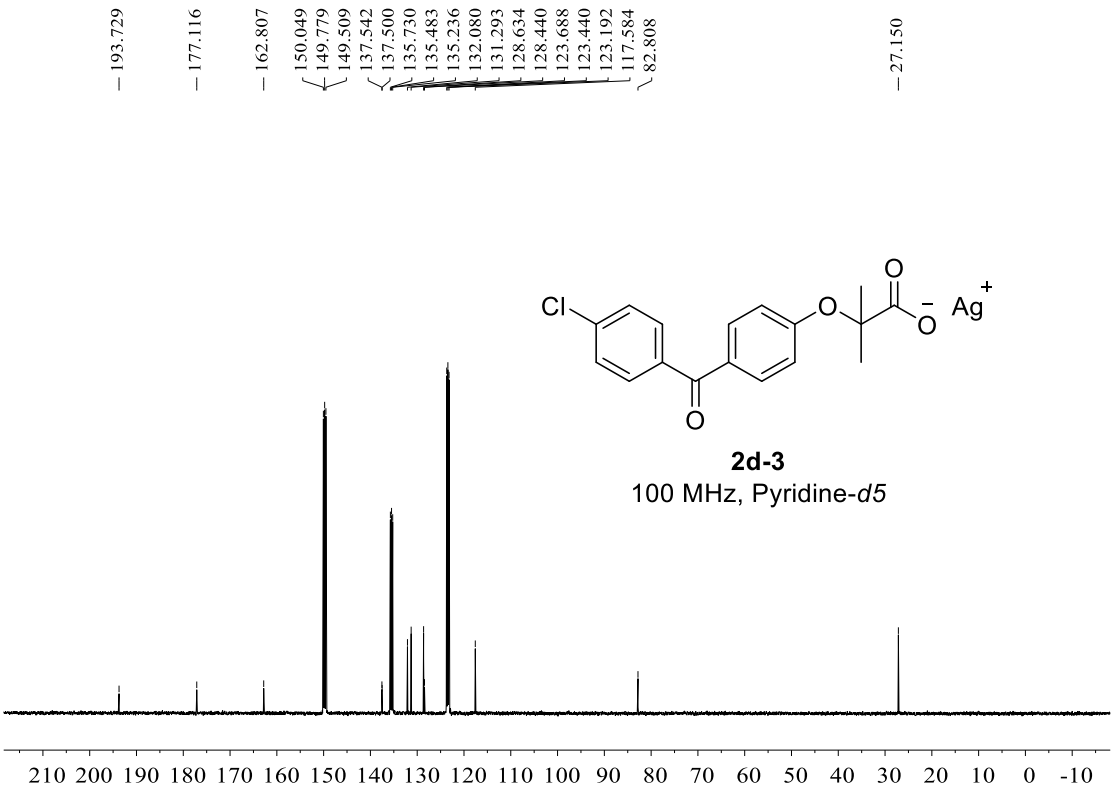
2d-1
100 MHz, DMSO-*d6*


8.720
8.188
8.137
8.133
8.116
8.112
7.837
7.816
7.756
7.734
7.573
7.302
7.296
7.260
7.253
7.237
7.231
7.205
5.078
4.455
4.437
4.419
4.402
3.755
1.977
1.959
O
O
O
Ag+
2d-2
400 MHz, Pyridine-d5
1.00
1.00
1.00
1.00
1.00
1.00
3.00
3.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

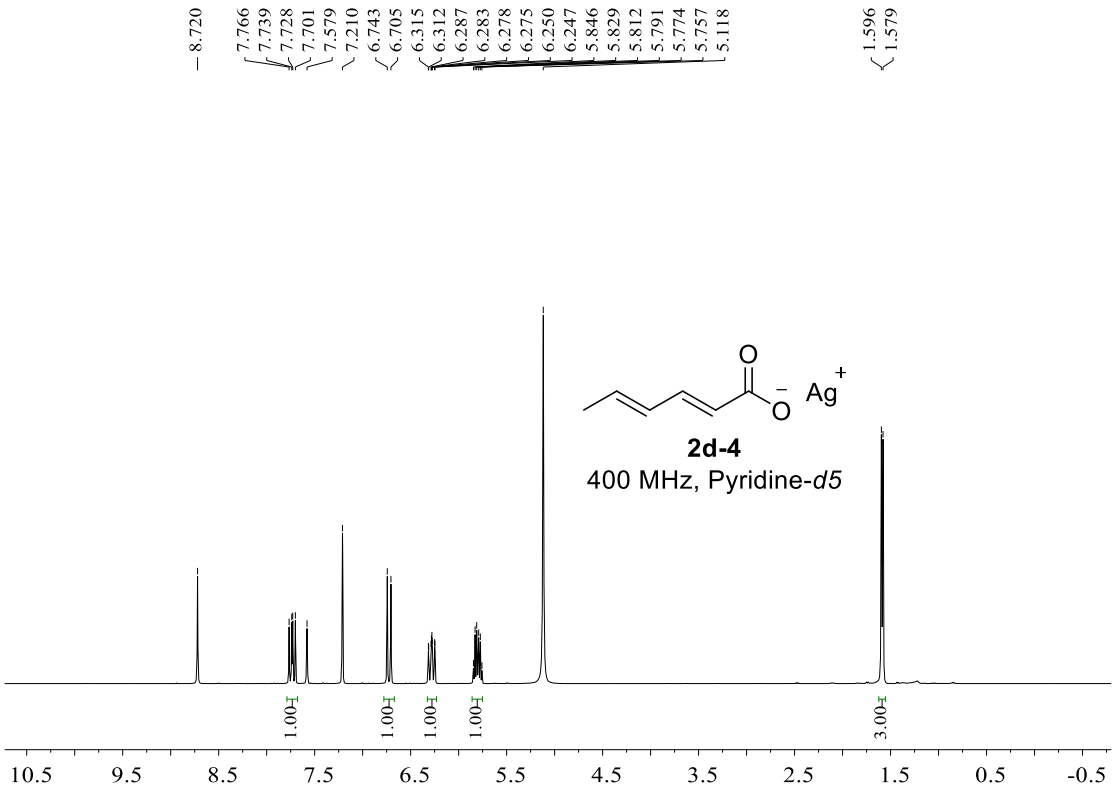

179.318
157.391
150.054
149.785
149.515
142.218
135.723
135.476
135.229
133.703
129.651
129.481
128.521
126.567
126.077
123.688
123.440
123.192
118.595
106.129
55.084
49.470
21.072
O
O
O
Ag+
2d-2
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

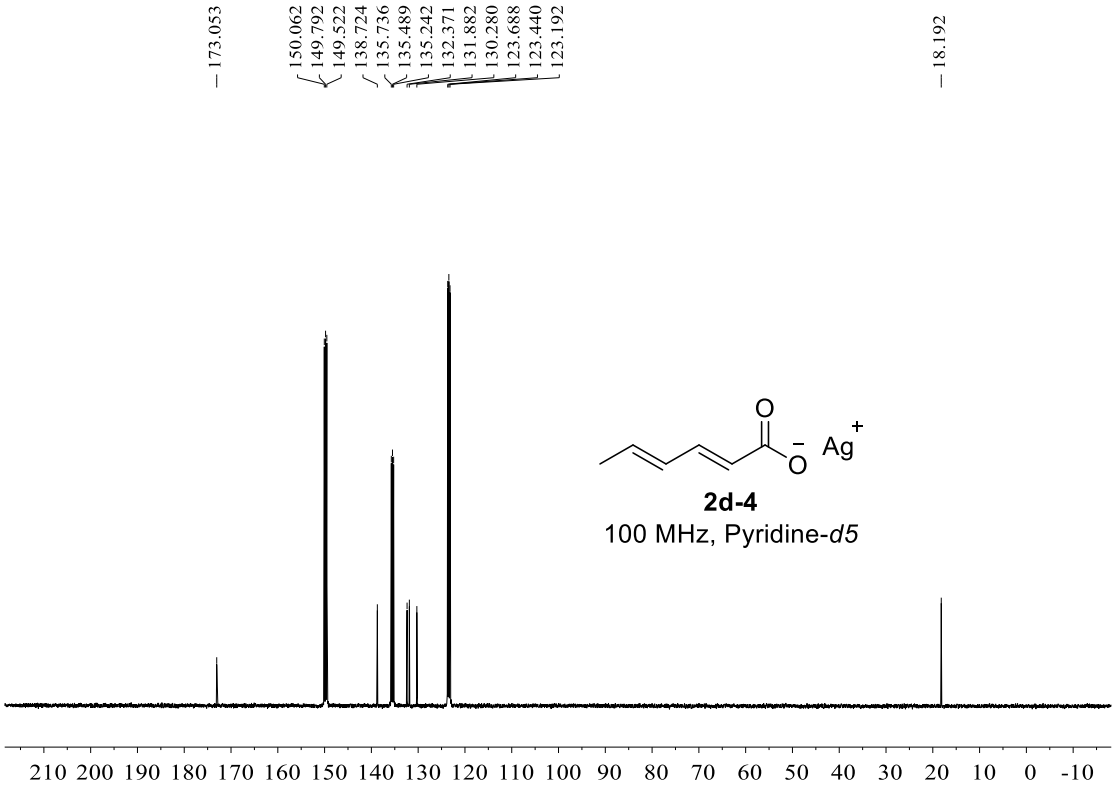


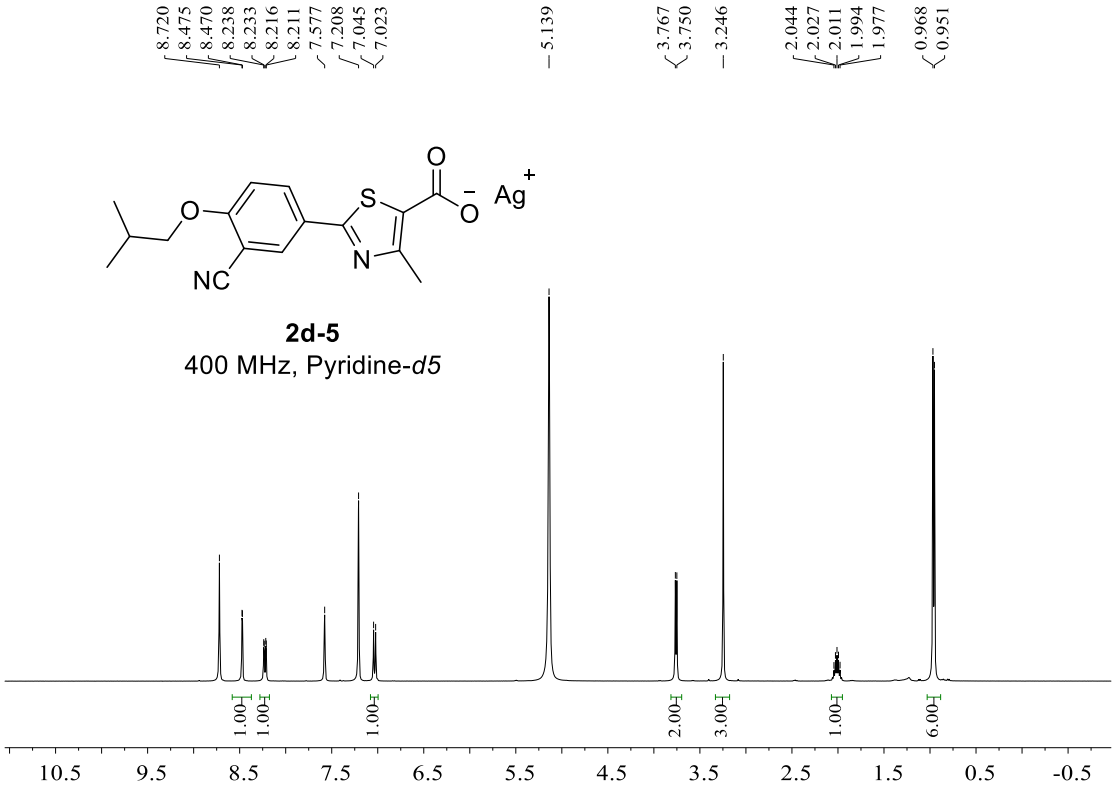
2d-3
400 MHz, Pyridine-*d5*



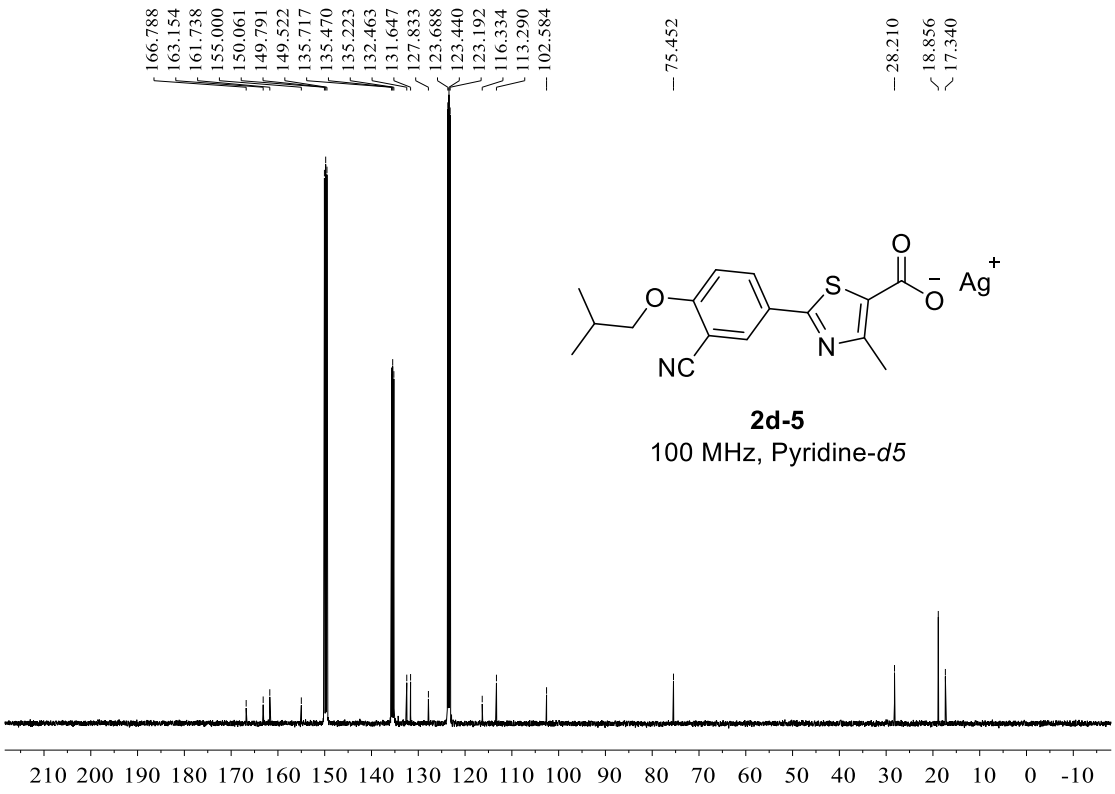
2d-3
100 MHz, Pyridine-*d5*


8.720
7.766
7.739
7.728
7.701
7.579
7.210
6.743
6.705
6.315
6.312
6.287
6.283
6.278
6.275
6.250
6.247
5.846
5.829
5.812
5.791
5.774
5.757
5.118
1.596
1.579
2d-4
400 MHz, Pyridine-d5
1.00
1.00
1.00
1.00
3.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

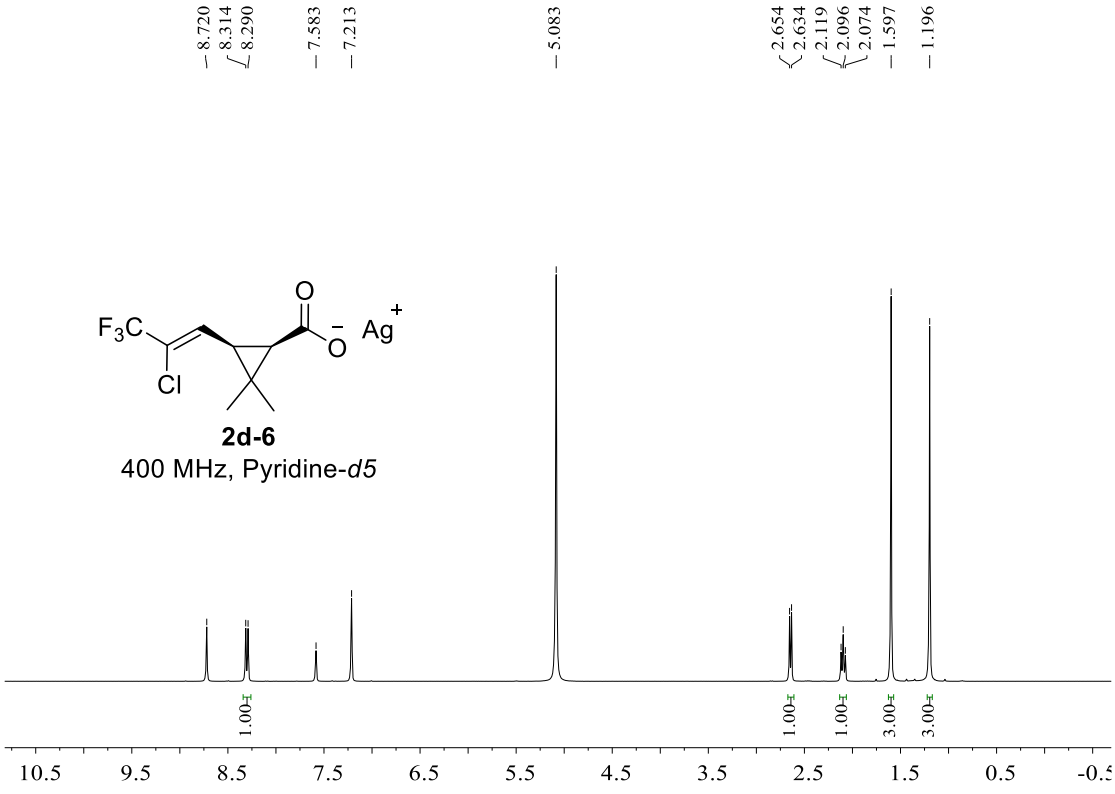

173.053
150.062
149.792
149.522
138.724
135.736
135.489
135.242
132.371
131.882
130.280
123.688
123.440
123.192
18.192
2d-4
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

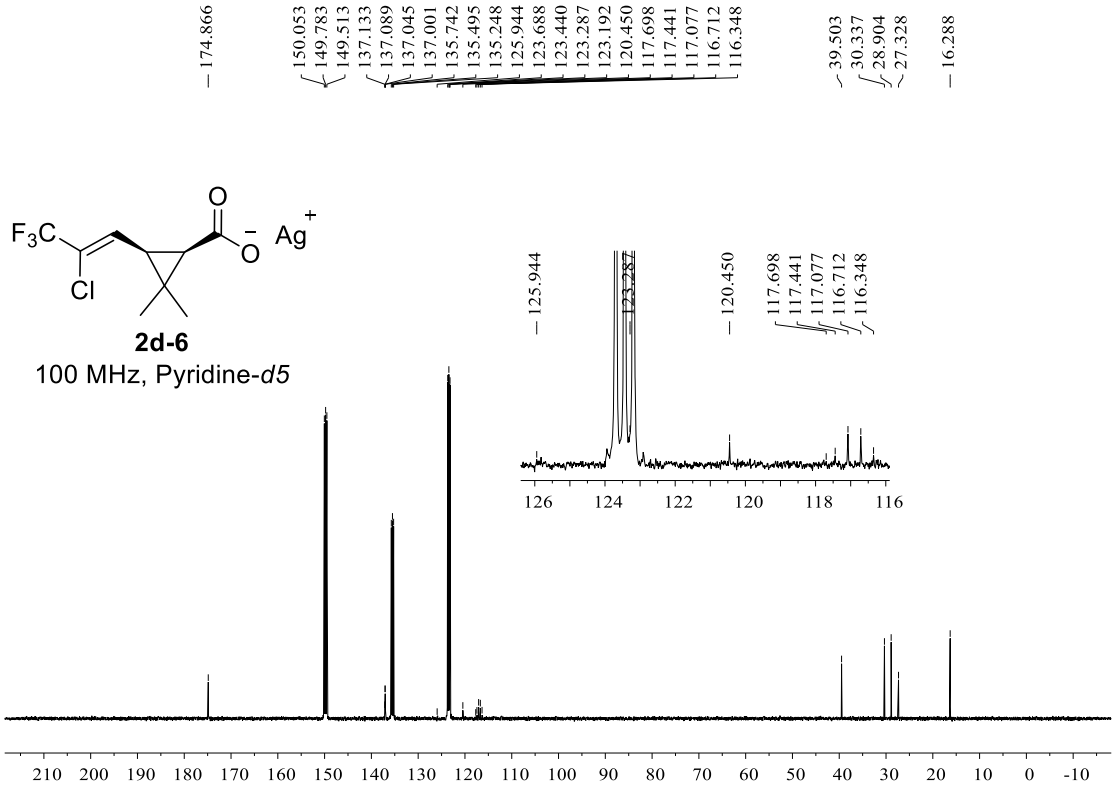


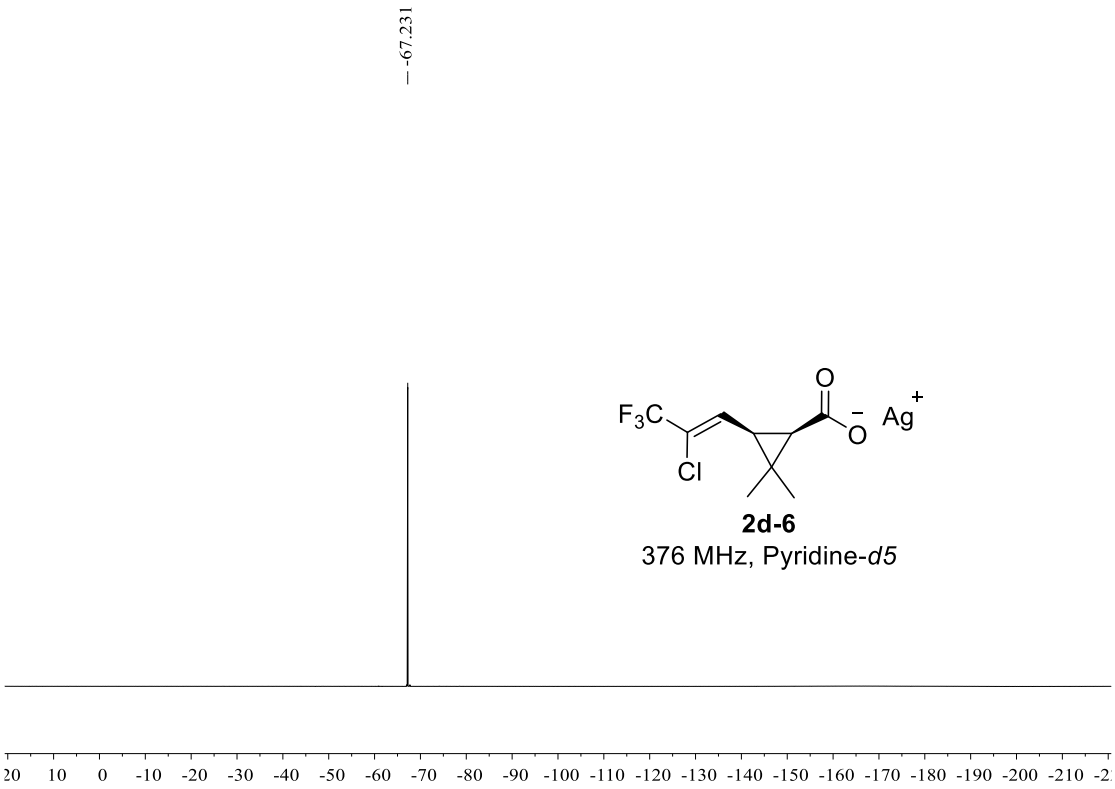
2d-5
400 MHz, Pyridine-*d5*

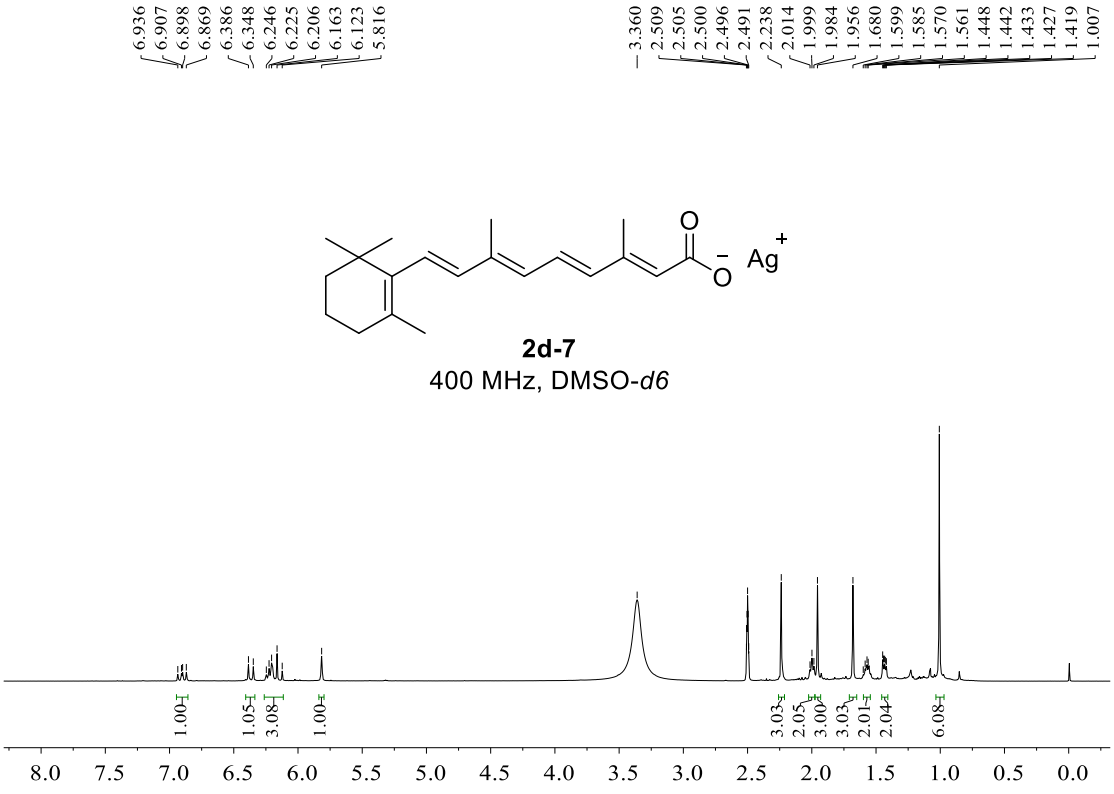


2d-5
100 MHz, Pyridine-*d5*

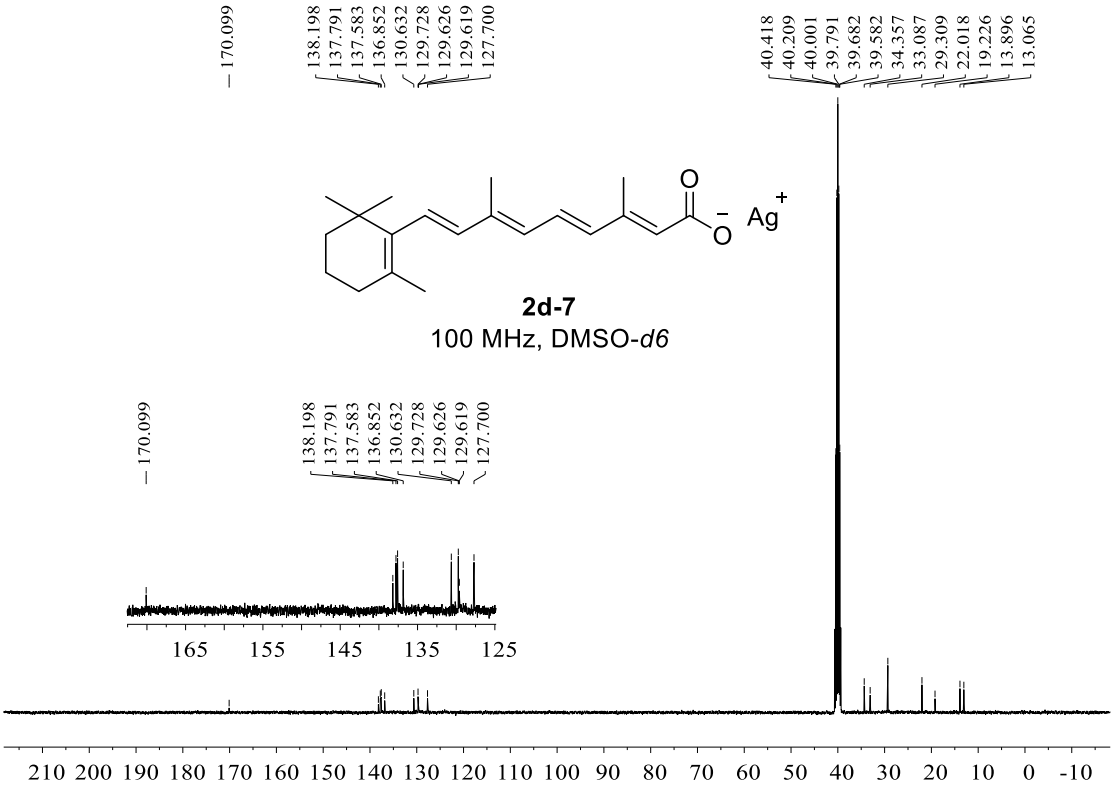

8.720
8.314
8.290
7.583
7.213
5.083
2.654
2.634
2.119
2.096
2.074
1.597
1.196
F3C
Cl
O
O
Ag+
2d-6
400 MHz, Pyridine-d5
1.00
1.00
1.00
3.00
3.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


174.866
150.053
149.783
149.513
137.133
137.089
137.045
137.001
135.742
135.495
135.248
125.944
123.688
123.440
123.287
123.192
120.450
117.698
117.441
117.077
116.712
116.348
39.503
30.337
28.904
27.328
16.288
F3C
Cl
O
O
Ag+
2d-6
100 MHz, Pyridine-d5
125.944
123.287
120.450
117.698
117.441
117.077
116.712
116.348
126
124
122
120
118
116
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10

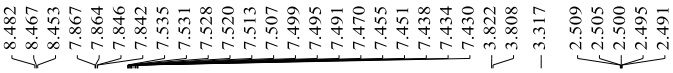

-67.231
F3C
Cl
O
O
Ag+
2d-6
376 MHz, Pyridine-d5
20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210

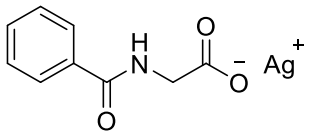


2d-7
400 MHz, DMSO-*d6*



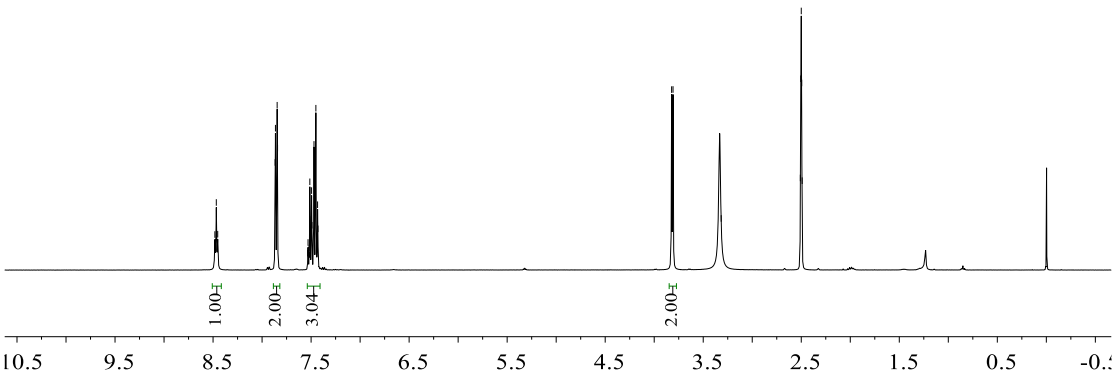
2d-7
100 MHz, DMSO-*d6*

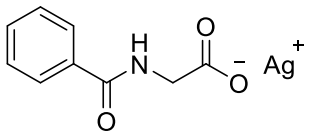




2d-8

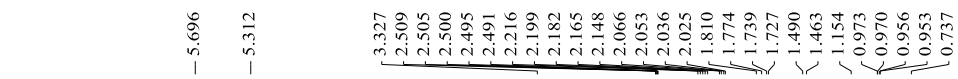
400 MHz, DMSO-*d6*

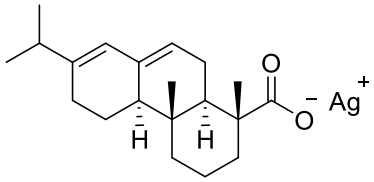




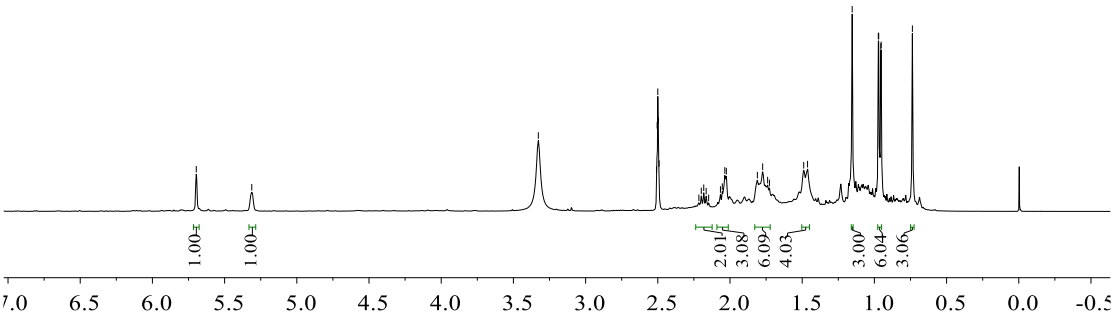
2d-8

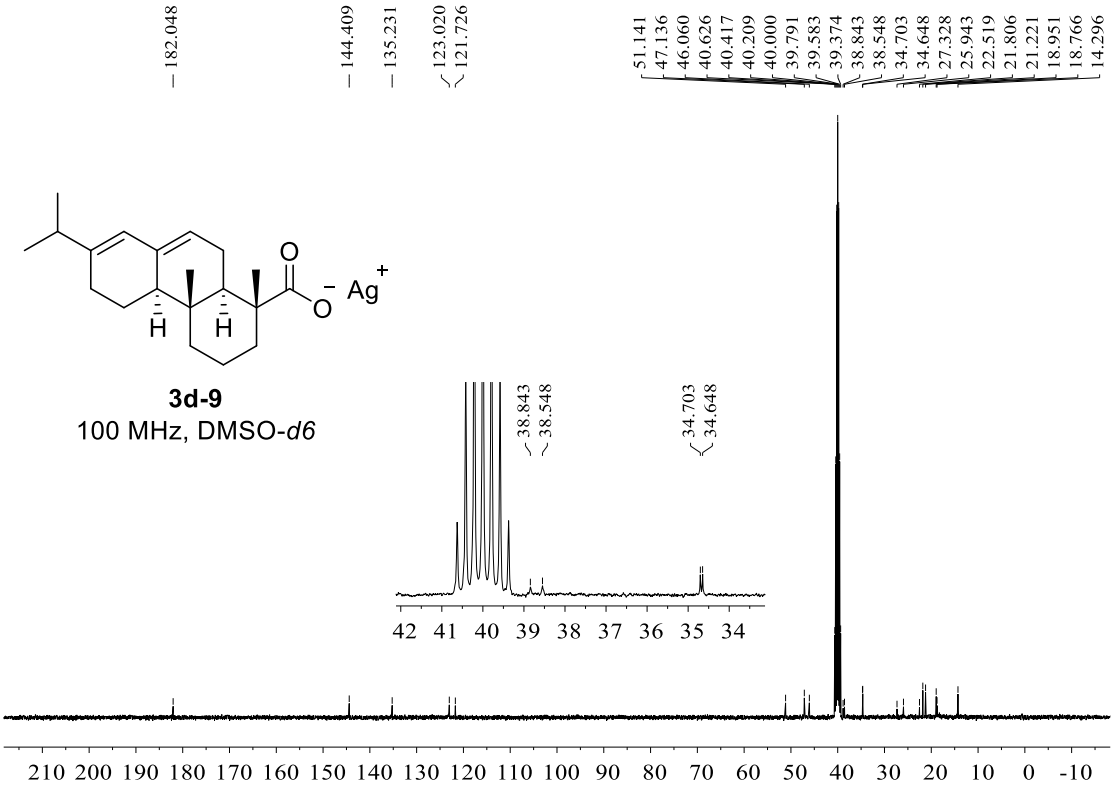
100 MHz, DMSO-*d6*



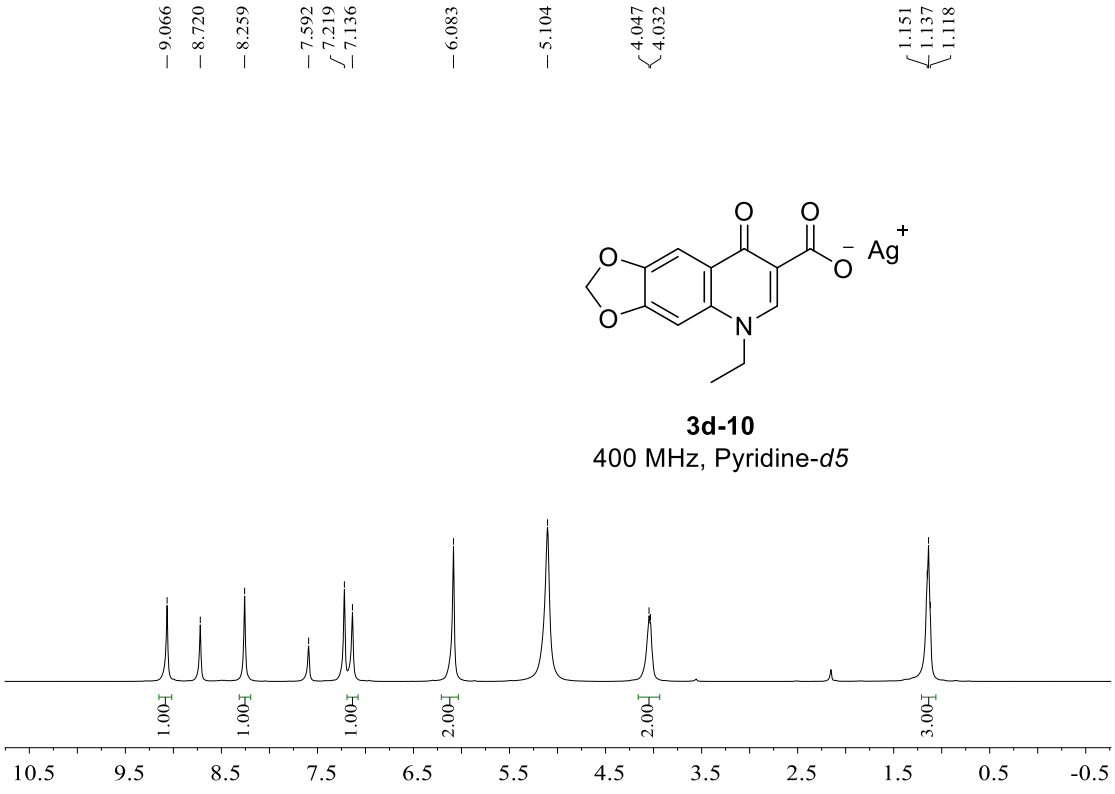


3d-9
400 MHz, DMSO-*d6*

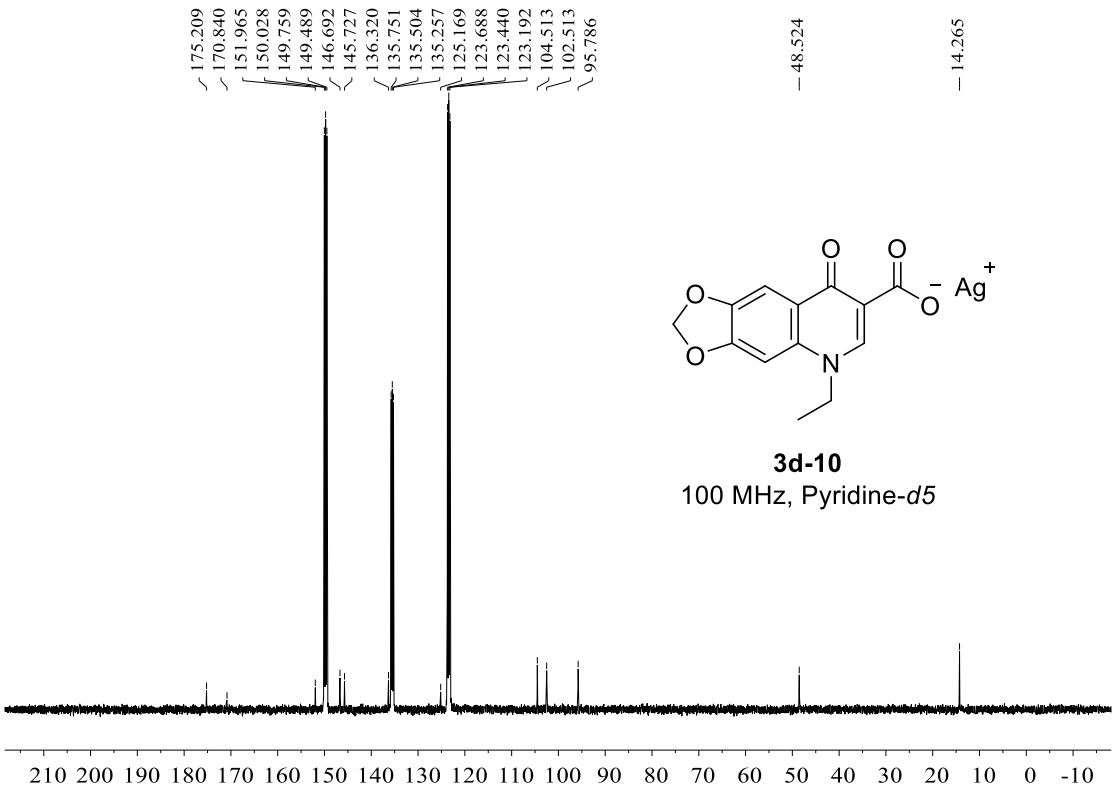




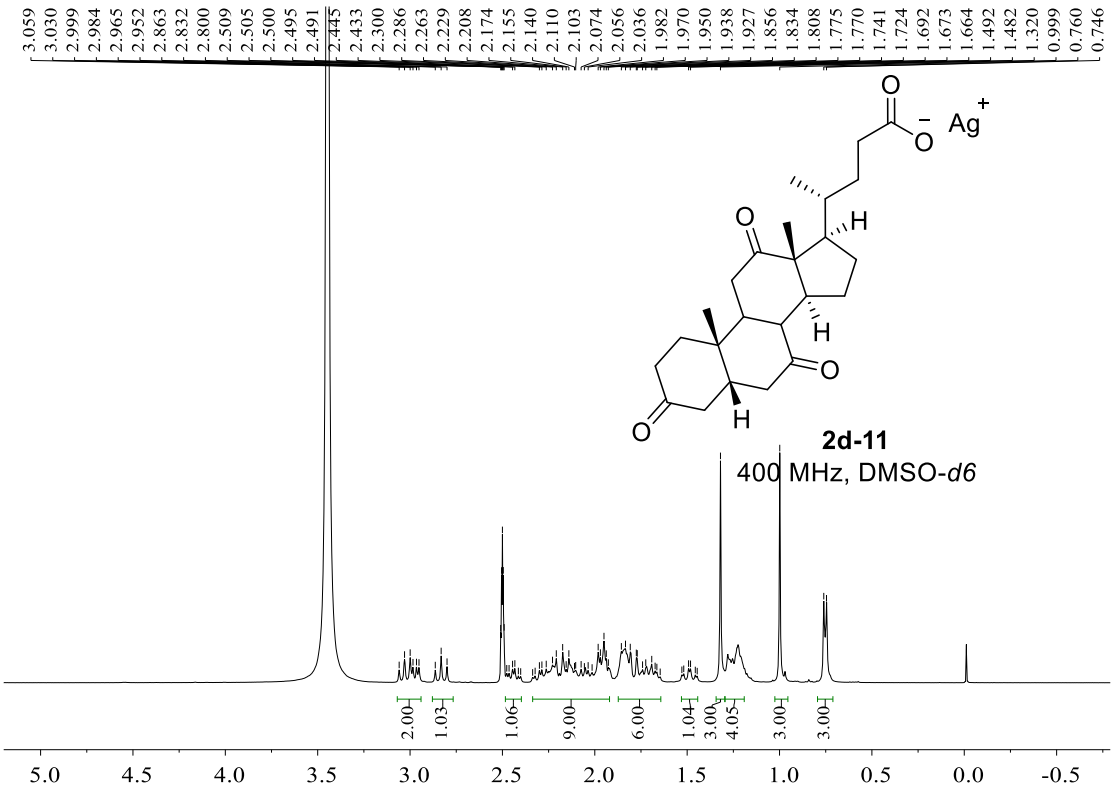
3d-9
100 MHz, DMSO-*d6*

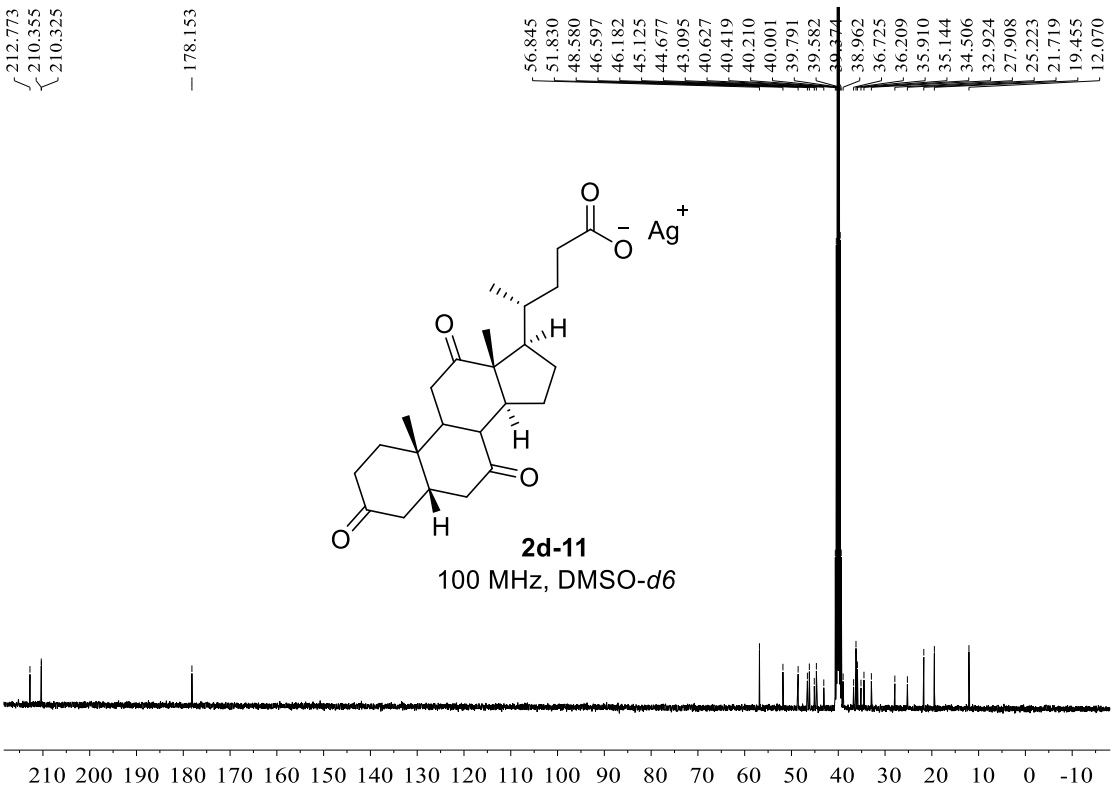


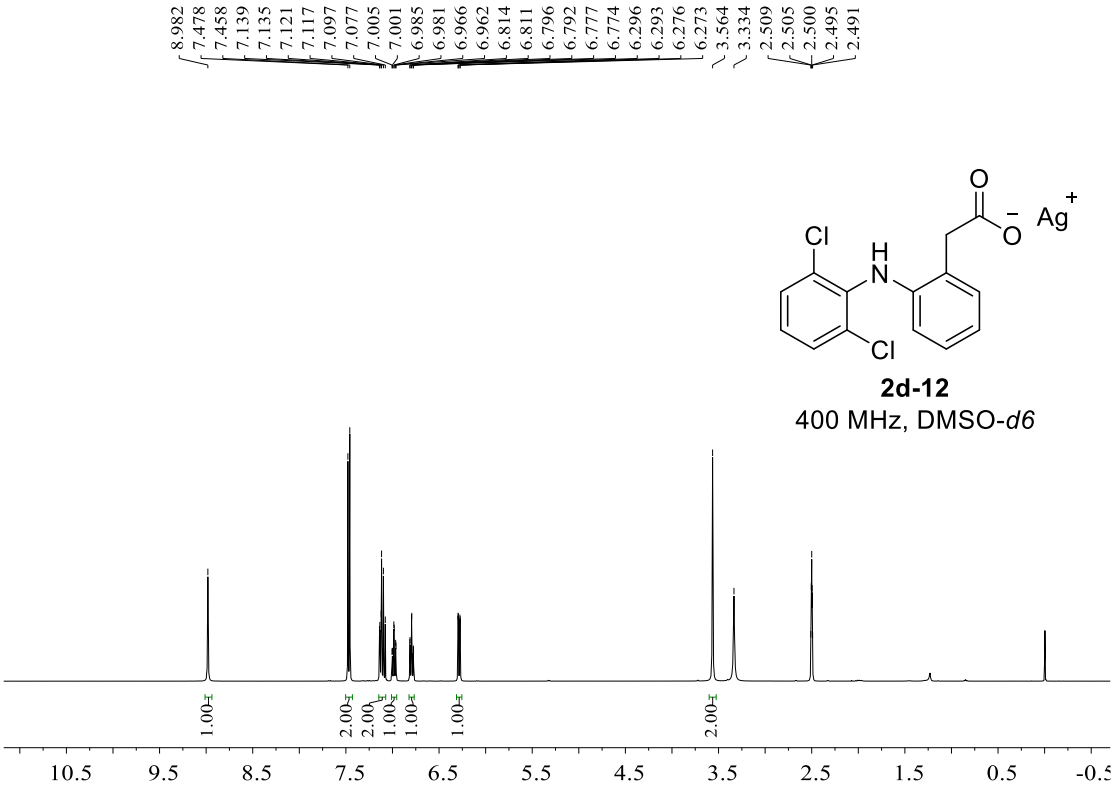
3d-10
400 MHz, Pyridine-*d5*

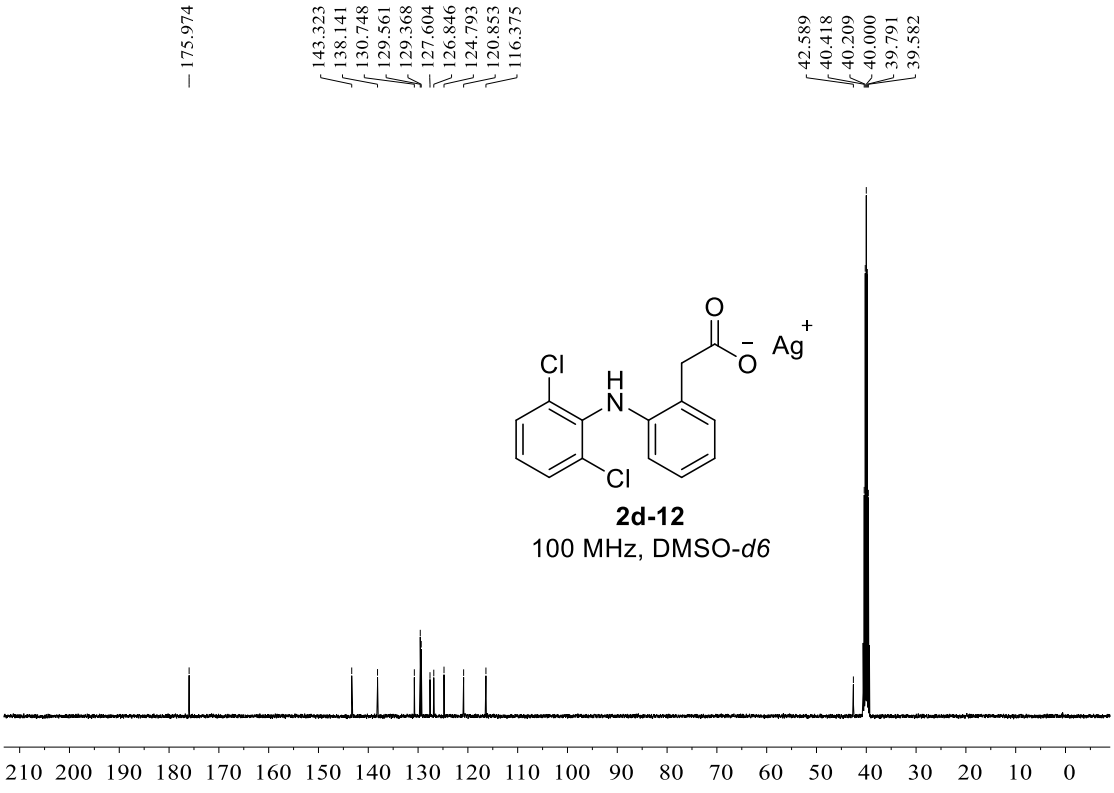


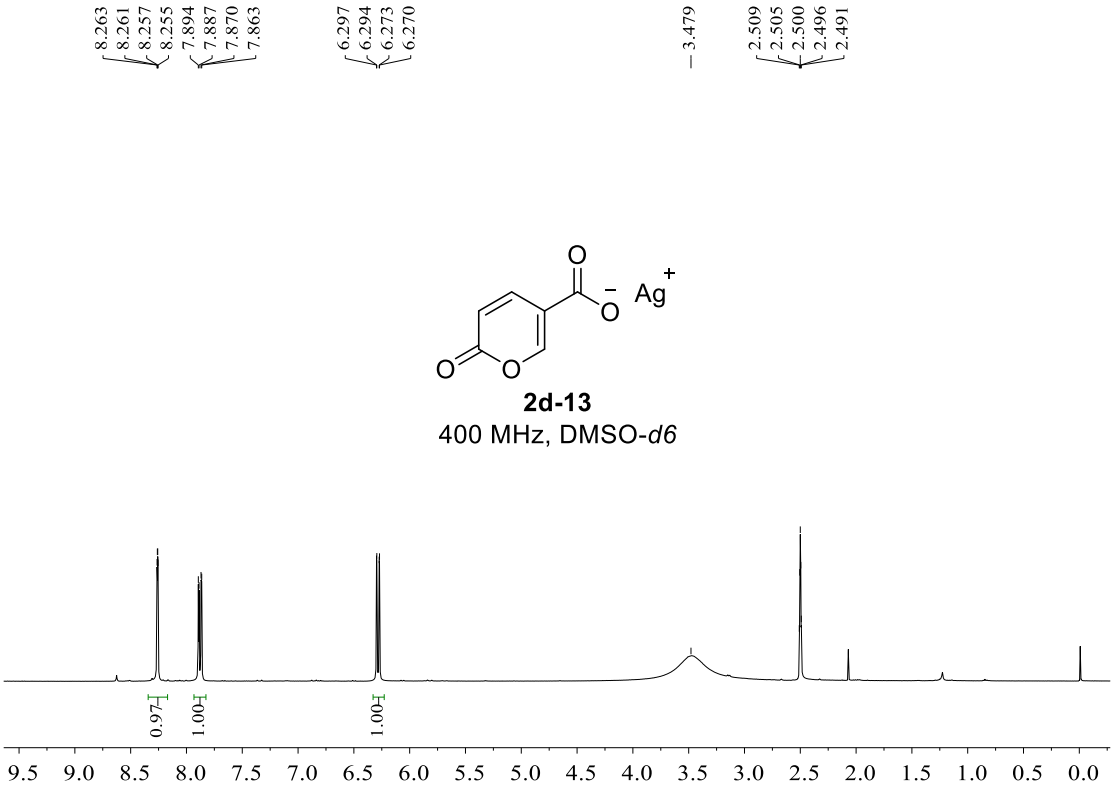
3d-10
100 MHz, Pyridine-*d5*

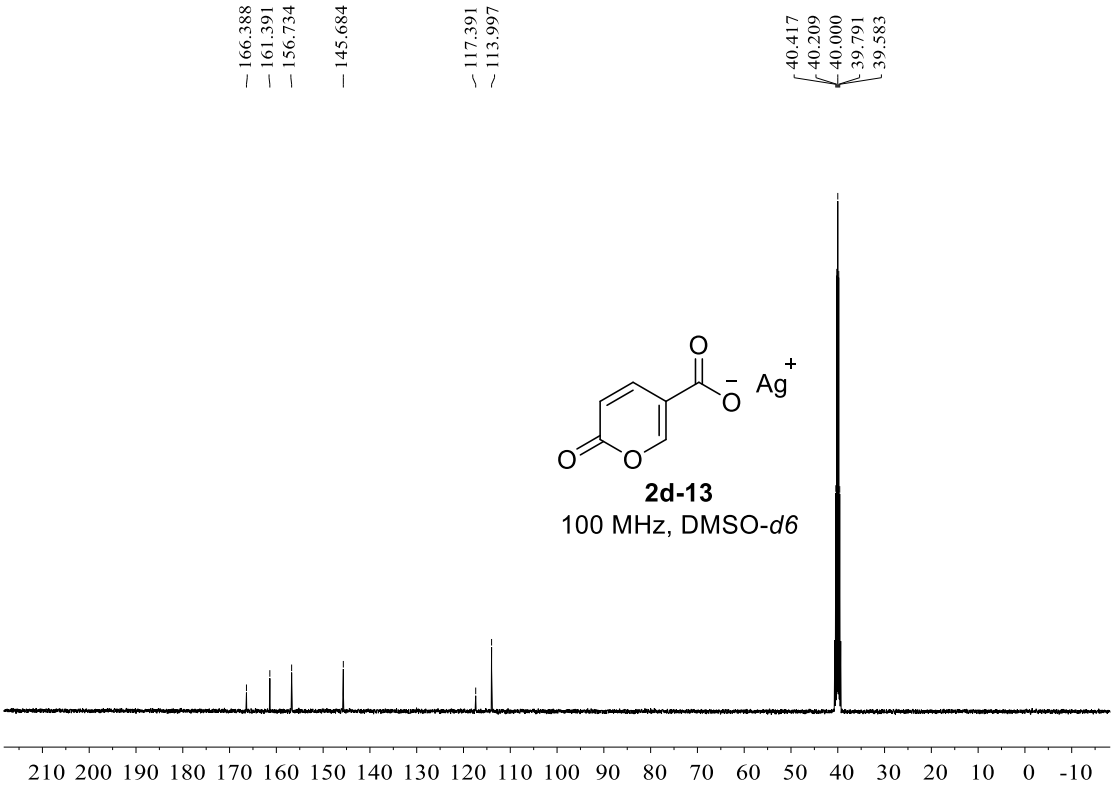

3.059
3.030
2.999
2.984
2.965
2.952
2.863
2.832
2.800
2.509
2.505
2.500
2.495
2.491
2.445
2.433
2.300
2.286
2.263
2.229
2.208
2.174
2.155
2.140
2.110
2.103
2.074
2.056
2.036
1.982
1.970
1.950
1.938
1.927
1.856
1.834
1.808
1.775
1.770
1.741
1.724
1.692
1.673
1.664
1.492
1.482
1.320
0.999
0.760
0.746
O
O
Ag+
H
O
H
O
H
O
2d-11
400 MHz, DMSO-d6
2.00
1.03
1.06
9.00
6.00
1.04
3.00
4.05
3.00
3.00
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5

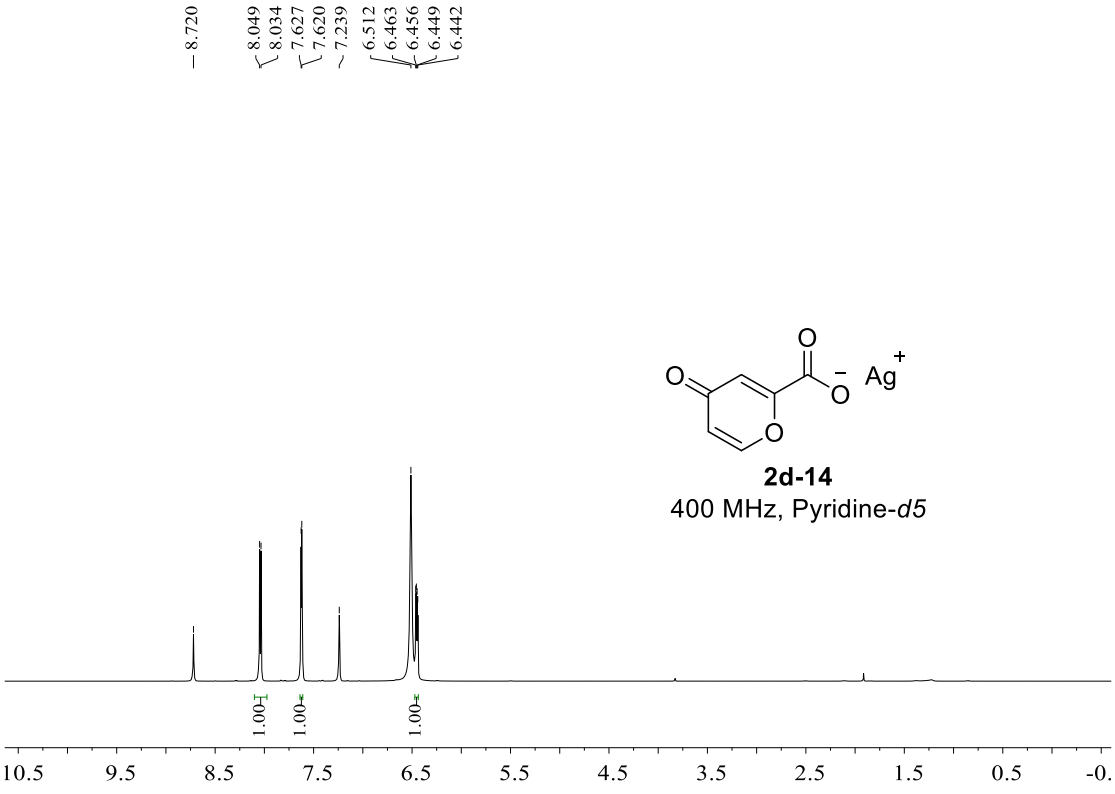

212.773
210.355
210.325
178.153
56.845
51.830
48.580
46.597
46.182
45.125
44.677
43.095
40.627
40.419
40.210
40.001
39.791
39.582
39.374
38.962
36.725
36.209
35.910
35.144
34.506
32.924
27.908
25.223
21.719
19.455
12.070
O
O
Ag+
H
O
H
O
H
O
2d-11
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

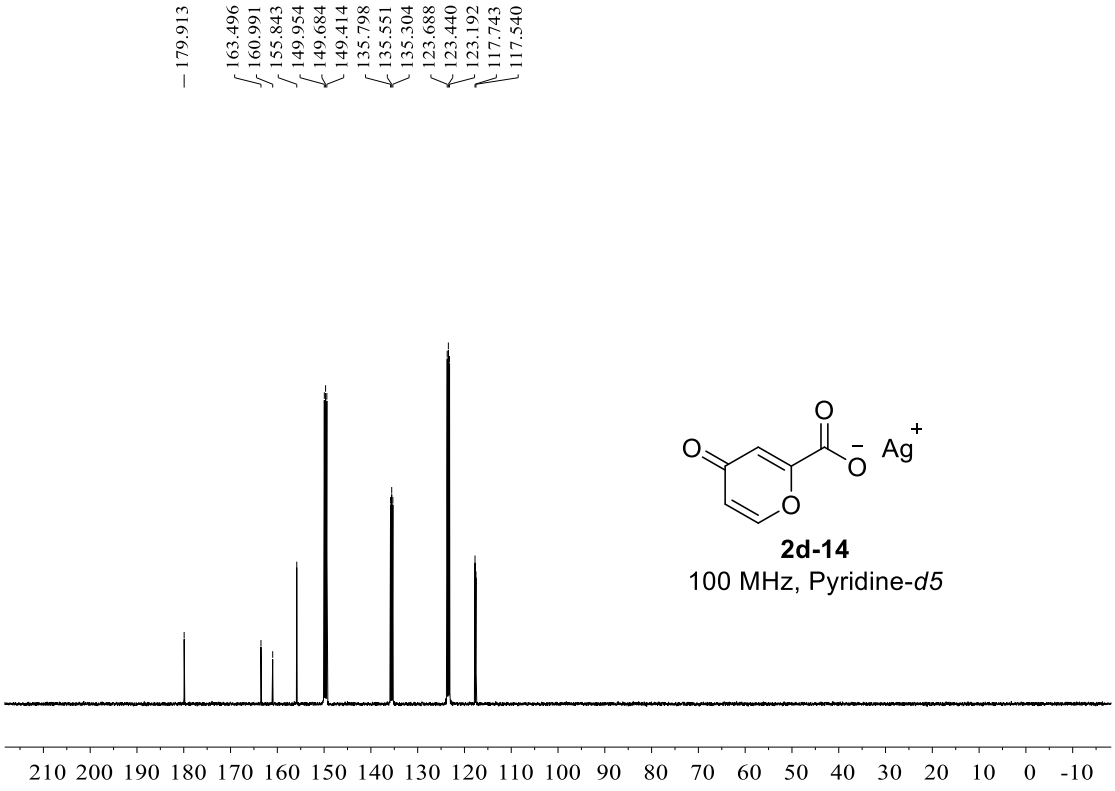

8.982
7.478
7.458
7.139
7.135
7.121
7.117
7.097
7.077
7.005
7.001
6.985
6.981
6.966
6.962
6.814
6.811
6.796
6.792
6.777
6.774
6.296
6.293
6.276
6.273
3.564
3.334
2.509
2.505
2.500
2.495
2.491
Cl
H
N
Cl
O
O
Ag+
2d-12
400 MHz, DMSO-d6
1.00
2.00
2.00
1.00
1.00
1.00
2.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5

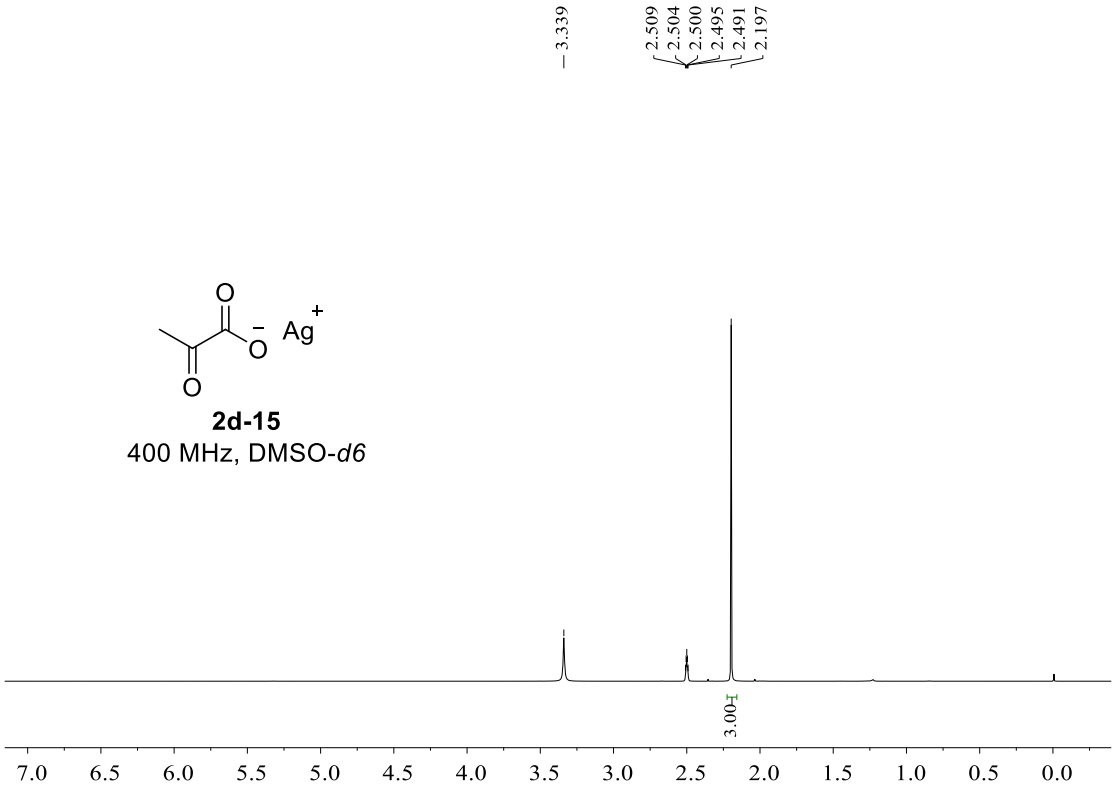

175.974
143.323
138.141
130.748
129.561
129.368
127.604
126.846
124.793
120.853
116.375
42.589
40.418
40.209
40.000
39.791
39.582
Cl
H
N
Cl
O
O
Ag+
2d-12
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

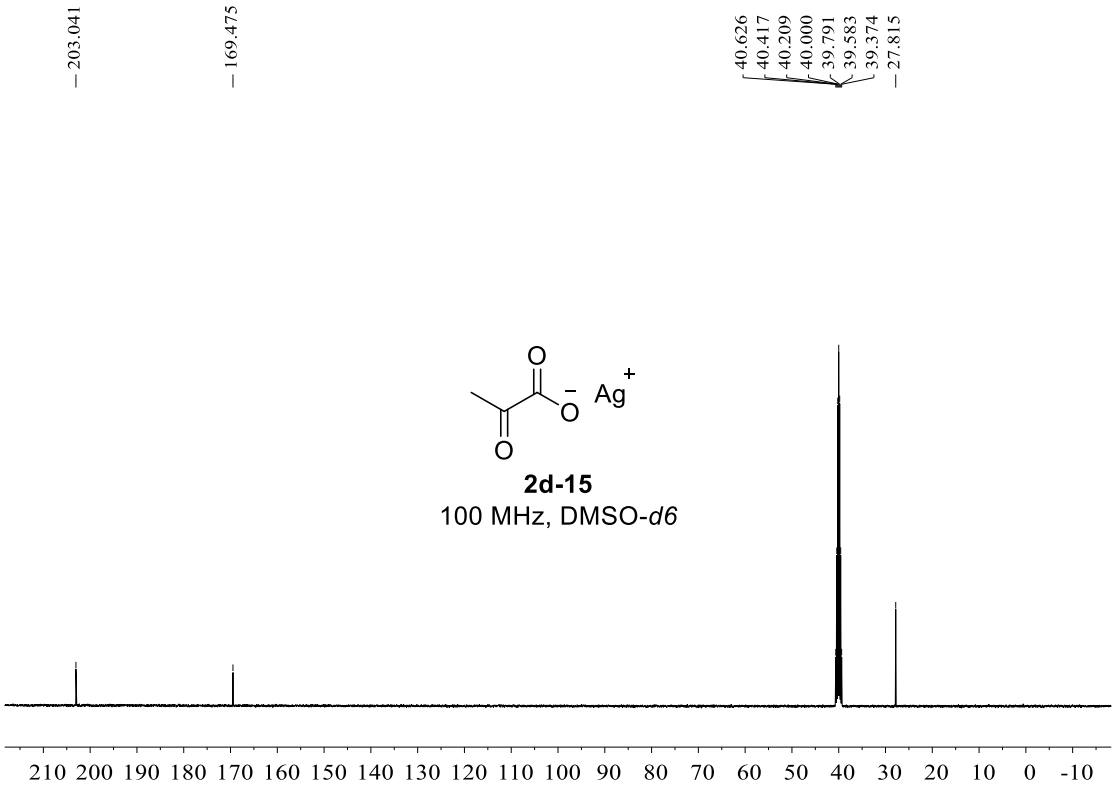

8.263
8.261
8.257
8.255
7.894
7.887
7.870
7.863
6.297
6.294
6.273
6.270
3.479
2.509
2.505
2.500
2.496
2.491
O
O
Ag+
O
O
2d-13
400 MHz, DMSO-d6
0.97
1.00
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

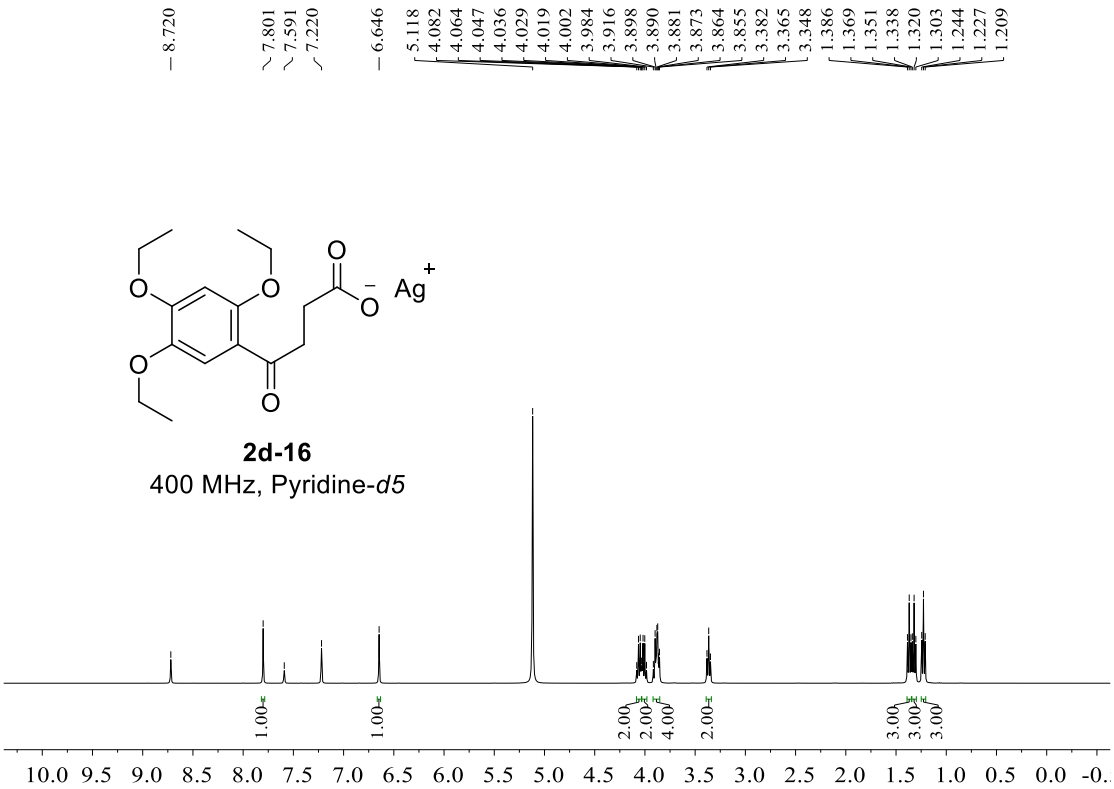

166.388
161.391
156.734
145.684
117.391
113.997
40.417
40.209
40.000
39.791
39.583
O
O
Ag+
O
O
2d-13
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

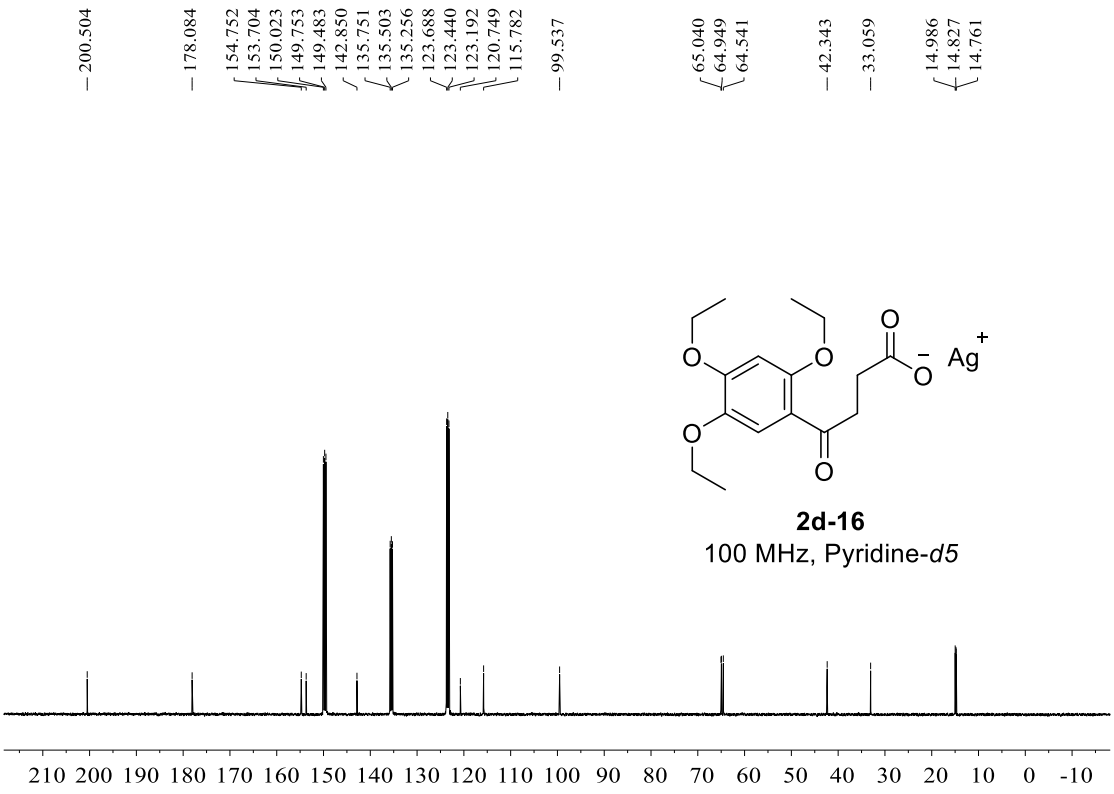

8.720
8.049
8.034
7.627
7.620
7.239
6.512
6.463
6.456
6.449
6.442
1.00
1.00
1.00
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.
Ag+
2d-14
400 MHz, Pyridine-d5


179.913
163.496
160.991
155.843
149.954
149.684
149.414
135.798
135.551
135.304
123.688
123.440
123.192
117.743
117.540
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10
Ag+
2d-14
100 MHz, Pyridine-d5

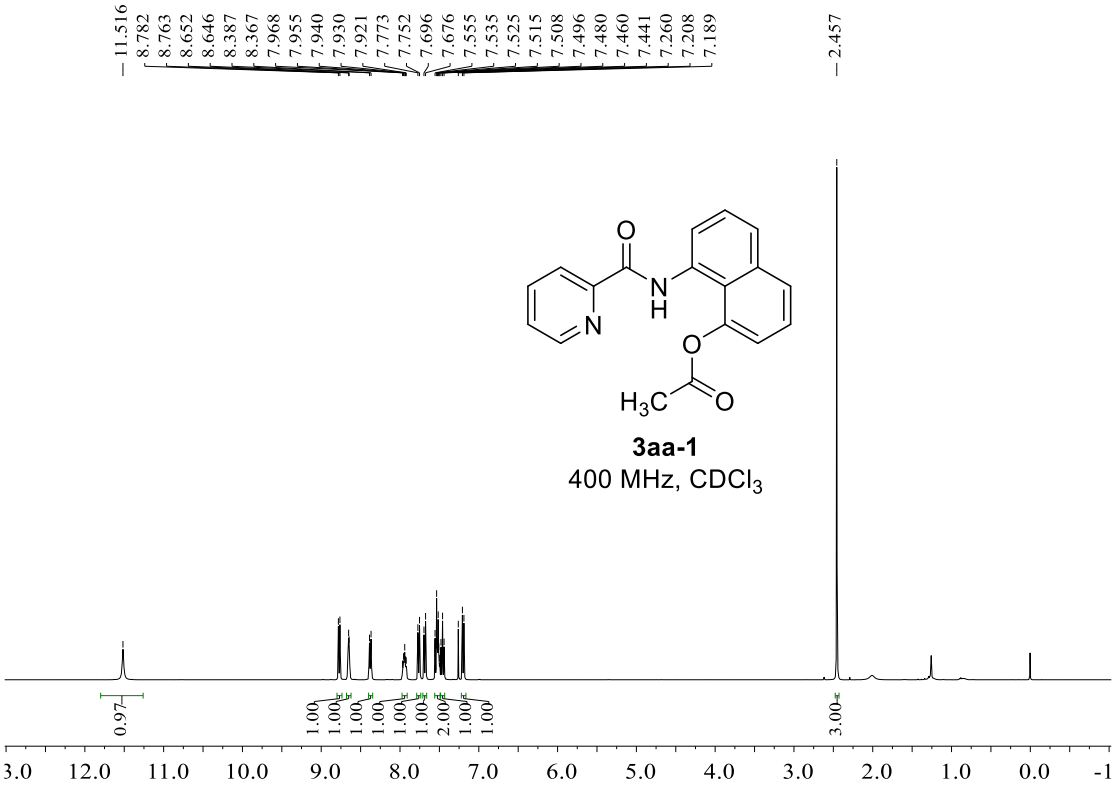

3.339
2.509
2.504
2.500
2.495
2.491
2.197
O
O
Ag+
O
2d-15
400 MHz, DMSO-d6
3.00
7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0

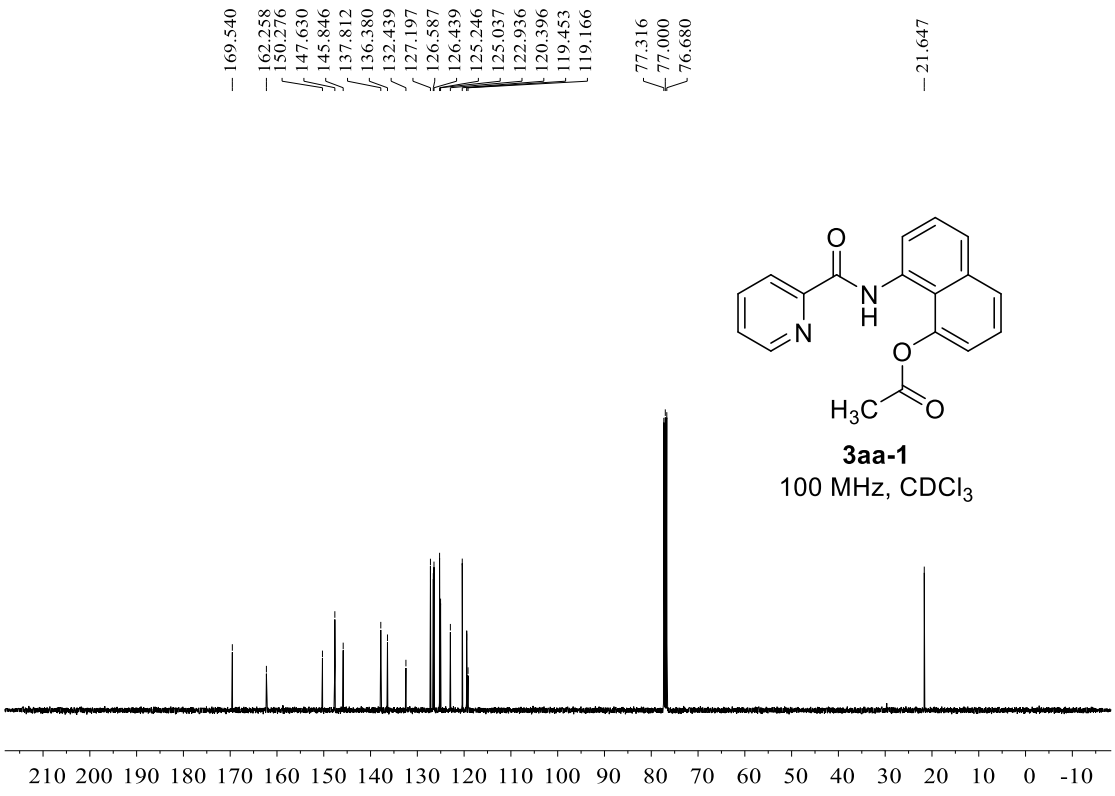

203.041
169.475
40.626
40.417
40.209
40.000
39.791
39.583
39.374
27.815
O
O
Ag+
O
2d-15
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

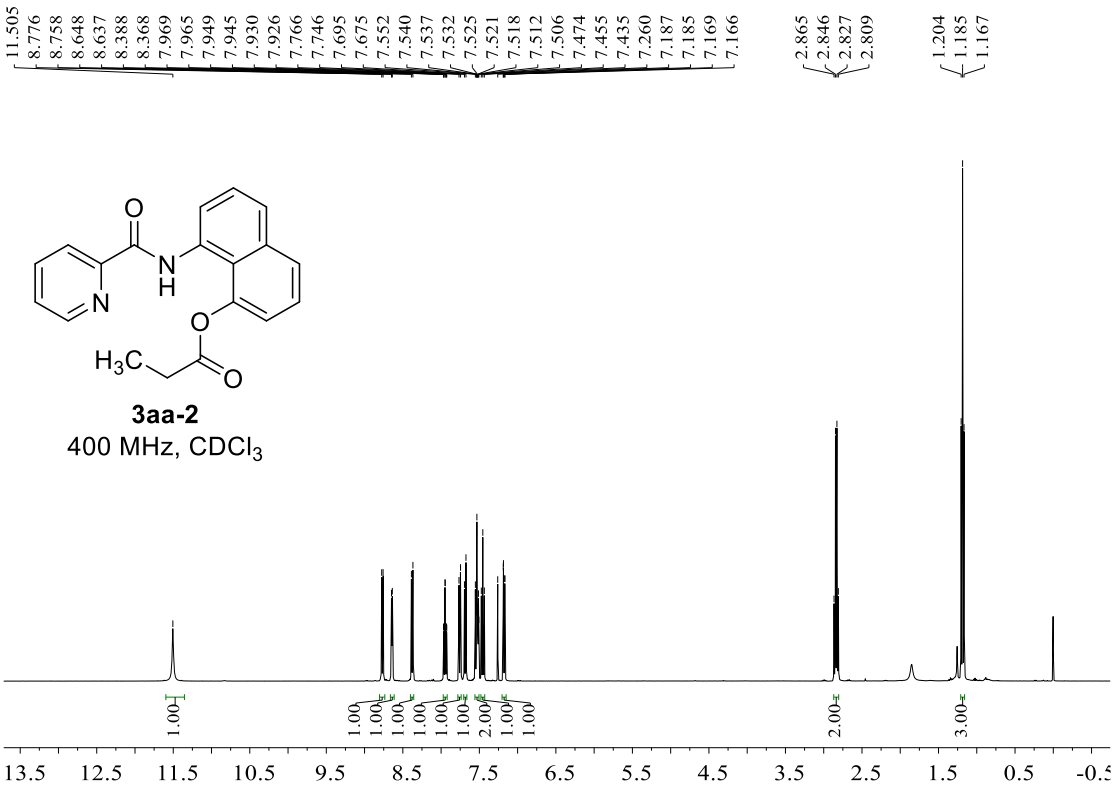

8.720
7.801
7.591
7.220
6.646
5.118
4.082
4.064
4.047
4.036
4.029
4.019
4.002
3.984
3.916
3.898
3.890
3.881
3.873
3.864
3.855
3.382
3.365
3.348
1.386
1.369
1.351
1.338
1.320
1.303
1.244
1.227
1.209
Ag+
2d-16
400 MHz, Pyridine-d5
1.00
1.00
2.00
2.00
4.00
2.00
3.00
3.00
3.00
10.0 9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0.0


200.504
178.084
154.752
153.704
150.023
149.753
149.483
142.850
135.751
135.503
135.256
123.688
123.440
123.192
120.749
115.782
99.537
65.040
64.949
64.541
42.343
33.059
14.986
14.827
14.761
Ag+
2d-16
100 MHz, Pyridine-d5
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

9. Copies of ^{1}H, ^{13}C and ^{19}F NMR spectra of products **3aa-1**–**3wa**






11.505
8.776
8.758
8.648
8.637
8.388
8.368
7.969
7.965
7.949
7.945
7.930
7.926
7.766
7.746
7.695
7.675
7.552
7.540
7.537
7.532
7.525
7.521
7.518
7.512
7.506
7.474
7.455
7.435
7.260
7.187
7.185
7.169
7.166
2.865
2.846
2.827
2.809
1.204
1.185
1.167
O
N
H
N
O
H3C
O
3aa-2
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
2.00
1.00
1.00
2.00
3.00
13.5
12.5
11.5
10.5
9.5
8.5
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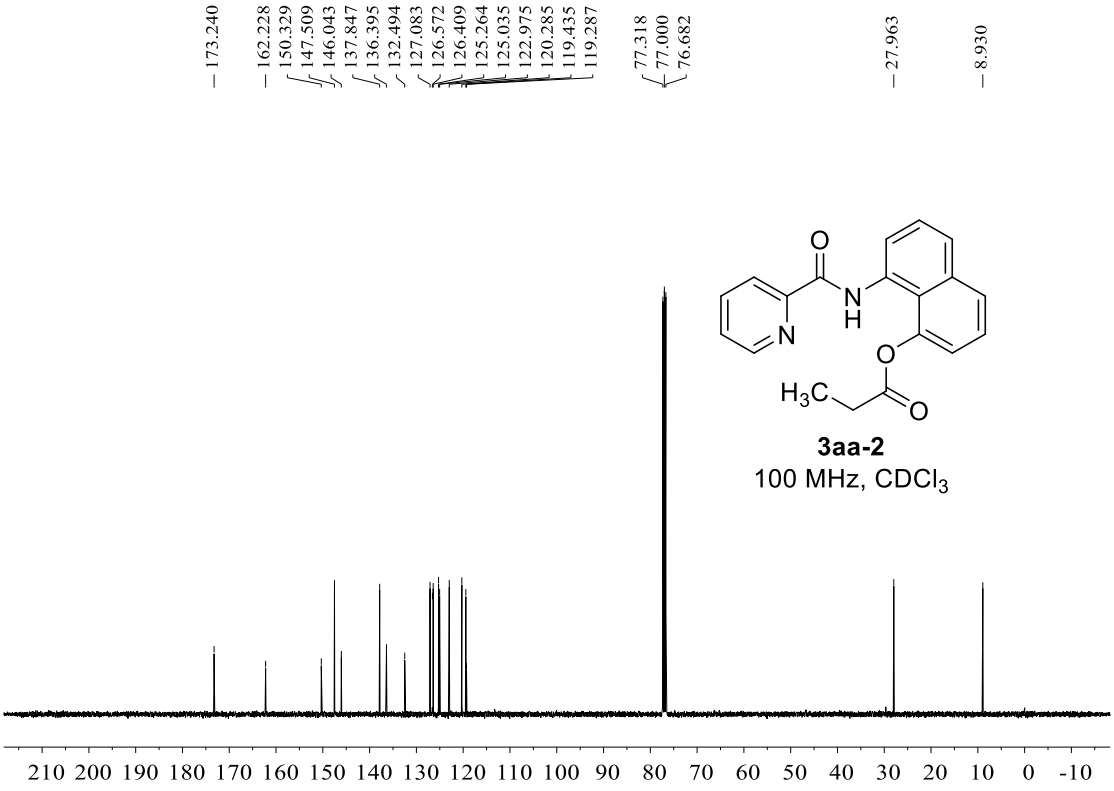
0.5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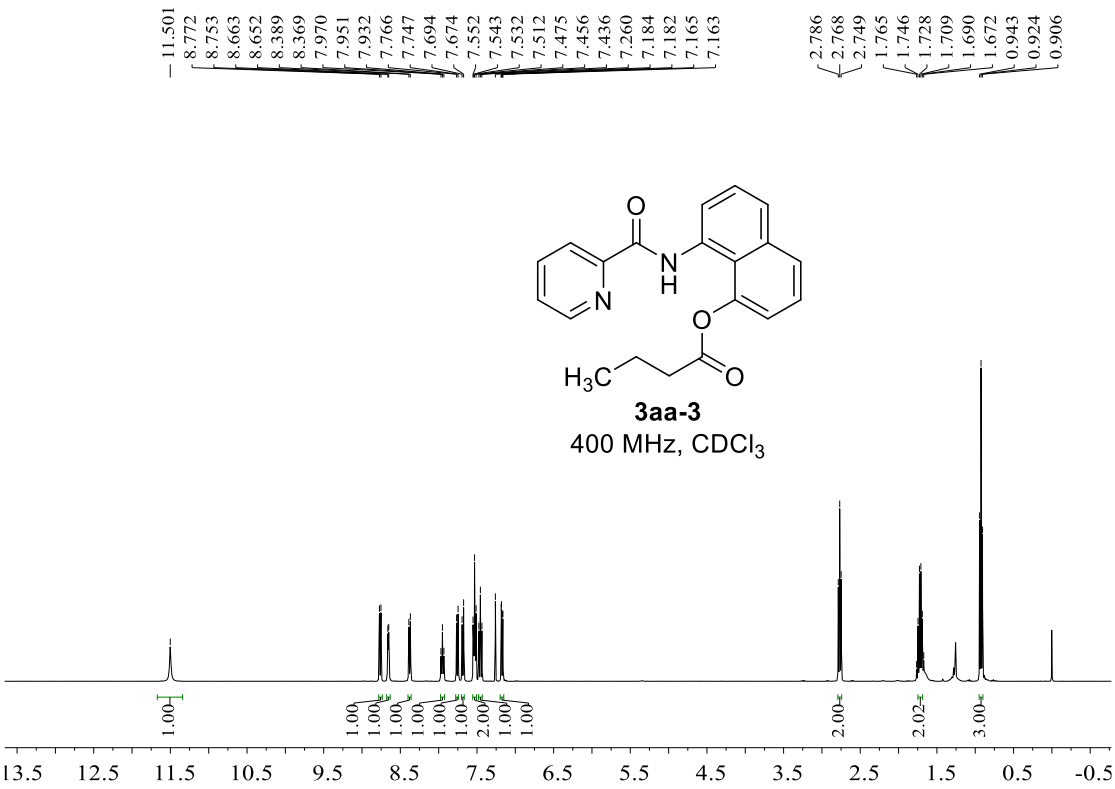
162.228
150.329
147.509
146.043
137.847
136.395
132.494
127.083
126.572
126.409
125.264
125.035
122.975
120.285
119.435
119.287
77.318
77.000
76.682
27.963
8.930
O
N
H
N
O
H3C
O
3aa-2
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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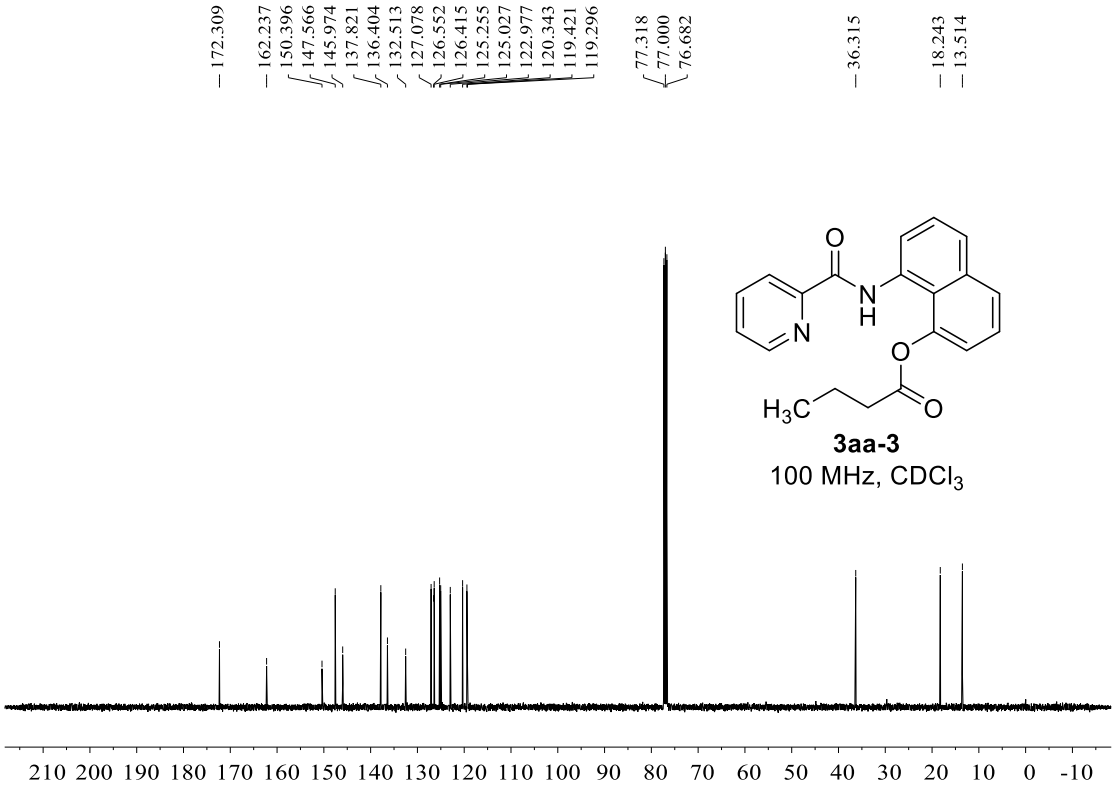
8.772
8.753
8.663
8.652
8.389
8.369
7.970
7.951
7.932
7.766
7.747
7.694
7.674
7.552
7.543
7.532
7.512
7.475
7.456
7.436
7.260
7.184
7.182
7.165
7.163
2.786
2.768
2.749
1.765
1.746
1.728
1.709
1.690
1.672
0.943
0.924
0.906
O
N
H
N
O
H3C
O
3aa-3
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
2.00
1.00
1.00
2.00
2.02
3.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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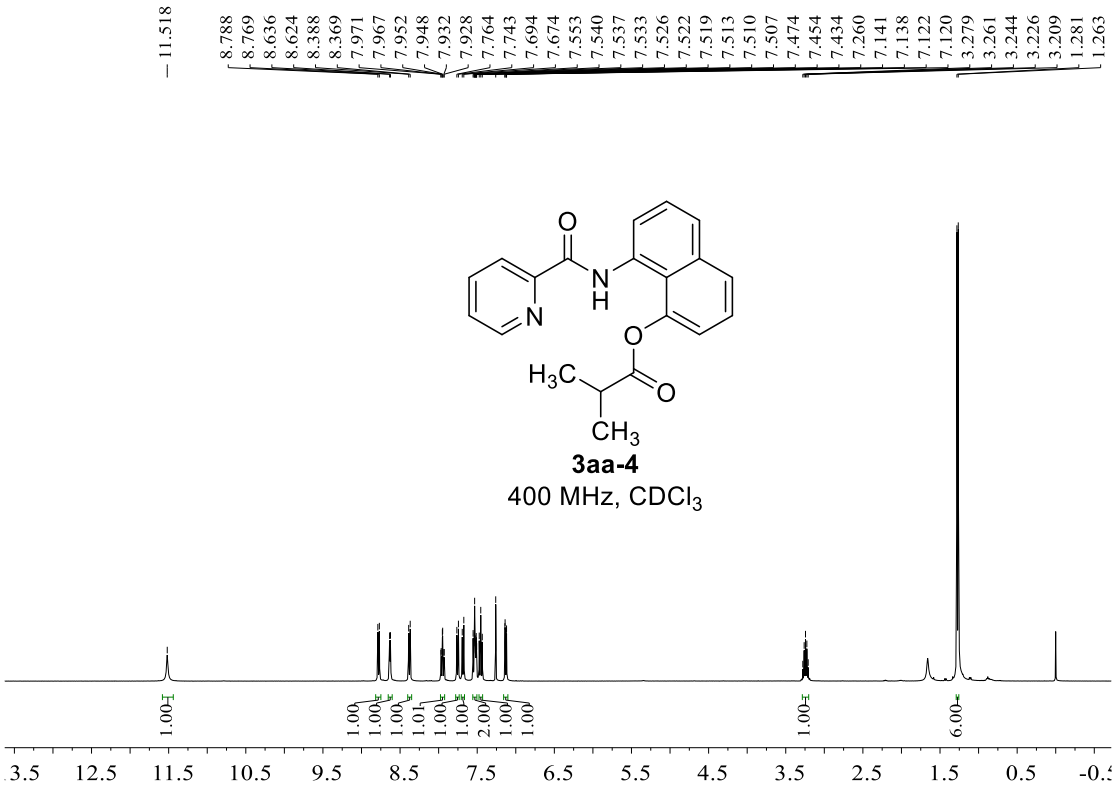
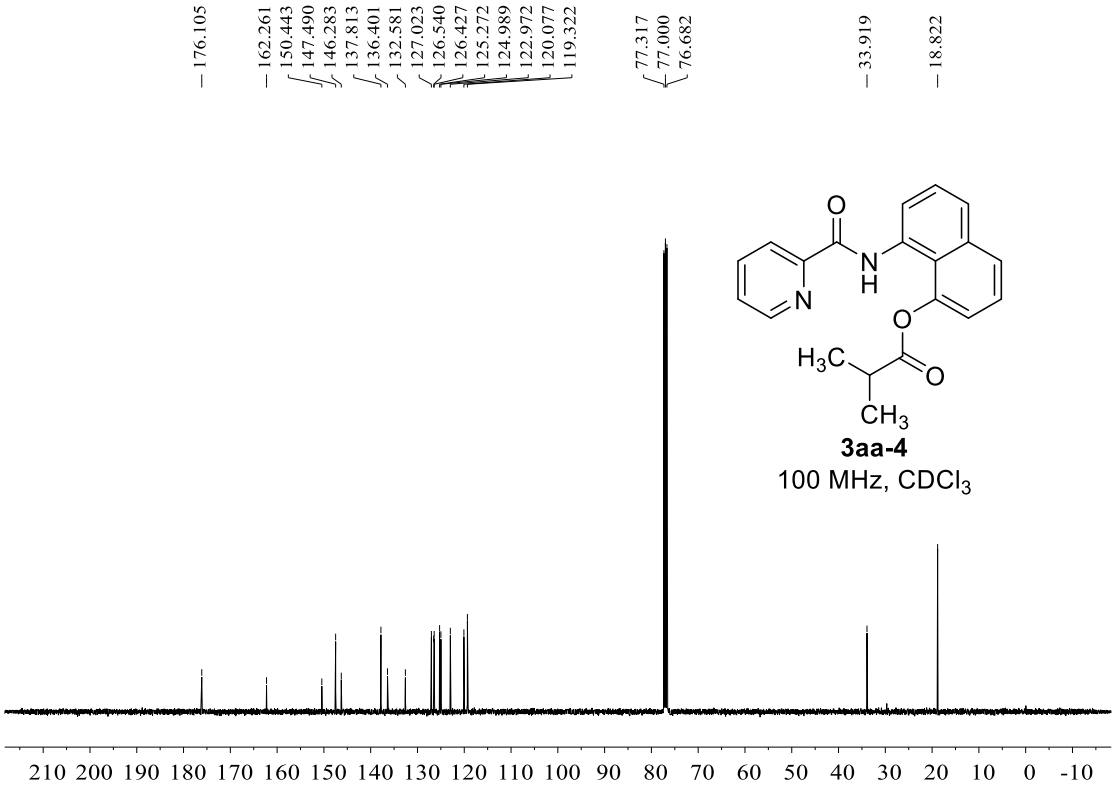
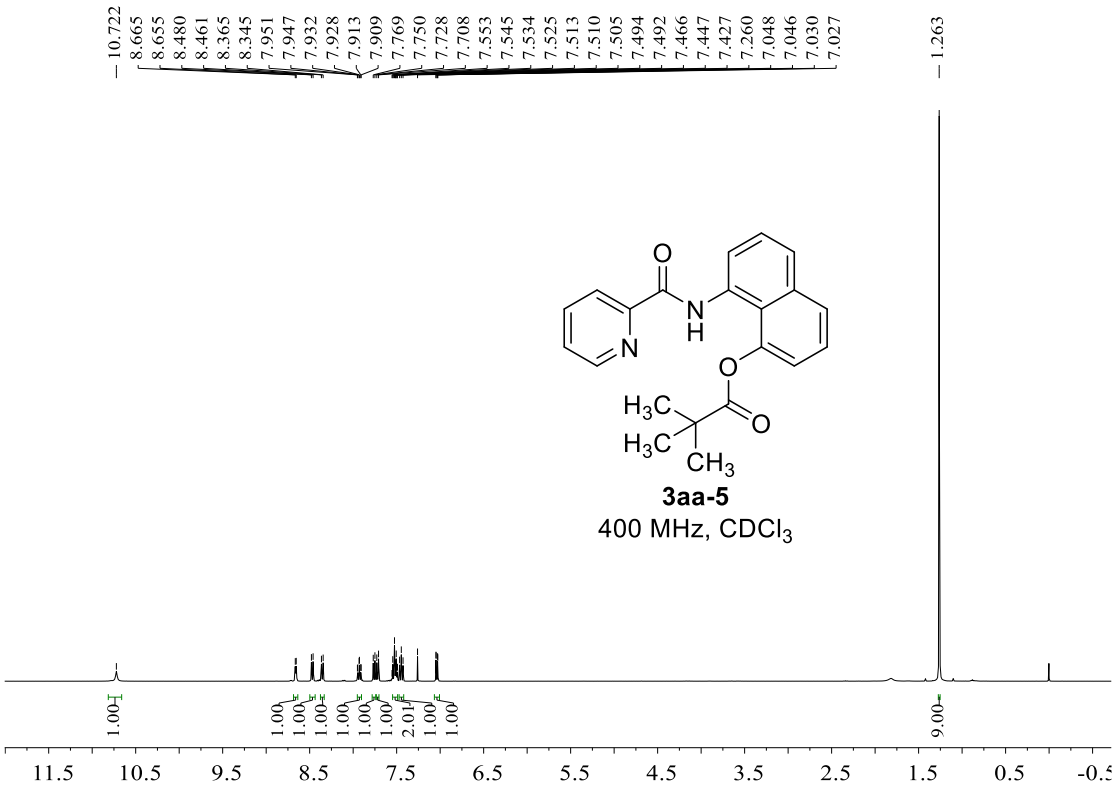
162.237
150.396
147.566
145.974
137.821
136.404
132.513
127.078
126.552
126.415
125.255
125.027
122.977
120.343
119.421
119.296
77.318
77.000
76.682
36.315
18.243
13.514
O
N
H
N
O
H3C
O
3aa-3
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

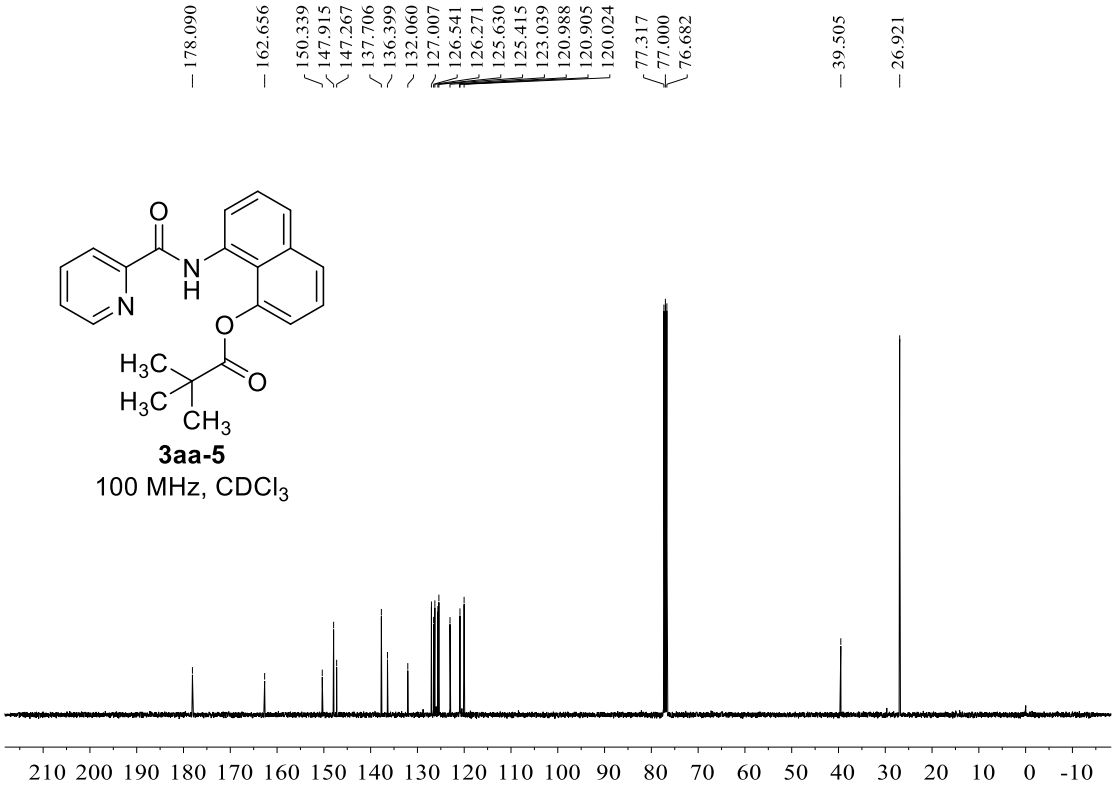

11.518
8.788
8.769
8.636
8.624
8.388
8.369
7.971
7.967
7.952
7.948
7.932
7.928
7.764
7.743
7.694
7.674
7.553
7.540
7.537
7.533
7.526
7.522
7.519
7.513
7.510
7.507
7.474
7.454
7.434
7.260
7.141
7.138
7.122
7.120
3.279
3.261
3.244
3.226
3.209
1.281
1.263
O
N
H
N
O
H3C
O
CH3
3aa-4
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.01
1.00
1.00
2.00
1.00
1.00
1.00
6.00
3.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5


176.105
162.261
150.443
147.490
146.283
137.813
136.401
132.581
127.023
126.540
126.427
125.272
124.989
122.972
120.077
119.322
77.317
77.000
76.682
33.919
18.822
O
N
H
N
O
H3C
O
CH3
3aa-4
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10



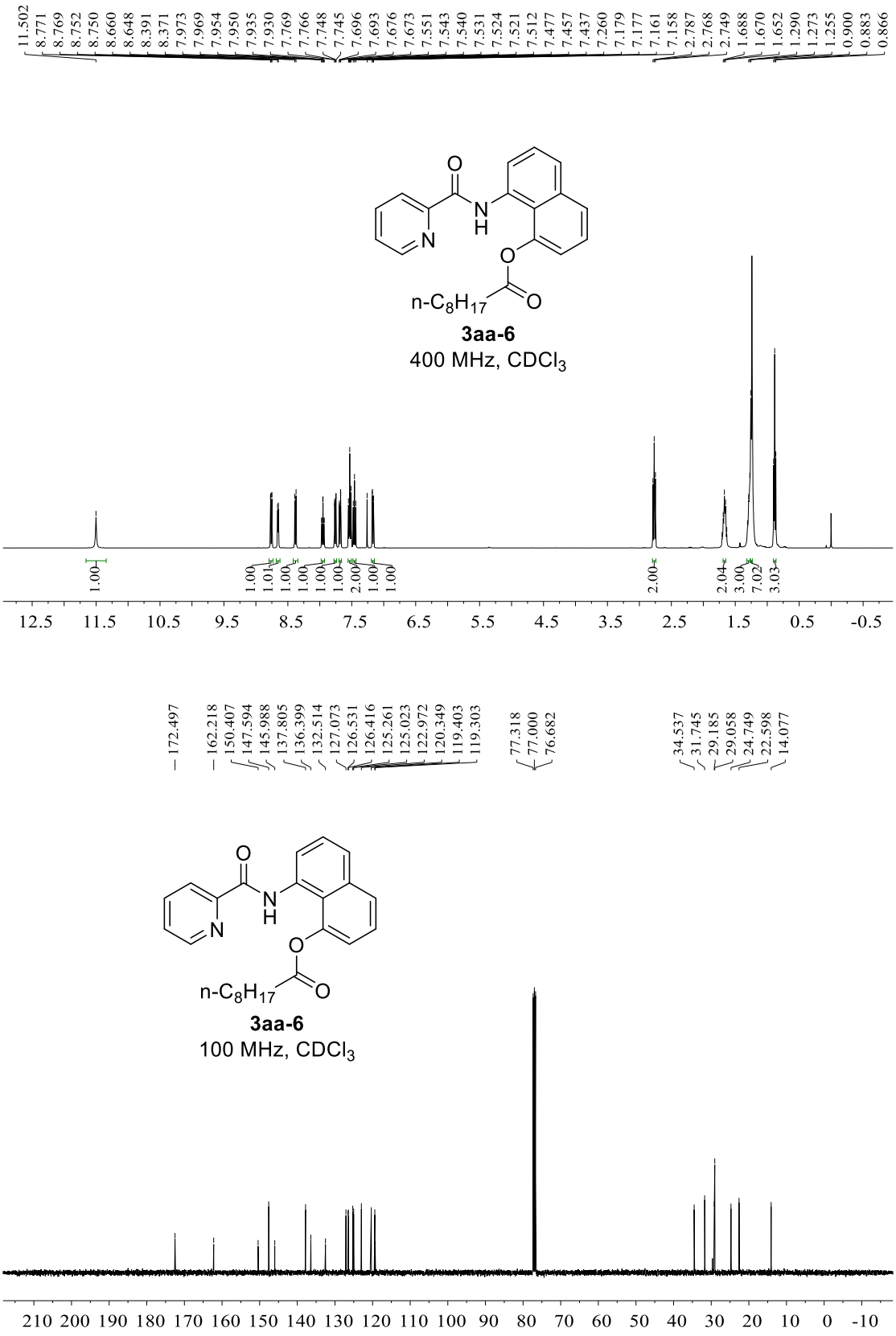
3aa-5

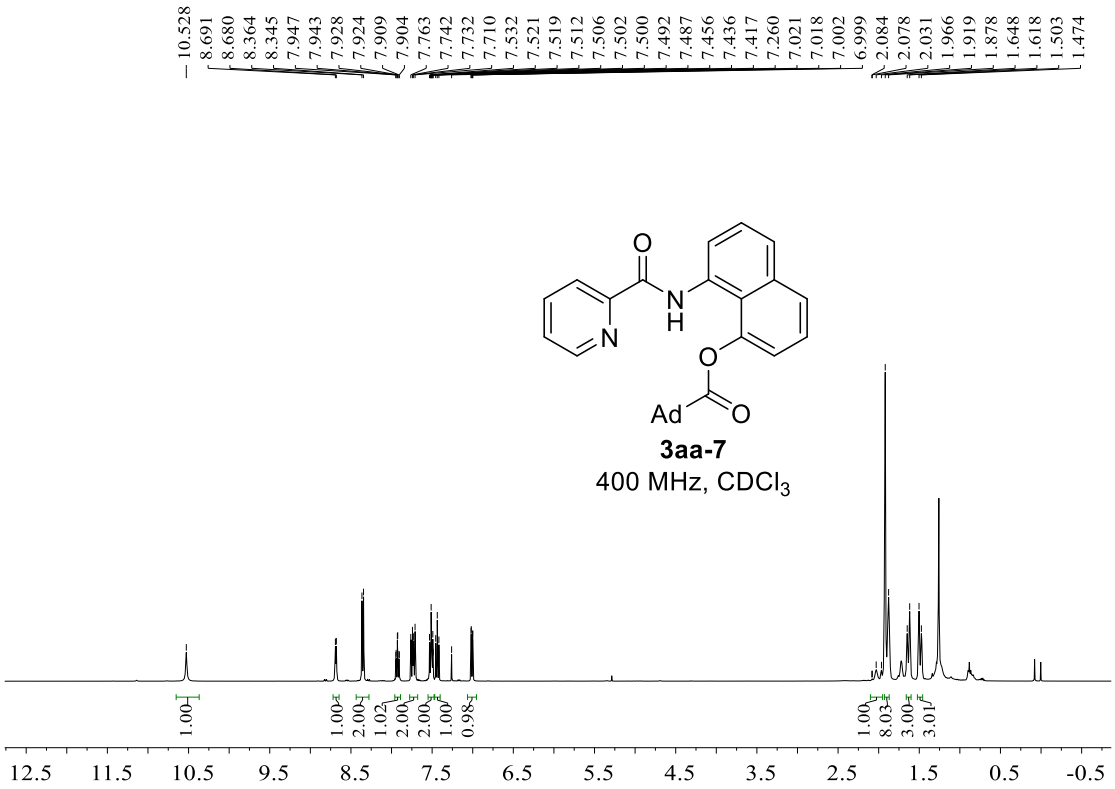
400 MHz, $CDCl_3$

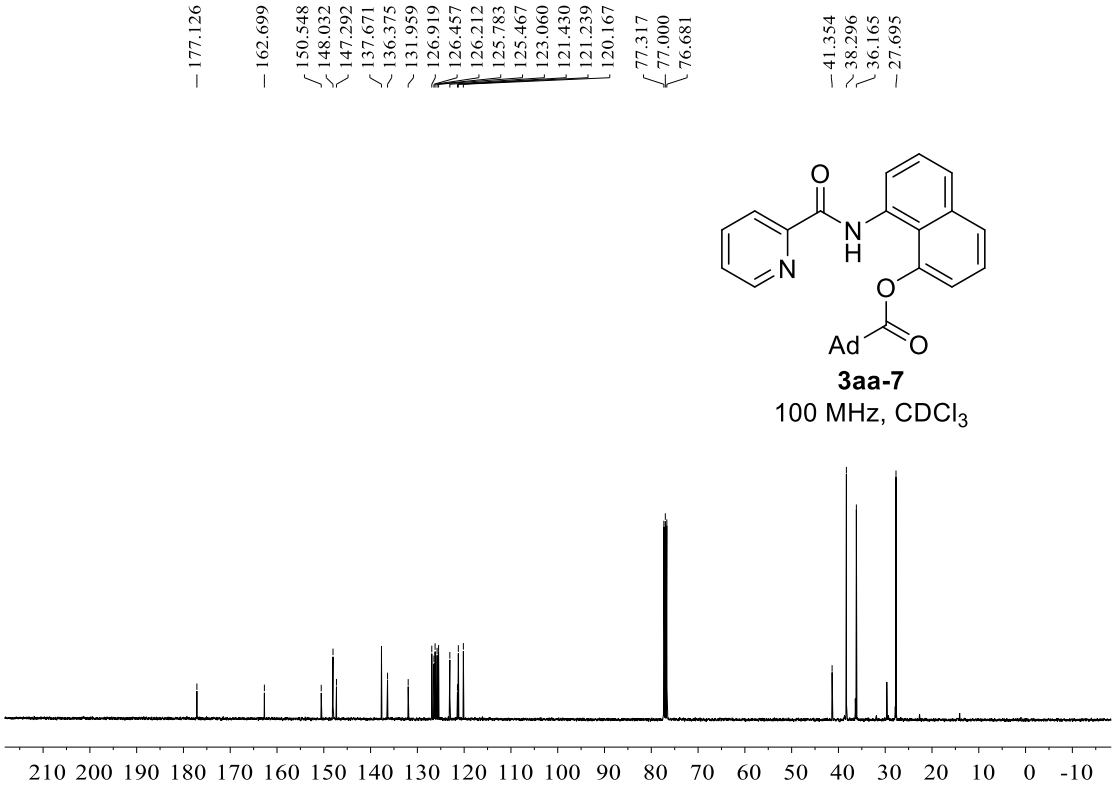


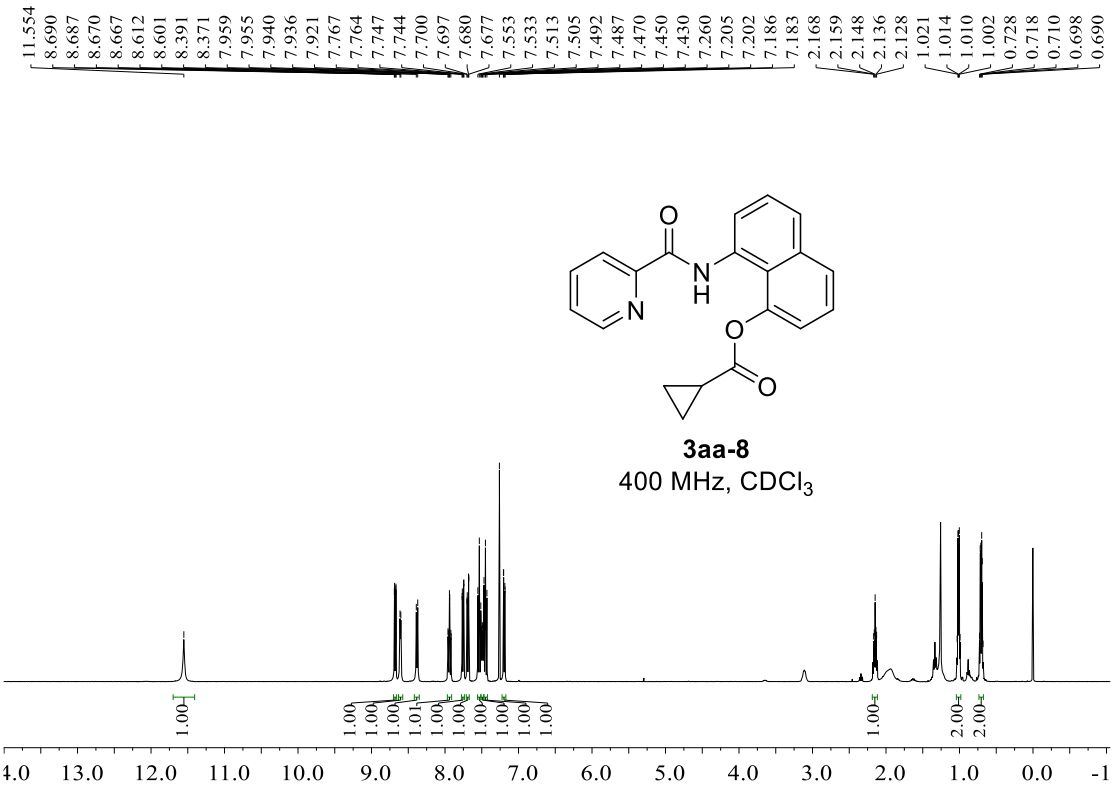
3aa-5

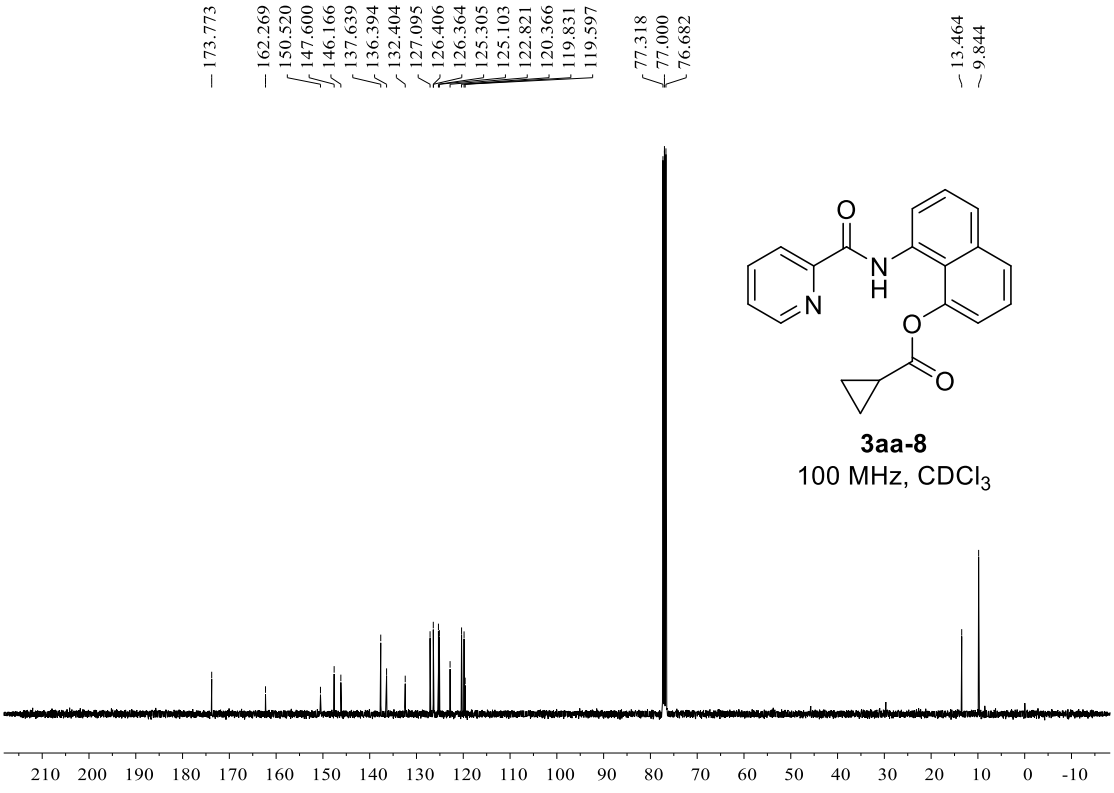
100 MHz, $CDCl_3$

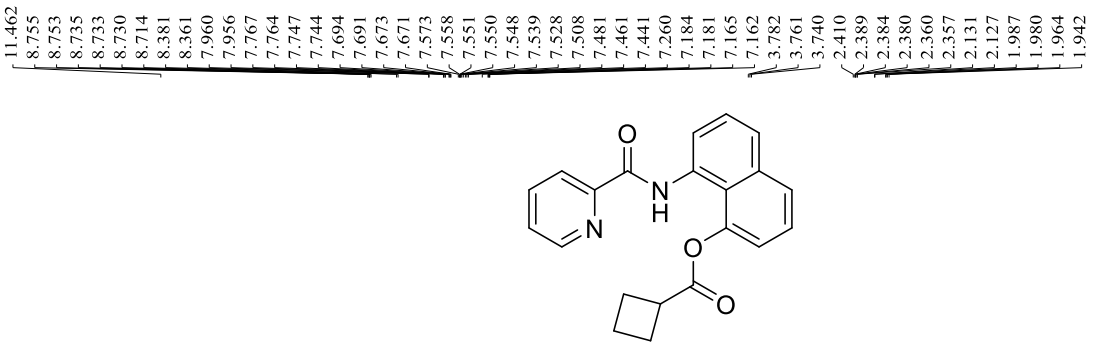

11.502
8.771
8.769
8.752
8.750
8.660
8.648
8.391
8.371
7.973
7.969
7.954
7.950
7.935
7.930
7.769
7.766
7.748
7.745
7.696
7.693
7.676
7.673
7.551
7.543
7.540
7.531
7.524
7.521
7.512
7.477
7.457
7.437
7.260
7.179
7.177
7.161
7.158
2.787
2.768
2.749
1.688
1.670
1.652
1.290
1.273
1.255
0.900
0.883
0.866
n-C8H17
3aa-6
400 MHz, CDCl3
1.00
1.00
1.01
1.00
1.00
1.00
2.00
1.00
2.00
2.04
3.00
7.02
3.03
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
172.497
162.218
150.407
147.594
145.988
137.805
136.399
132.514
127.073
126.531
126.416
125.261
125.023
122.972
120.349
119.403
119.303
77.318
77.000
76.682
34.537
31.745
29.185
29.058
24.749
22.598
14.077
n-C8H17
3aa-6
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


10.528
8.691
8.680
8.364
8.345
7.947
7.943
7.928
7.924
7.909
7.904
7.763
7.742
7.732
7.710
7.532
7.521
7.519
7.512
7.506
7.502
7.500
7.492
7.487
7.456
7.436
7.417
7.260
7.021
7.018
7.002
6.999
2.084
2.078
2.031
1.966
1.919
1.878
1.648
1.618
1.503
1.474
O
N
H
N
O
Ad
O
3aa-7
400 MHz, CDCl3
1.00
1.00
2.00
1.02
2.00
2.00
1.00
0.98
1.00
8.03
3.00
3.01
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

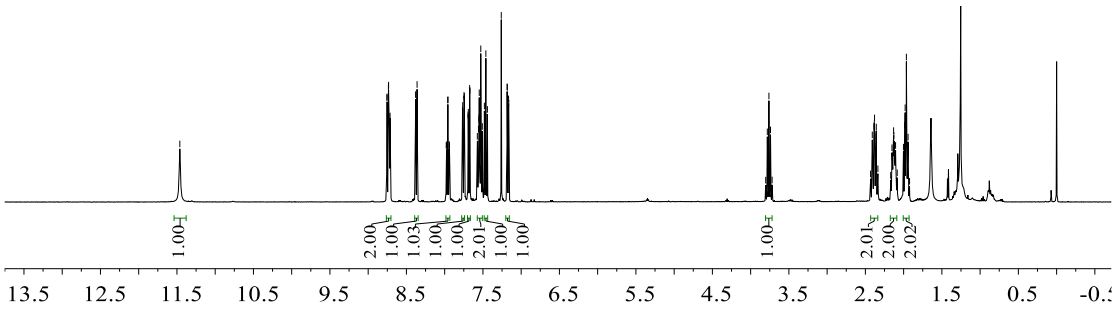

177.126
162.699
150.548
148.032
147.292
137.671
136.375
131.959
126.919
126.457
126.212
125.783
125.467
123.060
121.430
121.239
120.167
77.317
77.000
76.681
41.354
38.296
36.165
27.695
O
N
H
N
O
Ad
O
3aa-7
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

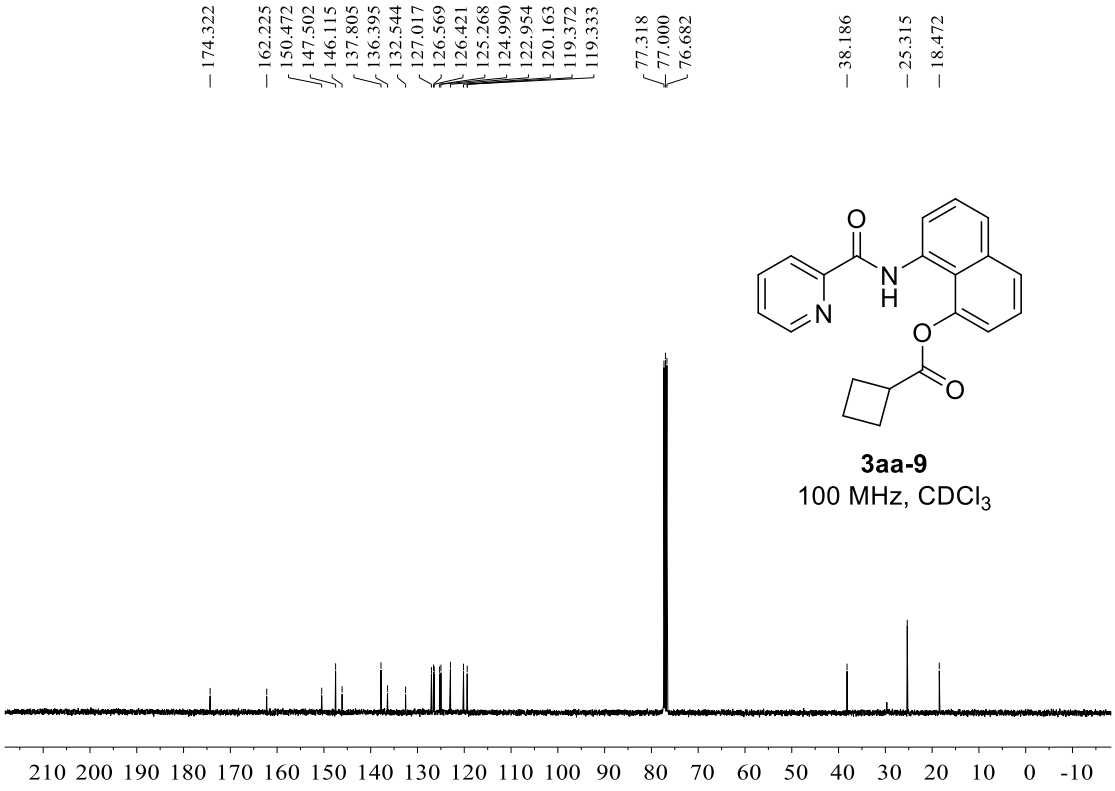

11.554
8.690
8.687
8.670
8.667
8.612
8.601
8.391
8.371
7.959
7.955
7.940
7.936
7.921
7.767
7.764
7.747
7.744
7.700
7.697
7.680
7.677
7.553
7.533
7.513
7.505
7.492
7.487
7.470
7.450
7.430
7.260
7.205
7.202
7.186
7.183
2.168
2.159
2.148
2.136
2.128
1.021
1.014
1.010
1.002
0.728
0.718
0.710
0.698
0.690
O
N
H
N
O
O
3aa-8
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.01
1.00
1.00
1.00
1.00
1.00
1.00
2.00
2.00
4.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1


173.773
162.269
150.520
147.600
146.166
137.639
136.394
132.404
127.095
126.406
126.364
125.305
125.103
122.821
120.366
119.831
119.597
77.318
77.000
76.682
13.464
9.844
O
N
H
N
O
O
3aa-8
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10

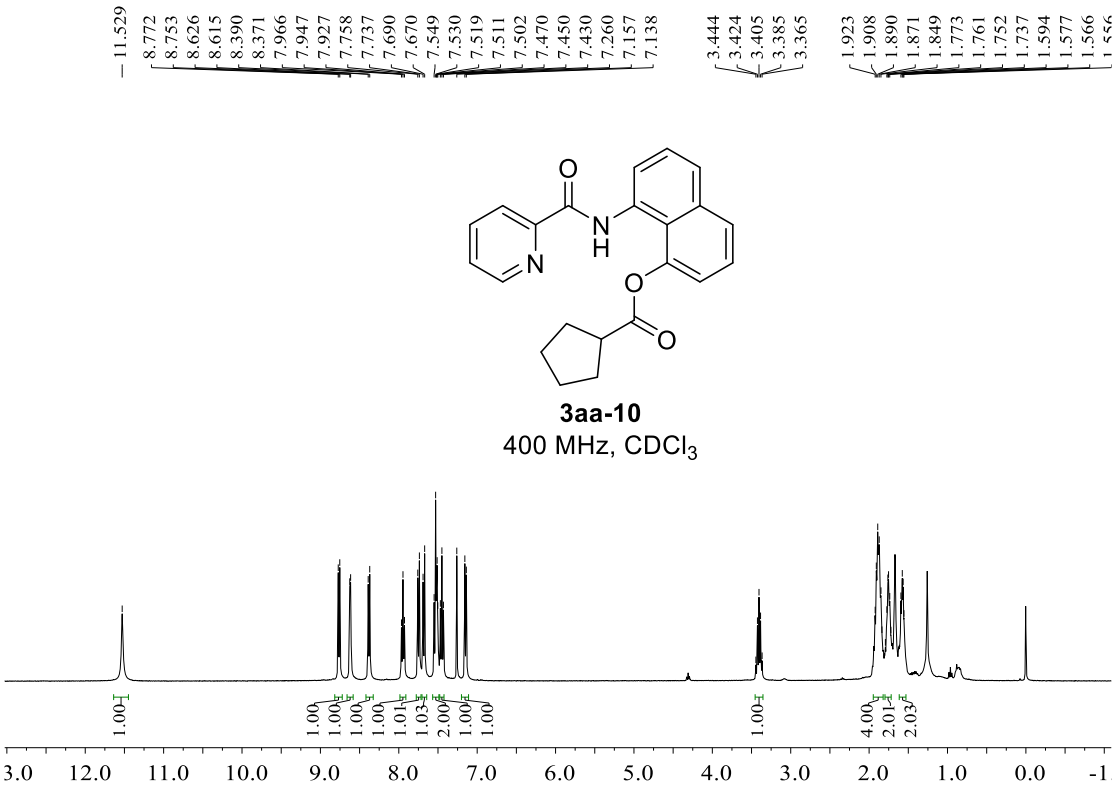


3aa-9
400 MHz, $CDCl_3$

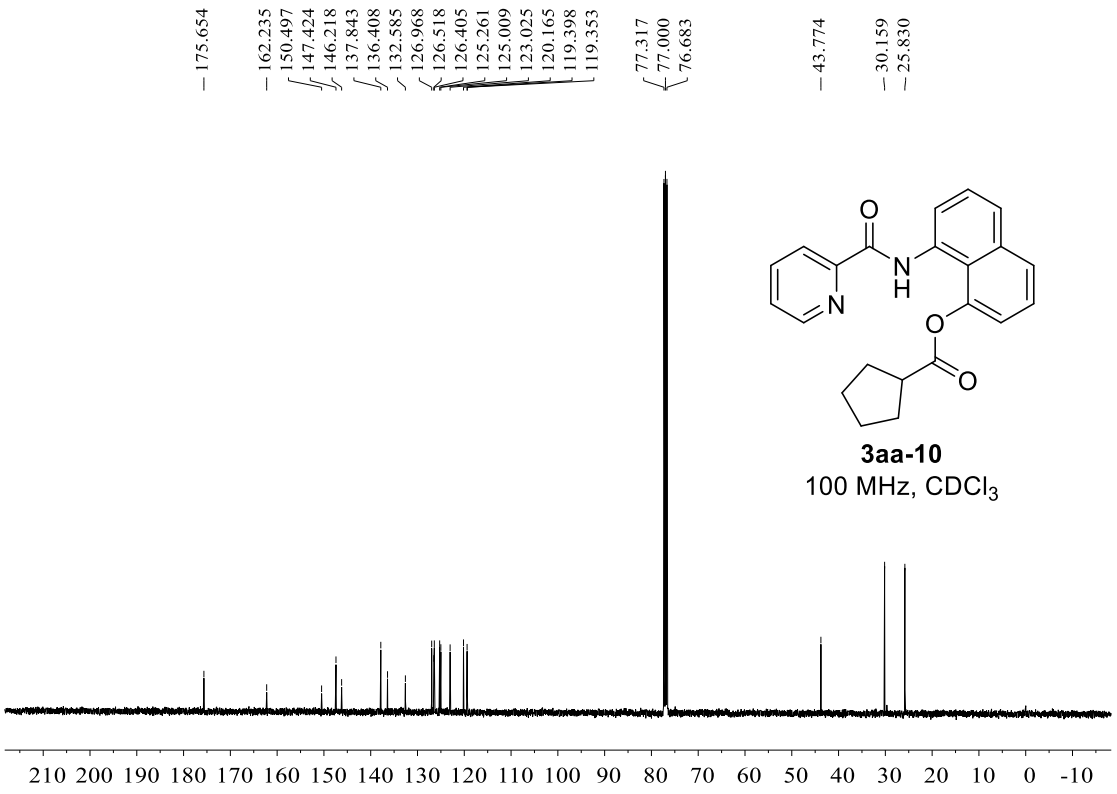




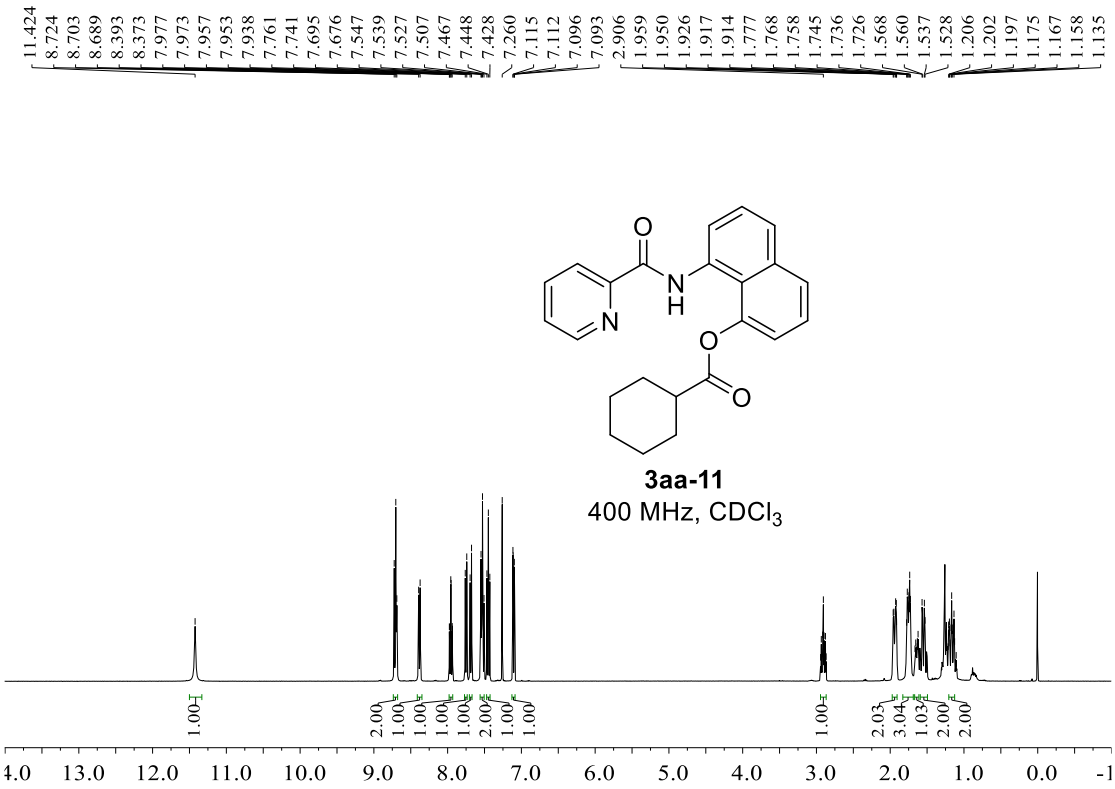
3aa-9
100 MHz, $CDCl_3$



3aa-10
400 MHz, $CDCl_3$



3aa-10
100 MHz, $CDCl_3$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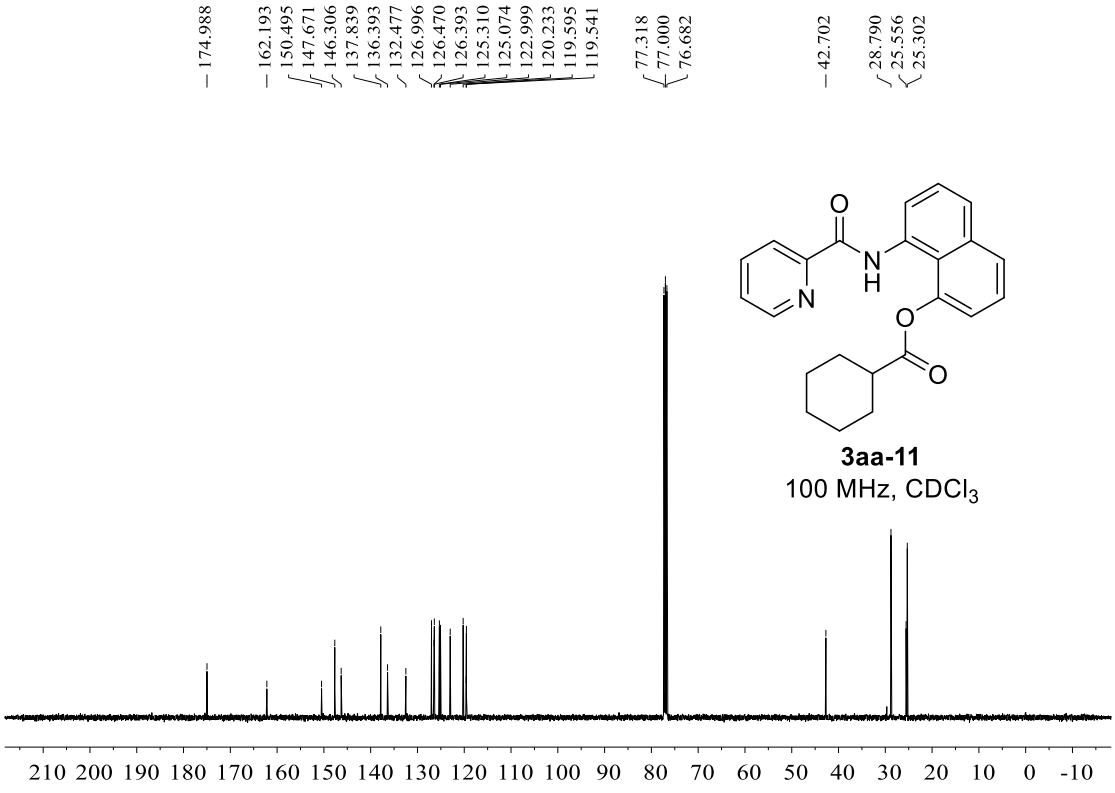
8.703
8.689
8.393
8.373
7.977
7.973
7.957
7.953
7.938
7.761
7.741
7.695
7.676
7.547
7.539
7.527
7.507
7.467
7.448
7.428
7.260
7.115
7.112
7.096
7.093
2.906
1.959
1.950
1.926
1.917
1.914
1.777
1.768
1.758
1.745
1.736
1.726
1.568
1.560
1.537
1.528
1.206
1.202
1.197
1.175
1.167
1.158
1.135
O
N
H
N
O
O
3aa-11
400 MHz, CDCl3
1.00
2.00
1.00
1.00
1.00
2.00
1.00
1.00
1.00
2.03
3.04
1.03
2.00
2.00
4.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1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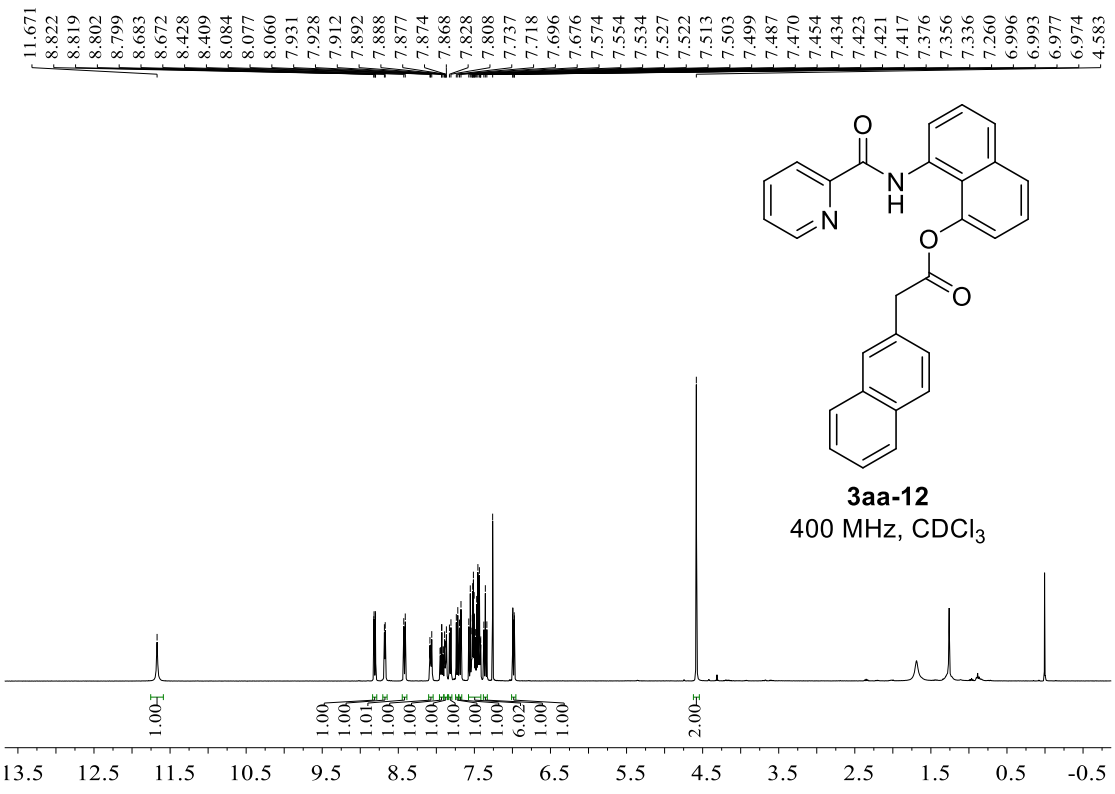
162.193
150.495
147.671
146.306
137.839
136.393
132.477
126.996
126.470
126.393
125.310
125.074
122.999
120.233
119.595
119.541
77.318
77.000
76.682
42.702
28.790
25.556
25.302
O
N
H
N
O
O
3aa-11
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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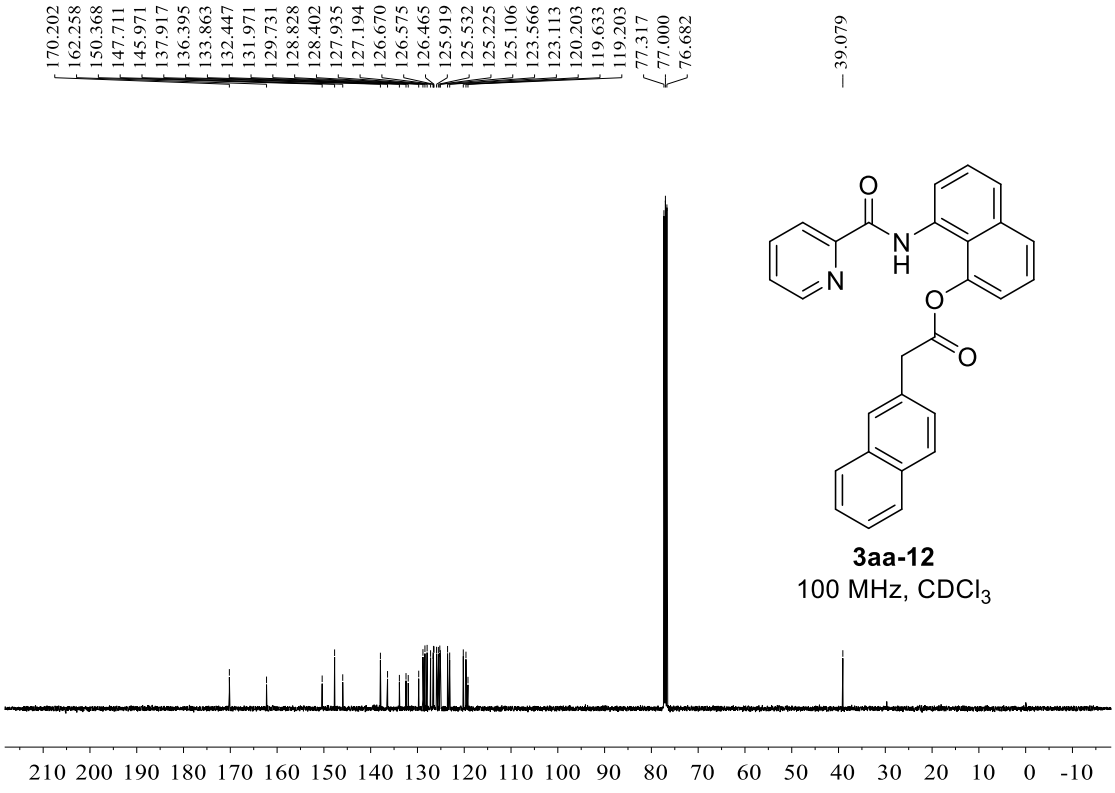
8.822
8.819
8.802
8.799
8.683
8.672
8.428
8.409
8.084
8.077
8.060
7.931
7.928
7.912
7.892
7.888
7.877
7.874
7.868
7.828
7.808
7.737
7.718
7.696
7.676
7.574
7.554
7.534
7.527
7.522
7.513
7.503
7.499
7.487
7.470
7.454
7.434
7.423
7.421
7.417
7.376
7.356
7.336
7.260
6.996
6.993
6.977
6.974
4.583
O
N
H
N
O
O
3aa-12
400 MHz, CDCl3
1.00
1.00
1.00
1.01
1.00
1.00
1.00
1.00
1.00
1.00
6.02
1.00
1.00
2.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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147.711
145.971
137.917
136.395
133.863
132.447
131.971
129.731
128.828
128.402
127.935
127.194
126.670
126.575
126.465
125.919
125.532
125.225
125.106
123.566
123.113
120.203
119.633
119.203
77.317
77.000
76.682
39.079
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N
O
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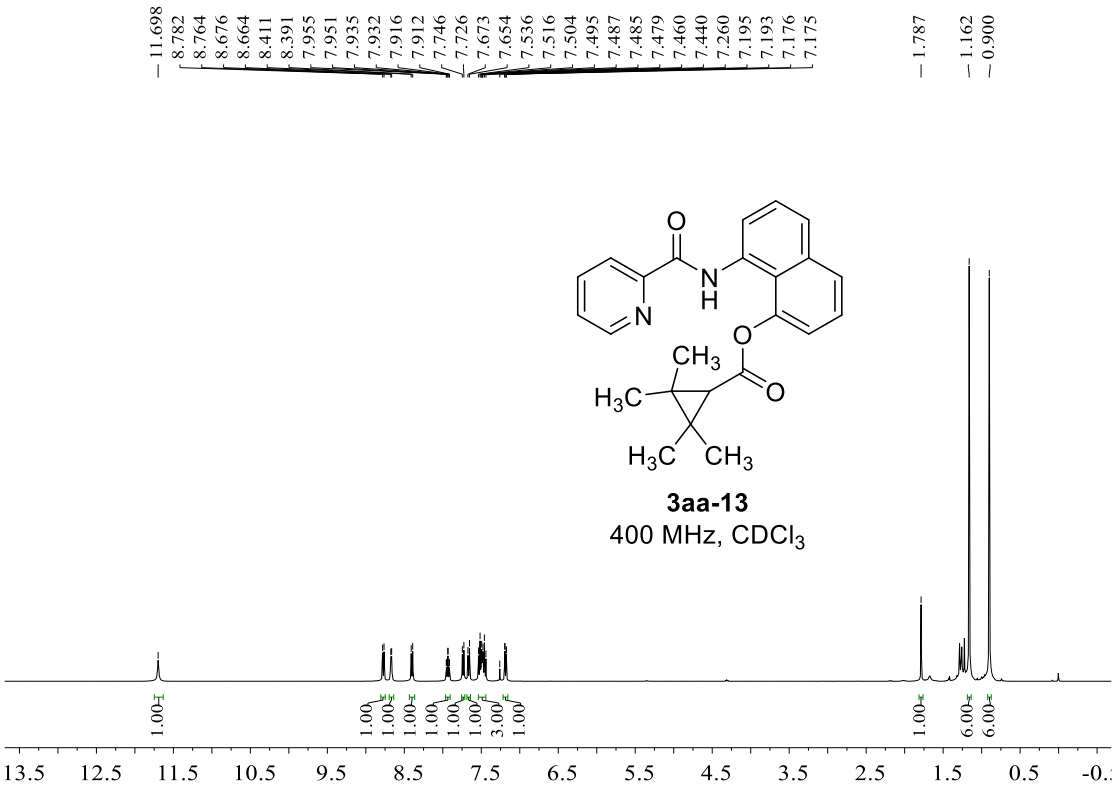
3aa-12
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


11.698
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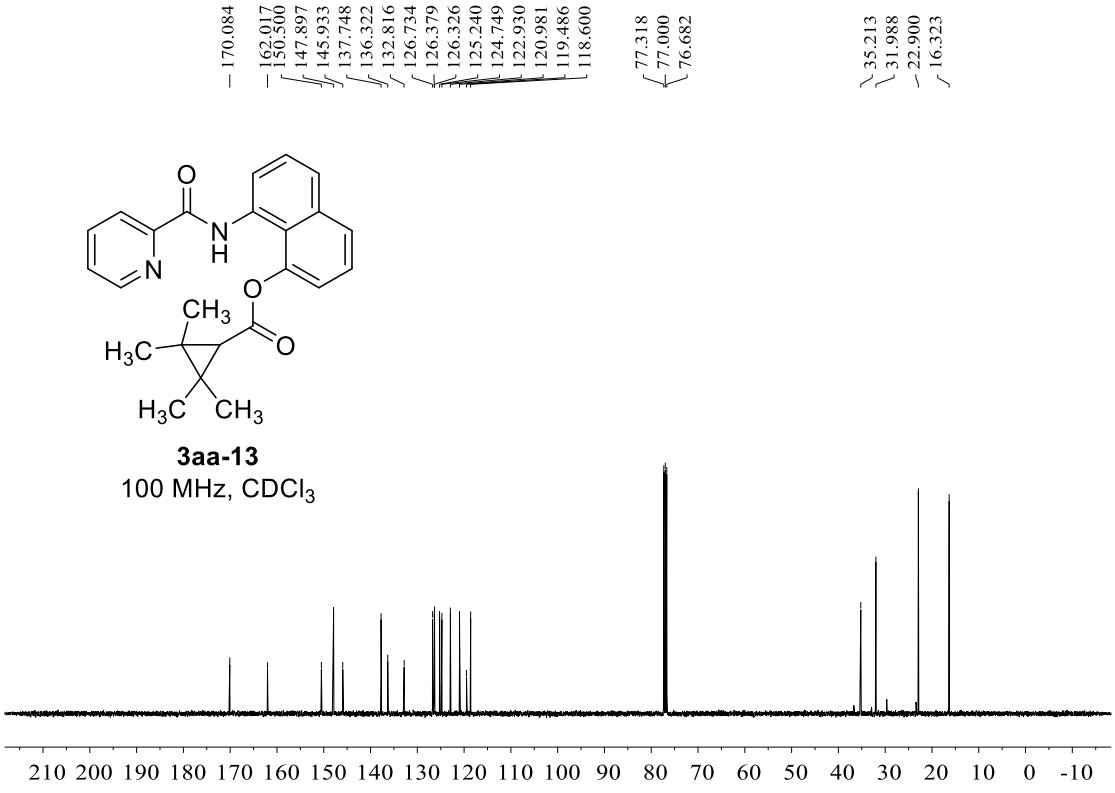
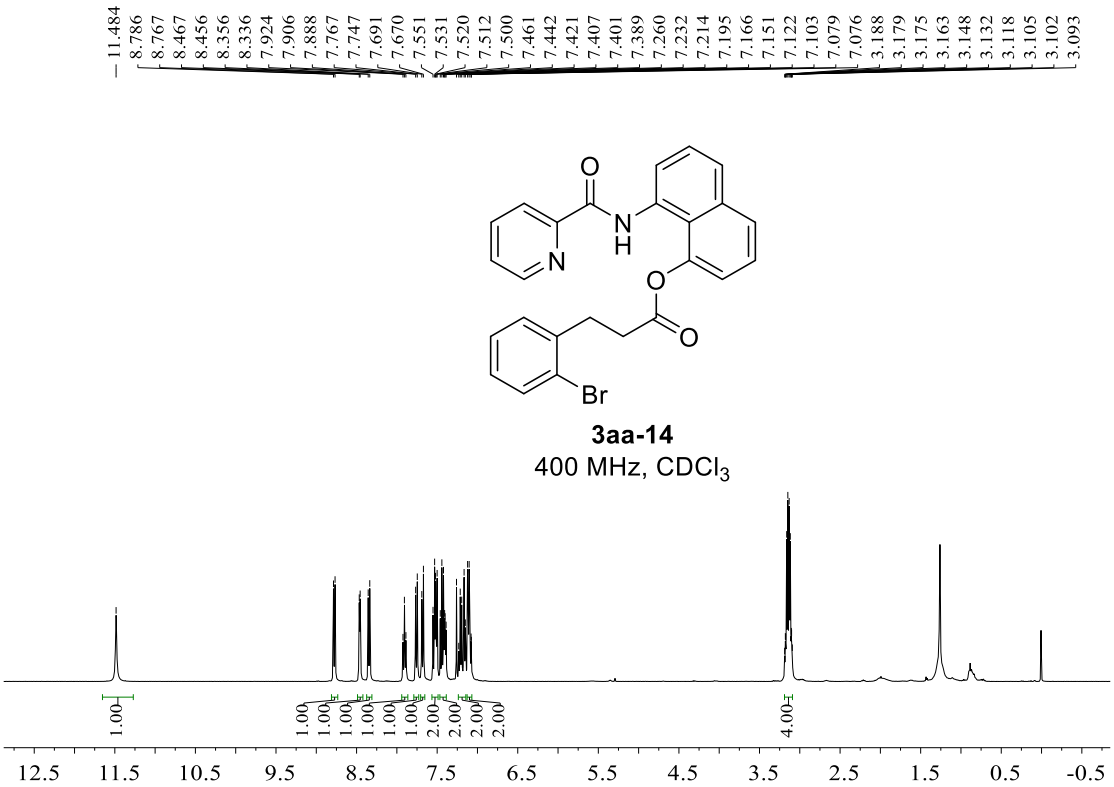
8.764
8.676
8.664
8.411
8.391
7.955
7.951
7.935
7.932
7.916
7.912
7.746
7.726
7.673
7.654
7.536
7.516
7.504
7.495
7.487
7.485
7.479
7.460
7.440
7.260
7.195
7.193
7.176
7.175
1.787
1.162
0.900
3aa-13
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
3.00
1.00
1.00
6.00
6.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5


170.084
162.017
150.500
147.897
145.933
137.748
136.322
132.816
126.734
126.379
126.326
125.240
124.749
122.930
120.981
119.486
118.600
77.318
77.000
76.682
35.213
31.988
22.900
16.323
3aa-13
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


11.484
8.786
8.767
8.467
8.456
8.356
8.336
7.924
7.906
7.888
7.767
7.747
7.691
7.670
7.551
7.531
7.520
7.512
7.500
7.461
7.442
7.421
7.407
7.401
7.389
7.260
7.232
7.214
7.195
7.166
7.151
7.122
7.103
7.079
7.076
3.188
3.179
3.175
3.163
3.148
3.132
3.118
3.105
3.102
3.093
O
N
H
N
O
O
Br
3aa-14
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
2.00
2.00
2.00
2.00
4.00
12.5
11.5
10.5
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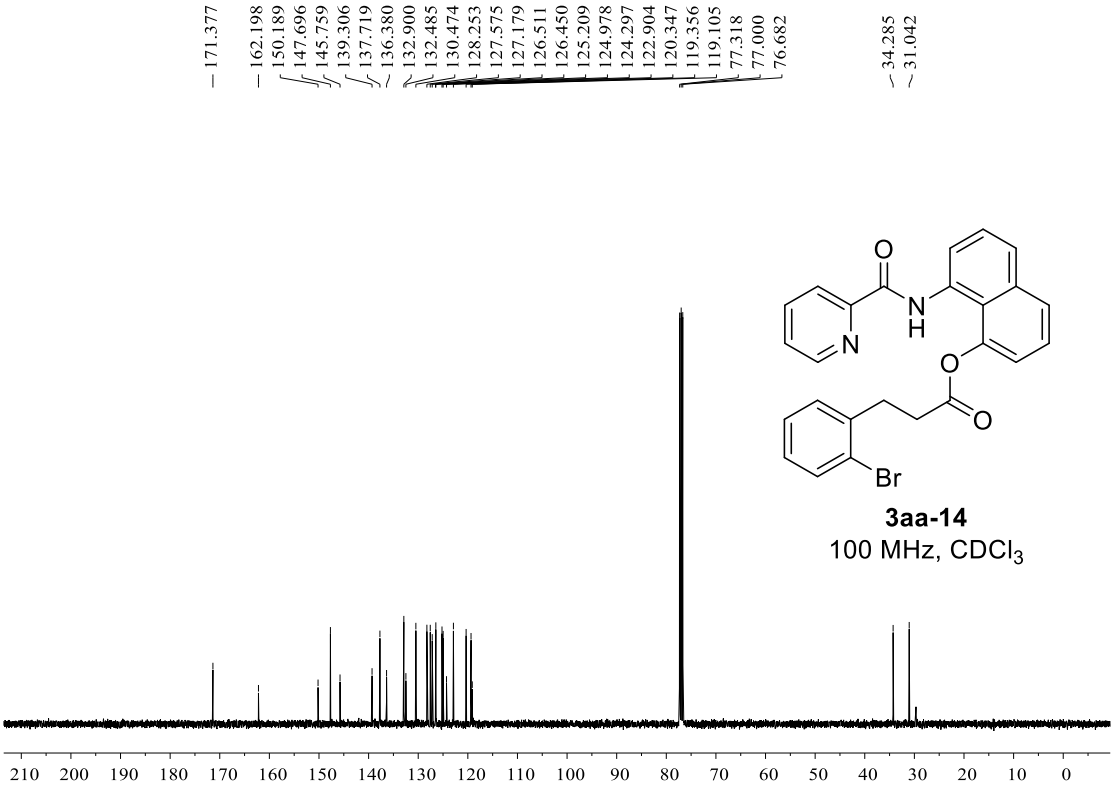
-0.5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136.380
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128.253
127.575
127.179
126.511
126.450
125.209
124.978
124.297
122.904
120.347
119.356
119.105
77.318
77.000
76.682
34.285
31.042
O
N
H
N
O
O
Br
3aa-14
100 MHz, CDCl3
210
200
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180
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150
140
130
120
110
100
90
80
70
60
50
40
30
20
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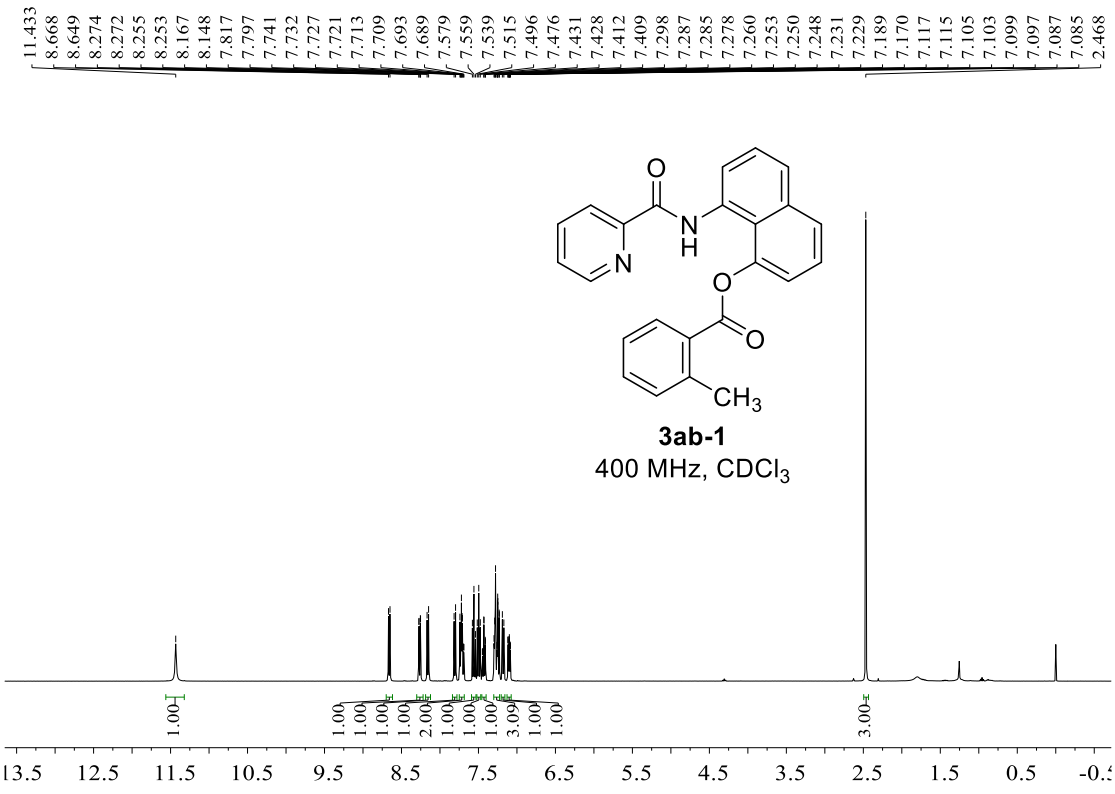
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8.255
8.253
8.167
8.148
7.817
7.797
7.741
7.732
7.727
7.721
7.713
7.709
7.693
7.689
7.579
7.559
7.539
7.515
7.496
7.476
7.431
7.428
7.412
7.409
7.298
7.287
7.285
7.278
7.260
7.253
7.250
7.248
7.231
7.229
7.189
7.170
7.117
7.115
7.105
7.103
7.099
7.097
7.087
7.085
2.468
O
N
H
N
O
O
CH3
3ab-1
400 MHz, CDCl3
1.00
1.00
1.00
1.00
2.00
1.00
1.00
3.09
1.00
1.00
3.00
13.5
12.5
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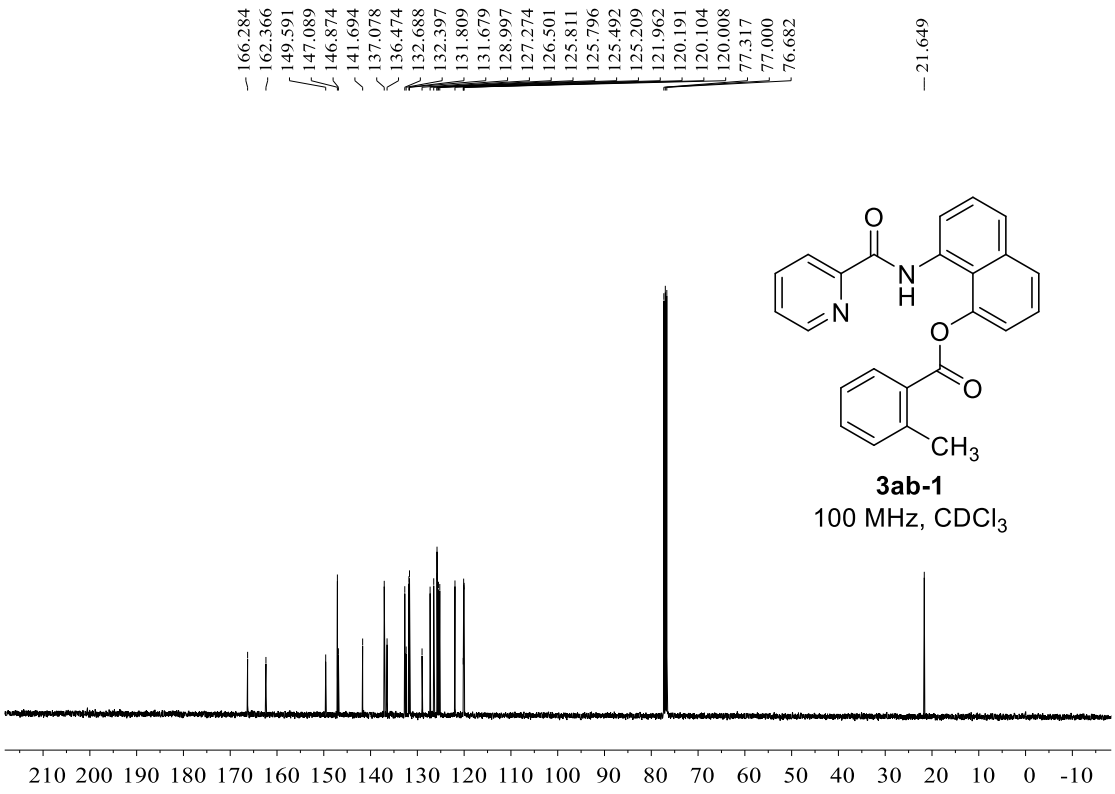
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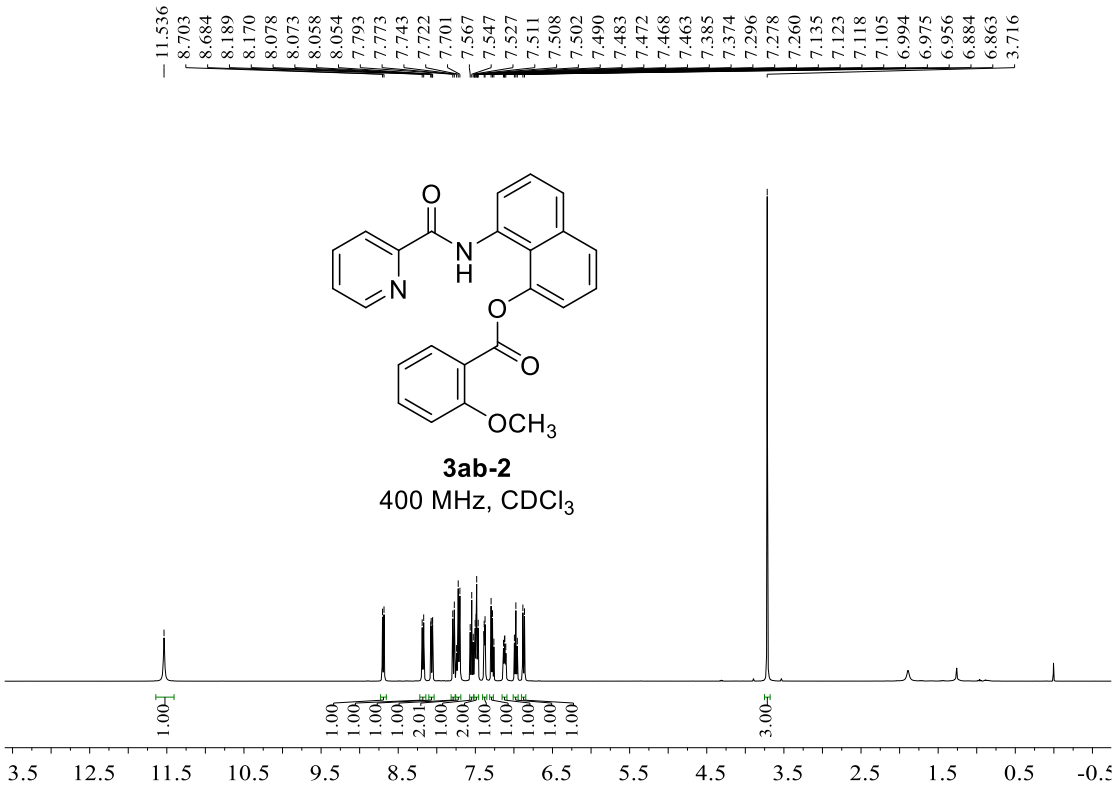
127.274
126.501
125.811
125.796
125.492
125.209
121.962
120.191
120.104
120.008
77.317
77.000
76.682
21.649
O
N
H
N
O
O
CH3
3ab-1
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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8.078
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8.058
8.054
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7.773
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7.722
7.701
7.567
7.547
7.527
7.511
7.508
7.502
7.490
7.483
7.472
7.468
7.463
7.385
7.374
7.296
7.278
7.260
7.135
7.123
7.118
7.105
6.994
6.975
6.956
6.884
6.863
3.716
O
N
H
N
O
O
OCH3
3ab-2
400 MHz, CDCl3
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1.00
1.00
1.00
1.00
2.01
1.00
2.00
1.00
1.00
1.00
1.00
3.00
3.5
12.5
11.5
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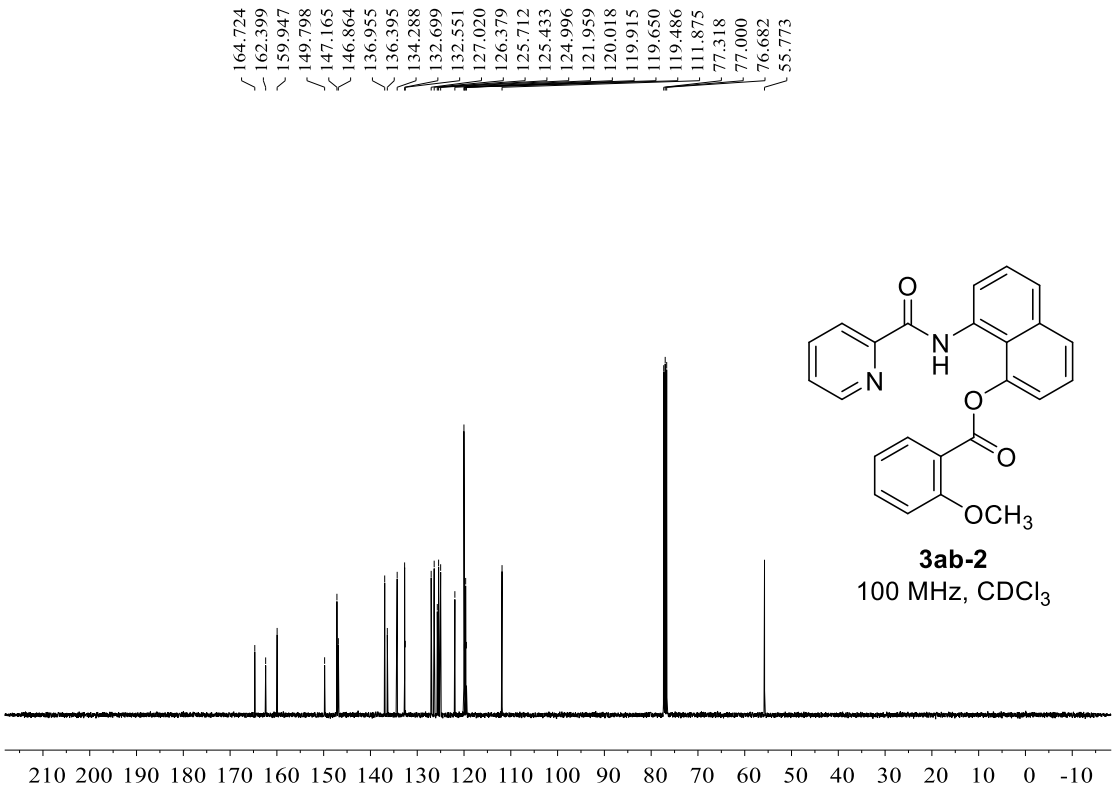
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136.395
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132.699
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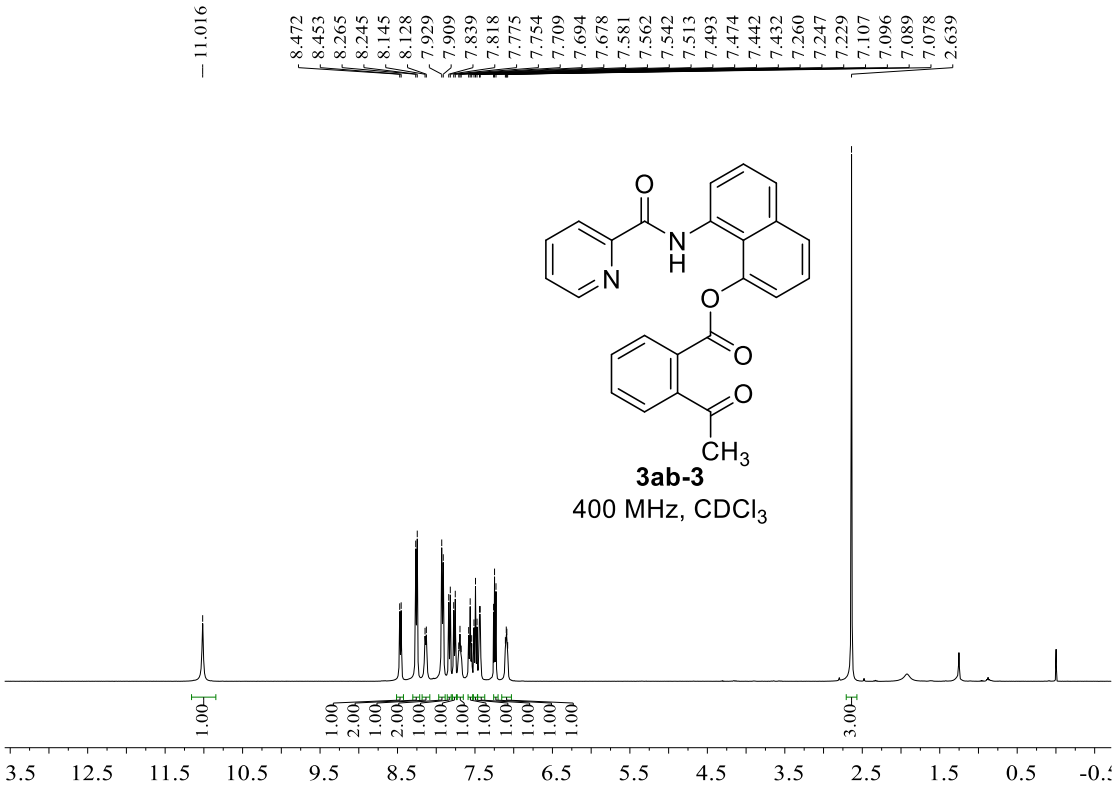
125.712
125.433
124.996
121.959
120.018
119.915
119.650
119.486
111.875
77.318
77.000
76.682
55.773
O
N
H
N
O
O
OCH3
3ab-2
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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8.245
8.145
8.128
7.929
7.909
7.839
7.818
7.775
7.754
7.709
7.694
7.678
7.581
7.562
7.542
7.513
7.493
7.474
7.442
7.432
7.260
7.247
7.229
7.107
7.096
7.089
7.078
2.639
3ab-3
400 MHz, CDCl3
1.00
1.00
2.00
1.00
2.00
1.00
1.00
1.00
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1.00
1.00
1.00
3.00
3.5
12.5
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6.5
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4.5
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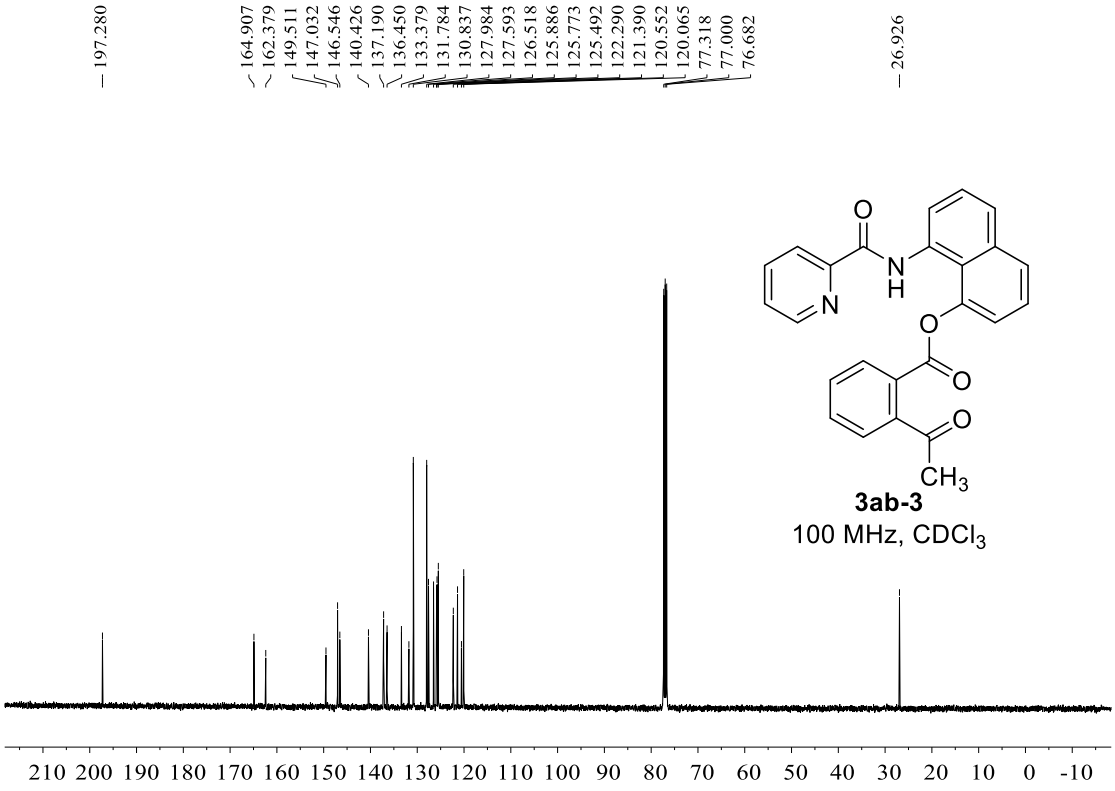
2.5
1.5
0.5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133.379
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130.837
127.984
127.593
126.518
125.886
125.773
125.492
122.290
121.390
120.552
120.065
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77.000
76.682
26.926
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100 MHz, CDCl3
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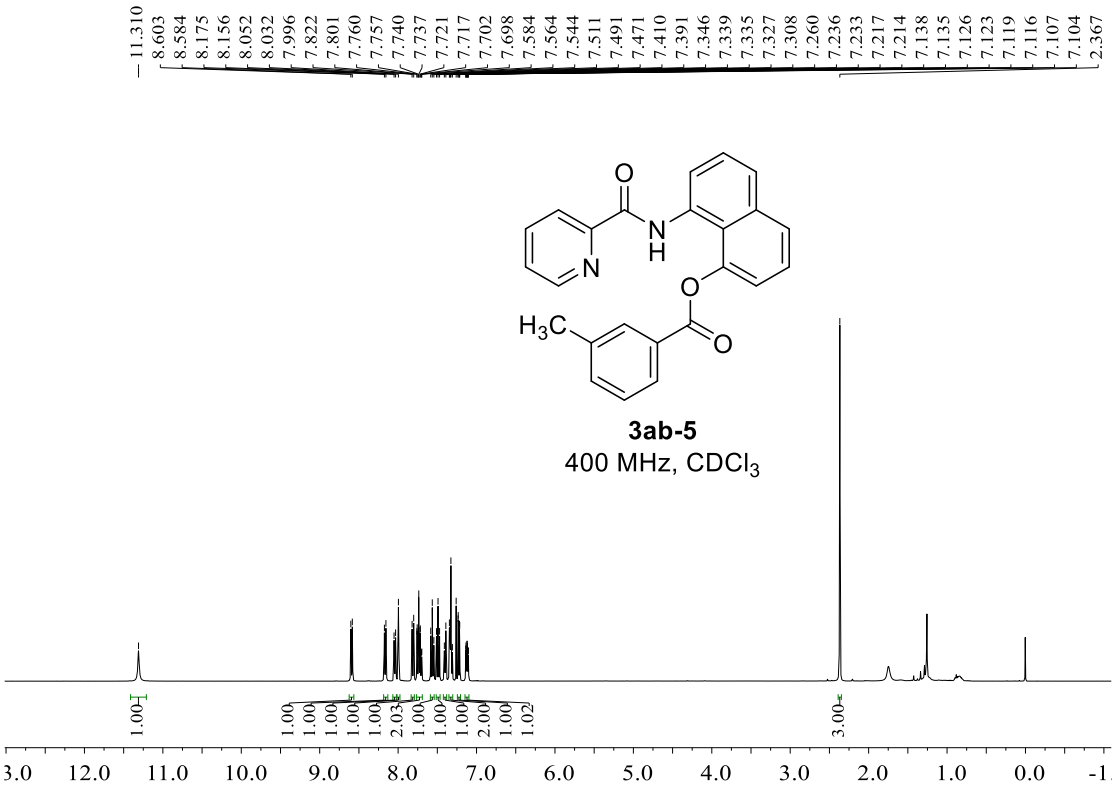
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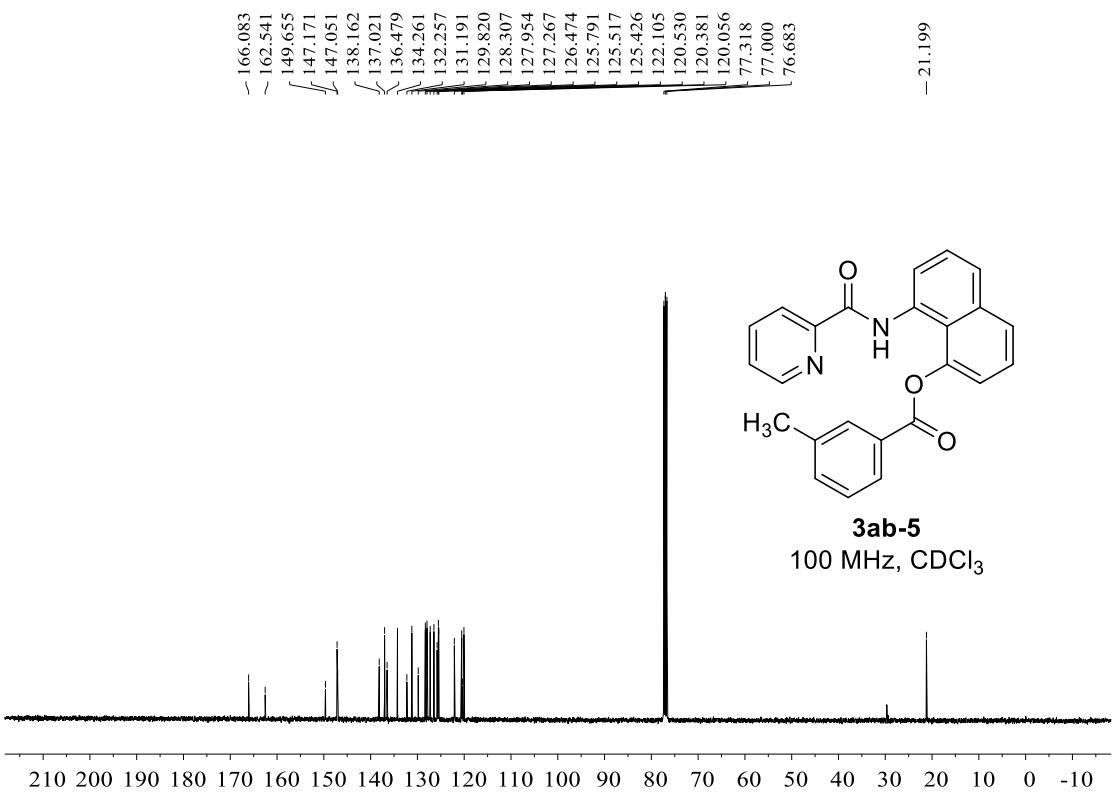
8.175
8.156
8.052
8.032
7.996
7.822
7.801
7.760
7.757
7.740
7.737
7.721
7.717
7.702
7.698
7.584
7.564
7.544
7.511
7.491
7.471
7.410
7.391
7.346
7.339
7.335
7.327
7.308
7.260
7.236
7.233
7.217
7.214
7.138
7.135
7.126
7.123
7.119
7.116
7.107
7.104
2.367
O
N
H
N
O
H3C
O
3ab-5
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
2.03
1.00
1.00
2.00
1.00
1.02
3.00
3.0 12.0 11.0 10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 0.0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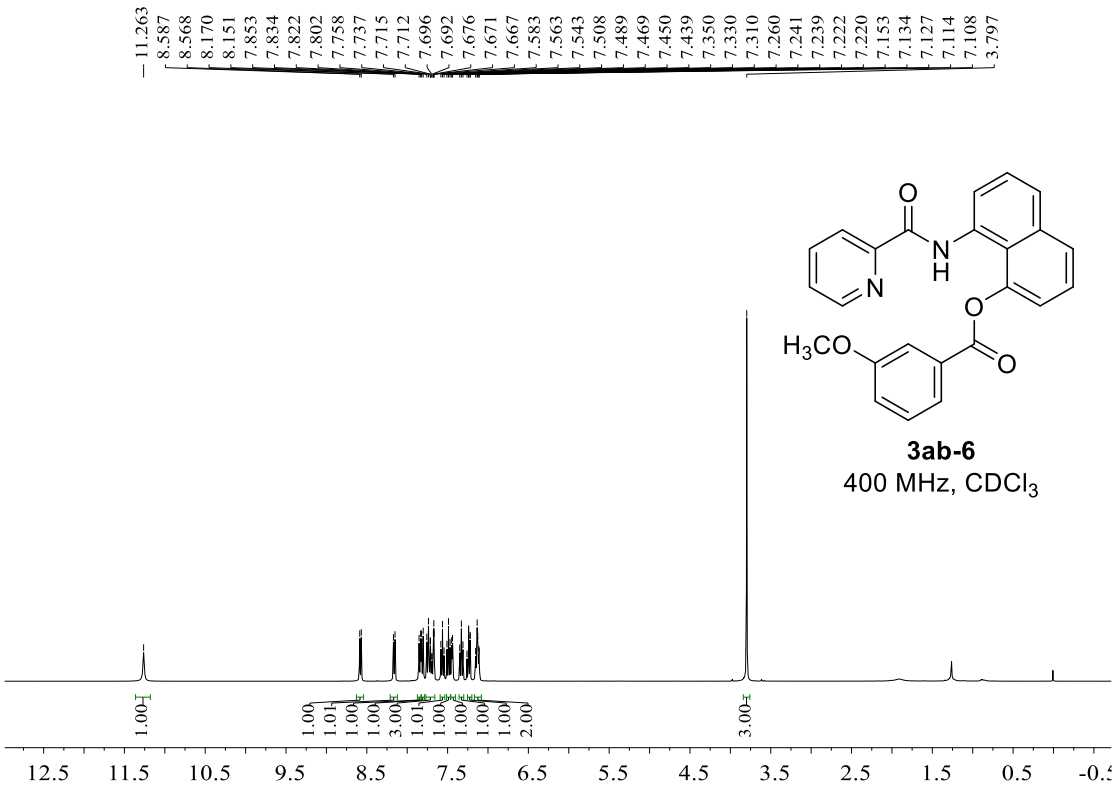
128.307
127.954
127.267
126.474
125.791
125.517
125.426
122.105
120.530
120.381
120.056
77.318
77.000
76.683
21.199
O
N
H
N
O
H3C
O
3ab-5
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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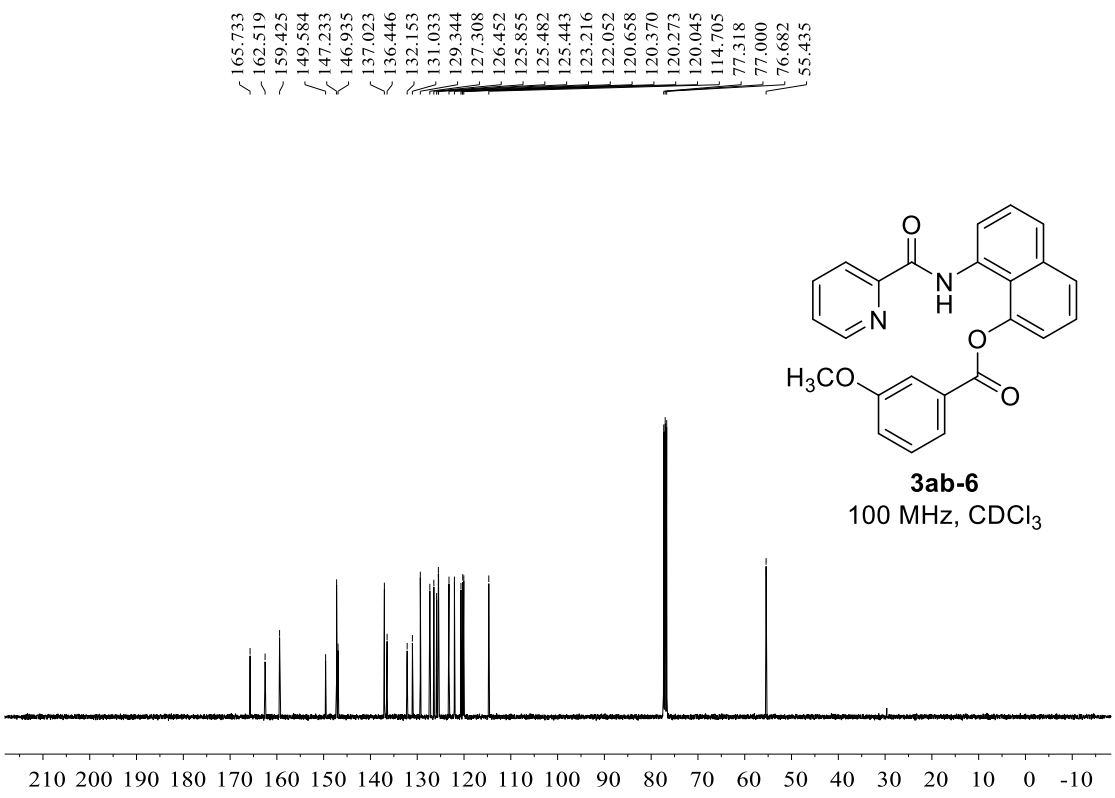
7.822
7.802
7.758
7.737
7.715
7.712
7.696
7.692
7.676
7.671
7.667
7.583
7.563
7.543
7.508
7.489
7.469
7.450
7.439
7.350
7.330
7.310
7.260
7.241
7.239
7.222
7.220
7.153
7.134
7.127
7.114
7.108
3.797
O
N
H
N
O
H3CO
O
3ab-6
400 MHz, CDCl3
1.00
1.00
1.01
1.00
1.00
3.00
1.01
1.00
1.00
1.00
2.00
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5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136.446
132.153
131.033
129.344
127.308
126.452
125.855
125.482
125.443
123.216
122.052
120.658
120.370
120.273
120.045
114.705
77.318
77.000
76.682
55.435
O
N
H
N
O
H3CO
O
3ab-6
100 MHz, CDCl3
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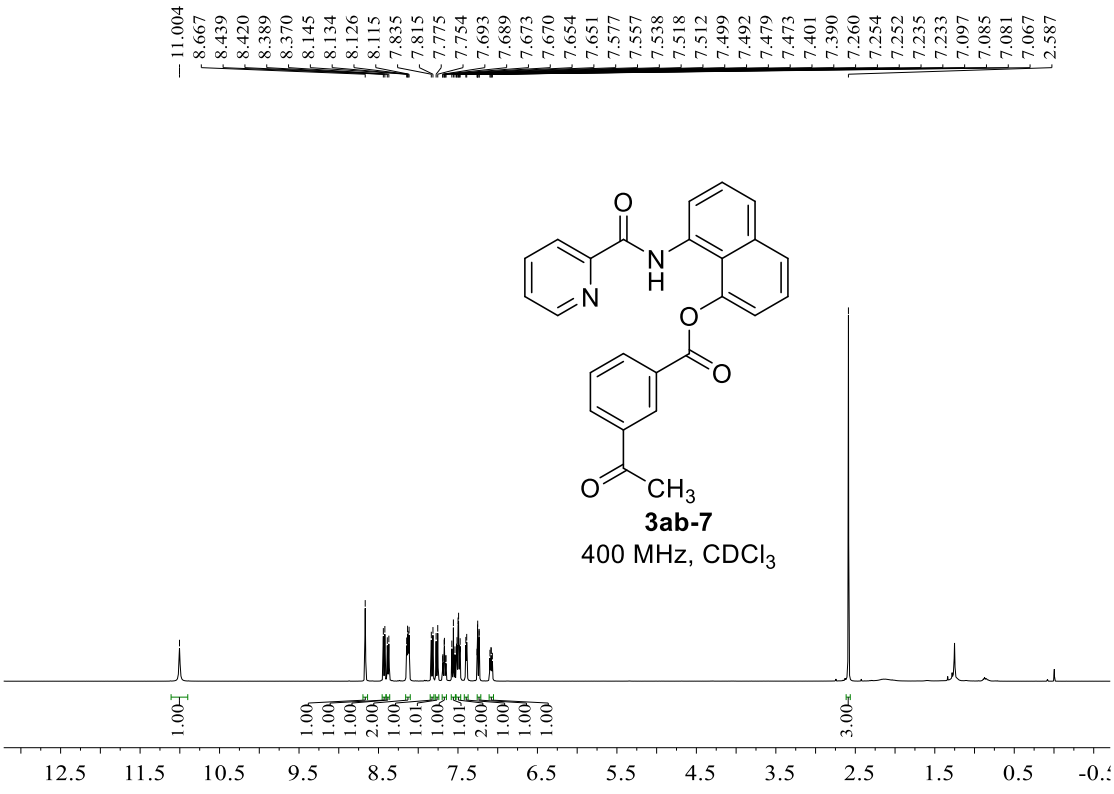
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8.134
8.126
8.115
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7.754
7.693
7.689
7.673
7.670
7.654
7.651
7.577
7.557
7.538
7.518
7.512
7.499
7.492
7.479
7.473
7.401
7.390
7.260
7.254
7.252
7.235
7.233
7.097
7.085
7.081
7.067
2.587
O
N
H
N
O
O
O
CH3
3ab-7
400 MHz, CDCl3
1.00
1.00
1.00
2.00
1.00
1.01
1.00
1.01
2.00
1.00
1.00
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
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4.5
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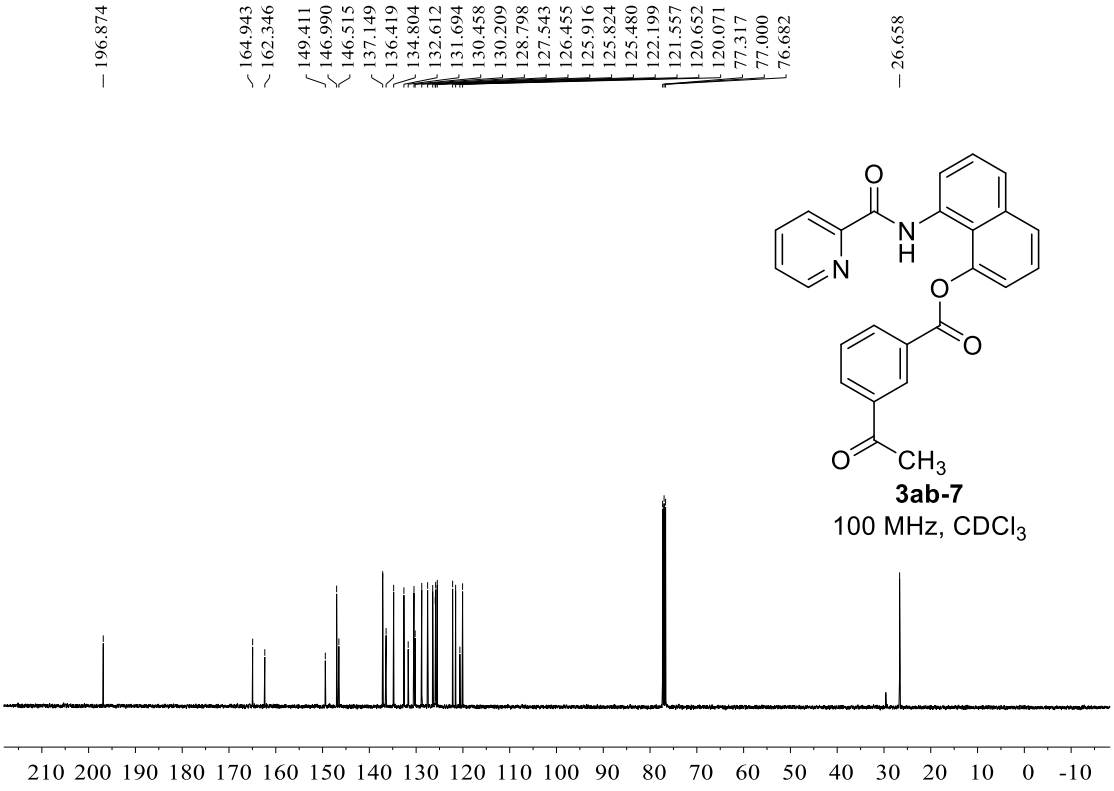
2.5
1.5
0.5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130.209
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127.543
126.455
125.916
125.824
125.480
122.199
121.557
120.652
120.071
77.317
77.000
76.682
26.658
O
N
H
N
O
O
O
CH3
3ab-7
100 MHz, CDCl3
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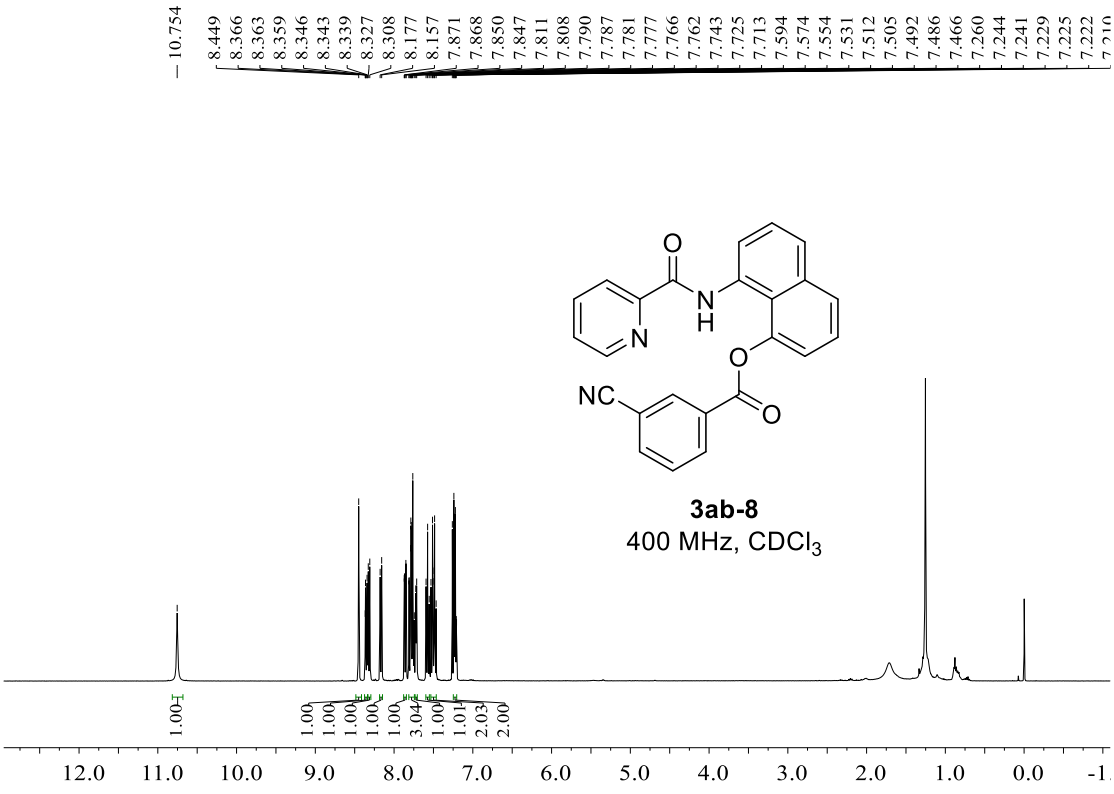
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8.308
8.177
8.157
7.871
7.868
7.850
7.847
7.811
7.808
7.790
7.787
7.781
7.777
7.766
7.762
7.743
7.725
7.713
7.594
7.574
7.554
7.531
7.512
7.505
7.492
7.486
7.466
7.260
7.244
7.241
7.229
7.225
7.222
O
N
H
N
O
NC
O
3ab-8
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
3.04
1.00
1.01
2.03
2.00
12.0
11.0
10.0
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8.0
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1.0
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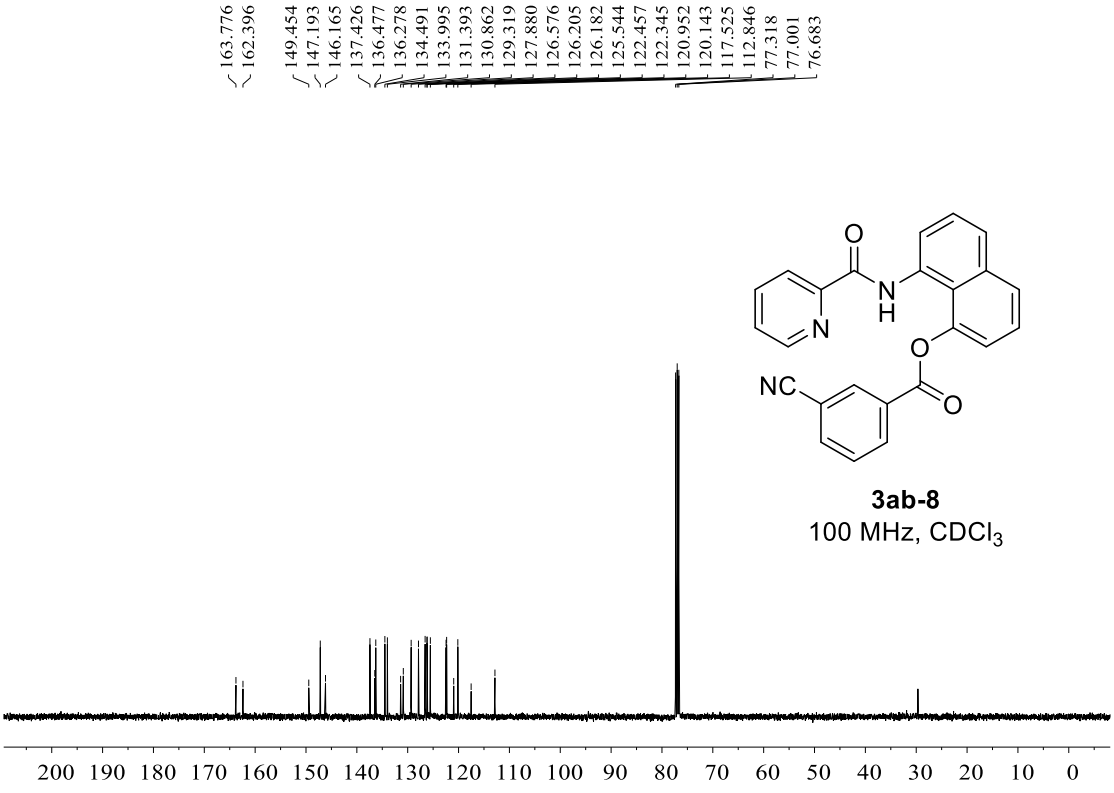
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126.182
125.544
122.457
122.345
120.952
120.143
117.525
112.846
77.318
77.001
76.683
O
N
H
N
O
NC
O
3ab-8
100 MHz, CDCl3
200
190
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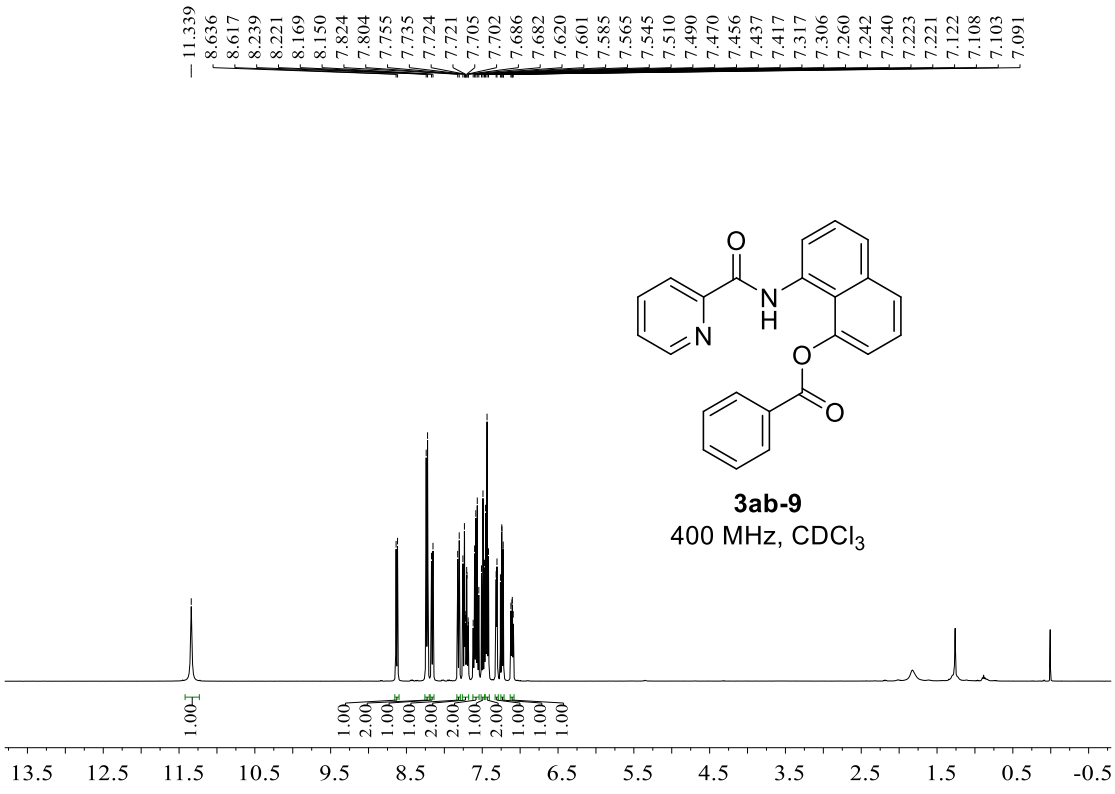
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7.755
7.735
7.724
7.721
7.705
7.702
7.686
7.682
7.620
7.601
7.585
7.565
7.545
7.510
7.490
7.470
7.456
7.437
7.417
7.317
7.306
7.260
7.242
7.240
7.223
7.221
7.122
7.108
7.103
7.091
O
N
H
N
O
O
3ab-9
400 MHz, CDCl3
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2.00
1.00
1.00
2.00
2.00
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1.00
1.00
1.00
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12.5
11.5
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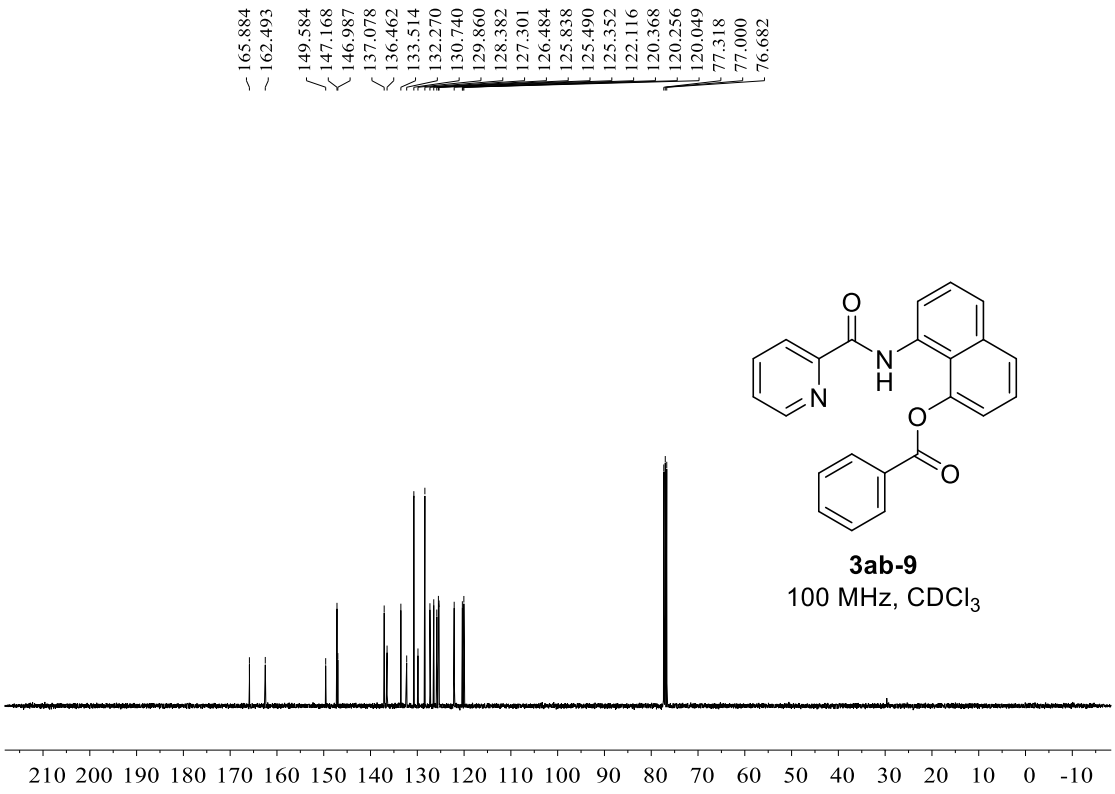
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127.301
126.484
125.838
125.490
125.352
122.116
120.368
120.256
120.049
77.318
77.000
76.682
O
N
H
N
O
O
3ab-9
100 MHz, CDCl3
210
200
190
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140
130
120
110
100
90
80
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50
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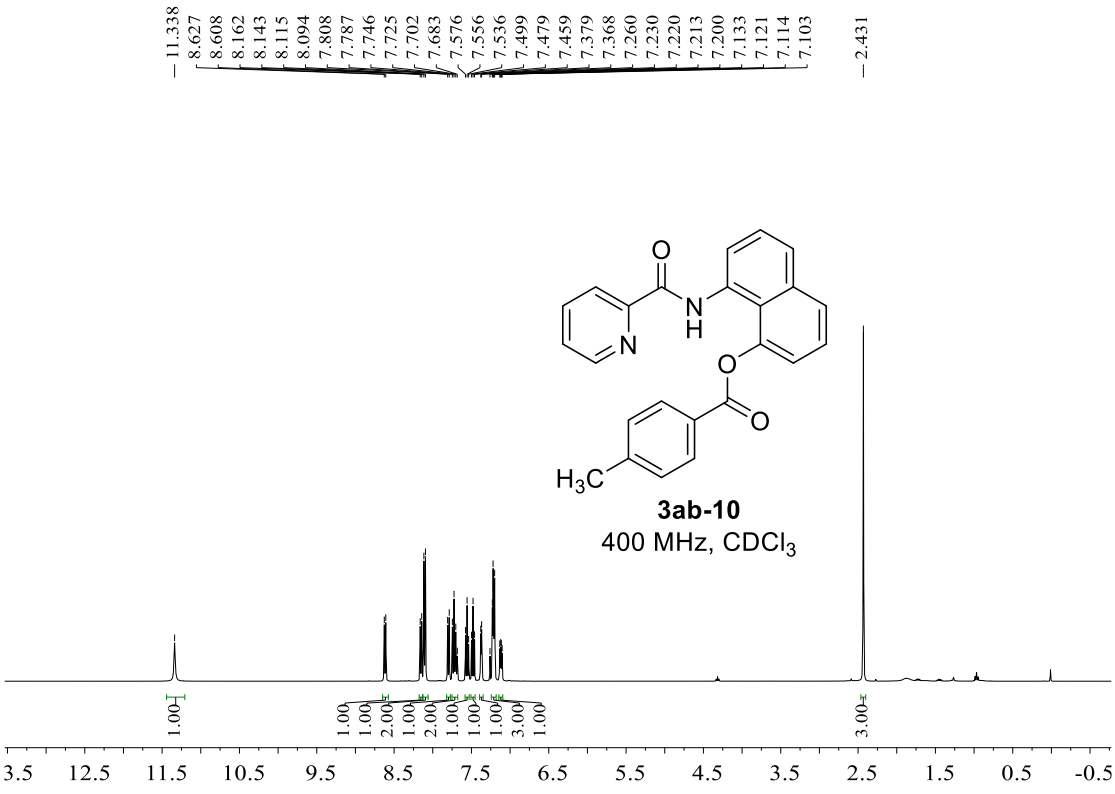
0
-10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7.725
7.702
7.683
7.576
7.556
7.536
7.499
7.479
7.459
7.379
7.368
7.260
7.230
7.220
7.213
7.200
7.133
7.121
7.114
7.103
2.431
O
N
H
N
O
O
H3C
3ab-10
400 MHz, CDCl3
1.00
1.00
2.00
1.00
2.00
1.00
1.00
1.00
3.00
1.00
3.00
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12.5
11.5
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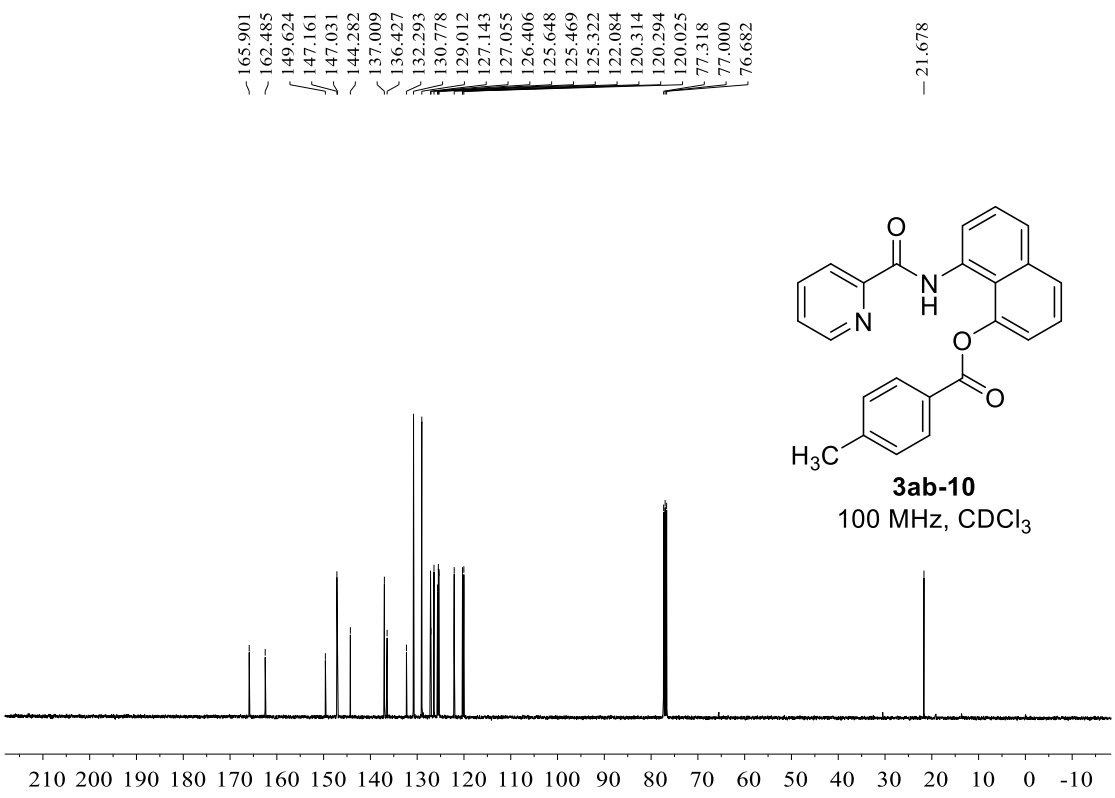
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127.055
126.406
125.648
125.469
125.322
122.084
120.314
120.294
120.025
77.318
77.000
76.682
21.678
O
N
H
N
O
O
H3C
3ab-10
100 MHz, CDCl3
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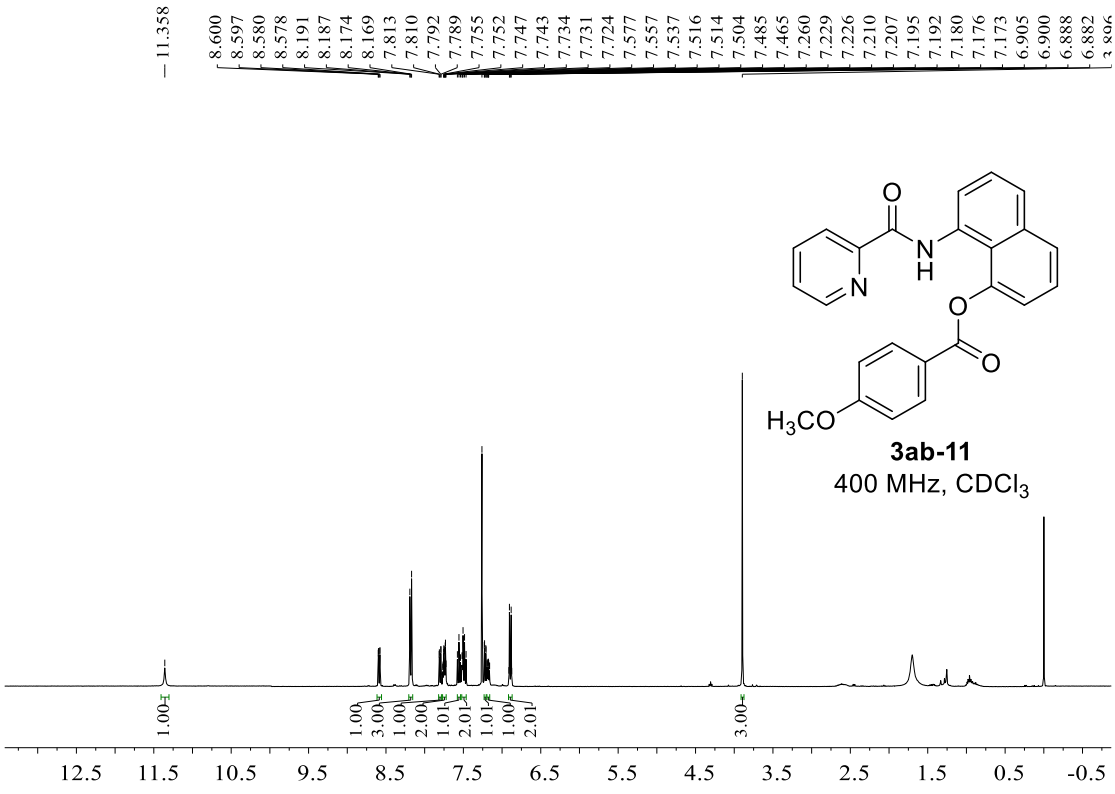
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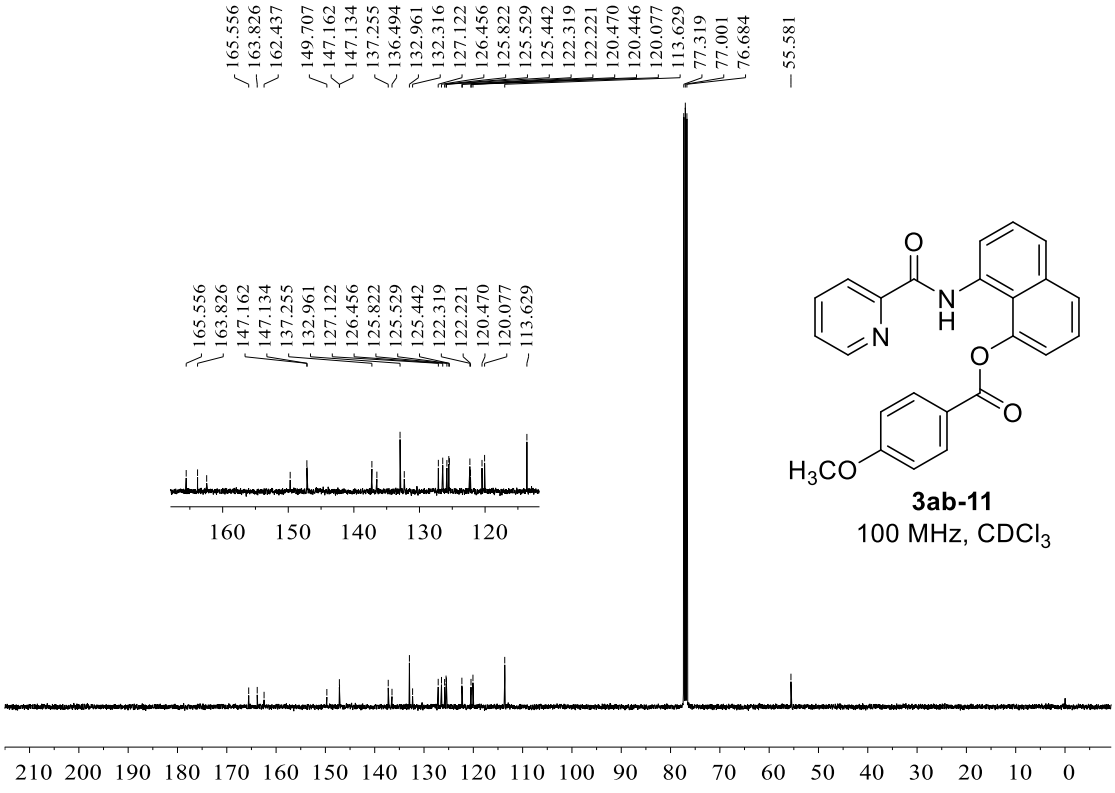
8.580
8.578
8.191
8.187
8.174
8.169
7.813
7.810
7.792
7.789
7.755
7.752
7.747
7.743
7.734
7.731
7.724
7.577
7.557
7.537
7.516
7.514
7.504
7.485
7.465
7.260
7.229
7.226
7.210
7.207
7.195
7.192
7.180
7.176
7.173
6.905
6.900
6.888
6.882
O
N
H
N
O
O
H3CO
3ab-11
400 MHz, CDCl3
1.00
3.00
1.00
2.00
1.01
2.01
1.01
1.00
2.01
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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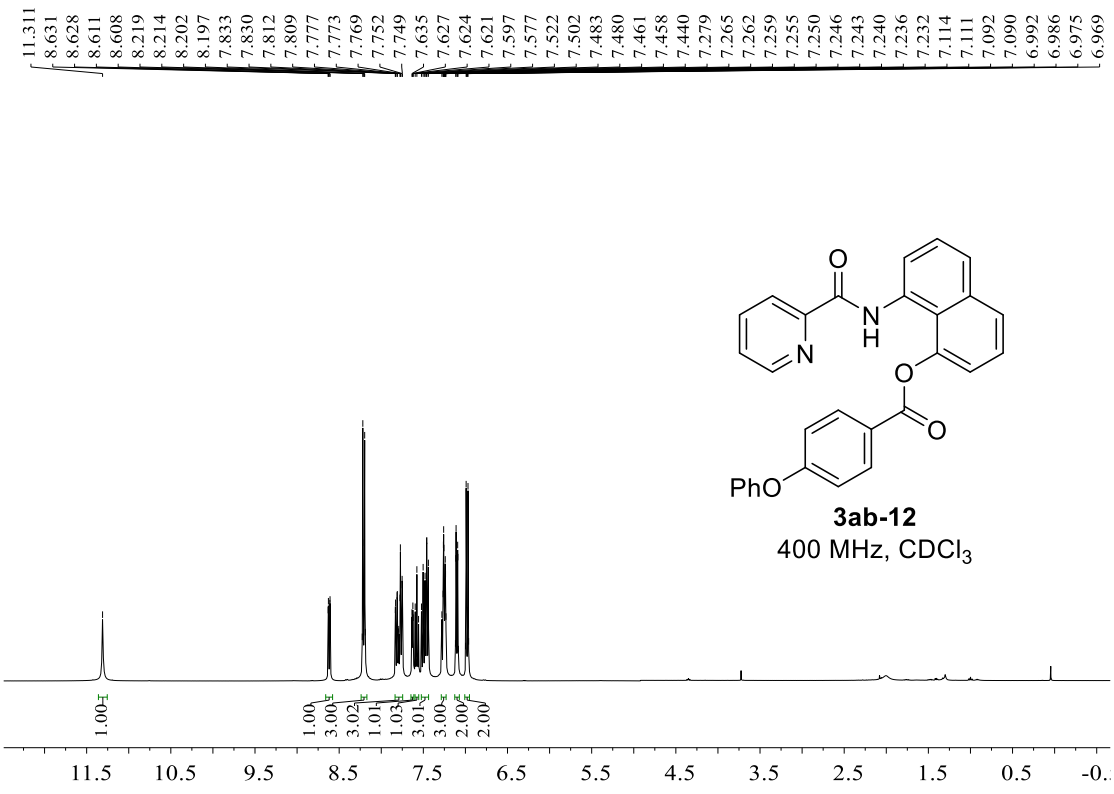
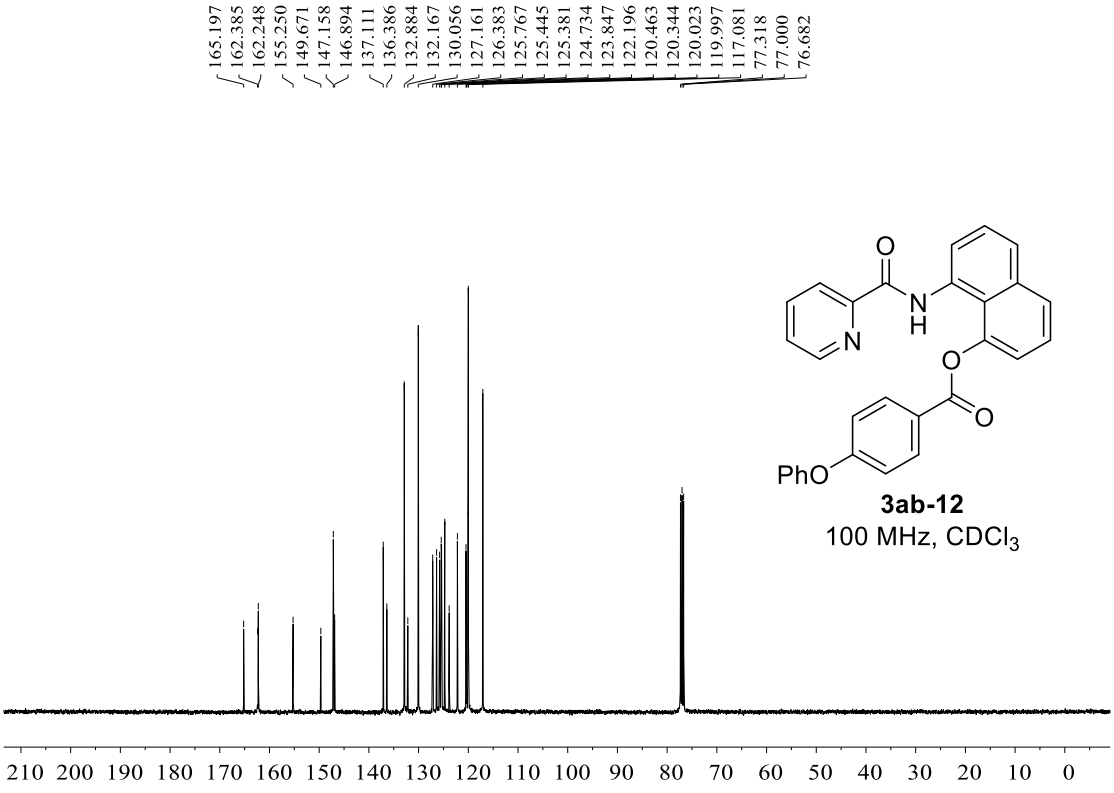
163.826
162.437
149.707
147.162
147.134
137.255
136.494
132.961
132.316
127.122
126.456
125.822
125.529
125.442
122.319
122.221
120.470
120.446
120.077
113.629
77.319
77.001
76.684
55.581
165.556
163.826
147.162
147.134
137.255
132.961
127.122
126.456
125.822
125.529
125.442
122.319
122.221
120.470
120.077
113.629
160
150
140
130
120
O
N
H
N
O
O
H3CO
3ab-11
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0


11.311
8.631
8.628
8.611
8.608
8.219
8.214
8.202
8.197
7.833
7.830
7.812
7.809
7.777
7.773
7.769
7.752
7.749
7.635
7.627
7.624
7.621
7.597
7.577
7.522
7.502
7.483
7.480
7.461
7.458
7.440
7.279
7.265
7.262
7.259
7.255
7.250
7.246
7.243
7.240
7.236
7.232
7.114
7.111
7.092
7.090
6.992
6.986
6.975
6.969
O
N
H
N
O
O
PhO
3ab-12
400 MHz, CDCl3
1.00
1.00
3.00
3.02
1.01
1.03
3.01
3.00
2.00
2.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5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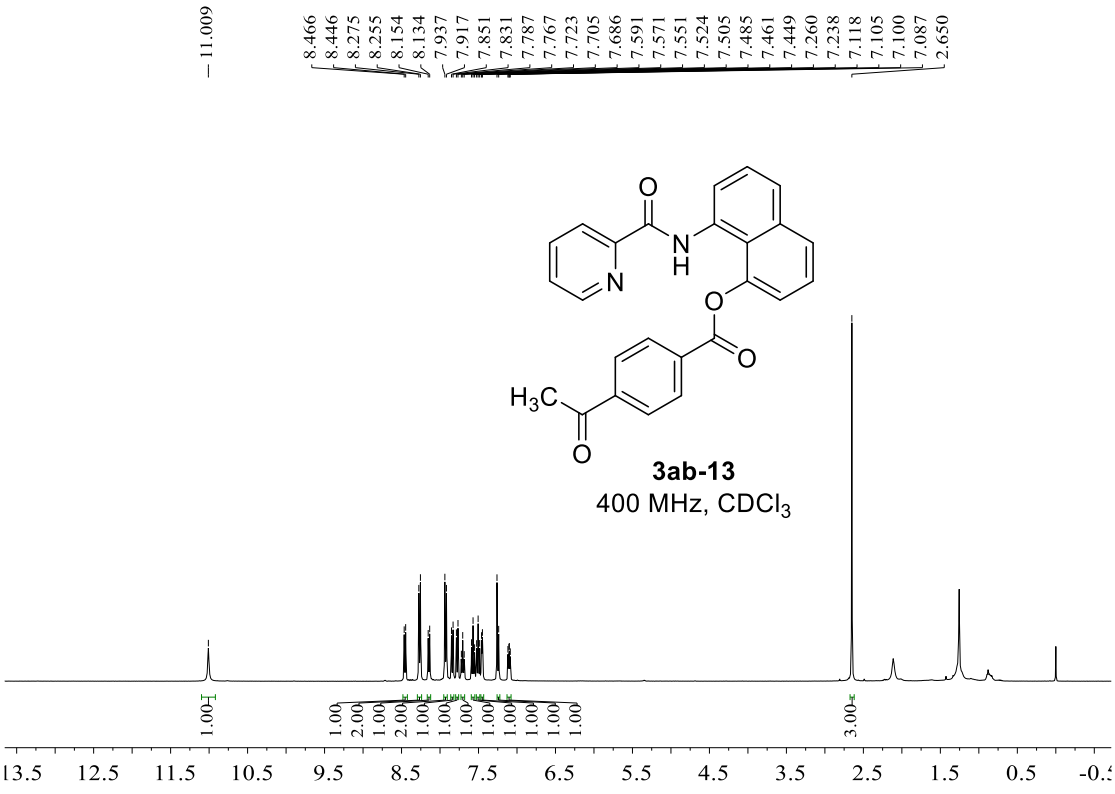
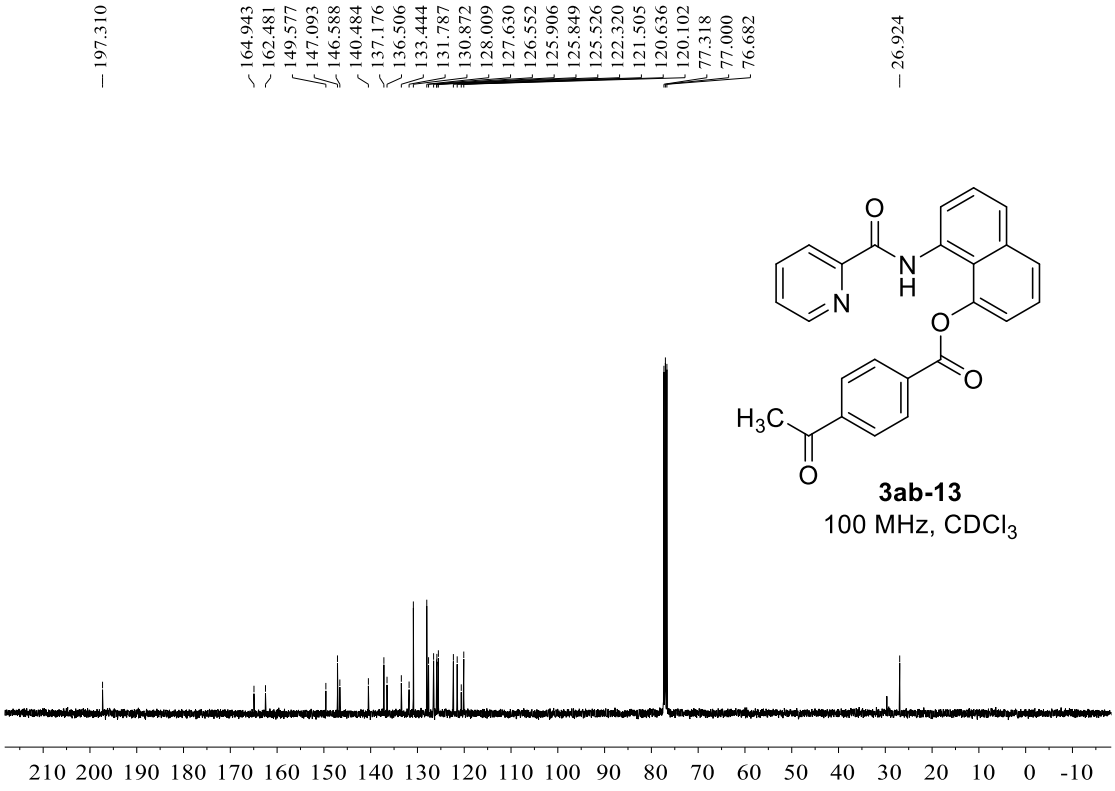
162.385
162.248
155.250
149.671
147.158
146.894
137.111
136.386
132.884
132.167
130.056
127.161
126.383
125.767
125.445
125.381
124.734
123.847
122.196
120.463
120.344
120.023
119.997
117.081
77.318
77.000
76.682
O
N
H
N
O
O
PhO
3ab-12
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0


11.009
8.466
8.446
8.275
8.255
8.154
8.134
7.937
7.917
7.851
7.831
7.787
7.767
7.723
7.705
7.686
7.591
7.571
7.551
7.524
7.505
7.485
7.461
7.449
7.260
7.238
7.118
7.105
7.100
7.087
2.650
3ab-13
400 MHz, CDCl3
1.00
1.00
2.00
1.00
2.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
3.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5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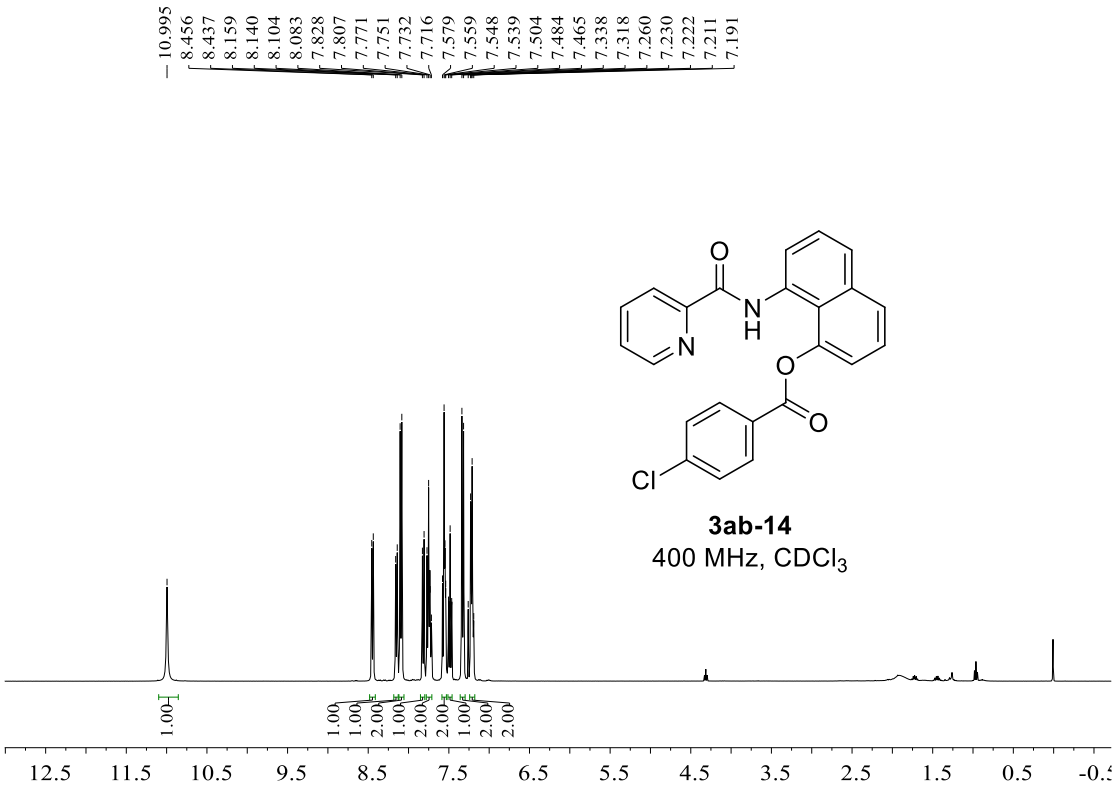
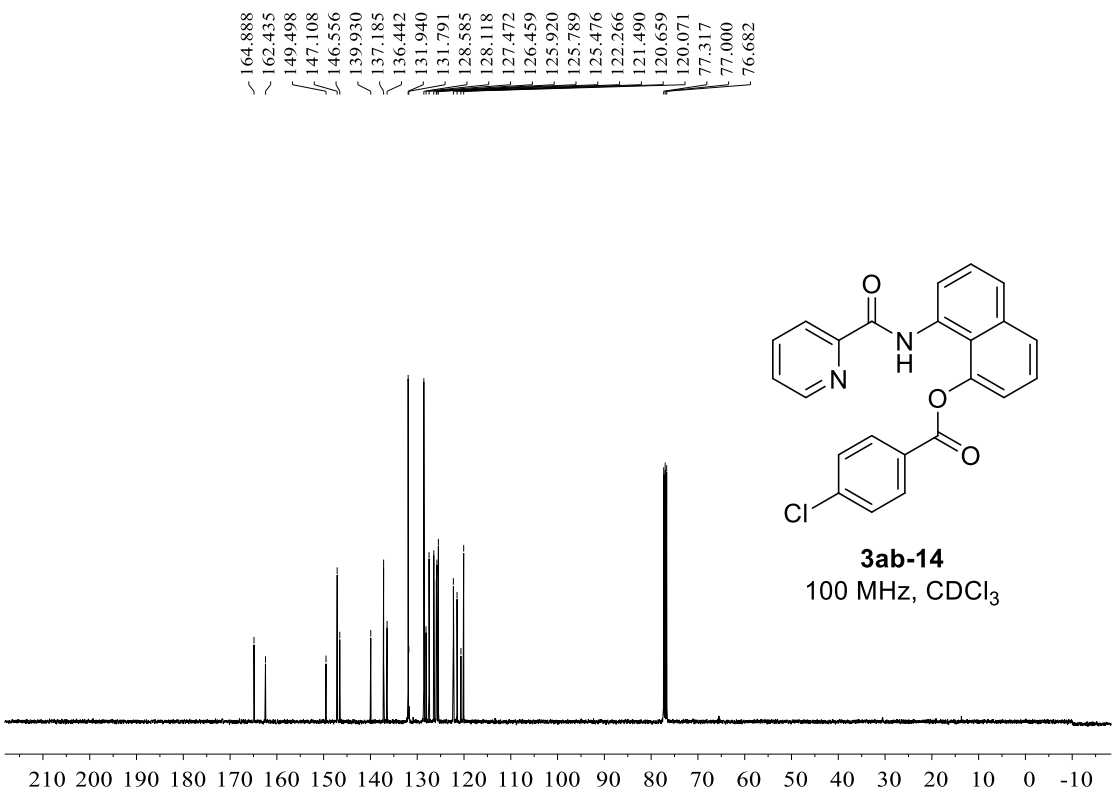
164.943
162.481
149.577
147.093
146.588
140.484
137.176
136.506
133.444
131.787
130.872
128.009
127.630
126.552
125.906
125.849
125.526
122.320
121.505
120.636
120.102
77.318
77.000
76.682
26.924
3ab-13
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


10.995
8.456
8.437
8.159
8.140
8.104
8.083
7.828
7.807
7.771
7.751
7.732
7.716
7.579
7.559
7.548
7.539
7.504
7.484
7.465
7.338
7.318
7.260
7.230
7.222
7.211
7.191
O
N
H
N
O
O
Cl
3ab-14
400 MHz, CDCl3
1.00
1.00
1.00
2.00
1.00
2.00
2.00
1.00
2.00
2.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5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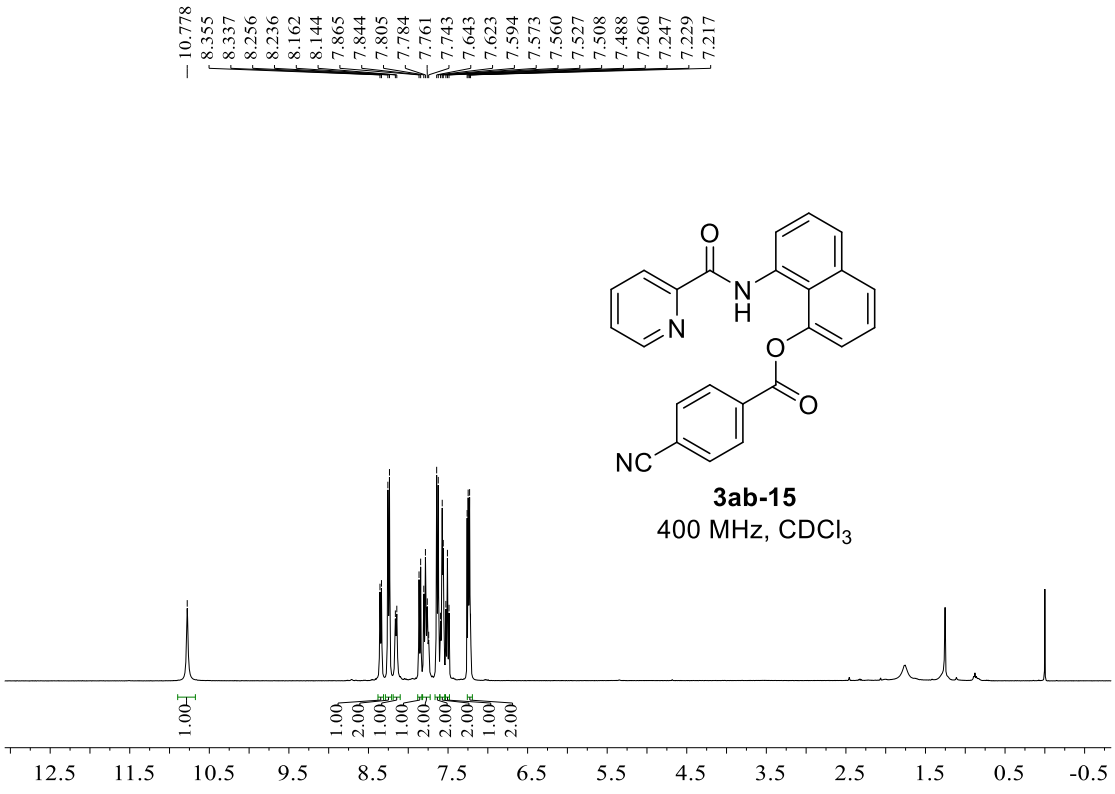
162.435
149.498
147.108
146.556
139.930
137.185
136.442
131.940
131.791
128.585
128.118
127.472
126.459
125.920
125.789
125.476
122.266
121.490
120.659
120.071
77.317
77.000
76.682
O
N
H
N
O
O
Cl
3ab-14
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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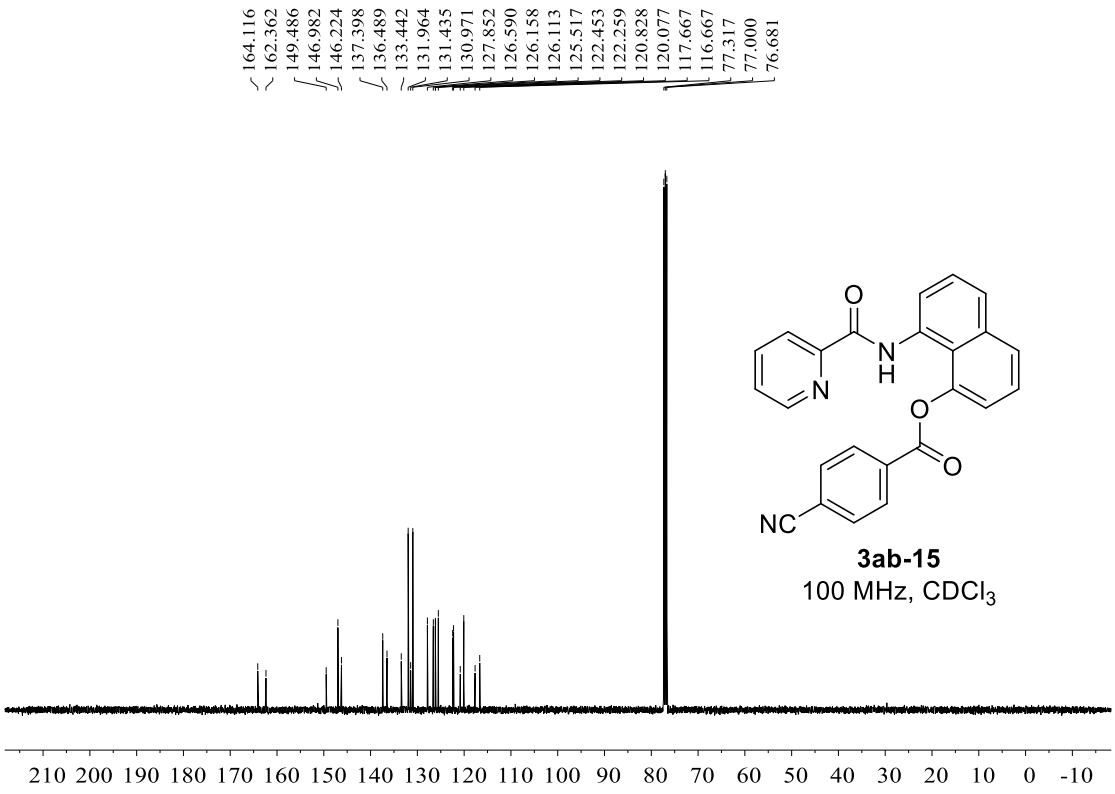
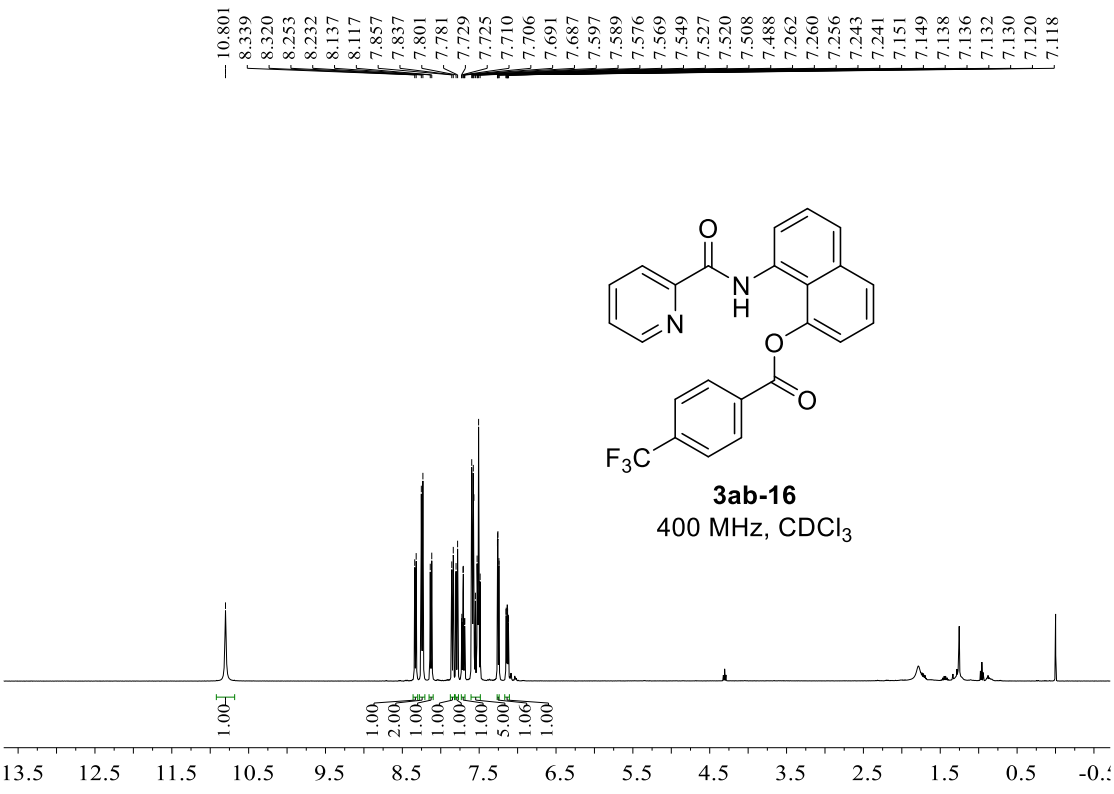
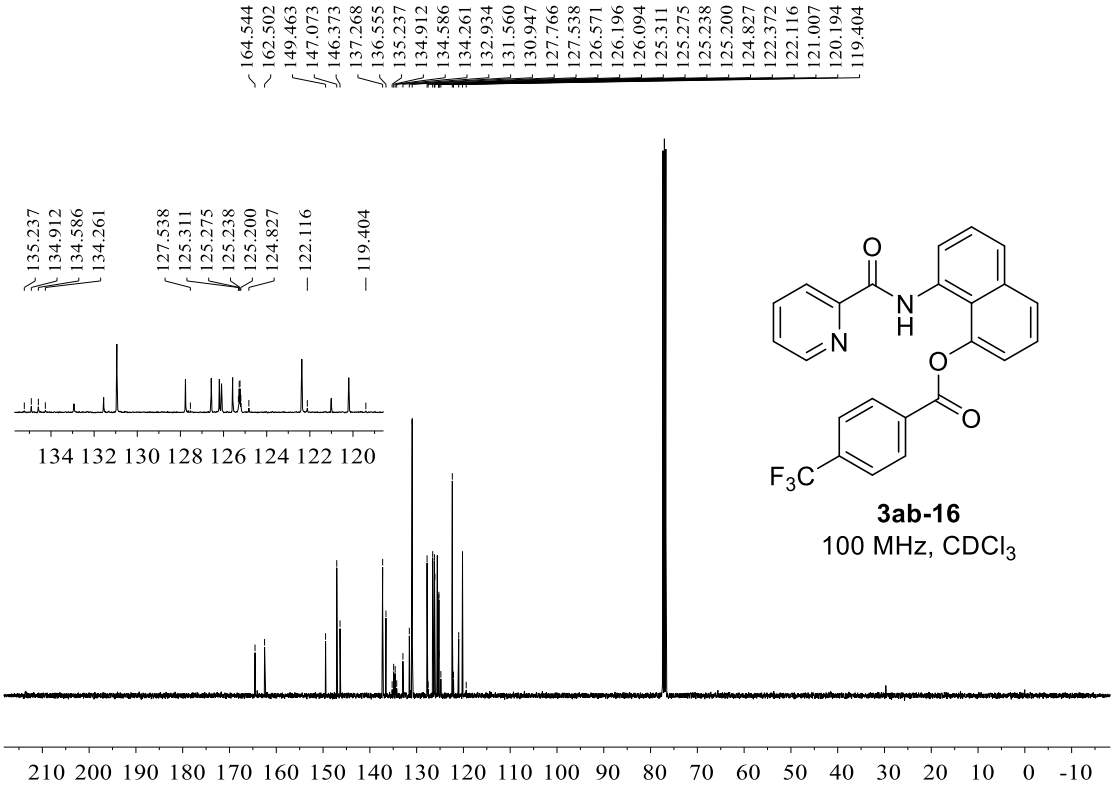
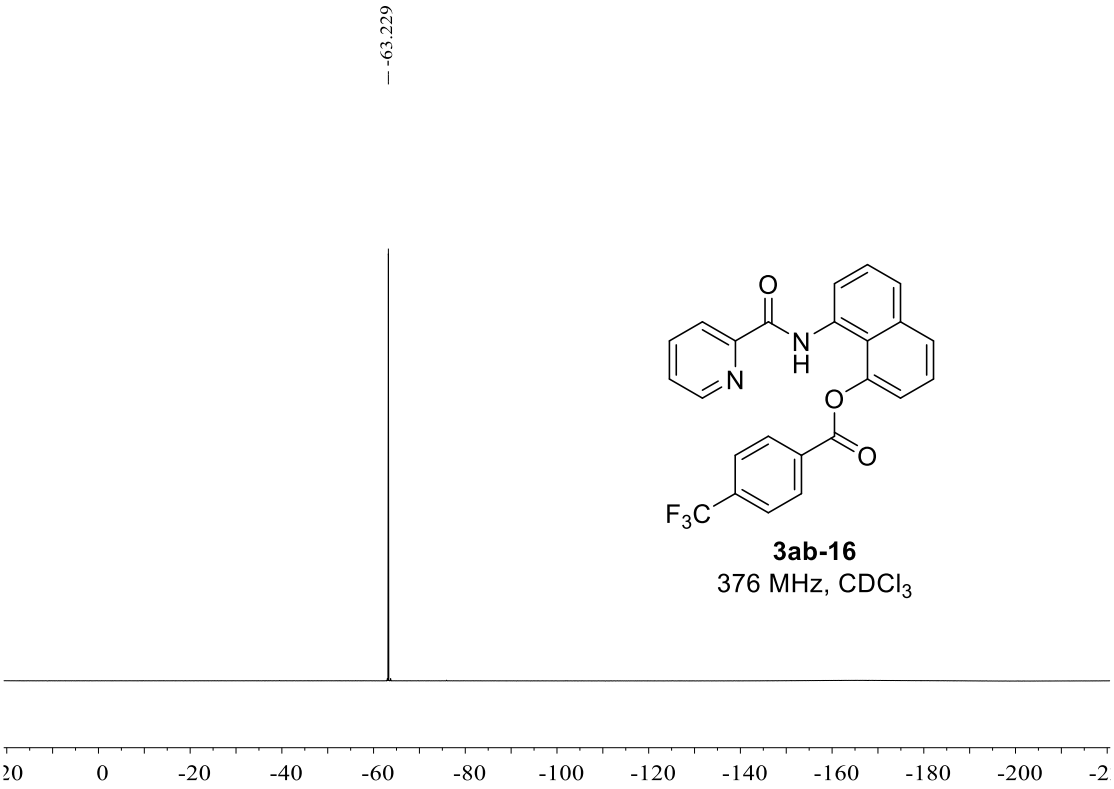
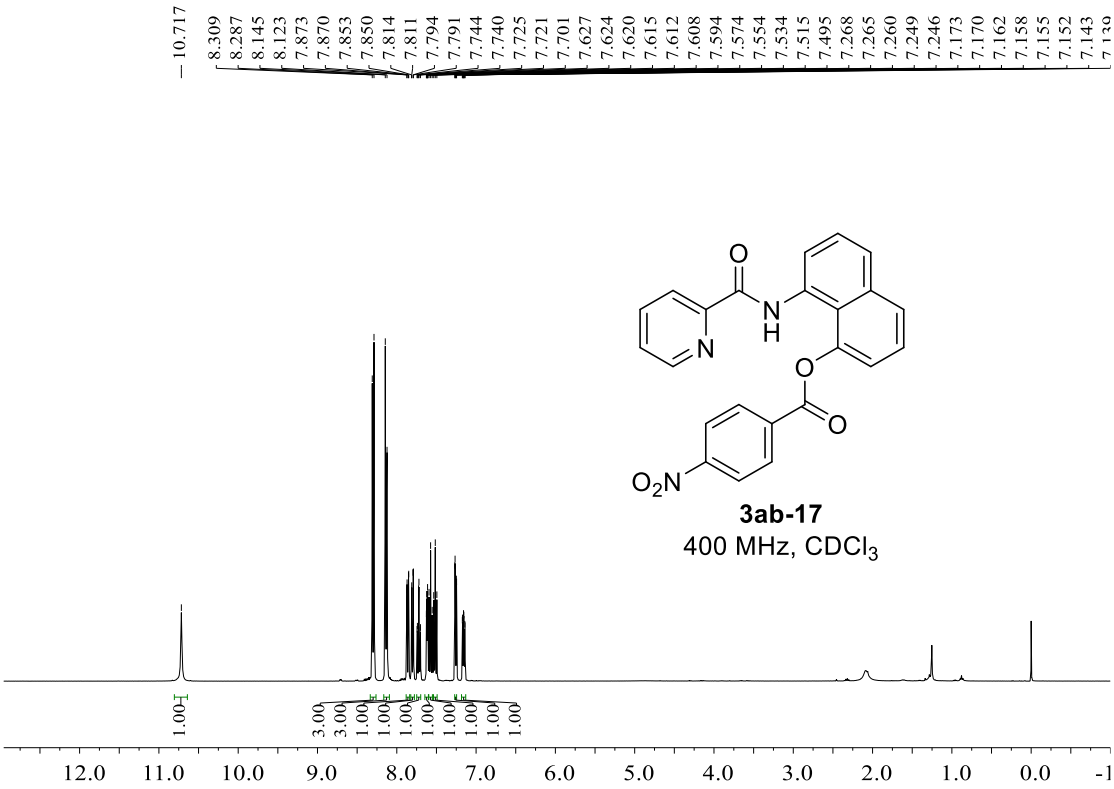
8.337
8.256
8.236
8.162
8.144
7.865
7.844
7.805
7.784
7.761
7.743
7.643
7.623
7.594
7.573
7.560
7.527
7.508
7.488
7.260
7.247
7.229
7.217
O
N
H
N
O
O
NC
3ab-15
400 MHz, CDCl3
1.00
1.00
2.00
1.00
1.00
2.00
2.00
2.00
1.00
2.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


164.116
162.362
149.486
146.982
146.224
137.398
136.489
133.442
131.964
131.435
130.971
127.852
126.590
126.158
126.113
125.517
122.453
122.259
120.828
120.077
117.667
116.667
77.317
77.000
76.681
O
N
H
N
O
O
NC
3ab-15
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


10.801
8.339
8.320
8.253
8.232
8.137
8.117
7.857
7.837
7.801
7.781
7.729
7.725
7.710
7.706
7.691
7.687
7.597
7.589
7.576
7.569
7.549
7.527
7.520
7.508
7.488
7.262
7.260
7.256
7.243
7.241
7.151
7.149
7.138
7.136
7.132
7.130
7.120
7.118
O
N
H
N
O
O
F3C
3ab-16
400 MHz, CDCl3
1.00
1.00
2.00
1.00
1.00
1.00
1.00
5.00
1.06
1.00
13.5 12.5 11.5 10.5 9.5 8.5 7.5 6.5 5.5 4.5 3.5 2.5 1.5 0.5


164.544
162.502
149.463
147.073
146.373
137.268
136.555
135.237
134.912
134.586
134.261
132.934
131.560
130.947
127.766
127.538
126.571
126.196
126.094
125.311
125.275
125.238
125.200
124.827
122.372
122.116
121.007
120.194
119.404
135.237
134.912
134.586
134.261
127.538
125.311
125.275
125.238
125.200
124.827
122.116
119.404
134 132 130 128 126 124 122 120
O
N
H
N
O
O
F3C
3ab-16
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


-63.229
O
N
H
N
O
O
F3C
3ab-16
376 MHz, CDCl3
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-2


10.717
8.309
8.287
8.145
8.123
7.873
7.870
7.853
7.850
7.814
7.811
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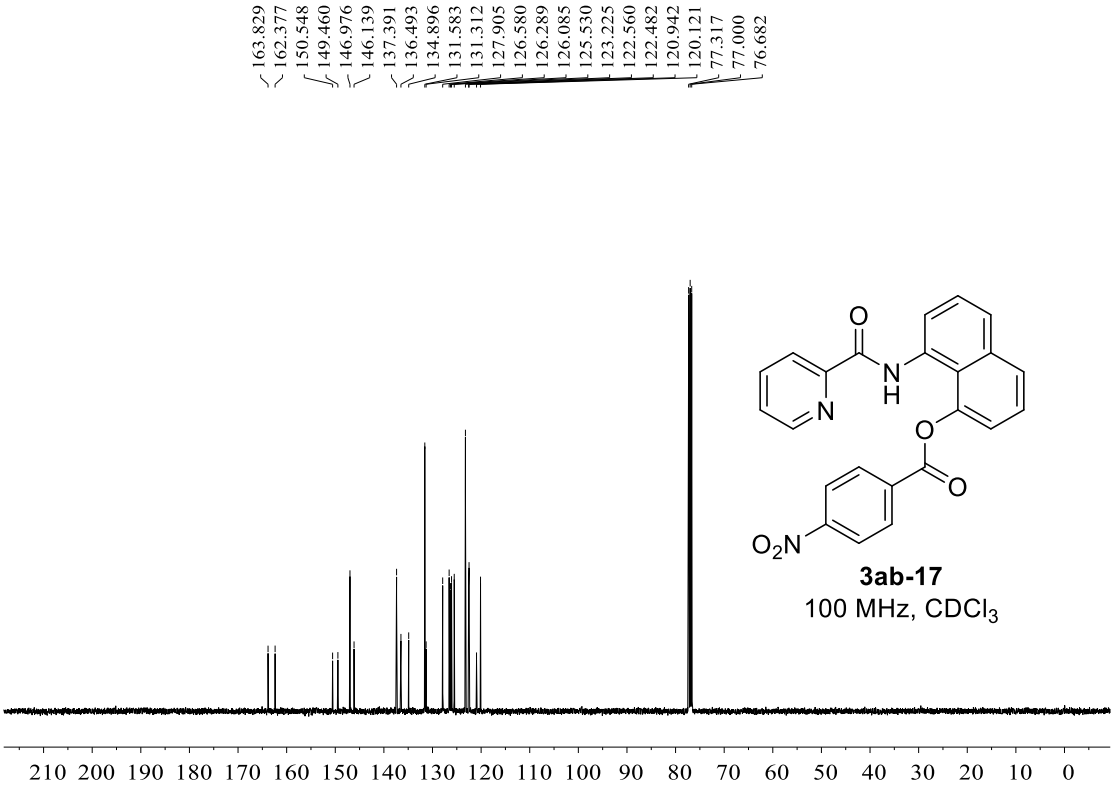
7.791
7.744
7.740
7.725
7.721
7.701
7.627
7.624
7.620
7.615
7.612
7.608
7.594
7.574
7.554
7.534
7.515
7.495
7.268
7.265
7.260
7.249
7.246
7.173
7.170
7.162
7.158
7.155
7.152
7.143
1.00
3.00
3.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
3ab-17
400 MHz, CDCl3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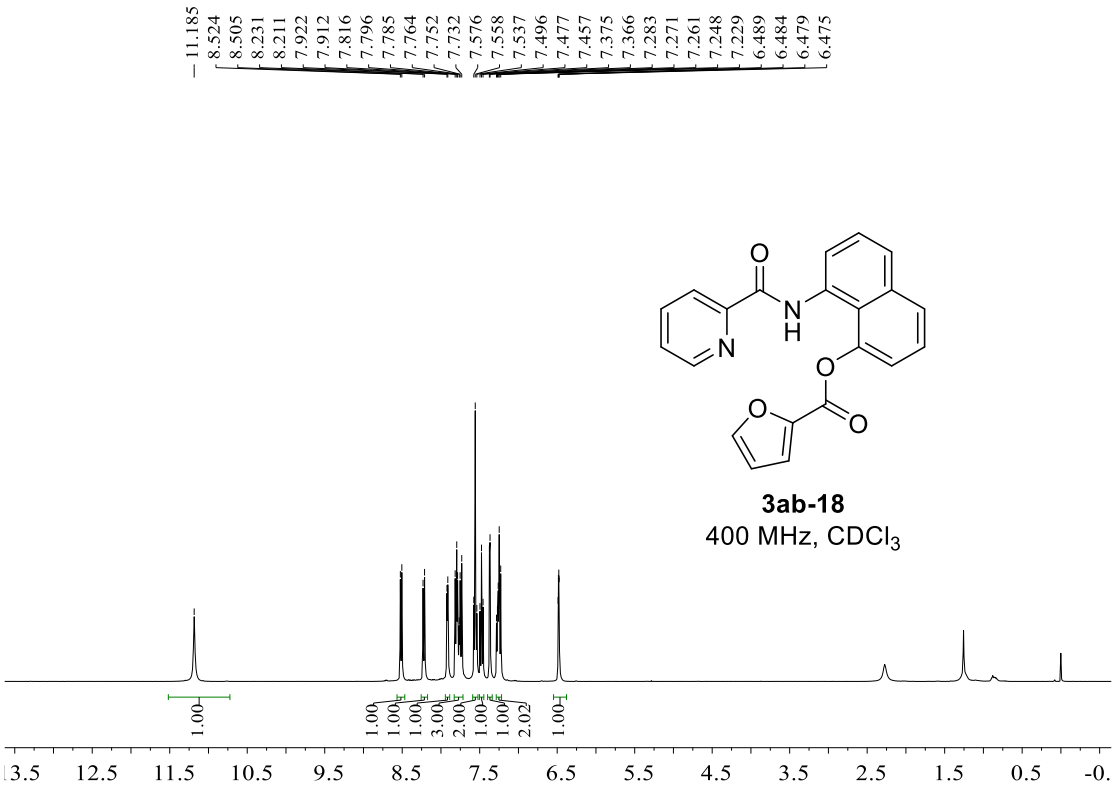
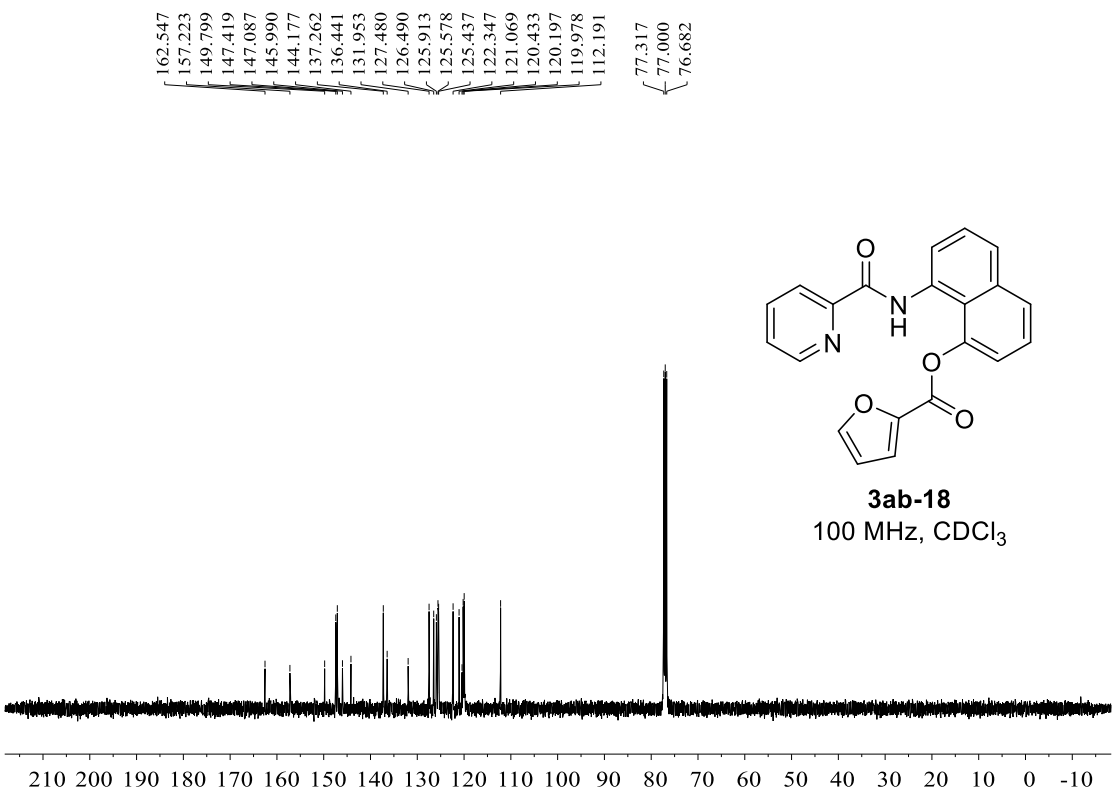
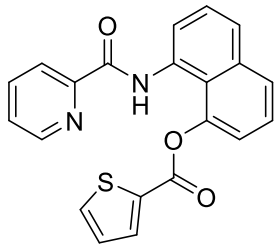
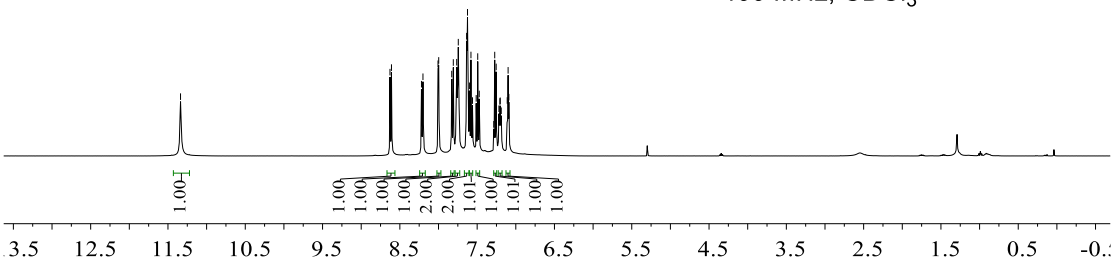
162.377
150.548
149.460
146.976
146.139
137.391
136.493
134.896
131.583
131.312
127.905
126.580
126.289
126.085
125.530
123.225
122.560
122.482
120.942
120.121
77.317
77.000
76.682
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
3ab-17
100 MHz, CDCl3

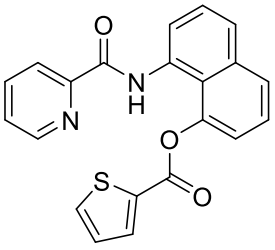

11.185
8.524
8.505
8.231
8.211
7.922
7.912
7.816
7.796
7.785
7.764
7.752
7.732
7.576
7.558
7.537
7.496
7.477
7.457
7.375
7.366
7.283
7.271
7.261
7.248
7.229
6.489
6.484
6.479
6.475
O
N
H
N
O
O
O
3ab-18
400 MHz, CDCl3
1.00
1.00
1.00
1.00
3.00
2.00
1.00
1.00
2.02
1.00
3.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.


162.547
157.223
149.799
147.419
147.087
145.990
144.177
137.262
136.441
131.953
127.480
126.490
125.913
125.578
125.437
122.347
121.069
120.433
120.197
119.978
112.191
77.317
77.000
76.682
O
N
H
N
O
O
O
3ab-18
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

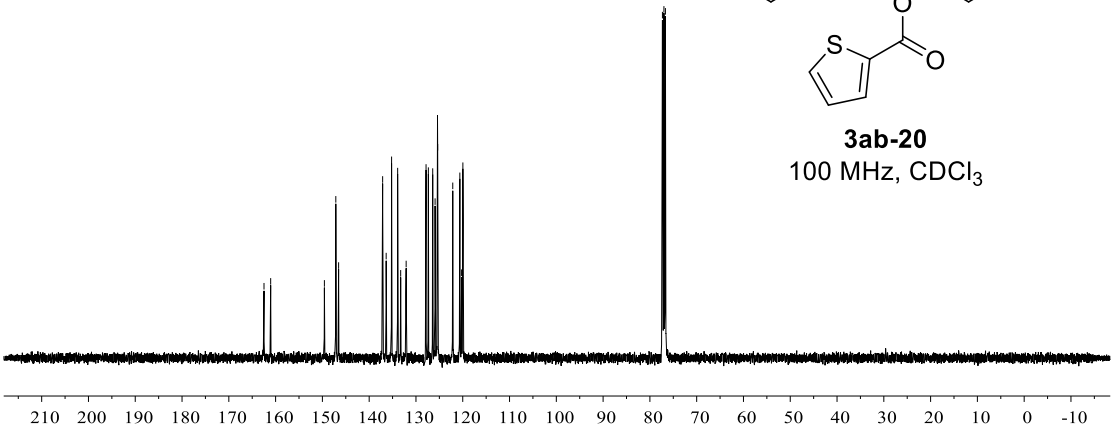


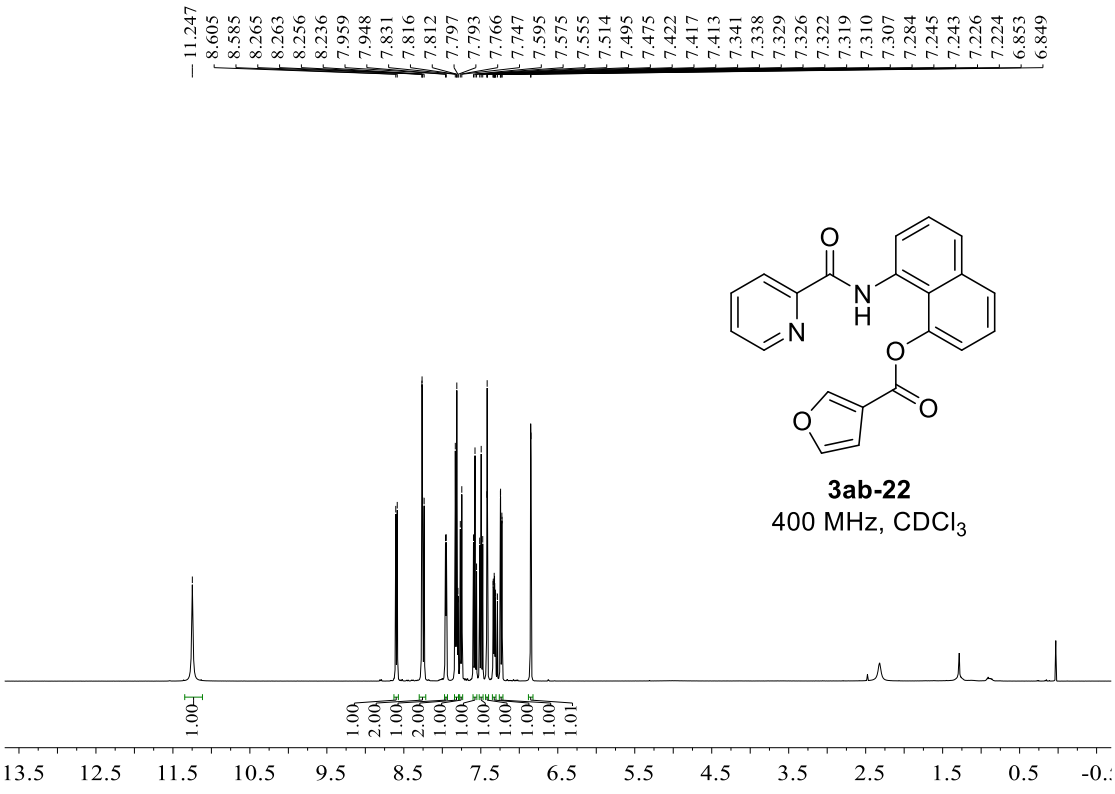
3ab-20
400 MHz, $CDCl_3$





3ab-20
100 MHz, $CDCl_3$

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8.605
8.585
8.265
8.263
8.256
8.236
7.959
7.948
7.831
7.816
7.812
7.797
7.793
7.766
7.747
7.595
7.575
7.555
7.514
7.495
7.475
7.422
7.417
7.413
7.341
7.338
7.329
7.326
7.322
7.319
7.310
7.307
7.284
7.245
7.243
7.226
7.224
6.853
6.849
O
N
H
N
O
O
O
3ab-22
400 MHz, CDCl3
1.00
1.00
2.00
1.00
2.00
1.00
1.00
1.00
1.00
1.00
1.01
13.5
12.5
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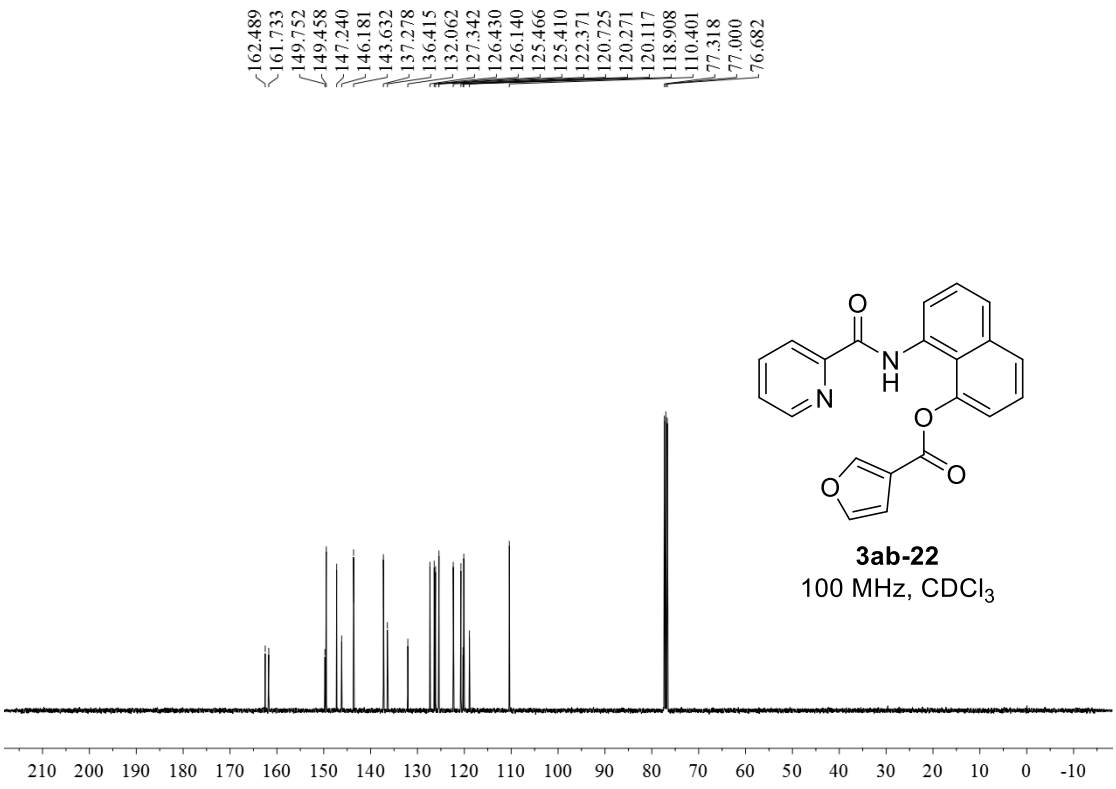
5.5
4.5
3.5
2.5
1.5
0.5


162.489
161.733
149.752
149.458
147.240
146.181
143.632
137.278
136.415
132.062
127.342
126.430
126.140
125.466
125.410
122.371
120.725
120.271
120.117
118.908
110.401
77.318
77.000
76.682
O
N
H
N
O
O
O
3ab-22
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
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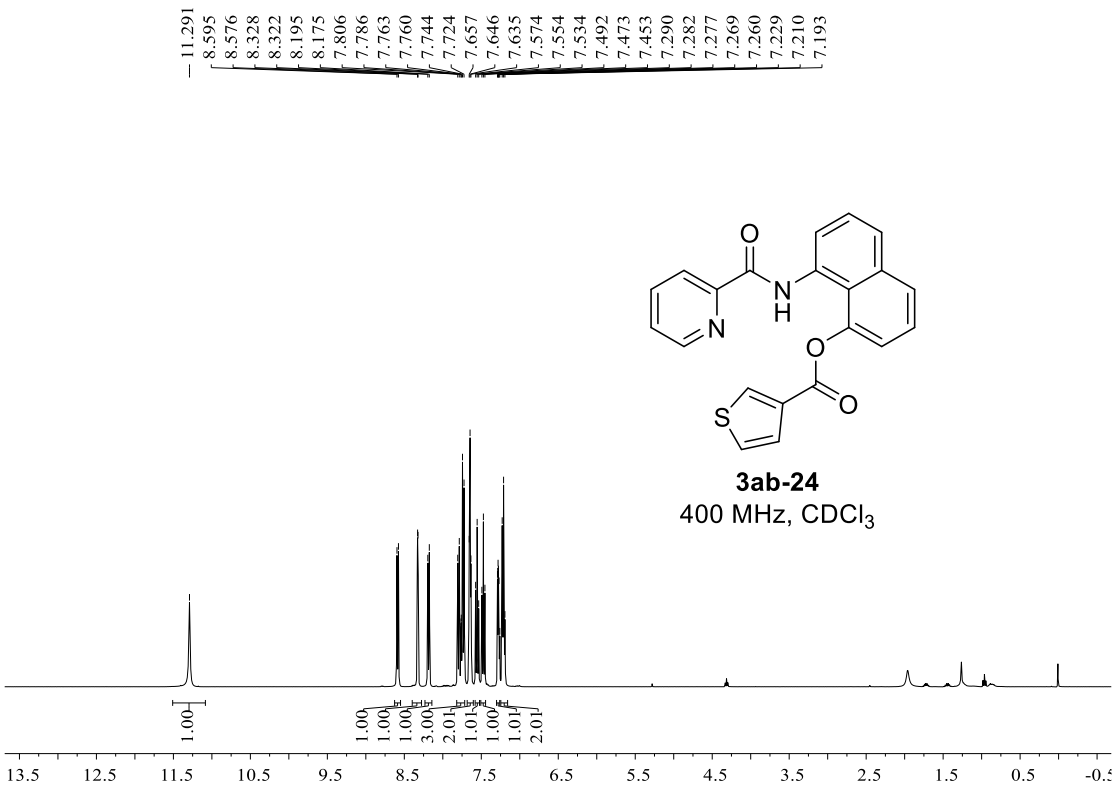
-10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8.175
7.806
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7.763
7.760
7.744
7.724
7.657
7.646
7.635
7.574
7.554
7.534
7.492
7.473
7.453
7.290
7.282
7.277
7.269
7.260
7.229
7.210
7.193
O
N
H
N
O
S
O
3ab-24
400 MHz, CDCl3
1.00
1.00
1.00
1.00
3.00
2.01
1.01
1.00
1.01
2.01
13.5
12.5
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7.5
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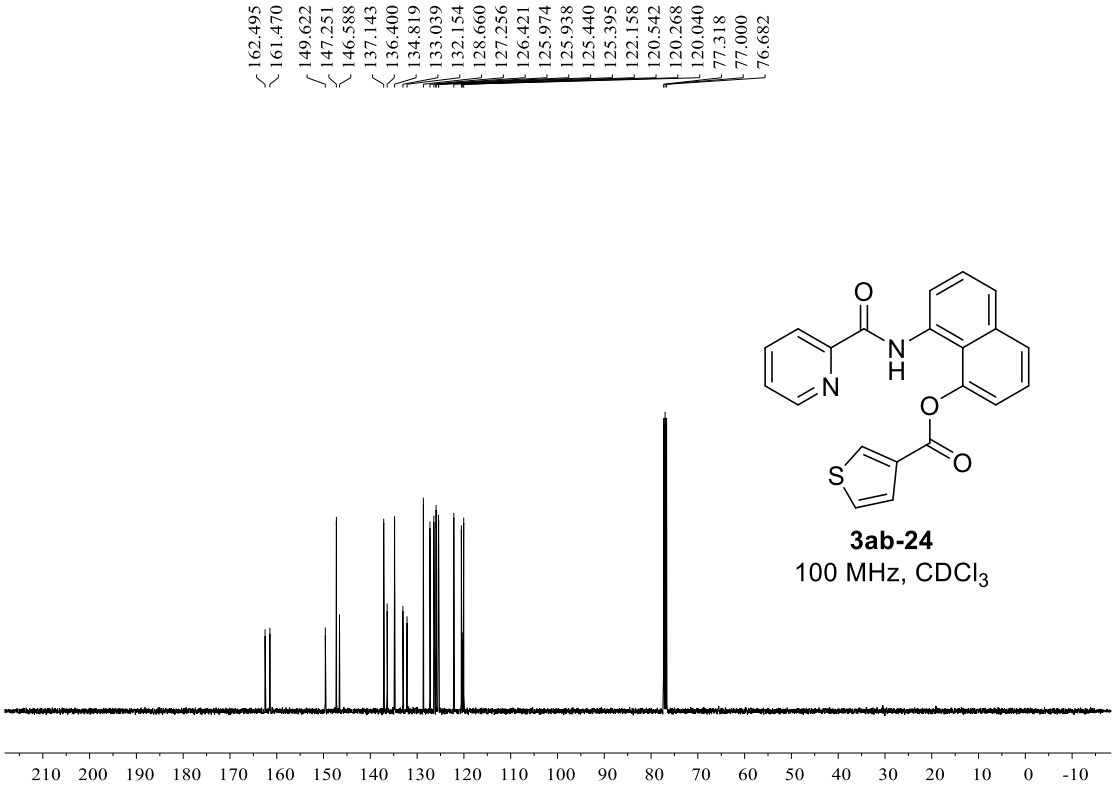
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127.256
126.421
125.974
125.938
125.440
125.395
122.158
120.542
120.268
120.040
77.318
77.000
76.682
O
N
H
N
O
S
O
3ab-24
100 MHz, CDCl3
210
200
190
180
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140
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120
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100
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80
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60
50
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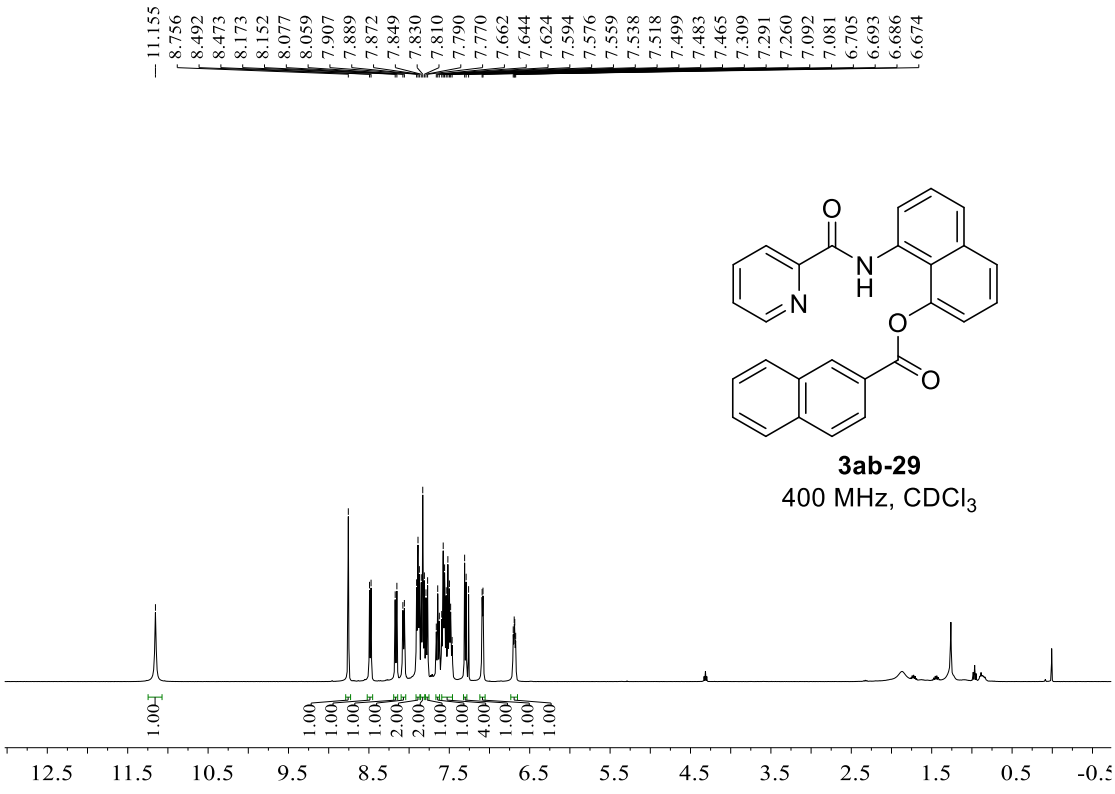
30
20
10
0
-10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7.810
7.790
7.770
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7.624
7.594
7.576
7.559
7.538
7.518
7.499
7.483
7.465
7.309
7.291
7.260
7.092
7.081
6.705
6.693
6.686
6.674
O
N
H
N
O
O
3ab-29
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
2.00
2.00
1.00
4.00
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11.5
10.5
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5.5
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3.5
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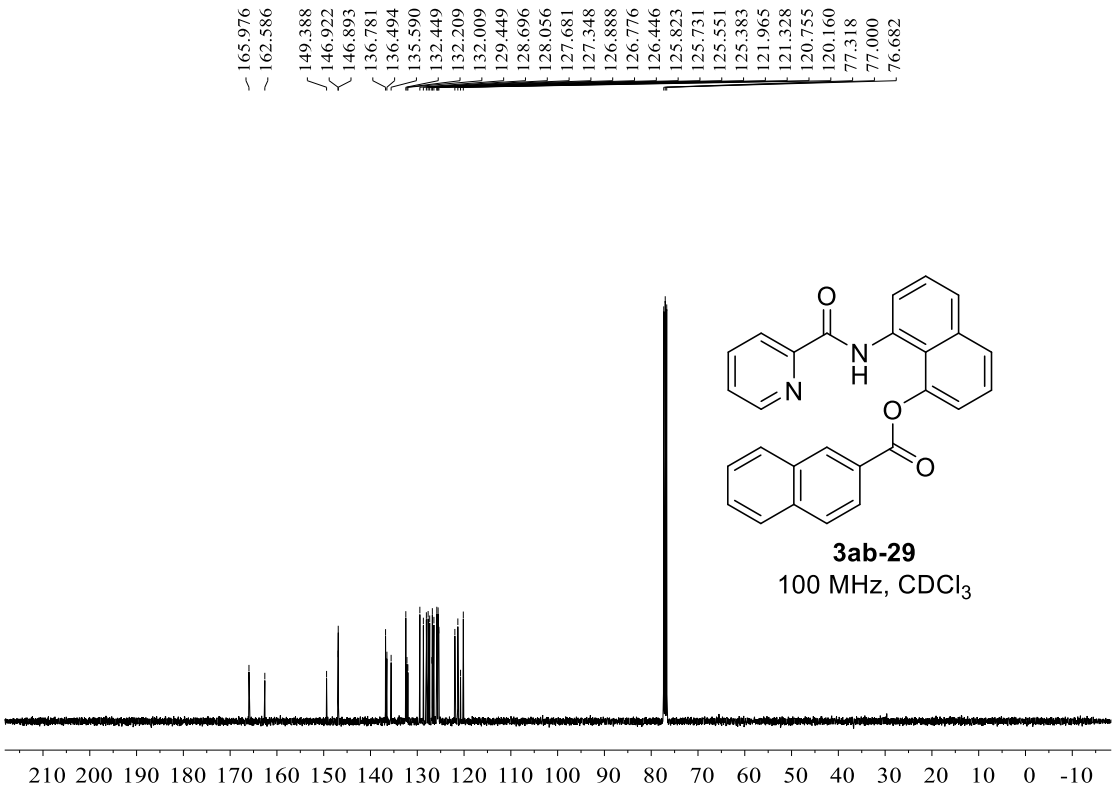
-0.5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127.681
127.348
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126.776
126.446
125.823
125.731
125.551
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121.328
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77.000
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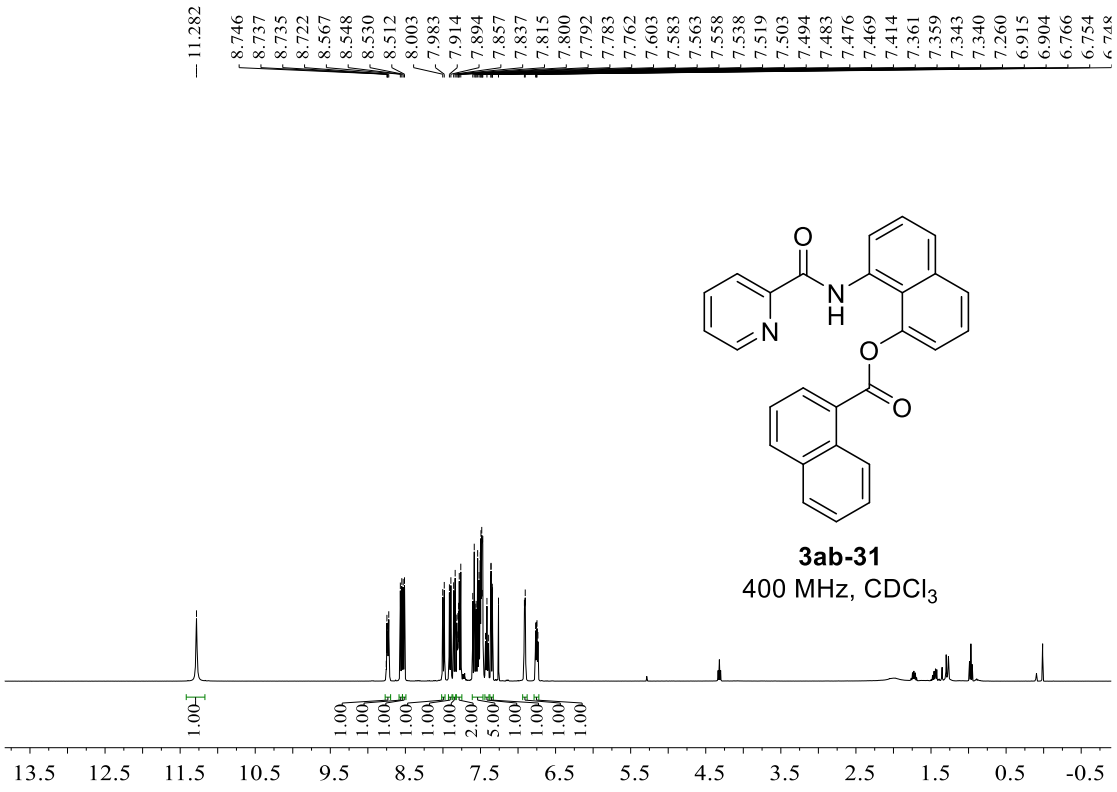
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8.548
8.530
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7.857
7.837
7.815
7.800
7.792
7.783
7.762
7.603
7.583
7.563
7.558
7.538
7.519
7.503
7.494
7.483
7.476
7.469
7.414
7.361
7.359
7.343
7.340
7.260
6.915
6.904
6.766
6.754
O
N
H
N
O
O
3ab-31
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
2.00
5.00
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1.00
1.00
1.00
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12.5
11.5
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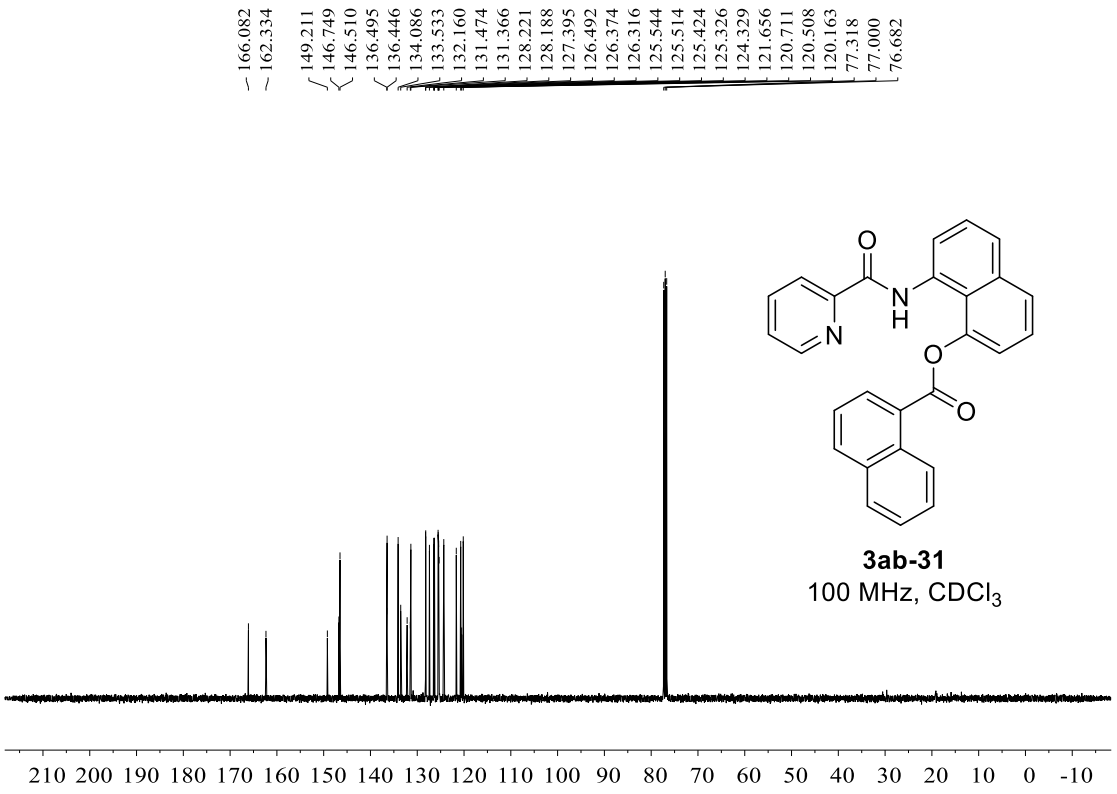
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134.086
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128.188
127.395
126.492
126.374
126.316
125.544
125.514
125.424
125.326
124.329
121.656
120.711
120.508
120.163
77.318
77.000
76.682
O
N
H
N
O
O
3ab-31
100 MHz, CDCl3
210
200
190
180
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140
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120
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100
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80
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60
50
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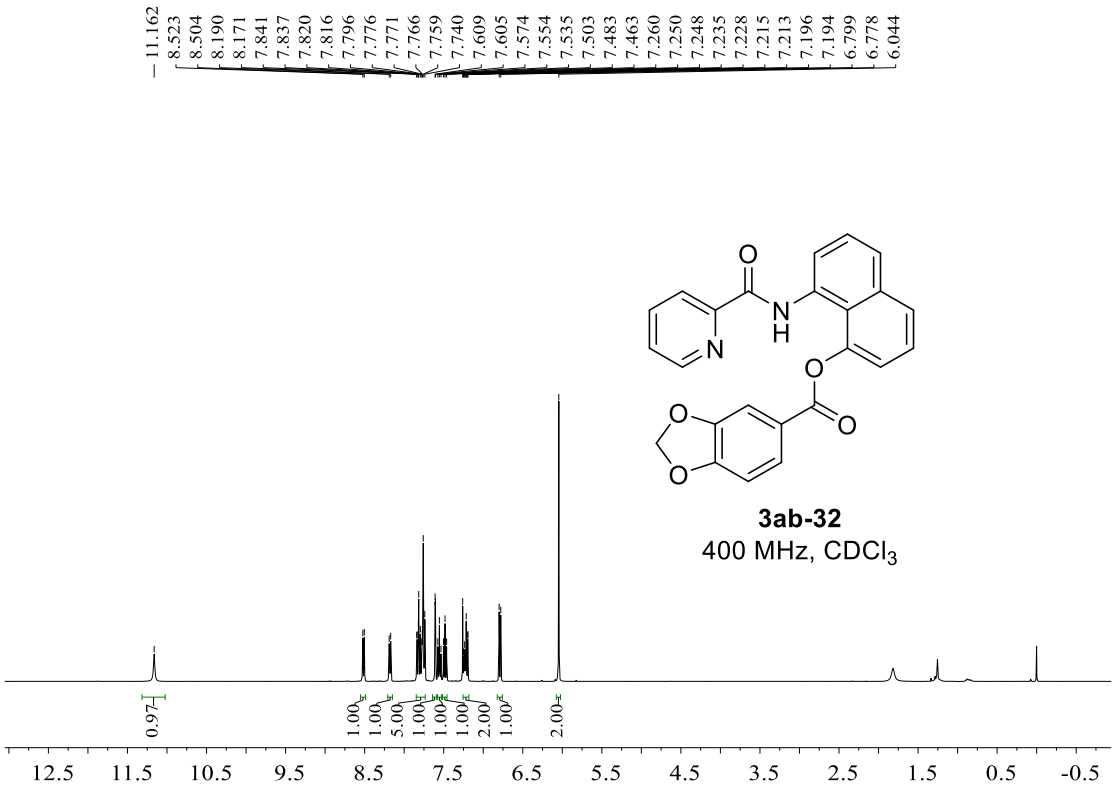
30
20
10
0
-10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7.776
7.771
7.766
7.759
7.740
7.609
7.605
7.574
7.554
7.535
7.503
7.483
7.463
7.260
7.250
7.248
7.235
7.228
7.215
7.213
7.196
7.194
6.799
6.778
6.044
O
N
H
N
O
O
O
O
3ab-32
400 MHz, CDCl3
0.97
1.00
1.00
5.00
1.00
1.00
1.00
2.00
1.00
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12.5
11.5
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7.5
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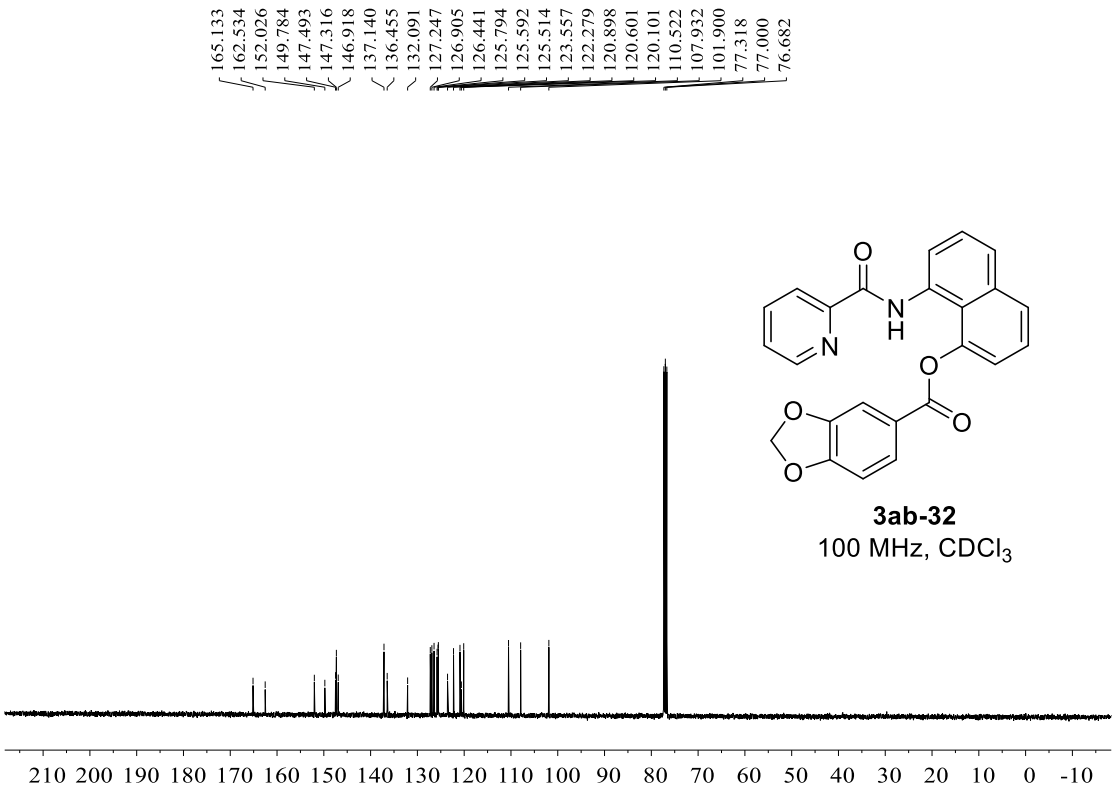
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132.091
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125.592
125.514
123.557
122.279
120.898
120.601
120.101
110.522
107.932
101.900
77.318
77.000
76.682
O
N
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O
O
O
3ab-32
100 MHz, CDCl3
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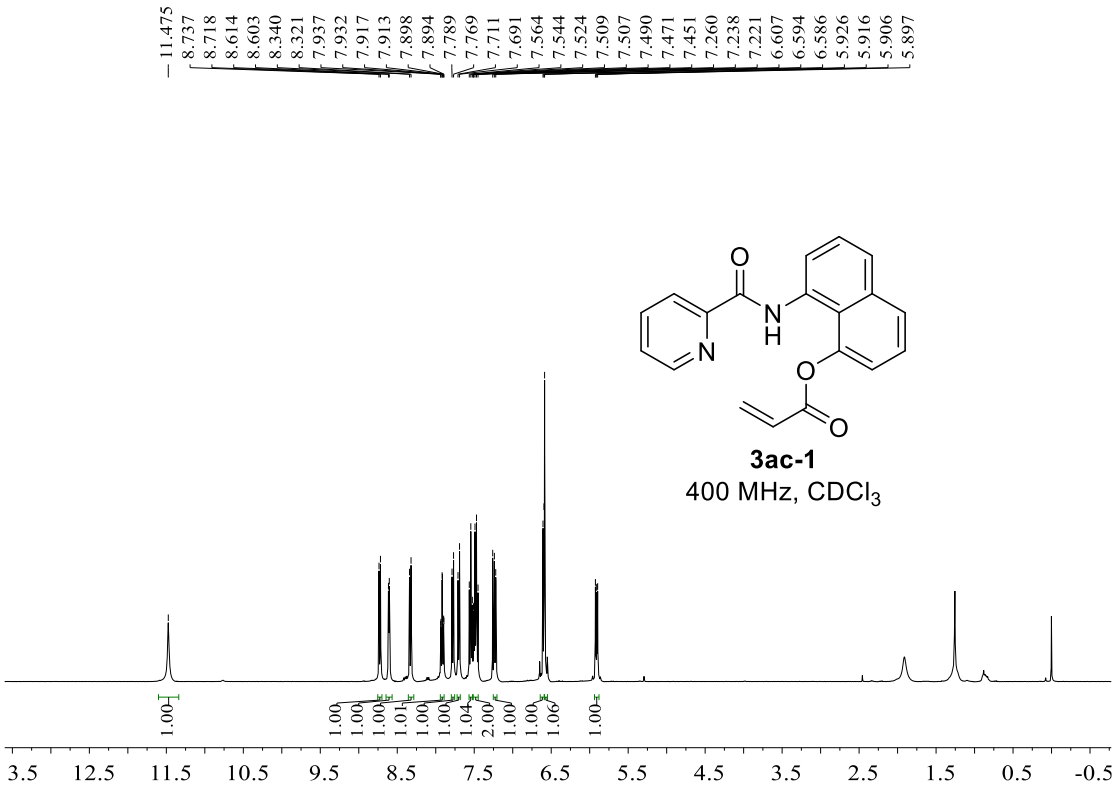
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7.937
7.932
7.917
7.913
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7.894
7.789
7.769
7.711
7.691
7.564
7.544
7.524
7.509
7.507
7.490
7.471
7.451
7.260
7.238
7.221
6.607
6.594
6.586
5.926
5.916
5.906
5.897
3ac-1
400 MHz, CDCl3
1.00
1.00
1.00
1.01
1.00
1.00
1.04
2.00
1.00
1.00
1.06
1.00
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11.5
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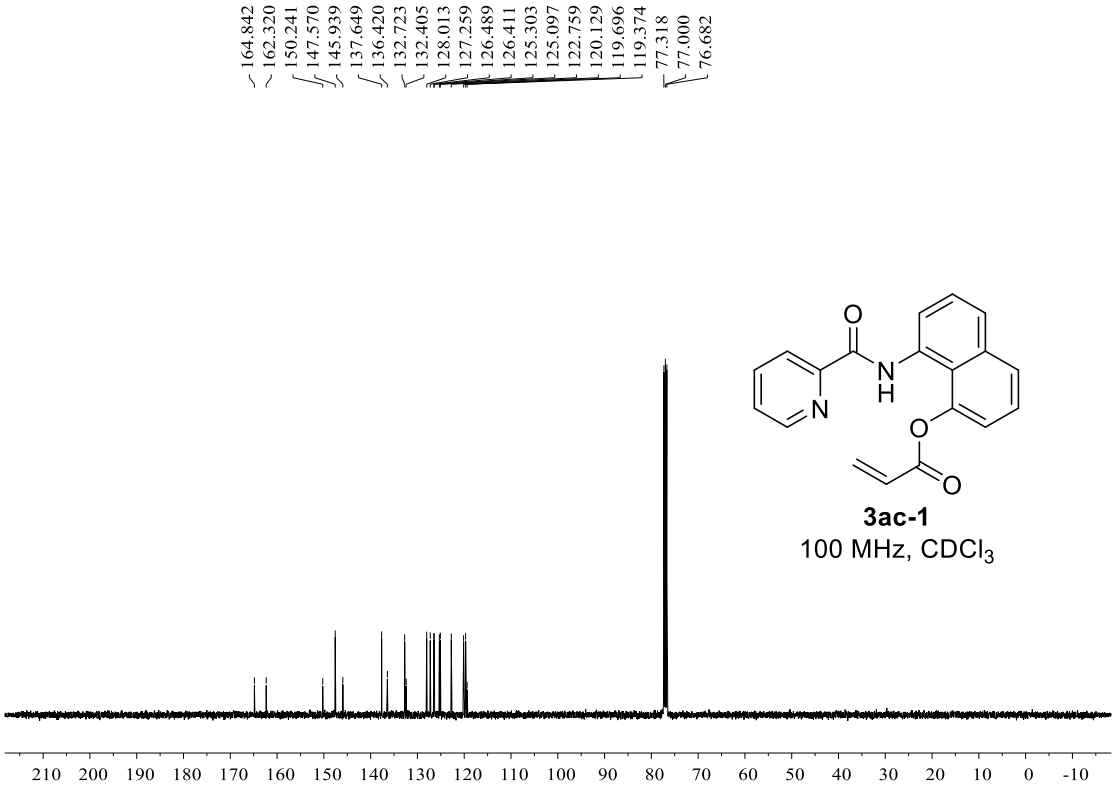
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125.303
125.097
122.759
120.129
119.696
119.374
77.318
77.000
76.682
3ac-1
100 MHz, CDCl3
210
200
190
180
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140
130
120
110
100
90
80
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60
50
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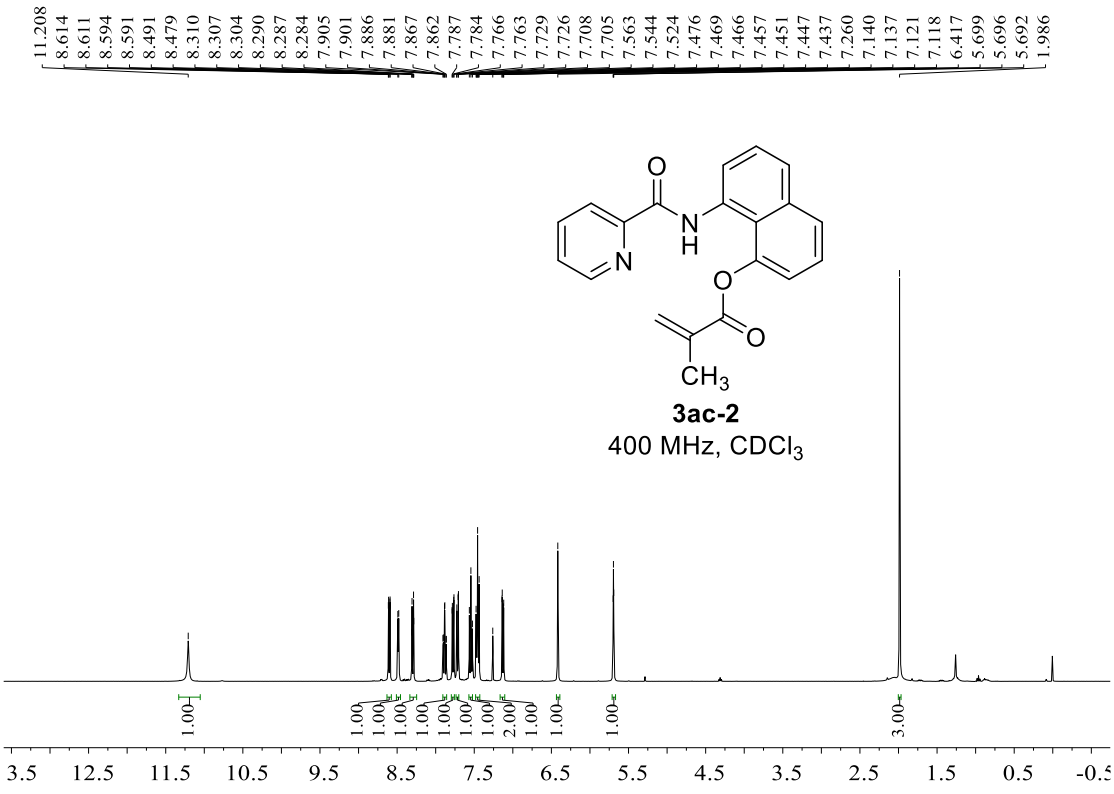
20
10
0
-10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8.310
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8.290
8.287
8.284
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7.901
7.886
7.881
7.867
7.862
7.787
7.784
7.766
7.763
7.729
7.726
7.708
7.705
7.563
7.544
7.524
7.476
7.469
7.466
7.457
7.451
7.447
7.437
7.260
7.140
7.137
7.121
7.118
6.417
5.699
5.696
5.692
1.986
O
N
H
N
O
O
CH3
3ac-2
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1.00
1.00
2.00
1.00
1.00
1.00
3.00
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12.5
11.5
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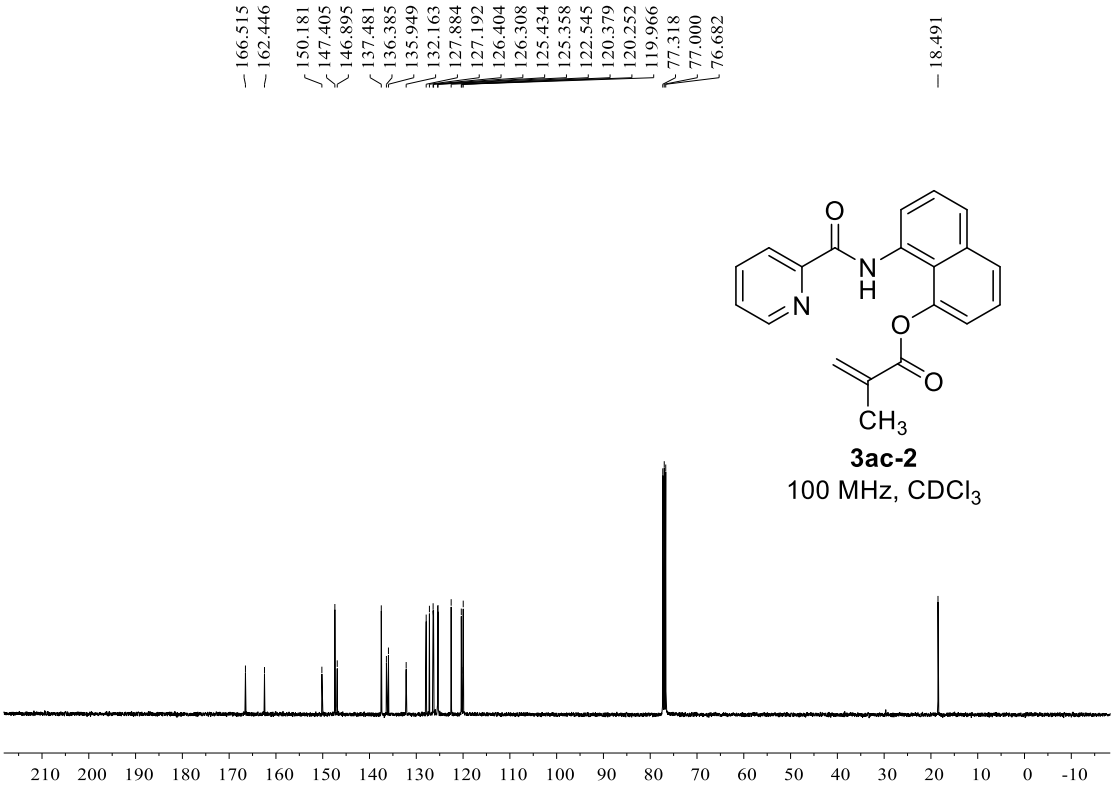
-0.5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126.308
125.434
125.358
122.545
120.379
120.252
119.966
77.318
77.000
76.682
18.491
O
N
H
N
O
O
CH3
3ac-2
100 MHz, CDCl3
210
200
190
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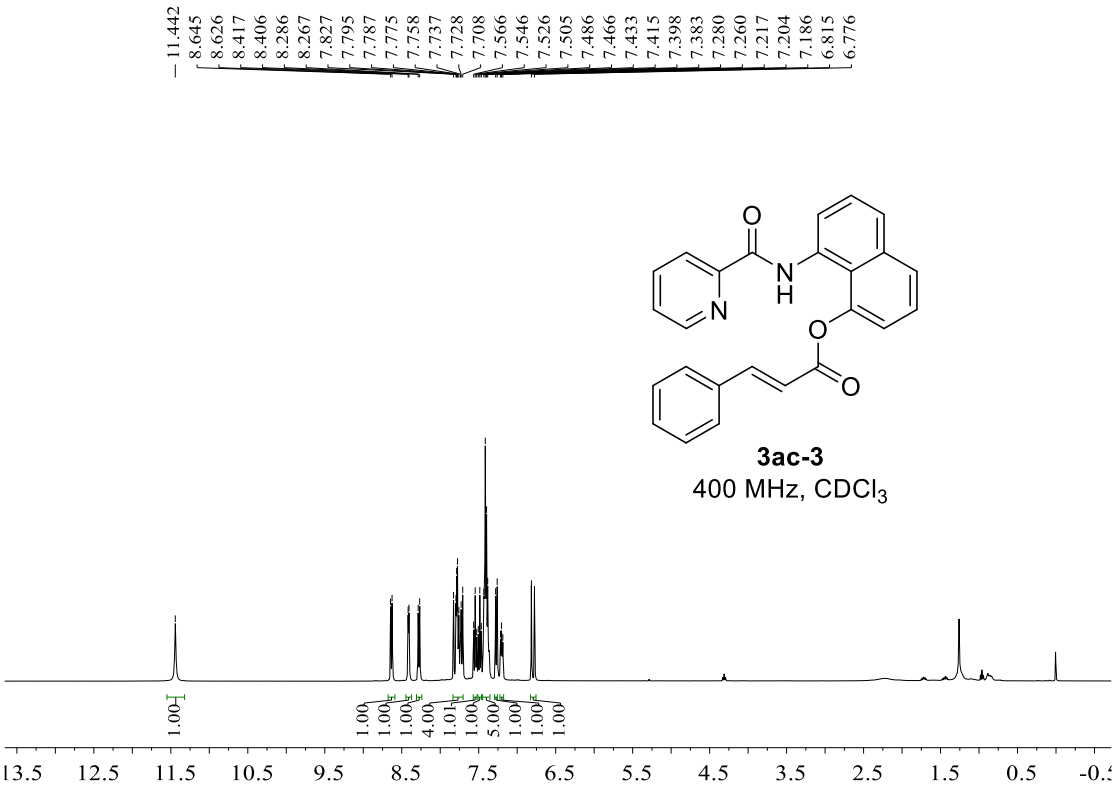
-10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7.708
7.566
7.546
7.526
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7.486
7.466
7.433
7.415
7.398
7.383
7.280
7.260
7.217
7.204
7.186
6.815
6.776
O
N
H
N
O
O
3ac-3
400 MHz, CDCl3
1.00
1.00
1.00
1.00
4.00
1.01
1.00
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1.00
1.00
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12.5
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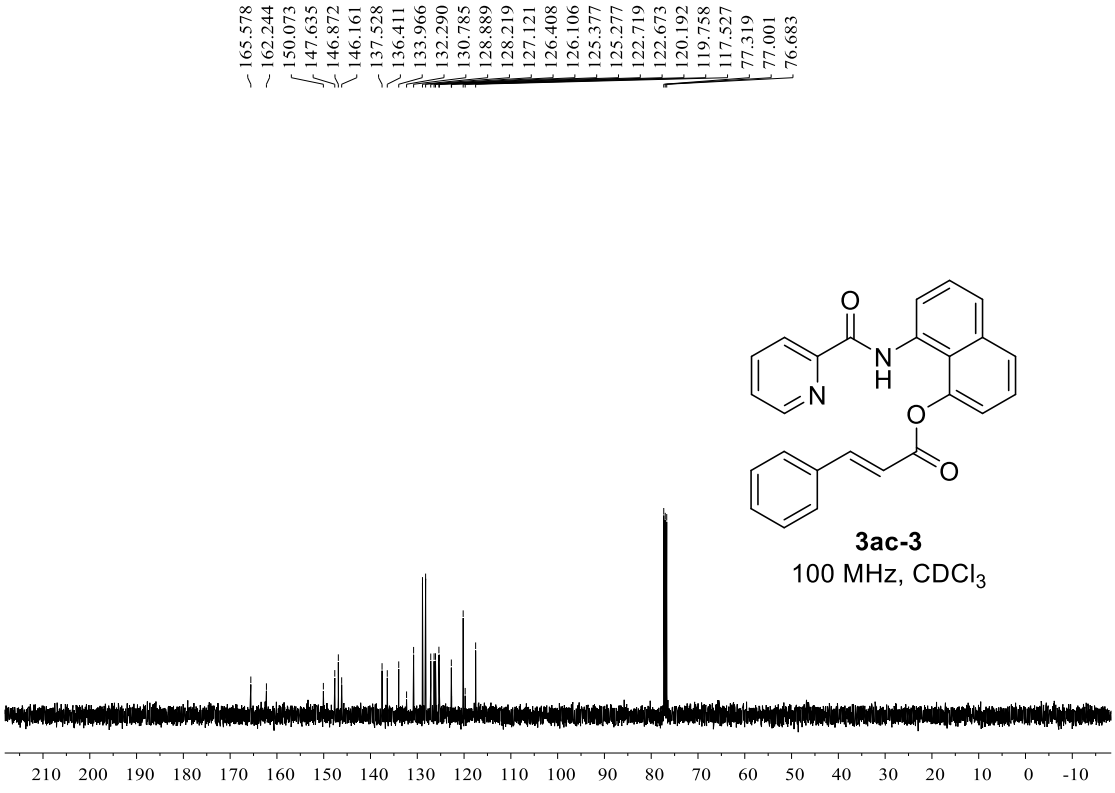
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128.219
127.121
126.408
126.106
125.377
125.277
122.719
122.673
120.192
119.758
117.527
77.319
77.001
76.683
O
N
H
N
O
O
3ac-3
100 MHz, CDCl3
210
200
190
180
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140
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120
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100
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80
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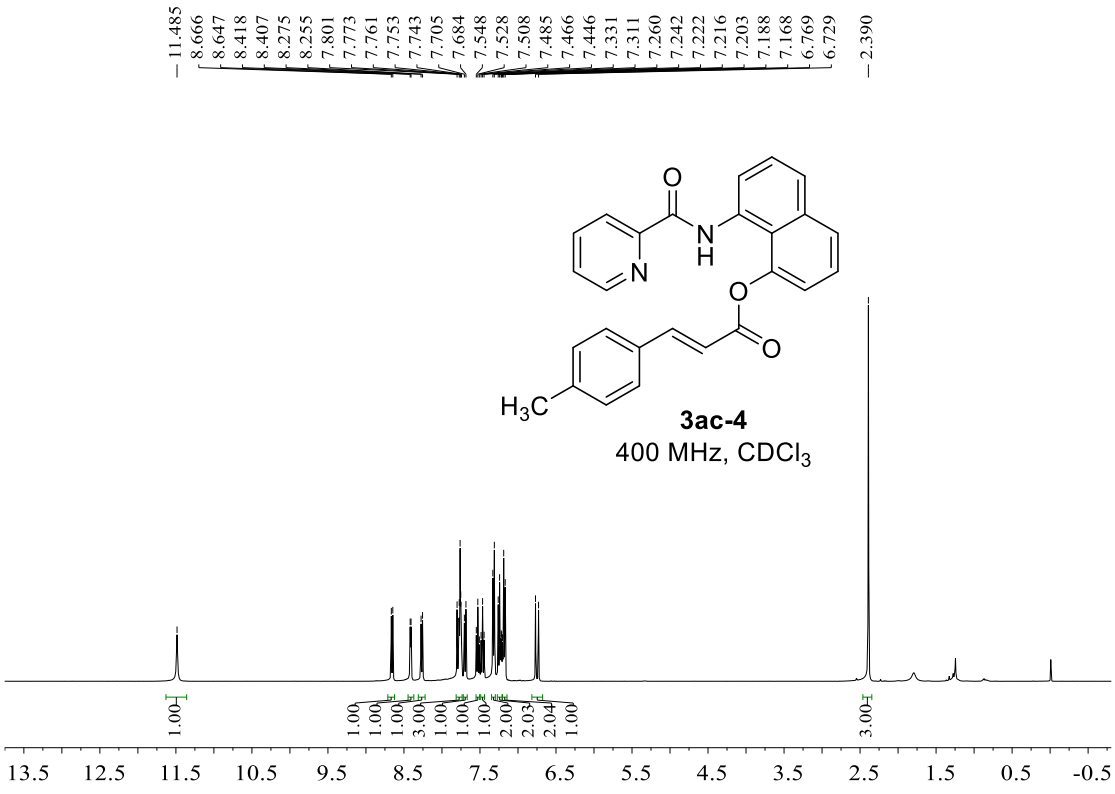
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7.753
7.743
7.705
7.684
7.548
7.528
7.508
7.485
7.466
7.446
7.331
7.311
7.260
7.242
7.222
7.216
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7.188
7.168
6.769
6.729
2.390
O
N
H
N
O
O
H3C
3ac-4
400 MHz, CDCl3
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1.00
1.00
3.00
1.00
1.00
2.00
2.03
2.04
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3.00
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12.5
11.5
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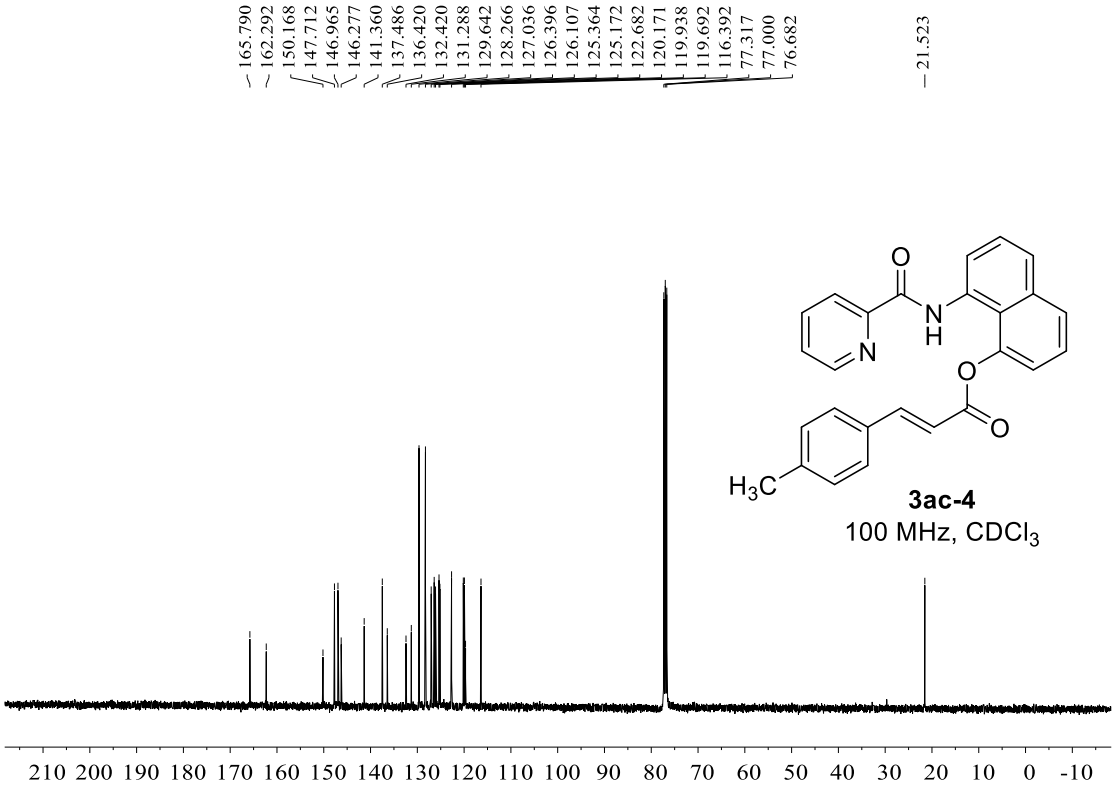
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126.396
126.107
125.364
125.172
122.682
120.171
119.938
119.692
116.392
77.317
77.000
76.682
21.523
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O
H3C
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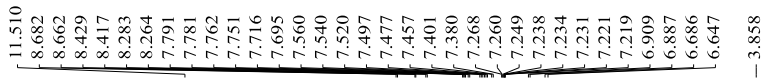
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7.540
7.520
7.497
7.477
7.457
7.401
7.380
7.268
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7.234
7.231
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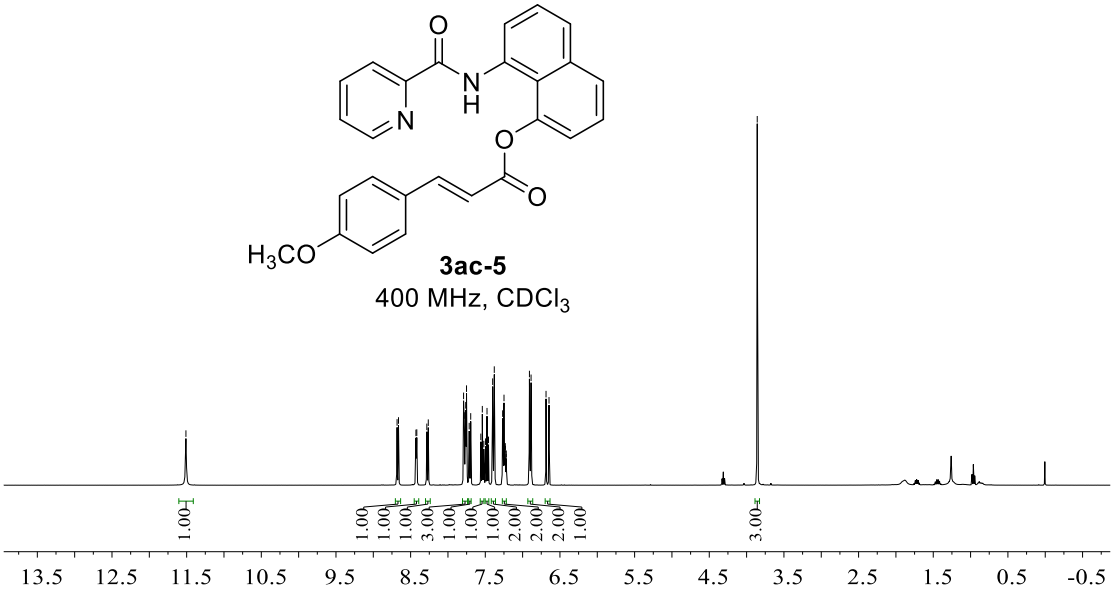
3.858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N
H
N
O
O
H3CO
3ac-5
400 MHz, CDCl3
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1.00
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1.00
1.00
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2.00
2.00
2.00
1.00
3.00
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12.5
11.5
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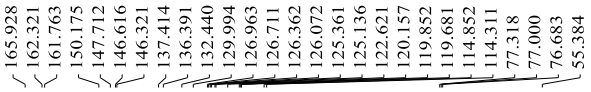
-0.5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126.072
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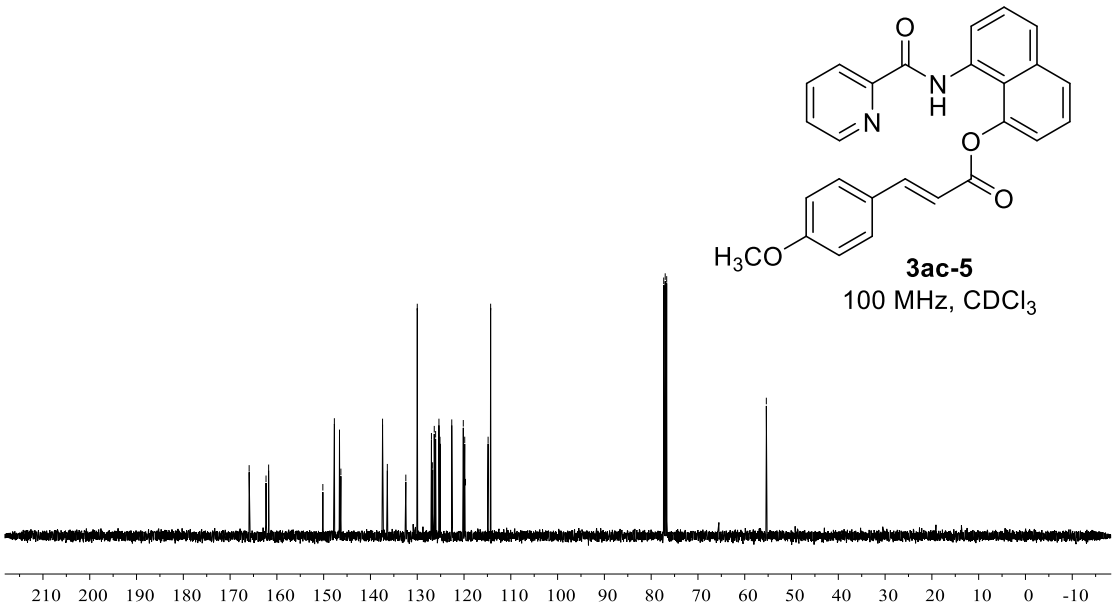
55.384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N
H
N
O
O
H3CO
3ac-5
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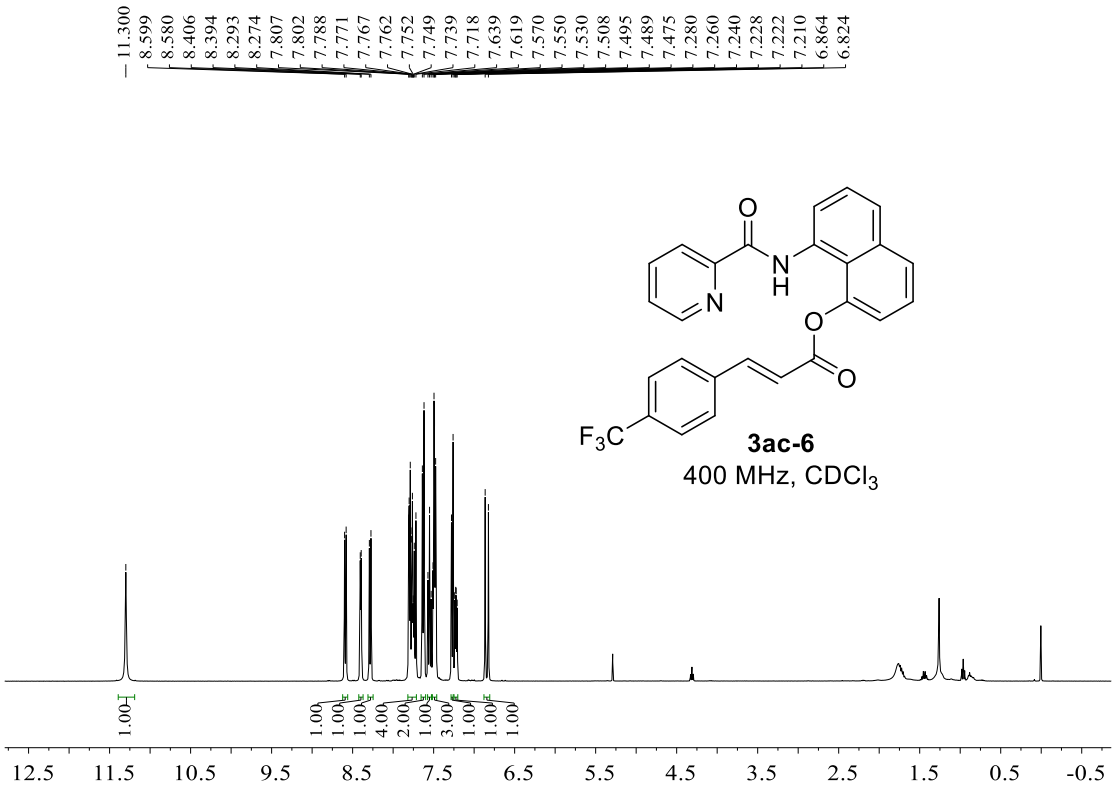
-10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7.280
7.260
7.240
7.228
7.222
7.210
6.864
6.824
O
N
H
N
O
O
F3C
3ac-6
400 MHz, CDCl3
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1.00
1.00
4.00
2.00
1.00
3.00
1.00
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3.5
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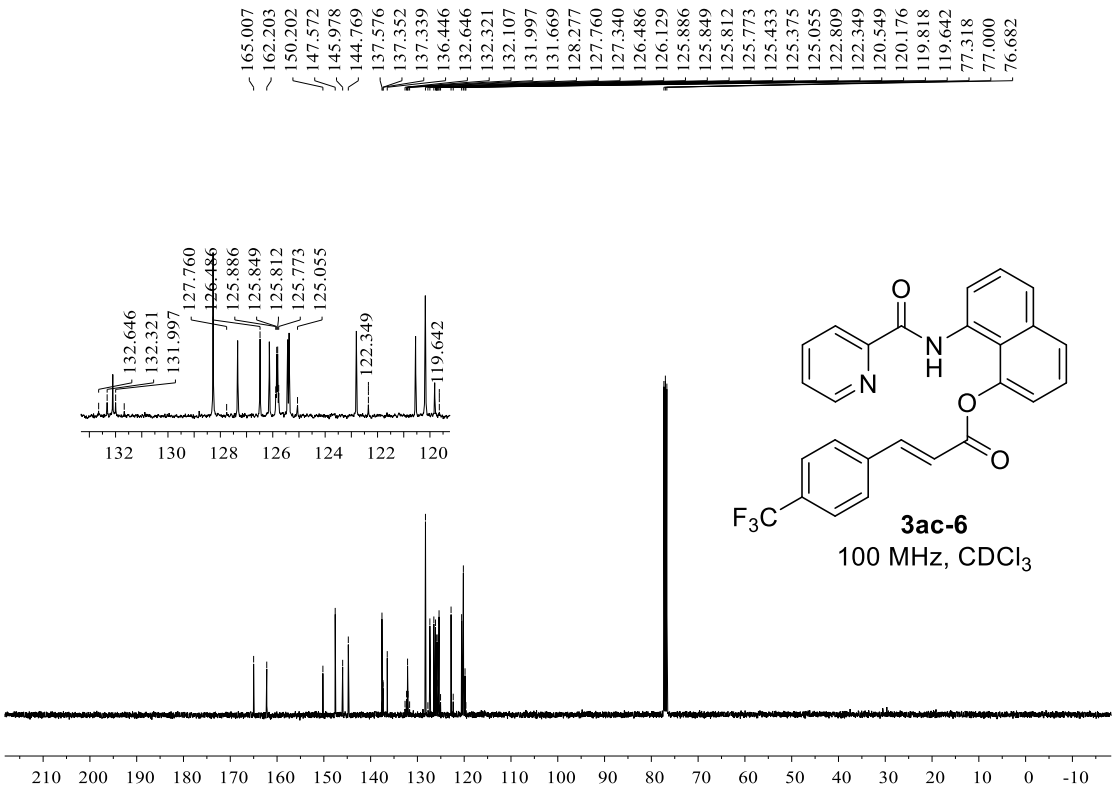
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150.202
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137.352
137.339
136.446
132.646
132.321
132.107
131.997
131.669
128.277
127.760
127.340
126.486
126.129
125.886
125.849
125.812
125.773
125.433
125.375
125.055
122.809
122.349
120.549
120.176
119.818
119.642
77.318
77.000
76.682
132.646
132.321
131.997
127.760
126.486
125.886
125.849
125.812
125.773
125.055
122.349
119.642
132
130
128
126
124
122
120
O
N
H
N
O
O
F3C
3ac-6
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
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100
90
80
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60
50
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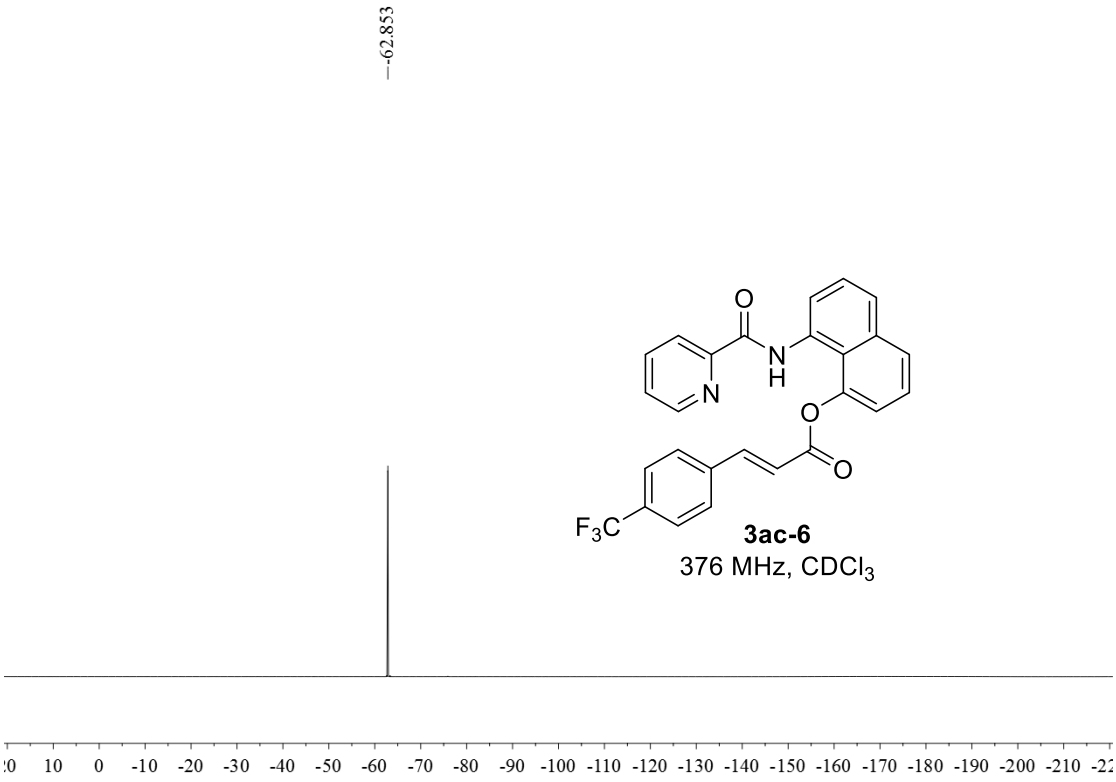
0
-10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3ac-6
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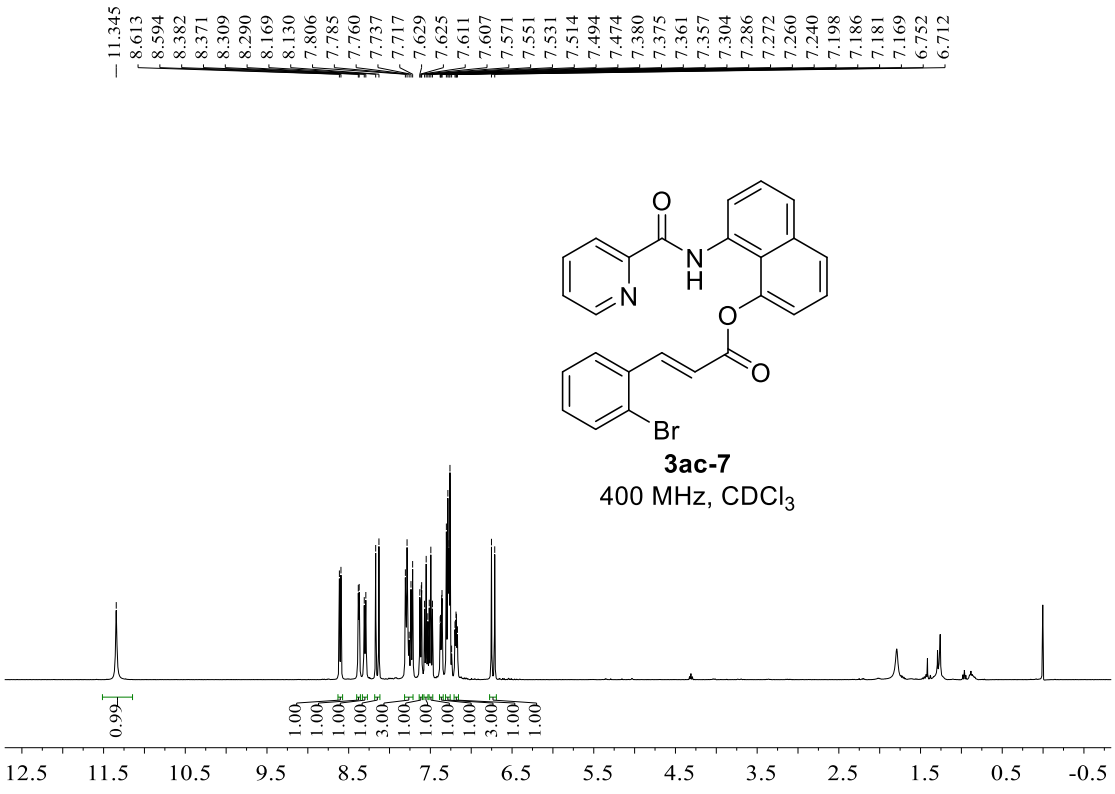
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8.594
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8.169
8.130
7.806
7.785
7.760
7.737
7.717
7.629
7.625
7.611
7.607
7.571
7.551
7.531
7.514
7.494
7.474
7.380
7.375
7.361
7.357
7.304
7.286
7.272
7.260
7.240
7.198
7.186
7.181
7.169
6.752
6.712
O
N
H
N
O
O
Br
3ac-7
400 MHz, CDCl3
0.99
1.00
1.00
1.00
1.00
3.00
1.00
1.00
1.00
1.00
3.00
1.00
1.00
12.5
11.5
10.5
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6.5
5.5
4.5
3.5
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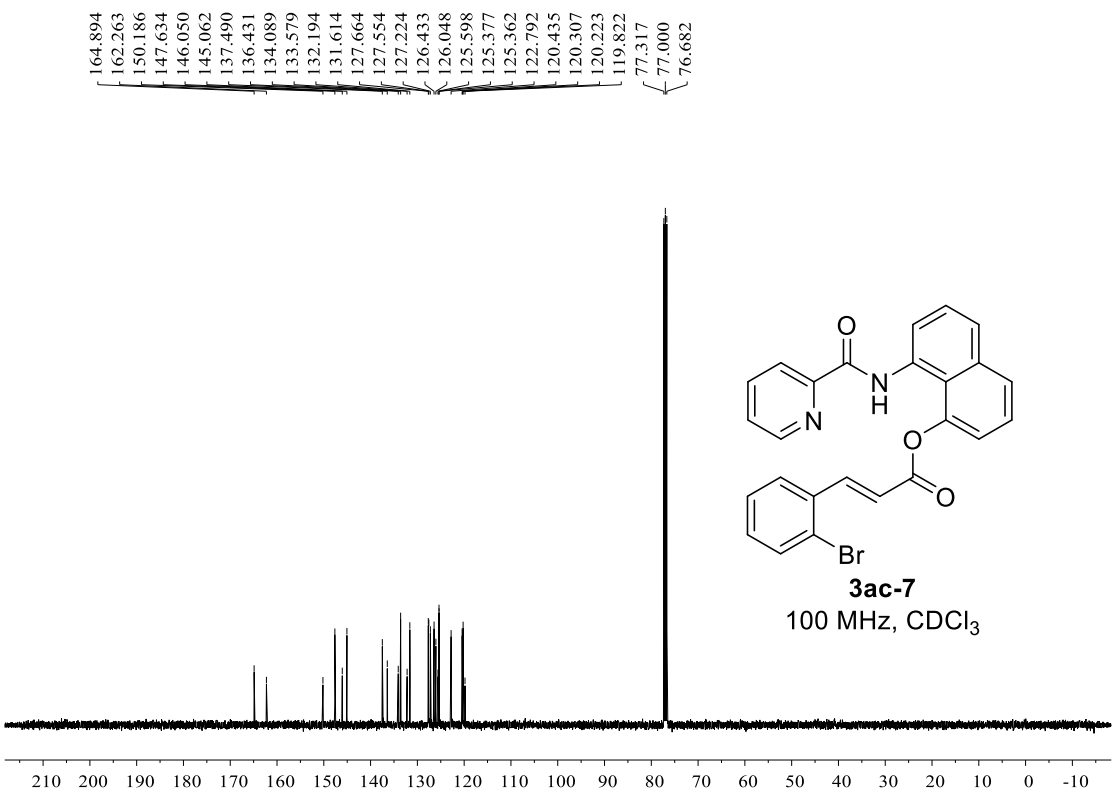
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162.263
150.186
147.634
146.050
145.062
137.490
136.431
134.089
133.579
132.194
131.614
127.664
127.554
127.224
126.433
126.048
125.598
125.377
125.362
122.792
120.435
120.307
120.223
119.822
77.317
77.000
76.682
O
N
H
N
O
O
Br
3ac-7
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
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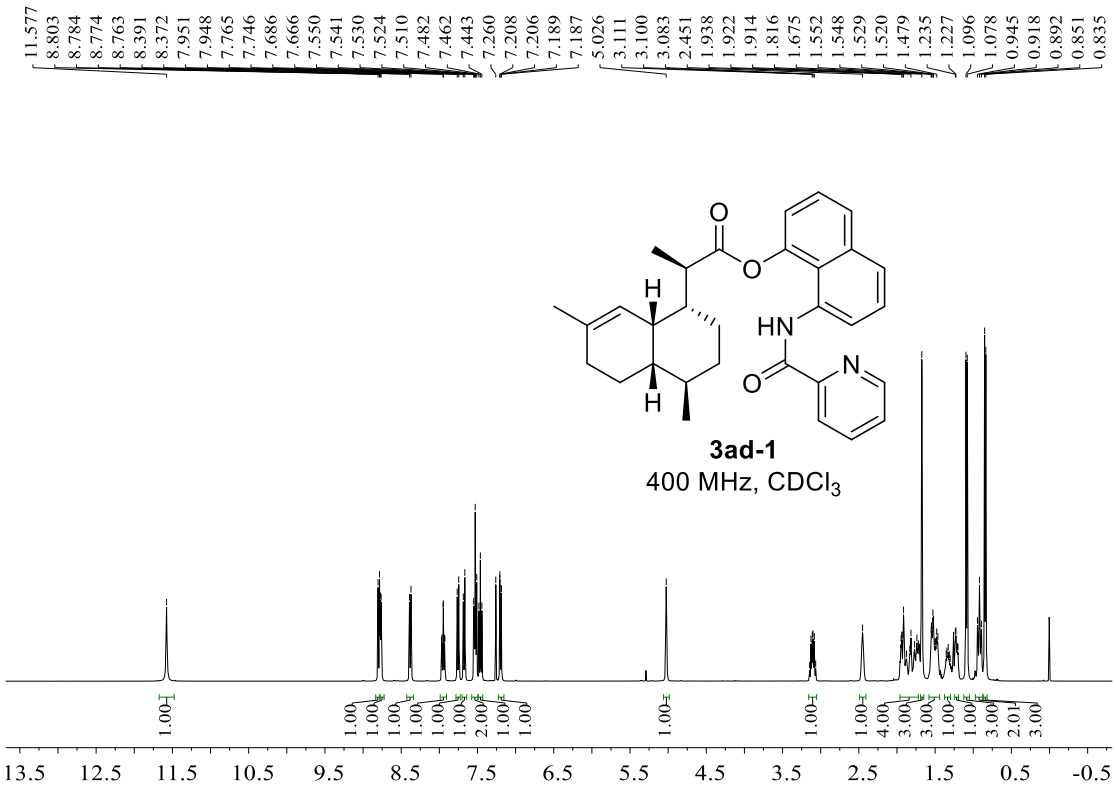
60
50
40
30
20
10
0
-10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8.391
8.372
7.951
7.948
7.765
7.746
7.686
7.666
7.550
7.541
7.530
7.524
7.510
7.482
7.462
7.443
7.260
7.208
7.206
7.189
7.187
5.026
3.111
3.100
3.083
2.451
1.938
1.922
1.914
1.816
1.675
1.552
1.548
1.529
1.520
1.479
1.235
1.227
1.096
1.078
0.945
0.918
0.892
0.851
0.835
O
O
H
HN
O
N
H
3ad-1
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
2.00
1.00
1.00
1.00
1.00
1.00
4.00
3.00
3.00
1.00
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2.01
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12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
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1.5
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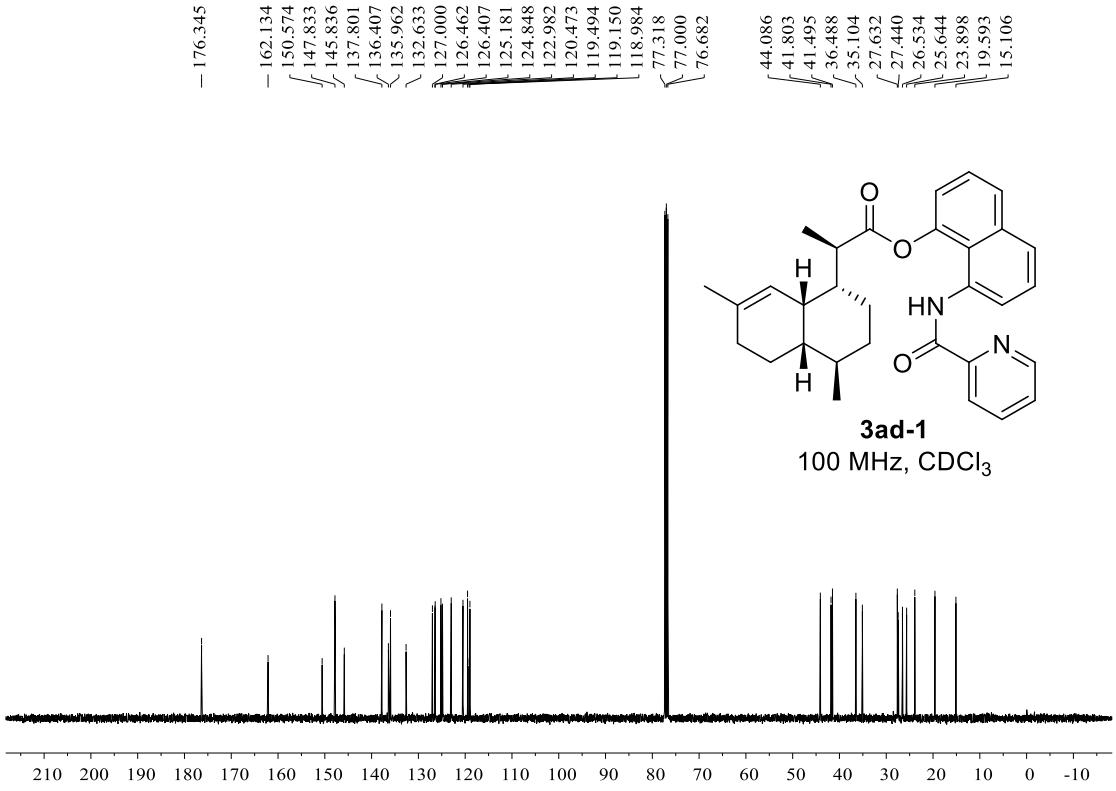
-0.5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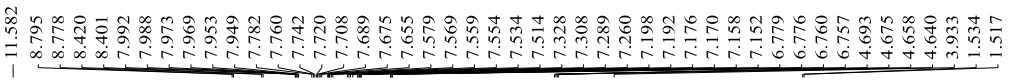
135.962
132.633
127.000
126.462
126.407
125.181
124.848
122.982
120.473
119.494
119.150
118.984
77.318
77.000
76.682
44.086
41.803
41.495
36.488
35.104
27.632
27.440
26.534
25.644
23.898
19.593
15.106
O
O
H
HN
O
N
H
3ad-1
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10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8.420
8.401
7.992
7.988
7.973
7.969
7.953
7.949
7.782
7.760
7.742
7.720
7.708
7.689
7.675
7.655
7.579
7.569
7.559
7.554
7.534
7.514
7.328
7.308
7.289
7.260
7.198
7.192
7.176
7.170
7.158
7.152
6.779
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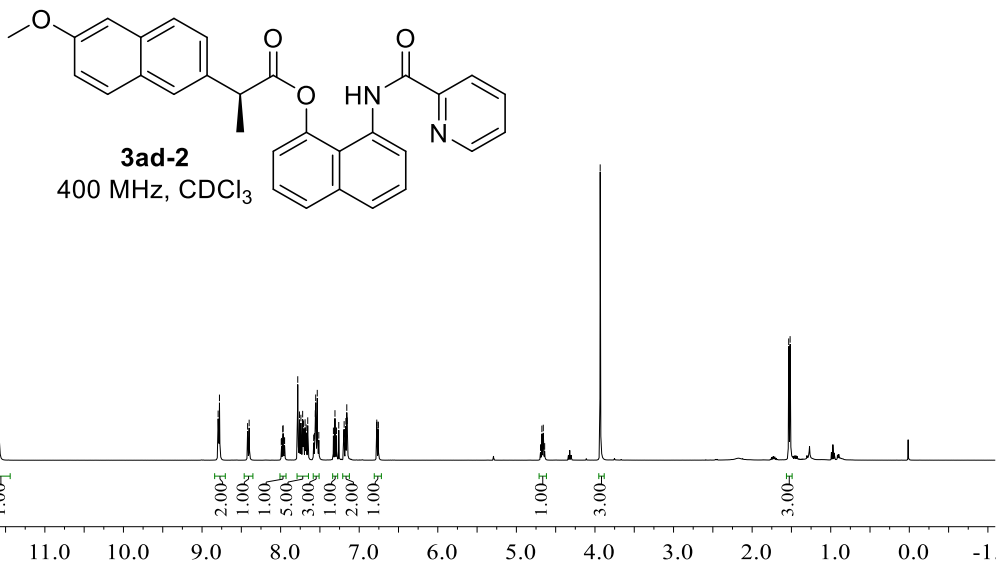
6.760
6.757
4.693
4.675
4.658
4.640
3.933
1.534
1.517


O
O
O
HN
N
3ad-2
400 MHz, CDCl3
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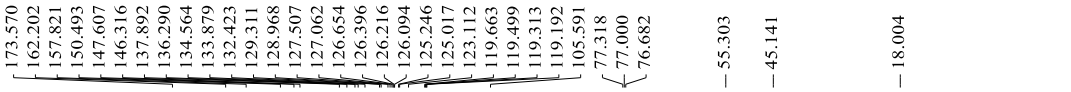
2.00
1.00
1.00
5.00
3.00
1.00
2.00
1.00
1.00
3.00
3.00
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0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157.821
150.493
147.607
146.316
137.892
136.290
134.564
133.879
132.423
129.311
128.968
127.507
127.062
126.654
126.396
126.216
126.094
125.246
125.017
123.112
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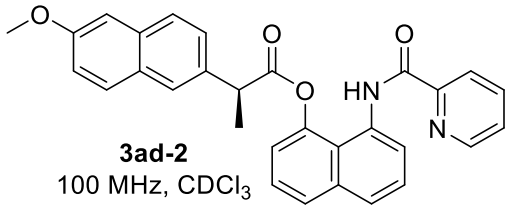
119.313
119.192
105.591
77.318
77.000
76.682
55.303
45.141
18.004


O
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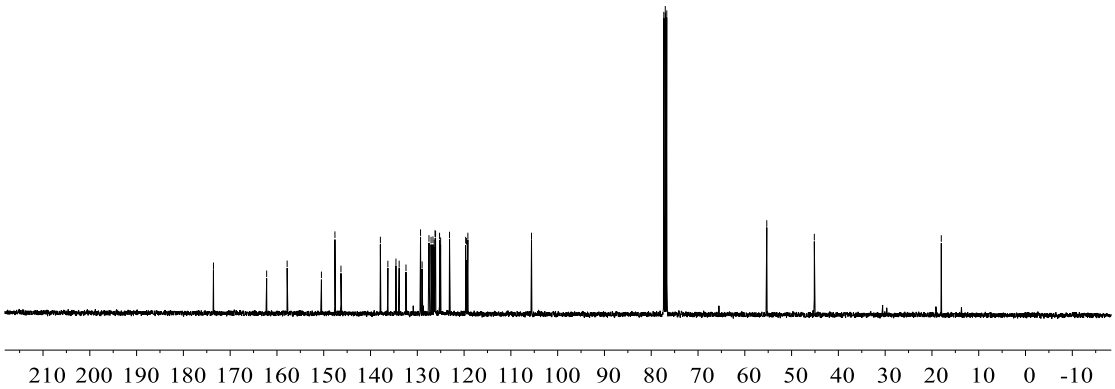
O
HN
N
3ad-2
100 MHz, CDCl3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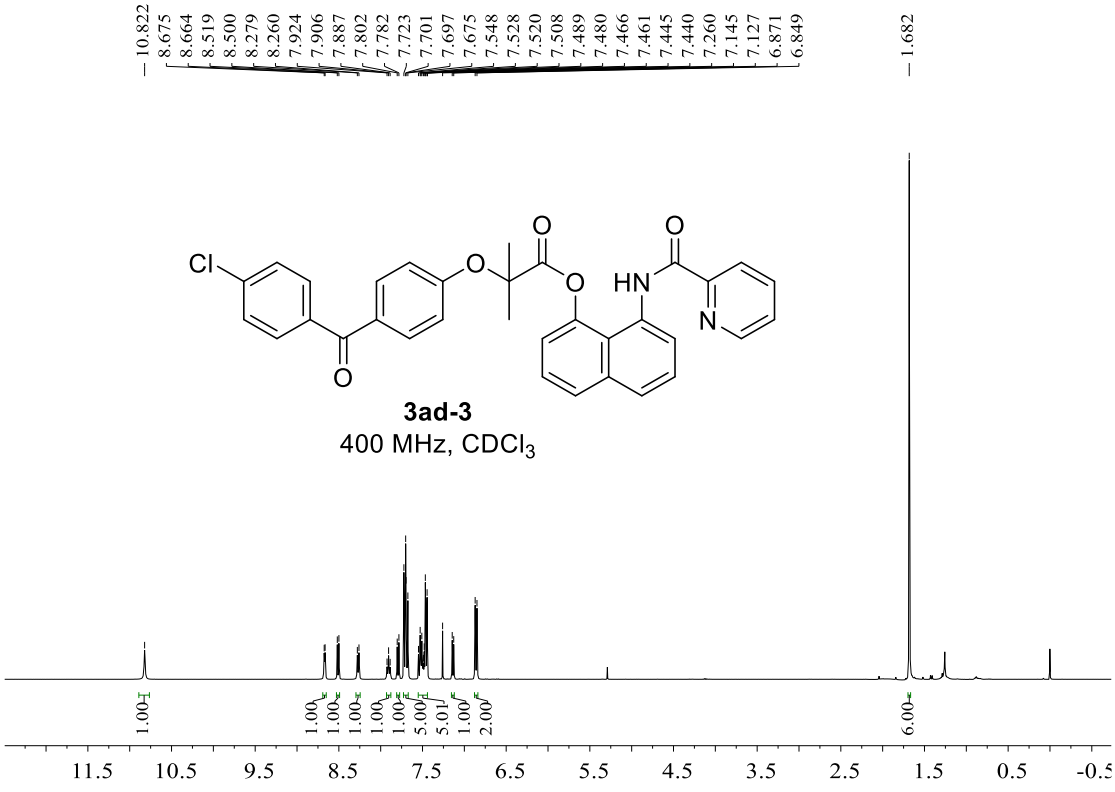
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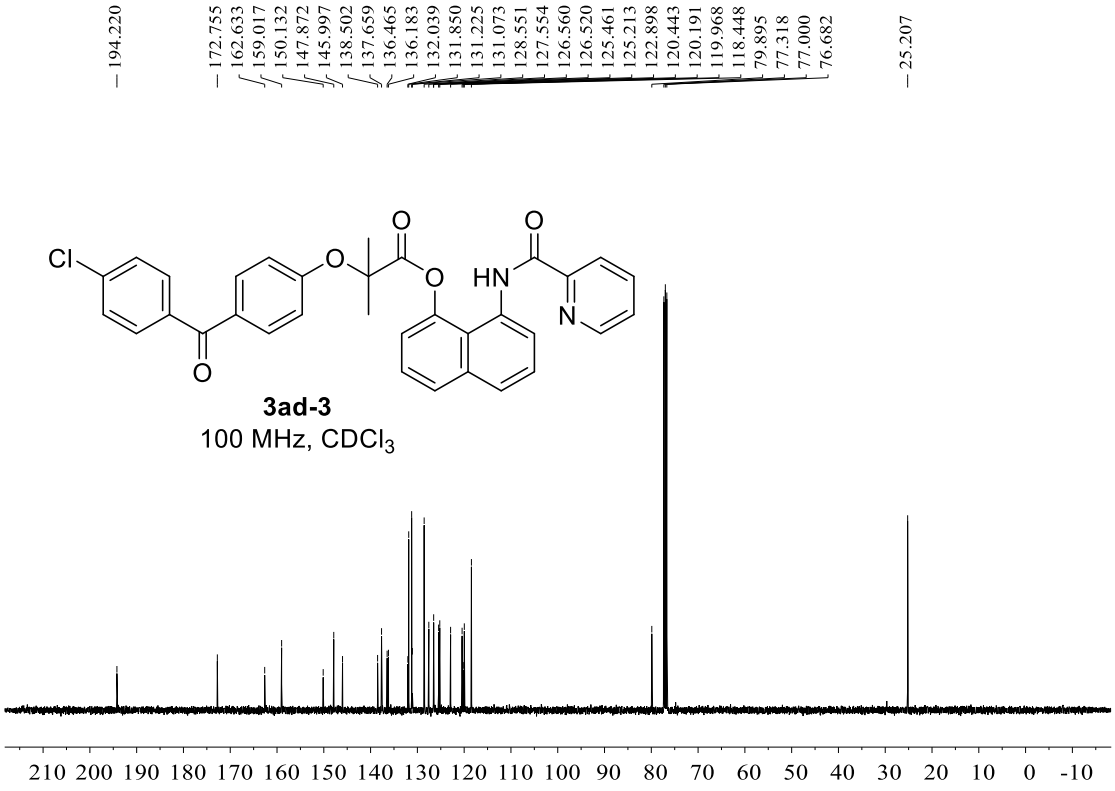
8.664
8.519
8.500
8.279
8.260
7.924
7.906
7.887
7.802
7.782
7.723
7.701
7.697
7.675
7.548
7.528
7.520
7.508
7.489
7.480
7.466
7.461
7.445
7.440
7.260
7.145
7.127
6.871
6.849
1.682
Cl
O
O
O
HN
N
O
3ad-3
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
5.00
5.01
1.00
2.00
6.00
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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159.017
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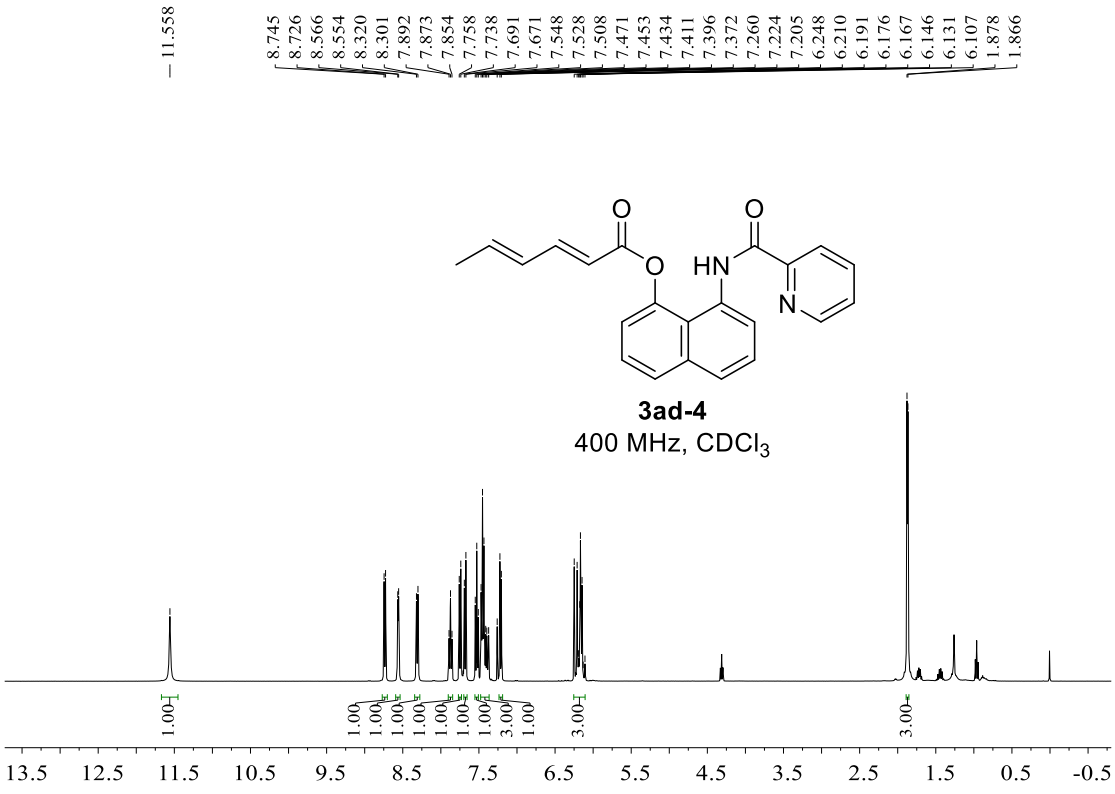
147.872
145.997
138.502
137.659
136.465
136.183
132.039
131.850
131.225
131.073
128.551
127.554
126.560
126.520
125.461
125.213
122.898
120.443
120.191
119.968
118.448
79.895
77.318
77.000
76.682
25.207
Cl
O
O
O
HN
N
O
3ad-3
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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7.691
7.671
7.548
7.528
7.508
7.471
7.453
7.434
7.411
7.396
7.372
7.260
7.224
7.205
6.248
6.210
6.191
6.176
6.167
6.146
6.131
6.107
1.878
1.866
O
O
HN
O
N
3ad-4
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
3.00
1.00
3.00
3.00
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12.5
11.5
10.5
9.5
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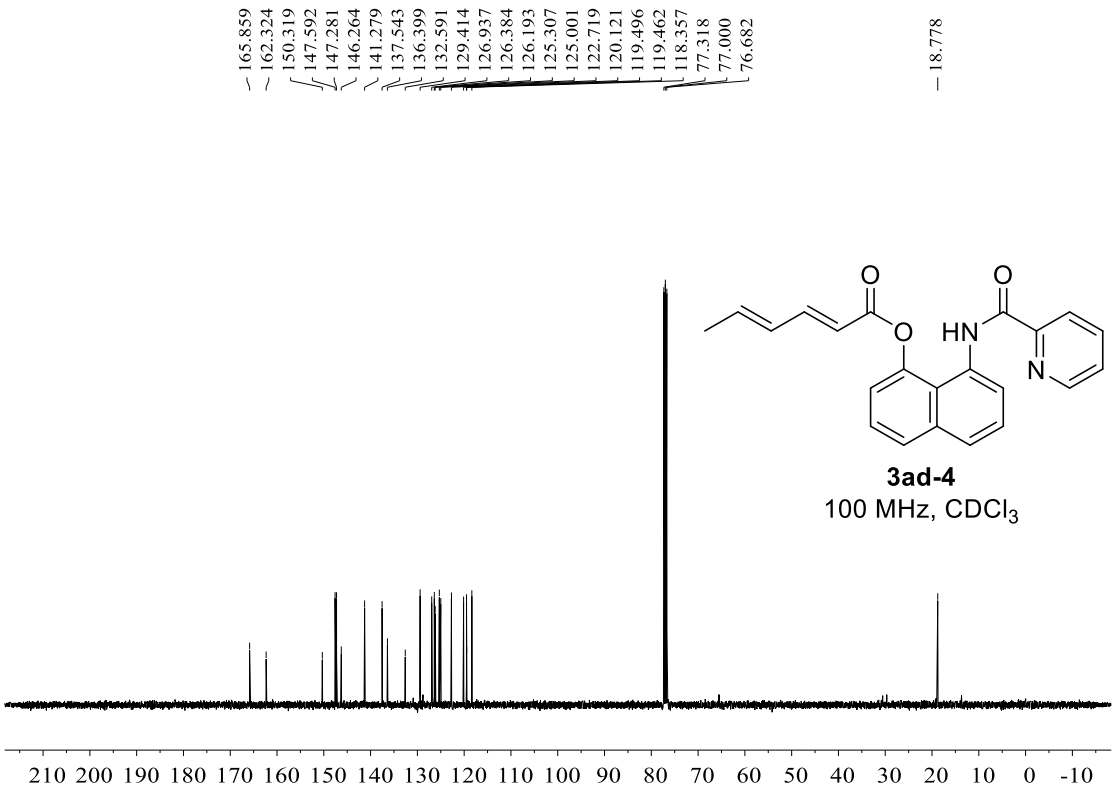
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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137.543
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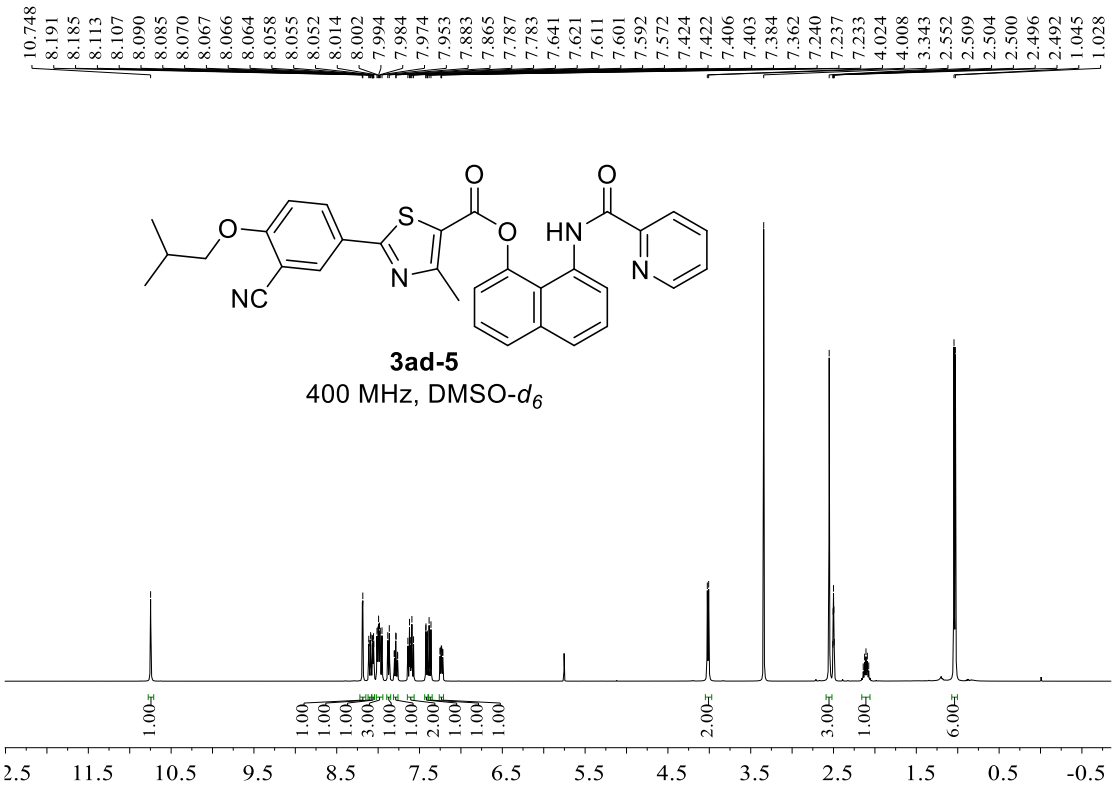
129.414
126.937
126.384
126.193
125.307
125.001
122.719
120.121
119.496
119.462
118.357
77.318
77.000
76.682
18.778
O
O
HN
O
N
3ad-4
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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8.070
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8.066
8.064
8.058
8.055
8.052
8.014
8.002
7.994
7.984
7.974
7.953
7.883
7.865
7.787
7.783
7.641
7.621
7.611
7.601
7.592
7.572
7.424
7.422
7.406
7.403
7.384
7.362
7.240
7.237
7.233
4.024
4.008
3.343
2.552
2.509
2.504
2.500
2.496
2.492
1.045
1.028
O
O
S
O
HN
O
N
N
NC
3ad-5
400 MHz, DMSO-d_6
1.00
1.00
1.00
1.00
3.00
1.00
1.00
2.00
1.00
1.00
2.00
3.00
1.00
6.00
2.5
11.5
10.5
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7.5
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5.5
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1.5
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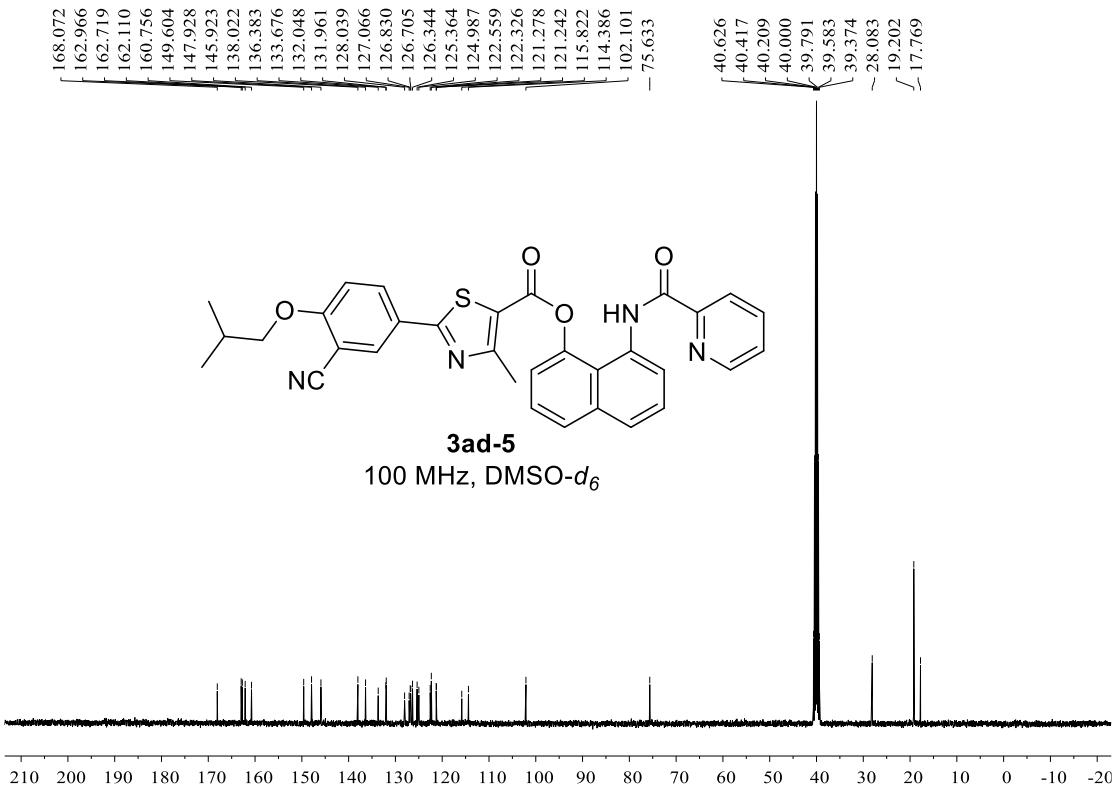
-0.5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126.344
125.364
124.987
122.559
122.326
121.278
121.242
115.822
114.386
102.101
75.633
40.626
40.417
40.209
40.000
39.791
39.583
39.374
28.083
19.202
17.769
O
O
S
O
HN
O
N
N
NC
3ad-5
100 MHz, DMSO-d_6
210
200
190
180
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150
140
130
120
110
100
90
80
70
60
50
40
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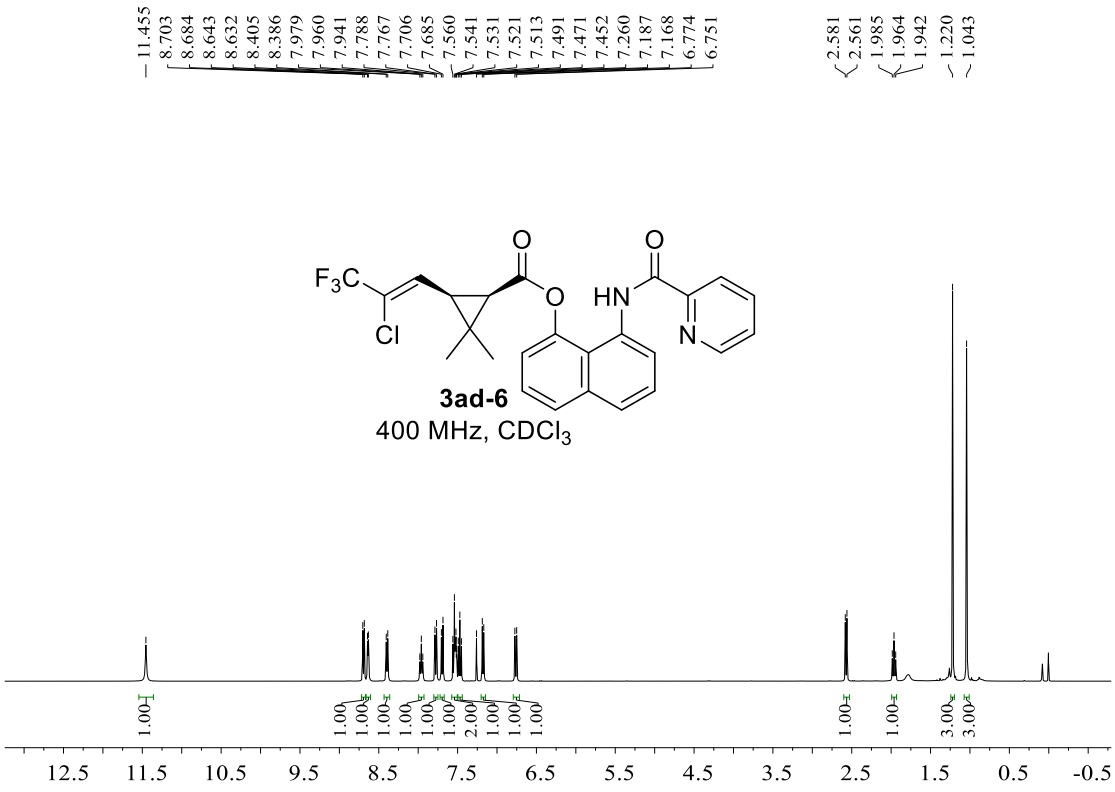
10
0
-10
-20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8.643
8.632
8.405
8.386
7.979
7.960
7.941
7.788
7.767
7.706
7.685
7.560
7.541
7.531
7.521
7.513
7.491
7.471
7.452
7.260
7.187
7.168
6.774
6.751
2.581
2.561
1.985
1.964
1.942
1.220
1.043
F3C
Cl
O
O
HN
O
N
3ad-6
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
2.00
1.00
1.00
1.00
1.00
3.00
3.00
12.5
11.5
10.5
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5.5
4.5
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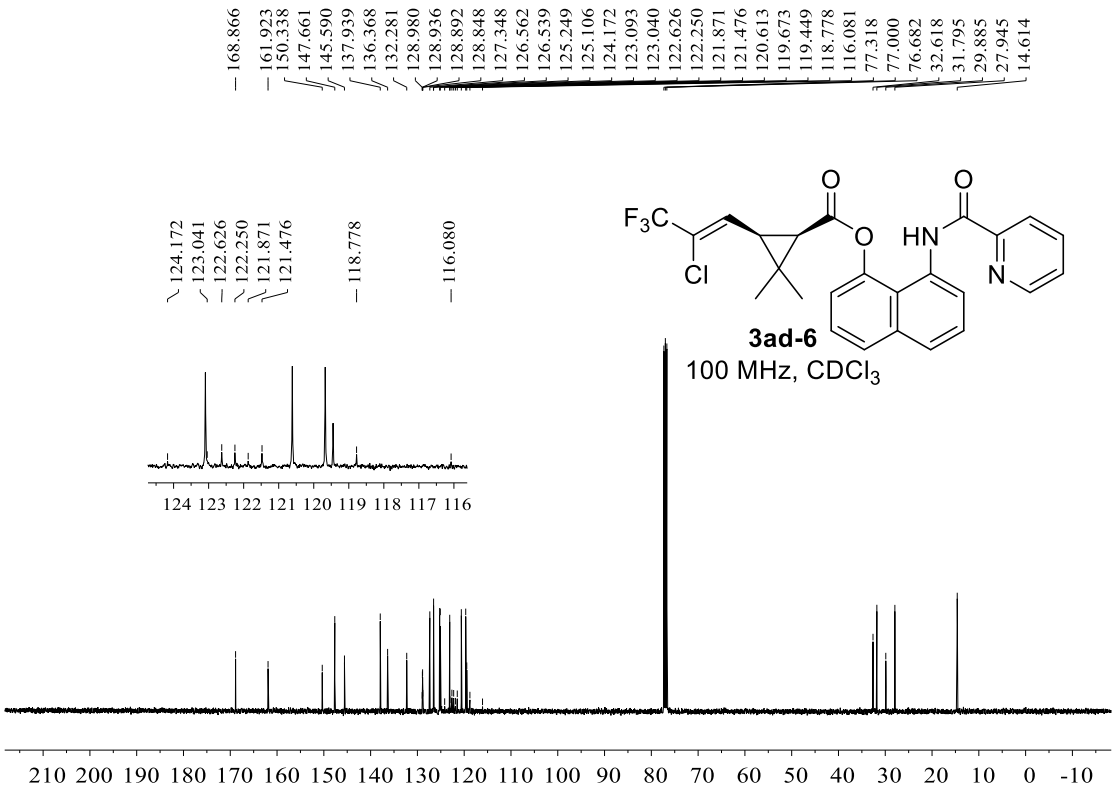
-0.5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128.980
128.936
128.892
128.848
127.348
126.562
126.539
125.249
125.106
124.172
123.093
123.040
122.626
122.250
121.871
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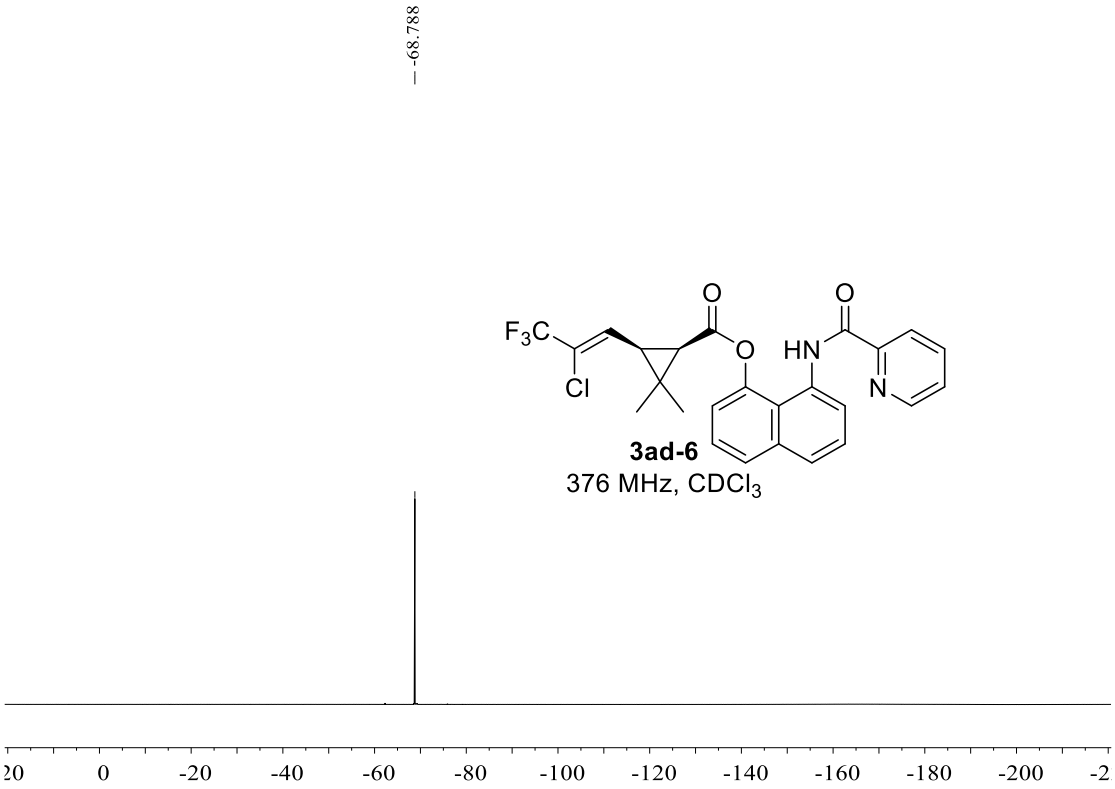
120.613
119.673
119.449
118.778
116.081
77.318
77.000
76.682
32.618
31.795
29.885
27.945
14.614
124.172
123.041
122.626
122.250
121.871
121.476
118.778
116.080
124 123 122 121 120 119 118 117 116
F3C
Cl
O
O
HN
O
N
3ad-6
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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3ad-6
376 MHz, CDCl3
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-120
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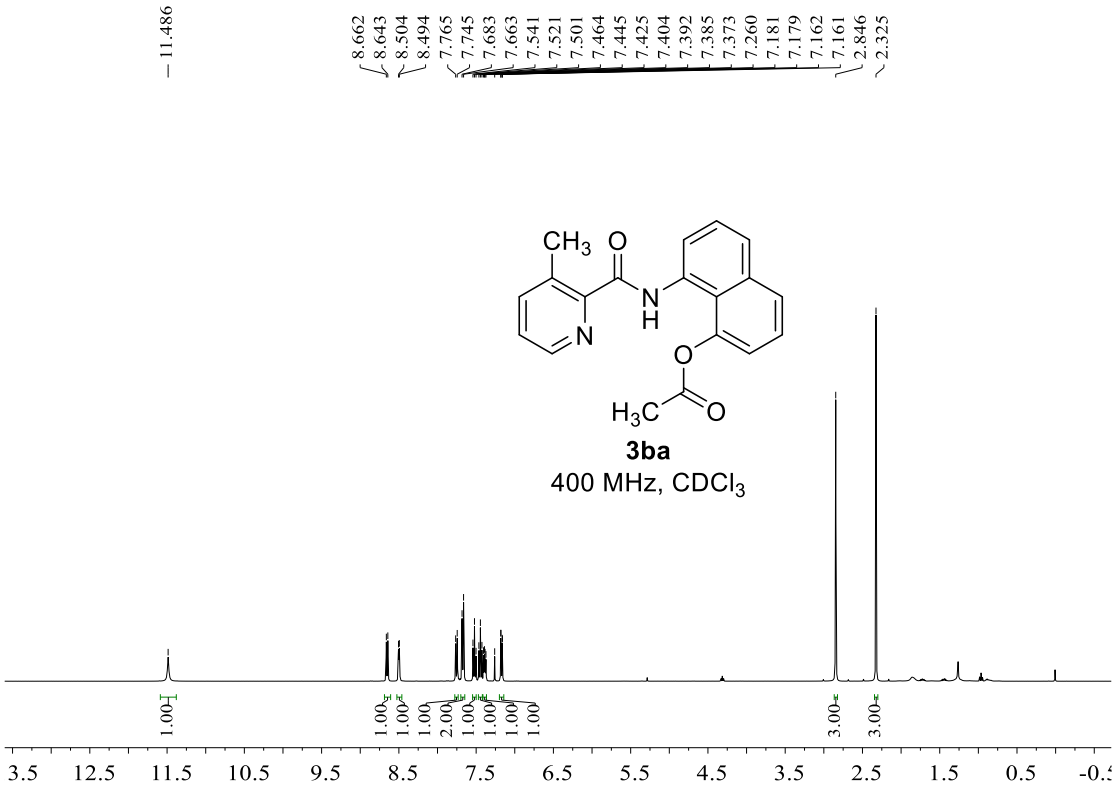
-2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7.765
7.745
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7.541
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7.501
7.464
7.445
7.425
7.404
7.392
7.385
7.373
7.260
7.181
7.179
7.162
7.161
2.846
2.325
CH3
O
N
H
N
O
H3C
O
3ba
400 MHz, CDCl3
1.00
1.00
1.00
1.00
2.00
1.00
1.00
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12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
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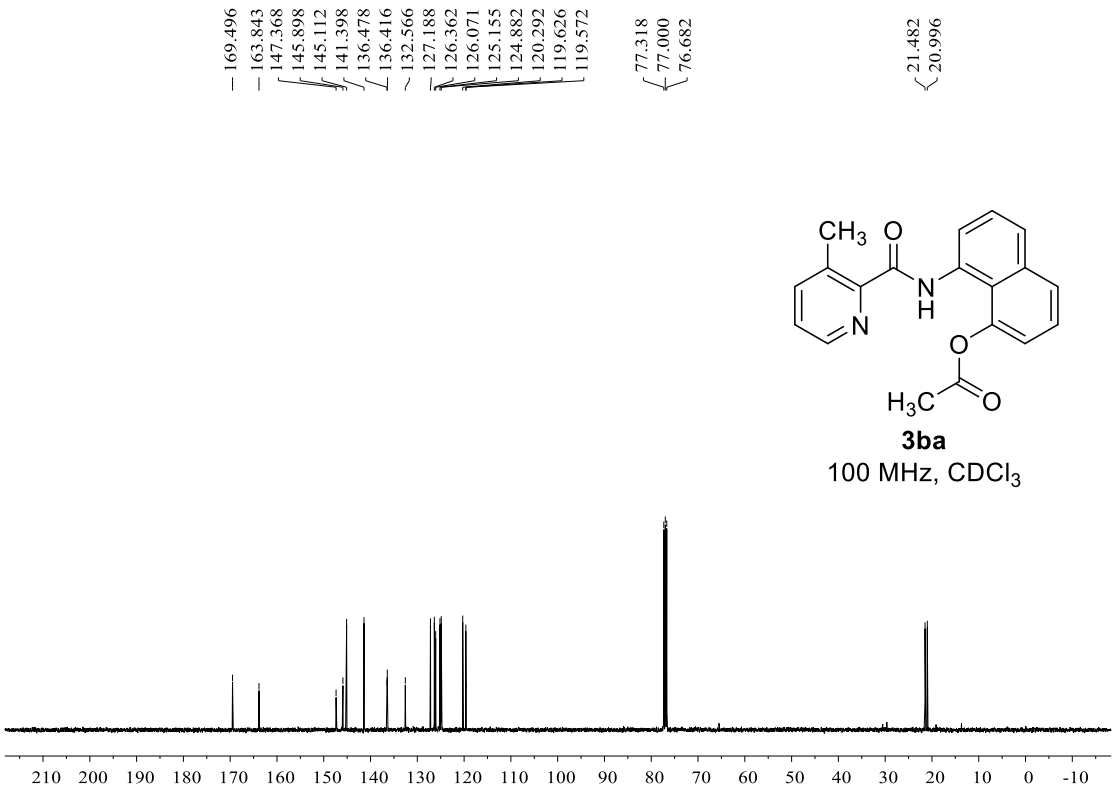
0.5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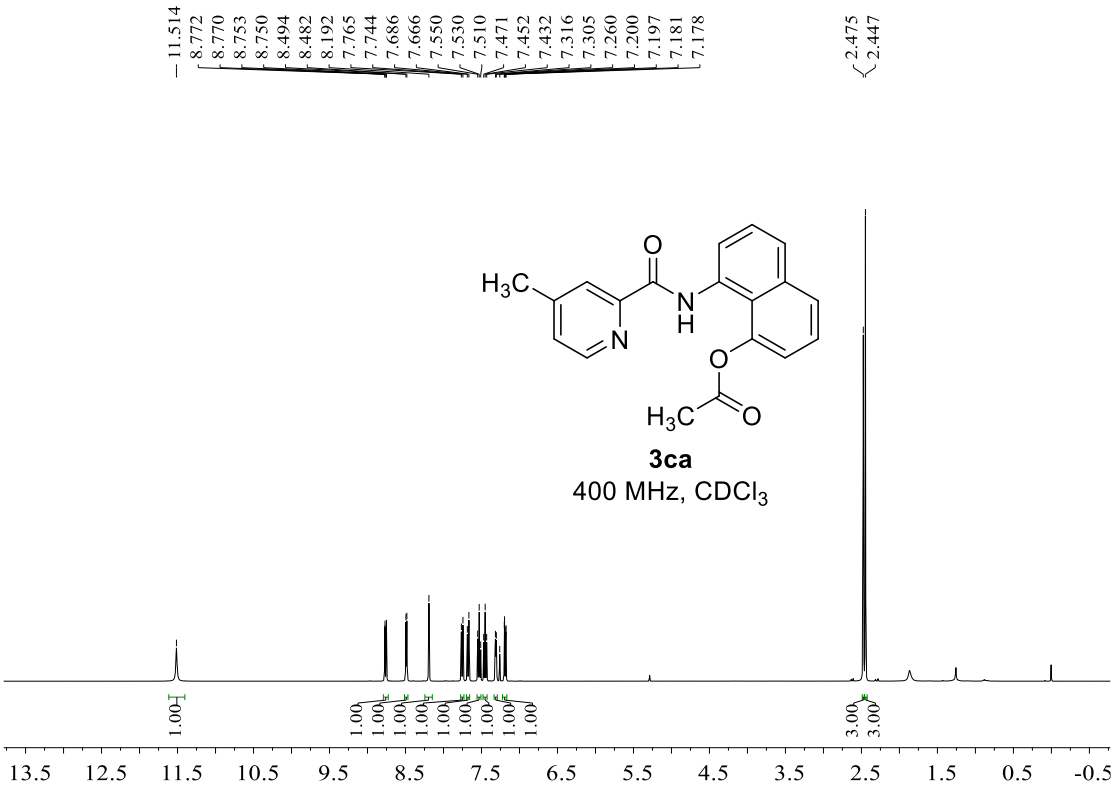
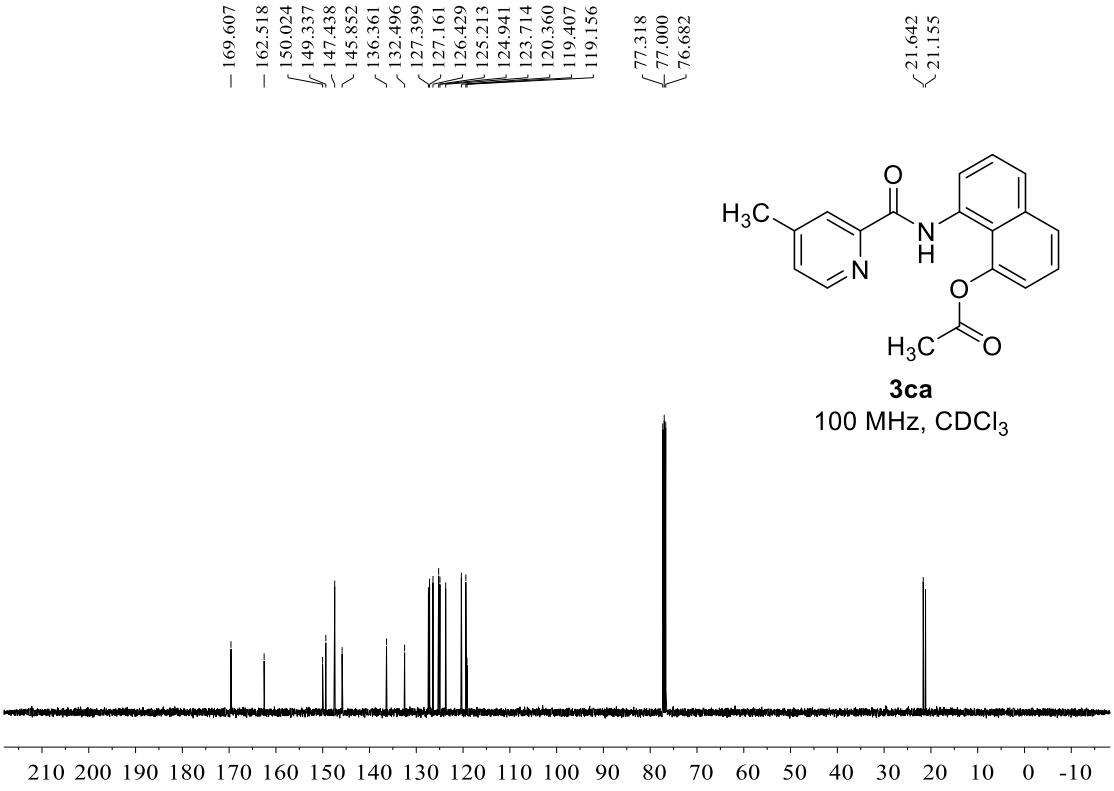
145.898
145.112
141.398
136.478
136.416
132.566
127.188
126.362
126.071
125.155
124.882
120.292
119.626
119.572
77.318
77.000
76.682
21.482
20.996
CH3
O
N
H
N
O
H3C
O
3ba
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10


11.514
8.772
8.770
8.753
8.750
8.494
8.482
8.192
7.765
7.744
7.686
7.666
7.550
7.530
7.510
7.471
7.452
7.432
7.316
7.305
7.260
7.200
7.197
7.181
7.178
2.475
2.447
O
H3C
N
H
N
O
H3C
O
3ca
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
3.00
3.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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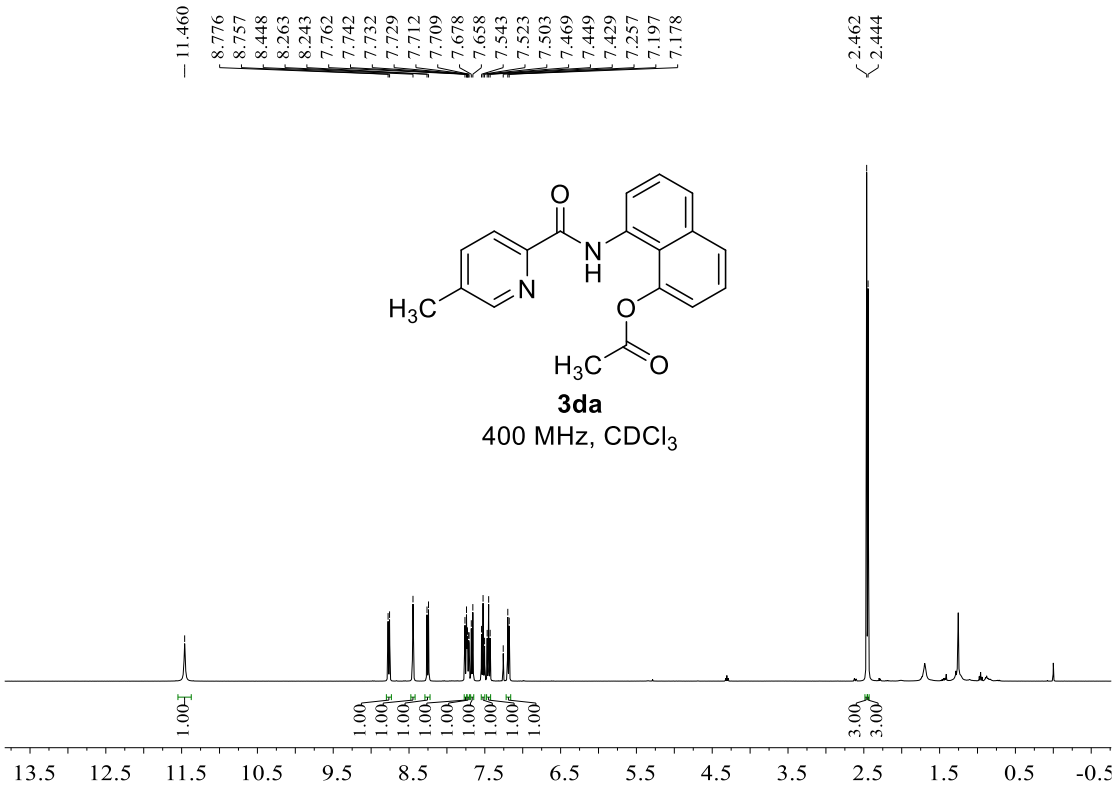
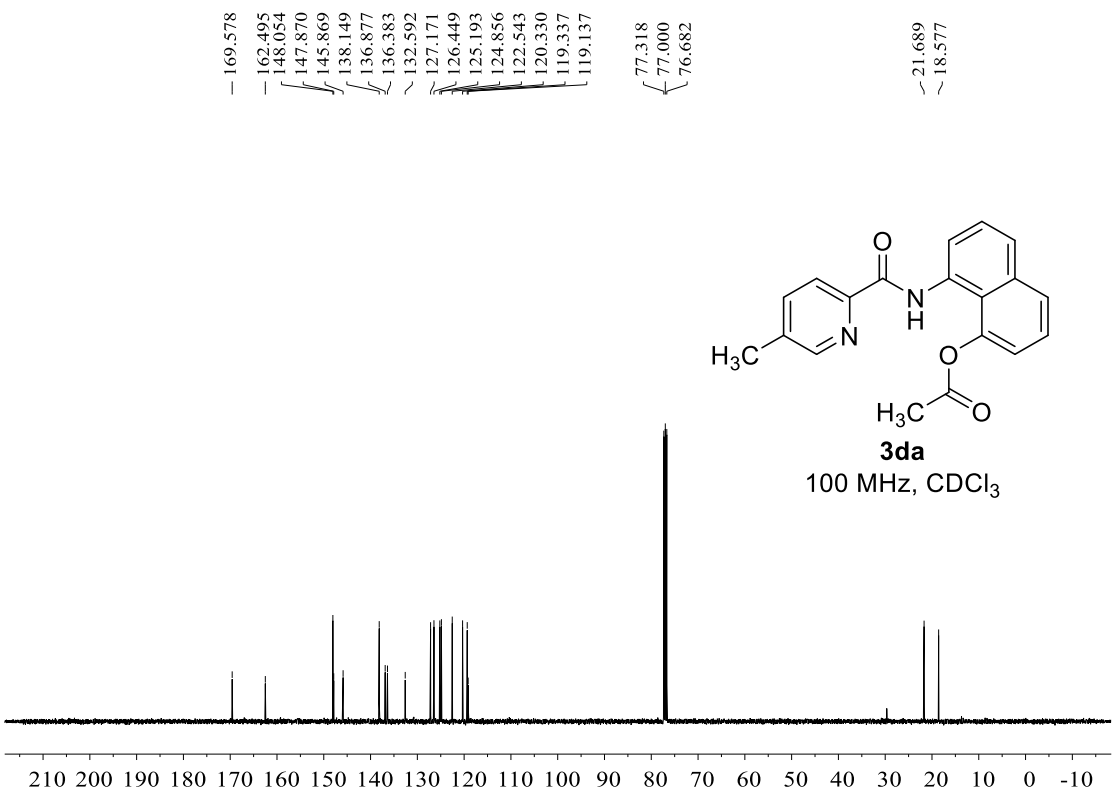
150.024
149.337
147.438
145.852
136.361
132.496
127.399
127.161
126.429
125.213
124.941
123.714
120.360
119.407
119.156
77.318
77.000
76.682
21.642
21.155
O
H3C
N
H
N
O
H3C
O
3ca
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10



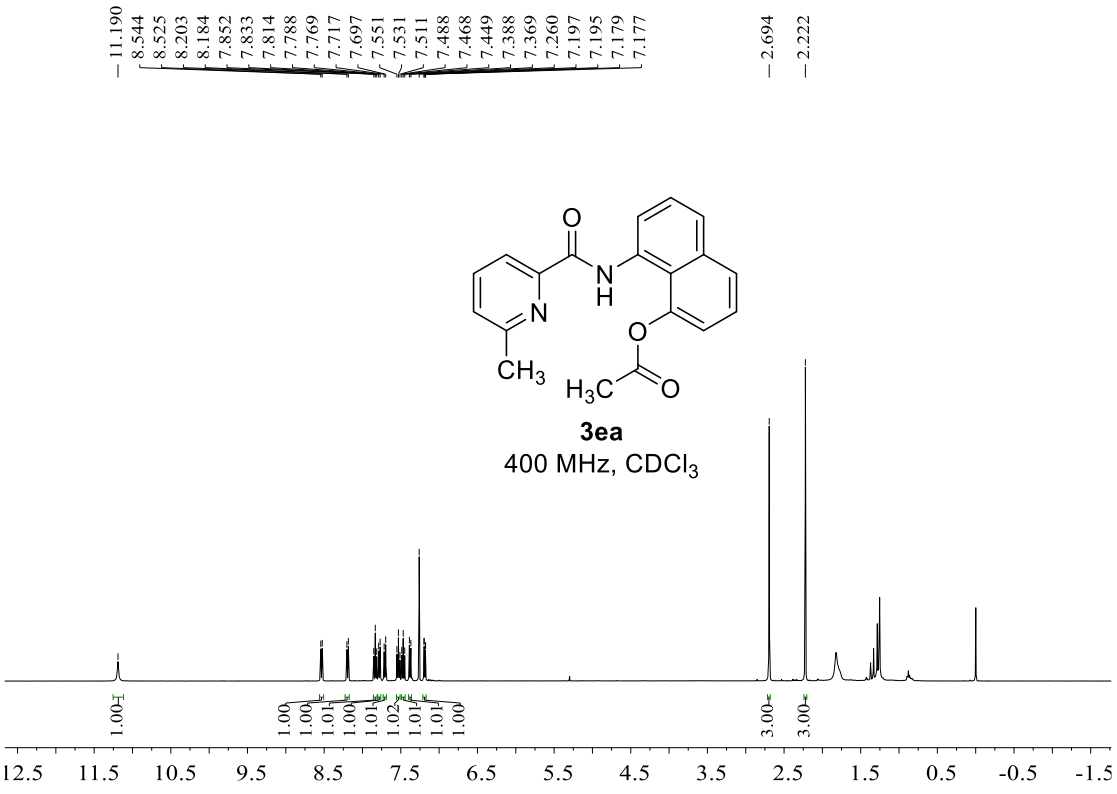
3da

400 MHz, $CDCl_3$



3da

100 MHz, $CDCl_3$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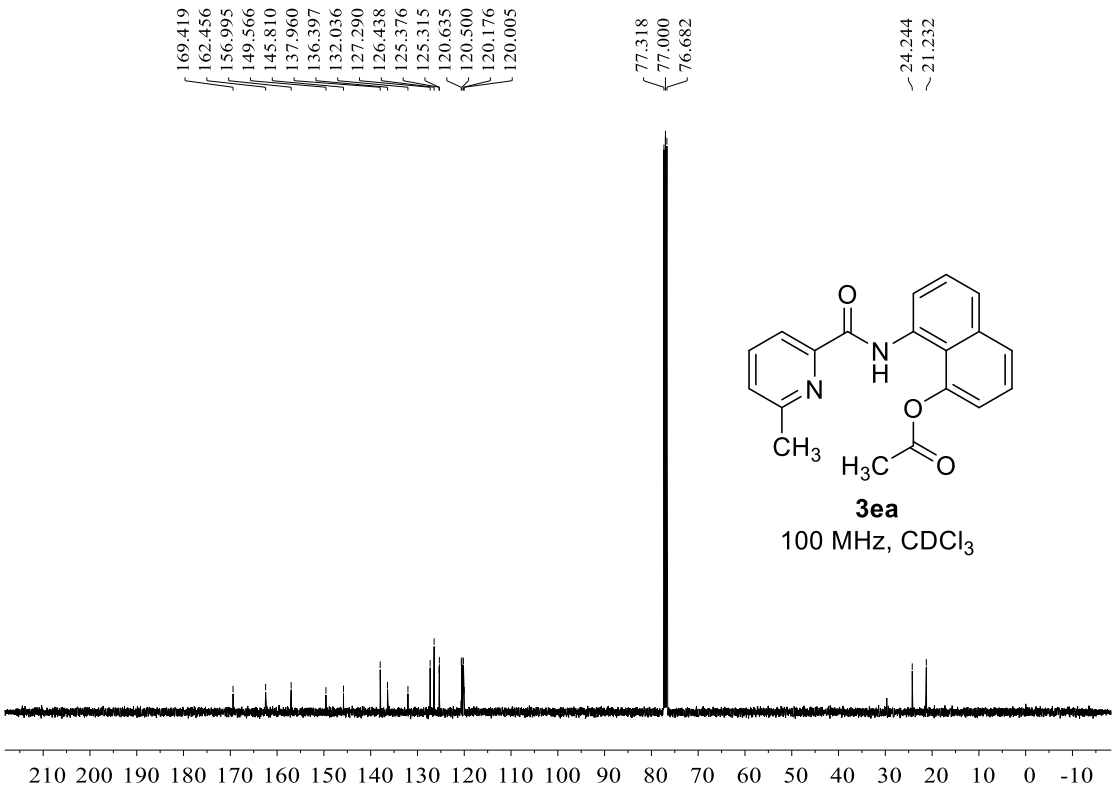
8.544
8.525
8.203
8.184
7.852
7.833
7.814
7.788
7.769
7.717
7.697
7.551
7.531
7.511
7.488
7.468
7.449
7.388
7.369
7.260
7.197
7.195
7.179
7.177
2.694
2.222
O
N
H
N
O
CH3
H3C
O
3ea
400 MHz, CDCl3
1.00
1.00
1.00
1.01
1.00
1.01
1.02
1.01
1.01
1.00
3.00
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5
-1.5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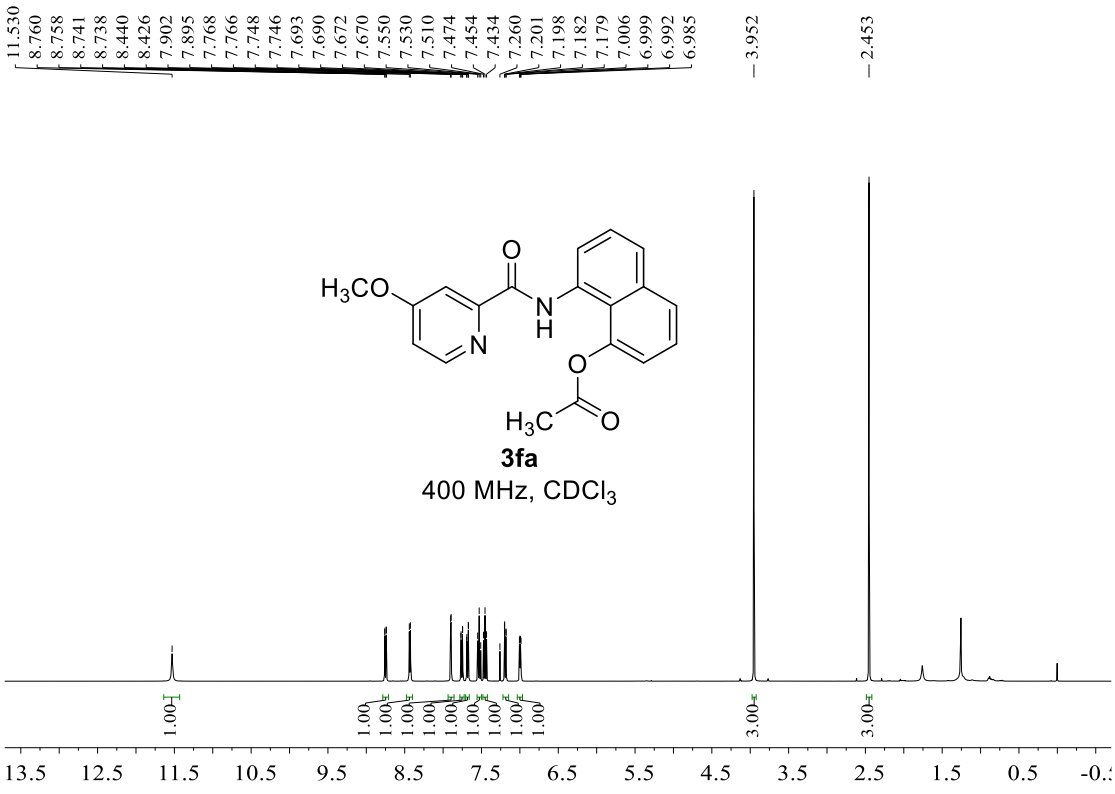
162.456
156.995
149.566
145.810
137.960
136.397
132.036
127.290
126.438
125.376
125.315
120.635
120.500
120.176
120.005
77.318
77.000
76.682
24.244
21.232
O
N
H
N
O
CH3
H3C
O
3ea
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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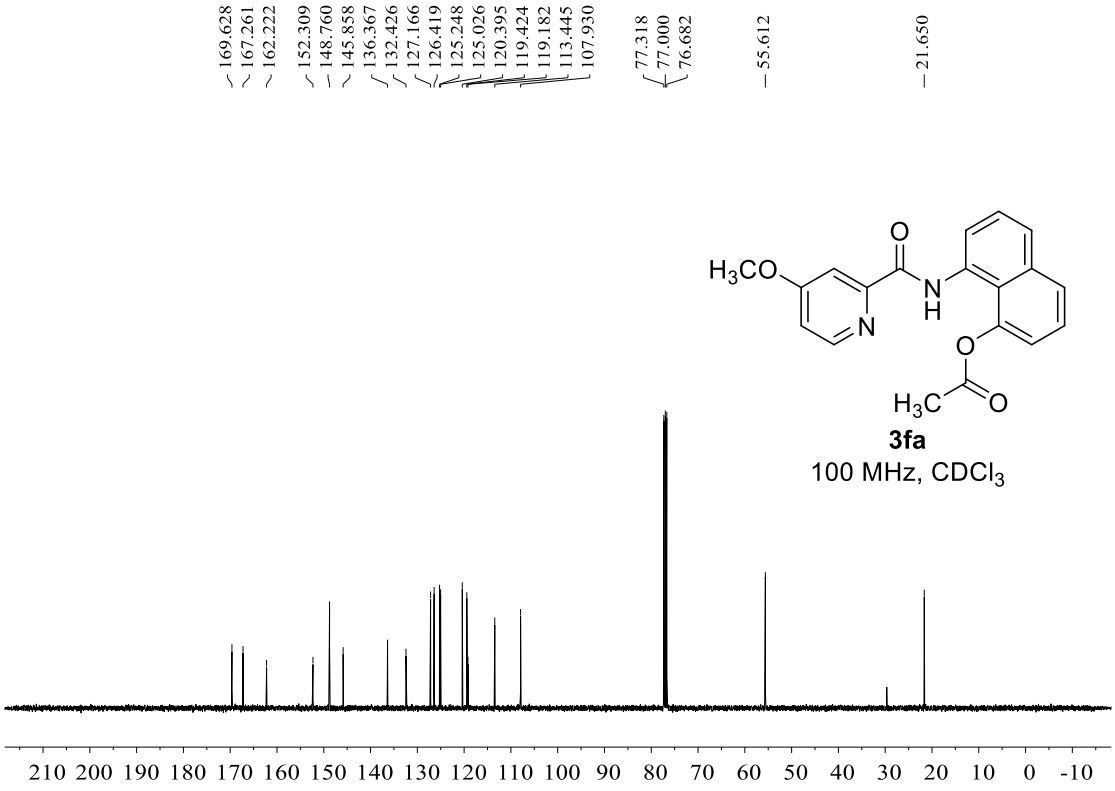
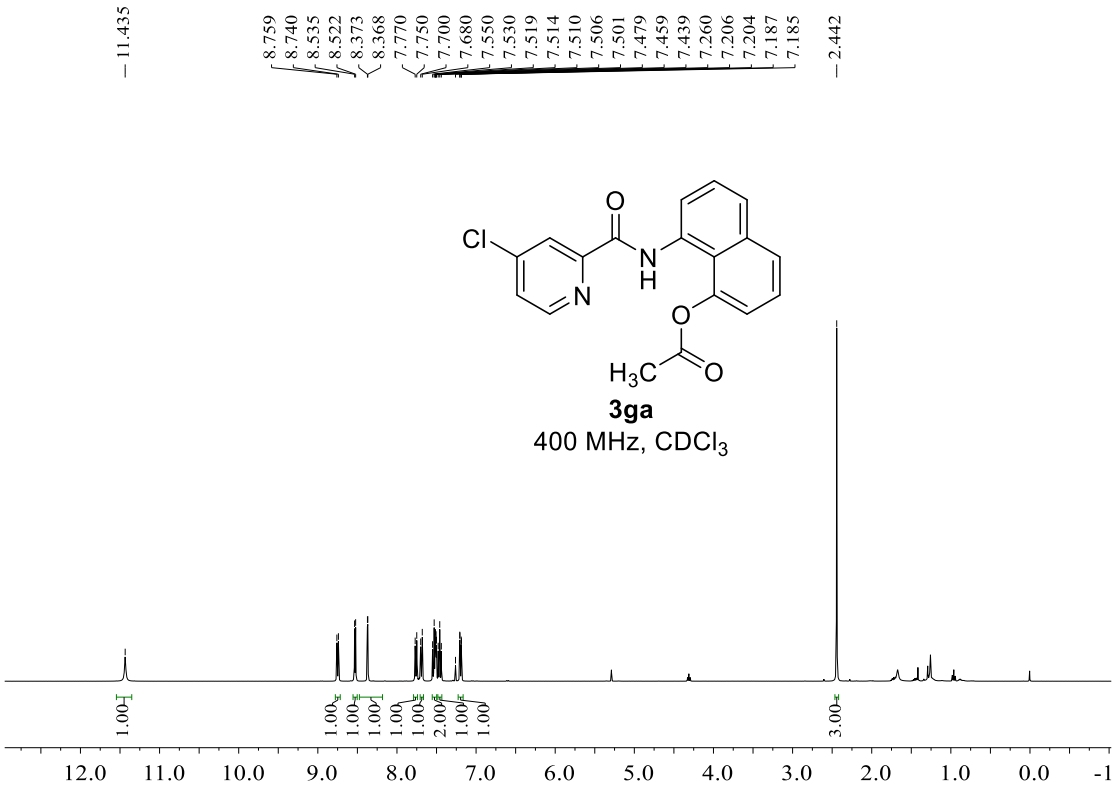
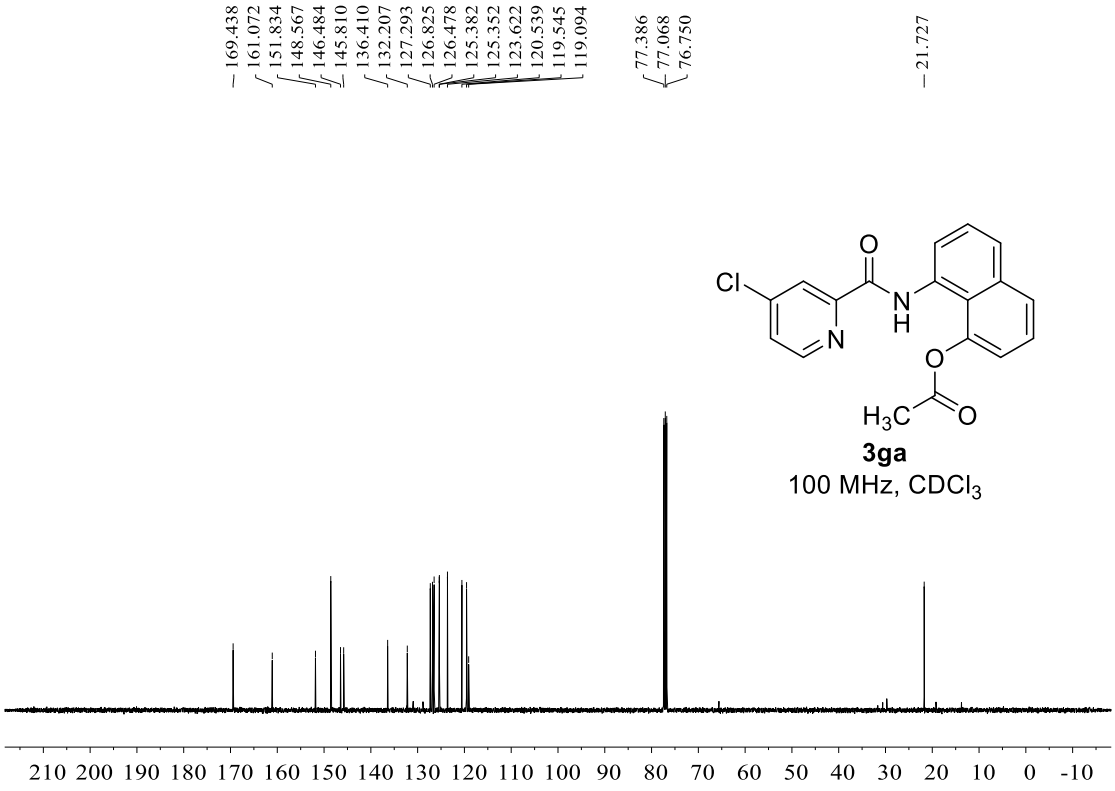
8.760
8.758
8.741
8.738
8.440
8.426
7.902
7.895
7.768
7.766
7.748
7.746
7.693
7.690
7.672
7.670
7.550
7.530
7.510
7.474
7.454
7.434
7.260
7.201
7.198
7.182
7.179
7.006
6.999
6.992
6.985
3.952
2.453
H3CO
O
N
H
N
O
H3C
O
3fa
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
3.00
3.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5


169.628
167.261
162.222
152.309
148.760
145.858
136.367
132.426
127.166
126.419
125.248
125.026
120.395
119.424
119.182
113.445
107.930
77.318
77.000
76.682
55.612
21.650
H3CO
O
N
H
N
O
H3C
O
3fa
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


11.435
8.759
8.740
8.535
8.522
8.373
8.368
7.770
7.750
7.700
7.680
7.550
7.530
7.519
7.514
7.510
7.506
7.501
7.479
7.459
7.439
7.260
7.206
7.204
7.187
7.185
2.442
Cl
N
H
O
H3C
3ga
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
2.00
1.00
1.00
3.00
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1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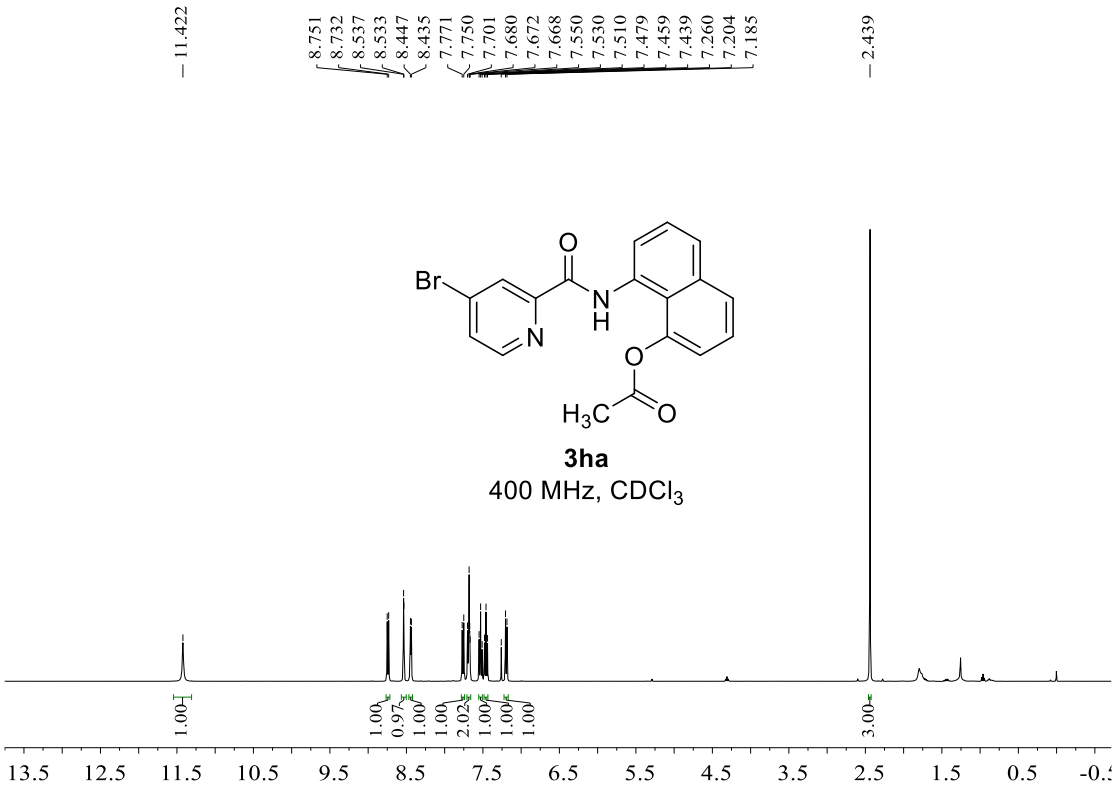
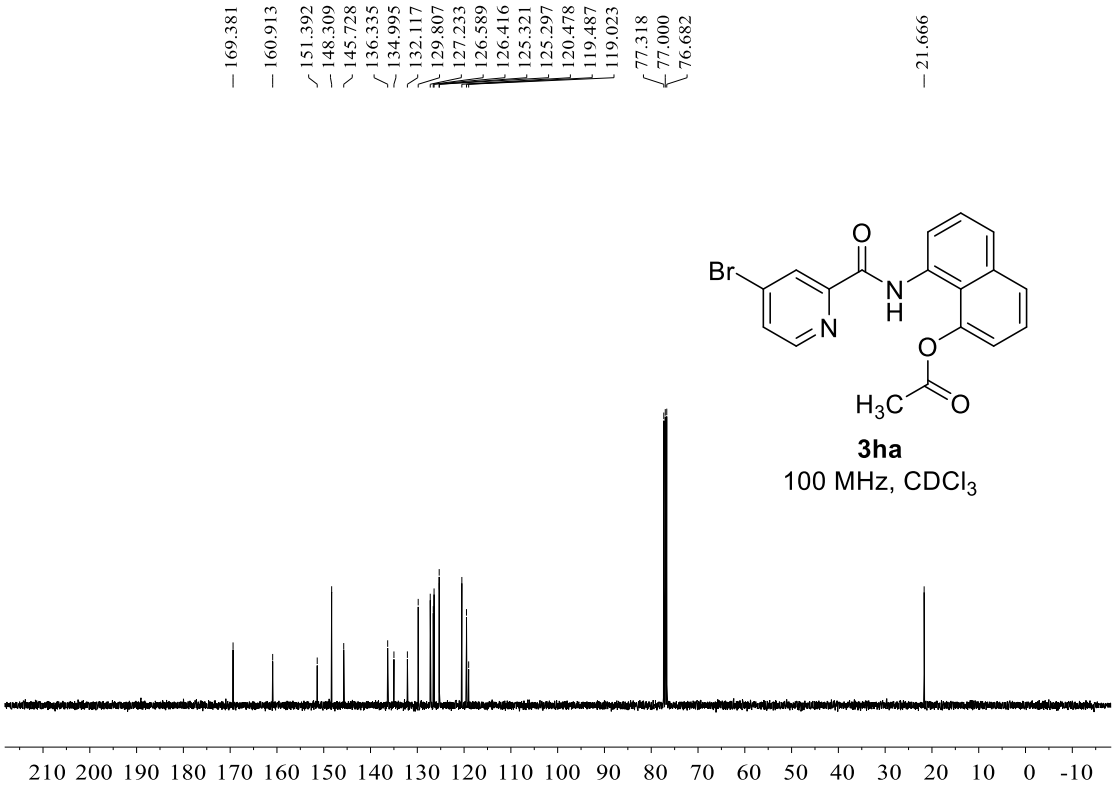
161.072
151.834
148.567
146.484
145.810
136.410
132.207
127.293
126.825
126.478
125.382
125.352
123.622
120.539
119.545
119.094
77.386
77.068
76.750
21.727
Cl
N
H
O
H3C
3ga
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10



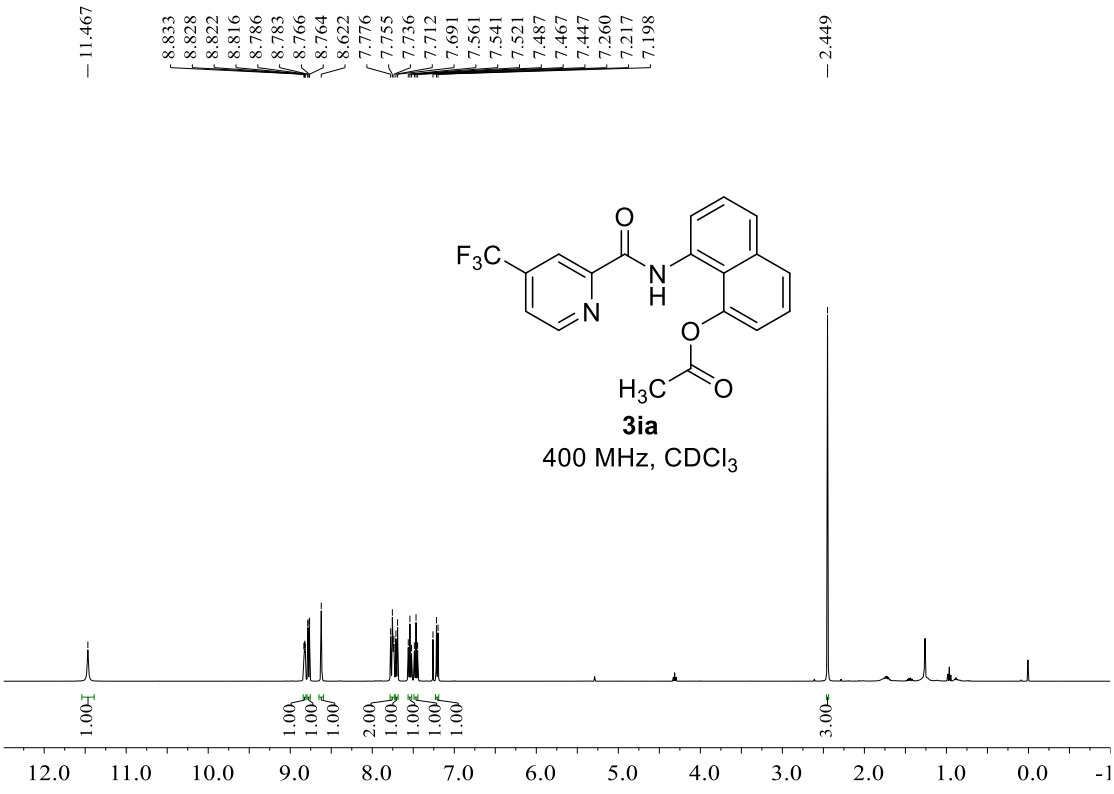
3ha

400 MHz, $CDCl_3$



3ha

100 MHz, $CDCl_3$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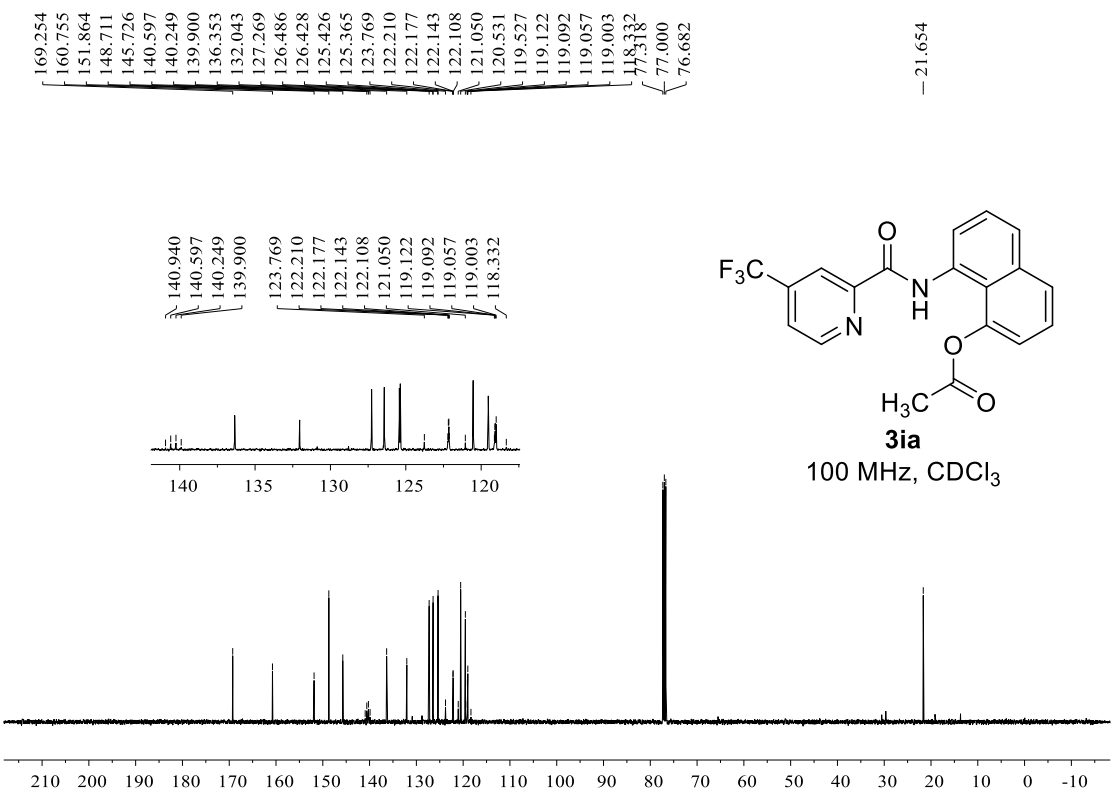
8.833
8.828
8.822
8.816
8.786
8.783
8.766
8.764
8.622
7.776
7.755
7.736
7.712
7.691
7.561
7.541
7.521
7.487
7.467
7.447
7.260
7.217
7.198
2.449
F3C
O
N
H
N
O
H3C
O
3ia
400 MHz, CDCl3
1.00
1.00
1.00
1.00
2.00
1.00
1.00
1.00
3.00
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0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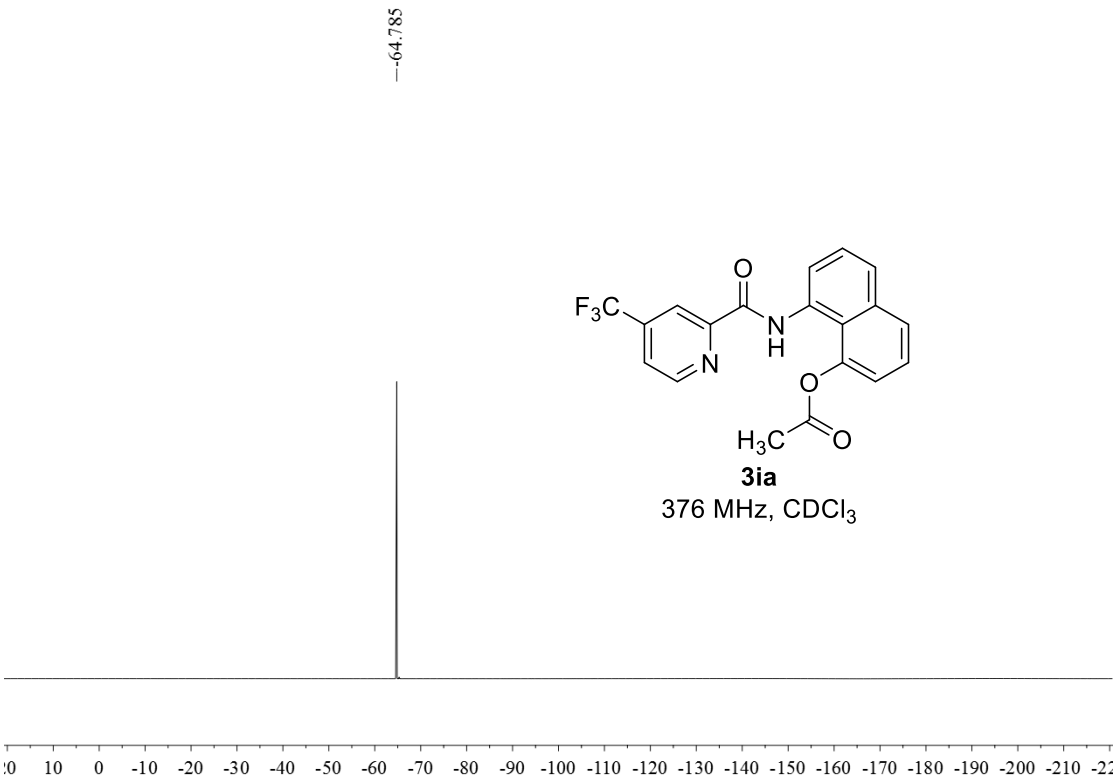
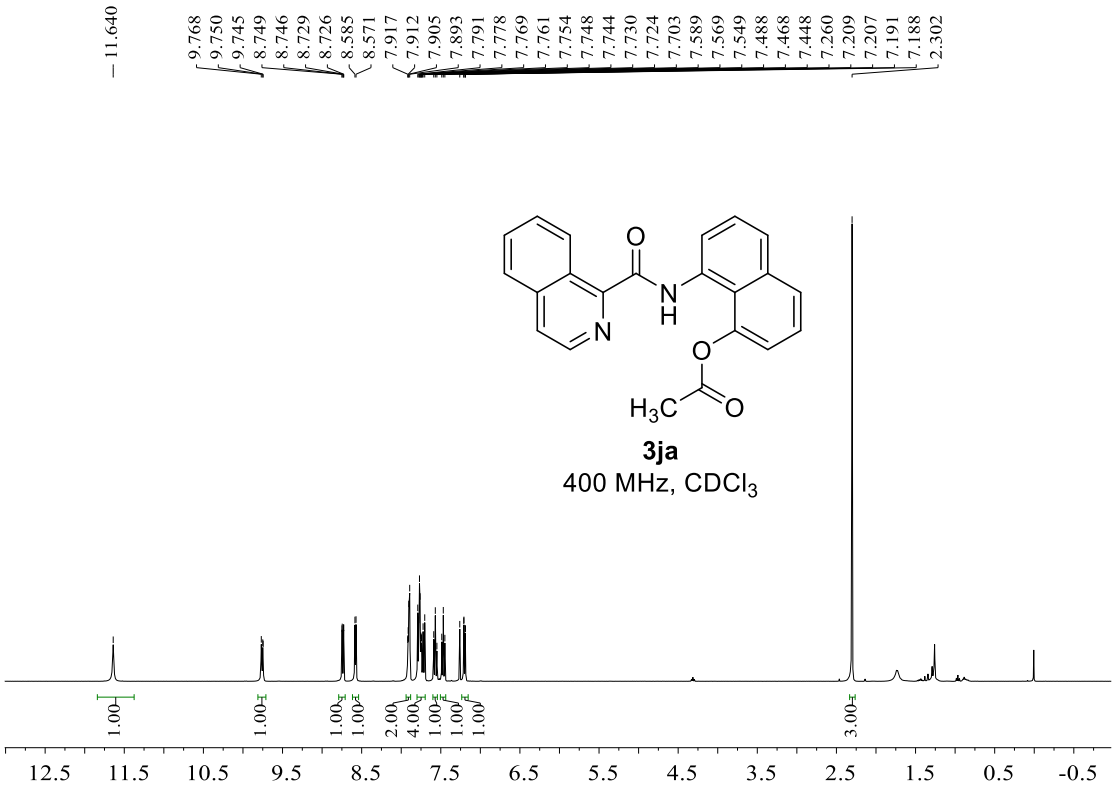
160.755
151.864
148.711
145.726
140.597
140.249
139.900
136.353
132.043
127.269
126.486
126.428
125.426
125.365
123.769
122.210
122.177
122.143
122.108
121.050
120.531
119.527
119.122
119.092
119.057
119.003
118.332
77.318
77.000
76.682
21.654
140.940
140.597
140.249
139.900
123.769
122.210
122.177
122.143
122.108
121.050
119.122
119.092
119.057
119.003
118.332
140
135
130
125
120
F3C
O
N
H
N
O
H3C
O
3ia
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10


-64.785
F3C
O
N
H
N
O
H3C
O
3ia
376 MHz, CDCl3
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210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9.768
9.750
9.745
8.749
8.746
8.729
8.726
8.585
8.571
7.917
7.912
7.905
7.893
7.791
7.778
7.769
7.761
7.754
7.748
7.744
7.730
7.724
7.703
7.589
7.569
7.549
7.488
7.468
7.448
7.260
7.209
7.207
7.191
7.188
2.302
O
N
H
N
O
H3C
O
3ja
400 MHz, CDCl3
1.00
1.00
1.00
1.00
2.00
4.00
1.00
1.00
1.00
3.00
12.5
11.5
10.5
9.5
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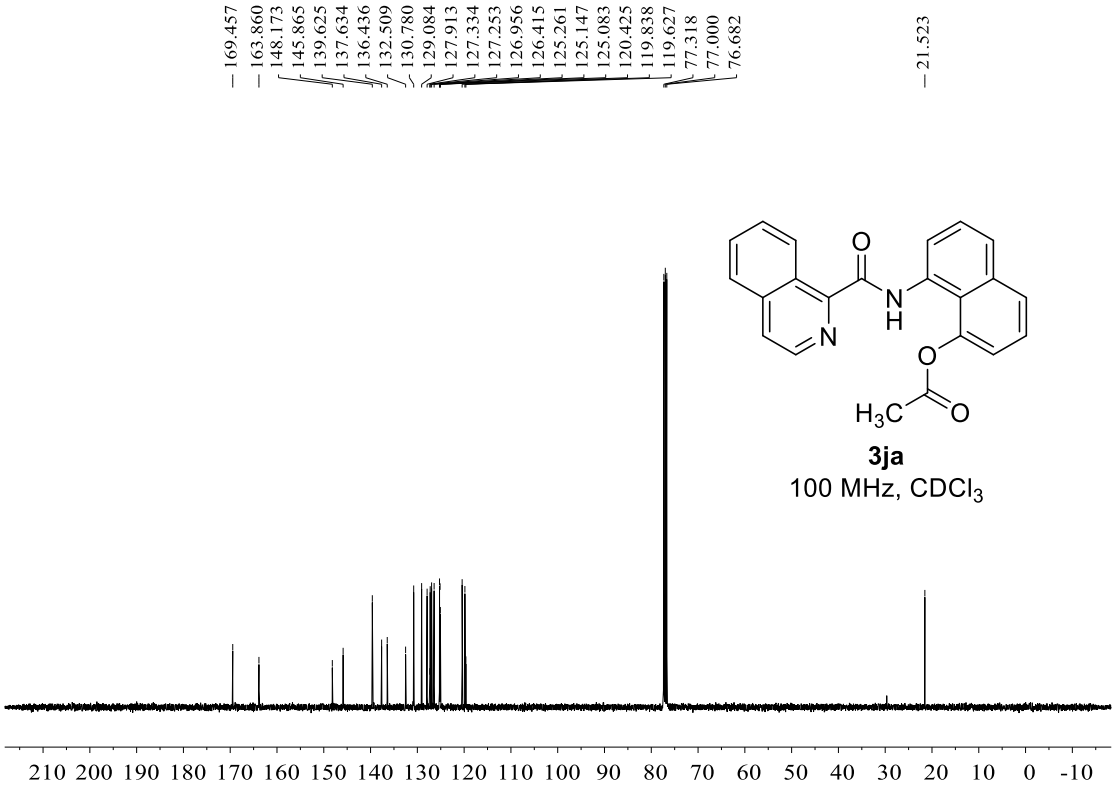
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5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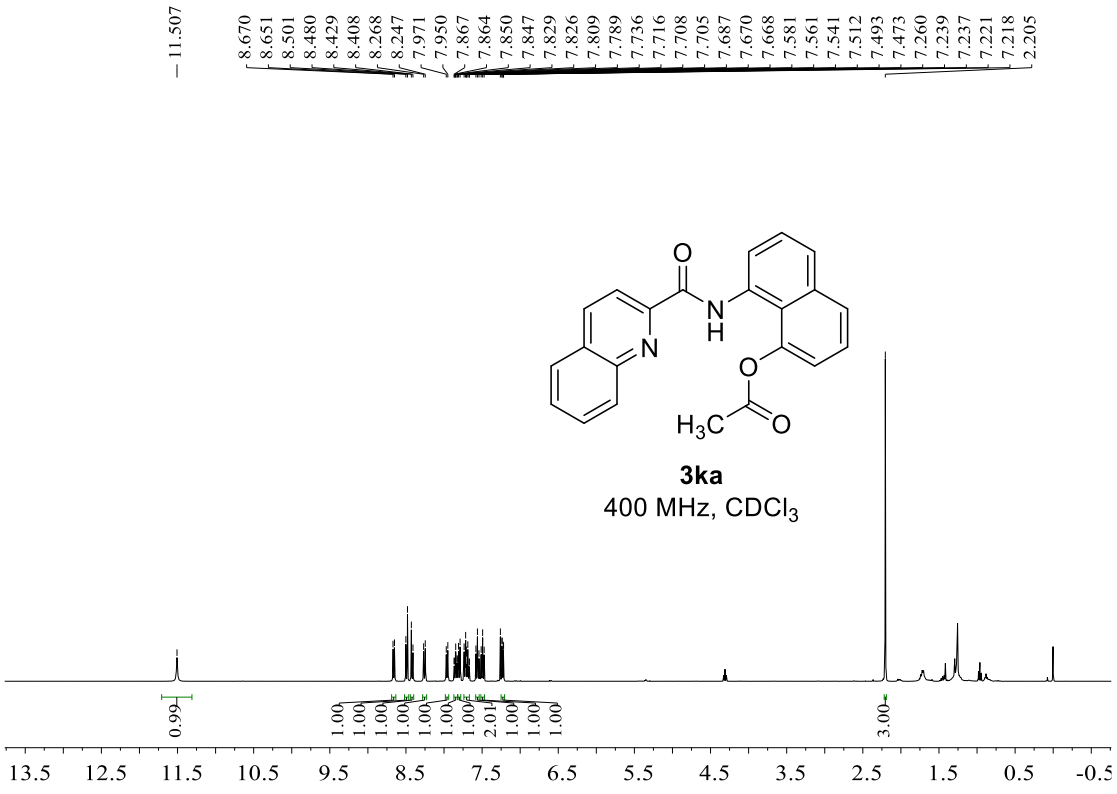
137.634
136.436
132.509
130.780
129.084
127.913
127.334
127.253
126.956
126.415
125.261
125.147
125.083
120.425
119.838
119.627
77.318
77.000
76.682
21.523
O
N
H
N
O
H3C
O
3ja
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10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7.971
7.950
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7.864
7.850
7.847
7.829
7.826
7.809
7.789
7.736
7.716
7.708
7.705
7.687
7.670
7.668
7.581
7.561
7.541
7.512
7.493
7.473
7.260
7.239
7.237
7.221
7.218
2.205
O
N
H
N
O
H3C
O
3ka
400 MHz, CDCl3
0.99
1.00
1.00
1.00
1.00
1.00
1.00
2.01
1.00
1.00
1.00
3.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
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5.5
4.5
3.5
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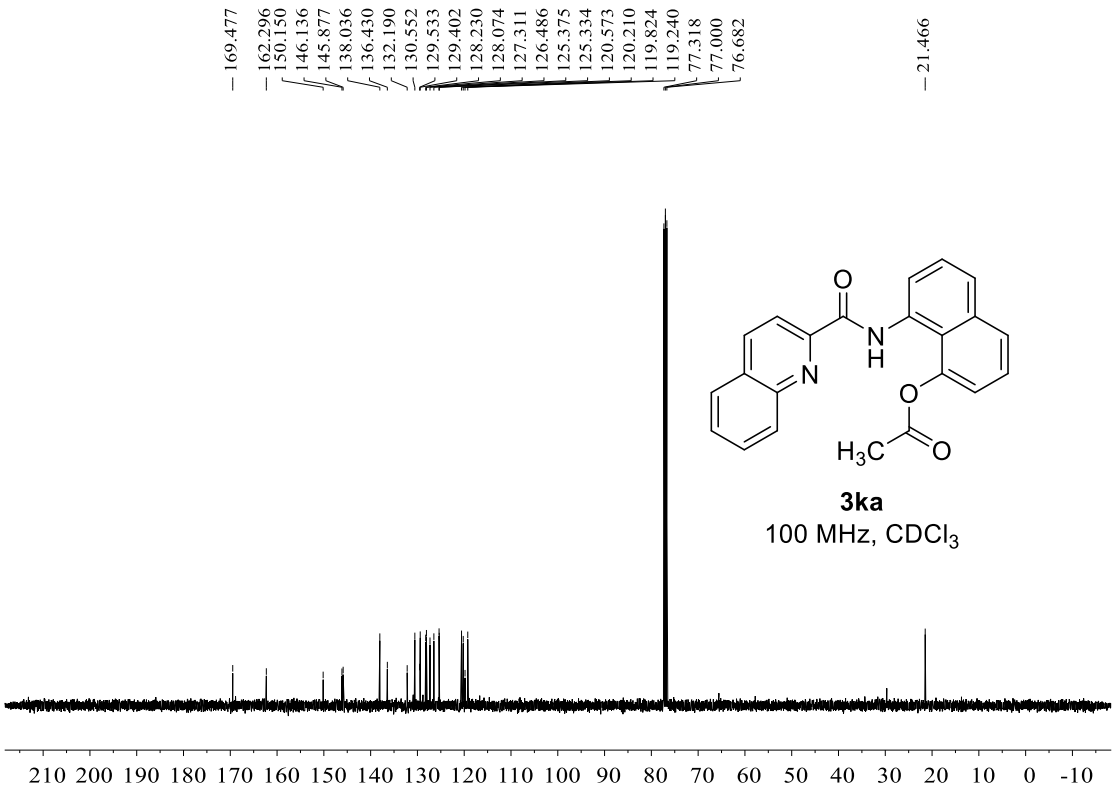
1.5
0.5
-0.5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162.296
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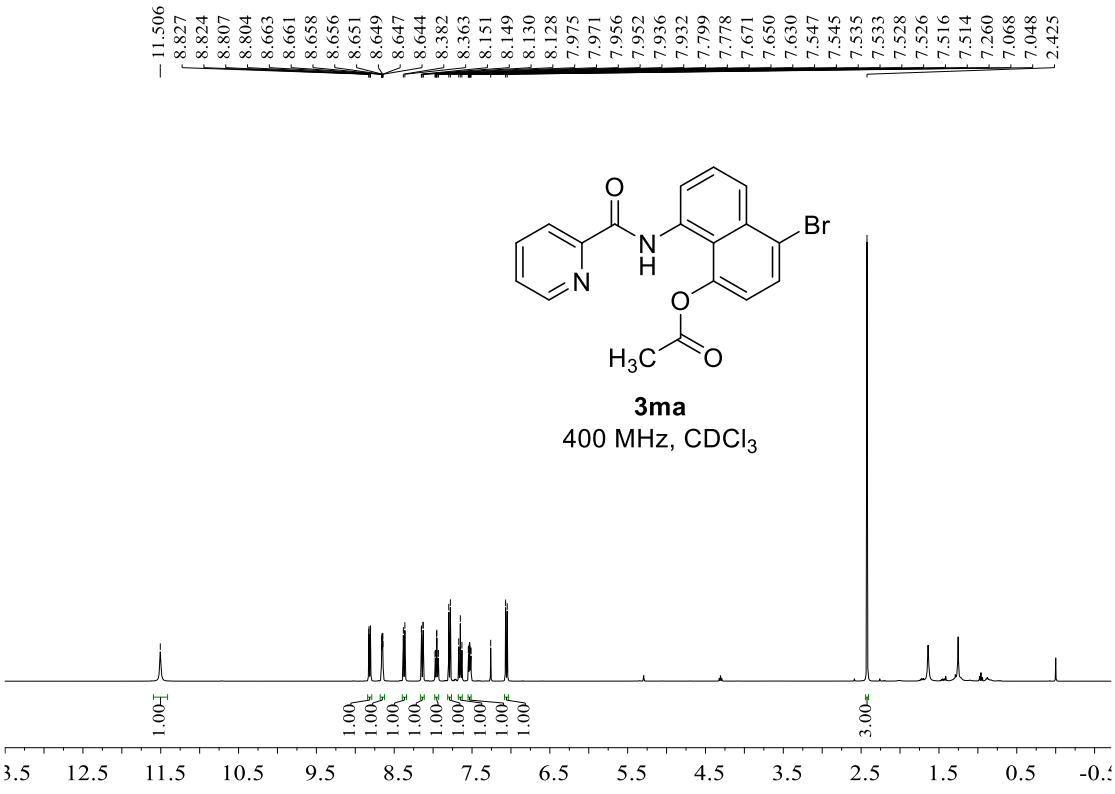
146.136
145.877
138.036
136.430
132.190
130.552
129.533
129.402
128.230
128.074
127.311
126.486
125.375
125.334
120.573
120.210
119.824
119.240
77.318
77.000
76.682
21.466
O
N
H
N
O
H3C
O
3ka
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10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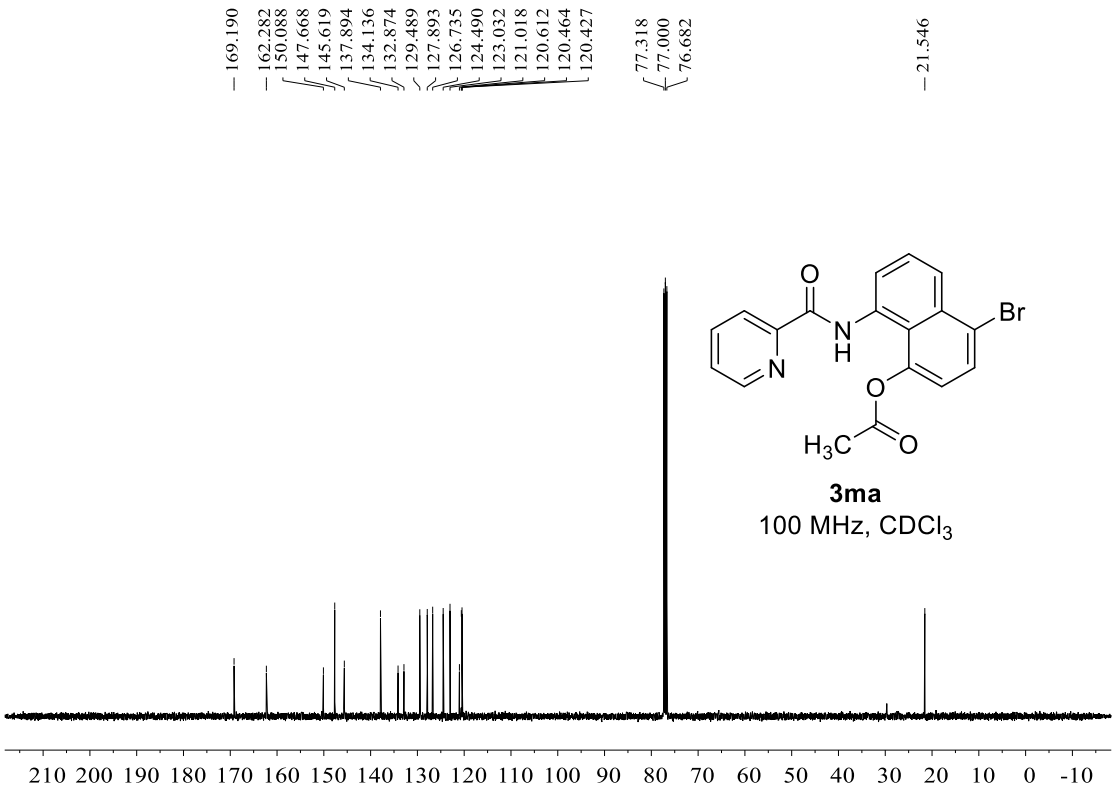
8.804
8.663
8.661
8.658
8.656
8.651
8.649
8.647
8.644
8.382
8.363
8.151
8.149
8.130
8.128
7.975
7.971
7.956
7.952
7.936
7.932
7.799
7.778
7.671
7.650
7.630
7.547
7.545
7.535
7.533
7.528
7.526
7.516
7.514
7.260
7.068
7.048
2.425
O
N
H
N
Br
O
H3C
O
3ma
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
3.00
3.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5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147.668
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132.874
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127.893
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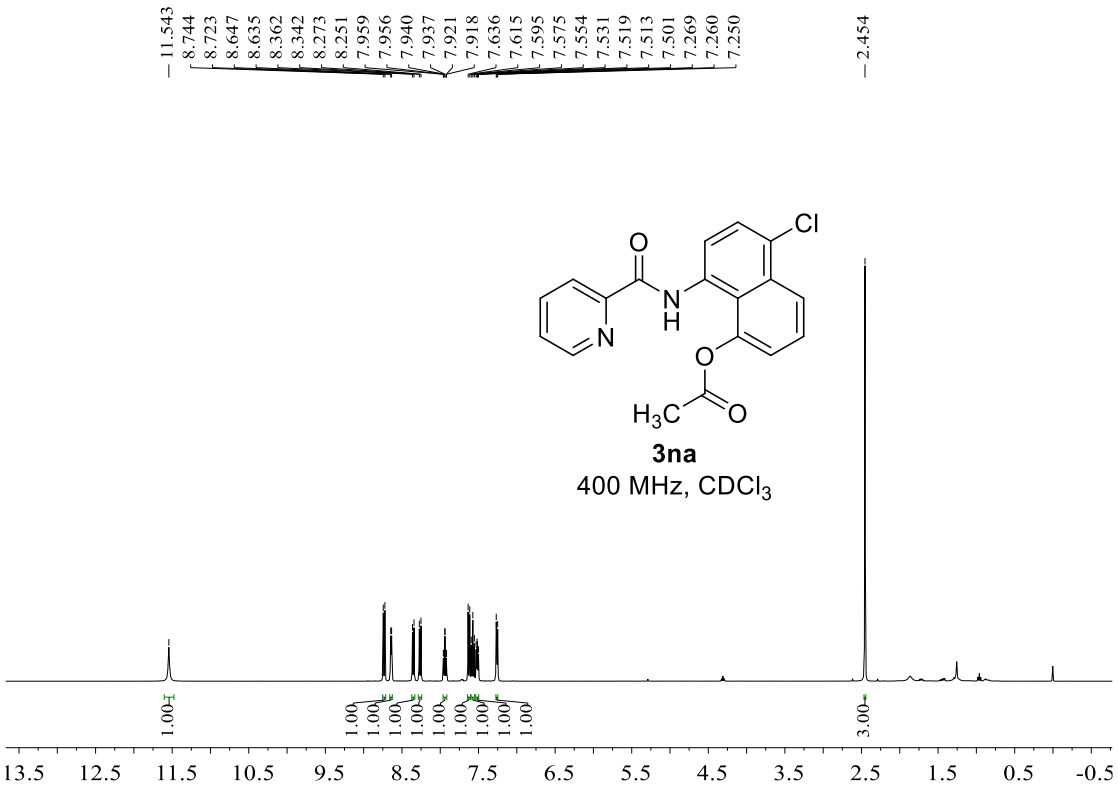
124.490
123.032
121.018
120.612
120.464
120.427
77.318
77.000
76.682
21.546
O
N
H
N
Br
O
H3C
O
3ma
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10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8.362
8.342
8.273
8.251
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7.956
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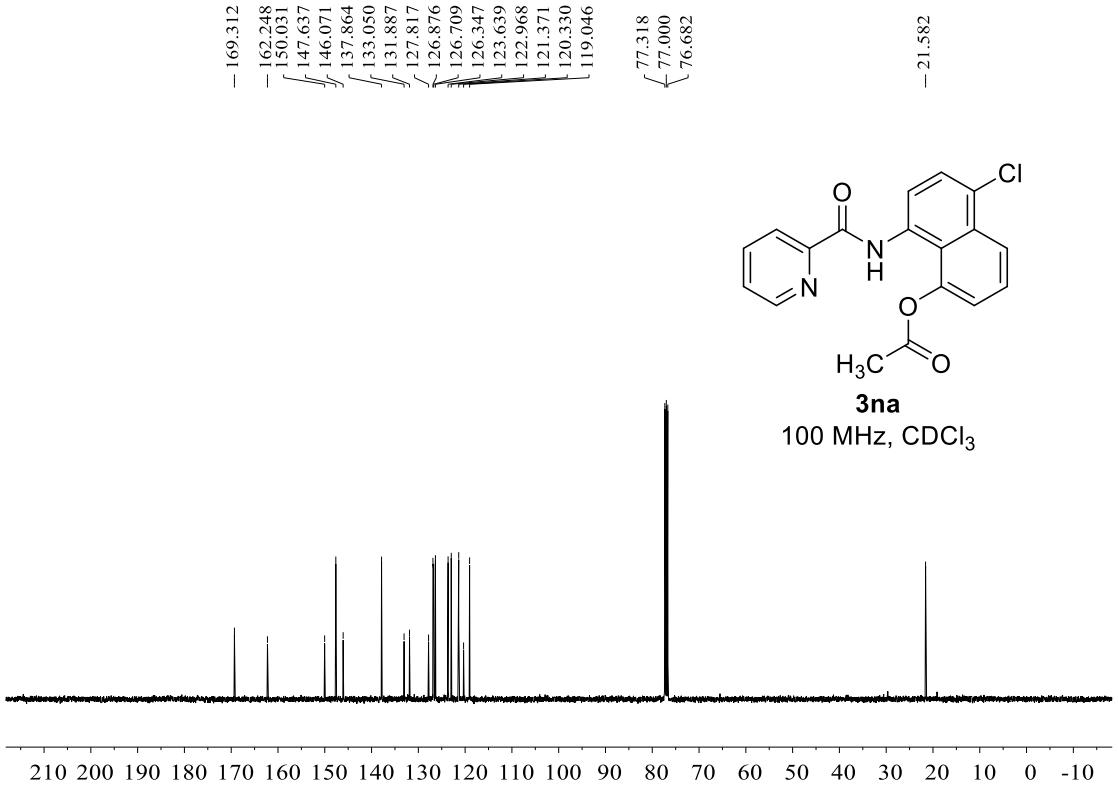
7.937
7.921
7.918
7.636
7.615
7.595
7.575
7.554
7.531
7.519
7.513
7.501
7.269
7.260
7.250
2.454
Cl
O
N
H
N
O
H3C
O
3na
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
3.00
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


169.312
162.248
150.031
147.637
146.071
137.864
133.050
131.887
127.817
126.876
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126.347
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77.000
76.682
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O
H3C
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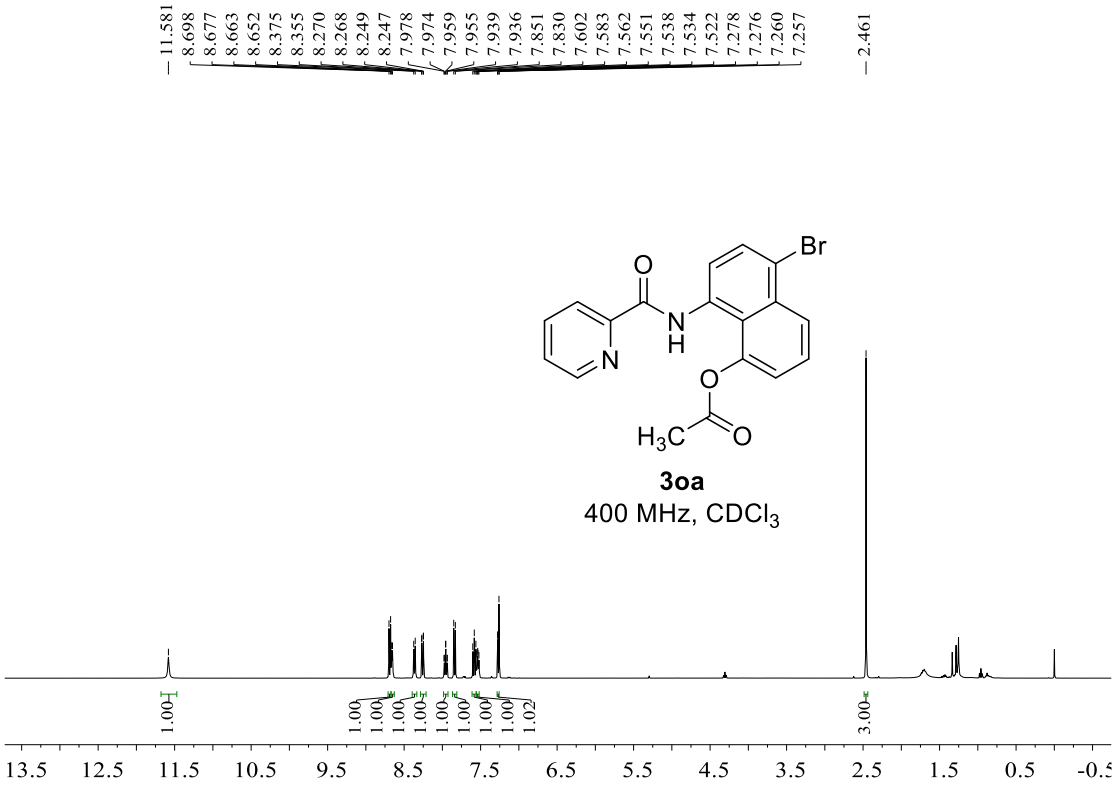
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7.534
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7.276
7.260
7.257
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Br
O
N
H
N
O
H3C
O
3oa
400 MHz, CDCl3
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1.00
1.00
1.00
1.00
1.00
1.00
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1.02
3.00
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11.5
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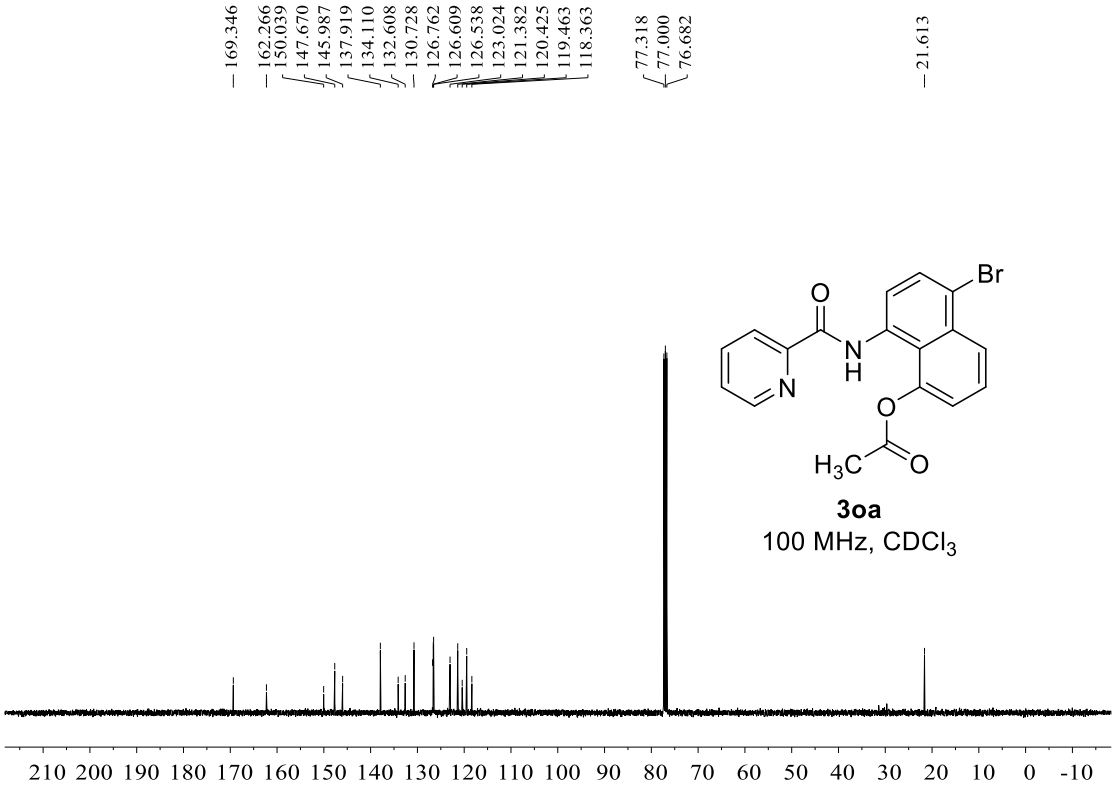
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120.425
119.463
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77.000
76.682
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Br
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H3C
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100 MHz, CDCl3
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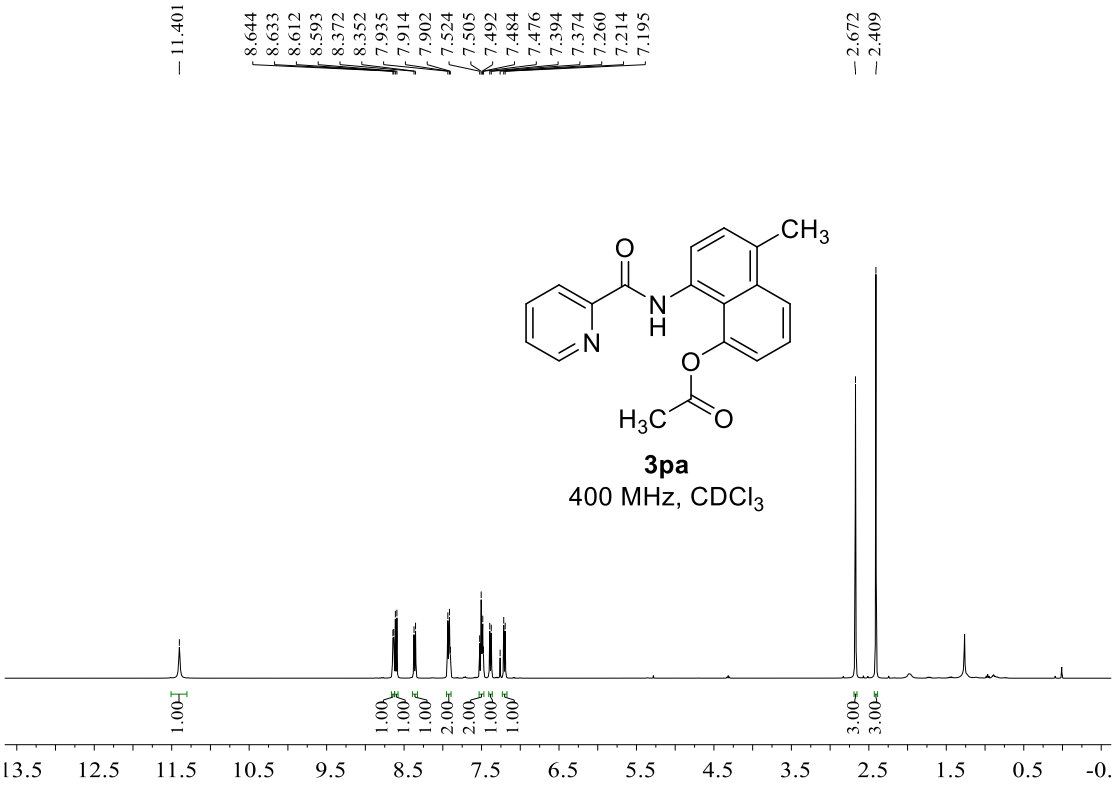
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7.476
7.394
7.374
7.260
7.214
7.195
2.672
2.409
CH3
O
N
H
N
O
H3C
O
3pa
400 MHz, CDCl3
1.00
1.00
1.00
1.00
2.00
2.00
1.00
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3.00
3.00
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11.5
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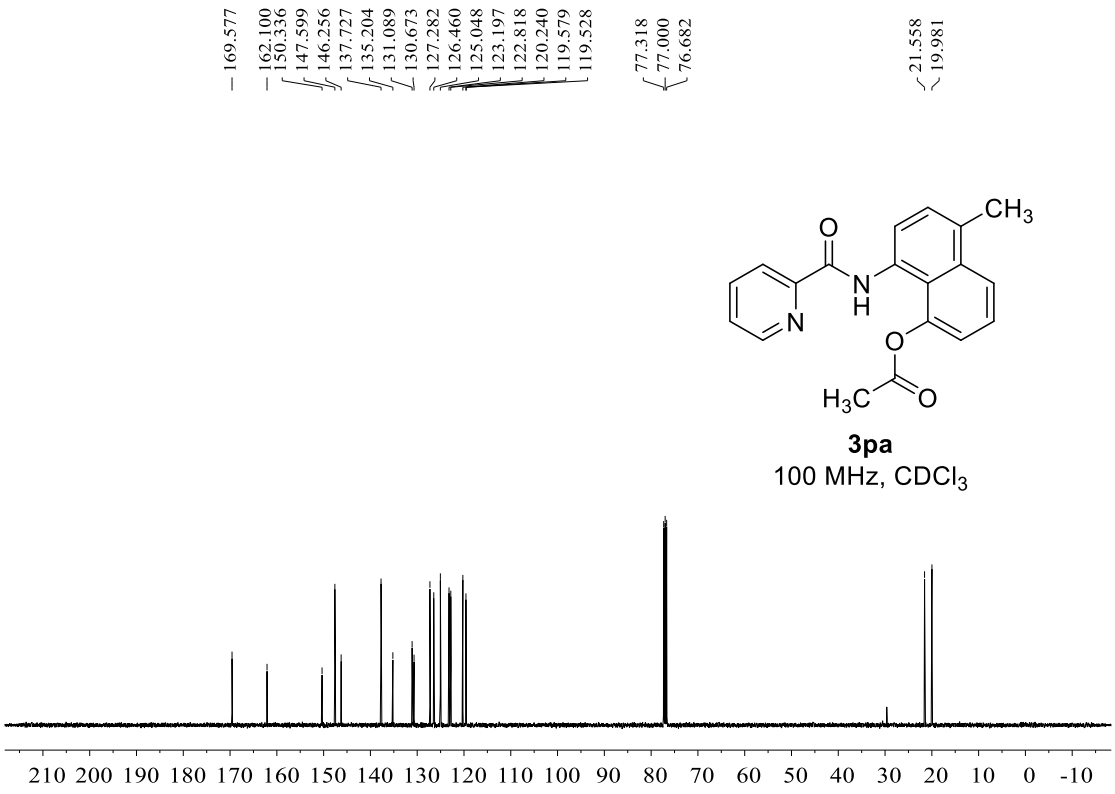
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19.981
CH3
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100 MHz, CDCl3
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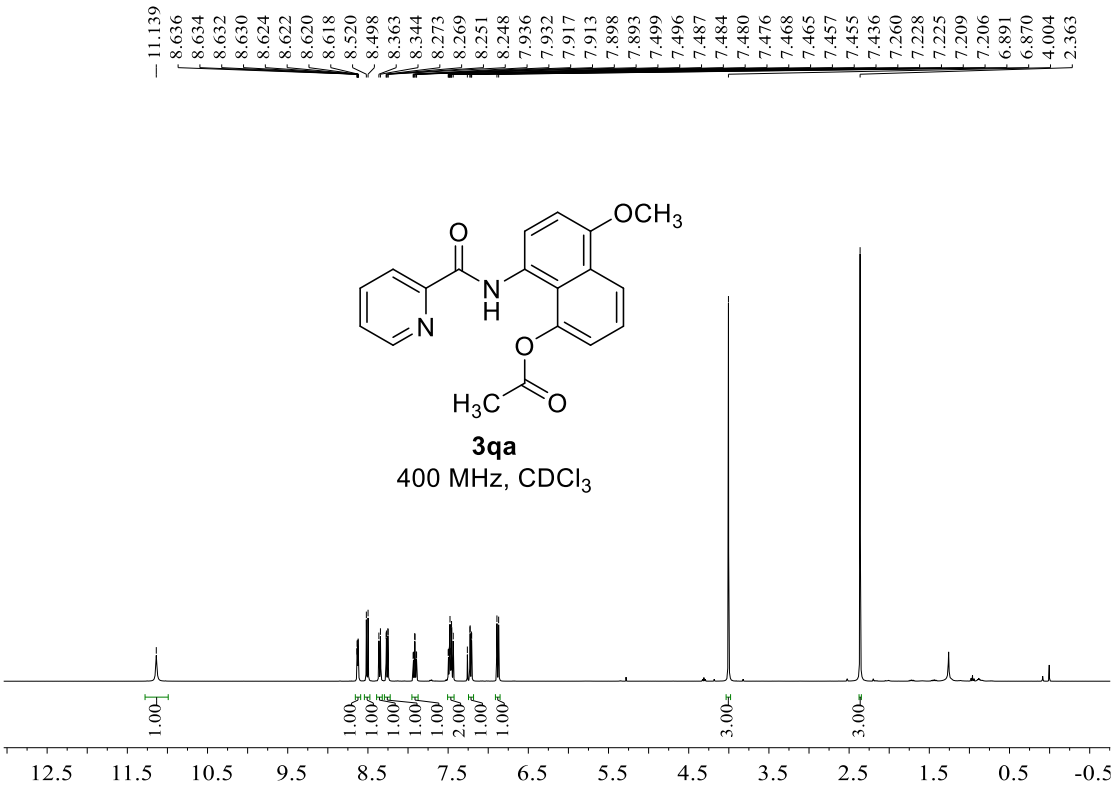
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8.498
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8.344
8.273
8.269
8.251
8.248
7.936
7.932
7.917
7.913
7.898
7.893
7.499
7.496
7.487
7.484
7.480
7.476
7.468
7.465
7.457
7.455
7.436
7.260
7.228
7.225
7.209
7.206
6.891
6.870
4.004
2.363
OCH3
O
N
H
N
O
H3C
O
3qa
400 MHz, CDCl3
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1.00
1.00
1.00
2.00
1.00
1.00
3.00
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12.5
11.5
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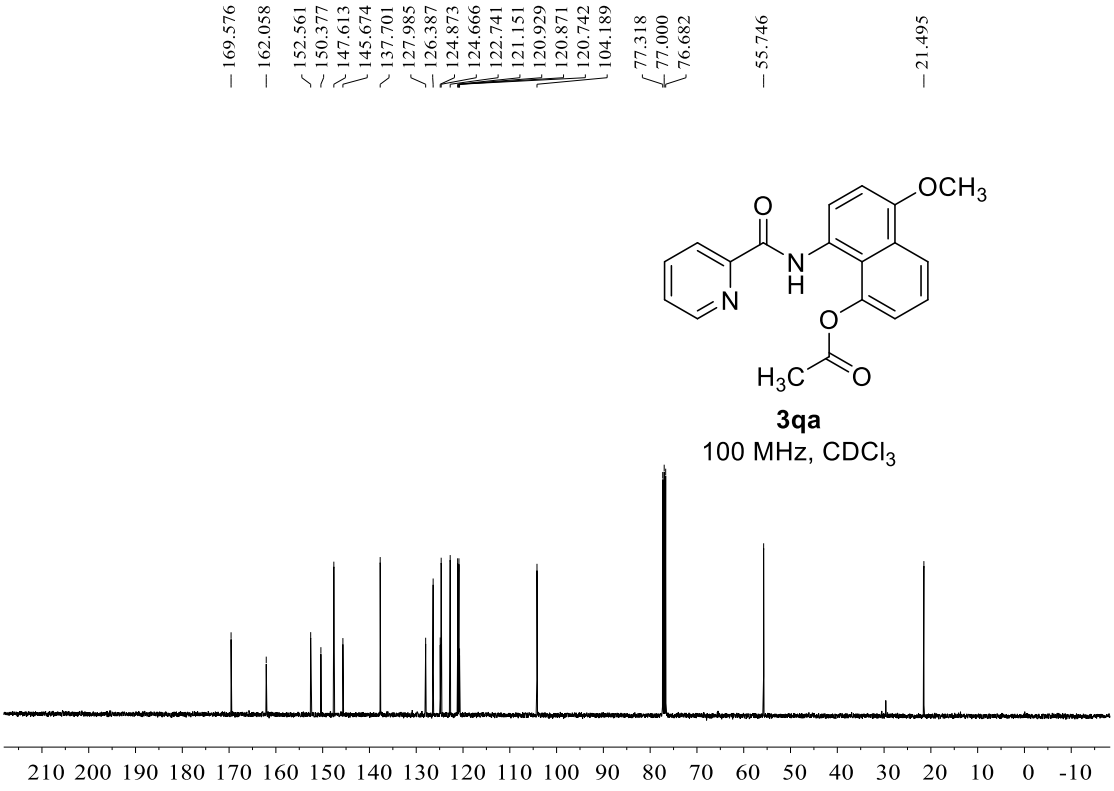
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120.871
120.742
104.189
77.318
77.000
76.682
55.746
21.495
OCH3
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N
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O
H3C
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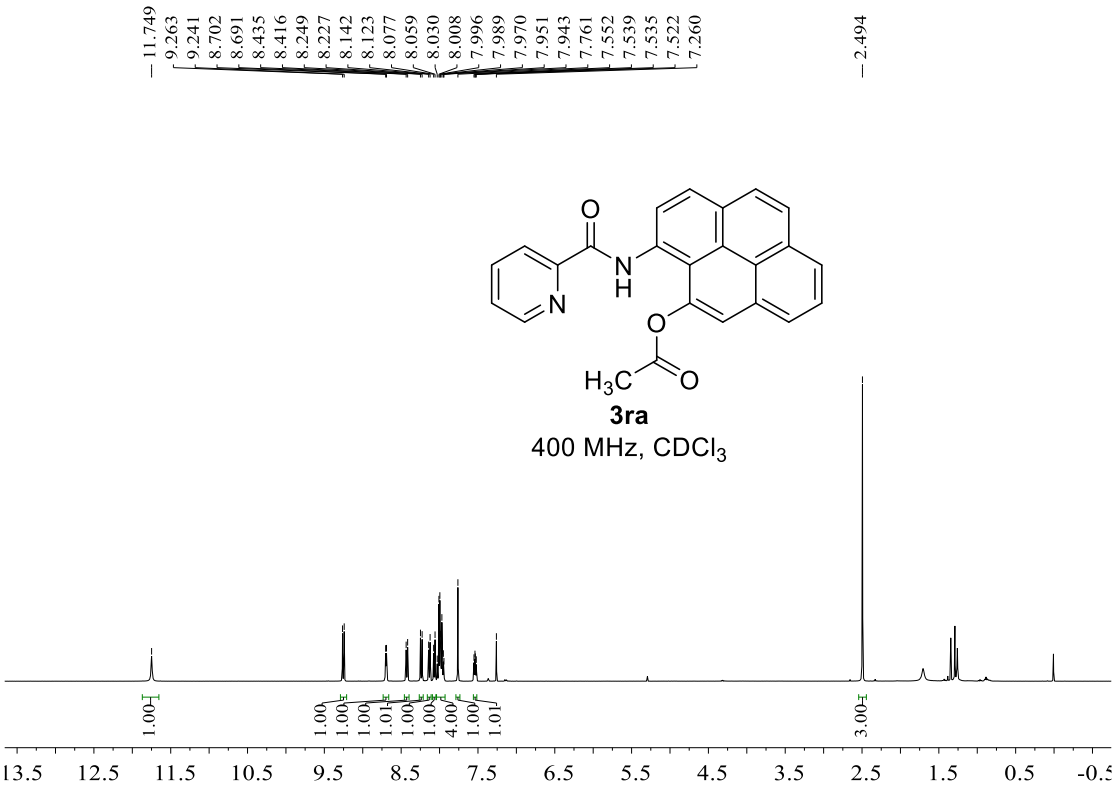
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8.249
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8.077
8.059
8.030
8.008
7.996
7.989
7.970
7.951
7.943
7.761
7.552
7.539
7.535
7.522
7.260
2.494
O
N
H
N
O
H3C
O
3ra
400 MHz, CDCl3
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1.00
1.00
1.01
1.00
1.00
4.00
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1.01
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12.5
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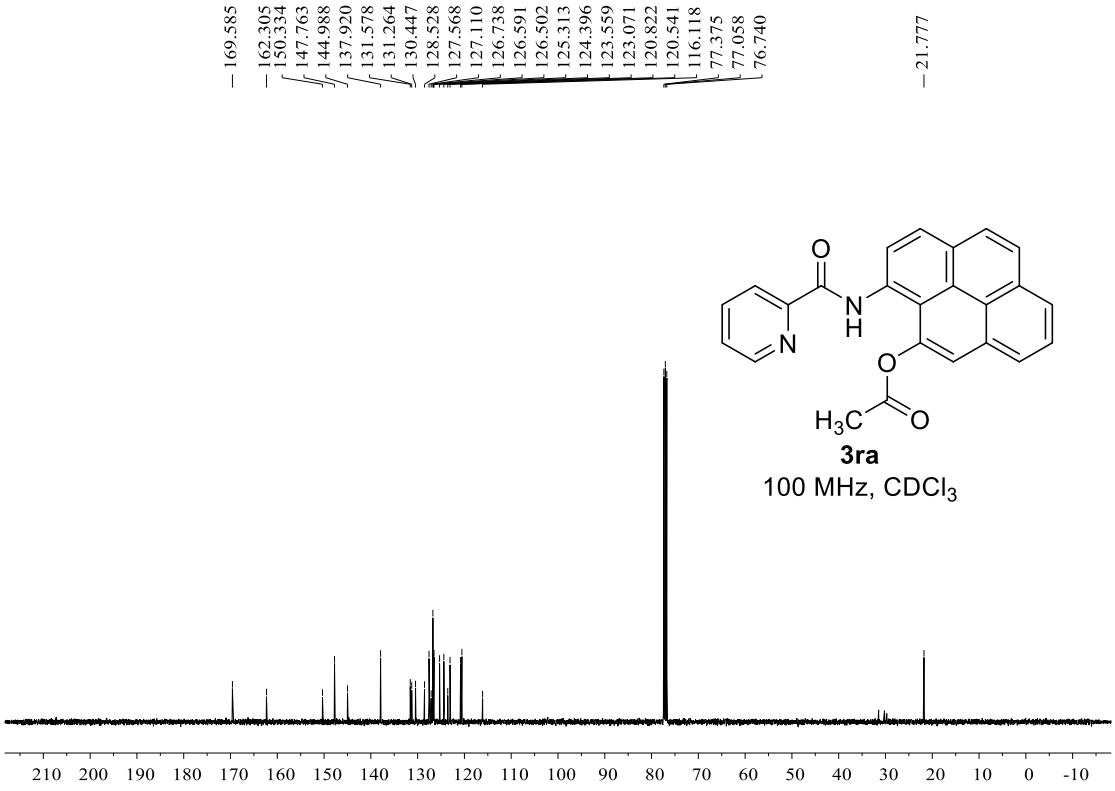
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125.313
124.396
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123.071
120.822
120.541
116.118
77.375
77.058
76.740
21.777
O
N
H
N
O
H3C
O
3ra
100 MHz, CDCl3
210
200
190
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120
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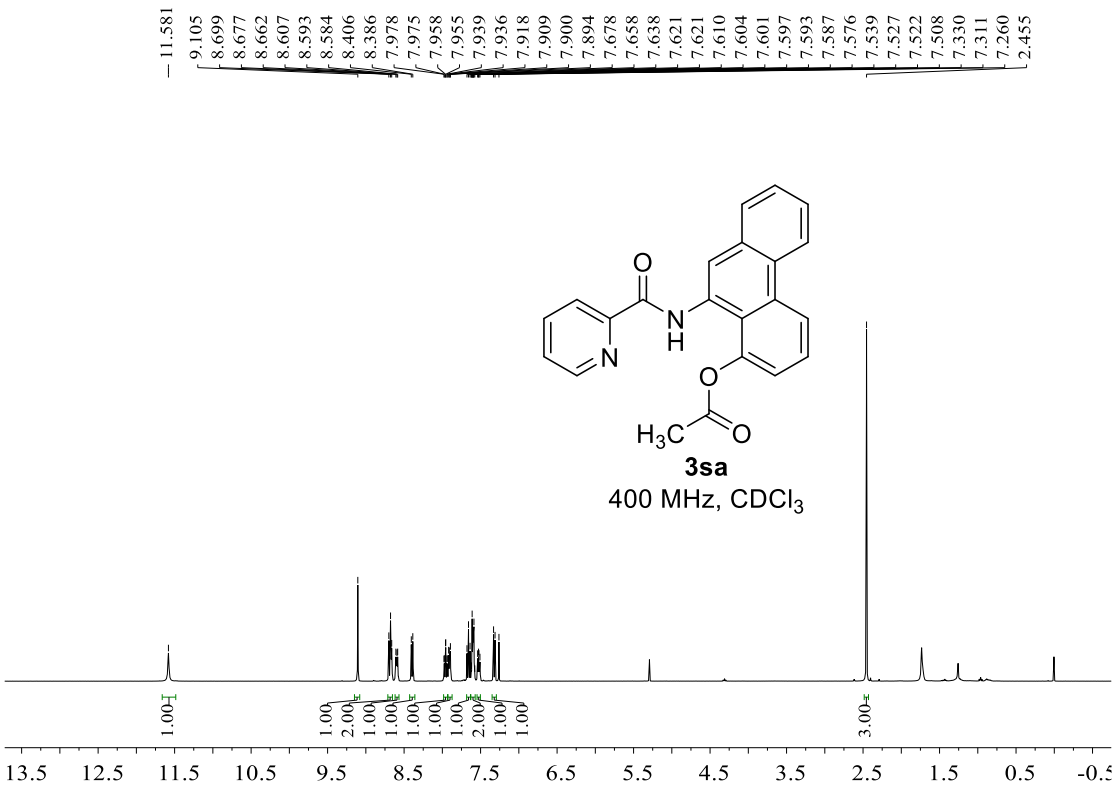
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7.955
7.939
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7.918
7.909
7.900
7.894
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7.658
7.638
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7.621
7.610
7.604
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7.597
7.593
7.587
7.576
7.539
7.527
7.522
7.508
7.330
7.311
7.260
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H
N
O
H3C
O
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400 MHz, CDCl3
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1.00
1.00
1.00
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12.5
11.5
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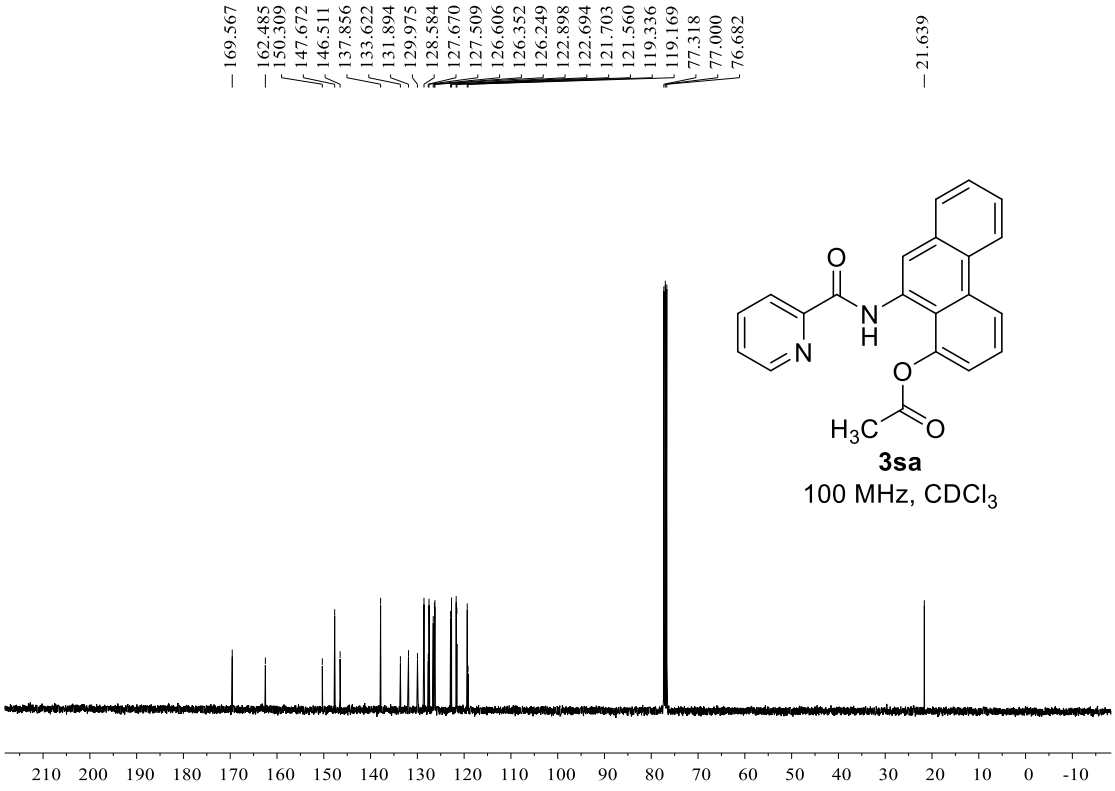
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122.694
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119.336
119.169
77.318
77.000
76.682
21.639
O
N
H
N
O
H3C
O
3sa
100 MHz, CDCl3
210
200
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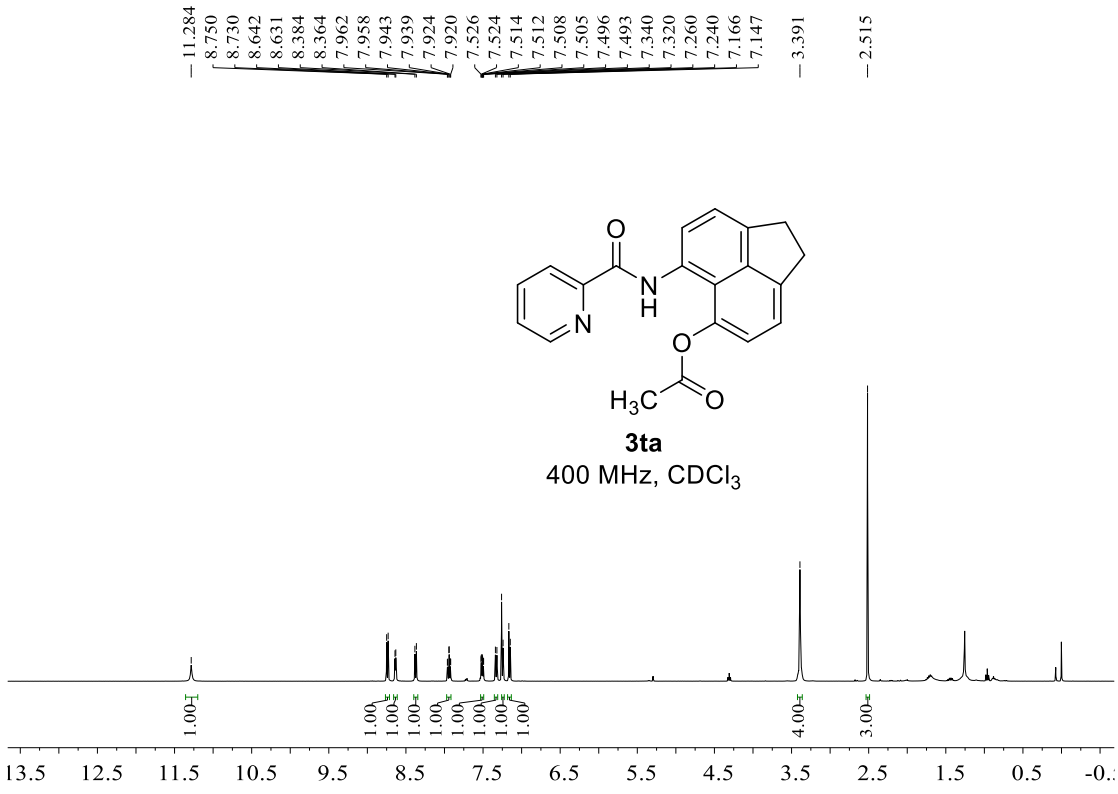
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7.524
7.514
7.512
7.508
7.505
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7.493
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7.260
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7.166
7.147
3.391
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O
N
H
N
O
H3C
O
3ta
400 MHz, CDCl3
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1.00
1.00
1.00
1.00
1.00
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12.5
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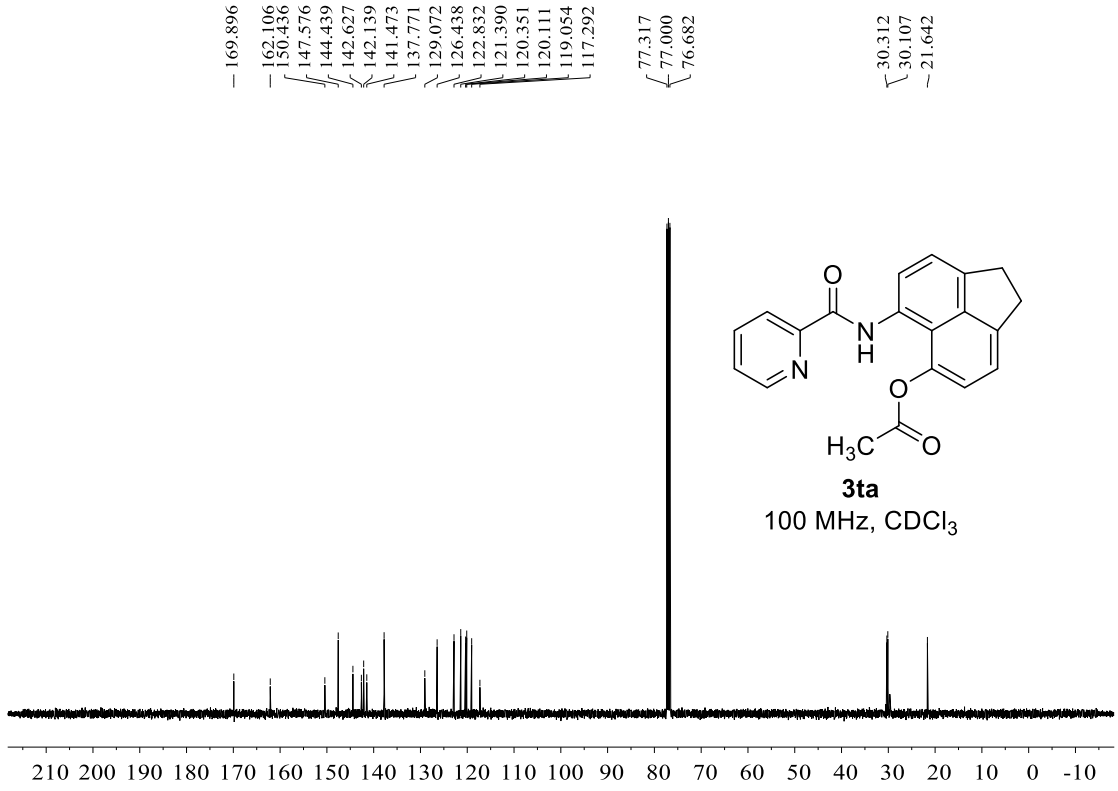
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77.317
77.000
76.682
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30.107
21.642
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H
N
O
H3C
O
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100 MHz, CDCl3
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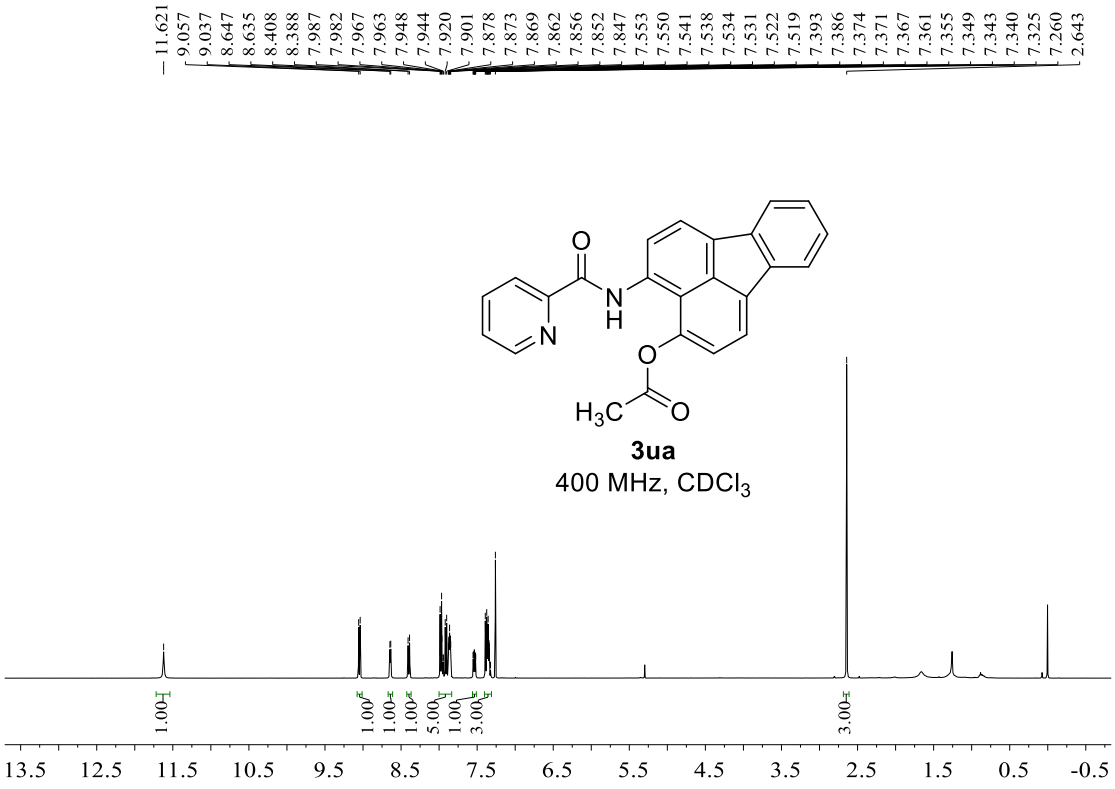
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7.550
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7.519
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7.340
7.325
7.260
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N
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N
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H3C
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400 MHz, CDCl3
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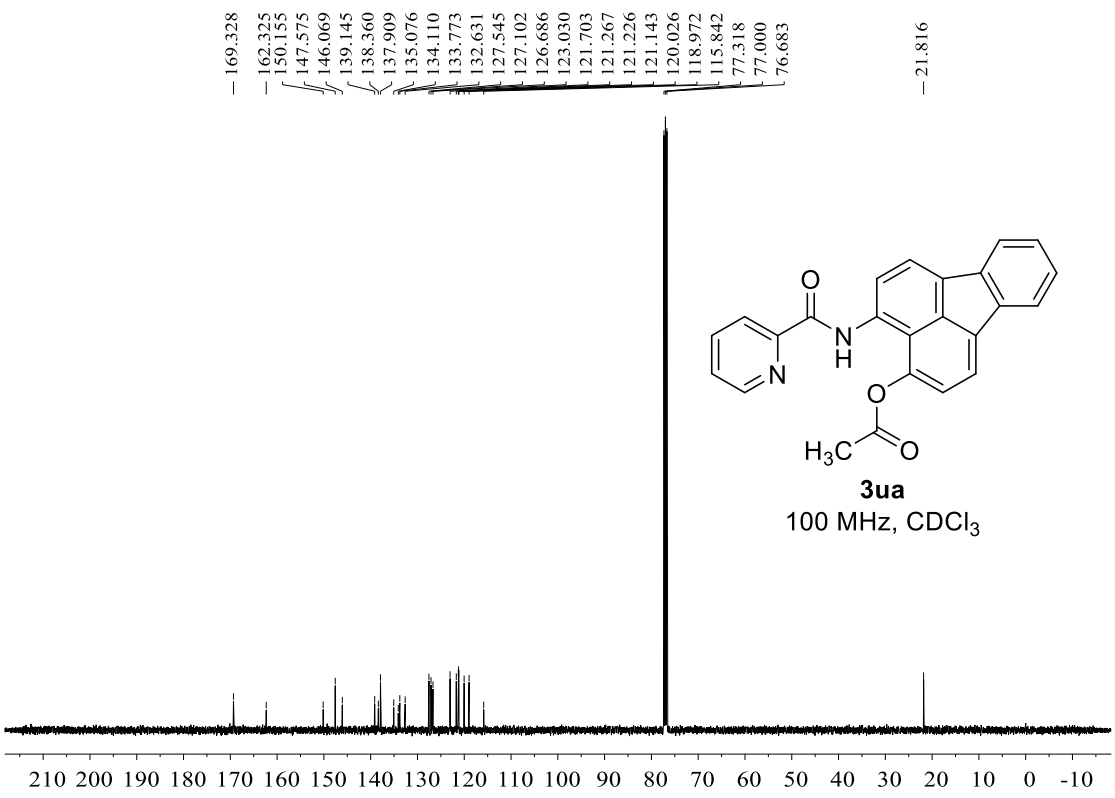
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121.226
121.143
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H3C
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3ua
100 MHz, CDCl3
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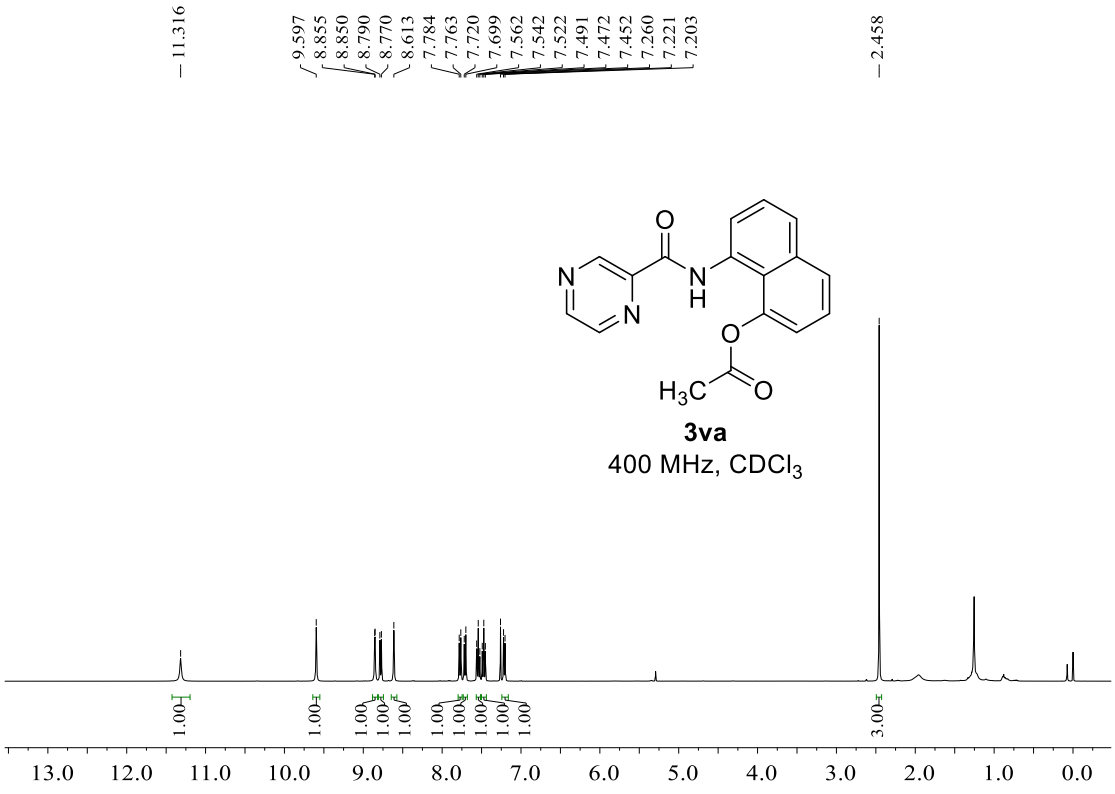
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7.542
7.522
7.491
7.472
7.452
7.260
7.221
7.203
2.458
O
N
N
H
N
O
H3C
O
3va
400 MHz, CDCl3
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1.00
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1.00
1.00
1.00
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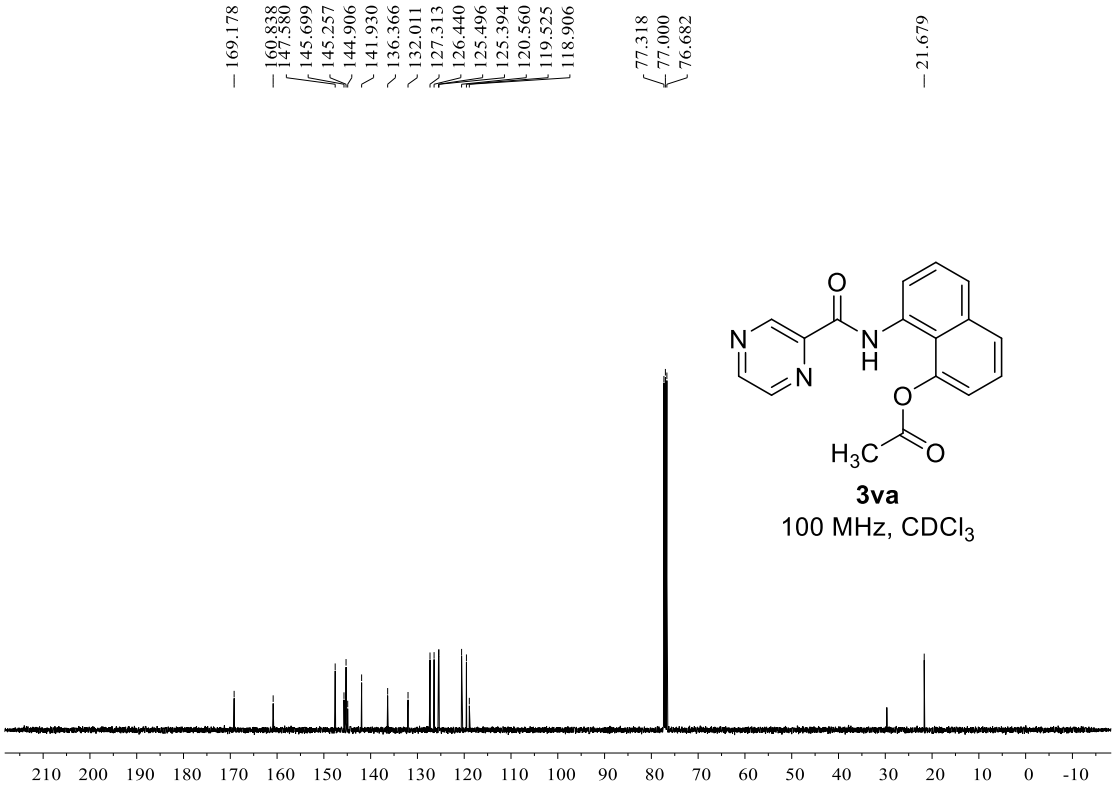
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119.525
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76.682
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O
N
N
H
N
O
H3C
O
3va
100 MHz, CDCl3
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200
190
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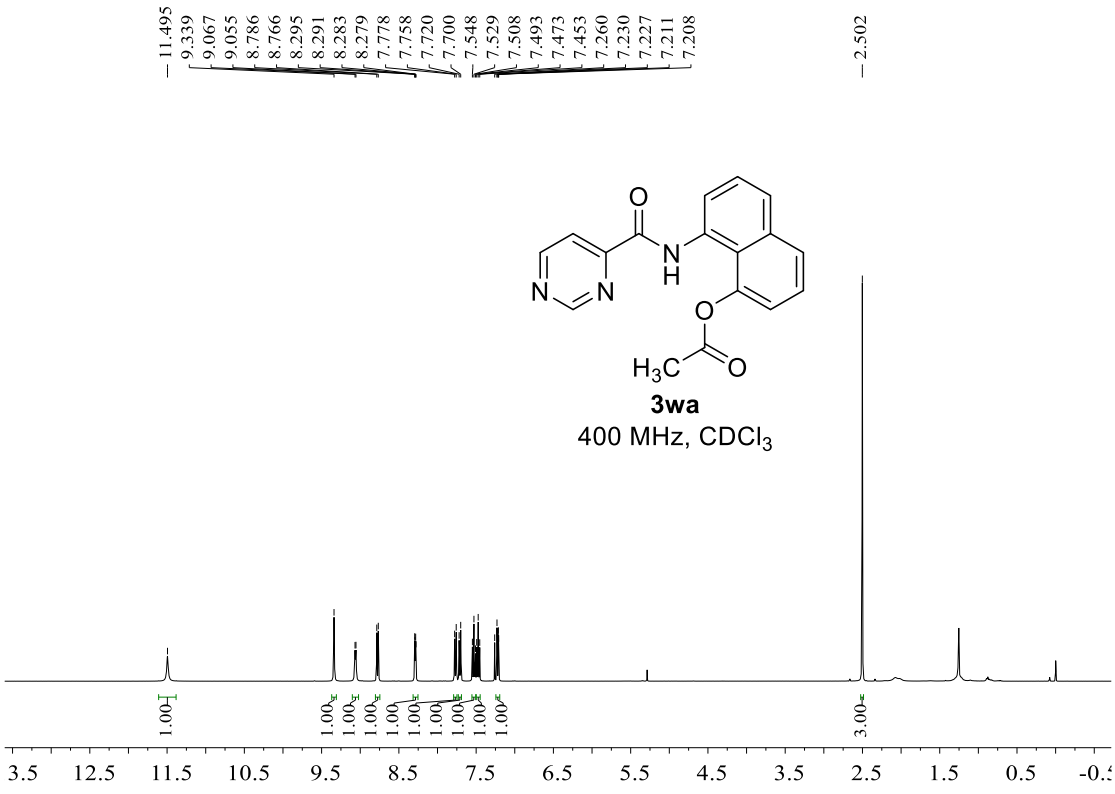
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7.260
7.230
7.227
7.211
7.208
2.502
O
N
H
N
N
O
H3C
O
3wa
400 MHz, CDCl3
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1.00
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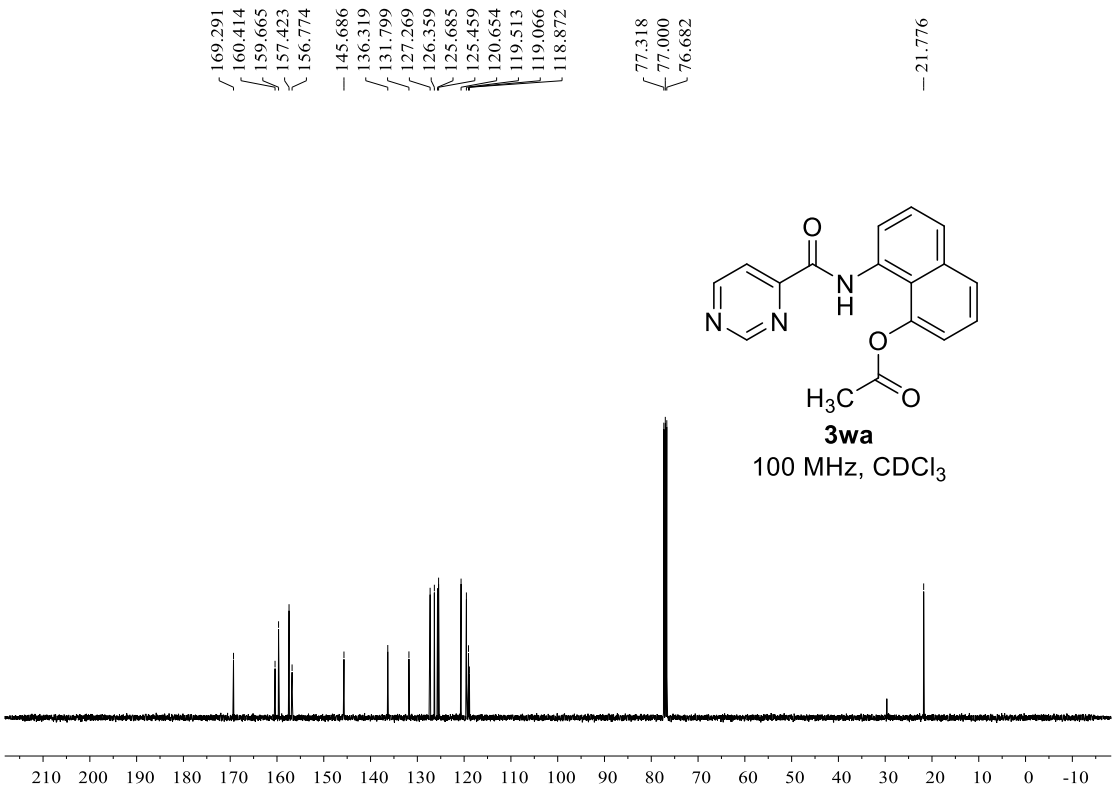
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N
H
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N
O
H3C
O
3wa
100 MHz, CDCl3
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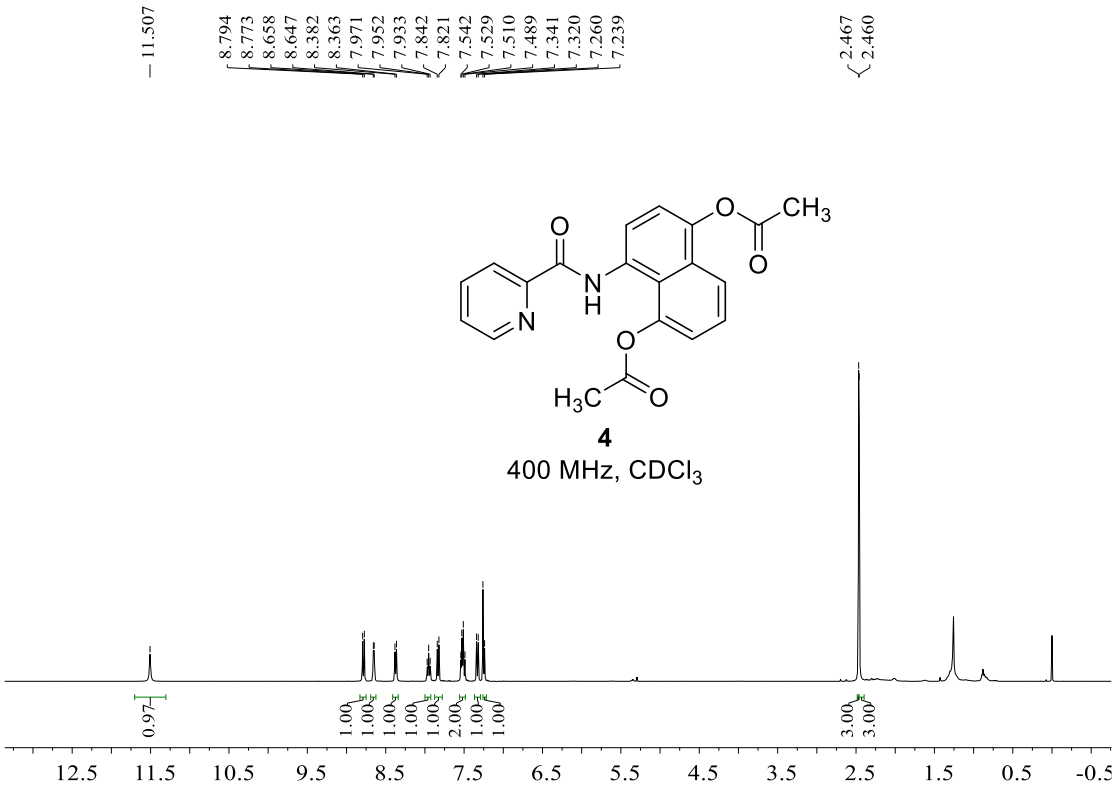
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7.542
7.529
7.510
7.489
7.341
7.320
7.260
7.239
2.467
2.460
O
CH3
O
N
H
N
O
H3C
O
4
400 MHz, CDCl3
0.97
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1.00
1.00
1.00
2.00
1.00
1.00
3.00
3.00
12.5
11.5
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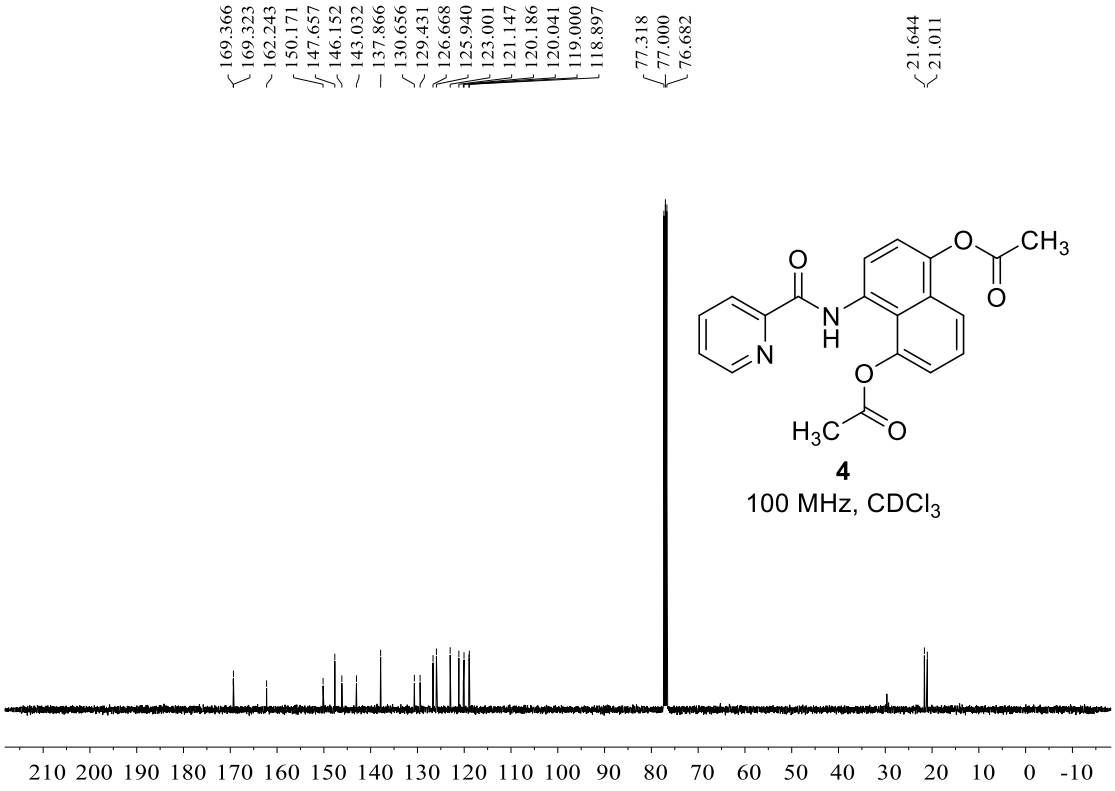
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77.000
76.682
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21.011
O
CH3
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N
H
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O
H3C
O
4
100 MHz, CDCl3
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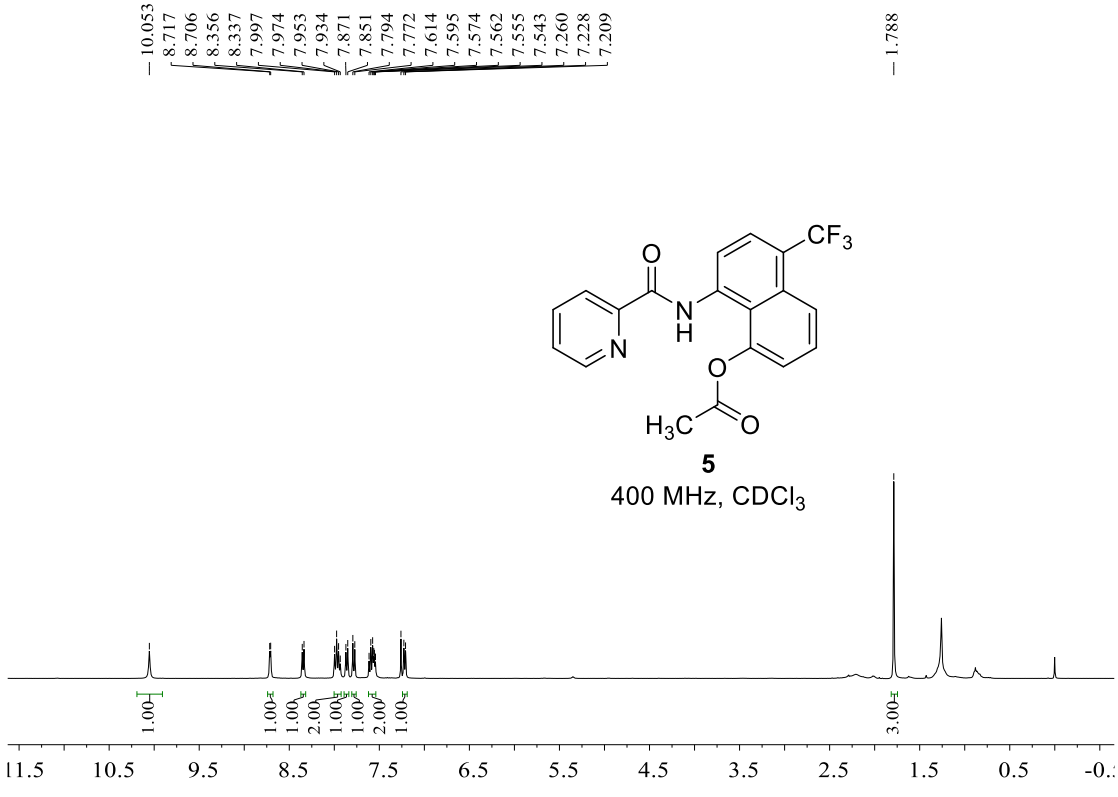
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7.772
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7.595
7.574
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7.555
7.543
7.260
7.228
7.209
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CF3
O
N
H
N
O
H3C
O
5
400 MHz, CDCl3
1.00
1.00
1.00
2.00
1.00
2.00
1.00
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9.5
8.5
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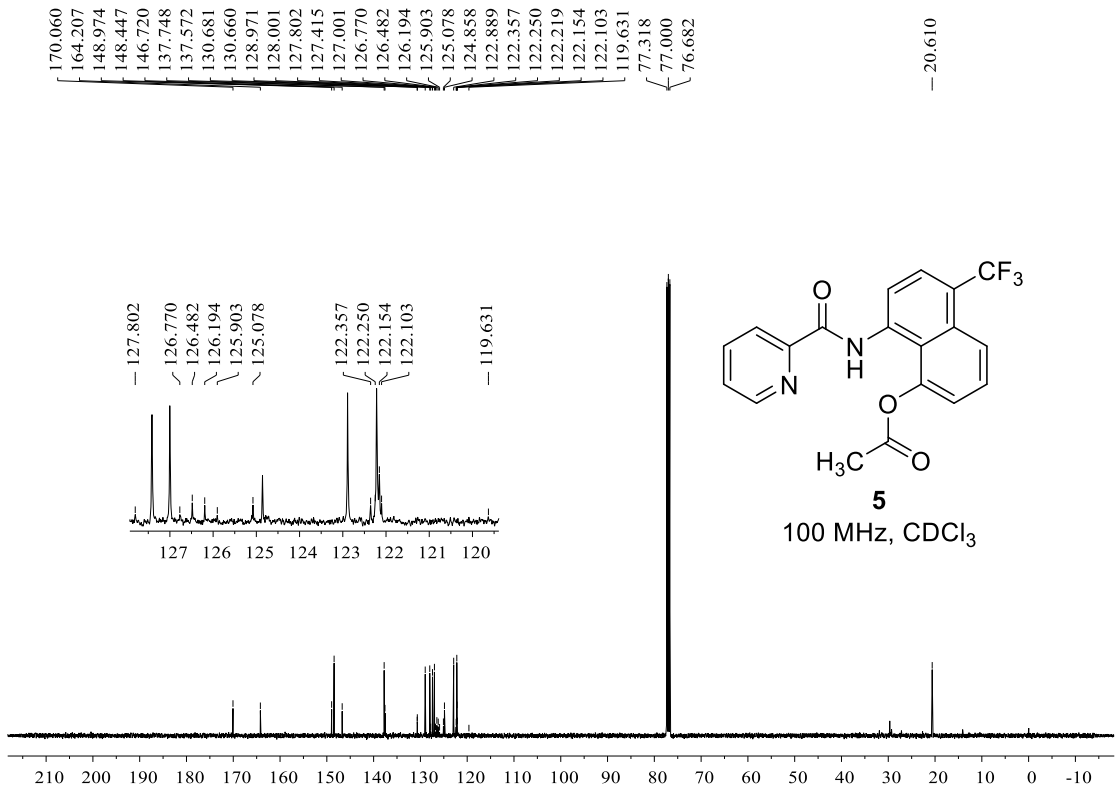
6.5
5.5
4.5
3.5
2.5
1.5
0.5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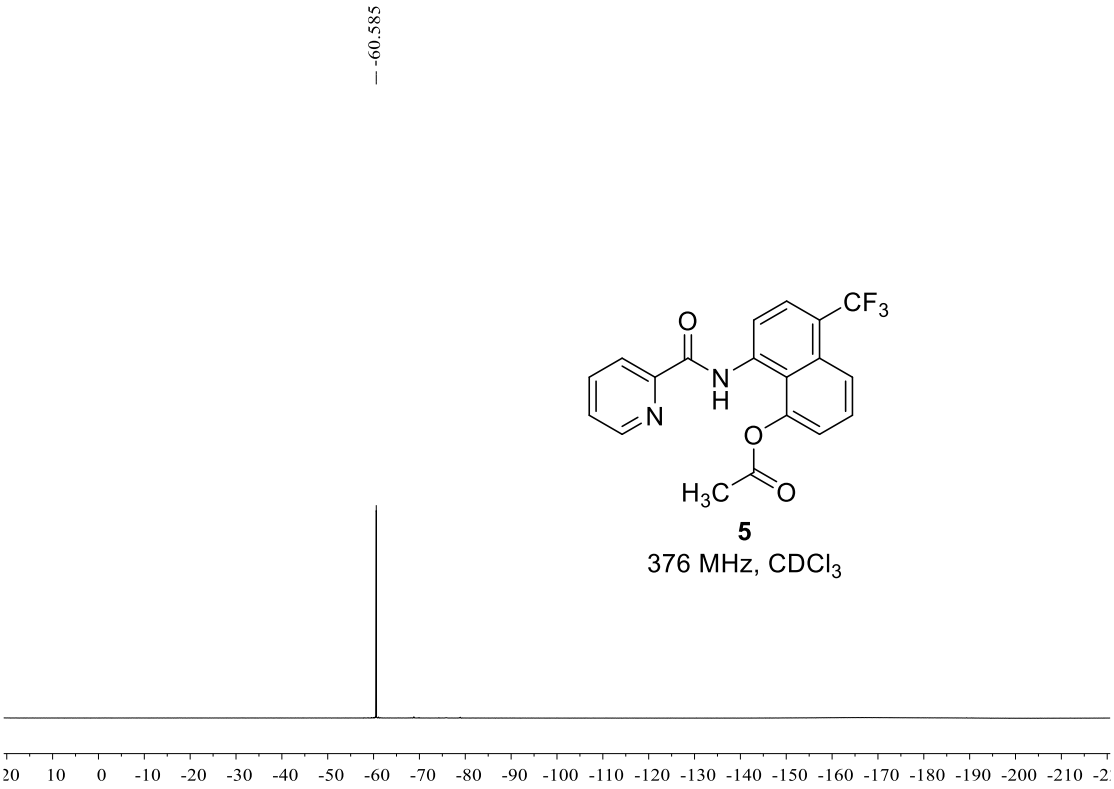
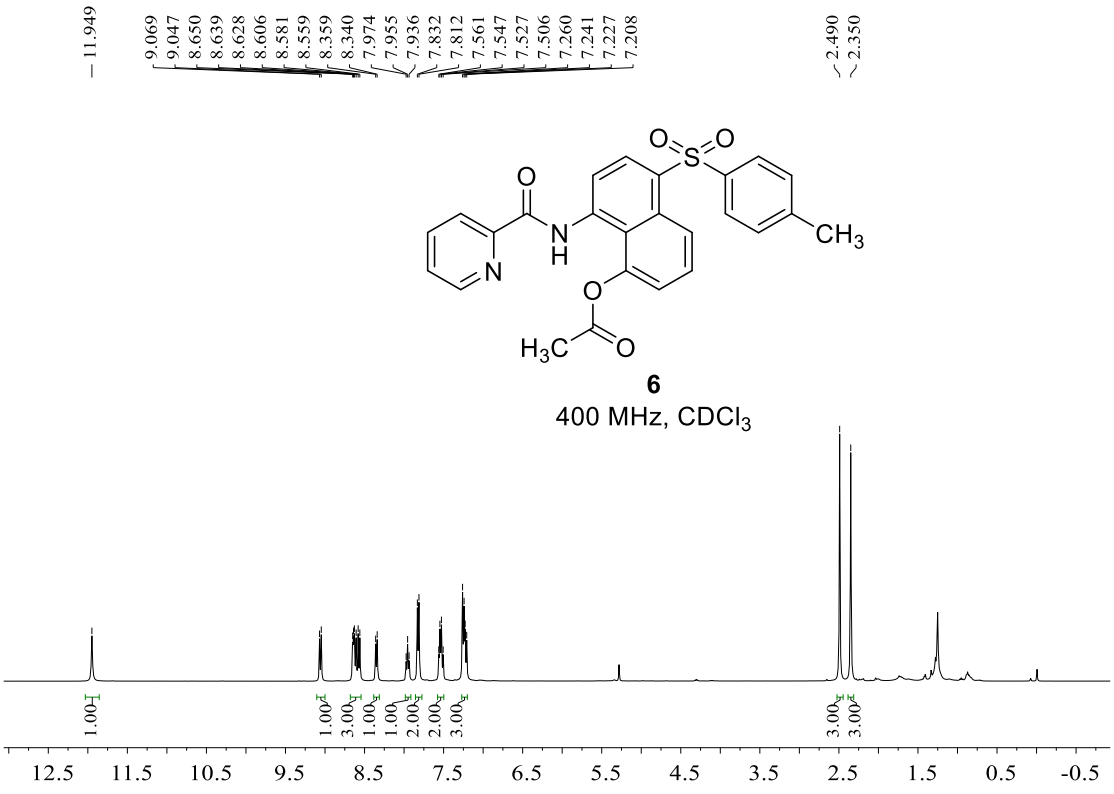
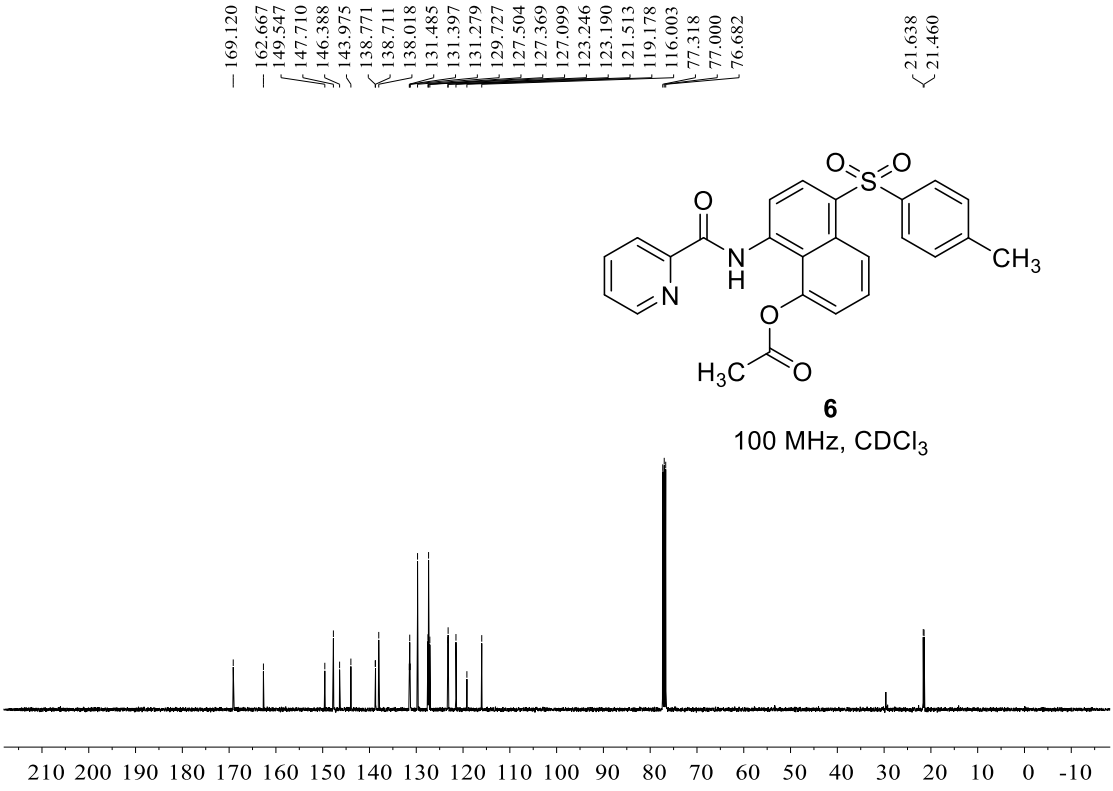
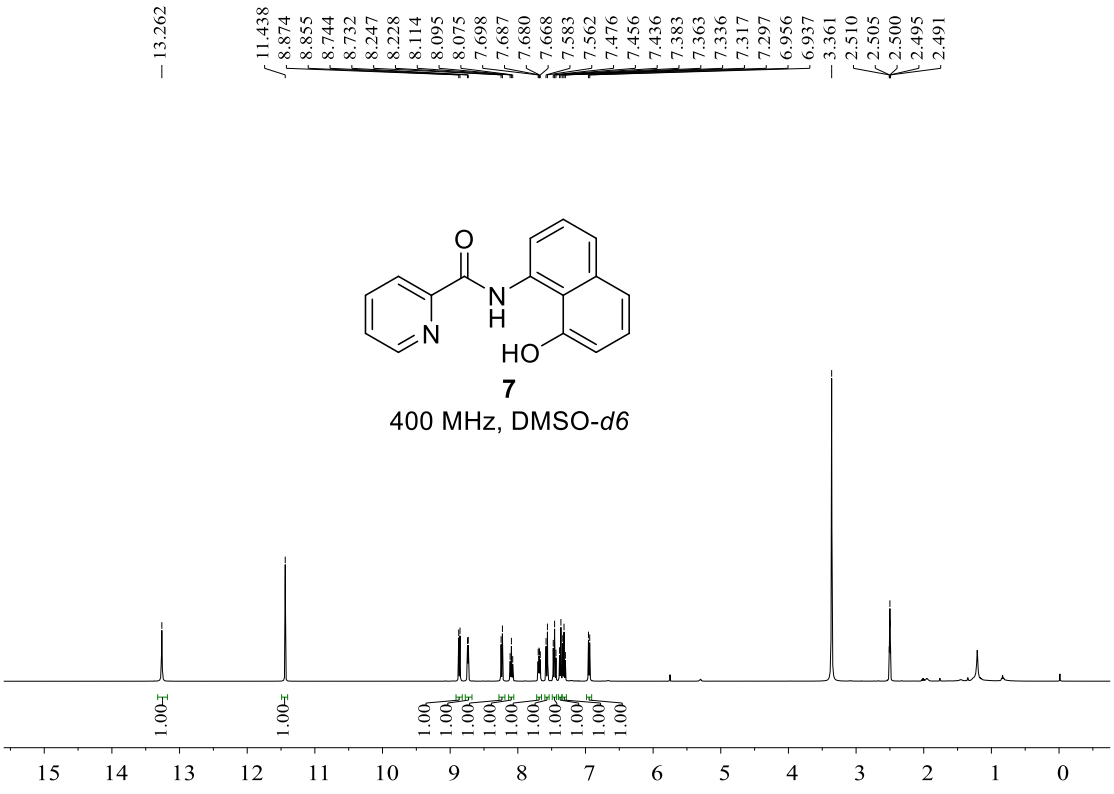
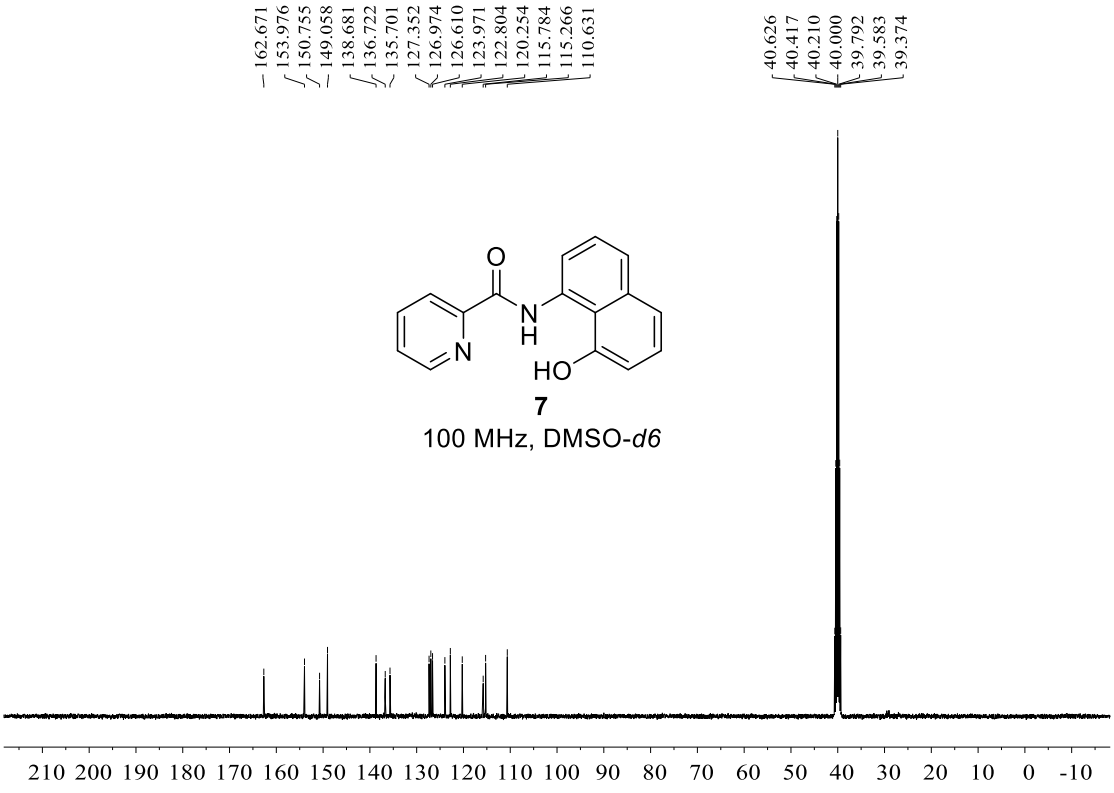
164.207
148.974
148.447
146.720
137.748
137.572
130.681
130.660
128.971
128.001
127.802
127.415
127.001
126.770
126.482
126.194
125.903
125.078
124.858
122.889
122.357
122.250
122.219
122.154
122.103
119.631
77.318
77.000
76.682
20.610
127.802
126.770
126.482
126.194
125.903
125.078
122.357
122.250
122.154
122.103
119.631
127
126
125
124
123
122
121
120
CF3
O
N
H
N
O
H3C
O
5
100 MHz, CDCl3
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10

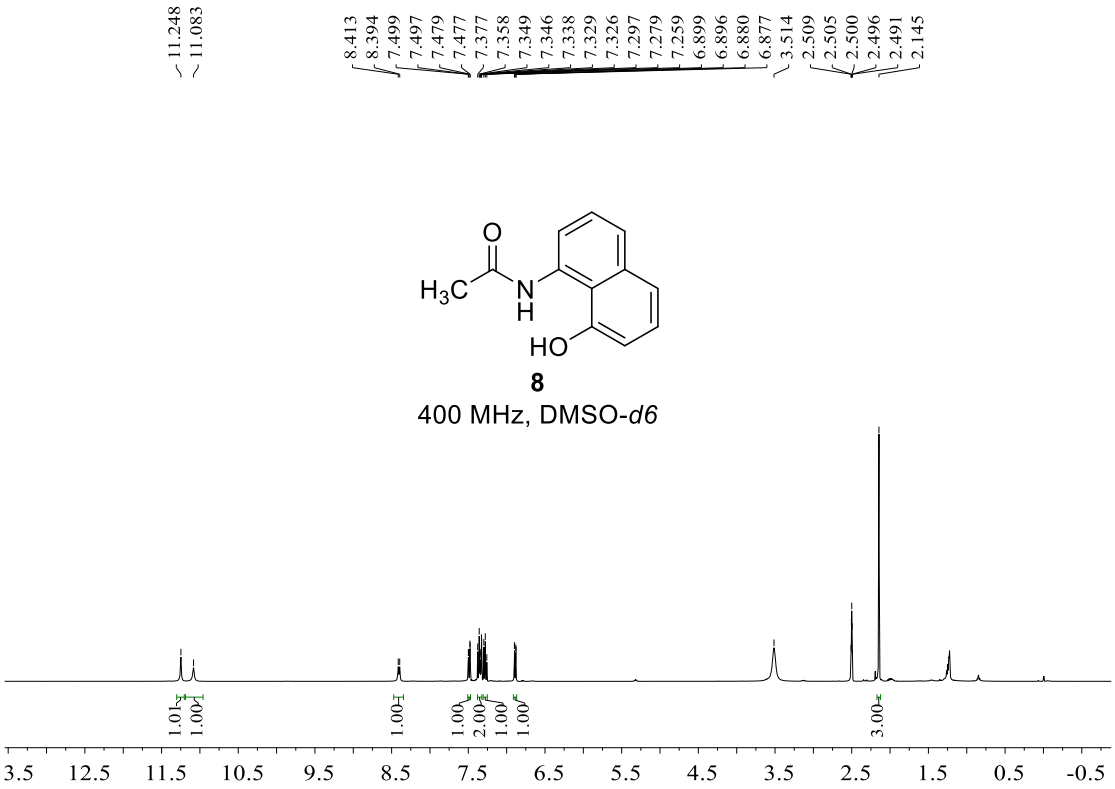

-60.585
CF3
O
N
H
N
O
H3C
O
5
376 MHz, CDCl3
20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210

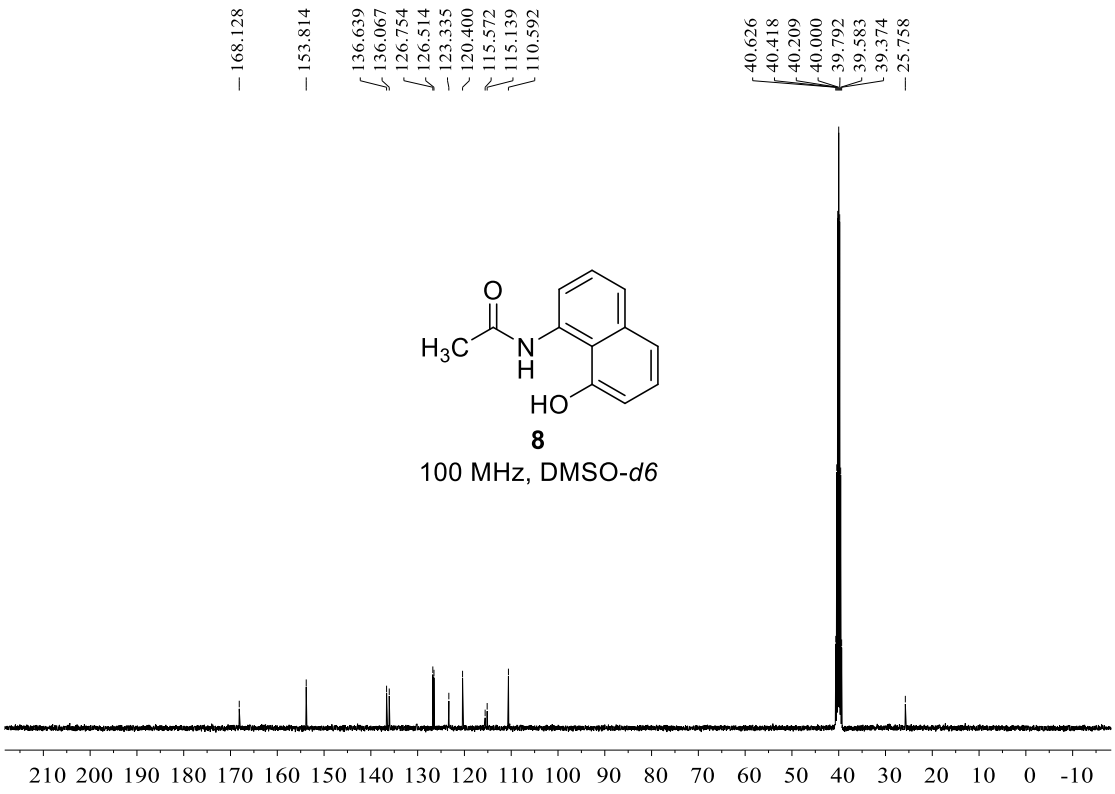

11.949
9.069
9.047
8.650
8.639
8.628
8.606
8.581
8.559
8.359
8.340
7.974
7.955
7.936
7.832
7.812
7.561
7.547
7.527
7.506
7.260
7.241
7.227
7.208
2.490
2.350
O
S
O
O
N
H
N
CH3
O
H3C
O
6
400 MHz, CDCl3
1.00
1.00
3.00
1.00
1.00
2.00
2.00
3.00
3.00
3.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

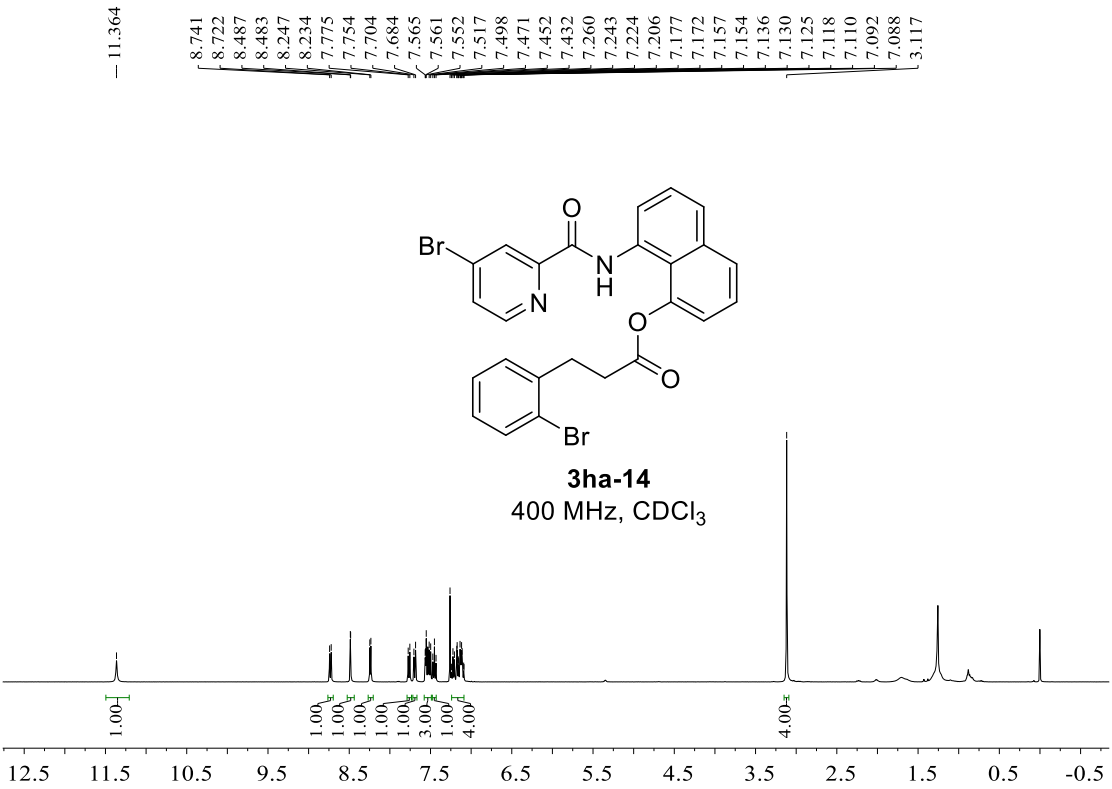

169.120
162.667
149.547
147.710
146.388
143.975
138.771
138.711
138.018
131.485
131.397
131.279
129.727
127.504
127.369
127.099
123.246
123.190
121.513
119.178
116.003
77.318
77.000
76.682
21.638
21.460
O
S
O
O
N
H
N
CH3
O
H3C
O
6
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

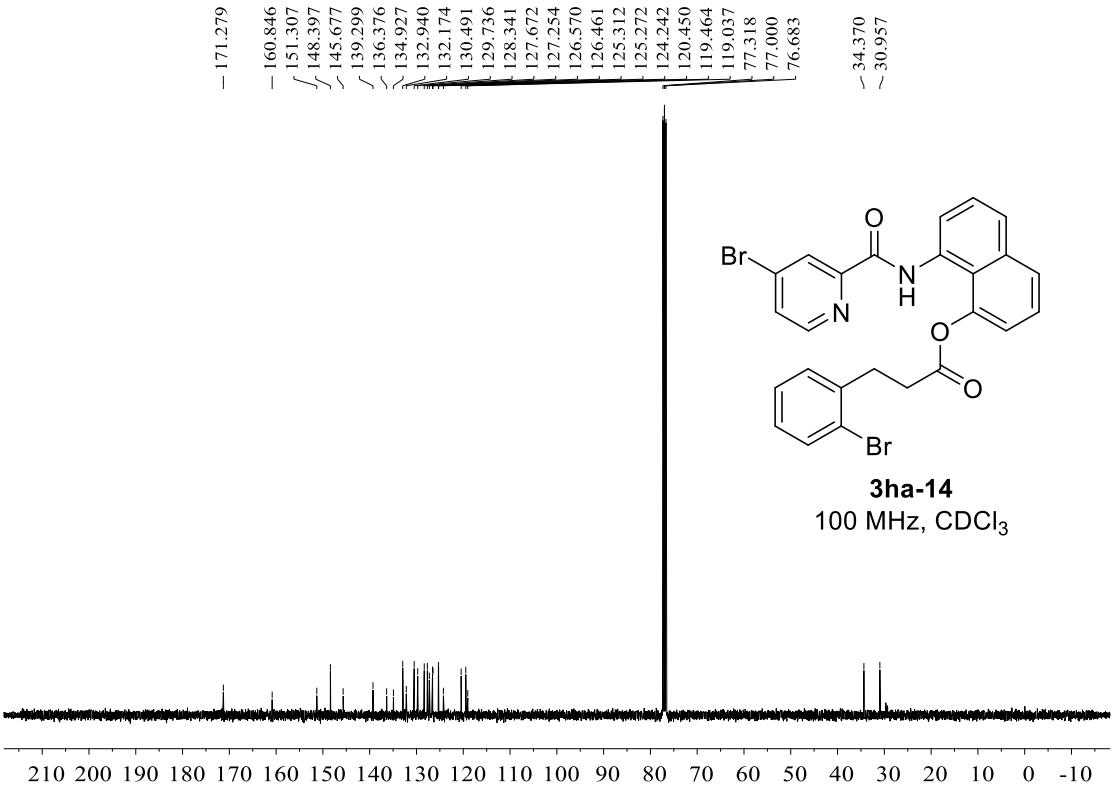

13.262
11.438
8.874
8.855
8.744
8.732
8.247
8.228
8.114
8.095
8.075
7.698
7.687
7.680
7.668
7.583
7.562
7.476
7.456
7.436
7.383
7.363
7.336
7.317
7.297
6.956
6.937
3.361
2.510
2.505
2.500
2.495
2.491
O
N
H
N
HO
7
400 MHz, DMSO-d6
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
1.00
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

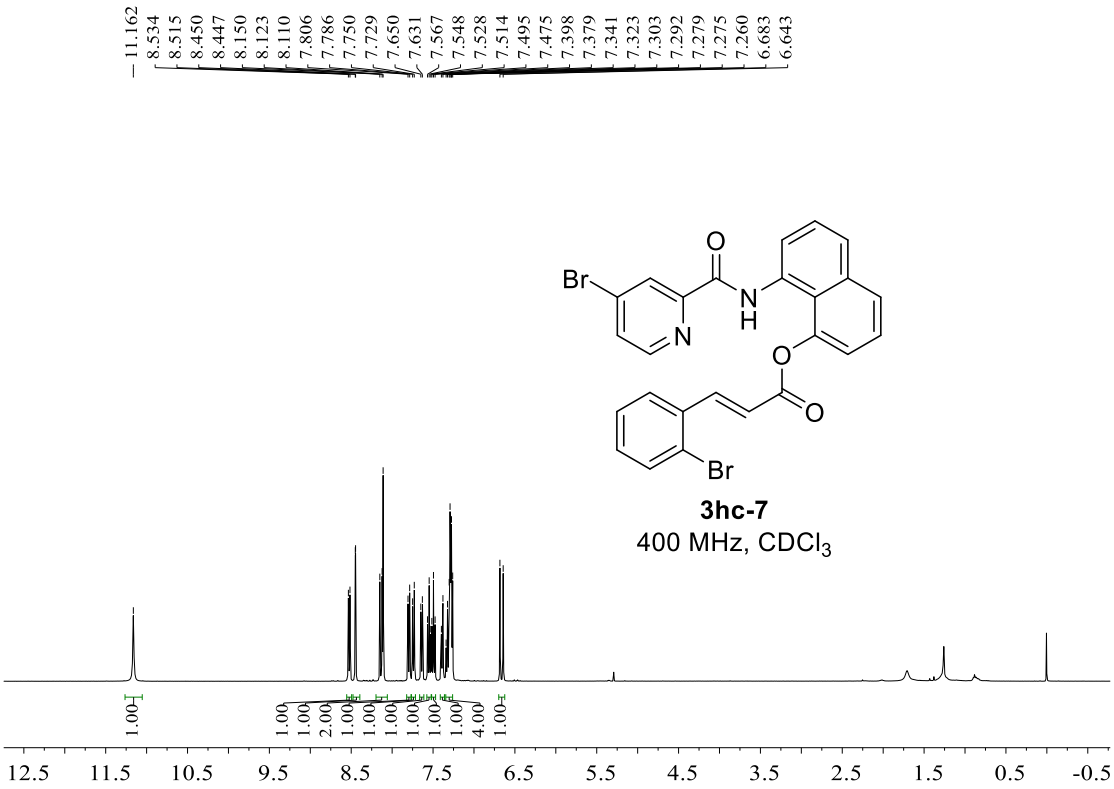

162.671
153.976
150.755
149.058
138.681
136.722
135.701
127.352
126.974
126.610
123.971
122.804
120.254
115.784
115.266
110.631
40.626
40.417
40.210
40.000
39.792
39.583
39.374
O
N
H
N
HO
7
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

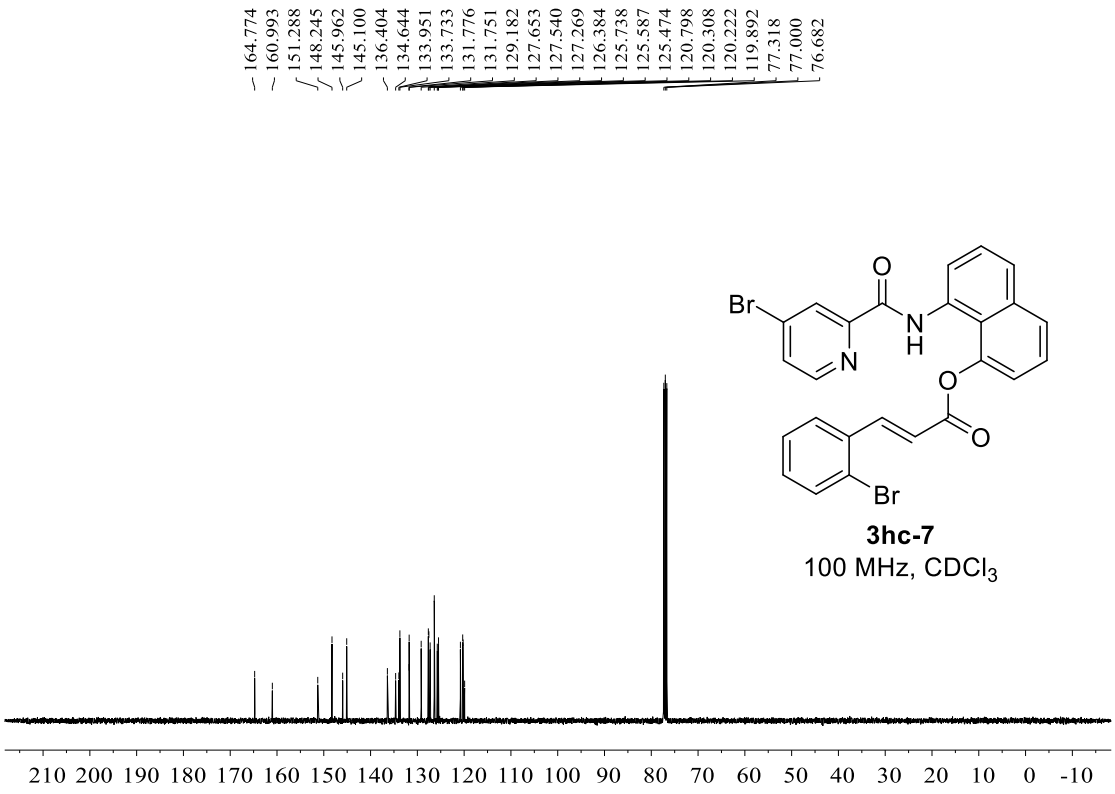

11.248
11.083
8.413
8.394
7.499
7.497
7.479
7.477
7.377
7.358
7.349
7.346
7.338
7.329
7.326
7.297
7.279
7.259
6.899
6.896
6.880
6.877
3.514
2.509
2.505
2.500
2.496
2.491
2.145
O
H3C
N
H
HO
8
400 MHz, DMSO-d6
1.01
1.00
1.00
1.00
2.00
1.00
1.00
3.00
3.5 12.5 11.5 10.5 9.5 8.5 7.5 6.5 5.5 4.5 3.5 2.5 1.5 0.5 -0.5

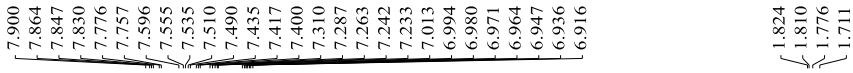

168.128
153.814
136.639
136.067
126.754
126.514
123.335
120.400
115.572
115.139
110.592
40.626
40.418
40.209
40.000
39.792
39.583
39.374
25.758
O
H3C
N
H
HO
8
100 MHz, DMSO-d6
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

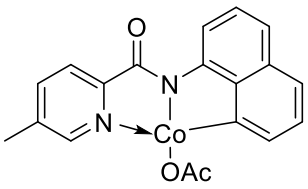

11.364
8.741
8.722
8.487
8.483
8.247
8.234
7.775
7.754
7.704
7.684
7.565
7.561
7.552
7.517
7.498
7.471
7.452
7.432
7.260
7.243
7.224
7.206
7.177
7.172
7.157
7.154
7.136
7.130
7.125
7.118
7.110
7.092
7.088
3.117
Br
N
H
O
O
O
Br
3ha-14
400 MHz, CDCl3
1.00
1.00
1.00
1.00
1.00
1.00
3.00
1.00
4.00
4.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5


171.279
160.846
151.307
148.397
145.677
139.299
136.376
134.927
132.940
132.174
130.491
129.736
128.341
127.672
127.254
126.570
126.461
125.312
125.272
124.242
120.450
119.464
119.037
77.318
77.000
76.683
34.370
30.957
Br
N
H
O
O
O
Br
3ha-14
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10


11.162
8.534
8.515
8.450
8.447
8.150
8.123
8.110
7.806
7.786
7.750
7.729
7.650
7.631
7.567
7.548
7.528
7.514
7.495
7.475
7.398
7.379
7.341
7.323
7.303
7.292
7.279
7.275
7.260
6.683
6.643
Br
N
H
O
O
O
Br
3hc-7
400 MHz, CDCl3
1.00
1.00
2.00
1.00
1.00
1.00
1.00
1.00
1.00
4.00
1.00
12.5
11.5
10.5
9.5
8.5
7.5
6.5
5.5
4.5
3.5
2.5
1.5
0.5
-0.5

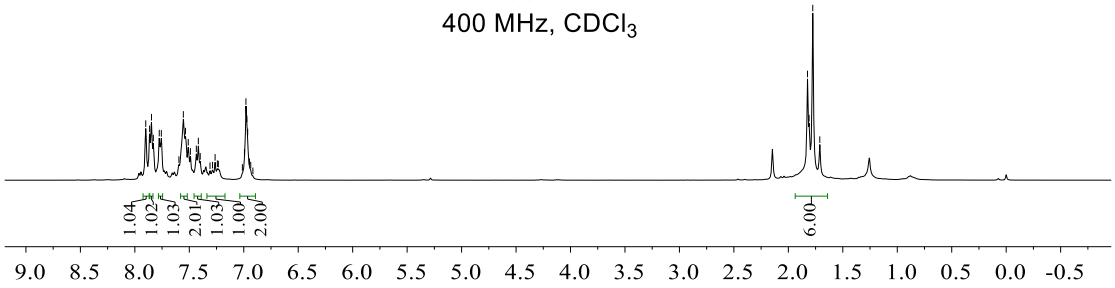

164.774
160.993
151.288
148.245
145.962
145.100
136.404
134.644
133.951
133.733
131.776
131.751
129.182
127.653
127.540
127.269
126.384
125.738
125.587
125.474
120.798
120.308
120.222
119.892
77.318
77.000
76.682
Br
N
H
O
O
O
Br
3hc-7
100 MHz, CDCl3
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10

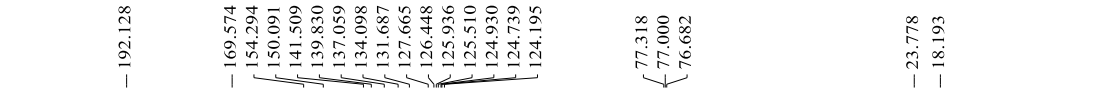


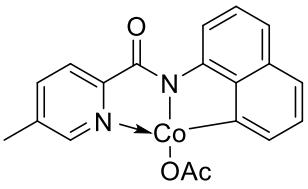


Co-1d

400 MHz, $CDCl_3$

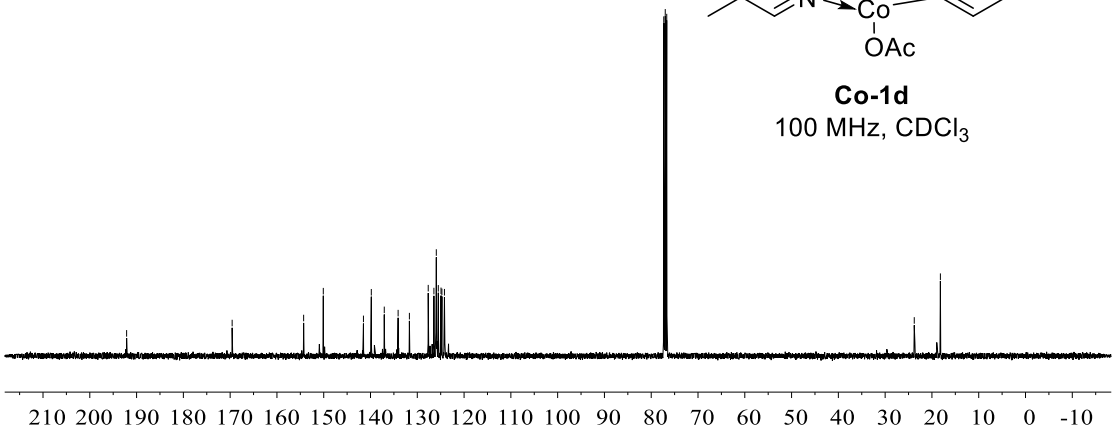




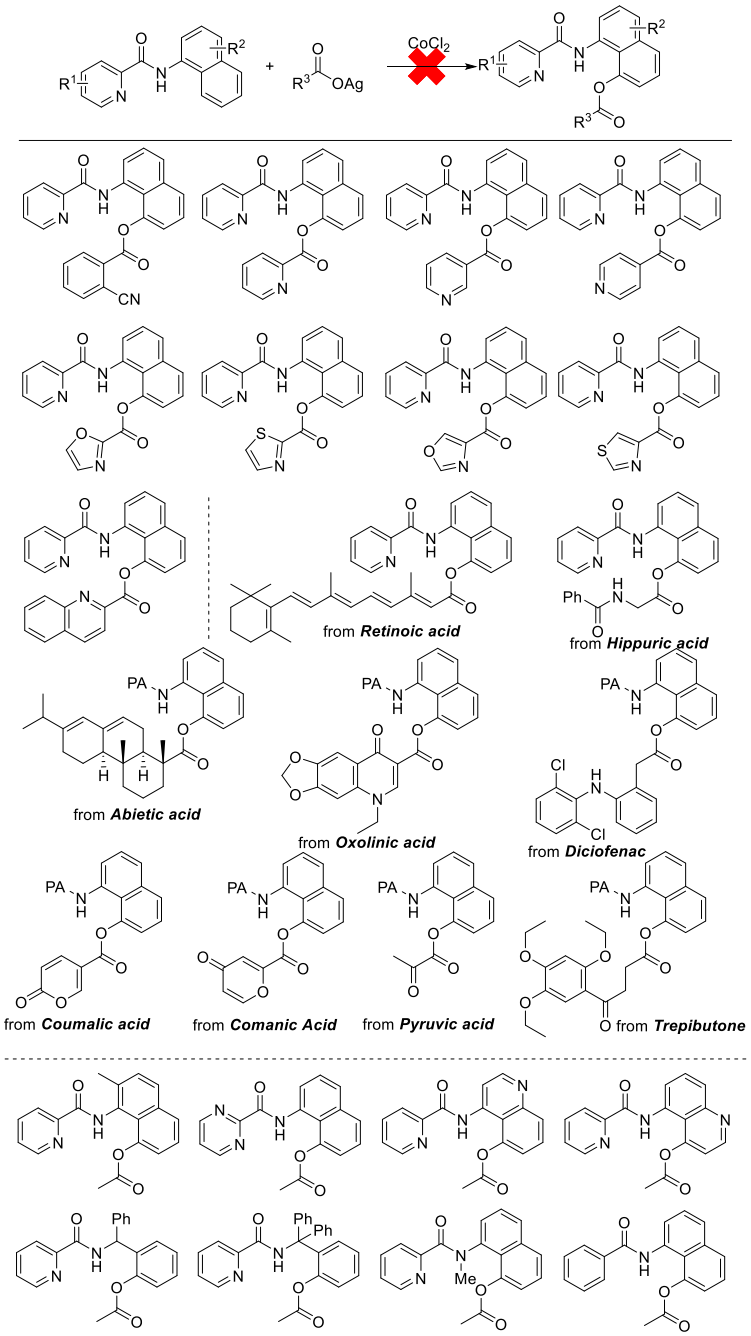


Co-1d

100 MHz, $CDCl_3$



10. Failure examples of C–H bond acyloxylation.



11. References

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2 K. J. Alexander, M. McConville, K. R. Williams, K. V. Luzyanin, I. A. O'Neil, R. Cosstick, *Chem. Eur. J.* **2018**, *24*, 3013.

3 L. Grigorjeva, O. Daugulis, *Angew. Chem. Int. Ed.* **2014**, *53*, 10209.

4 L. Wang, C. W. Barth, M. Sibrian-Vazquez, J. O. Escobedo, M. Lowry, J. Muschler, H. Li, S. L. Gibbs, R. M. Strongin, *ACS Omega* **2017**, *2*, 154.