Supporting information

Copper-Mediated Trifluoromethylation of ArylBoronic Acids by Trifluoromethyl Sulfonium Salts

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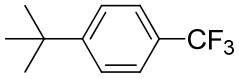
Experimental Details

1. General

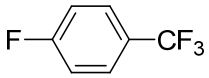
Unless otherwise stated, NMR spectra were recorded in $CDCl_3$ at 300 MHz (^{1}H NMR) and 282 MHz (^{19}F NMR). All chemical shifts are reported in ppm relative to TMS or $CFCl_3$ (positive for downfield shifts) as external standards. DMF (≥99.5%) and Cu (≥99.0%) were used without purification. *S*-(Trifluoromethyl)diphenylsulfonium triflate $[Ph_2SCF_3]^+[OTf]^-$ was synthesized according to the literature procedure.[1] Other reagents were purchased from commercial sources.

2. General Procedure for the Trifluoromethylation of Aryl- and Alkenylboronic Acids (1a-q).

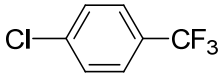
In a 5 mL sealed tube, biphen-4-ylboronic acid (39.9 mg, 0.201 mmol) and $[Ph_2SCF_3]^+[OTf]^-$ (162 mg, 0.4 mmol) were dissolved in DMF (3 mL). Copper powder (26.3 mg, 0.4 mmol) and $NaHCO_3$ (17.1 mg, 0.2 mmol) were added. The reaction mixture was then stirred at 50 °C for 11 h. After dilution with diethyl ether (30 mL), the reaction mixture was washed with water (3×20 mL), dried over anhydrous sodium sulfate and evaporated under reduced pressure. The crude product was purified by column chromatography (eluent: pentane), providing 4-(trifluoromethyl)biphenyl **2c** [2a] (22.6 mg, 0.102 mmol, 51% yield) as a white solid. ^{1}H NMR (300 MHz, CD_3COCD_3): δ 7.90 (d, *J* = 8.3 Hz, 2H), 7.81 (d, *J* = 8.3 Hz, 2H), 7.74 (dm, *J* = 7.6 Hz, 2H), 7.52 (t, *J* = 7.6 Hz, 2H), 7.44 (t, *J* = 7.4 Hz, 1H). ^{19}F NMR (282 MHz, CD_3COCD_3): -63.3 (s, 3F).



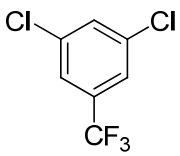
1-*tert*-Butyl-4-trifluoromethyl-benzene (**2b**) [2b]: Colorless oil. ^{1}H NMR (300MHz, $CDCl_3$): δ 7.55 (d, *J* = 8.3 Hz, 2H), 7.49 (d, *J* = 8.3 Hz, 2H), 1.34 (s, 9H). ^{19}F NMR (282MHz, $CDCl_3$): δ -62.0 (s, 3F).



1-Fluoro-4-(trifluoromethyl)benzene (**2d**) [2c]: ^{19}F NMR (282MHz, $CDCl_3$): -60.7 (s, 3F). GC-MS (m/z): 164.0 (t = 2.542 min).

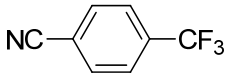


1-Chloro-4-(trifluoromethyl)benzene (**2e**) [2d]: Yellow oil. H NMR (300MHz, $CDCl_3$): δ 7.48 (d, *J* = 8.8 Hz, 2H), 7.41 (d, *J* = 8.8 Hz, 2H). ^{19}F NMR (282MHz, $CDCl_3$): δ -61.4 (s, 3F).

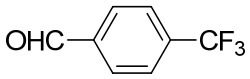


1,3-Dichloro-5-(trifluoromethyl)benzene (**2f**) [2e]: Colorless oil. H NMR (300MHz, $CDCl_3$): δ

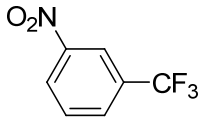
7.55 (s, 1H), 7.52 (s, 2H). ^{19}F NMR (282MHz, $CDCl_3$): -62.7 (s, 3F).



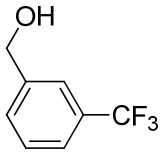
4-(Trifluoromethyl)benzonitrile (**2g**) [2d] : White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 7.75 (d, *J* = 8.5 Hz, 2H), 7.70 (d, *J* = 8.5 Hz, 2H). ^{19}F NMR (282MHz, $CDCl_3$): δ -63.9 (s, 3F).



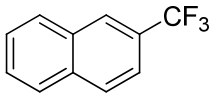
4-(Trifluoromethyl)benzaldehyde (**2h**) [2f]: Colorless oil. ^{1}H NMR (300MHz, $CDCl_3$): δ 10.09 (s, 1H), 8.00 (d, *J* = 7.9 Hz, 2H), 7.80 (d, *J* = 7.9 Hz, 2H). ^{19}F NMR (282MHz, $CDCl_3$): δ -62.7 (s, 3F).



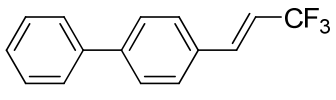
1-Nitro-3-(trifluoromethyl)benzene (**2i**) [2b]: Yellow oil. ^{1}H NMR (300MHz, $CDCl_3$): δ 8.53 (s, 1H), 8.45 (d, *J* = 8.3 Hz, 1H), 7.99 (d, *J* = 7.9 Hz), 7.75 (t, *J* = 8.1Hz, 1H). ^{19}F NMR (282MHz, $CDCl_3$): δ -62.6 (s, 3F).



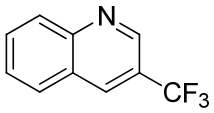
(3-(Trifluoromethyl)phenyl)methanol (**2j**) [2g]: Yellow oil. ^{1}H NMR (300MHz, $CDCl_3$): δ 7.64 (s, 1H), 7.56-7.54 (m, 2H), 7.47 (t, *J* = 7.4Hz, 1H), 4.76 (d, *J* = 5.4Hz, 2H), 1.91 (t, *J* = 5.4Hz, 1H). ^{19}F NMR (282MHz, $CDCl_3$): δ -62.4 (s, 3F).



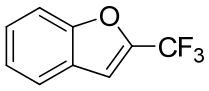
2-(Trifluoromethyl)naphthalene (**2k**) [2b]: White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 8.16 (s, 1H), 7.97-7.90 (m, 3H), 7.66-7.57 (m, 3H). ^{19}F NMR (282MHz, $CDCl_3$): δ -62.6 (s, 3F).



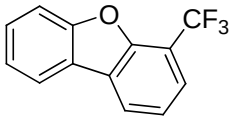
4-(3,3,3-Trifluoroprop-1-enyl)biphenyl (**2l**) [2h,2j]: White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 7.55 (m, 4H), 7.46 (d, *J* = 8.5Hz, 2H), 7.38 (tm, *J* = 7.7Hz, 2H), 7.31 (m, 1H), 7.12 (dq, *J* = 16.2Hz, *J* = 1.8Hz, 1H), 6.17 (dq, *J* = 16.1Hz, *J* = 6.5Hz, 1H). ^{19}F NMR (282MHz, $CDCl_3$): δ -63.6 (d, *J* = 6.5Hz, 3F).



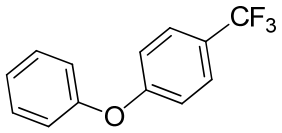
3-(Trifluoromethyl)quinoline (**2m**) [2i]: White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 9.11 (d, *J* = 1.5 Hz, 1H), 8.46 (s, 1H), 8.20 (d, *J* = 8.5 Hz, 1H), 7.94 (d, *J* = 8.1 Hz, 1H), 7.87 (tm, *J* = 7.2Hz, 1H), 7.68 (t, *J* = 7.2Hz, 1H). ^{19}F NMR (282MHz, $CDCl_3$): δ -61.4 (s, 3F).



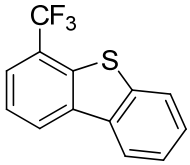
2-(Trifluoromethyl)benzofuran (**2n**) [2b]: Colorless oil. ^{1}H NMR (300MHz, $CDCl_3$): δ 7.68 (d, *J* = 7.9Hz, 1H), 7.58 (dm, *J* = 8.3Hz, 1H), 7.45 (tm, *J* = 7.7Hz, 1H), 7.34 (tm, *J* = 7.2Hz, 1H), 7.18 (m, 1H). ^{19}F NMR (282MHz, $CDCl_3$): δ -65.2 (s, 3F).



4-(Trifluoromethyl)dibenzo[b,d]furan (**2o**) [2j]: White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 8.13 (d, *J* = 7.7 Hz, 1H), 7.98 (d, *J* = 7.5 Hz, 1H), 7.70 (d, *J* = 7.7 Hz, 1H), 7.67 (d, *J* = 8.5 Hz, 1H), 7.53 (t, *J* = 7.8 Hz, 1H), 7.45-7.38 (m, 2H). ^{19}F NMR (282MHz, $CDCl_3$): δ -60.8 (s, 3F).



1-Phenoxy-4-(trifluoromethyl)benzene (**2p**) [2k]: White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 7.53 (d, *J* = 8.7 Hz, 2H), 7.36 (t, *J* = 7.5 Hz, 2H), 7.15-7.05 (m, 5H). ^{19}F NMR (282MHz, $CDCl_3$): δ -61.6 (s, 3F).



4-(Trifluoromethyl)dibenzo[b,d]thiophene (**2q**): White solid. ^{1}H NMR (300MHz, $CDCl_3$): δ 8.21 (d, *J* = 7.9Hz, 1H), 8.08 (m, 1H), 7.78 (m, 1H), 7.67 (d, *J* = 7.7Hz, 1H), 7.42(m, 3H). ^{19}F NMR (282MHz, $CDCl_3$): δ -62.7 (s, 3F). ^{13}C NMR (100MHz, $CDCl_3$): δ 139.5 (q, *J* = 1.5Hz), 137.4, 136.4, 134.3, 127.6, 125.2 (q, *J* = 33Hz), 124.8, 124.7, 124.3 (q, *J* = 5.2 Hz), 124.3, 124.2 (q, *J* = 273Hz), 122.6, 121.7. EI (m/z, %): 253 (14.7), 252 (100), 251 (14.0), 233 (12.1), 202 (9.4), 184 (52.2), 139 (18.1), 126 (10.0). IR (KBr): 1455, 1445, 1403, 1335, 1302, 1254, 1200, 1174, 1133, 1108, 1074, 1030, 799, 748 cm^{-1}. HRMS for $C_{13}H_7F_3S$: 252.0221; Found: 252.0223.

References

(1) (a) E. Magnier, J. C. Blazejewski, M. Tordeux and C. Wakselman, *Angew. Chem. Int. Ed.* 2006, **45**, 1279; (b) Y. Mace, B. Raymondeau, C. Pradet, J. -C. Blazejewski and E. Magnier, *Eur. J. Org. Chem.* 2009, 1390; (c) C. -P. Zhang, H. -P. Cao, Z. -L. Wang, C. -T. Zhang, Q. -Y. Chen and J. -C. Xiao, *Synlett.* 2010, **7**, 1089; (d) C. -P. Zhang, Z. -L. Wang, Q. -Y. Chen, C. -T. Zhang, Y. -C. Gu and J. -C. Xiao, *Angew. Chem. Int. Ed.* 2011, **50**, 1896.
(2) (a) S. Gao, Z. Zheng, L. Jian and R. Cao, *Chem. Commun.* 2010, **46**, 7584; (b) L. Chu and F. -L. Qing, *Org. Lett.* 2010, **12**, 5060; (c) D. Naumann and J. Kischkewitz, *J. Fluorine Chem.* 1990, **47**, 283; (d) M. Oishi, H. Kondo and H. Amii, *Chem. Commun.* 2009, 1909; (e) J. M. Paratian, E. Labbe, S. Sibille and J. Perichon, *J. Organomet. Chem.* 1995, **489**, 137; (f) P. V. Ramachandran and A. Chatterjee, *Org. Lett.* 2008, **10**, 1195; (g) K. Miyamoto, N. Tada and M. Ochiai, *J. Am. Chem. Soc.* 2007, **129**, 2772; (h) S. Furuta and T. Hiyama, *Synlett* 1996, 1199; (i) J. M. Paratian, S. Sibille and J. Perichon, *J. Chem. Soc. Chem. Commun.* 1992, 53; (j) J. Xu, D. -F. Luo, B. Xiao, Z. -J. Liu, T. -J. Gong, Y. Fu and L. Liu, *Chem. Commun.* 2011, 4300; (k) T. D. Senecal, A. T. Parsons and S. L. Buchwald, *J. Org. Chem.* 2011, **76**, 1174.

^{19}F NMR and MS Analysis of Reaction Mixtures

The NMR experiments listed in Table 1 were run directly without any further purification of the reaction mixtures. All the experiments were done in the reaction solvents, using $[OTf]^-$ (from $[Ph_2SCF_3]^+[OTf]^-$) as the internal standard.

Table 1, entry 1 (^{19}F NMR in DMF)

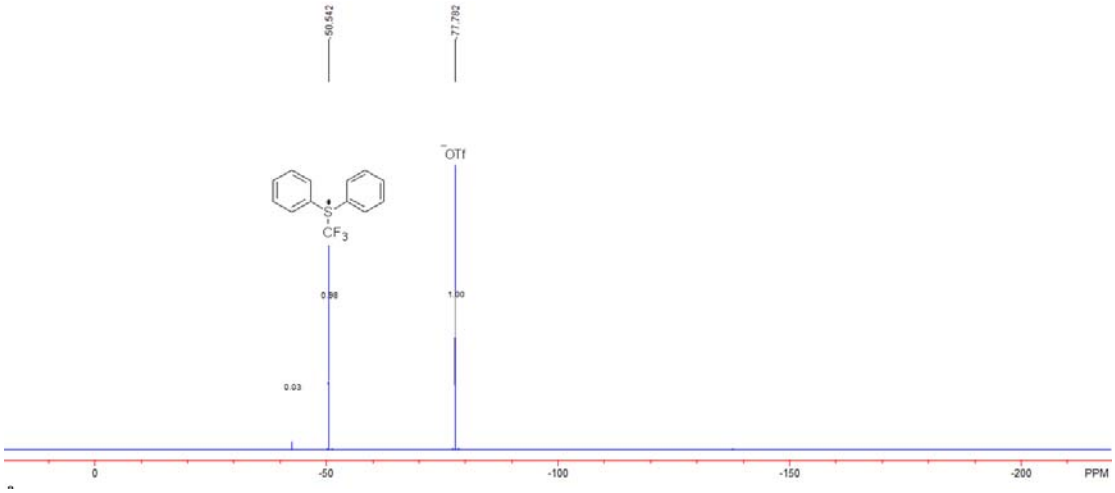


Table 1, entry 2 (^{19}F NMR in DMF)

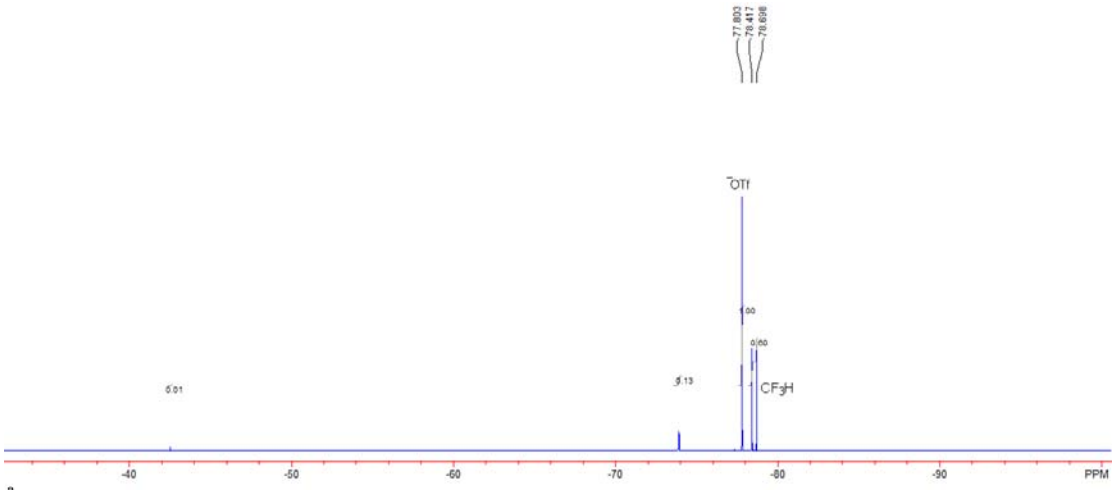


Table 1, entry 3 (^{19}F NMR in DMF)

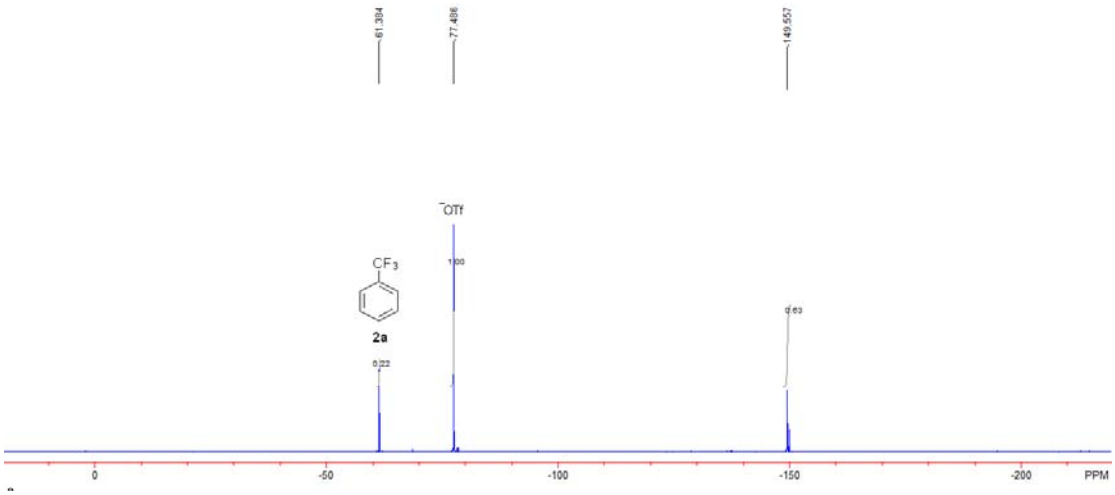


Table 1, entry 4 (^{19}F NMR in DMF)

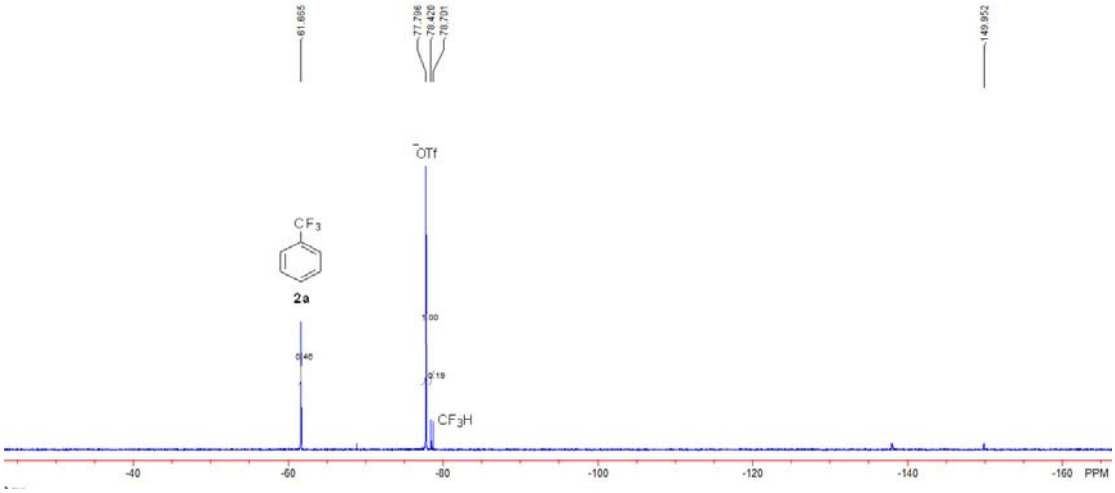


Table 1, entry 5 (^{19}F NMR in DMF)

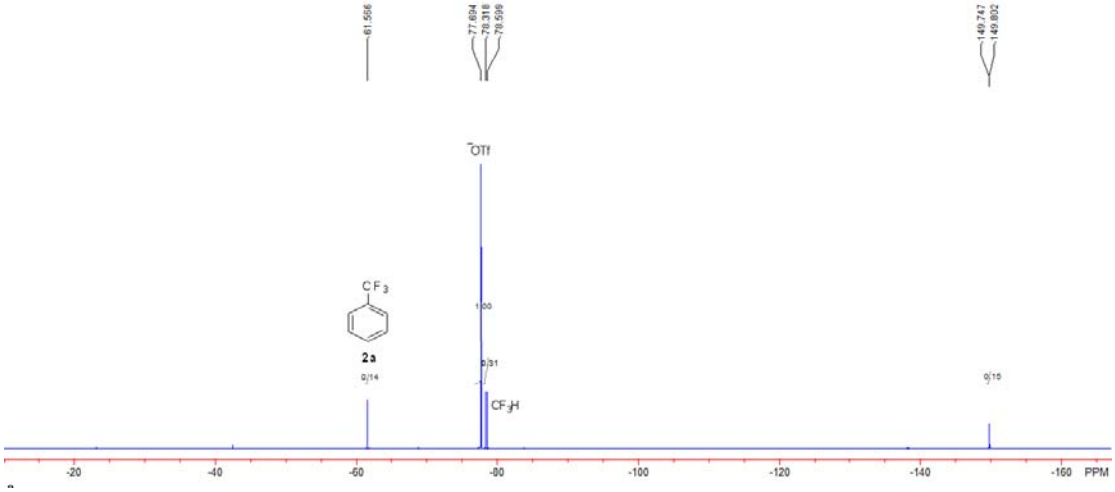


Table 1, entry 6 (^{19}F NMR in DMF)

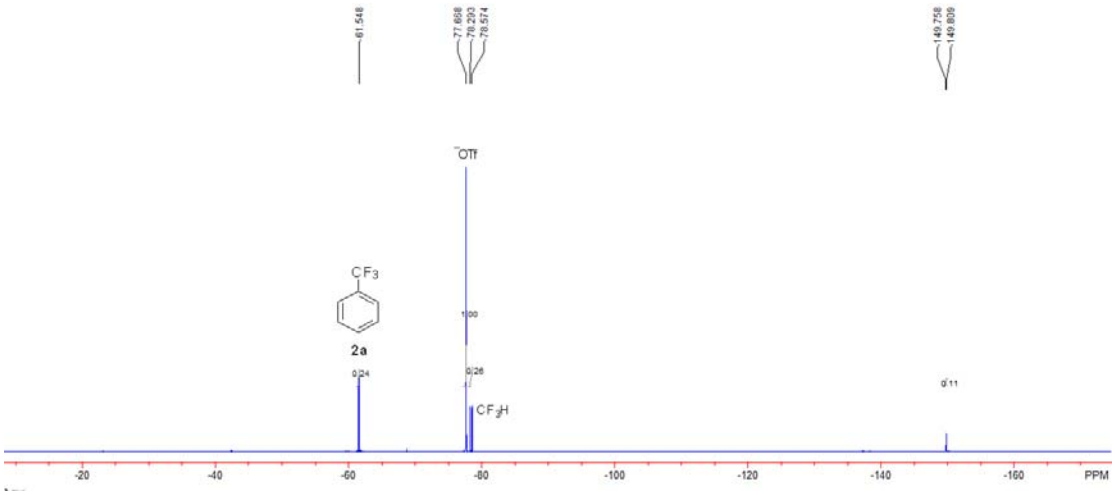


Table 1, entry 7 (^{19}F NMR in DMF)

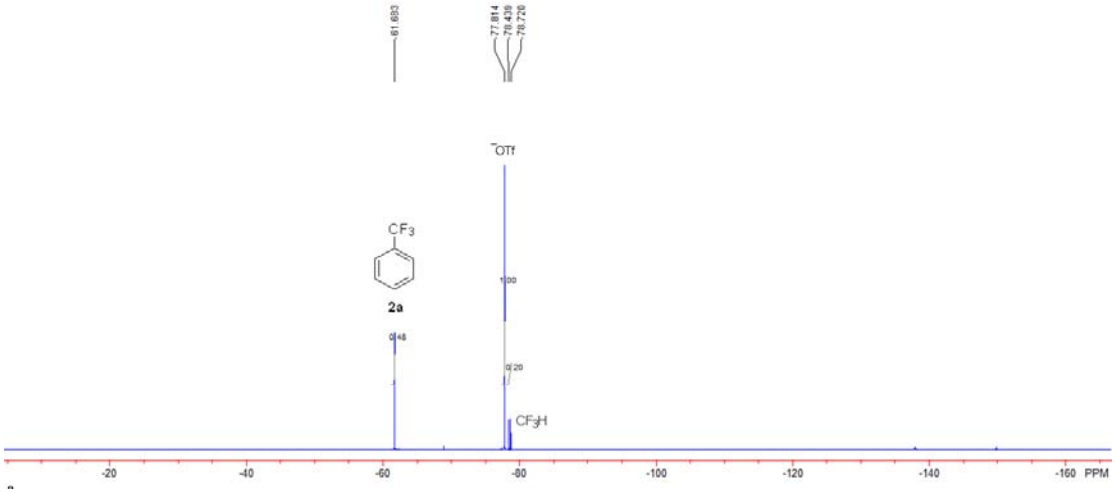


Table 1, entry 8 (^{19}F NMR in DMF)

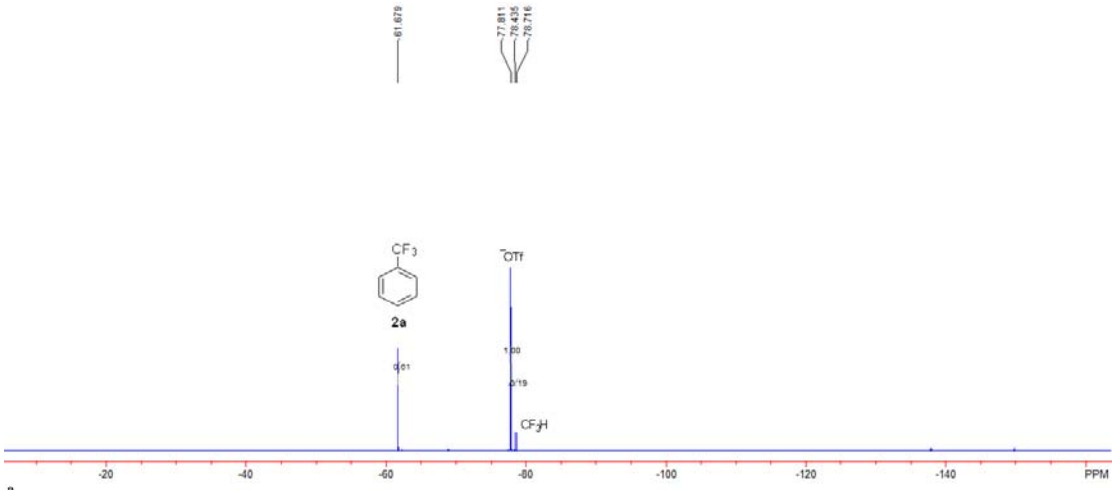


Table 1, entry 9 (^{19}F NMR in DMF)

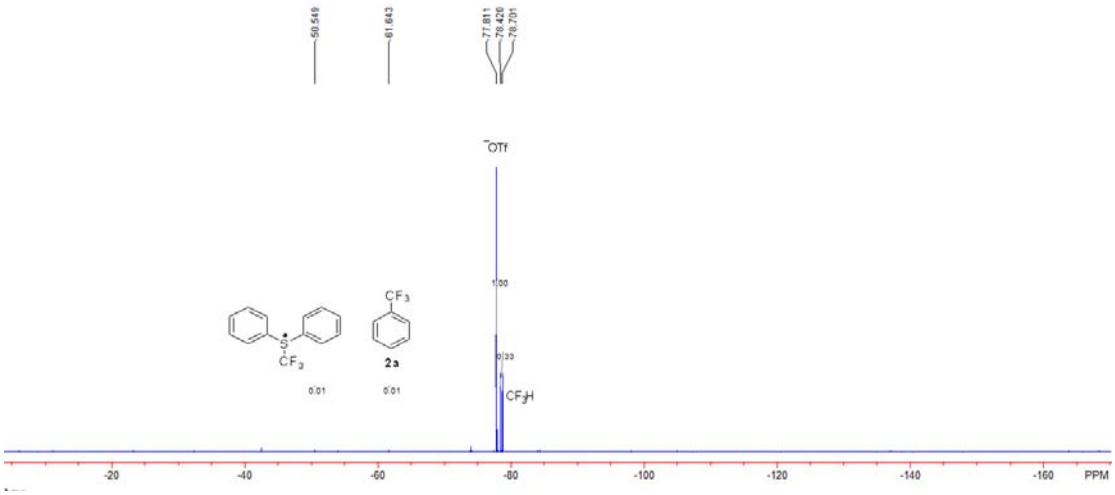


Table 1, entry 10 (^{19}F NMR in CH_3CN)

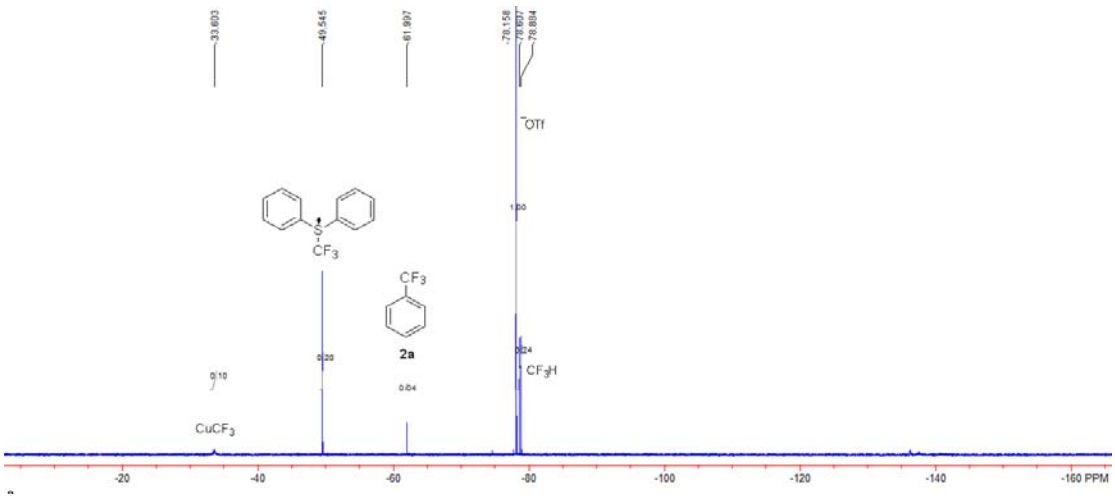


Table 1, entry 11 (^{19}F NMR in DCM)

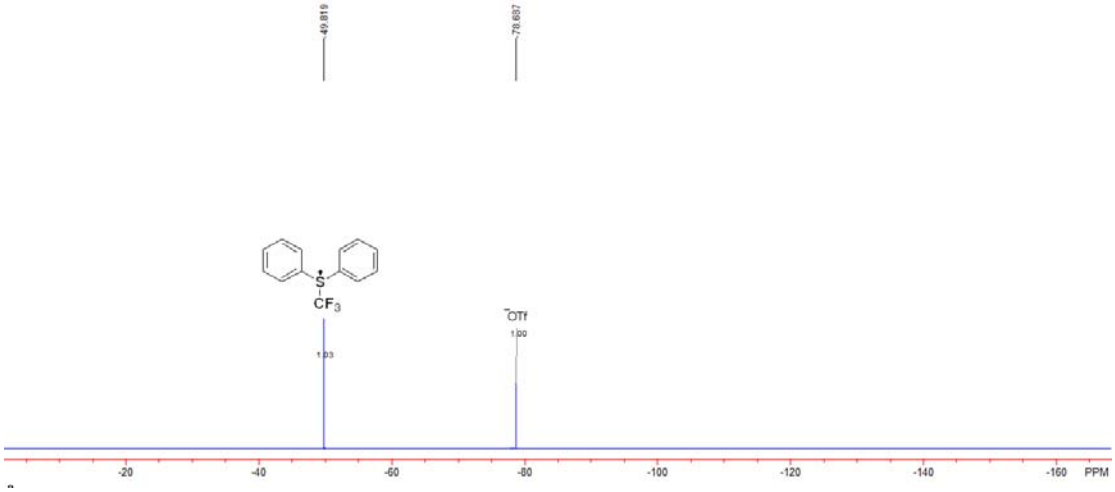


Table 1, entry 12 (^{19}F NMR in DMSO)

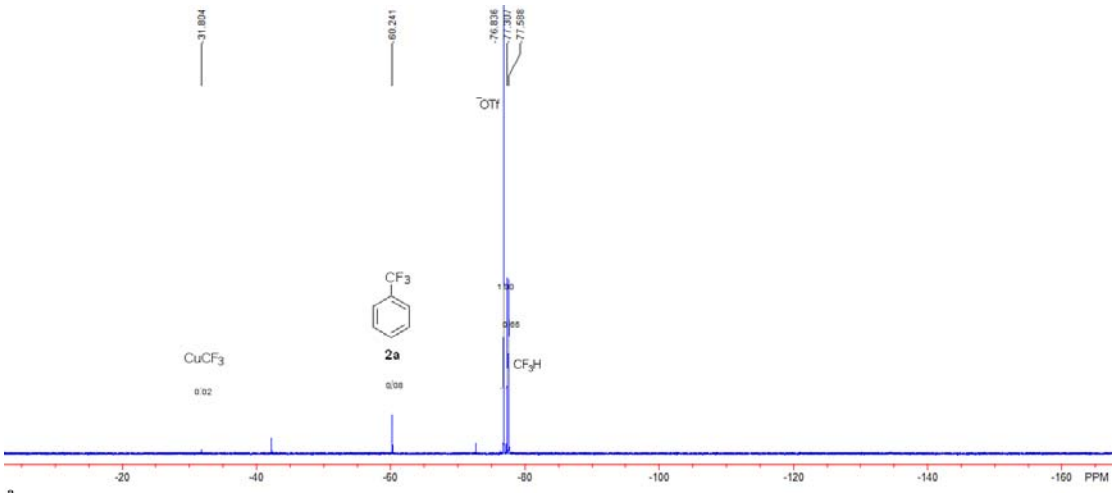


Table 1, entry 13 (^{19}F NMR in THF)

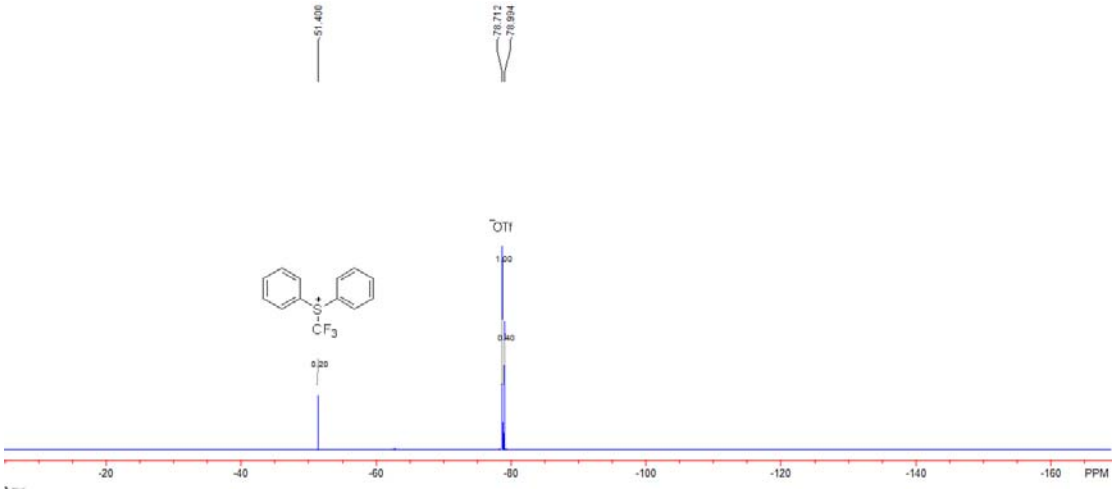


Table 1, entry 14 (^{19}F NMR in DMF)

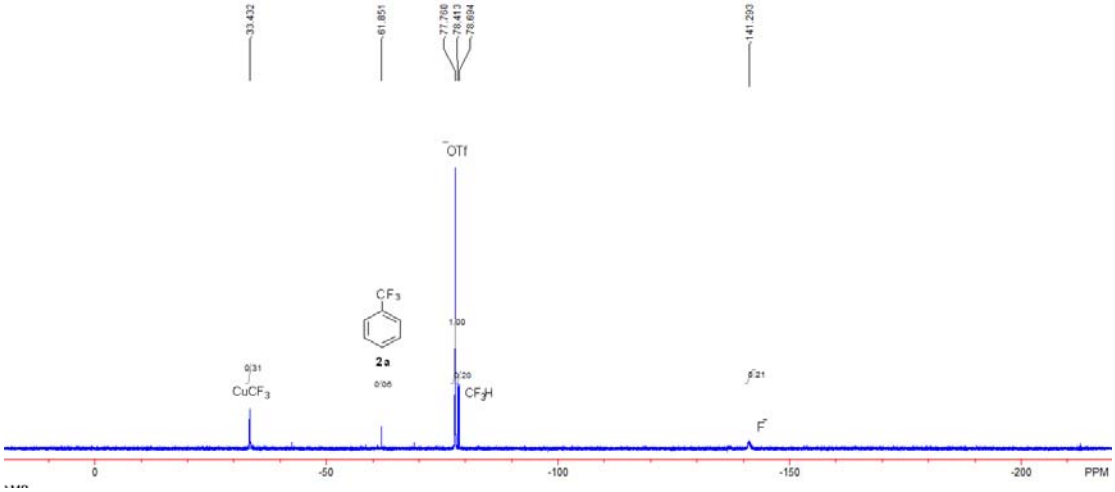


Table 1, entry 15 (^{19}F NMR in DMF)

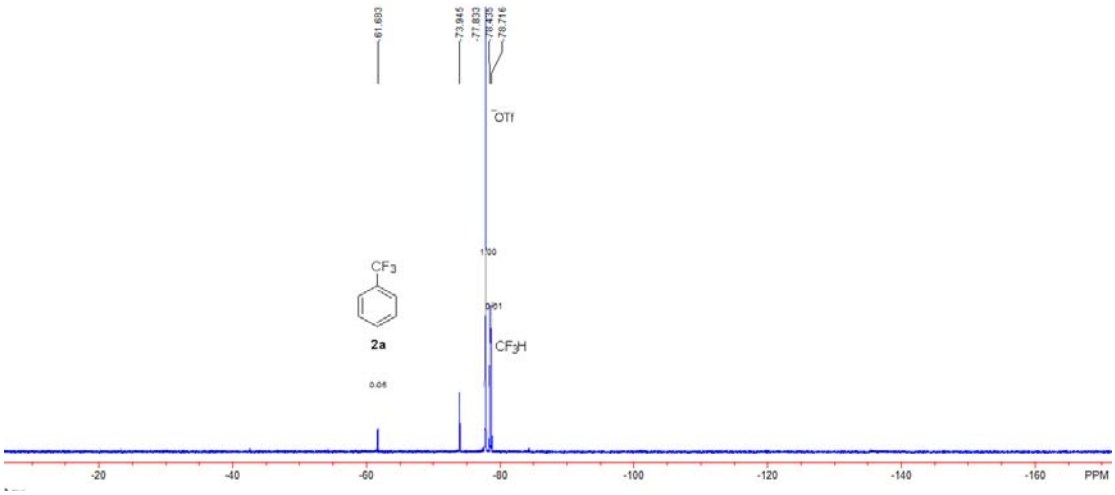


Table 1, entry 16 (^{19}F NMR in DMF)

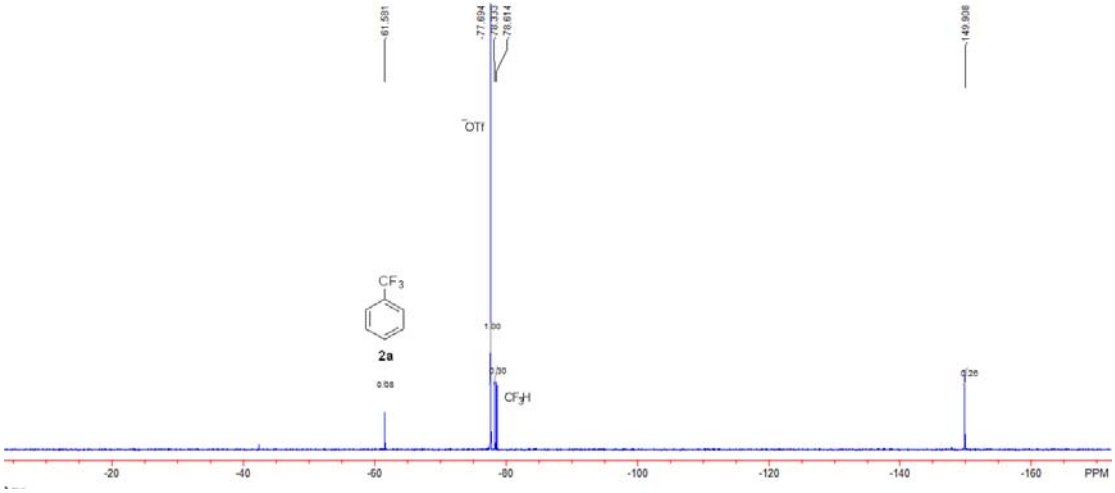


Table 1, entry 17 (^{19}F NMR in DMF)

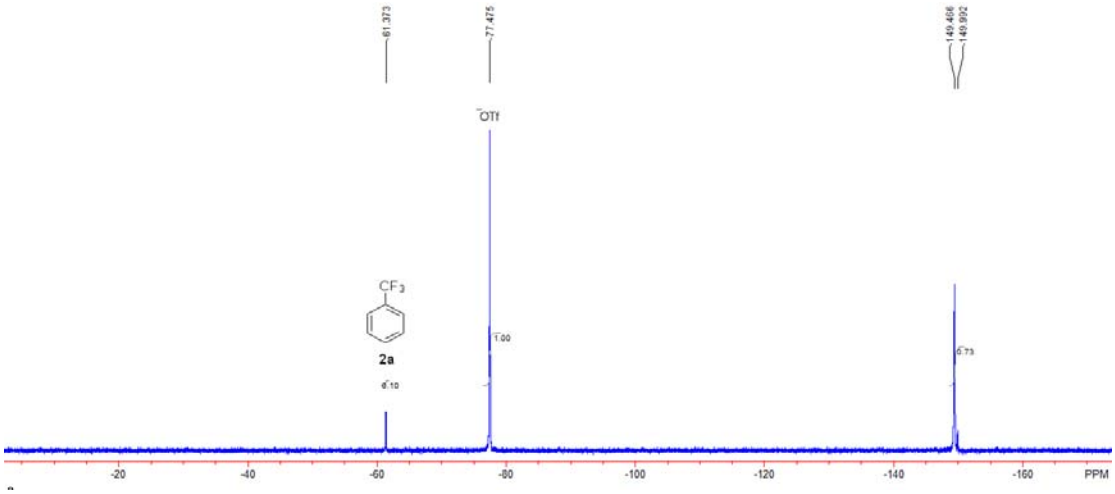


Table 1, entry 18 (^{19}F NMR in DMF)

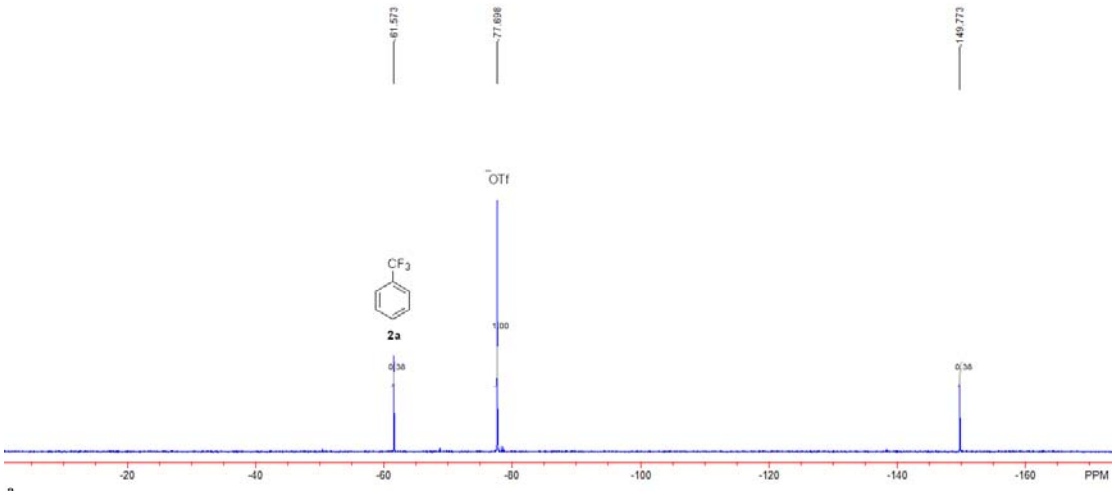


Table 1, entry 19 (^{19}F NMR in DMF)

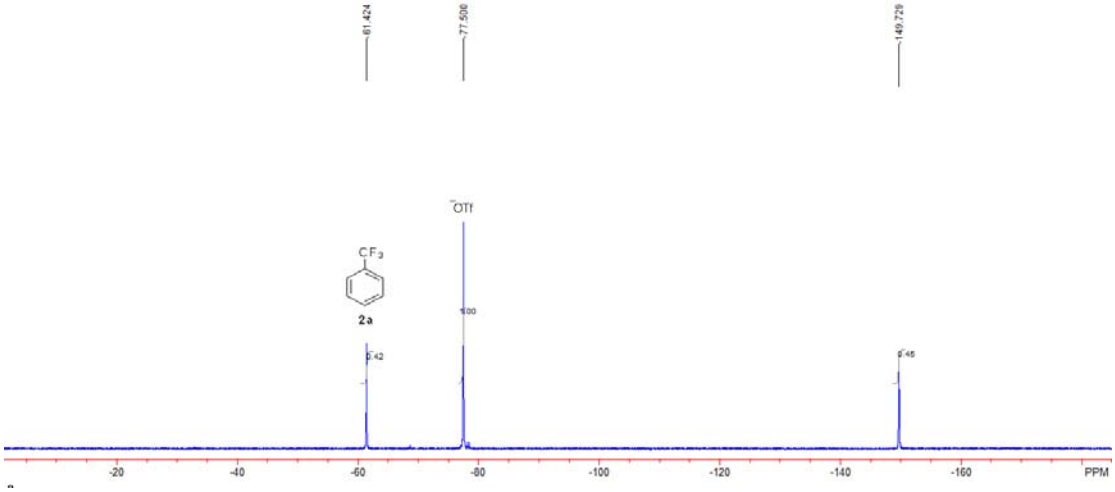
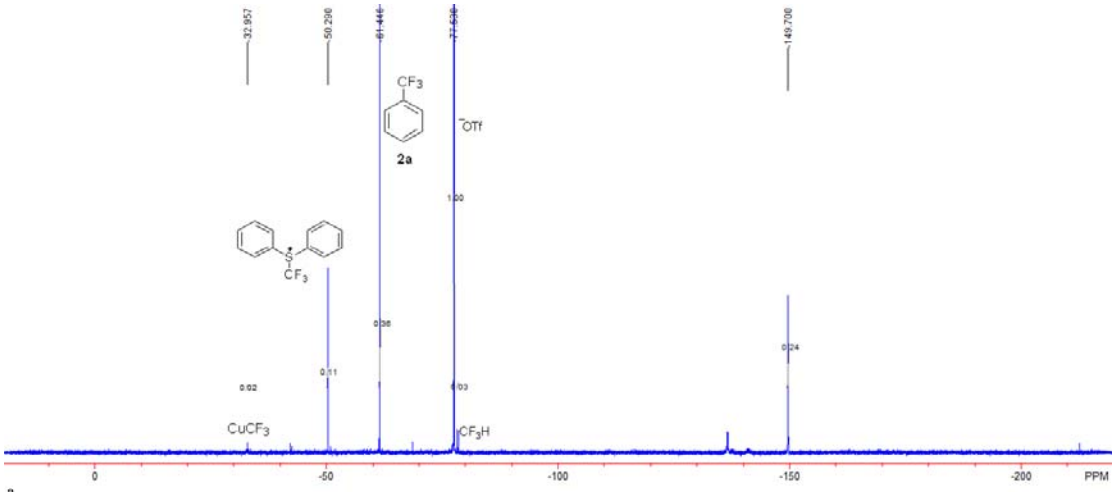


Table 1, entry 20 (^{19}F NMR in DMF)



MS analysis of the reaction mixture (Table 1, entry 20)

MSD1 SPC, scan=38, time=0.636 of 2010753-1.D
数据文件: : D:\DATA\2010753-1.D
样品名称 :

操作者 :
仪器 : 仪器 1 位置 : 样品瓶 21
进样日期 : 2011-4-18 10:41:45 进样次数 : 1
进样量 : 3.0 μl

采集方法 : D:\METHOD\STANDBY.M
最后修改 : 2011-4-18 10:40:46
(调用后修改)
分析方法 : D:\METHOD\STANDBY.M
最后修改 : 2011-3-24 9:35:16

ES-API, Pos, Scan, Frag: 70

ESI

m/z	丰度	m/z	丰度	m/z	丰度
44.20	0.2	188.00	0.1	291.90	0.1
46.10	2.0	189.10	0.1	296.90	0.1
47.00	0.1	194.90	1.2	297.80	0.1
58.10	1.2	195.70	0.1	298.80	0.1
59.00	0.1	196.80	0.2	301.00	0.5
62.90	0.1	199.80	0.1	302.10	0.1
65.00	0.3	200.10	0.1	303.00	0.2
73.10	18.6	201.90	0.1	304.00	0.1
74.10	1.4	209.00	15.8	305.90	0.3
75.00	0.1	210.00	1.0	307.90	0.2
80.10	0.2	211.00	7.3	309.90	0.1
90.10	0.1	212.00	0.5	317.00	0.1
96.10	100.0	212.90	0.1	322.00	0.3
97.10	3.7	214.30	0.1	322.80	0.1
98.20	0.2	215.20	0.1	323.80	0.1
100.40	0.1	216.10	0.1	324.70	0.1
100.90	0.2	216.80	0.1	325.10	0.1
119.10	0.1	217.30	0.1	326.90	0.3
121.60	0.2	218.00	0.2	328.10	0.1
122.10	0.1	220.30	0.1	329.00	0.1
131.90	2.3	224.00	0.1	331.00	1.4
134.00	1.1	225.00	0.1	331.90	0.4
134.90	0.1	226.10	0.1	333.00	0.1
136.00	0.1	228.00	5.5	337.90	0.1
137.10	0.1	229.00	0.4	340.60	0.1
138.20	0.1	230.00	2.2	341.10	0.1
138.70	0.1	231.00	0.2	342.80	0.1
139.40	0.1	232.10	0.1	345.10	0.1
141.10	7.2	252.80	0.1	350.10	0.1
142.00	3.4	255.00	94.0	351.90	0.1
145.00	1.7	256.00	13.6	357.90	11.9
145.80	0.1	257.00	5.4	358.90	1.4
146.90	0.8	258.00	0.7	359.90	6.4
148.10	0.1	259.20	0.1	361.00	0.7
149.10	0.1	262.10	0.1	362.00	0.4
149.80	0.1	263.00	2.3	363.00	0.4
153.30	0.1	264.10	0.6	364.20	0.1
164.00	4.4	264.90	0.2	366.10	0.1
164.90	0.3	265.20	0.2	366.90	0.2
165.90	1.9	265.90	0.1	368.90	0.1
166.80	0.1	267.90	0.8	370.20	0.1
169.10	2.3	269.00	4.4	388.80	0.2
170.10	0.1	270.00	0.8	390.00	0.1
177.00	6.6	271.00	0.3	390.90	0.1
177.90	0.6	283.10	3.6	391.80	0.1
179.00	2.9	284.00	0.7	393.00	0.1
180.00	0.3	284.90	0.4	400.00	0.3
180.90	0.4	286.10	0.0	401.80	0.2
183.00	0.2	287.00	0.2	420.80	0.1
186.00	3.1	289.90	0.1	423.00	0.1
187.10	0.5	290.60	0.1	426.20	0.1

仪器 1 2011-4-20 15:33:40 页 1/2

MSD1 SPC, scan=35, time=0.619 of 2010753-1-N.D
数据文件: : D:\DATA\2010753-1-N.D
样品名称 :

操作者 :
仪器 : 仪器 1 位置 : 样品瓶 21
进样日期 : 2011-4-18 15:36:55 进样次数 : 1
进样量 : 5.0 μl

采集方法 : D:\METHOD\STANDBY.M
最后修改 : 2011-4-18 15:36:03
(调用后修改)
分析方法 : D:\METHOD\STANDBY.M
最后修改 : 2011-3-24 9:35:16

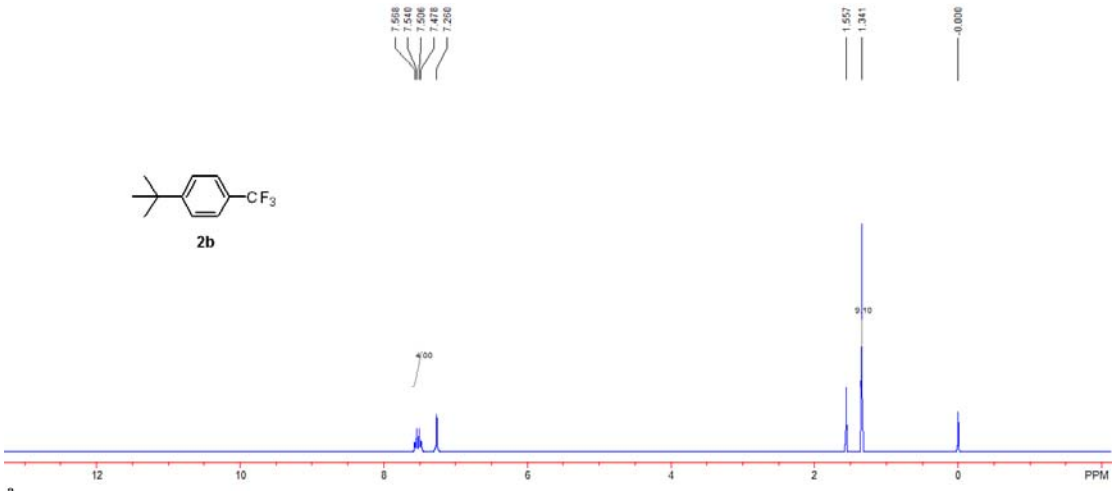
ES-API . Neg . Scan

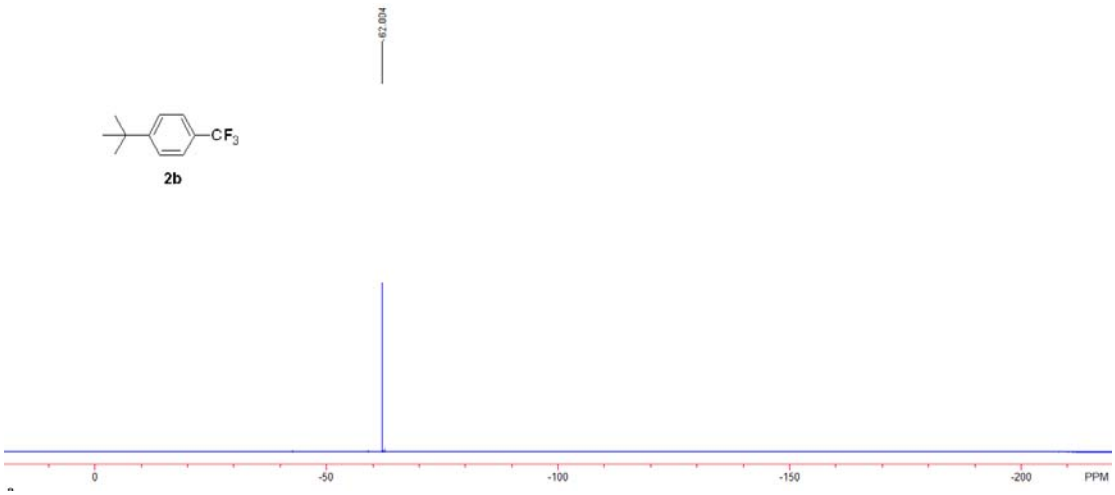
m/z	丰度	m/z	丰度	m/z	丰度
79.90	0.6	492.80	1.8	912.80	0.2
87.00	0.2	493.60	0.2	914.30	0.2
98.20	0.3	494.90	0.2	914.70	0.2
99.10	1.1	509.80	5.9	916.40	0.2
111.00	0.2	510.60	0.4		
149.00	100.0	511.80	3.3		
150.00	2.3	512.60	0.2		
151.00	5.3	513.70	0.6		
200.80	1.4	523.70	0.2		
202.80	0.4	534.80	0.3		
249.80	0.5	539.70	0.2		
251.80	0.5	551.80	1.1		
263.80	0.2	553.60	0.9		
269.90	1.6	582.10	0.2		
271.00	0.8	593.80	0.2		
271.80	0.4	595.80	0.1		
280.90	0.5	610.80	0.2		
281.80	0.2	612.60	0.3		
282.90	0.4	622.70	0.2		
320.90	11.4	624.60	0.2		
321.90	0.4	636.50	0.2		
322.80	1.3	664.80	0.6		
338.90	28.8	665.60	0.2		
339.80	1.2	666.70	0.2		
340.90	13.9	681.70	2.4		
341.80	0.7	682.70	0.4		
343.90	14.9	683.80	1.1		
344.80	1.1	684.50	0.2		
346.00	1.6	685.80	0.2		
349.90	0.3	723.70	0.5		
360.80	1.3	725.70	0.3		
362.90	0.9	740.60	0.7		
379.80	4.6	742.60	0.5		
380.80	0.2	744.50	0.2		
381.80	3.1	752.80	0.3		
383.90	0.2	754.70	0.4		
391.70	0.3	756.40	0.1		
393.80	0.2	765.60	0.1		
414.80	0.2	782.40	0.1		
418.80	0.8	836.50	0.2		
420.80	0.2	837.00	0.2		
421.60	0.2	853.70	0.5		
422.70	0.2	855.60	0.4		
441.70	0.1	857.60	0.2		
442.80	0.3	870.20	0.3		
443.10	0.3	870.60	0.4		
470.70	0.5	872.60	0.4		
471.90	1.5	874.40	0.2		
472.80	0.4	874.70	0.2		
473.20	0.3	895.60	0.3		
473.90	0.8	897.50	0.2		

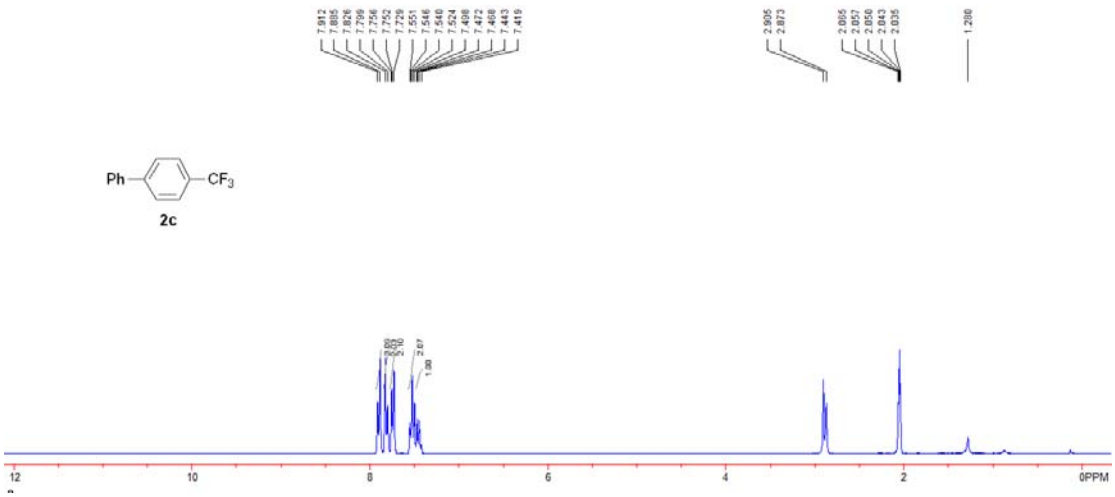
ESI

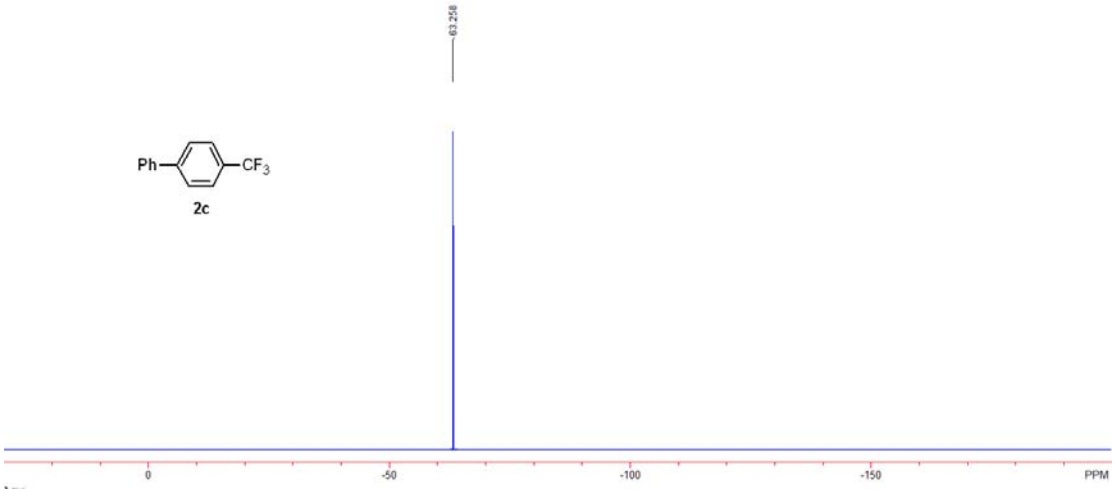
仪器 1 2011-4-20 15:34:38 页 1/1

Copies of NMR Spectra for 2b-q





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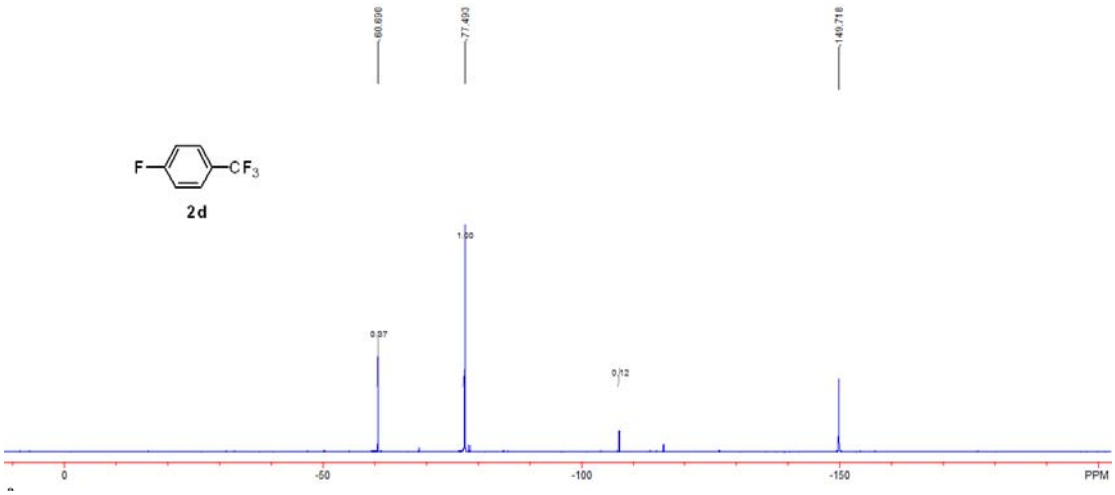
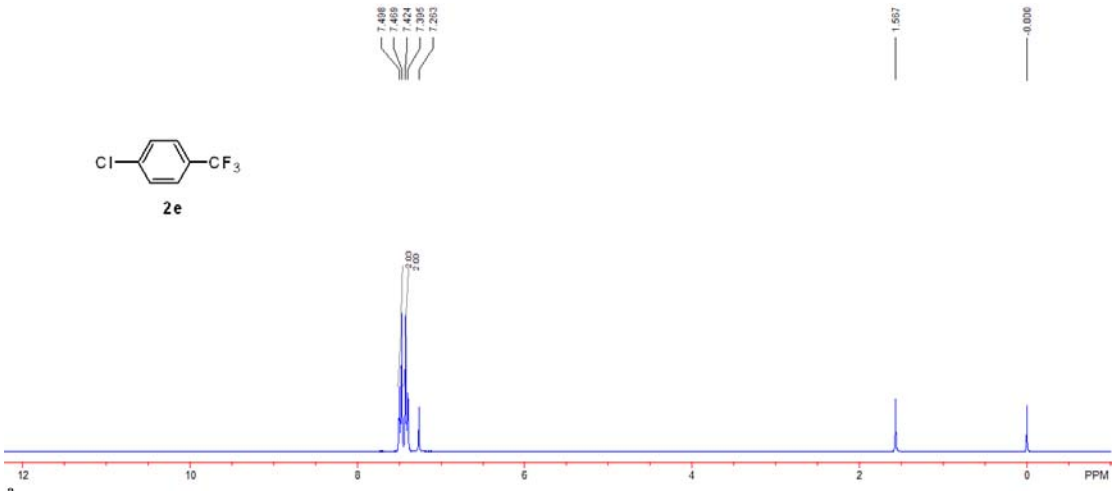
Ph
CF3
0
-50
-100
-150
PPM

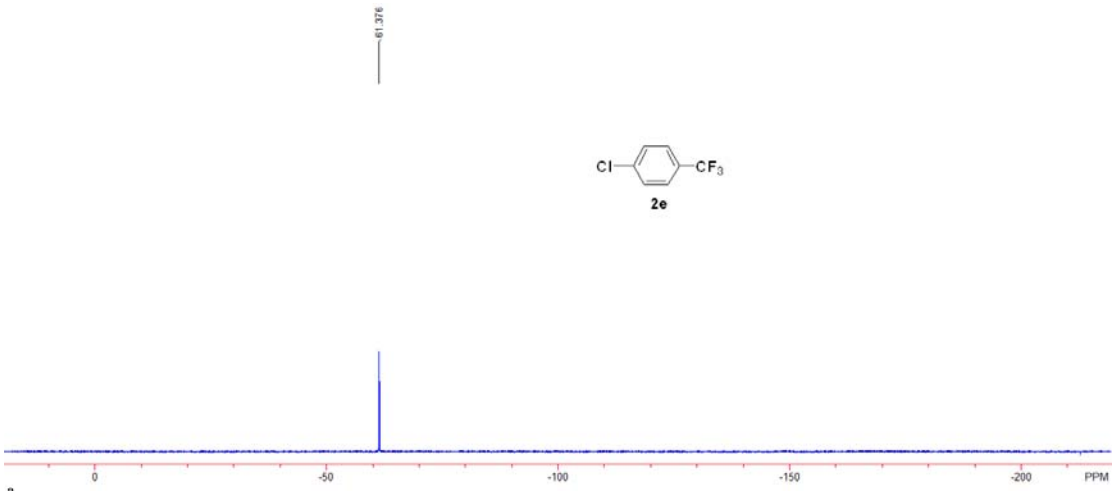
2c


60.696
77.493
140.718
F
CF3
1.00
0.97
0.12
0
-50
-100
-150
PPM

2d


7.498
7.489
7.424
7.395
7.293
1.567
-0.000
Cl
CF3
2.03
2.00
12
10
8
6
4
2
0
PPM

2e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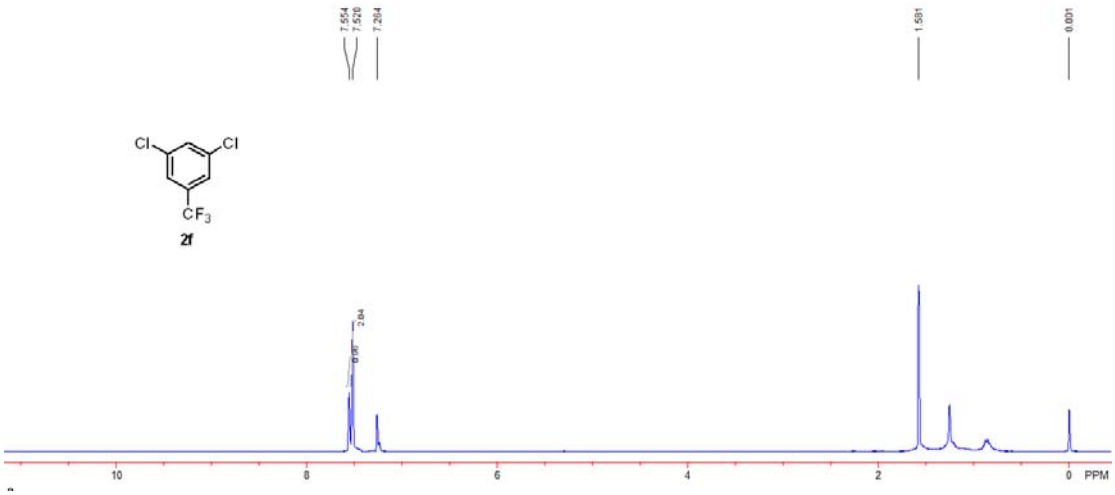
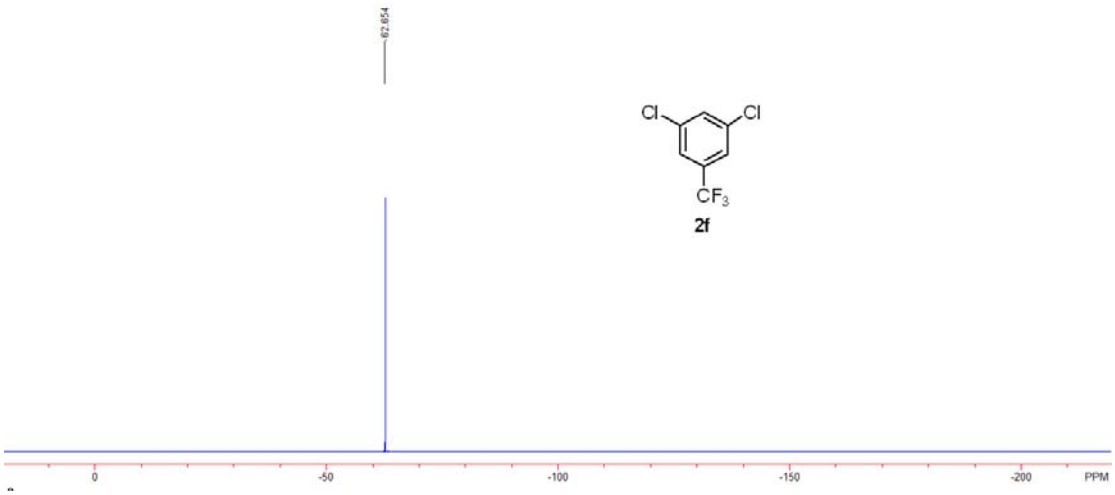
Cl
CF3
2e
0
-50
-100
-150
-200
PPM


7.554
7.526
7.264
1.591
0.601
Cl
Cl
CF3
2f
10
8
6
4
2
0
PPM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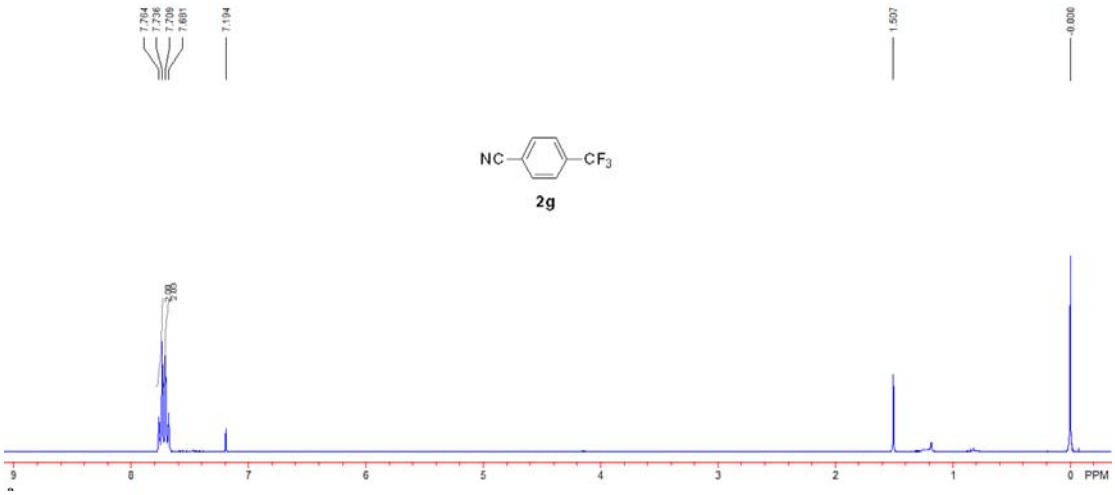
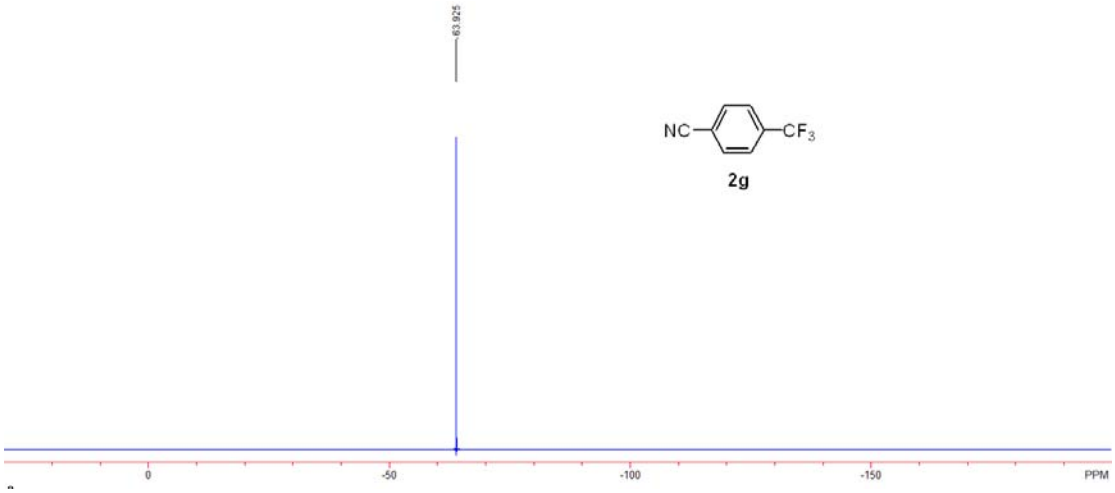
Cl
Cl
CF3
2f
0
-50
-100
-150
-200
PPM


7.764
7.736
7.709
7.691
7.194
1.507
0.000
NC
CF3
2g
2.08
2.05
9
8
7
6
5
4
3
2
1
0
PPM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NC
CF3
2g
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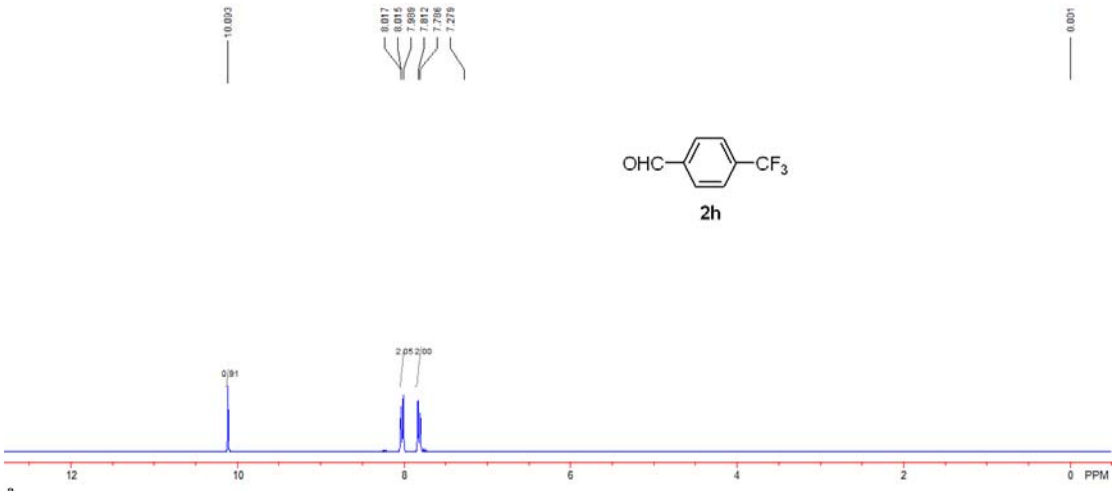
-100
-150
PPM


10.093
8.017
8.015
7.999
7.812
7.706
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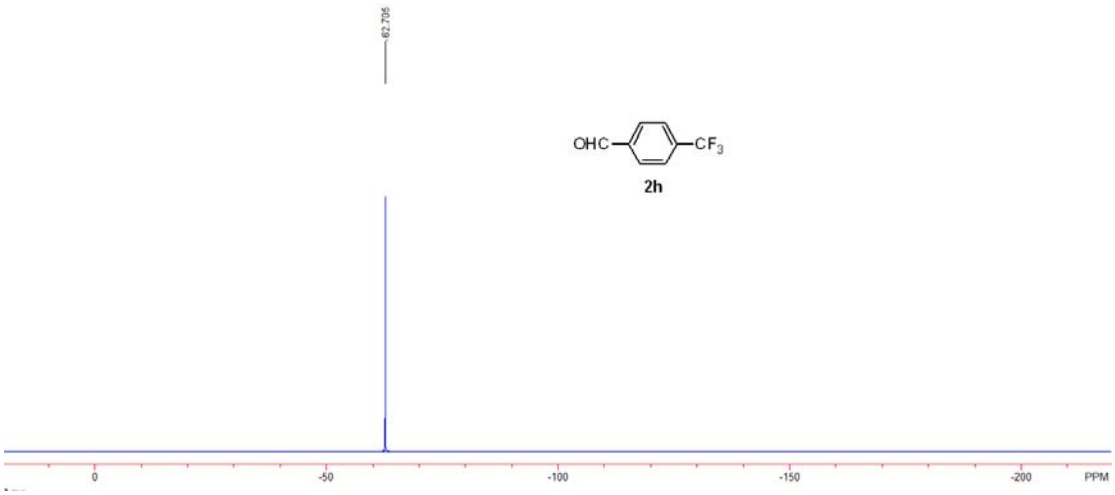
0.001
OHC
CF3
2h
0.91
2.05
2.00
12
10
8
6
4
2
0
PPM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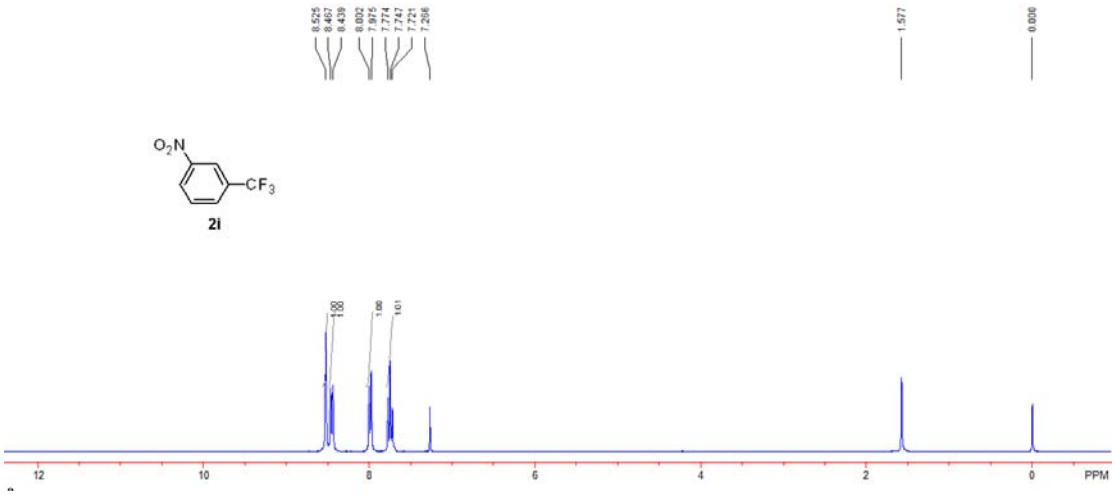
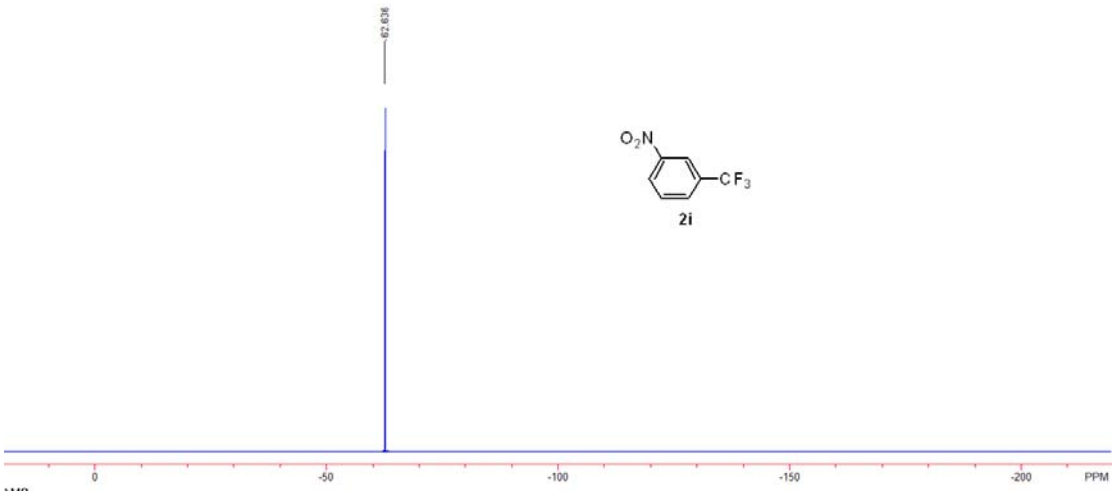
-200
PPM


8.525
8.467
8.439
8.002
7.975
7.774
7.747
7.721
7.256
1.577
0.000
O2N
CF3
2i
1.00
1.06
1.01
12
10
8
6
4
2
0
PPM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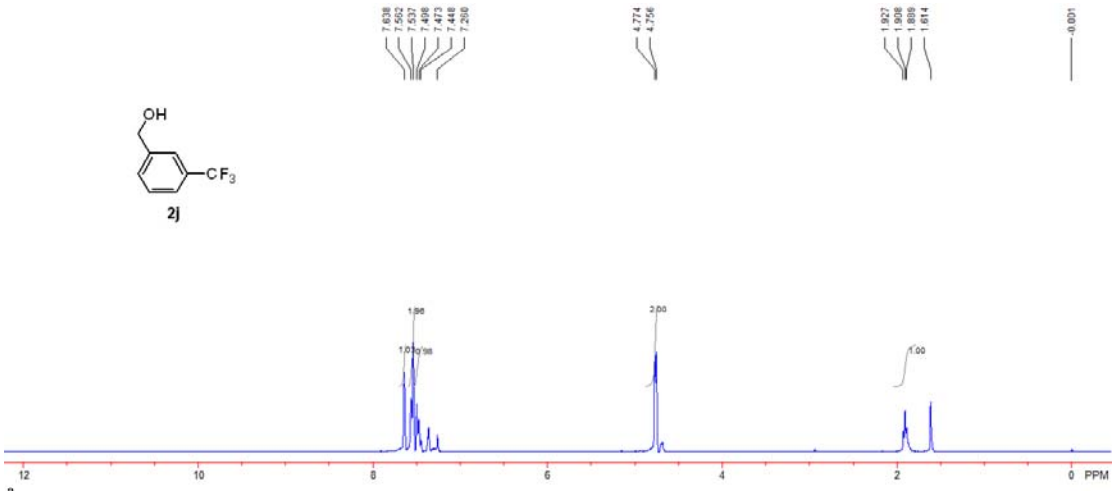
O2N
CF3
2i
0
-50
-100
-150
-200
PPM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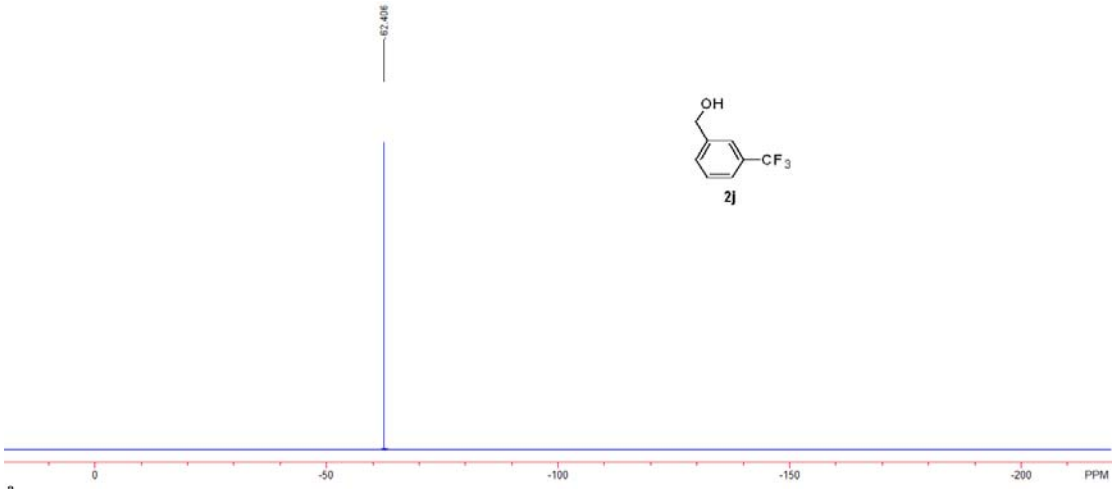
7.592
7.537
7.498
7.473
7.448
7.290
4.774
4.756
1.927
1.908
1.899
1.614
-0.001
OH
CF3
2j
1.86
1.00
2.00
1.00
12
10
8
6
4
2
0
PPM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CF3
2j
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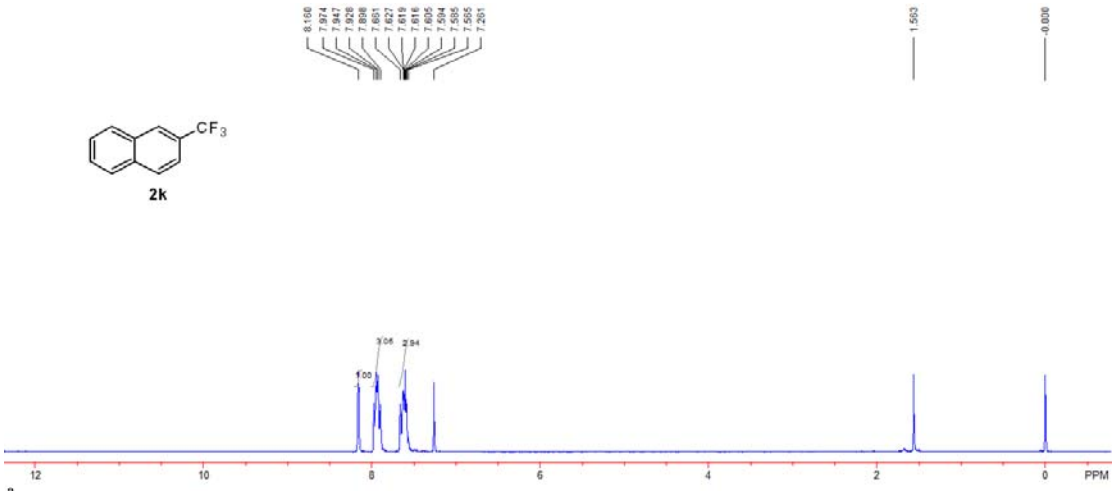
-100
-150
-200
PPM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7.947
7.928
7.898
7.651
7.627
7.619
7.616
7.605
7.594
7.585
7.565
7.261
1.563
-0.000
CF3
2k
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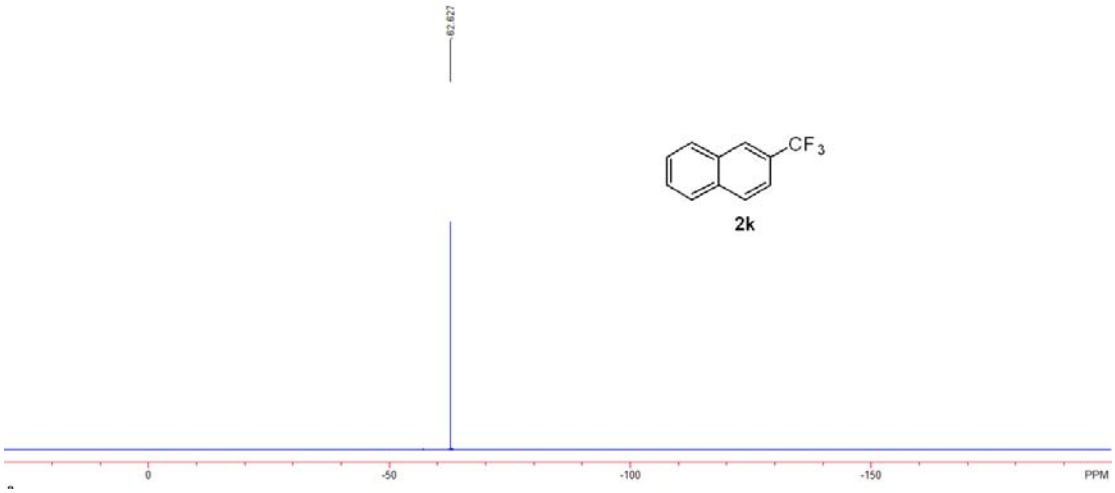
2.94
1.00
12
10
8
6
4
2
0
PPM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2k
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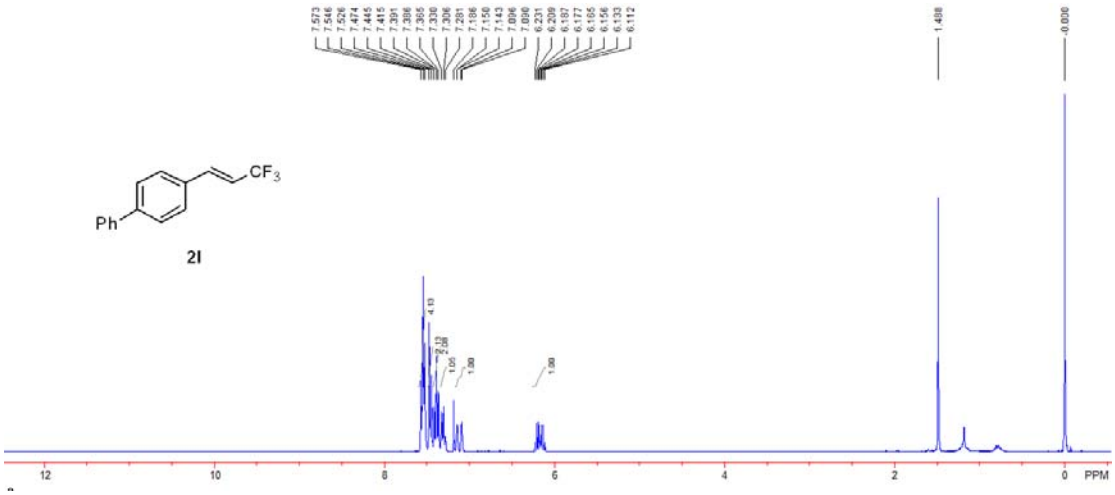
-150
PPM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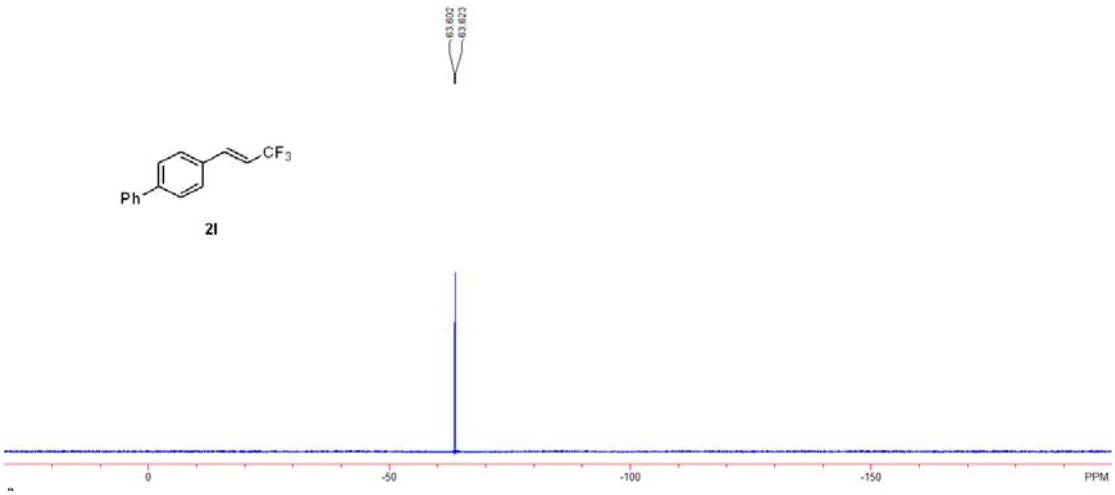
7.526
7.474
7.445
7.415
7.391
7.386
7.365
7.330
7.306
7.281
7.186
7.156
7.143
7.096
7.090
6.231
6.209
6.197
6.177
6.165
6.156
6.133
6.112
1.488
0.000
4.19
2.28
2.28
1.05
1.00
1.00
CF3
Ph
2l
12
10
8
6
4
2
0
PPM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-100
-150
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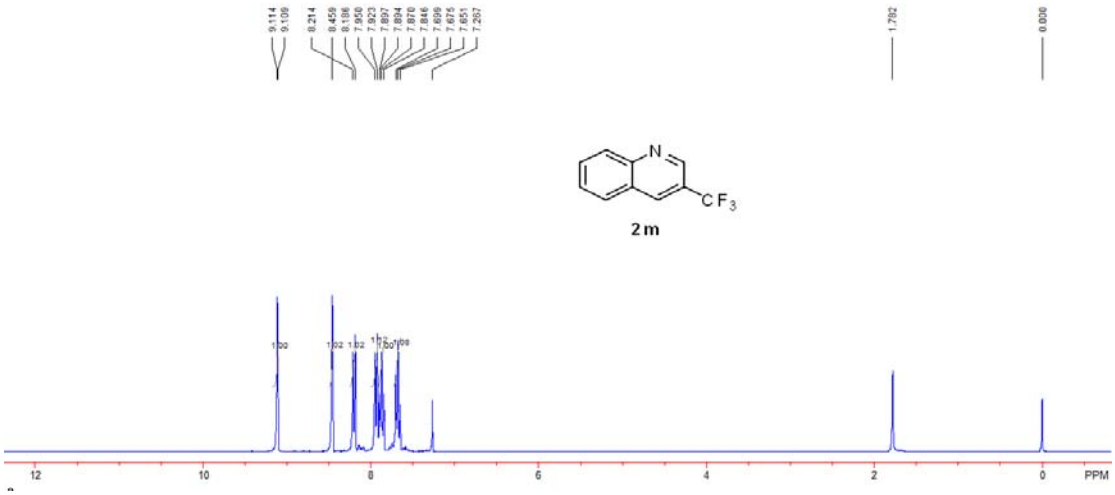
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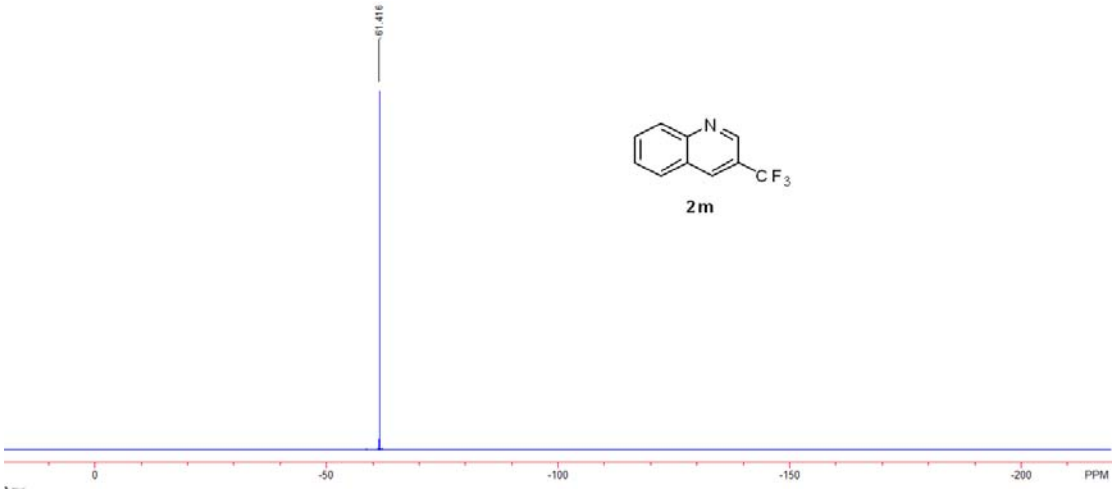
9.109
8.214
8.459
8.196
7.950
7.923
7.897
7.894
7.870
7.846
7.699
7.675
7.651
7.297
1.792
0.000
N
CF3
2m
1.00
1.02
1.02
1.01
1.09
12
10
8
6
4
2
0
PPM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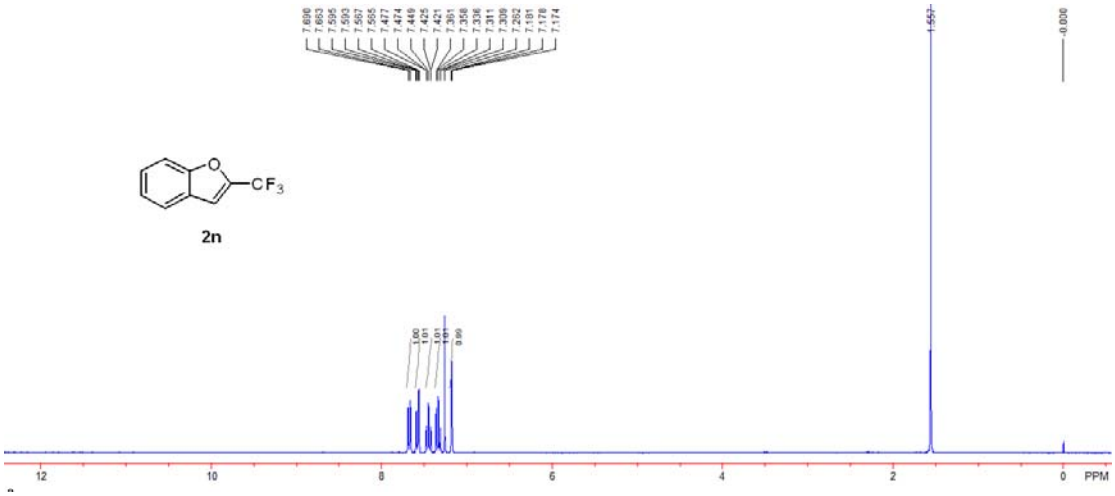
CF3
2m
0
-50
-100
-150
-200
PPM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7.595
7.593
7.567
7.565
7.477
7.474
7.449
7.425
7.421
7.361
7.358
7.336
7.311
7.309
7.252
7.181
7.178
7.174
1.557
0.000
CF3
2n
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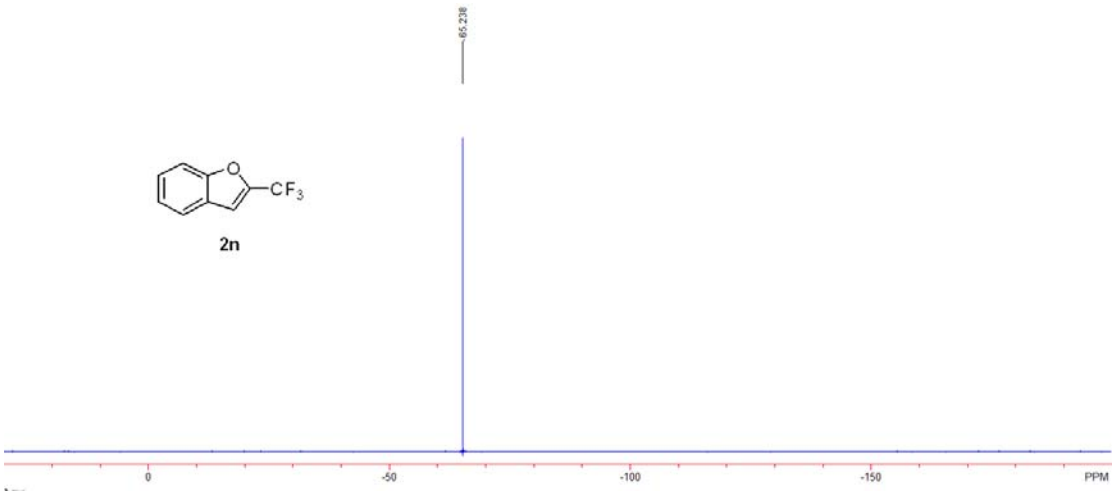
1.01
1.01
1.01
0.99
12
10
8
6
4
2
0
PPM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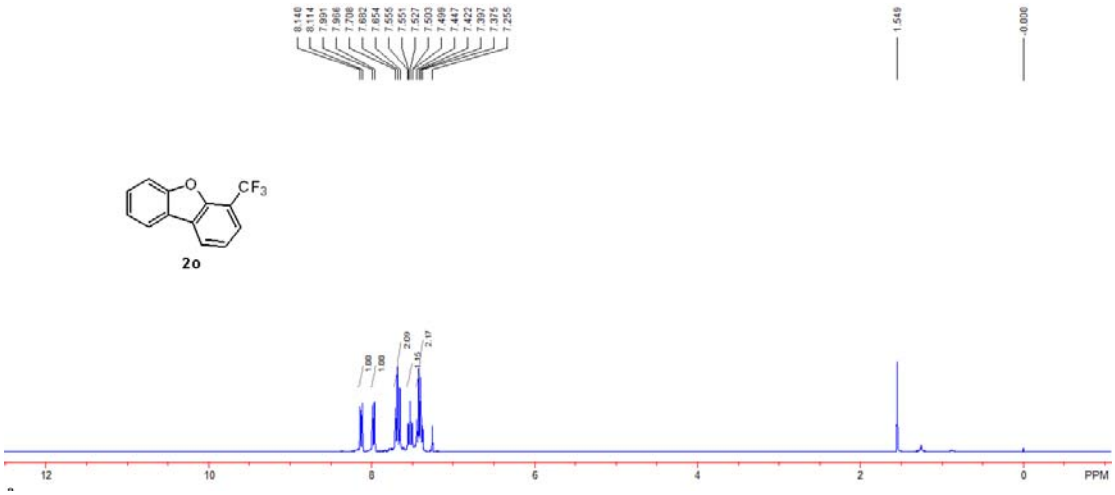
CF3
0
-50
-100
-150
PPM

2n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7.256
1.549
-0.006
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1.00
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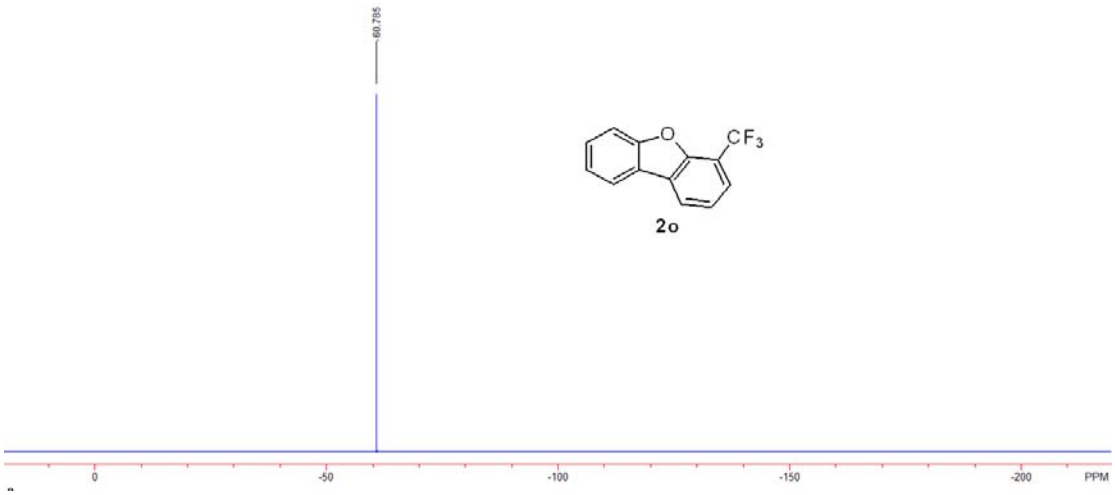
PPM

2o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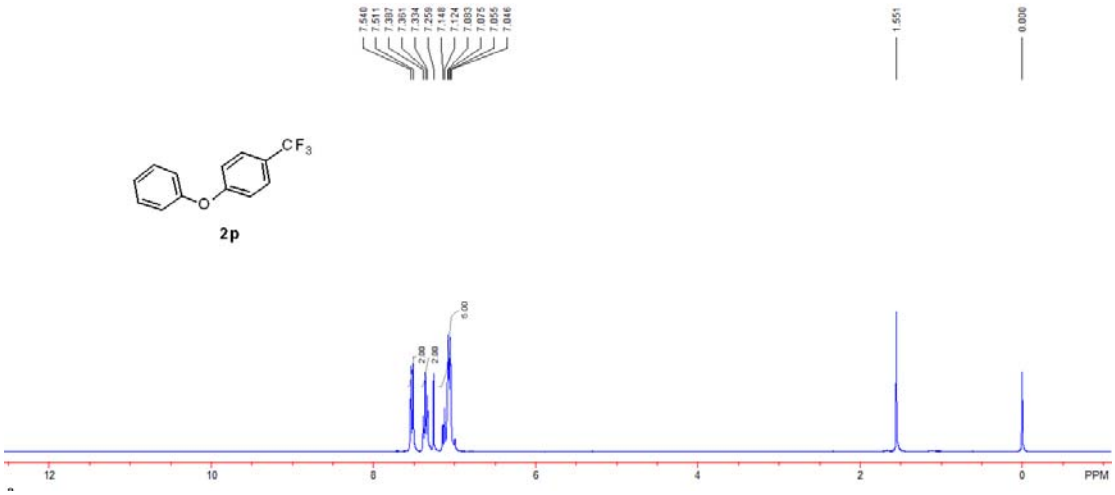
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12
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8
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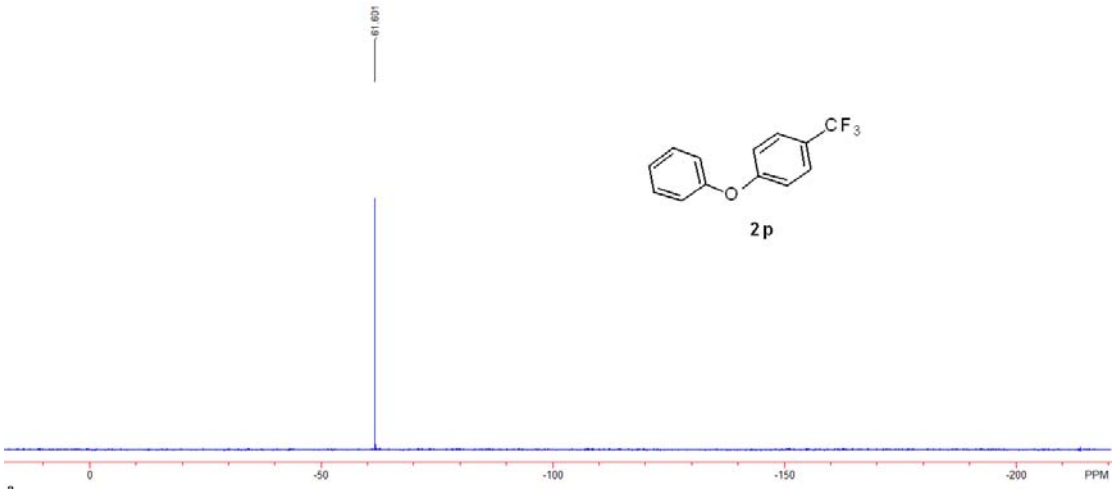
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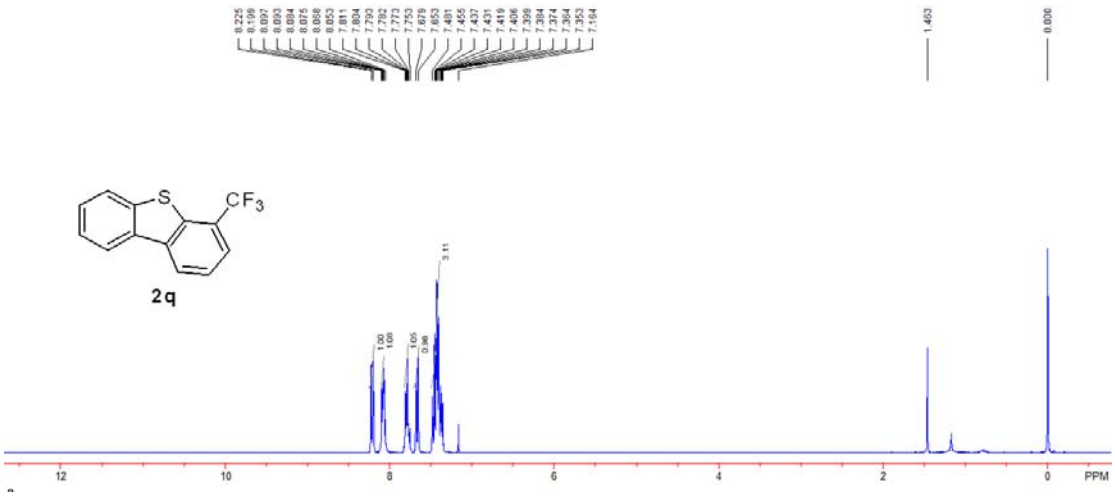
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8.075
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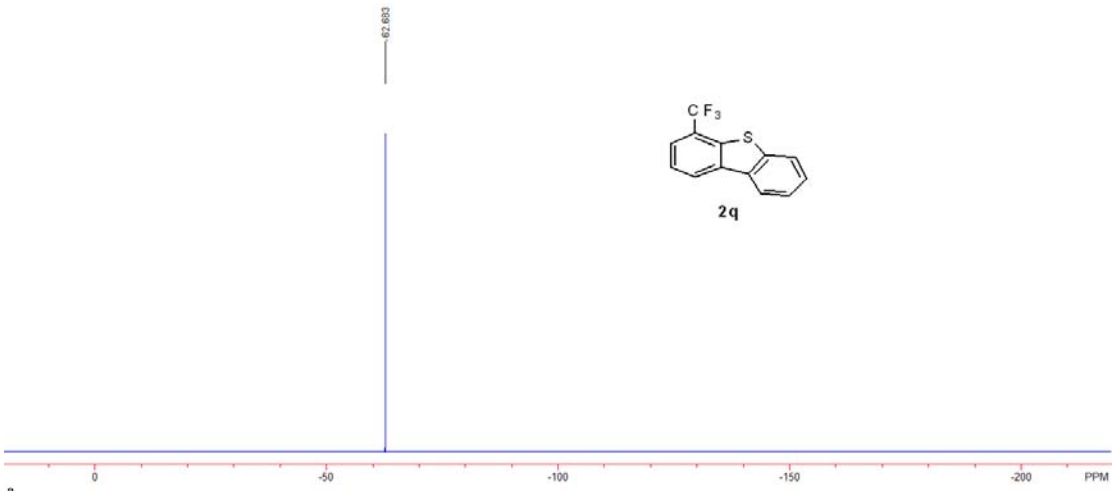
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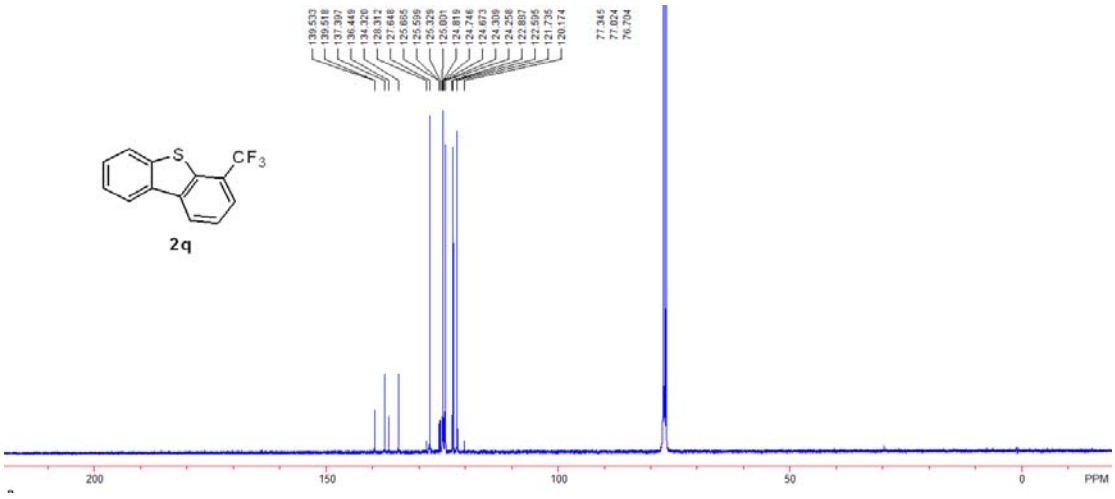
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S
CF3
2q
200
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0
PPM