Electronic Supplementary Material (ESI) for Chemical Communications.

Mechanochemical synthesis of aromatic sulfonamides.

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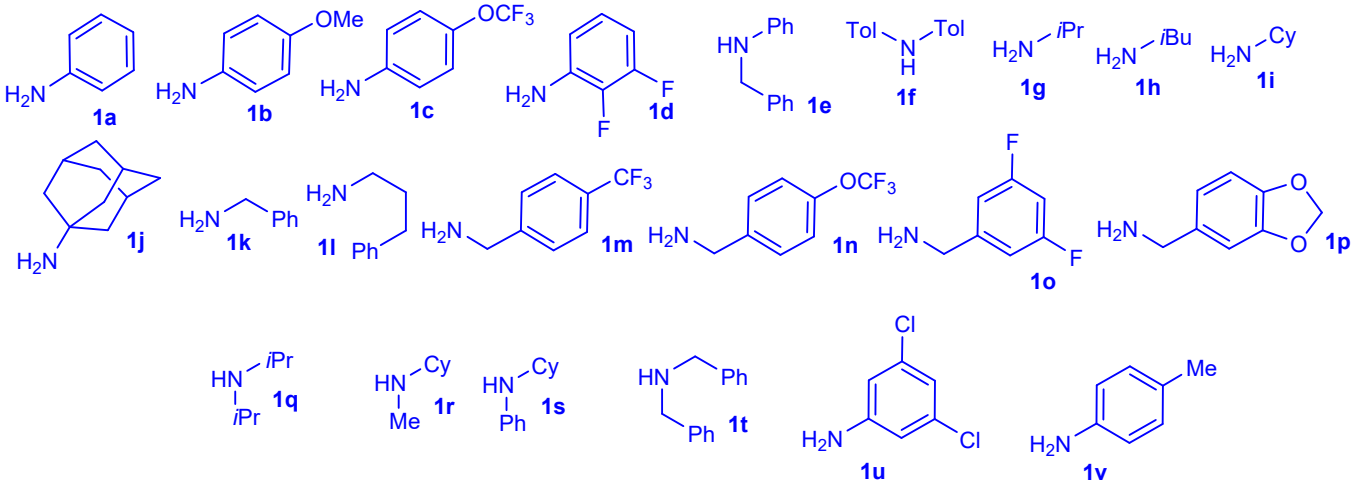
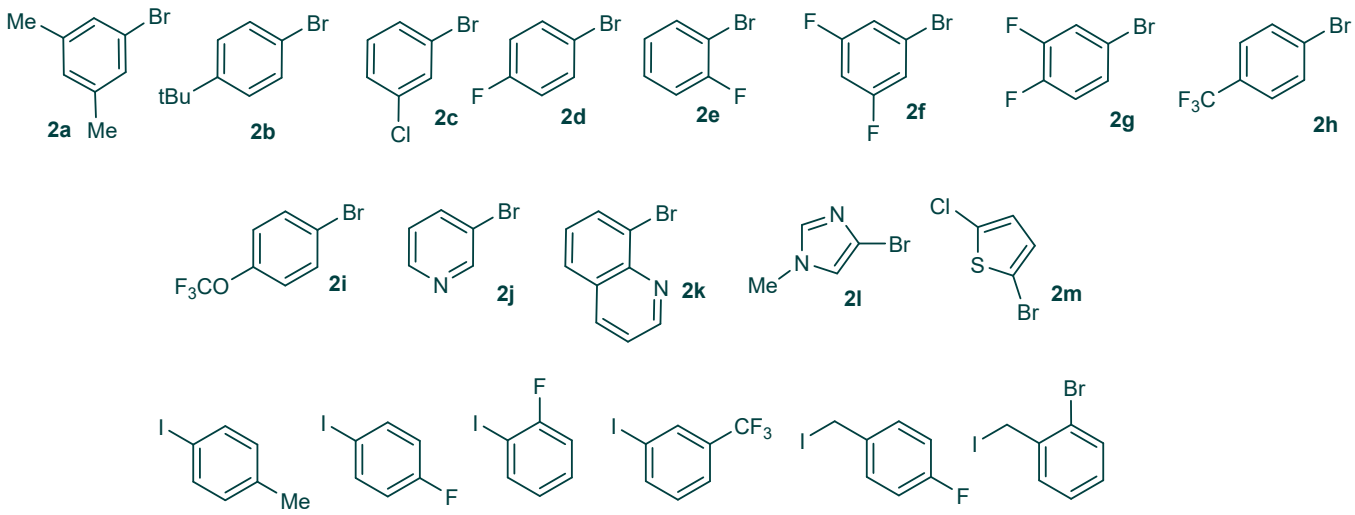
(A) Experimental Section.

Commercially available starting materials, reagents, catalysts, anhydrous and degassed solvents were used without further purification. Flash column chromatography was performed with Merck Silica gel 60 (230-400 mesh). The solvents for column chromatography were distilled before the use. Thin layer chromatography was carried out using Merck TLC Silica gel 60 F_{254} and visualized by short-wavelength ultraviolet light or by treatment with potassium permanganate ($KMnO_4$) stain. ^{1}H, ^{13}C and ^{19}F NMR spectra were recorded on a Bruker 250, 400 and 500 MHz at 20ºC. All ^{1}H NMR spectra are reported in parts per million (ppm) downfield of TMS and were measured relative to the signals for $CHCl_3$ (7.26 ppm) and DMSO (2.50 ppm). All $^{13}C\{^{1}H\}$ NMR spectra were reported in ppm relative to residual $CHCl_3$ (77.00 ppm) or DMSO (39.70 ppm) and were obtained with ^{1}H decoupling. Coupling constants, *J*, are reported in Hertz (Hz). Gas chromatographic analyses was performed on Gas Chromatograph Mass Spectrometer GCMS-QP2010 Ultra instrument. Mechanochemical synthesis was performed using the Retsch MM400 mill using the standard kit. Liquid chemicals were dosed using gas tight micro syringes. Isolation of obtained compounds was achieved by column chromatography on Silica gel. All commercially available compounds were purchased from appropriate vendors.

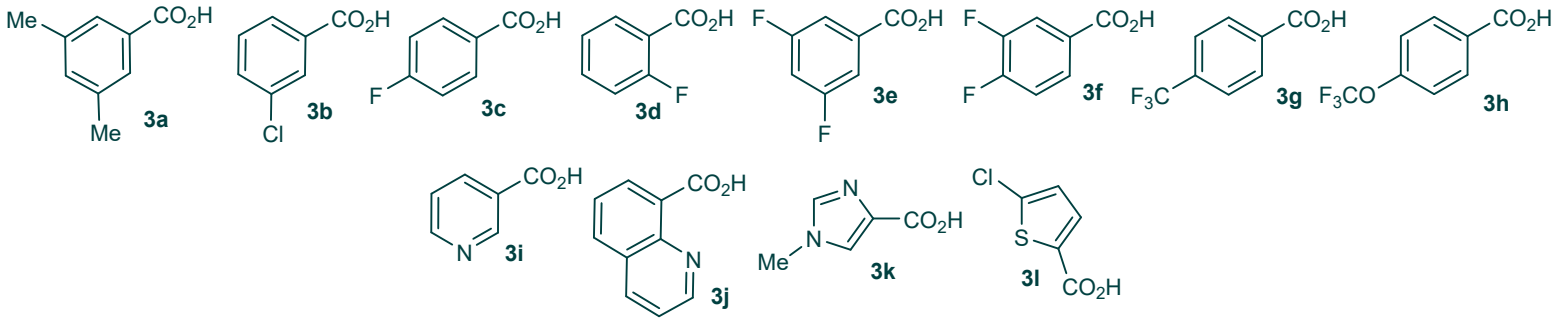
A-1. Scope of the reagents used.



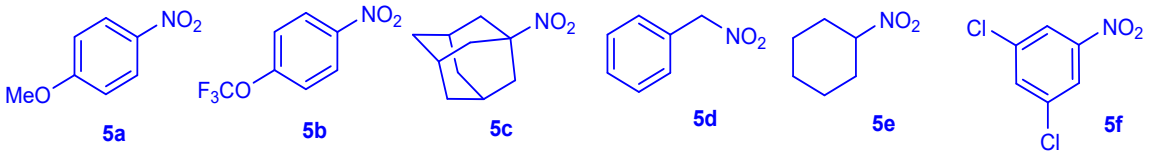
Scheme S1. List of amines.



Scheme S2. List of aryl bromides and aryl iodides.



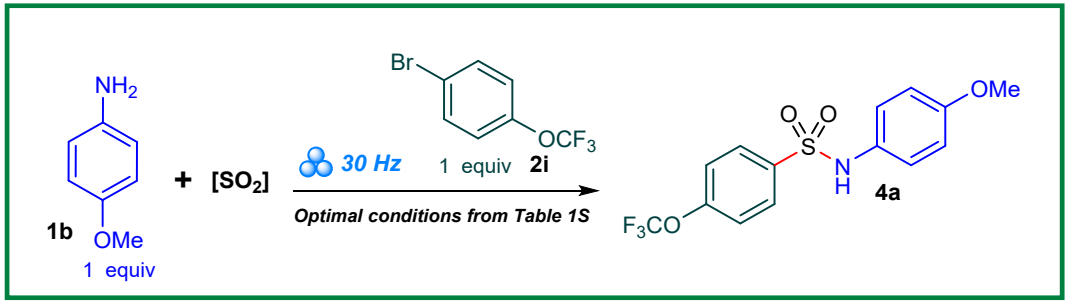
Scheme S3. List of aromatic carboxylic acids.



Scheme S4. List of nitro compounds.

A-2. Reaction condition screening for arylation of *ortho*-hydroxyarylenaminones.

Table S1. Optimization of the reaction conditions.

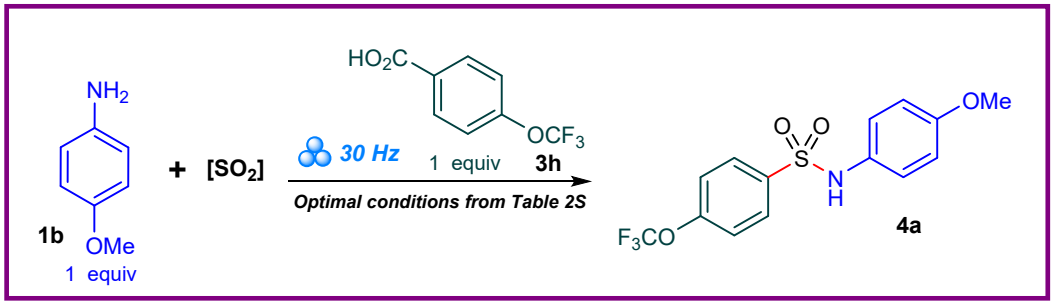


Reaction (a)

entry	reaction components	frequency/time	yield (%) **4a**[a]
1	$K_2S_2O_5$ (1.2 equiv.), cucurbit[7]uril (0.05 equiv.), $CuBr_2$ (0.1 equiv.), r.t.	30Hz/60min	0
2	$K_2S_2O_5$ (1.2 equiv.), cucurbit[7]uril (0.05 equiv.), CuI (0.1 equiv.), r.t.	30Hz/60min	0
3	$K_2S_2O_5$ (1.2 equiv.), cucurbit[7]uril (0.05 equiv.), $[RuCl_2(p\text{-cymene})]_2$ (0.1 equiv.), r.t.	30Hz/60min	20
4	$K_2S_2O_5$ (1.2 equiv.), cucurbit[7]uril (0.05 equiv.), $RuCl_2(PPh_3)_4$ (0.1 equiv.), r.t.	30Hz/60min	35
5	$K_2S_2O_5$ (1.2 equiv.), cucurbit[7]uril (0.05 equiv.), $[Ir(1,5\text{-cod})Cl]_2$ (0.03 equiv.), r.t., under Ar.	30Hz/60min	0
6	$K_2S_2O_5$ (1.2 equiv.), $RhCl(PPh_3)_3$ (0.05 equiv.), r.t., under Ar.	30Hz/60min	34
7	$K_2S_2O_5$ (1.2 equiv.), $Pd(OAc)_2$ (0.05 equiv.), $P(^tBu)_3$ (0.1 equiv.), r.t., under Ar.	30Hz/60min	31
8	$K_2S_2O_5$ (1.2 equiv.), $Pd(OAc)_2$ (0.05 equiv.), S-Phos (0.1 equiv.), r.t., under Ar.	30Hz/60min	37
9	$K_2S_2O_5$ (1.2 equiv.), $Pd_2(dba)_3$ (0.05 equiv.), Xantphos (0.05 equiv.), r.t., under Ar.	30Hz/60min	44
10	$K_2S_2O_5$ (1.2 equiv.), $PdBr_2$ (0.05 equiv.), Xantphos (0.05 equiv.), r.t., under Ar.	30Hz/60min	37
11	$K_2S_2O_5$ (1.2 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.	30Hz/60min	43
12	$K_2S_2O_5$ (1.2 equiv.), cucurbit[7]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.	30Hz/60min	81
13	**$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.**	**30Hz/60min**	**80**
14	DABSO (1.1 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.	30Hz/60min	82
15	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $RuCl_2(PPh_3)_2$ (0.03 equiv.), r.t.	30Hz/60min	53
16	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2NiBr_2$ (0.05 equiv.), r.t.	30Hz/60min	0
17	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2NiI_2$ (0.05 equiv.), r.t.	30Hz/60min	0
18	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2CoCl_2$ (0.05 equiv.), r.t.	30Hz/60min	0
Reactions in solution			
19	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t., in 1,4-dioxane under Ar.	------/10h	0
20	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in 1,4-dioxane under Ar.	------/10h	17
21	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t., in DMF under Ar.	------/10h	0
22	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), 100 ^oC, in DMF under Ar.	------/10h	13
23	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t., in EtOH under Ar.	------/10h	0
24	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in EtOH under Ar.	------/10h	31
25	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t., in CH_2Cl_2 under Ar.	------/10h	0
26	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in CH_2Cl_2 under Ar.	------/10h	0
27	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t., in NEt_3 under Ar.	------/10h	0
28	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in NEt_3 under Ar.	------/10h	0

[a] Isolated yield.

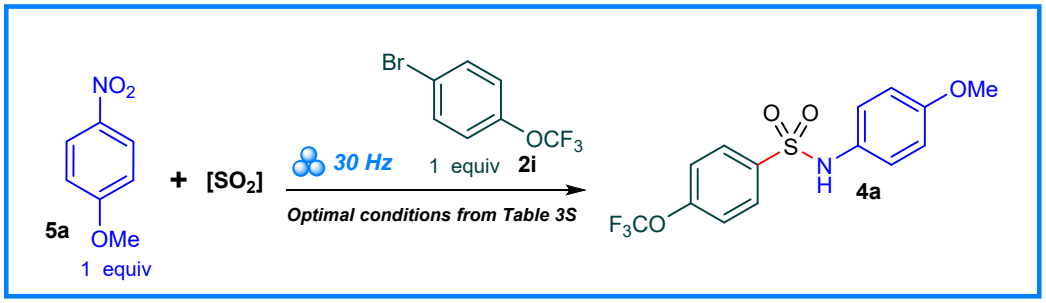
Table S2. Optimization of the reaction conditions.



Reaction (b)			
entry	reaction components	frequency/time	yield (%) **4a**[a]
1	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.	30Hz/60min	17
2	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), CuI (1.4 equiv.), r.t.	30Hz/60min	31
3	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuCl_2$ (1.4 equiv.), r.t.	30Hz/60min	37
4	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), CuO (1.4 equiv.), r.t.	30Hz/60min	60
5	**$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), r.t.**	**30Hz/60min**	**79**
6	DABSO (1.1 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), r.t.	30Hz/60min	83
Reactions in solution			
7	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in 1,4-dioxane under Ar.	------/10h	0
8	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), 130 °C, in DMF under Ar.	------/10h	19
9	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in EtOH under Ar.	------/10h	0
10	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in CH_2Cl_2 under Ar.	------/10h	0
11	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in NEt_3 under Ar.	------/10h	0

[a] Isolated yield.

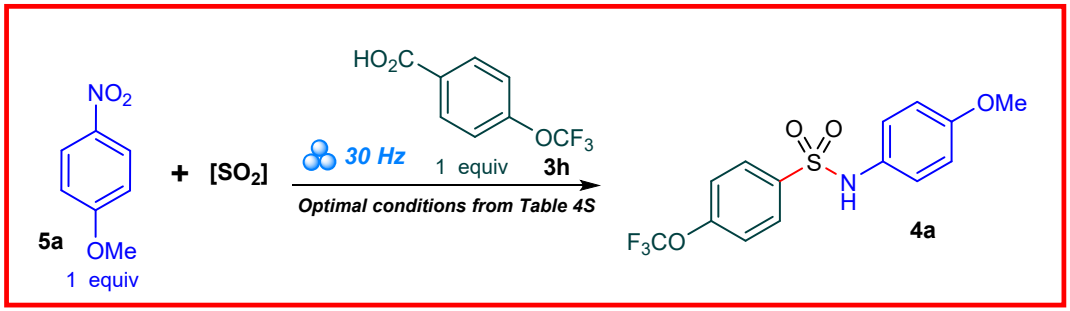
Table S3. Optimization of the reaction conditions.



Reaction (c)			
entry	reaction components	frequency/time	yield (%) **4a**[a]
1	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.	30Hz/60min	21
2	**$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), r.t.**	**30Hz/60min**	**68**
Reactions in solution			
3	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in 1,4-dioxane under Ar.	------/10h	0
4	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), 130 °C, in DMF under Ar.	------/10h	17
5	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in EtOH under Ar.	------/10h	33
6	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in CH_2Cl_2 under Ar.	------/10h	0
7	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), reflux, in NEt_3 under Ar.	------/10h	0

[a] Isolated yield.

Table S4. Optimization of the reaction conditions.



Reaction (d)

entry	reaction components	frequency/time	yield (%) **4a**[a]
1	$K_2S_2O_5$ (1.2 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), r.t.	30Hz/60min	17
2	**$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), r.t.**	**30Hz/60min**	**61**
Reactions in solution			
3	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in 1,4-dioxane under Ar.	------/10h	0
4	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), 130 ^oC, in DMF under Ar.	------/10h	21
5	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in EtOH under Ar.	------/10h	0
6	$K_2S_2O_5$ (4.8 equiv.), cucurbit[6]uril (0.05 equiv.), $(PPh_3)_2PdCl_2$ (0.03 equiv.), $CuBr_2$ (1.4 equiv.), reflux, in NEt_3 under Ar.	------/10h	0

[a] Isolated yield.

Reaction procedures with optimised reaction conditions.

General procedure for the synthesis of sulfonamides 4 by the reaction between amines 1, aryl bromides 2 and $K_2S_2O_5$.

In air, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aryl bromide (1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then an appropriate amine (1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica gel to isolate the desired compound.

The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls.

General procedure for the synthesis of sulfonamides 4 by the reaction between amines 1, aromatic carboxylic acids 3 and $K_2S_2O_5$.

In air, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aromatic carboxylic acid (1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.); then an appropriate amine (1.0 mmol, 1.0 equiv.) was added

and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica gel to isolate the desired compound.

The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls.

General procedure for the synthesis of sulfonamides 4 by the reaction between amines 1, aryl bromides 2 and DABSO.

In air, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aryl bromide (1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then an appropriate amine (1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica gel to isolate the desired compound.

The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls.

General procedure for the synthesis of sulfonamides 4 by the reaction between amines 1, aromatic carboxylic acids 3 and DABSO.

In air, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aromatic carboxylic acid (1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.); then an appropriate amine (1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls.

General procedure for the synthesis of sulfonamides 4 by the reaction between nitro compounds 5, aryl bromides 2 and $K_2S_2O_5$.

In air, to 10 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aryl bromide (1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then an appropriate nitro compound (1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.
The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls.

General procedure for the synthesis of sulfonamides 4 by the reaction between nitro compounds 5, aromatic carboxylic acids 3 and $K_2S_2O_5$.

In air, to 10 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aromatic carboxylic acid (1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.); then an appropriate nitro compound (1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica gel to isolate the desired compound.
The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls.

General procedure for the synthesis of sulfonamides 4 by the reaction between amines 1, aryl iodides and $K_2S_2O_5$.

In air, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an appropriate aryl iodide (1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then an appropriate amine (1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica gel to isolate the desired compound.

Procedure for the synthesis of sulfonamide 4aa by the reaction between amine 1t, corresponding aryl palladium bromide intermediate 9 and $K_2S_2O_5$ (*Scheme S6a*).

In air, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently the freshly prepared CF_3Ph-$Pd(PPh_3)_2$-Br **9** (428 mg, 0.5 mmol, 1.0 equiv.), $K_2S_2O_5$ (134 mg, 0.6 mmol, 1.2 equiv.), cucurbit[6]uril (25 mg, 0.025 mmol, 0.05 equiv.); then an appropriate amine (99 mg, 0.5 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, subsequently extracted two times by dichloromethane. The organic layers were combined washed with water and brine and then dried over $MgSO_4$. The dichloromethane solution was concentrated in vacuum and the resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

Procedure for the arylation of p-tolylamine by 1-bromo-4-methylbenzene (Scheme S6b).

In dry box, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently 1-bromo-4-methylbenzene (171 mg, 1.0 mmol, 1.0 equiv.), K_2CO_3 (166 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then p-tolylamine (107 mg, 1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction,

the content of the vessel was generously treated with distilled water, subsequently extracted two times by dichloromethane. The organic layers were combined washed with water and brine and then dried over $MgSO_4$. The dichloromethane solution was concentrated in vacuum and the resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

Procedure for the arylation of p-tolylamine by 4-methylbenzoic acid (Scheme S6c).

In dry box, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently an 4-methylbenzoic acid (136 mg, 1.0 mmol, 1.0 equiv.), K_2CO_3 (166 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.); then p-tolylamine (107 mg, 1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, filtered and washed two times with distilled water and finally properly dried in vacuum. The resulted crude was directly subjected to gradient flash chromatography on silica gel to isolate the desired compound.

Procedure for the preparation of 1-(methylsulfonyl)-4-(trifluoromethoxy)benzene 11 by a reaction between 1-bromo-4-(trifluoromethoxy)benzene 10, MeI and $K_2S_2O_5$ (Scheme S6d).

In dry box, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently 1-bromo-4-(trifluoromethoxy)benzene **10** (241 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then MeI (426 mg, 3.0 mmol, 3.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, subsequently extracted two times by dichloromethane. The organic layers were combined washed with water and brine and then dried over $MgSO_4$. The dichloromethane solution was concentrated in vacuum and the resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

Procedure for the preparation of sulfonyldibenzene 13 by a reaction between bromobenzene 12, phenyl boronic acid and $K_2S_2O_5$ (*Scheme S6e*).

In dry box, to 5 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently bromobenzene **12** (157 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then phenyl boronic acid (122 mg, 1.0 mmol, 1.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 60 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, subsequently extracted two times by dichloromethane. The organic layers were combined washed with water and brine and then dried over $MgSO_4$. The dichloromethane solution was concentrated in vacuum and the resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

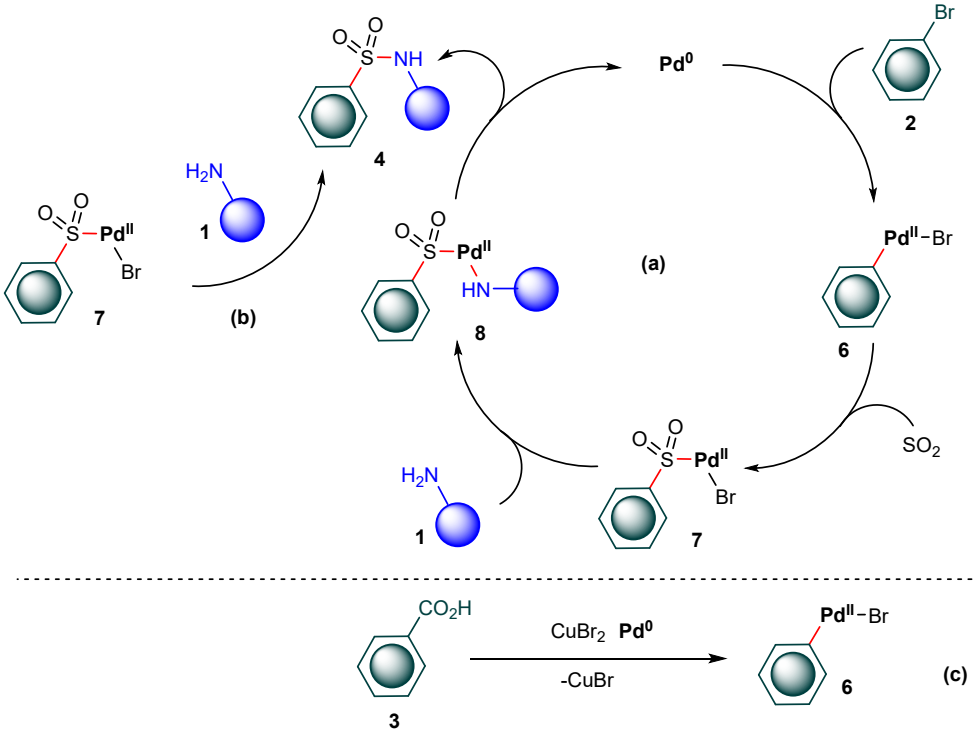
Procedure for the synthesis of 3,5-dichloroaniline 1u from nitro compound 5f (*Scheme S6f*).

In air, to 10 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently nitro compound **5f** (192 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then distilled water (0.036 mL, 2.0 mmol, 2.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 35 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water and small portion of dichloromethane, subsequently extracted two times by dichloromethane. The organic layers were combined washed with water and brine and then dried over $MgSO_4$. The dichloromethane solution was concentrated in vacuum and the resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

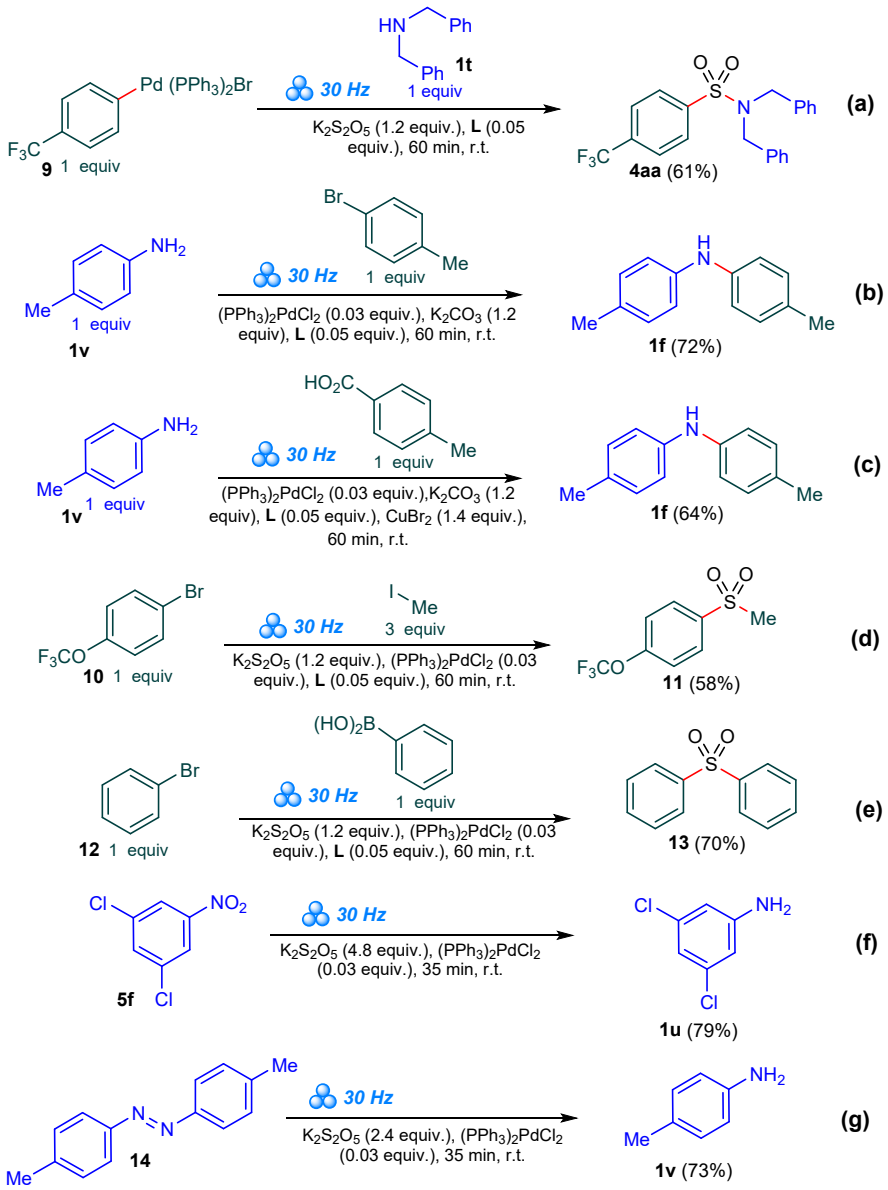
Procedure for the synthesis of p-toluidine 1v from 1,2-di-p-tolyldiazene 14 (*Scheme S6g*).

In air, to 10 mL grinding vessel (made of stainless) equipped with three balls (made of stainless, diameter: 5 mm) was placed consequently 1,2-di-p-tolyldiazene **14** (210 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (0.53 g, 2.4 mmol, 2.4 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); then distilled water (0.036 mL, 2.0 mmol, 2.0 equiv.) was added and the reaction vessel was properly capped. Finally, the reaction vessel was installed on the mill and subjected to milling at 30 Hz for 35 minutes. After completion of the reaction, the content of the vessel was generously treated with distilled water, subsequently extracted two times by dichloromethane. The organic layers were combined washed with water and brine and then dried over $MgSO_4$. The dichloromethane solution was concentrated in vacuum and the resulted crude was directly subjected to gradient flash chromatography on silica to isolate the desired compound.

The reaction mechanisms for the developed synthetic protocols.



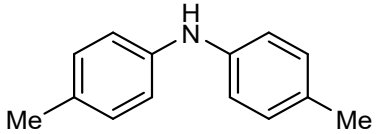
Scheme S5. Putative reaction mechanisms for the developed synthetic protocols.



Scheme S6. Control experiments.

(B) Characterization of products.

di-p-tolylamine 1f.



This compound was prepared starting from 1-bromo-4-methylbenzene (171 mg, 1.0 mmol, 1.0 equiv.), K_2CO_3 (166 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and p-tolylamine **1v** (107 mg, 1.0 mmol, 1.0 equiv.) The purification was performed by column chromatography on silica gel to provide the desired compound **1f** (142 mg, 0.72 mmol, 72%).

Alternatively, the title compound was prepared starting from 4-methylbenzoic acid (136 mg, 1.0 mmol, 1.0 equiv.), K_2CO_3 (166 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and p-tolylamine **1v** (107 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **1f** (126 mg, 0.64 mmol, 64%).

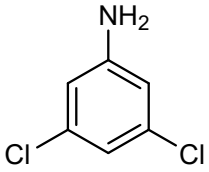
Colorless solid, mp 79-80 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 2.44 (s, 6H, 2xMe), 4.46 (br. s, H, NH), 7.08 (d, 4H, ^3J = 8.4 Hz, CH_{Ar}), 7.21 (d, 4H, ^3J = 8.4 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 20.6, 117.8, 129.7, 129.9, 141.0.

MS (GC, 70eV): m/z (%) = 197 (M^+, 100), 180 (16), 91 (18).

Anal. calcd. for $C_{14}H_{15}N$: C, 85.24; H, 7.66; N, 7.10. Found: C, 85.19; H, 7.48, N, 7.33.

3,5-dichloroaniline 1u.



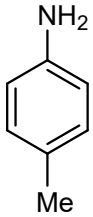
This compound was prepared starting from nitro compound **5f** (192 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), $(PPh_3)_2PdCl_2$ (21[illegible] mg, 0.03 mmol, 0.03 equiv.) and distilled water (0.036 mL, 2.0 mmol, 2.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **1u** (128 mg, 0.79 mmol, 79%).

Colorless solid, mp 49-50 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 3.76 (s, 2H, NH_2), 6.52 (d, 2H, ^4J = 1.7 Hz, CH_{Ar}), 6.72 (t, 1H, ^4J = 1.7 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 113.1, 118.2, 135.3, 148.2.

MS (GC, 70eV): m/z (%) = 161 (M^+, 100), 126 (18), 90 (22).

p-toluidine 1v.

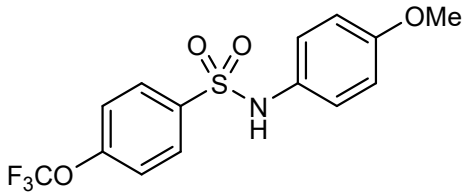


This compound was prepared starting from 1,2-di-p-tolyldiazene **14** (210 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (0.53 g, 2.4 mmol, 2.4 equiv.), $(PPh_3)_2PdCl_2$ (21[illegible] mg, 0.03 mmol, 0.03 equiv.) and distilled water (0.036 mL, 2.0 mmol, 2.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **1v** (78 mg, 0.73 mmol, 73%).

Colorless solid, mp 41-42 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 2.13 (s, 3H, Me), 4.77 (s, 2H, NH_2), 6.47 (d, 2H, ^3J = 7.7 Hz, CH_{Ar}), 6.81 (d, 2H, ^3J = 8.4 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 20.1, 114.1, 124.0, 129.3, 146.1.

N-(4-methoxyphenyl)-4-(trifluoromethoxy)benzenesulfonamide 4a.



This compound was prepared starting from aryl bromide **2i** (240 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1b** (123 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4a** (278 mg, 0.80 mmol, 80%). The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls and desired **4a** was prepared in 77% (2.67 g, 7.7 mmol) yield.

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3h** (206 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1b** (123 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4a** (274 mg, 0.79 mmol, 79%). The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls and desired **4a** was prepared in 72% (2.50 g, 7.2 mmol) yield.

Alternatively, the title compound was prepared starting from aryl bromide **2i** (240 mg, 1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1b** (123 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4a** (284 mg, 0.82 mmol, 82%). The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls and desired **4a** was prepared in 74% (2.57 g, 7.4 mmol) yield.

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3h** (206 mg, 1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1b** (123 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide

the desired compound **4a** (288 mg, 0.83 mmol, 83%). The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls and desired **4a** was prepared in 69% (2.39 g, 6.9 mmol) yield.

Alternatively, the title compound was prepared starting from aryl bromide **2i** (240 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and nitro compound **5a** (153 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4a** (236 mg, 0.68 mmol, 68%).

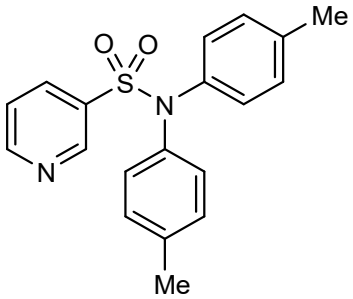
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3h** (206 mg, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and nitro compound **5a** (153 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4a** (212 mg, 0.61mmol, 61%).

Yellow solid, mp 99 - 100 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 3.84 (s, 3H, OMe), 6.88 (d, 2H, ^3J = 8.8 Hz, CH_{Ar}), 6.92 (d, 2H, ^3J = 8.8 Hz, CH_{Ar}), 7.54 (d, 2H, ^3J = 7.5 Hz, CH_{Ar}), 7.64 (t, 2H, ^3J = 7.9 Hz, CH_{Ar}), 7.76 (s, 2H, CH_{Ar}), 7.94 (d, 2H, ^3J = 7.5 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 55.5, 114.8, 120.3 (q, $^1J_{CF}$ = 256.2 Hz), 121.3, 125.7, 1266, 126.9, 130.8, 132.4, 141.0, 149.0, 161.3.

HRMS (TOF MS ES+) m/z: $[M - H]^+$: Calcd for $C_{14}H_{11}NO_4SF_3$ 346.0363. Found 346.0361.

N,N-di-p-tolylpyridine-3-sulfonamide 4b.



This compound was prepared starting from aryl bromide **2j** (157 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1f** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was

performed by column chromatography on silica gel to provide the desired compound **4b** (274 mg, 0.81 mmol, 81%). The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls and desired **4b** was prepared in 80% (3.10 g, 8.0 mmol) yield.

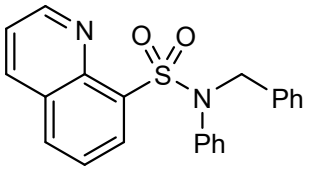
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3i** (123 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1f** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4b** (294 mg, 0.87 mmol, 87%). The gram scale synthesis was performed on 10 mmol of the starting amine in 25 mL grinding vessel using three 10 mm balls and desired **4b** was prepared in 80% (3.10 g, 8.0 mmol) yield.

Yellowish solid, mp 118 - 120 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 2.32 (s, 6H, 2xMe), 7.11 – 7.16 (m, 8H, CH_{Ar}), 7.41 – 7.44 (m, 1H, CH_{Ar}), 7.95 (dt, 1H, ^3J = 8.0 Hz, ^4J = 1.8 Hz, CH_{Ar}), 8.80 (d, 1H, ^3J = 4.6 Hz, CH_{Ar}), 8.91 (dd, 1H, ^4J = 2.0 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, DMSO-d_6): δ 21.0, 123.5, 128.1, 130.1, 135.3, 137.0, 138.0, 138.3, 148.5, 153.1.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{19}H_{19}N_2O_2S$ 339.1175. Found 339.1167.

N-benzyl-N-phenylquinoline-8-sulfonamide 4c.



This compound was prepared starting from aryl bromide **2k** (207 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1e** (183 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4c** (337 mg, 0.90 mmol, 90%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3j** (173 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4

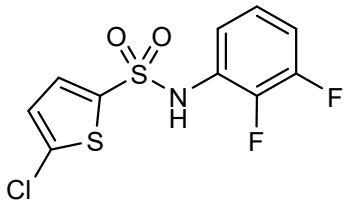
equiv.) and amine **1e** (183 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4c** (310 mg, 0.83 mmol, 83%).

Yellowish solid, mp 167 - 170 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 5.40 (s, 2H, CH_2), 6.94 (d, 2H, ^3J = 7.4 Hz, CH_{Ar}), 7.05 – 7.10 (m, 3H, CH_{Ar}), 7.22 – 7.24 (m, 1H, CH_{Ar}), 7.30 (t, 2H, ^3J = 7.9 Hz, CH_{Ar}), 7.36 (d, 2H, ^3J = 7.5 Hz, CH_{Ar}), 7.63 (t, 1H, ^3J = 7.6 Hz, CH_{Ar}), 7.77 – 7.79 (m, 1H, CH_{Ar}), 8.19 (dd, 1H, ^3J = 7.4 Hz, ^4J = 1.2 Hz, CH_{Ar}), 8.28 (d, 1H, ^3J = 7.8 Hz, CH_{Ar}), 8.58 (dd, 1H, ^3J = 8.4 Hz, ^4J = 1.7 Hz, CH_{Ar}), 9.24 – 9.25 (m, 1H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, DMSO-d_6): δ 56.4, 122.6, 125.6, 127.1, 127.2, 127.8, 127.9, 128.3, 128.6, 128.8, 133.0, 134.3, 136.2, 137.1, 138.1, 139.0, 143.2, 151.7.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{22}H_{19}N_2O_2S$ 375.1178. Found 375.1167.

5-chloro-N-(2,3-difluorophenyl)thiophene-2-sulfonamide 4d.



This compound was prepared starting from aryl bromide **2m** (196 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1d** (129 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4d** (222 mg, 0.72 mmol, 72%).

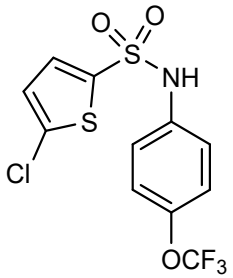
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3l** (162 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1d** (129 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica to provide the desired compound **4d** (229 mg, 0.74 mmol, 74%).

Light brown solid, mp 129- 130 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 6.97 – 7.00 (m, 2H, NH, CH_{Ar}), 7.15 (q, 1H, ^3J = 5.4 Hz, CH_{Ar}), 7.33 (q, 1H, ^3J = 8.1 Hz, CH_{Ar}), 7.59 (q, 2H, ^4J = 3.7 Hz, CH_{Ar}).

$^{13}C\{^1H\}$ NMR (126 MHz, $CDCl_3$): δ 120.3 (d, J_{CF} = 16.8 Hz), 123.1 (d, J_{CF} = 9.9 Hz), 124.0 (m), 127.0, 127.8, 135.6, 135.9, 141.1, 148.8 (dd, $^1J_{CF}$ = 260.7 Hz, J_{CF} = 12.8 Hz), 151.0 (dd, $^1J_{CF}$ = 254.3 Hz, J_{CF} = 11.4 Hz).

HRMS (TOF MS ES+) m/z: $[M - H]^+$: Calcd for $C_{10}H_5NO_2S_2F_2Cl$ 307.9426. Found 307.9418.

5-chloro-N-(4-(trifluoromethoxy)phenyl)thiophene-2-sulfonamide 4e.



This compound was prepared starting from aryl bromide **2m** (196 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1c** (177mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4e** (303 mg, 0.85 mmol, 85%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3l** (162 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1c** (177 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4e** (289 mg, 0.81 mmol, 81%).

Alternatively, the title compound was prepared starting from aryl bromide **2m** (196 mg, 1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1c** (177 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4e** (260 mg, 0.73 mmol, 73%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3l** (162 mg, 1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4

equiv.) and amine **1c** (177 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4e** (281 mg, 0.79 mmol, 79%).

Alternatively, the title compound was prepared starting from aryl bromide **2m** (196 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and nitro compound **5b** (207 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4e** (207 mg, 0.58 mmol, 58%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3l** (162 mg, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and nitro compound **5b** (207 mg, (1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4e** (225 mg, 0.63mmol, 63%).

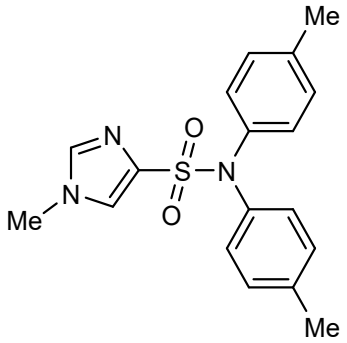
Yellow solid, mp 173 - 174 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 7.00 (d, 2H, ^4J = 3.2 Hz, CH_{Ar}), 7.18 (d, 2H, ^3J = 8.3 Hz, CH_{Ar}), 7.25 (d, 2H, ^3J = 8.3 Hz, CH_{Ar}), 7.56 (d, 2H, ^4J = 3.2 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 120.2 (q, $^1J_{CF}$ = 257.1 Hz), 127.0, 131.7, 132.7, 135.4, 136.1, 140.8, 150.7.

MS (GC, 70eV): m/z (%) = 357 (M^+, 0.2), 298 (39), 292 (34), 257 (15), 183 (41), 181 (100), 133 (24), 105 (56).

Anal. calcd. for $C_{11}H_7NO_3S_2F_3Cl$: C, 36.93; H, 1.97; N, 3.92. Found: C, 36.99; H, 2.01, N, 3.92.

1-methyl-N,N-di-p-tolyl-1H-imidazole-4-sulfonamide 4f.



This compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1f** (197mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4f** (300 mg, 0.88 mmol, 88%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3k** (126 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1f** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4f** (280 mg, 0.82 mmol, 82%).

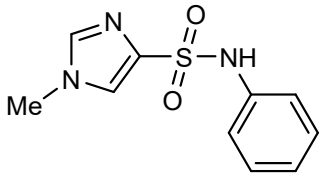
Yellowish solid, mp 120 - 121 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 2.29 (s, 6H, 2xMe), 3.60 (s, 3H, Me), 7.09 (d, 4H, ^3J = 7.2 Hz, CH_{Ar}), 7.24 (s, 1H, Imidazole), 7.36 (dd, 4H, ^3J = 8.4 Hz, ^4J = 1.8 Hz, CH_{Ar}), 7.50 (s, 1H, Imidazole).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 20.9, 33.8, 117.8, 125.4, 128.1, 129.6, 136.7, 138.9, 139.1, 139.7.

MS (GC, 70eV): m/z (%) = 341 (M^+, 22), 197 (16), 196 (100), 181 (63).

Anal. calcd. for $C_{18}H_{19}N_3O_2S$: C, 63.32; H, 5.61; N, 12.31; Found: C, 63.18; H, 5.65; N, 12.37.

1-methyl-N-phenyl-1H-imidazole-4-sulfonamide 4g.



This compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1a** (93 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4g** (199 mg, 0.84 mmol, 84%).

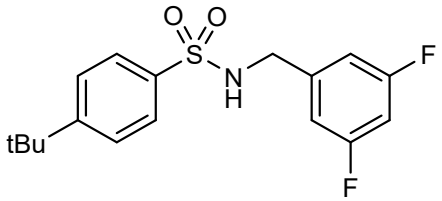
White solid, mp 203 - 204 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 3.67 (s, 3H, Me), 7.00 (t, 1H, ^3J = 7.5 Hz, CH_{Ar}), 7.19 – 7.20 (m, 2H, CH_{Ar}), 7.23 – 7.26 (m, 2H, CH_{Ar}), 7.76 (d, 1H, ^4J = 0.8 Hz, Imidazole), 7.85 (d, 1H, ^4J = 1.0 Hz, Imidazole), 10.27 (s, 1H, NH).

^{13}C{^{1}H} NMR (126 MHz, DMSO-d_6): δ 33.5, 119.1, 123.2, 125.4, 128.9, 138.2, 138.5, 139.8.

MS (GC, 70eV): m/z (%) = 237 (M^+, 96), 173 (39), 145 (72), 132 (69), 92 (52), 65 (70), 42 (100).

Anal. calcd. for $C_{10}H_{11}N_3O_2S$: C, 50.62; H, 4.67; N, 17.71; Found: C, 50.69; H, 4.73; N, 17.63.

4-(tert-butyl)-N-(3,5-difluorobenzyl)benzenesulfonamide 4h.



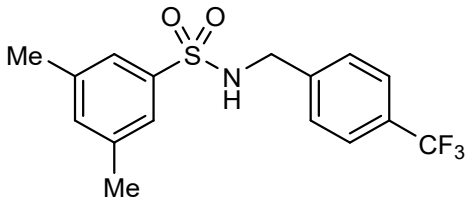
This compound was prepared starting from aryl bromide **2b** (212 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1o** (143 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4h** (305 mg, 0.90 mmol, 90%).

White solid, mp 99- 100 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 1.31 (s, 9H, *t*Bu), 4.17 (d, 2H, ^3J = 4.5 Hz, CH_2), 5.43 (s, 1H, NH), 6.59 – 6.64 (m, 1H, CH_{Ar}), 6.67 – 6.72 (m, 1H, CH_{Ar}), 7.17 – 7.22 (m, 1H, CH_{Ar}), 7.41 (d, 2H, ^3J = 8.5 Hz, CH_{Ar}), 7.69 (d, 2H, ^3J = 8.5 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 31.0, 35.0, 40.7, 103.6 (t, J_{CF} = 26.7 Hz), 111.1 (dd, J_{CF} = 21.3 Hz, J_{CF} = 3.8 Hz), 119.6 (m), 125.9, 126.8, 131.0 (m), 136.8, 156.4, 160.5 (dd, $^1J_{CF}$ = 235.6 Hz, J_{CF} = 12.2 Hz), 162.5 (dd, $^1J_{CF}$ = 236.5 Hz, J_{CF} = 12.2 Hz).

HRMS (TOF MS ES-) m/z: $[M - H]^+$: Calcd for $C_{17}H_{18}NO_2SF_2$ (M-H) 338.1026. Found 338.1026.

3,5-dimethyl-N-(4-(trifluoromethyl)benzyl)benzenesulfonamide 4i.



This compound was prepared starting from aryl bromide **2a** (184 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1m** (191 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4i** (312 mg, 0.91 mmol, 91%).

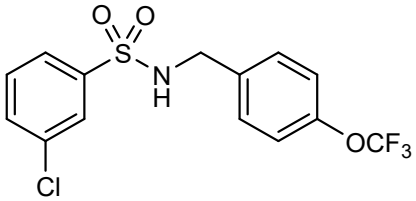
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3a** (150 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1m** (191 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4i** (322 mg, 0.94 mmol, 94%).

White solid, mp 129- 130 ^{o}C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 2.31 (s, 6H, 2xMe), 4.17 (d, 2H, ^{3}J = 6.0 Hz, CH_2), 5.49 (s, 1H, NH), 7.16 (s, 1H, CH_{Ar}), 7.31 (d, 2H, ^{3}J = 7.9 Hz, CH_{Ar}), 7.42 (s, 2H, CH_{Ar}), 7.48 (d, 2H, ^{3}J = 7.7 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 21.1, 46.6, 123.9 (q, $^{1}J_{CF}$ = 272.0 Hz), 124.5, 125.3 (m), 128.0, 129.8 (q, $^{2}J_{CF}$ = 32.2 Hz), 134.4, 139.2, 139.3, 140.6.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{16}H_{17}NO_2SF_3$ (M+H) 344.0939. Found 344.0932.

3-chloro-N-(4-(trifluoromethoxy)benzyl)benzenesulfonamide 4j.



This compound was prepared starting from aryl bromide **2c** (190 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1n** (191 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4j** (312 mg, 0.95 mmol, 95%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3b** (157 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1n** (191 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4j** (322 mg, 0.91 mmol, 91%).

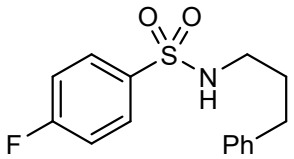
Yellowish solid, mp 85 - 86 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 4.16 (d, 2H, ^3J = 6.3 Hz, NCH_2), 5.34 (br. s, 1H, NH), 7.09 (d, 2H, ^3J = 8.1 Hz, CH_{Ar}), 7.21 (d, 2H, ^3J = 8.6 Hz, CH_{Ar}), 7.40 (t, 1H, ^3J = 8.1 Hz, CH_{Ar}), 7.52 (dd, 1H, ^3J = 8.1 Hz, ^4J = 0.9 Hz, CH_{Ar}), 7.68 (t, 1H, ^3J = 7.9 Hz, CH_{Ar}), 7.79 (t, 1H, ^4J = 1.8 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 46.5, 120.3 (q, $^1J_{CF}$ = 257.3 Hz), 121.1, 125.0, 127.2, 129.3, 130.4, 132.9, 134.6, 135.3, 141.6, 148.8.

MS (GC, 70eV): m/z (%) = 365 (M^+, 1), 190 (100), 175 (13), 111 (17), 77 (17).

Anal. calcd. for $C_{14}H_{11}NO_3SClF_3$: C, 45.97; H, 3.03; N, 3.83. Found: C, 46.09; H, 3.14; N, 3.95.

4-fluoro-N-(3-phenylpropyl)benzenesulfonamide 4k.



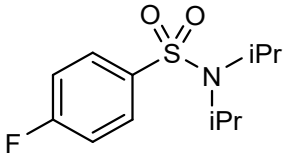
This compound was prepared starting from aryl bromide **2d** (174 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1l** (135 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4k** (266 mg, 0.91 mmol, 91%).

White solid, mp 62 - 63 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 1.86 (quint, 2H, ^3J = 7.3 Hz, CH_2), 2.67 (t, 2H, ^3J = 7.4 Hz, CH_2), 3.02 (q, 2H, ^3J = 6.6 Hz, CH_2), 5.14 (s, 1H, NH), 7.14 – 7.15 (m, 2H, CH_{Ar}), 7.21 – 7.26 (m, 3H, CH_{Ar}), 7.30 – 7.33 (m, 2H, CH_{Ar}), 7.93 – 7.96 (m, 2H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 31.0, 32.6, 42.5, 120.3 (d, J_{CF} = 22.3 Hz), 126.1, 128.3 (d, J_{CF} = 19.0 Hz), 129.7 (d, J_{CF} = 9.4 Hz), 135.8, 140.7, 165.0 (d, $^1J_{CF}$ = 254.4 Hz).

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{15}H_{17}NO_2SF$ 294.0968. Found 294.0964.

4-fluoro-N,N-diisopropylbenzenesulfonamide 4l.



This compound was prepared starting from aryl bromide **2d** (174 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1q** (101 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4l** (210 mg, 0.81 mmol, 81%).

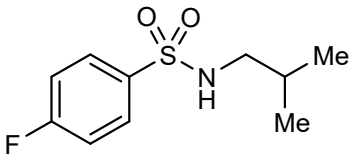
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3c** (140 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1q** (101 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4l** (189 mg, 0.73 mmol, 73%).

White solid, mp 68 - 69 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 1.23 (d, 12H, ^3J = 7.1 Hz, 4xMe), 3.64 – 3.70 (m, 2H, 2xCH), 7.11 – 7.14 (m, 2H, CH_{Ar}), 7.84 – 7.86 (m, 2H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 21.8, 48.6, 115.8 (d, J_{CF} = 22.3 Hz), 129.6 (d, J_{CF} = 9.0 Hz), 137.2, 138.6, 164.6 (d, $^1J_{CF}$ = 257.2 Hz).

HRMS (TOF MS ES+Na) m/z: $[M + H]^+$: Calcd for $C_{12}H_{18}NO_2SFNa$ 282.0945. Found 282.0940.

4-fluoro-N-isobutylbenzenesulfonamide 4m.



This compound was prepared starting from aryl bromide **2d** (174 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1h** (73 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4m** (169 mg, 0.73 mmol, 73%).

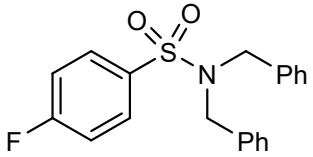
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3c** (140 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1h** (73 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4m** (162 mg, 0.70 mmol, 70%).

White solid, mp 85 - 86 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 0.83 (d, 6H, ^3J = 6.7 Hz, 2xMe), 1.67 – 1.70 (m, 1H, 2xCH), 2.72 (t, 2H, CH_2), 5.18 (s, 1H, NH), 7.17 (t, 2H, ^3J = 8.4 Hz, CH_{Ar}), 7.87 – 7.90 (m, 2H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): 19.8, 28.3, 50.5, 116.2 (d, J_{CF} = 22.4 Hz), 129.7 (d, J_{CF} = 9.5 Hz), 136.0, 164.9 (d, $^1J_{CF}$ = 256.0 Hz).

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{10}H_{15}NO_2SF$ 232.0809. Found 232.0808.

N,N-dibenzyl-4-fluorobenzenesulfonamide 4n.



This compound was prepared starting from aryl bromide **2d** (174 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1t** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4n** (284 mg, 0.80 mmol, 80%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3c** (140 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1t** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4n** (294 mg, 0.83 mmol, 83%).

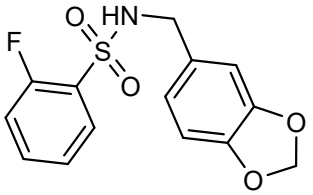
White solid, mp 89 - 90 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 4.36 (s, 4H, 2xNCH_2), 7.08 – 7.10 (m, 4H, CH_{Ar}), 7.17 (t, 2H, ^3J = 8.5 Hz, CH_{Ar}), 7.25 – 7.26 (m, 6H, CH_{Ar}), 7.83 – 7.86 (m, 2H, CH_{Ar}).

$^{13}C\{^1H\}$ NMR (126 MHz, $CDCl_3$): δ 50.4, 116.1 (d, J_{CF} = 21.1 Hz), 127.7, 128.4 (m), 129.7 (d, J_{CF} = 9.0 Hz), 135.3, 136.8 (m), 164.8 (d, $^1J_{CF}$ = 254.4 Hz).

MS (GC, 70eV): m/z (%) = 355 (M^+, 1), 264 (20), 196 (34), 91 (100).

Anal. calcd. for $C_{20}H_{18}NO_2FS$: C, 67.59; H, 5.10; N, 3.94. Found: C, 67.63; H, 5.22; N, 4.03.

N-(benzo[d][1,3]dioxol-5-ylmethyl)-2-fluorobenzenesulfonamide 4o.



This compound was prepared starting from aryl bromide **2e** (174 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1p** (151 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4o** (284 mg, 0.84 mmol, 84%).

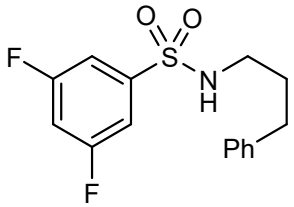
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3d** (140 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1p** (151 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4o** (294 mg, 0.82 mmol, 82%).

White solid, mp 108 - 109 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 4.07 (d, 2H, ^3J = 6.3 Hz, NCH_2), 5.17 (br. s, 1H, NH), 5.89 (s, 1H, OCH_2O), 6.21 – 6.66 (m, 3H, CH_{Ar}), 7.13 – 7.19 (m, 1H, CH_{Ar}), 7.24 (dt, 1H, ^3J = 7.7 Hz, ^4J = 0.8 Hz, CH_{Ar}), 7.52 – 7.56 (m, 1H, CH_{Ar}), 7.84 (dt, 1H, ^3J = 7.5 Hz, ^4J = 1.7 Hz, CH_{Ar}).

$^{13}C\{^1H\}$ NMR (126 MHz, $CDCl_3$): δ 47.2, 101.1, 108.2 (d, J_{CF} = 33.7 Hz), 116.7 (d, J_{CF} = 19.6 Hz,), 121.4, 121.4 (d, J_{CF} = 3.7 Hz,), 128.0 (d, J_{CF} = 13.5 Hz), 129.6, 134.8 (d, J_{CF} = 8.6 Hz), 147.5 (d, J_{CF} = 69.5 Hz), 158.6 (d, $^1J_{CF}$ = 253.5 Hz).

HRMS (TOF MS ES-) m/z: $[M - H]^+$: Calcd for $C_{14}H_{11}NO_4SF$ 308.0399. Found 308.0393.

3,5-difluoro-N-(3-phenylpropyl)benzenesulfonamide 4p.



This compound was prepared starting from aryl bromide **2f** (192 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1l** (135 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4p** (230 mg, 0.74 mmol, 74%).

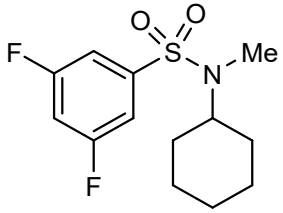
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3e** (158 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1l** (135 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4p** (289 mg, 0.93 mmol, 93%).

White solid, mp 108 - 109 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 1.91 (quint, 2H, ^3J = 7.4 Hz, CH_2), 2.71 (t, 2H, ^3J = 6.7 Hz, CH_2), 3.08 (q, 2H, ^3J = 7.4 Hz, CH_2), 5.24 (br. s, 1H, NH), 7.08 – 7.12 (m, 1H, CH_{Ar}), 7.18 (d, 2H, ^3J = 6.9 Hz, CH_{Ar}), 7.26 – 7.29 (m, 1H, CH_{Ar}), 7.33 – 7.36 (m, 2H, CH_{Ar}), 7.47 – 7.49 (m, 2H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 31.0, 32.5, 42.7, 108.2 (d, J_{CF} = 26.2 Hz), 110.4 (dd, J_{CF} = 21.3 Hz, J_{CF} = 7.1 Hz), 126.1, 128.3, 128.5, 140.5, 143.2 (d, J_{CF} = 8.1 Hz), 162.8 (dd, $^1J_{CF}$ = 255.7 Hz, J_{CF} = 11.9 Hz).

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{15}H_{16}NO_2SF_2$ 312.0868. Found 312.0870.

N-cyclohexyl-3,5-difluoro-N-methylbenzenesulfonamide 4q.



This compound was prepared starting from aryl bromide **2f** (192 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1r** (113 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4q** (234 mg, 0.81 mmol, 81%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3e** (158 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1r** (113 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4q** (257 mg, 0.89 mmol, 89%).

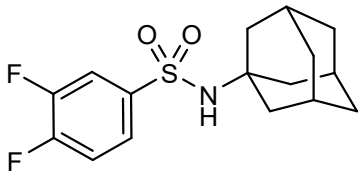
White solid, mp 77 - 78 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 0.96 – 1.00 (m, 1H, Cycl.), 1.25 – 1.35 (m, 4H, Cycl.), 1.46 – 1.48 (m, 2H, Cycl.), 1.56 – 1.59 (m, 1H, Cycl.), 1.71 – 1.73 (m, 2H, Cycl.), 2.75 (s, 3H, Me), 3.70 – 3.73 (m, 1H, Cycl.), 6.98 (tt, 1H, ^3J = 8.3 Hz, ^4J = 2.3 Hz, CH_{Ar}), 7.30 – 7.31 (m, 2H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 25.1, 25.6, 28.6, 30.2, 57.1, 107.7 (t, J_{CF} = 25.1 Hz), 110.1 (dd, J_{CF} = 20.7 Hz, J_{CF} = 7.6 Hz), 143.7 (m), 162.7 (dd, $^1J_{CF}$ = 254.7 Hz, J_{CF} = 12.0 Hz).

MS (GC, 70eV): m/z (%) = 289 (M^+, 22), 246 (100), 177 (77), 113 (30).

Anal. calcd. for $C_{13}H_{17}NO_2F_2S$: C, 53.97; H, 5.92; N, 4.84. Found: C, 54.08; H, 5.76; N, 4.96.

N-(adamantan-1-yl)-3,4-difluorobenzenesulfonamide 4r.



This compound was prepared starting from aryl bromide **2f** (192 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1j** (151 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4r** (235 mg, 0.72 mmol, 72%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3e** (158 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1j** (151 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4r** (229 mg, 0.70 mmol, 70%).

Alternatively, the title compound was prepared starting from aryl bromide **2f** (192 mg, 1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1j** (151 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4r** (229 mg, 0.70 mmol, 70%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3e** (158 mg, 1.0 mmol, 1.0 equiv.), DABSO (264 mg, 1.1 mmol, 1.1 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1j** (151 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4r** (219 mg, 0.67 mmol, 67%).

Alternatively, the title compound was prepared starting from aryl bromide **2f** (192 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and nitro compound **5c** (181 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4r** (199 mg, 0.61 mmol, 61%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3e** (158 mg, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and nitro compound **5b** (207 mg, (1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4r** (190 mg, 0.58 mmol, 58%).

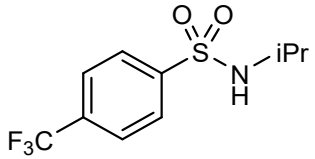
White solid, mp 144 - 145 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 1.57 (q, 6H, ^3J = 13.6 Hz, Adamantyl), 1.78 (s, 6H, Adamantyl), 2.01 (s, 3H, Adamantyl), 5.16 (s, 1H, NH), 7.28 (q, 1H, ^3J = 8.4 Hz, CH_{Ar}), 7.70 – 7.77 (m, 2H, CH_{Ar}).

$^{13}C\{^1H\}$ NMR (126 MHz, $CDCl_3$): δ 29.4, 35.7, 42.9, 55.5, 116.8 (d, J_{CF} = 18.6 Hz), 118.0 (d, J_{CF} = 17.9 Hz), 123.8 (m), 140.9 (m), 149.8 (dd, $^1J_{CF}$ = 254.4 Hz, J_{CF} = 14.0 Hz), 152.6 (dd, $^1J_{CF}$ = 255.8 Hz, J_{CF} = 12.6 Hz).

MS (GC, 70eV): m/z (%) = 327 (M^+, 37), 270 (45), 135 (19), 113 (43), 93 (100).

Anal. calcd. for $C_{16}H_{19}NO_2F_2S$: C, 58.70; H, 5.85; N, 4.28. Found: C, 58.72; H, 5.93; N, 4.11.

N-isopropyl-4-(trifluoromethyl)benzenesulfonamide 4s.



This compound was prepared starting from aryl bromide **2h** (224 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1g** (59 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4s** (238 mg, 0.89 mmol, 89%).

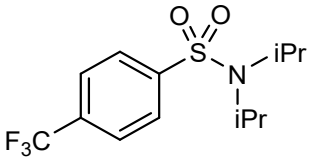
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3g** (190 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1g** (59 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4s** (214 mg, 0.80 mmol, 80%).

White solid, mp 77 - 78 °C. **^1H NMR** (500 MHz, $CDCl_3$): δ 1.05 (d, 6H, ^3J = 6.8 Hz, 2xMe), 3.45 – 3.47 (m, 1H, CH.), 5.03 (s, 1H, NH), 7.73 (d, 2H, ^3J = 8.2 Hz, CH_{Ar}), 8.0 (d, 2H, ^3J = 8.2 Hz, CH_{Ar}).

$^{13}C\{^1H\}$ NMR (126 MHz, $CDCl_3$): δ 23.6, 46.4, 123.3 (q, $^1J_{CF}$ = 278.8 Hz), 126.2, 127.4, 134.1 (q, $^2J_{CF}$ = 33.1 Hz), 144.8.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{10}H_{13}NO_2SF_3$ 268.0612. Found 268.0619.

N,N-diisopropyl-4-(trifluoromethyl)benzenesulfonamide 4t.



This compound was prepared starting from aryl bromide **2h** (224 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1q** (101 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4t** (222 mg, 0.72 mmol, 72%).

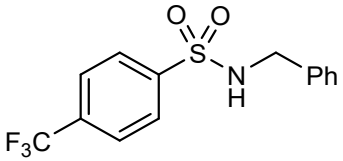
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3g** (190 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1q** (101 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4t** (185 mg, 0.60 mmol, 60%).

White solid, mp 100 - 101 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 1.25 (d, 12H, ^3J = 6.9 Hz, 4xMe), 3.72 – 3.75 (m, 2H, 2xCH.), 7.73 (d, 2H, ^3J = 8.3 Hz, CH_{Ar}), 7.98 (d, 2H, ^3J = 8.0 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 21.9, 49.0, 123.3 (q, $^1J_{CF}$ = 274.2 Hz), 126.0 (m), 127.6, 133.5 (q, $^2J_{CF}$ = 32.7 Hz), 146.2.

HRMS (TOF MS ES+Na) m/z: $[M + Na]^+$: Calcd for $C_{13}H_{18}NO_2SNaF_3$ 332.0930. Found 332.0908.

N-benzyl-4-(trifluoromethyl)benzenesulfonamide 4u.



This compound was prepared starting from aryl bromide **2h** (224 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1k** (107 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4u** (249 mg, 0.79 mmol, 79%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3g** (190 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1k** (107 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4u** (277 mg, 0.88 mmol, 88%).

Alternatively, the title compound was prepared starting from aryl bromide **2h** (224 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and nitro compound **5d** (137 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4u** (202 mg, 0.64 mmol, 64%).

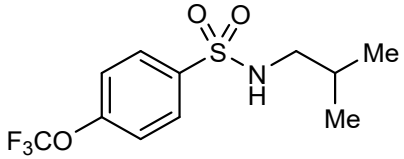
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3g** (190 mg, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and nitro compound **5d** (137 mg, (1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4u** (208 mg, 0.66 mmol, 66%).

White solid, mp 121 - 122 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 4.16 (d, 2H, ^3J = 6.2 Hz, CH_2), 5.35 (s, 1H, NH), 7.14 – 7.16 (m, 2H, CH_{Ar}), 7.22 – 7.26 (m, 3H, CH_{Ar}), 7.70 (d, 2H, ^3J = 8.2 Hz, CH_{Ar}), 7.92 (d, 2H, ^3J = 8.2 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 47.2, 123.1 (q, $^1J_{CF}$ = 268.2 Hz), 126.1 (m), 127.5, 127.8, 128.0, 128.7, 134.2 (q, $^2J_{CF}$ = 35.0 Hz), 135.7.

HRMS (TOF MS ES-) m/z: $[M - H]^+$: Calcd for $C_{14}H_{11}NO_2SF_3$ 314.0467. Found 314.0463.

N-isobutyl-4-(trifluoromethoxy)benzenesulfonamide 4v.



This compound was prepared starting from aryl bromide **2i** (240 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1h** (73 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4v** (211 mg, 0.71 mmol, 71%).

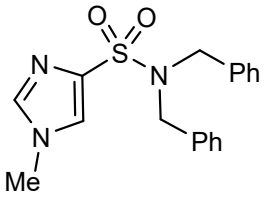
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3h** (206 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1h** (73 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4v** (175 mg, 0.59 mmol, 59%).

White solid, mp 120 - 122 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 0.86 (d, 6H, ^3J = 6.8 Hz, 2xMe), 1.69 – 1.74 (m, 1H, CH), 2.76 (t, 2H, ^3J = 6.4 Hz, CH_2), 5.12 (s, 1H, NH), 7.32 (d, 1H, ^3J = 8.8 Hz, CH_{Ar}), 7.92 (d, 1H, ^3J = 8.8 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 19.8, 28.4, 50.5, 120.2 (q, $^1J_{CF}$ = 259.2 Hz), 121.0, 129.1, 138.4, 152.0.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{11}H_{15}NO_3SF_3$ 298.0725. Found 298.0725.

N,N-dibenzyl-1-methyl-1H-imidazole-4-sulfonamide 4w.



This compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1t** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4w** (252 mg, 0.74 mmol, 74%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3k** (126 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1t** (197 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4w** (280 mg, 0.82 mmol, 82%).

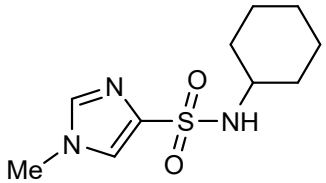
White solid, mp 120 - 122 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 3.71 (s, 3H, Me), 4.30 (s, 4H, 2xCH_2), 7.13 – 7.15 (m, 4H, CH_{Ar}), 7.19 – 7.23 (m, 6H, CH_{Ar}), 7.86 (s, 1H, Imidazole), 7.86 (s, 1H, Imidazole).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 33.5, 51.4, 125.2, 127.2, 128.1, 128.2, 136.5, 138.5, 139.9.

MS (GC, 70eV): m/z (%) = 341 (M^+, 9), 145 (33), 95 (100).

Anal. calcd. for $C_{18}H_{19}N_3O_2S$: C, 63.32; H, 5.61; N, 12.31. Found: C, 63.33; H, 5.693; N, 12.21.

N-cyclohexyl-1-methyl-1H-imidazole-4-sulfonamide 4x.



This compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1i** (99 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4x** (170 mg, 0.70mmol, 70%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3k** (126 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1i** (99 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4x** (209 mg, 0.86 mmol, 86%).

Alternatively, the title compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and nitro compound **5e** (99 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4x** (148 mg, 0.55 mmol, 55%).

Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3g** (190 mg, 1.0 equiv.), $K_2S_2O_5$ (1.068 g, 4.8 mmol, 4.8 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and

nitro compound **5e** (99 mg, (1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4x** (139 mg, 0.57 mmol, 57%).

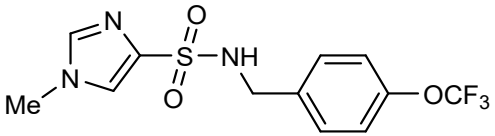
White solid, mp 177-178 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 1.00 – 1.17 (m, 5H, Cycl.), 1.43 – 1.45 (m, 1H, Cycl.), 1.58 – 1.66 (m, 4H, Cycl.), 2.96 – 2.97 (m, 1H, Cycl.), 3.68 (s, 3H, Me), 7.36 (d, 1H, ^3J = 7.3 Hz, NH), 7.65 (d, 1H, ^4J = 1.1 Hz, Imidazole), 7.73 (d, 1H, ^4J = 0.7 Hz, Imidazole).

^{13}C{^{1}H} NMR (126 MHz, DMSO-d_6): δ 24.6, 25.0, 33.40, 33.44, 52.1, 123.6, 139.4, 141.0.

MS (GC, 70eV): m/z (%) = 243(M^+, 1), 200 (31), 145 (65), 136 (21), 123 (21), 98 (100), 82 (74).

Anal. calcd. for $C_{10}H_{17}N_3O_2S$: C, 49.36; H, 7.04; N, 17.27. Found: C, 49.45; H, 7.11; N, 17.21.

1-methyl-N-(4-(trifluoromethoxy)benzyl)-1H-imidazole-4-sulfonamide 4y.



This compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1n** (191 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4y** (228 mg, 0.68 mmol, 68%).

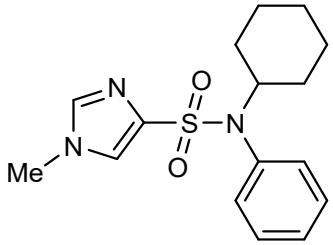
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3k** (126 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1n** (191 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4y** (261 mg, 0.78 mmol, 78%).

White solid, mp 170 - 171 °C. **^{1}H NMR** (500 MHz, DMSO-d_6): δ 3.60 (s, 3H, Me), 4.07 (s, 2H, CH_2), 7.27 (d, 2H, ^3J = 8.0 Hz, CH_{Ar}), 7.39 (d, 2H, ^3J = 8.7 Hz, CH_{Ar}), 7.71 (d, 1H, ^4J = 1.1 Hz, Imidazole), 7.62 (d, 1H, ^4J = 1.0 Hz, Imidazole), 8.00 (br. s, 1H, NH).

^{13}C{^{1}H} NMR (126 MHz, DMSO-d_6): δ 33.4, 45.3, 120.1 (q, $^1J_{CF}$ = 259.9 Hz), 120.8, 124.2, 129.4, 137.9, 139.6, 139.7, 147.3.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{12}H_{13}N_3O_3SF_3$ 336..0631. Found 336.0630.

N-cyclohexyl-1-methyl-N-phenyl-1H-imidazole-4-sulfonamide 4z.



This compound was prepared starting from aryl bromide **2l** (160 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and amine **1s** (175 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4z** (230 mg, 0.72 mmol, 72%).

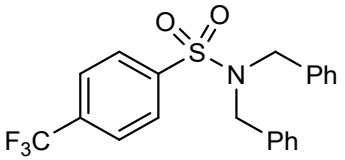
Alternatively, the title compound was prepared starting from aromatic carboxylic acid **3k** (126 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.); $CuBr_2$ (313 mg, 1.4 mmol, 1.4 equiv.) and amine **1s** (175 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4z** (191 mg, 0.60 mmol, 60%).

White solid, mp 194 - 195 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 0.78 – 0.83 (m, 1H, Cy), 1.00 – 1.04 (m, 2H, Cy), 1.29 – 1.31 (m, 2H, Cy), 1.48 (br. s, 1H, Cy), 1.67 (br. s, 2H, Cy), 1.98 (br. s, 2H, Cy), 3.61 (s, 3H, Me), 4.08 – 4.13 (m, 1H, Cy), 7.13 – 7.28 (m, 6H, CH_{Ar}), 7.44 – 7.45 (m, 1H, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 25.0, 25.8, 32.7, 33.8, 59.1, 124.3, 128.2, 128.5, 132.3, 135.8, 138.8, 141.0.

HRMS (TOF MS ES+) m/z: $[M + H]^+$: Calcd for $C_{15}H_{22}N_5OS$ 320.1576. Found 320.1545.

N,N-dibenzyl-4-(trifluoromethyl)benzenesulfonamide 4aa.



This compound was prepared starting from CF_3Ph-$Pd(PPh_3)_2$-Br (428 mg, 0.5 mmol, 1.0 equiv.), $K_2S_2O_5$ (134 mg, 0.6 mmol, 1.2 equiv.), cucurbit[6]uril (25 mg, 0.025 mmol, 0.05 equiv.) and amine **1t** (99 mg, 0.5 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **4aa** (122 mg, 0.31 mmol, 61%).

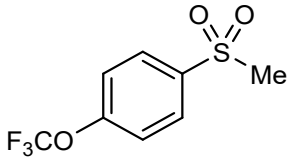
White solid, mp 91 - 92 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 4.40 (s, 4H, 2xCH_2), 7.07 – 7.09 (m, 4H, CH_{Ar}), 7.25 – 7.26 (m, 4H, CH_{Ar}), 7.74 (d, 2H, ^3J = 7.3 Hz, CH_{Ar}), 7.92 (d, 2H, ^3J = 7.3 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 50.6, 123.2 (q, $^1J_{CF}$ = 274.9 Hz), 126.2 (m), 127.5, 127.8, 128.4, 128.5, 134.0 (q, $^2J_{CF}$ = 32.9 Hz), 135.0.

MS (GC, 70eV): m/z (%) = 405 (M^+, 2), 314 (12), 195 (19), 91 (100).

Anal. calcd. for $C_{21}H_{18}F_3NO_2S$: C, 62.21; H, 4.48; N, 3.45. Found: C, 62.18; H, 4.53; N, 3.52.

1-(methylsulfonyl)-4-(trifluoromethoxy)benzene 11.



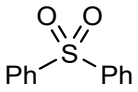
This compound was prepared starting from 1-bromo-4-(trifluoromethoxy)benzene **10** (241 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and MeI (426 mg, 3.0 mmol, 3.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **11** (139 mg, 0.58 mmol, 58%).

White solid, mp 67-69 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 3.06 (s, 3H, Me), 7.37(d, 2H, ^3J = 8.7 Hz, CH_{Ar}), 7.98 (dt, 2H, ^3J = 8.9 Hz, ^4J = 2.1 Hz, CH_{Ar}).

^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 44.4, 120.1 (q, $^1J_{CF}$ = 257.9 Hz), 121.1, 129.6 (m), 129.7, 138.7, 152.9.

Anal. calcd. for $C_8H_7F_3O_3S$: C, 40.00; H, 2.94. Found: C, 40.12; H, 3.06.

sulfonyldibenzene 13.



This compound was prepared starting from bromobenzene **12** (157 mg, 1.0 mmol, 1.0 equiv.), $K_2S_2O_5$ (267 mg, 1.2 mmol, 1.2 equiv.), cucurbit[6]uril (50 mg, 0.05 mmol, 0.05 equiv.), $(PPh_3)_2PdCl_2$ (21 mg, 0.03 mmol, 0.03 equiv.) and boronic acid (122 mg, 1.0 mmol, 1.0 equiv.). The purification was performed by column chromatography on silica gel to provide the desired compound **13** (153 mg, 0.70 mmol, 70%).

White solid, mp 125-126 °C. **^{1}H NMR** (500 MHz, $CDCl_3$): δ 7.45 (t, 4H, ^3J = 8.4 Hz, CH_{Ar}), 7.50 – 7.52 (m, 2H, CH_{Ar}), 7.92 (d, 4H, ^3J = 7.6 Hz, CH_{Ar}).

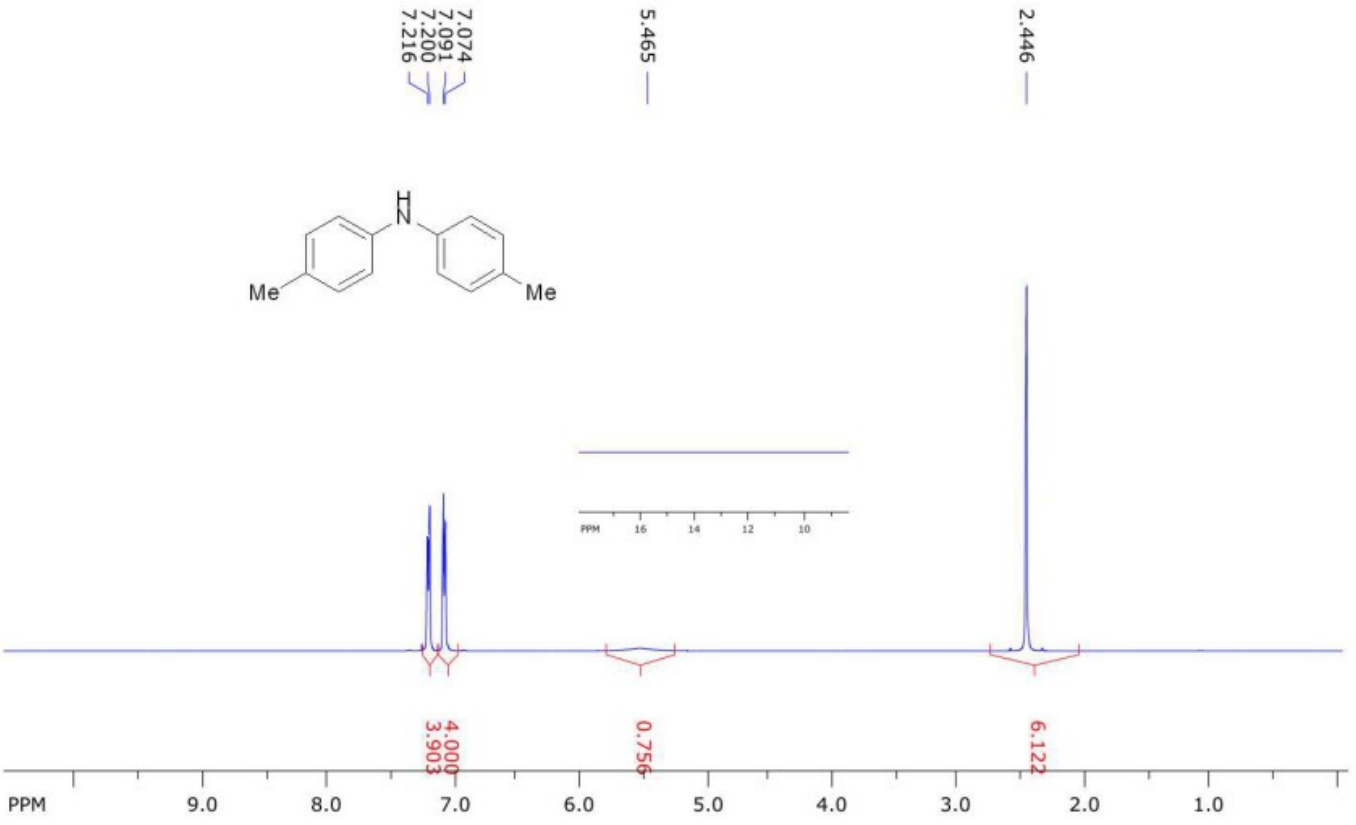
^{13}C{^{1}H} NMR (126 MHz, $CDCl_3$): δ 124.4, 129.1, 133.1, 141.3.

Anal. calcd. for $C_{12}H_{10}O_2S$: C, 66.03; H, 4.62. Found: C, 66.13; H, 4.69.

(C) Copies ^{1}H and ^{13}C NMR spectra.

Compound 1f

SpinWorks 4: IVA 2423 1H CDCl3



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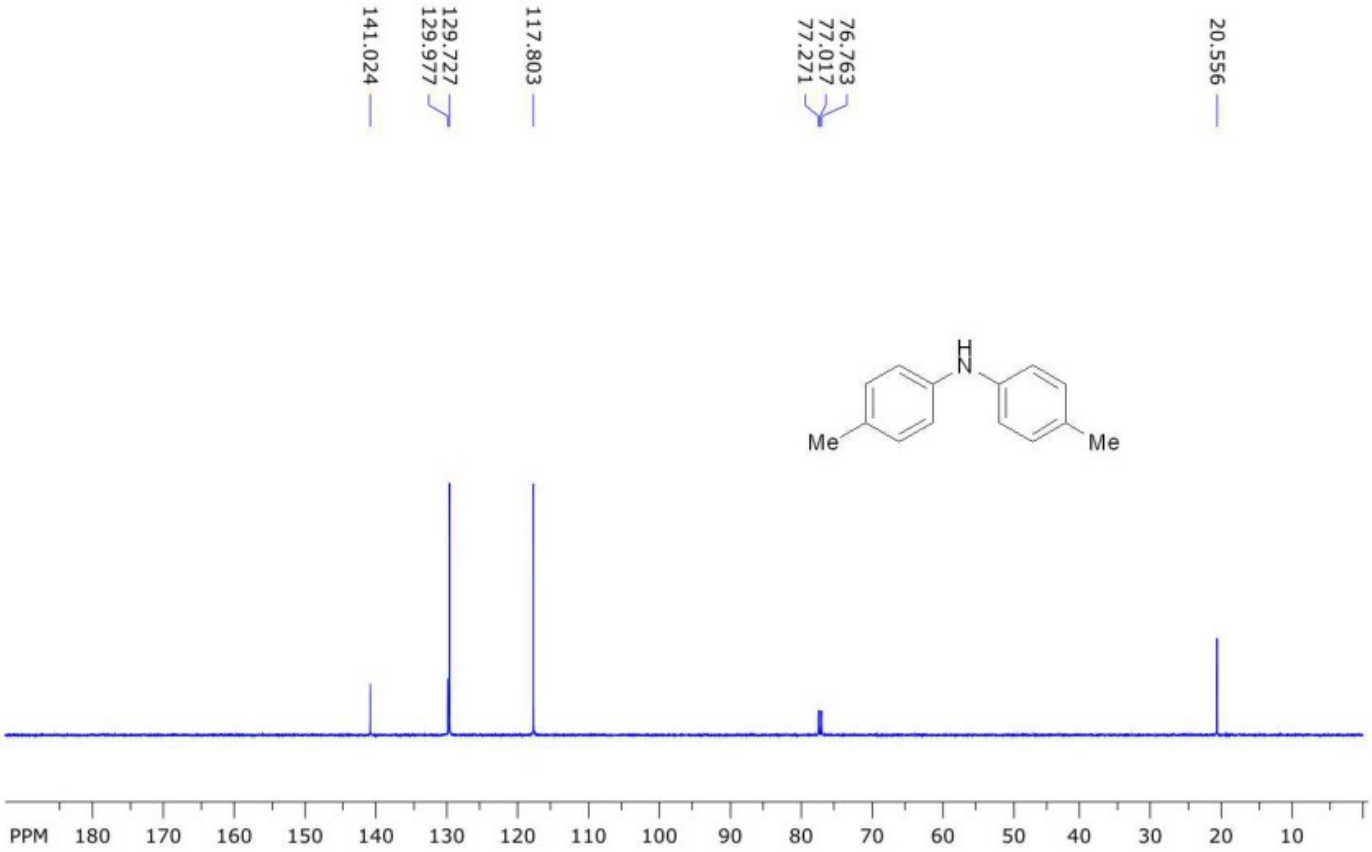
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130022 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 213.416 ppm/cm: 0.42672

Compound 1f

SpinWorks 4: IVA 2423 13C CDCl3



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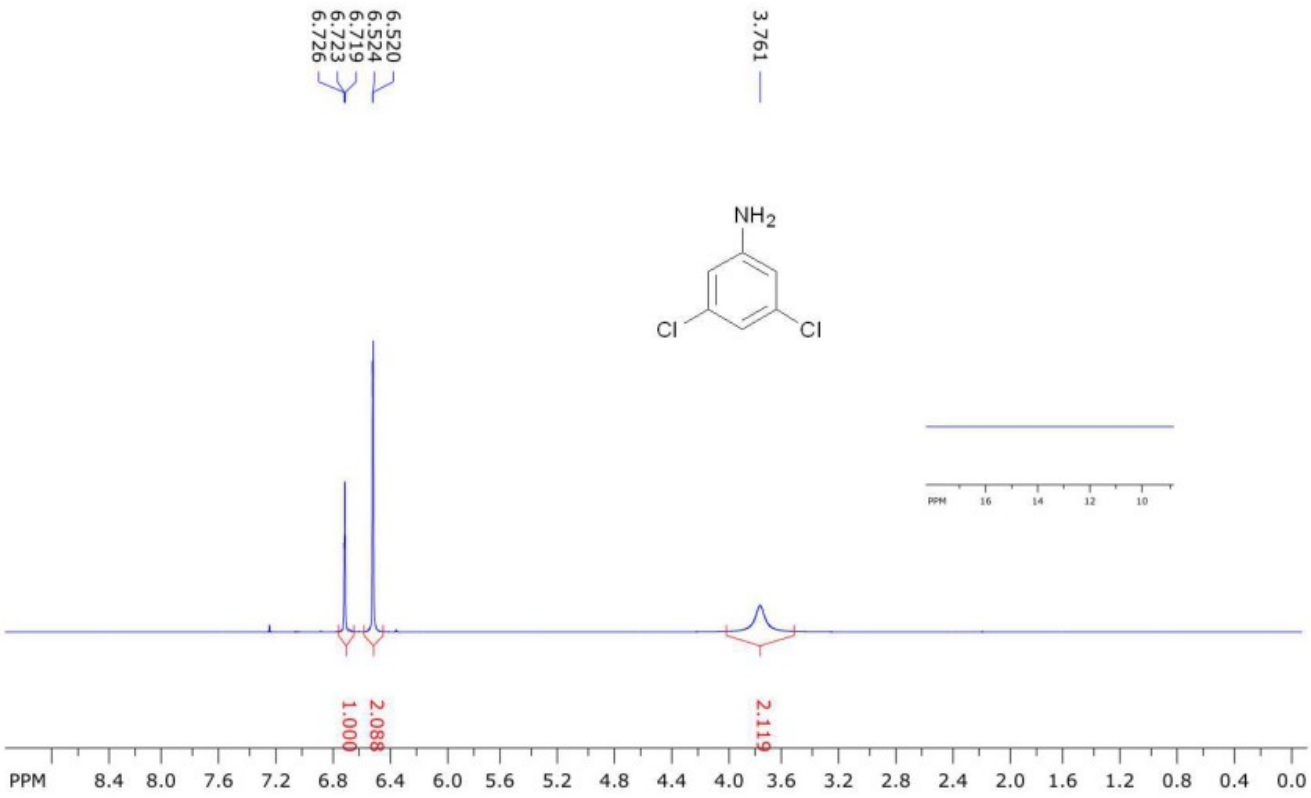
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 64

freq. of 0 ppm: 125.757824 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 971.643 ppm/cm: 7.72538

Compound 1u

SpinWorks 4: IVA 2432 1H CDCl3



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number of scans: 24

freq. of 0 ppm: 500.130023 MHz
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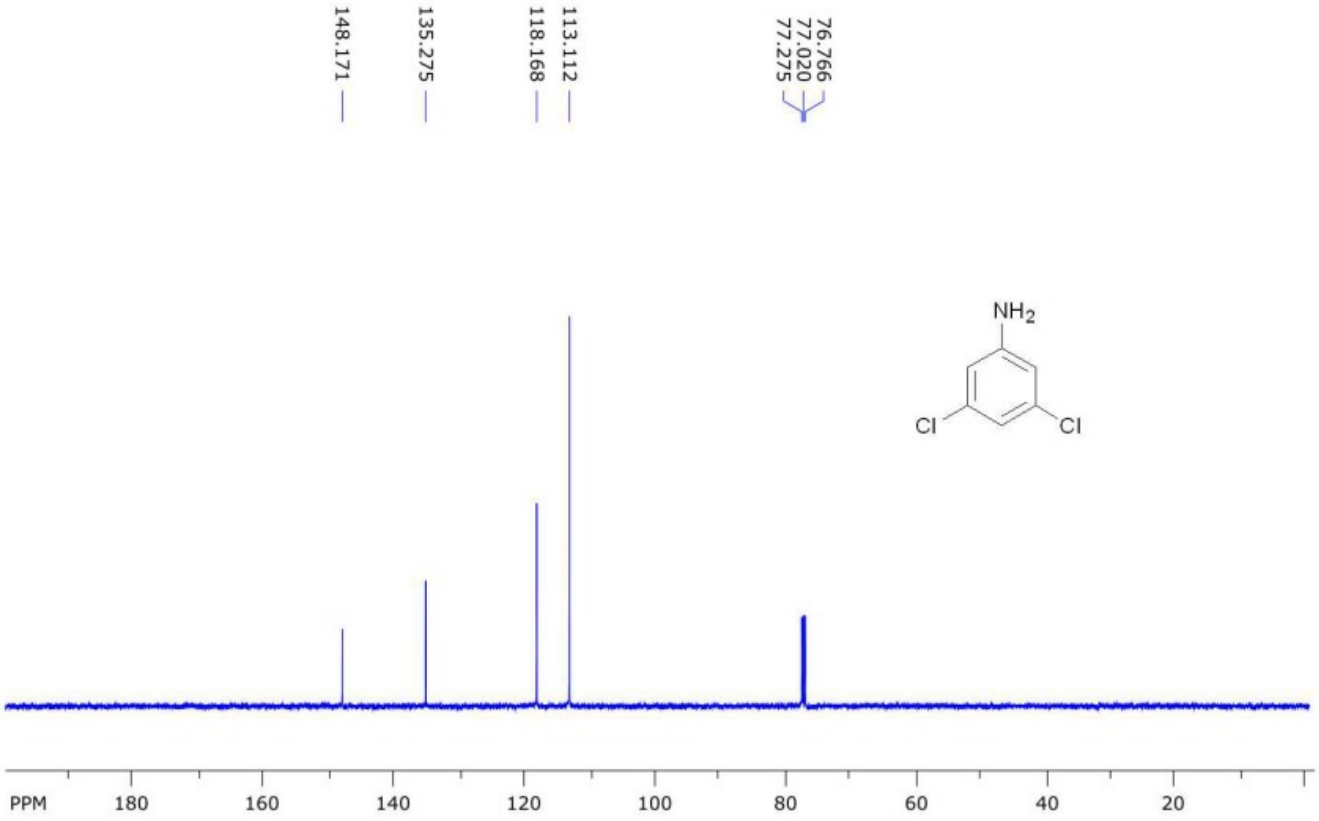
Hz/cm: 185.033 ppm/cm: 0.36997

Compound 1u

SpinWorks 4: IVA 2432 13c CDCL3



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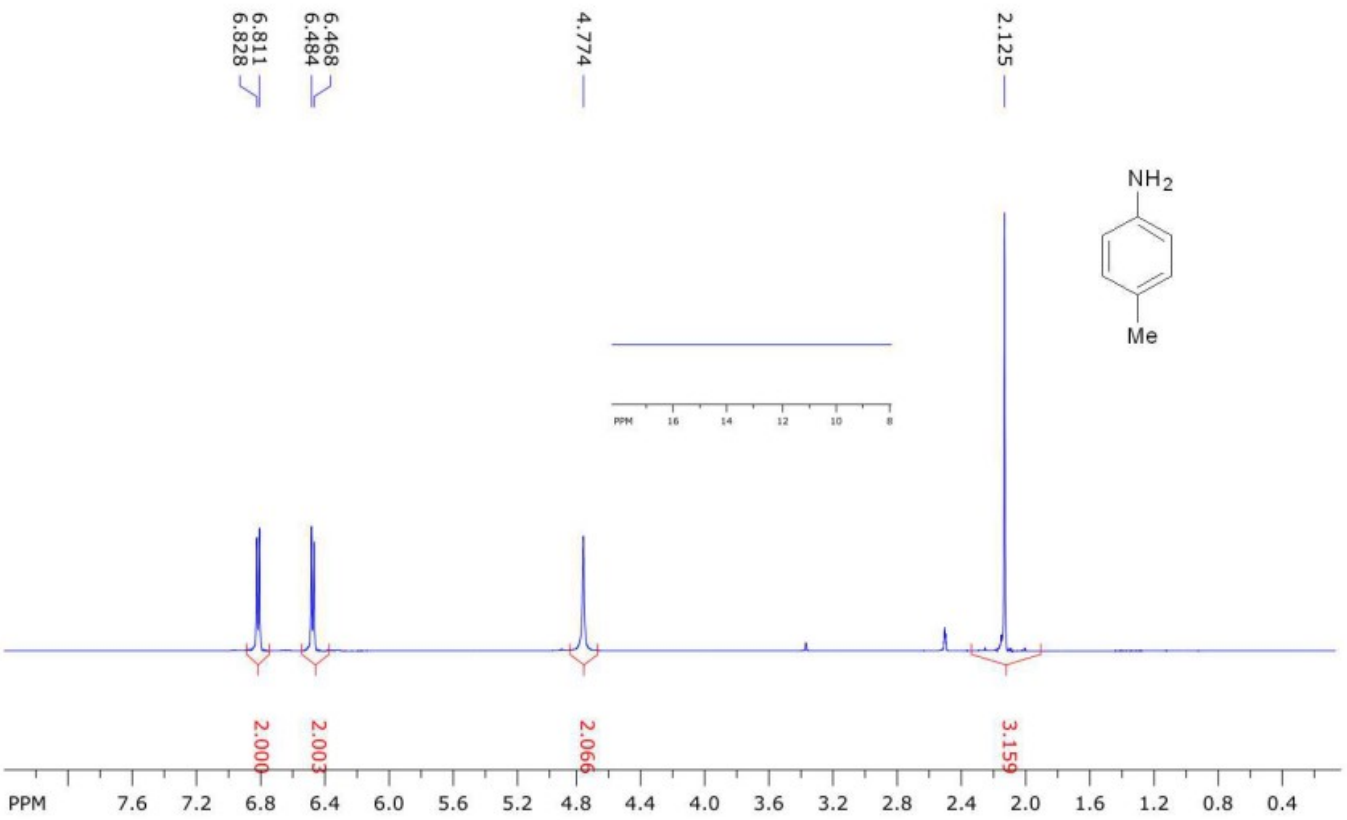
number of scans: 64

freq. of 0 ppm: 125.757805 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1011.530 ppm/cm: 8.04251

Compound 1v

SpinWorks 4: IVA 1341 1H DMSO



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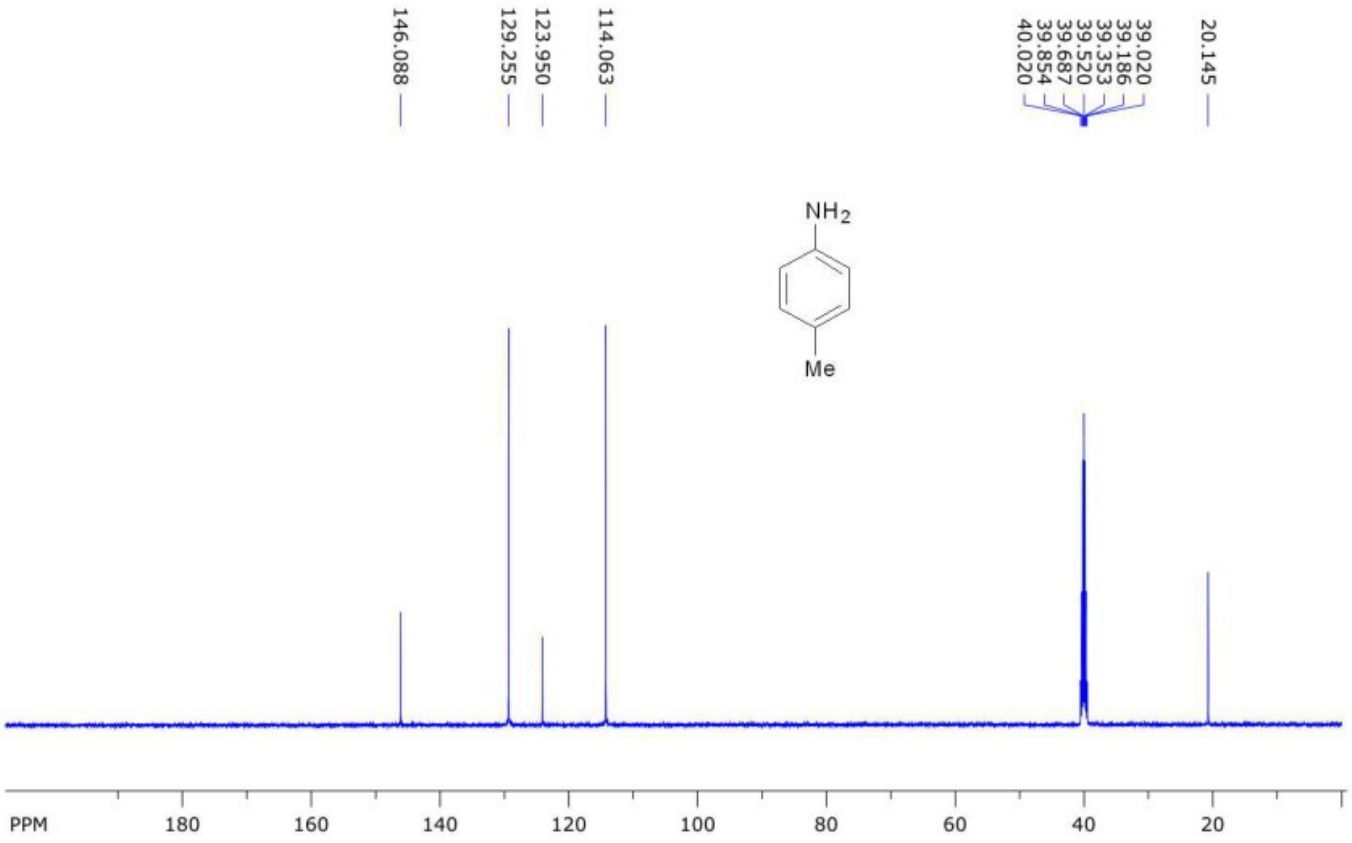
number of scans: 24

freq. of 0 ppm: 500.130005 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 167.567 ppm/cm: 0.33504

Compound 1v

SpinWorks 4: IVA 1341 13C DMSO



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number of scans: 512

freq. of 0 ppm: 125.757843 MHz
processed size: 32768 complex points
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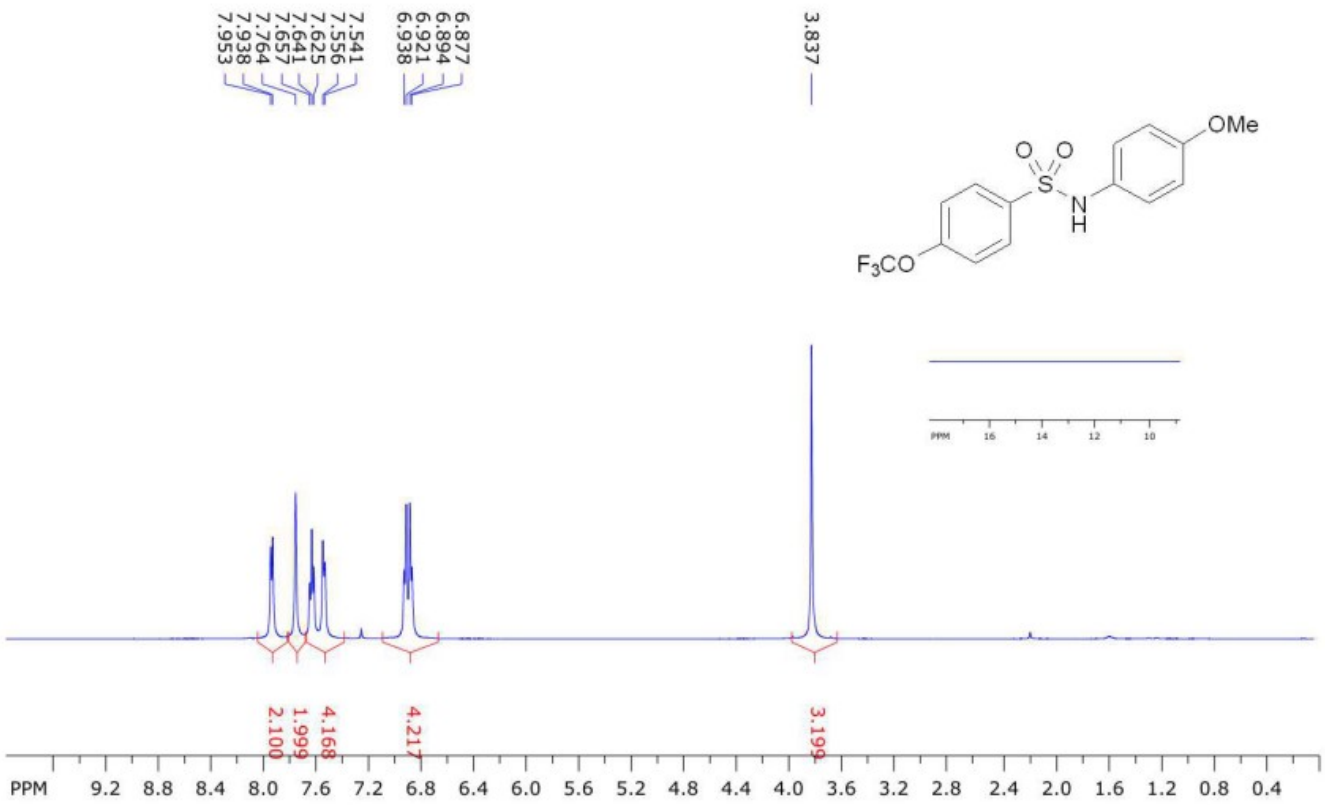
Compound 4a

SpinWorks 4: IVA 2979 1H CDCl3



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number of scans: 24

freq. of 0 ppm: 500.130021 MHz
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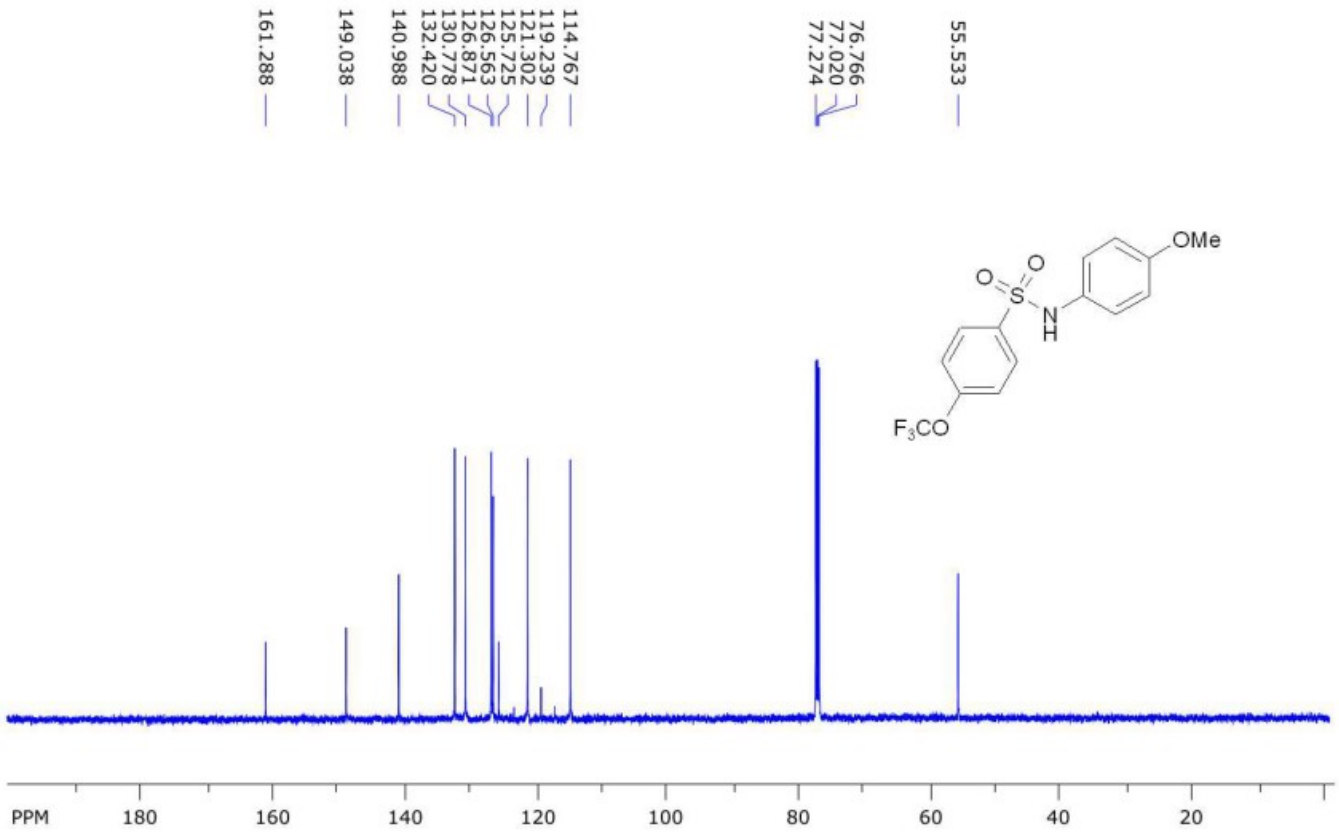
Hz/cm: 199.224 ppm/cm: 0.39834

Compound 4a

SpinWorks 4: IVA 2979 13C CDCl3



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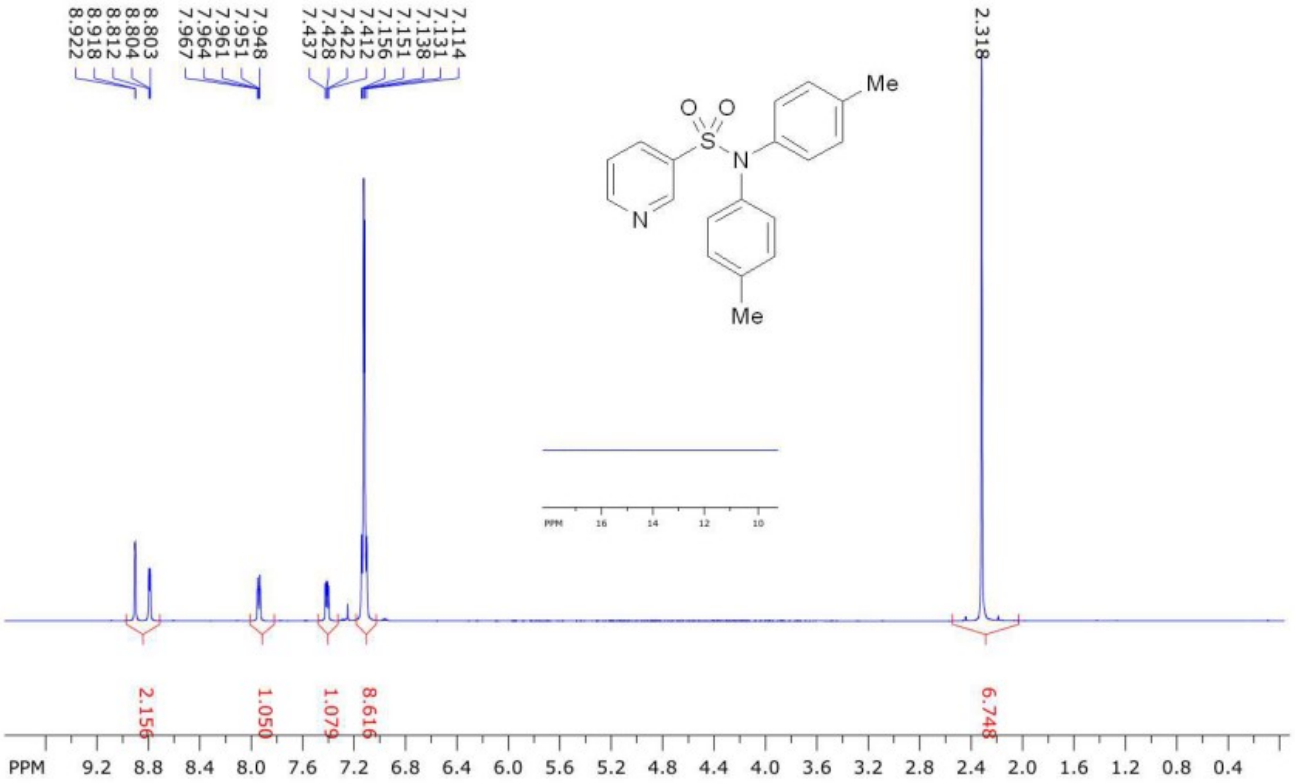
number of scans: 512

freq. of 0 ppm: 125.757793 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1016.316 ppm/cm: 8.08057

Compound 4b

SpinWorks 4: IVA 3052 1H CDCl3



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time domain size: 65536 points
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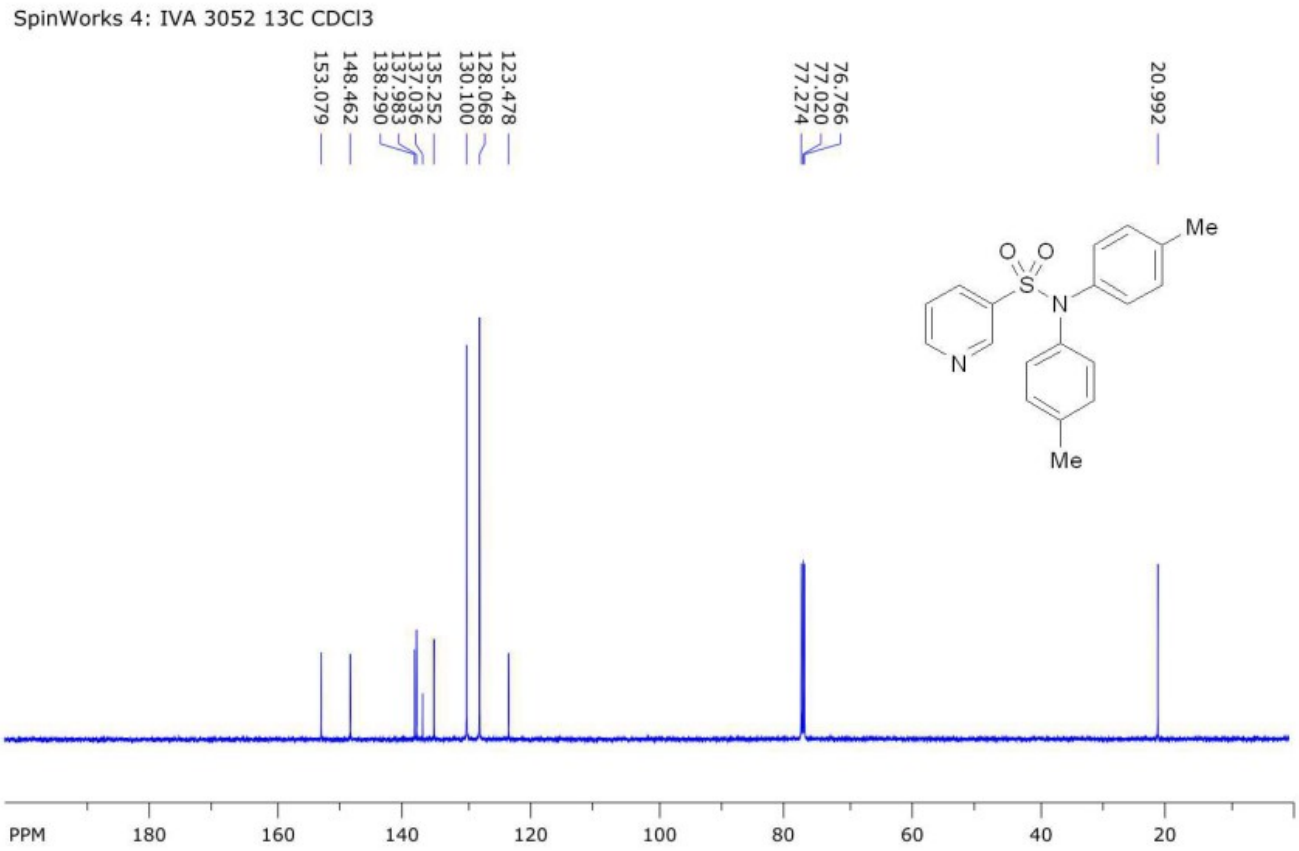
number of scans: 24

freq. of 0 ppm: 500.130022 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 199.770 ppm/cm: 0.39943

Compound 4b


SpinWorks 4: IVA 3052 13C CDCl3
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137.983
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130.100
128.068
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77.020
76.766
20.992
Me
O
O
S
N
N
Me
PPM
180
160
140
120
100
80
60
40
20
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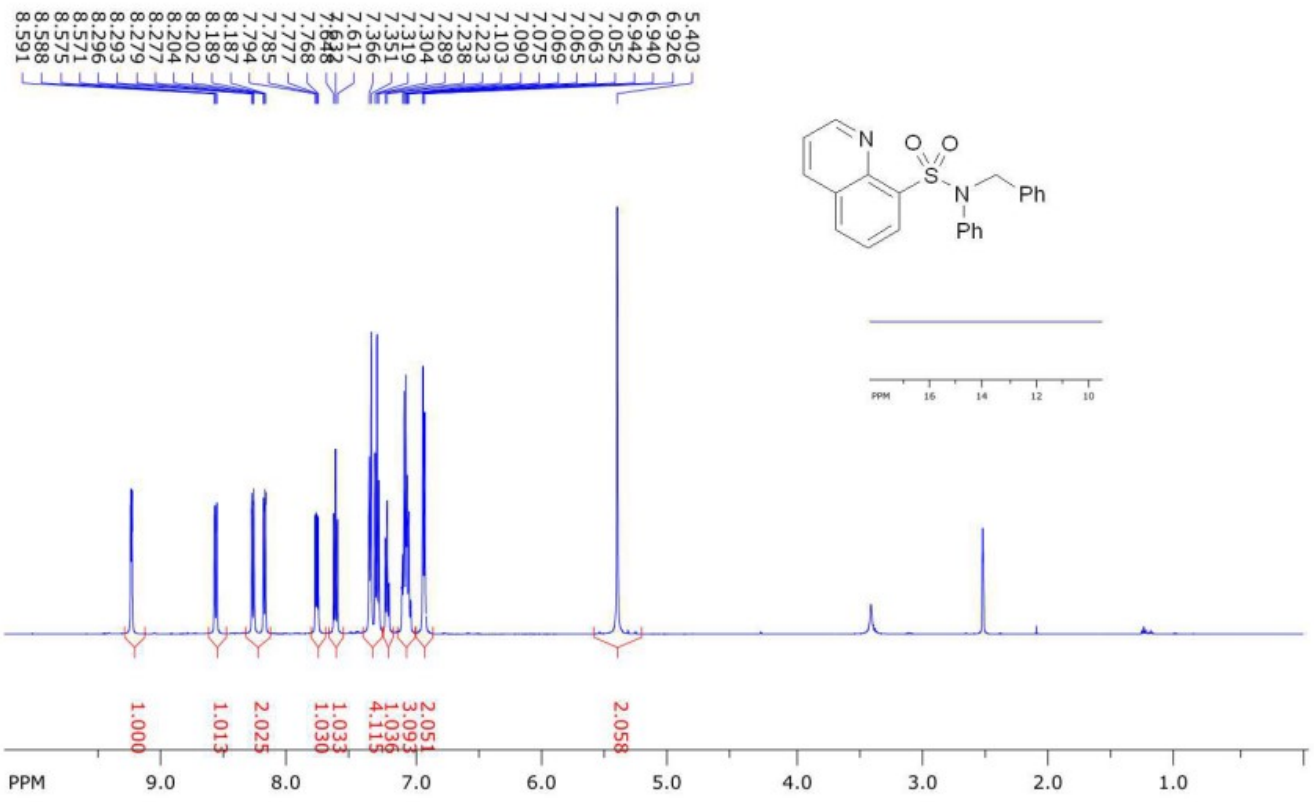
Hz/cm: 1019.507 ppm/cm: 8.10594

Compound 4c

SpinWorks 4: IVA 2097 1H DMSO



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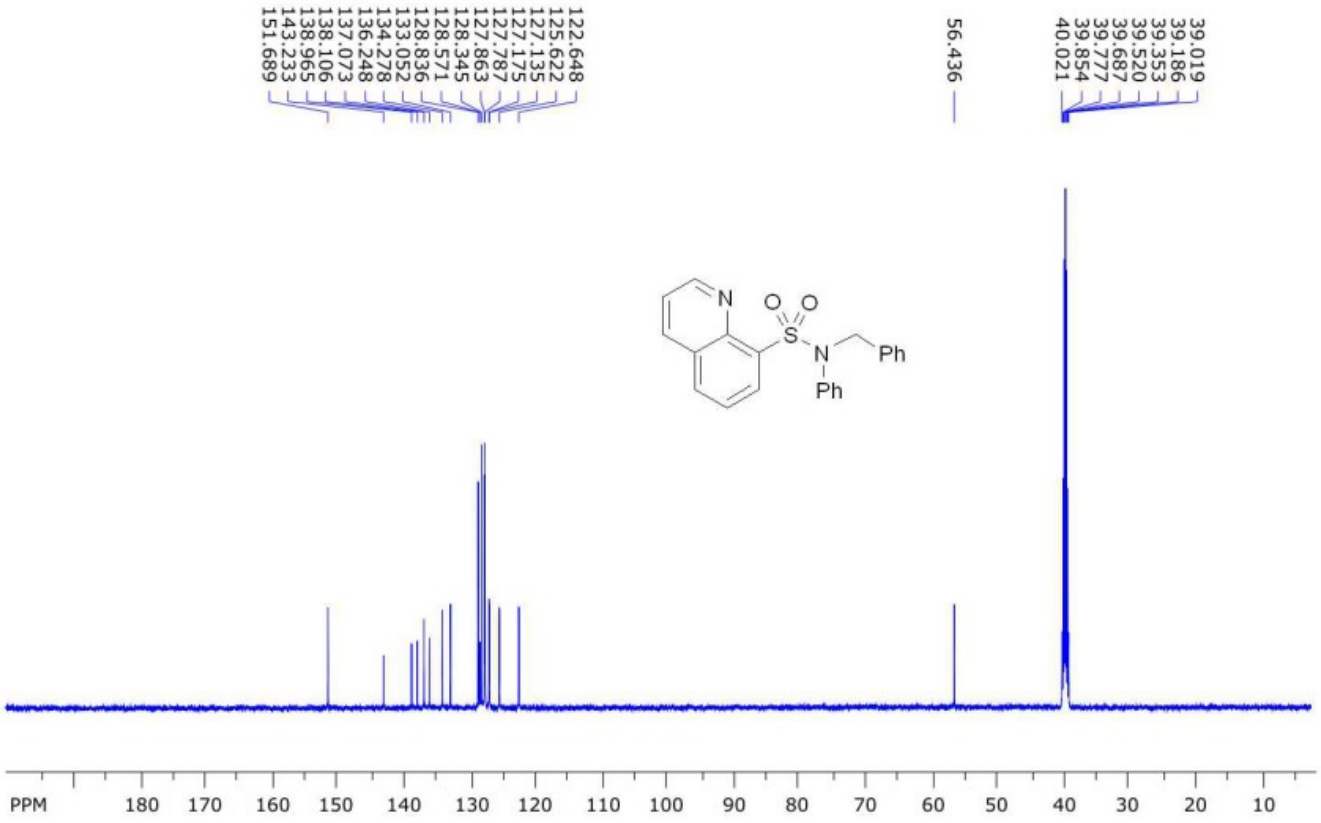
number of scans: 24

freq. of 0 ppm: 500.130000 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 205.774 ppm/cm: 0.41144

Compound 4c

SpinWorks 4: IVA 2097 13C DMSO

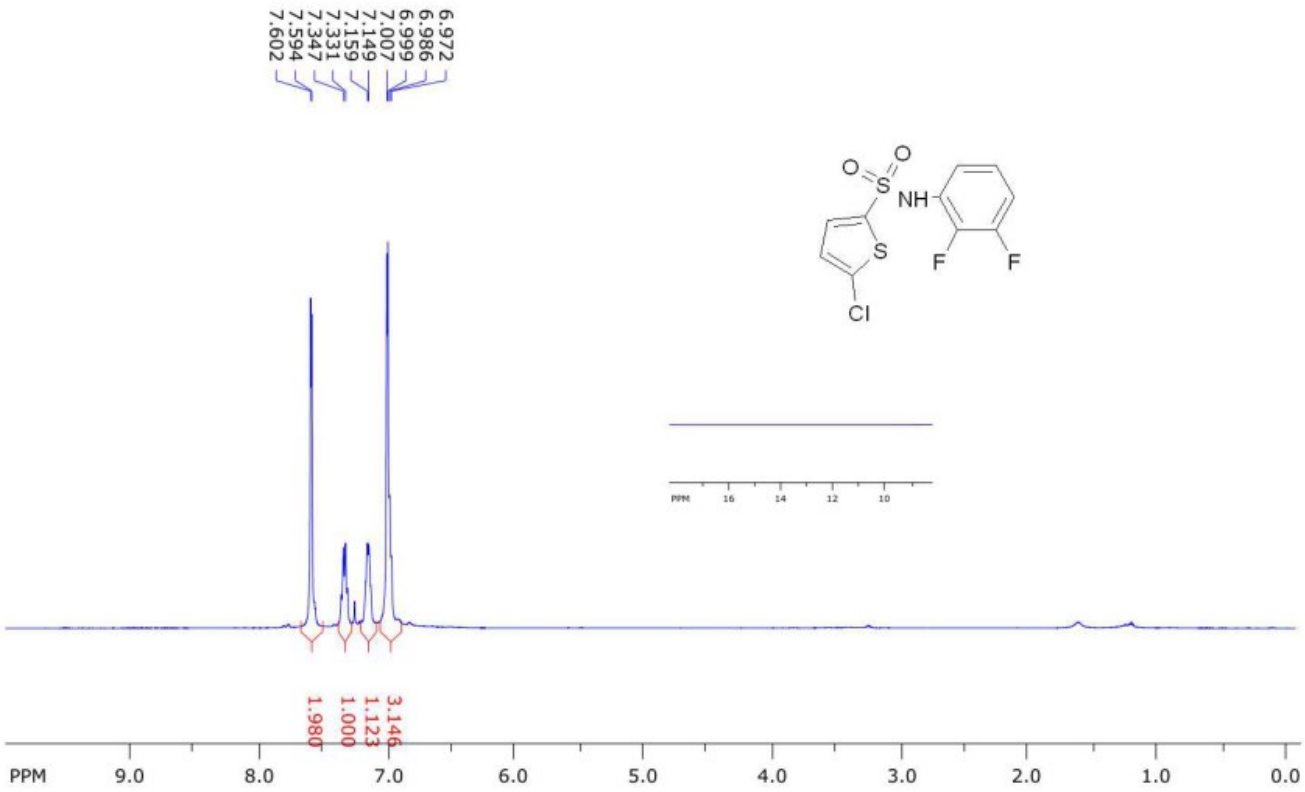


file: D:\NAPO\NMR\500-2\mkr10508\28\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757846 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 998.766 ppm/cm: 7.94103

Compound 4d

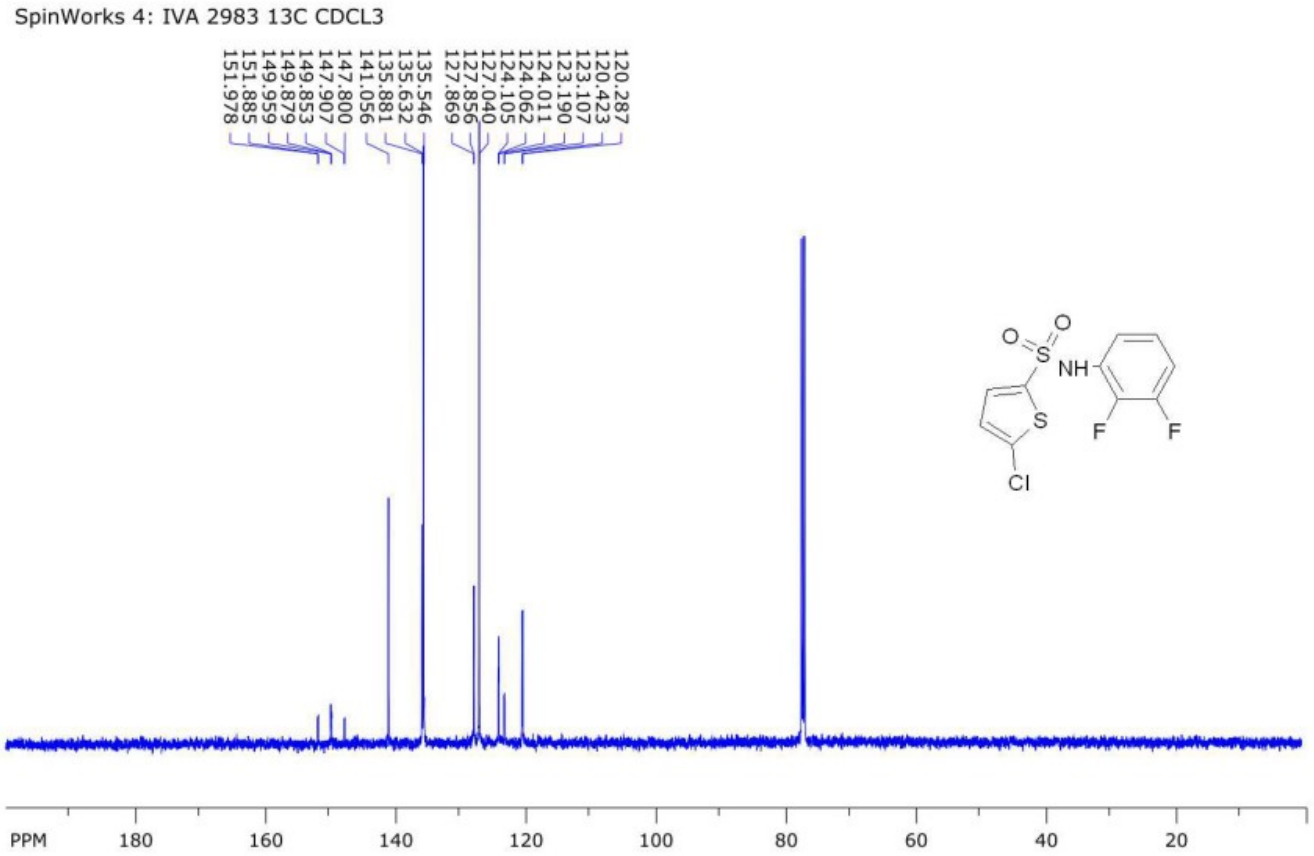
SpinWorks 4: IVA 2983 1H CDCl3



file: ...NAPO\NMR\500-2\mkr12606\5 2983\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 201.953 ppm/cm: 0.40380

Compound 4d

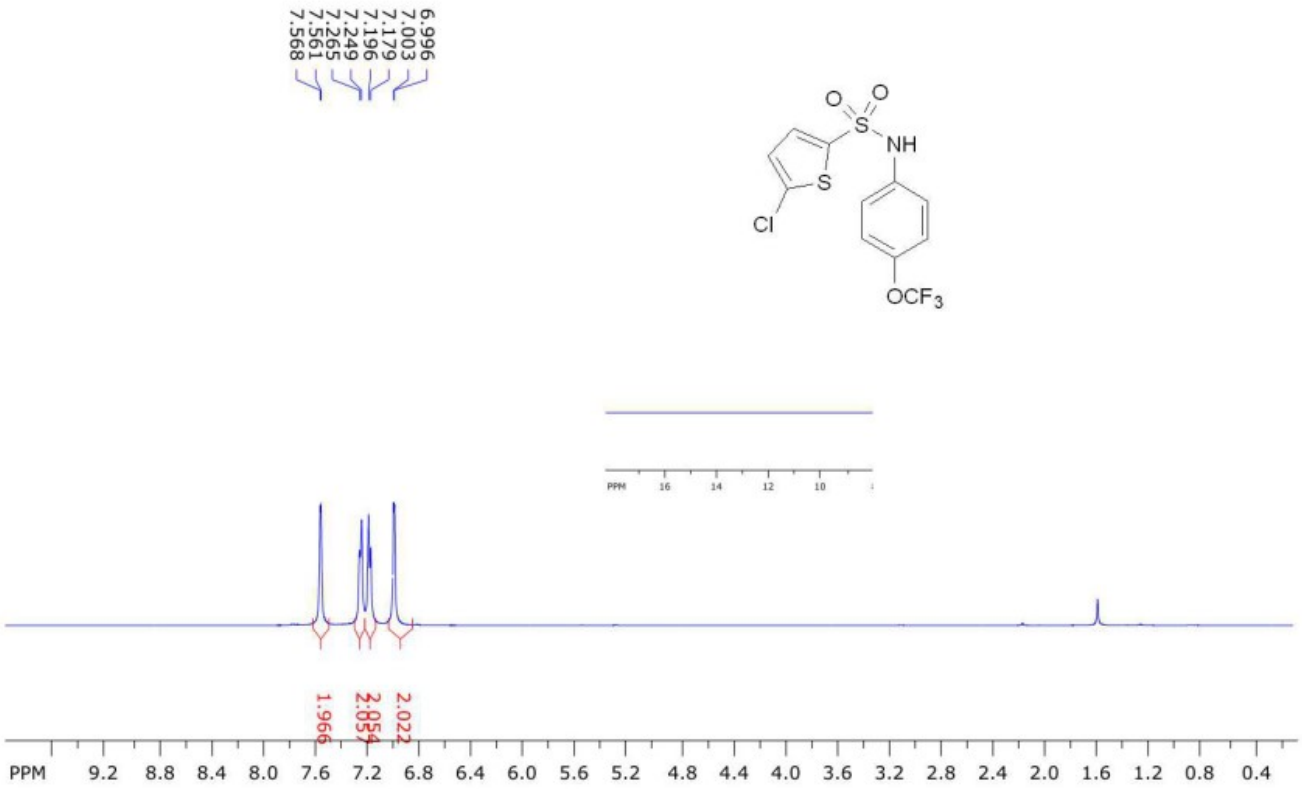


file: D:\NAPO\NMR\500-2\mkr12606\6\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757797 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1006.744 ppm/cm: 8.00446

Compound 4e

SpinWorks 4: IVA 2900 1H

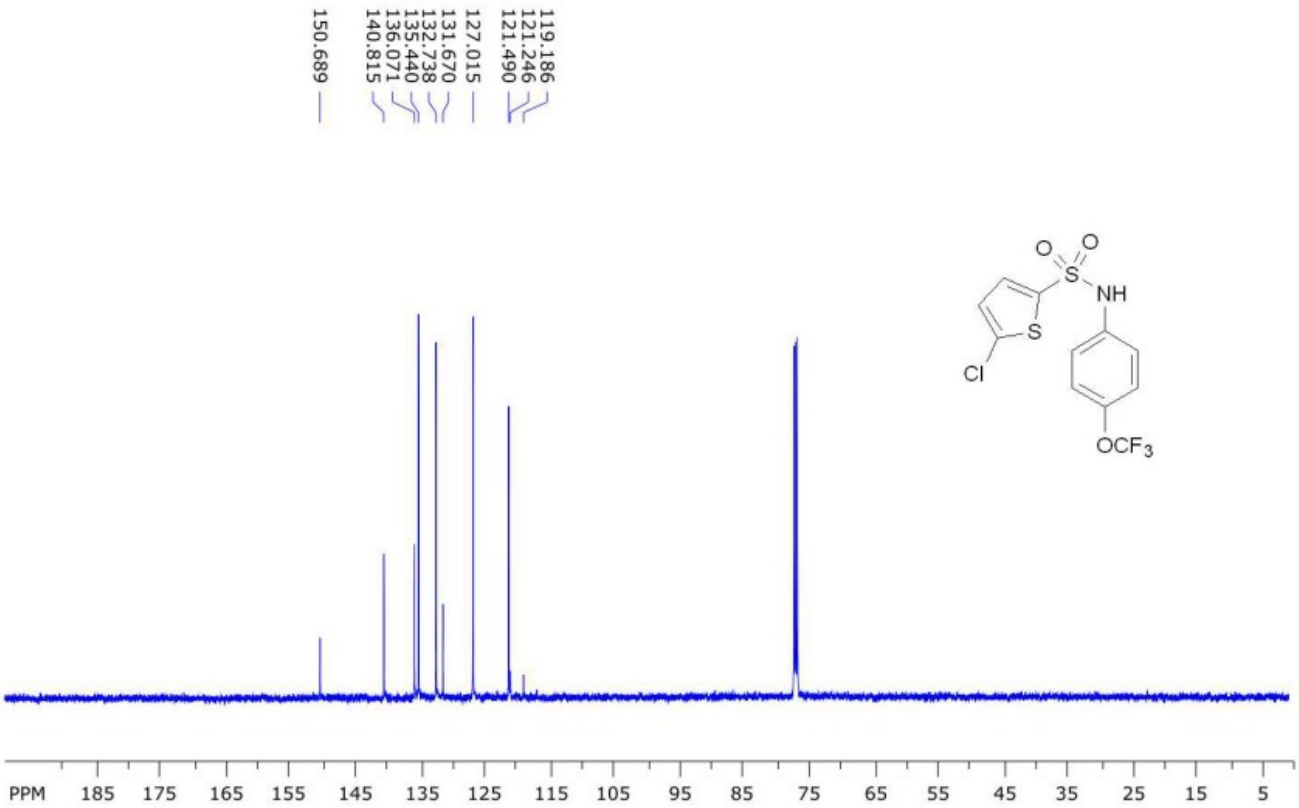


file: ...NAPO\NMR\500-2\mkr10706\1 2900\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 198.133 ppm/cm: 0.39616

Compound 4e

SpinWorks 4: IVA 2900 13C

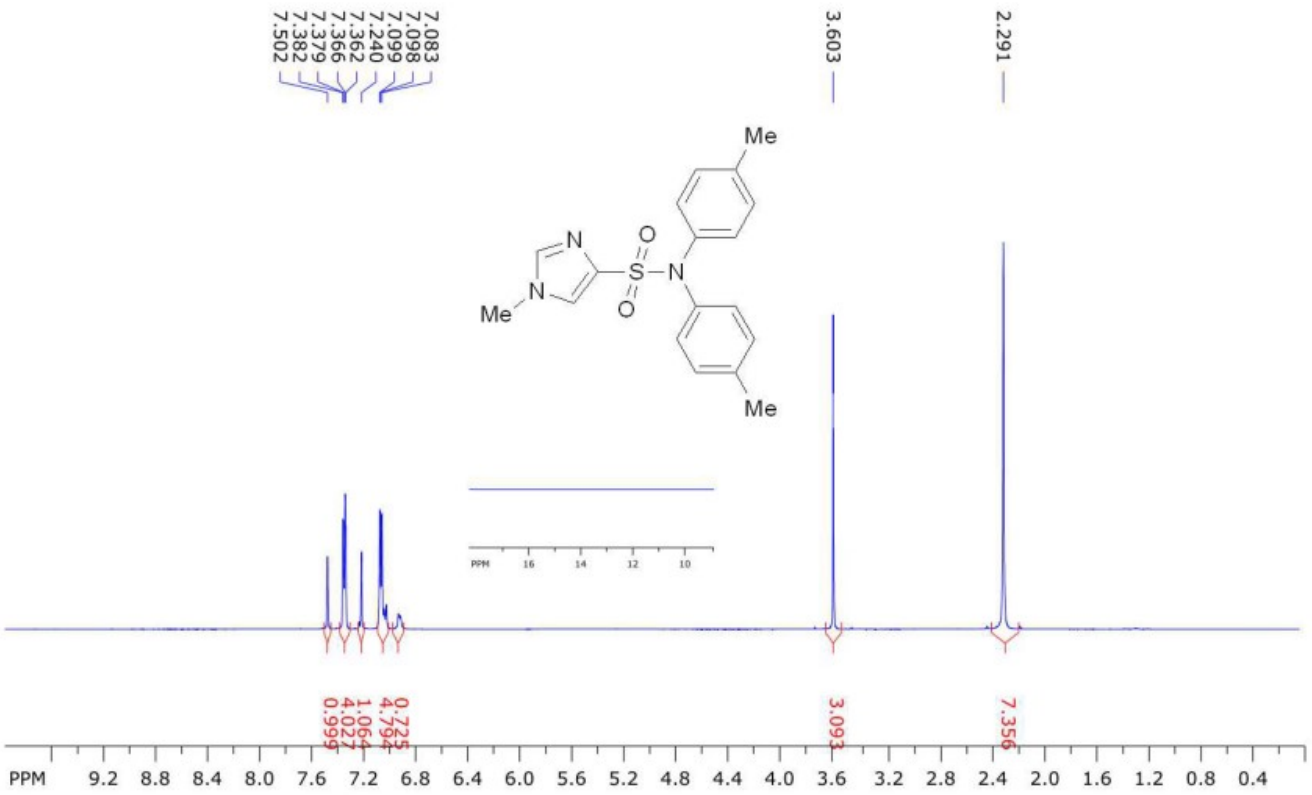


file: D:\NAPO\NMR\500-2\mkr10706\2\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757796 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1000.362 ppm/cm: 7.95372

Compound 4f

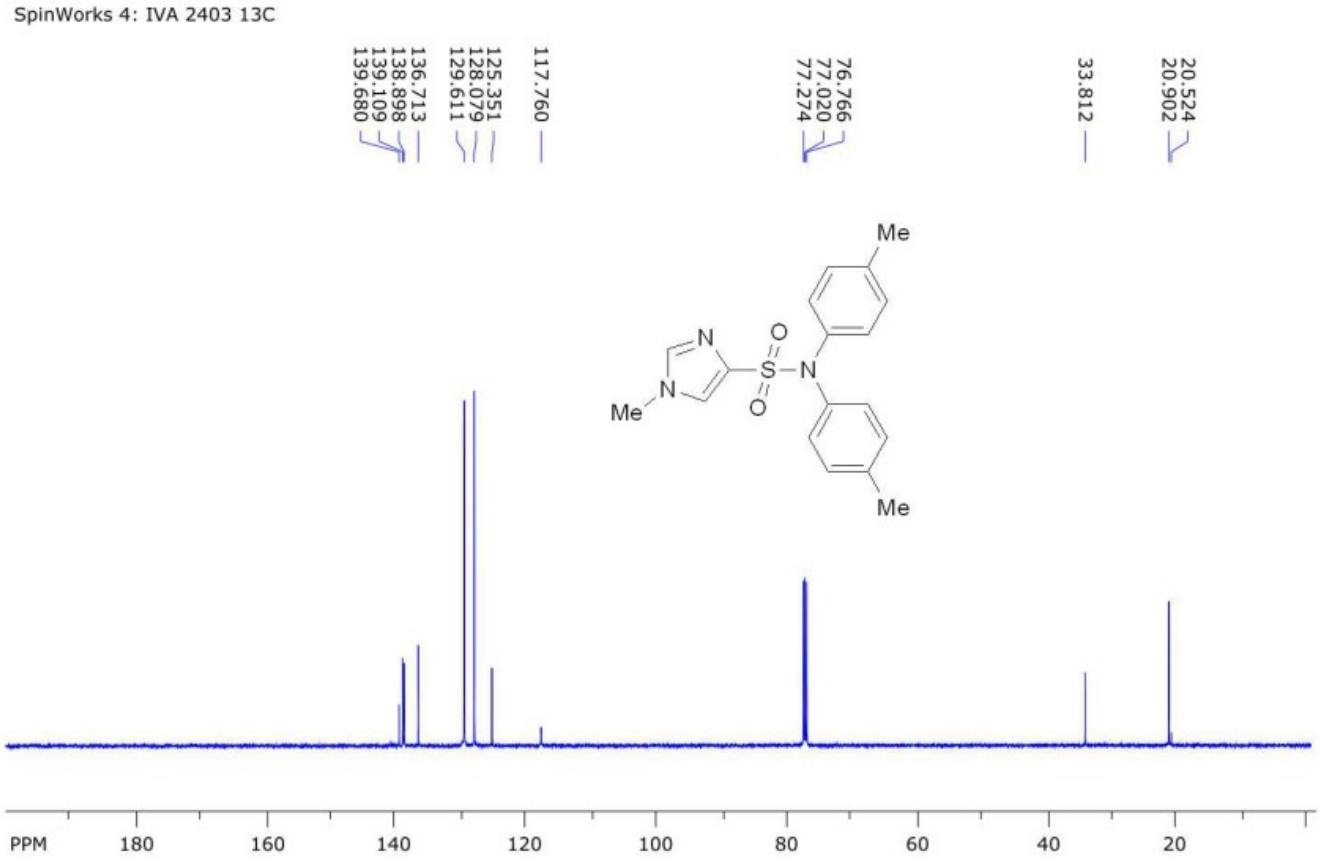
SpinWorks 4: IVA 2403 1H



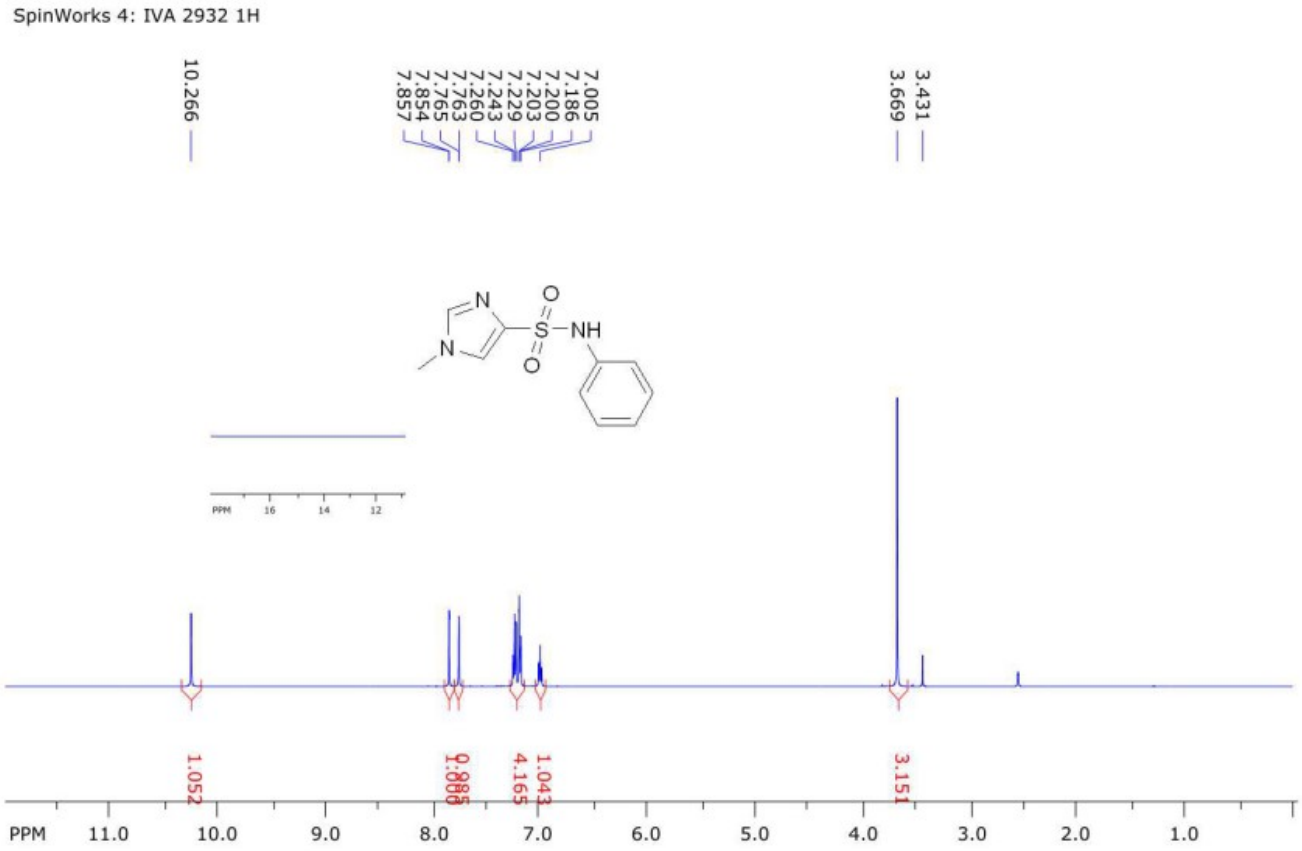
file: D:\NAPO\NMR\500-2\mkr23004\21\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 199.770 ppm/cm: 0.39943

Compound 4f


SpinWorks 4: IVA 2403 13C
139.680
139.109
138.898
136.713
129.611
128.079
125.351
117.760
77.274
77.020
76.766
33.812
20.902
20.524
Me
N
N
Me
S
O
O
N
Me
PPM
180
160
140
120
100
80
60
40
20
file: D:\NAPO\NMR\500-2\mkr23004\22\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512
freq. of 0 ppm: 125.757809 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1013.125 ppm/cm: 8.05520

Compound 4g

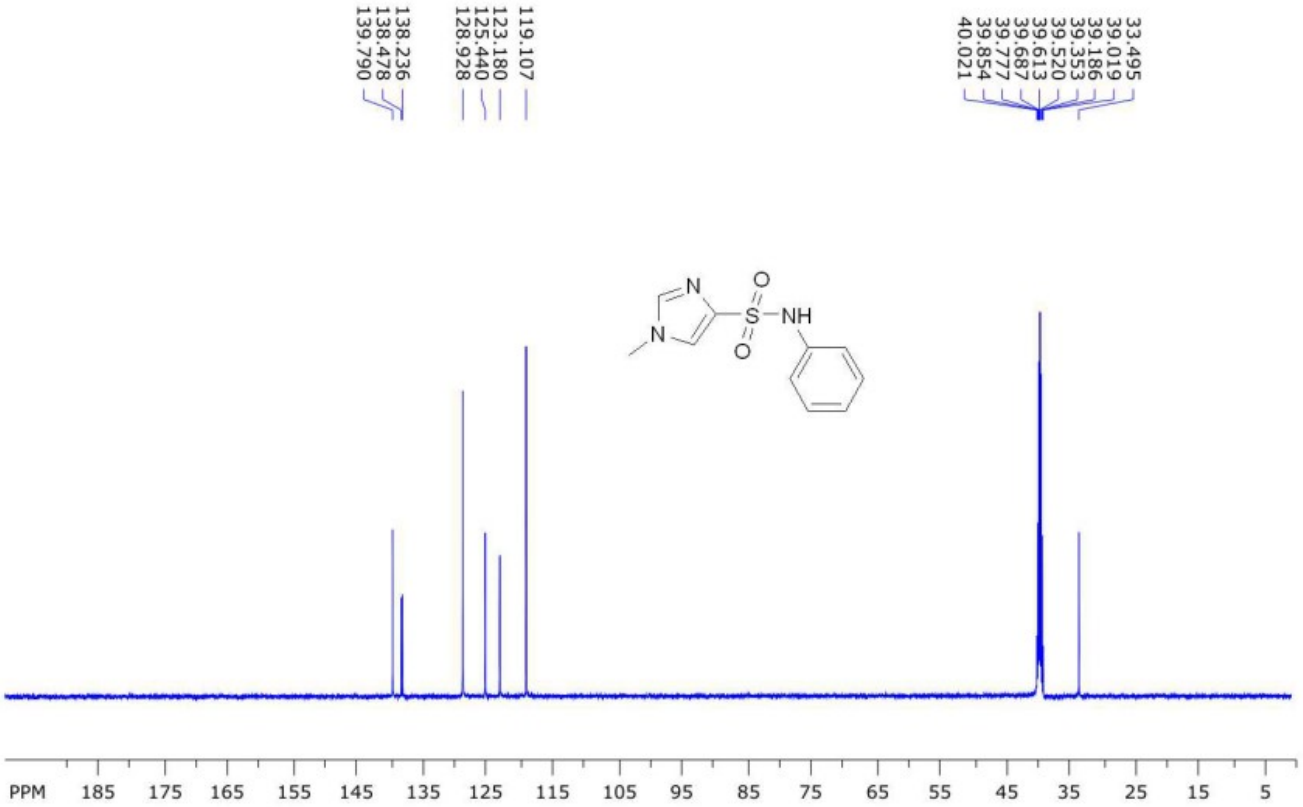


file: ...APO\NMR\500-2\mkr10207\13 2392\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.129985 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 240.707 ppm/cm: 0.48128

Compound 4g

SpinWorks 4: IVA 2392 13C

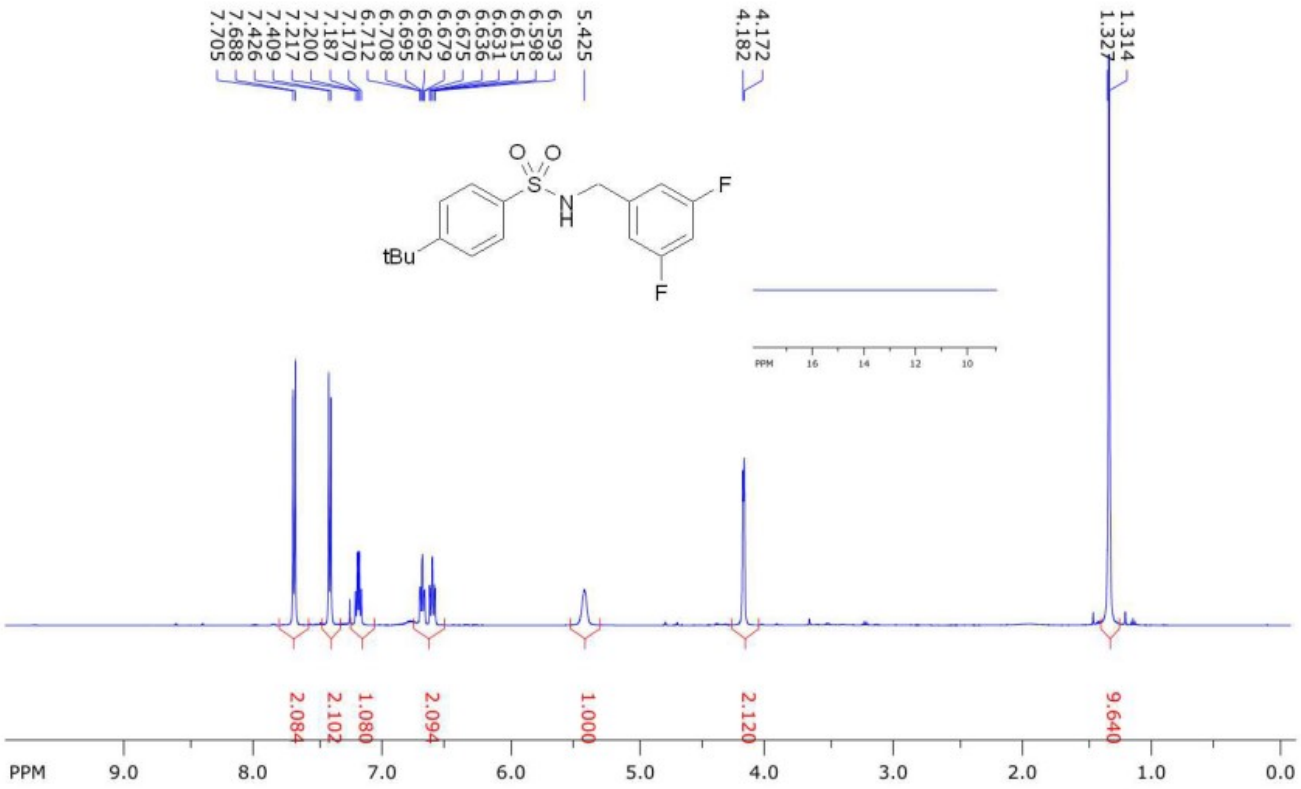


file: D:\NAPO\NMR\500-2\mkr10207\14\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757840 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1001.957 ppm/cm: 7.96640

Compound 4h

SpinWorks 4: IVA 3014 1H CDCl3

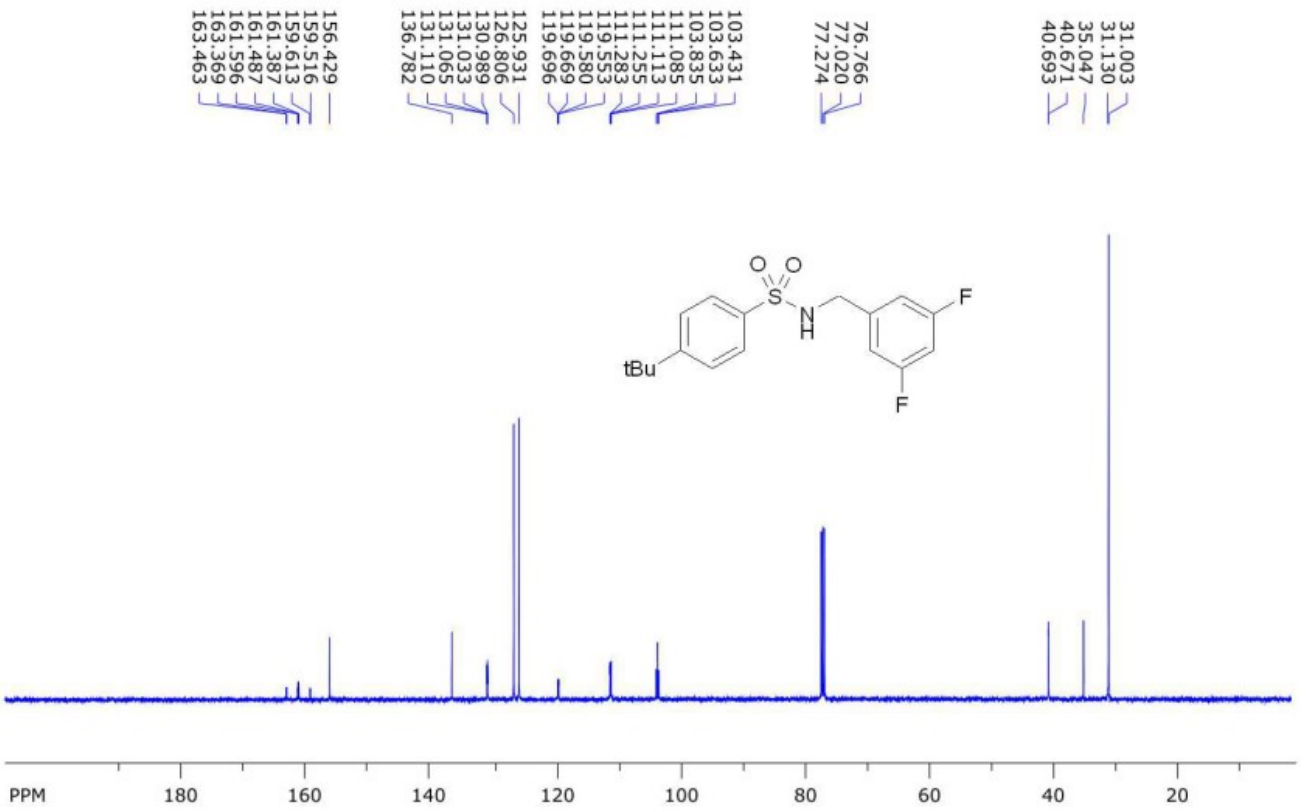


file: ...APO\NMR\500-2\mkr12606\13 3014\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 201.512 ppm/cm: 0.40292

Compound 4h

SpinWorks 4: IVA 3014 13C CDCl3

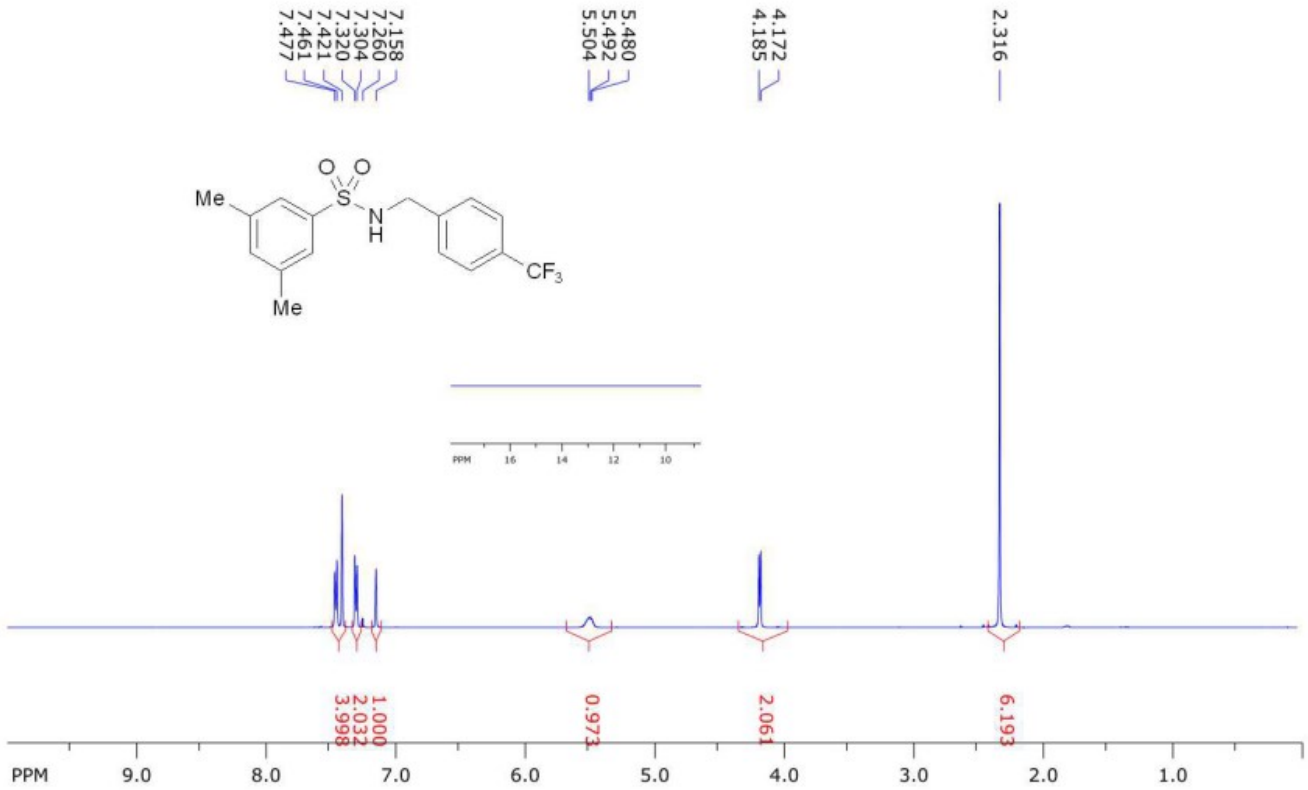


file: D:\NAPO\NMR\500-2\mkr12606\14\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757797 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1041.844 ppm/cm: 8.28353

Compound 4i

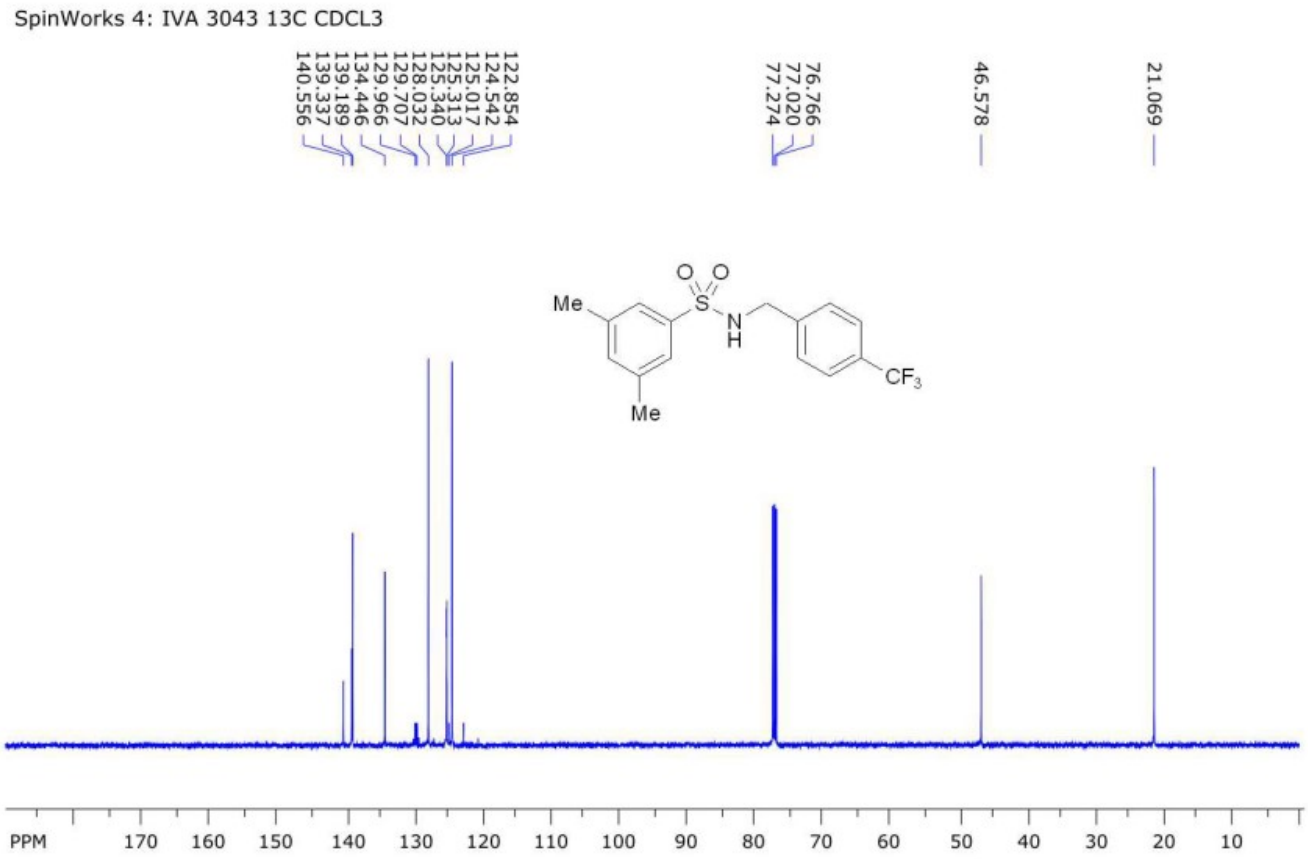
SpinWorks 4: IVA 3043 1H CDCL3



file: ...APO\NMR\500-2\mkr10307\15 3043\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 200.316 ppm/cm: 0.40053

Compound 4i

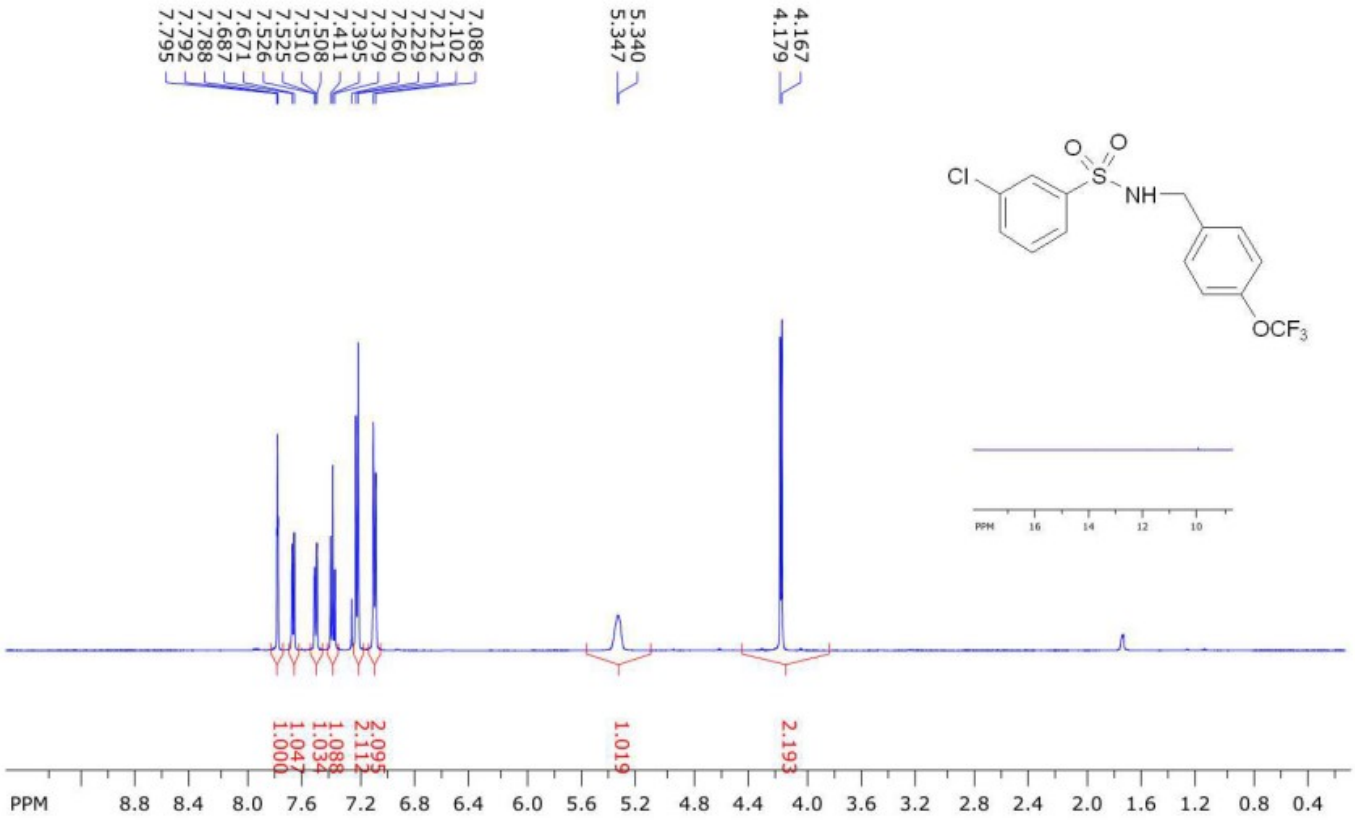


file: D:\NAPO\NMR\500-2\mkr10307\16\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757797 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 958.879 ppm/cm: 7.62390

Compound 4j

SpinWorks 4: IVA 2977 1H CDCl3

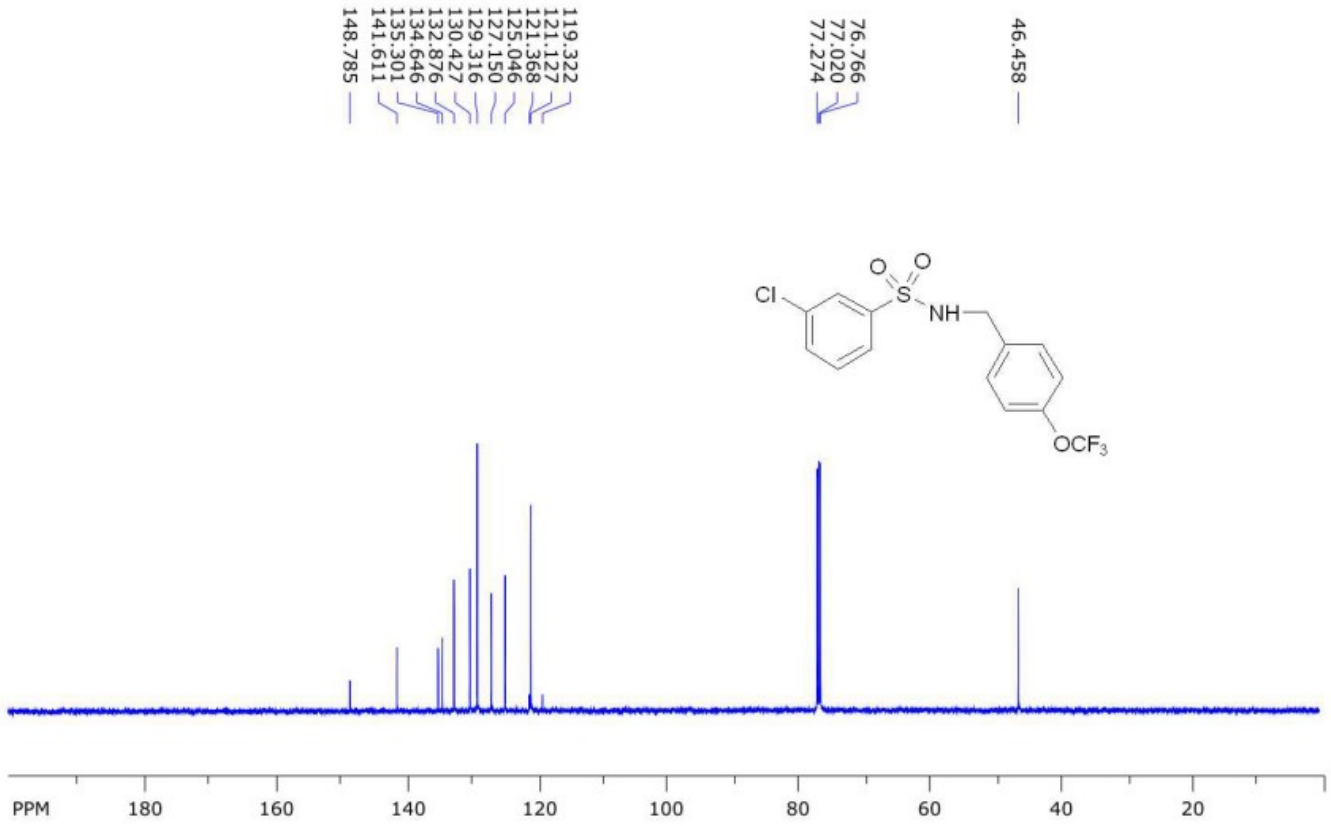


file: ...APO\NMR\500-2\mkr11306\27 2977\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 192.674 ppm/cm: 0.38525

Compound 4j

SpinWorks 4: IVA 2977 13C CDCl3

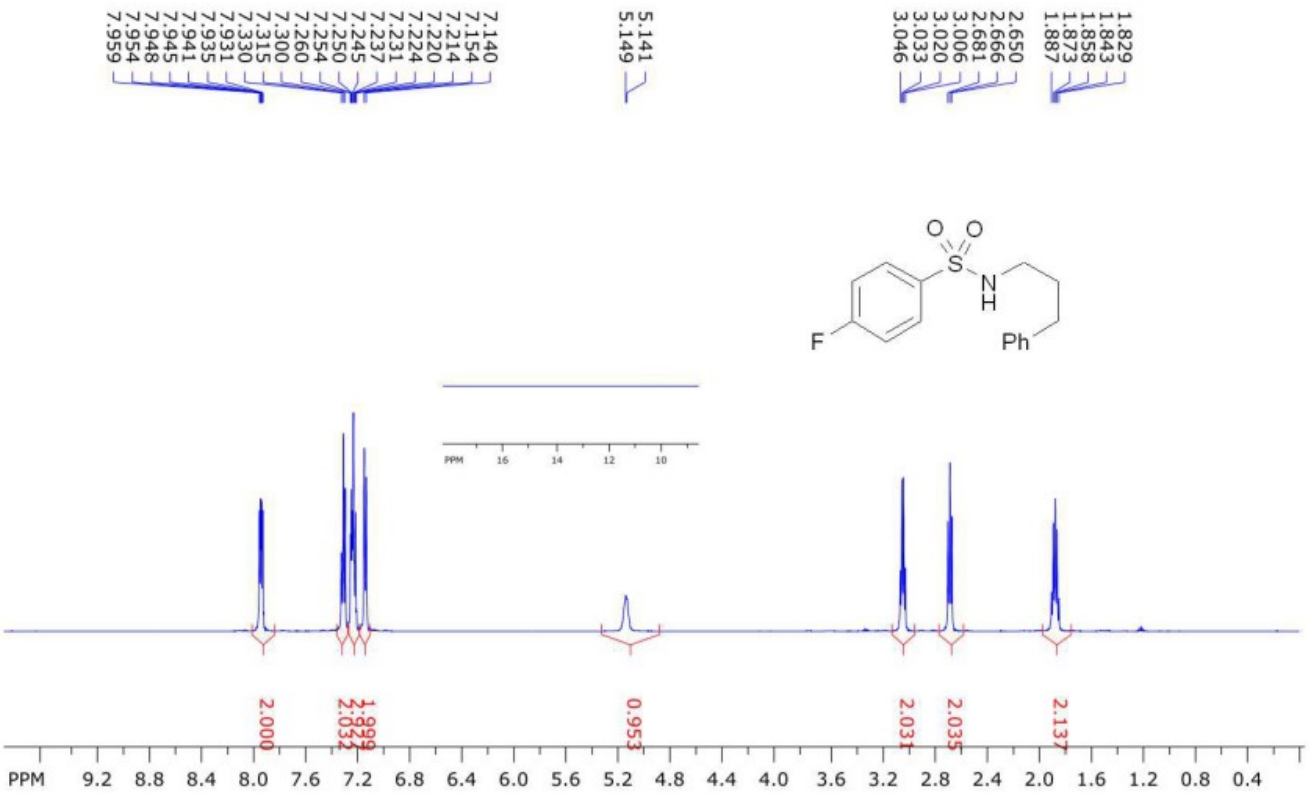


file: D:\NAPO\NMR\500-2\mkr11306\28\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757794 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1009.934 ppm/cm: 8.02983

Compound 4k

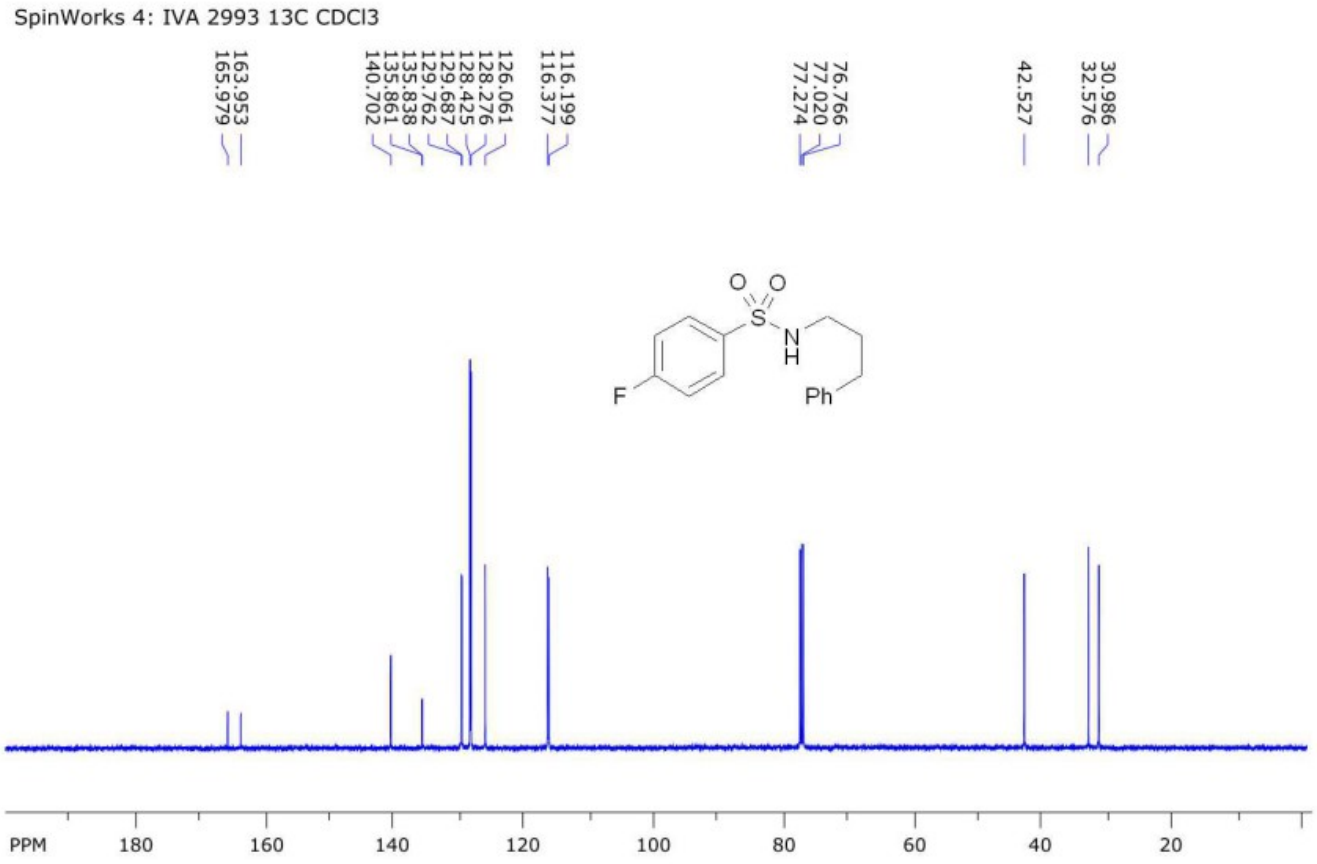
SpinWorks 4: IVA 2993 1H CDCl3



file: ...NAPO\NMR\500-2\mkr12606\7 2993\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.129992 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 198.678 ppm/cm: 0.39725

Compound 4k

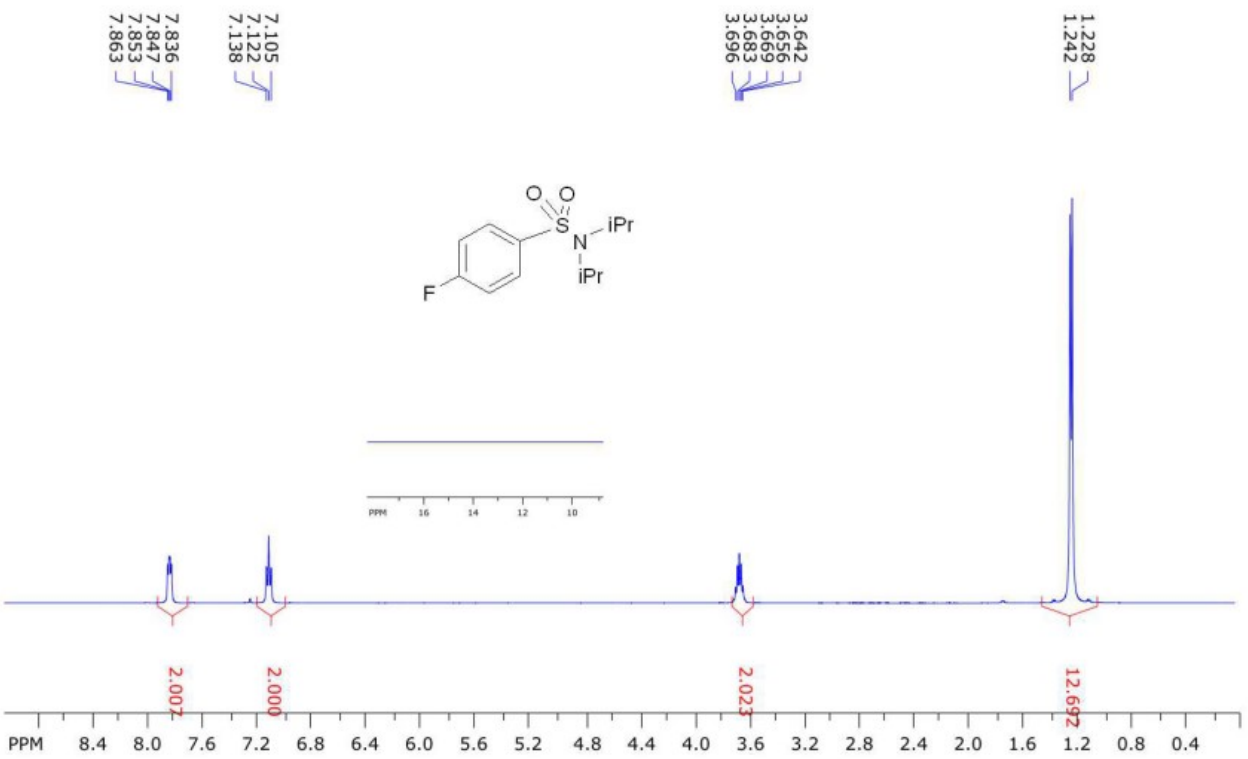


file: D:\NAPO\NMR\500-2\mkr12606\8\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757801 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1014.721 ppm/cm: 8.06788

Compound 4l

SpinWorks 4: IVA 3003 1H CDCl3

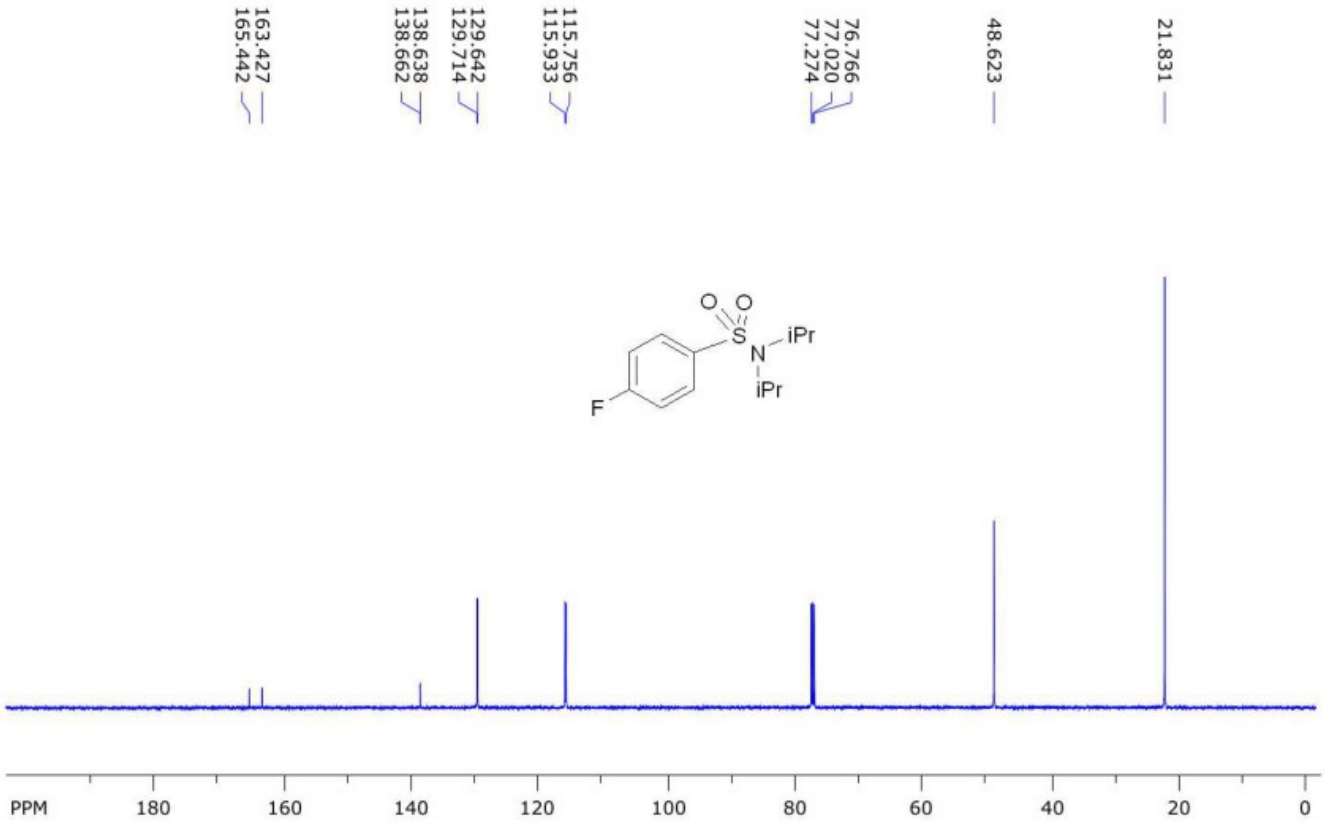


file: ...APO\NMR\500-2\mkr12606\27 3003\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 180.666 ppm/cm: 0.36124

Compound 4l

SpinWorks 4: IVA 3003 13C CDCl3

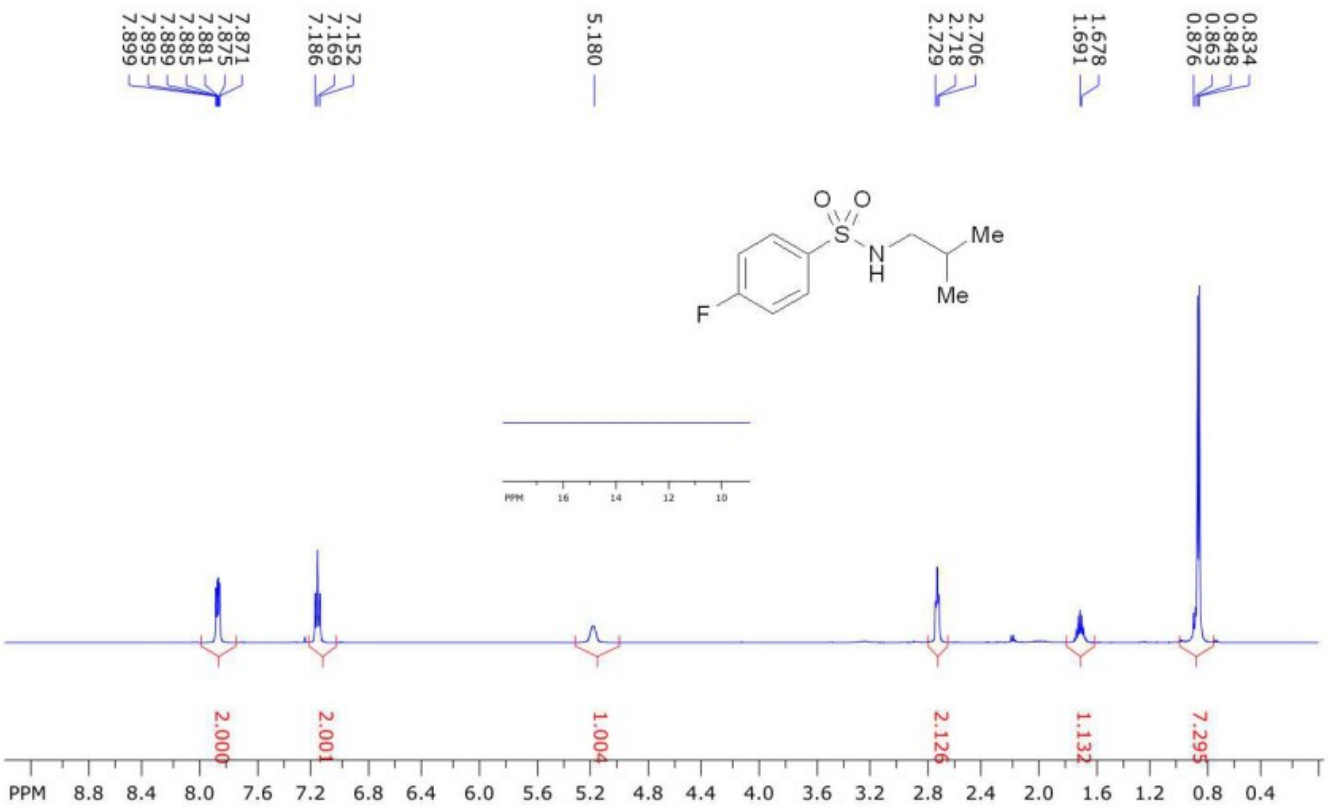


file: D:\NAPO\NMR\500-2\mkr12606\28\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757798 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1033.867 ppm/cm: 8.22011

Compound 4m

SpinWorks 4: IVA 2989 1H CDCl3

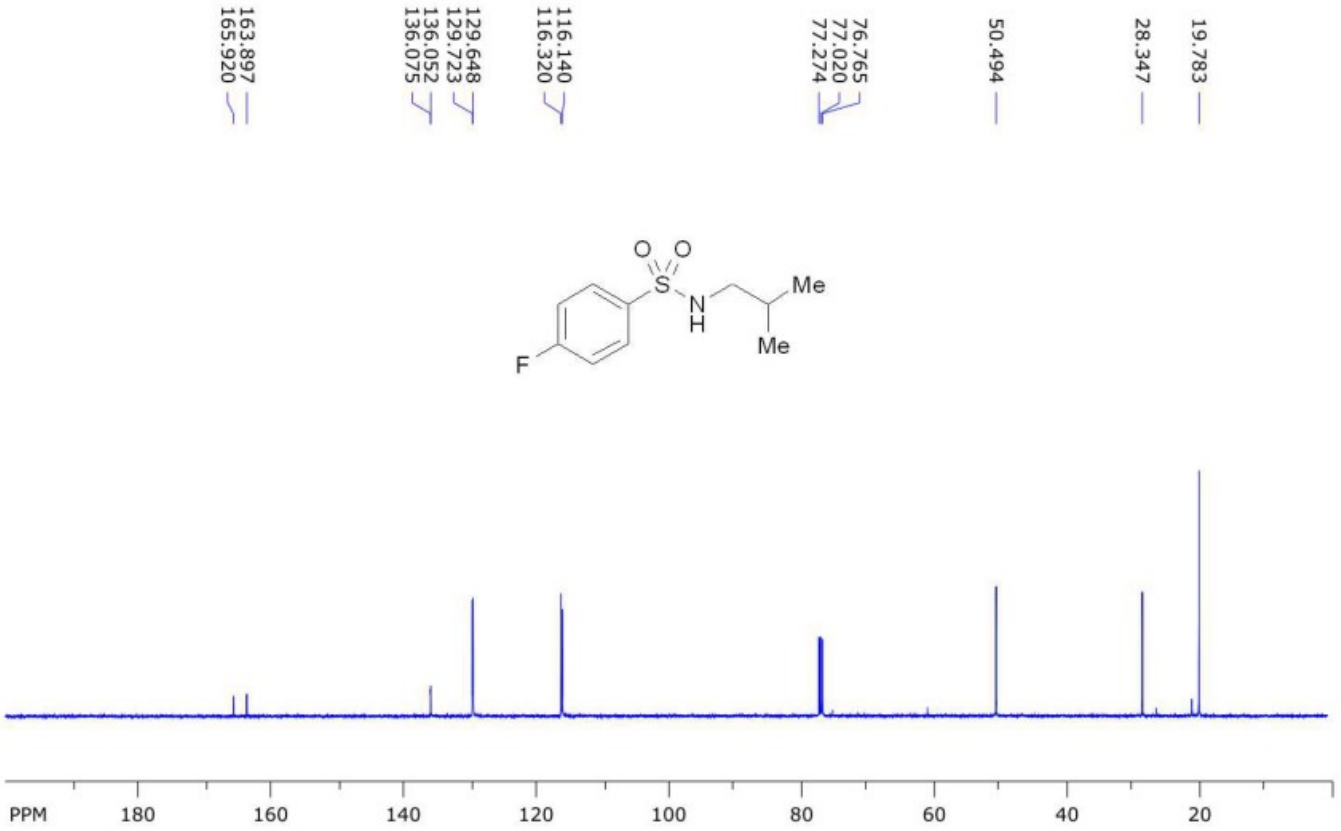


file: ...APO\NMR\500-2\mkr11306\23 2989\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 188.854 ppm/cm: 0.37761

Compound 4m

SpinWorks 4: IVA 2989 13C CDCl3

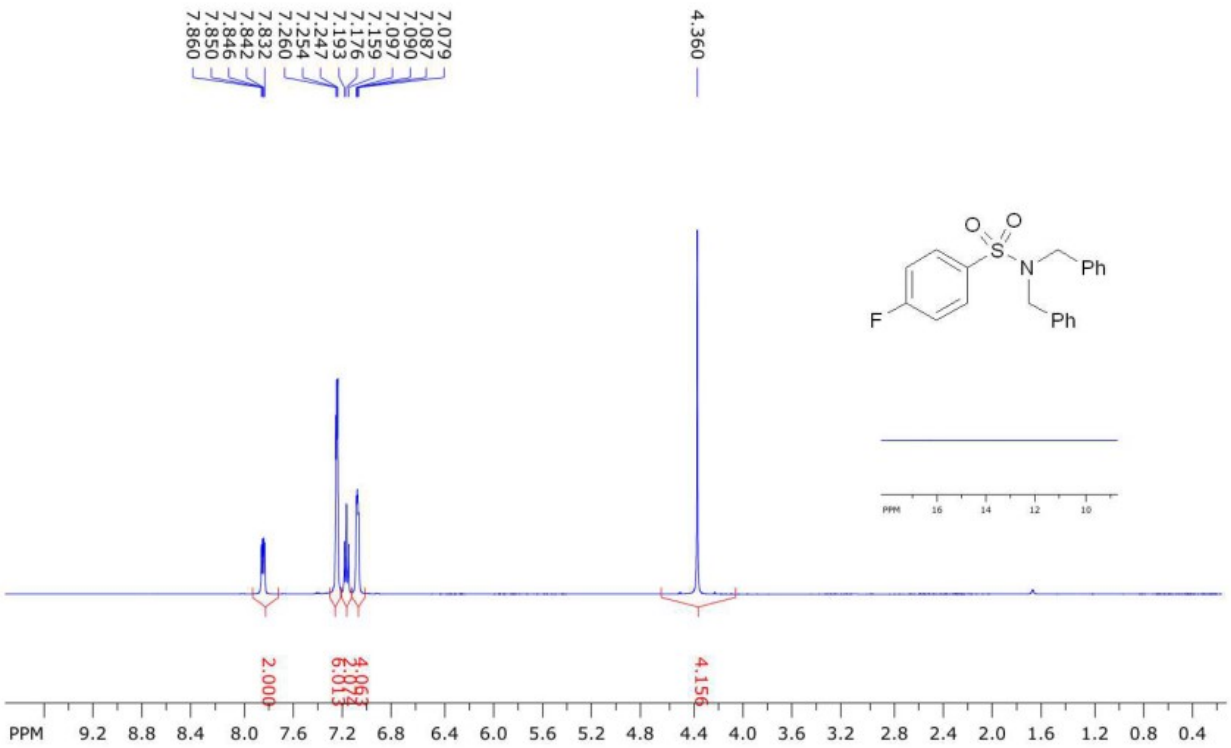


file: D:\NAPO\NMR\500-2\mkr11306\24\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757797 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1006.744 ppm/cm: 8.00446

Compound 4n

SpinWorks 4: IVA 2978 1H CDCl3

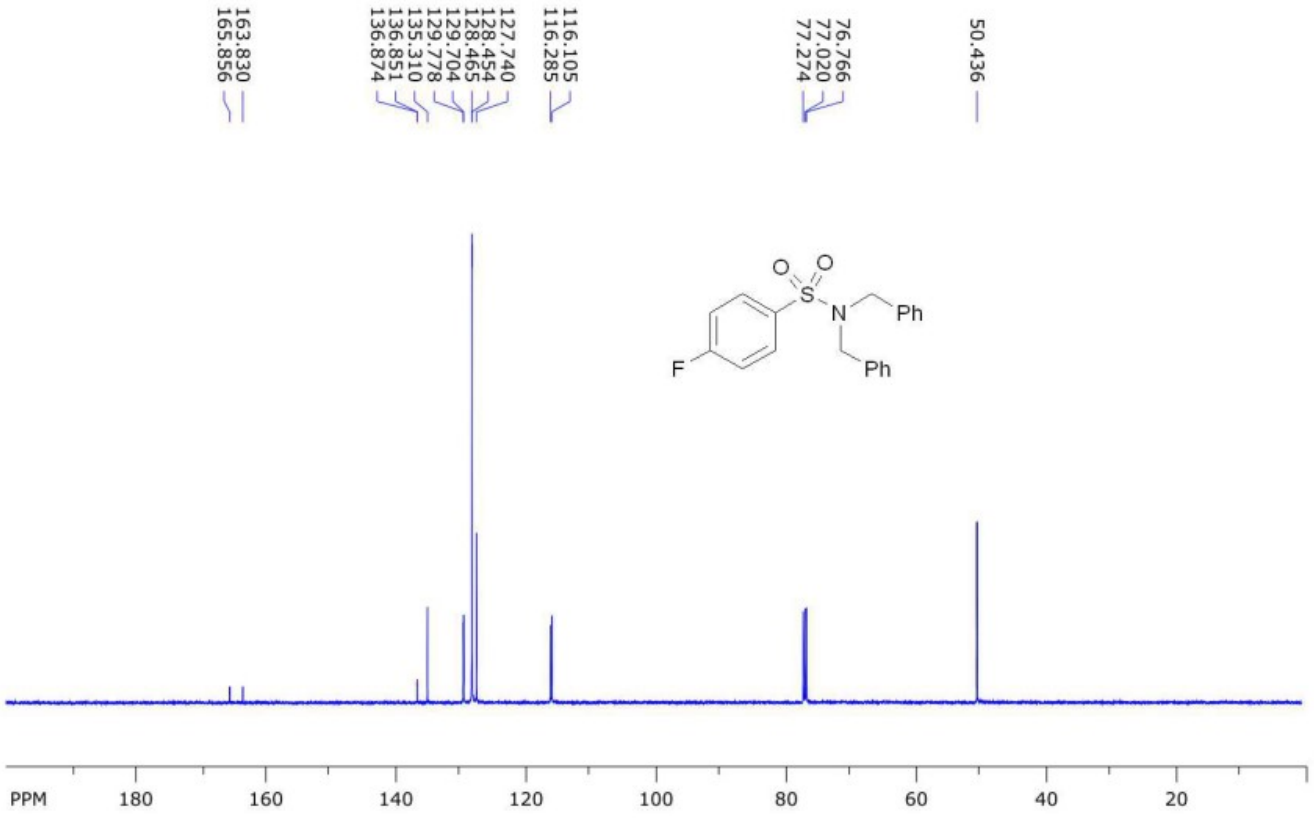


file: ...APO\NMR\500-2\mkr11406\13 2978\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130019 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 195.403 ppm/cm: 0.39070

Compound 4n

SpinWorks 4: IVA 2978 13C CDCl3

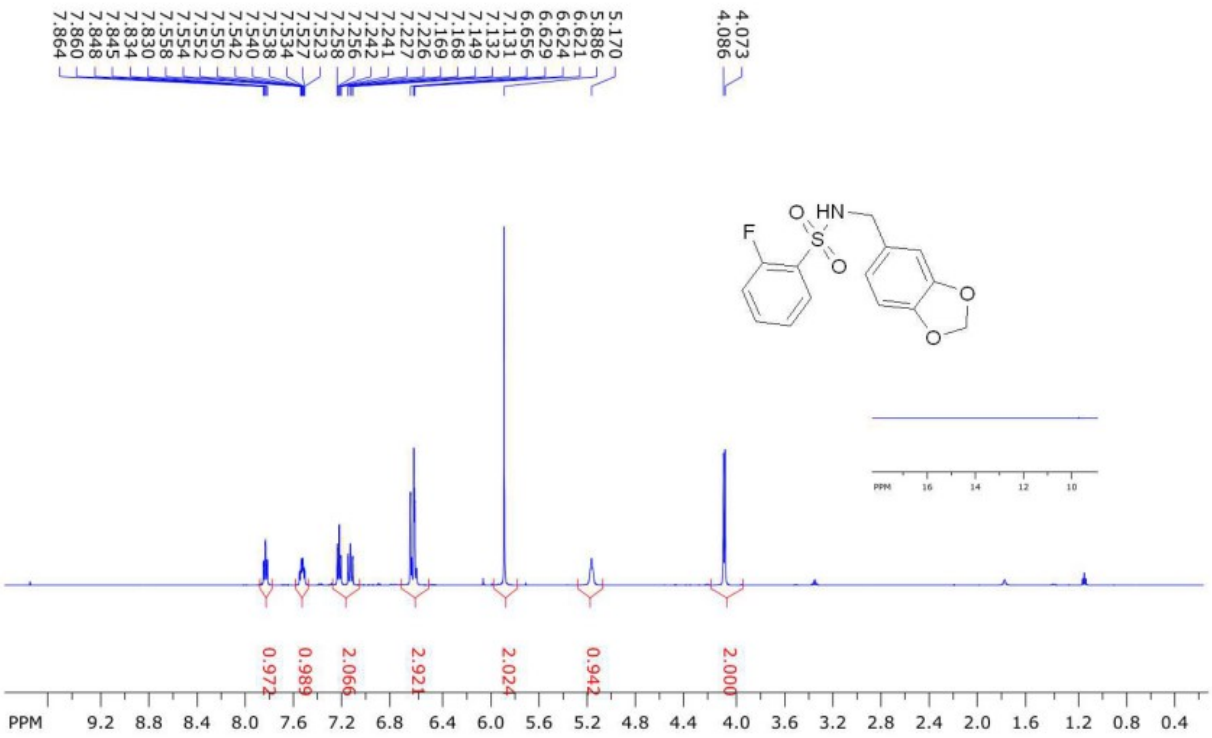


file: D:\NAPO\NMR\500-2\mkr11406\14\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757802 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1006.744 ppm/cm: 8.00446

Compound 4o

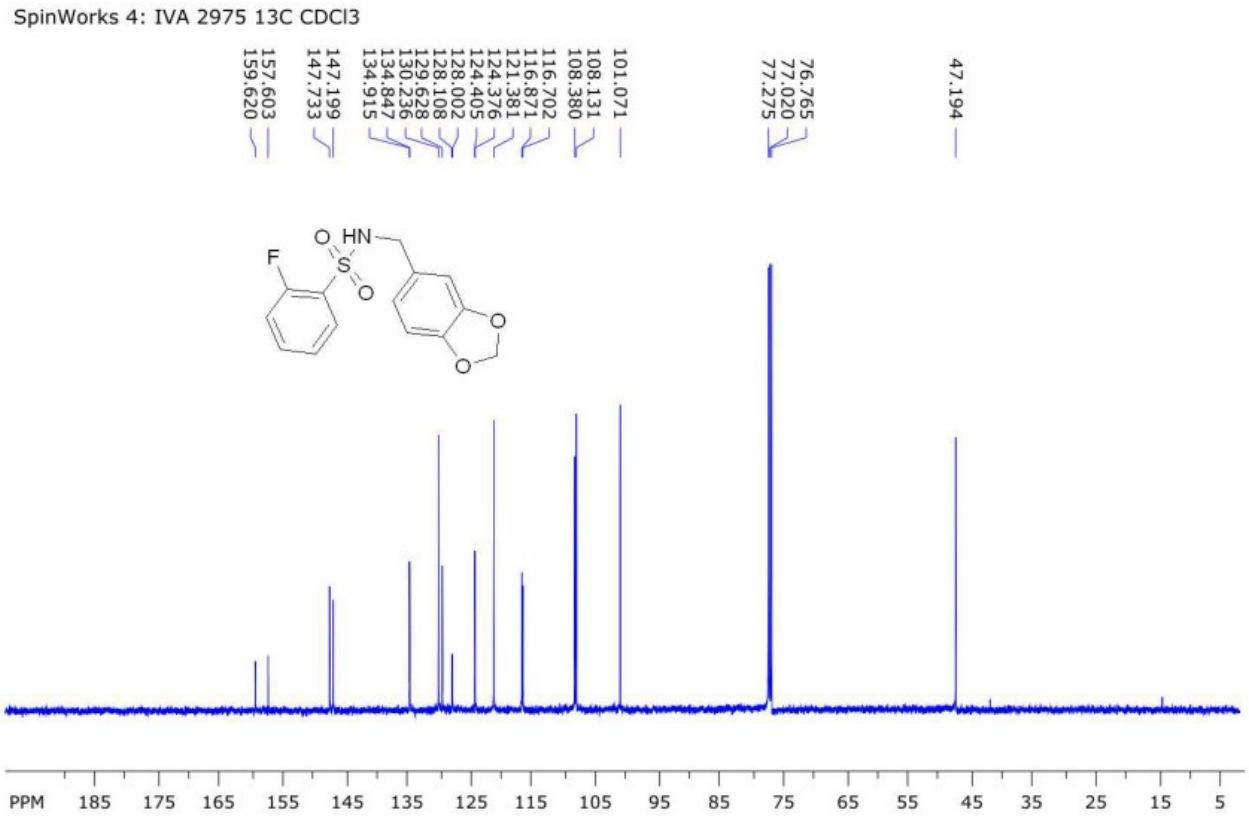
SpinWorks 4: IVA 2975 1H CDL3



file: ...NAPO\NMR\500-2\mkr12606\9 2975\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 197.041 ppm/cm: 0.39398

Compound 4o

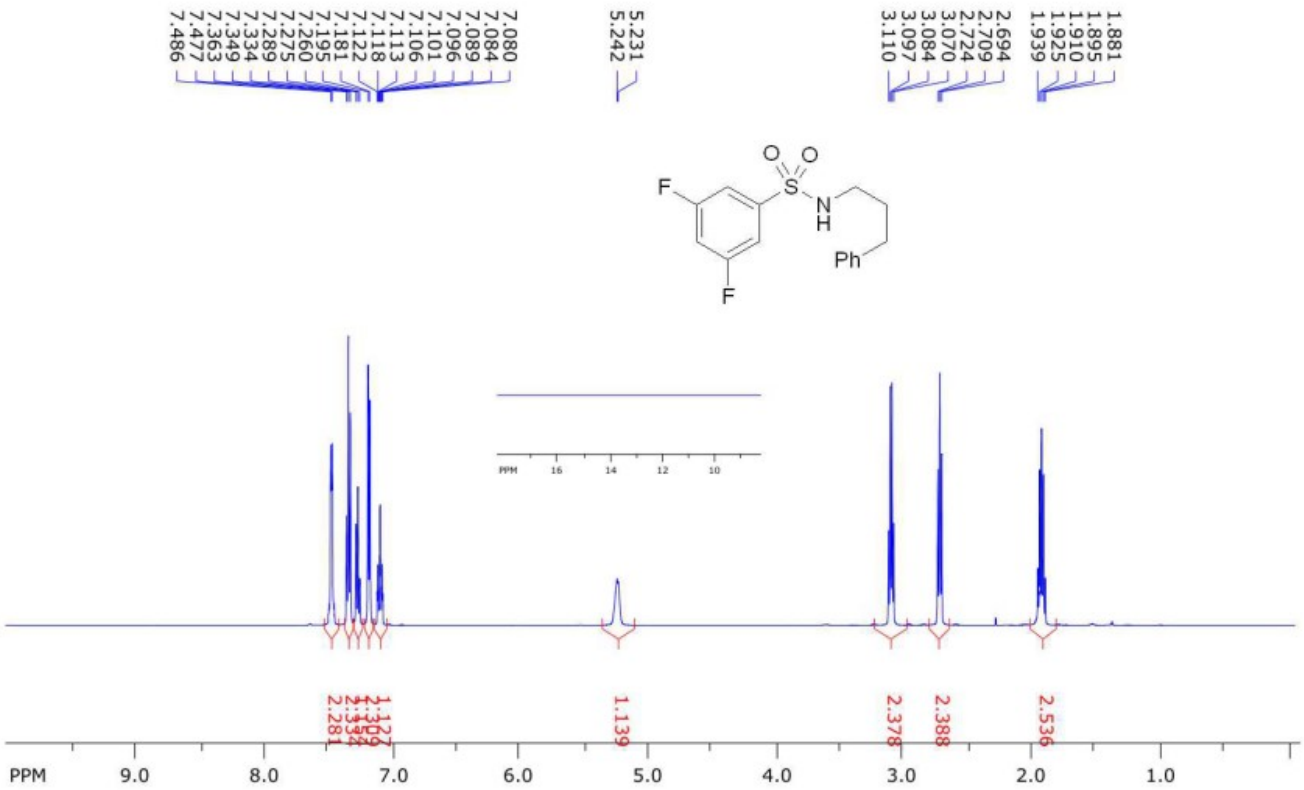


file: D:\NAPO\NMR\500-2\mkr12606\10\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757800 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 997.171 ppm/cm: 7.92834

Compound 4p

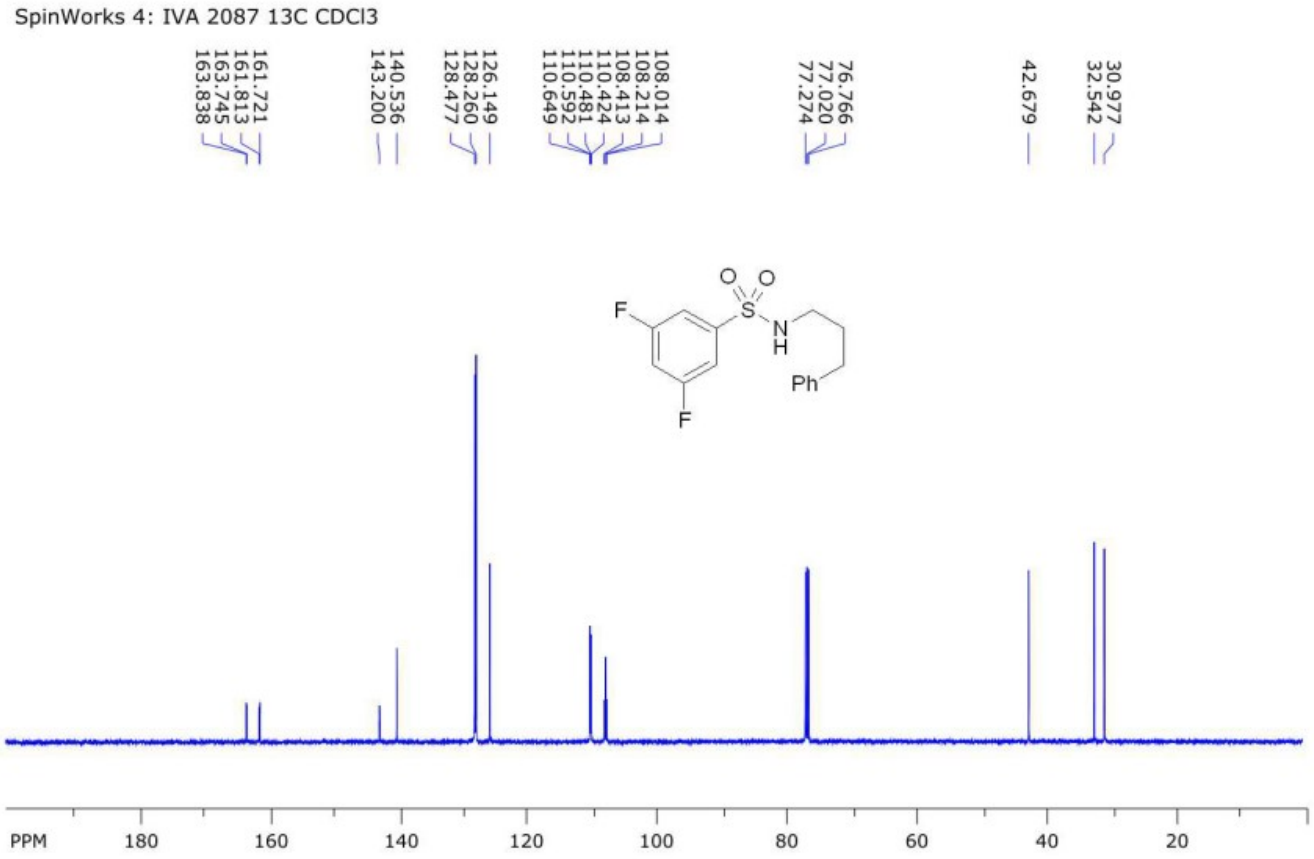
SpinWorks 4: IVA 2087 1H CDCL3



file: ...APO\NMR\500-2\mkr11306\17 2991\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.129984 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 202.499 ppm/cm: 0.40489

Compound 4p

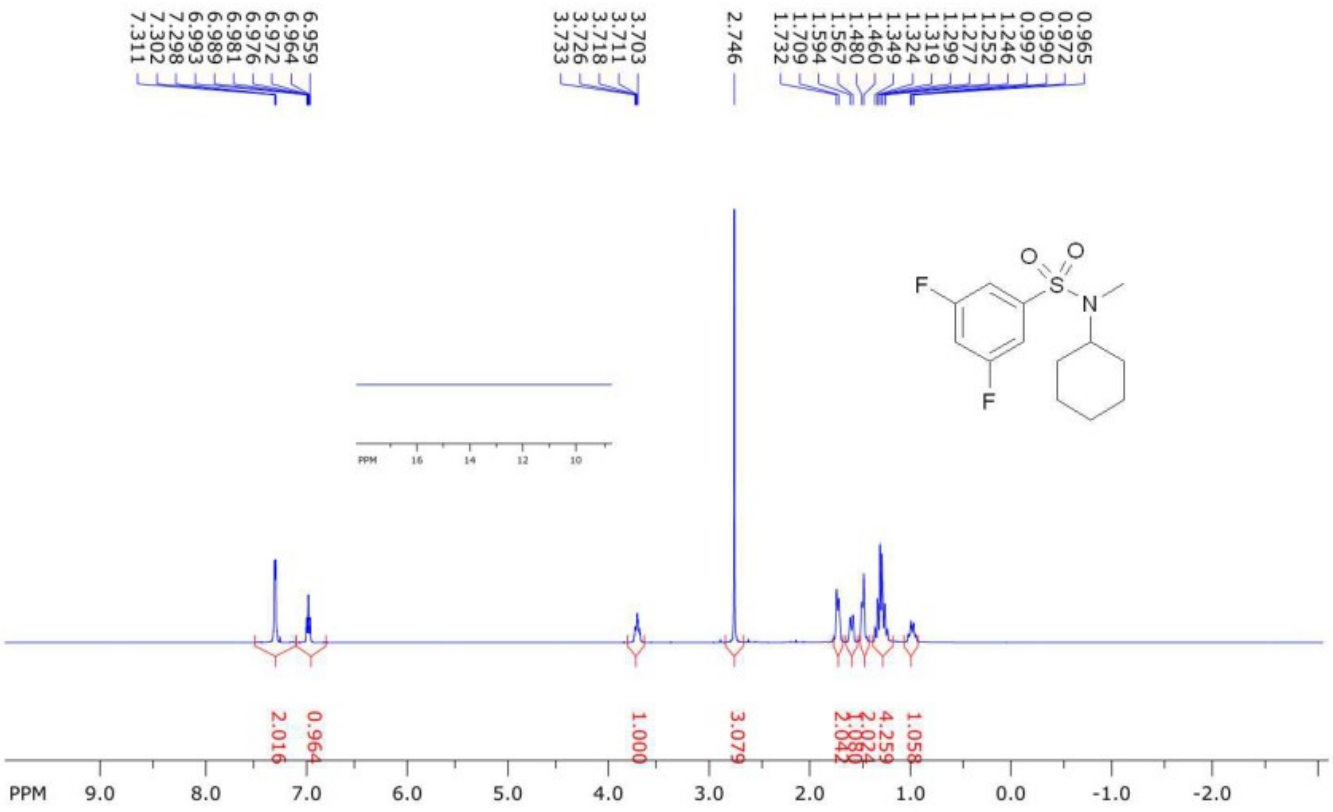


file: D:\NAPO\NMR\500-2\mkr11306\18\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757801 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1009.934 ppm/cm: 8.02983

Compound 4q

SpinWorks 4: IVA 2917 1H

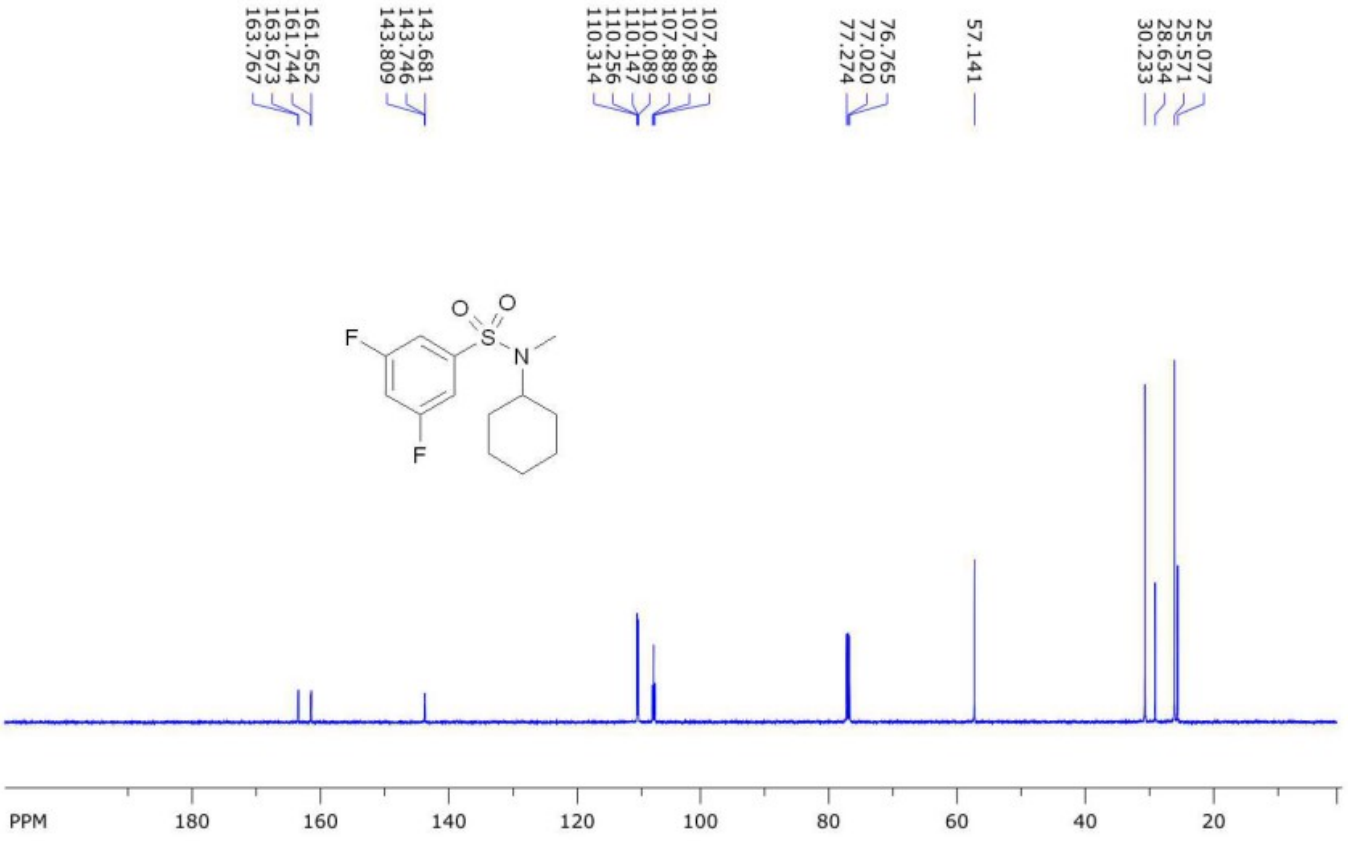


file: ...APO\NMR\500-2\mkr11106\19 2917\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 261.993 ppm/cm: 0.52385

Compound 4q

SpinWorks 4: IVA 2917 13C

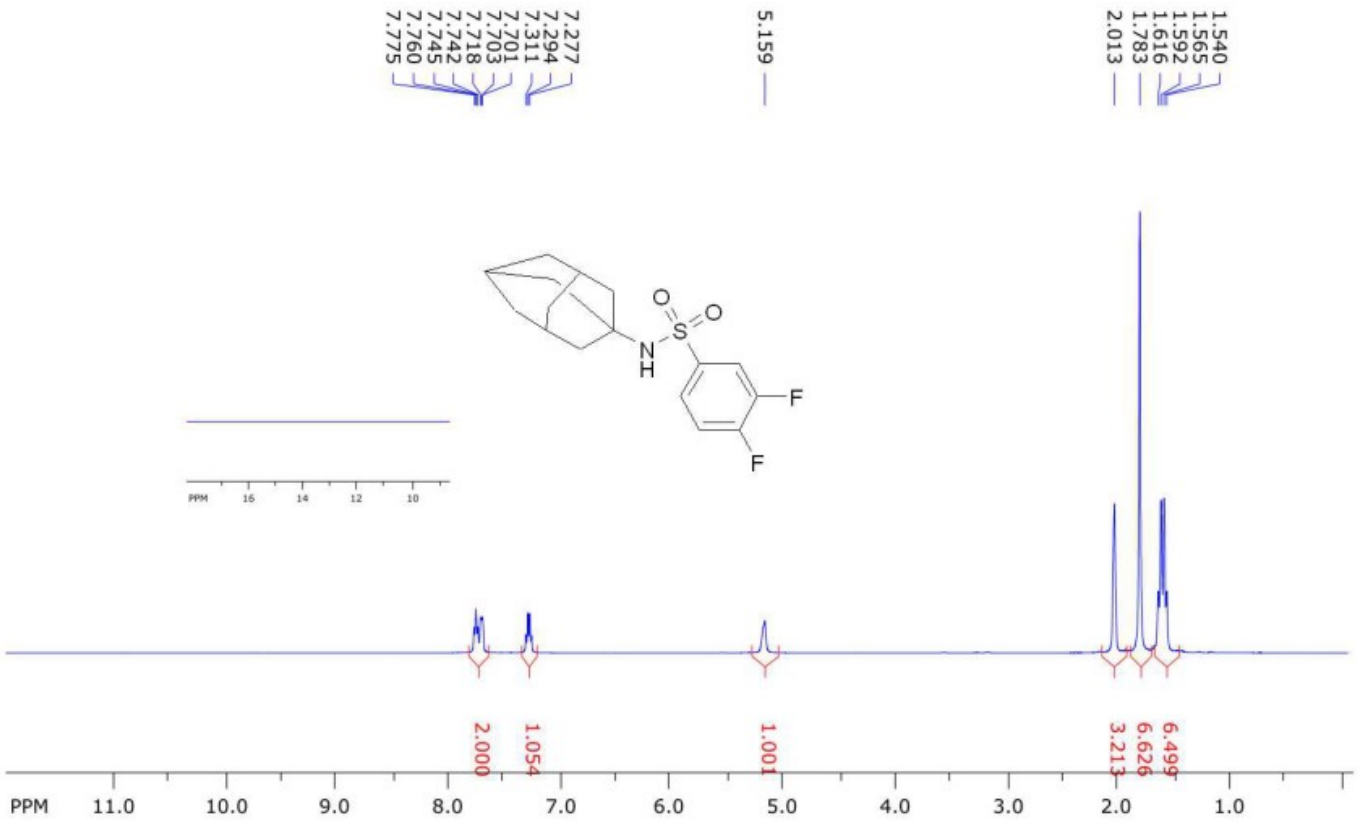


file: D:\NAPO\NMR\500-2\mkr11106\20\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757801 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1056.203 ppm/cm: 8.39770

Compound 4r

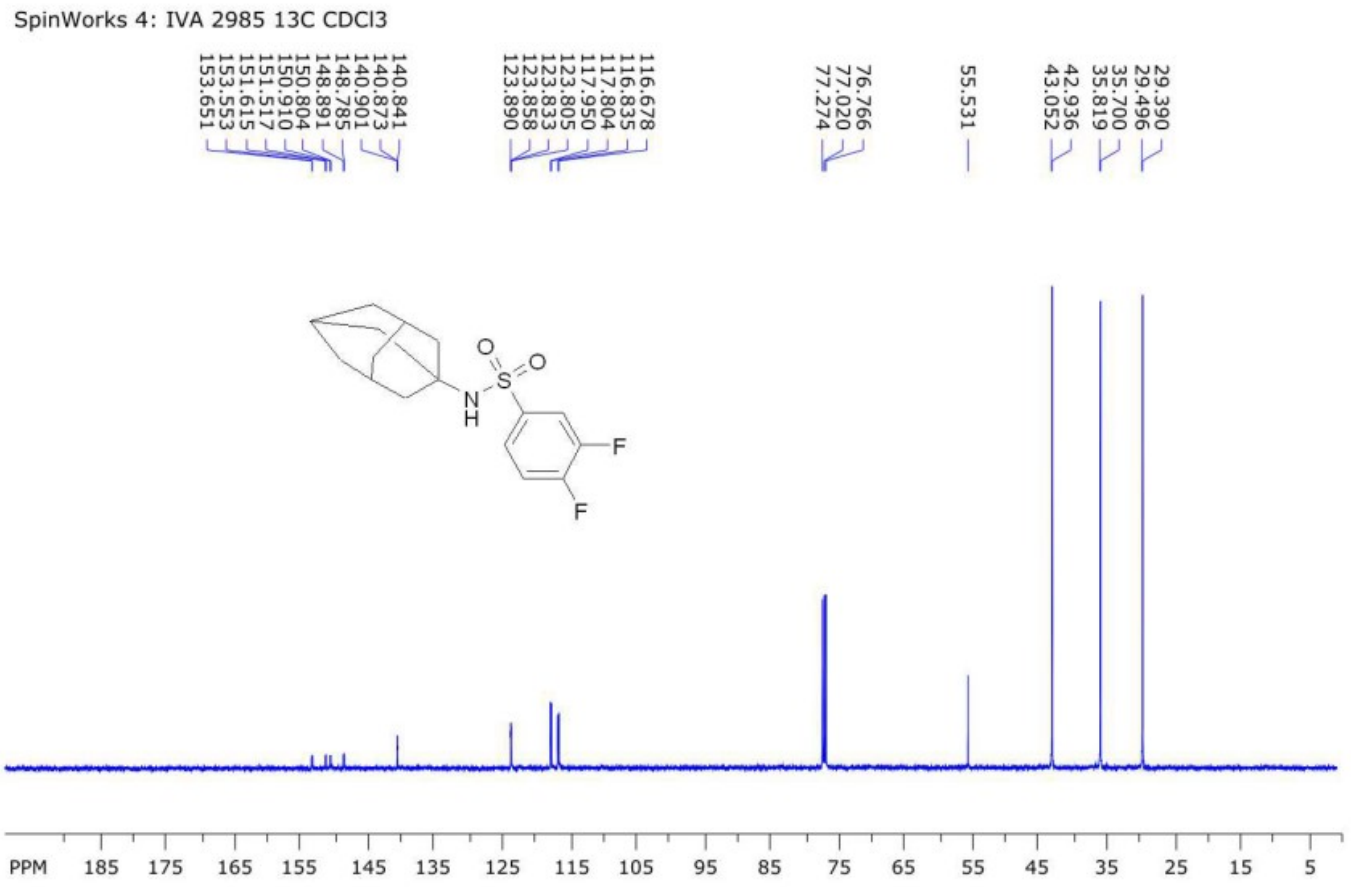
SpinWorks 4: IVA 2985 1H CDCl3



file: ...APO\NMR\500-2\mkr11306\15 2985\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130018 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 241.798 ppm/cm: 0.48347

Compound 4r

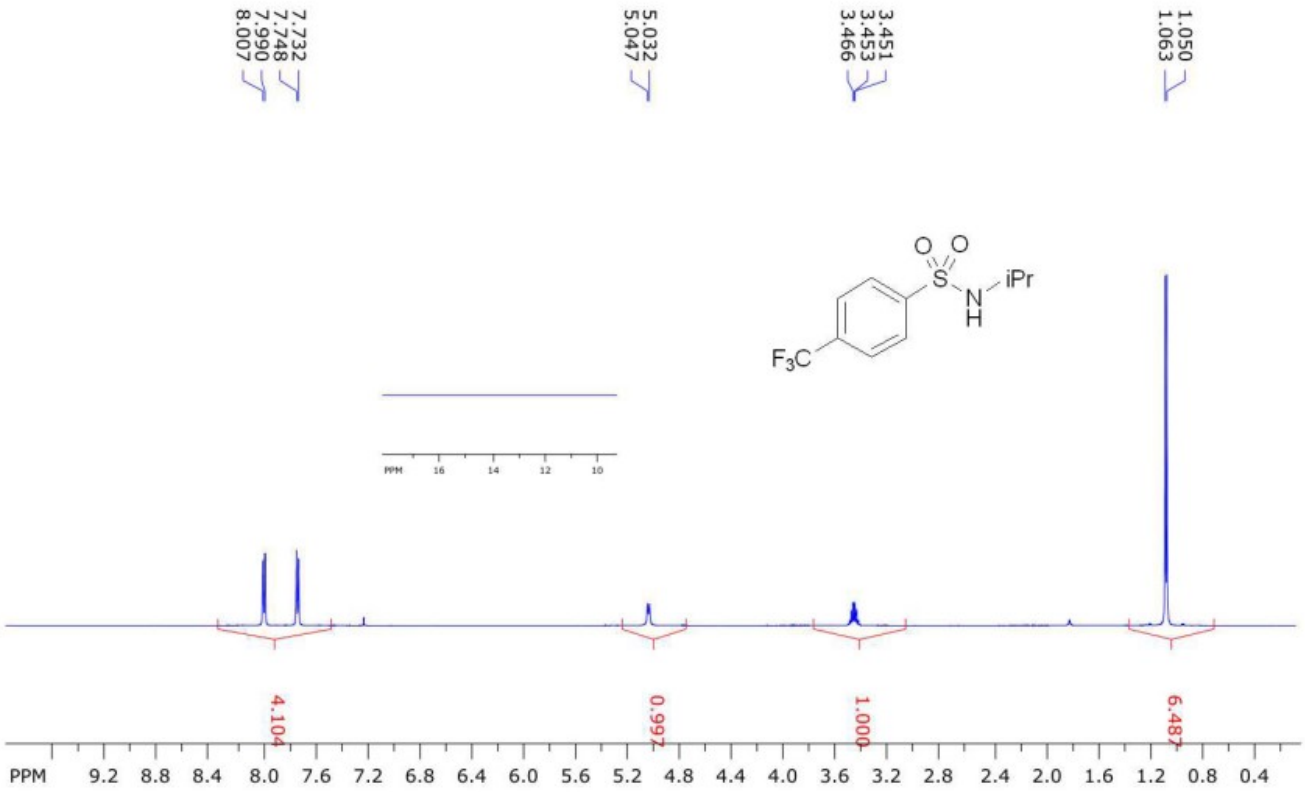


file: D:\NAPO\NMR\500-2\mkr11306\16\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757796 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1001.957 ppm/cm: 7.96640

Compound 4s

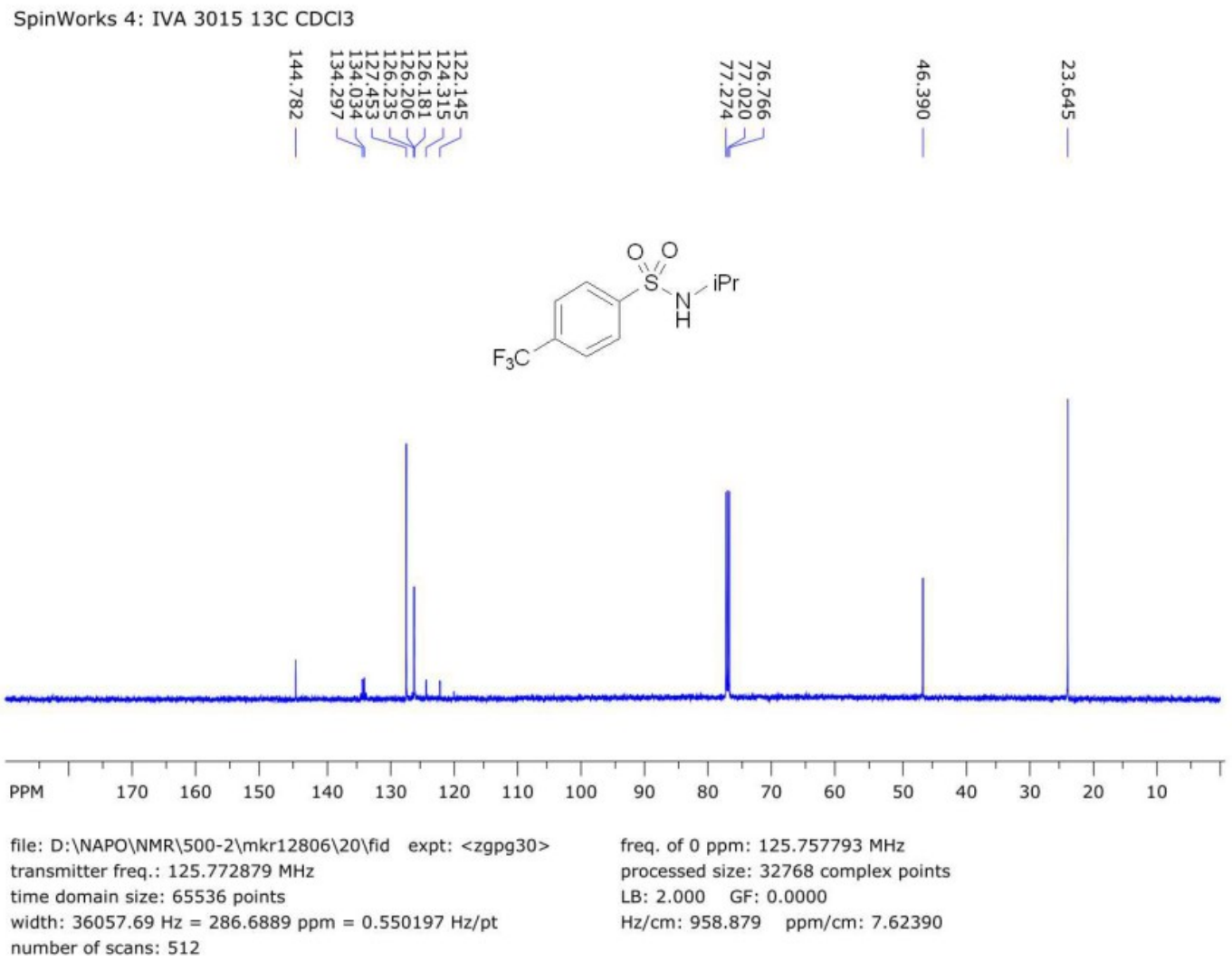
SpinWorks 4: IVA 3015 1H CDCl3



file: ...APO\NMR\500-2\mkr12806\19 3015\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

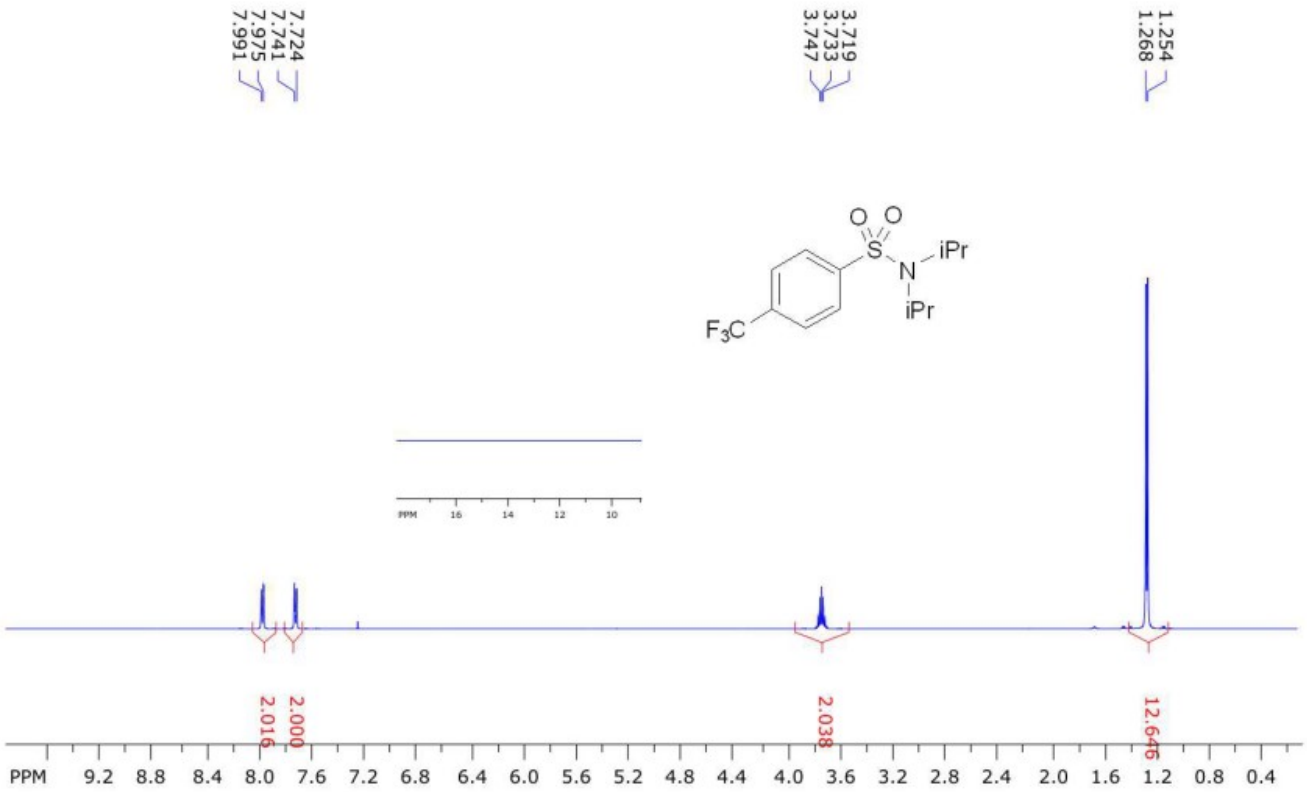
freq. of 0 ppm: 500.130038 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 198.678 ppm/cm: 0.39725

Compound 4s


SpinWorks 4: IVA 3015 13C CDCl3
144.782
134.297
134.034
127.453
126.235
126.206
126.181
124.315
122.145
77.274
77.020
76.766
46.390
23.645
O
O
S
N
H
iPr
F3C
PPM
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
file: D:\NAPO\NMR\500-2\mkr12806\20\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512
freq. of 0 ppm: 125.757793 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 958.879 ppm/cm: 7.62390

Compound 4t

SpinWorks 4: IVA 3004 1H CDCl3

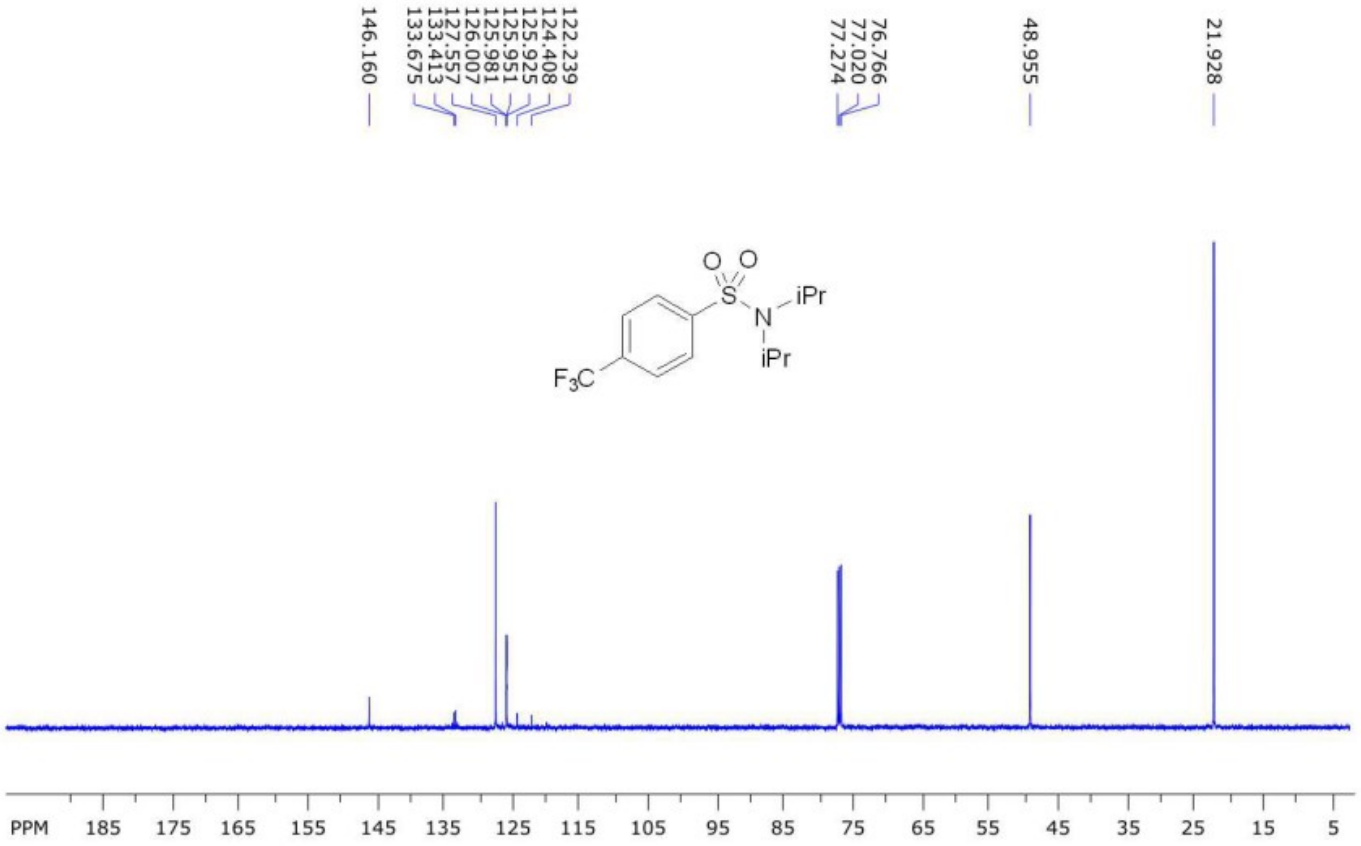


file: ...APO\NMR\500-2\mkr12606\19 3004\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 196.495 ppm/cm: 0.39289

Compound 4t

SpinWorks 4: IVA 3004 13C CDCl3

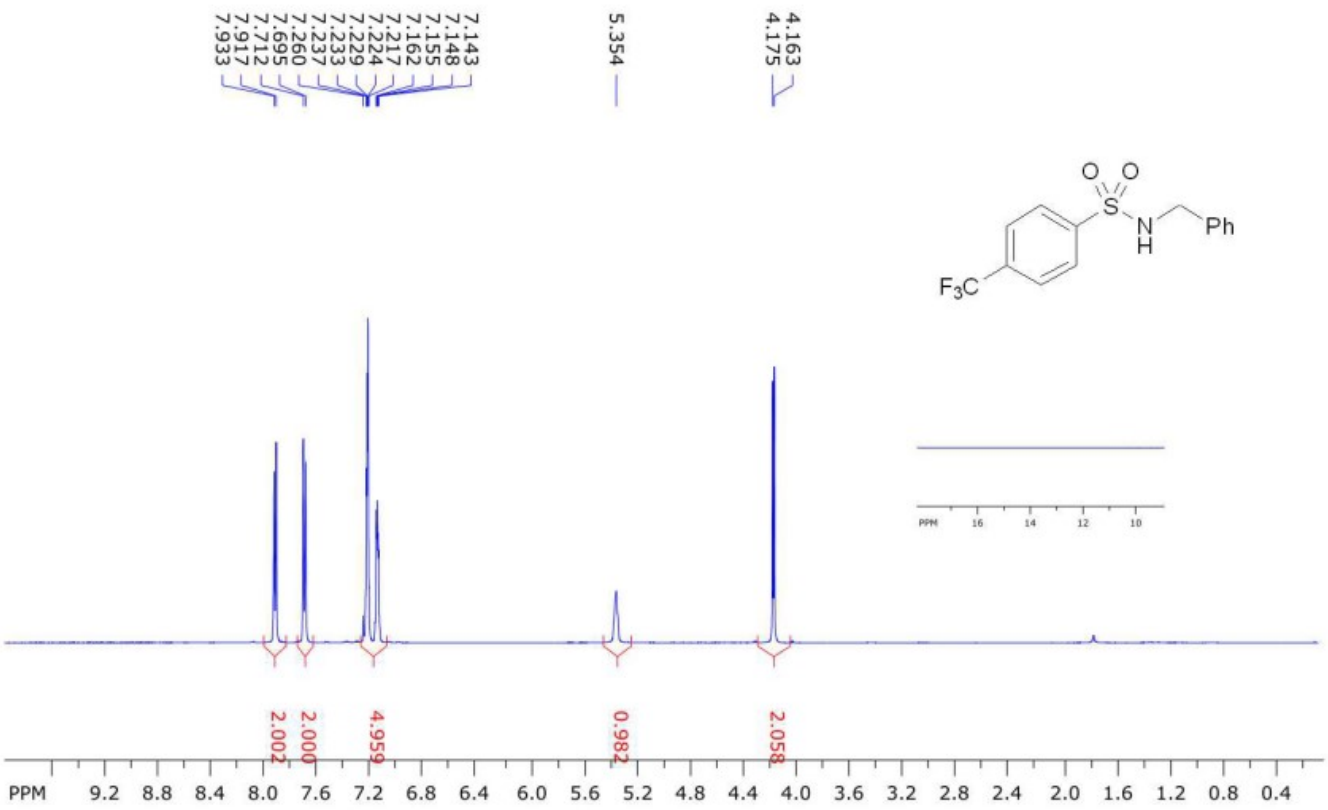


file: D:\NAPO\NMR\500-2\mkr12606\20\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757792 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 993.980 ppm/cm: 7.90297

Compound 4u

SpinWorks 4: IVA 3018 1H CDCl3

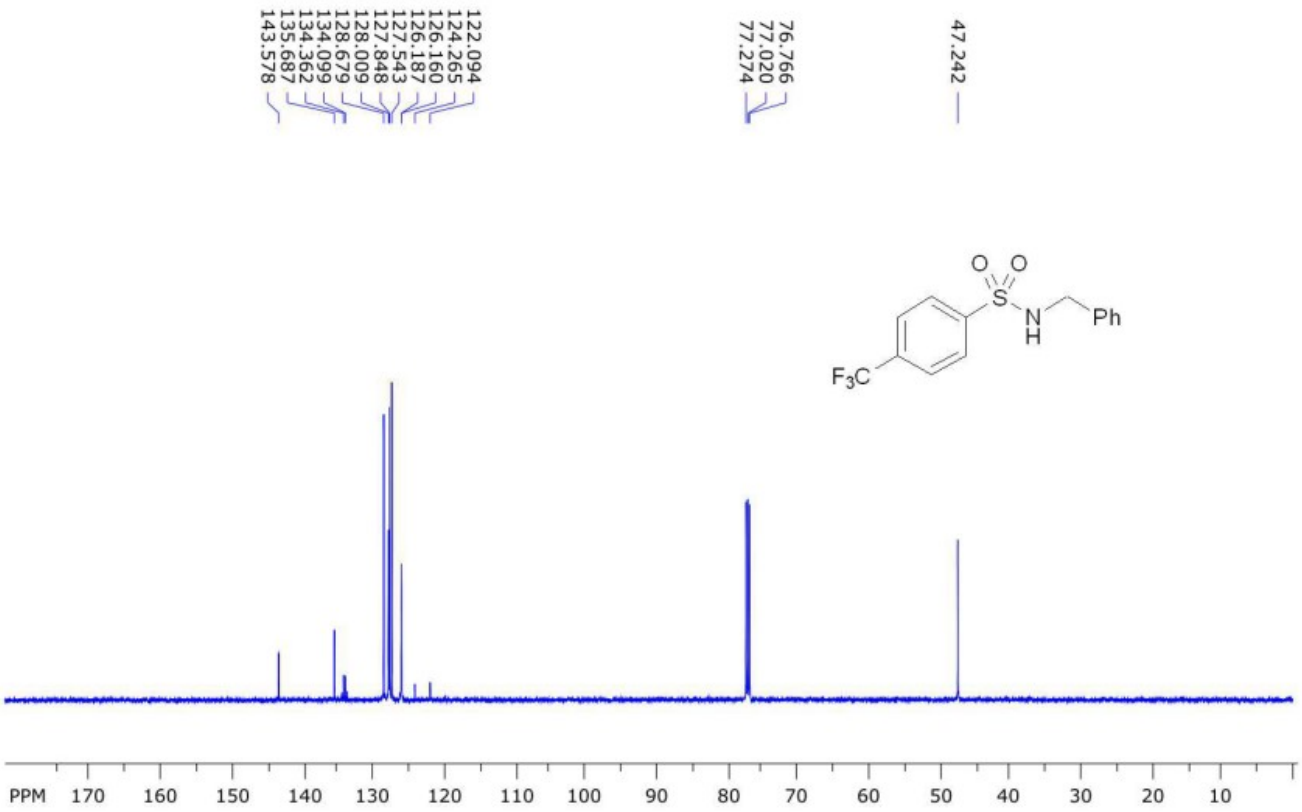


file: ...NAPO\NMR\500-2\mkr10307\3 3018\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 198.133 ppm/cm: 0.39616

Compound 4u

SpinWorks 4: IVA 3018 13C CDCl3

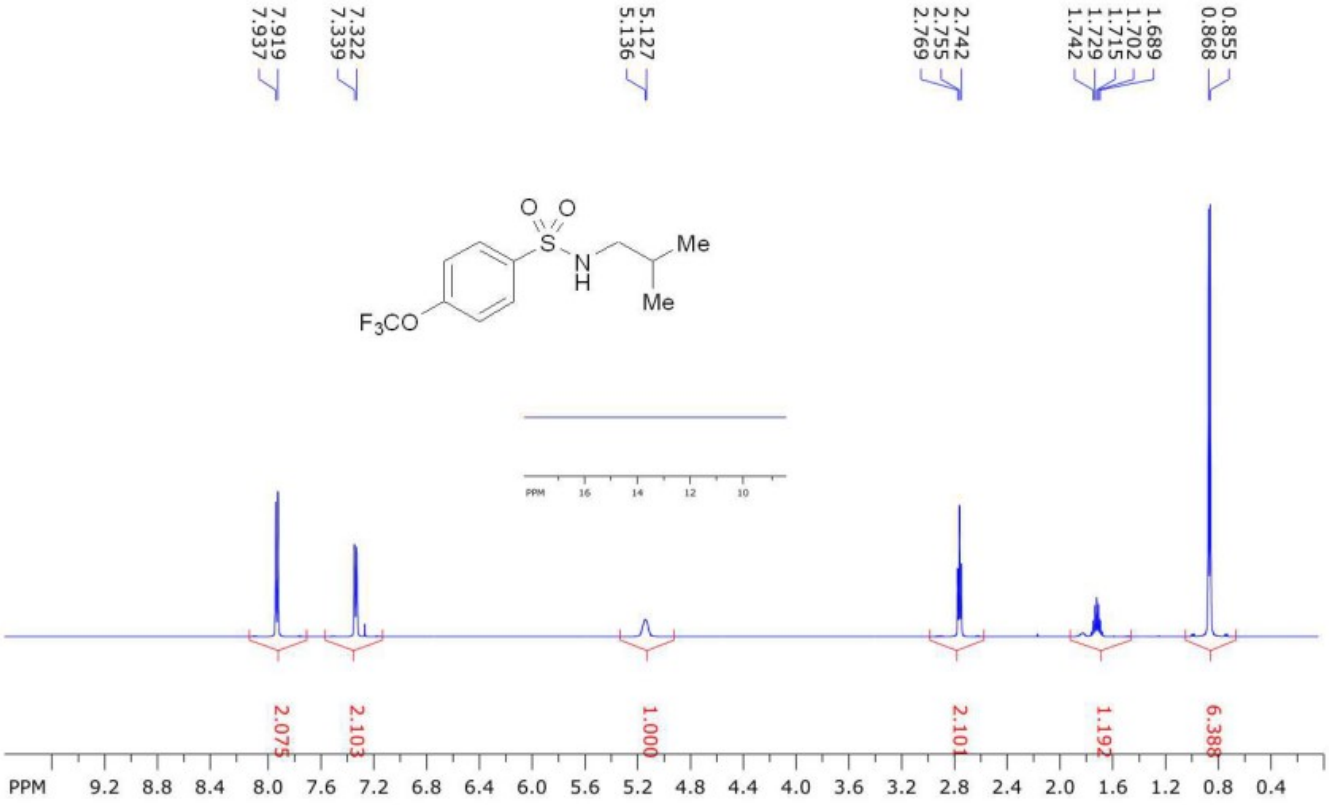


file: D:\NAPO\NMR\500-2\mkr10307\4\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757797 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 918.993 ppm/cm: 7.30676

Compound 4v

SpinWorks 4: IVA 2988 1H CDCL3

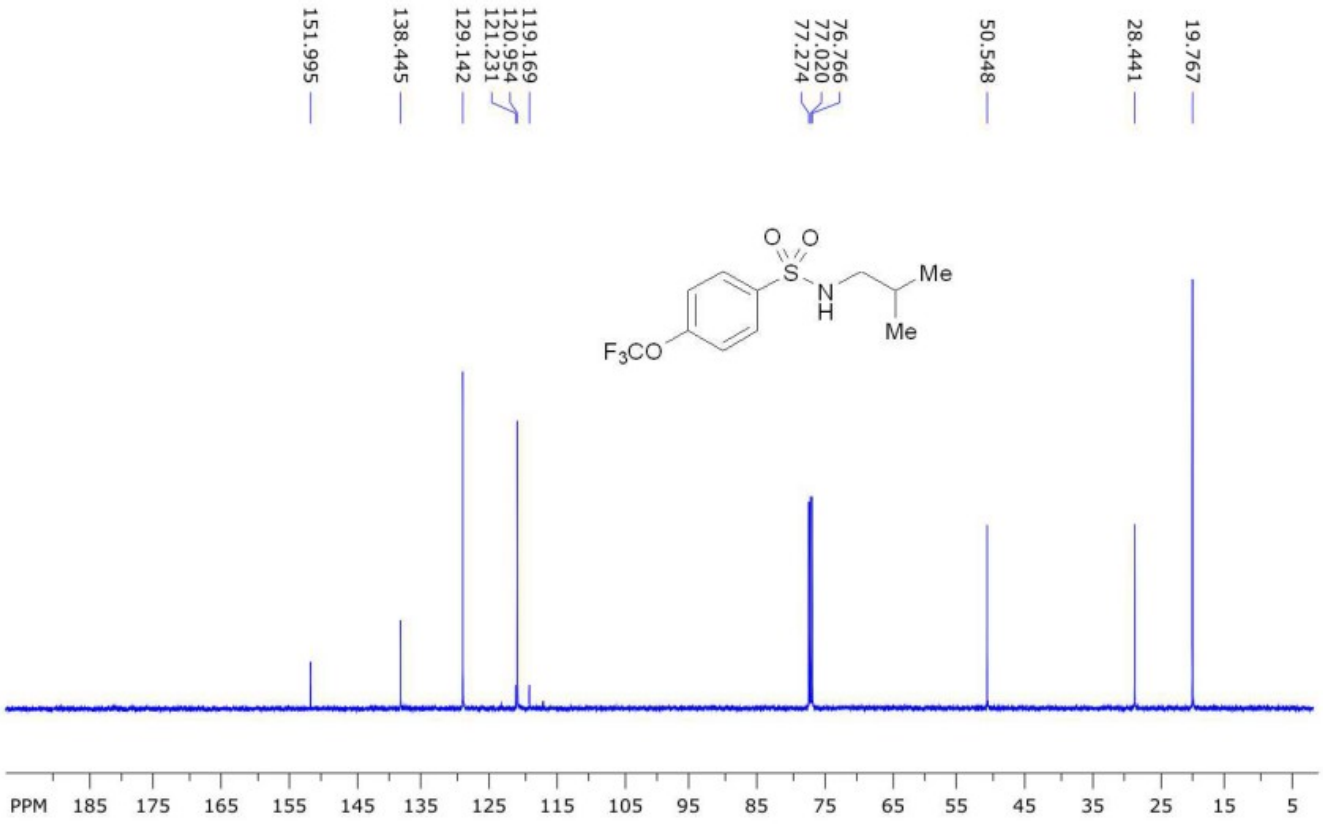


file: ...APO\NMR\500-2\mkr11406\21 2988\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 199.224 ppm/cm: 0.39834

Compound 4v

SpinWorks 4: IVA 2988 13C CDCL3

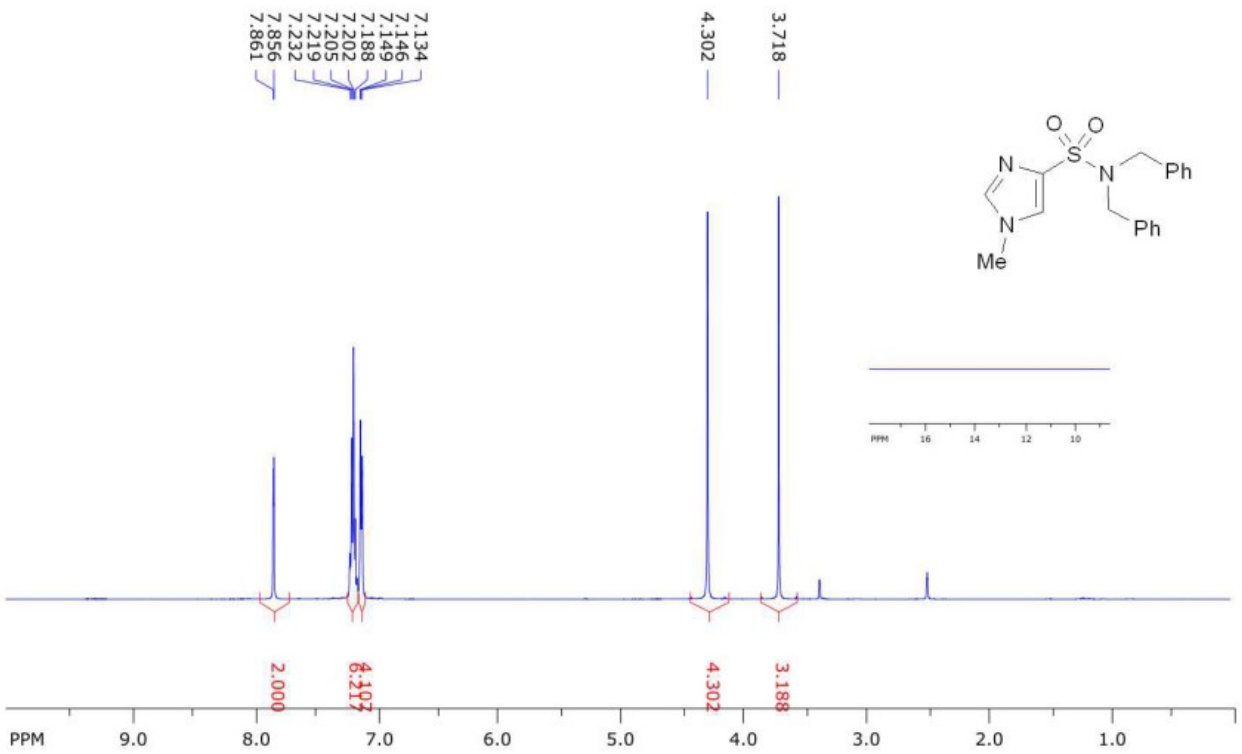


file: D:\NAPO\NMR\500-2\mkr11406\22\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757793 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 986.002 ppm/cm: 7.83955

Compound 4w

SpinWorks 4: IVA 2105 1H DMSO

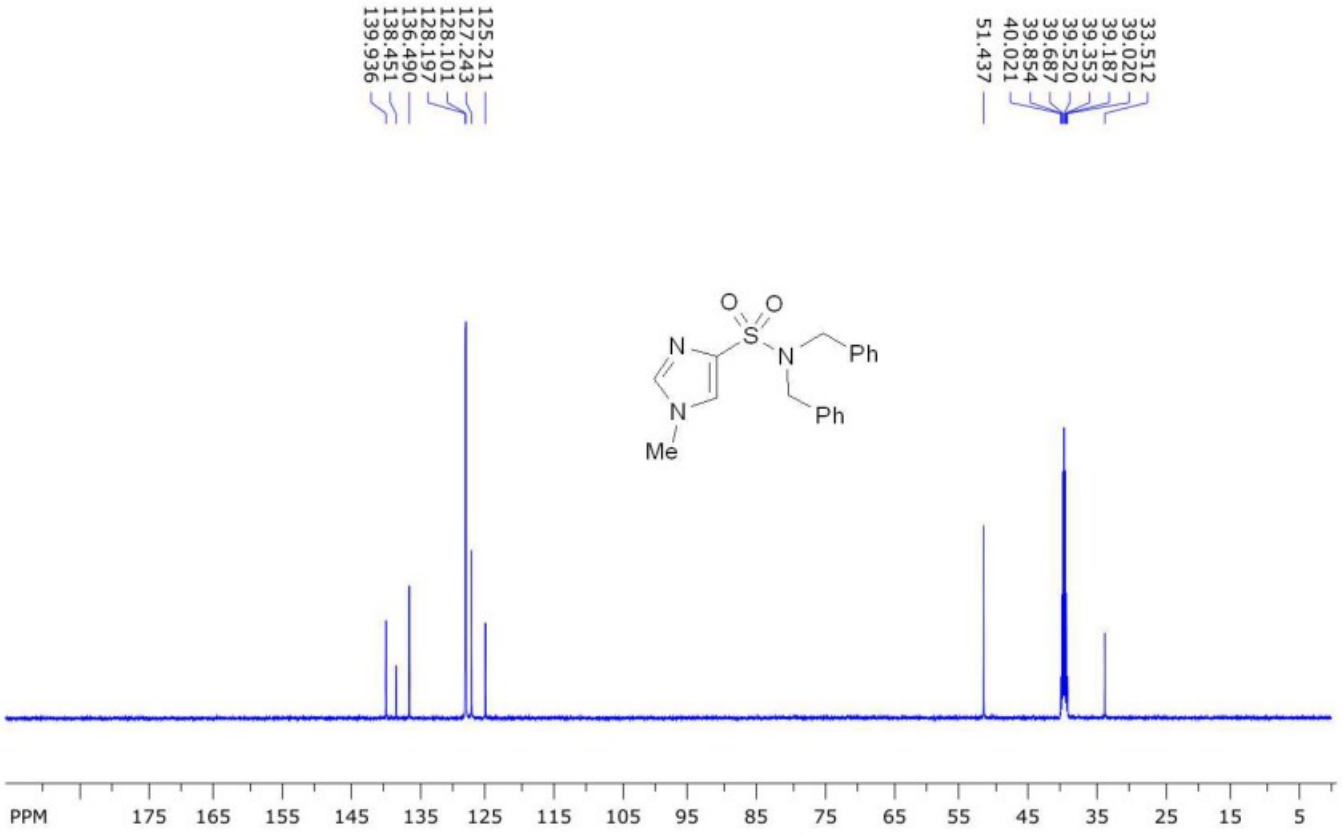


file: ...APO\NMR\500-2\mkr10608\25 2105\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130005 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 200.862 ppm/cm: 0.40162

Compound 4w

SpinWorks 4: IVA 2105 13C DMSO

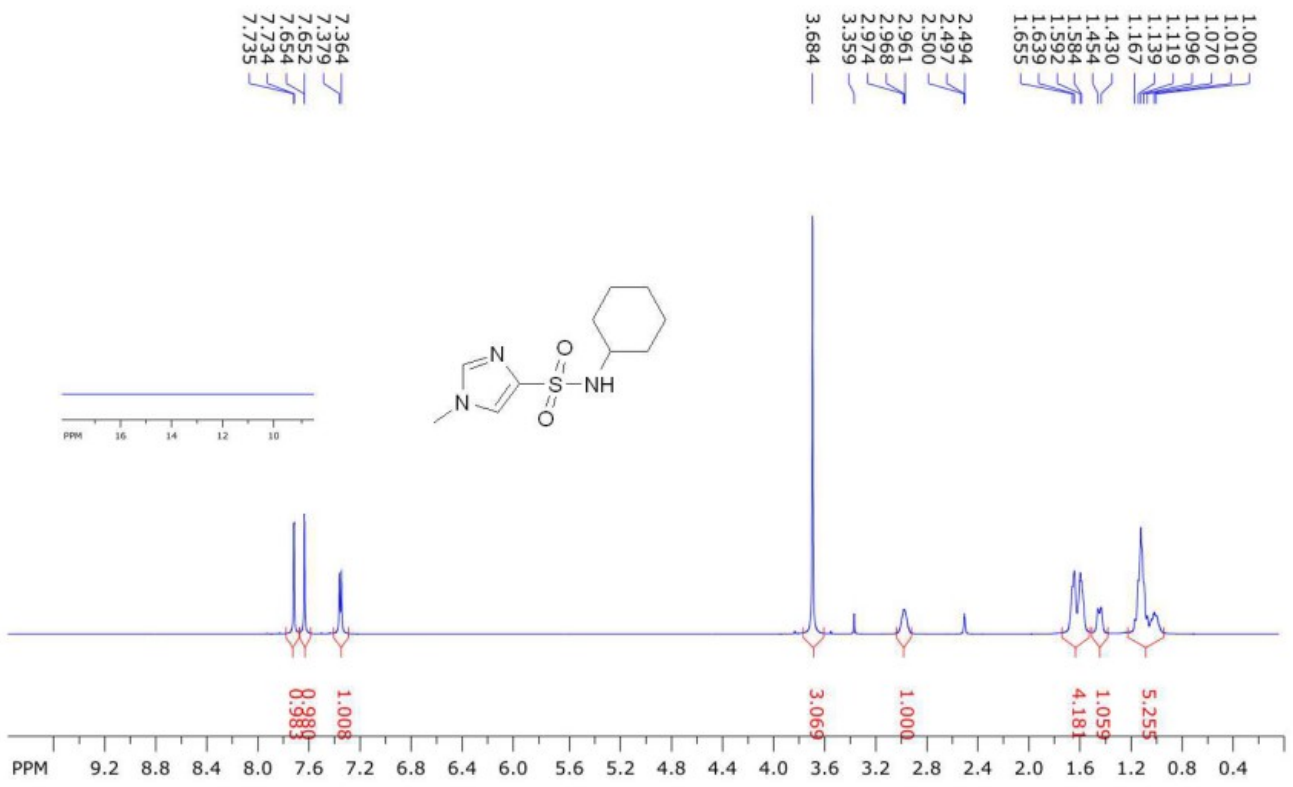


file: D:\NAPO\NMR\500-2\mkr10608\26\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757846 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 987.598 ppm/cm: 7.85223

Compound 4x

SpinWorks 4: IVA 2404 1H

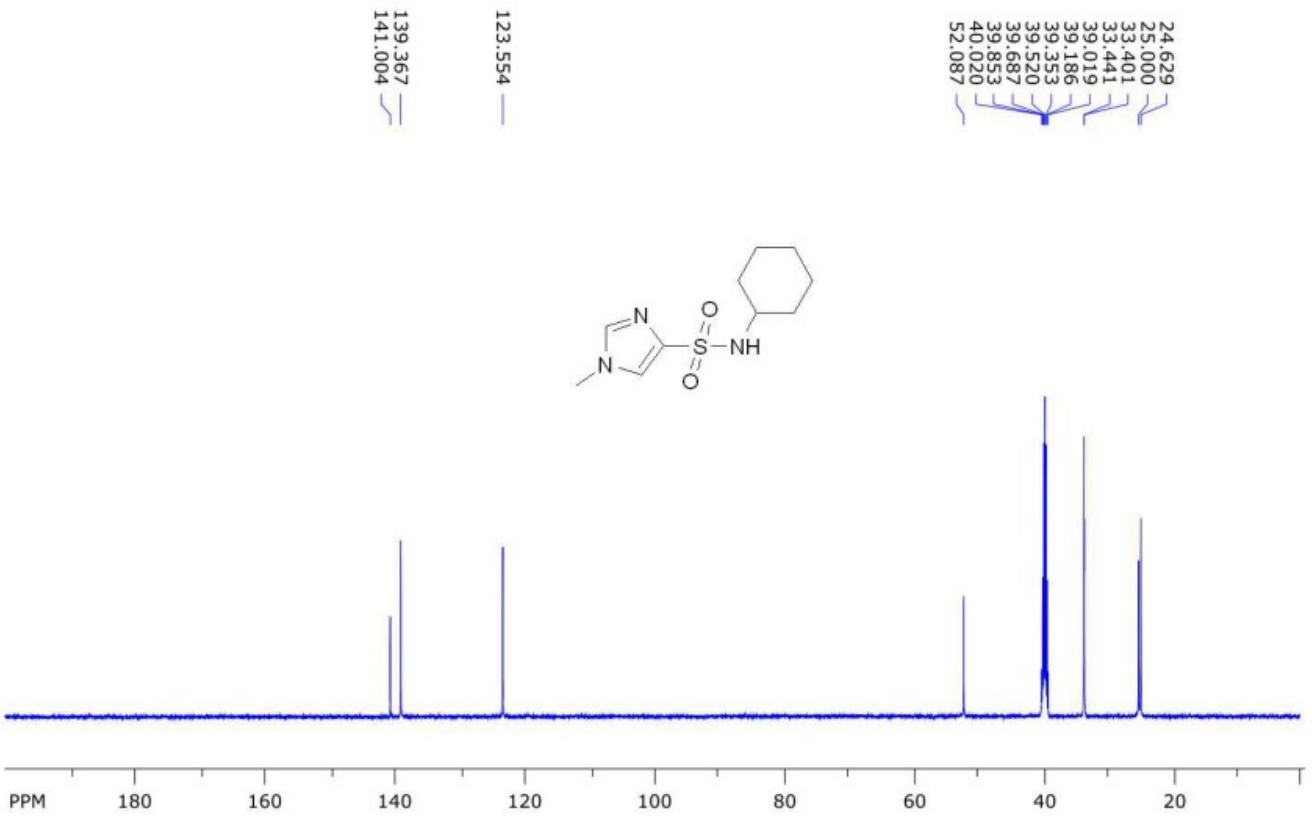


file: ...APO\NMR\500-2\mkr12506\25 2404\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130006 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 198.678 ppm/cm: 0.39725

Compound 4x

SpinWorks 4: IVA 2404 13C

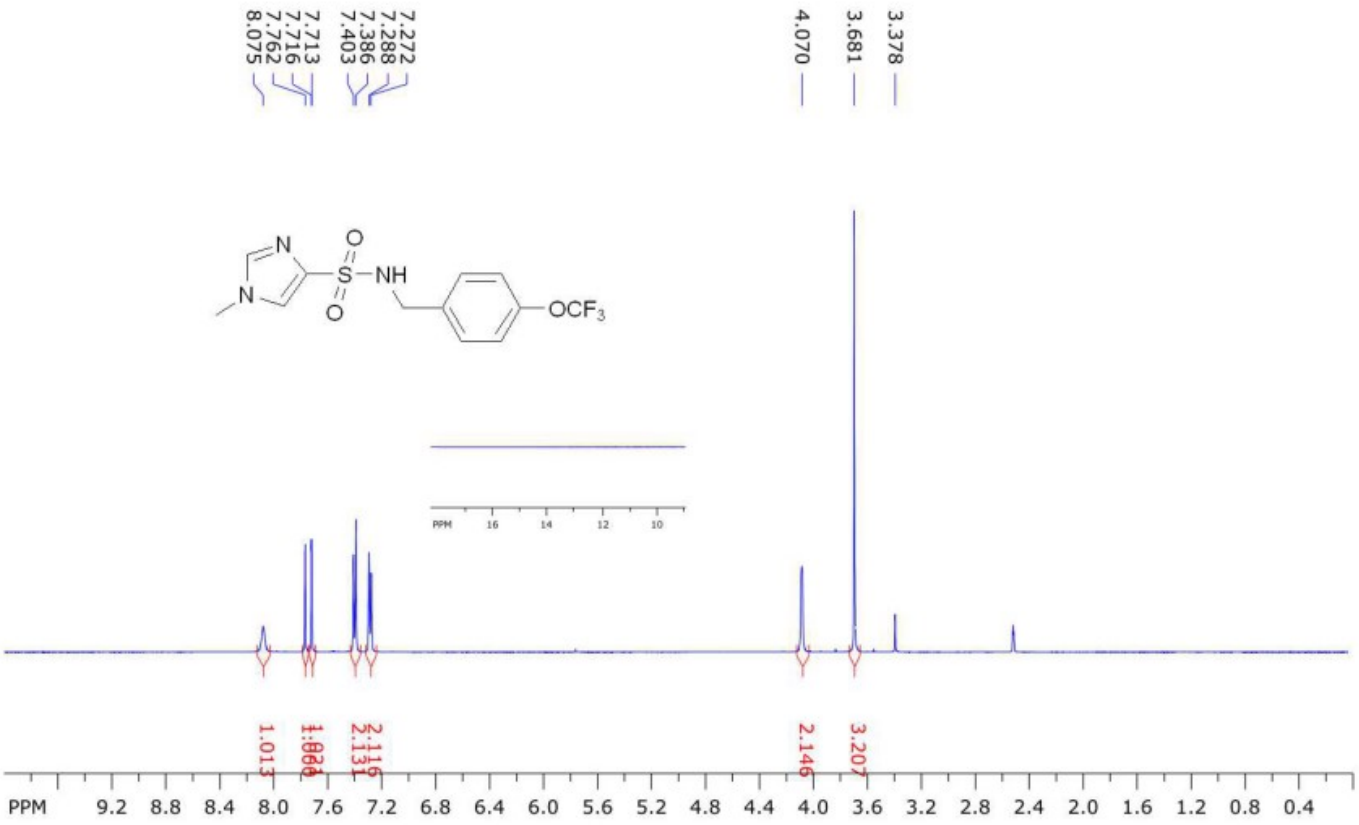


file: D:\NAPO\NMR\500-2\mkr12506\26\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757840 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1009.934 ppm/cm: 8.02983

Compound 4y

SpinWorks 4: IVA 2399 1H

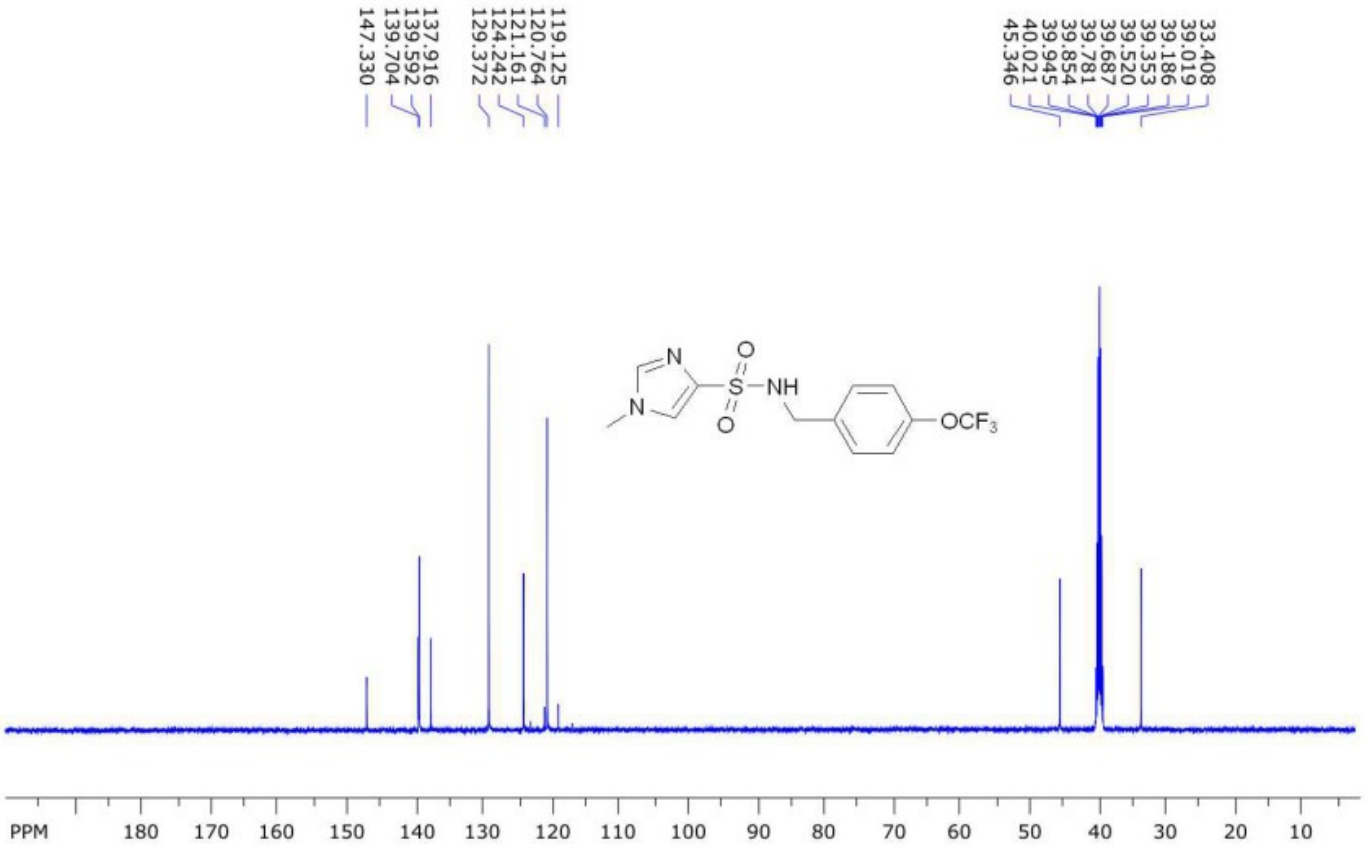


file: ...NAPO\NMR\500-2\mkr10207\5 2399\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130005 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 199.770 ppm/cm: 0.39943

Compound 4y

SpinWorks 4: IVA 2399 13C

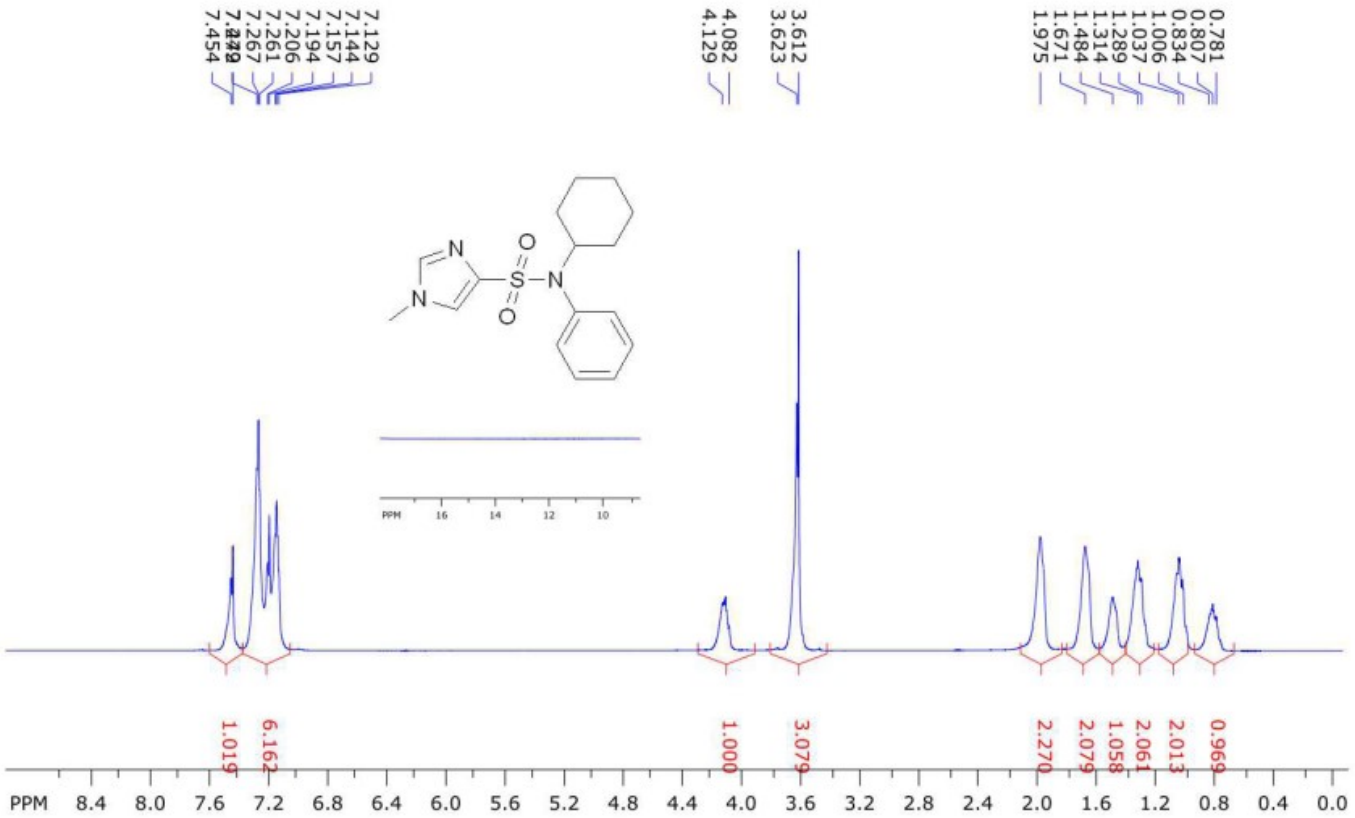


file: D:\NAPO\NMR\500-2\mkr10207\6\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757838 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 998.766 ppm/cm: 7.94103

Compound 4z

SpinWorks 4: IVA 2391 1H

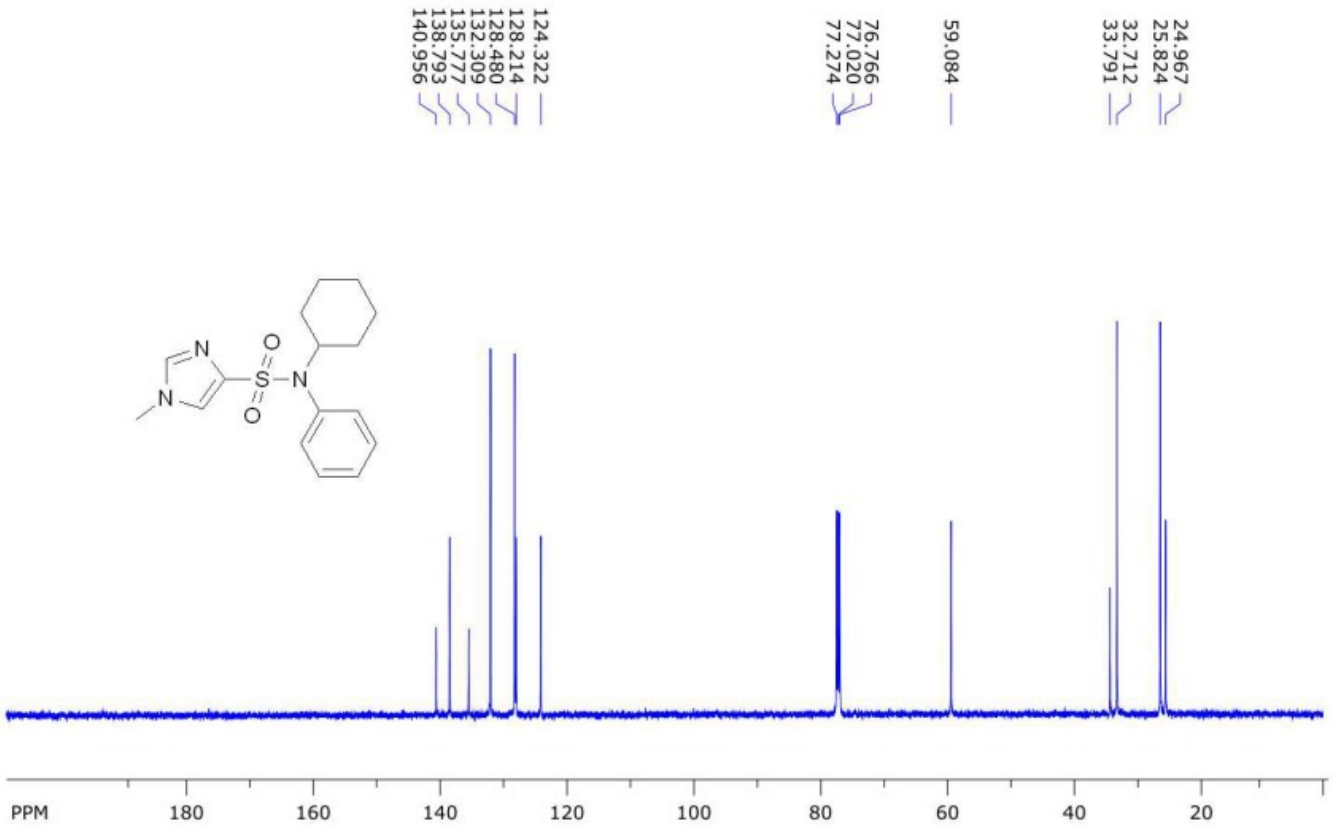


file: ...\NMR\500-2\mkr12205\9 iva 2391\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 181.212 ppm/cm: 0.36233

Compound 4z

SpinWorks 4: IVA 2391 13C

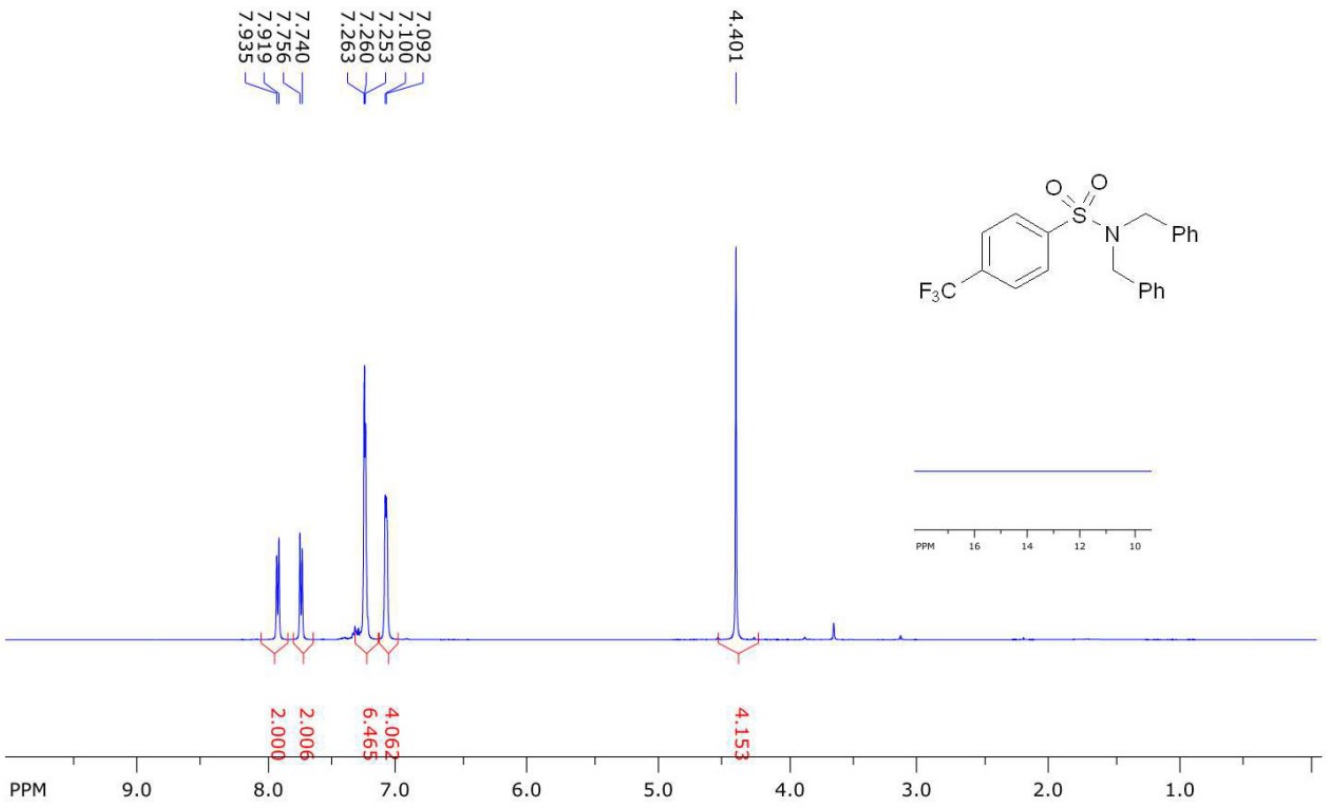


file: D:\NAPO\NMR\500-2\mkr12205\10\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757808 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1053.012 ppm/cm: 8.37233

Compound 4aa

SpinWorks 4: IVA 2976 1H CDCl3

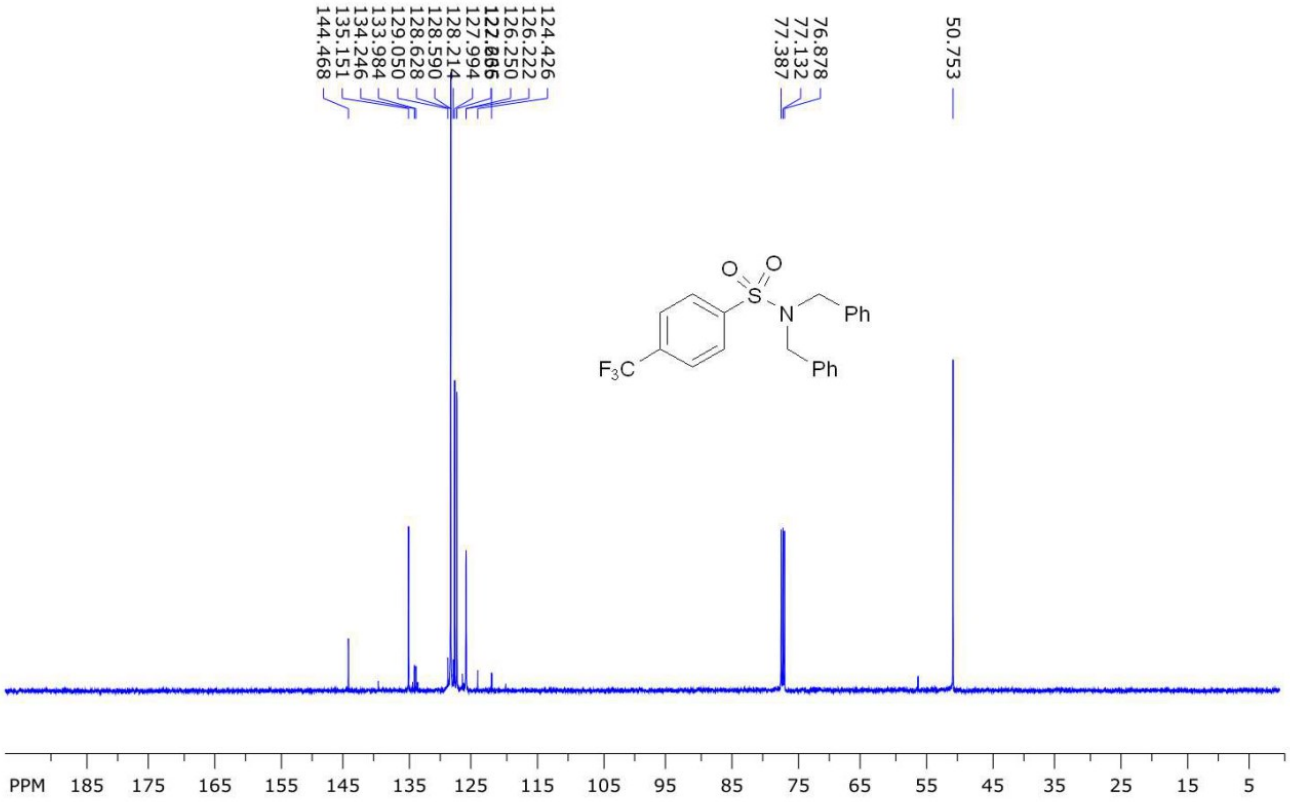


file: ...APO\NMR\500-2\mkr11406\17 2976\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130020 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 201.953 ppm/cm: 0.40380

Compound 4aa

SpinWorks 4: IVA 2976 13C CDCl3

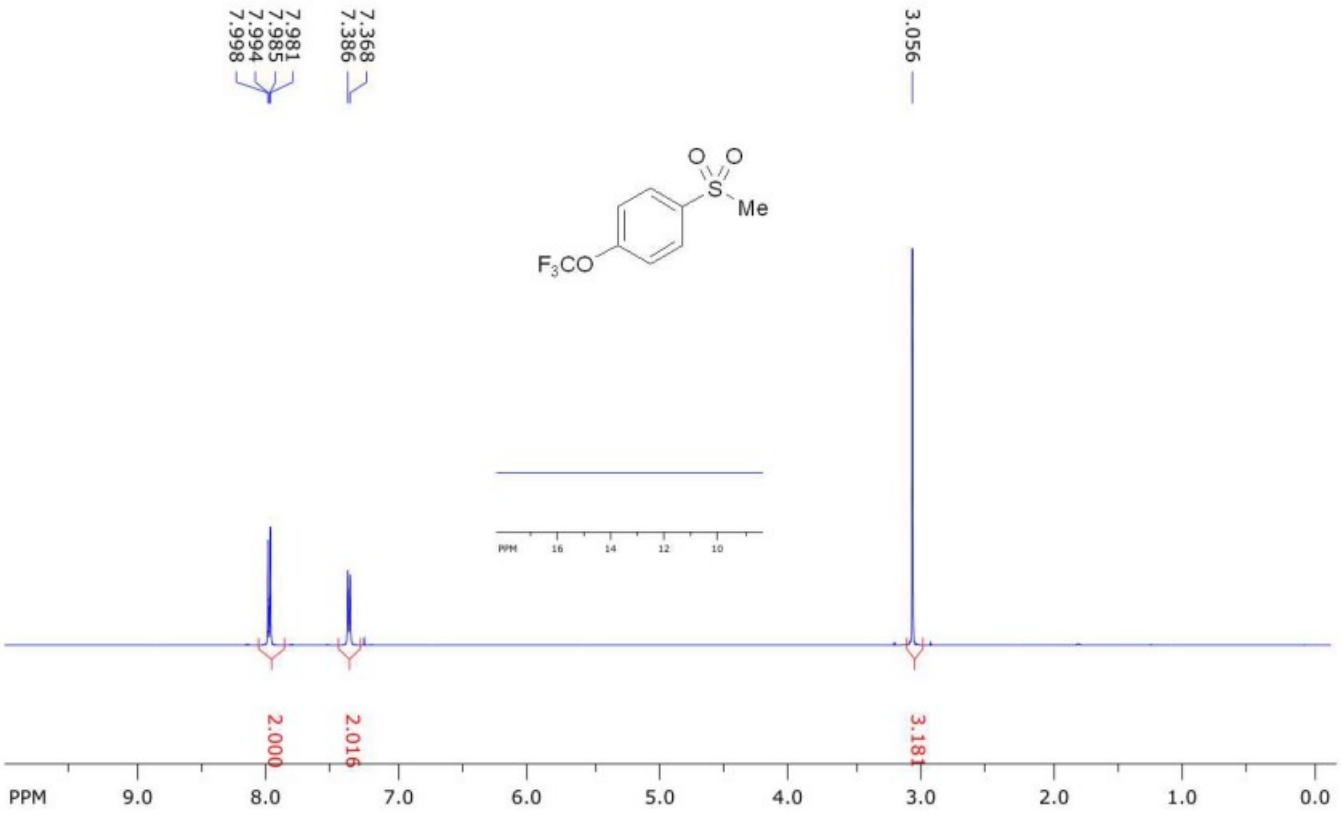


file: D:\NAPO\NMR\500-2\mkr11406\18\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757789 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 993.980 ppm/cm: 7.90297

Compound 11

SpinWorks 4: IVA 2489 1H CDCl3

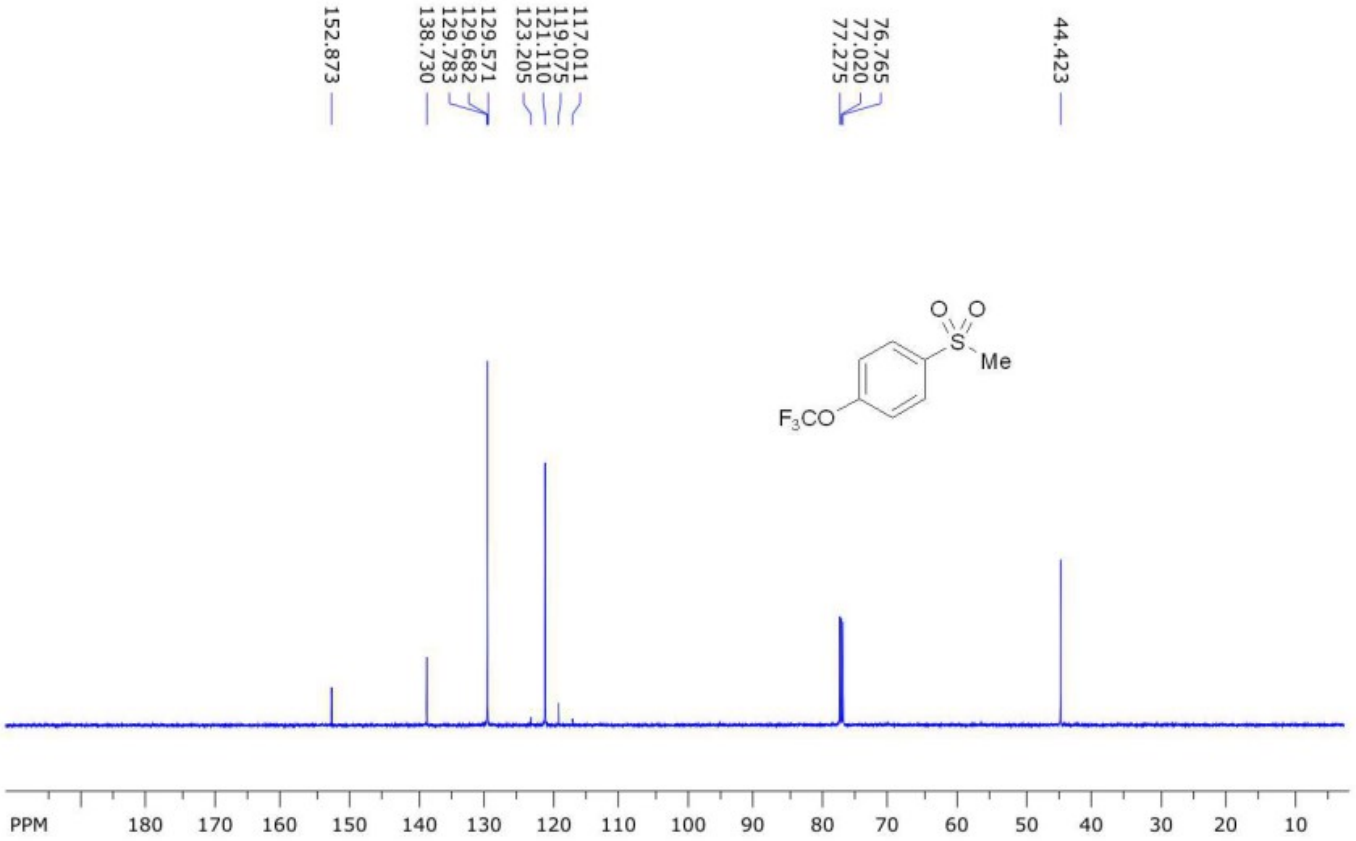


file: ...APO\NMR\500-2\mkr11906\13 2489\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130023 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 203.591 ppm/cm: 0.40707

Compound 11

SpinWorks 4: IVA 2489 13C CDCl3

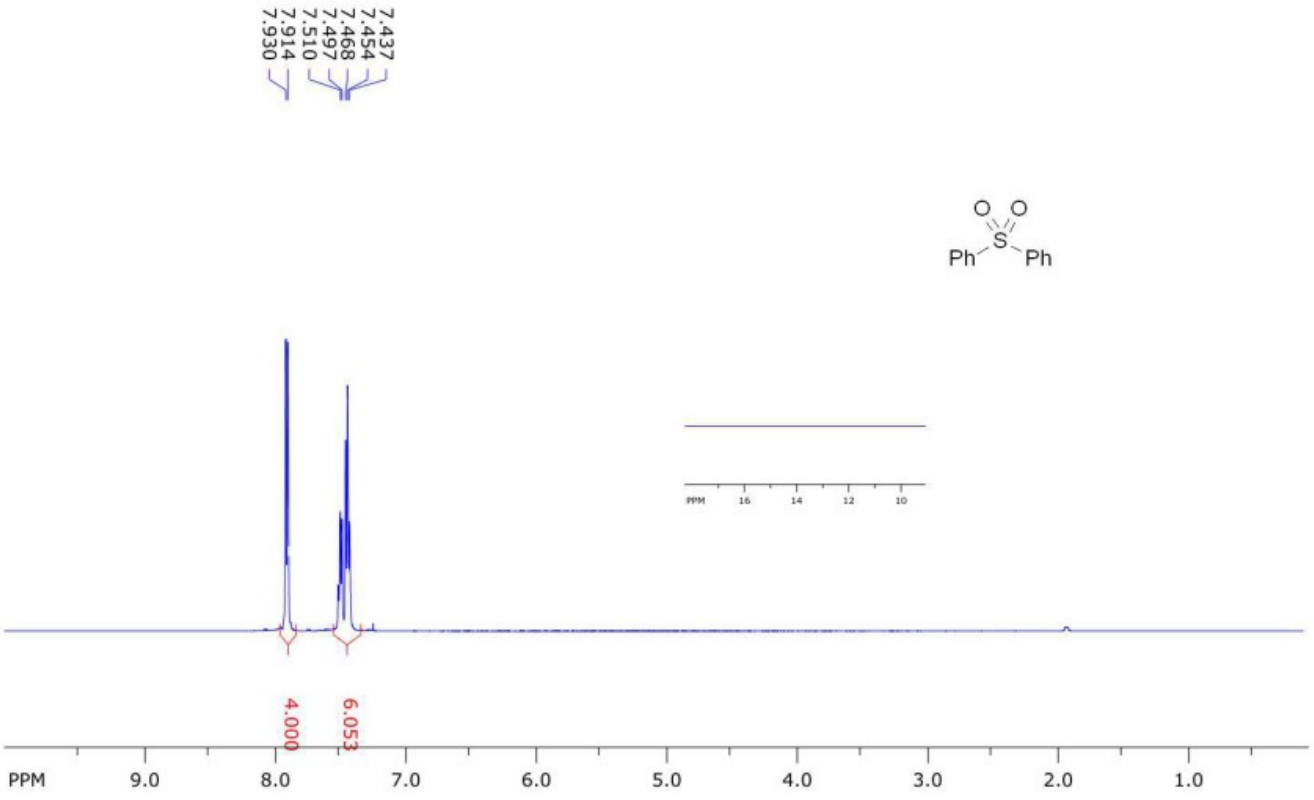


file: D:\NAPO\NMR\500-2\mkr11906\14\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757798 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1001.957 ppm/cm: 7.96640

Compound 13

SpinWorks 4: IVA 2641 1H CDCl3

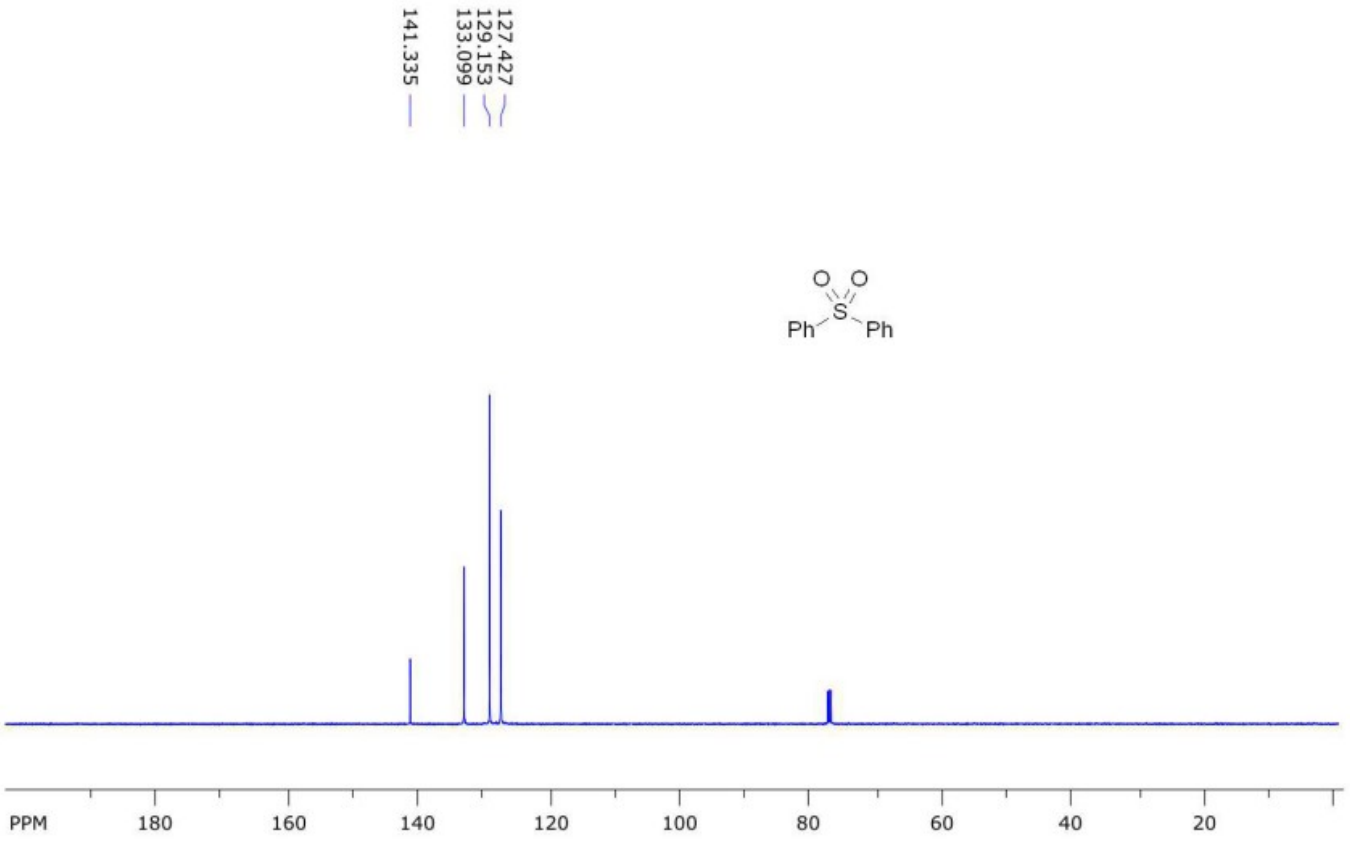


file: ...NAPO\NMR\500-2\mkr13105\7 2641\fid expt: <zg30>
transmitter freq.: 500.133001 MHz
time domain size: 65536 points
width: 12335.53 Hz = 24.6645 ppm = 0.188225 Hz/pt
number of scans: 24

freq. of 0 ppm: 500.130024 MHz
processed size: 65536 complex points
LB: 0.300 GF: 0.0000
Hz/cm: 200.316 ppm/cm: 0.40053

Compound 13

SpinWorks 4: IVA 2641 13C CDCl3



file: D:\NAPO\NMR\500-2\mkr13105\8\fid expt: <zgpg30>
transmitter freq.: 125.772879 MHz
time domain size: 65536 points
width: 36057.69 Hz = 286.6889 ppm = 0.550197 Hz/pt
number of scans: 512

freq. of 0 ppm: 125.757814 MHz
processed size: 32768 complex points
LB: 2.000 GF: 0.0000
Hz/cm: 1029.080 ppm/cm: 8.18205