

# Copper (I)-mediated synthesis of $\beta$ -hydroxysulfones from styrenes and sulfonylhydrazides. Electrochemical mechanistic study

Alexander O. Terent'ev,\*<sup>ab</sup> Olga M. Mulina,<sup>a</sup> Dmitry A. Pirgach,<sup>ab</sup>  
Dmitry V. Demchuk,<sup>a</sup> Mikhail A. Syroeshkin,<sup>a</sup> Gennady I. Nikishin<sup>a</sup>

<sup>a</sup> N. D. Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, 119991  
Moscow, Russian Federation. *Fax:* +7 499 135 53 28; *e-mail:* [terentev@ioc.ac.ru](mailto:terentev@ioc.ac.ru)

<sup>b</sup> D.I. Mendeleev University of Chemical Technology of Russia, 125047,  
Moscow, Russian Federation

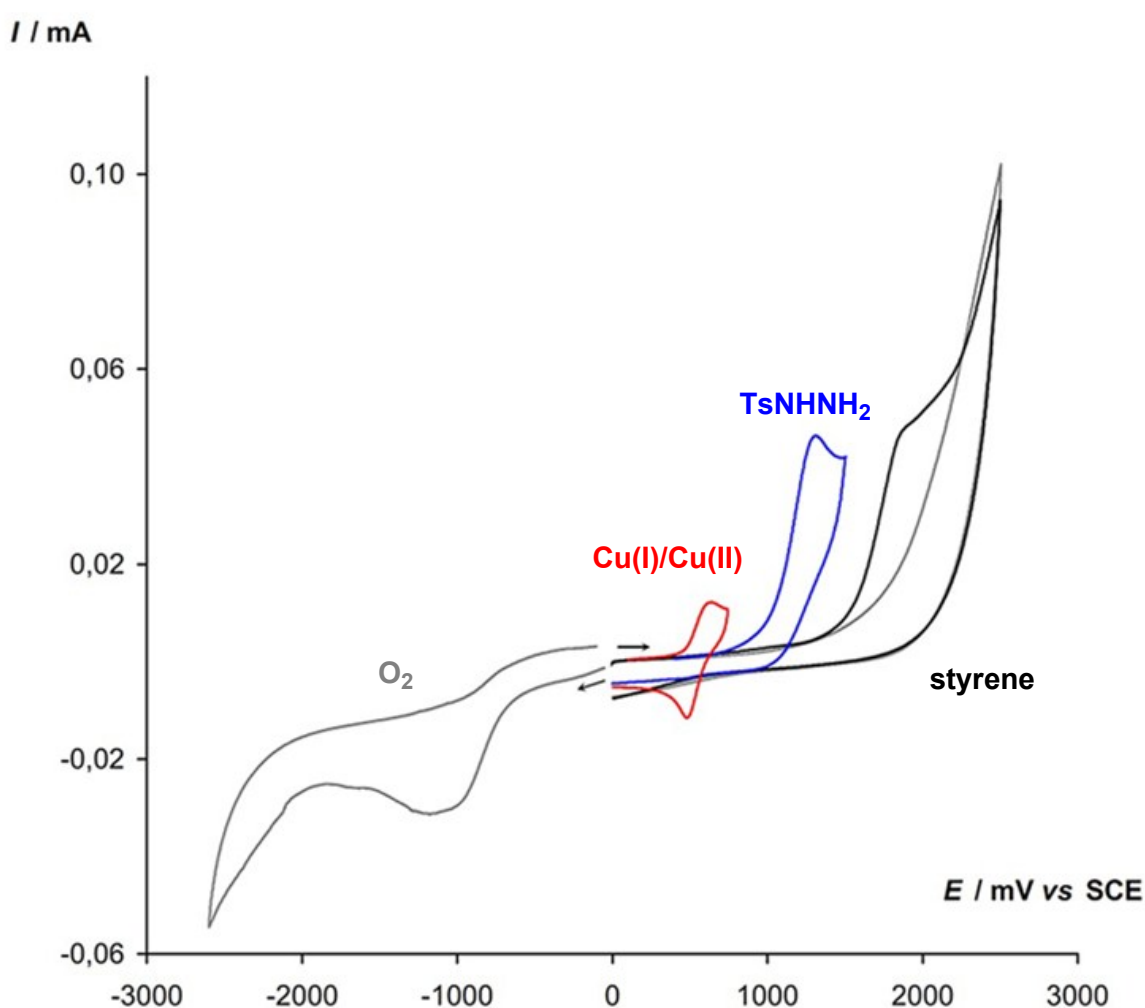
## SUPPORTING INFORMATION

### Table of Content

Electrochemical study of redox properties of the reagents .....	2
NMR Spectra of Synthesized Compounds .....	4

## Electrochemical study of redox properties of the reagents

Cyclic voltammetry (CV) were implemented on an IPC-Pro computer-assisted potentiostat manufactured by Econix (scan rate error 1.0%, potential setting 0.25 mV). The experiments were performed in a 10-ml five-neck glass conic electrochemical cell with a water jacket for thermostating. CV curves were recorded using a three-electrode scheme. The working electrode was a disc glassy-carbon electrode ( $d = 1.7$  mm). A platinum wire served as an auxiliary electrode. A saturated calomel electrode was used as the reference electrode and was linked to the solution by a bridge with a porous ceramic diaphragm filled with background electrolyte. The tested solutions were thermostatted at  $25 \pm 0.5$  °C. In a typical case, 5 ml solution was utilized and the depolarizer concentration was  $2 \text{ mmol} \cdot \text{L}^{-1}$ . The working electrode was polished before recording each CV curve.



**Figure 1** CV curves for 2.0 mmol/L solutions of CuBr (red), *p*-toluenesulfonylhydrazide **2a** (blue), styrene **1a** (black) and aerated supporting solution (grey) in 0.1M  $\text{Bu}_4\text{NClO}_4$  in  $\text{CH}_3\text{CN}-\text{H}_2\text{O}$  (5:1) on a working glassy-carbon electrode ( $d = 1.7$  mm) under scan rate 100 mV/s.

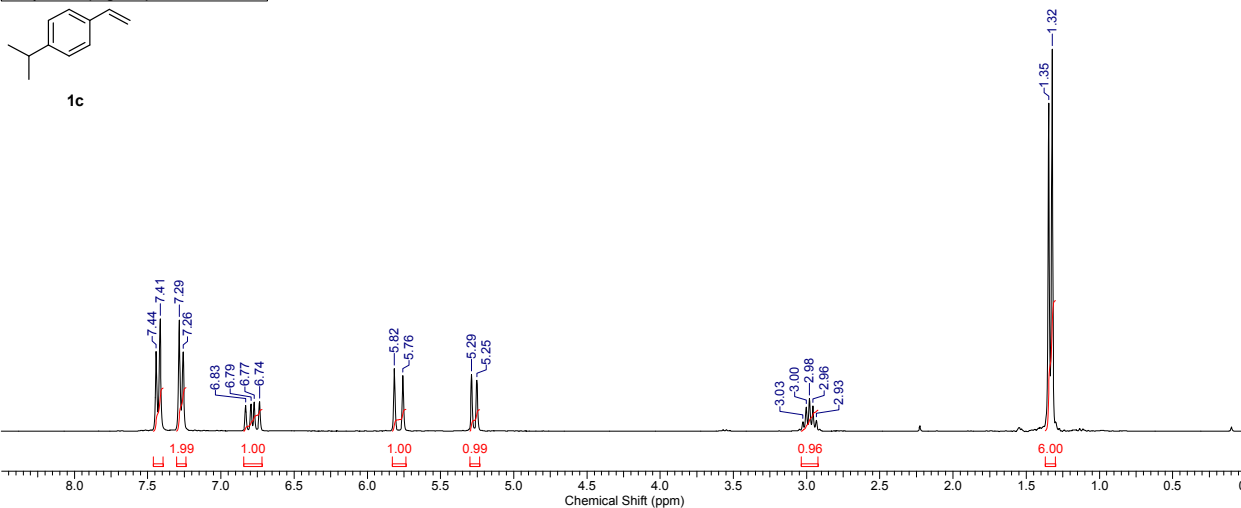
**Table 1** CV curves parameters in V vs SCE for styrene, TsNHNH<sub>2</sub>, CuBr and O<sub>2</sub> solutions in 0.1M Bu<sub>4</sub>NClO<sub>4</sub> in CH<sub>3</sub>CN–H<sub>2</sub>O (5:1) on a working glassy-carbon electrode (d = 1.7 mm) under scan rate 100 mV/s

<i>Substance</i>	$E^{onset}$	<i>Scan direction</i>	$E^{peak}_{forward}$	$E^{peak}_{reverse}$	$E^{1/2}$
Styrene	0	+	1.90	-	-
TsNHNH <sub>2</sub>	0	+	1.35	-	-
Cu <sup>+</sup>	0	+	0.65	0.45	0.55
O <sub>2</sub>	0	—	- 1.10	-	-

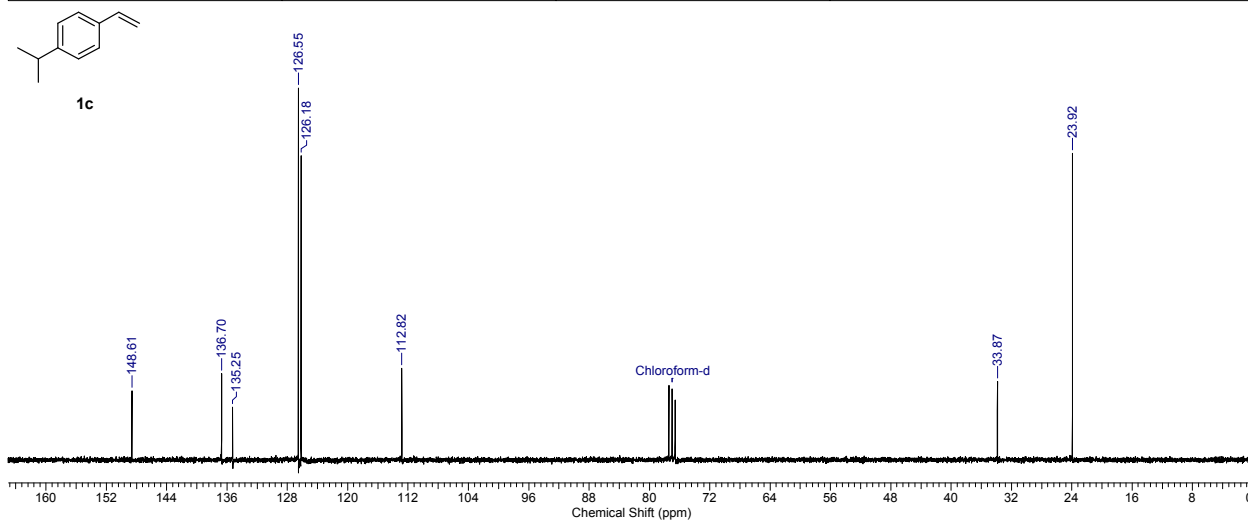
# NMR Spectra of Synthesized Compounds

## 1-Isopropyl-4-vinylbenzene (1c)

Acquisition Time (sec)	1.3518	Date	15 Oct 2015 11:41:52	Frequency (MHz)	300.13
File Name		Number of Transients	1	Original Points Count	8124
Nucleus	<sup>1</sup> H	Solvent	CHLOROFORM-D	Points Count	8192
Pulse Sequence	zg	Sweep Width (Hz)	6009.62		
Temperature (degree C)	26.000				

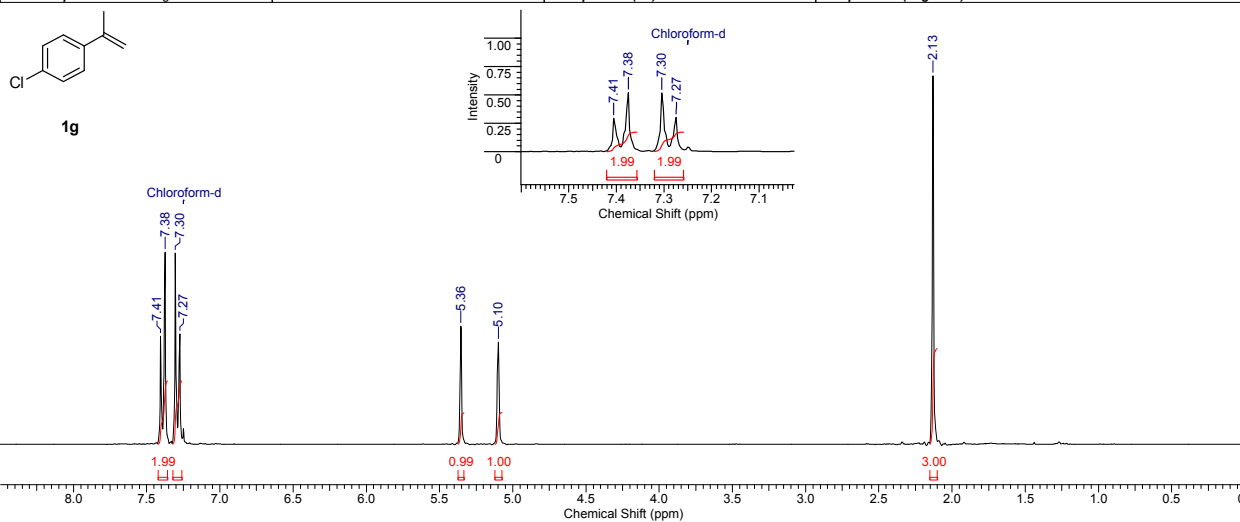


Acquisition Time (sec)	0.9006	Date	15 Oct 2015 16:00:00	Frequency (MHz)	75.48
File Name		Number of Transients	111	Original Points Count	16316
Nucleus	<sup>13</sup> C	Solvent	CHLOROFORM-D	Points Count	16384
Pulse Sequence	zgpg30	Sweep Width (Hz)	18115.94	Temperature (degree C)	25.800

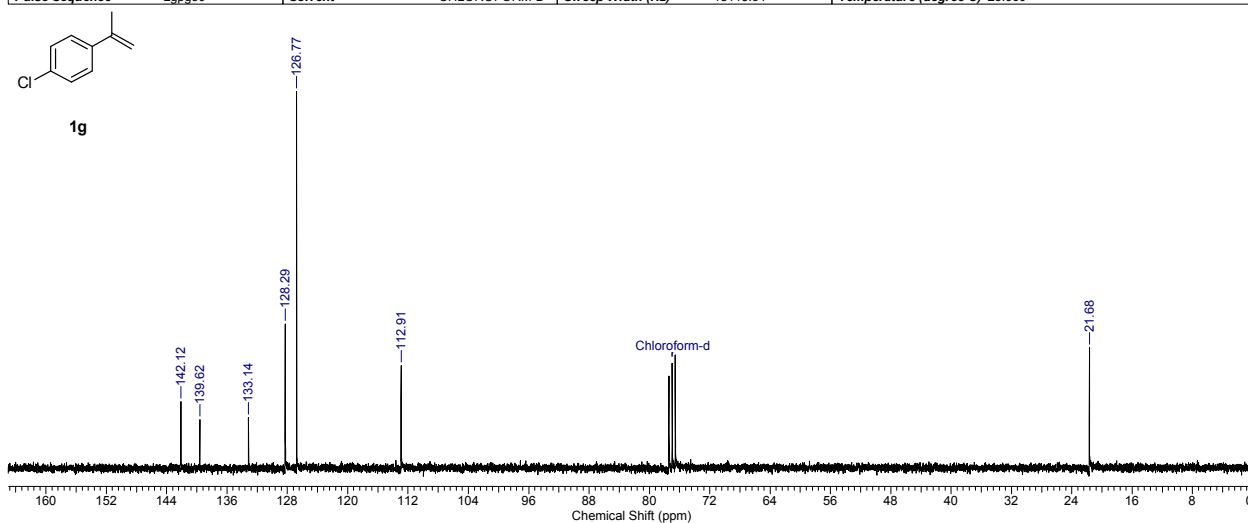


# 1-Chloro-4-isopropenylbenzene (1g)

Acquisition Time (sec)	1.0832	Comment	Avance-300, 1H CDCl3	Date	31 Jul 2015 14:43:12
File Name				Frequency (MHz)	300.13
Nucleus	1H	Number of Transients	1	Original Points Count	8124
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Sweep Width (Hz)	7500.00
				Points Count	8192
				Temperature (degree C)	24.800

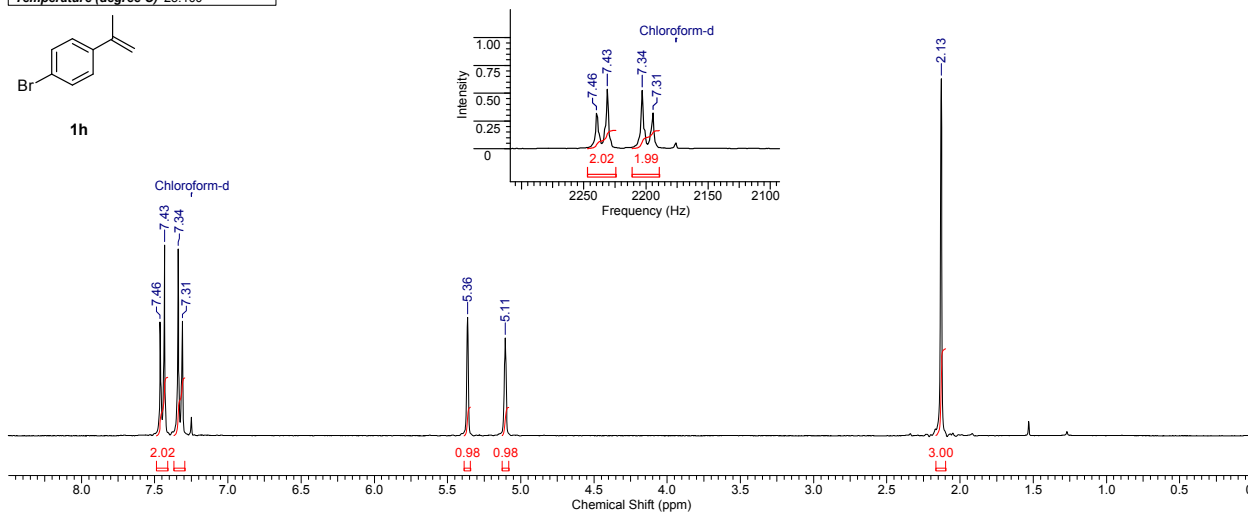


Acquisition Time (sec)	0.9006	Date	21 Jul 2015 14:30:24	Frequency (MHz)	75.48
File Name				Points Count	16384
Nucleus	13C	Number of Transients	115	Original Points Count	16316
Pulse Sequence	zgpg30	Solvent	CHLOROFORM-D	Sweep Width (Hz)	18115.94
				Temperature (degree C)	25.900

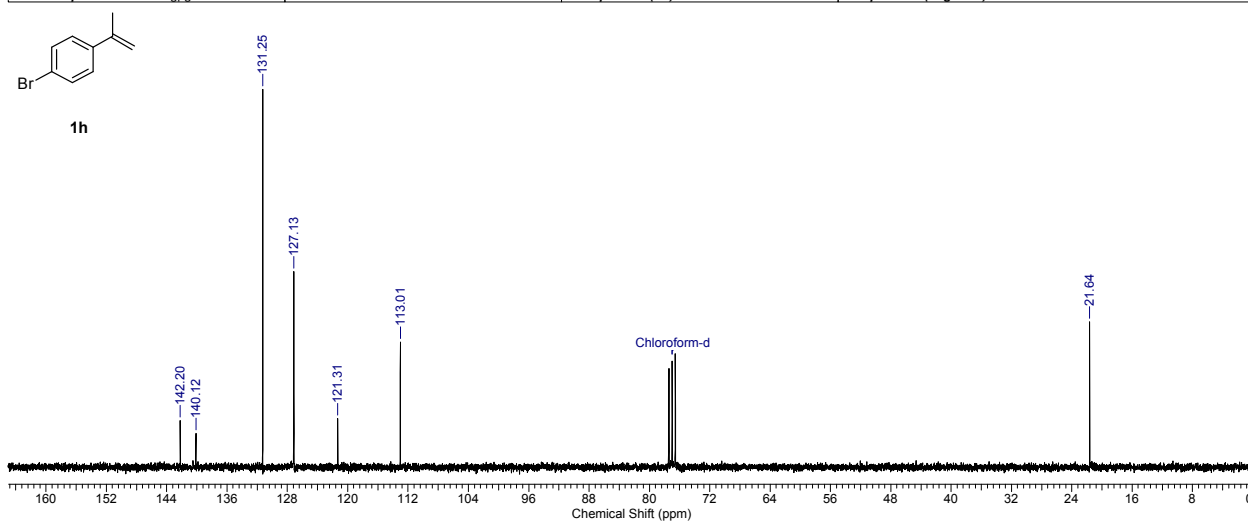


# 1-Bromo-4-isopropenylbenzene (1h)

Acquisition Time (sec)	1.3518	Date	24 Sep 2015 15:19:28	Frequency (MHz)	300.13
File Name		Number of Transients	1	Points Count	8124
Nucleus	<sup>1</sup> H	Solvent	CHLOROFORM-D	Sweep Width (Hz)	6009.62
Pulse Sequence	zg				
Temperature (degree C)	25.100				

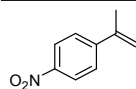


Acquisition Time (sec)	0.8680	Comment	adil.cdcl3.c13	Date	26 Sep 2015 10:14:24
File Name		Number of Transients	138	Points Count	16316
Nucleus	<sup>13</sup> C	Solvent	CHLOROFORM-D	Sweep Width (Hz)	18796.99
Pulse Sequence	zgpg60base			Temperature (degree C)	26.400

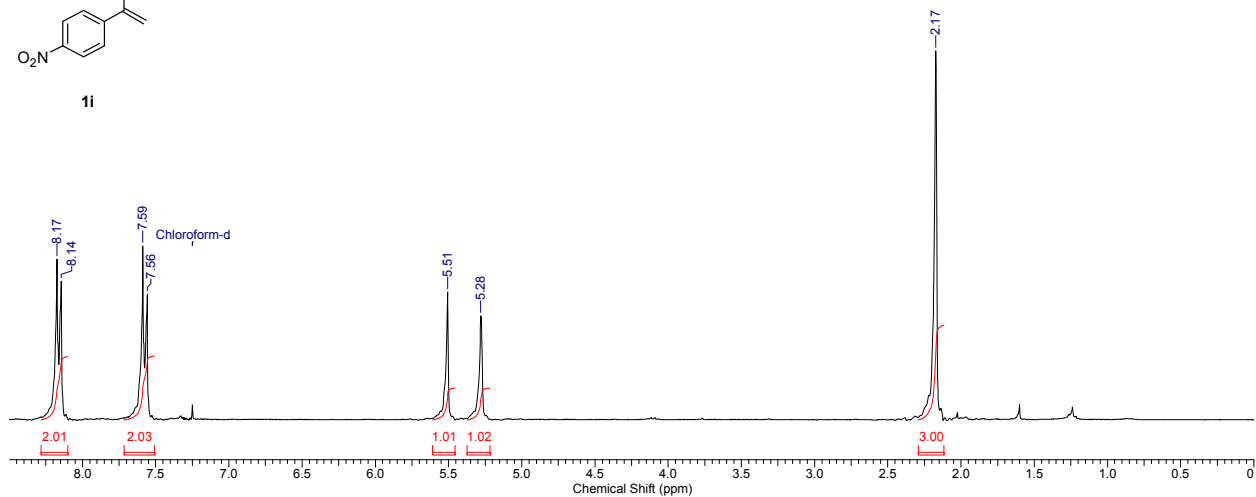


# 1-Isopropenyl-4-nitrobenzene (1i)

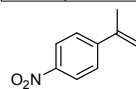
Acquisition Time (sec)	1.3518	Comment	Avance-300, 1H CDCl3	Date	03 Sep 2015 12:37:20
File Name				Frequency (MHz)	300.13
Nucleus	1H	Number of Transients	1	Original Points Count	8124
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Sweep Width (Hz)	6009.62
				Points Count	8192
				Temperature (degree C)	23.500



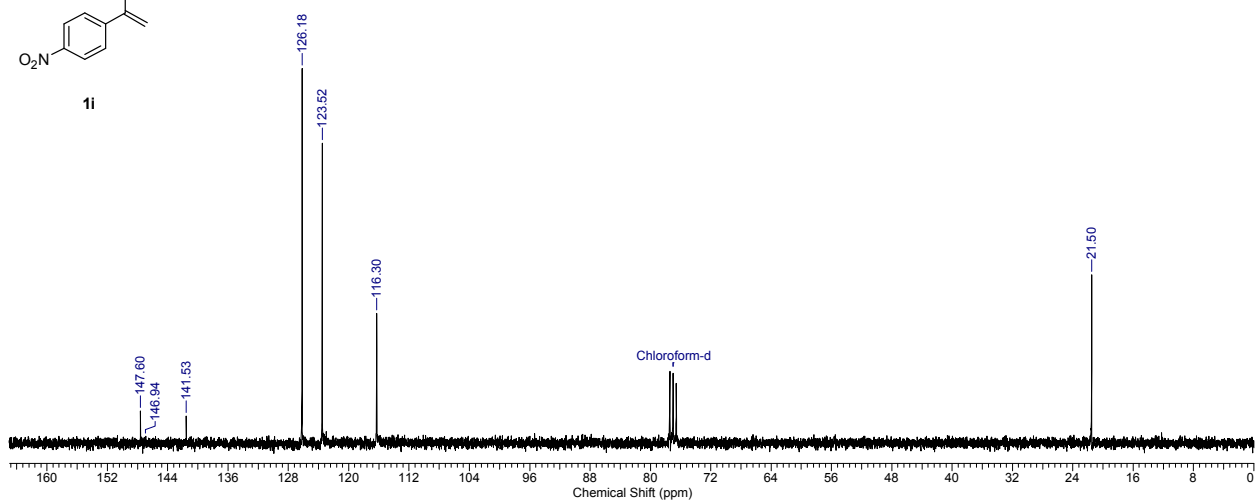
1i



Acquisition Time (sec)	0.8680	Comment	adil.cdcl3.c13	Date	04 Sep 2015 10:40:00
File Name				Frequency (MHz)	75.48
Nucleus	13C	Number of Transients	130	Original Points Count	16316
Pulse Sequence	zpgg60base	Solvent	CHLOROFORM-D	Sweep Width (Hz)	18796.99
				Points Count	16384
				Temperature (degree C)	25.600

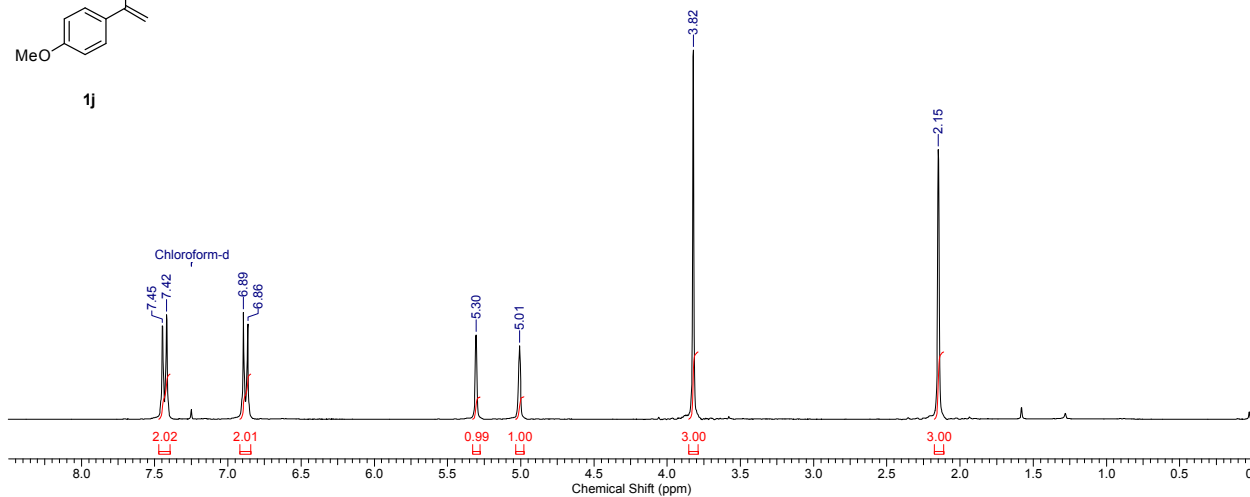
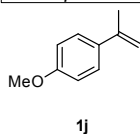


1i

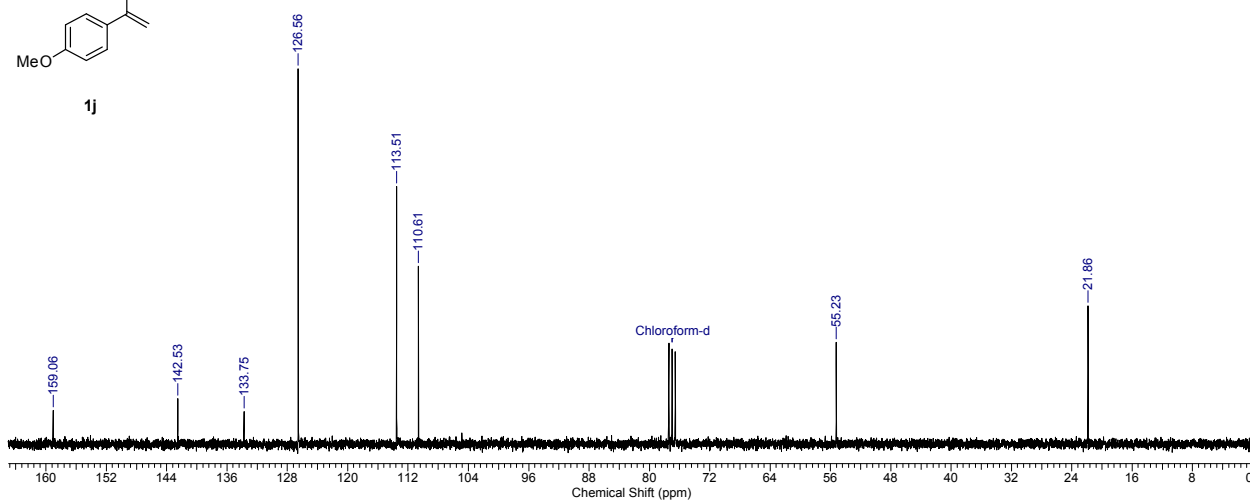
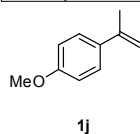


# 1-Isopropenyl-4-methoxybenzene (1j)

Acquisition Time (sec)	1.3518	Date	24 Sep 2015 15:21:36	Frequency (MHz)	300.13
File Name				Points Count	8192
Nucleus	<sup>1</sup> H	Number of Transients	1	Original Points Count	8124
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Sweep Width (Hz)	6009.62
				Temperature (degree C)	25.100



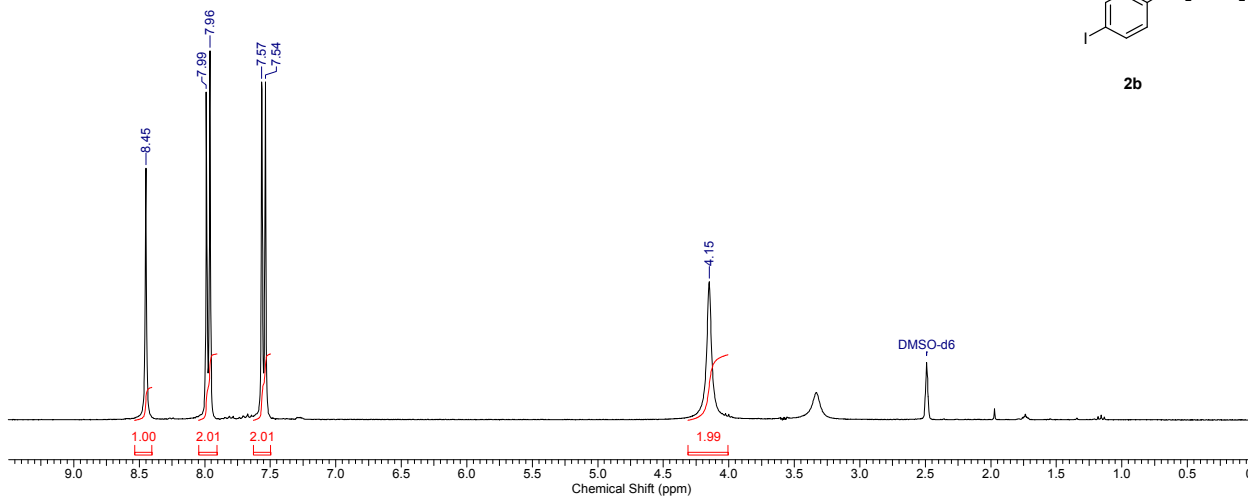
Acquisition Time (sec)	0.8680	Comment	adli.cdcl3.c13	Date	26 Sep 2015 09:59:28
File Name				Frequency (MHz)	75.48
Nucleus	<sup>13</sup> C	Number of Transients	67	Original Points Count	16316
Pulse Sequence	zpgg90base	Solvent	CHLOROFORM-D	Sweep Width (Hz)	18796.99
				Temperature (degree C)	25.500



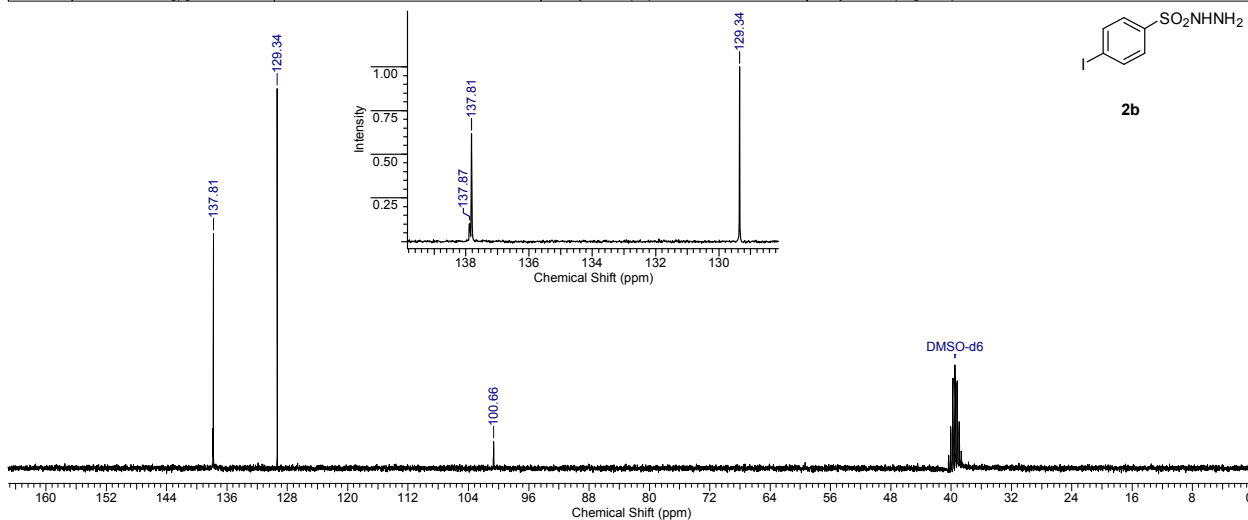


## 4-Iodobenzenesulfonohydrazide (2b)

Acquisition Time (sec)	1.3521	Comment	Avance-300, 1H DMSO-d6	Date	20 Aug 2015 15:30:08
File Name				Frequency (MHz)	300.13
Nucleus	1H	Number of Transients	1	Original Points Count	8116
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40
				Points Count	8192
				Temperature (degree C)	27.000

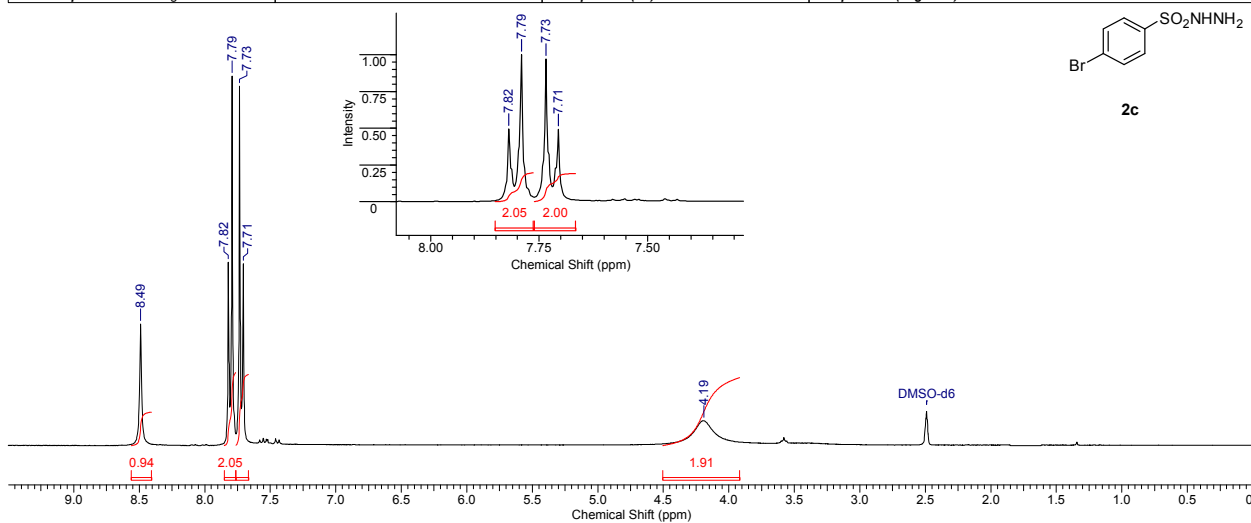


Acquisition Time (sec)	0.8643	Comment	c13,dms0	Date	24 Aug 2015 14:00:32
File Name				Frequency (MHz)	75.48
Nucleus	13C	Number of Transients	155	Original Points Count	16308
Pulse Sequence	zpgg60base	Solvent	DMSO-D6	Sweep Width (Hz)	18867.92
				Points Count	16384
				Temperature (degree C)	25.100

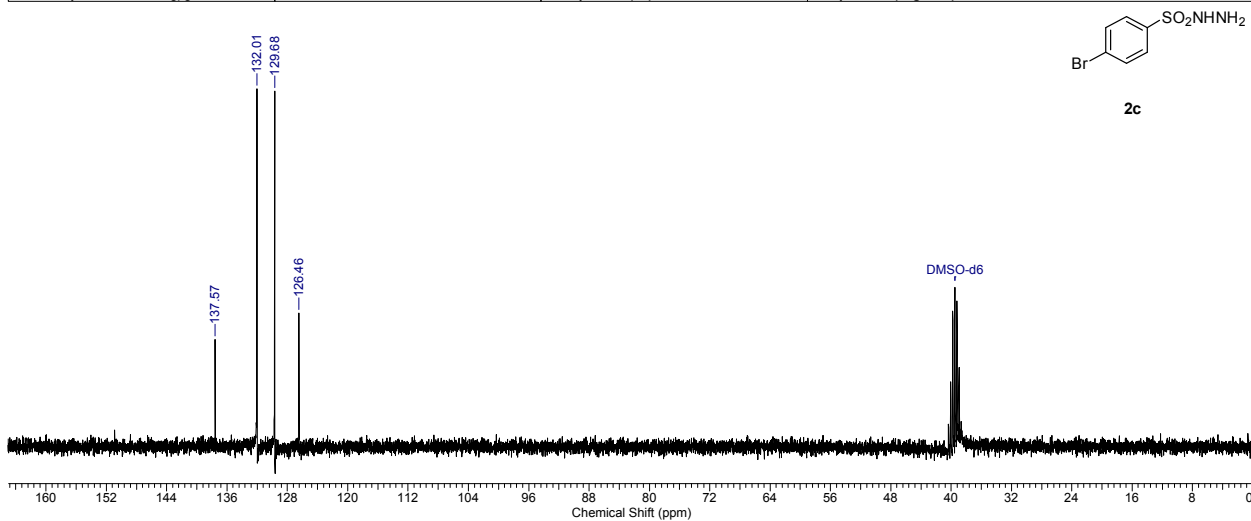


## 4-Bromobenzenesulfonohydrazide (2c)

Acquisition Time (sec)	1.3521	Comment	Avance-300, 1H DMSO-d6	Date	27 Aug 2015 10:40:00
File Name				Frequency (MHz)	300.13
Nucleus	1H	Number of Transients	1	Original Points Count	8116
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40
				Points Count	8192
				Temperature (degree C)	24.300

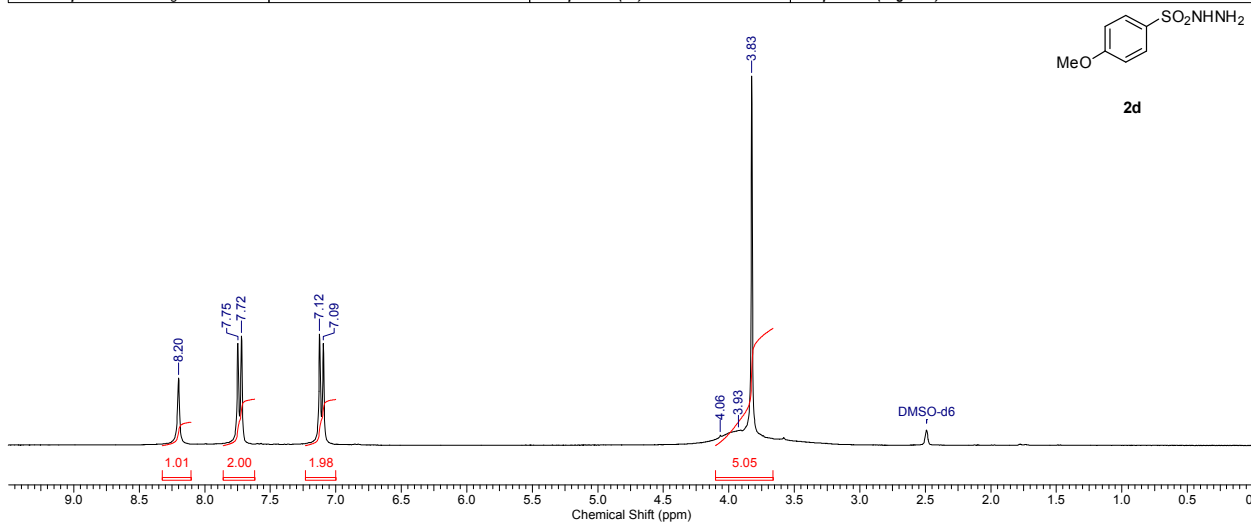


Acquisition Time (sec)	0.8643	Comment	c13.dms0	Date	05 Sep 2015 09:29:36
File Name				Frequency (MHz)	75.48
Nucleus	13C	Number of Transients	67	Original Points Count	16308
Pulse Sequence	zgpg90base	Solvent	DMSO-D6	Sweep Width (Hz)	18867.92
				Points Count	16384
				Temperature (degree C)	25.900

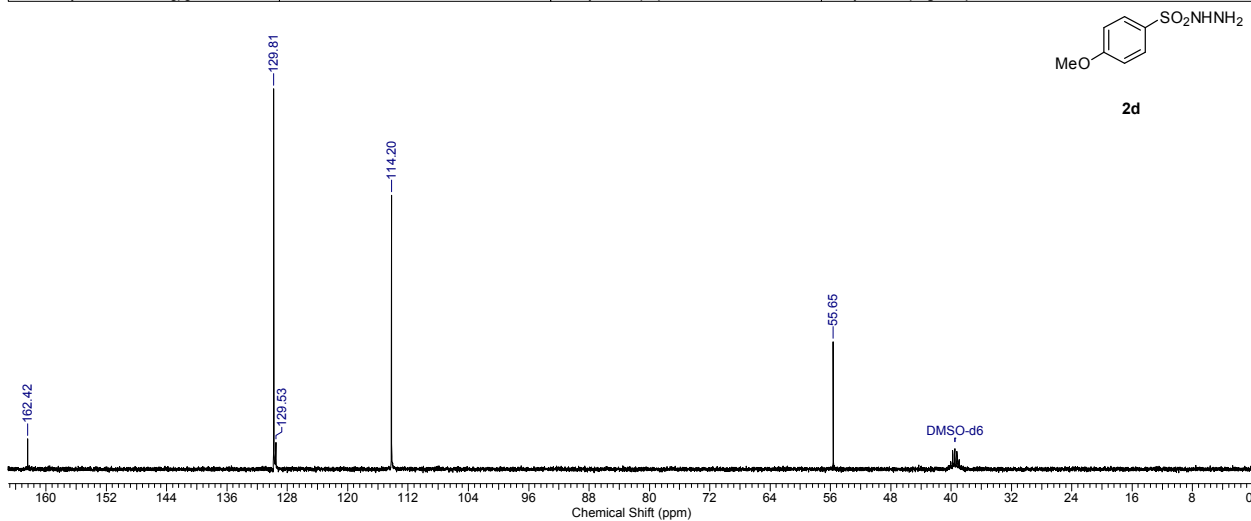


## 4-Methoxybenzenesulfonylhydrazide (2d)

Acquisition Time (sec)	1.3521	Date	15 Jul 2015 12:48:00		Frequency (MHz)	300.13	
File Name					Points Count	8192	
Nucleus	<sup>1</sup> H	Number of Transients	1	Original Points Count	8116	Temperature (degree C)	25.500
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40		

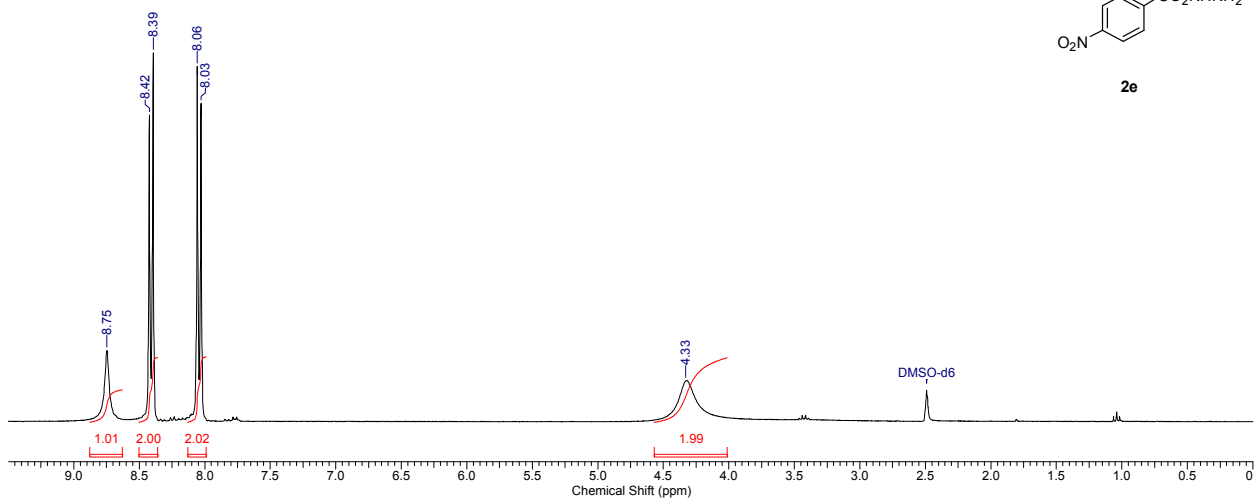


Acquisition Time (sec)	0.9002	Date	15 Jul 2015 12:52:16		Frequency (MHz)	75.48	
File Name					Points Count	16384	
Nucleus	<sup>13</sup> C	Number of Transients	177	Original Points Count	16308	Temperature (degree C)	25.600
Pulse Sequence	zpgg90base	Solvent	DMSO-D6	Sweep Width (Hz)	18115.94		

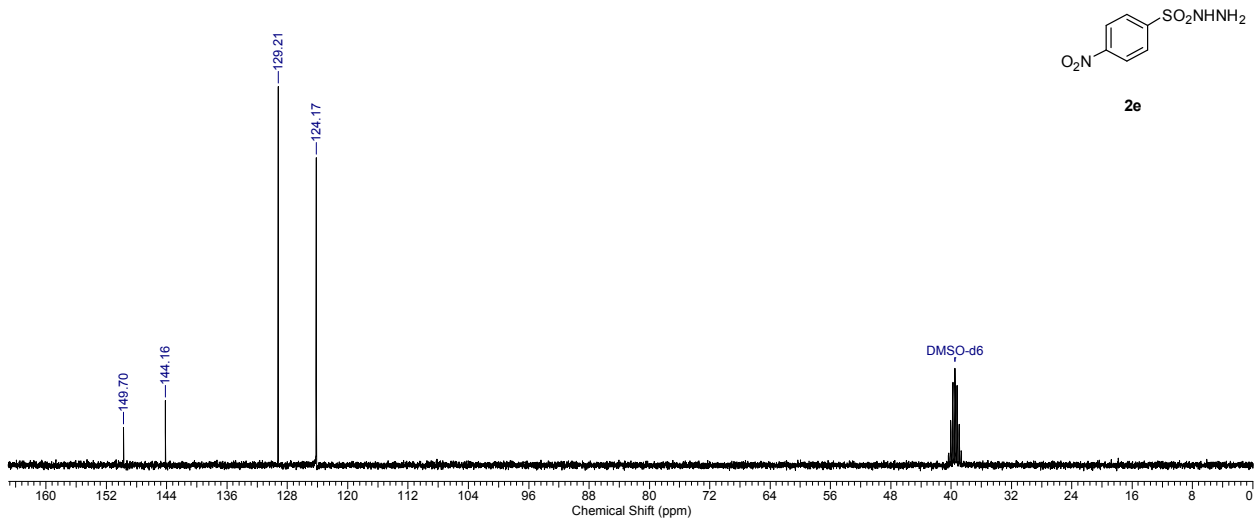


## 4-Nitrobenzenesulfonylhydrazide (2e)

Acquisition Time (sec)	1.3521	Comment	Avance-300, 1H DMSO-d6	Date	20 Aug 2015 11:54:40
File Name				Frequency (MHz)	300.13
Nucleus	1H	Number of Transients	1	Original Points Count	8116
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40
				Points Count	8192
				Temperature (degree C)	26.200

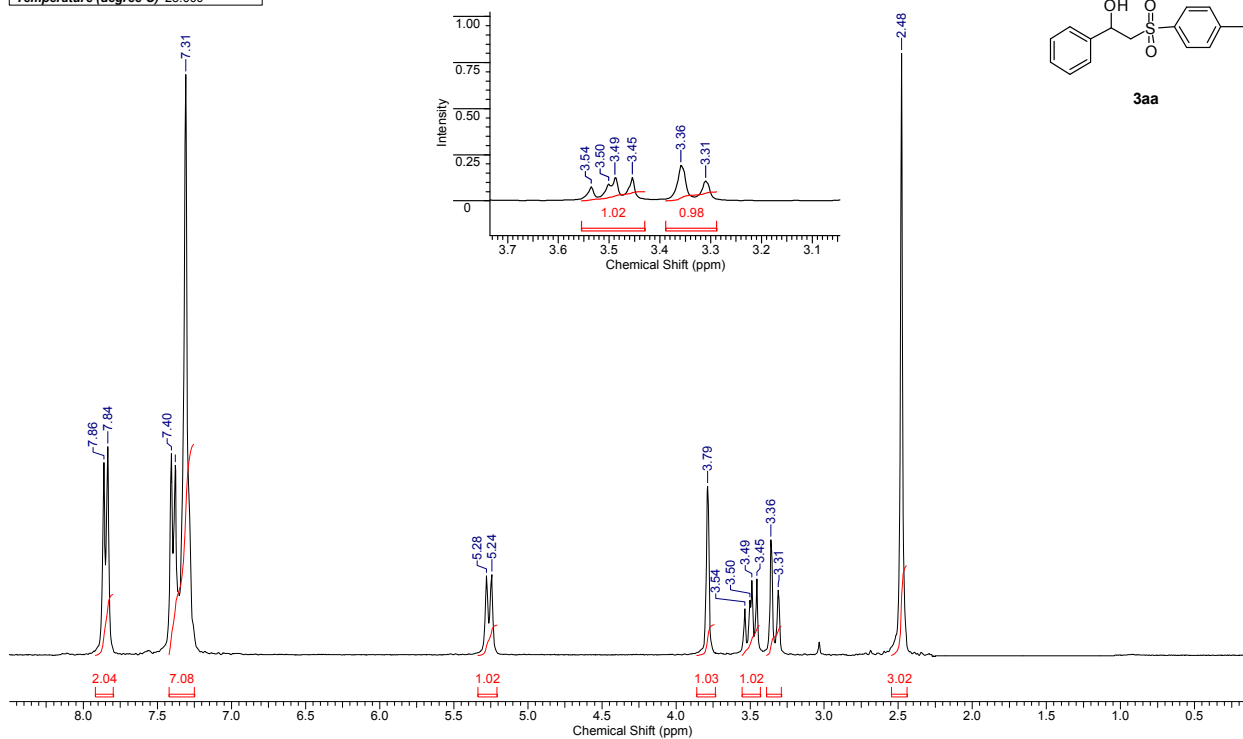


Acquisition Time (sec)	0.8643	Comment	c13,dms0	Date	21 Aug 2015 14:51:44
File Name				Frequency (MHz)	75.48
Nucleus	13C	Number of Transients	119	Original Points Count	16308
Pulse Sequence	zpgg60base	Solvent	DMSO-D6	Sweep Width (Hz)	18867.92
				Points Count	16384
				Temperature (degree C)	28.200

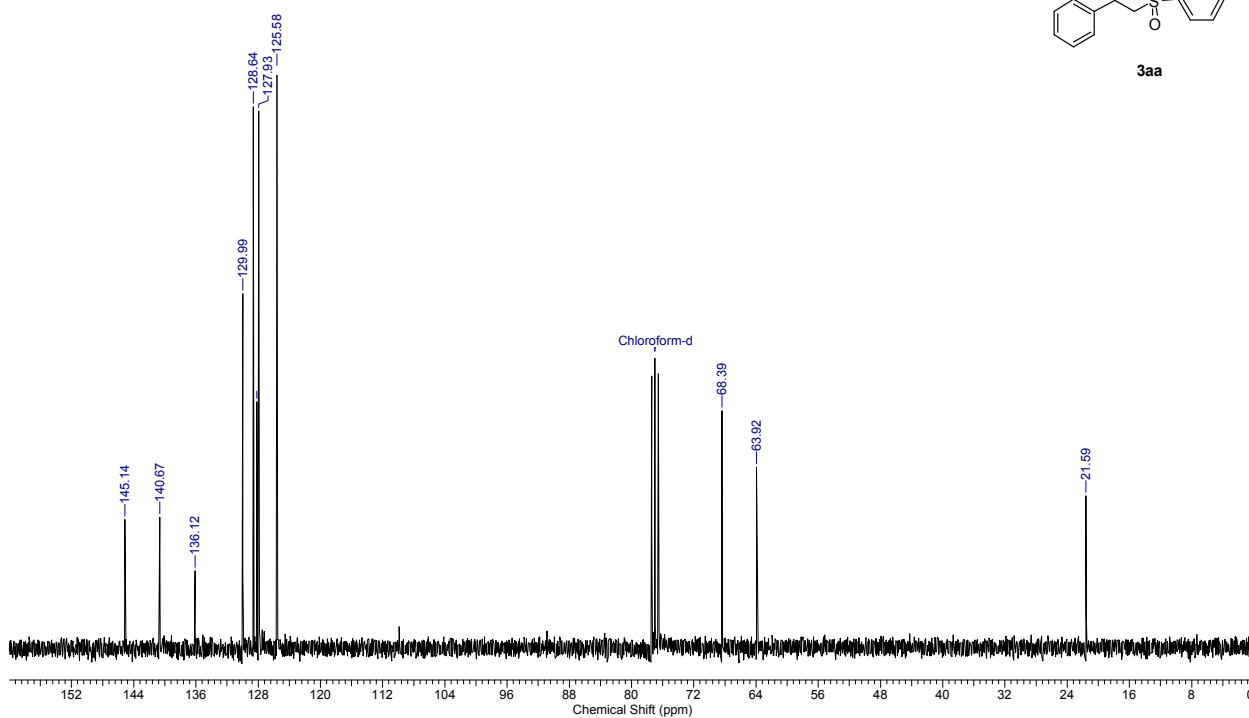
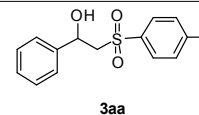


## 2-[(4-Methylphenyl)sulfonyl]-1-phenylethanol (3aa)

Acquisition Time (sec)	1.3518	Date	09 Nov 2015 17:44:32	Frequency (MHz)	300.13
File Name		Number of Transients	1	Original Points Count	8124
Nucleus	<sup>1</sup> H	Solvent	CHLOROFORM-D	Points Count	8192
Pulse Sequence	zg	Sweep Width (Hz)	6009.62		
Temperature (degree C)	25.000				

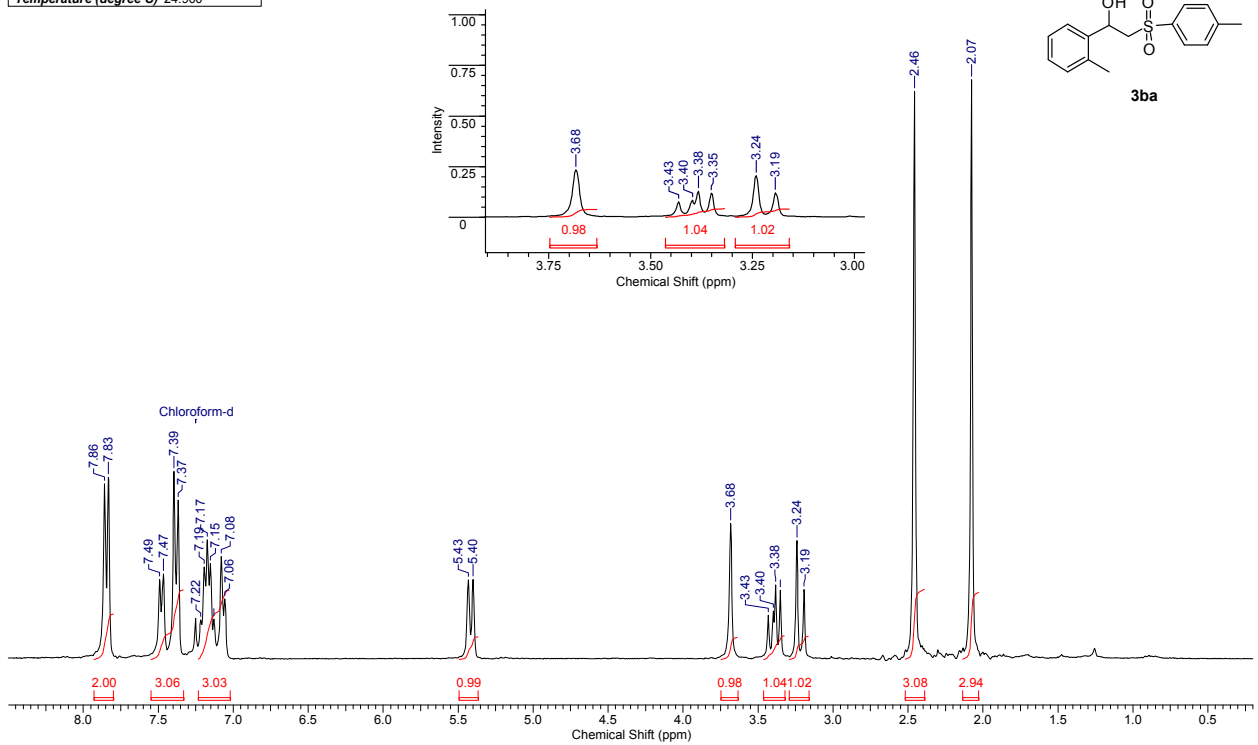


Acquisition Time (sec)	0.9006	Date	09 Nov 2015 17:46:40		Frequency (MHz)	75.48	
File Name		Number of Transients	190	Original Points Count	16316	Points Count	16384
Nucleus	<sup>13</sup> C	Solvent	CHLOROFORM-D		Sweep Width (Hz)	18115.94	
Pulse Sequence	zgpg30						
Temperature (degree C)	25.000						

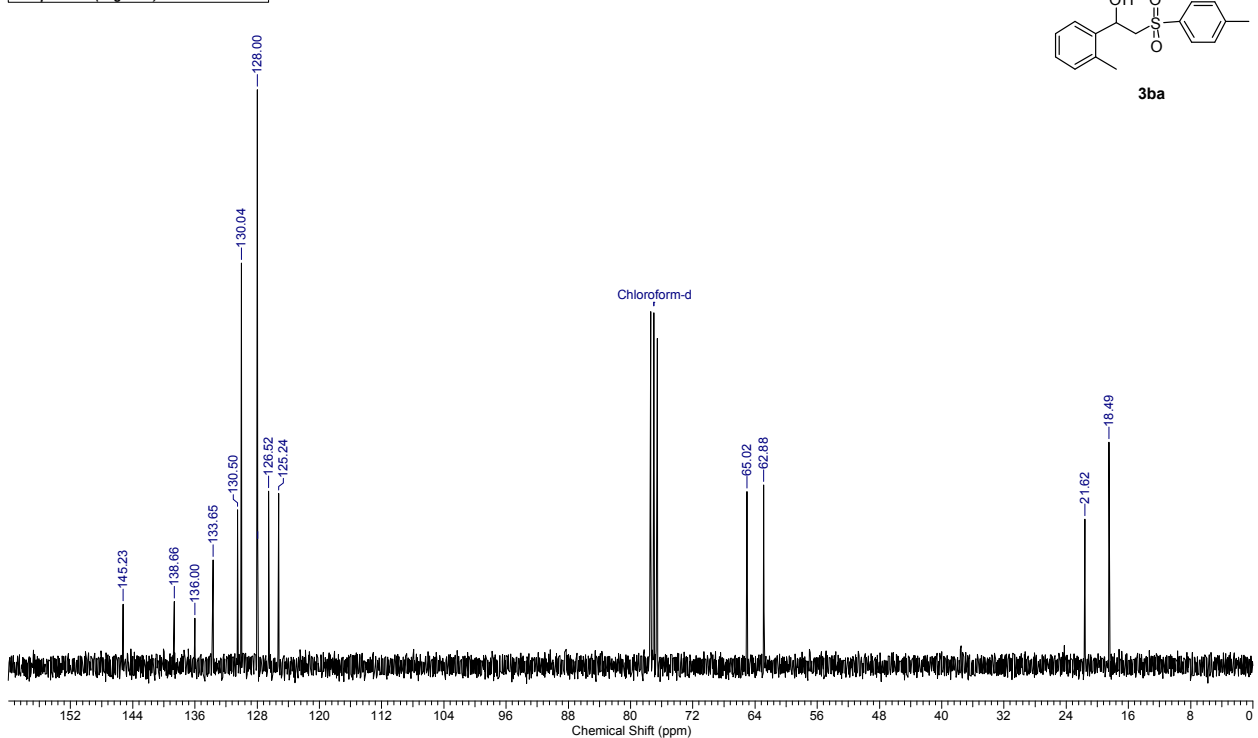


**1-(2-Methylphenyl)-2-[(4-methylphenyl)sulfonyl]ethanol (3ba)**

Acquisition Time (sec)	1.3518	Date	09 Nov 2015 15:04:32		Frequency (MHz)	300.13	
File Name		Number of Transients	1	Original Points Count	8124	Points Count	8192
Nucleus	<sup>1</sup> H	Solvent	CHLOROFORM-D		Sweep Width (Hz)	6009.62	
Pulse Sequence	zg	Temperature (degree C)	24.900				

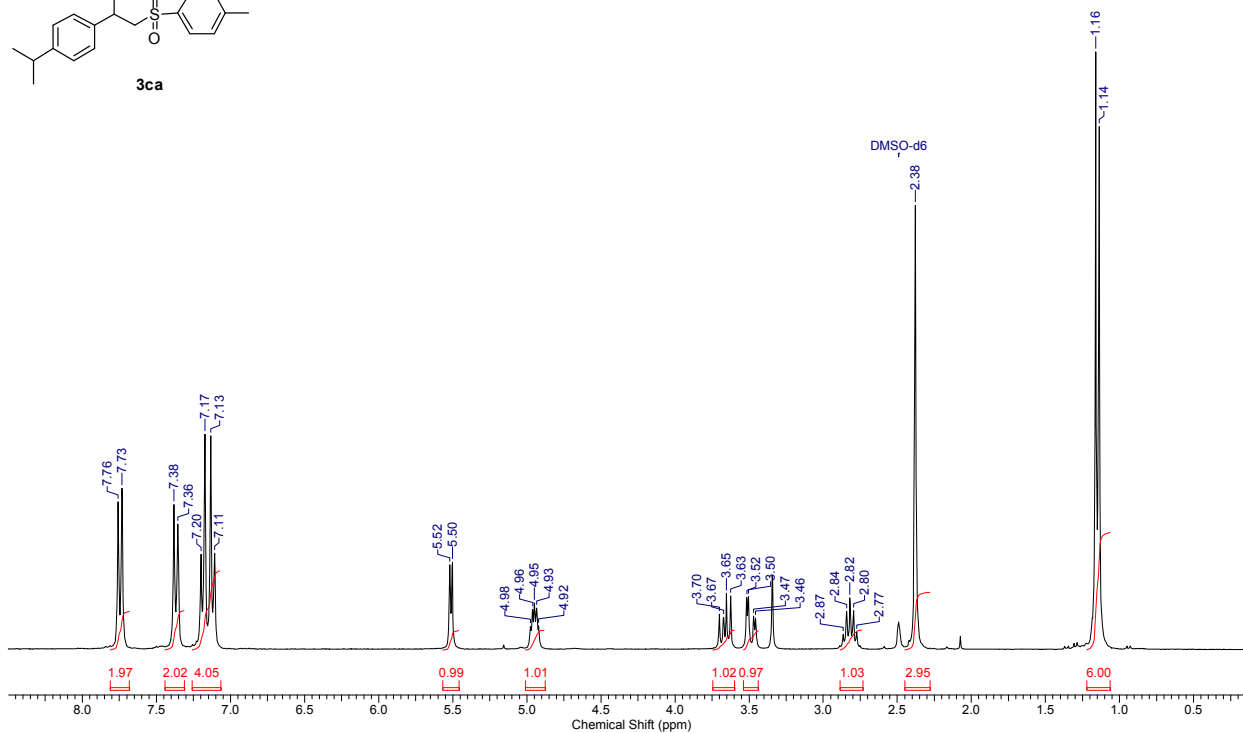
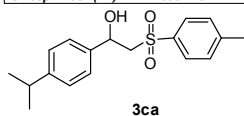


Acquisition Time (sec)	0.9006	Date	11 Nov 2015 11:48:16		Frequency (MHz)	75.48	
File Name		Number of Transients	164	Original Points Count	16316	Points Count	16384
Nucleus	<sup>13</sup> C	Solvent	CHLOROFORM-D		Sweep Width (Hz)	18115.94	
Pulse Sequence	zgpg30	Temperature (degree C)	24.500				

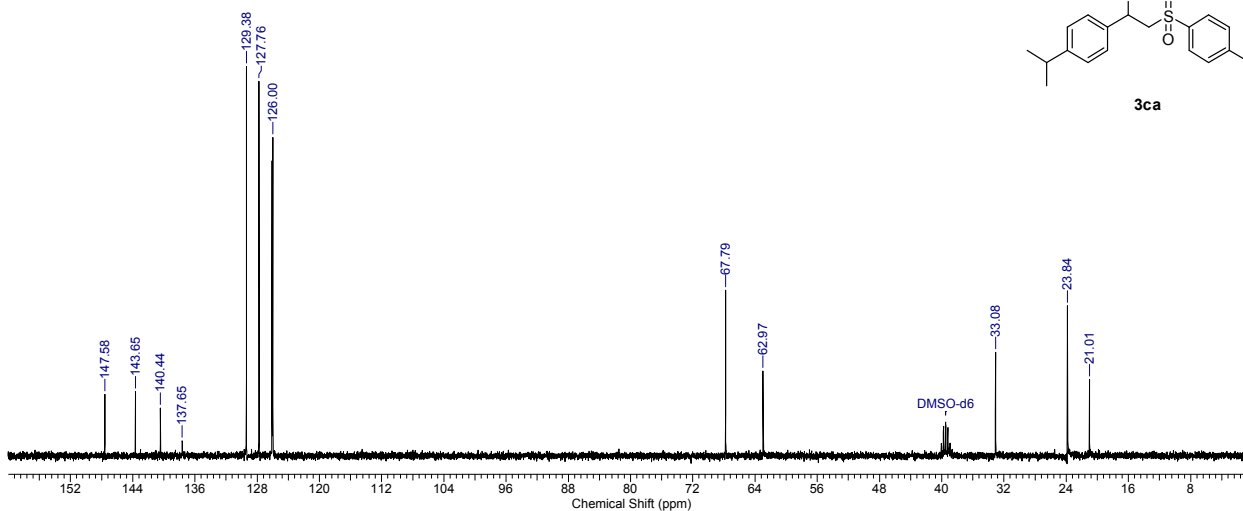
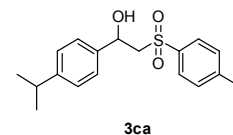


# 1-(4-Isopropylphenyl)-2-[(4-methylphenyl)sulfonyl]ethanol (3ca)

Acquisition Time (sec)	1.3521	Date	18 Nov 2015 17:21:04	File Name	
Number of Transients	1	Original Points Count	8116	Points Count	8192
Sweep Width (Hz)	6002.40	Temperature (degree C)	24.700	Frequency (MHz)	300.13
				Pulse Sequence	zg
				Nucleus	<sup>1</sup> H
				Solvent	DMSO-D6



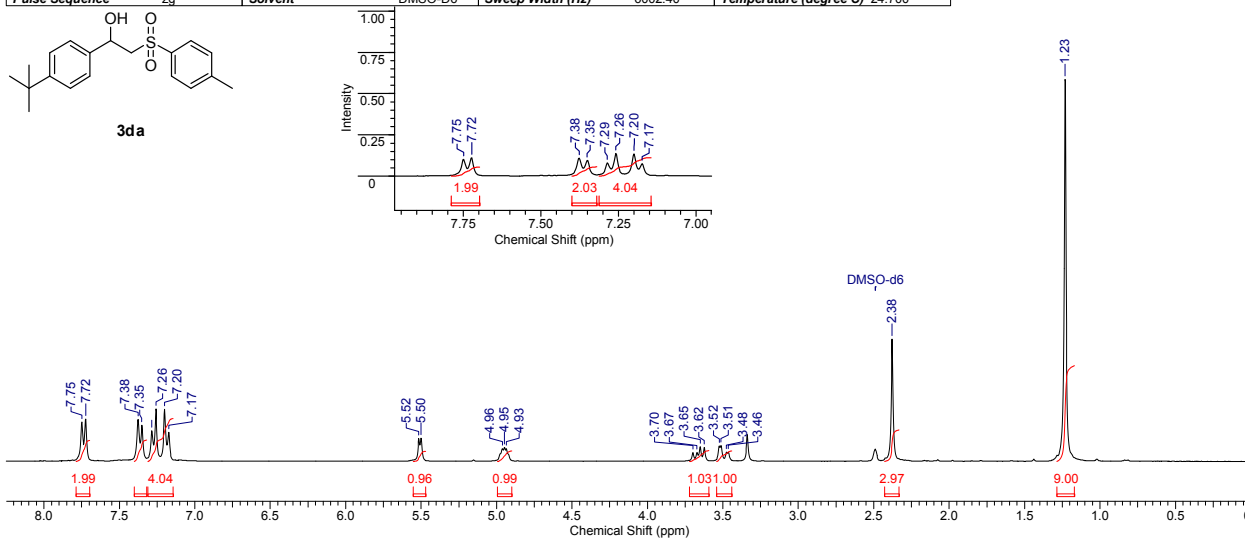
Acquisition Time (sec)	0.9002	Date	18 Nov 2015 17:21:04	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	120
Pulse Sequence	zpgg60base	Solvent	DMSO-D6	Original Points Count	16308
				Sweep Width (Hz)	18115.94
				Temperature (degree C)	24.600
				Points Count	16384



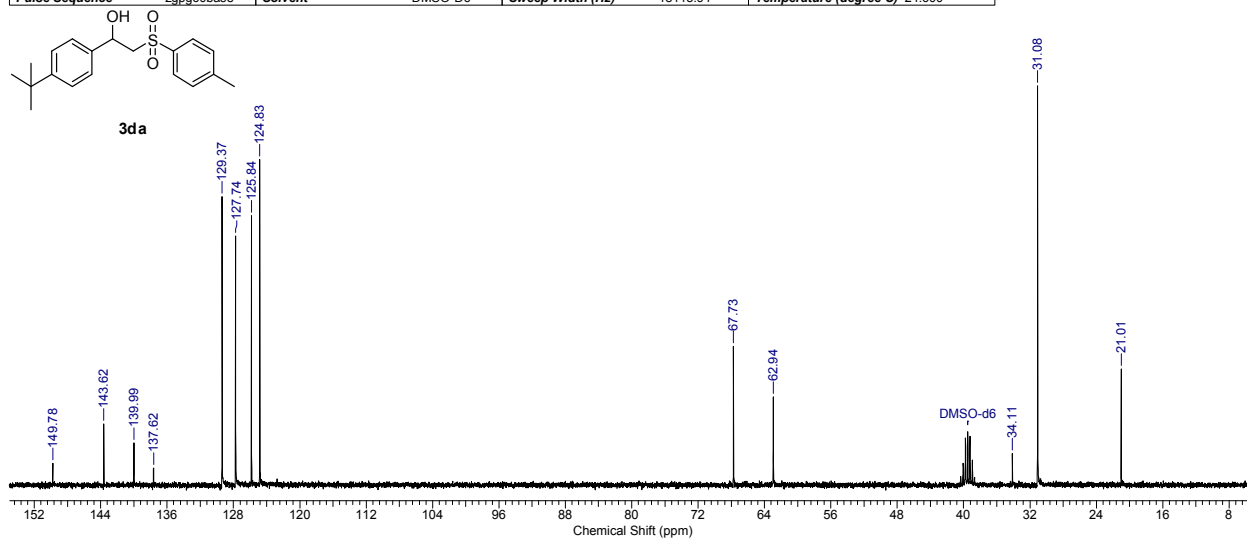


# 1-(4-*tert*-Butylphenyl)-2-[(4-methylphenyl)sulfonyl]ethanol (3da)

Acquisition Time (sec)	1.3521	Date	01 Dec 2015 11:29:04	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40
				Original Points Count	8116
				Points Count	8192



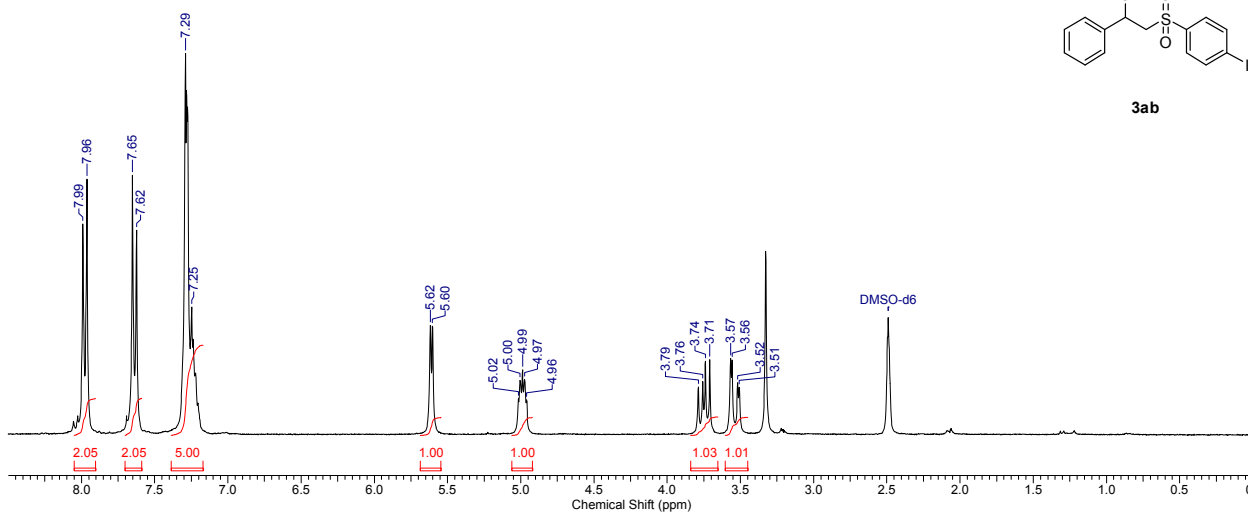
Acquisition Time (sec)	0.9002	Date	02 Dec 2015 11:39:44	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	307
Pulse Sequence	zgpg60base	Solvent	DMSO-D6	Sweep Width (Hz)	18115.94
				Original Points Count	16308
				Points Count	16384



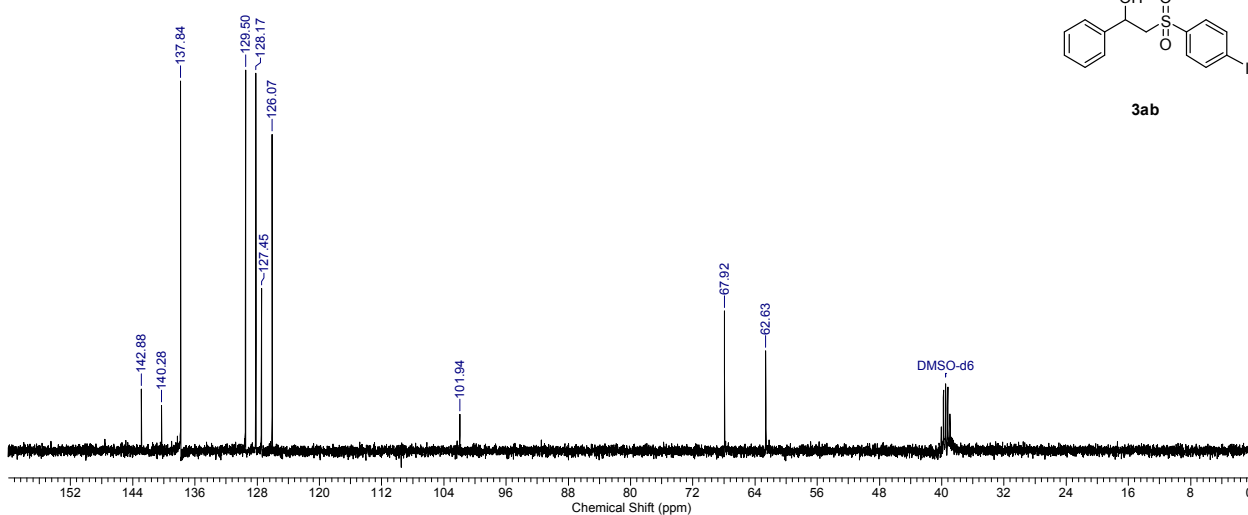


## 2-[(4-Iodophenyl)sulfonyl]-1-phenylethanol (3ab)

Acquisition Time (sec)	1.3521	Date	18 Nov 2015 17:10:24	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40
				Original Points Count	8116
				Points Count	8192
				Temperature (degree C)	24.500

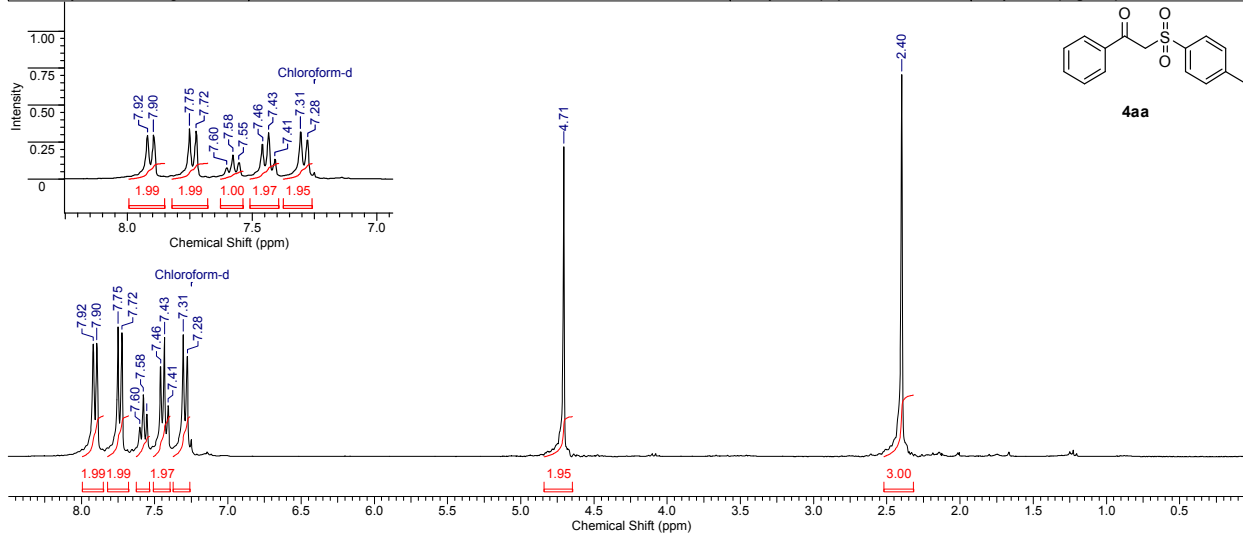


Acquisition Time (sec)	0.9002	Date	18 Nov 2015 17:12:32	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	226
Pulse Sequence	zpgg60base	Solvent	DMSO-D6	Sweep Width (Hz)	18115.94
				Original Points Count	16308
				Points Count	16384
				Temperature (degree C)	24.500

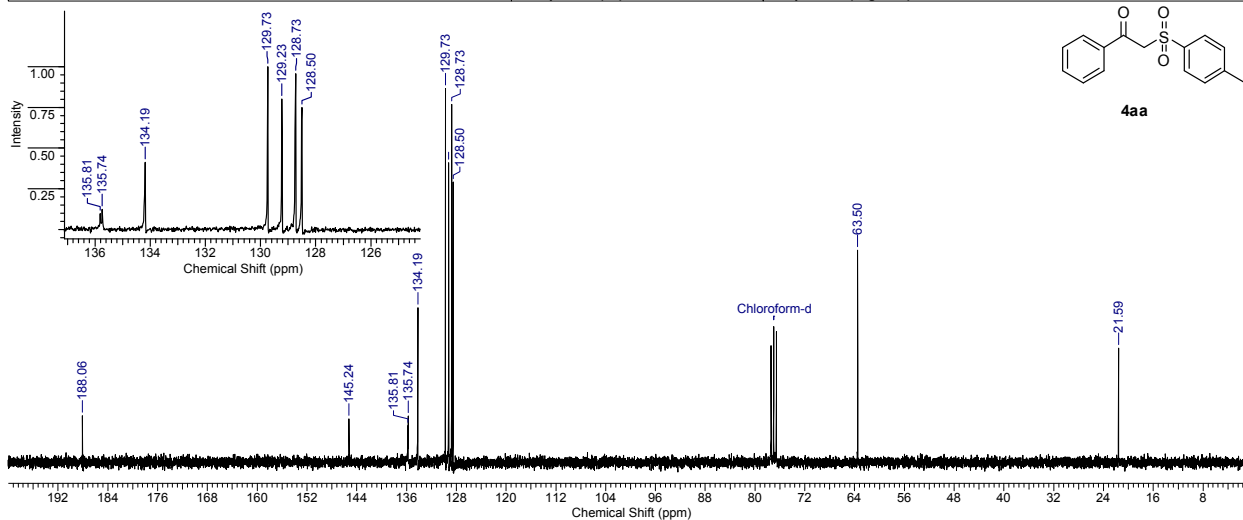


## 2-[(4-Methylphenyl)sulfonyl]-1-phenylethanone (4aa)

Acquisition Time (sec)	1.3518	Date	26 Nov 2015 13:39:12	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Original Points Count	8124
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Sweep Width (Hz)	6009.62
				Points Count	8192
				Temperature (degree C)	25.500

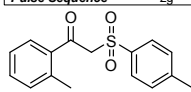


Acquisition Time (sec)	0.8680	Comment	adil_cdcl3.c13	Date	28 Nov 2015 11:46:08
File Name				Frequency (MHz)	75.48
Number of Transients	219	Original Points Count	16316	Nucleus	<sup>13</sup> C
Solvent	CHLOROFORM-D			Points Count	16384
				Pulse Sequence	zgpg60base
				Sweep Width (Hz)	18796.99
				Temperature (degree C)	26.600

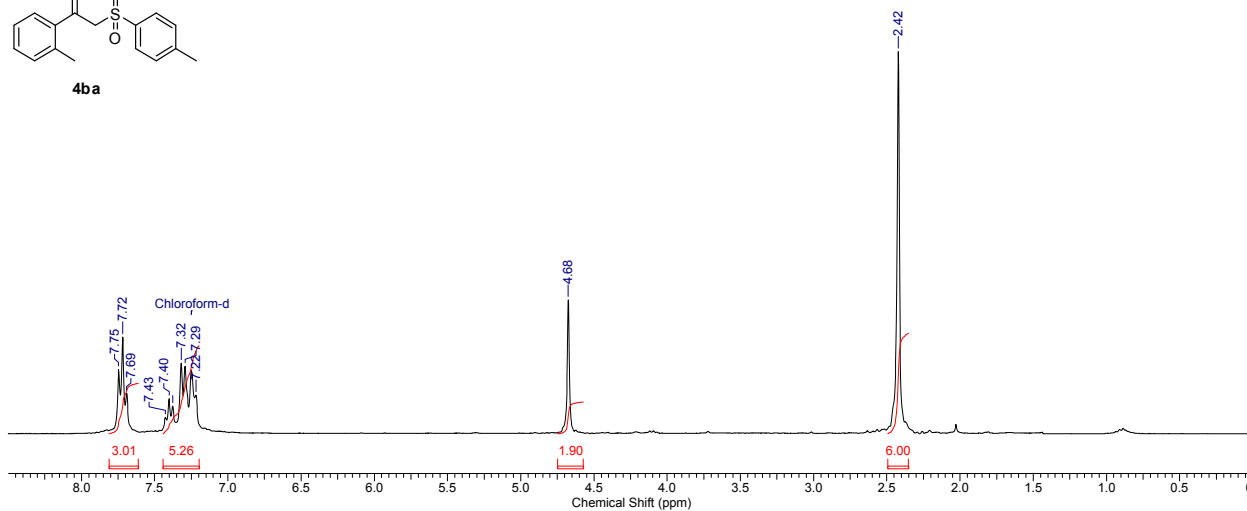


# 1-(2-Methylphenyl)-2-[(4-methylphenyl)sulfonyl]ethanone (4ba)

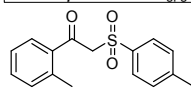
Acquisition Time (sec)	1.3518	Date	07 Dec 2015 16:25:36	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Original Points Count	8124
				Sweep Width (Hz)	6009.62
				Points Count	8192
				Temperature (degree C)	24.900



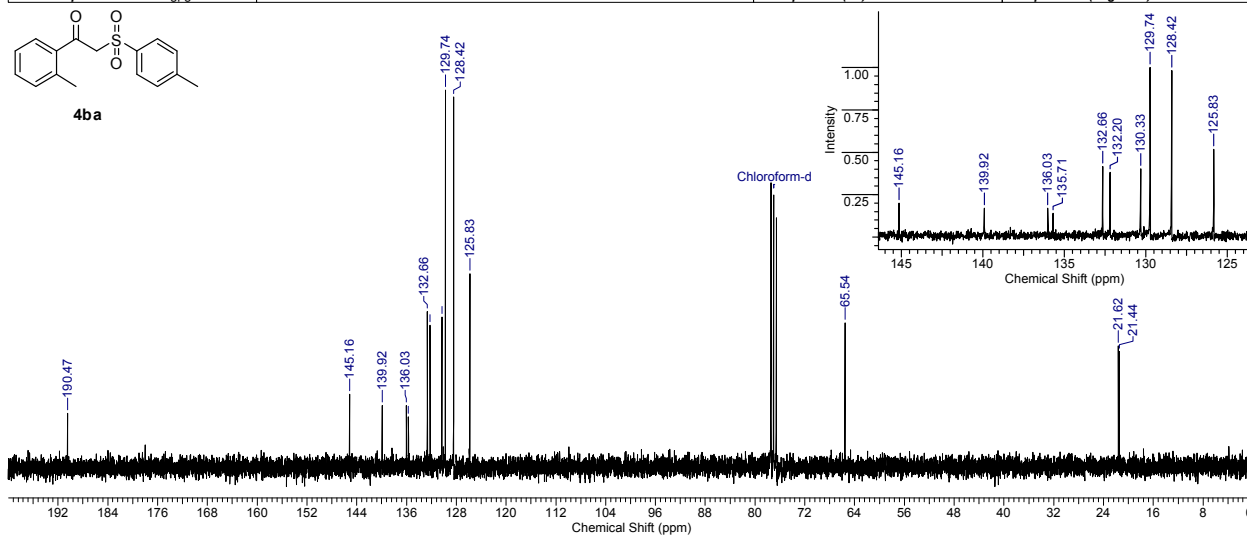
4ba



Acquisition Time (sec)	0.9006	Date	09 Dec 2015 15:13:04	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	126
Pulse Sequence	zpgg30	Solvent	CHLOROFORM-D	Original Points Count	16316
				Sweep Width (Hz)	18115.94
				Points Count	16384
				Temperature (degree C)	25.200

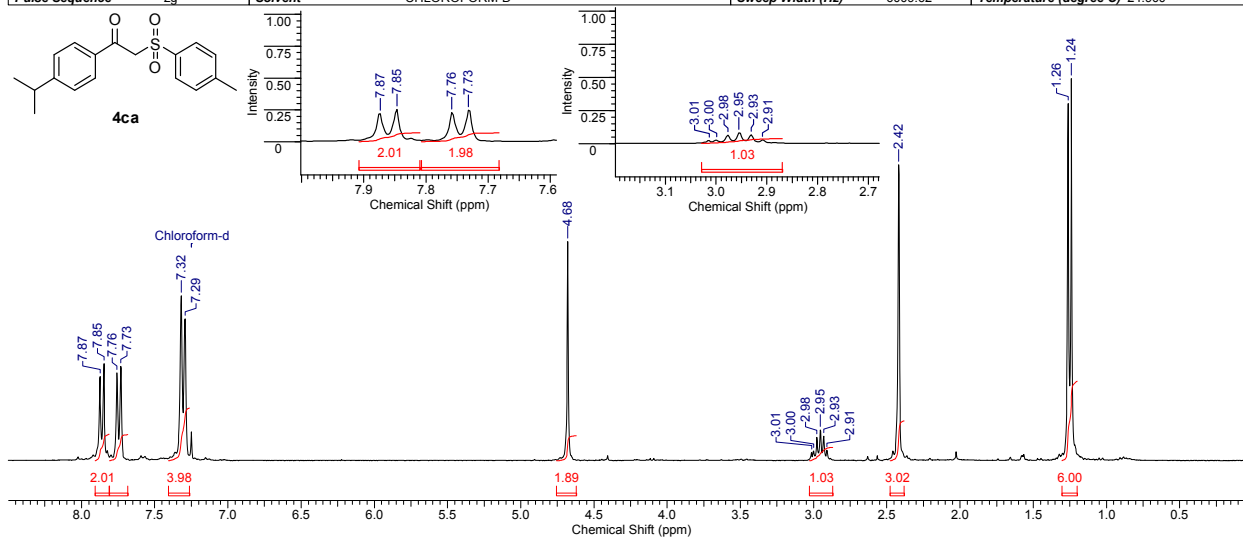


4ba

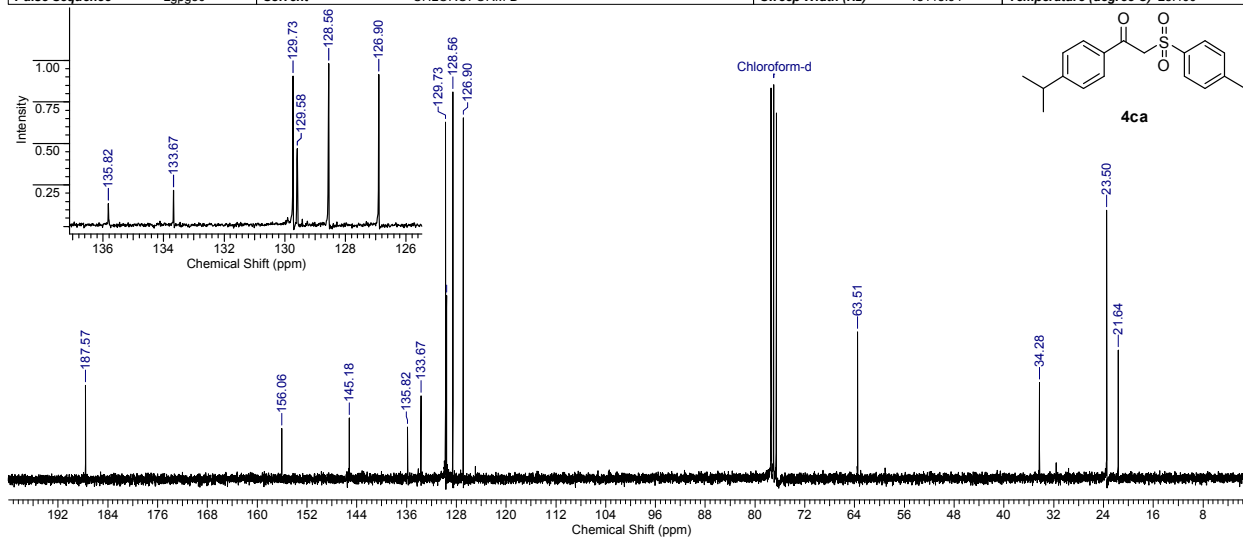


# 1-(4-Isopropylphenyl)-2-[(4-methylphenyl)sulfonyl]ethanone (4ca)

Acquisition Time (sec)	1.3518	Date	07 Dec 2015 16:27:44	File Name	
Frequency (MHz)	300.13	Nucleus	1H	Number of Transients	1
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Original Points Count	8124
				Sweep Width (Hz)	6009.62
				Points Count	8192
				Temperature (degree C)	24.900

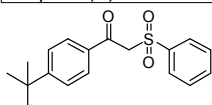


Acquisition Time (sec)	0.9006	Date	09 Dec 2015 15:21:36	File Name	
Frequency (MHz)	75.48	Nucleus	13C	Number of Transients	658
Pulse Sequence	zgpg30	Solvent	CHLOROFORM-D	Original Points Count	16316
				Sweep Width (Hz)	18115.94
				Points Count	16384
				Temperature (degree C)	25.100

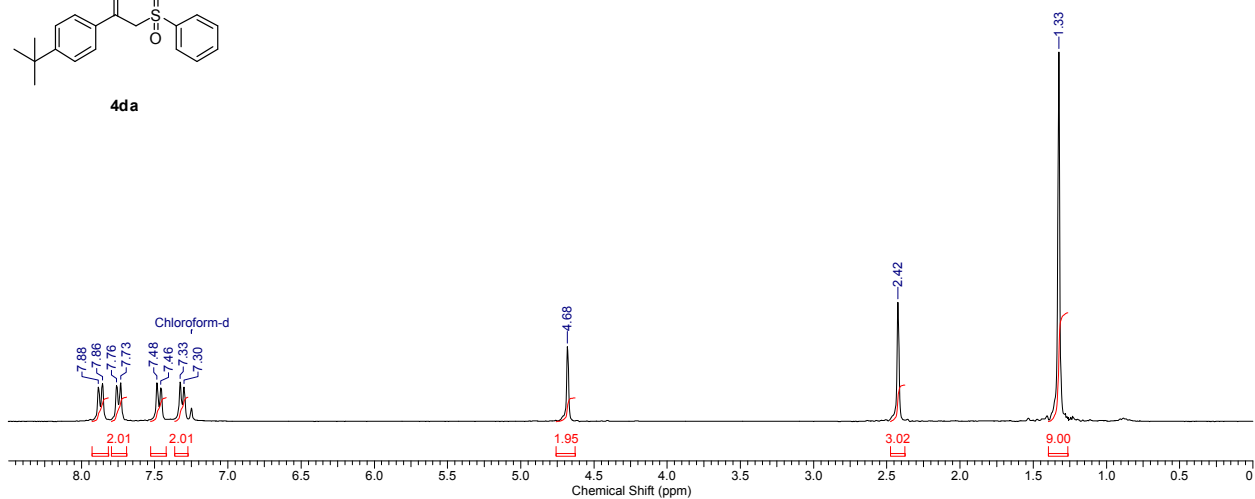


# 1-(4-*tert*-Butylphenyl)-2-[(4-methylphenyl)sulfonyl]ethanone (4da)

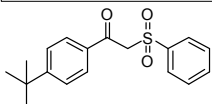
Acquisition Time (sec)	1.0832	Comment	Avance-300, 1H CDCl3	Date	11 Dec 2015 12:26:40
File Name		Frequency (MHz)	300.13	Nucleus	1H
Original Points Count	8124	Points Count	8192	Pulse Sequence	zg
Sweep Width (Hz)	7500.00	Temperature (degree C)	24.400	Solvent	CHLOROFORM-D



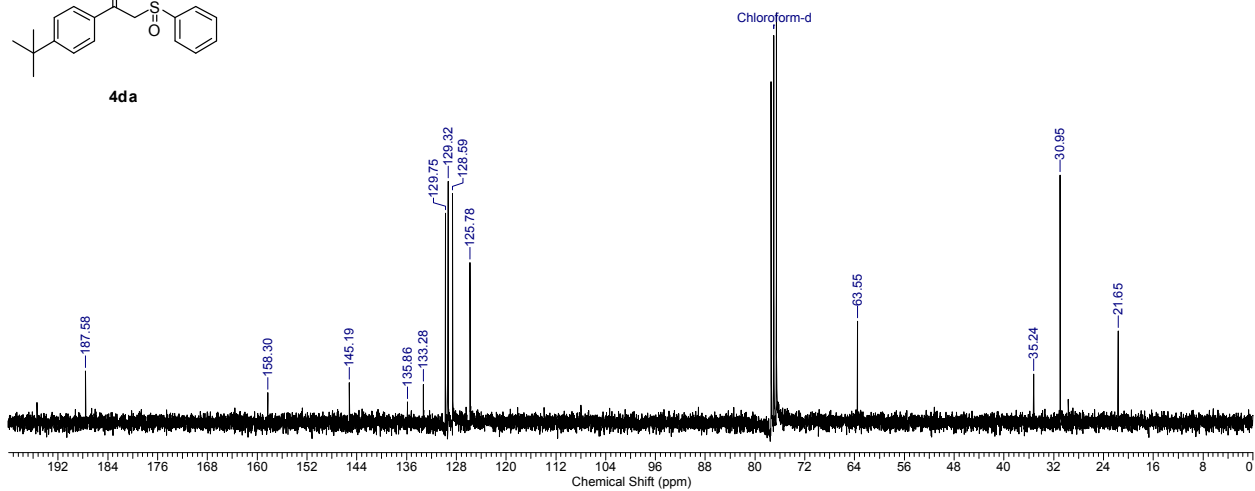
4da



Acquisition Time (sec)	0.8680	Comment	adil_cdcl3.c13	Date	12 Dec 2015 12:52:16
File Name		Frequency (MHz)	75.48	Nucleus	13C
Number of Transients	184	Original Points Count	16316	Points Count	16384
Solvent	CHLOROFORM-D	Sweep Width (Hz)	18796.99	Pulse Sequence	zpgg60base
		Temperature (degree C)	27.200		

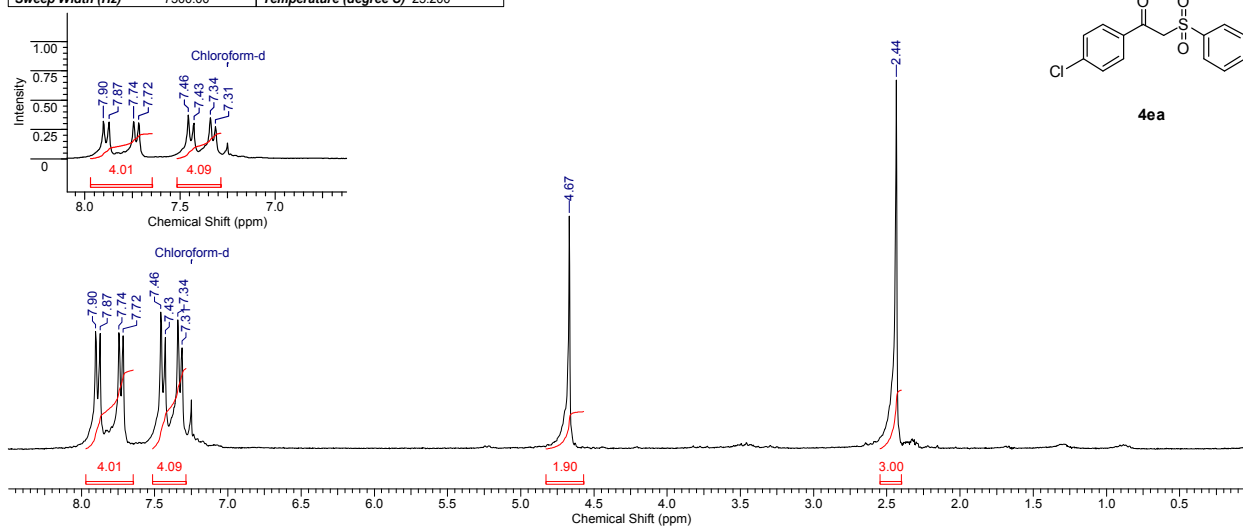


4da

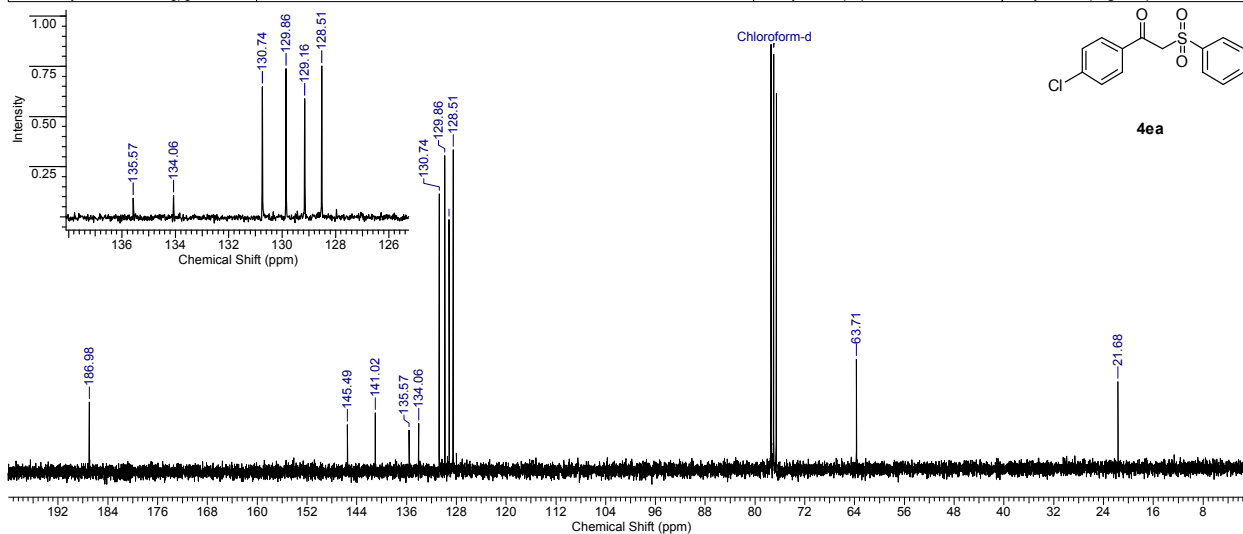


# 1-(4-Chlorophenyl)-2-[(4-methylphenyl)sulfonyl]ethanone (4ea)

Acquisition Time (sec)	1.0832	Comment	Avance-300, 1H CDCl3	Date	28 Nov 2015 10:14:24		
File Name		Frequency (MHz)	300.13	Nucleus	1H	Number of Transients	1
Original Points Count	8124	Points Count	8192	Pulse Sequence	zg	Solvent	CHLOROFORM-D
Sweep Width (Hz)	7500.00	Temperature (degree C)	25.200				



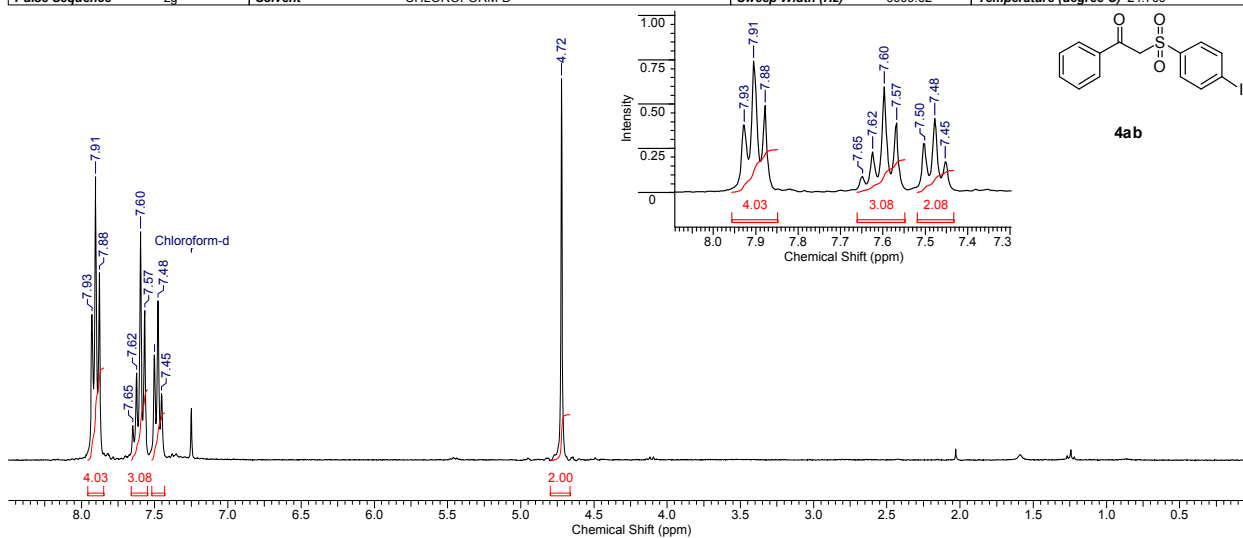
Acquisition Time (sec)	0.9006	Date	01 Dec 2015 11:54:40	File Name	
Frequency (MHz)	75.48	Nucleus	13C	Number of Transients	301
Pulse Sequence	zgpg30	Solvent	CHLOROFORM-D	Original Points Count	16316
				Sweep Width (Hz)	18115.94
				Points Count	16384
				Temperature (degree C)	24.700



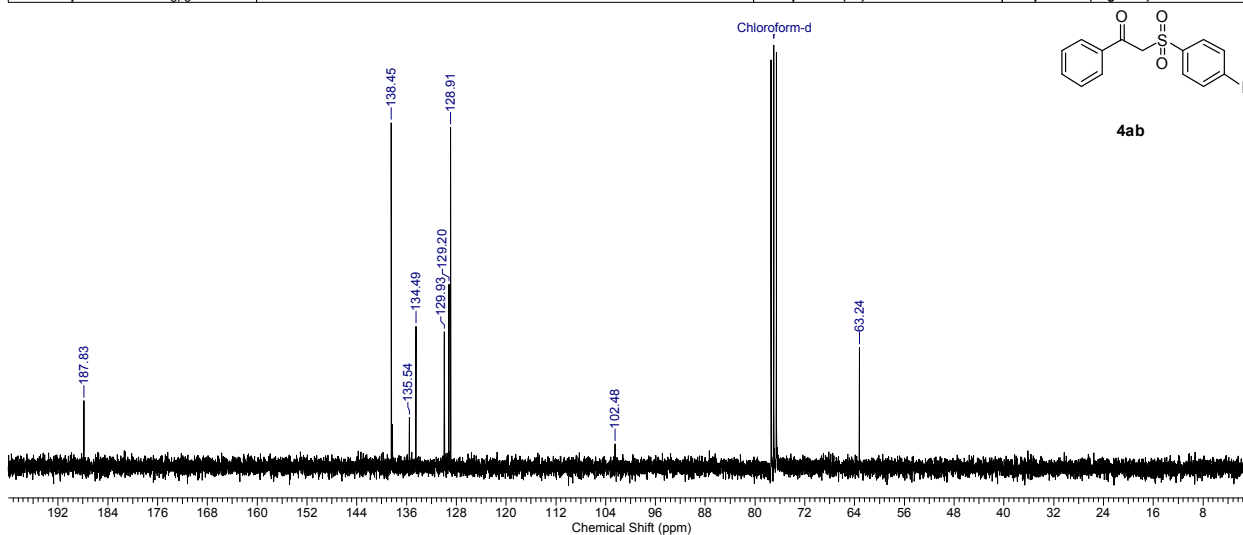


## 2-[(4-Iodophenyl)sulfonyl]-1-phenylethanone (4ab)

Acquisition Time (sec)	1.3518	Date	16 Dec 2015 13:11:28	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Original Points Count	8124
				Sweep Width (Hz)	6009.62
				Points Count	8192
				Temperature (degree C)	24.700

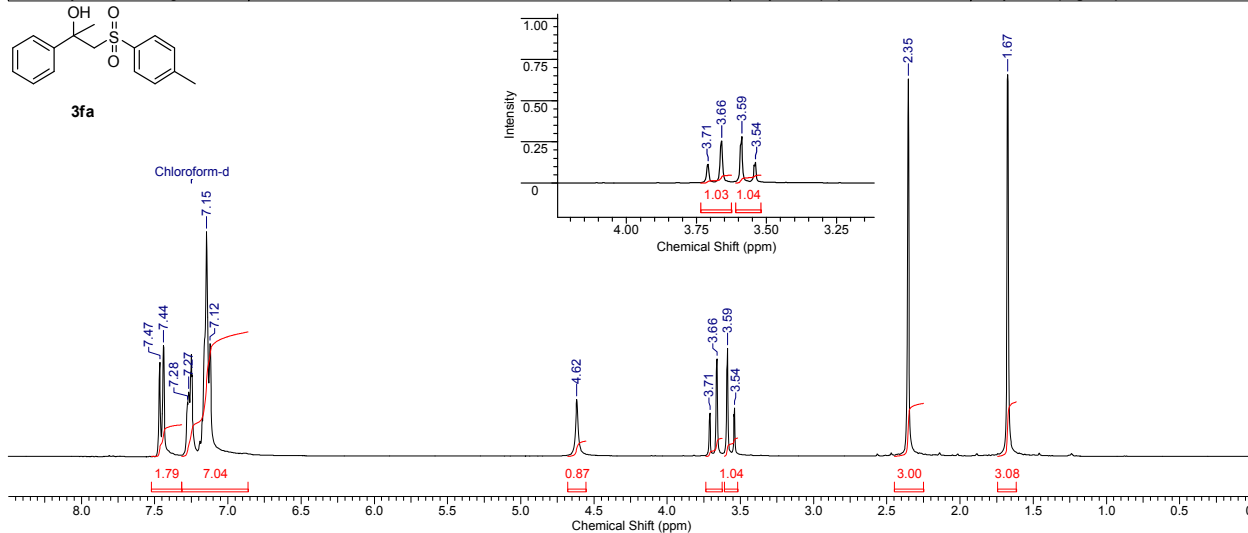


Acquisition Time (sec)	0.9006	Date	16 Dec 2015 16:04:16	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	200
Pulse Sequence	zgpg30	Solvent	CHLOROFORM-D	Original Points Count	16316
				Sweep Width (Hz)	18115.94
				Points Count	16384
				Temperature (degree C)	24.500

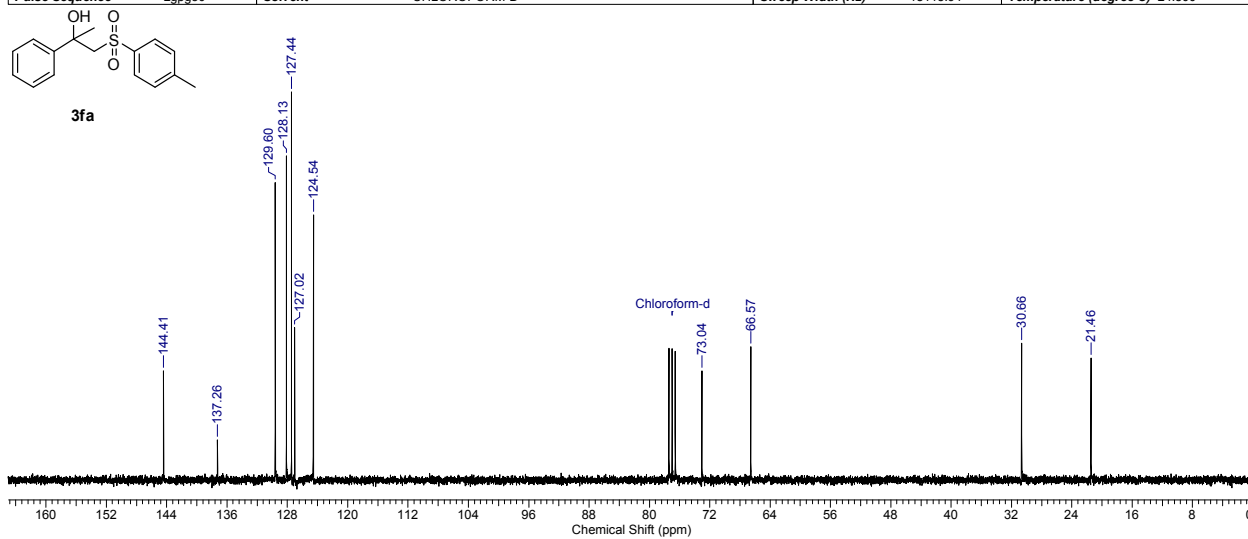


# 1-[(4-Methylphenyl)sulfonyl]-2-phenylpropan-2-ol (3fa)

Acquisition Time (sec)	1.3518	Date	07 May 2015 11:14:08	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	8
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Original Points Count	8124
				Sweep Width (Hz)	6009.62
				Points Count	8192
				Temperature (degree C)	24.500

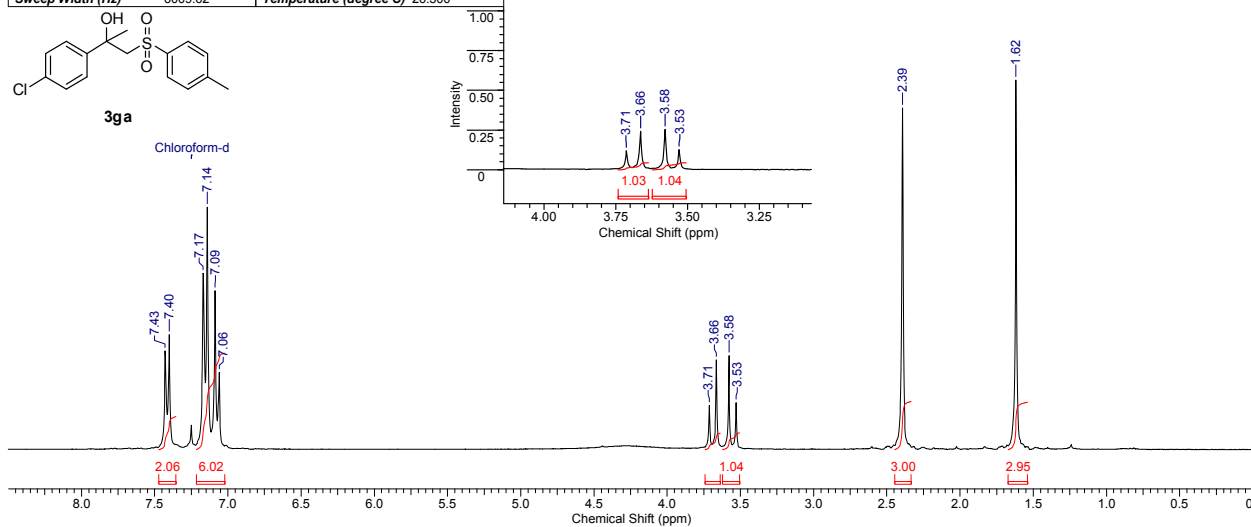


Acquisition Time (sec)	0.9006	Date	07 May 2015 12:56:32	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	180
Pulse Sequence	zgpg30	Solvent	CHLOROFORM-D	Original Points Count	16316
				Sweep Width (Hz)	18115.94
				Points Count	16384
				Temperature (degree C)	24.800

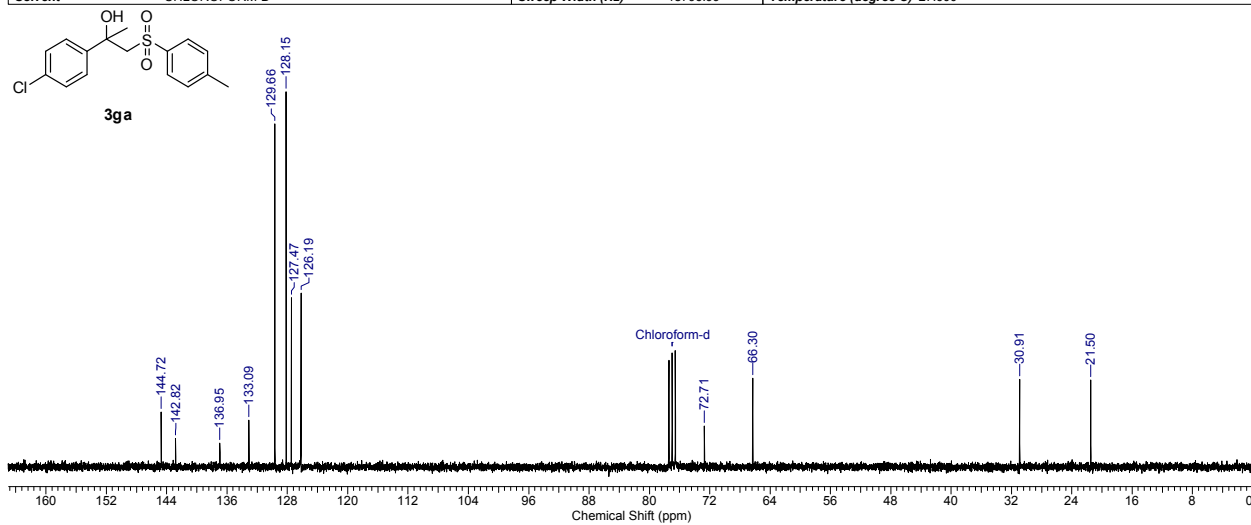


## 2-(4-Chlorophenyl)-1-[(4-methylphenyl)sulfonyl]propan-2-ol (3ga)

Acquisition Time (sec)	1.3518	Comment	Avance-300, 1H CDCl3	Date	20 Aug 2015 12:05:20
File Name		Frequency (MHz)	300.13	Nucleus	1H
Original Points Count	8124	Points Count	8192	Pulse Sequence	zg
Sweep Width (Hz)	6009.62	Temperature (degree C)	26.300	Solvent	CHLOROFORM-D

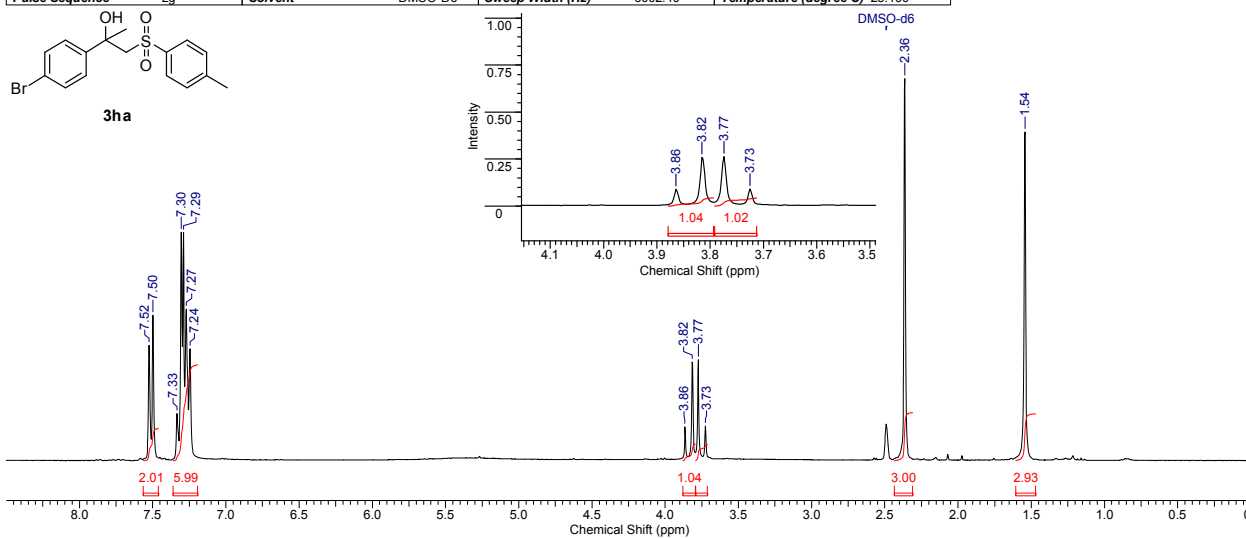


Acquisition Time (sec)	0.8680	Comment	adil_cdcl3.c13	Date	21 Aug 2015 14:28:16
File Name		Frequency (MHz)	75.48	Nucleus	13C
Number of Transients	103	Original Points Count	16316	Pulse Sequence	zgpg60base
Solvent	CHLOROFORM-D	Sweep Width (Hz)	18796.99	Temperature (degree C)	27.600

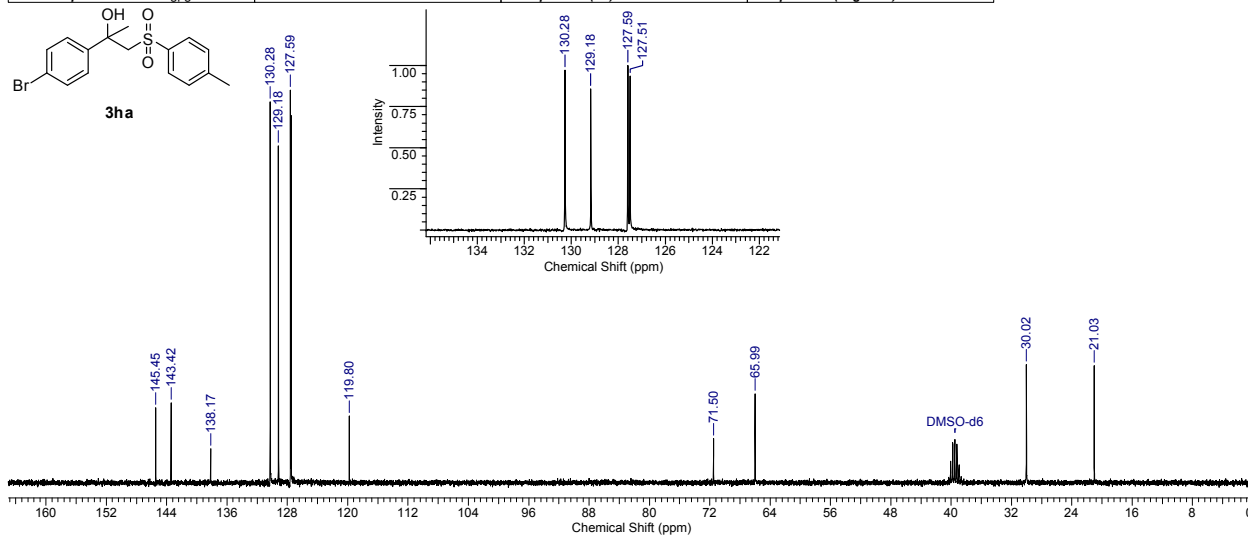


## 2-(4-Bromophenyl)-1-[(4-methylphenyl)sulfonyl]propan-2-ol (3ha)

Acquisition Time (sec)	1.3521	Date	03 Dec 2015 12:43:44	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	DMSO-D6	Original Points Count	8116
				Temperature (degree C)	25.100
				Points Count	8192

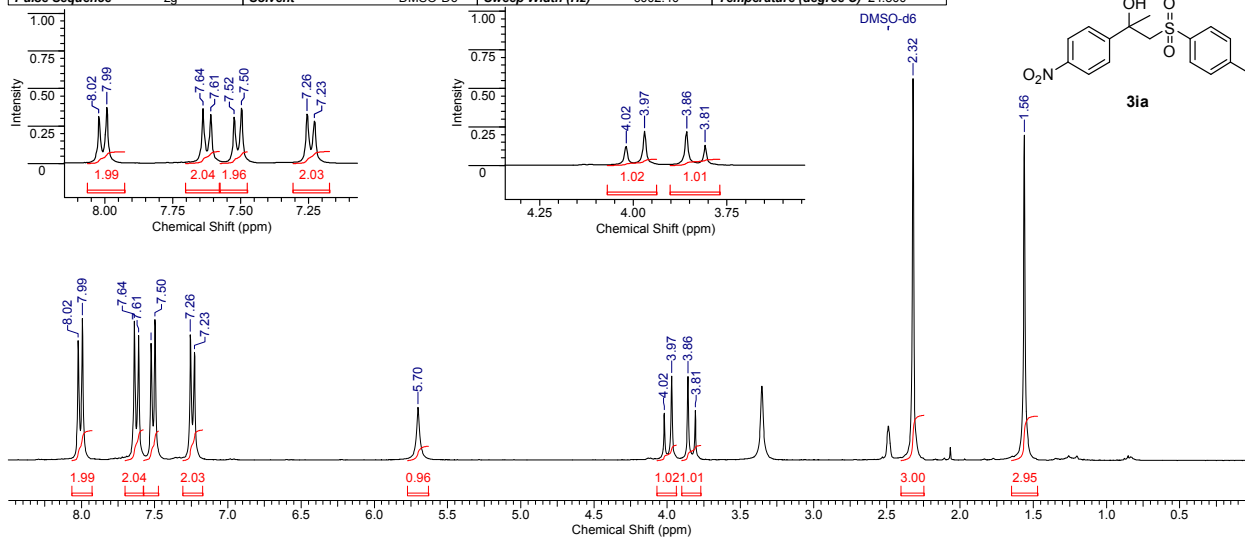


Acquisition Time (sec)	0.9002	Date	03 Dec 2015 12:45:52	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	275
Pulse Sequence	zpgg60base	Solvent	DMSO-D6	Original Points Count	16308
				Temperature (degree C)	25.100
				Points Count	16384

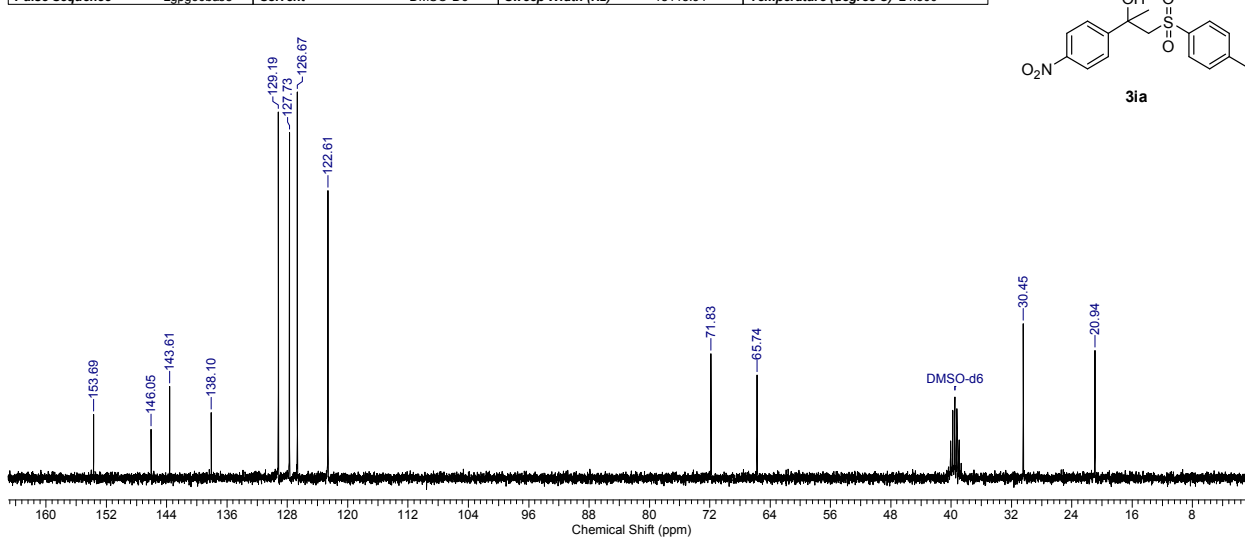


# 1-[(4-Methylphenyl)sulfonyl]-2-(4-nitrophenyl)propan-2-ol (3ia)

Acquisition Time (sec)	1.3521	Date	18 Nov 2015 17:27:28	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	DMSO-D6	Original Points Count	8116
				Temperature (degree C)	24.500
				Sweep Width (Hz)	6002.40
				Points Count	8192

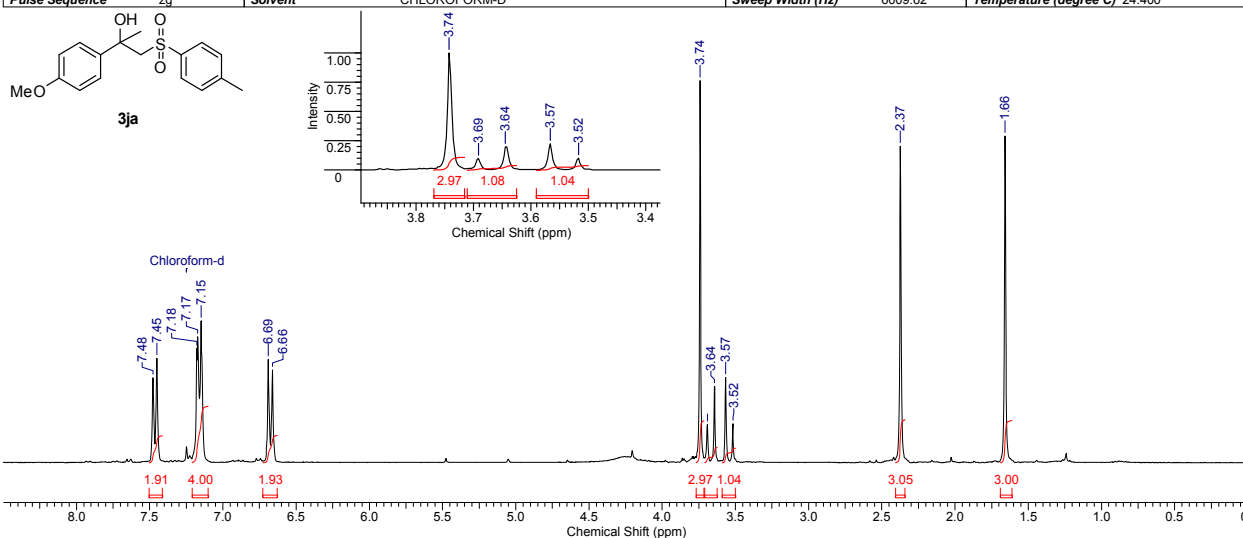


Acquisition Time (sec)	0.9002	Date	18 Nov 2015 17:27:28	File Name	
Frequency (MHz)	75.48	Nucleus	<sup>13</sup> C	Number of Transients	102
Pulse Sequence	zpgg50base	Solvent	DMSO-D6	Original Points Count	16308
				Temperature (degree C)	24.500
				Sweep Width (Hz)	18115.94
				Points Count	16384

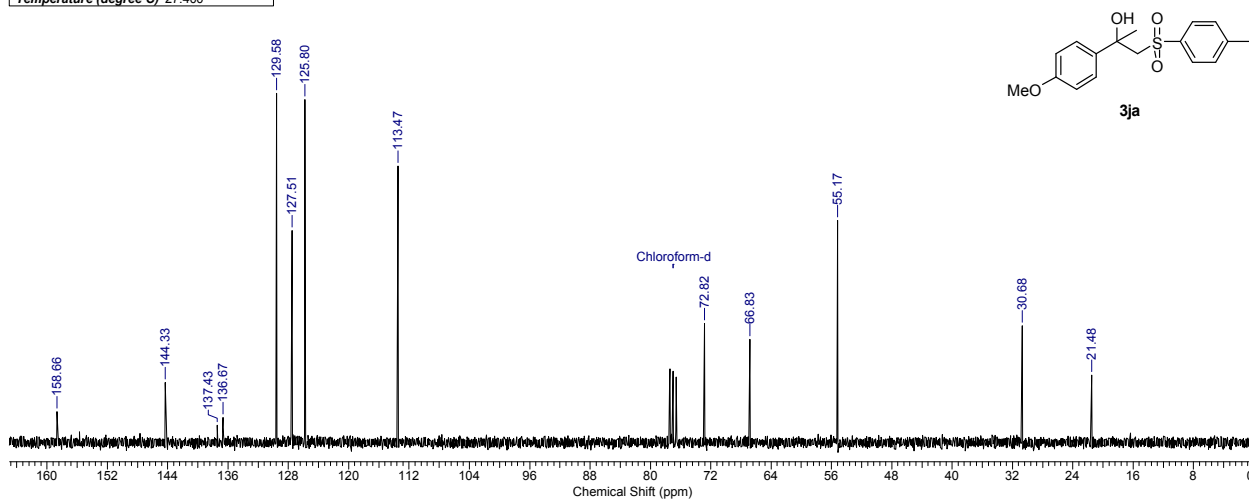


# 1-[(4-Methylphenyl)sulfonyl]-2-(4-methoxyphenyl)propan-2-ol (3ja)

Acquisition Time (sec)	1.3518	Date	01 Dec 2015 14:32:32	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Number of Transients	1
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Original Points Count	8124
				Sweep Width (Hz)	6009.62
				Temperature (degree C)	24.400

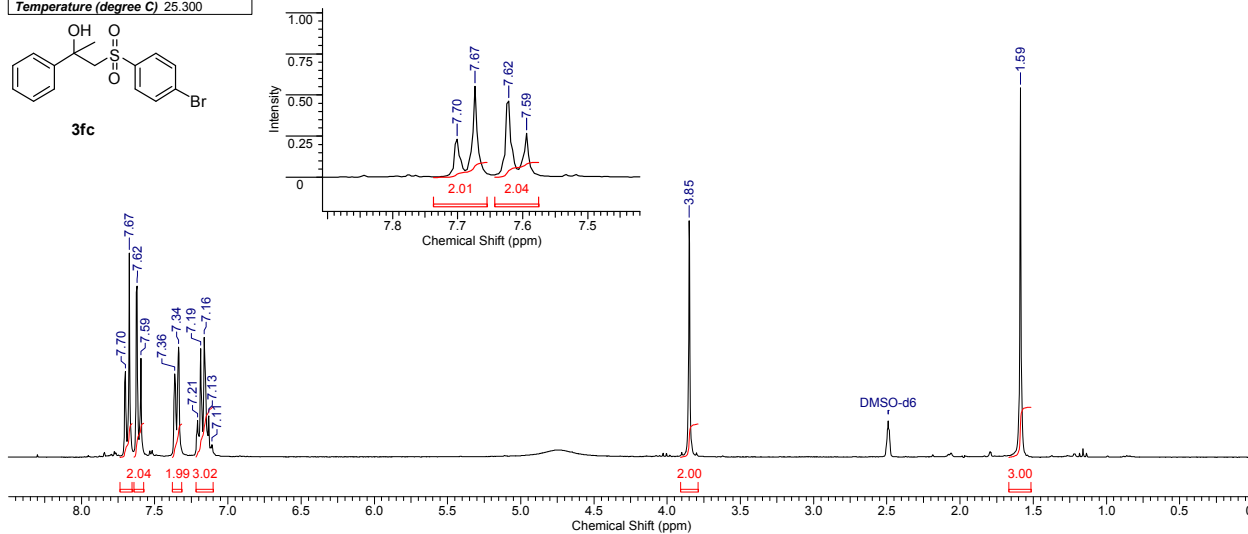


Acquisition Time (sec)	0.8680	Comment	adil.cdcl3.c13	Date	01 Feb 2016 08:53:20
File Name				Frequency (MHz)	75.48
Nucleus	<sup>13</sup> C	Number of Transients	152	Original Points Count	16316
Pulse Sequence	zgpg60base	Solvent	CHLOROFORM-D	Sweep Width (Hz)	18796.99
Temperature (degree C)	27.400				

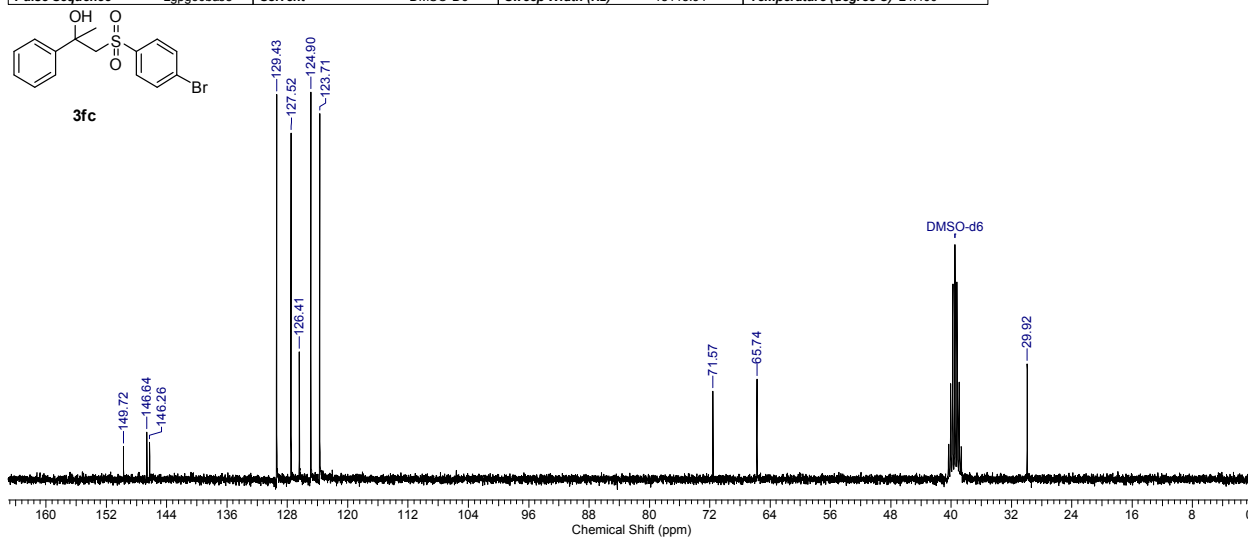


# 1-[(4-Bromophenyl)sulfonyl]-2-phenylpropan-2-ol (3fc)

Acquisition Time (sec)	1.0821	Comment	Avance-300, 1H DMSO-d6	Date	21 Nov 2015 10:08:00
File Name		Frequency (MHz)	300.13	Nucleus	1H
Original Points Count	8116	Points Count	8192	Pulse Sequence	zg
Temperature (degree C)	25.300			Solvent	DMSO-D6
				Number of Transients	1
				Sweep Width (Hz)	7500.00

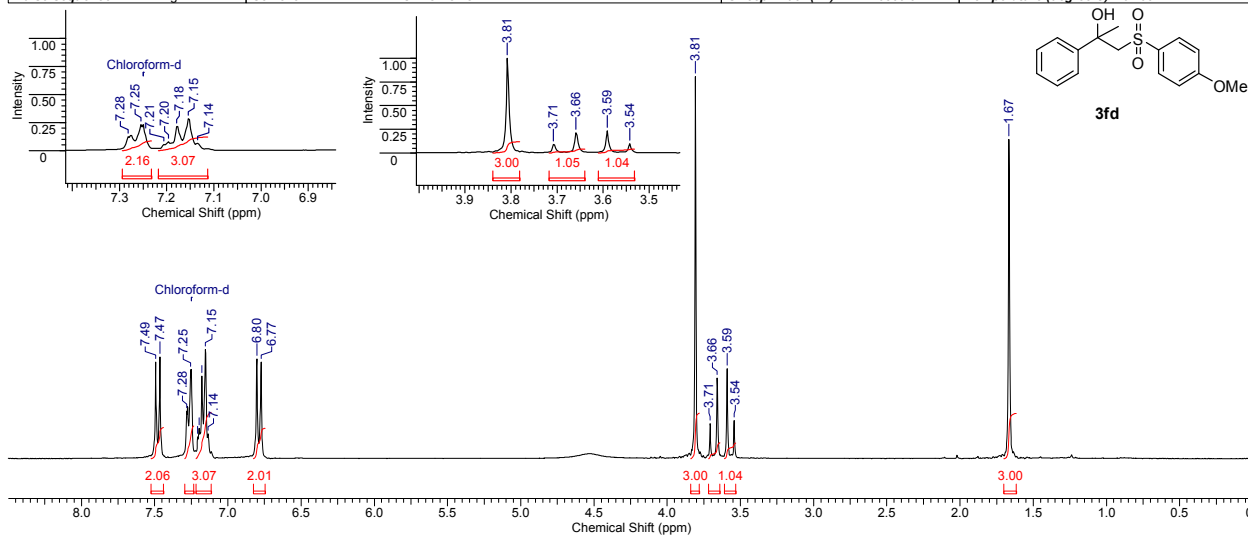


Acquisition Time (sec)	0.9002	Date	19 Nov 2015 11:52:32	File Name	
Frequency (MHz)	75.48	Nucleus	13C	Number of Transients	260
Pulse Sequence	zpgg60base	Solvent	DMSO-D6	Sweep Width (Hz)	18115.94
				Original Points Count	16308
				Points Count	16384
				Temperature (degree C)	24.400

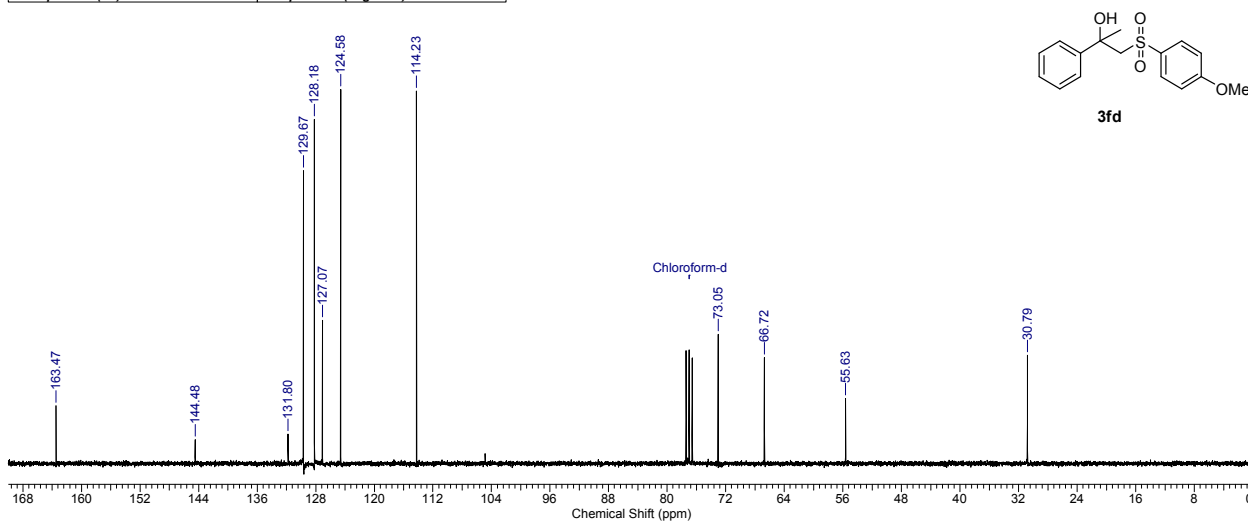


# 1-[(4-Methoxyphenyl)sulfonyl]-2-phenylpropan-2-ol (3fd)

Acquisition Time (sec)	1.3518	Date	08 Oct 2015 15:10:56	File Name	
Frequency (MHz)	300.13	Nucleus	<sup>1</sup> H	Original Points Count	8124
Pulse Sequence	zg	Solvent	CHLOROFORM-D	Points Count	8192
				Sweep Width (Hz)	6009.62
				Temperature (degree C)	26.400



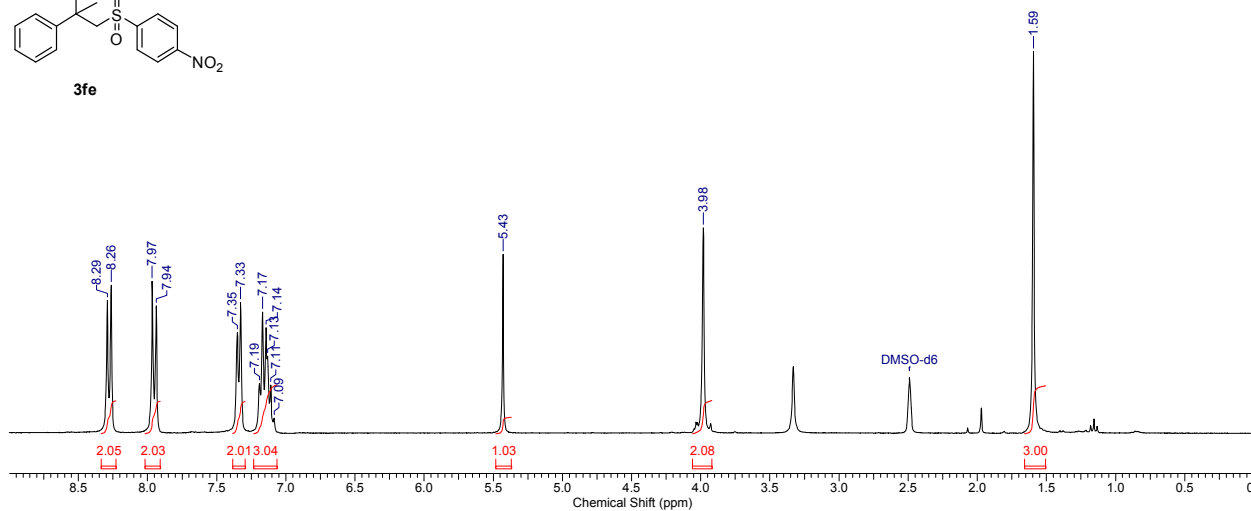
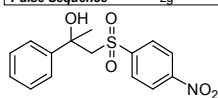
Acquisition Time (sec)	0.8680	Comment	adil.cdcl3.c13	Date	10 Oct 2015 10:33:36
File Name				Frequency (MHz)	75.48
Original Points Count	16316	Points Count	16384	Nucleus	<sup>13</sup> C
Sweep Width (Hz)	18796.99	Temperature (degree C)	25.900	Pulse Sequence	zpgp60base
				Solvent	CHLOROFORM-D
				Number of Transients	244





# 1-[(4-Nitrophenyl)sulfonyl]-2-phenylpropan-2-ol (3fe)

Acquisition Time (sec)	1.3521	Date	18 Nov 2015 16:51:12		File Name	
Frequency (MHz)	300.13	Nucleus	1H	Number of Transients	1	Original Points Count 8116
Pulse Sequence	zg	Solvent	DMSO-D6	Sweep Width (Hz)	6002.40	Points Count 8192
						Temperature (degree C) 24.700



Acquisition Time (sec)	0.9002	Date	19 Nov 2015 11:52:32		File Name	
Frequency (MHz)	75.48	Nucleus	13C	Number of Transients	260	Original Points Count 16308
Pulse Sequence	zpgg50base	Solvent	DMSO-D6	Sweep Width (Hz)	18115.94	Points Count 16384
						Temperature (degree C) 24.400

