

^1H and ^{13}C NMR

New Fluorescent Probes for Carbonic Anhydrases

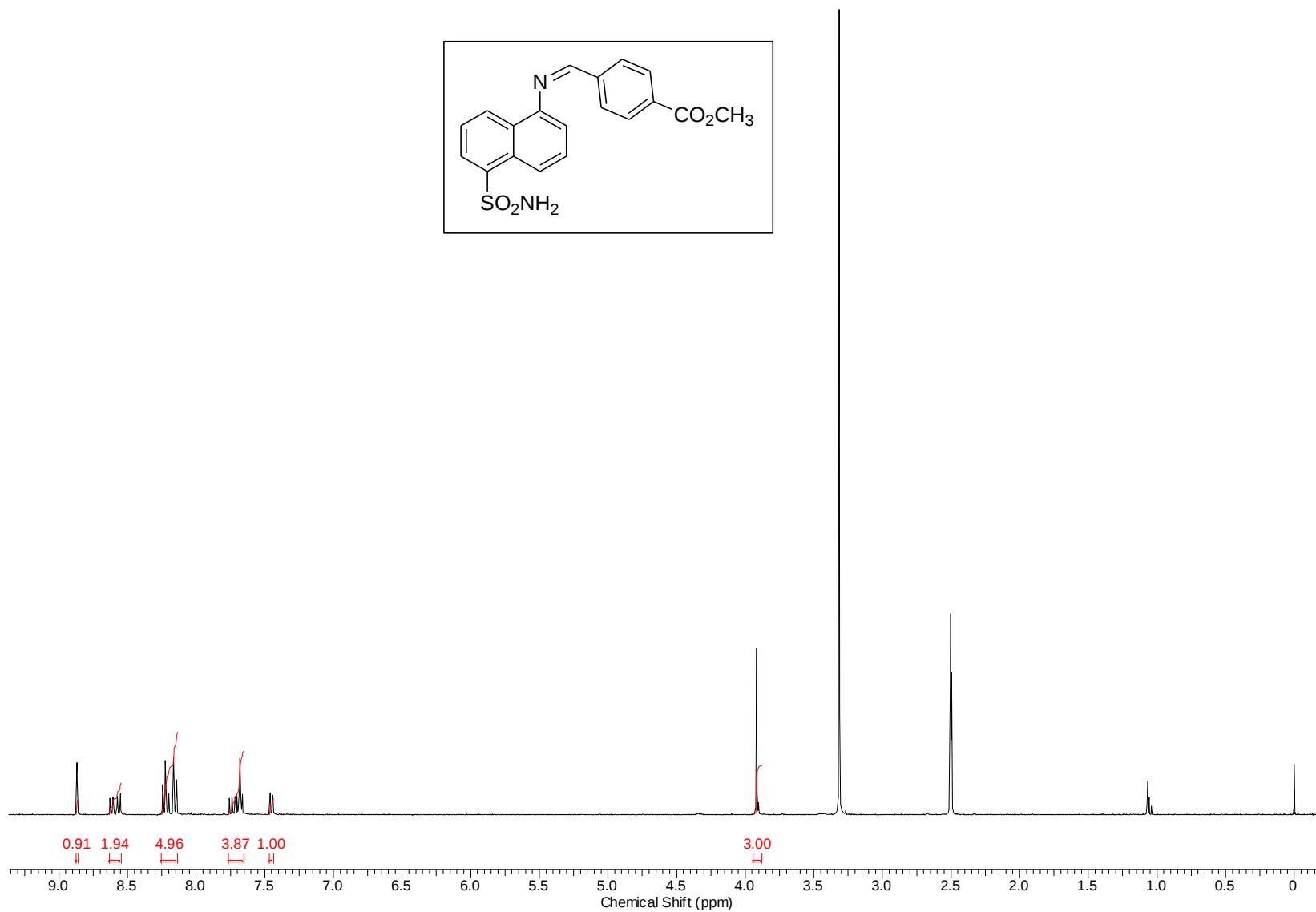
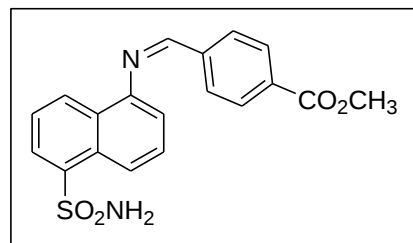
Jayati Banerjee¹, Manas K. Haldar¹, Sumathra Manokaran², Sanku Mallik^{1*} and D. K. Srivastava^{2*}

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Sanku.Mallik@ndsu.edu; DK.Srivastava@ndsu.edu

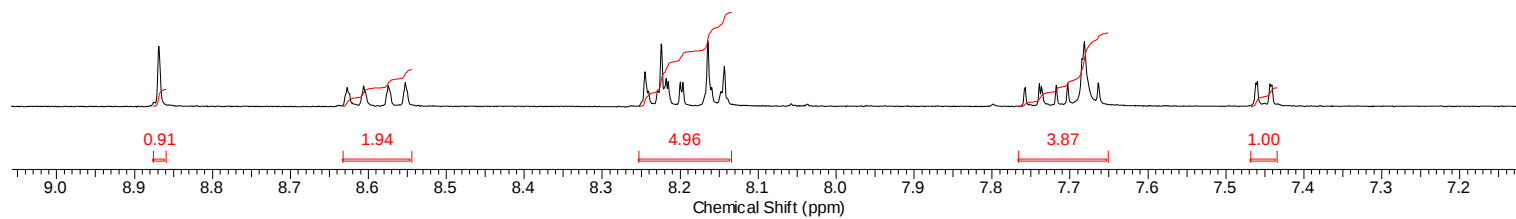
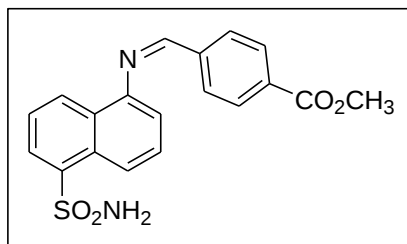
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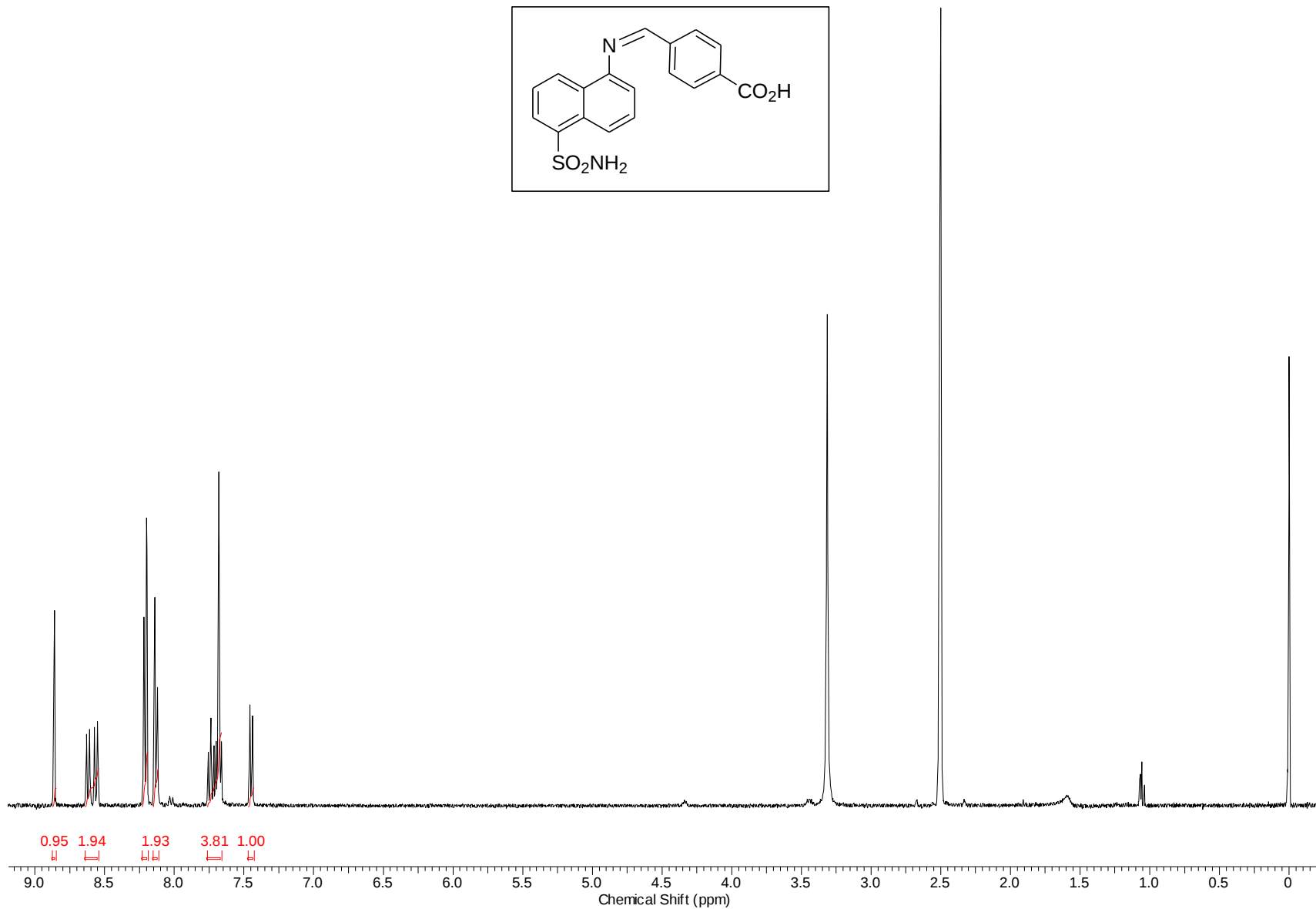
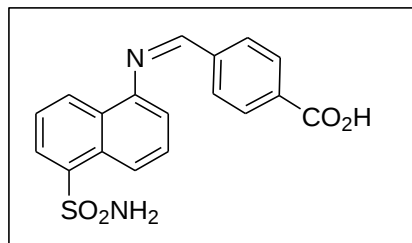
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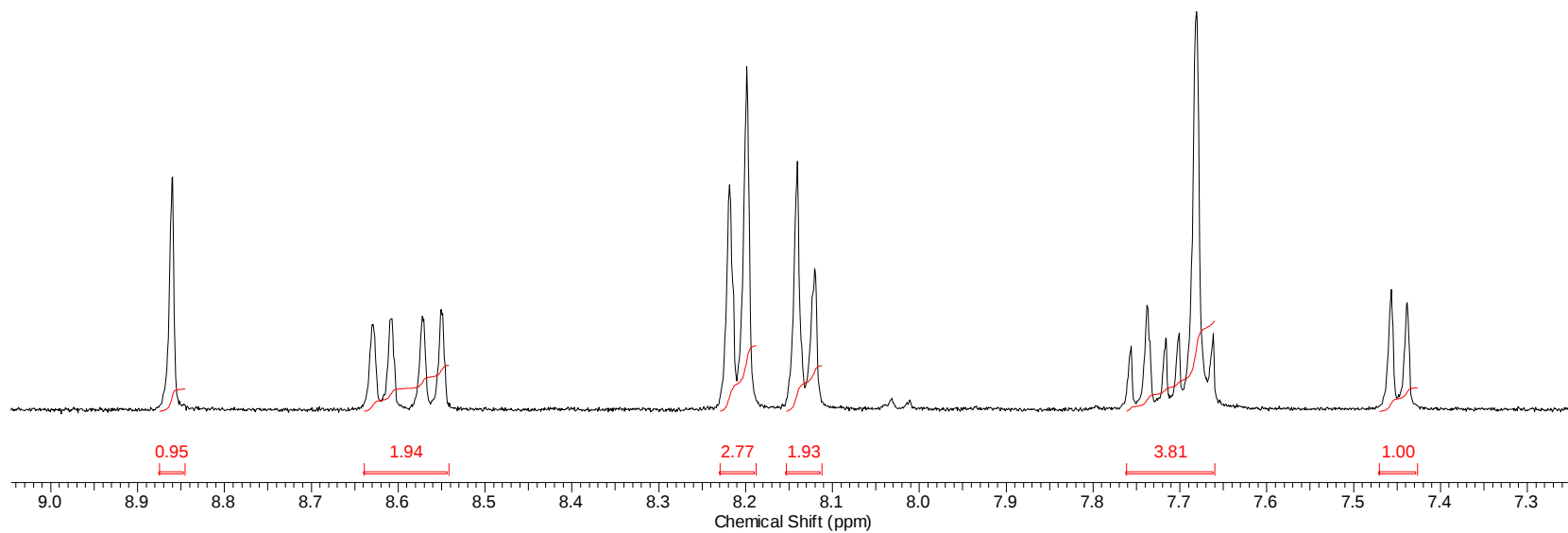
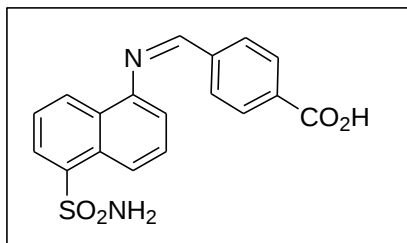
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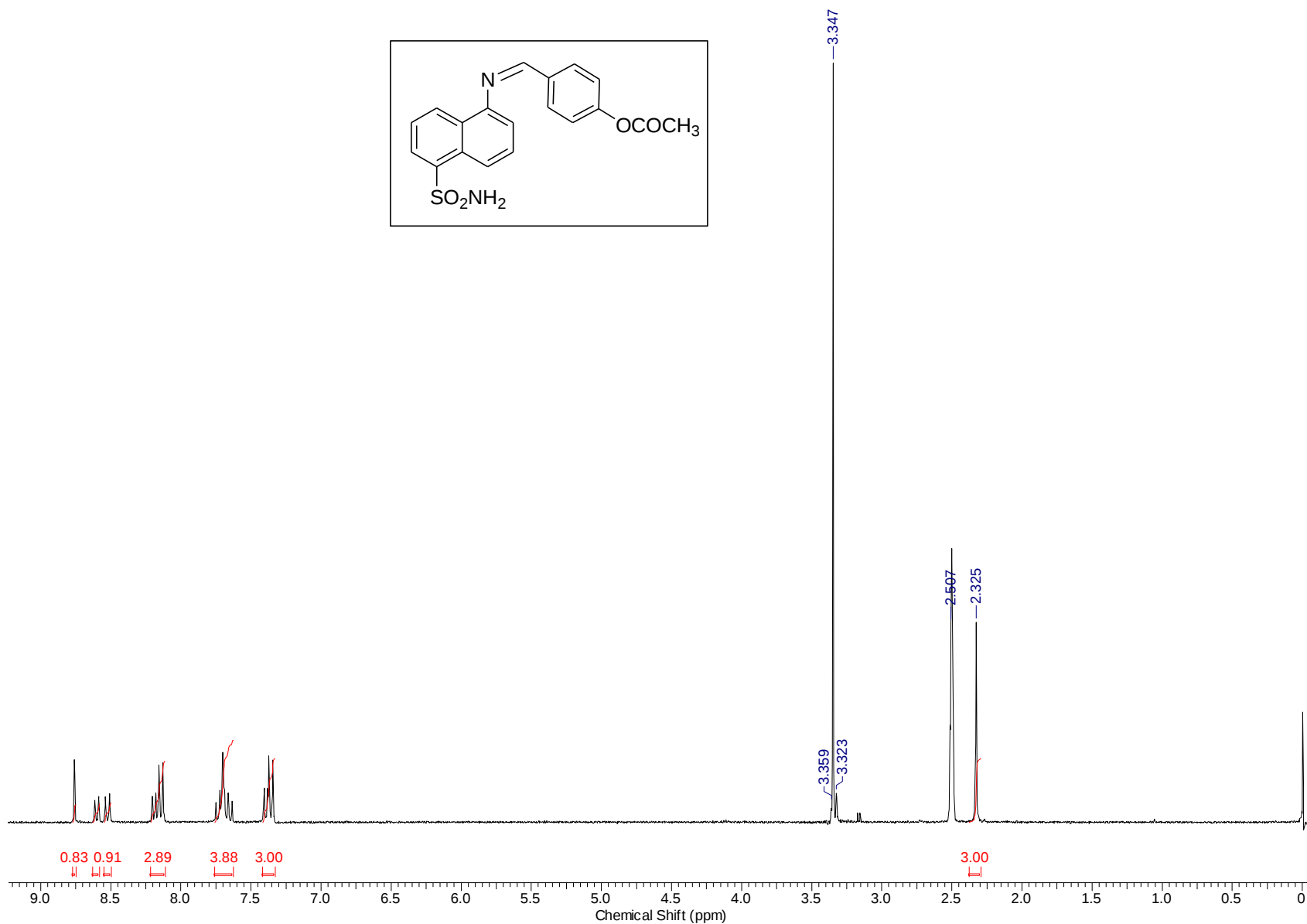
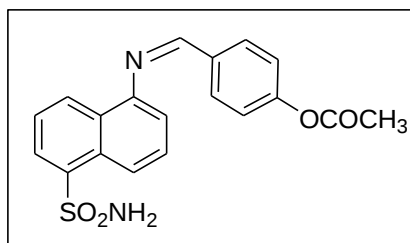
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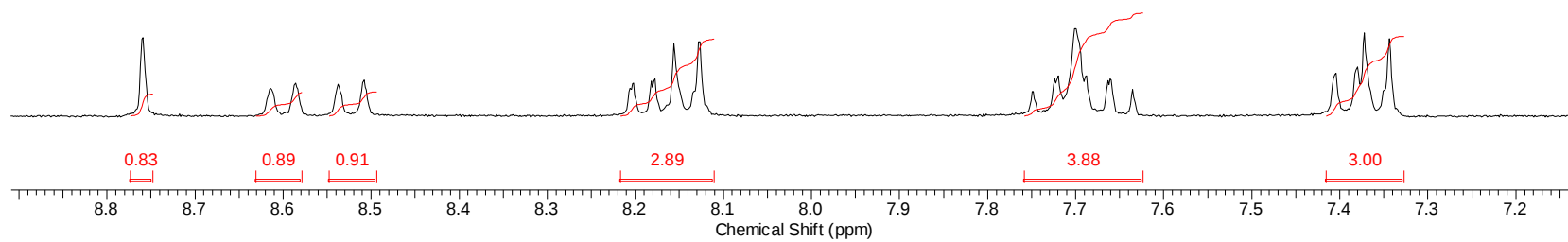
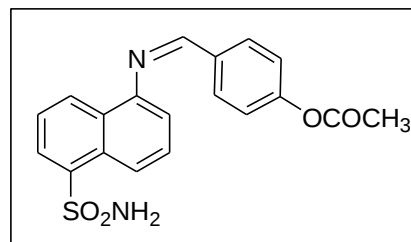
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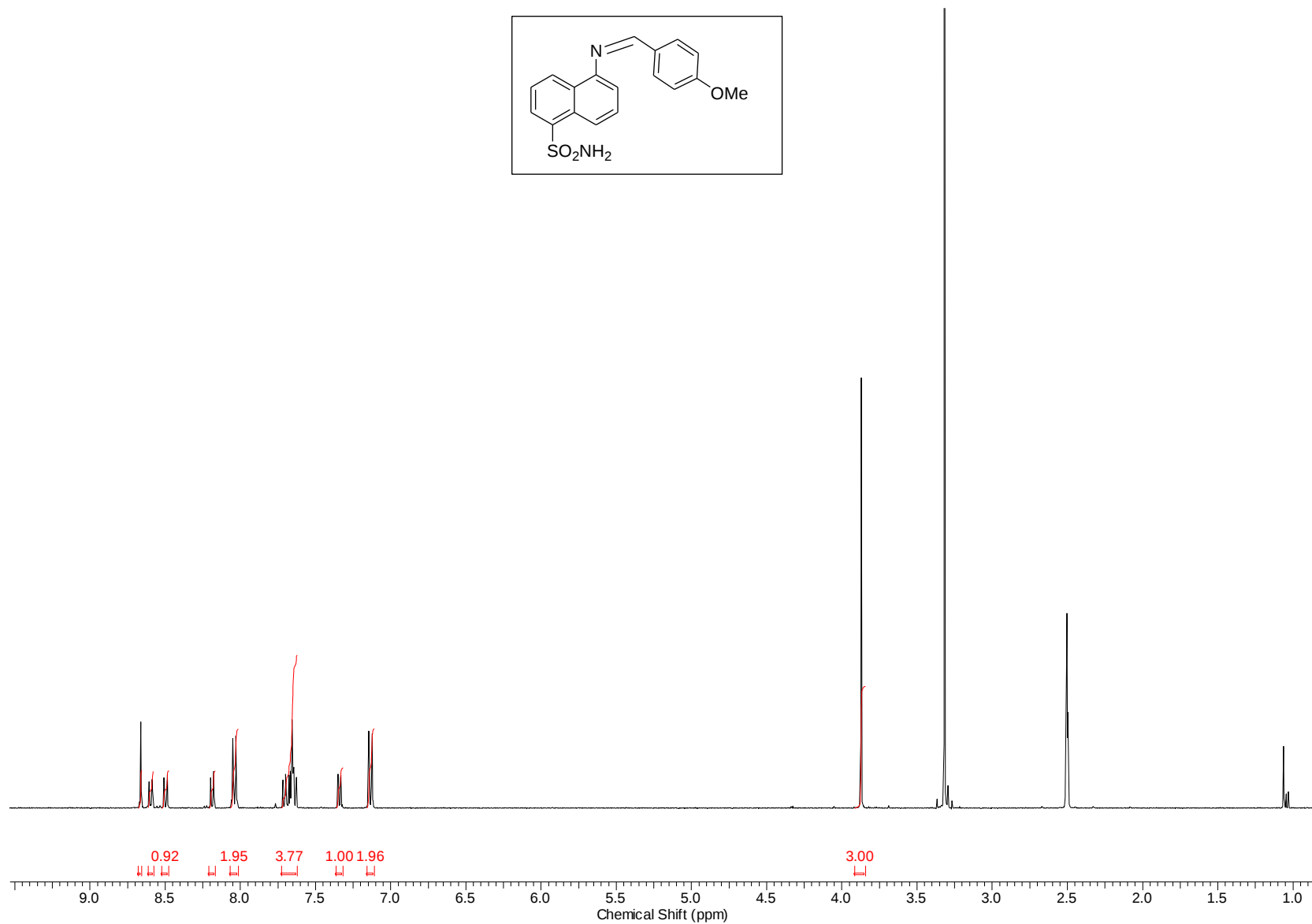
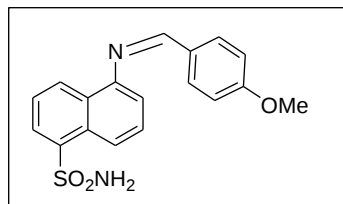
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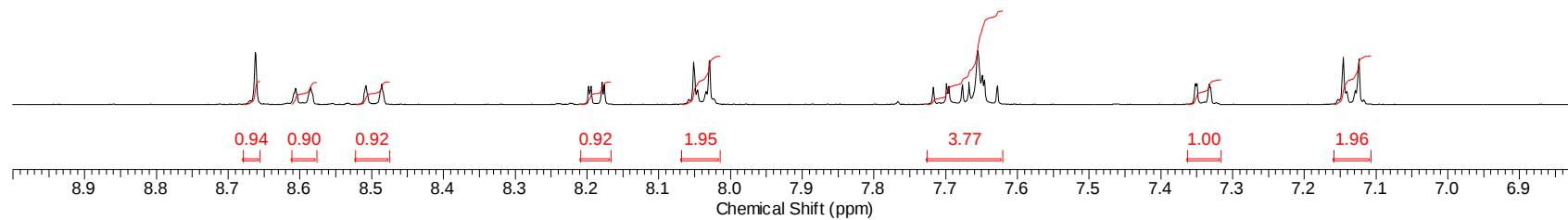
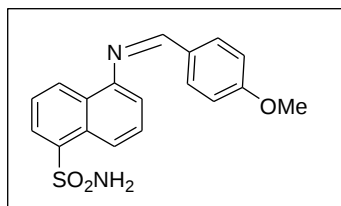
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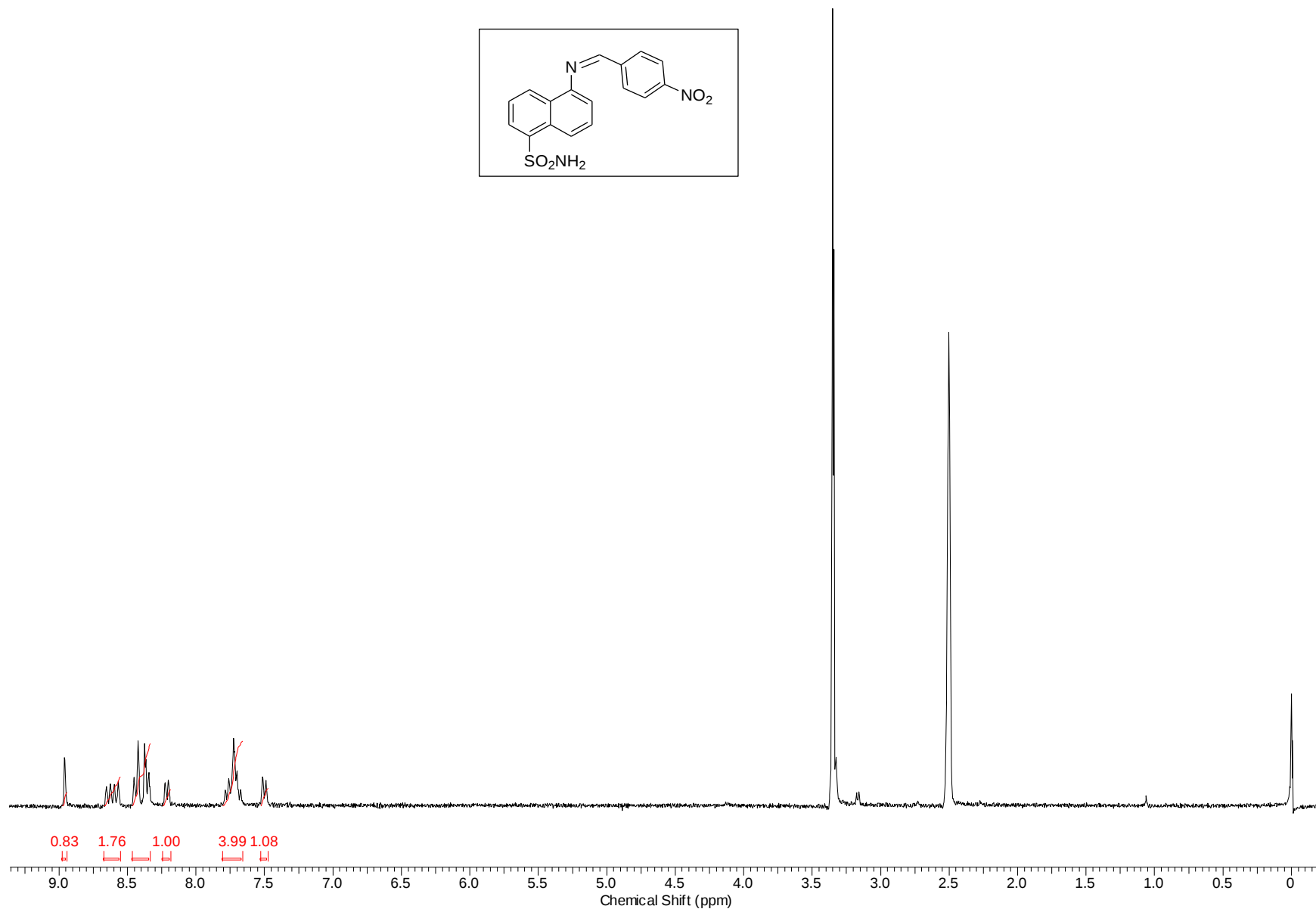
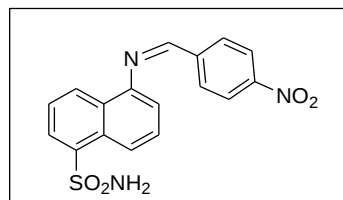
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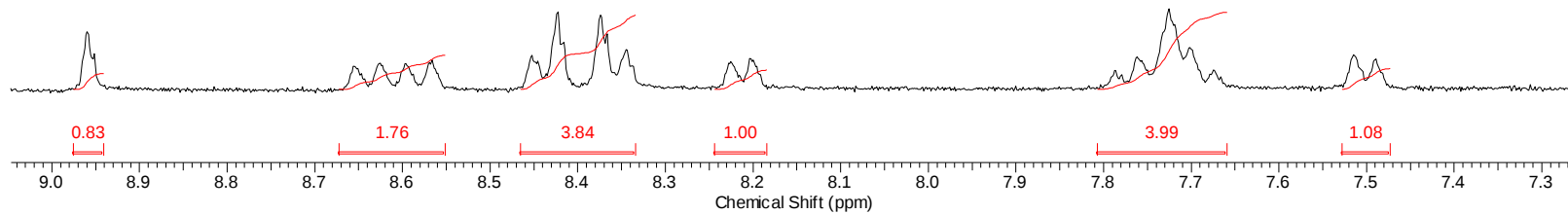
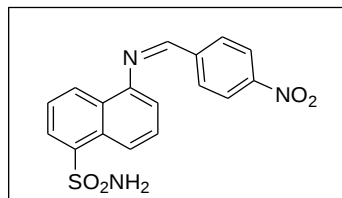
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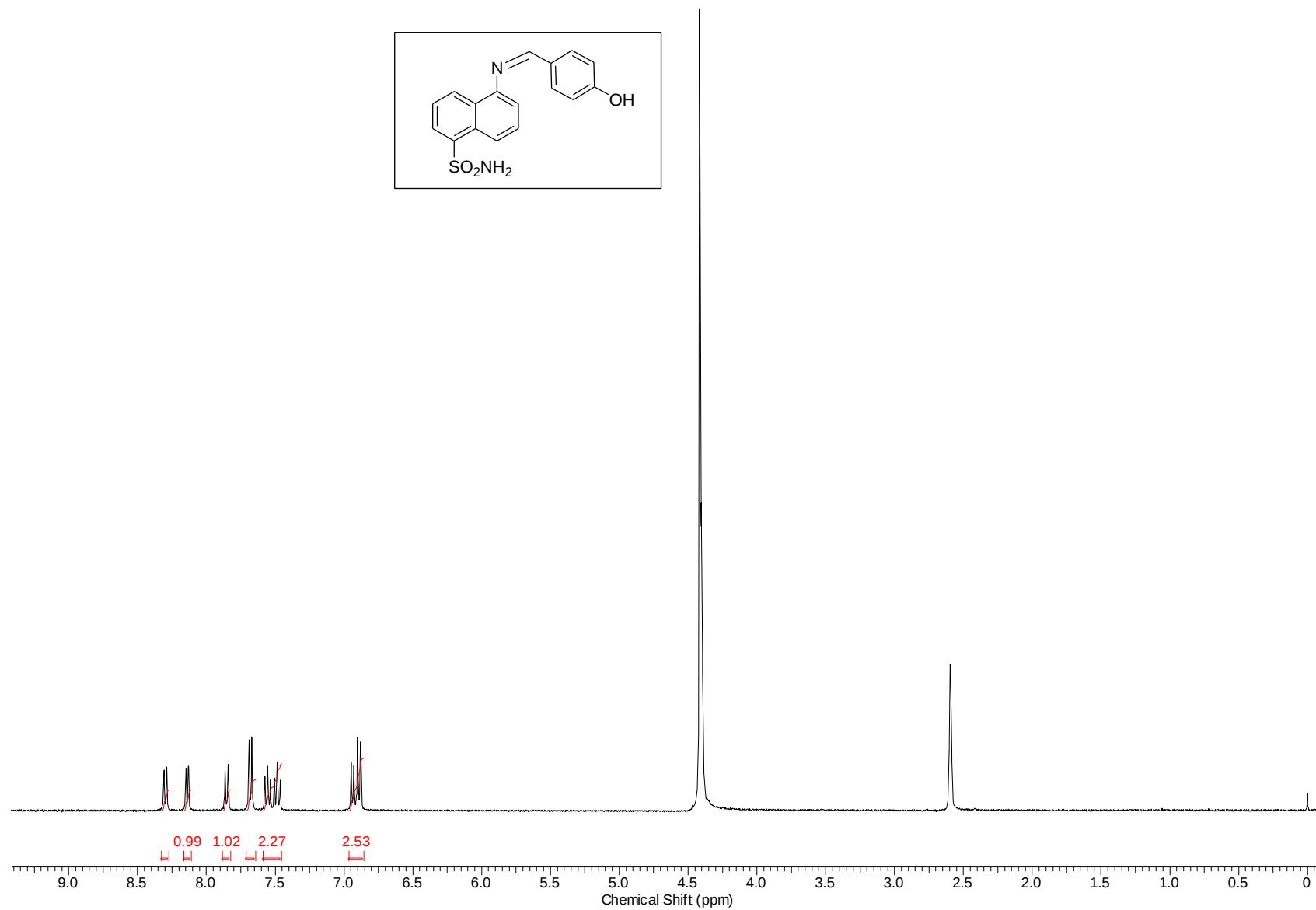
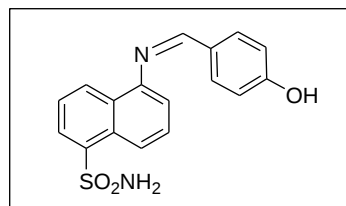
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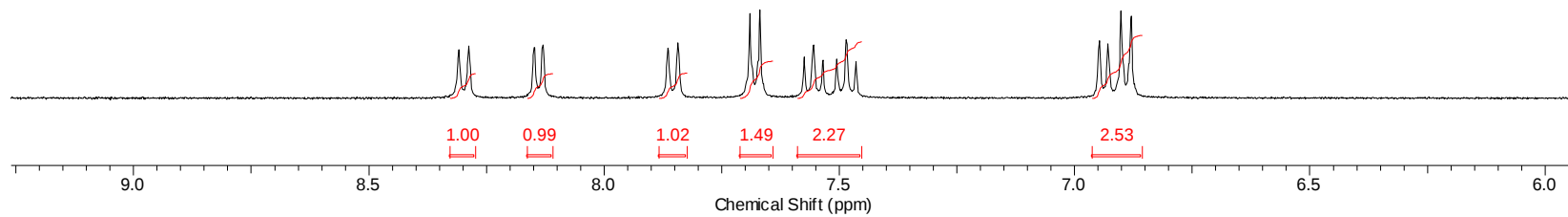
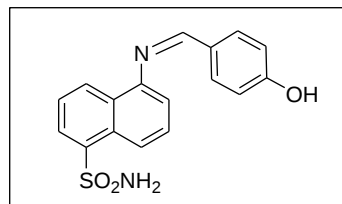
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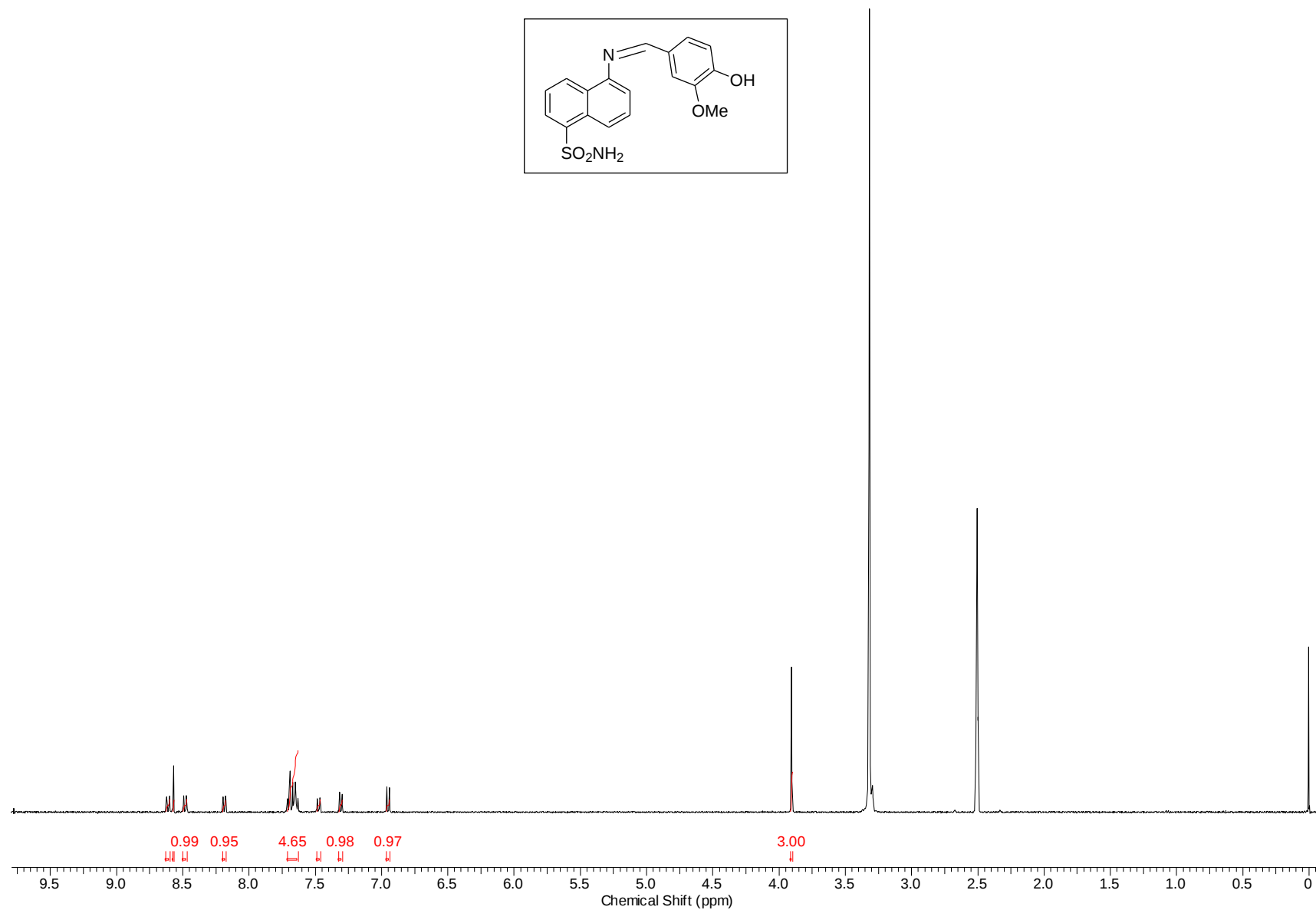
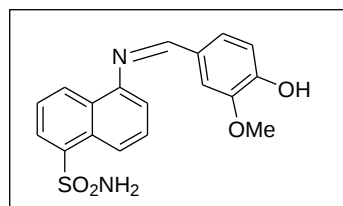
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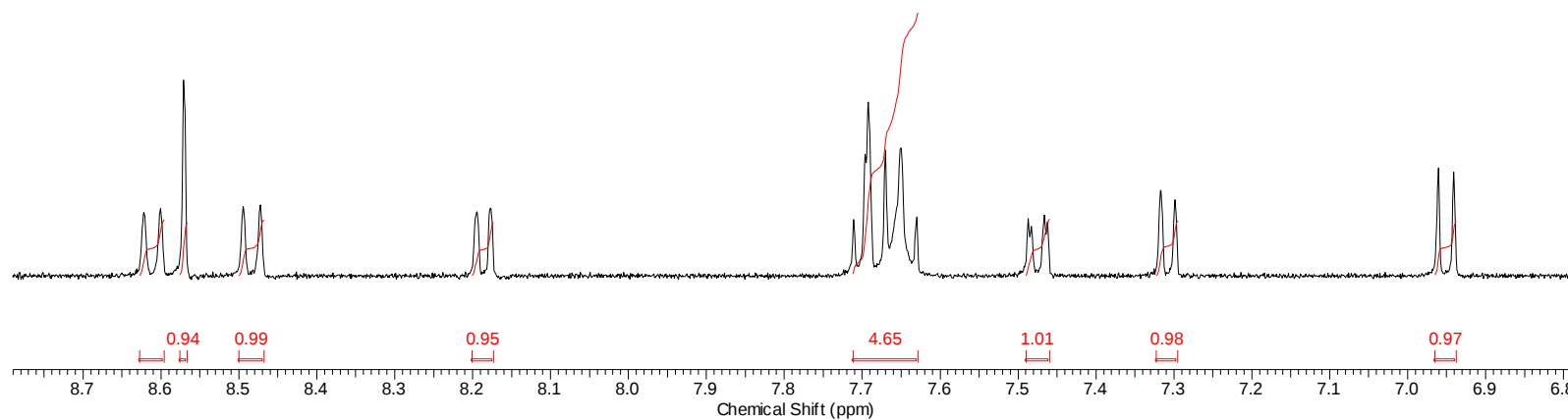
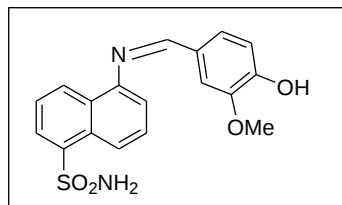
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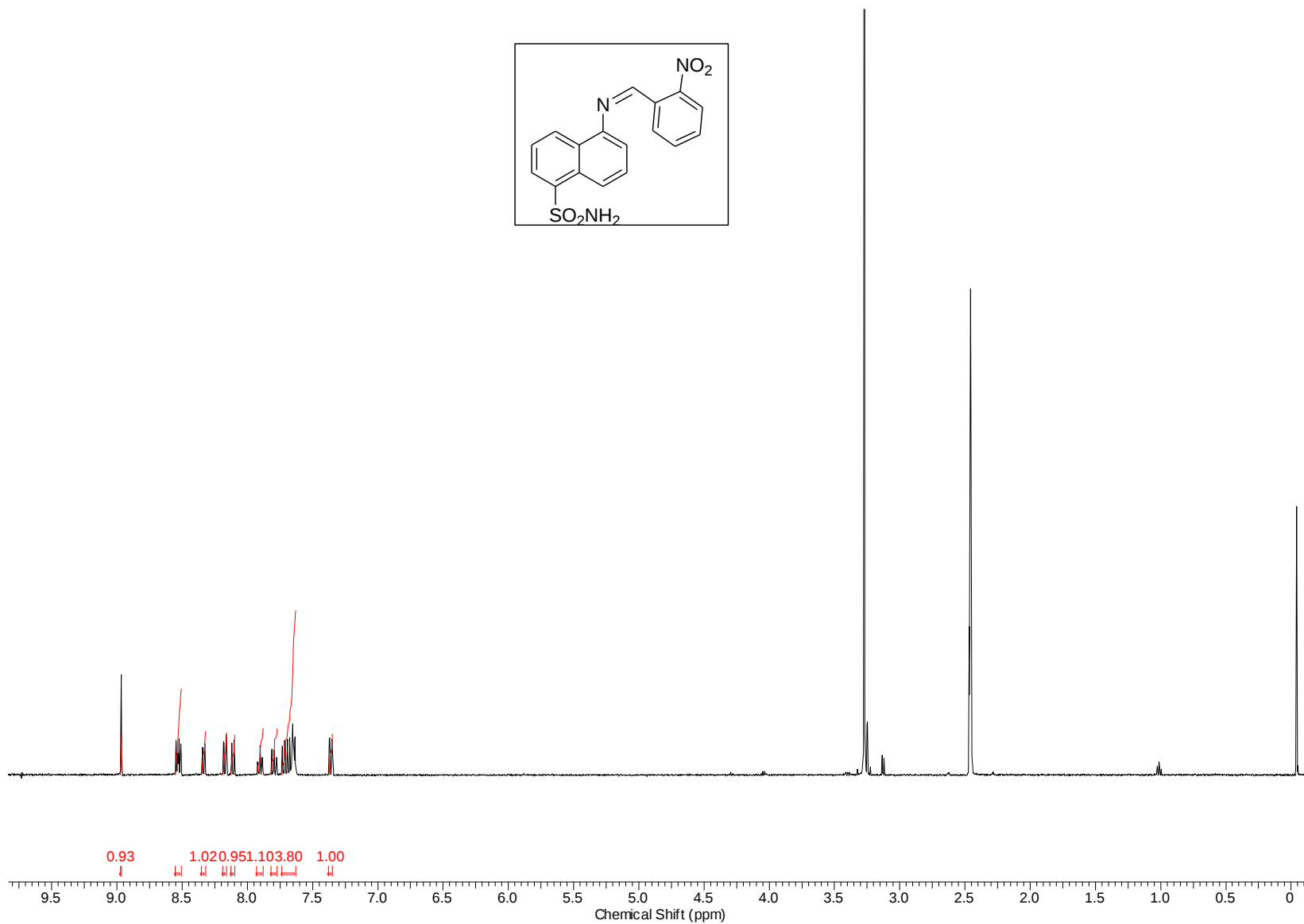
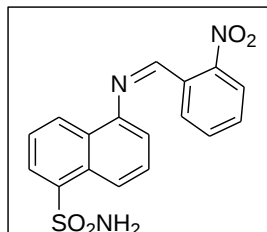
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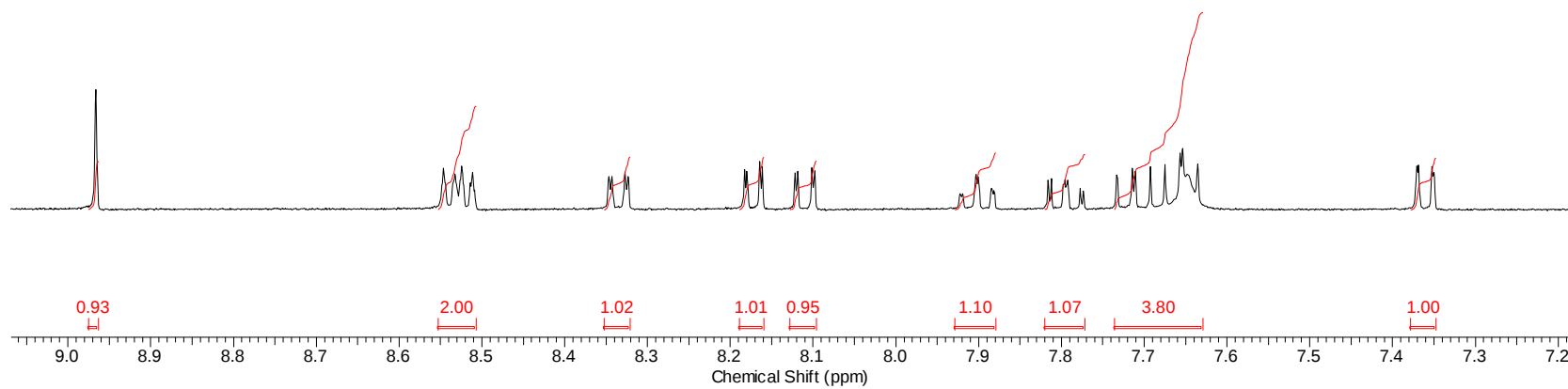
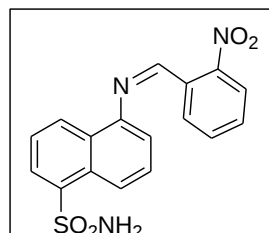
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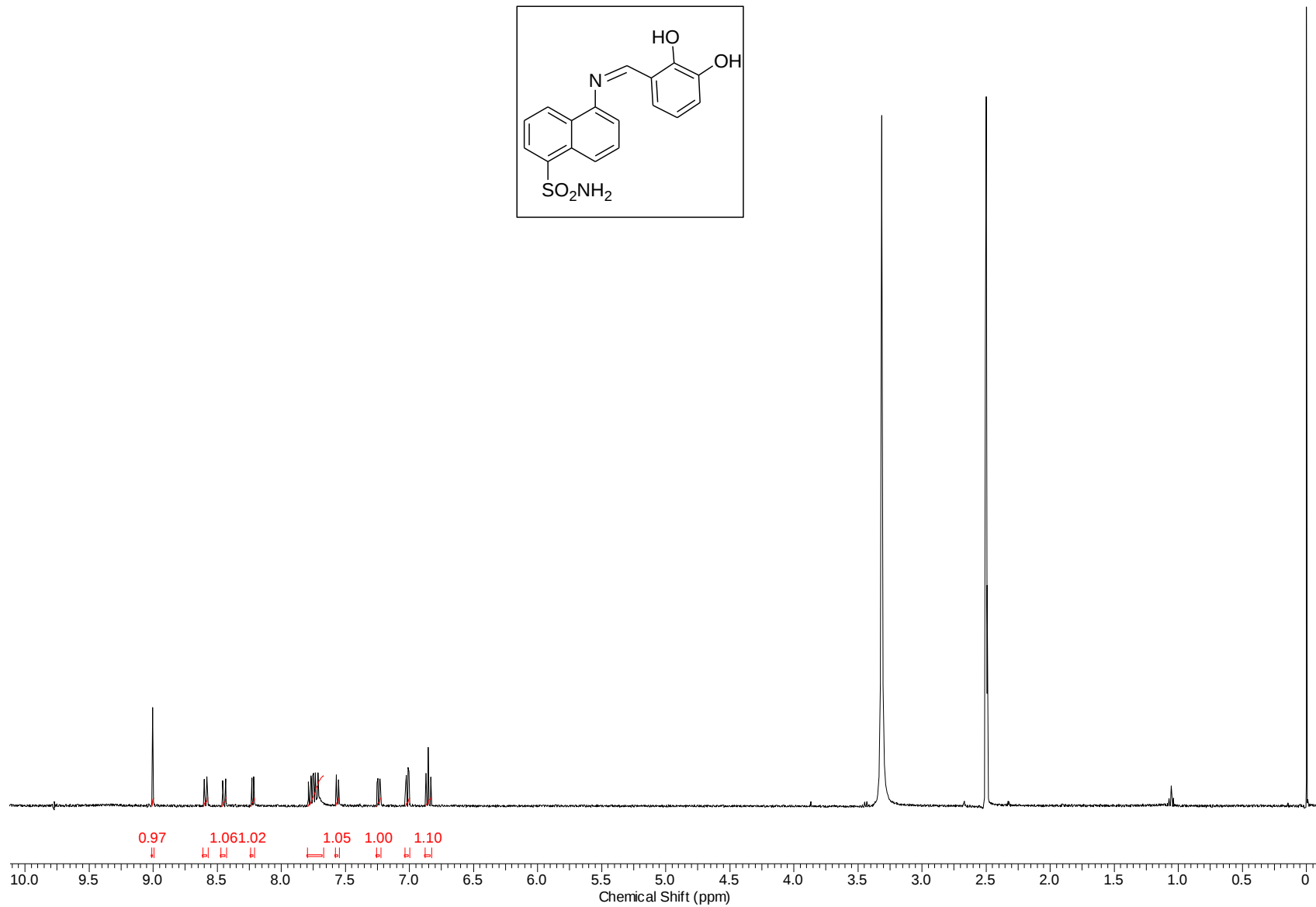
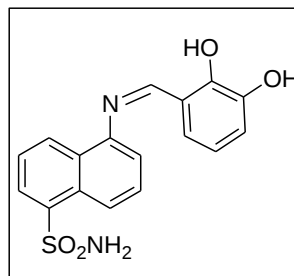
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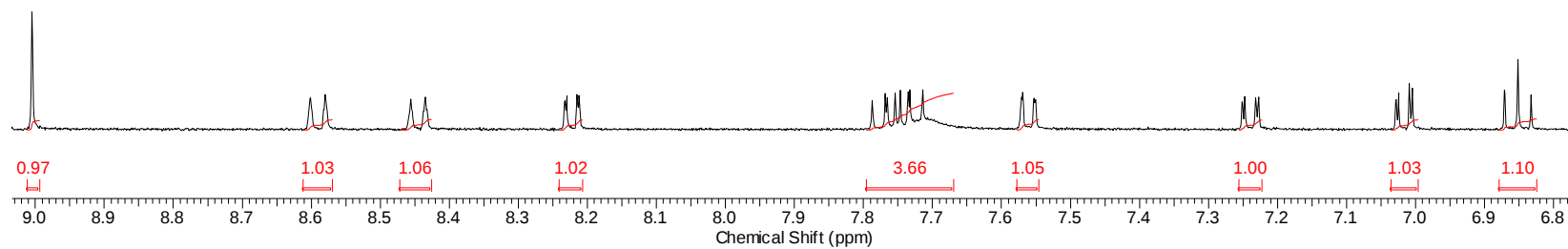
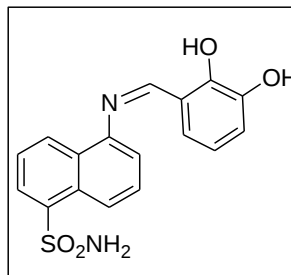
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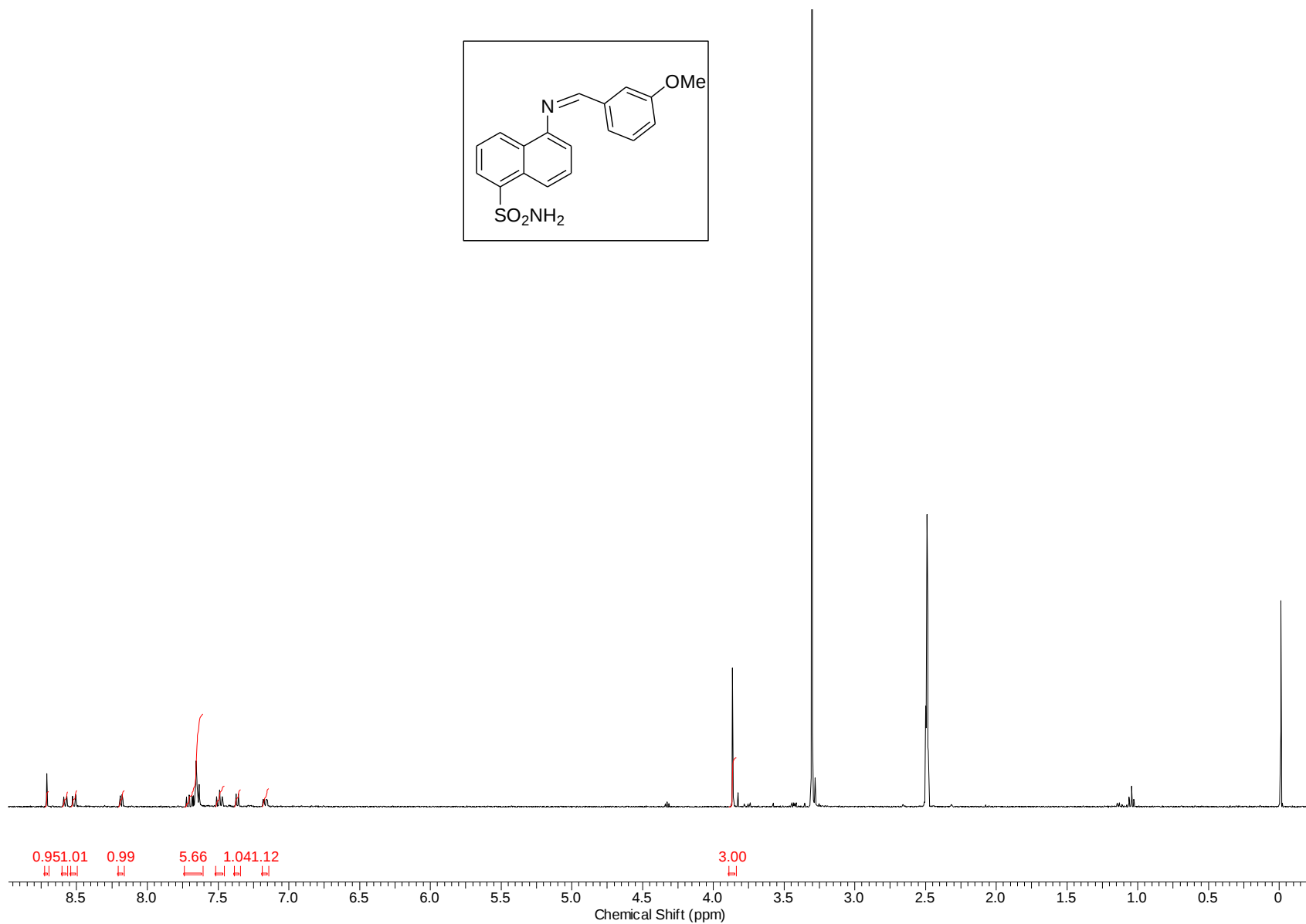
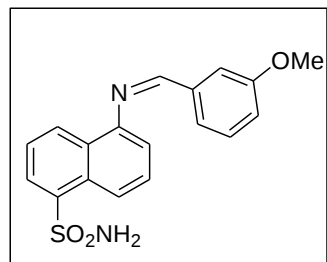
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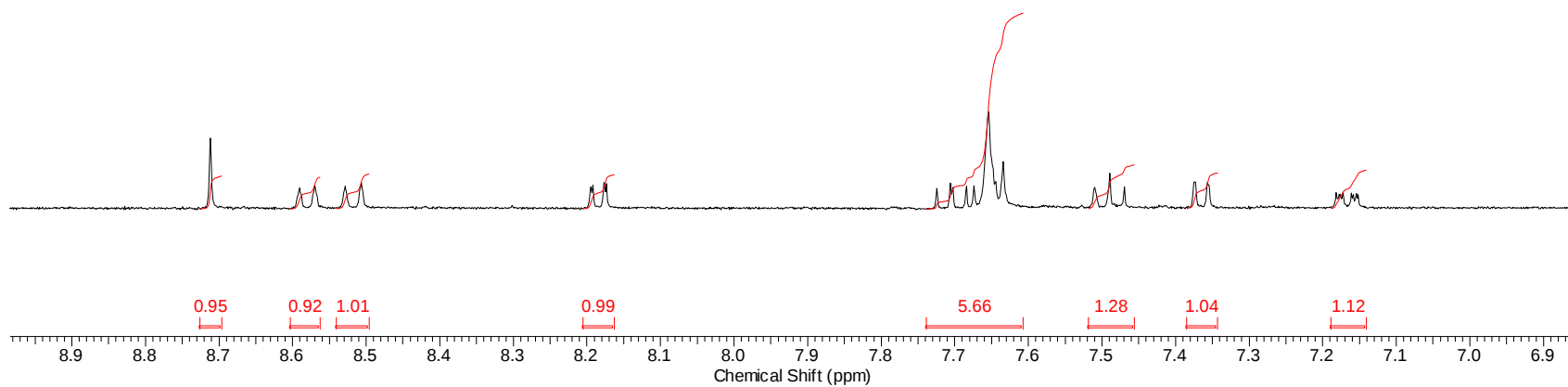
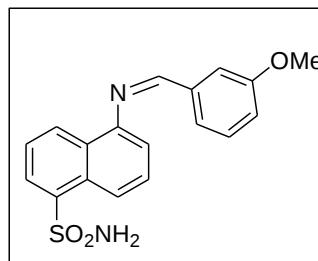
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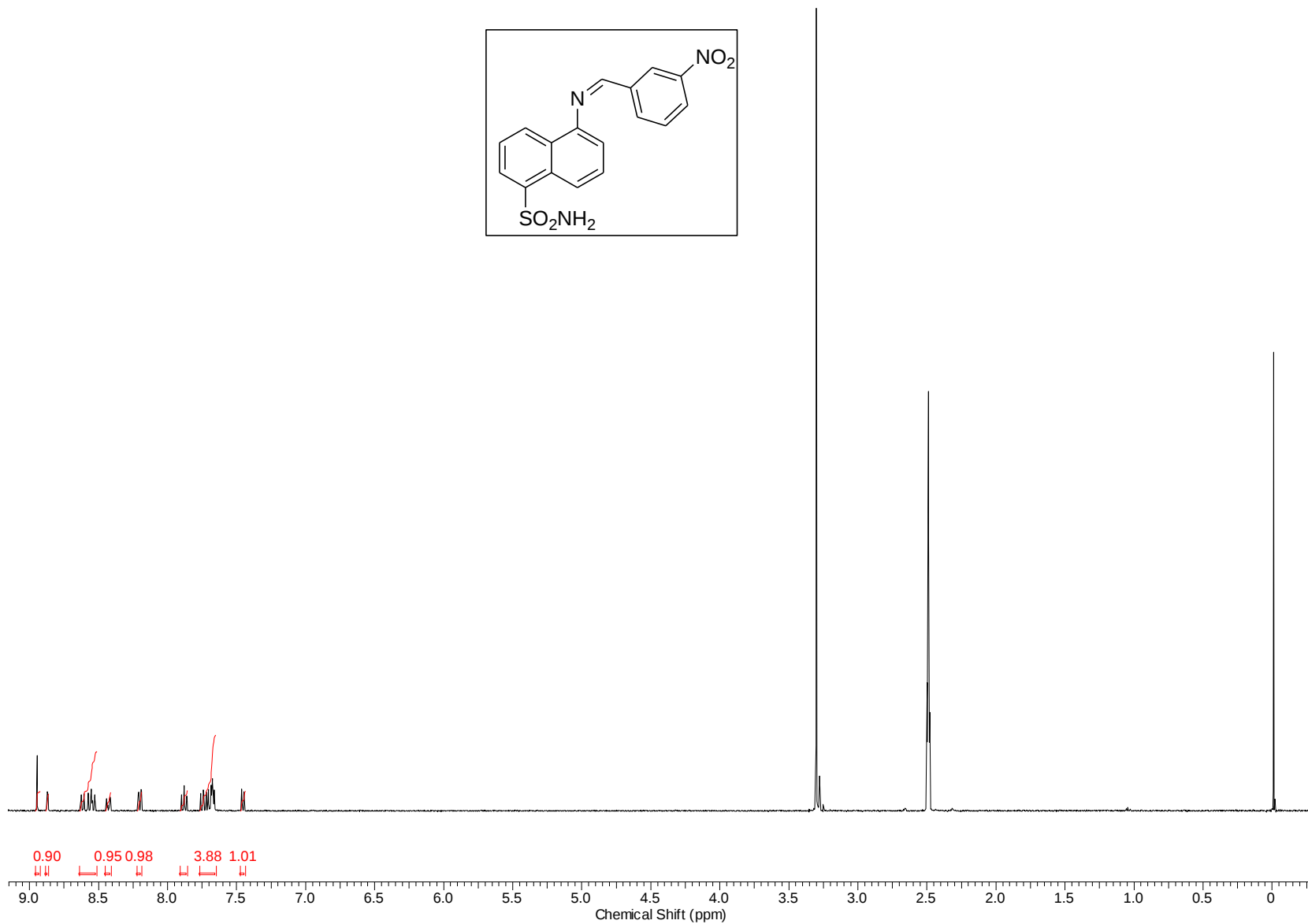
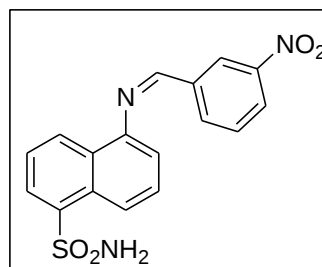
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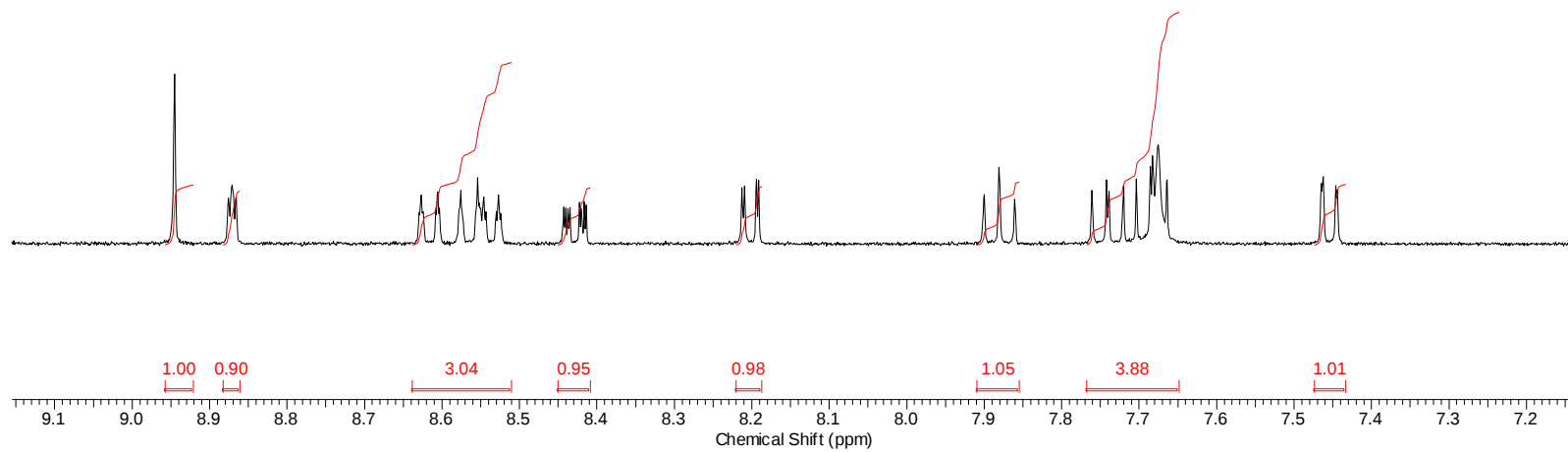
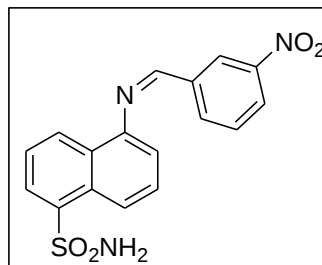
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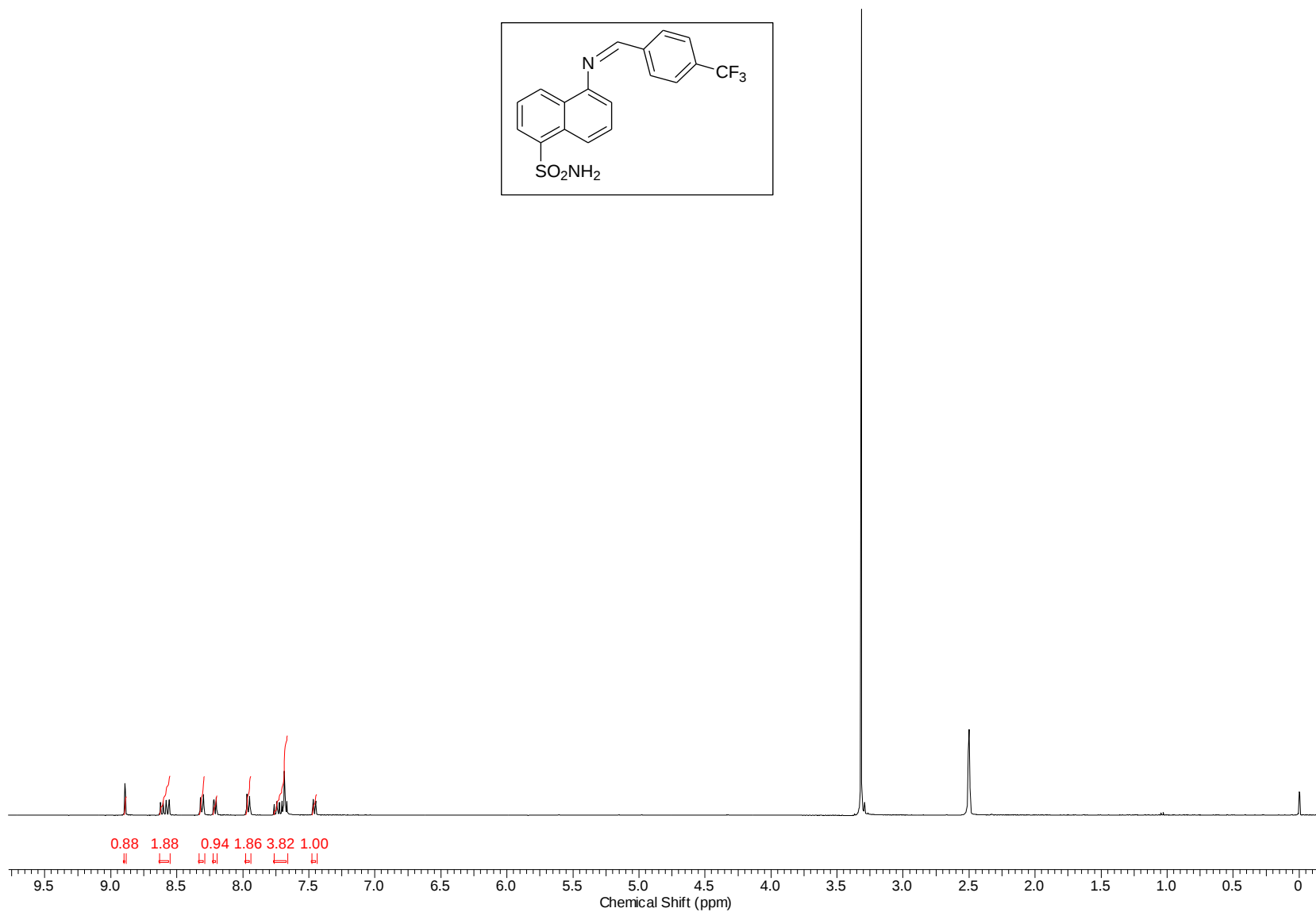
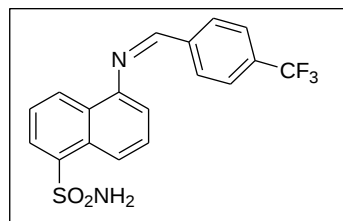
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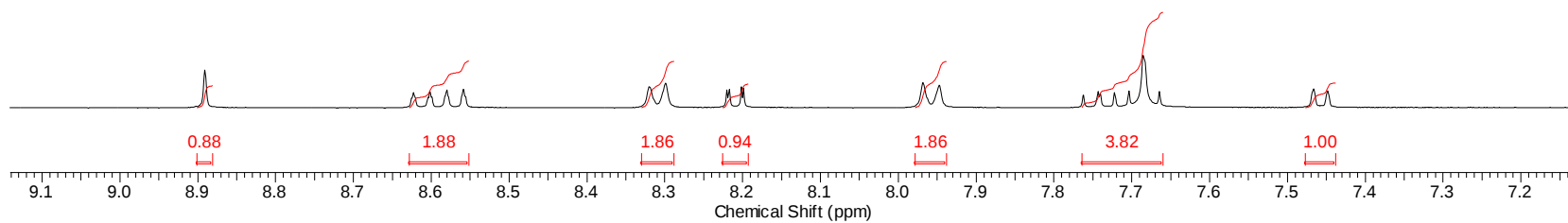
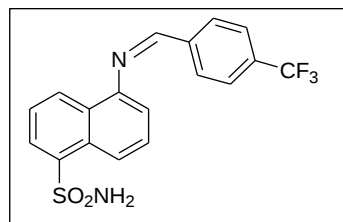
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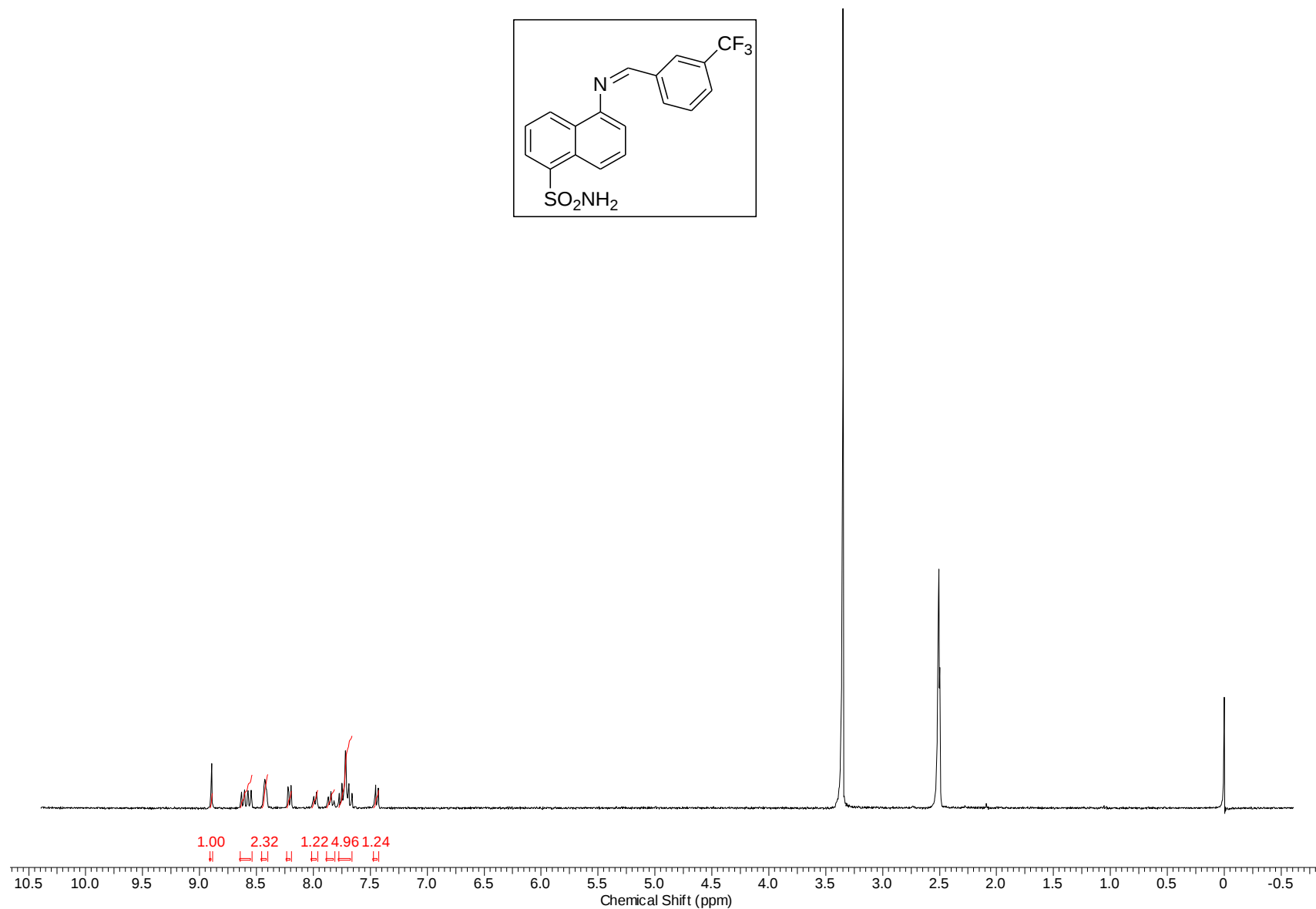
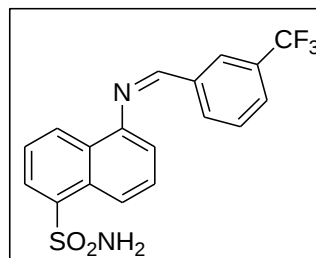
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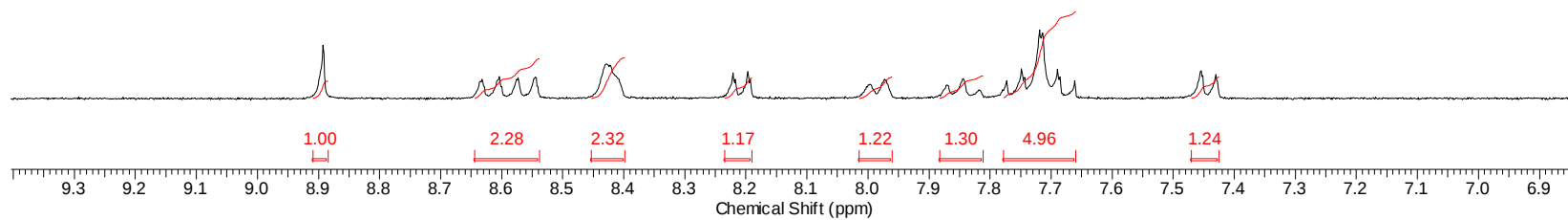
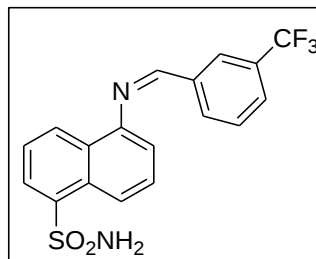
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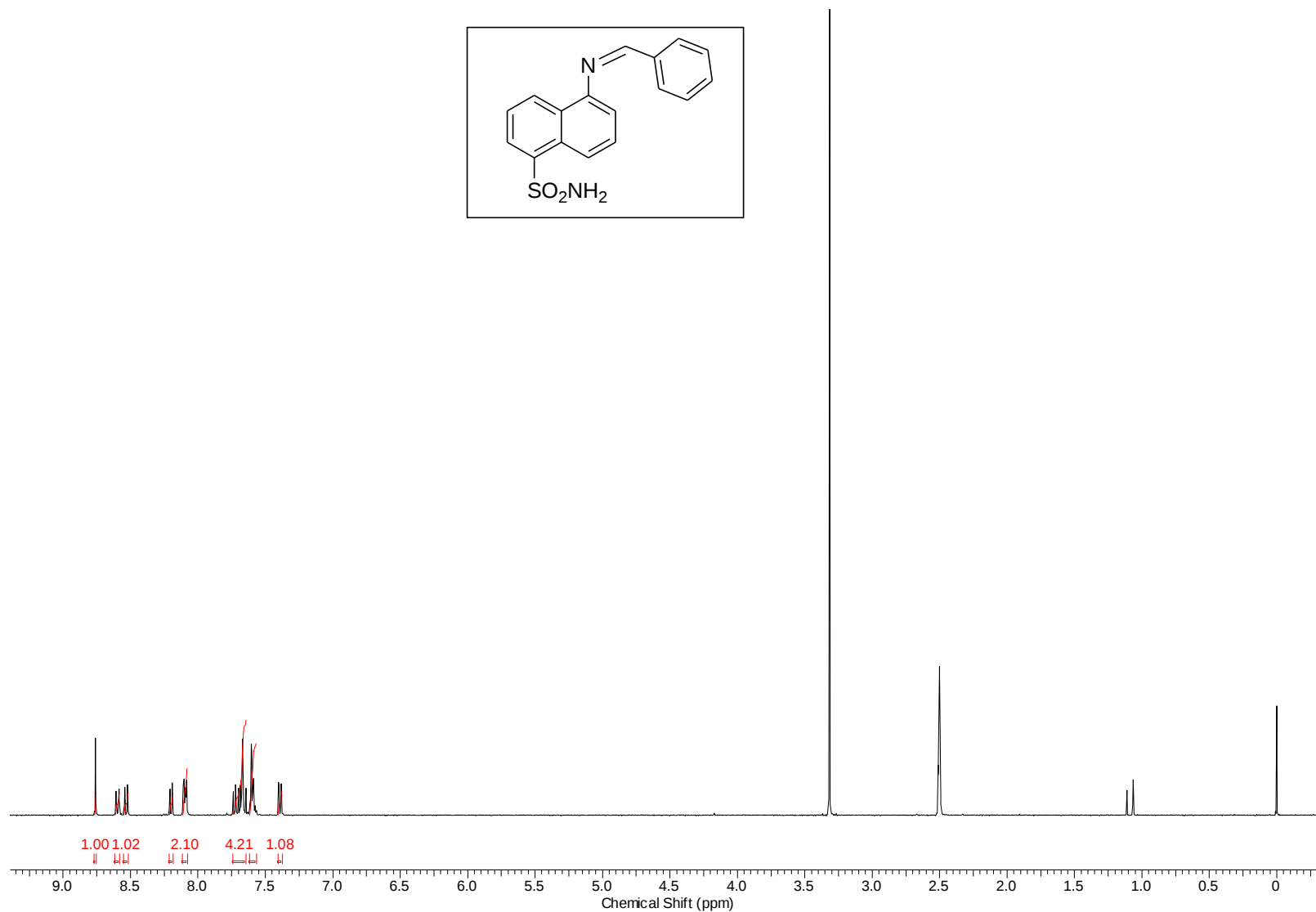
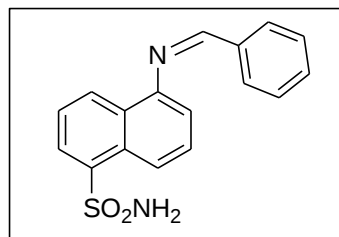
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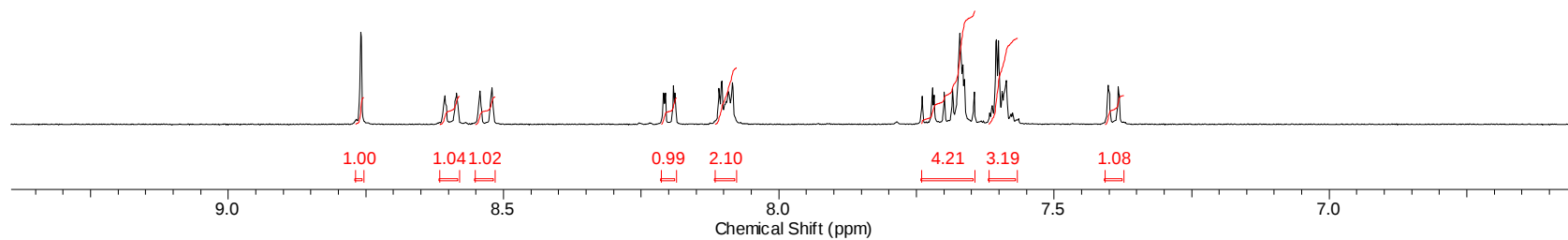
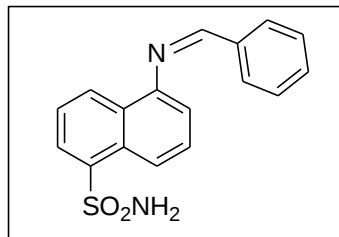
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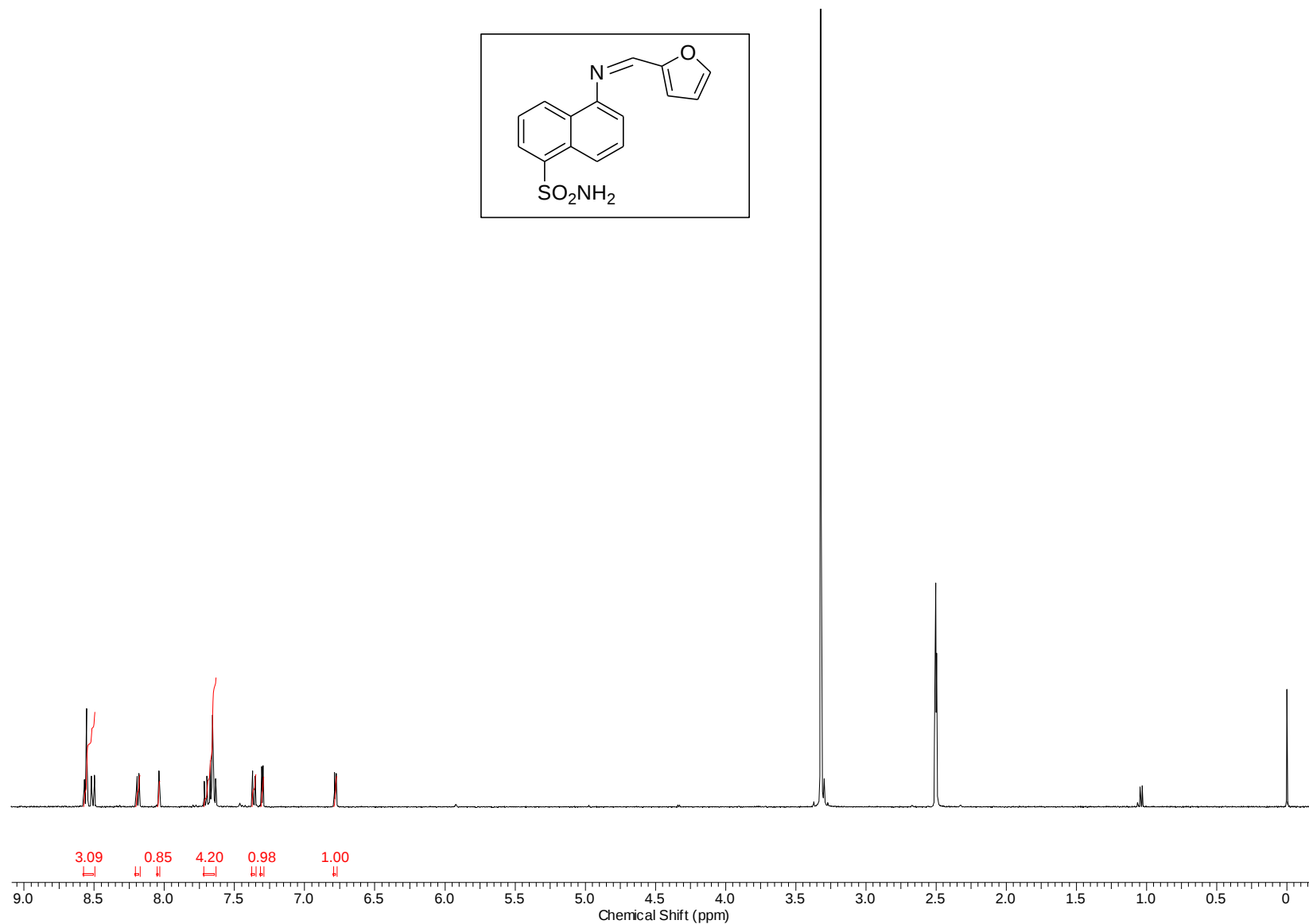
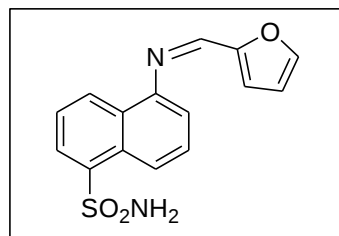
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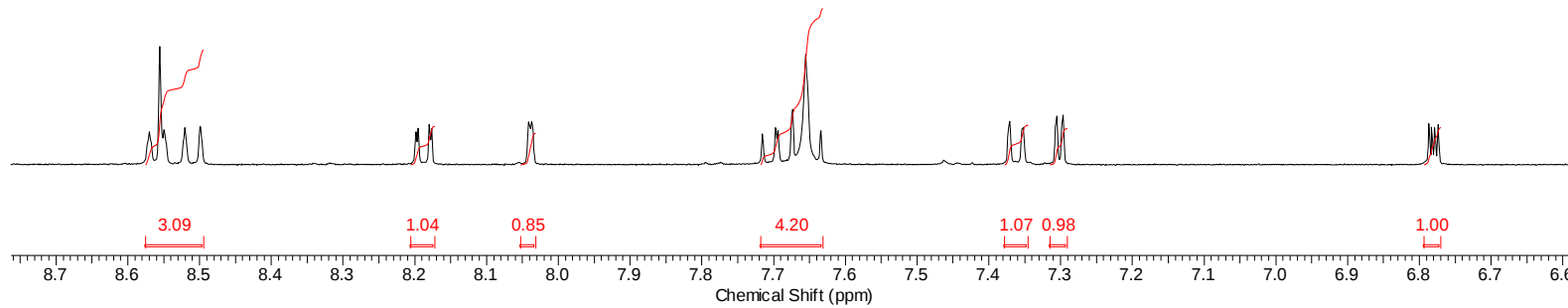
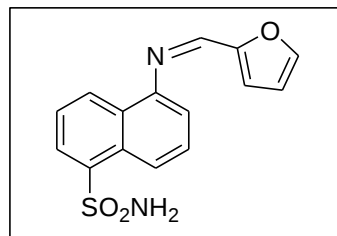
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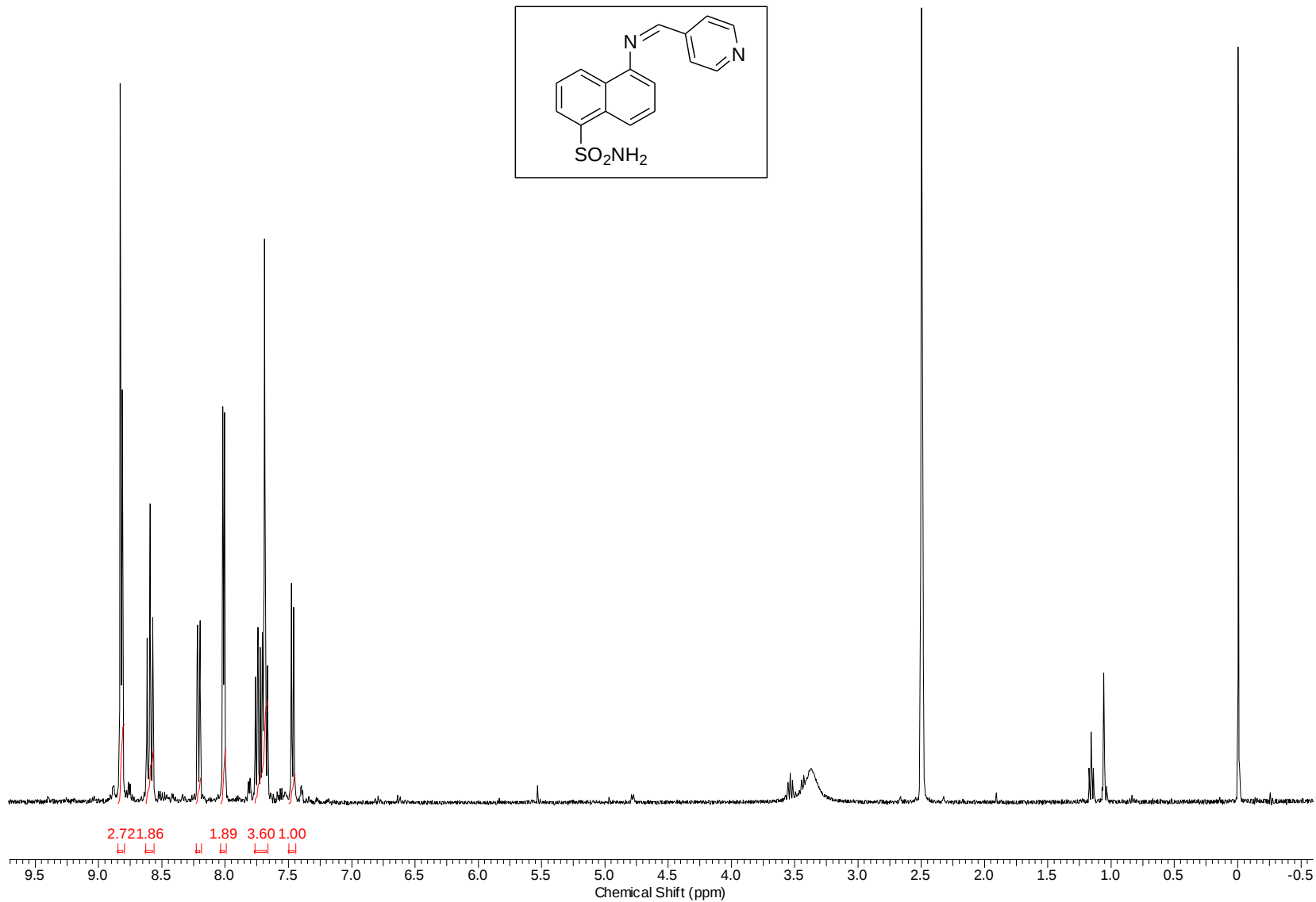
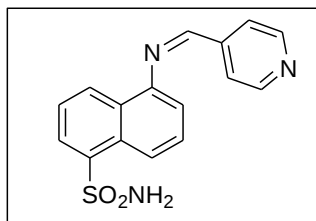
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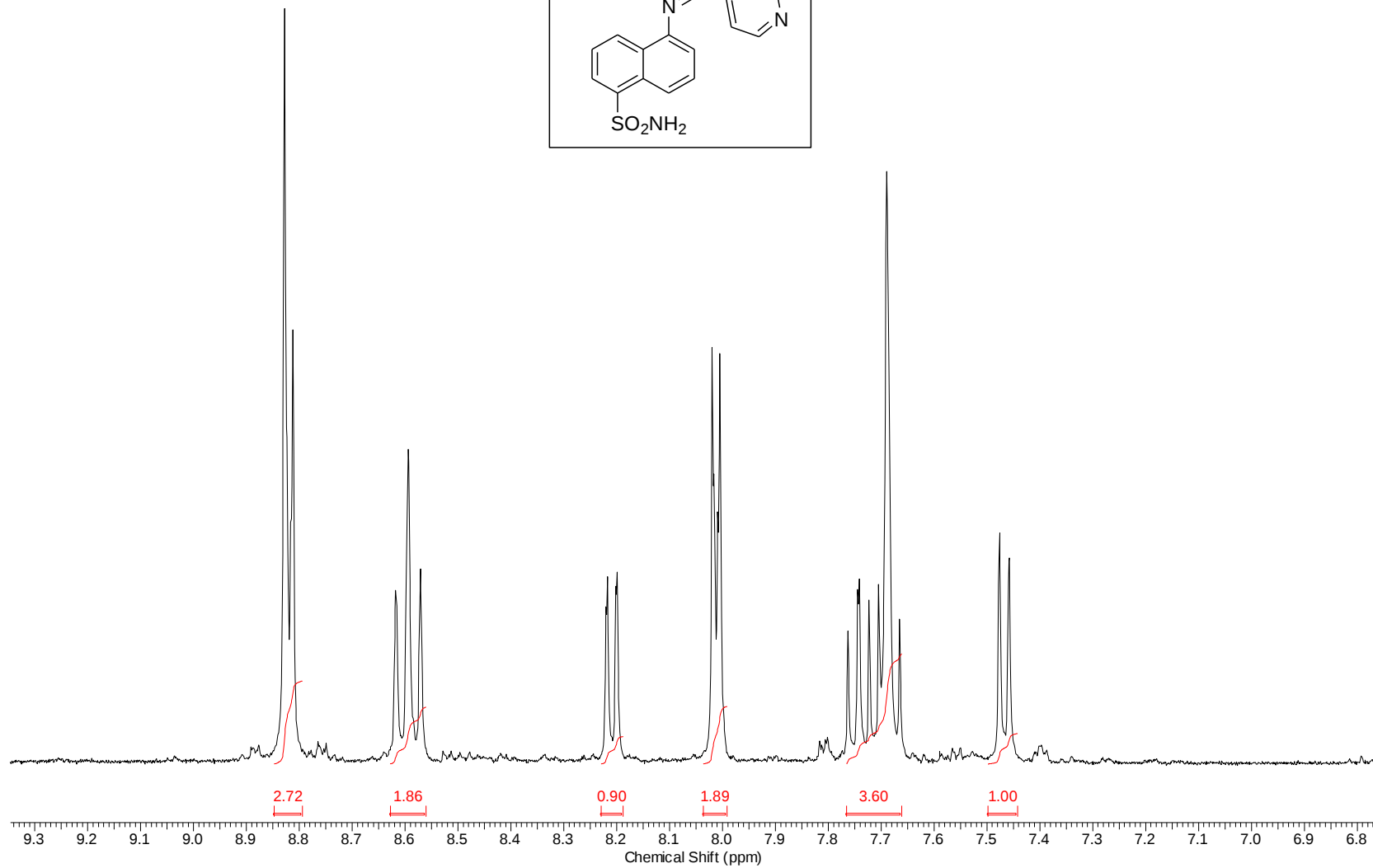
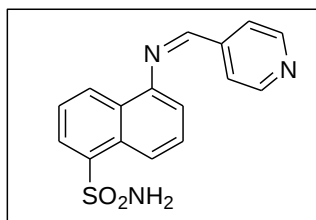
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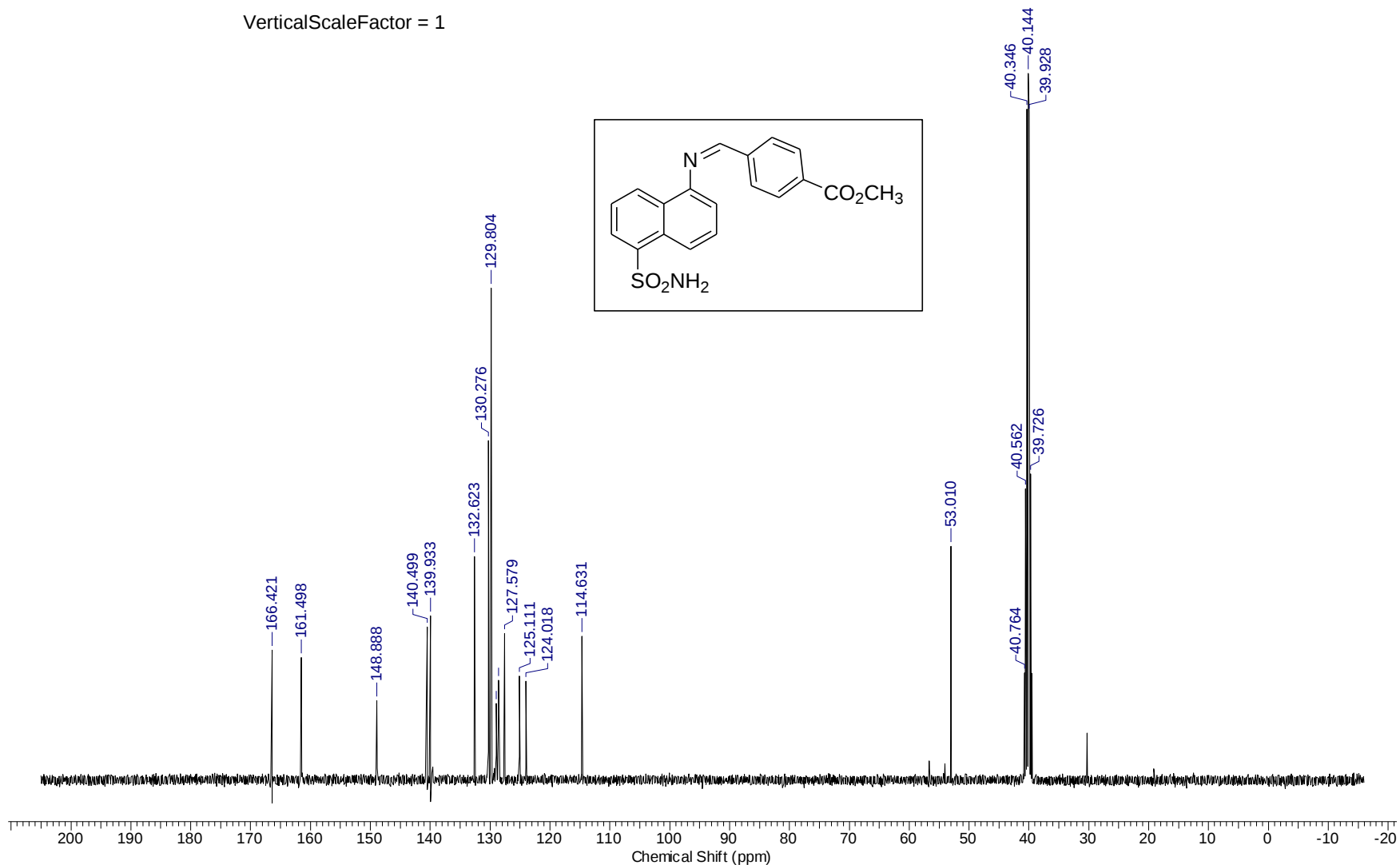


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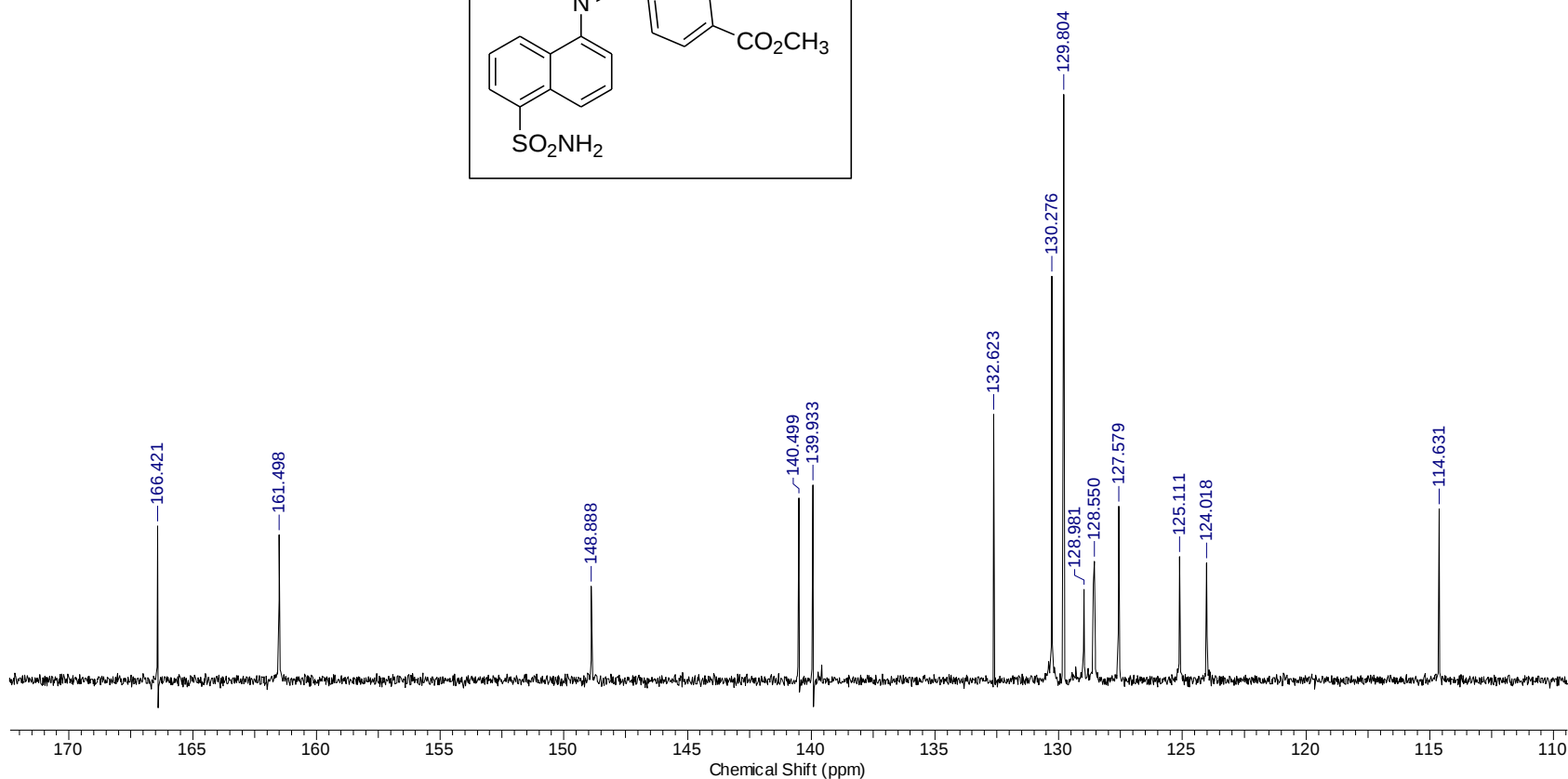
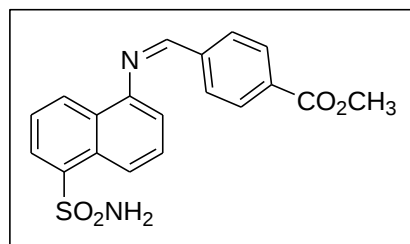
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Pulse Sequence	s2pul	Receiver Gain	60.00	Solvent	DMSO-d6
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000	Spectrum Offset (Hz)	9509.8994

VerticalScaleFactor = 1



Acquisition Time (sec)	0.7200	Comment	jb-2-79	Date	Oct 15 2006
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Pulse Sequence	s2pul	Receiver Gain	60.00	Solvent	DMSO-d6
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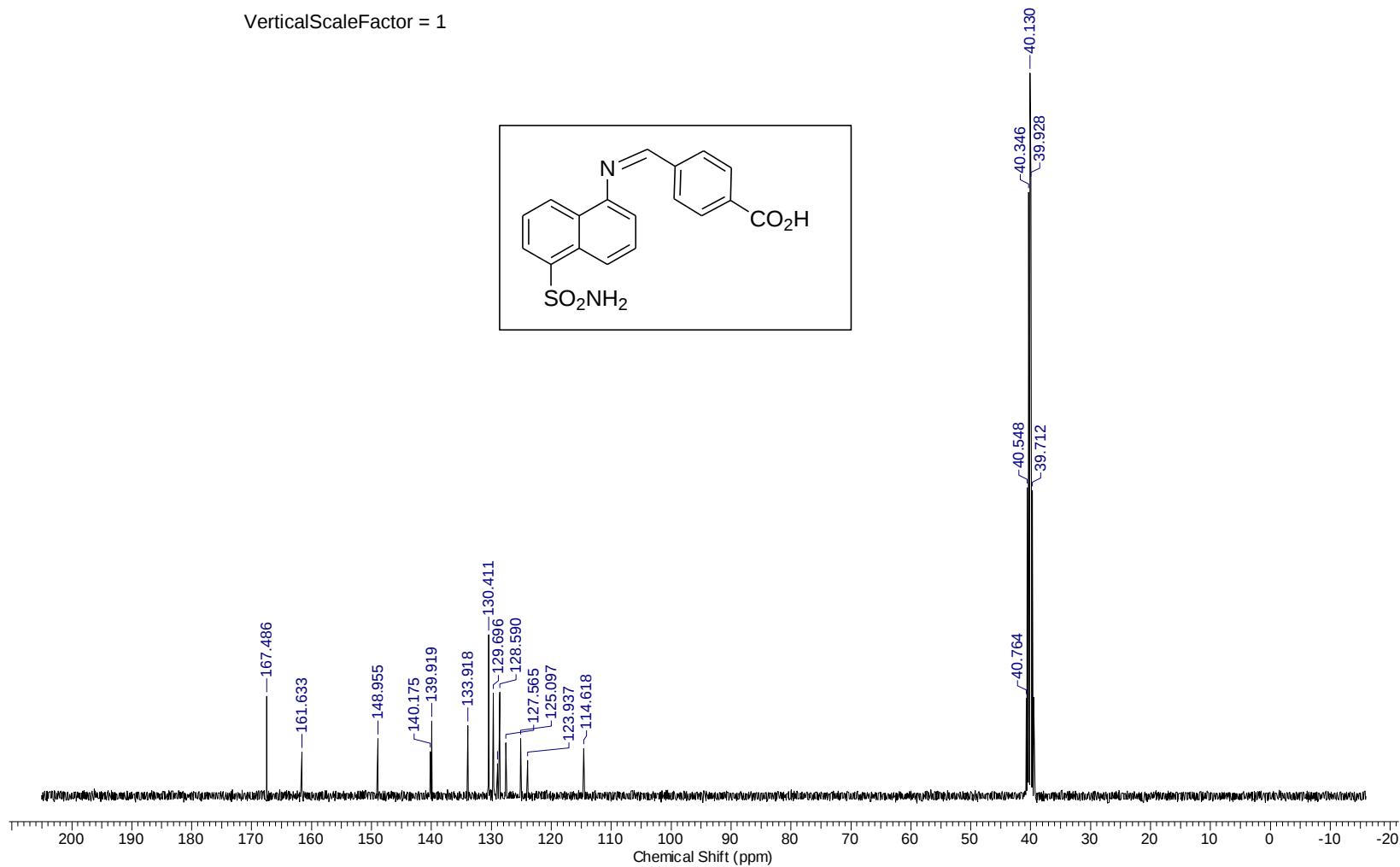
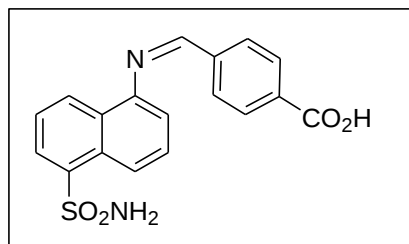


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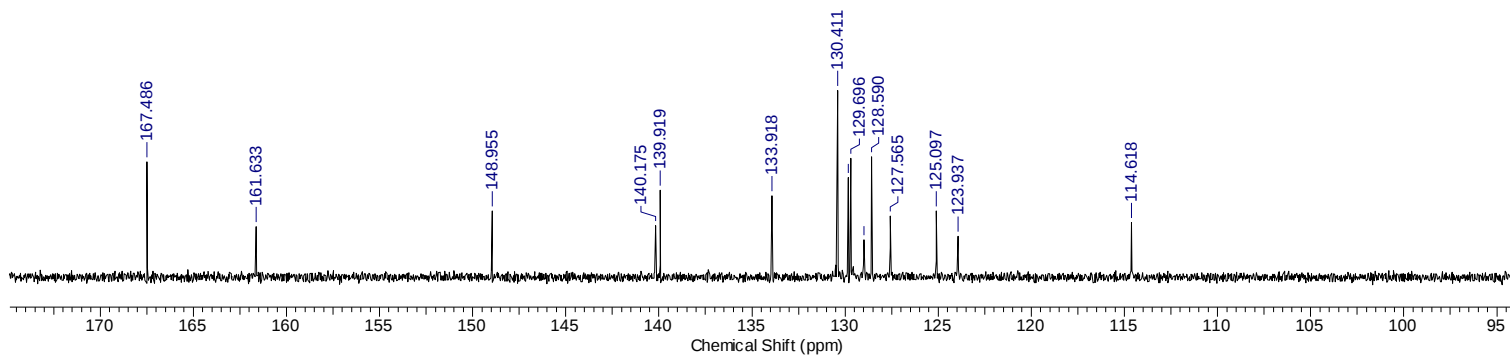
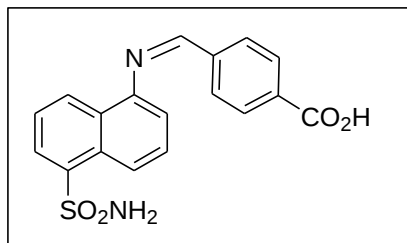


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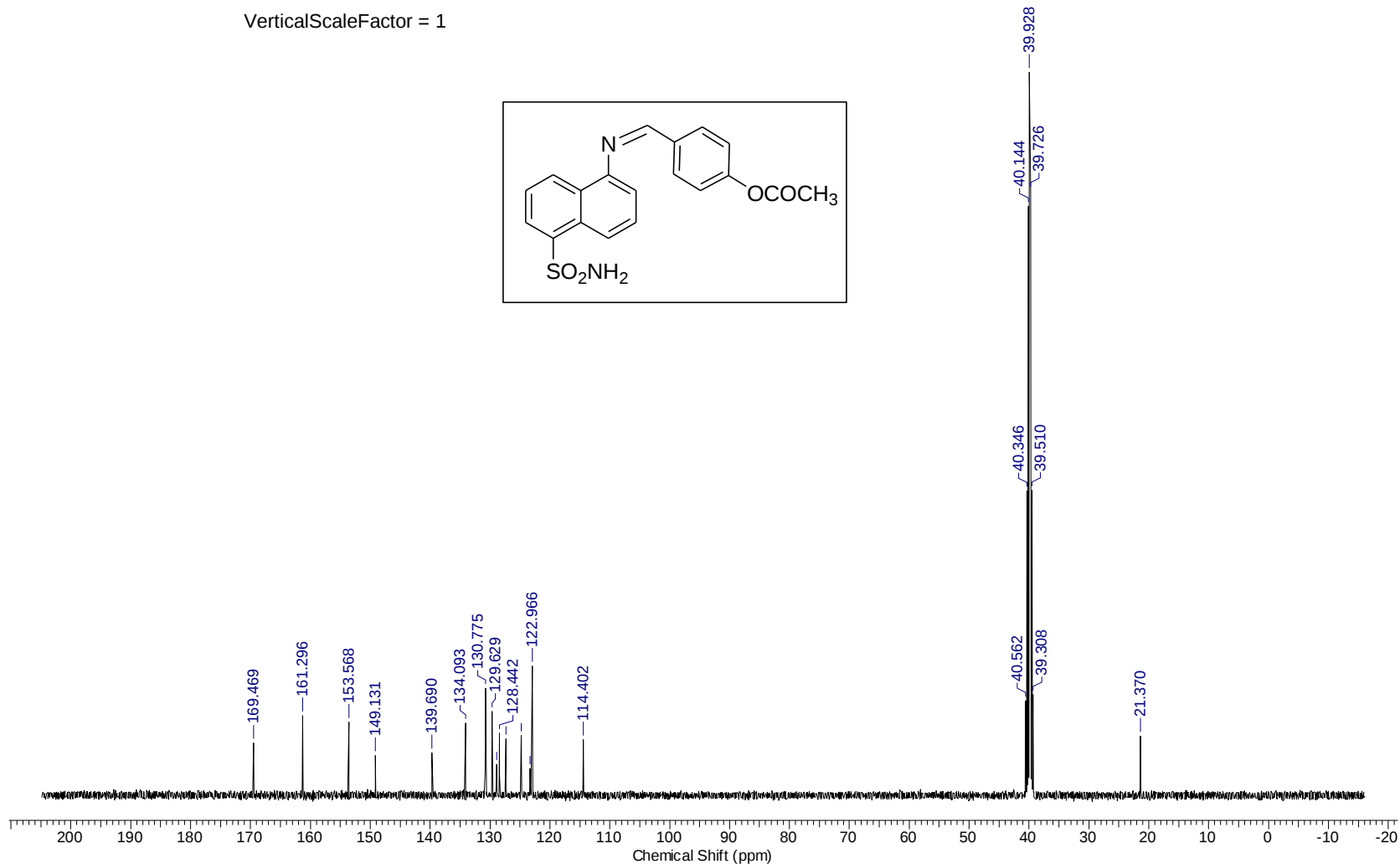
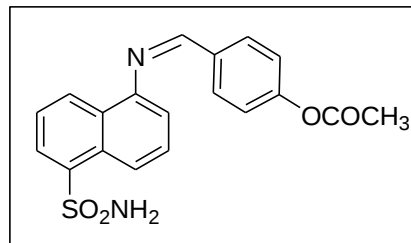


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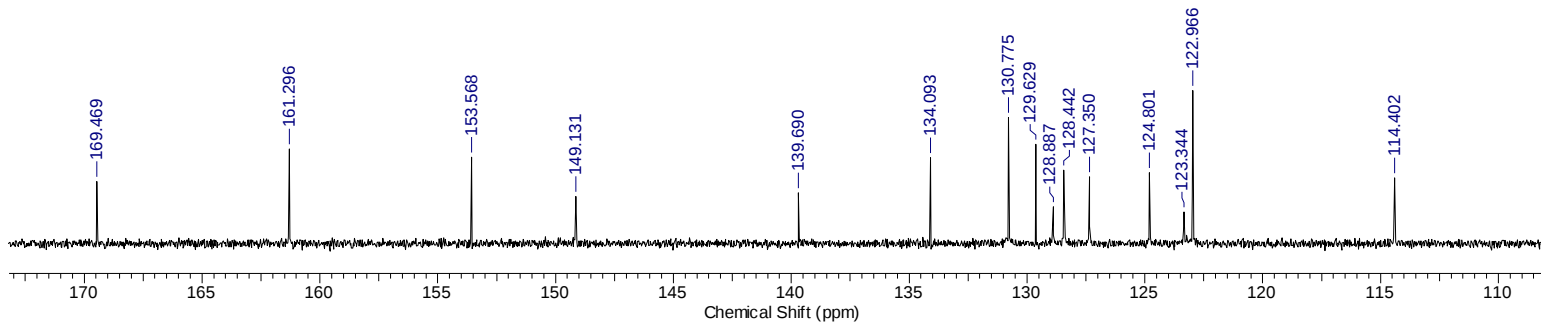
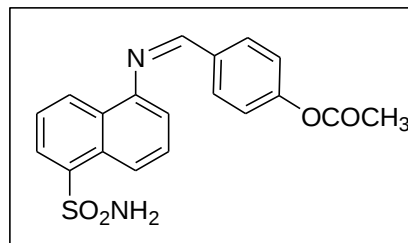


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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9493.6230	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

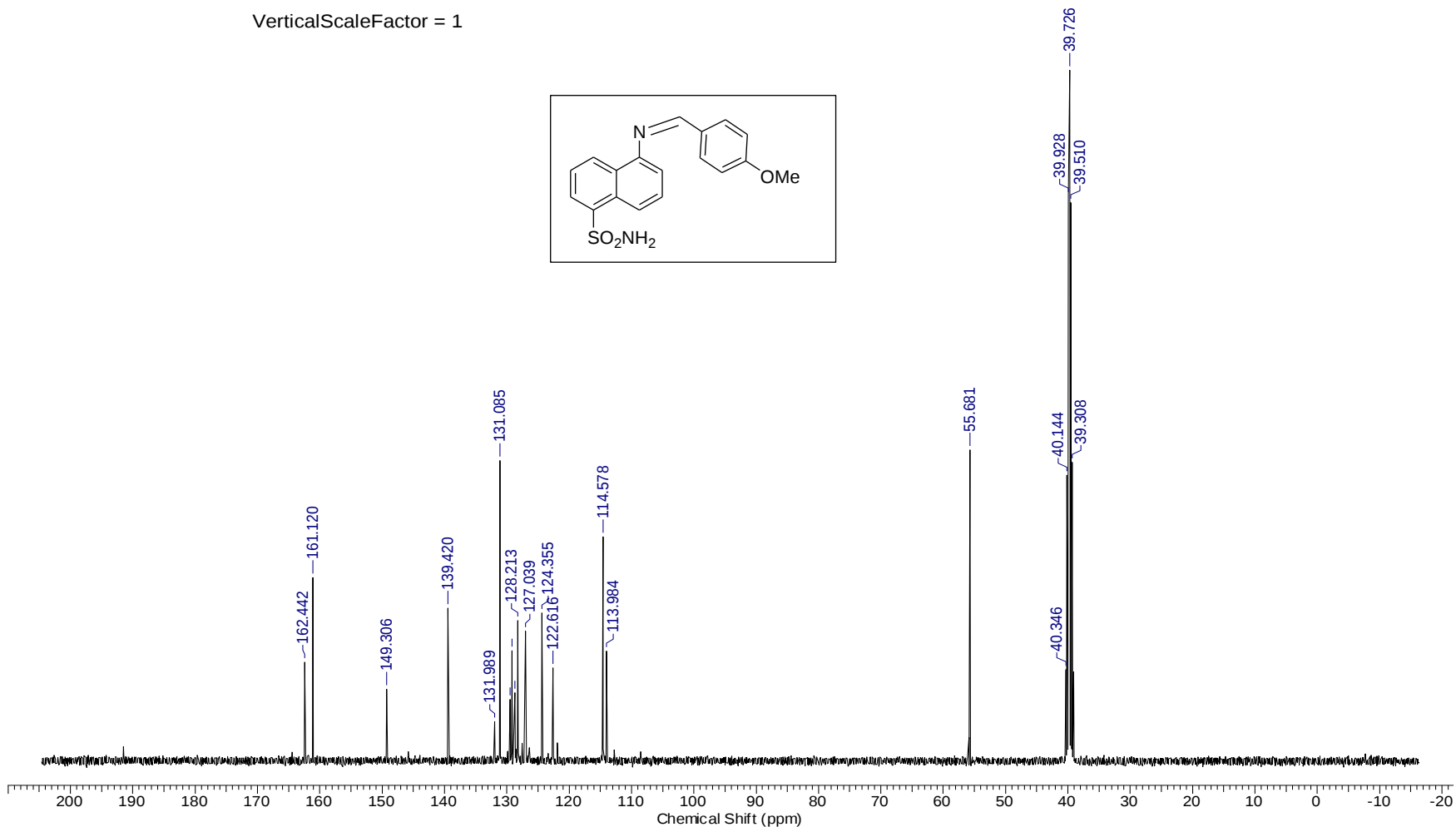
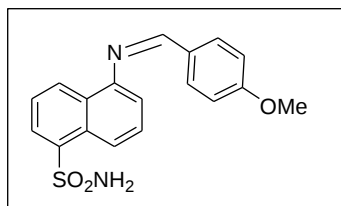


5d

12/15/2006 4:35 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-34	Date	Oct 20 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6600
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9467.8516	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

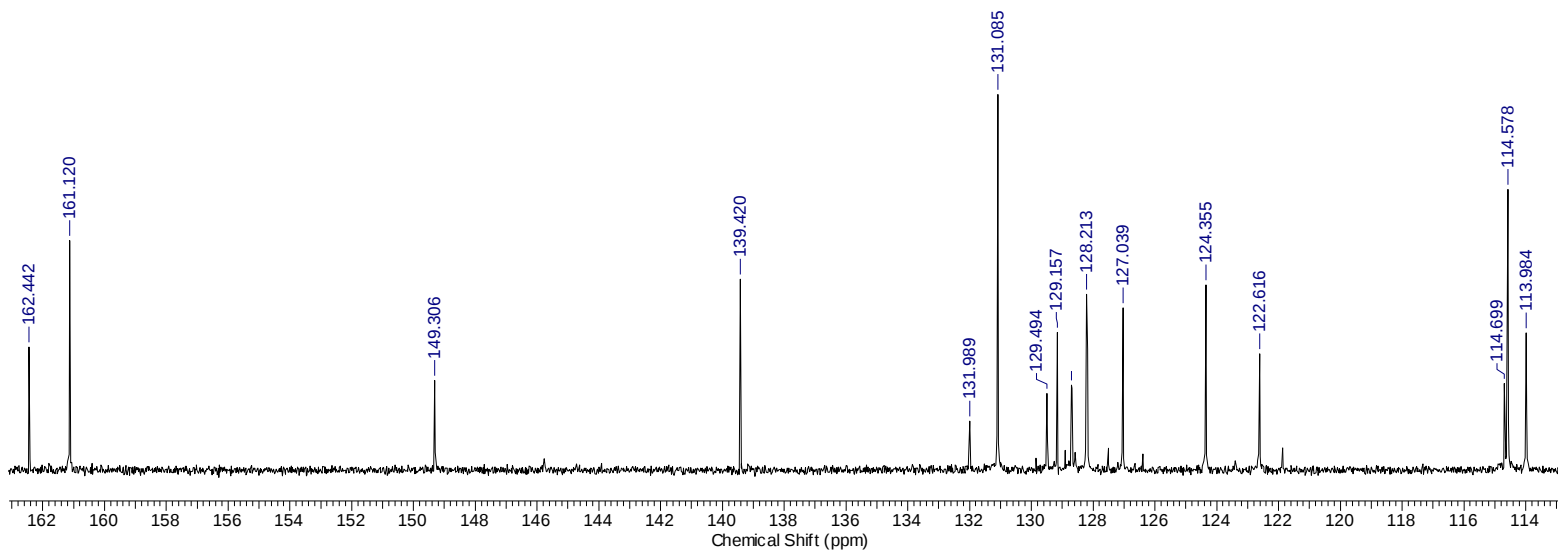
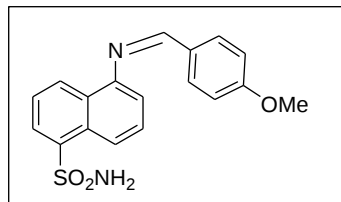


5d

12/15/2006 4:37 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-34	Date	Oct 20 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6600
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9467.8516	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

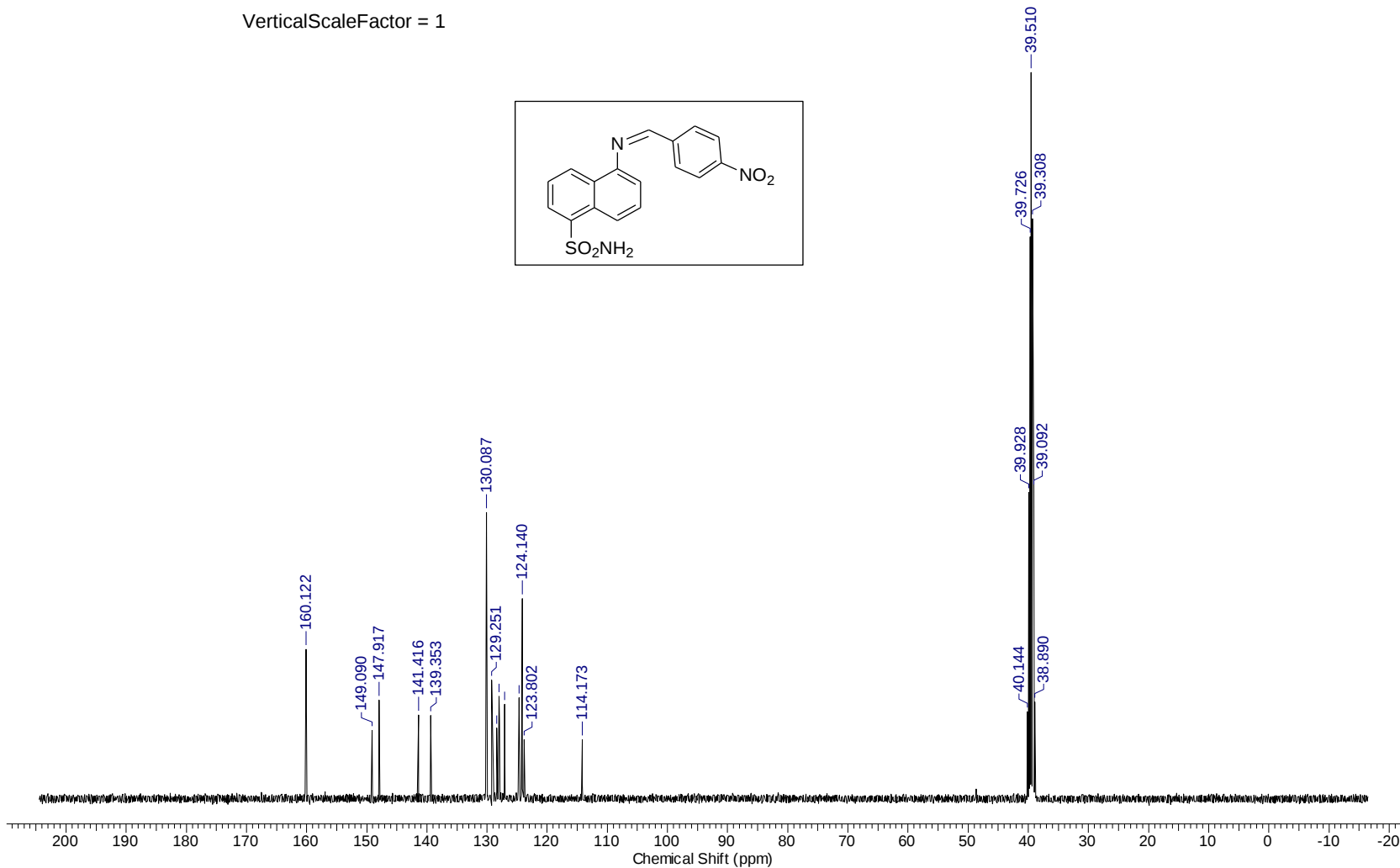
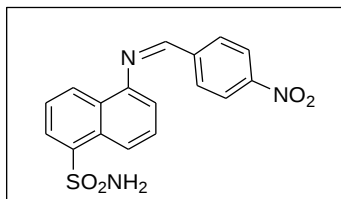


5e

12/15/2006 4:43 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-32	Date	Oct 3 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9451.5742	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

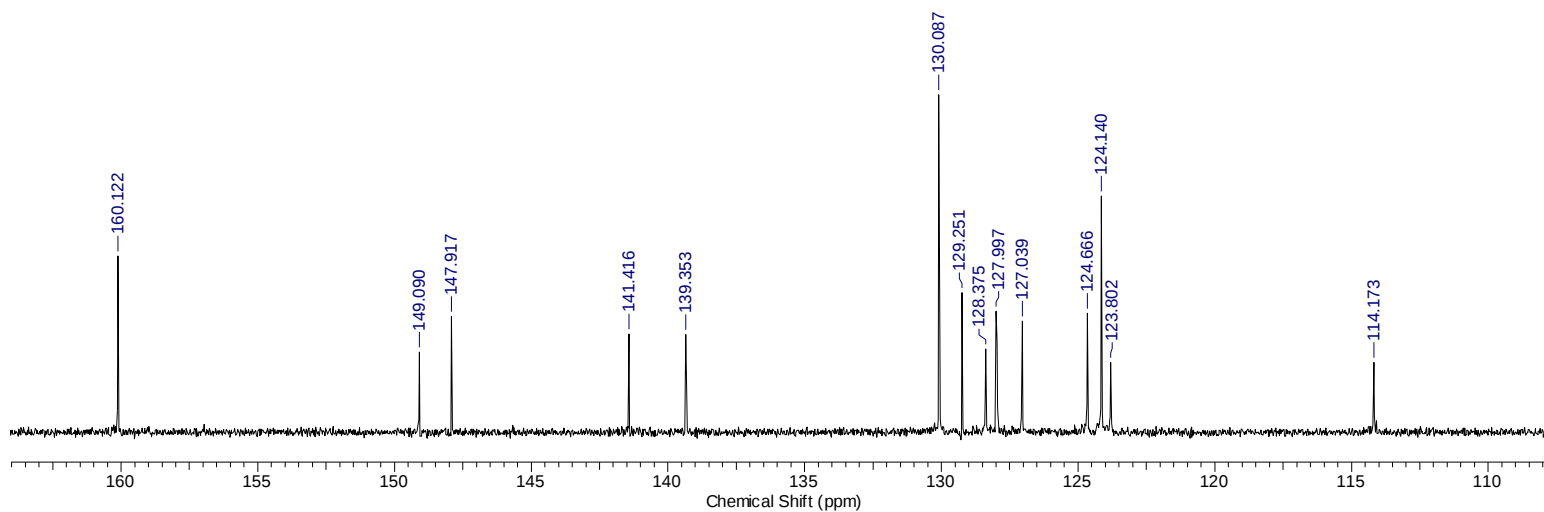
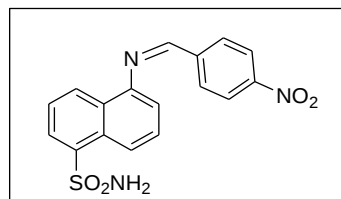


5e

12/15/2006 4:56 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-32	Date	Oct 3 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9451.5742	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

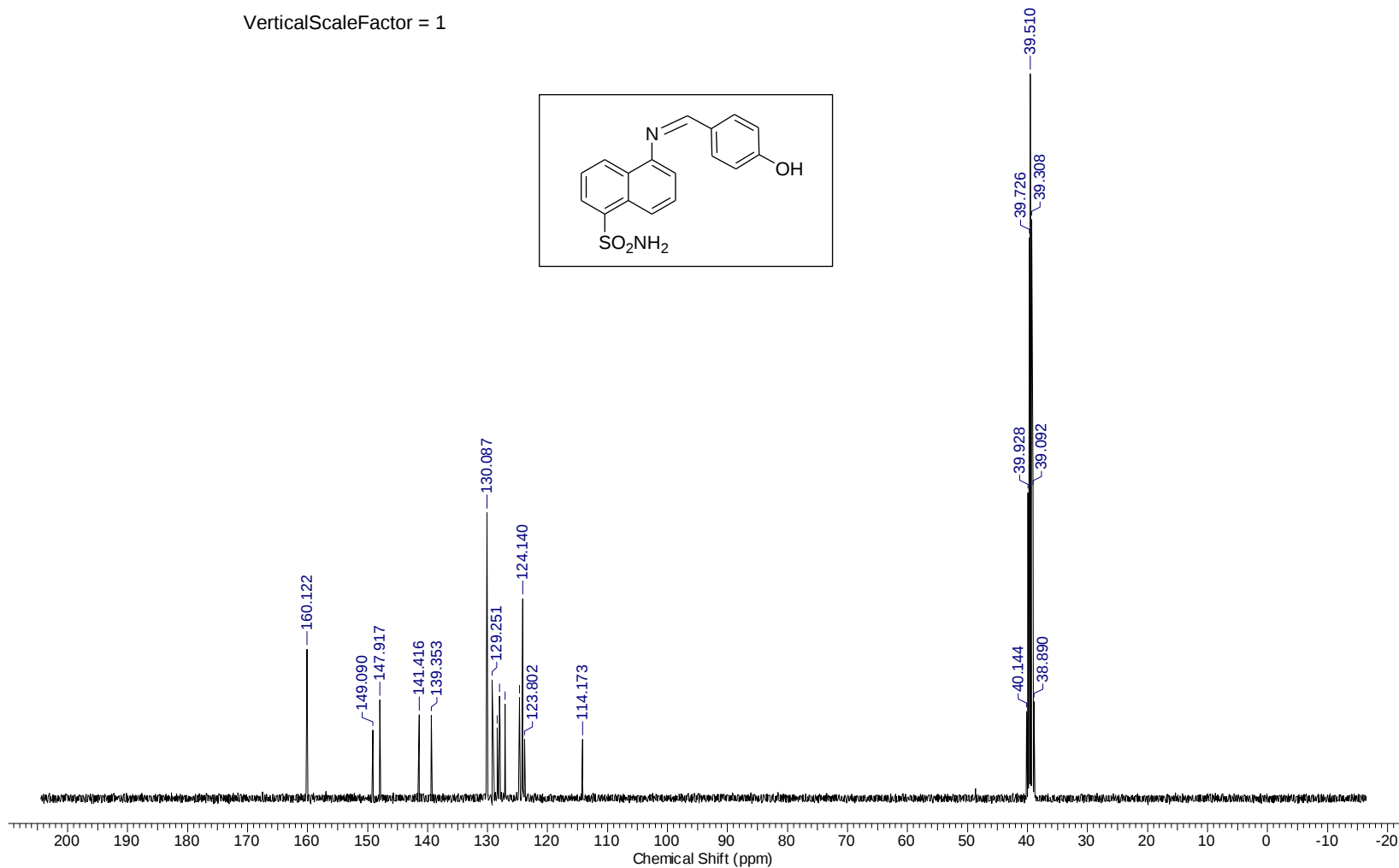
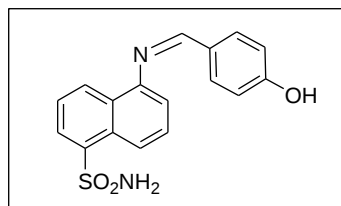


5f

12/15/2006 5:02 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-32	Date	Oct 3 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9451.5742	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

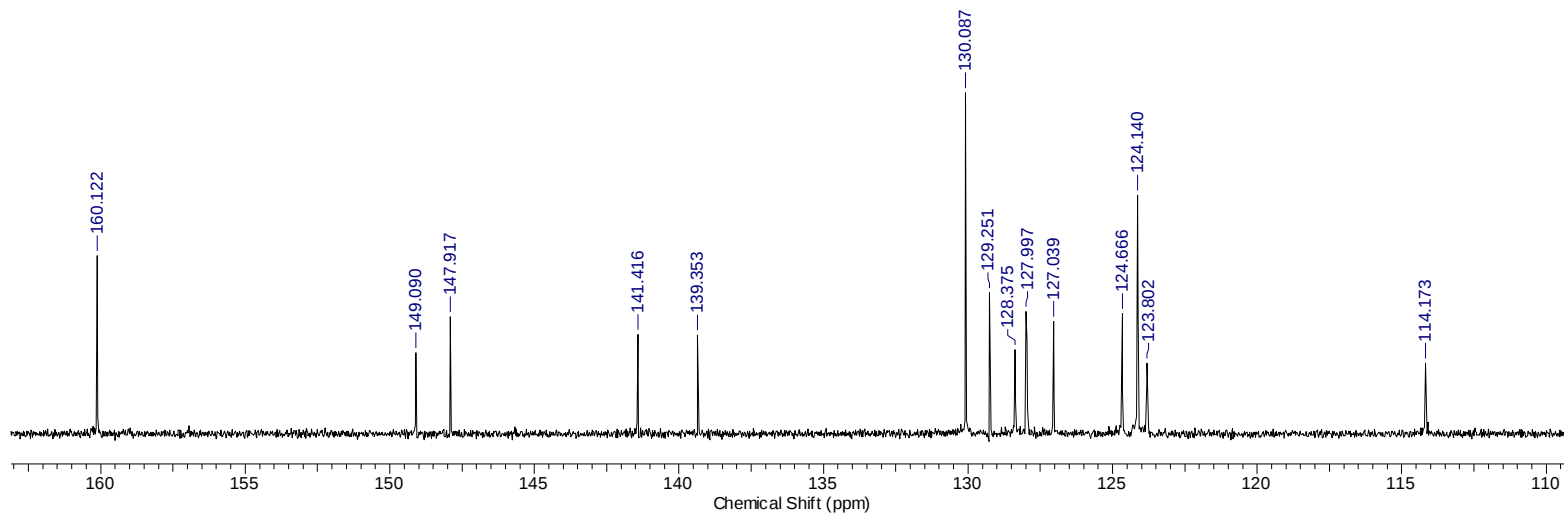
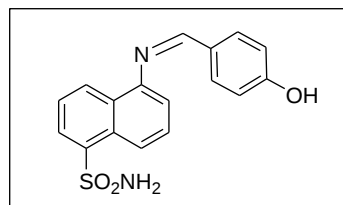


5f

12/15/2006 5:04 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-32	Date	Oct 3 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9451.5742	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

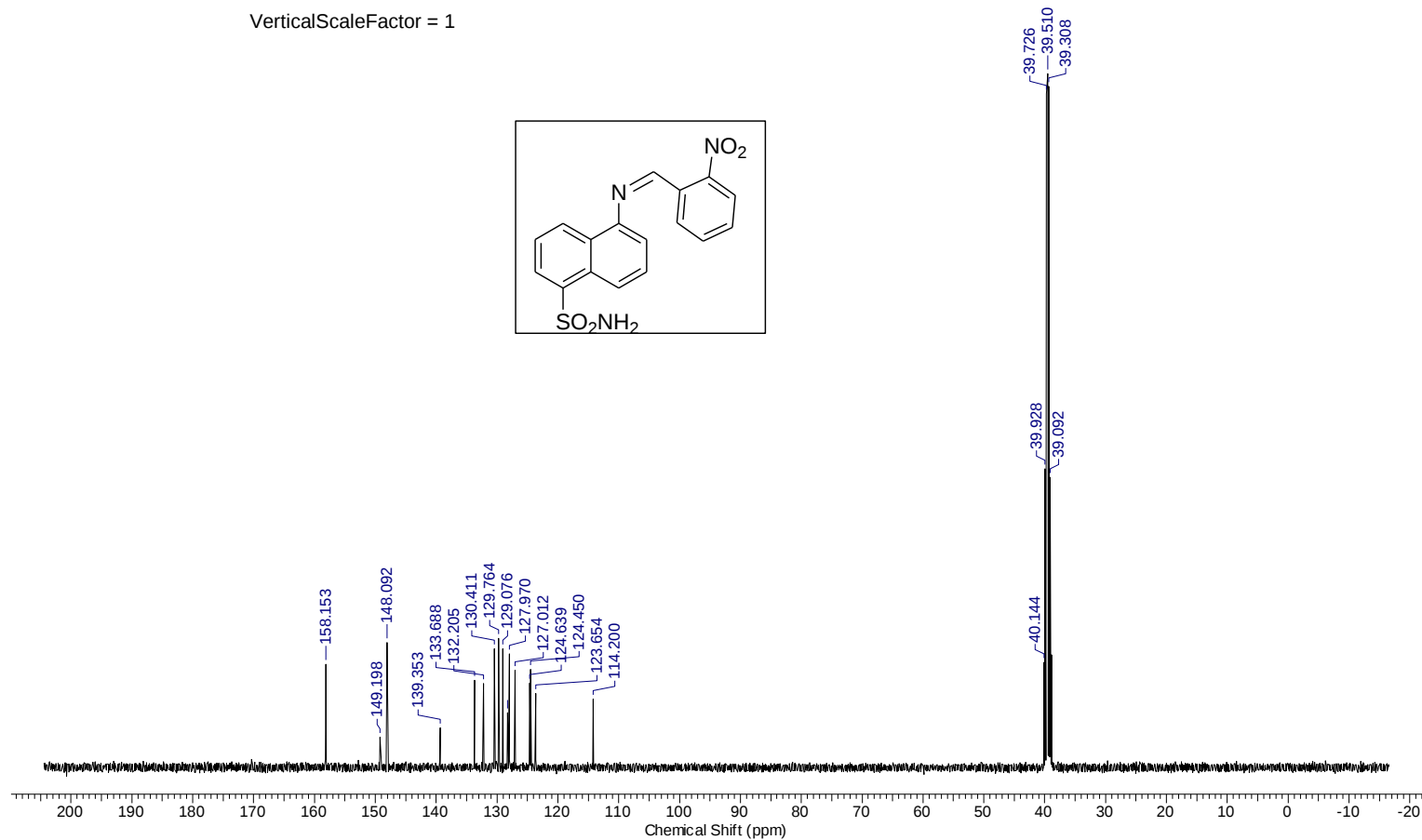
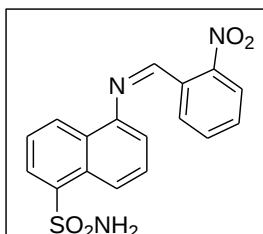


5h

12/15/2006 5:16 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-44	Date	Sep 28 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9447.5049
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

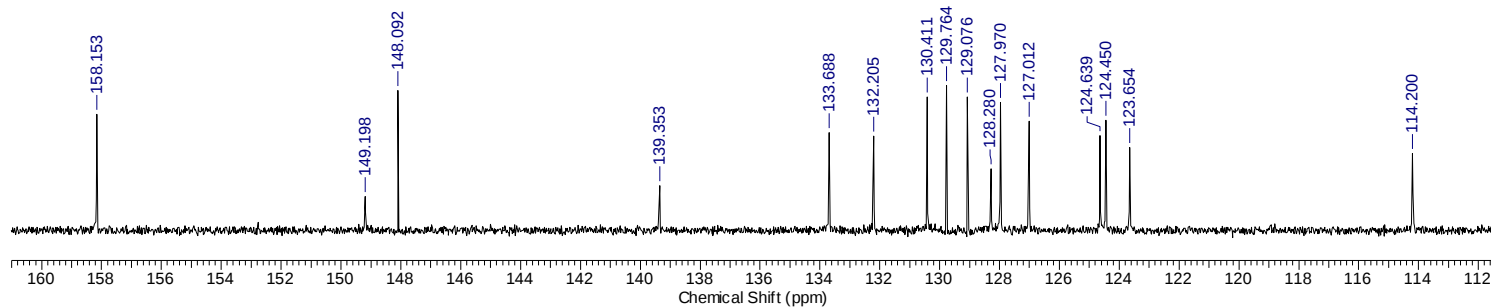
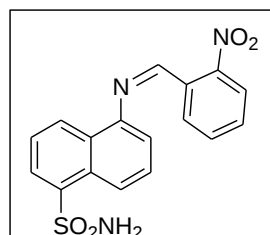


5h

12/15/2006 5:18 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-44	Date	Sep 28 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9447.5049
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

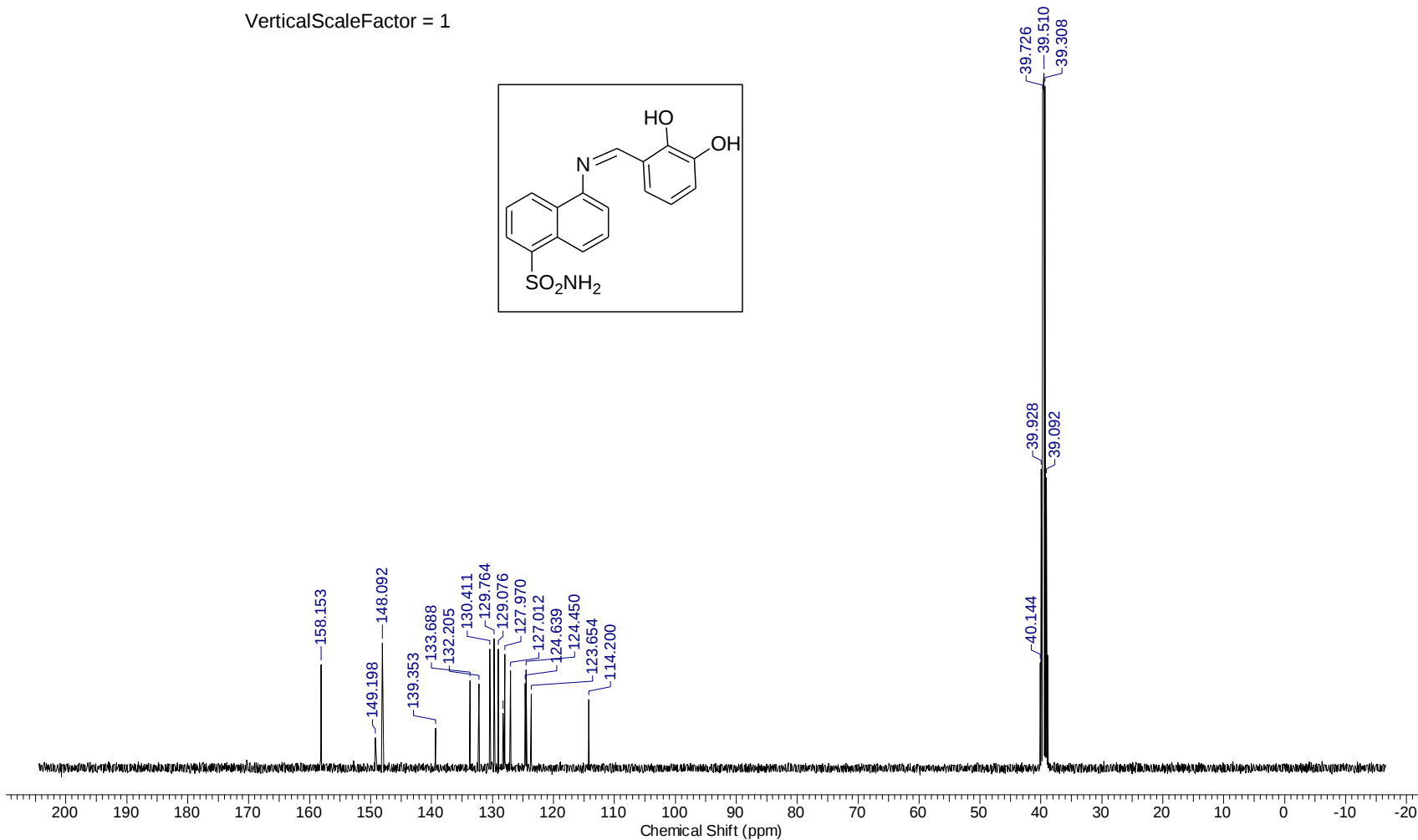
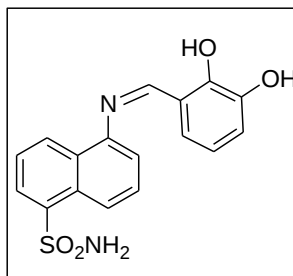


5i

12/15/2006 5:24 PM

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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9447.5049
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

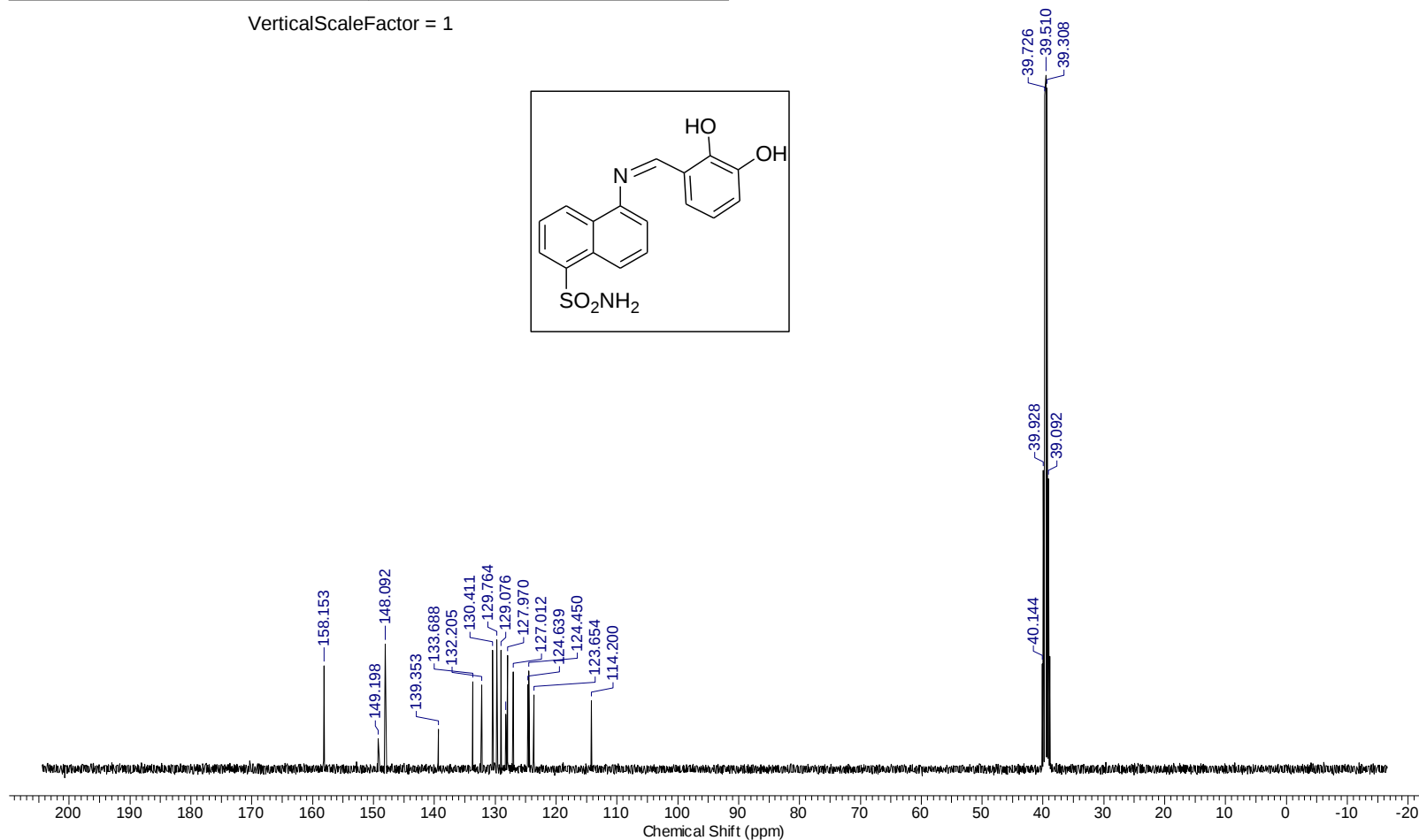
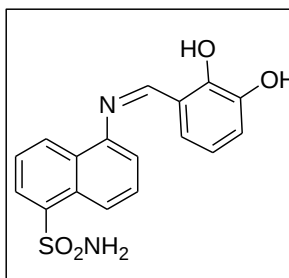


5i

12/15/2006 5:24 PM

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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6500
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9447.5049
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

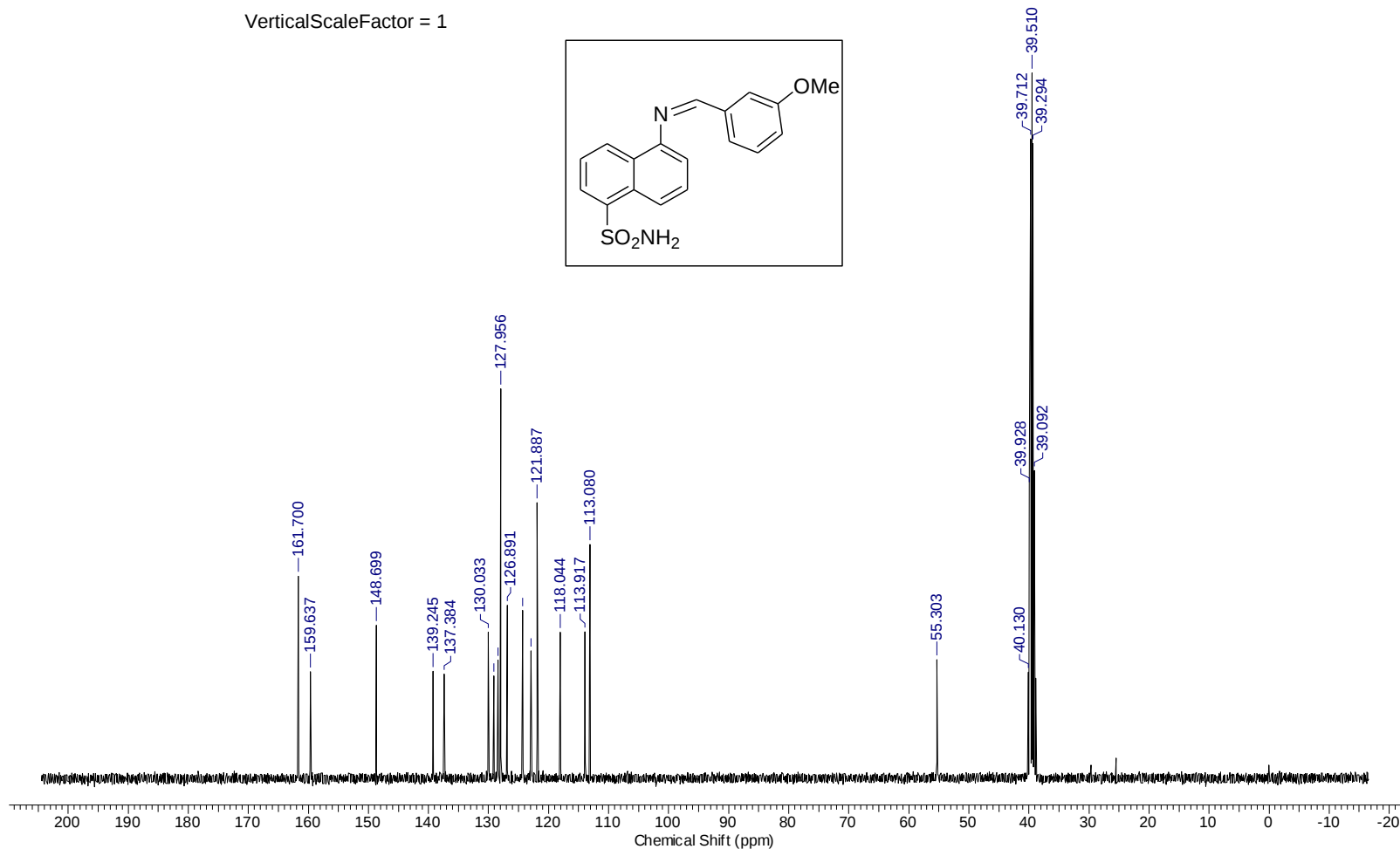
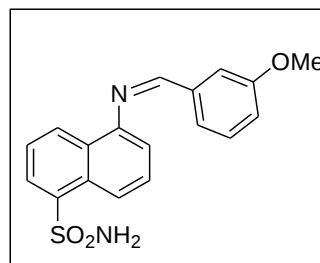


5j

12/15/2006 5:30 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-86	Date	Oct 16 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	5000
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
Original Points Count	16000				
Solvent	DMSO-d6				

VerticalScaleFactor = 1

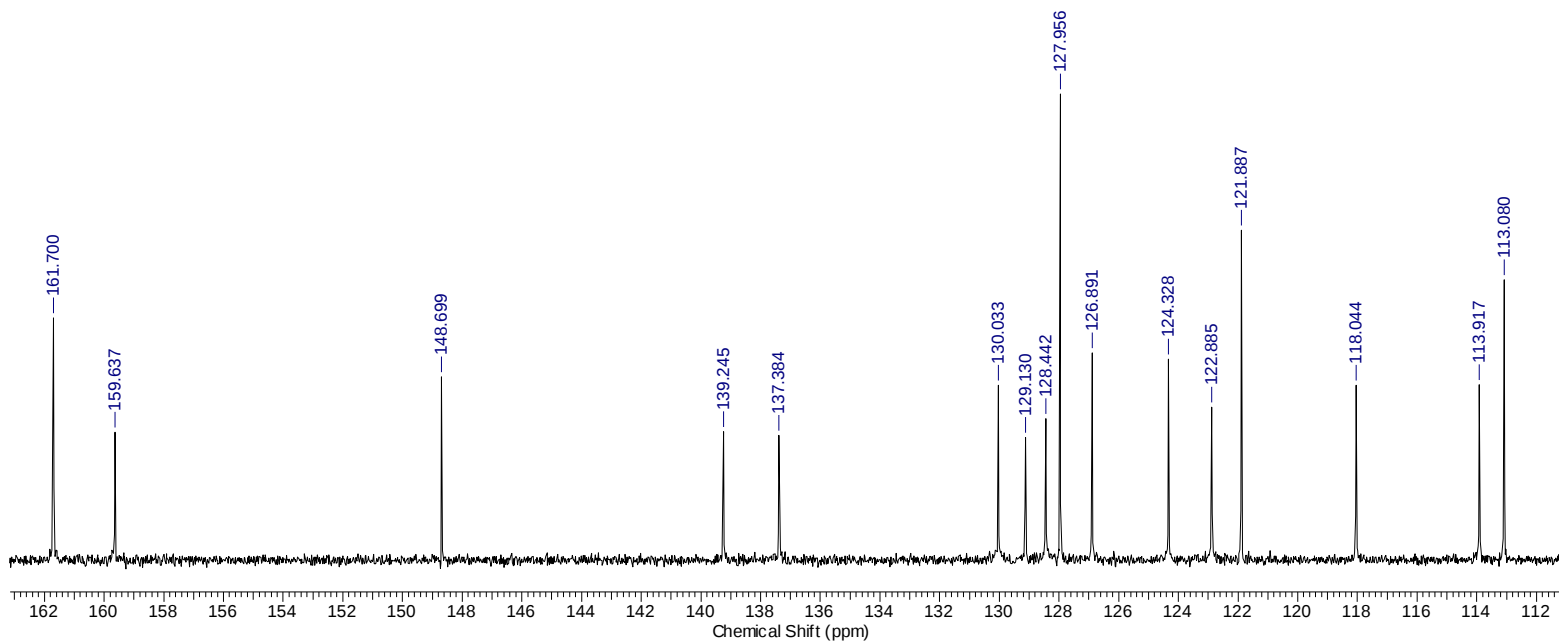
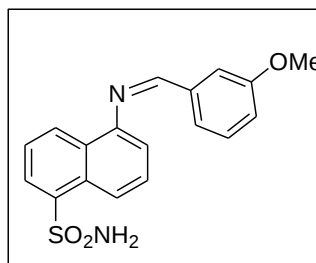


5j

12/15/2006 5:31 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-86	Date	Oct 16 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	5000
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

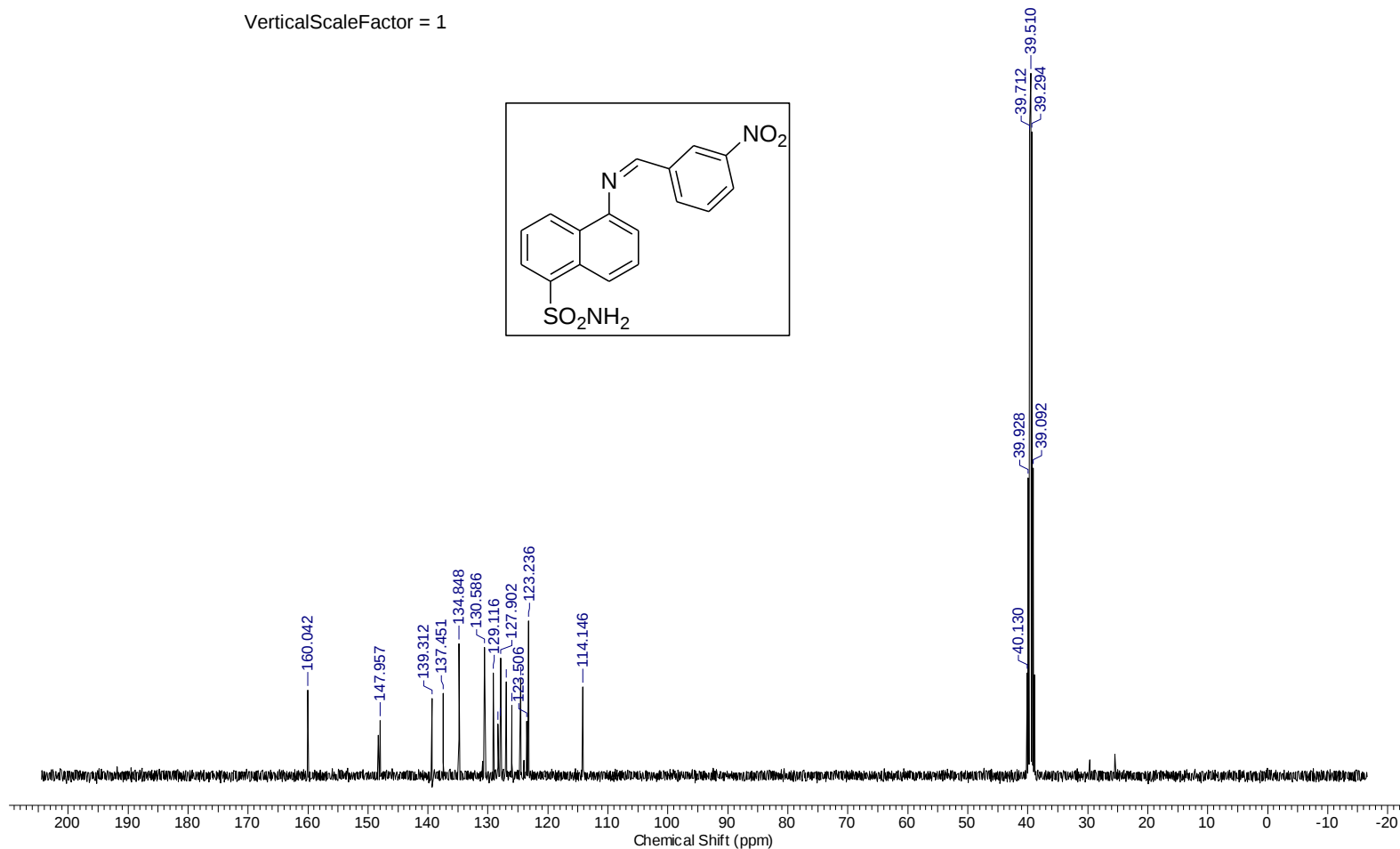
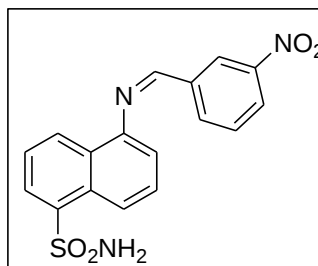


5k

12/15/2006 5:35 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-88	Date	Oct 17 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	4500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

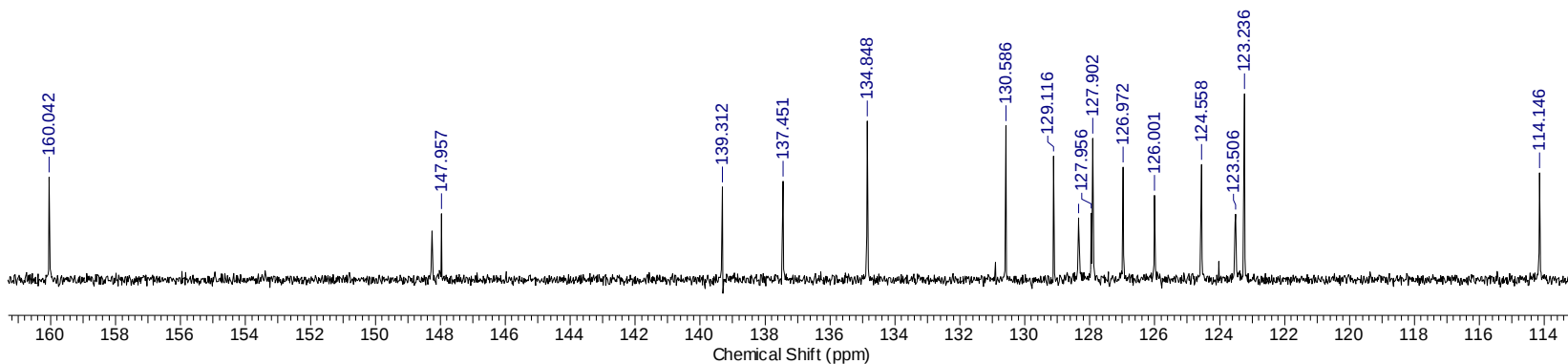
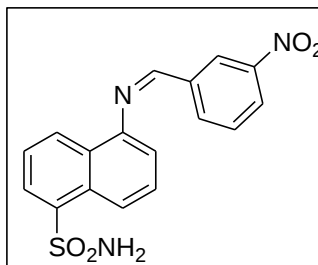


5k

12/15/2006 5:37 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-88	Date	Oct 17 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	4500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
		Original Points Count	16000	Solvent	
		DMSO-d6			

VerticalScaleFactor = 1

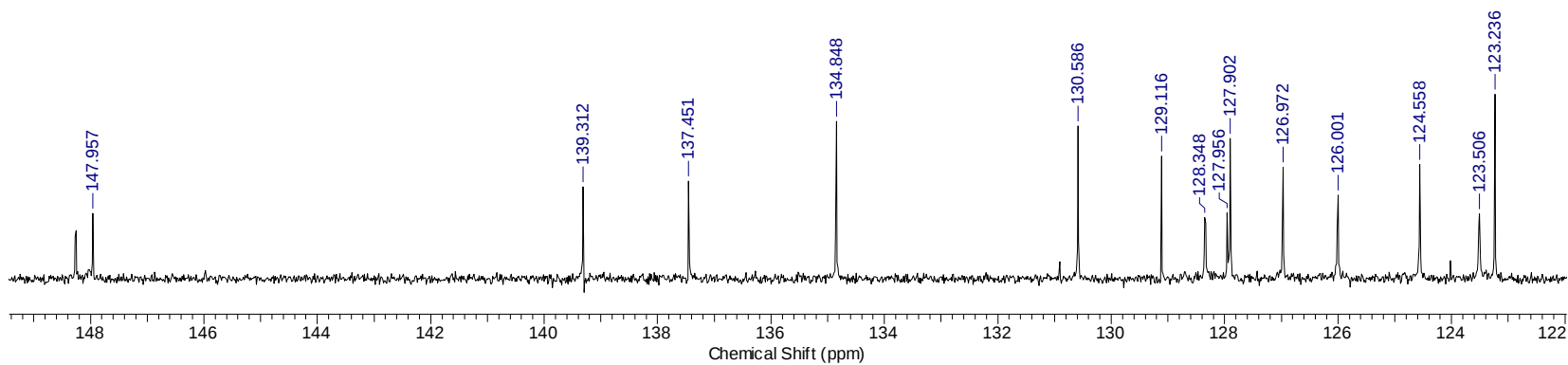
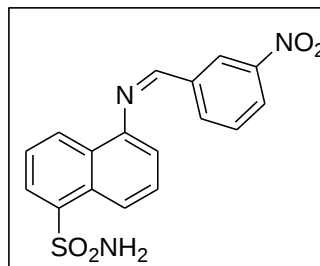


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12/15/2006 5:41 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-88	Date	Oct 17 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	4500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
Original Points Count	16000	Solvent	DMSO-d6		

VerticalScaleFactor = 1

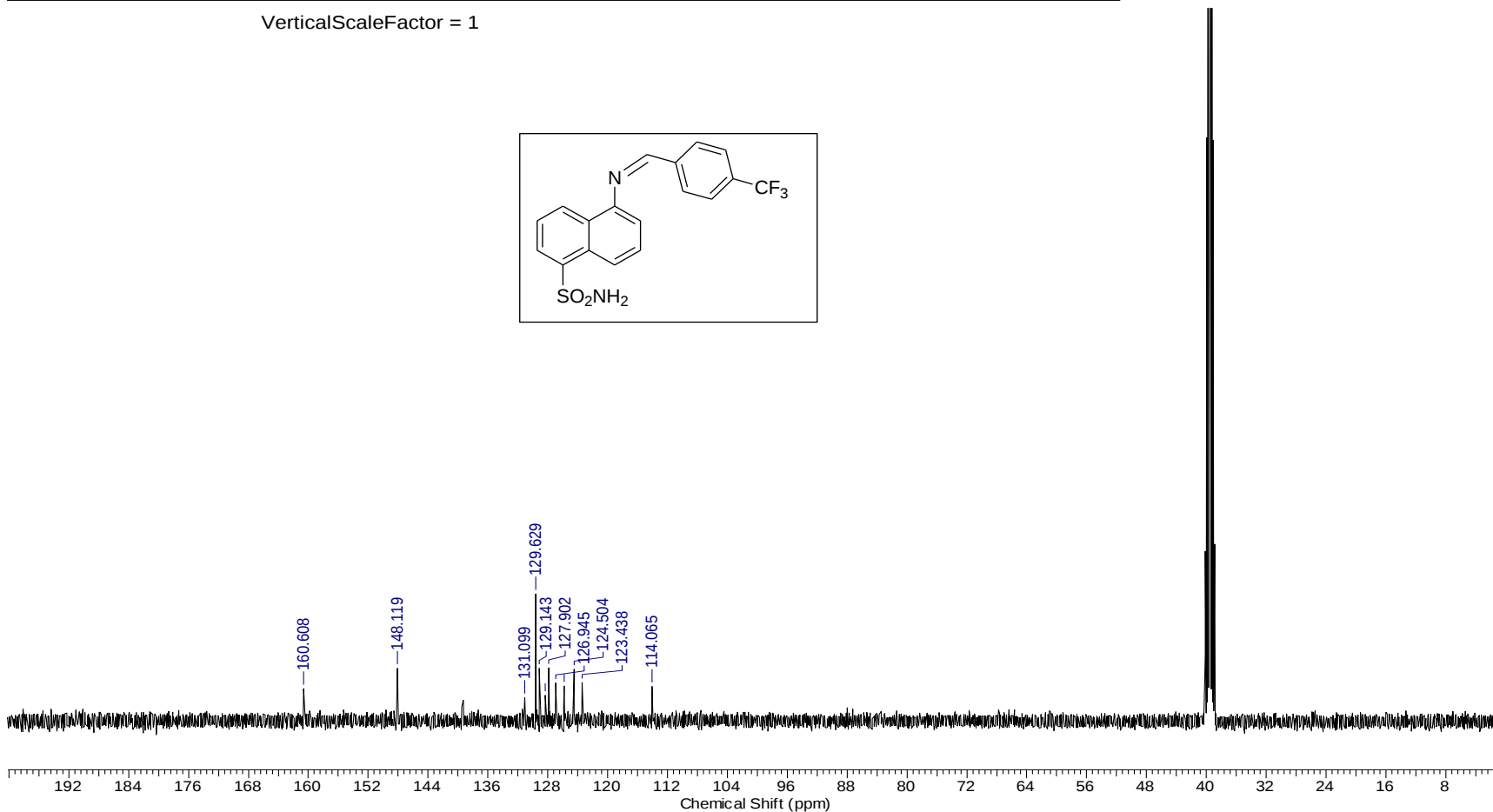
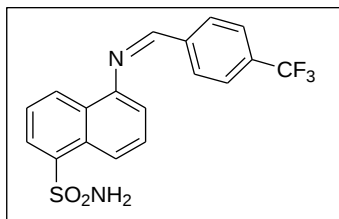


51

12/15/2006 5:52 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-90	Date	Oct 18 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	7000
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

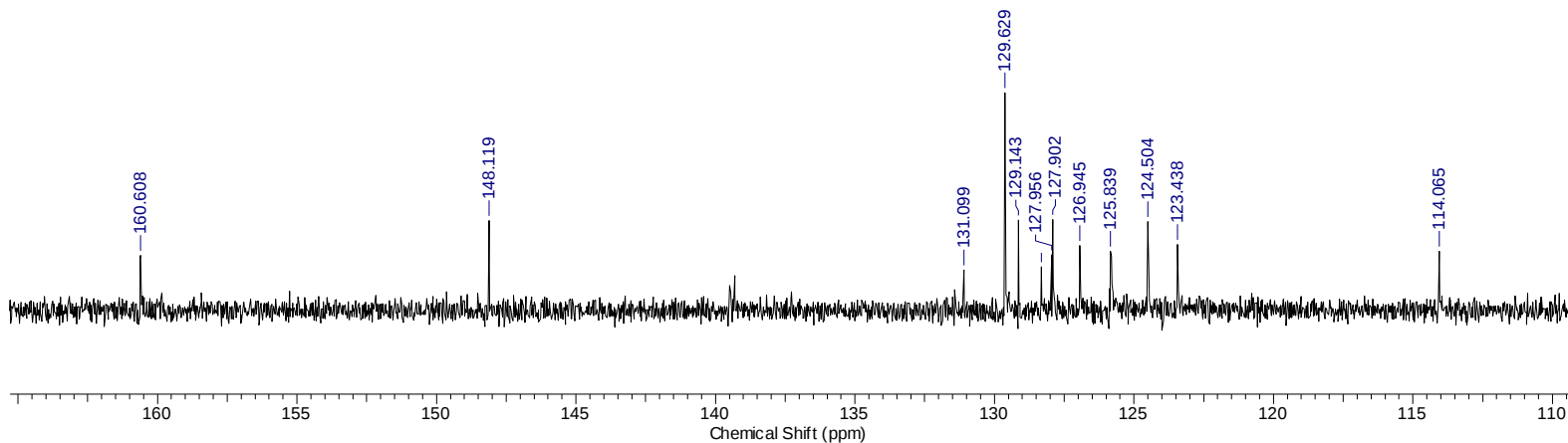
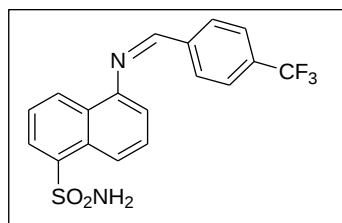


51

12/15/2006 5:54 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-90	Date	Oct 18 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	7000
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

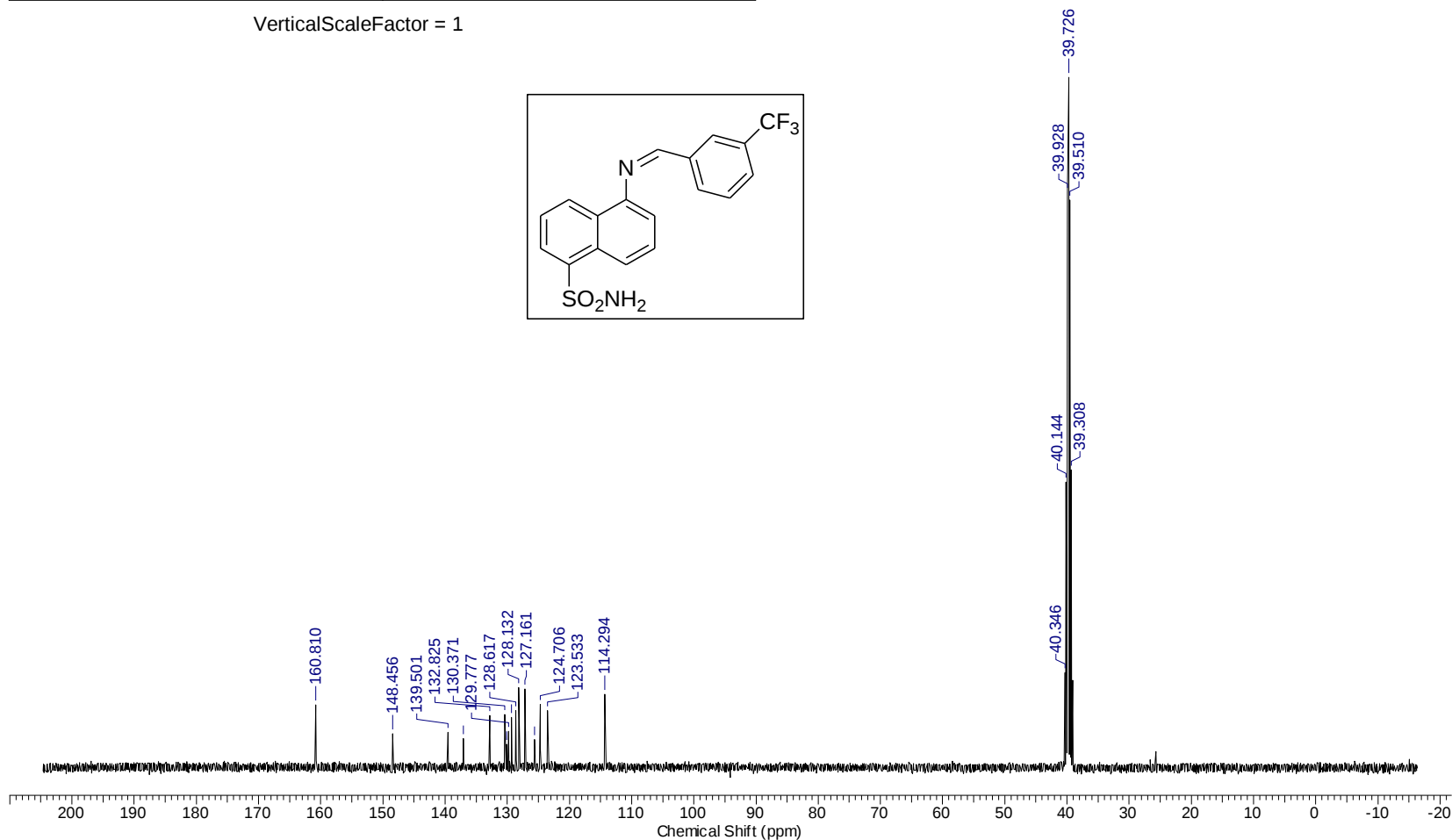
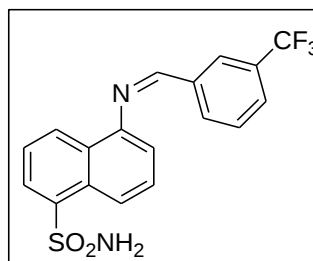


5m

12/15/2006 6:06 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-89	Date	Oct 19 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	5000
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9467.8516
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

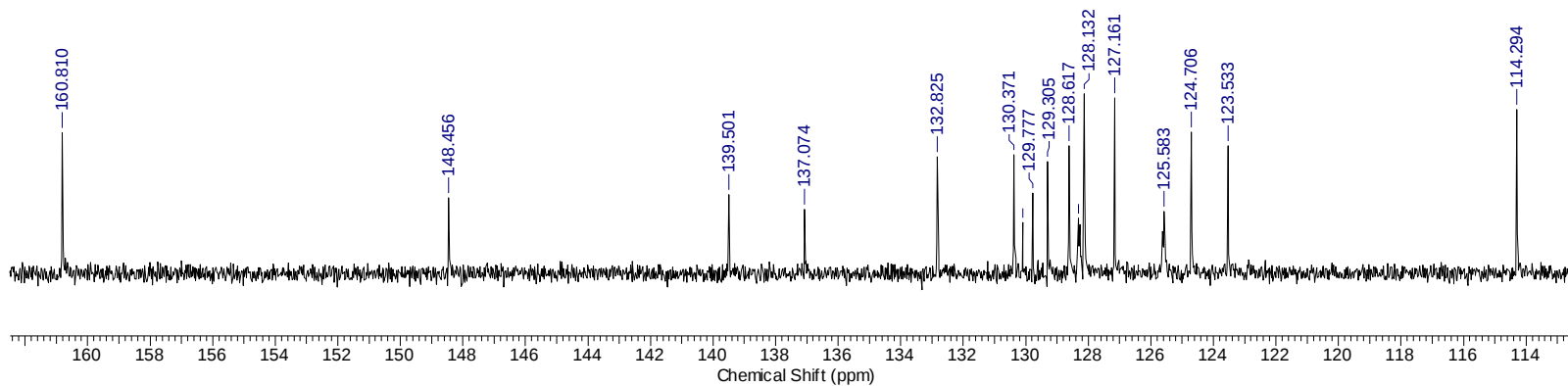
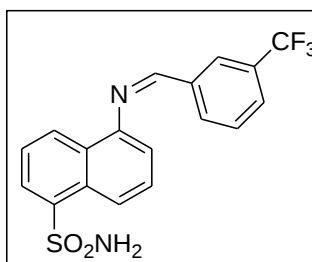


5m

12/15/2006 6:09 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-89	Date	Oct 19 2006
File Name	C:\DOCUMENTS AND SETTINGS\SMALLIK.52035000-174531\MY DOCUMENTS\JAYATI\NMR_DATA\JB-2-84-13C.FID\JB-2-37-13C.FID\JB-2-34-13C.FID\JB-2-32.FID\JB-2-42.FID\JB-2-44-13C.FID\JB-2-86.FID\JB-2-88-13C.FID\JB-2-90-13C.FID\JB-1-89-1ST.FID\JB-2-89-13C				
Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	5000
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9467.8516
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

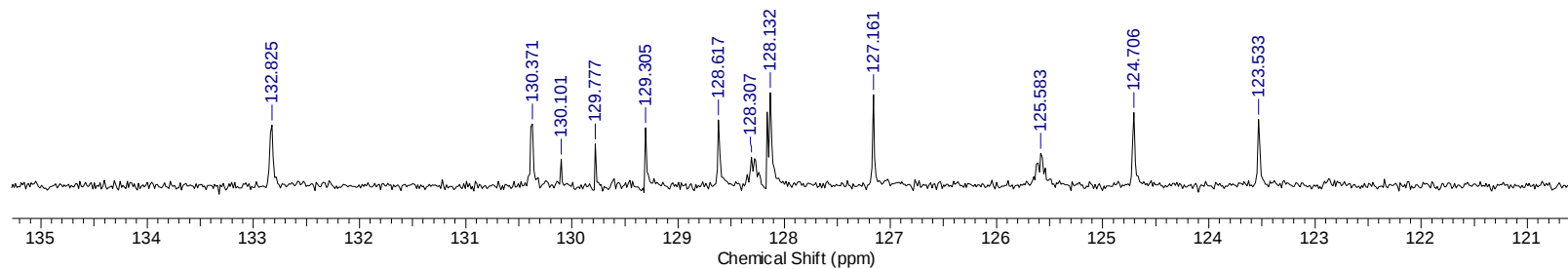
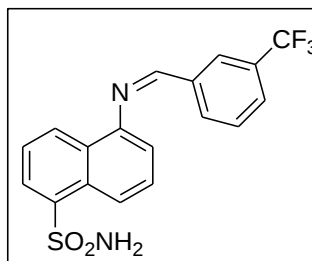


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12/15/2006 6:10 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-89	Date	Oct 19 2006
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Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	5000
Original Points Count	16000	Points Count	16384	Pulse Sequence	s2pul
Receiver Gain	60.00	Solvent	DMSO-d6	Spectrum Offset (Hz)	9467.8516
Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000		

VerticalScaleFactor = 1

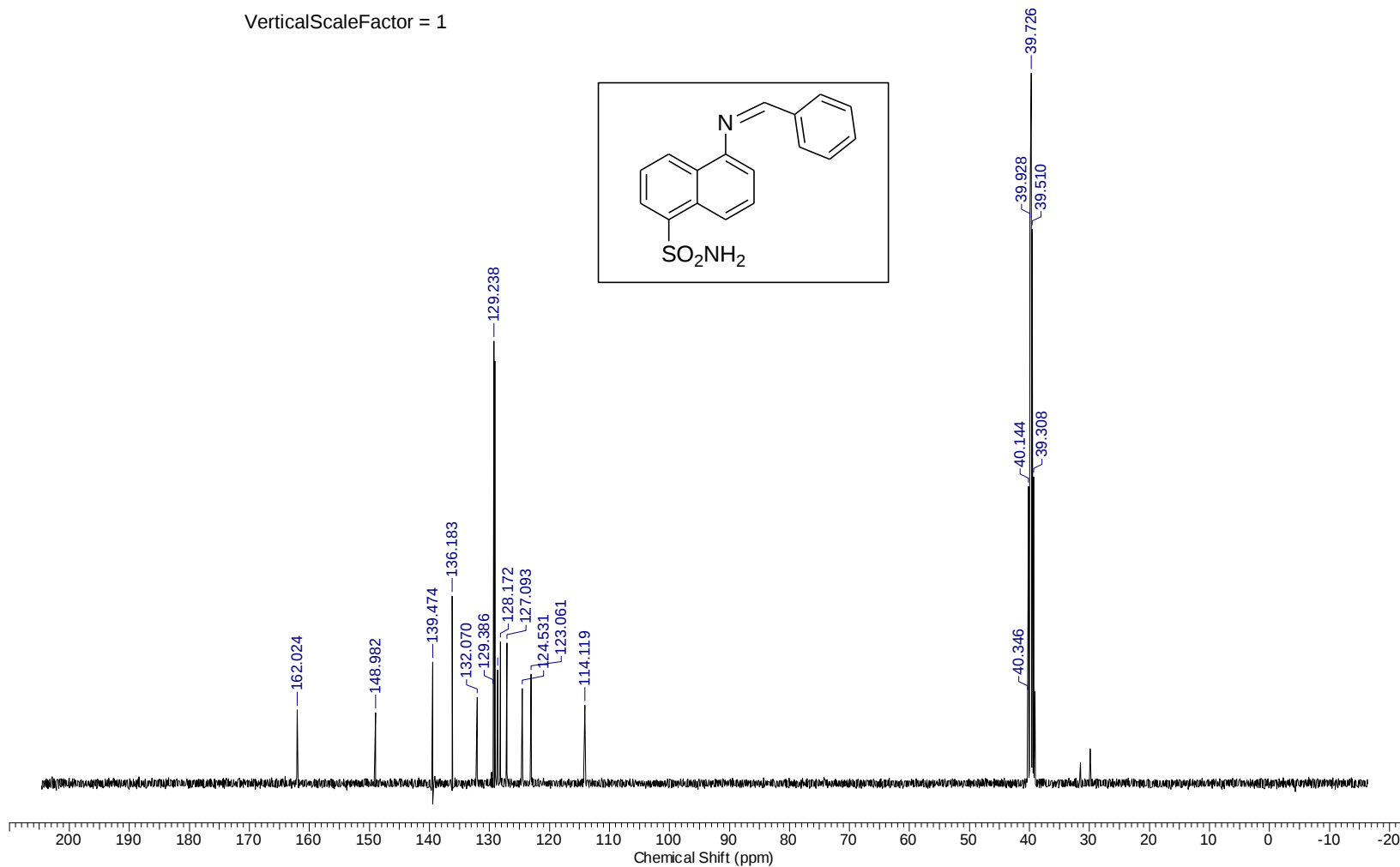
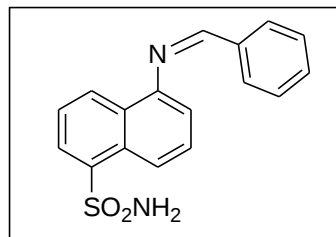


5n

12/15/2006 6:21 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-76	Date	Oct 5 2006
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6000
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9467.8516	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

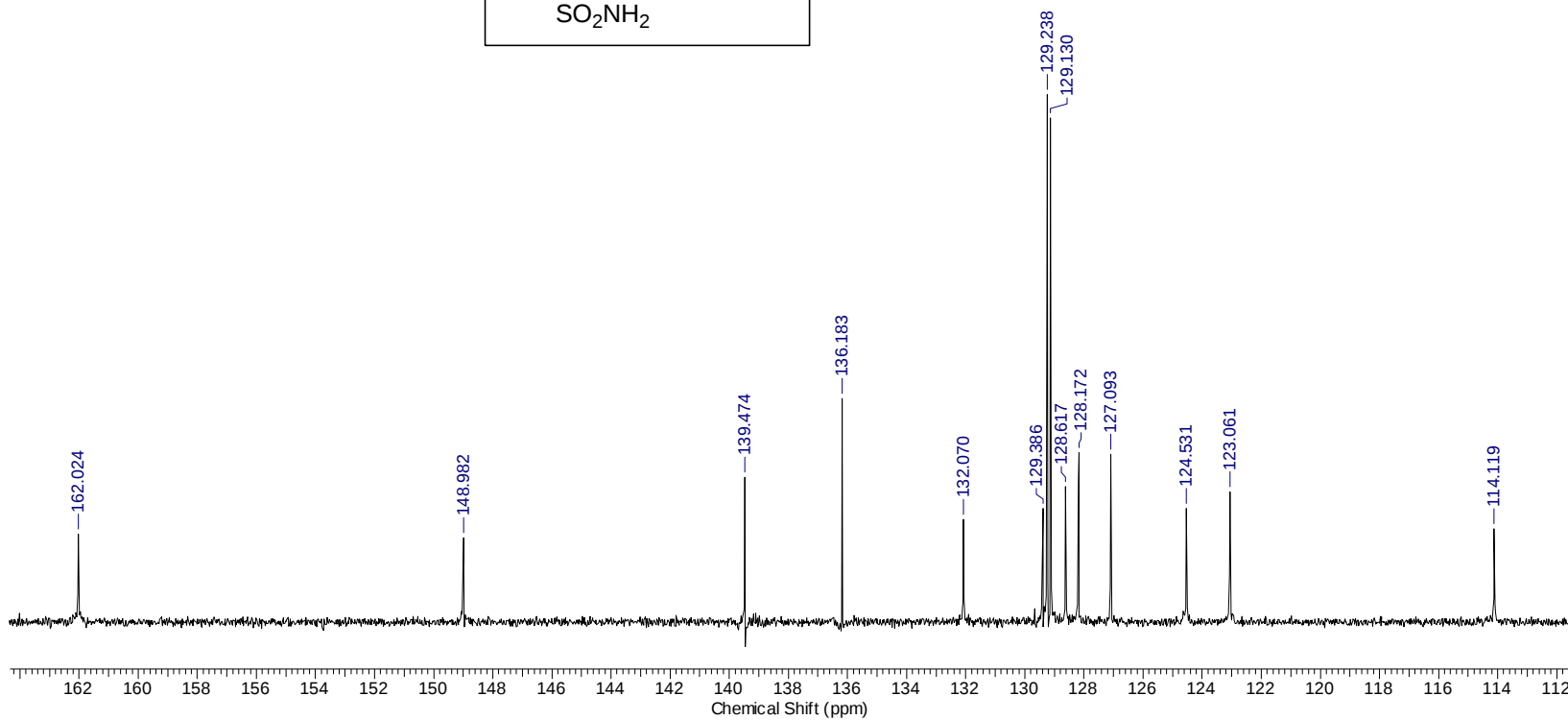
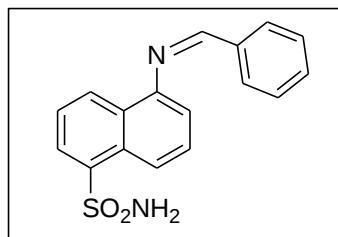


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12/15/2006 6:24 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-76	Date	Oct 5 2006
File Name	C:\DOCUMENTS AND SETTINGS\MALLIK.52035000-174531\MY DOCUMENTS\JAYATI\NMR_DATA\JB-2-76-13C				
Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6000
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9467.8516	Sweep Width (Hz)	22222.22	Solvent	DMSO-d6
		Temperature (degree C)	25.000		

VerticalScaleFactor = 1

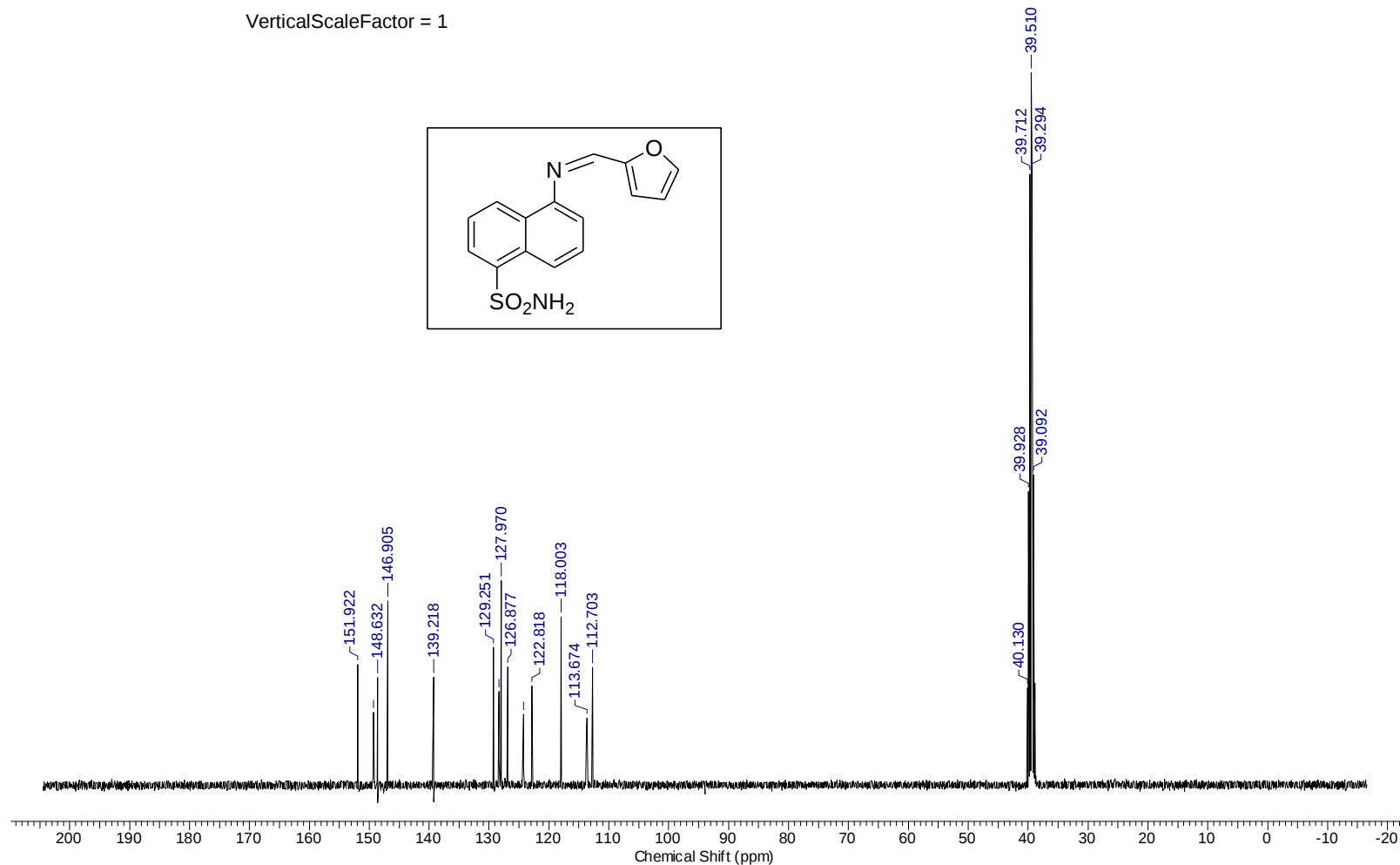
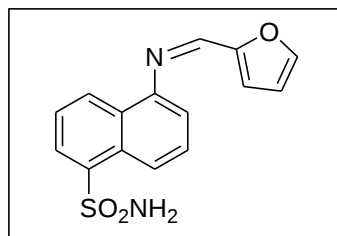


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12/15/2006 6:30 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-87	Date	Oct 16 2006
File Name	C:\DOCUMENTS AND SETTINGS\MALLIK.52035000-174531\MY DOCUMENTS\JAYATI\NMR_DATA\JB-2-76-13C.FID\JB-2-87-13C				
Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6800
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
		Original Points Count	16000	Solvent	DMSO-d6

VerticalScaleFactor = 1

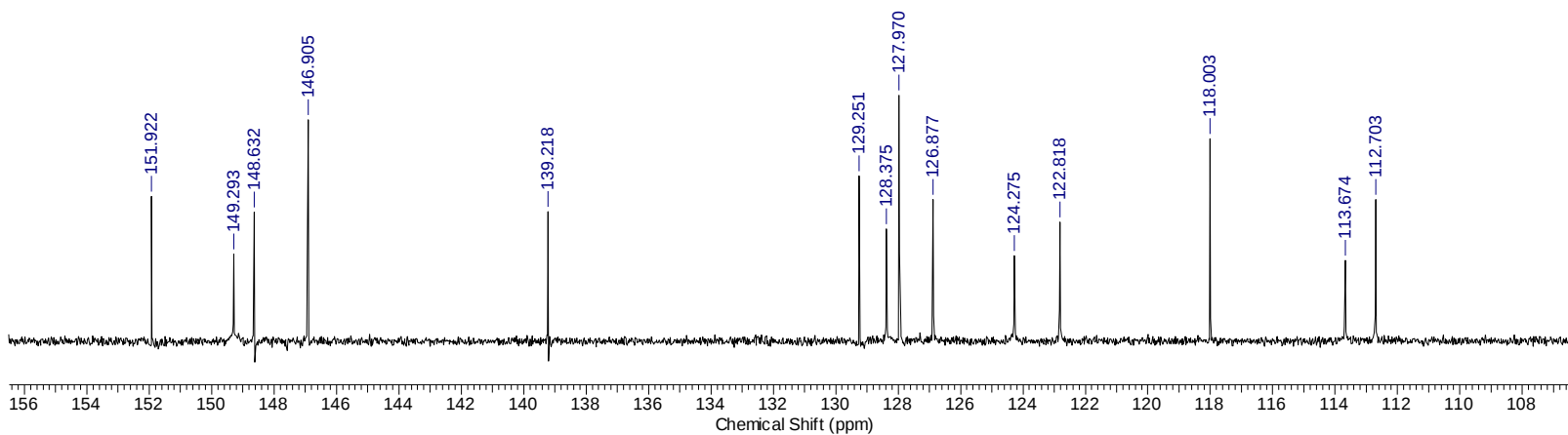
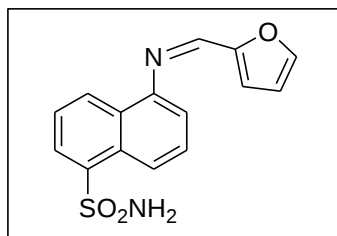


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12/15/2006 6:32 PM

Acquisition Time (sec)	0.7200	Comment	jb-2-87	Date	Oct 16 2006
File Name	C:\DOCUMENTS AND SETTINGS\SMALLIK.52035000-174531\MY DOCUMENTS\JAYATI\NMR_DATA\JB-2-76-13C.FID\JB-2-87-13C				
Frequency (MHz)	100.57	Nucleus	13C	Number of Transients	6800
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
		Original Points Count	16000	Solvent DMSO-d6	

VerticalScaleFactor = 1

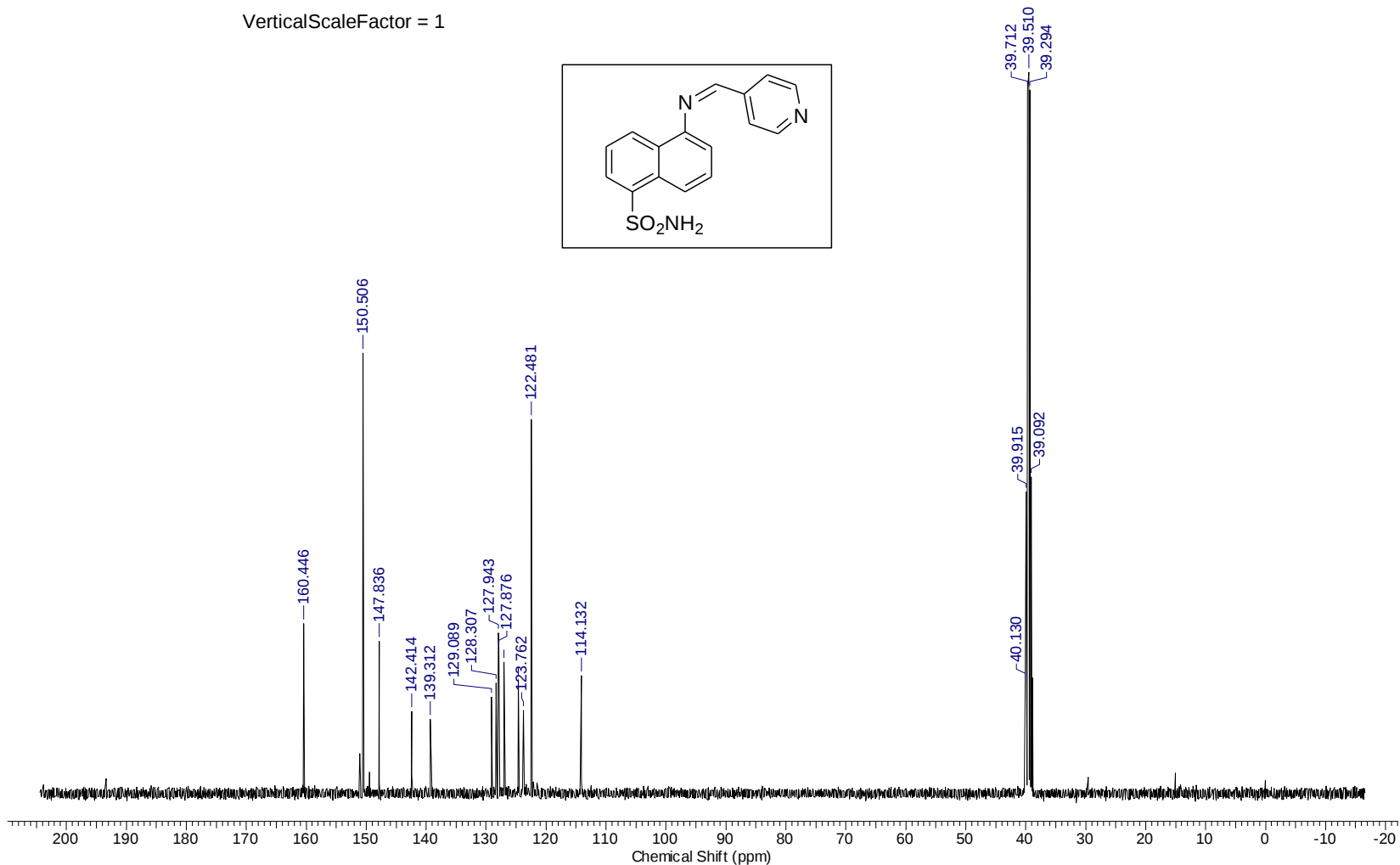
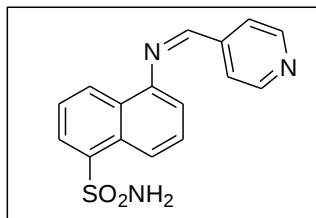


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Acquisition Time (sec)	0.7200	Comment	jb-2-56	Date	Oct 6 2006
File Name	C:\DOCUMENTS AND SETTINGS\MALLIK.52035000-174531\MY DOCUMENTS\JAYATI\NMR_DATA\JB-2-76-13C.FID\JB-2-87-13C.FID\JB-2-56-13C				
Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

VerticalScaleFactor = 1

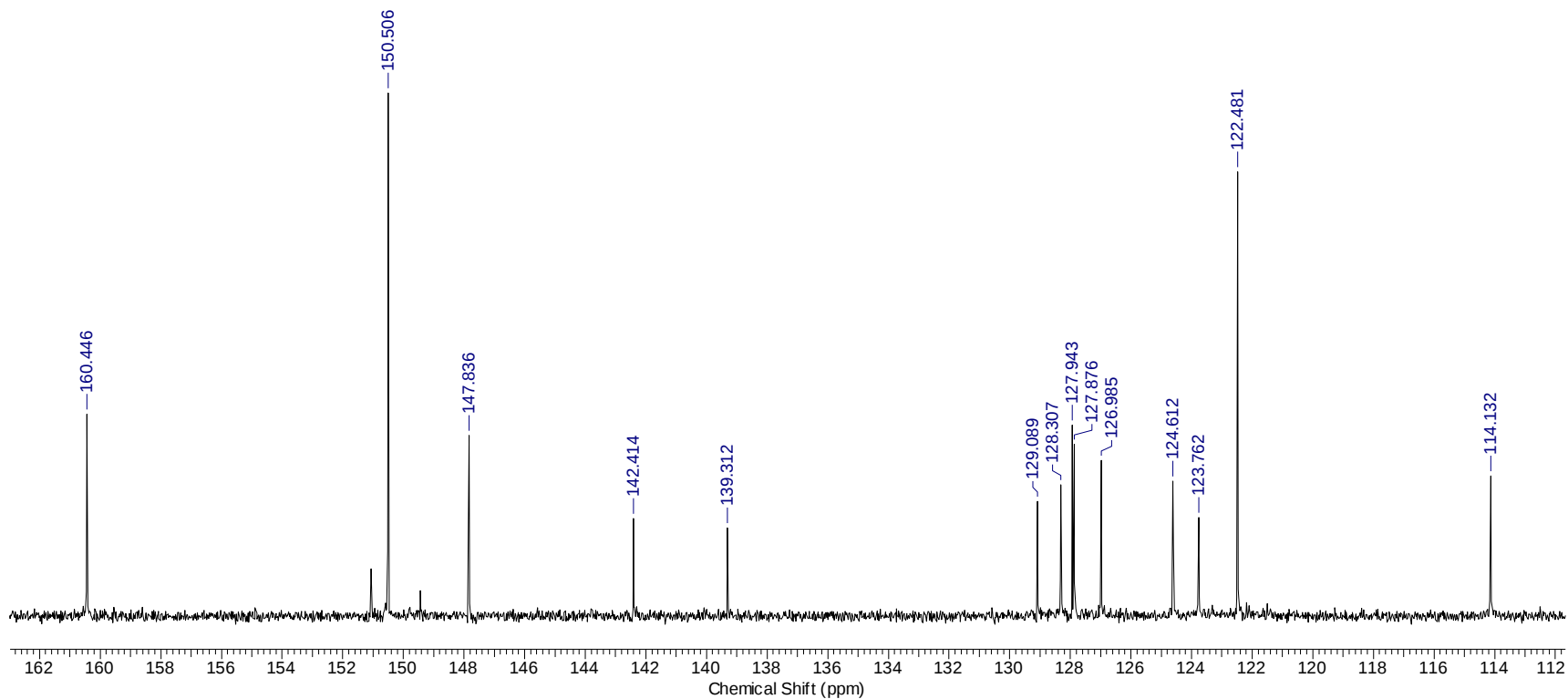
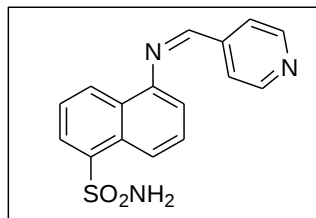


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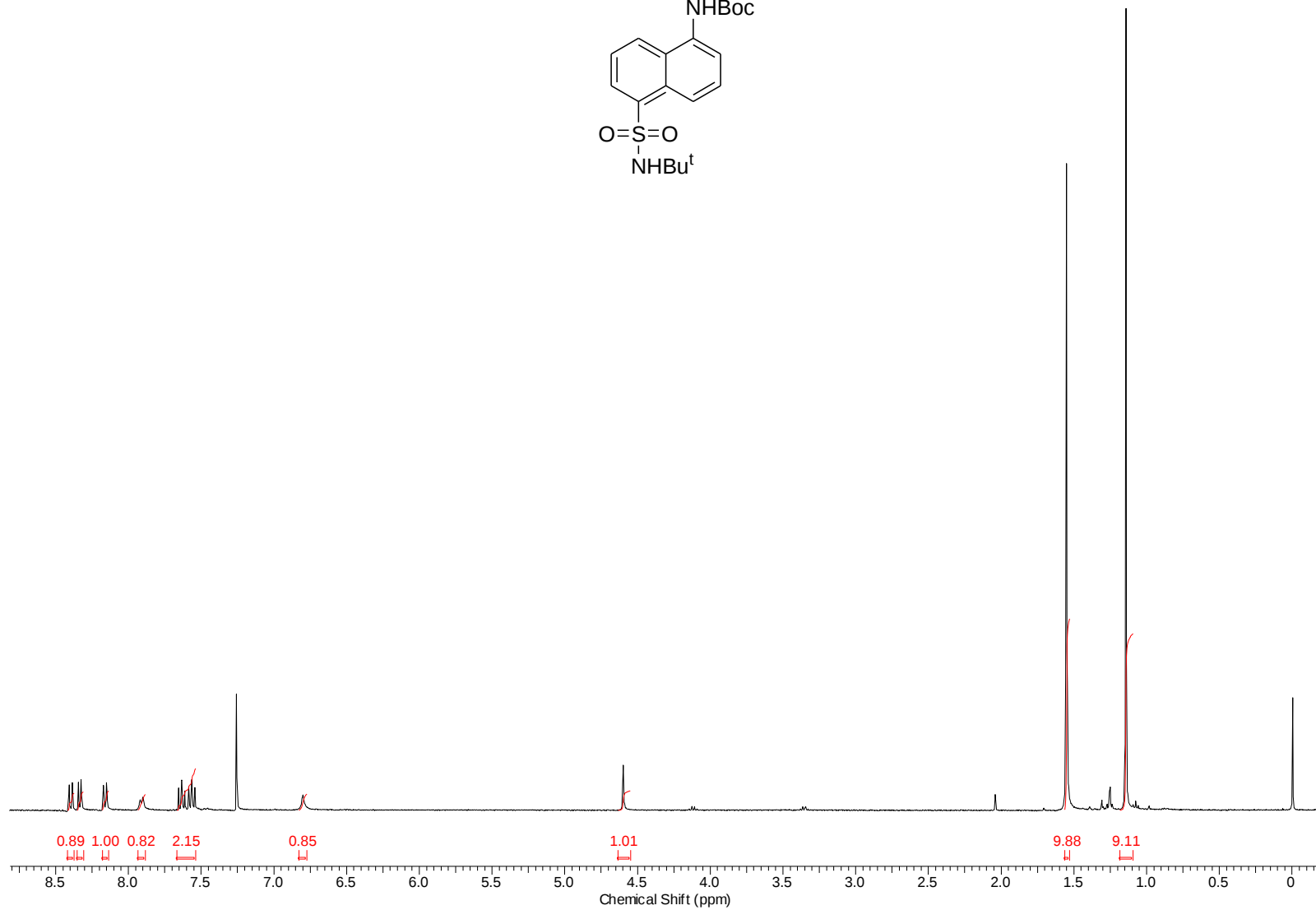
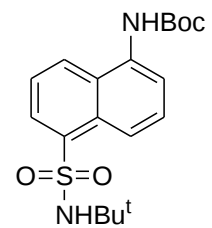
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Frequency (MHz)	100.57	Nucleus	¹³ C	Number of Transients	6500
Points Count	16384	Pulse Sequence	s2pul	Receiver Gain	60.00
Spectrum Offset (Hz)	9446.1484	Sweep Width (Hz)	22222.22	Temperature (degree C)	25.000
				Original Points Count	16000
				Solvent	DMSO-d6

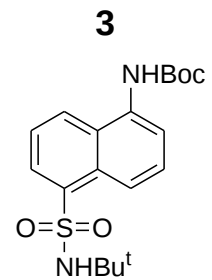
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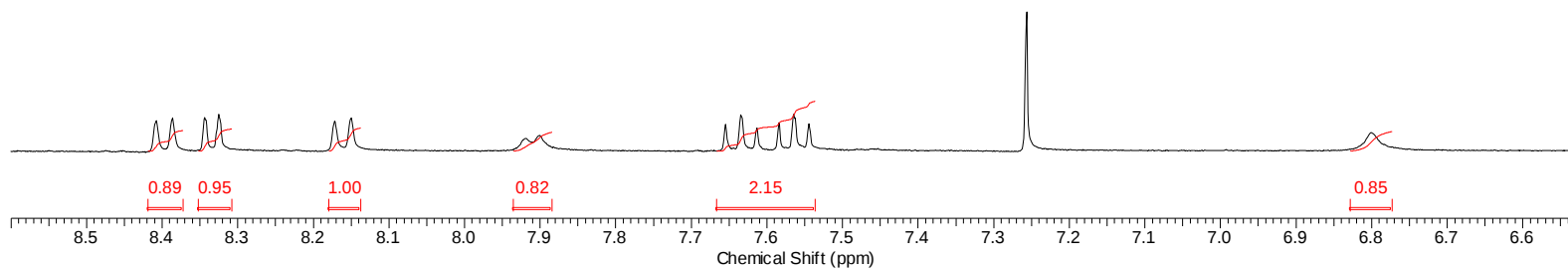
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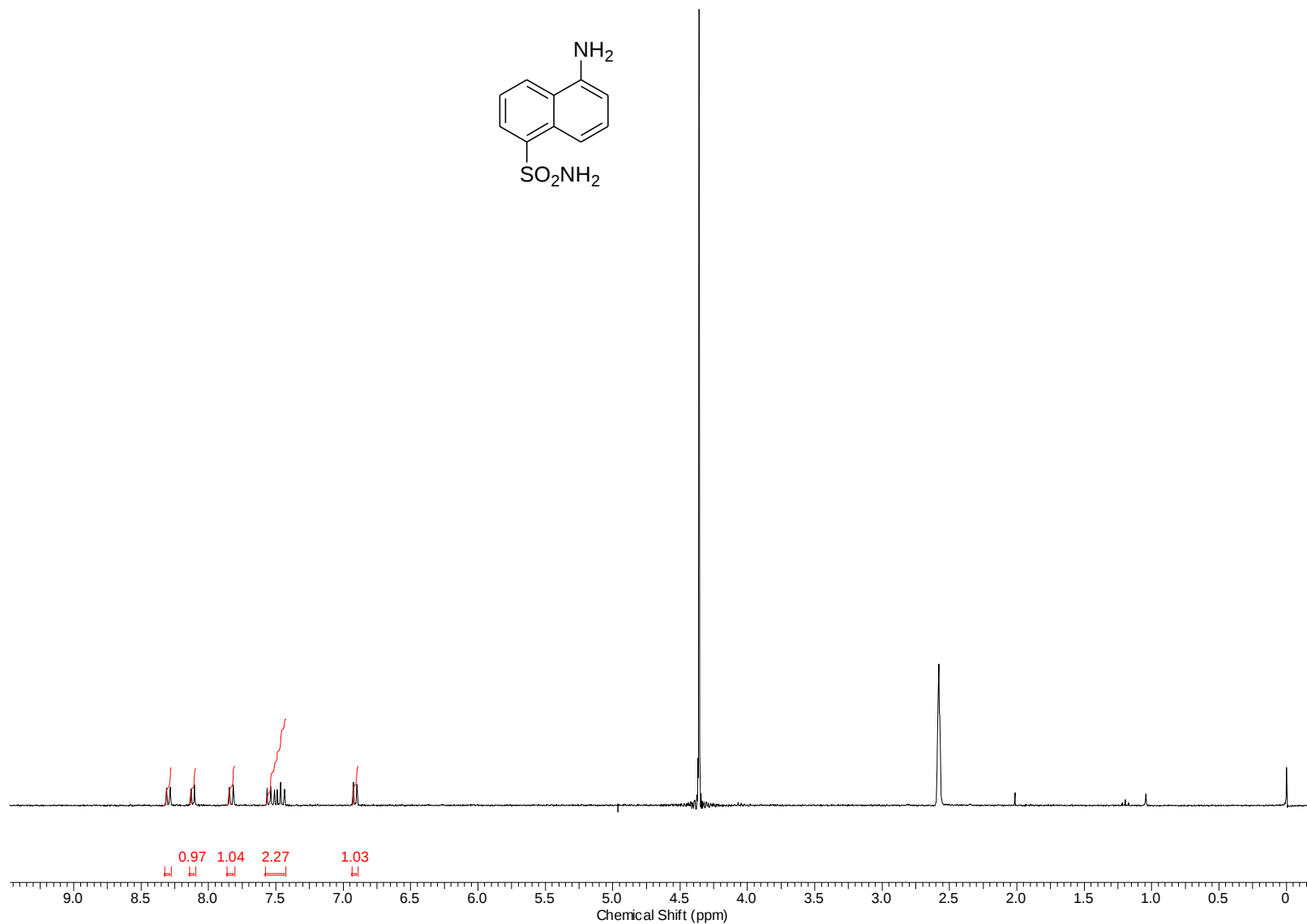
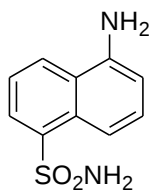


12/16/2006 12:05 AM



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12/16/2006 12:16 AM



4

12/16/2006 12:17 AM

