

## Supplementary Material

### Bis(2-cyanoacetamides): versatile precursors for bis(dihydropyridine-3,5-dicarbonitrile

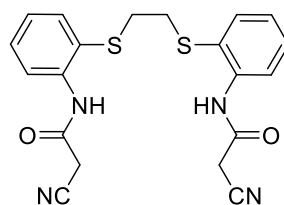
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*Email: [aelwahy@hotmail.com](mailto:aelwahy@hotmail.com), [ismail\\_shafy@yahoo.com](mailto:ismail_shafy@yahoo.com)*

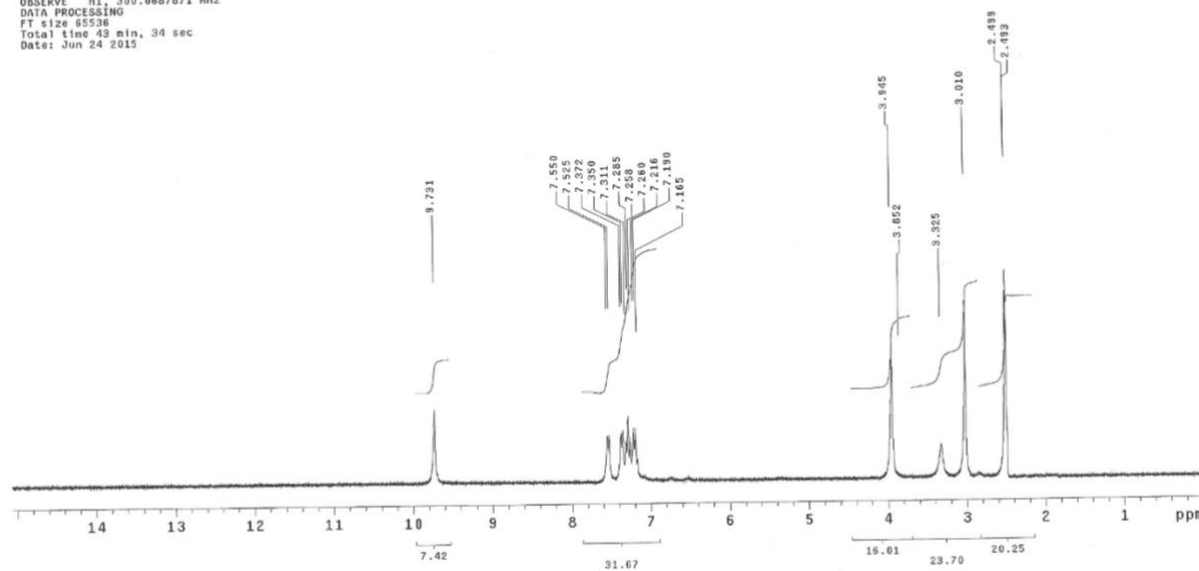
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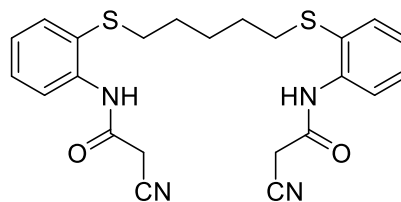
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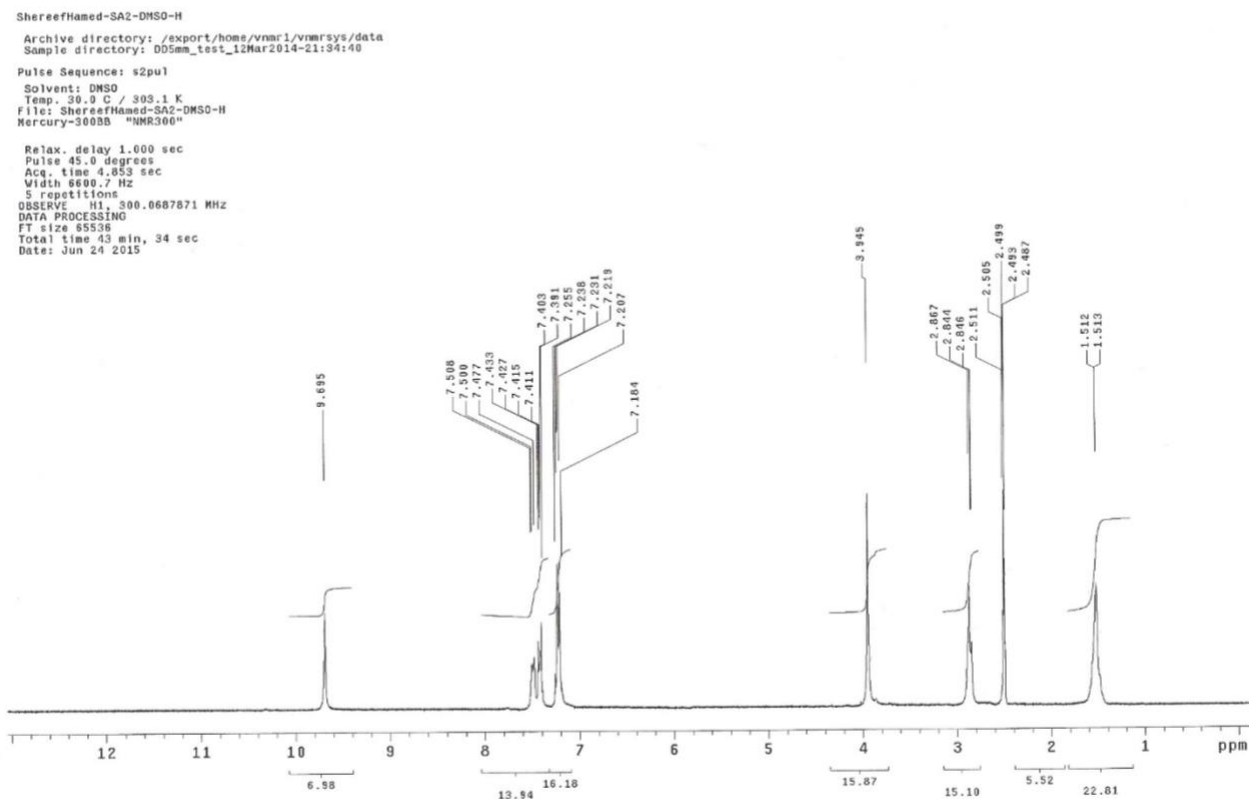
5a

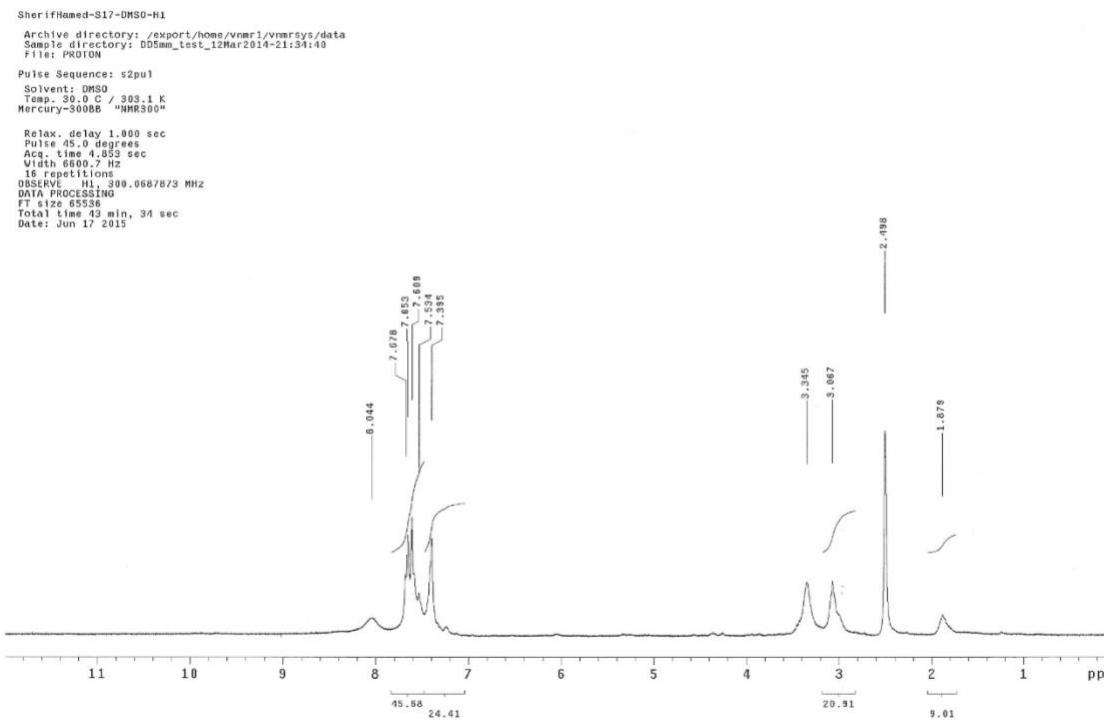
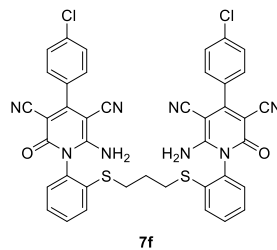
ShereefHamed-S30-DMSO-H  
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Sample directory: D05mm\_test\_12Mar2014-21:34:40  
File: PROTON  
Pulse Sequence: s2pu1  
Solvent: DMSO  
Temp: 30.9 C / 303.1 K  
Mercury-300BB "HMR300"  
Relax. delay 1.000 sec  
Pulse 45.0 degrees  
Acq. time 4.853 sec  
Width 6600.7 Hz  
20 repetitions  
OBSERVE H1, 300.0687671 MHz  
DATA PROCESSING  
FT size 95536  
Total time 43 min, 34 sec  
Date: Jun 24 2015

<sup>1</sup>H NMR Spectrum of compound 5a

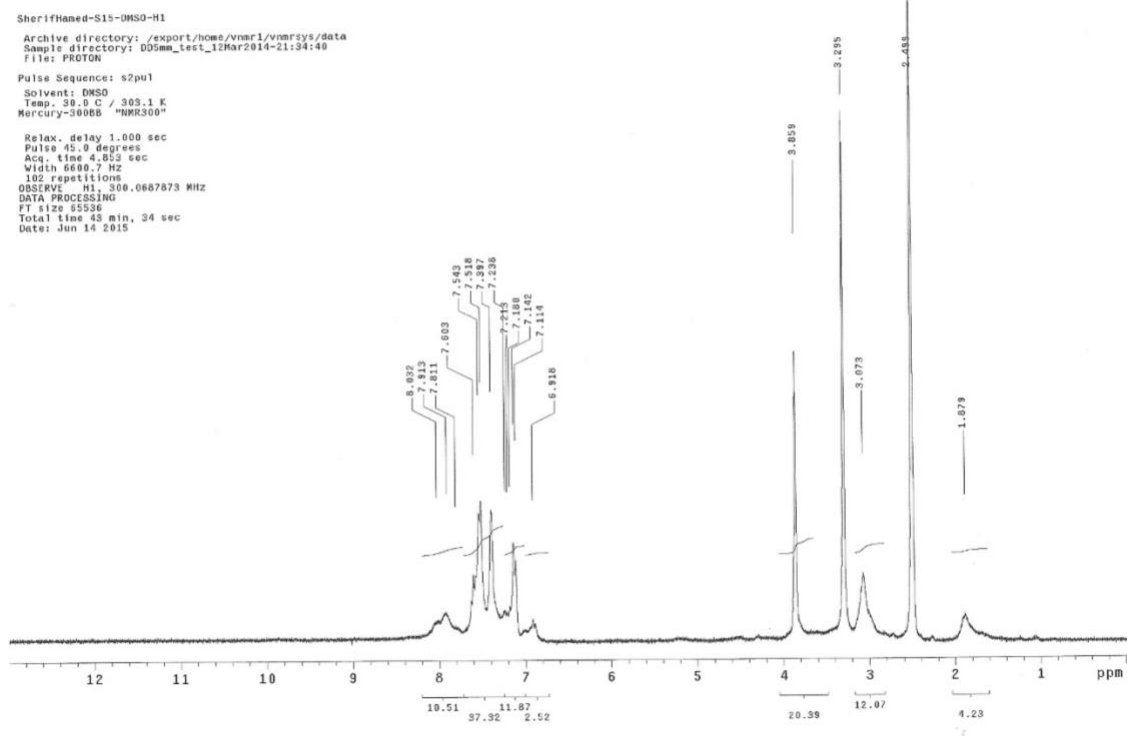
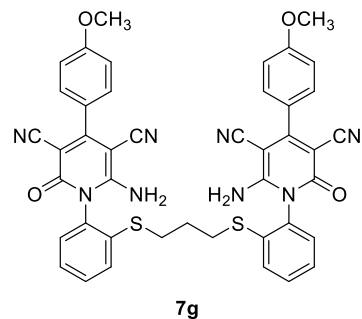


5d

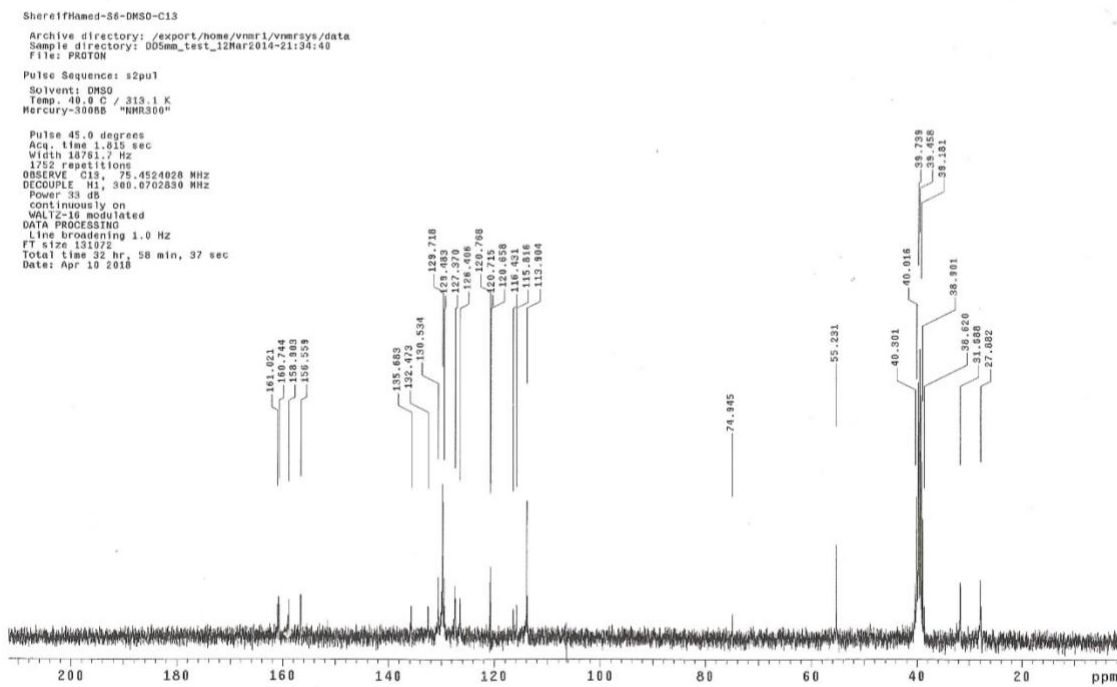
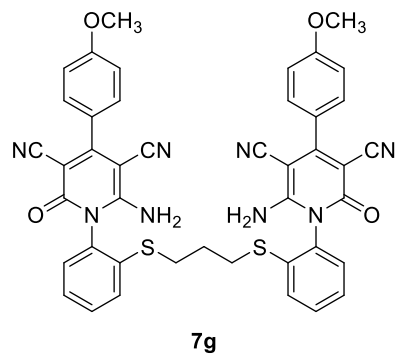
 $^1\text{H}$  NMR Spectrum of compound 5d



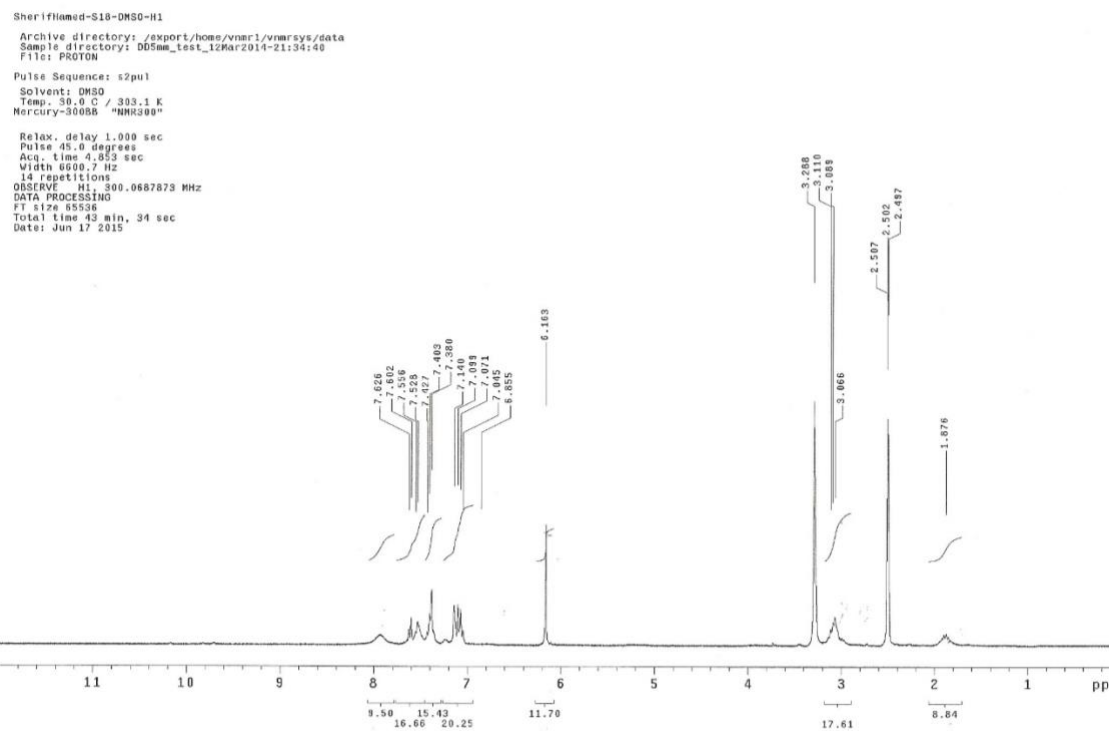
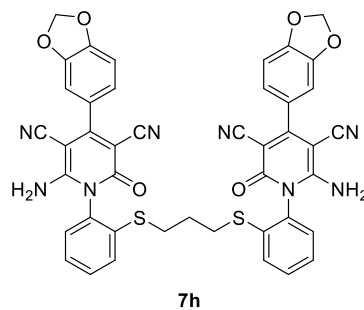
<sup>1</sup>H NMR Spectrum of compound 7f



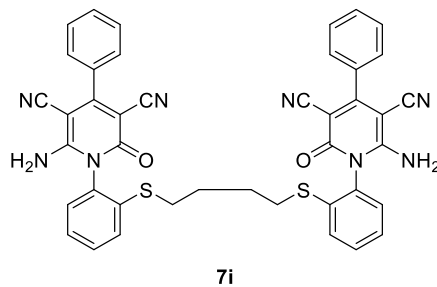
<sup>1</sup>H NMR Spectrum of compound 7g



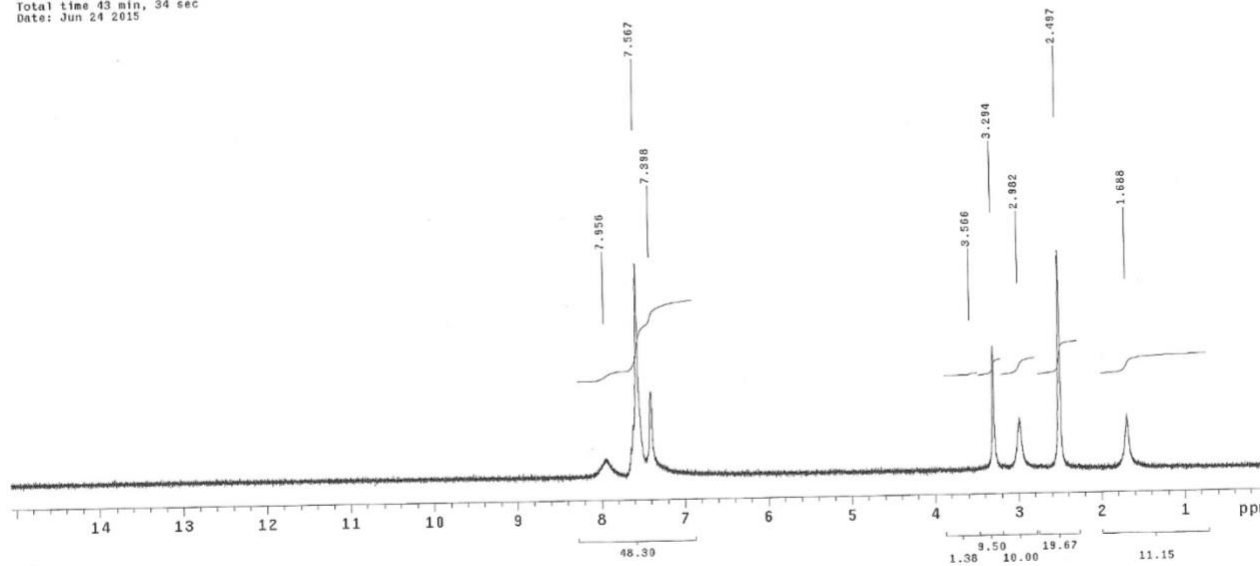
<sup>13</sup>C NMR Spectrum of compound **7g**



**<sup>1</sup>H NMR Spectrum of compound 7h**

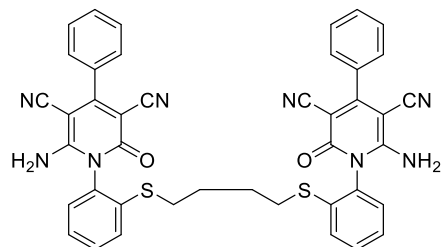


ShereefHamed-S22-DMSO-H  
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Sample directory: DD5mm\_test\_12Mar2014-21:34:40  
File: PROTON  
Pulse Sequence: s2pul  
Solvent: DMSO  
Temp. 30.0 C / 303.1 K  
Mercury-300BB "NMR300"  
Relax. delay 1.000 sec  
Pulse 45.0 degrees  
Acq. time 4.853 sec  
Width 6600.7 Hz  
5 repetitions  
OBSERVE H1, 300.0687871 MHz  
DATA PROCESSING  
F1 size 65536  
Total time 43 min, 34 sec  
Date: Jun 24 2015



**<sup>1</sup>H NMR Spectrum of compound 7i**



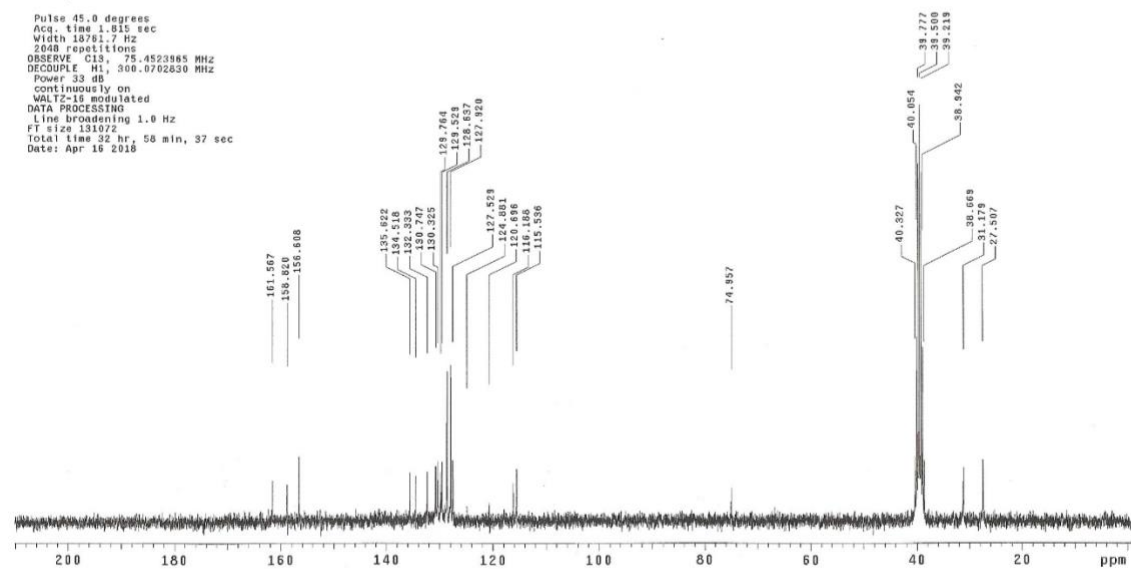


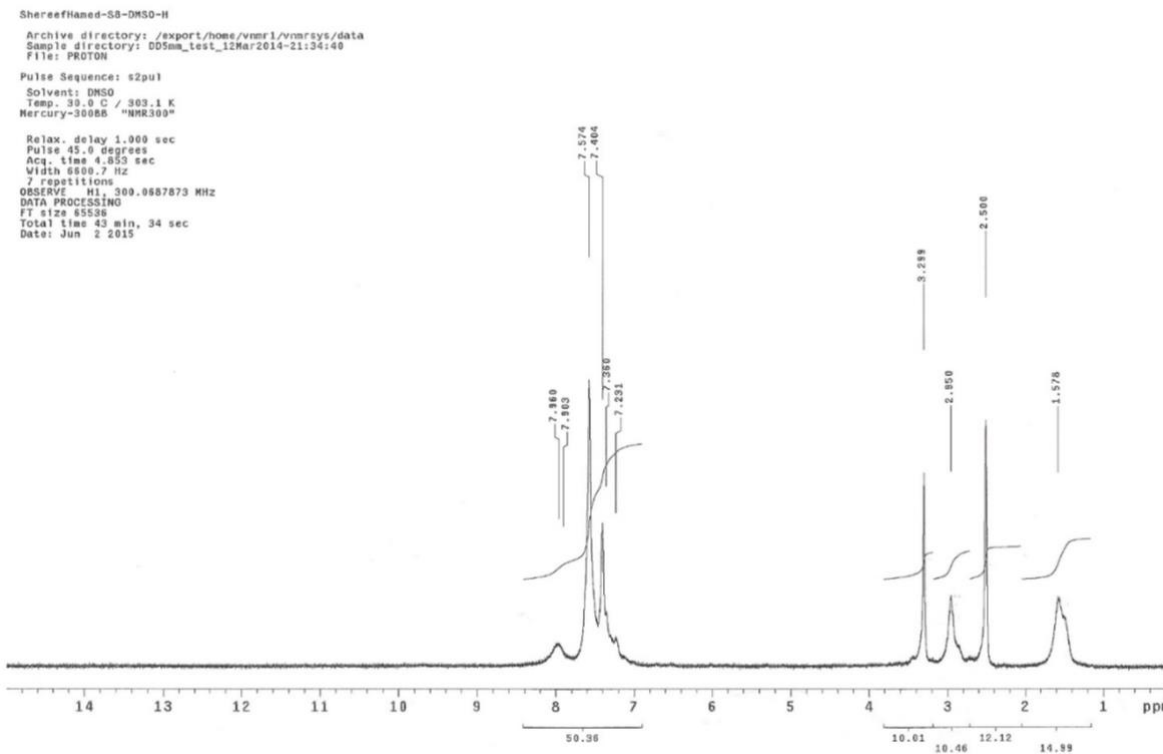
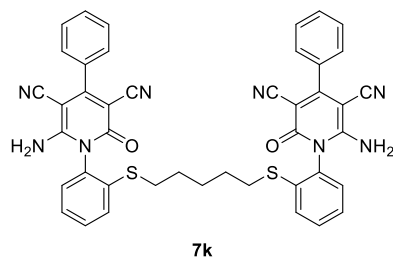
7i

Shereeflamed-S22-DMSO-C13

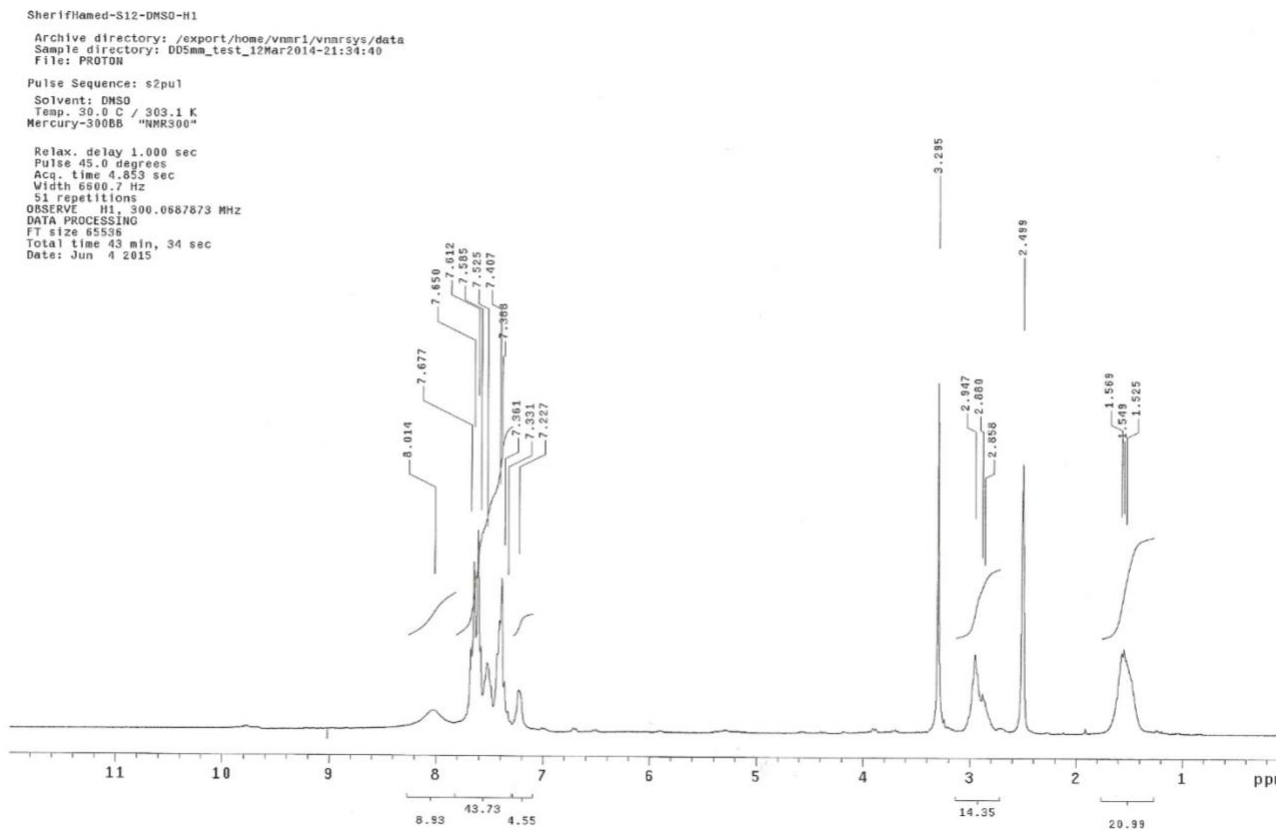
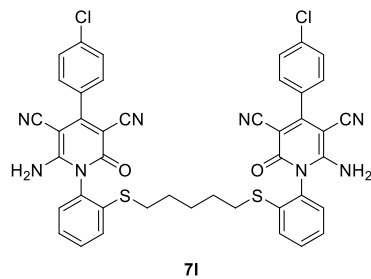
Archive directory: /export/home/vnmr1/vnmrsys/data  
Sample directory: 005mm\_test\_12Mar2014-21:34:40  
File: PROT08

Pulse Sequence: e2pul

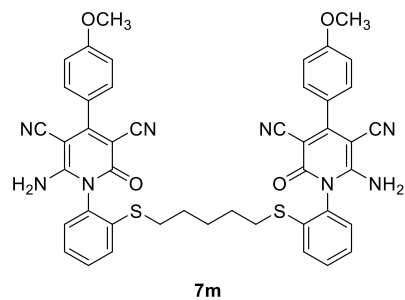
Solvent: DMSO  
Temp. 30.0 C / 303.1 K  
Mercury-300BB "NMR300"Pulse 45.0 degrees  
Acq. time 1.815 sec  
Width 13781.7 Hz  
2048 repetitions  
OBSERVE C13, 75.452385 MHz  
DECOUPLE H1, 306.0762630 MHz  
Power 33 dB  
Continuously on  
WALTZ-16 modulated  
DATA PROCESSING  
Line broadening 1.0 Hz  
FT size 131072  
Total time 32 hr, 50 min, 37 sec  
Date: Apr 16 2018 $^{13}\text{C}$  NMR Spectrum of compound 7i



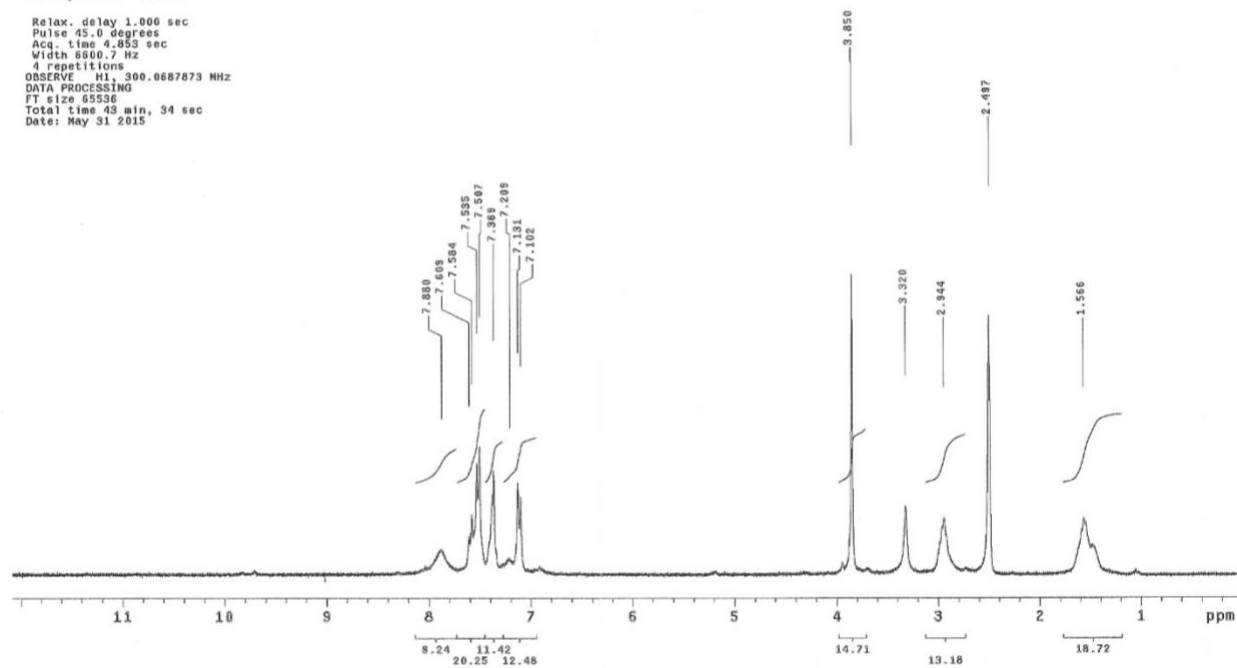
$^1\text{H}$  NMR Spectrum of compound 7k



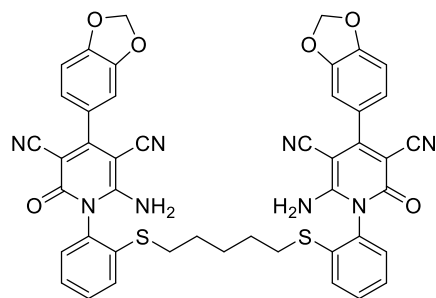
<sup>1</sup>H NMR Spectrum of compound 71



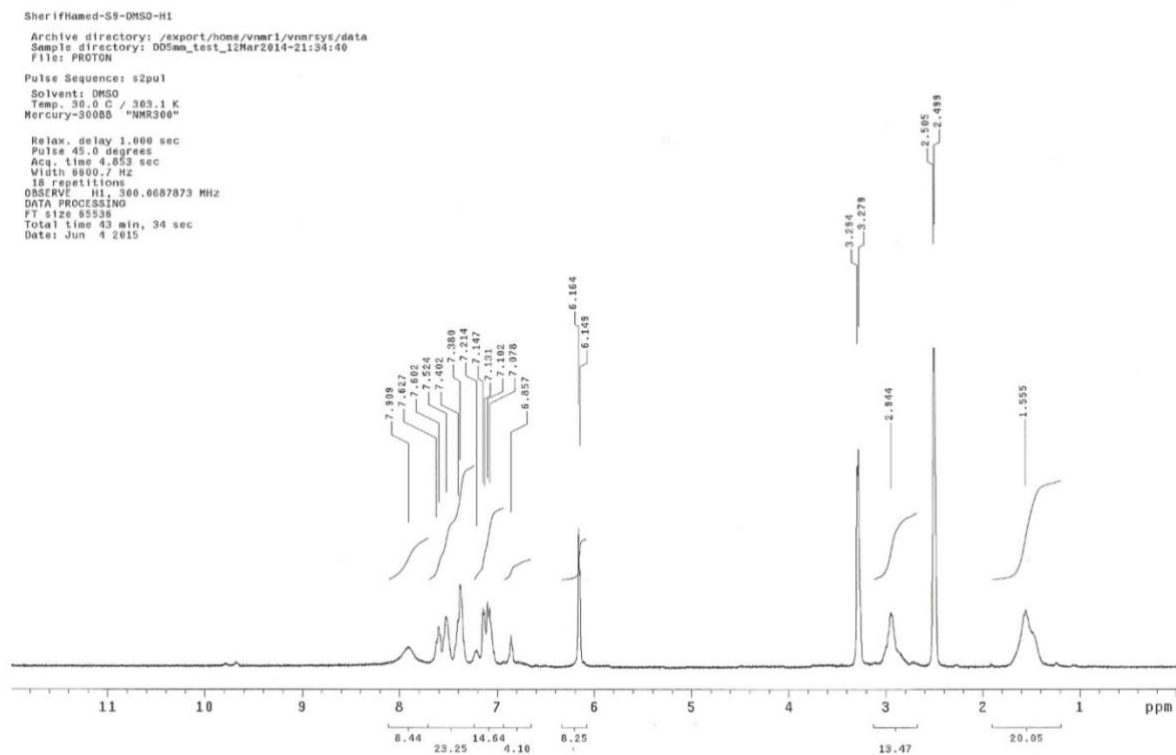
SherifHamed-S6-DMSO-H1  
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 Sample directory: 005mm\_test\_12Mar2014-21:34:40  
 File: PROTON  
 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temp: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 8900.7 Hz  
 4 repetitions  
 OBSERVE H1, 300.0687073 MHz  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: May 31 2015

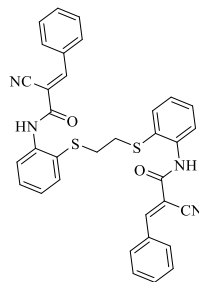


**<sup>1</sup>H NMR Spectrum of compound 7m**

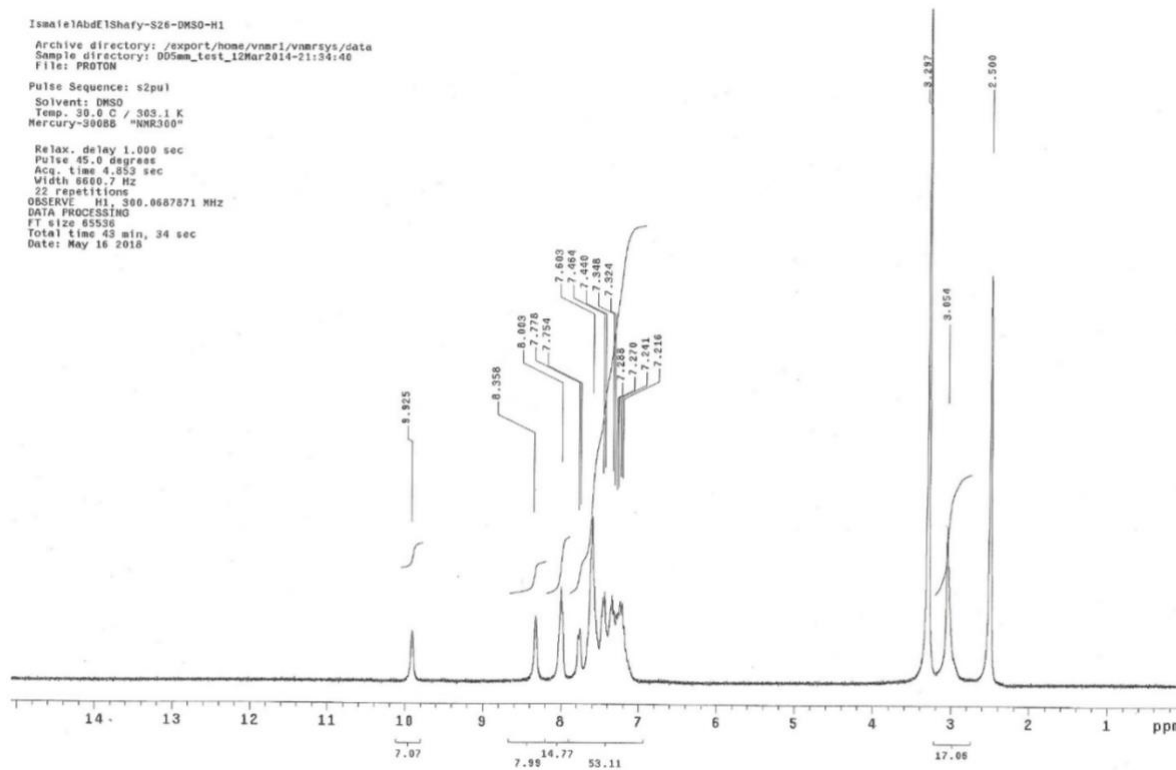


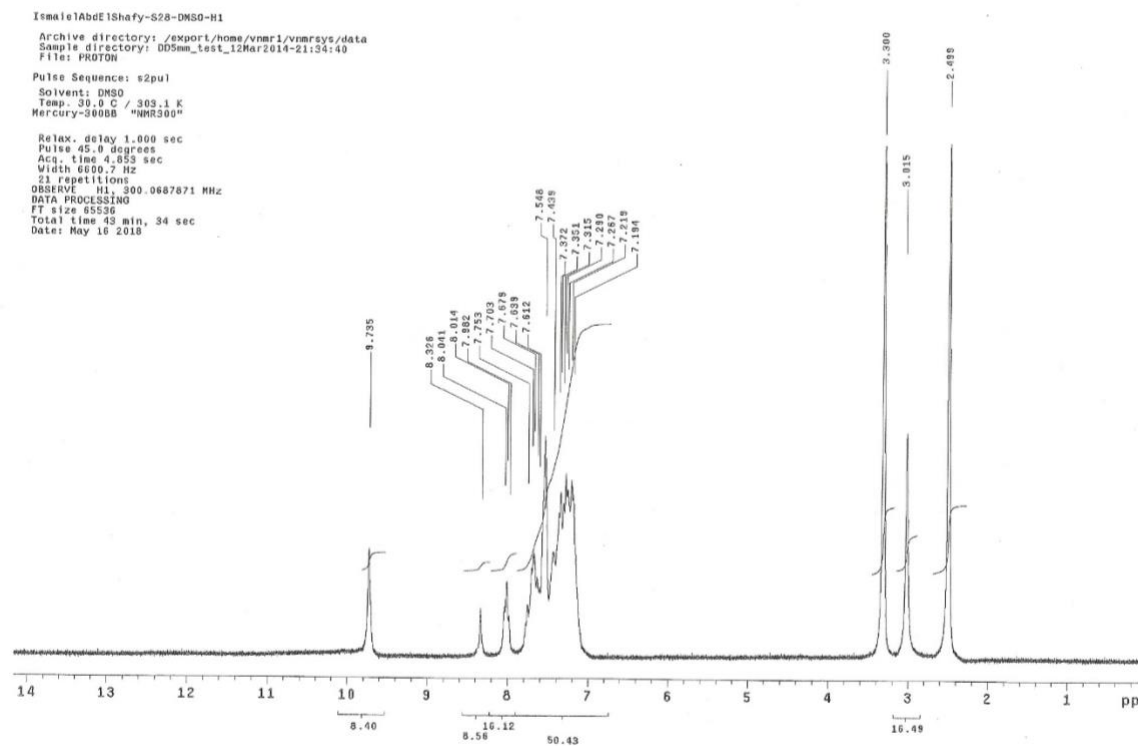
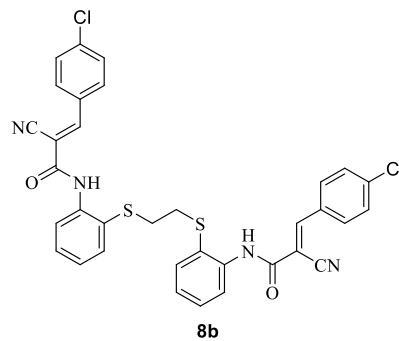
7n

<sup>1</sup>H NMR Spectrum of compound 7n

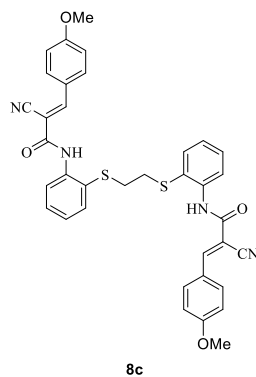


8a

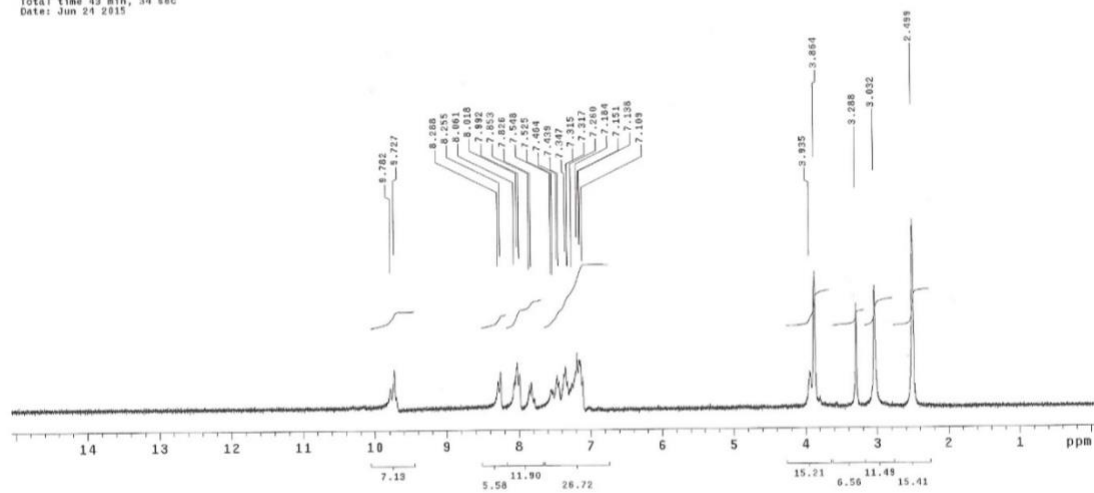
 $^1\text{H}$  NMR Spectrum of compound 8a



<sup>1</sup>H NMR Spectrum of compound 8b

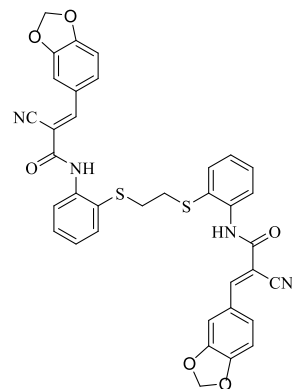


ShereefHamed-S27-DMSO-H  
Archive directory: /export/home/vmr1/vmarsys/data  
Sample directory: DD5mm\_test\_12Mar2014-21:34:40  
File: PROTON  
Pulse Sequence: s2pu1  
Solvent: DMSO  
Temp: 30.0 C / 303.1 K  
Mercury-300BB "NMR300"  
Relax. delay 1.000 sec  
Pulse 45.0 degrees  
Acq. time 4.853 sec  
Width 6900.7 Hz  
7 repetitions  
OBSERVE H1: 300.0687071 MHz  
DATA PROCESSING  
F1 size 85536  
Total time 49 min, 34 sec  
Date: Jun 24 2015



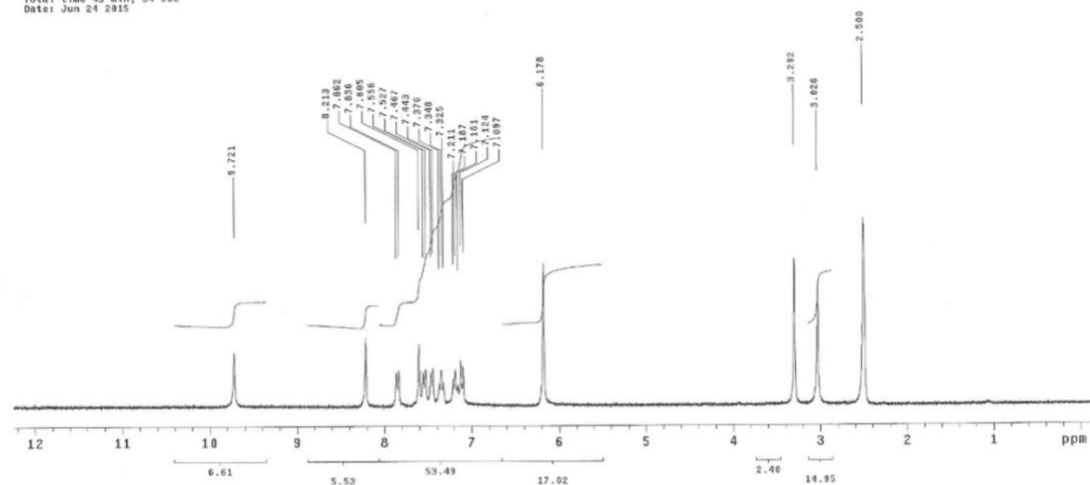
<sup>1</sup>H NMR Spectrum of compound 8c

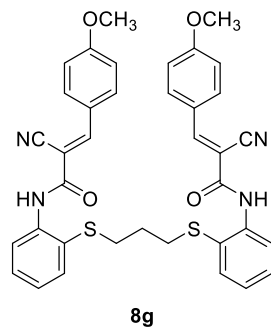




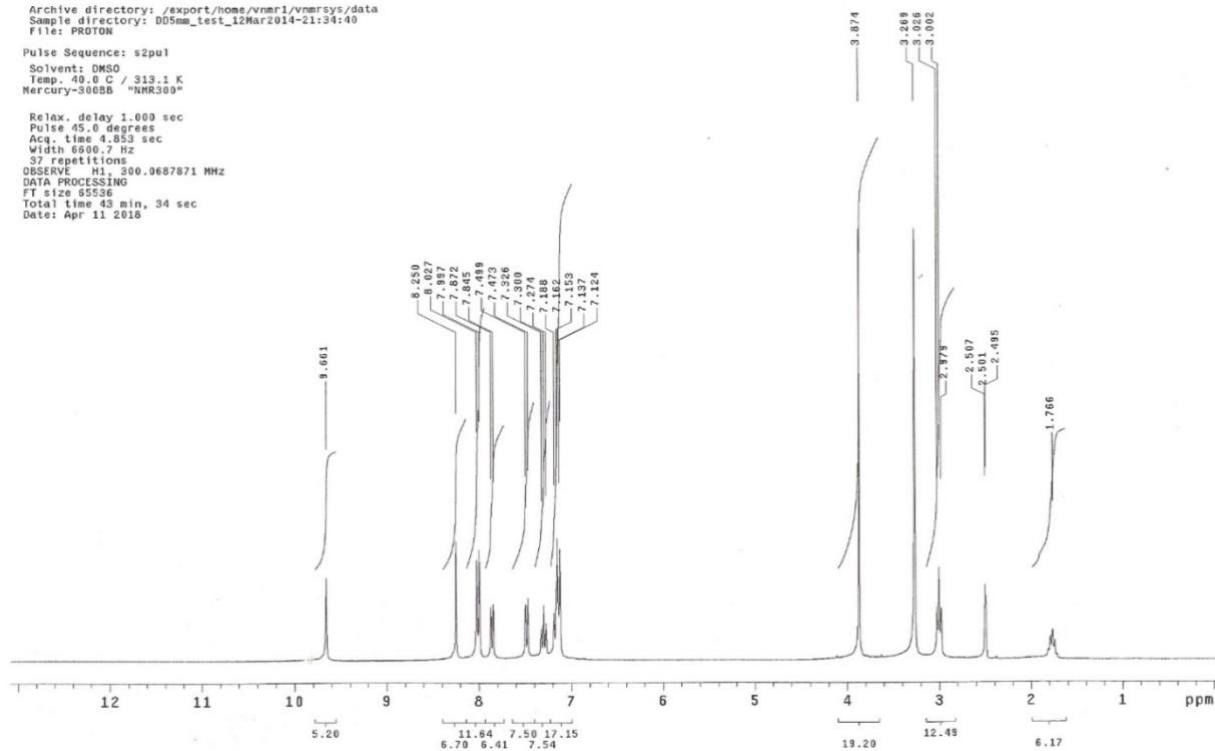
8d

ShreefHamad-S23-DMSO-H  
Archive directory: /export/home/vmr1/vmr/sys/data  
Sample directory: D05sm\_test\_12Mar2014-21:34:40  
Pulse Sequence: s2pu1  
Solvent: DMSO  
Temp. 30.0 C / 305.1 K  
File: ShreefHamad-S23-DMSO-H  
Mercury-3000B "NMR300"  
  
Relax. delay 1.000 sec  
Pulse 45.0 degree  
Acq. time 4.855 sec  
Width 6000.7 Hz  
8 repetitions  
OBSERVE H1 300.0687071 MHz  
DATA PROCESSING  
FT size 65536  
Total time 45 min, 34 sec  
Date: Jun 24 2015

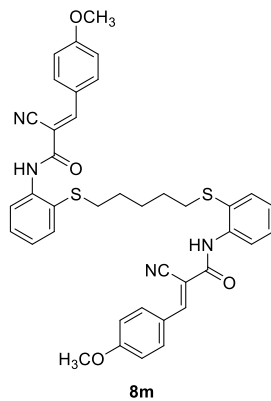
<sup>1</sup>H NMR Spectrum of compound 8d



SherifHamed-S18-DMSO-H1  
Archive directory: /export/home/vnmr1/vnmrSYS/data  
Sample directory: D05mm\_test\_12Mar2014-21:34:40  
File: PROTON  
Pulse Sequence: s2pu1  
Solvent: DMSO  
Temp. 40.0 C / 313.1 K  
Mercury-300BB "NMR300"  
Relax. delay 1.000 sec  
Pulse 45.0 degrees  
Acq. time 4.853 sec  
Width 6500.7 Hz  
37 repetitions  
OBSERVE H1, 300.0687871 MHz  
DATA PROCESSING  
FT size 65536  
Total time 43 min, 34 sec  
Date: Apr 11 2018

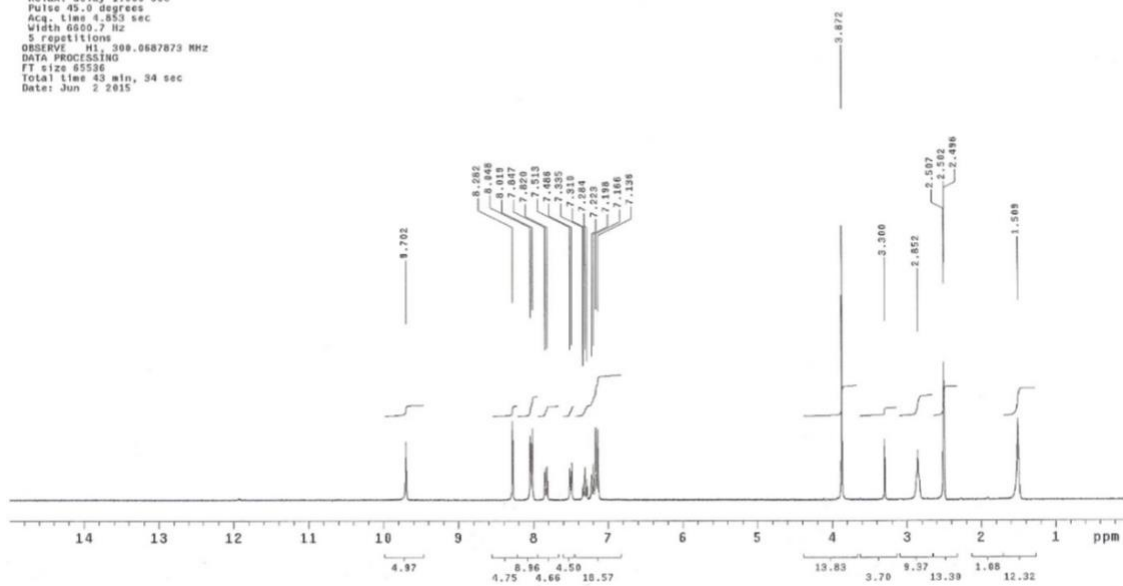


<sup>1</sup>H NMR Spectrum of compound 8g



ShereefHamed-S11-DMSO-H  
 Archive directory: /export/home/vmar1/vmrsys/data  
 Sample directory: D05am\_test\_12Mar2014-21:34:46  
 File: PROTON  
 Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temp. 30.0 C / 303.1 K  
 Mercury-300MS "NMR300"

Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6000.7 Hz  
 3 repetitions  
 OBSERVE H1, 300.0687879 MHz  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: Jun 2 2015



**<sup>1</sup>H NMR Spectrum of compound 8m**