

## Supplementary Material

### Synthesis of novel bis- and poly(hydrazinylthiazole) linked to benzofuran or benzothiazole as new hybrid molecules

Mostafa E. Salem, Ahmed F. Darweesh, Mohamed R. Shaaban, and Ahmed H. M. Elwahy\*

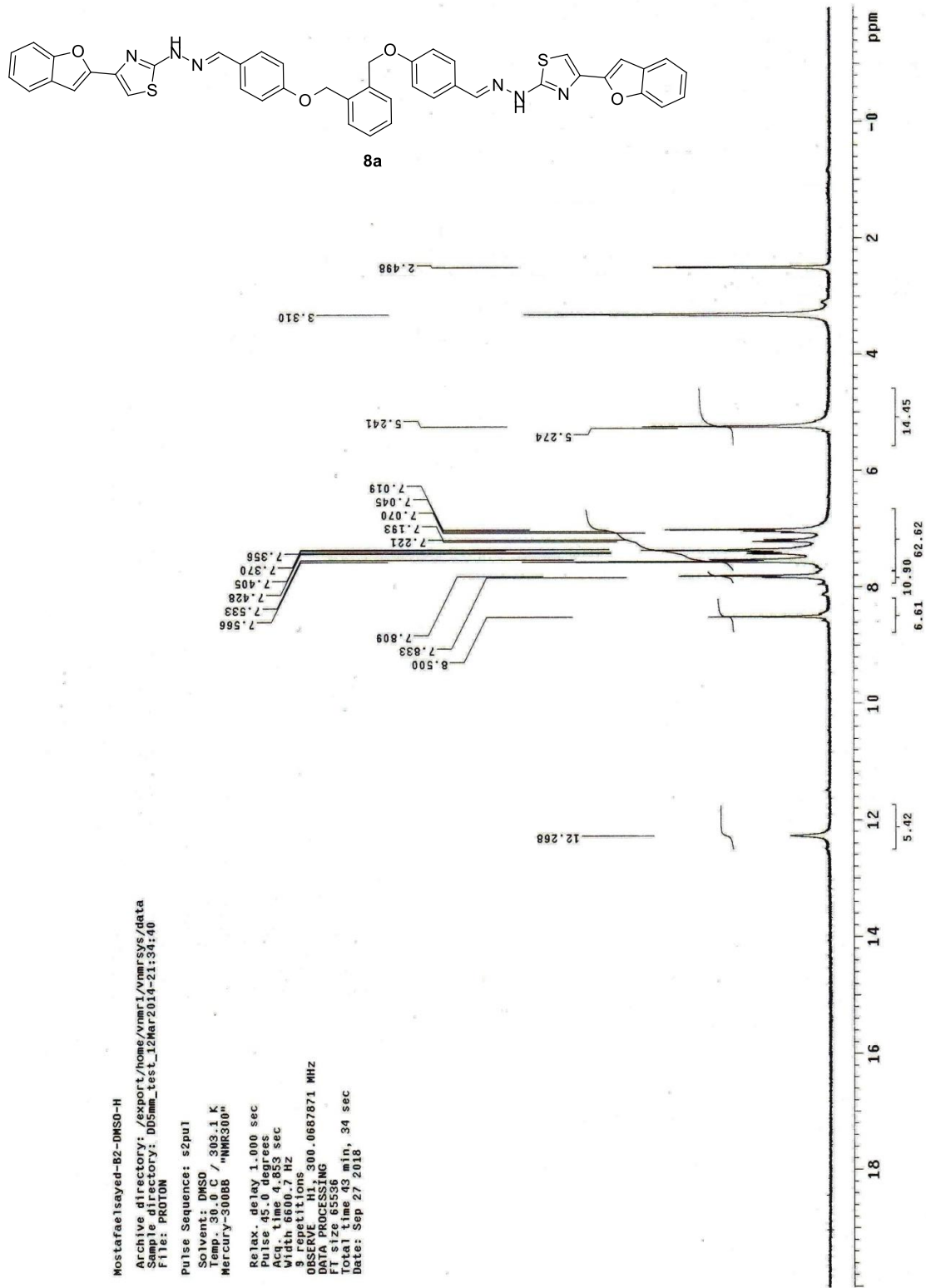
*Chemistry Department, Faculty of Science, Cairo University, Giza-Egypt*

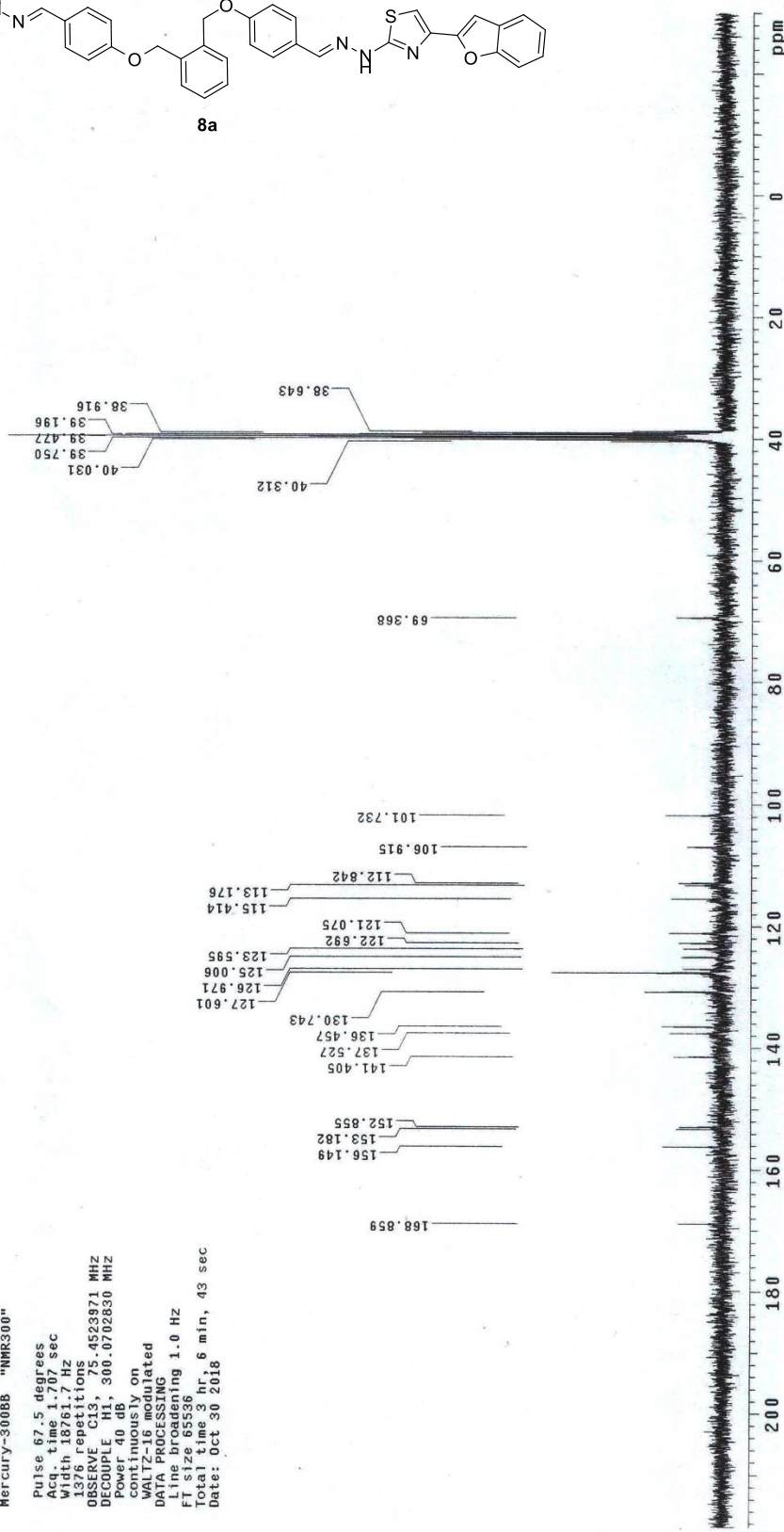
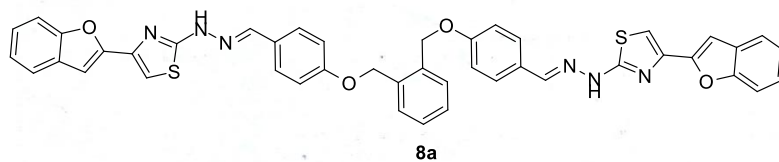
*E-mail: [aelwahy@hotmail.com](mailto:aelwahy@hotmail.com)*

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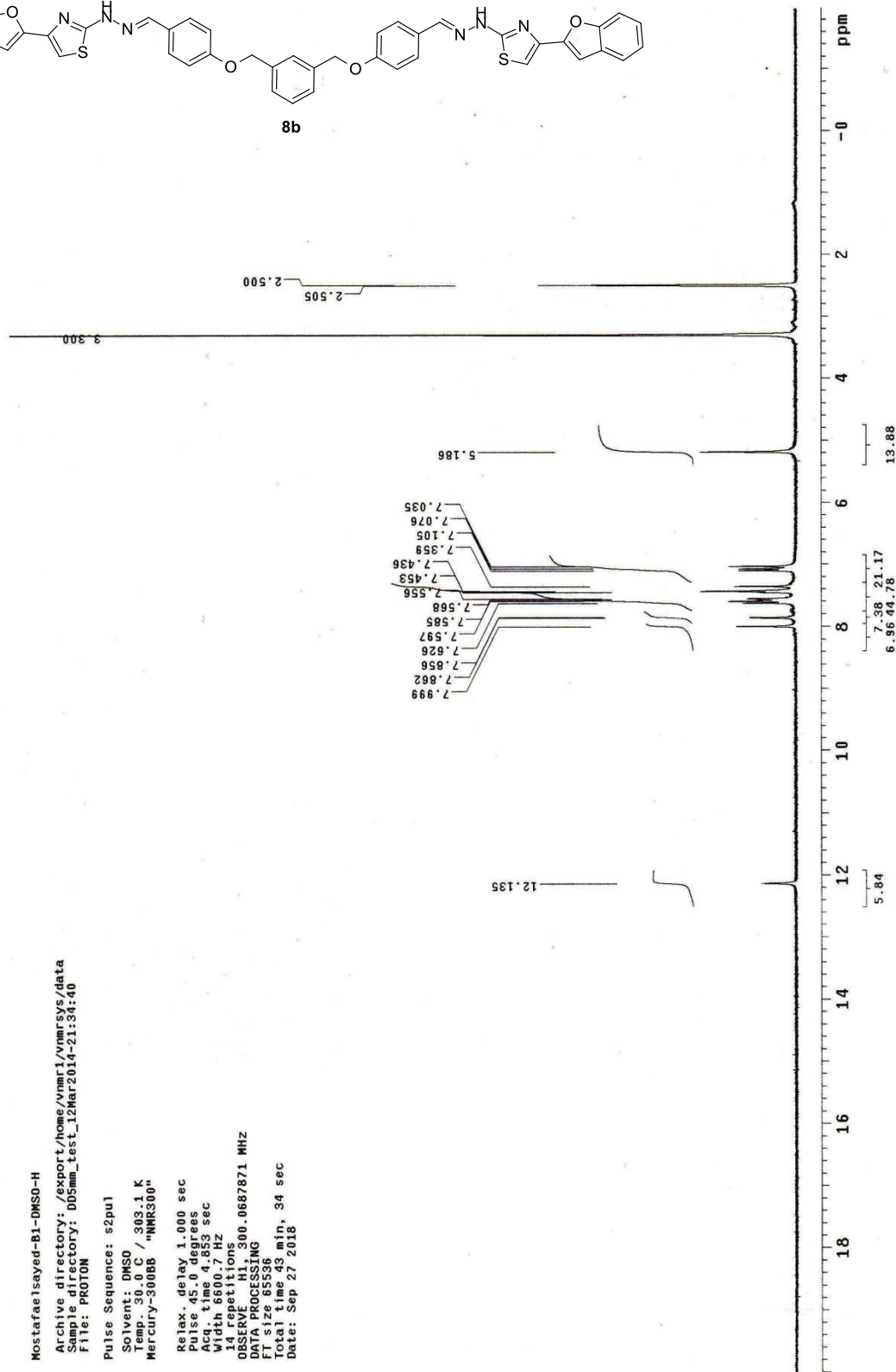
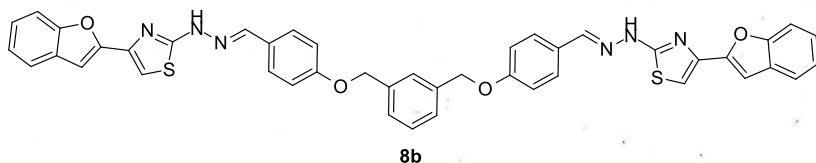
- |   |    |
|---|----|
| 1. <sup>1</sup> H- and <sup>13</sup> C-NMR spectra <b>8a-c; 9a-c; 11a,b; 12a,b; 17; 18; 20; 21 and 23</b> | S2 |
|---|----|

<sup>1</sup>H- and <sup>13</sup>C-NMR spectra

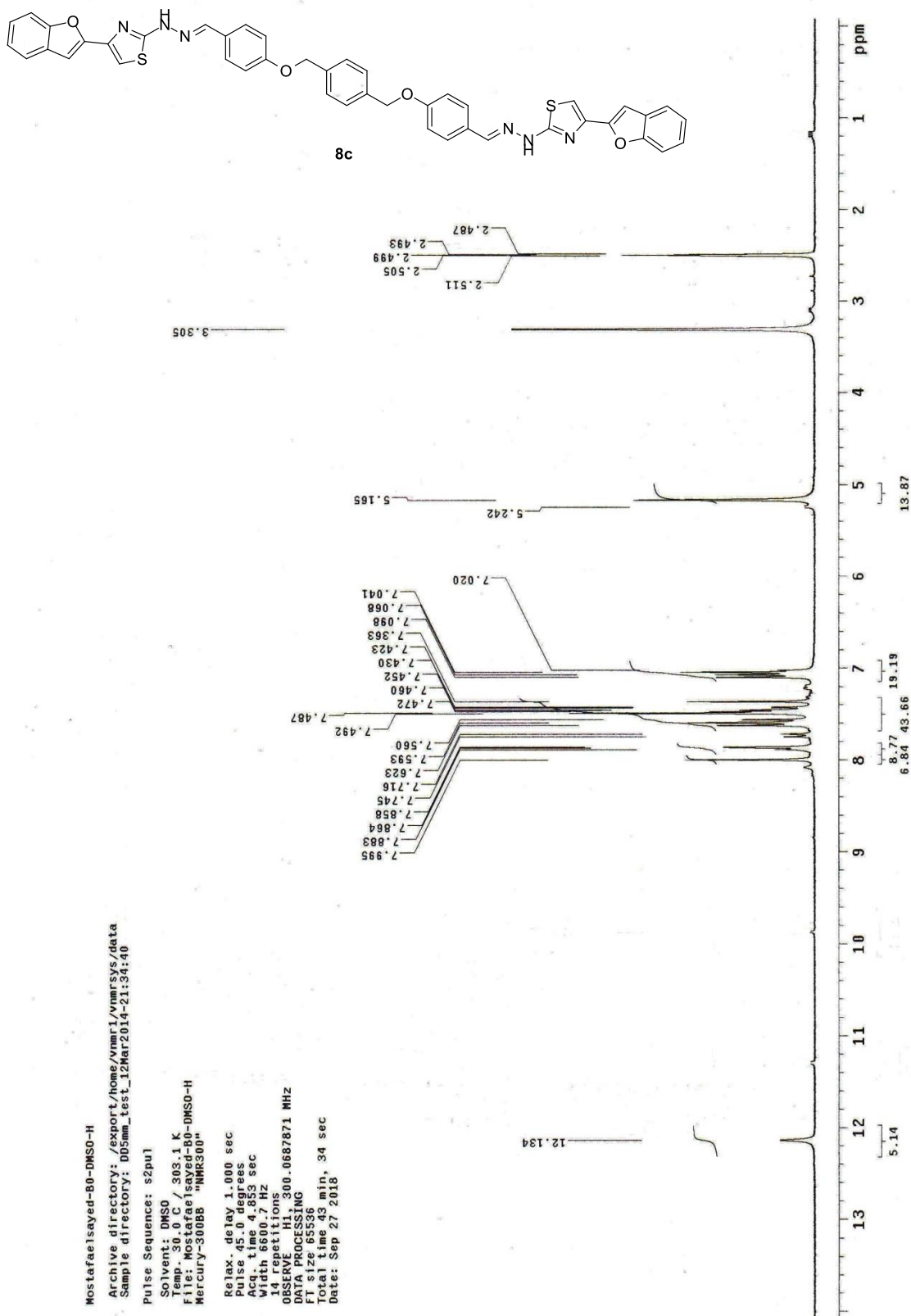




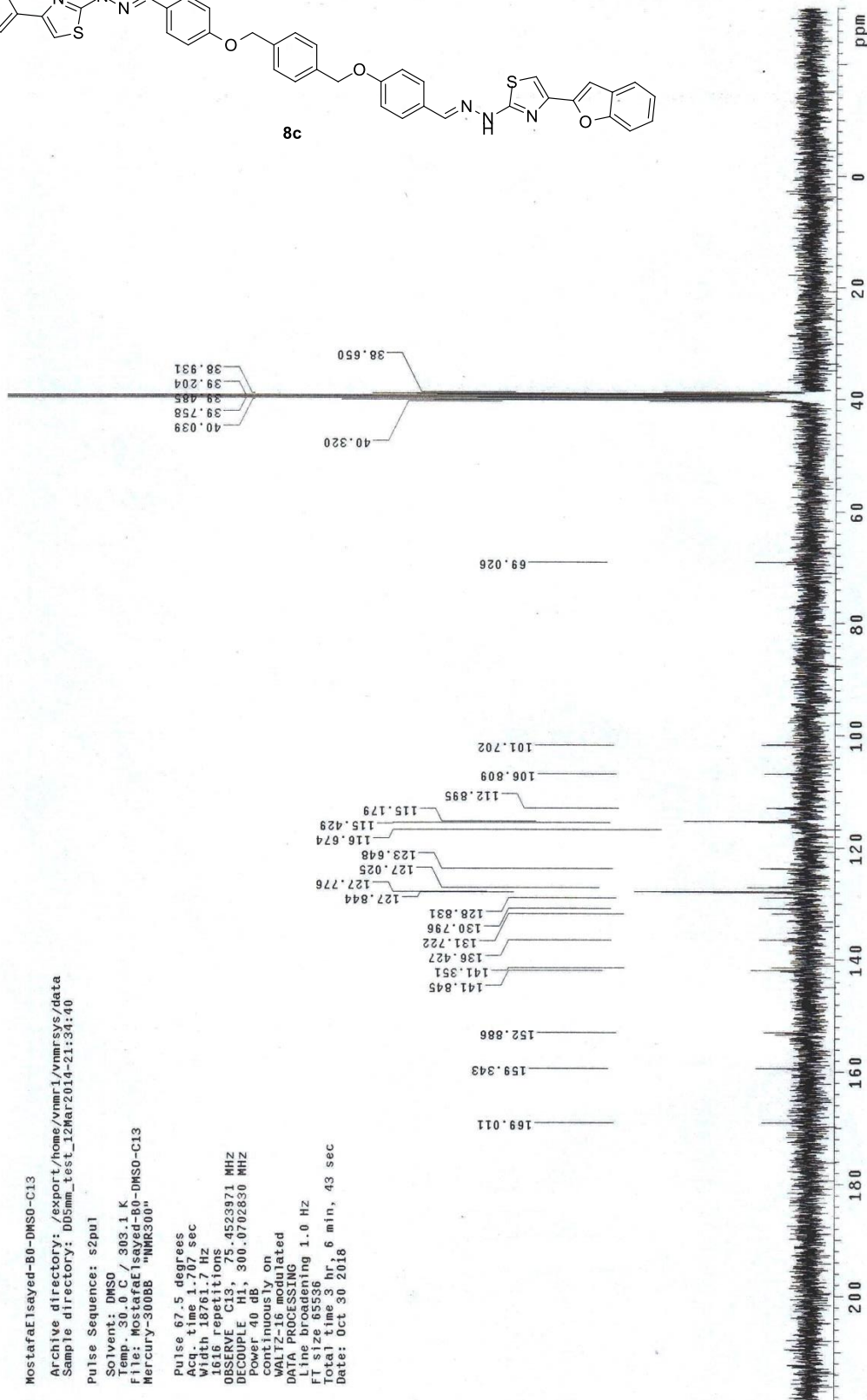
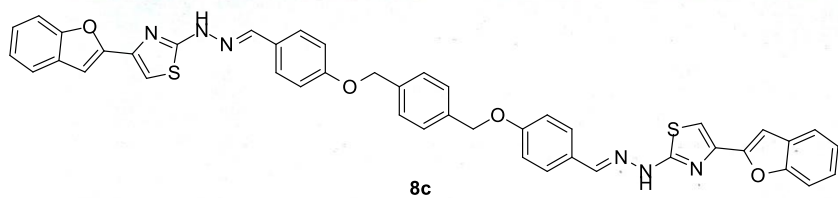
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 File: PRDTON  
 Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temp.: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Pulse 67.5 degrees  
 Acq. time 1.707 sec  
 Width 18761.7 Hz  
 1376 repetitions  
 OBSERVE C13, 75.4523971 MHz  
 DECOUPLE H1, 300.0702830 MHz  
 continuously on  
 WALTZ-16 modulated  
 DATA PROCESSING  
 Line broadening 1.0 Hz  
 FI size 65536  
 Total time 3 hr, 6 min, 43 sec  
 Date: Oct 30 2018



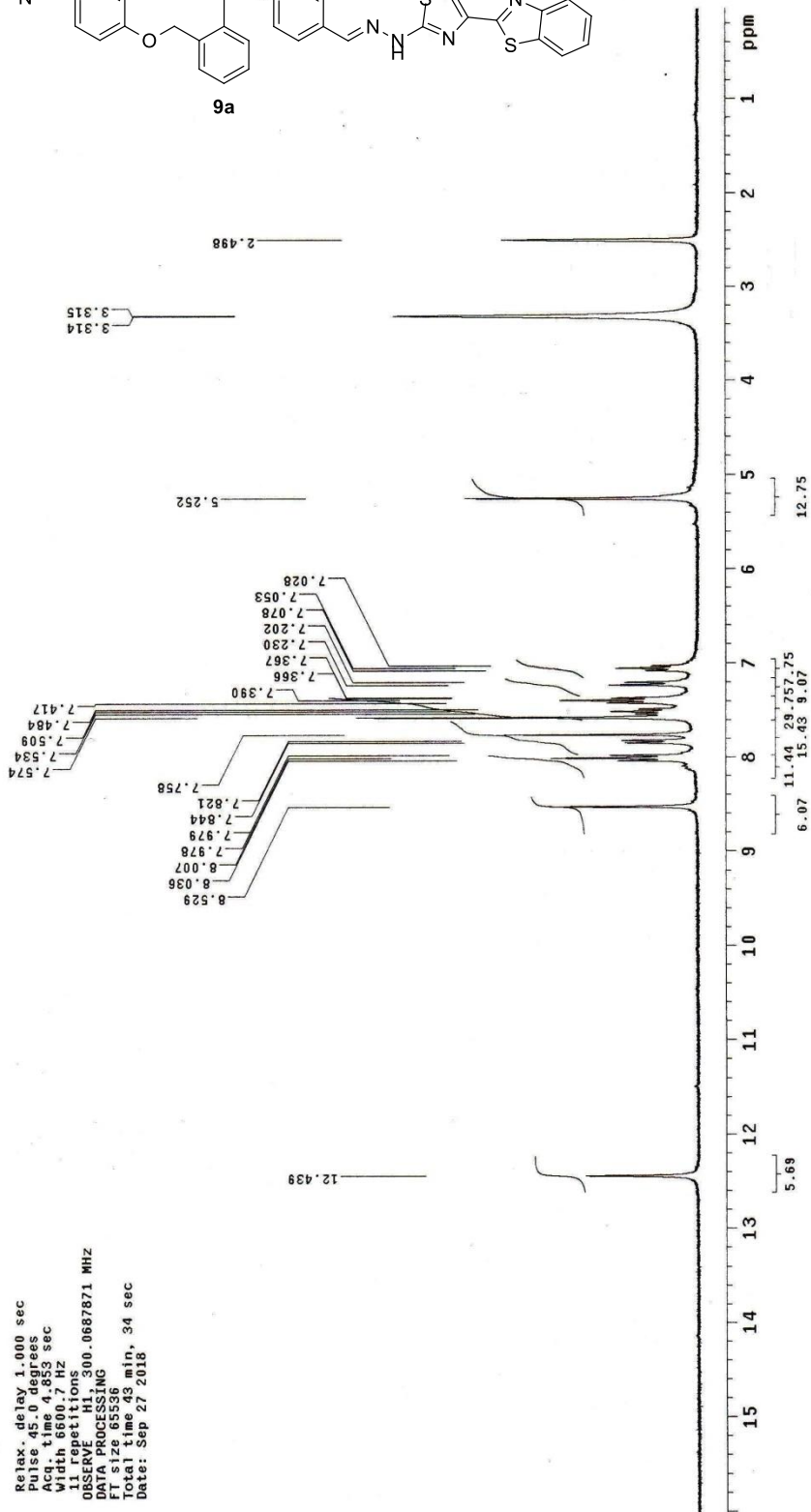
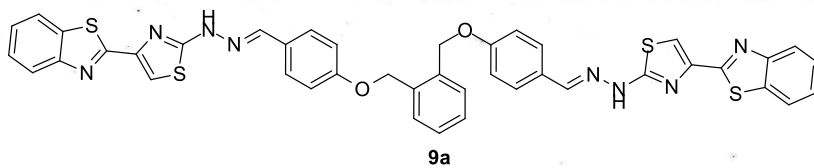
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 File: PROTON  
 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temperature: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6600.7 Hz  
 14 repetitions  
 OBSERVE H1, 300.0687871 MHz  
 DATA PROCESSING  
 FT size 65536  
 Total time: 43 min, 34 sec  
 Date: Sep 27 2016



MostafaeiSayed-B0-DMSO-H  
 Archive directory: /export/home/vnmr1/vnmrSYS/data  
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 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temp: 30.0 C / 303.1 K  
 File: MostafaeiSayed-B0-DMSO-H  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Width 680.7 Hz  
 14 repetitions  
 OBSERVE H1, 300.0687871 MHZ  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: Sep 27 2018



MostafaElsayed-B0-DMSO-C13  
 Archive directory: /export/home/vnmr1/vnmrsys/data  
 Sample directory: D05mm\_test\_12Mar2014-21:34:40  
 Pulse Sequence: s2pul  
 Solvent: DMSO / 303.1 K  
 File: MostafaElsayed-B0-DMSO-C13  
 Mercury-300BB "NMR300"  
 Pulse 67.5 degrees  
 AcqTime: 1.57 sec  
 Width 18761.7 Hz  
 1616 repetitions  
 OBSERVE C13, 75.4523971 MHZ  
 DECOUPLE H1, 300.0702830 MHZ  
 Power 40 dB  
 continuously on  
 WALTZ-16 modulated  
 DATA PROCESSING  
 Line broadening 1.0 Hz  
 F1 z-axis scaling 1.0  
 Total time: 30 hr, 6 min, 43 sec  
 Date: Oct 30 2018

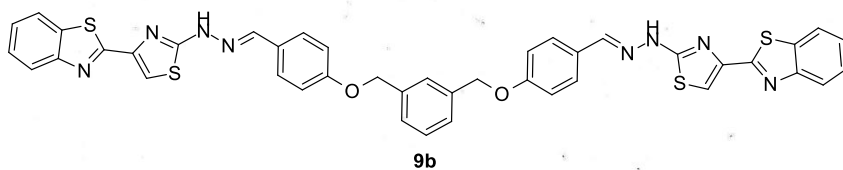


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 Solvent: DMSO  
 Temp. 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6600.7 Hz  
 Observed H1 Freq 300.0687871 MHz  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: Sep 27 2018

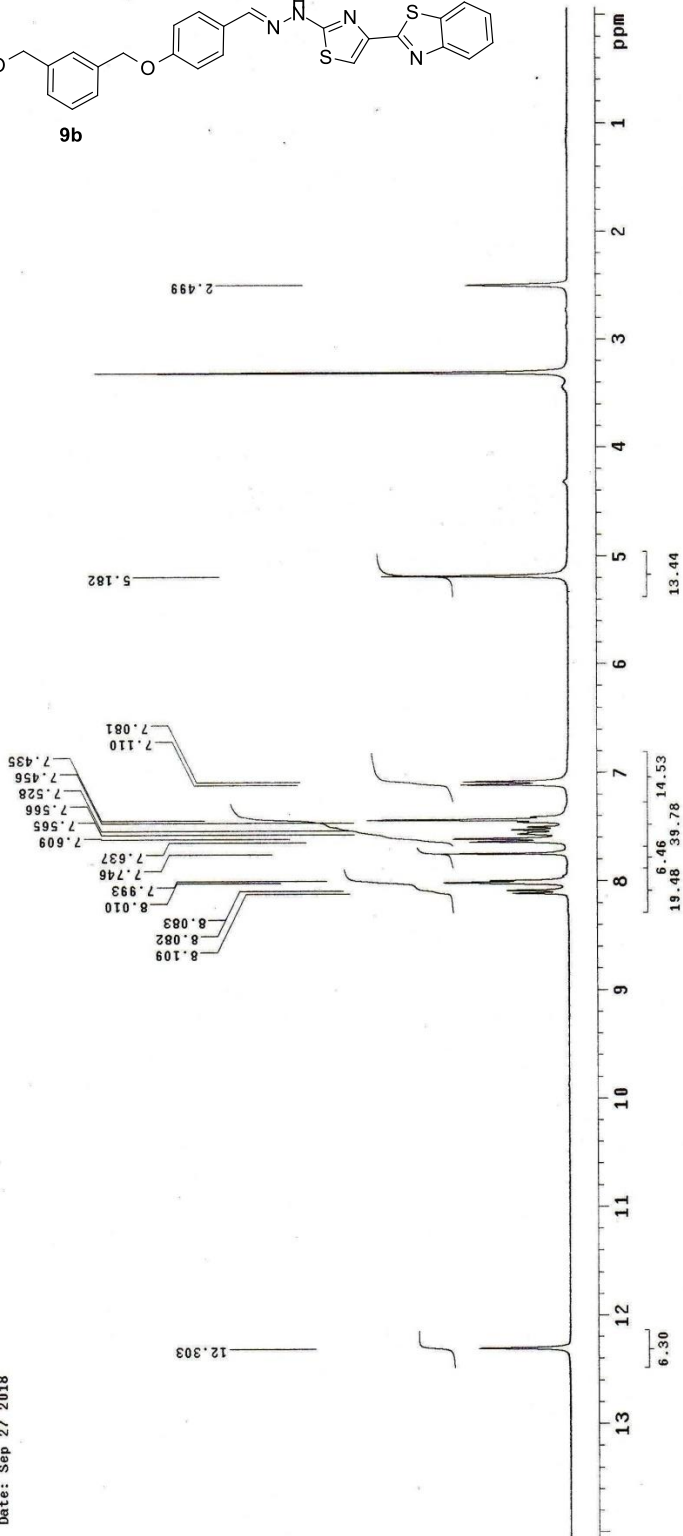


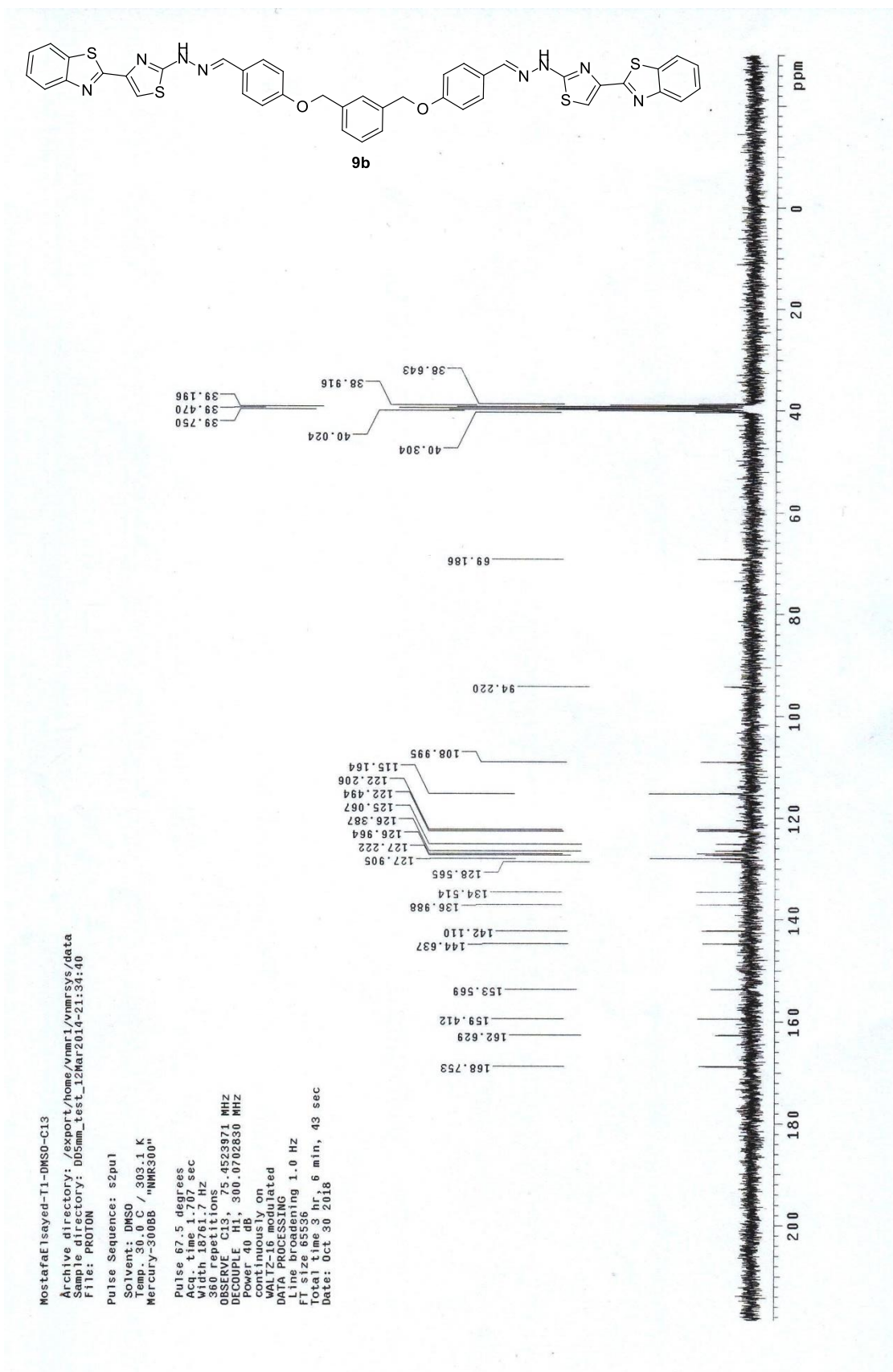


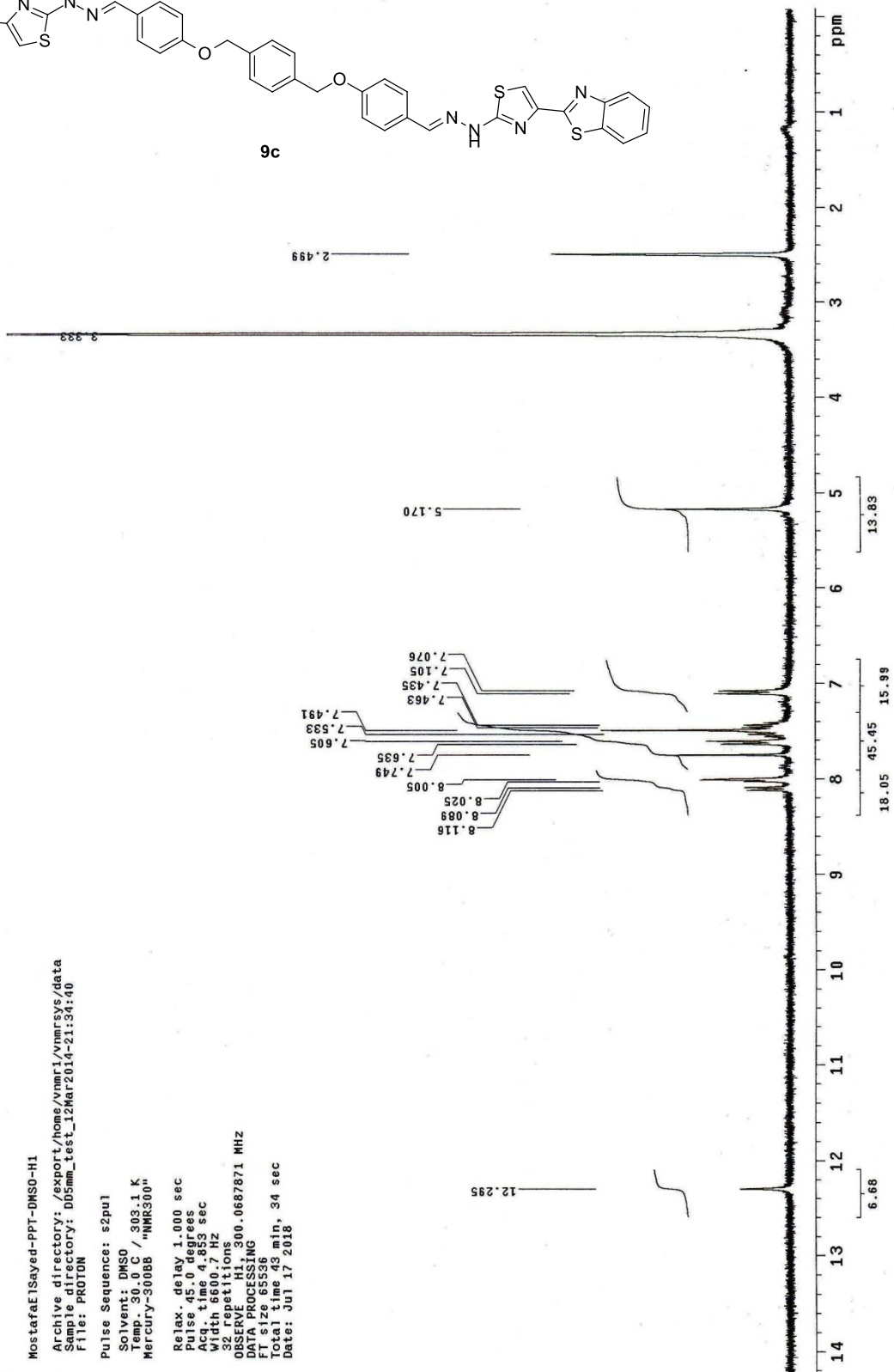
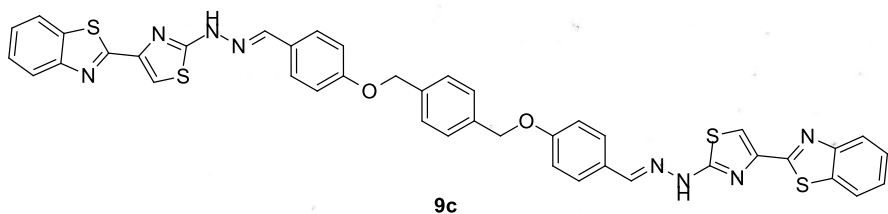




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 File: PROTON  
 Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temp. 30.0 C / 86.1 K  
 Mercury-300BBB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 4.000 sec  
 Acq. time 4.853 sec  
 Width 6800.7 Hz  
 19 repetitions  
 OBSERVE H1, 300.0687871 MHz  
 DATA PROCESSING  
 F1 size 65536  
 T1 time 7.35 min, 34 sec  
 Date: Sep 27 2018







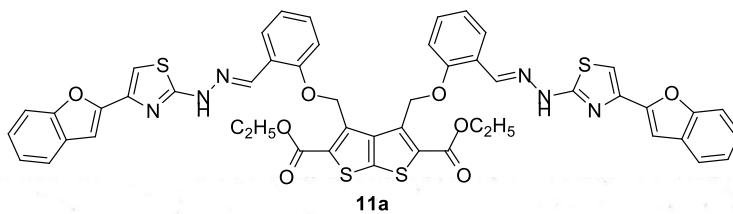
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 File: PROTON

Pulse Sequence: s2pu1

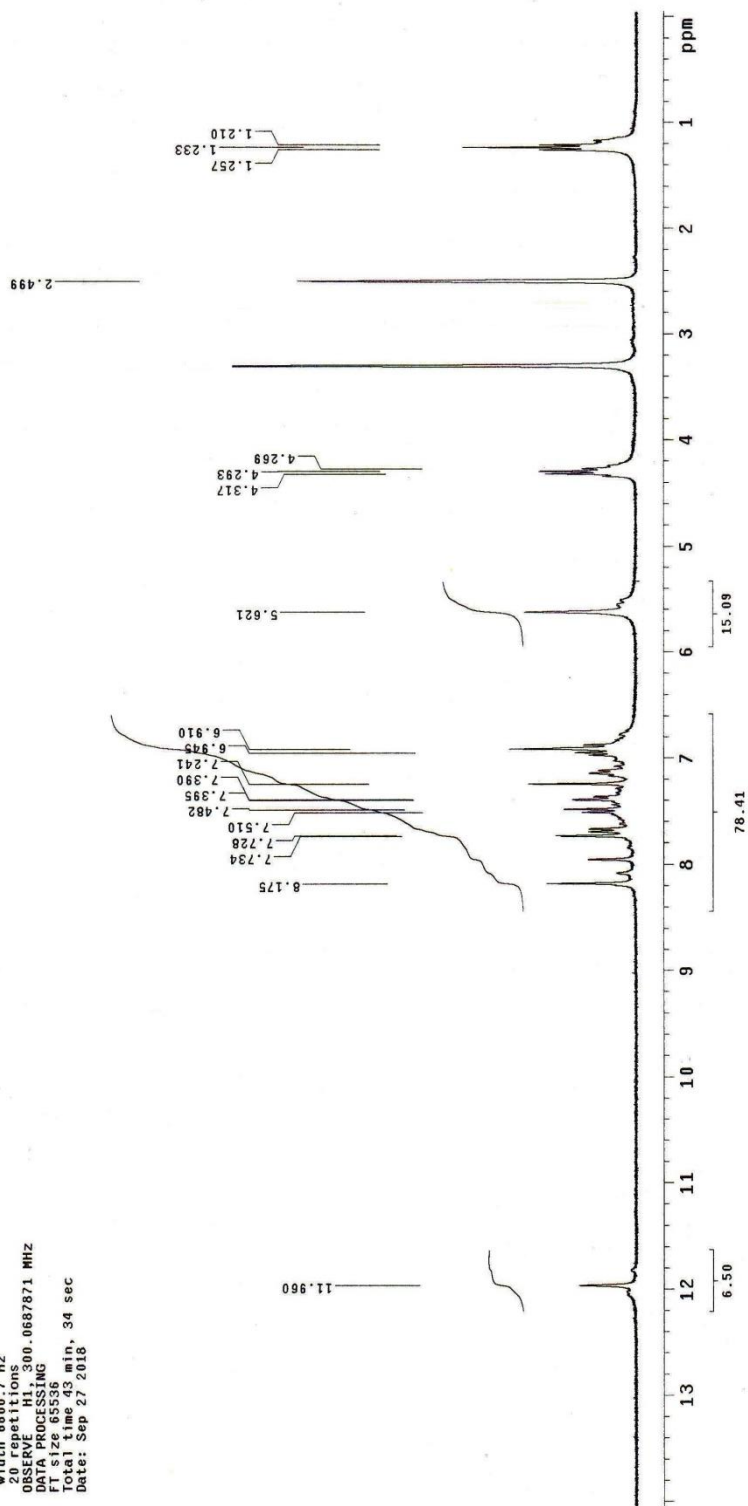
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 Temp.: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"

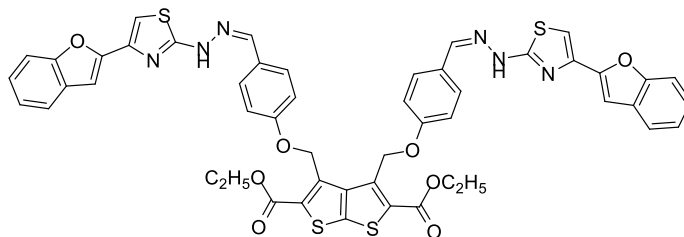
Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6600.7 Hz  
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OBSERVE: H1  
 OBSERVE F1: 300.0687871 MHZ  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min., 34 sec  
 Date: Jul 17 2018

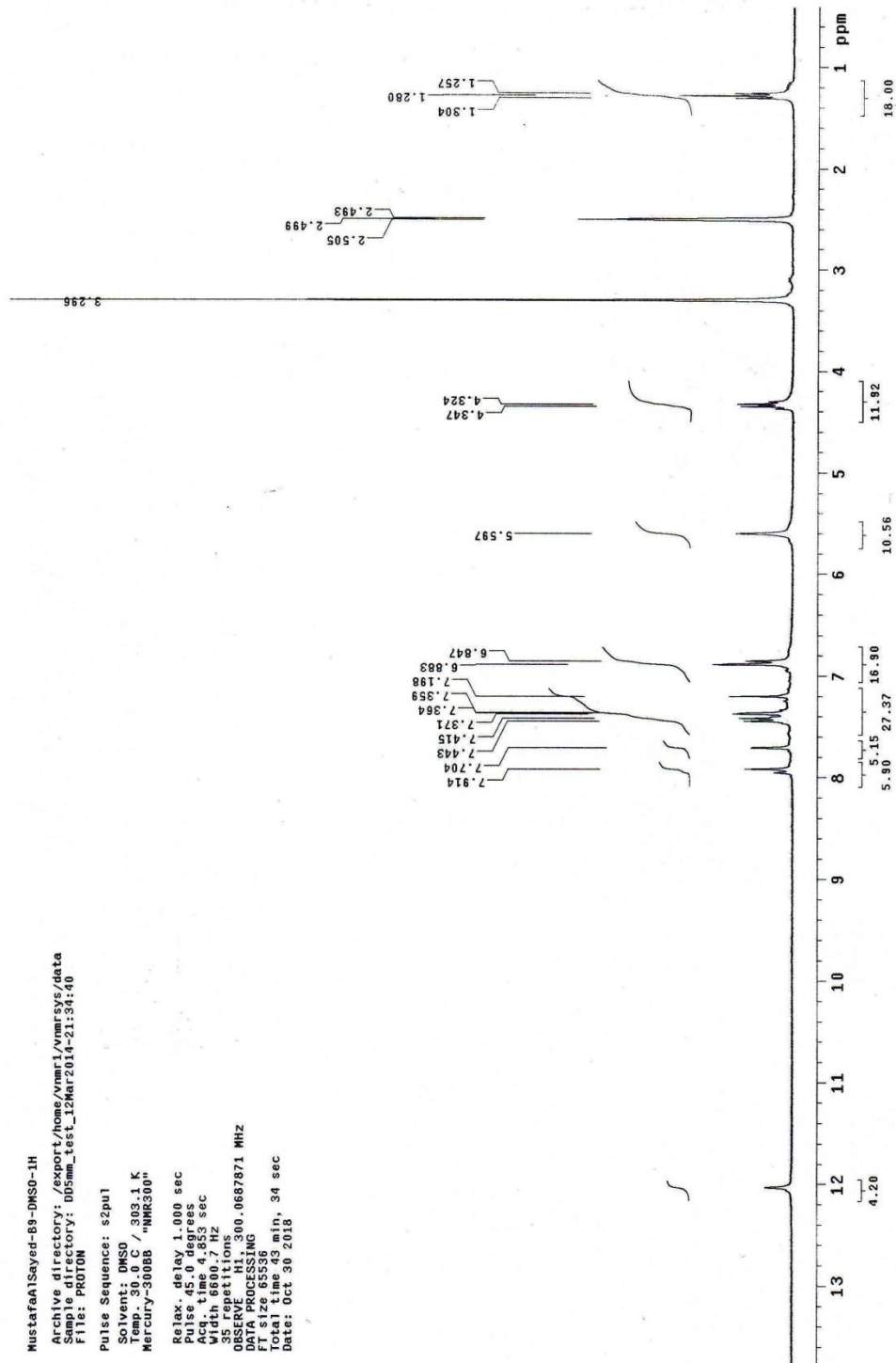


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 Sample directory: D05mm\_test\_12Mar2014-21:34:40  
 File: PR070N  
 Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temperature: 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6600.7 Hz  
 20 repetitions  
 DMSERPROC.MN 300.0687871 MHZ  
 DATA ACQUISITION  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: Sep 27 2018

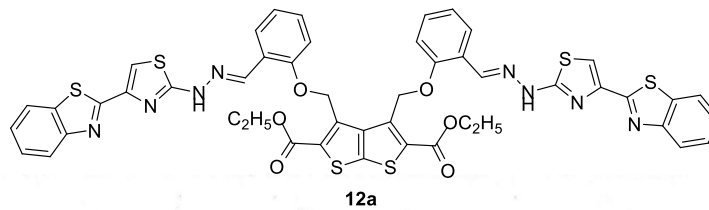




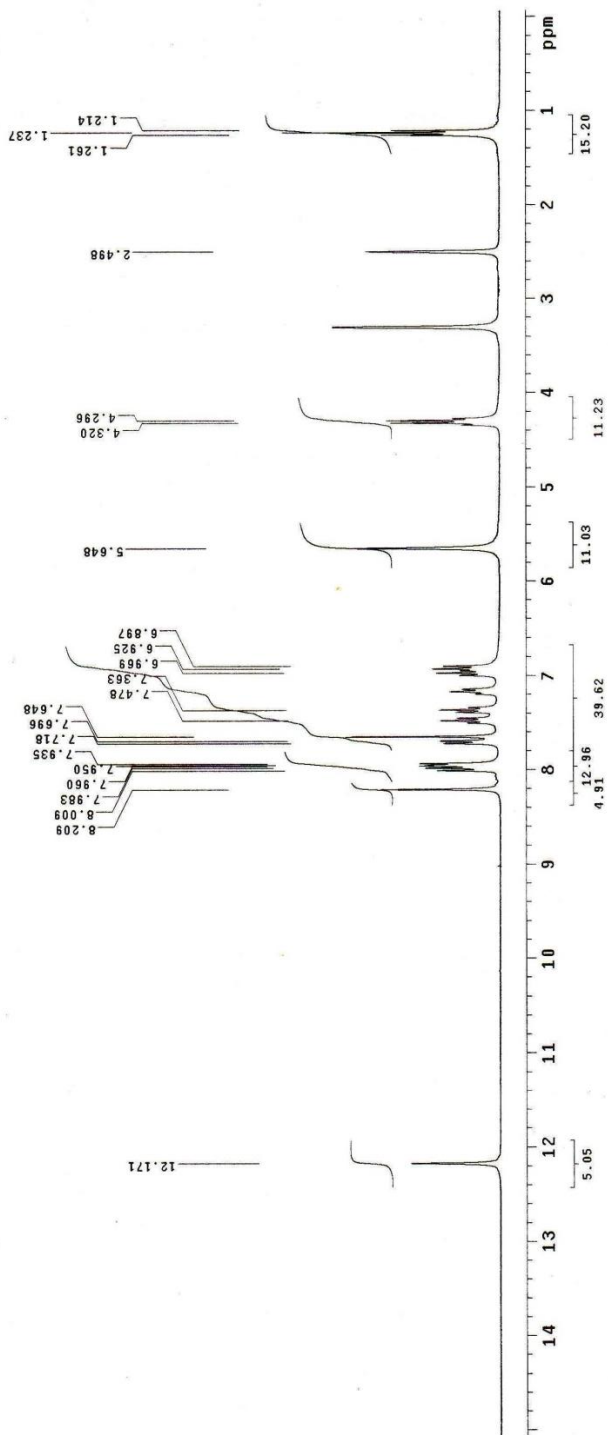
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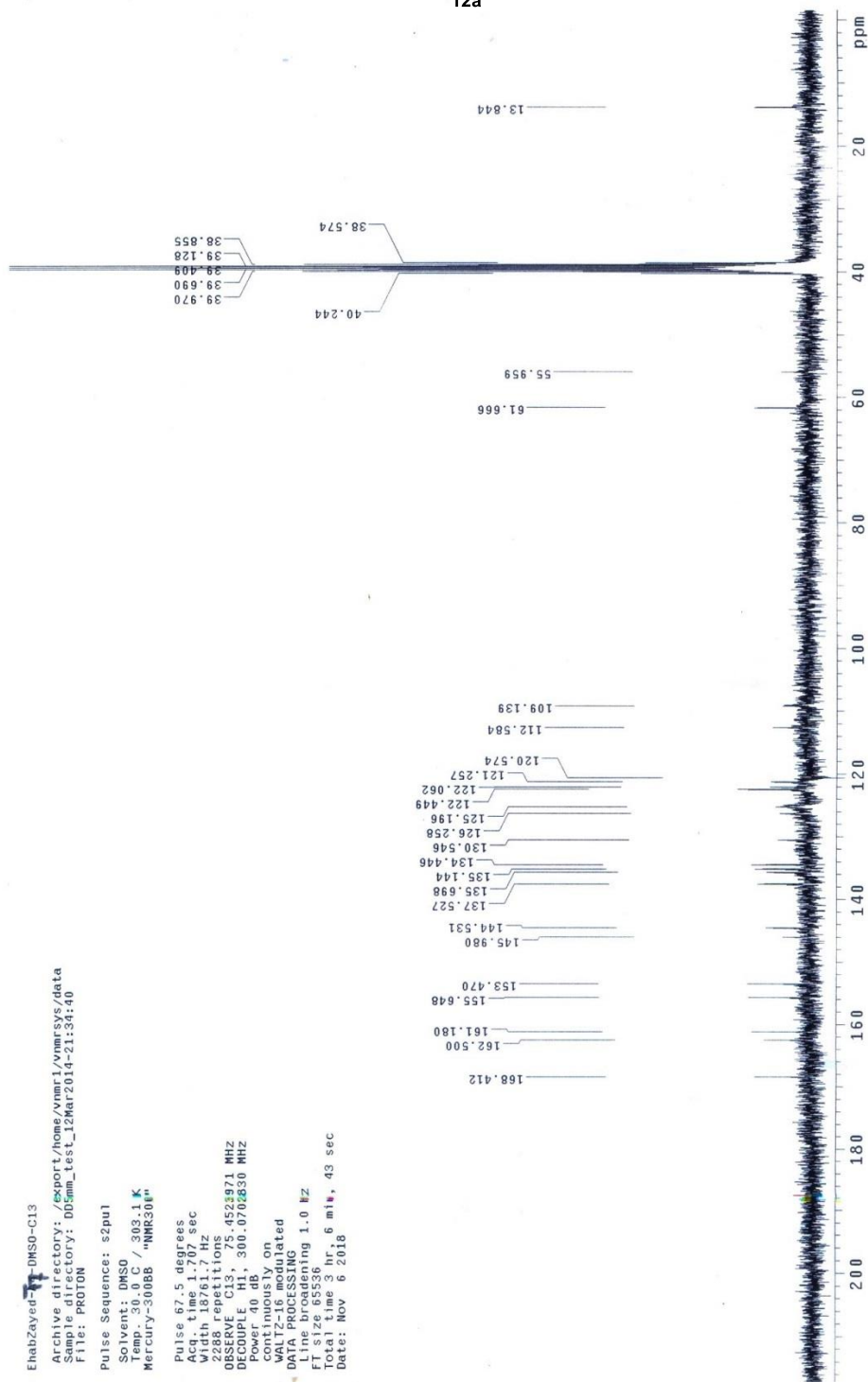
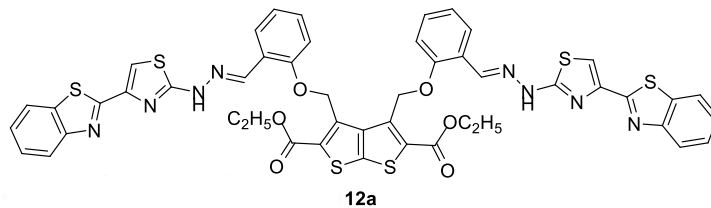


MustafaAlSayed-69-DMSO-1H  
 Archive directory: /export/home/vmmr1/vmmrSYS/data  
 Sample directory: D05mm\_test\_12Mar2014-21:34:40  
 File: PROTON  
 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temp: 30.0 / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6600.7 Hz  
 Spectrometer: spect  
 OBSERVE H1 300.0687871 MHZ  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: Oct 30 2018



MostafaElsayed-T7-DMSO-H  
 Archive directory: /export/home/vnmr1/vnmrsys/data  
 Sample directory: D05mm\_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 4.863 sec  
 101.000 Hz  
 73 Channels  
 OBSERVE H1, 300.0687871 MHZ  
 DATA PROCESSING  
 FT size 65536  
 Total time 7.7 min, 34 sec  
 Date: Sep 27 2018



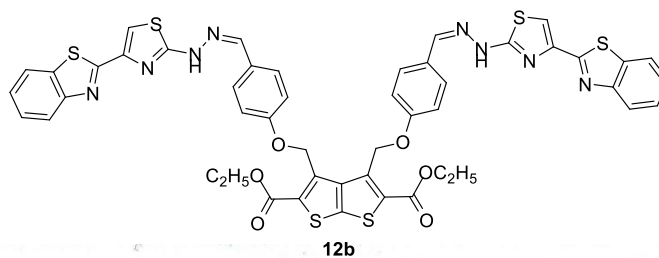


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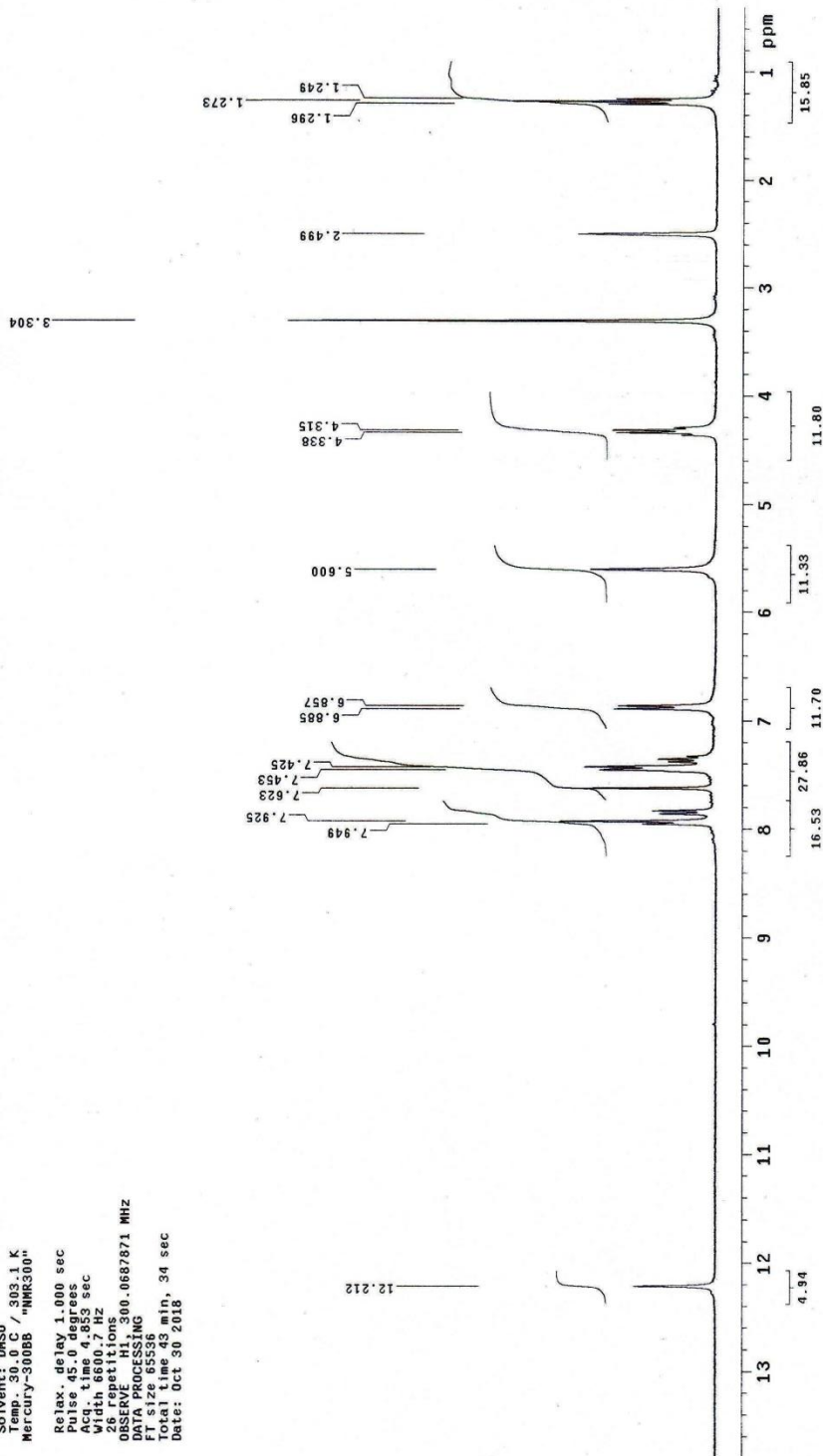
Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temp: 30.0 °C / 303.1 K  
 Mercury-300BB "NMR300"

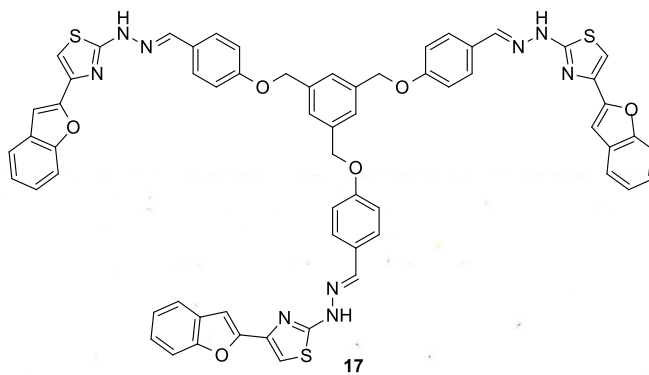
Pulse: 67.5 degrees  
 Acq. time: 1.767 sec  
 Width: 18761.7 Hz  
 2288 repetitions  
 DECOUPLE: H1, 5.452871 MHz  
 Power: 40 dB, 300.0702330 MHz  
 continuously on  
 WALTZ-16 modulated  
 DATA PROCESSING  
 Line broadening: 1.0 Hz  
 File size: 65536  
 Total time: 3 hr, 6 min, 43 sec  
 Date: Nov 6 2018



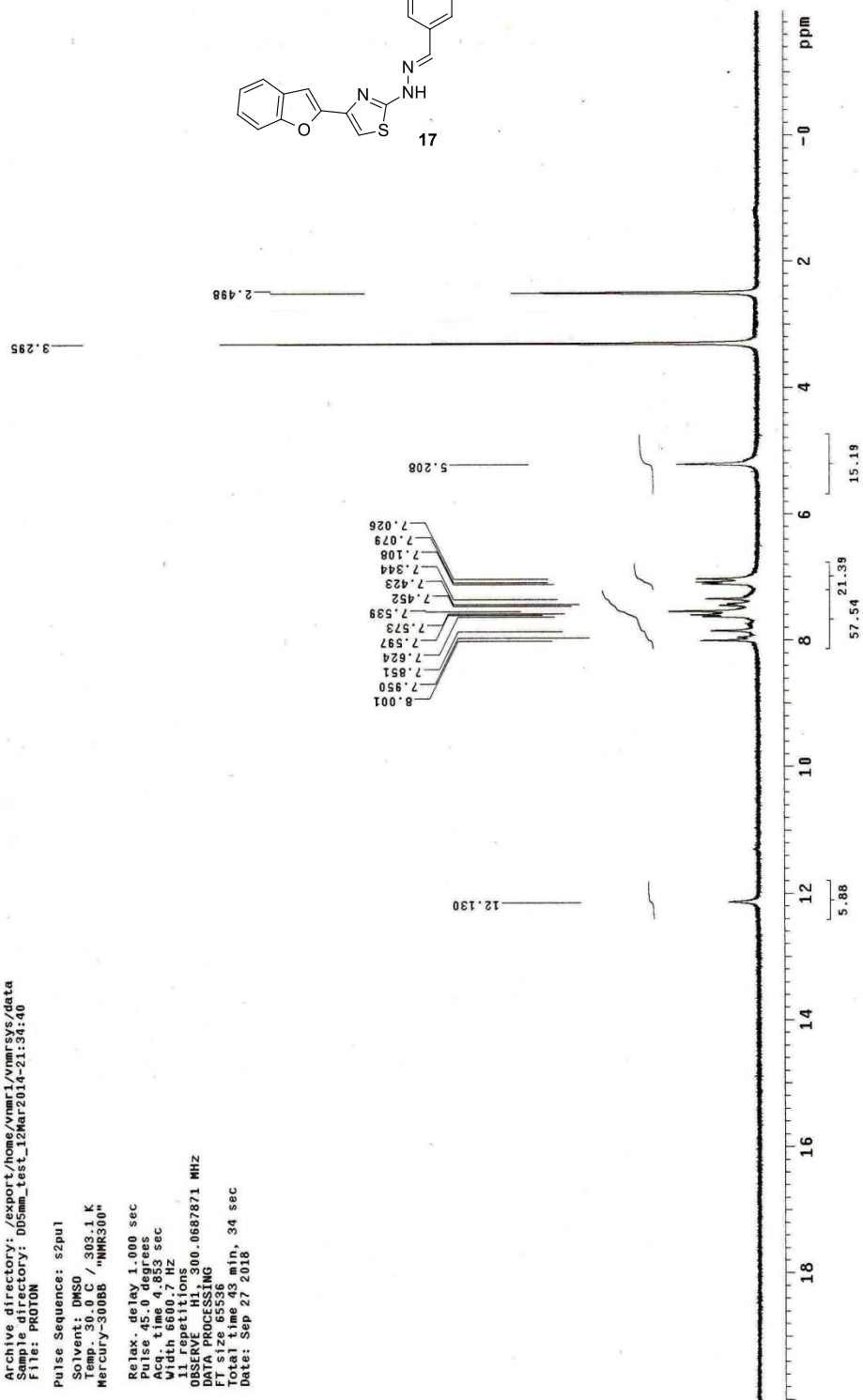


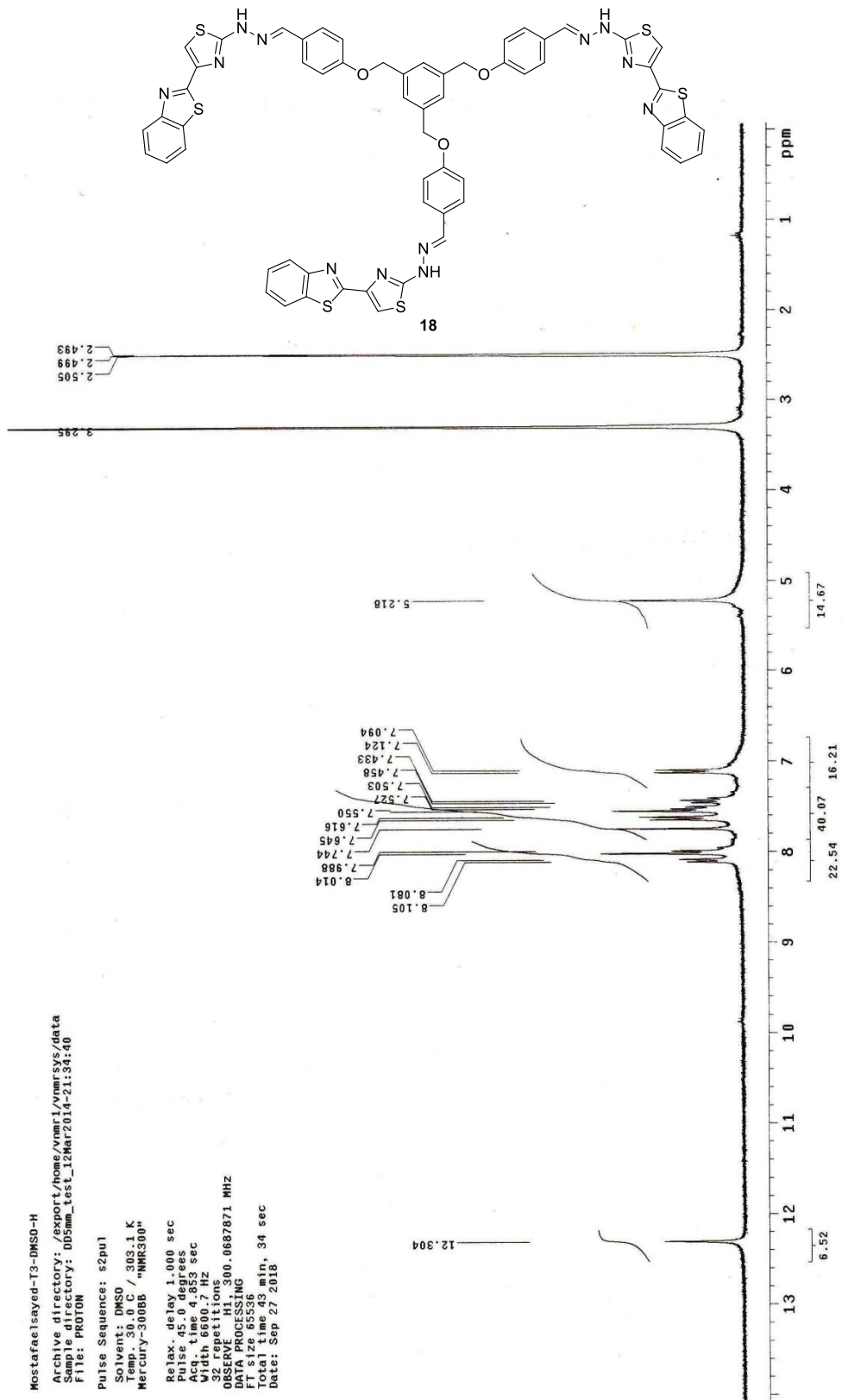
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 File: PROTON  
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 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temp: 30.0 C / 303.1 K  
 Mercury-3000BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Delay 0.052 sec  
 Width 6800.7 Hz  
 26 repetitions  
 OBSERVE H1, 300.0687871 MHZ  
 DATA PROCESSING  
 Total time 03 min, 34 sec  
 Date: Oct 30 2018



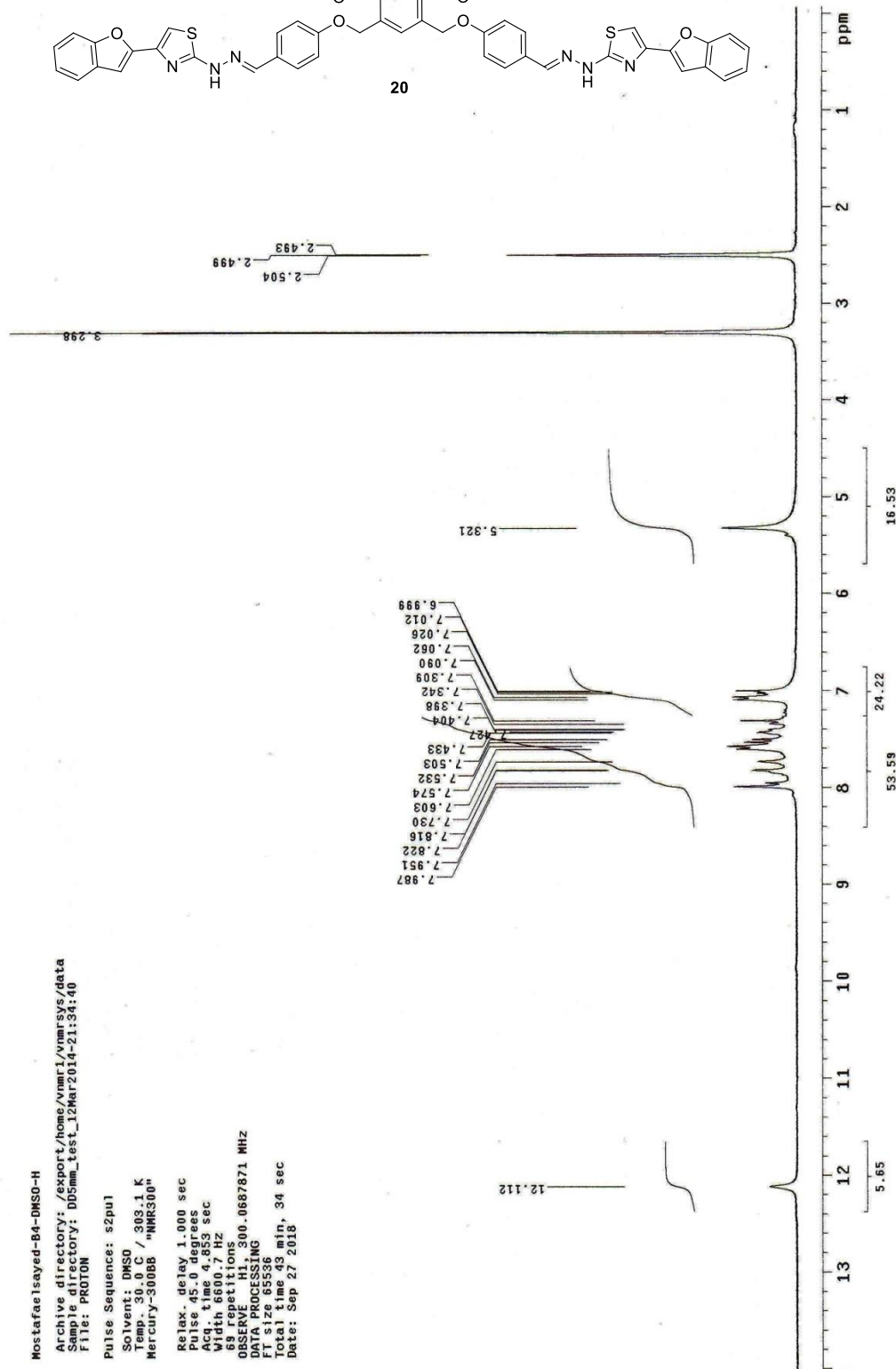
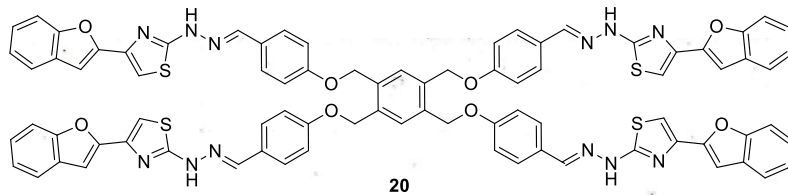


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 Sample directory: 005mm\_test\_12Mar2014-21:34:40  
 File: PR010N  
 Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temp: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
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 Date: Sep 27 2018

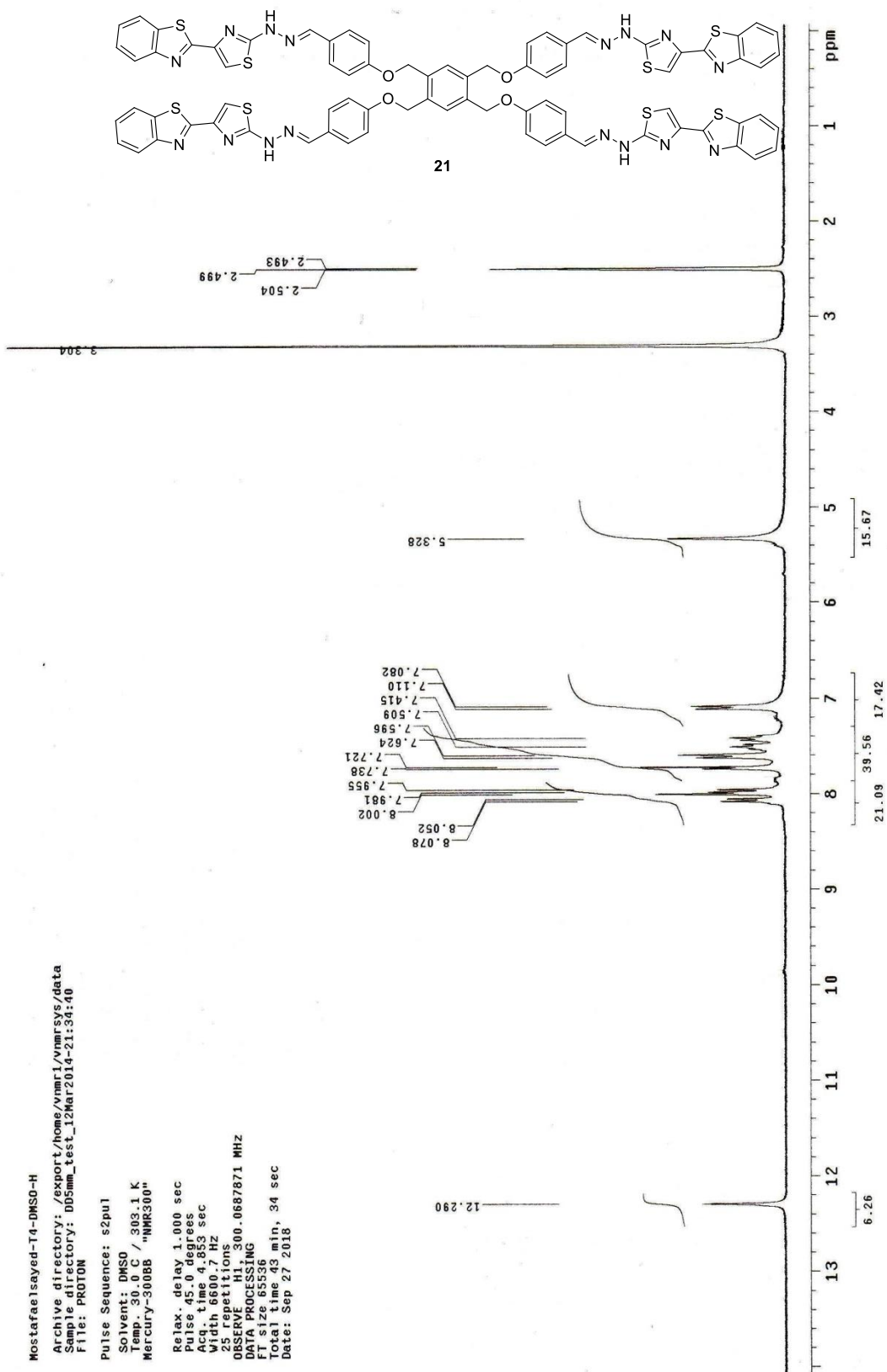




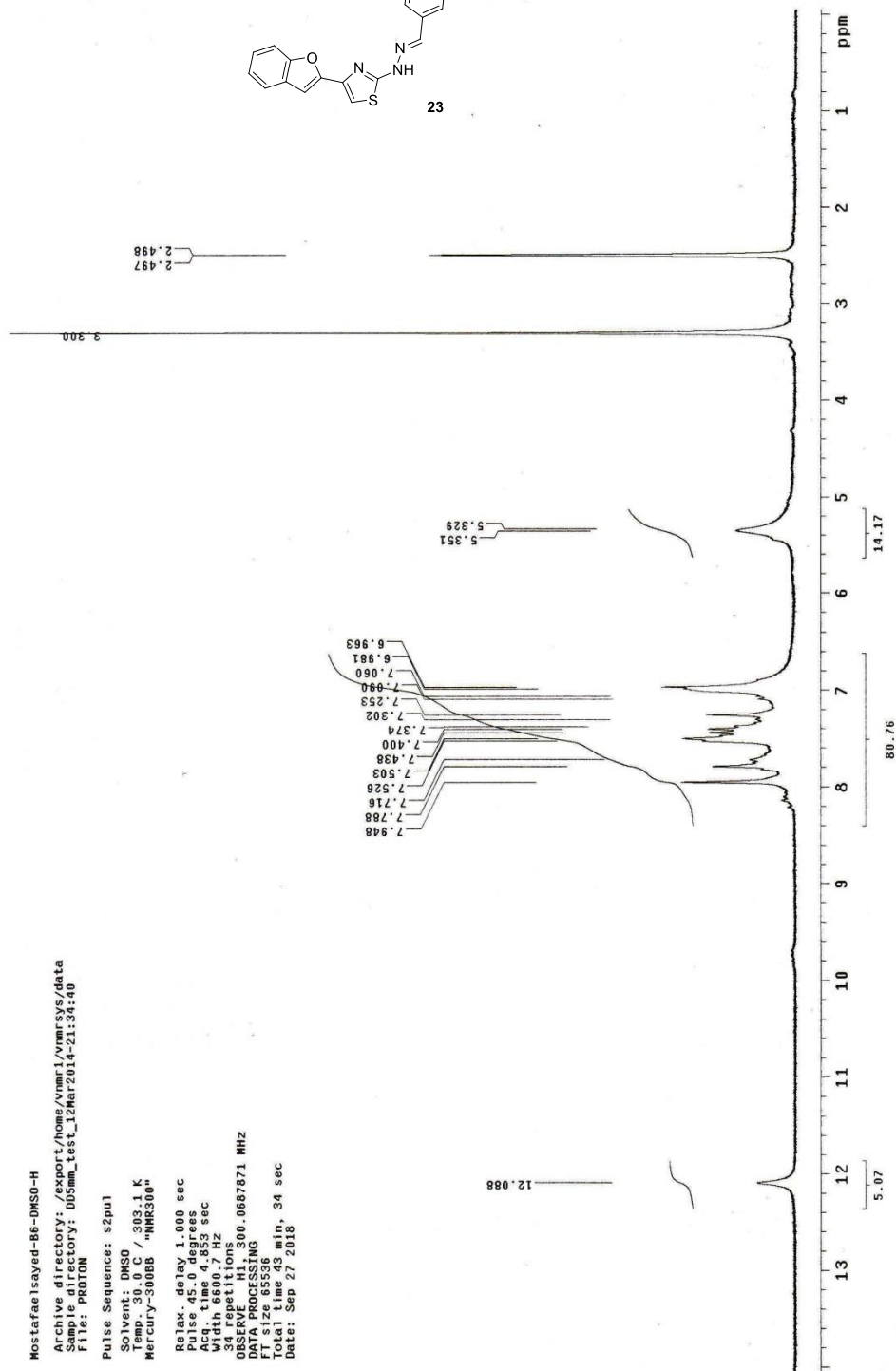
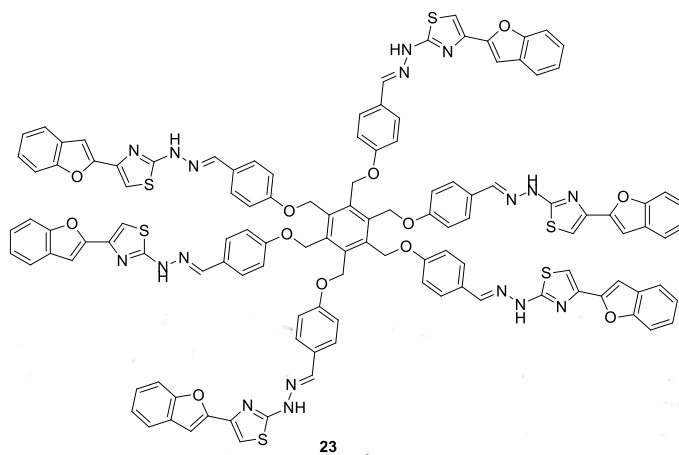
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 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temp: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulse 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6000.7 Hz  
 Observed F1 300.0687871 MHz  
 DATA PROCESSING  
 FT size 65536  
 Total time 43 min, 34 sec  
 Date: Sep 27 2016



Mostafae Isayed-B4-DMSO-H  
 Archive directory: /export/home/vnmr1/vnmrsys/data  
 Sample directory: DDSmm\_test\_12Mar2014-21:34:40  
 File: PROT0N  
 Pulse Sequence: s2pul  
 Solvent: DMSO  
 Temp.: 30.0 C / 303.1 K  
 Mercury-300BB "NMR300"  
 Relax. delay 1.000 sec  
 Pulp. 45.0 degrees  
 Acq. time 4.853 sec  
 Width 6600.7 Hz  
 69 repetitions  
 OBSERVE H1, 300.0687871 MHZ  
 DATA PROCESSING  
 F1 size: 65536  
 F2 size: 65536  
 F1 time: 2.70 min, 34 sec  
 Date: Sep 27 2018



Mostafaei sayed-T4-DMSO-H  
 Archive directory: /export/home/vnmr1/vnmrsvs/data  
 Sample directory: 005mm\_test\_12Mar2014-21:34:40  
 File: PROT0N  
 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: 6600.7 Hz  
 25 repetitions  
 OBSERVE: H1, 300.0687871 MHz  
 DATA PROCESSING  
 FT size: 65536  
 Total time: 43 min, 34 sec  
 Date: Sep 27 2018



Mostafaei sayed-B6-DMSO-H  
 Archive directory: /export/home/vram1/vram1s/data  
 Sample directory: D05mm\_test\_12Mar2014-21:34:40  
 File: PROTON  
 Pulse Sequence: s2pu1  
 Solvent: DMSO  
 Temp: 30.0 C / 86.1 K  
 Mercury-300BB "HNR300"  
 Relax. delay: 1.000 sec  
 Pulse: 45.0 degrees  
 Acq. time: 4.853 sec  
 Width: 6000.7 Hz  
 OBSERVATION: 00.0687871 MHz  
 DATA ACQUISITION: 00.0687871 MHz  
 DATA PROCESSING  
 FT size: 65536  
 Total time: 43 min, 34 sec  
 Date: Sep 27 2018