

Electronic Supplementary Material (ESI)

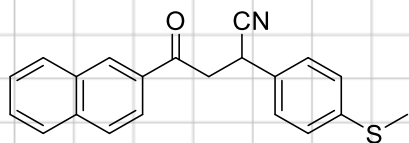
A convenient synthesis of 2,4-diarylpyrroles from β -cyanoketones *via* reductive rearrangement of *in situ* generated 2-aminofurans

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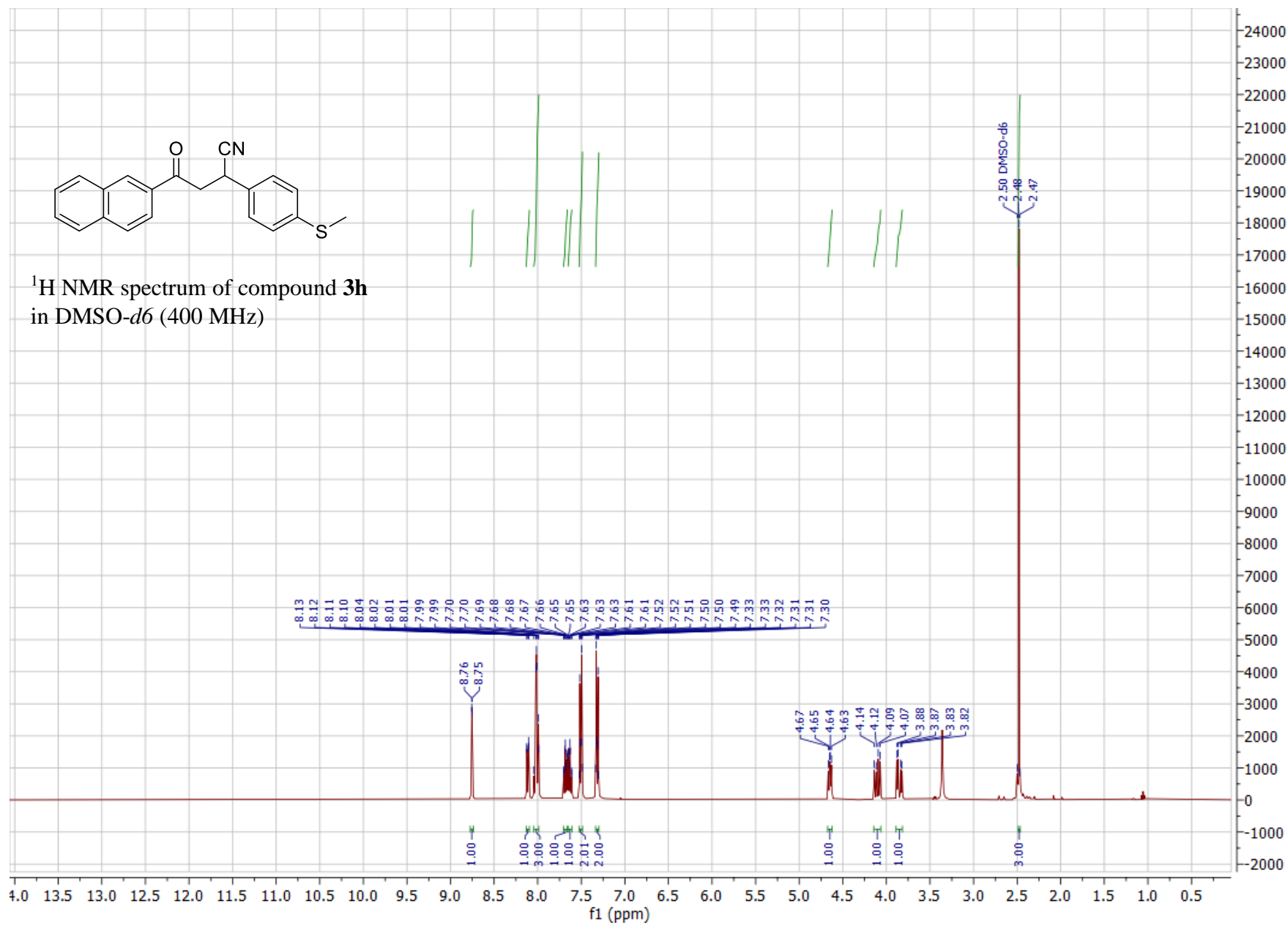
Department of Chemistry, North Caucasus Federal University, 1a Pushkin St., Stavropol 355017, Russia.

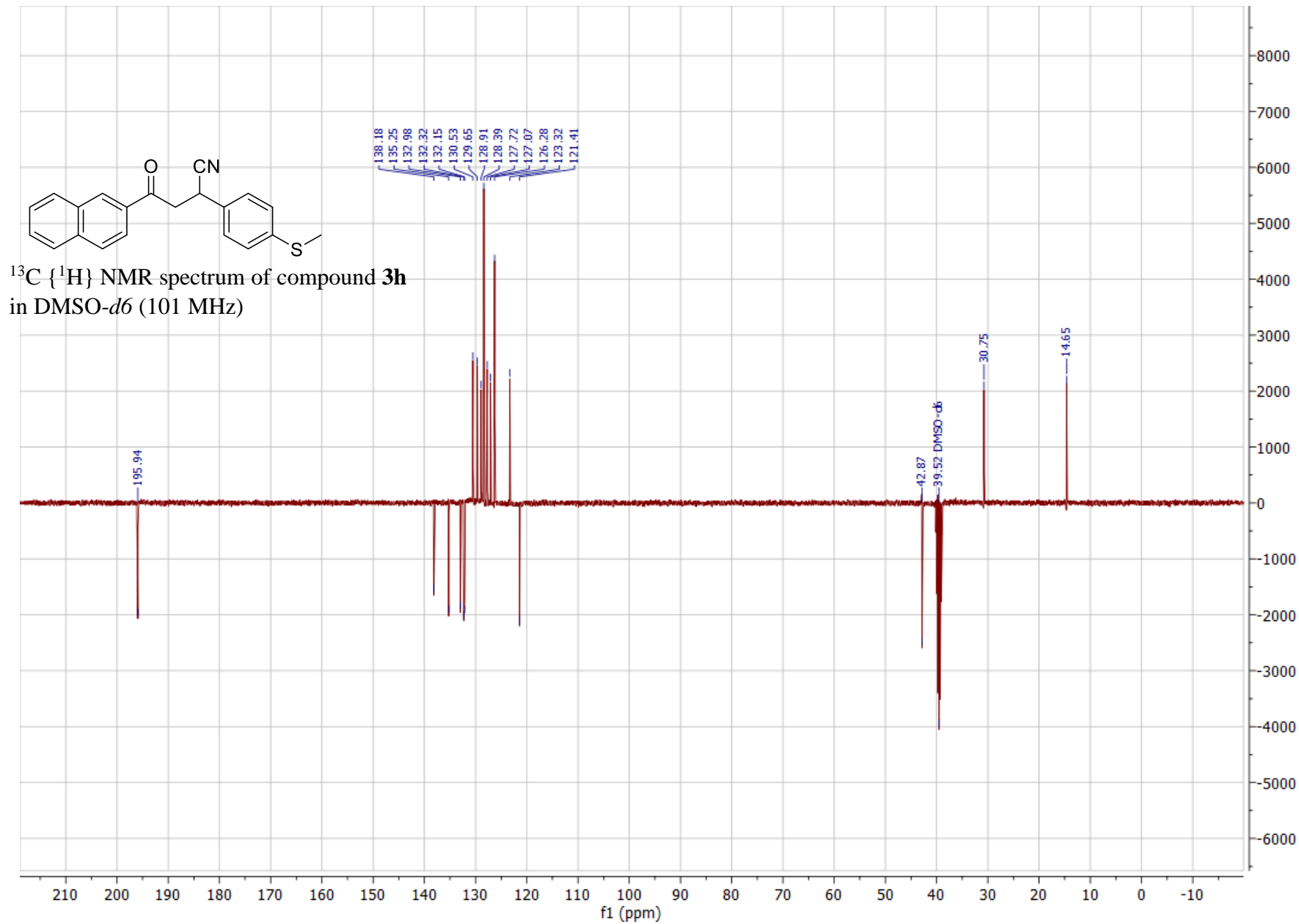
Department of Chemistry, North Caucasus Federal University, 1a Pushkin St., Stavropol 355017, Russia.

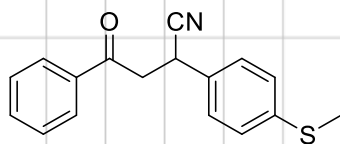
1. ^1H and ^{13}C NMR spectral charts of compounds 3h,3k	S2
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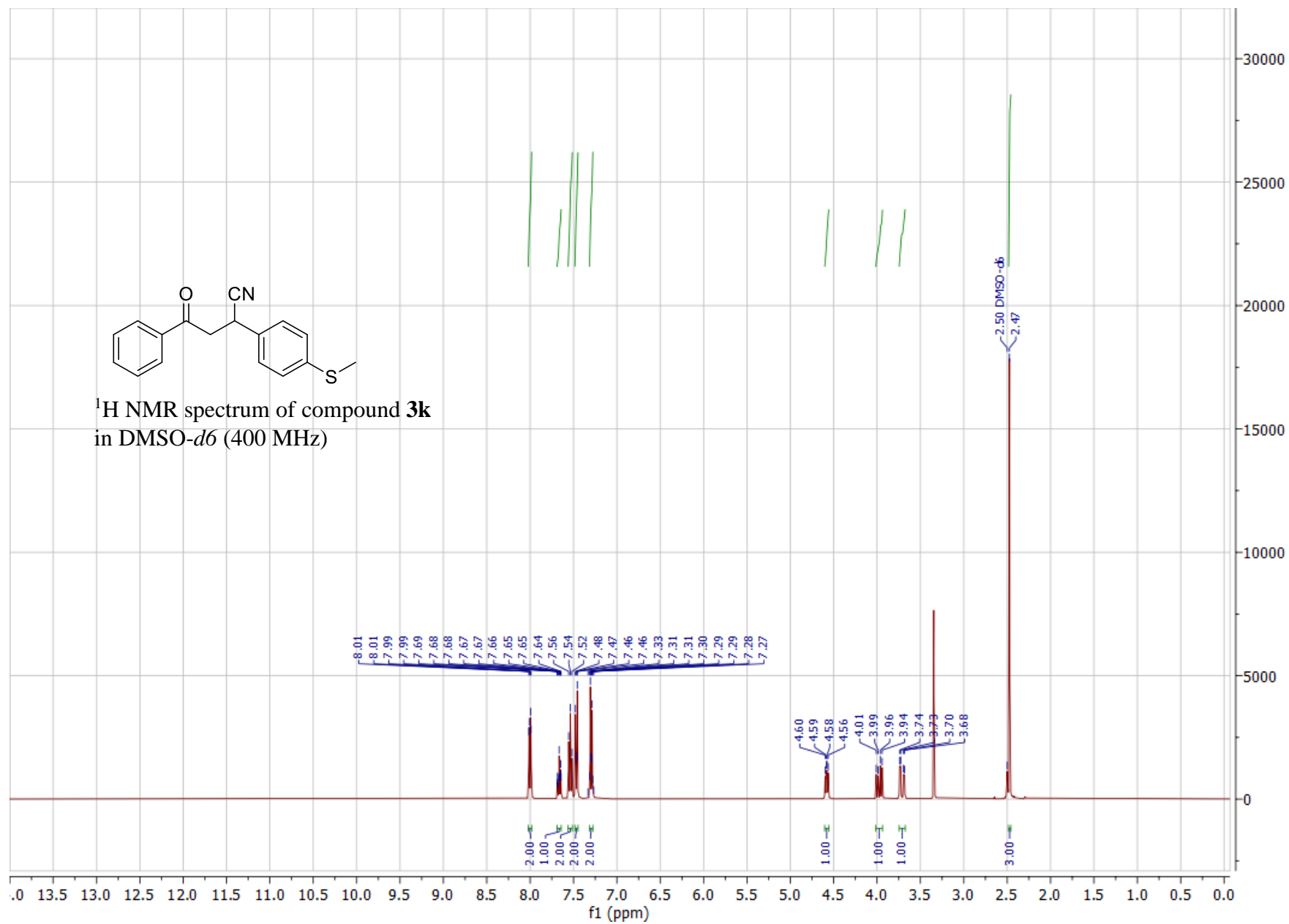
^1H NMR spectrum of compound **3h**
in DMSO-*d*₆ (400 MHz)

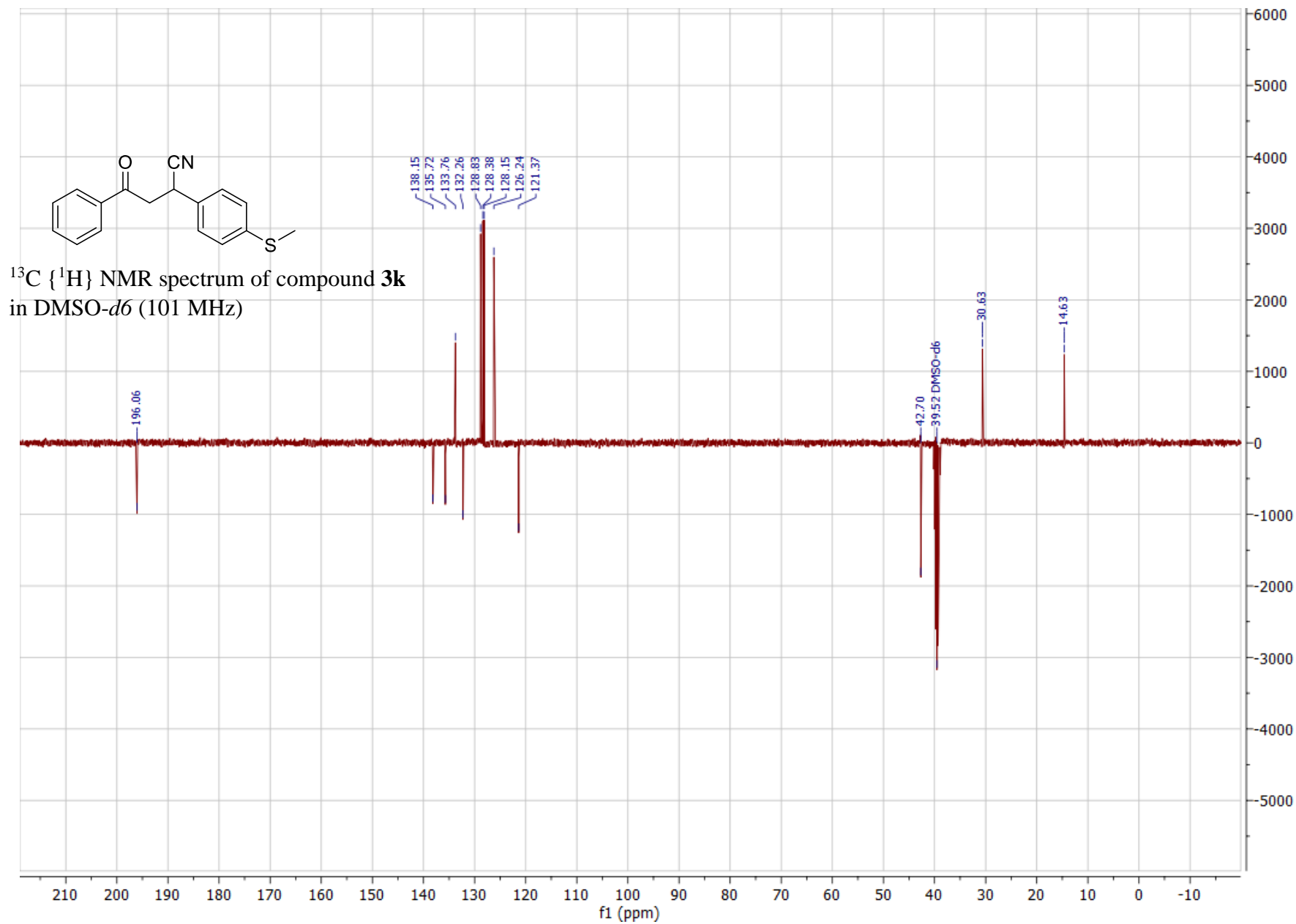


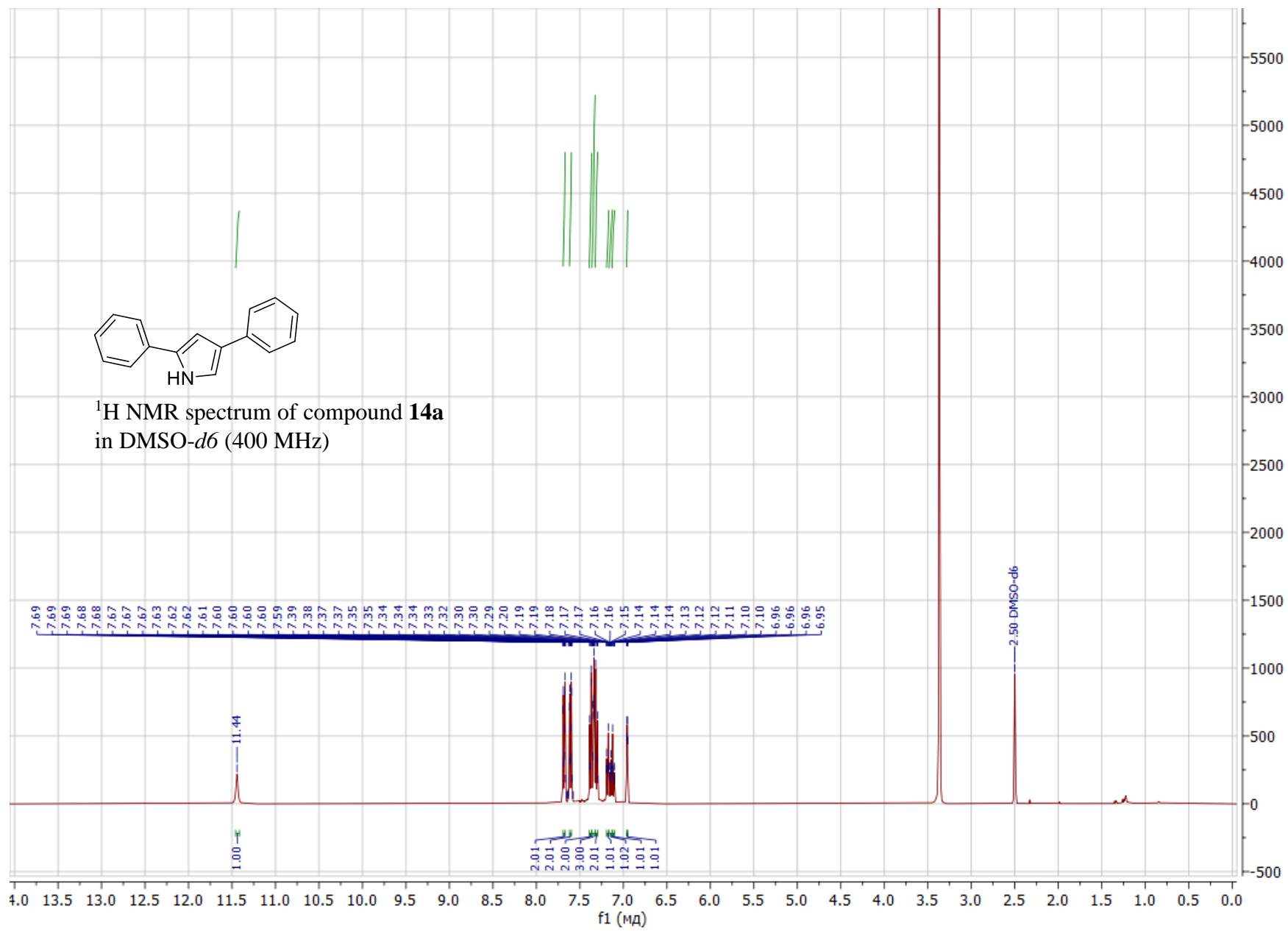


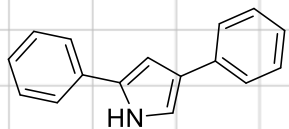


¹H NMR spectrum of compound **3k**
in DMSO-d₆ (400 MHz)

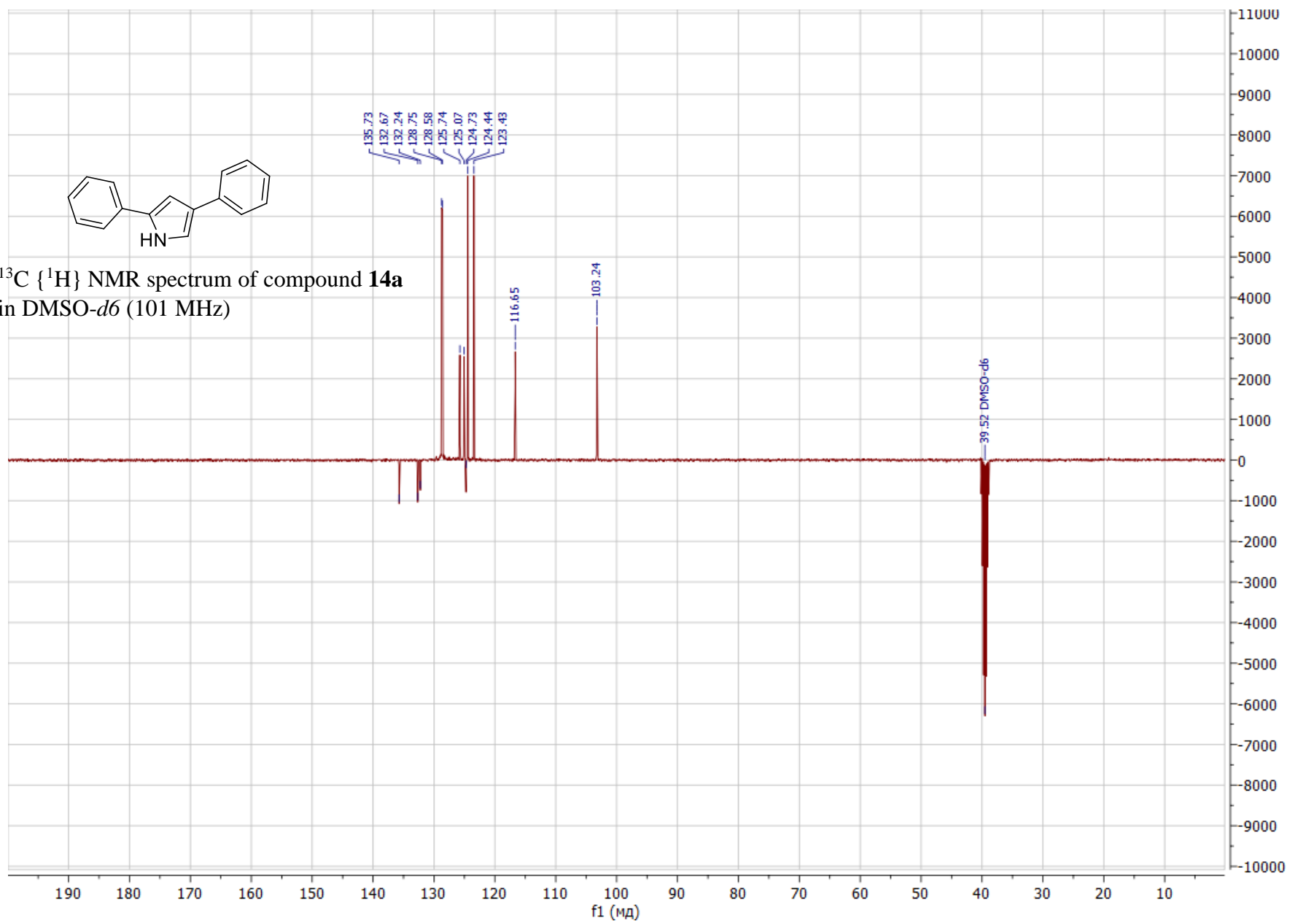


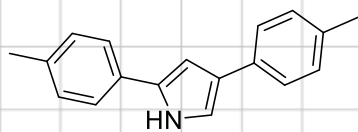




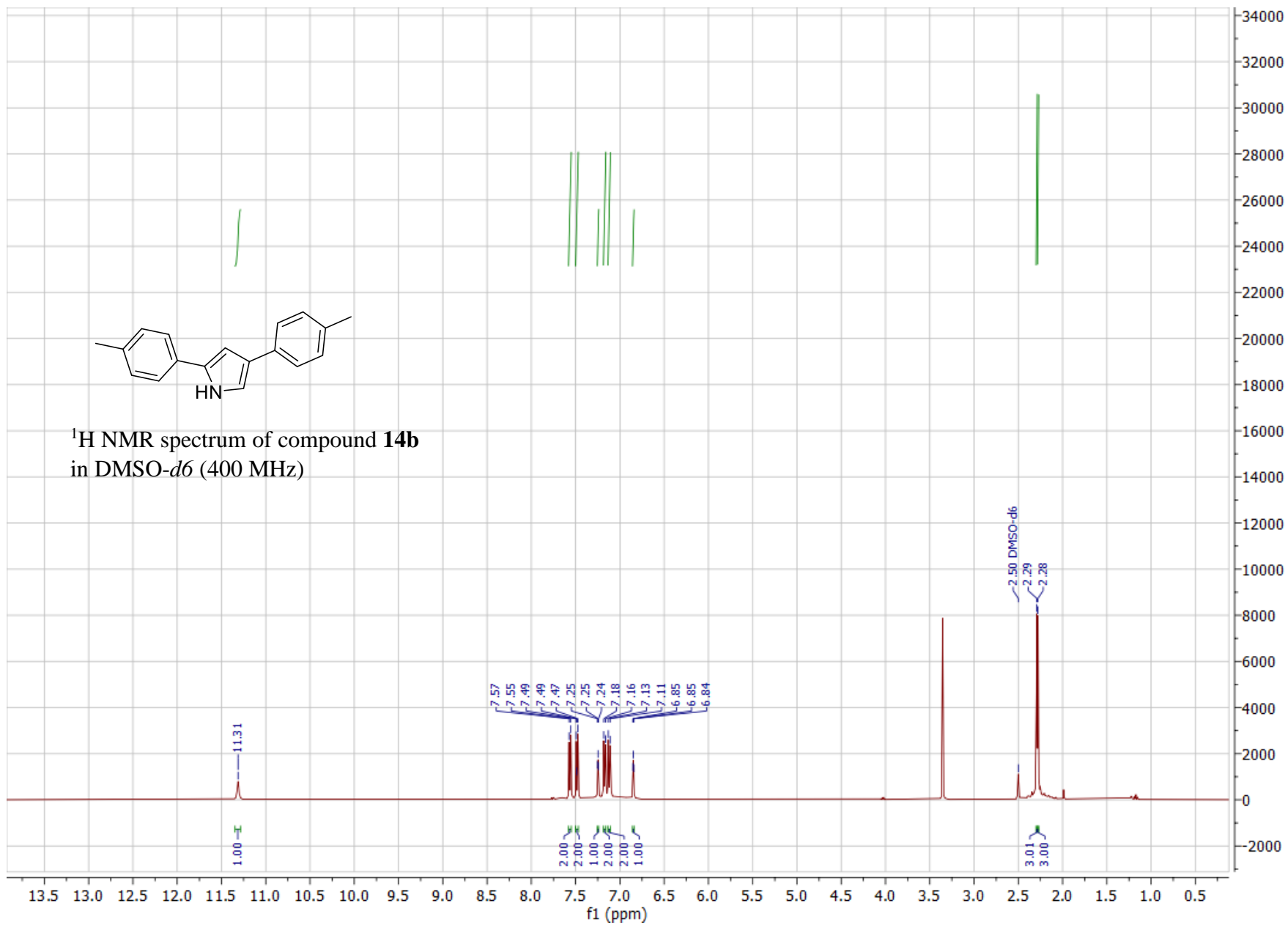


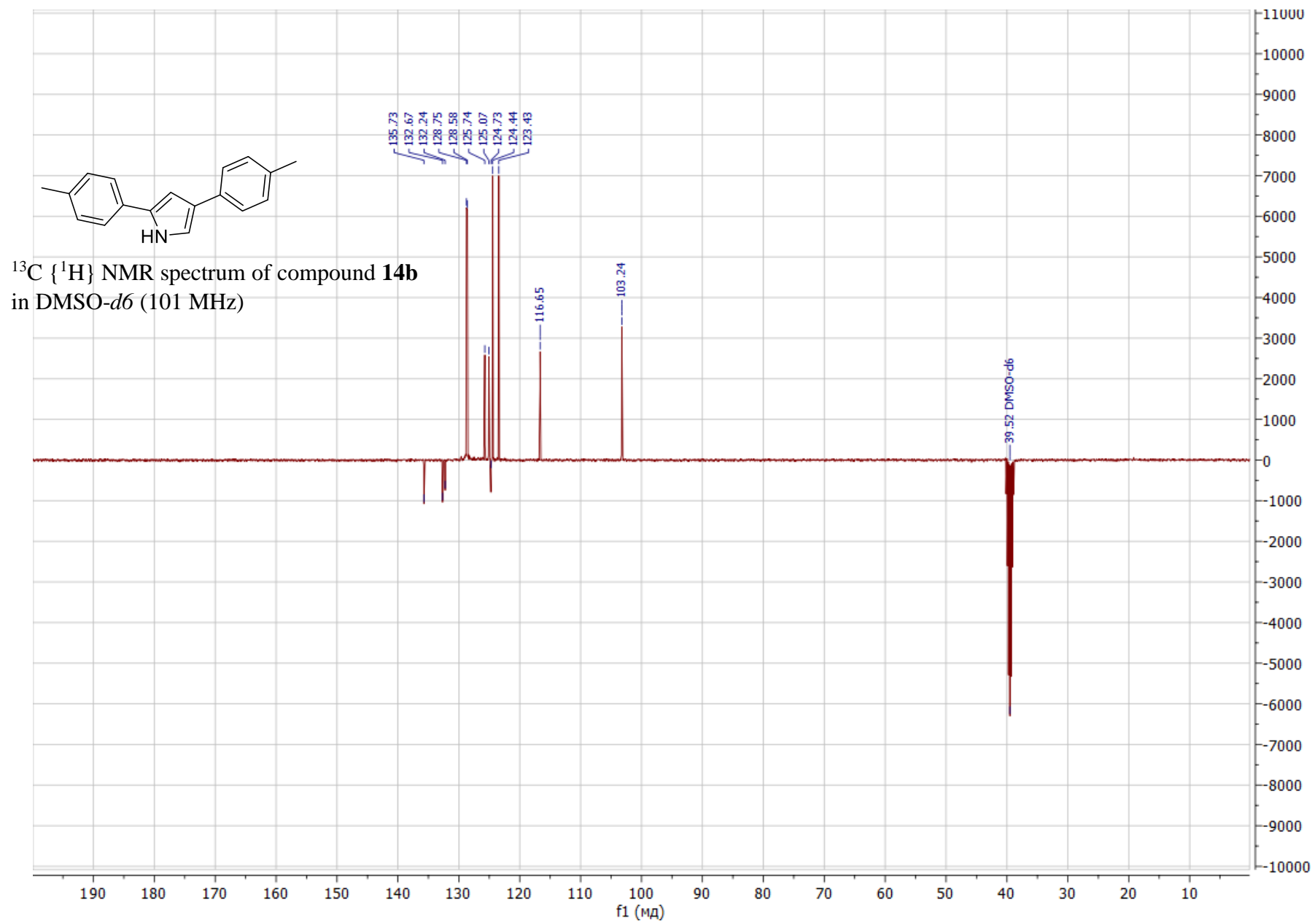
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14a**
in DMSO-*d*₆ (101 MHz)

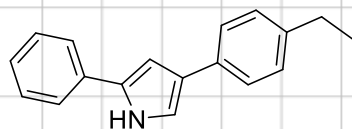




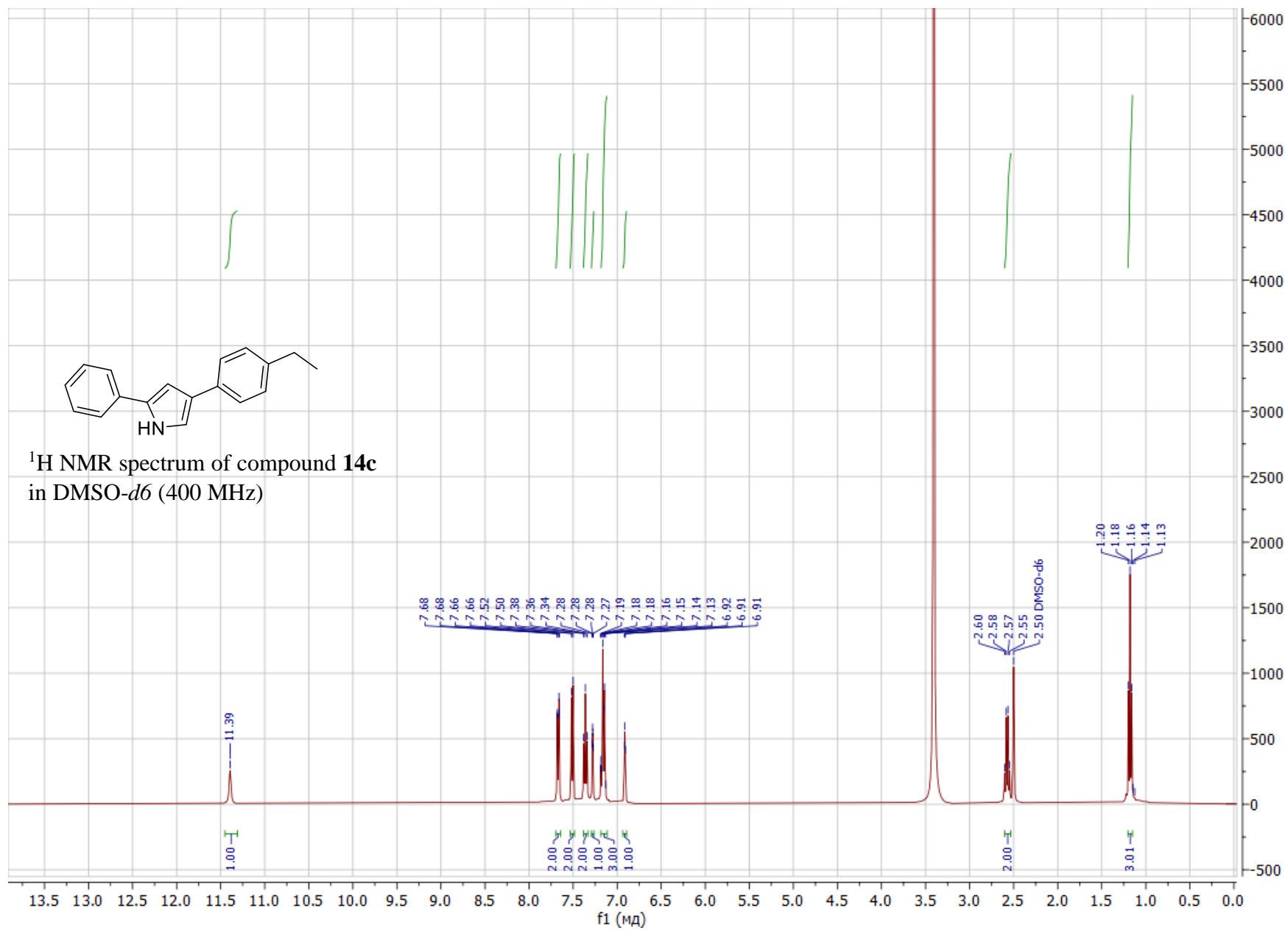
¹H NMR spectrum of compound **14b**
in DMSO-*d*₆ (400 MHz)

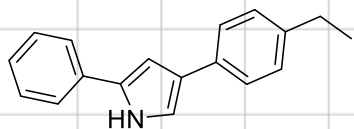




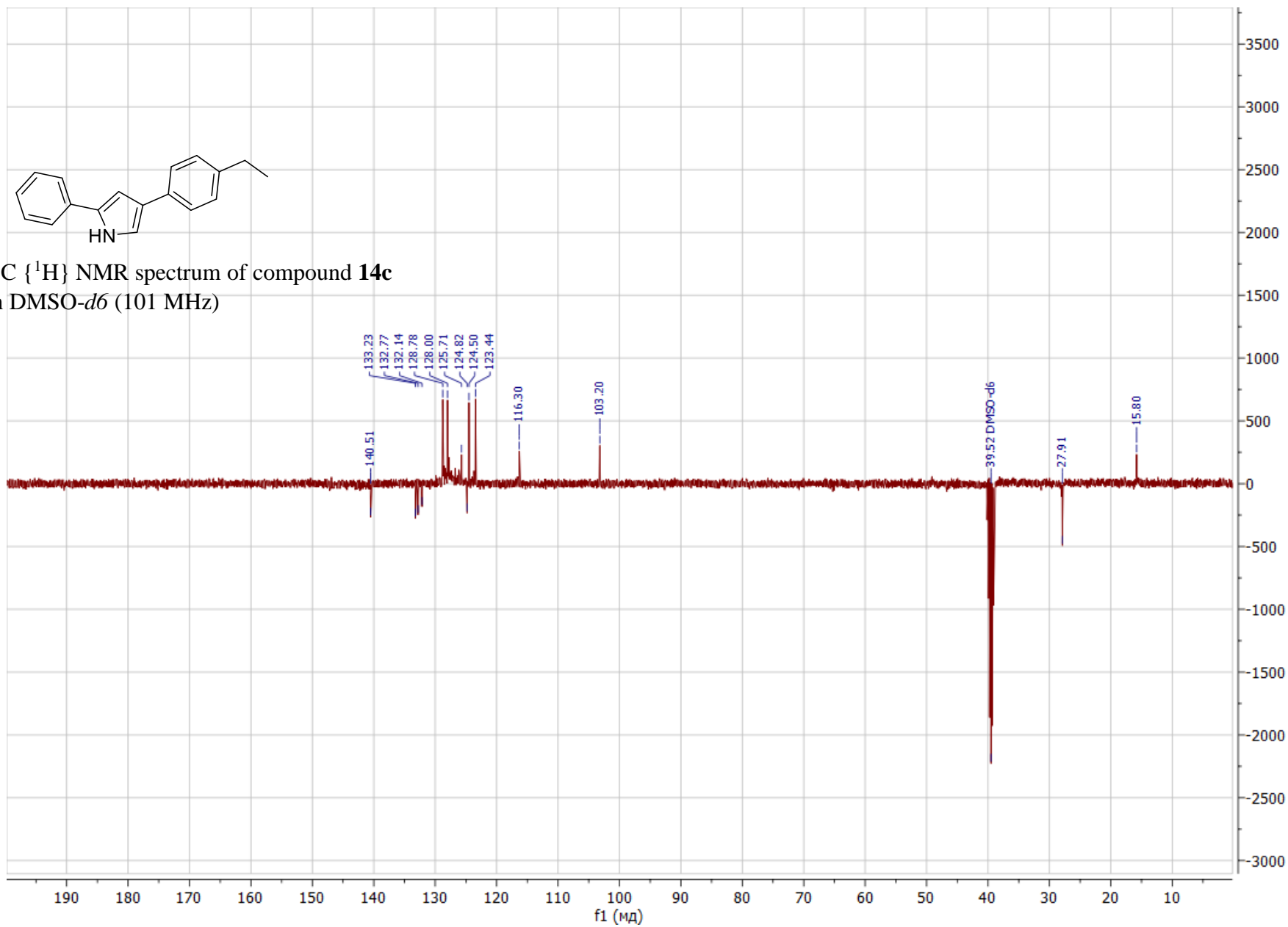


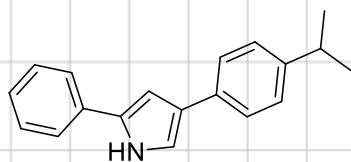
^1H NMR spectrum of compound **14c**
in DMSO-*d*₆ (400 MHz)



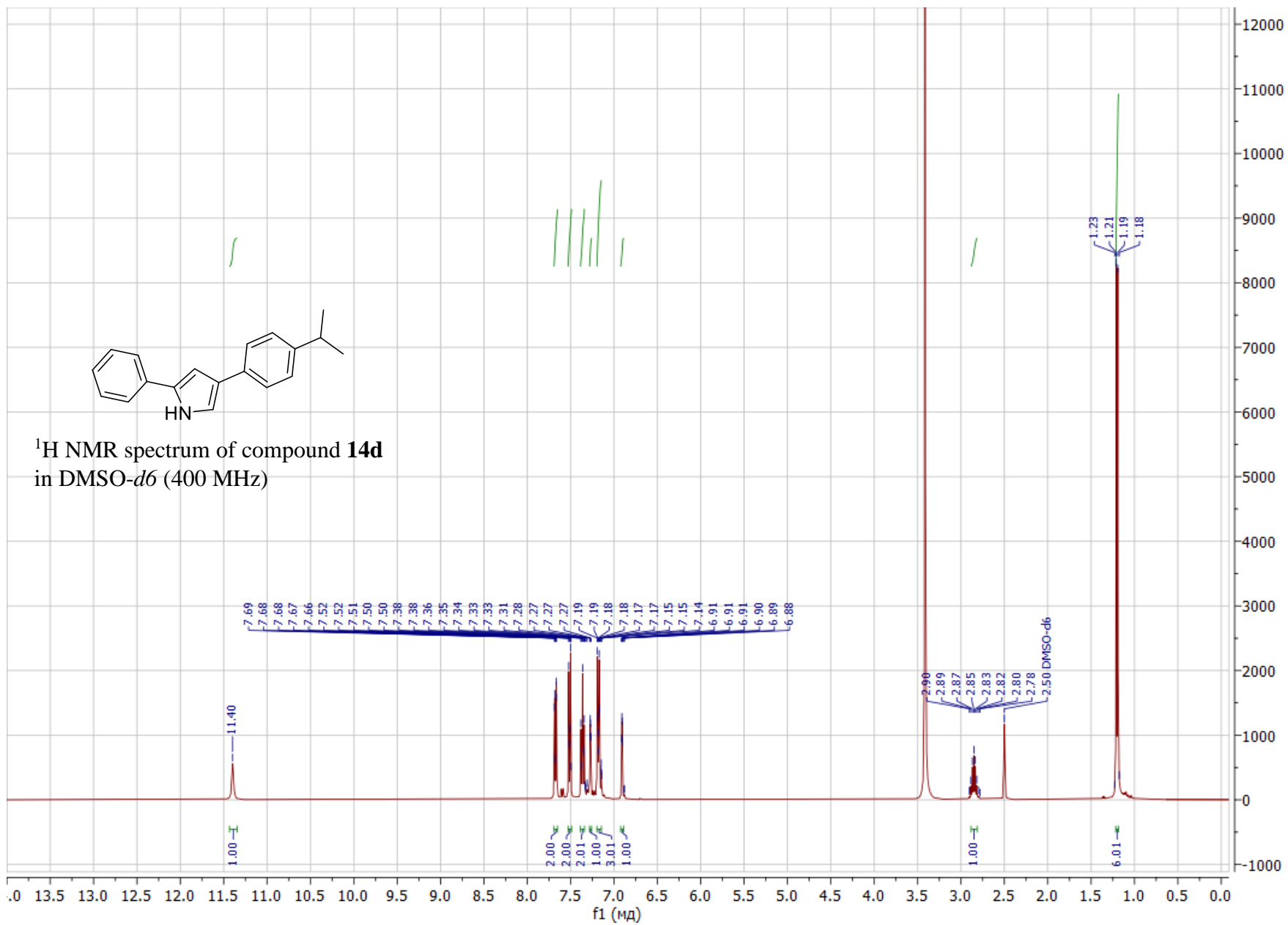


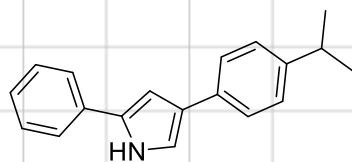
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14c**
in DMSO-*d*₆ (101 MHz)



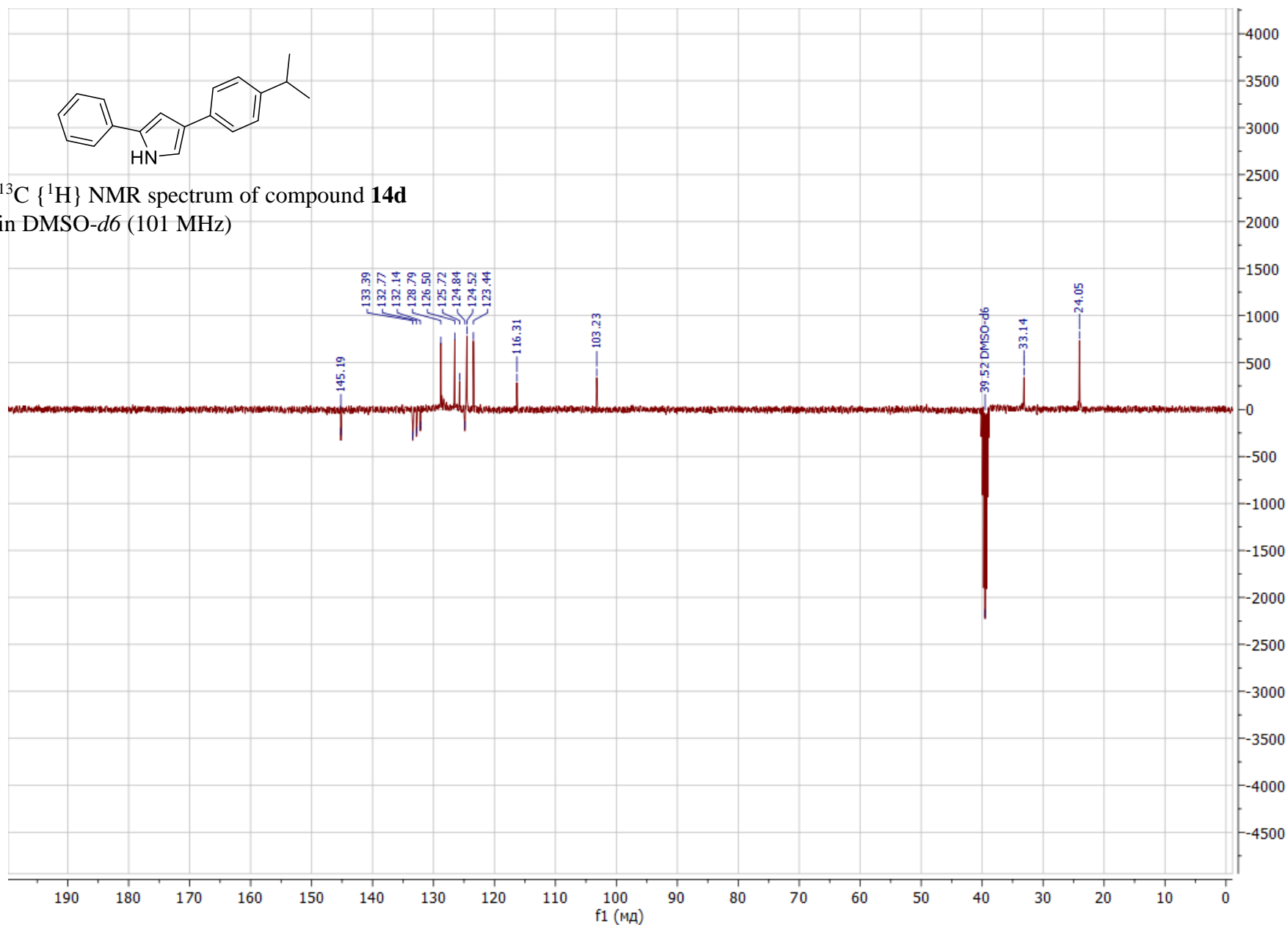


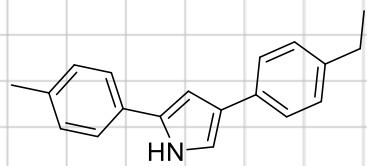
¹H NMR spectrum of compound **14d**
in DMSO-*d*₆ (400 MHz)



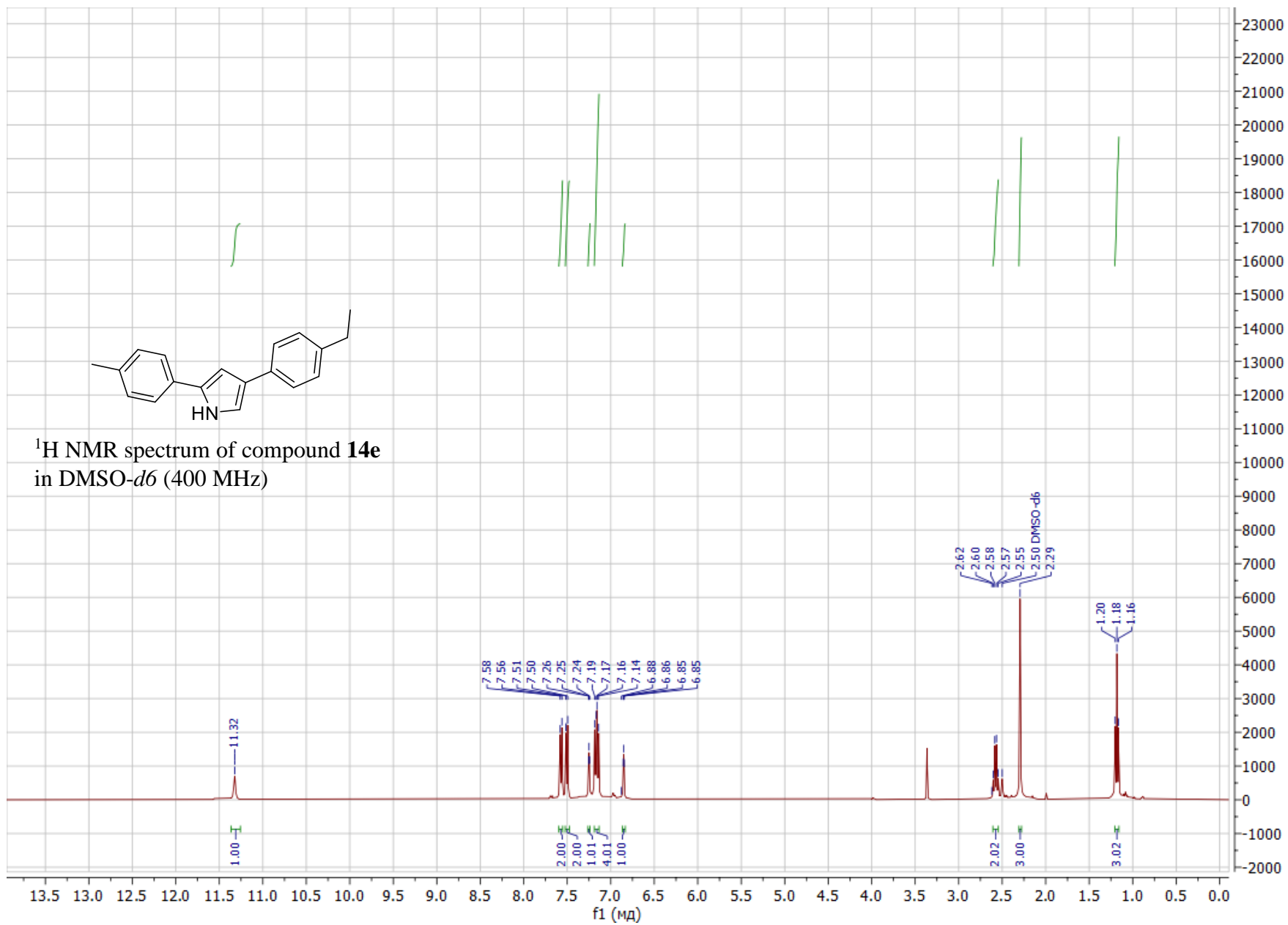


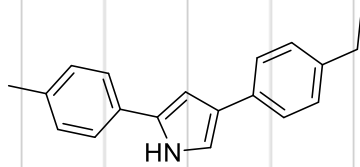
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14d**
in DMSO-*d*₆ (101 MHz)



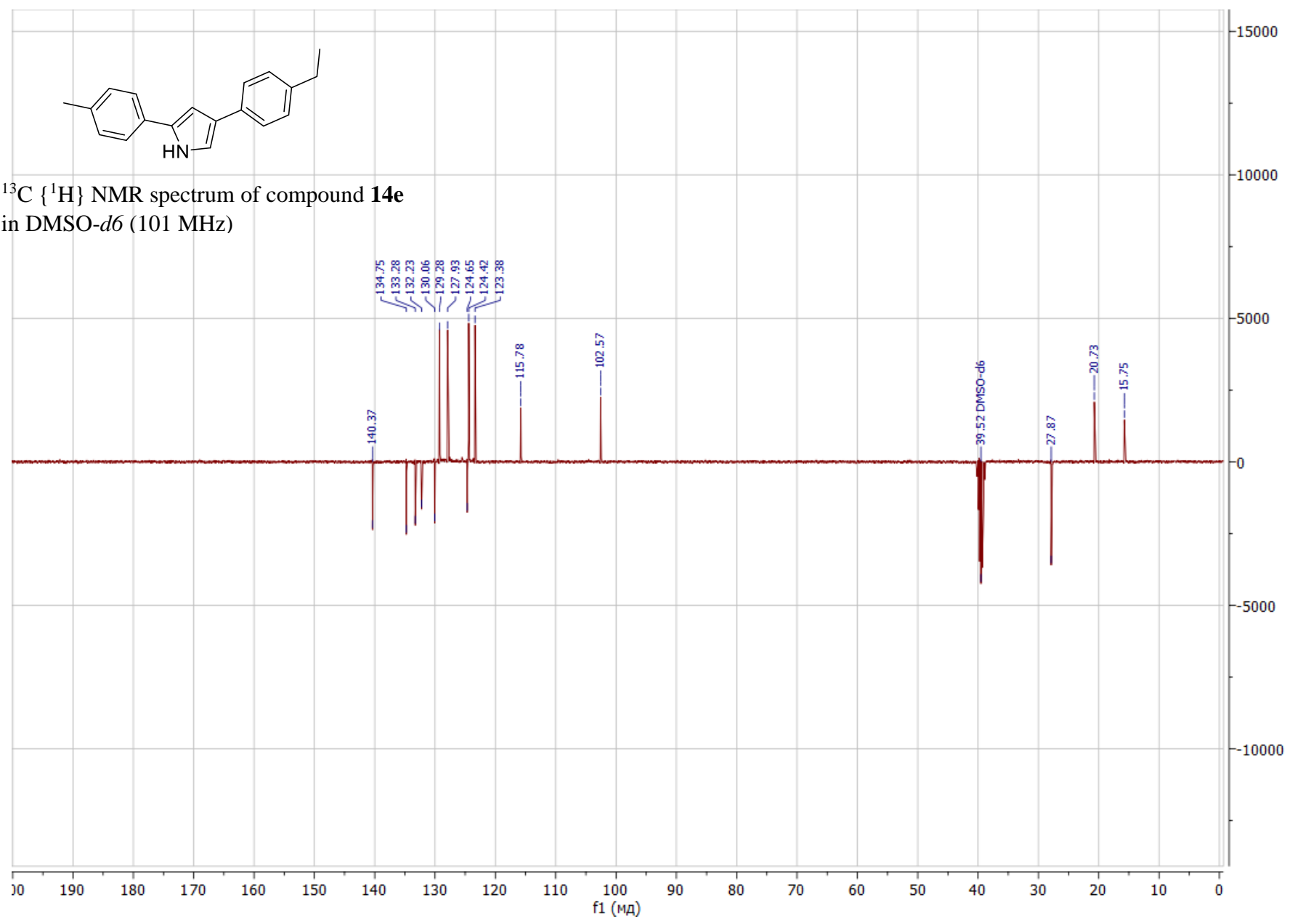


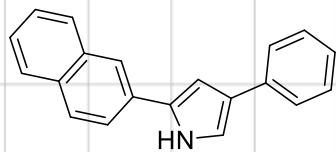
^1H NMR spectrum of compound **14e**
in DMSO-*d*₆ (400 MHz)



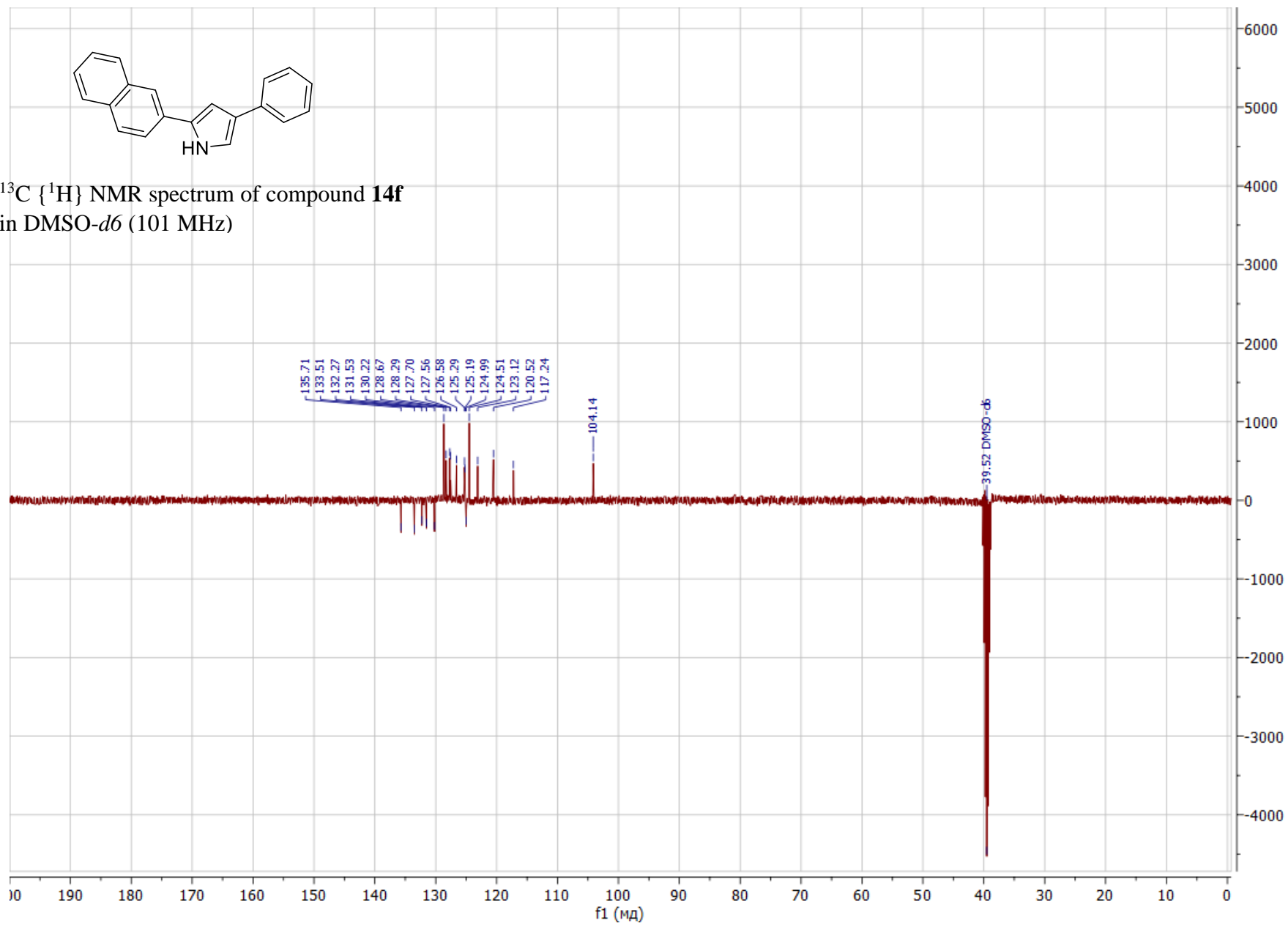


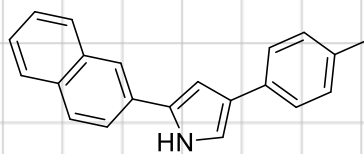
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14e**
in DMSO-*d*₆ (101 MHz)



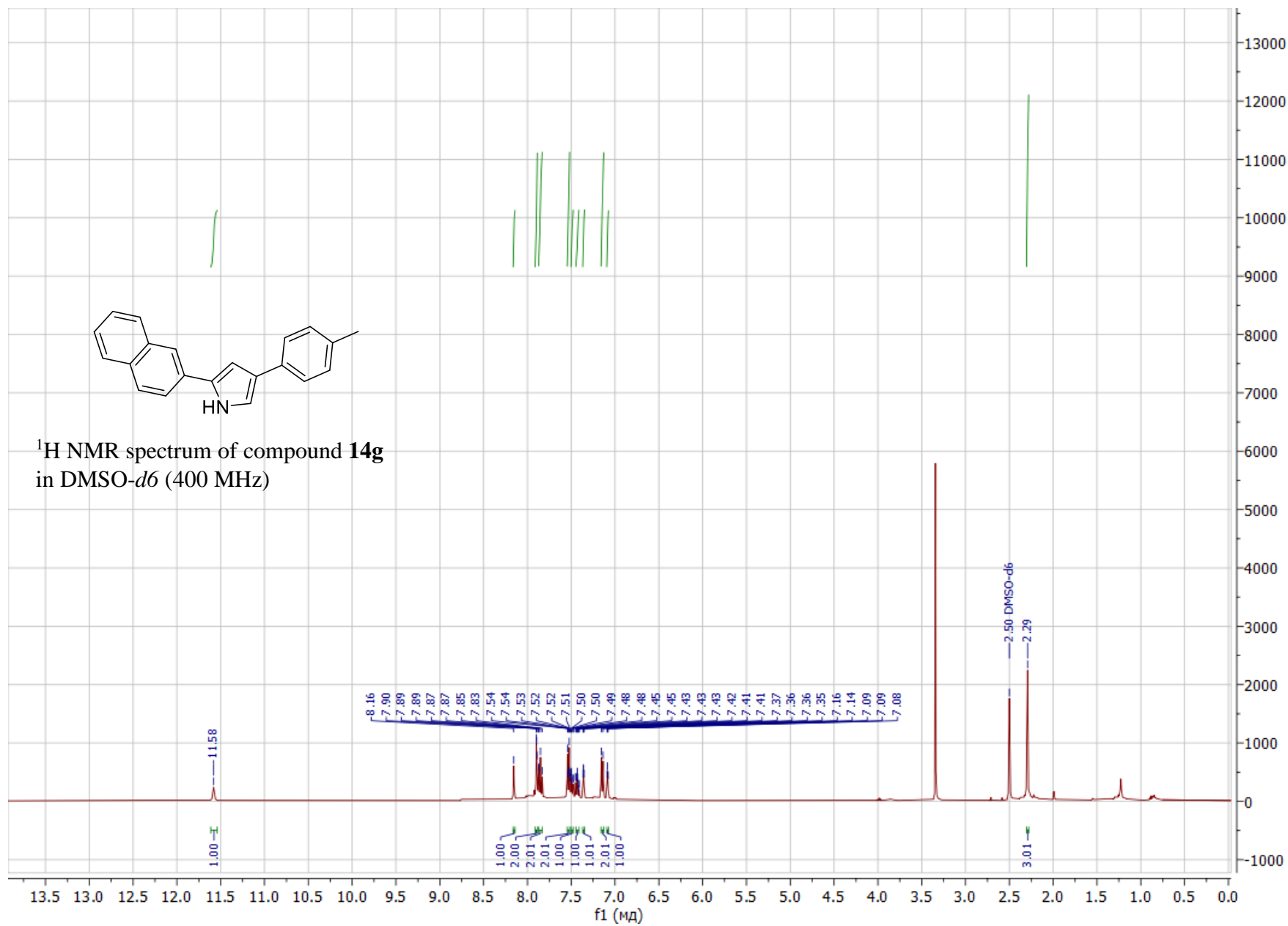


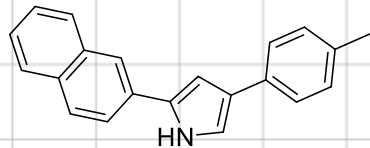
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14f**
in DMSO-*d*₆ (101 MHz)



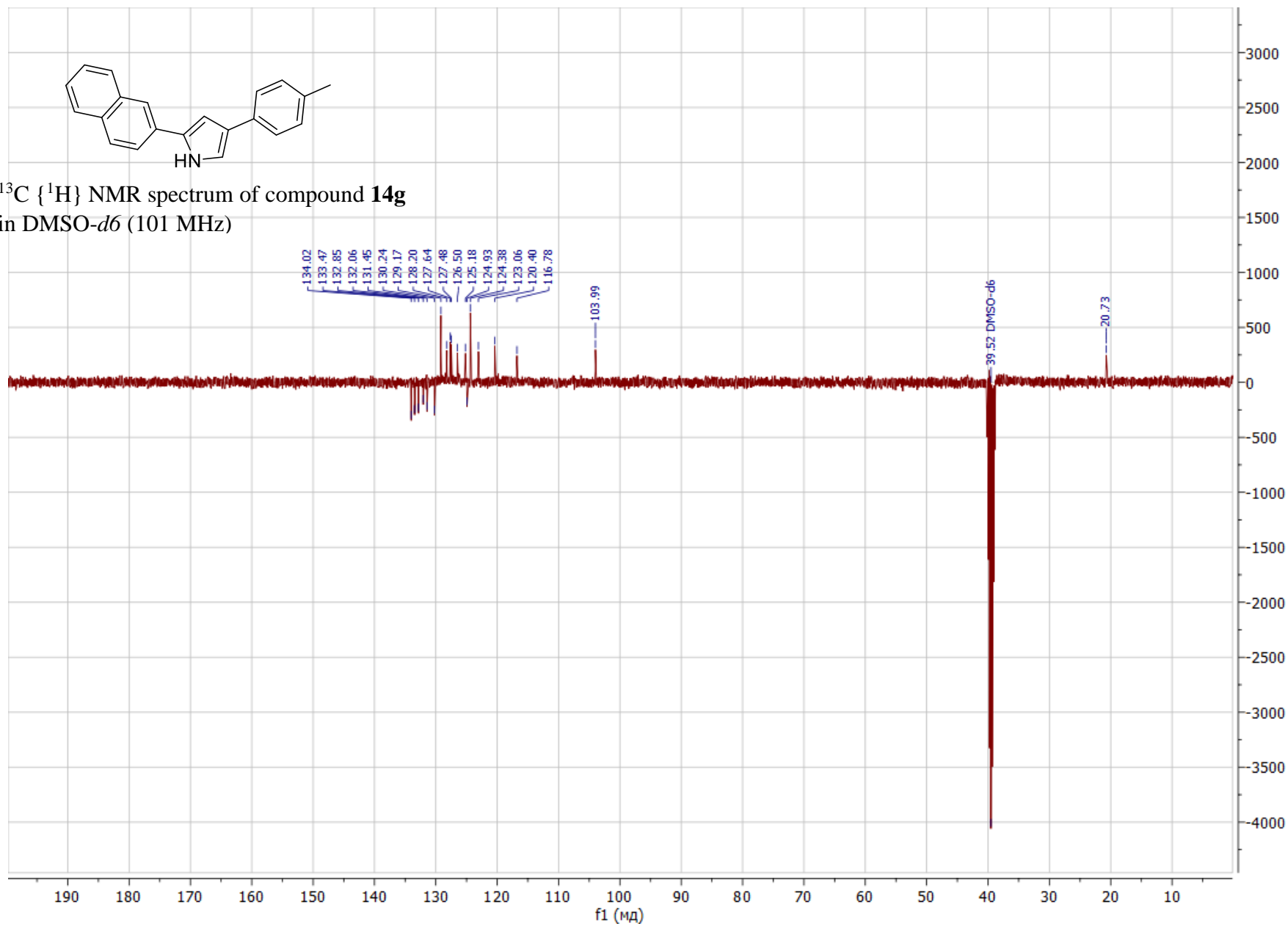


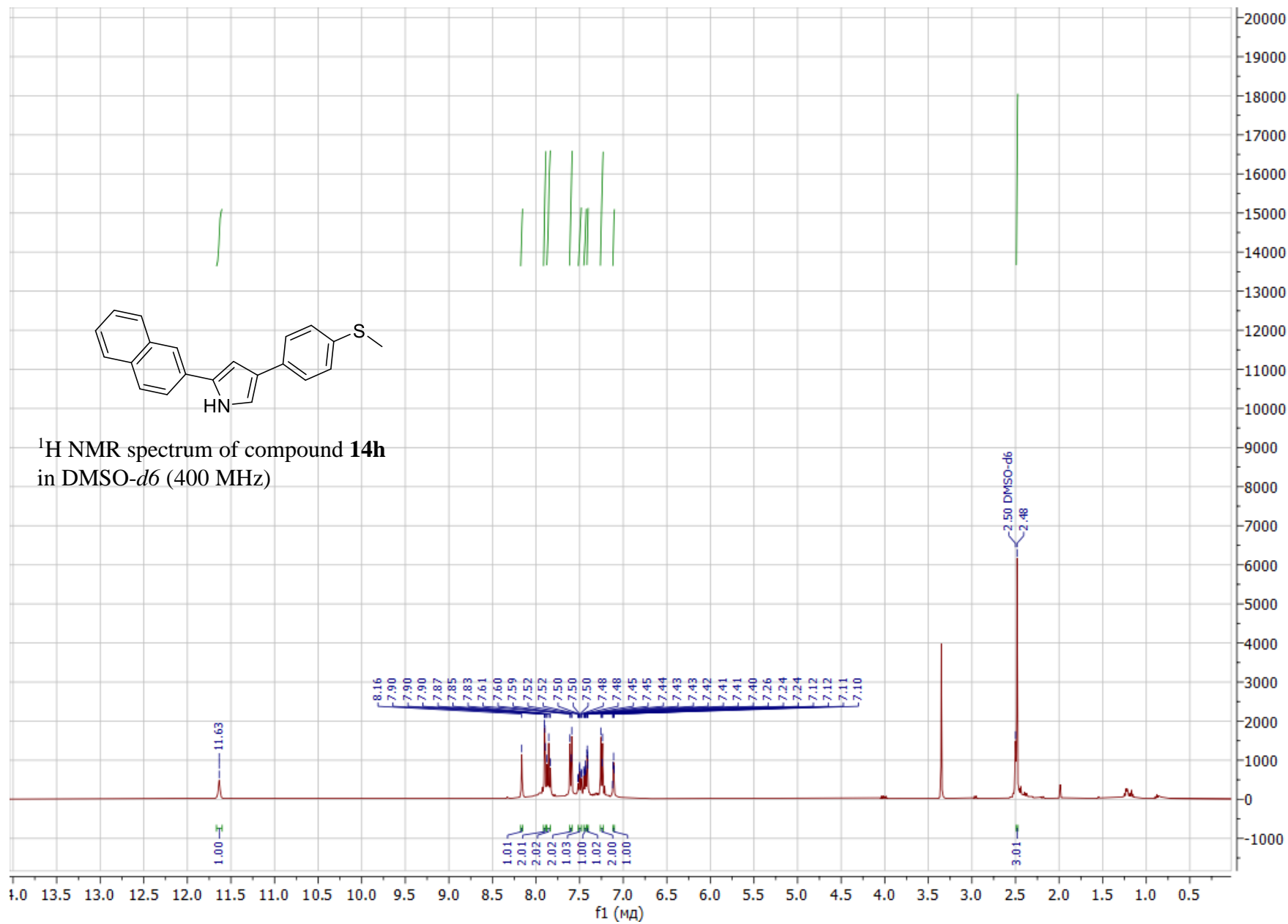
^1H NMR spectrum of compound **14g**
in DMSO-*d*₆ (400 MHz)

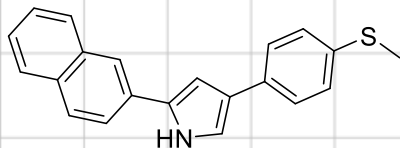




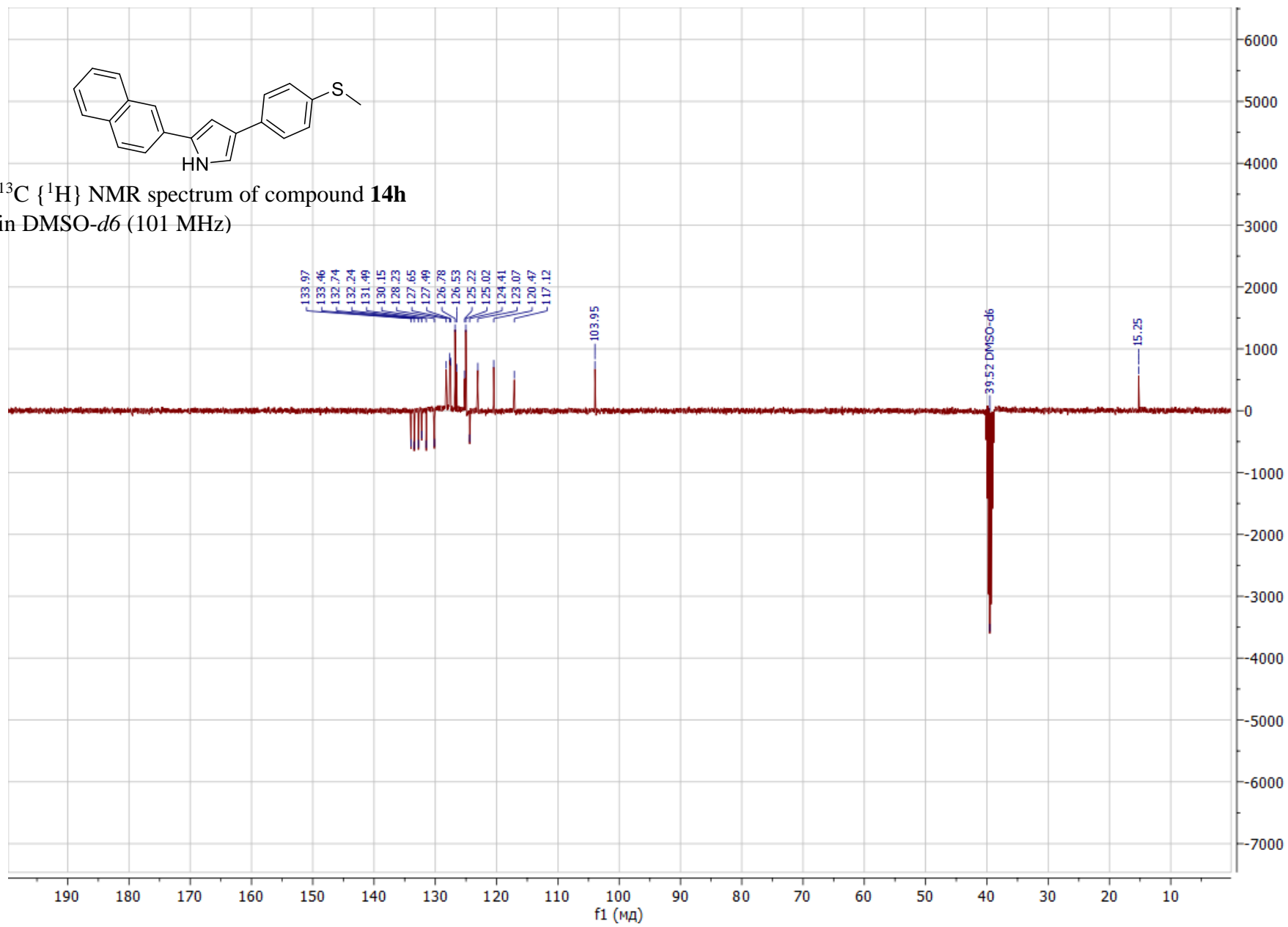
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14g**
in DMSO-*d*₆ (101 MHz)

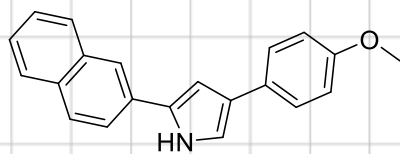




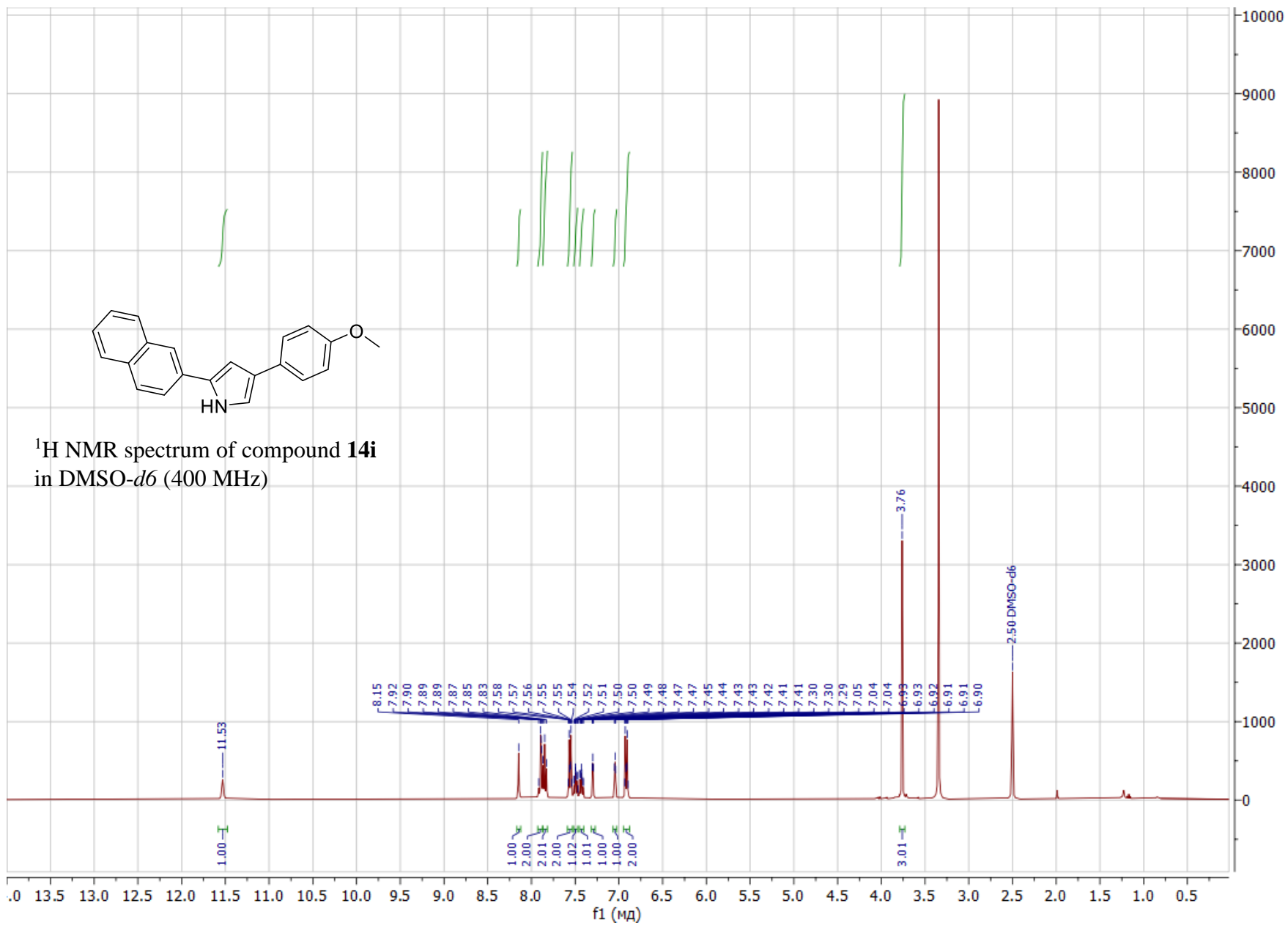


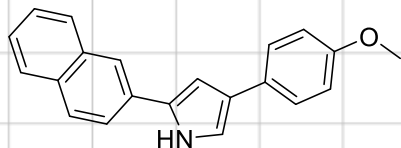
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14h**
in DMSO-*d*₆ (101 MHz)



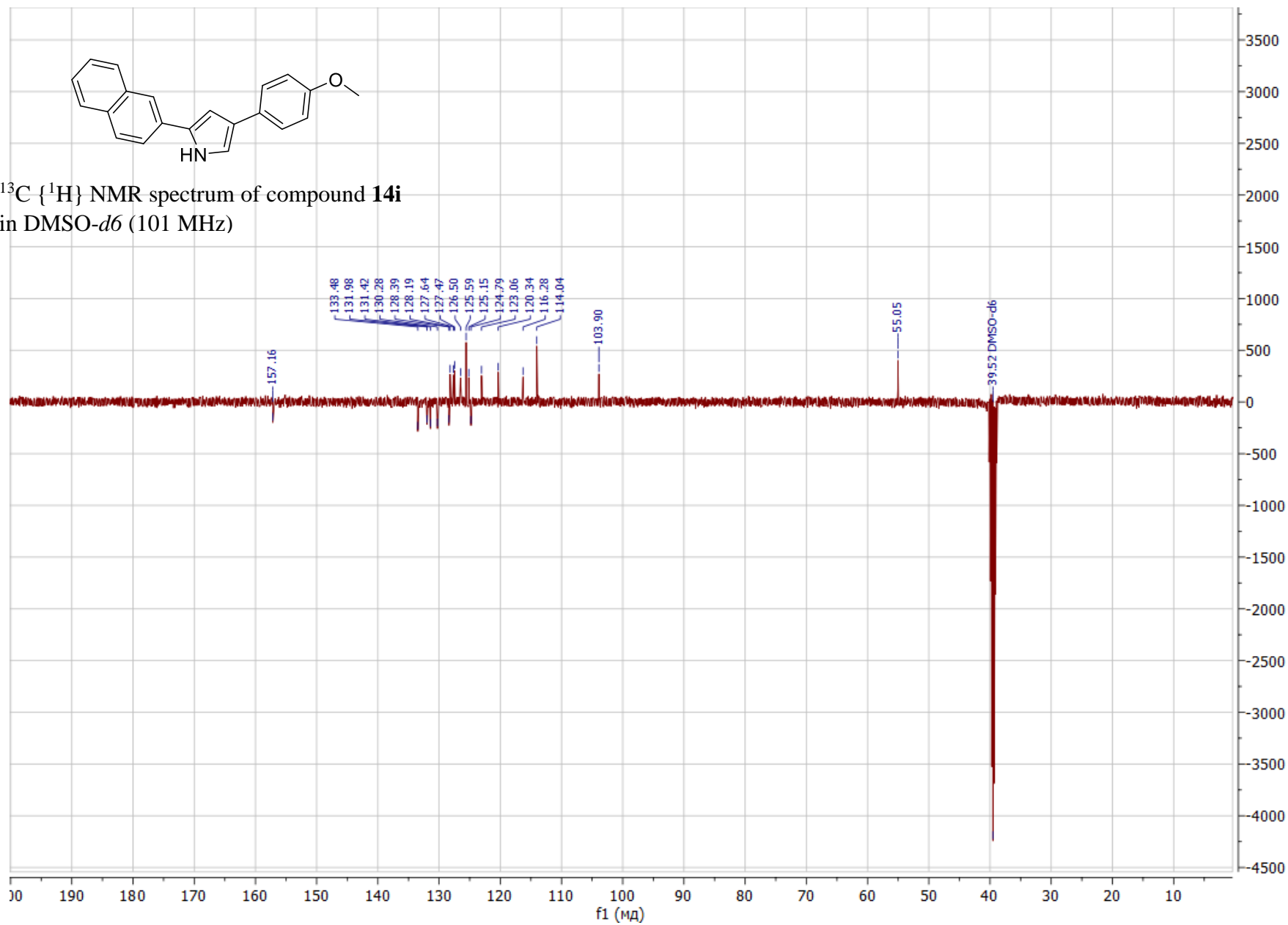


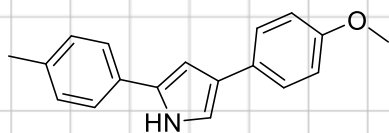
^1H NMR spectrum of compound **14i**
in DMSO- d_6 (400 MHz)



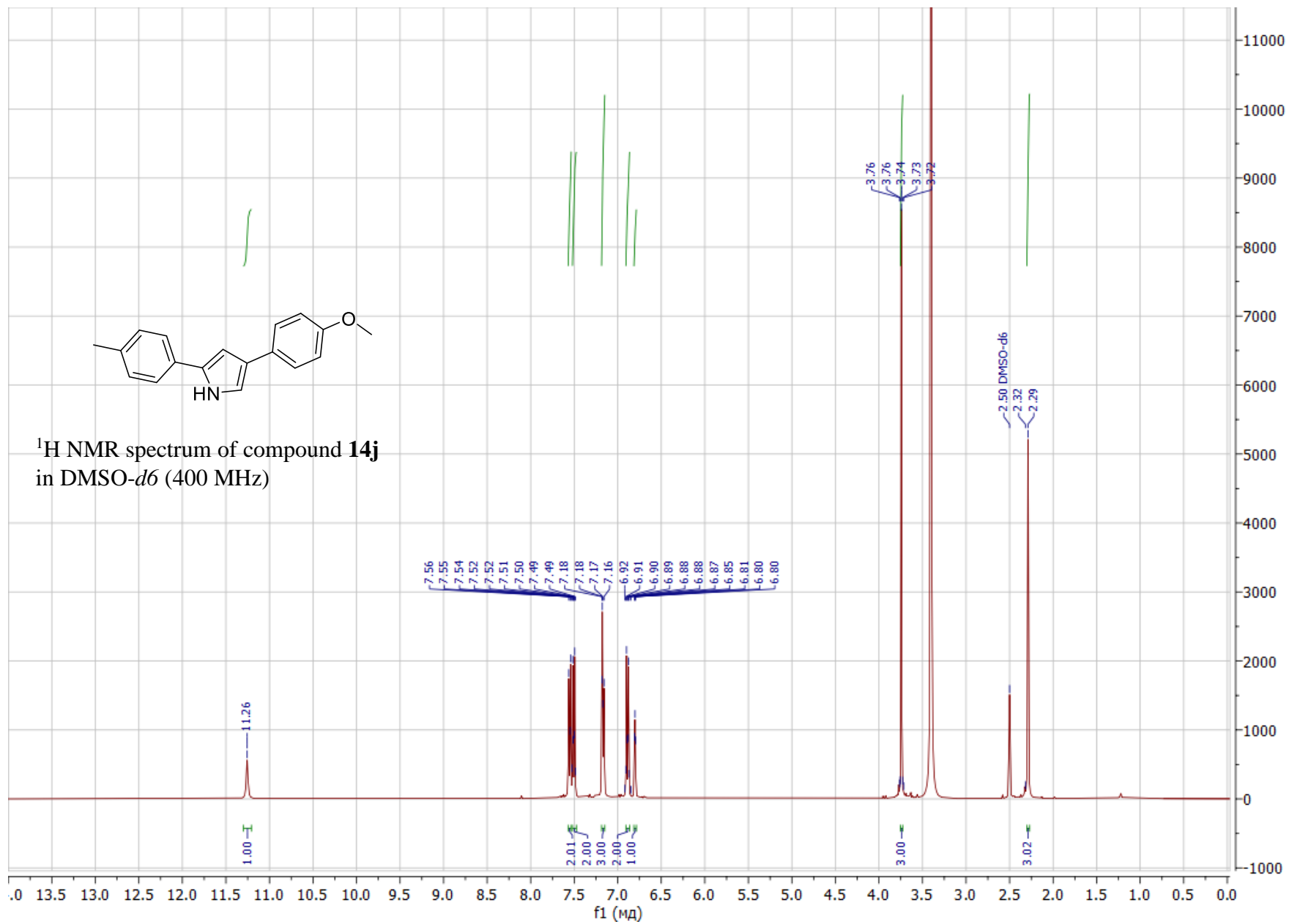


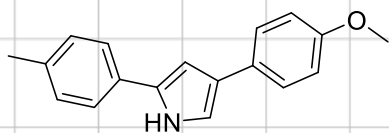
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14i**
in DMSO-*d*₆ (101 MHz)



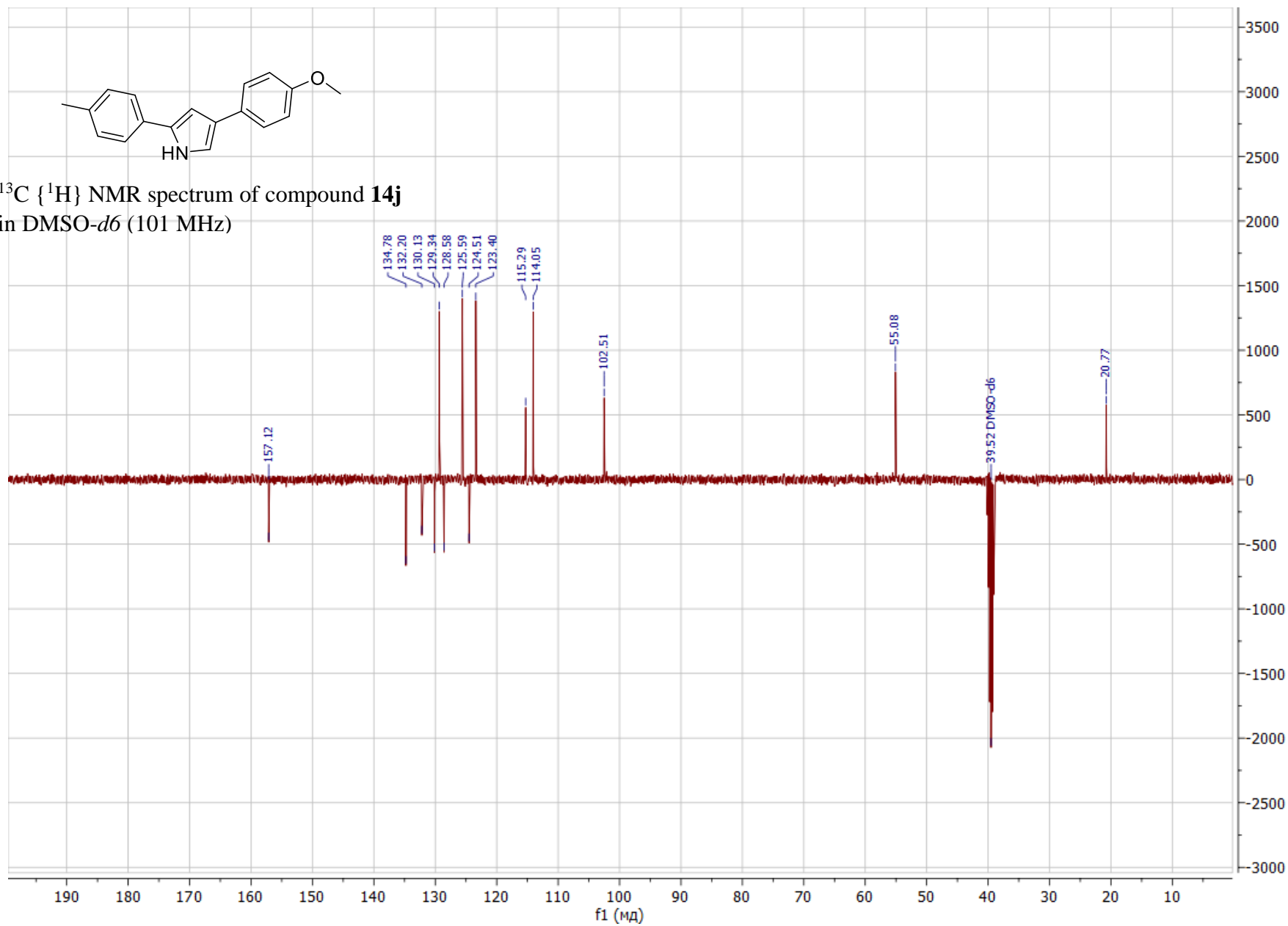


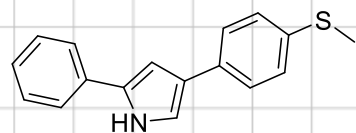
^1H NMR spectrum of compound **14j**
in DMSO-*d*₆ (400 MHz)



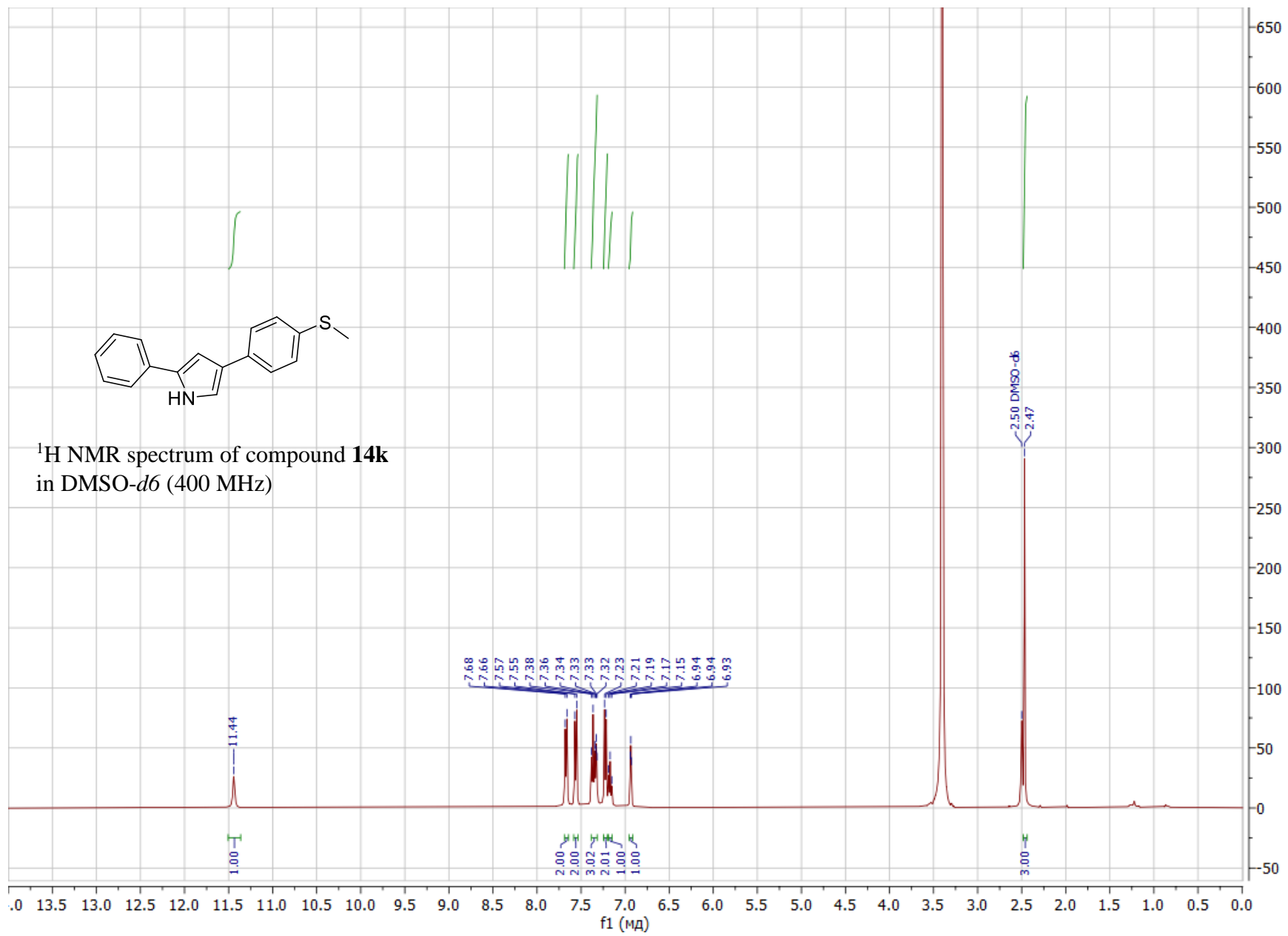


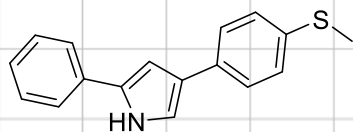
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14j**
in DMSO-*d*₆ (101 MHz)



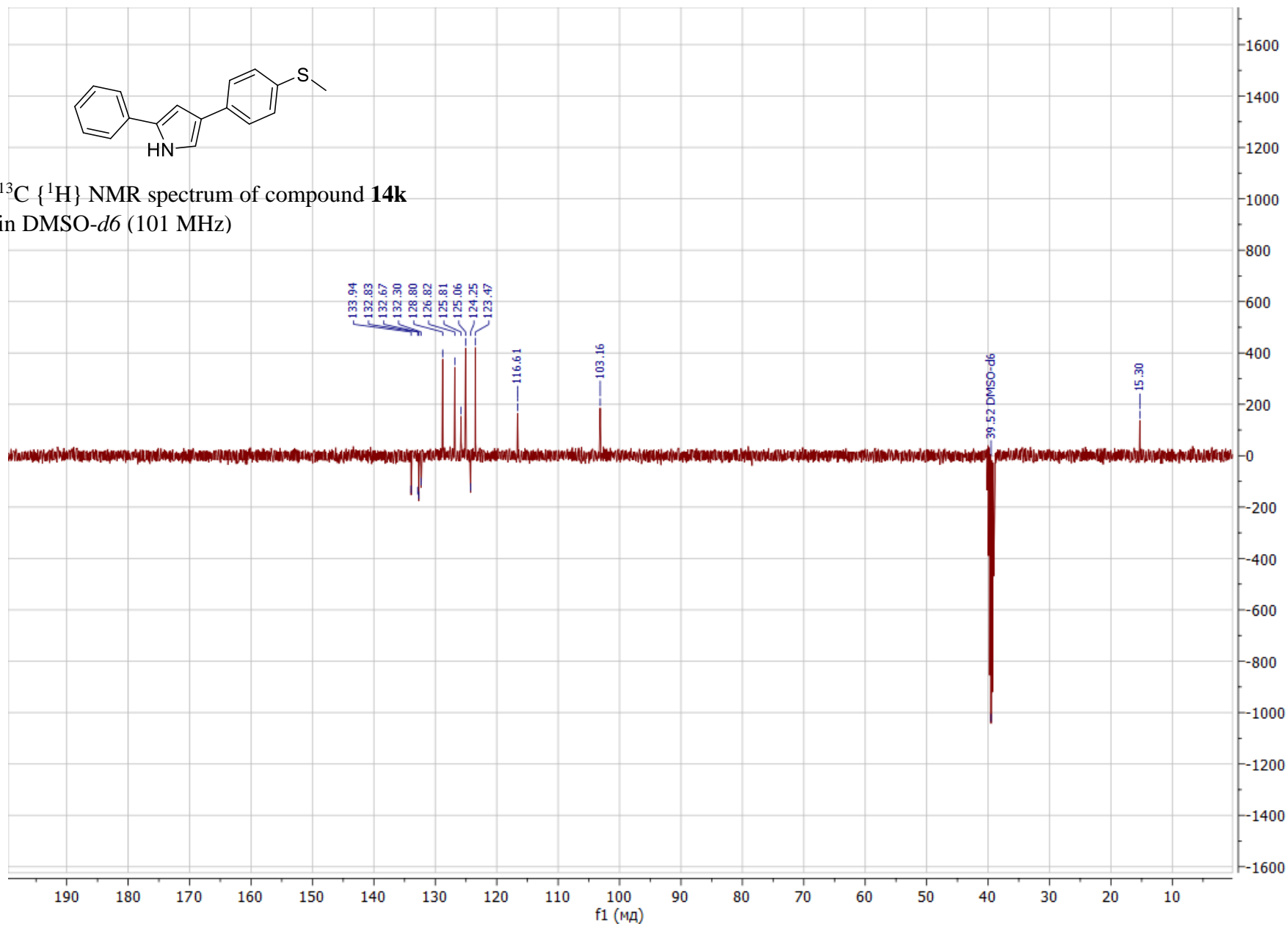


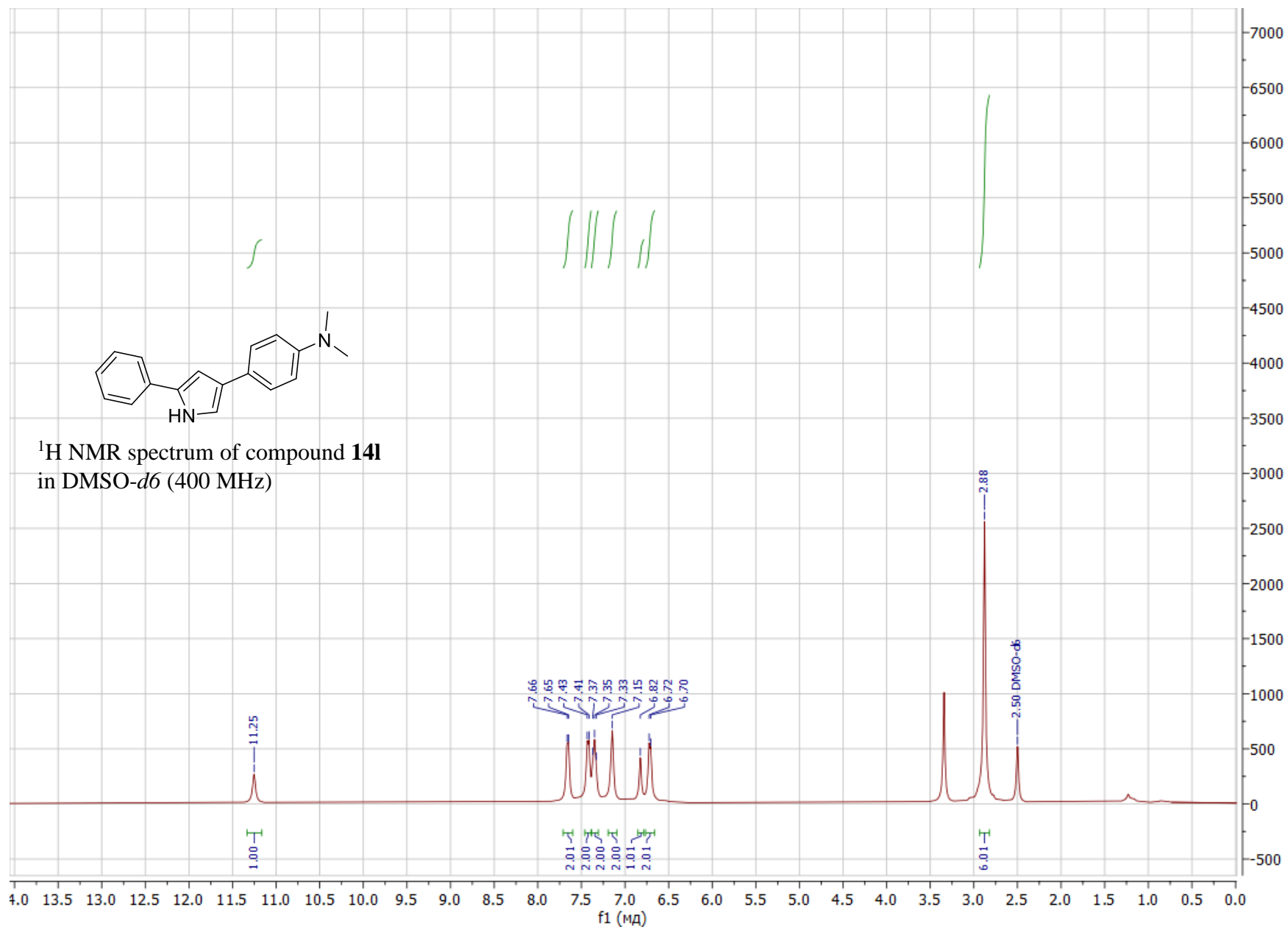
¹H NMR spectrum of compound **14k**
in DMSO-*d*₆ (400 MHz)

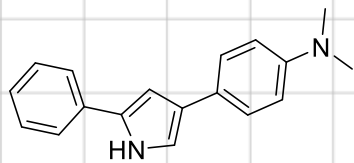




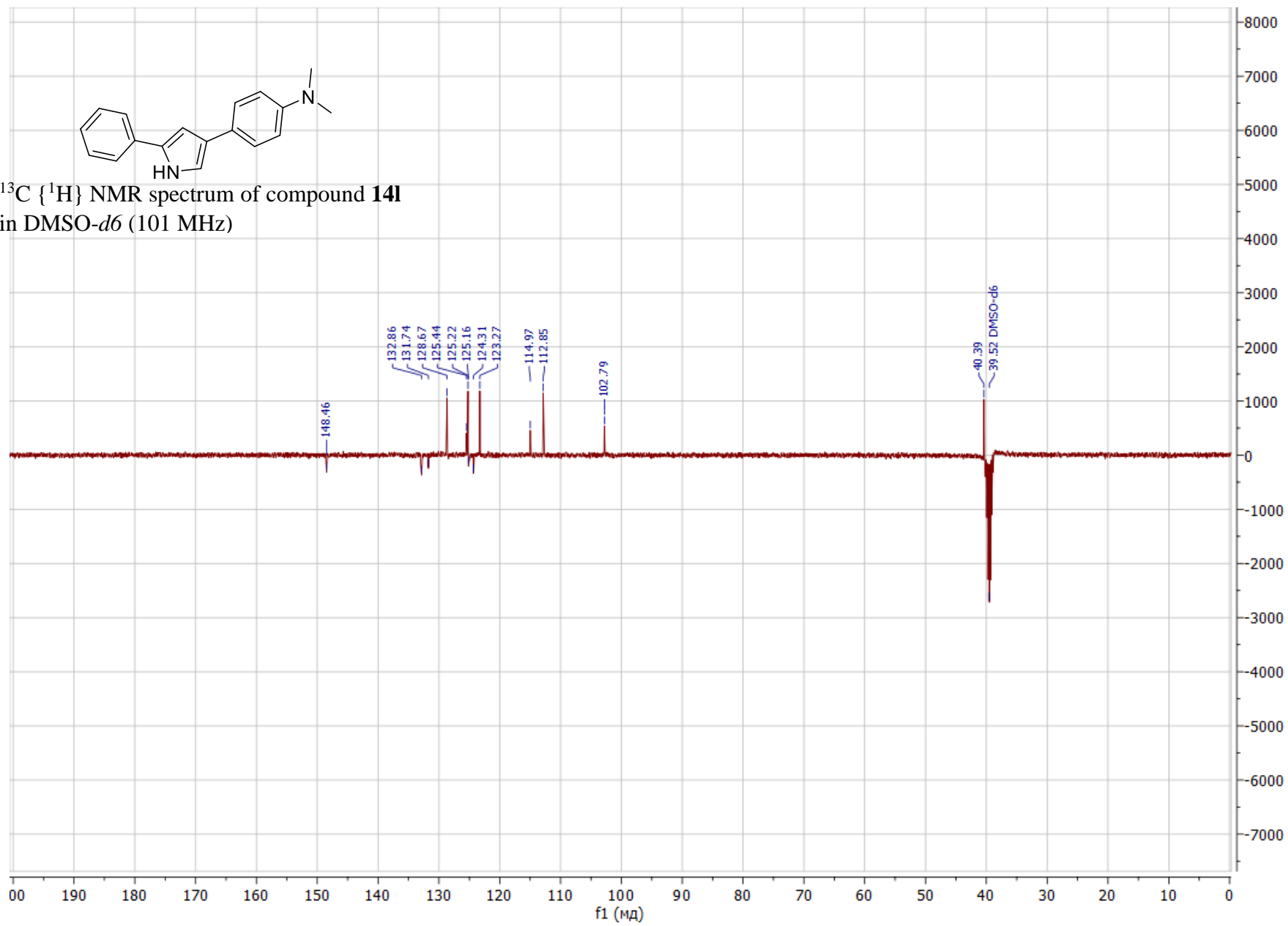
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14k**
in DMSO-*d*₆ (101 MHz)

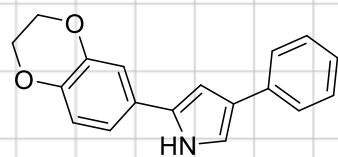




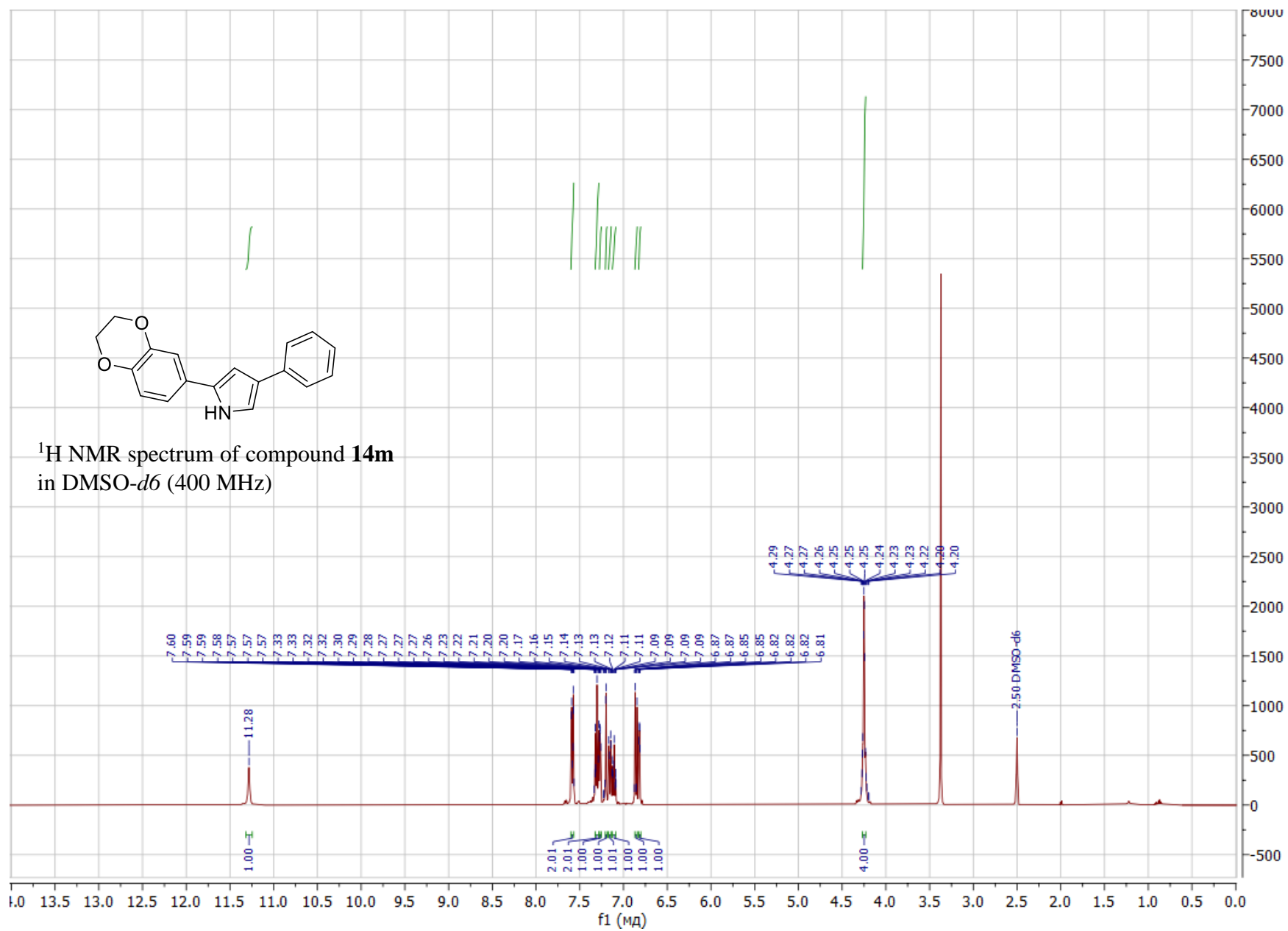


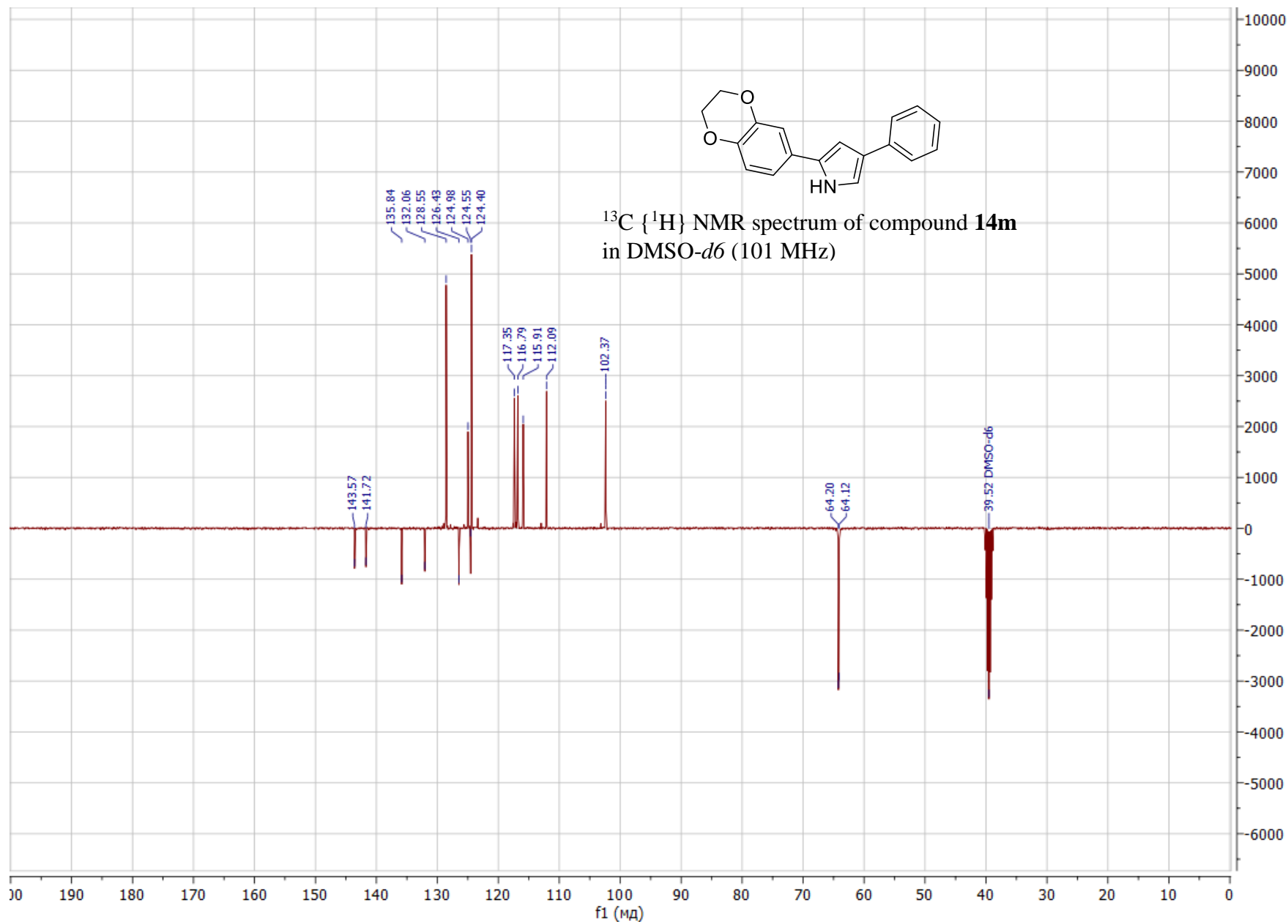
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14I**
in DMSO-*d*₆ (101 MHz)

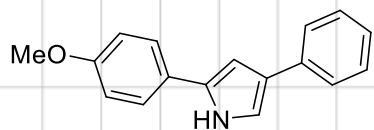




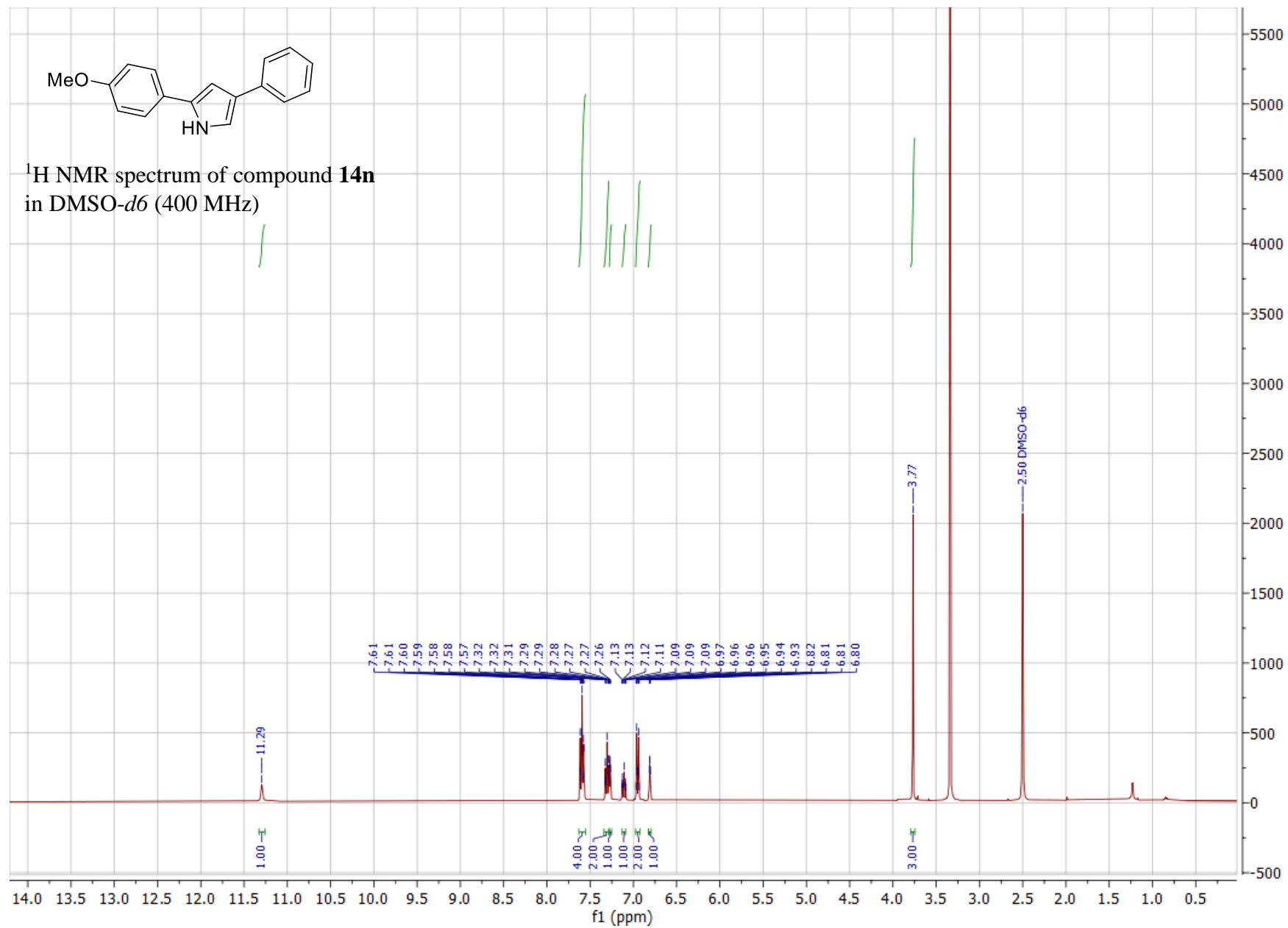
¹H NMR spectrum of compound **14m**
in DMSO-*d*₆ (400 MHz)

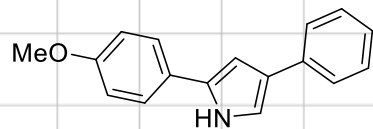




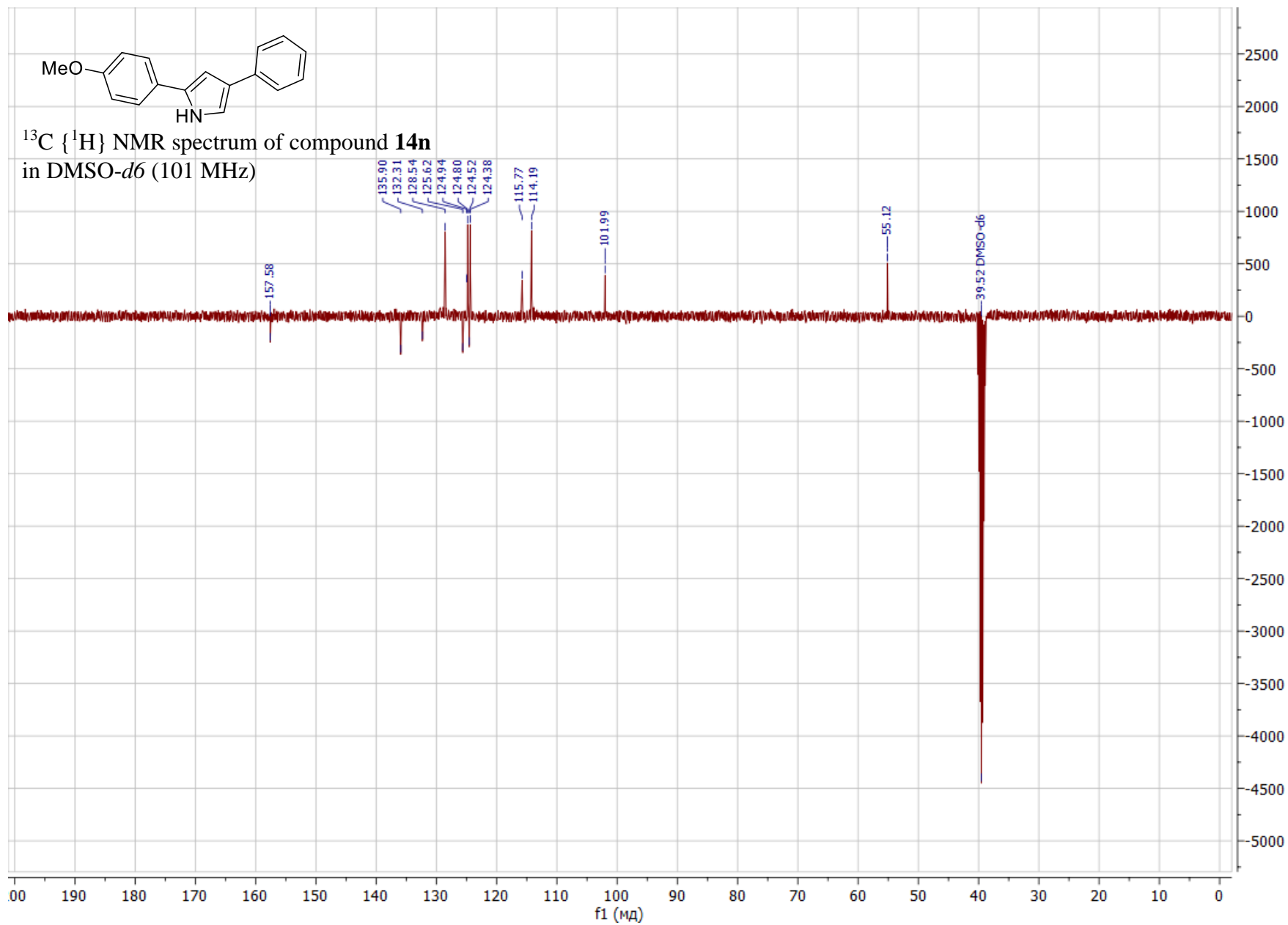


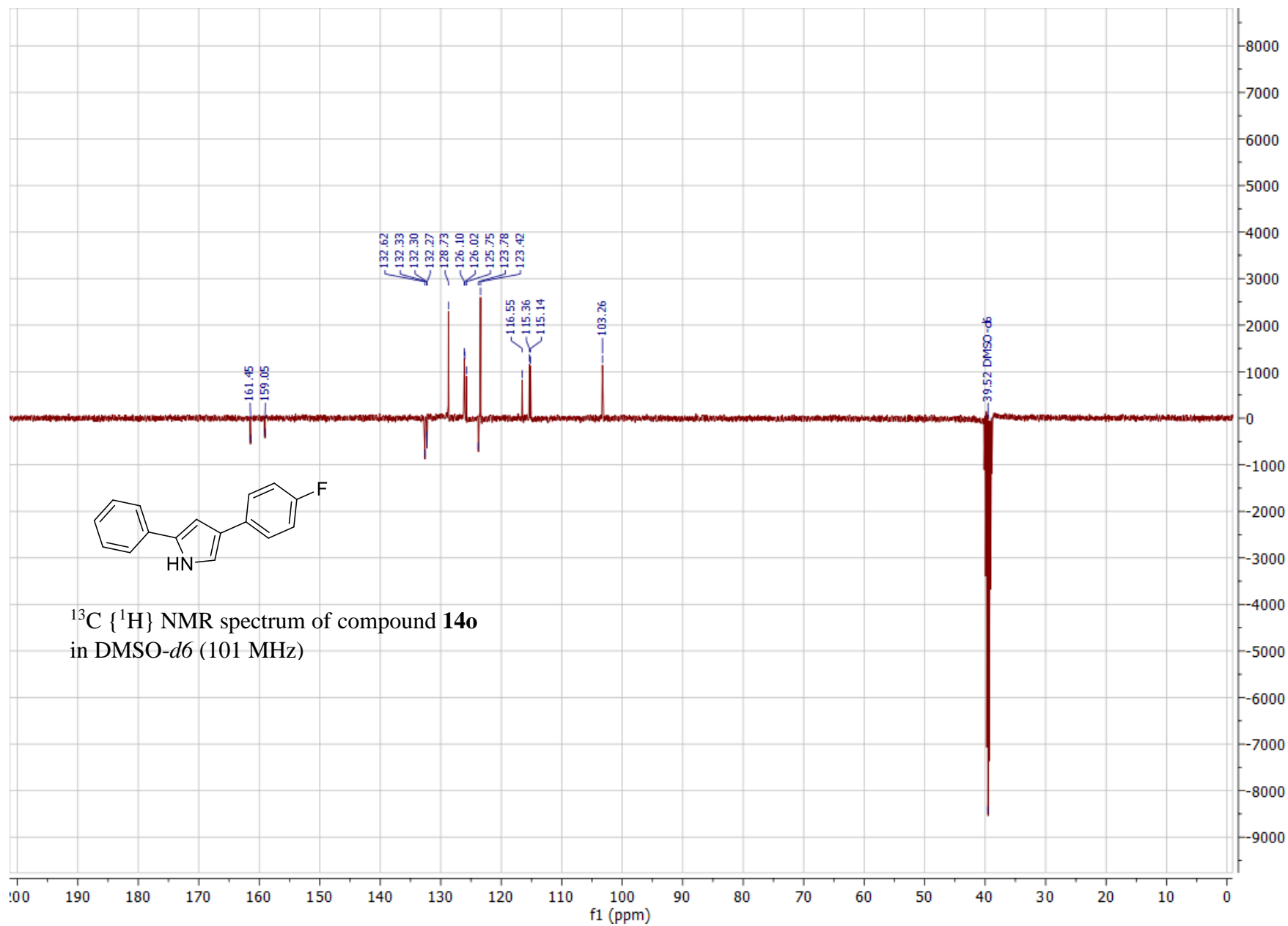
^1H NMR spectrum of compound **14n**
in DMSO-*d*₆ (400 MHz)

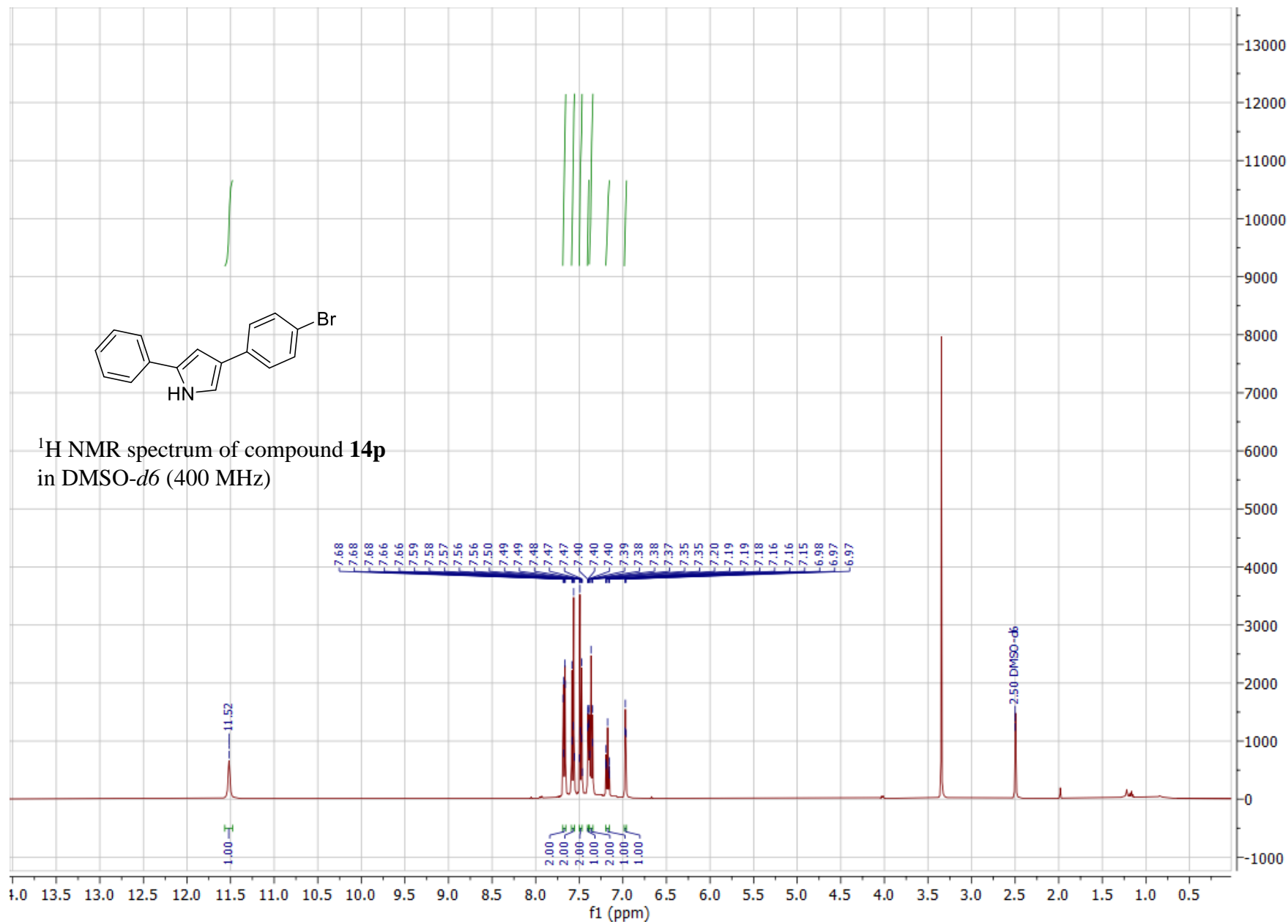


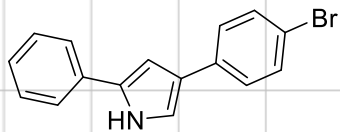


^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14n**
in DMSO-*d*₆ (101 MHz)

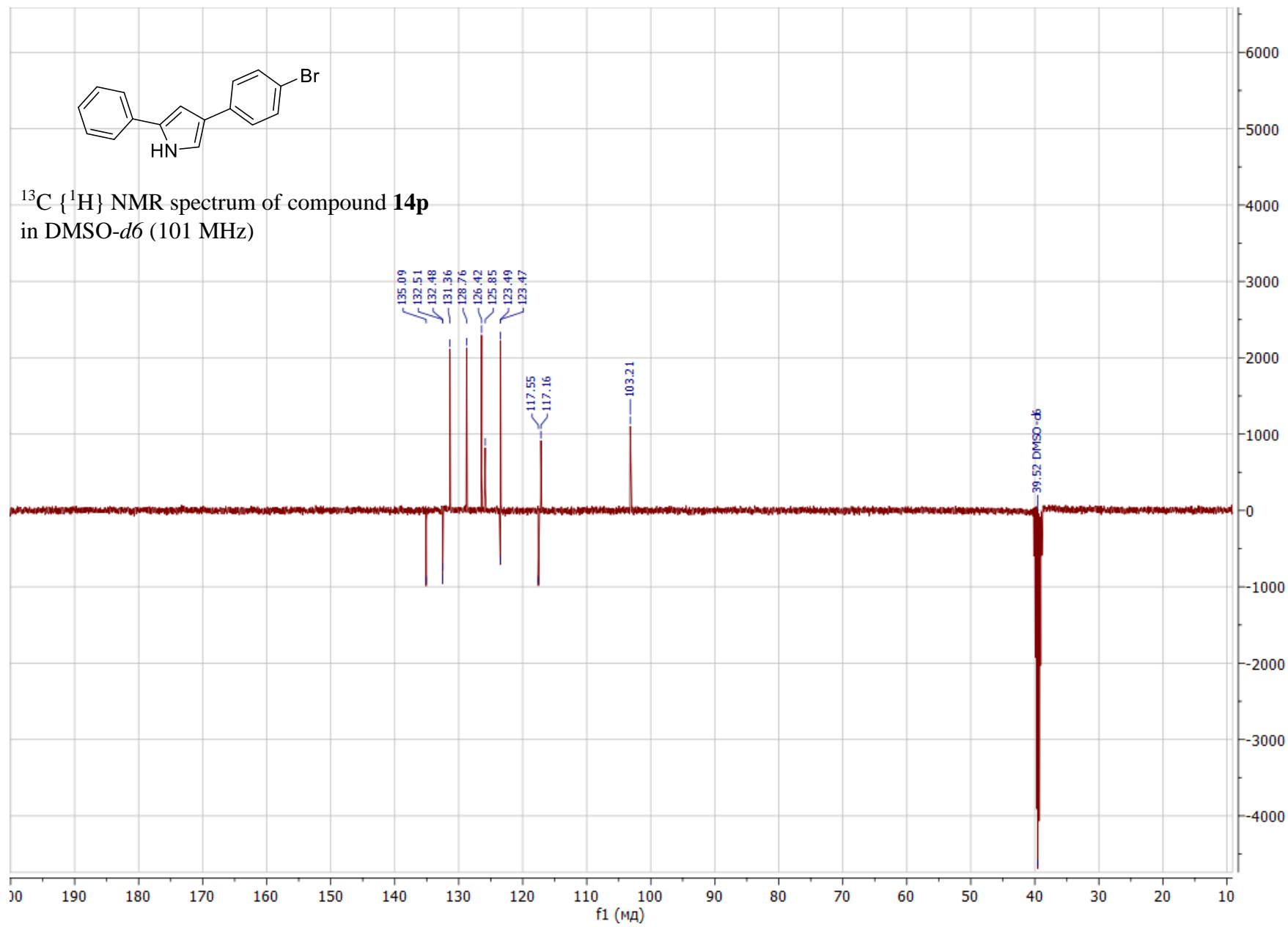


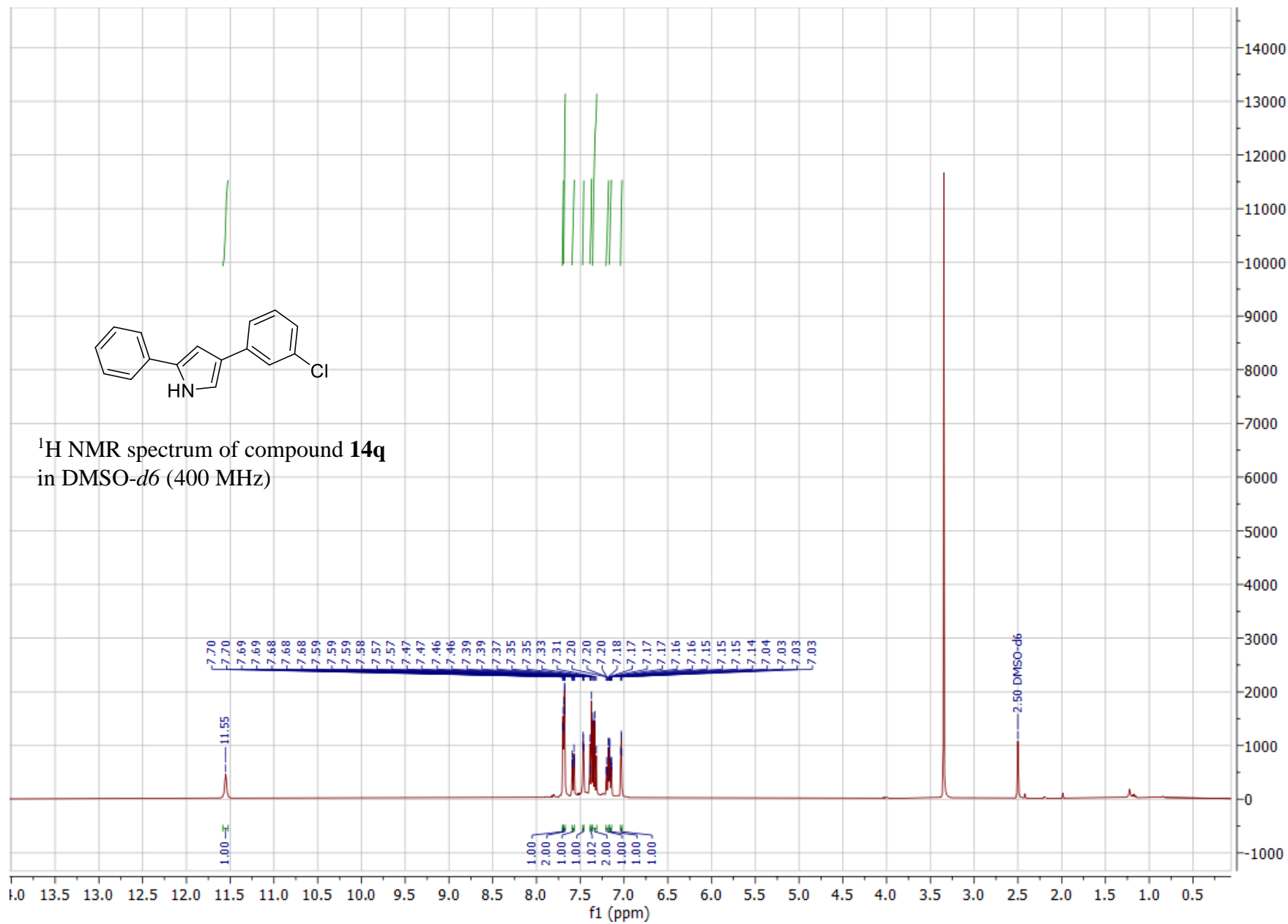


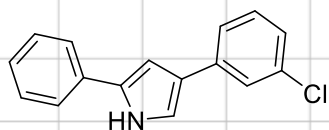




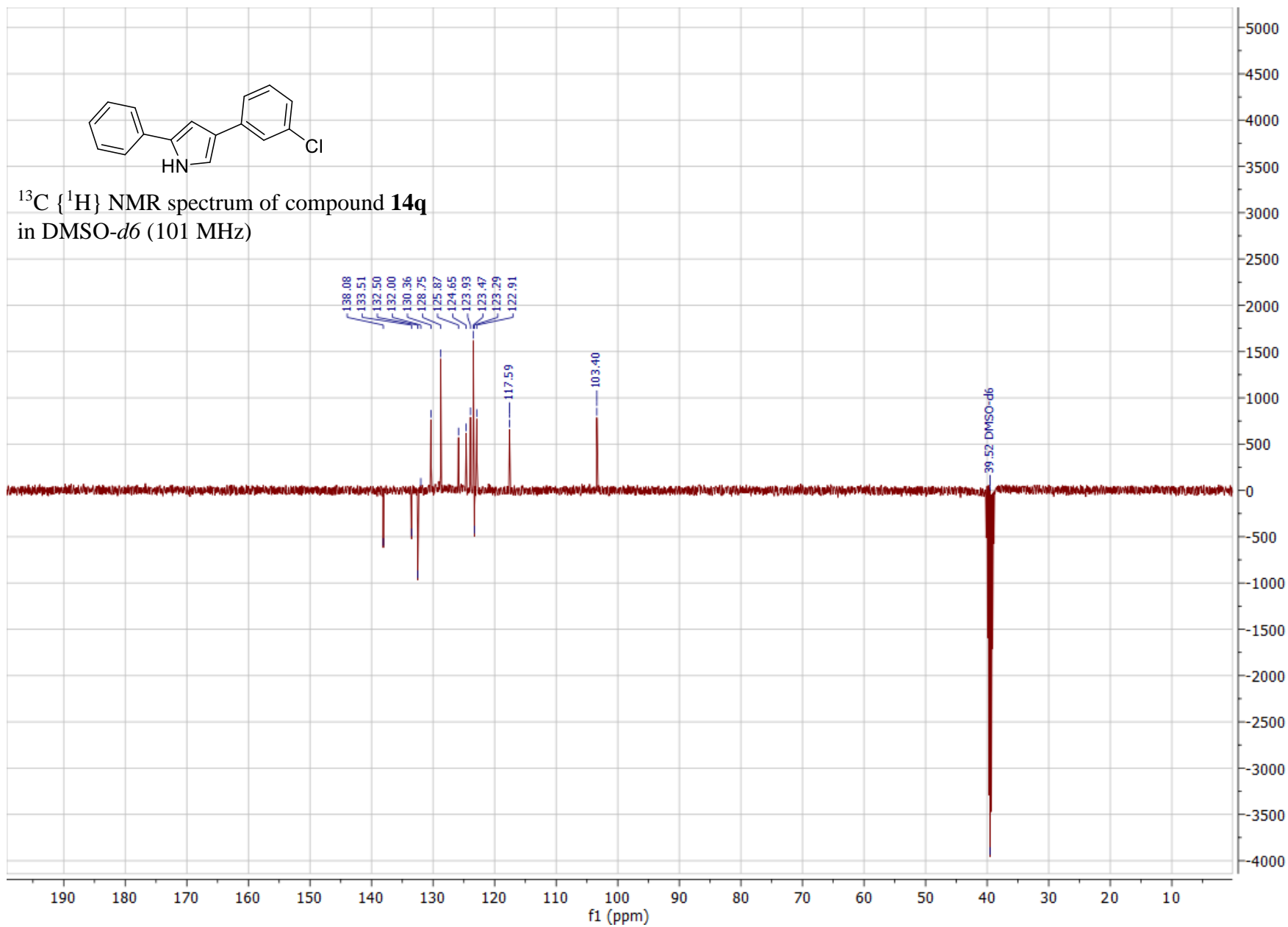
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14p**
in DMSO-*d*₆ (101 MHz)

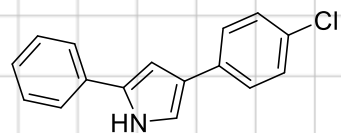




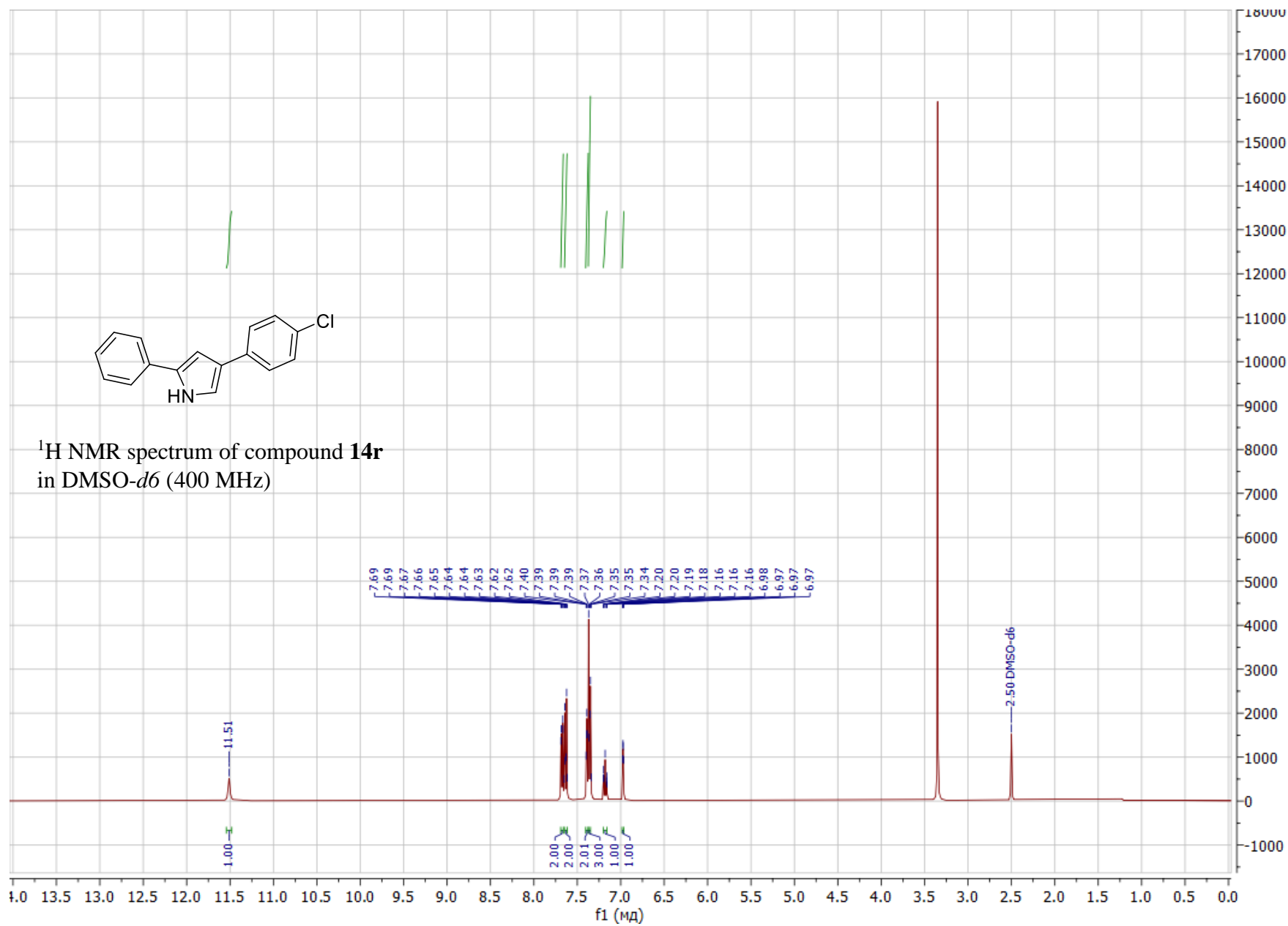


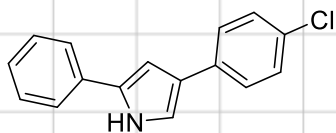
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14q**
in DMSO-*d*₆ (101 MHz)



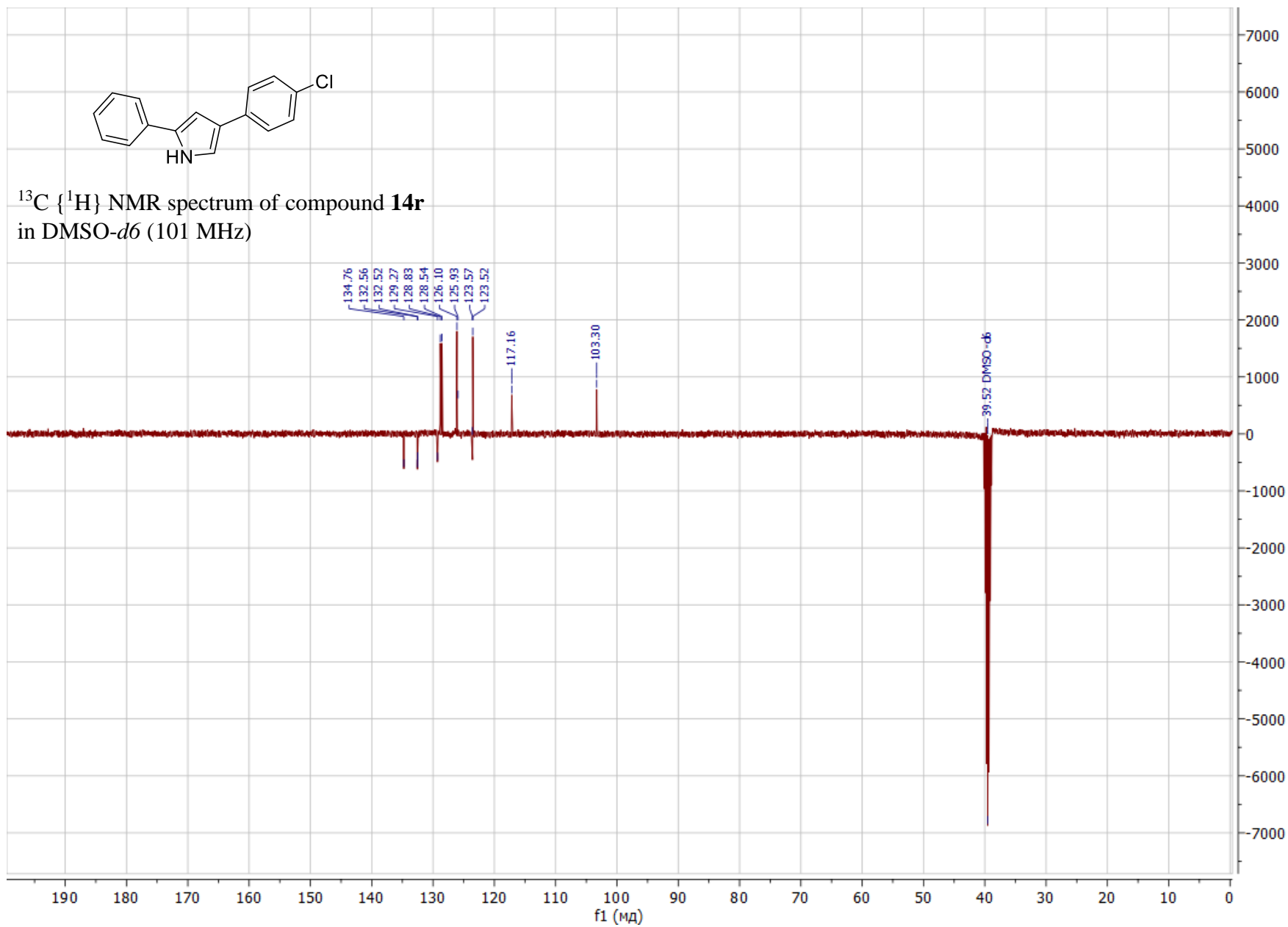


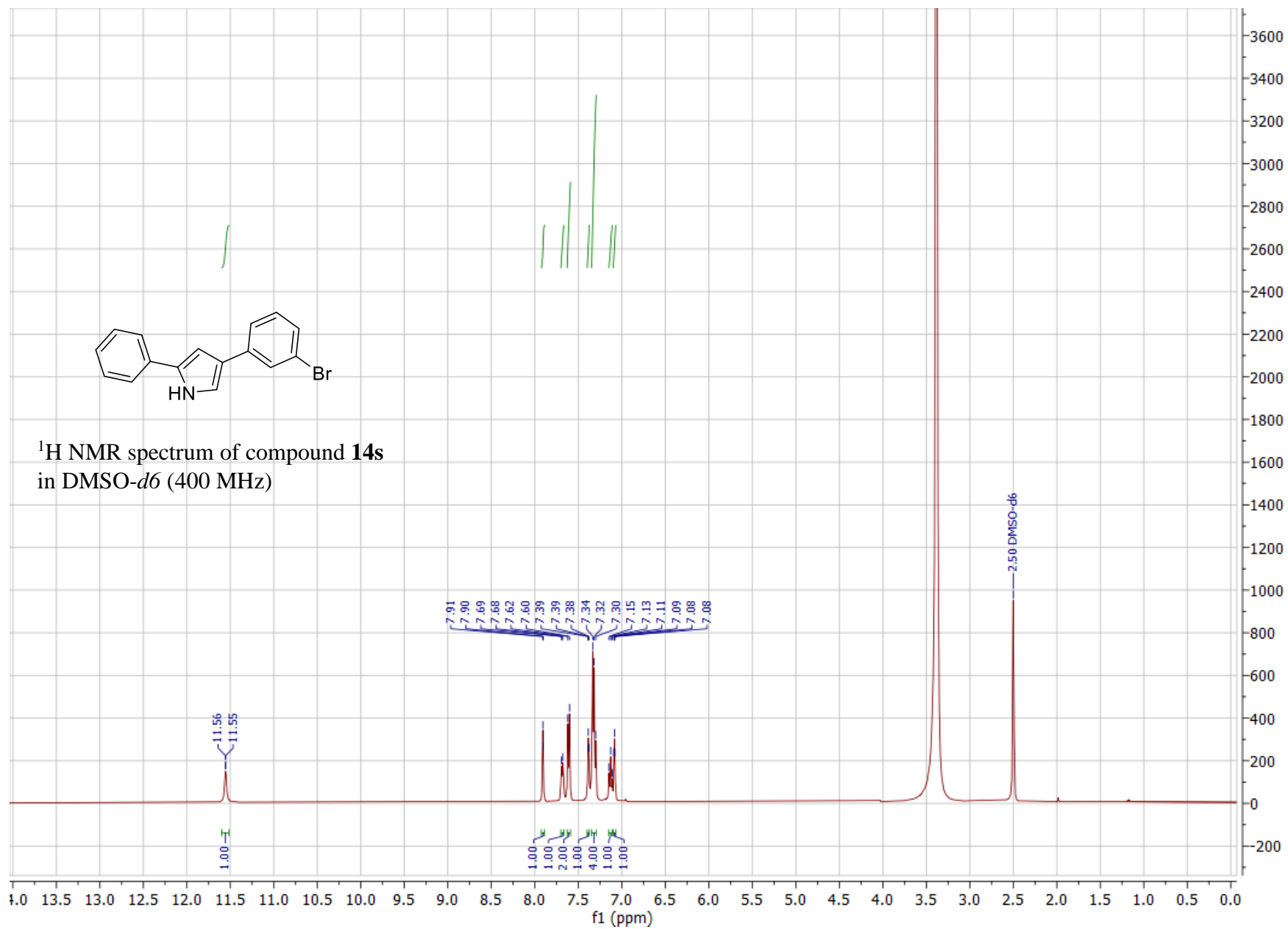
¹H NMR spectrum of compound **14r**
in DMSO-*d*₆ (400 MHz)

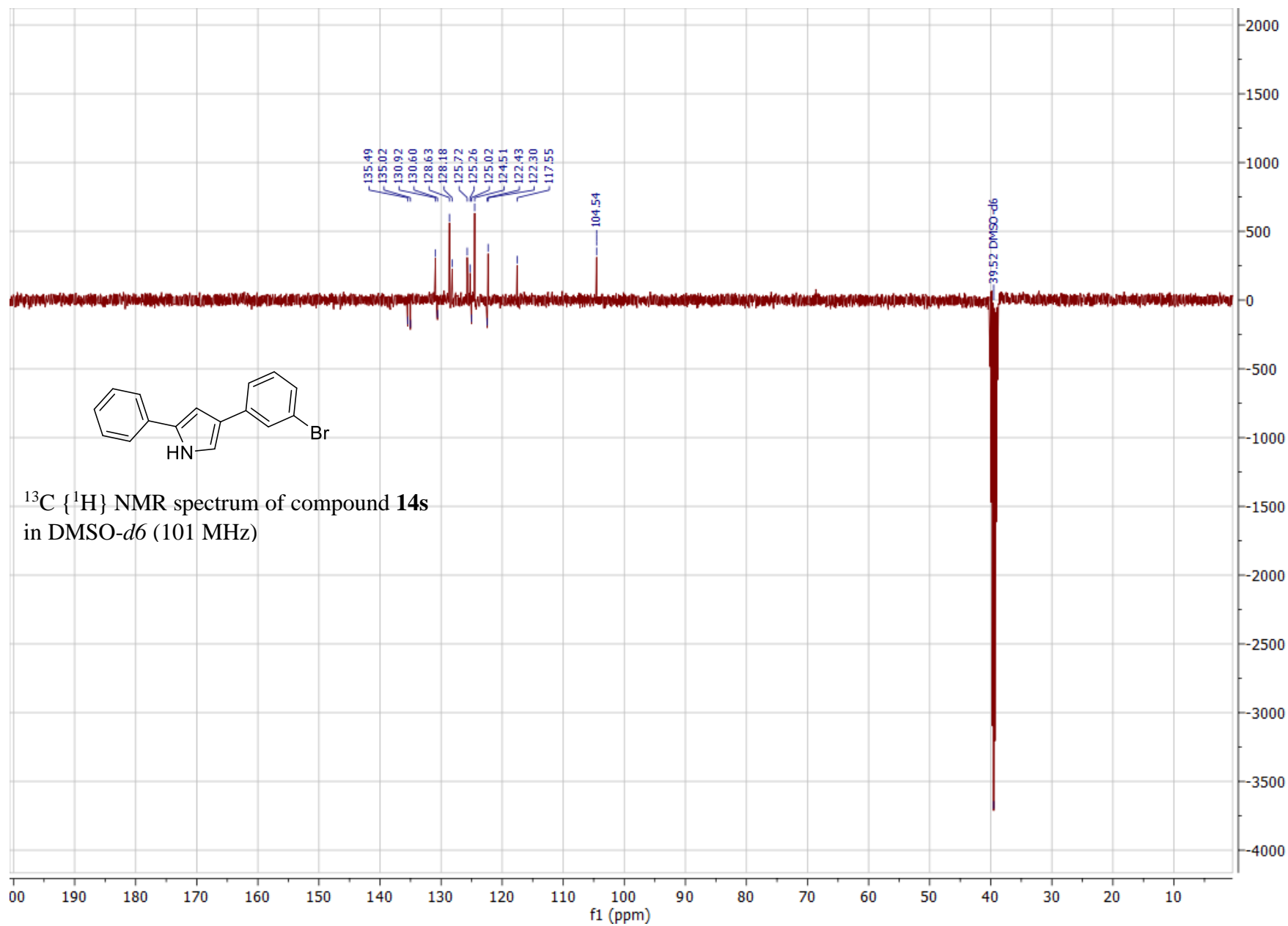


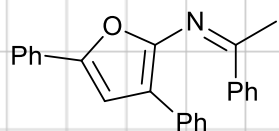


^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **14r**
in DMSO-*d*₆ (101 MHz)

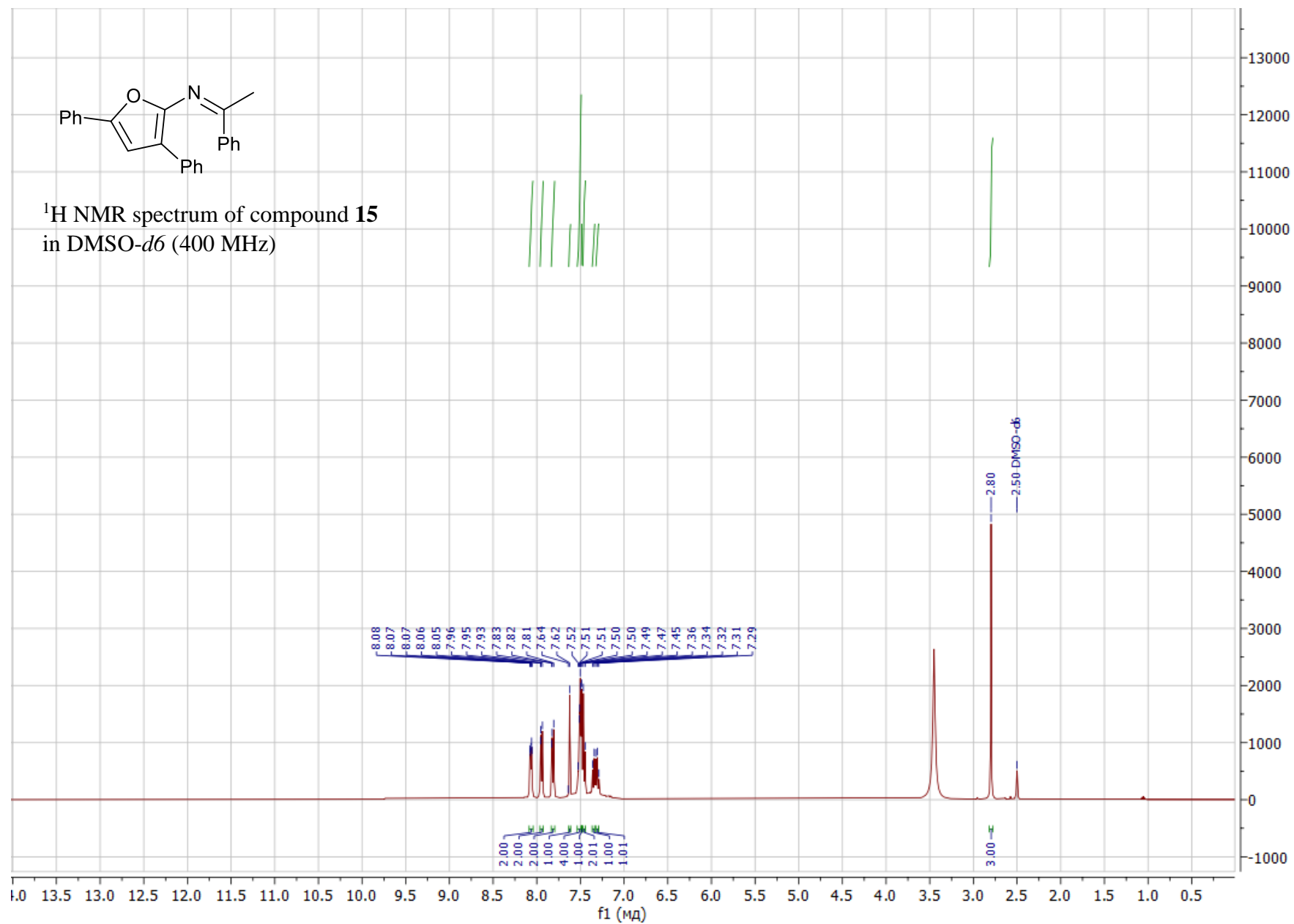


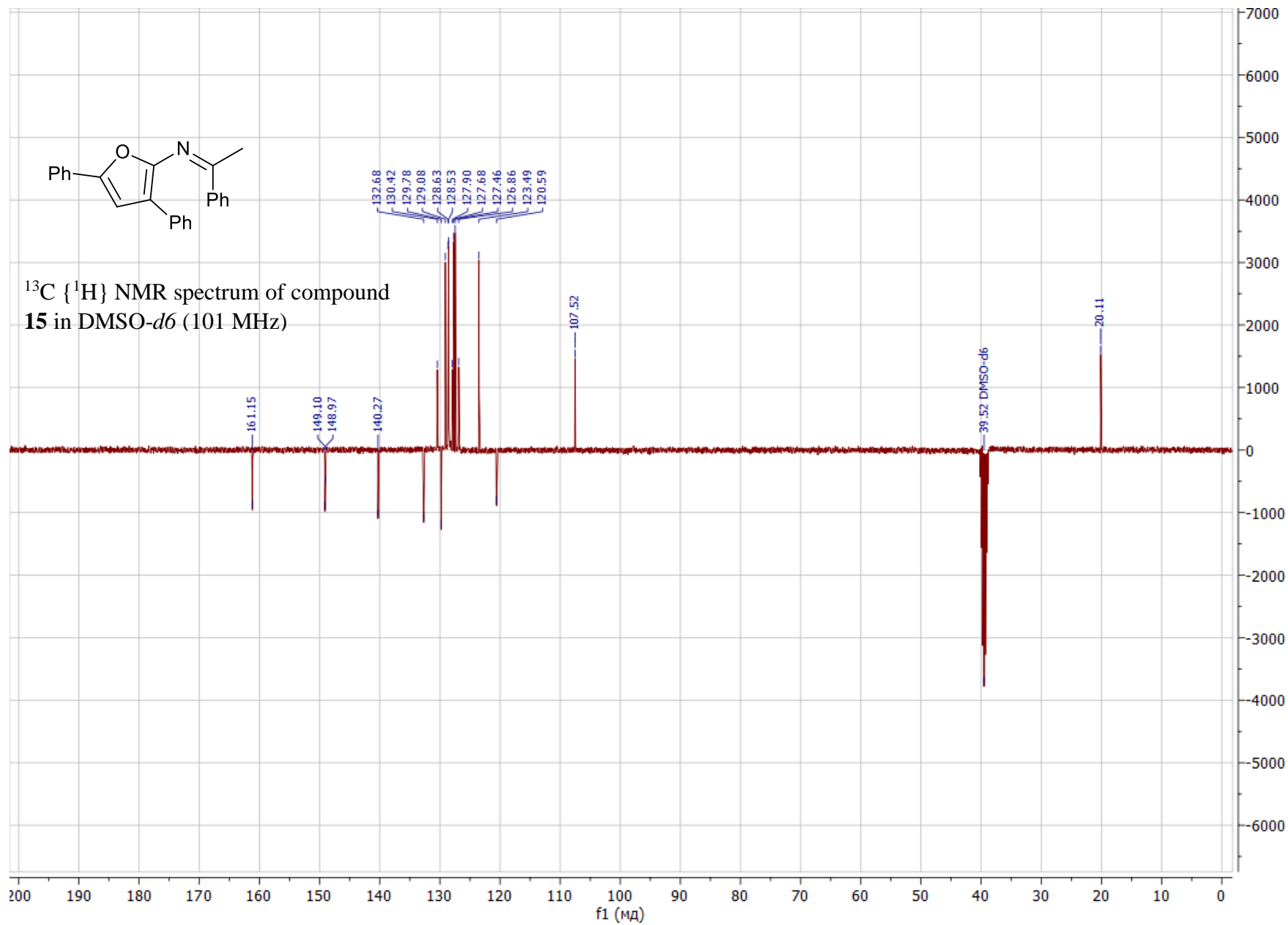


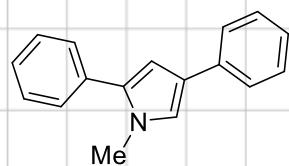




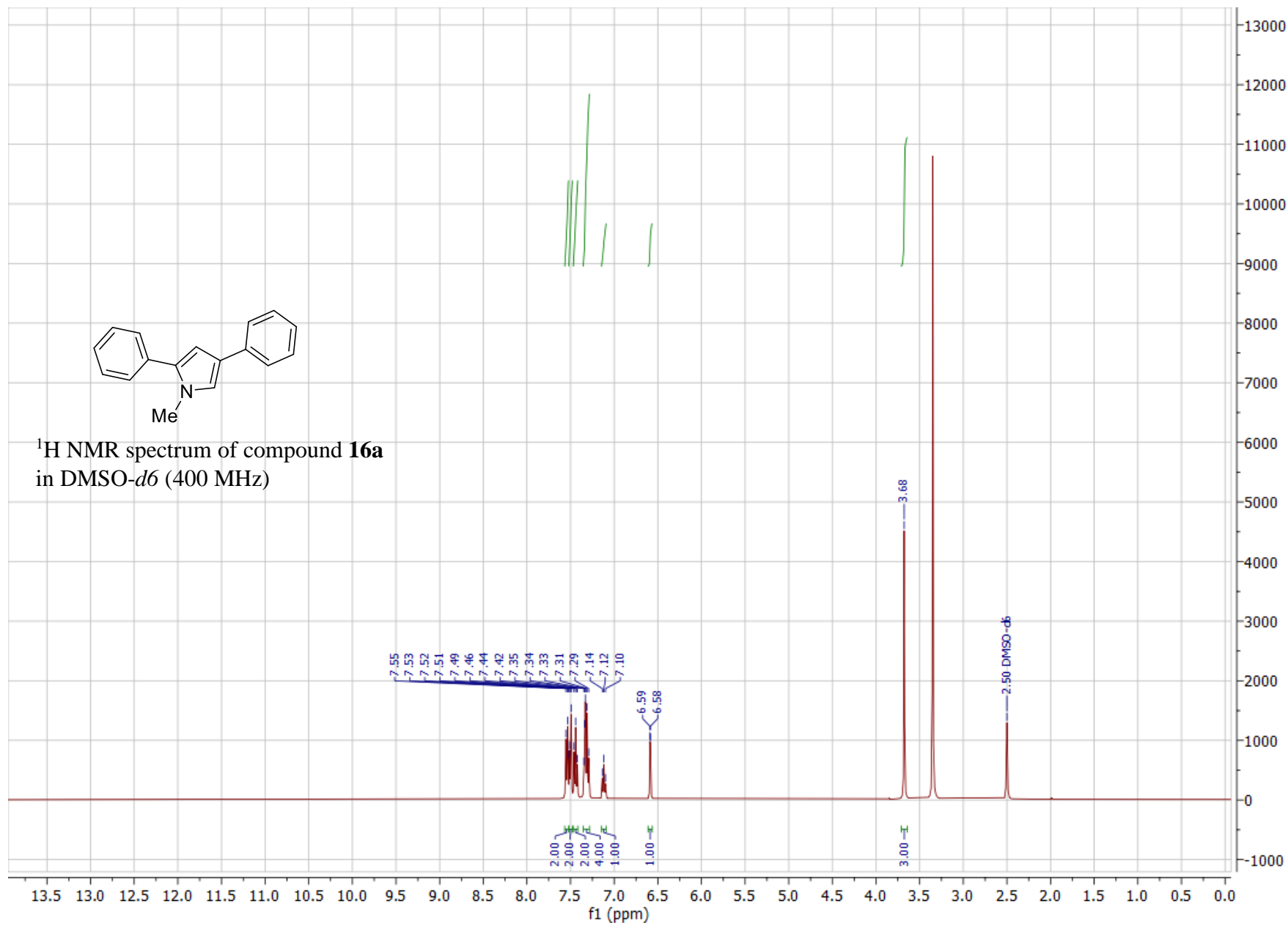
¹H NMR spectrum of compound **15**
in DMSO-*d*₆ (400 MHz)

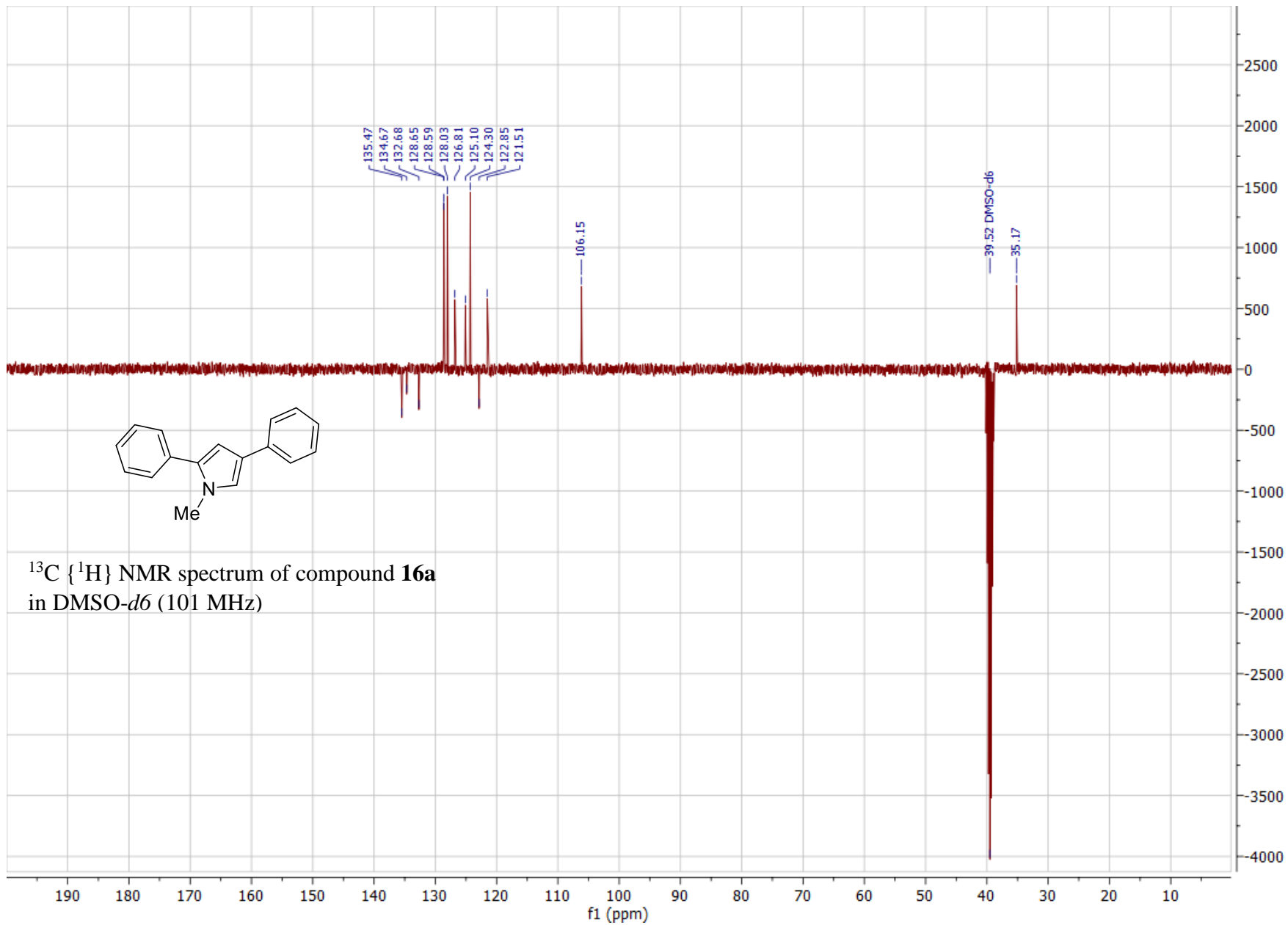


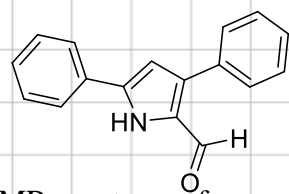




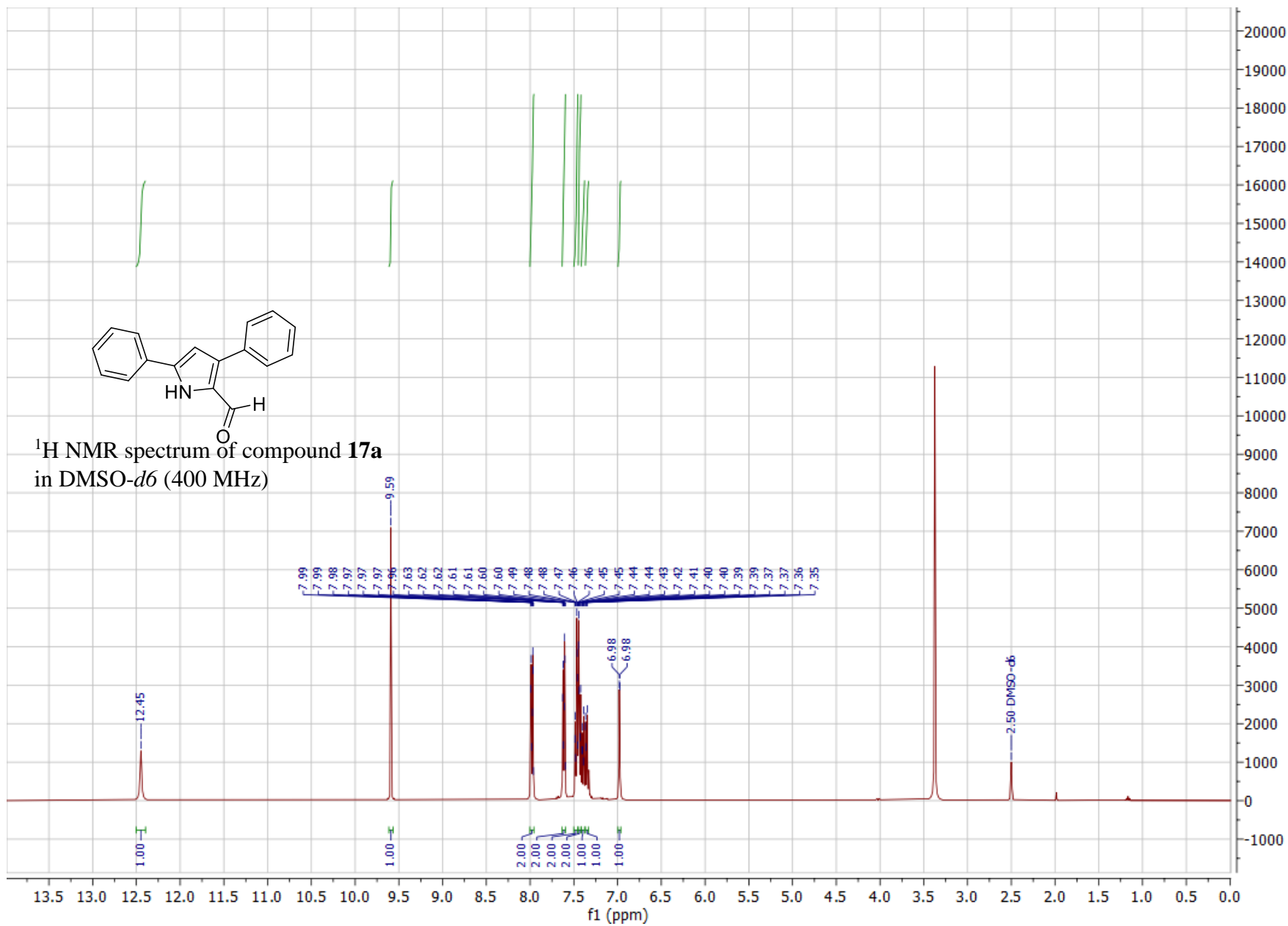
^1H NMR spectrum of compound **16a**
in DMSO- d_6 (400 MHz)

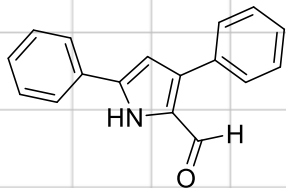




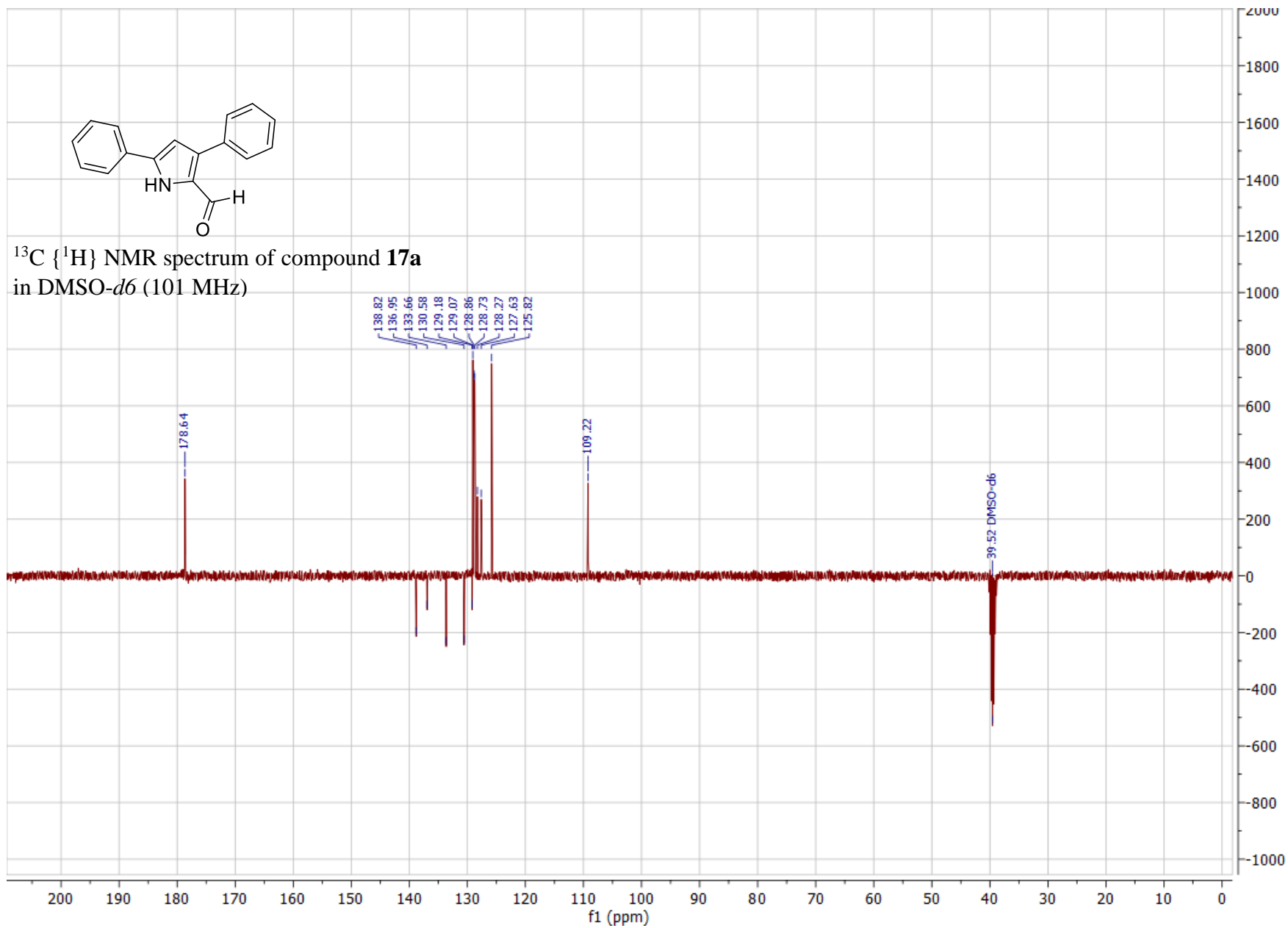


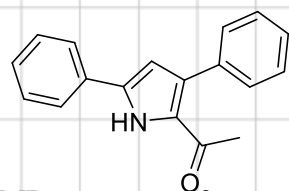
¹H NMR spectrum of compound **17a**
in DMSO-*d*₆ (400 MHz)



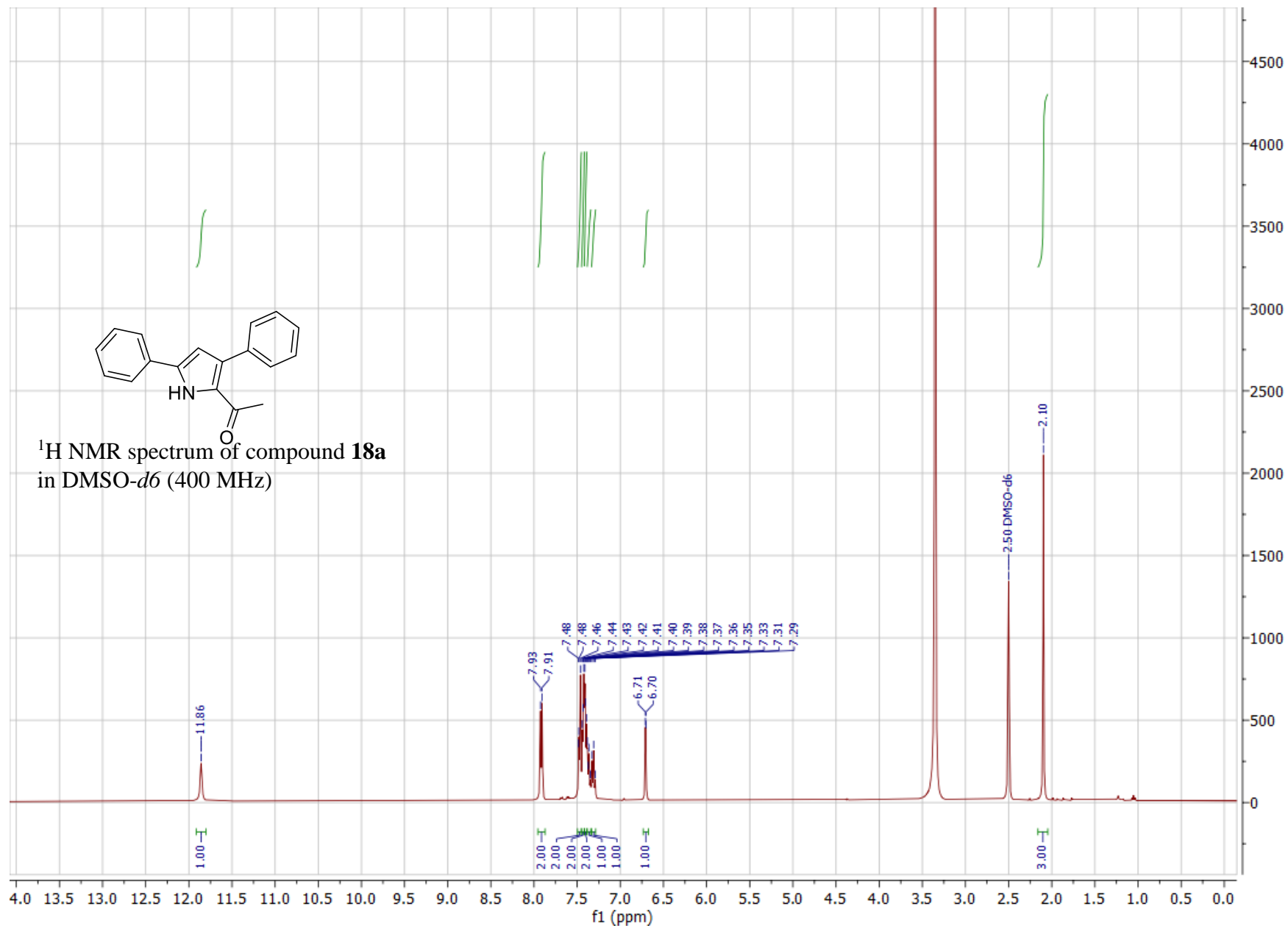


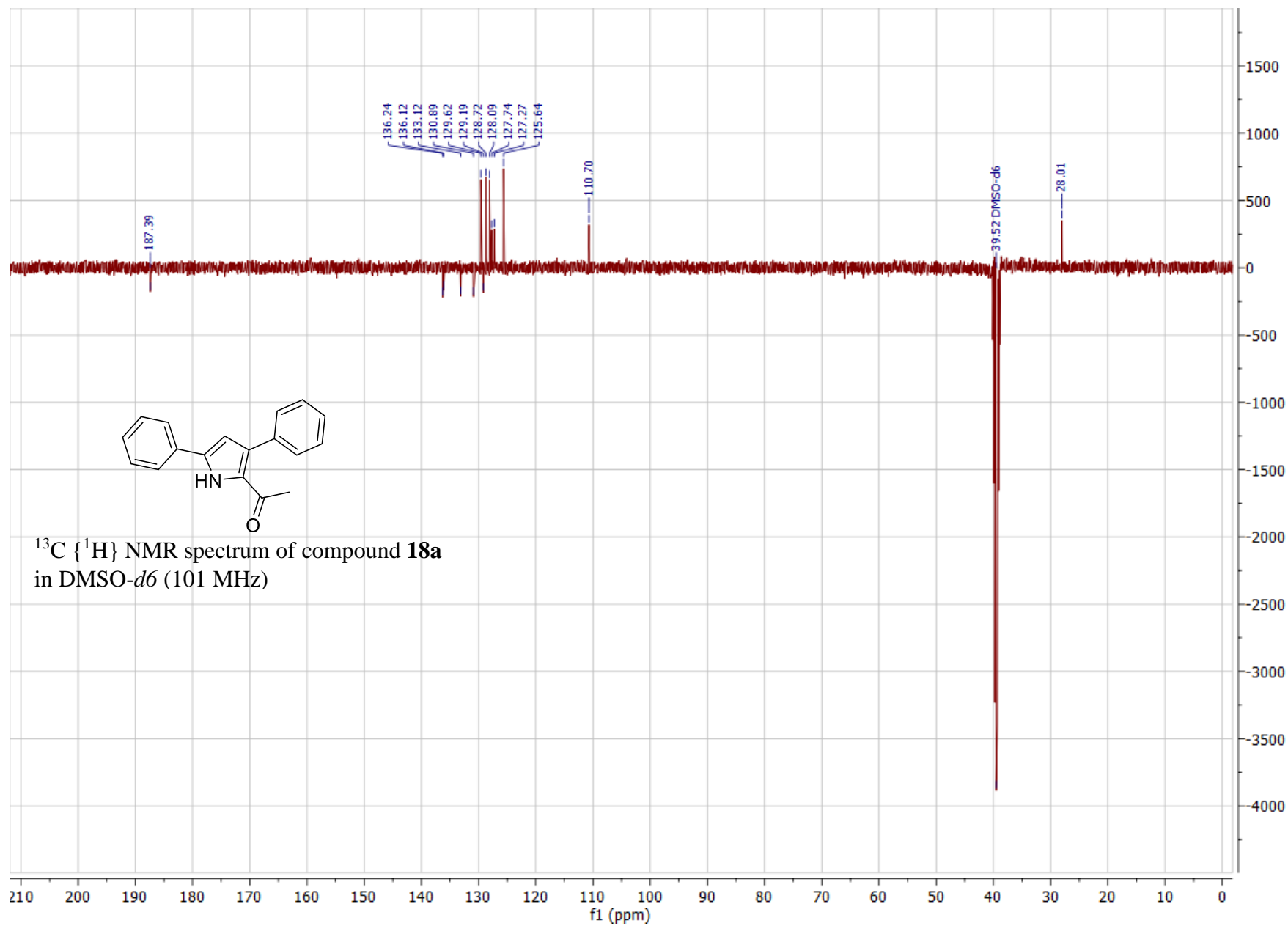
^{13}C $\{^1\text{H}\}$ NMR spectrum of compound **17a**
in $\text{DMSO-}d_6$ (101 MHz)





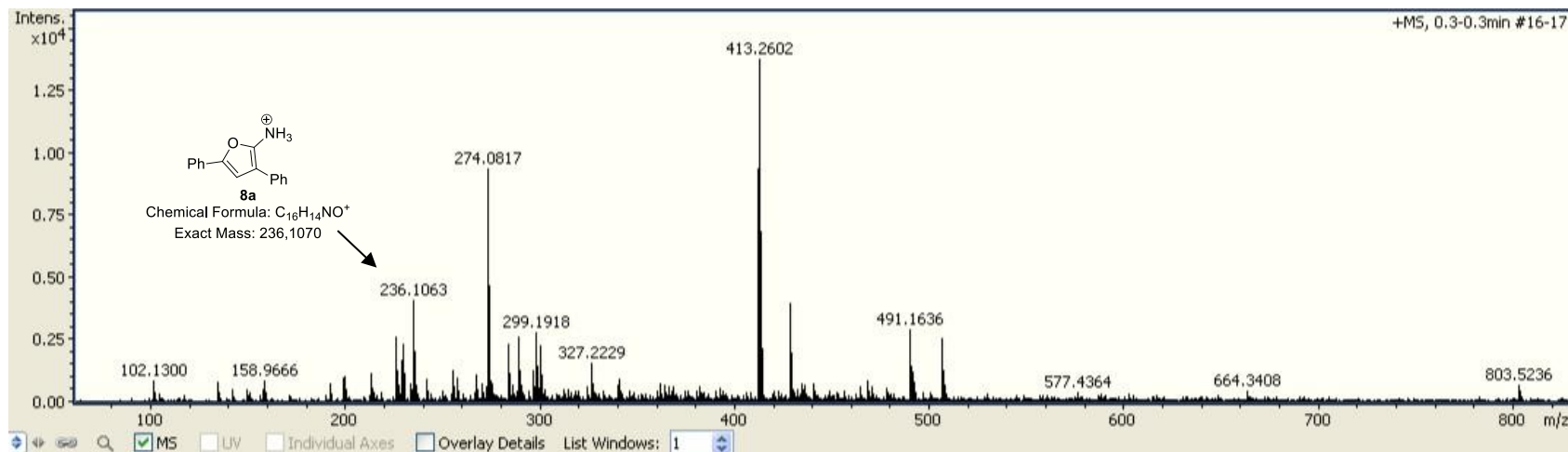
¹H NMR spectrum of compound **18a**
in DMSO-*d*₆ (400 MHz)



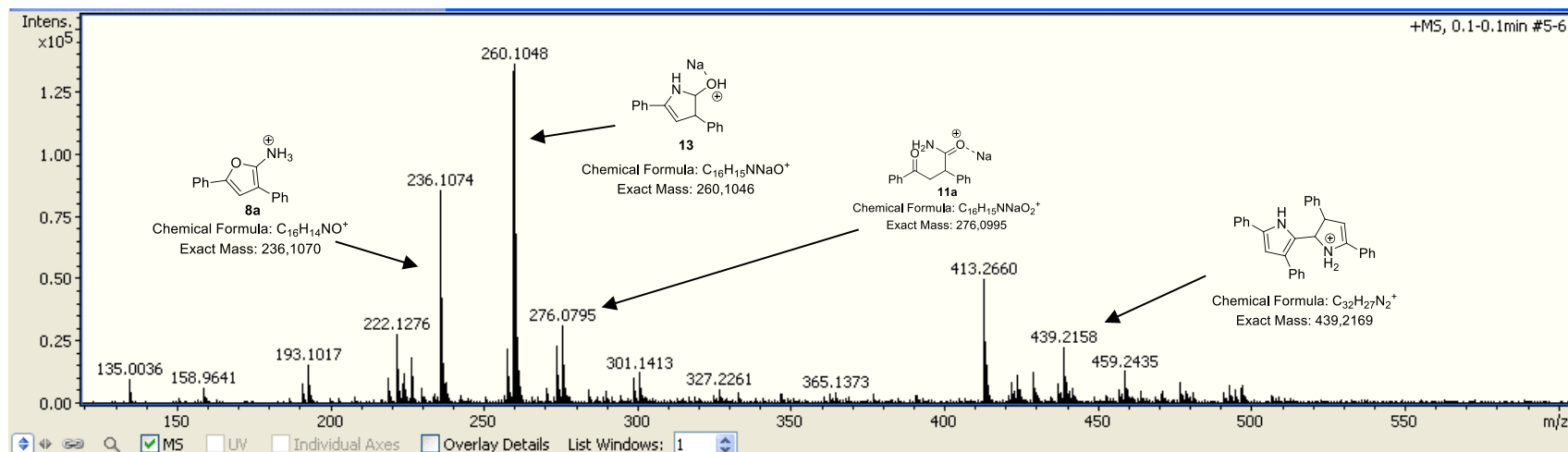


HRMS-analysis of reaction mixture

1. HRMS spectrum of the reaction mixture after 30 minutes at 70 °C. The presence of intermediate furan **8a** (M/Z = 236) in the reaction mixture is observed.



2. HRMS spectrum of the reaction mixture after addition of Zn and 15 minutes heating to 160°C. The presence of intermediates furan **8a** (M/Z = 236), amide **11a** (M/Z = 276) and 2,4-dihydro-1H-pyrrol-2-ol **13** (M/Z = 260) in the reaction mixture is observed. The target pyrrole is likely present in the spectrum as a dimeric form (M/Z = 439)



3. HRMS spectrum of the reaction mixture after addition of Zn and 45 minutes heating to 160°C. The presence of only 2,4-dihydro-1*H*-pyrrol-2-ol **13** (M/Z = 260) and dimeric form of pyrrole (M/Z = 439) in the reaction mixture is observed.

