

**Immobilized nickel boride nanoparticles on magnetic functionalized multi-walled carbon nanotubes: a new nanocomposite for the efficient one-pot synthesis of 1,4-benzodiazepines**

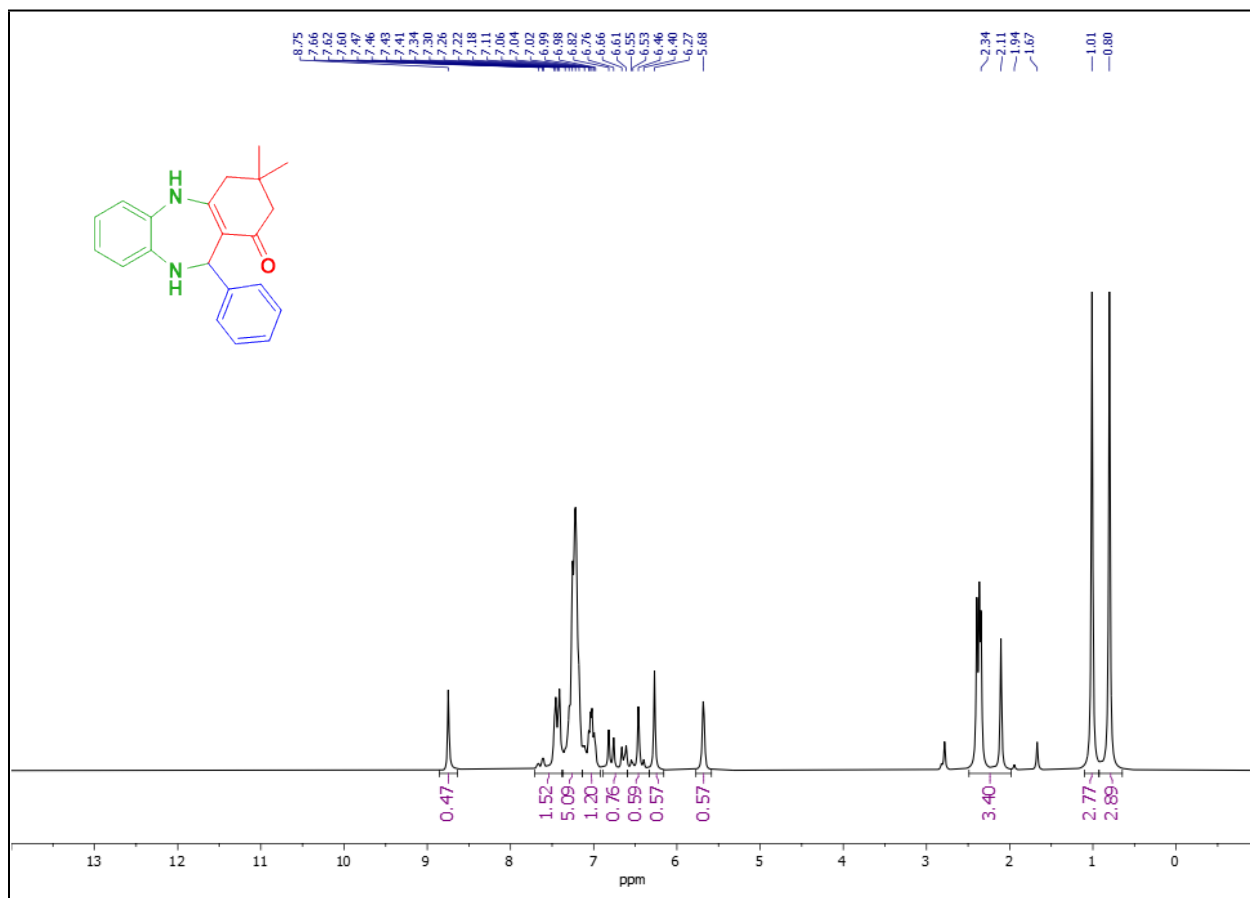
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<sup>a</sup>Department of Chemistry, Urmia University, Urmia 5756151818, Iran

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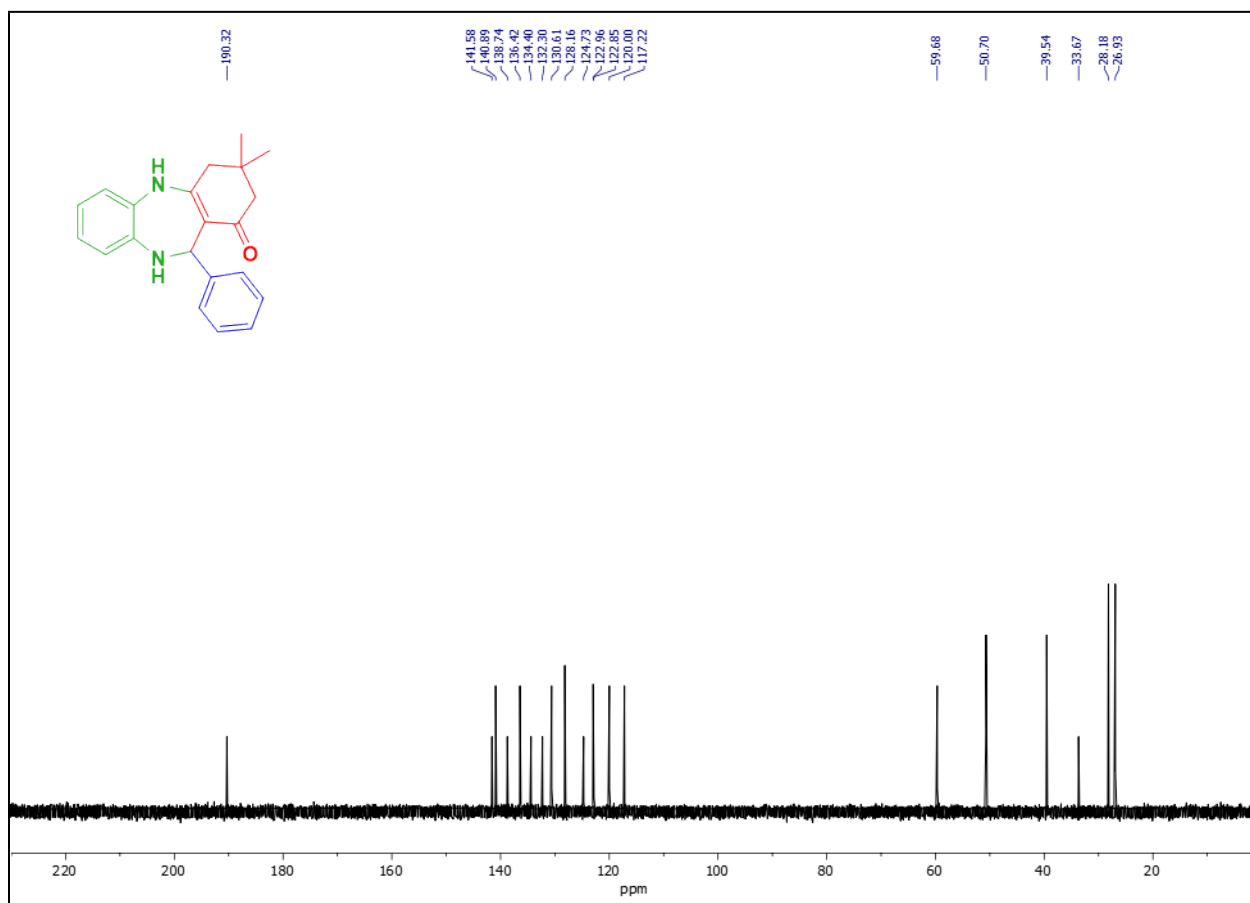
Selected spectroscopic data of the 1,4-benzodiazepines (**4a–o**)

**4a. 3,3-Dimethyl-11-phenyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



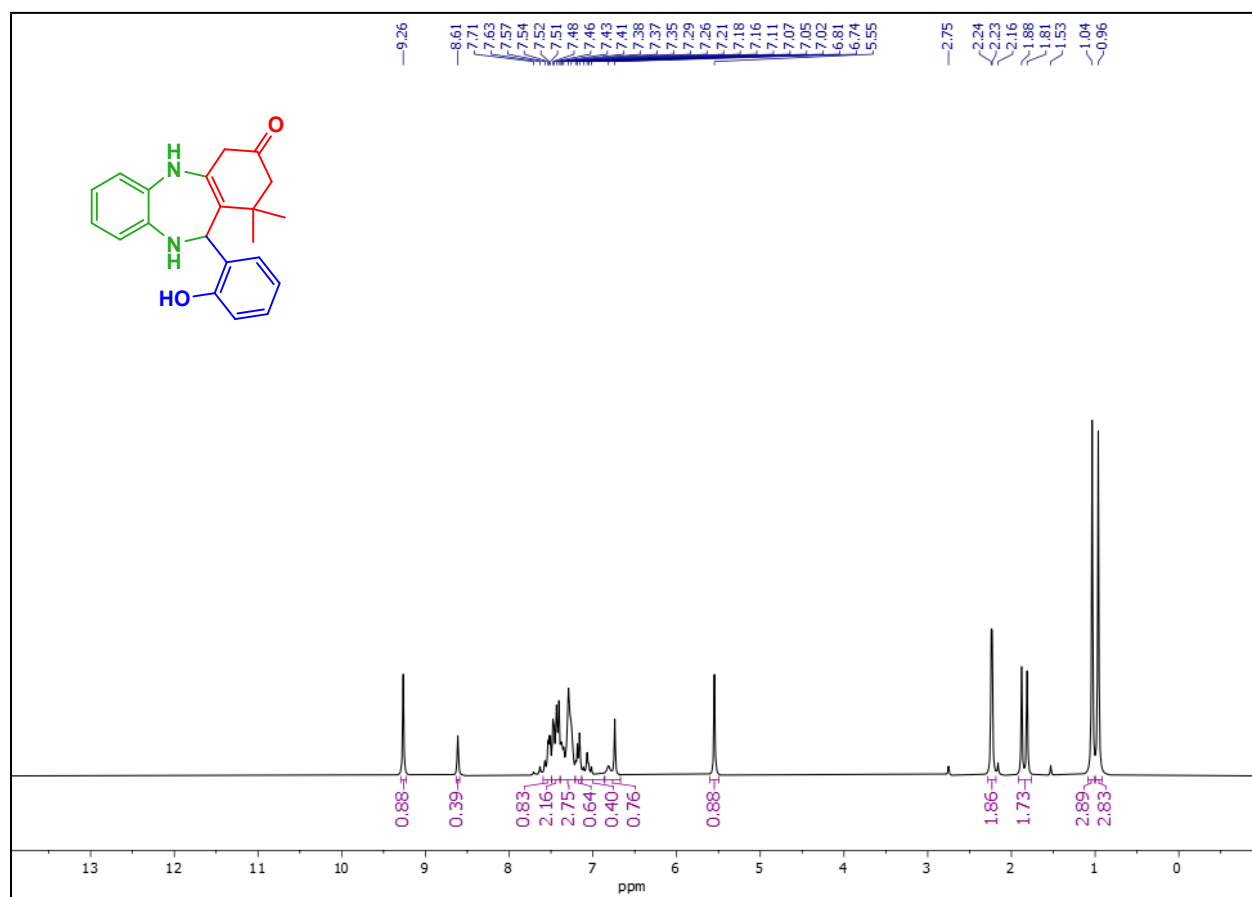
<sup>1</sup>H-NMR spectra of **4a**

4a. 3,3-Dimethyl-11-phenyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:



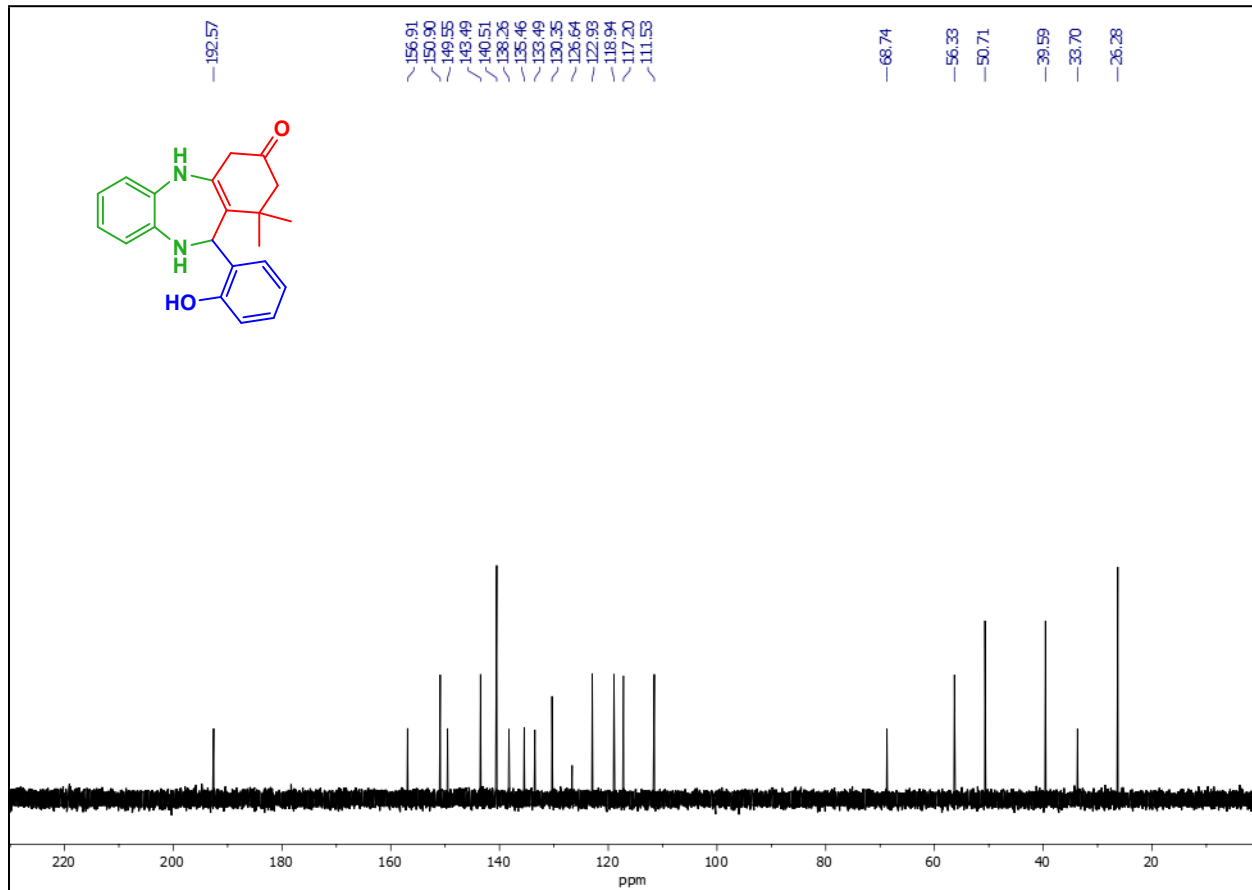
$^{13}\text{C}$ -NMR spectra of **4a**

**4b. 11-(2-Hydroxyphenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



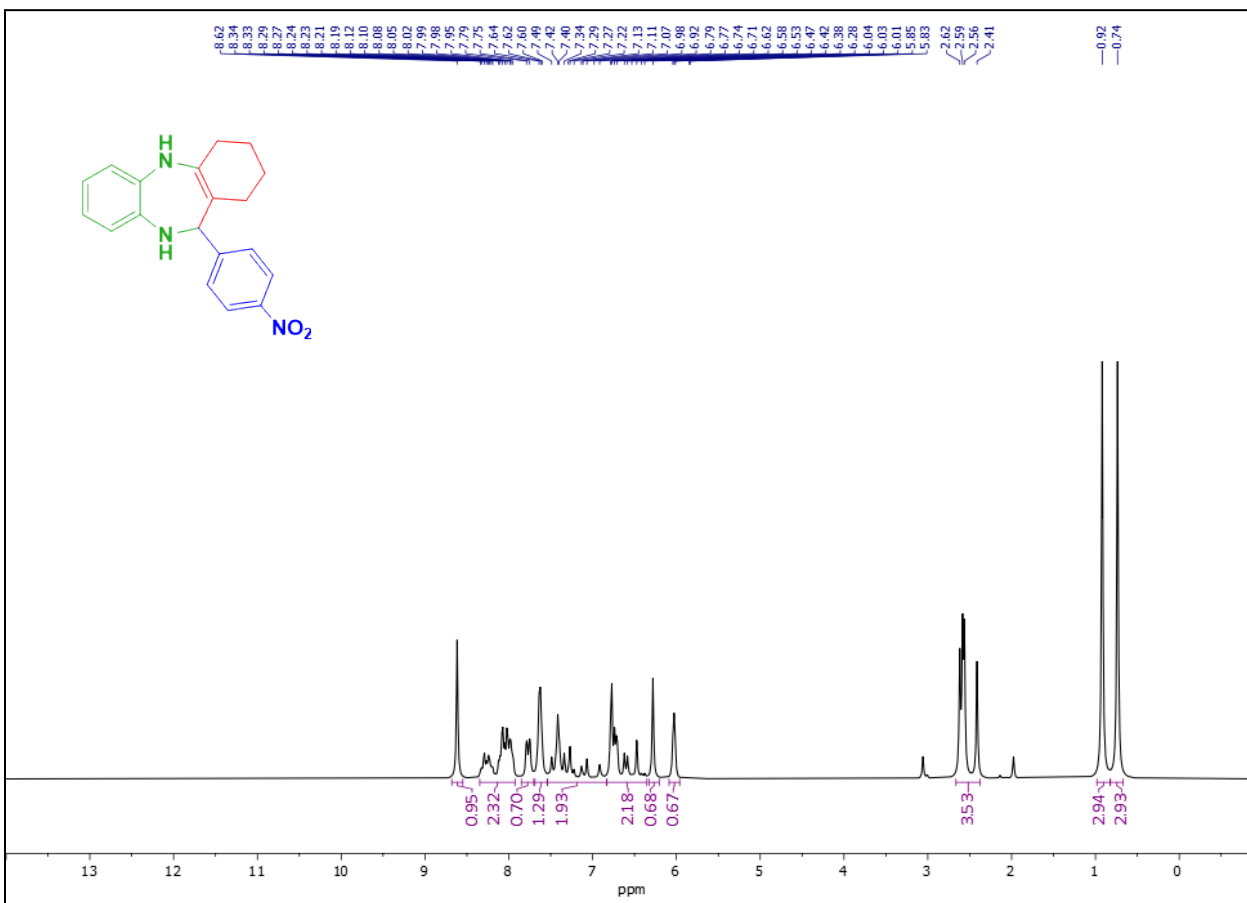
<sup>1</sup>H-NMR spectra of **4b**

**4b. 11-(2-Hydroxyphenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



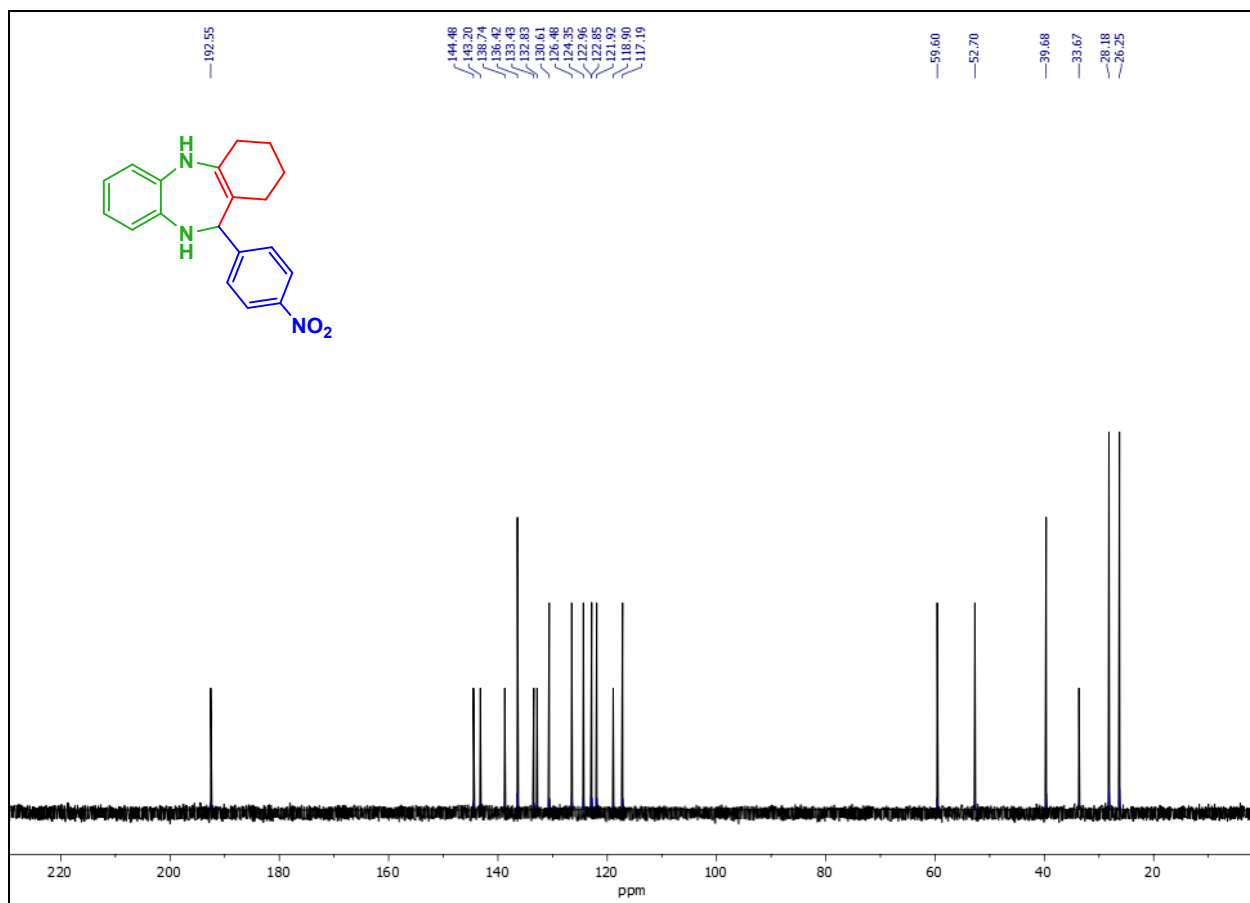
<sup>13</sup>C-NMR spectra of **4b**

4c. 3,3-Dimethyl-11-(4-nitrophenyl)-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:



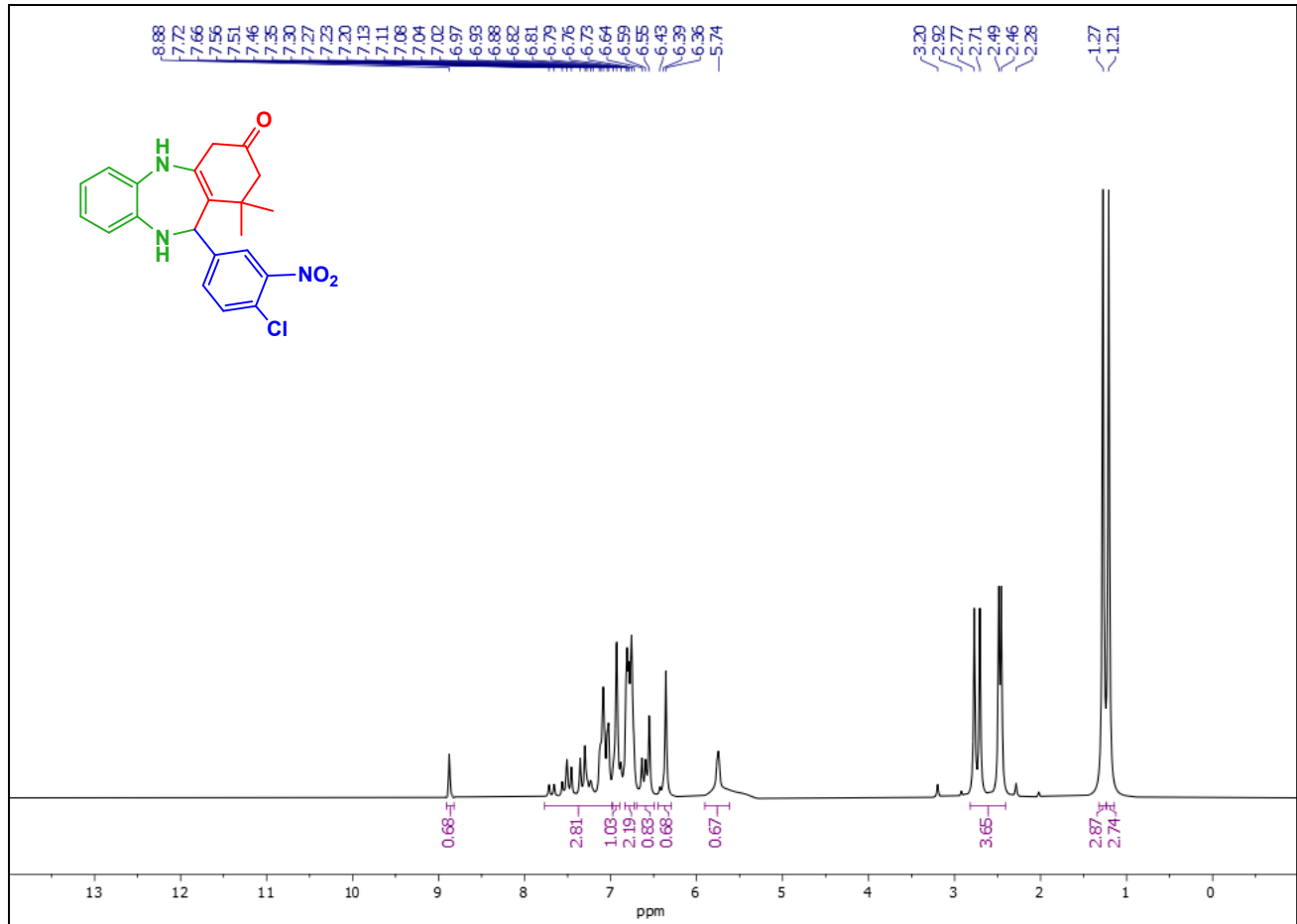
<sup>1</sup>H-NMR spectra of 4c

**4c. 3,3-Dimethyl-11-(4-nitrophenyl)-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:**



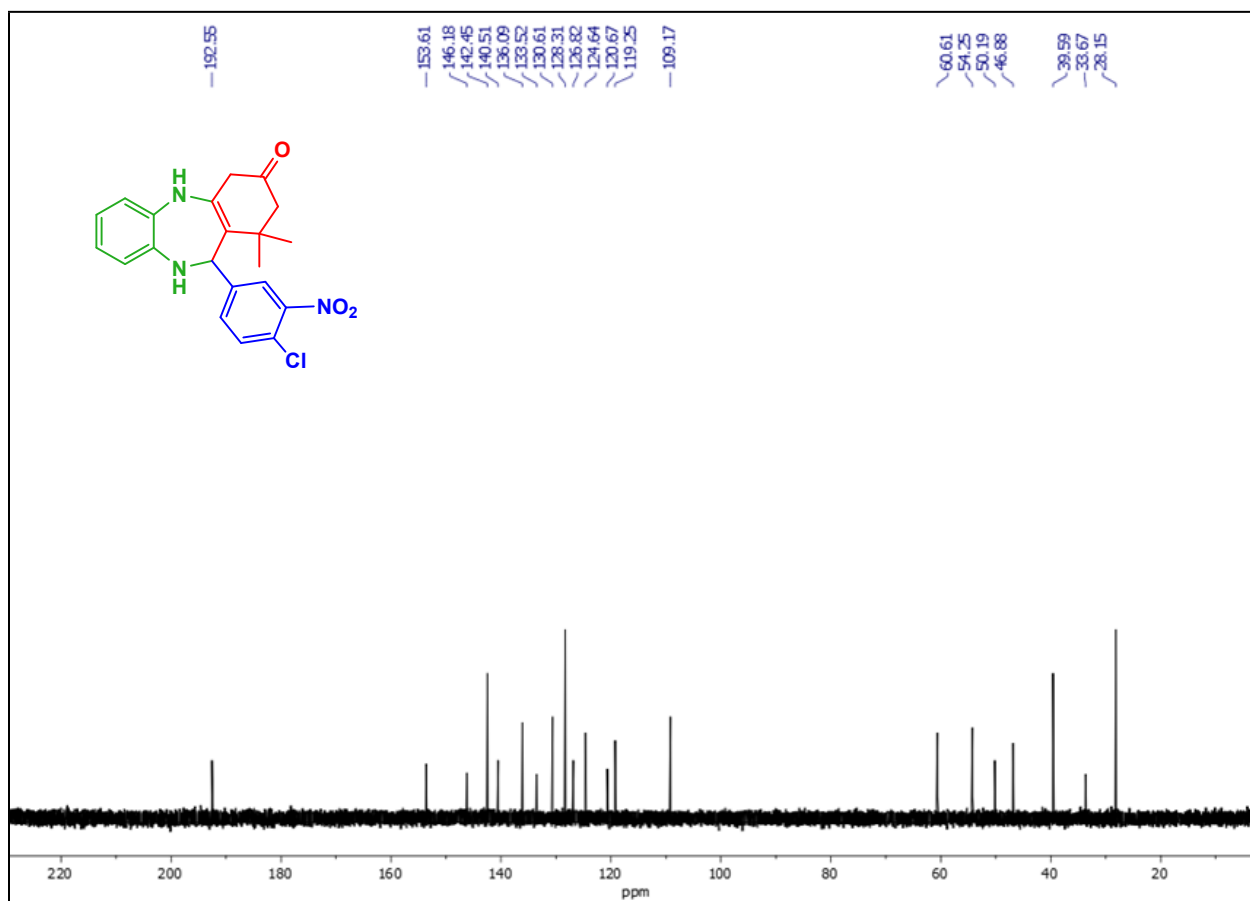
<sup>13</sup>C-NMR spectra of **4c**

4e. 11-(4-Chloro-3-nitrophenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:



<sup>1</sup>H-NMR spectra of 4e

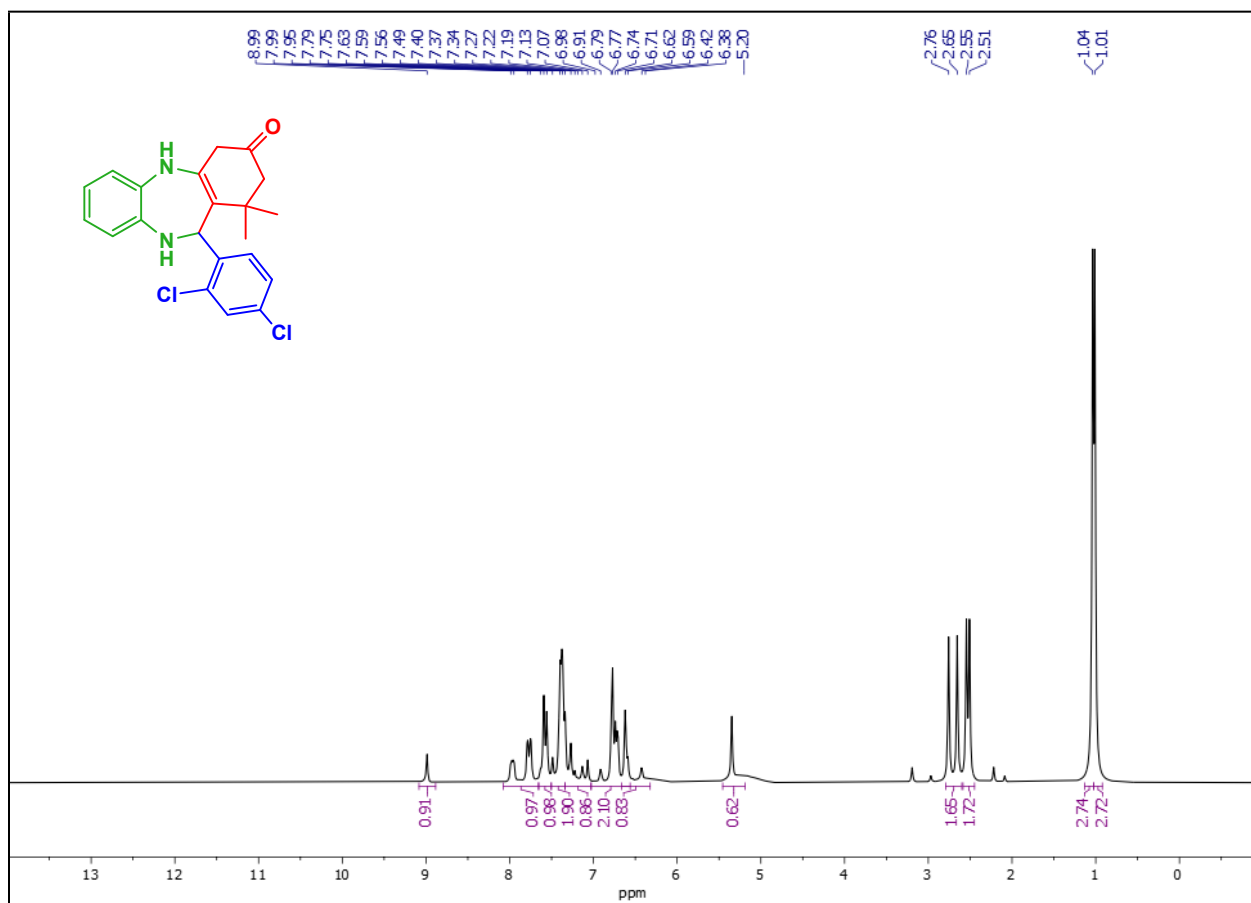
4e. 11-(4-Chloro-3-nitrophenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:



$^{13}\text{C}$ -NMR spectra of 4e

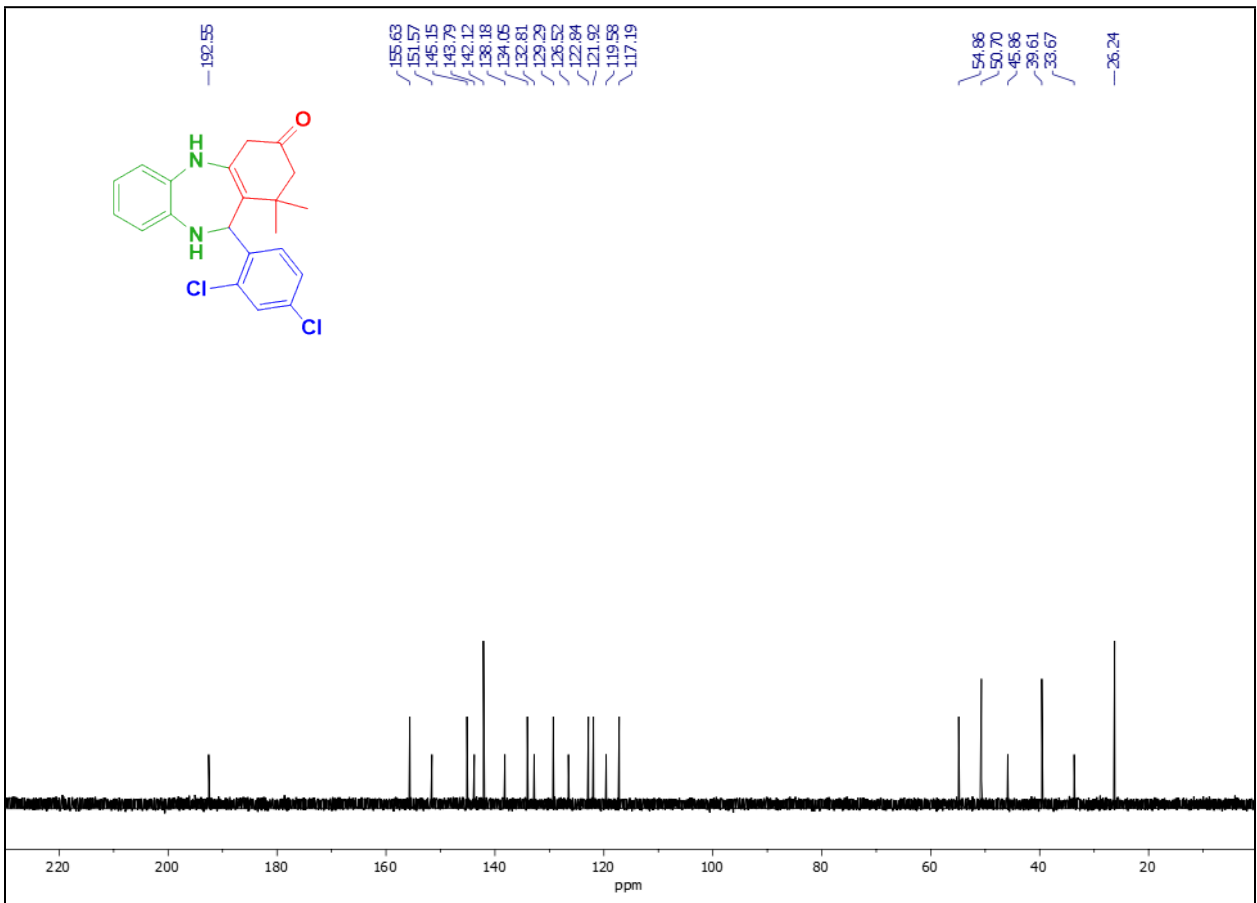


4f. 11-(2,4-Dichlorophenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:



<sup>1</sup>H-NMR spectra of **4f**

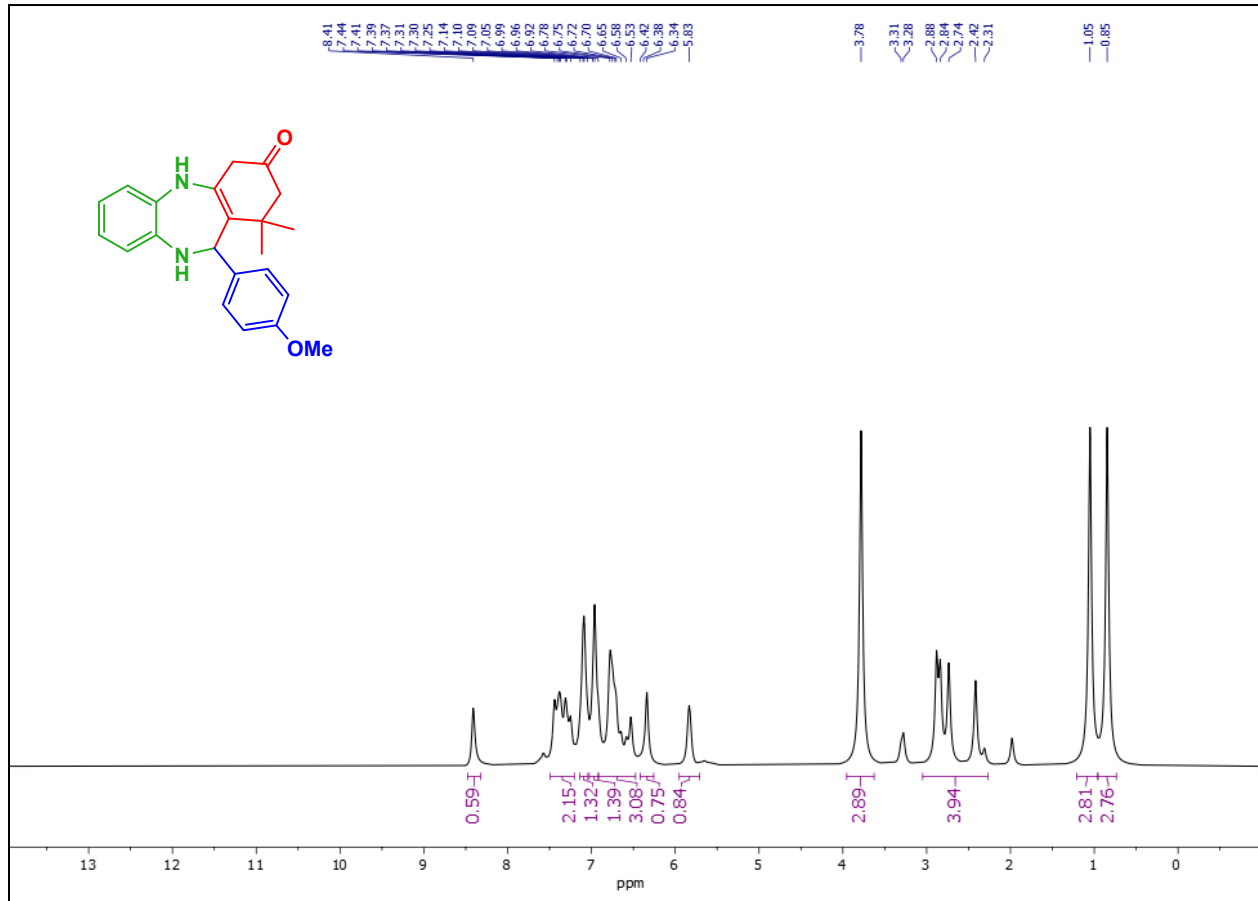
**4f. 11-(2,4-Dichlorophenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



<sup>13</sup>C-NMR spectra of **4f**

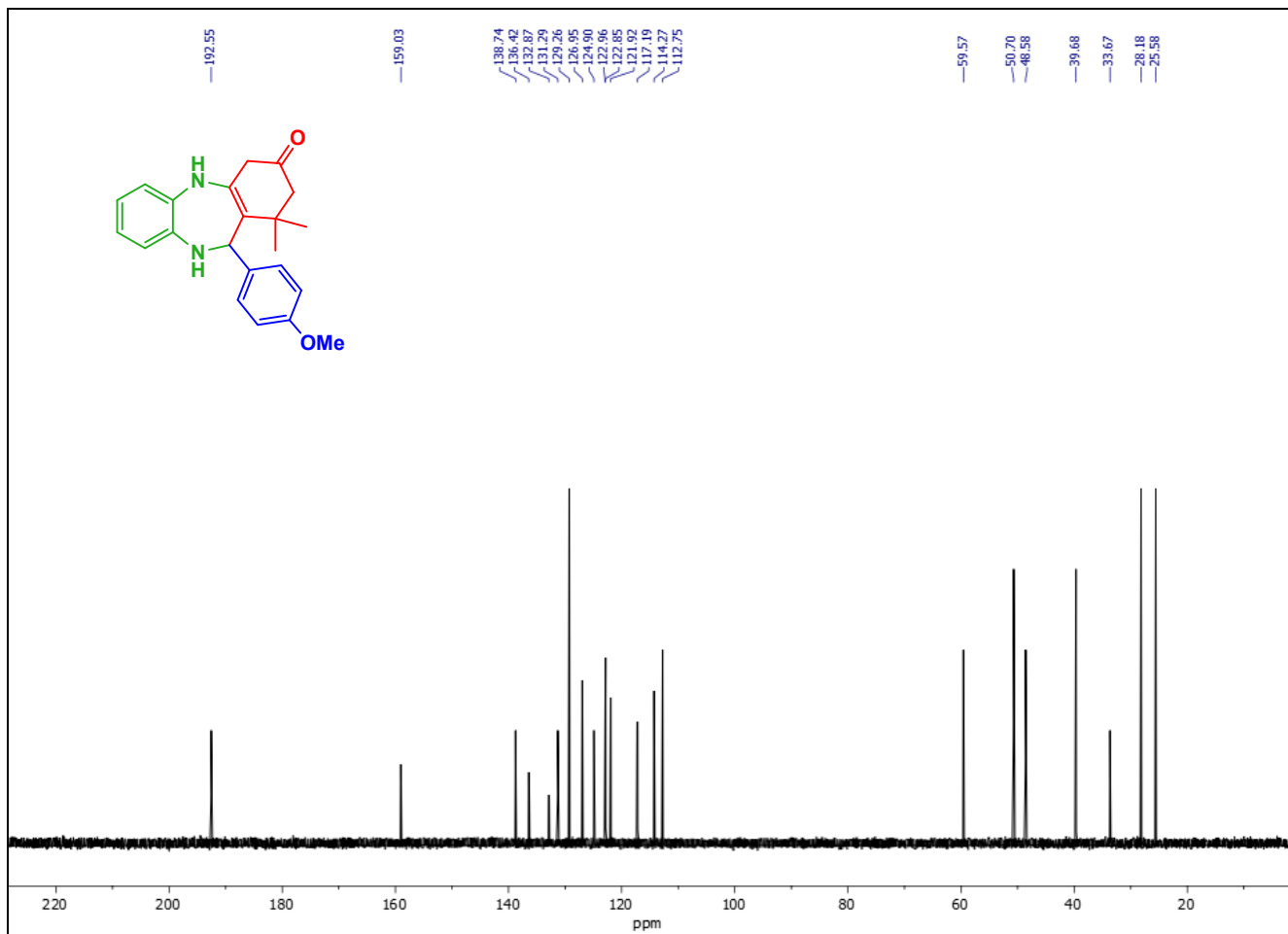


4h. 11-(4-Methoxyphenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:



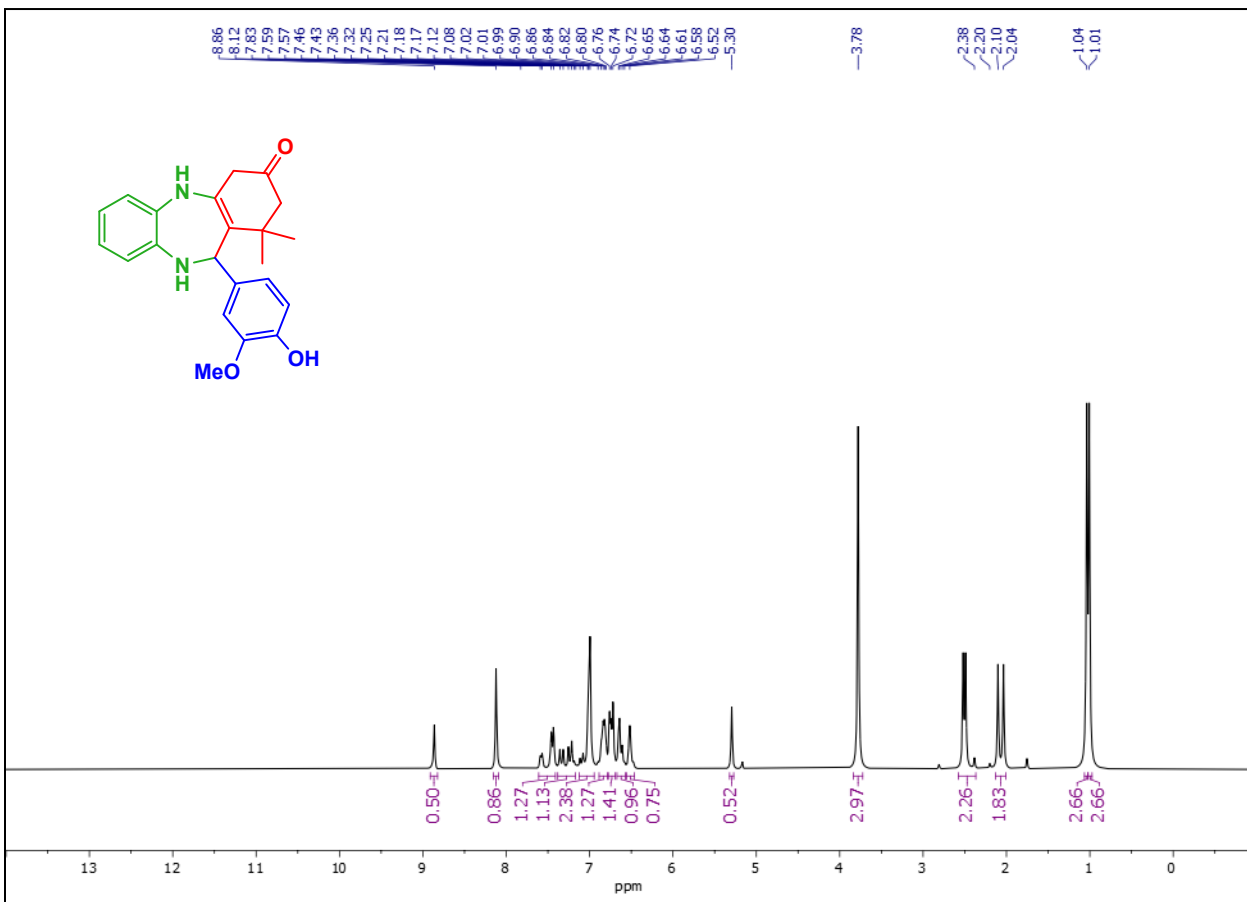
<sup>1</sup>H-NMR spectra of 4h

**4h. 11-(4-Methoxyphenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



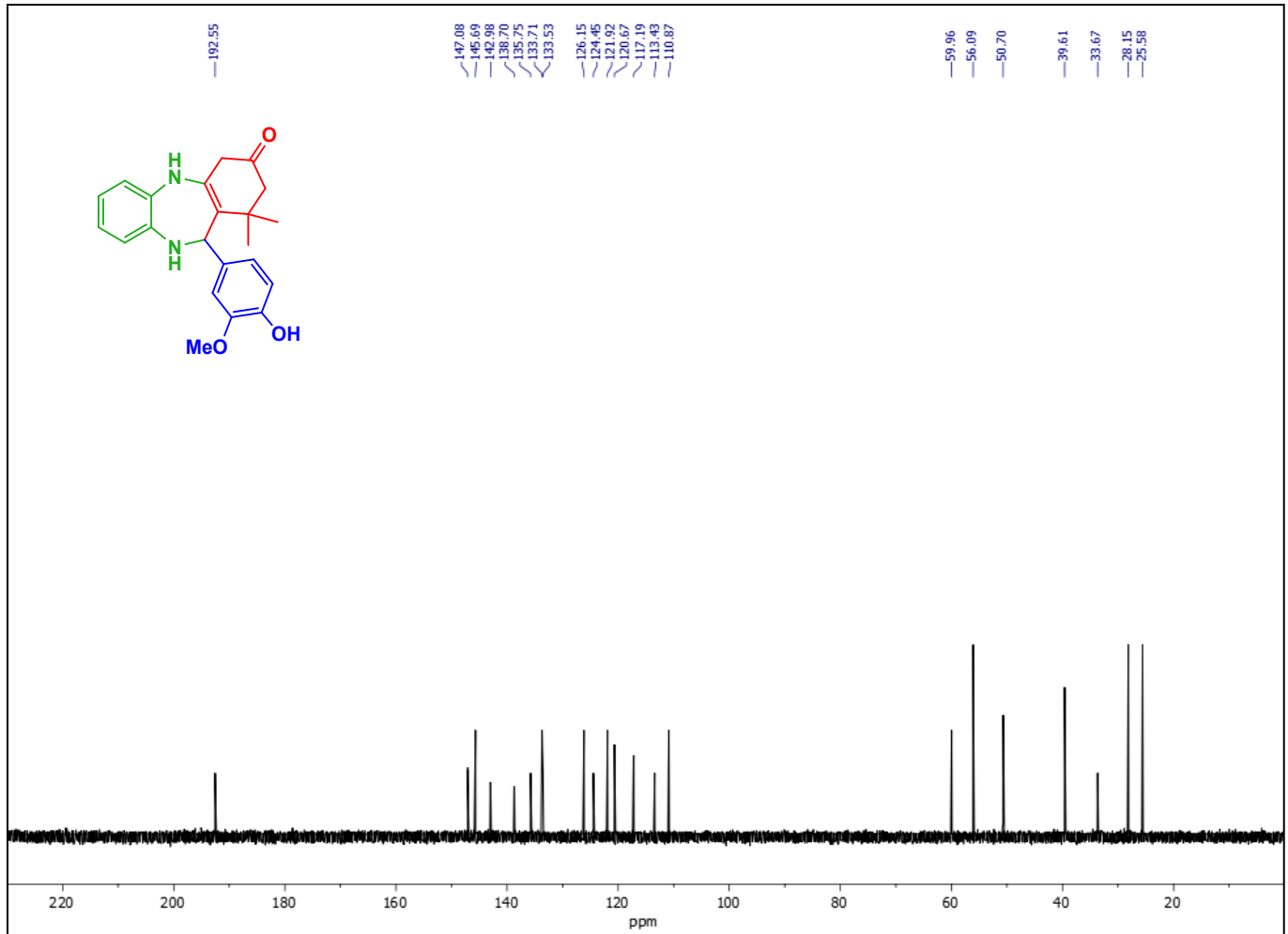
$^{13}\text{C}$ -NMR spectra of 4h

4i. 11-(4-Hydroxy-3-methoxyphenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:



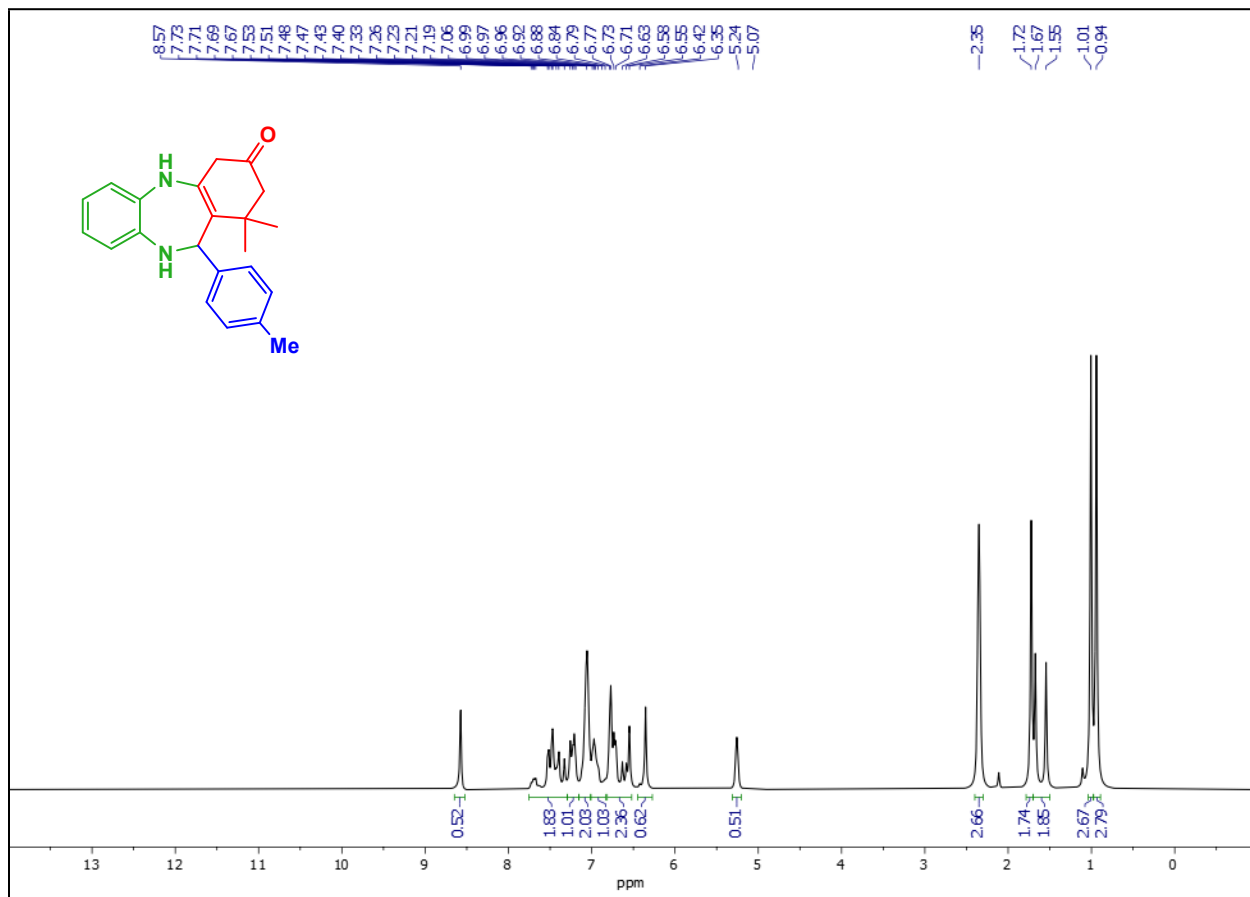
<sup>1</sup>H-NMR spectra of 4i

4i. 11-(4-Hydroxy-3-methoxyphenyl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:



<sup>13</sup>C-NMR spectra of 4i

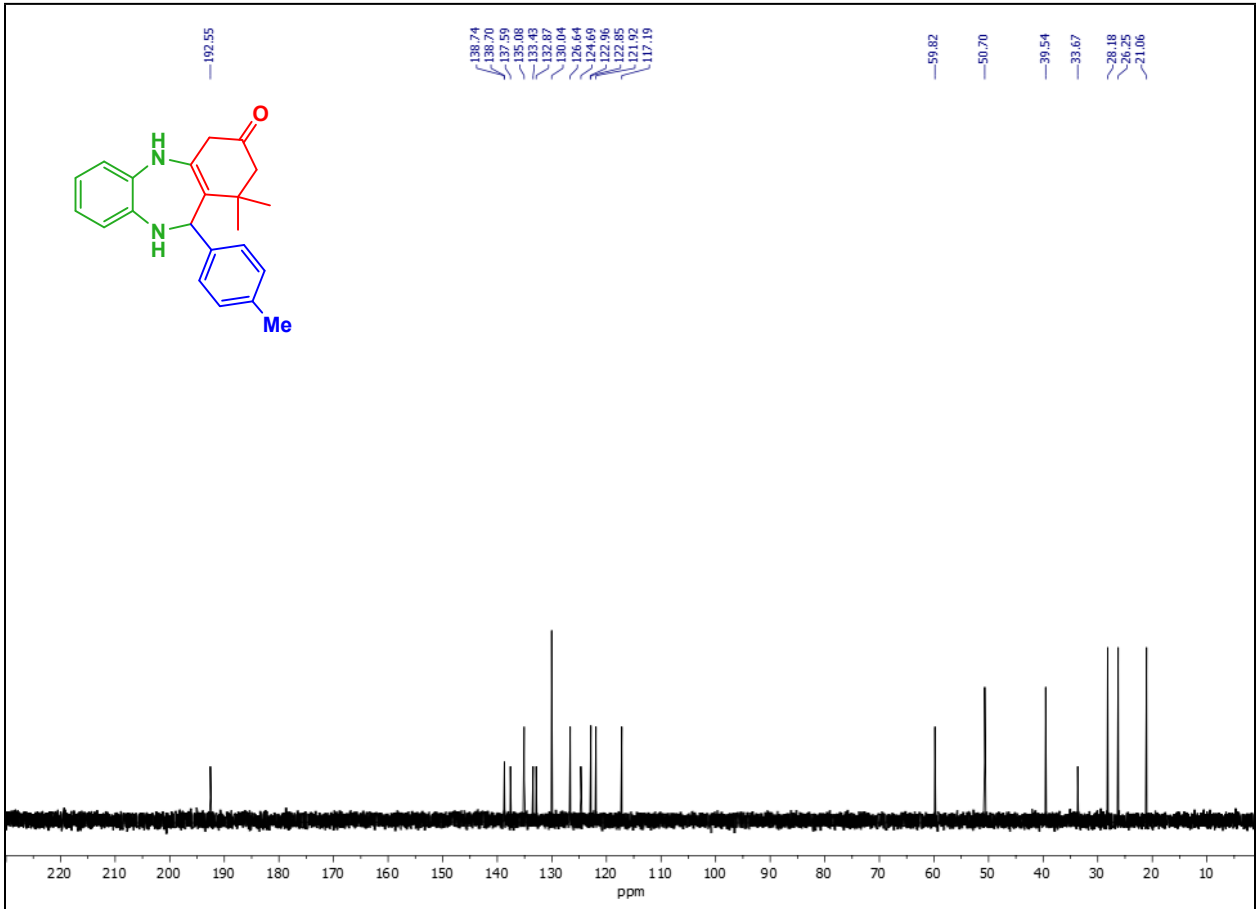
**4k. 3,3-Dimethyl-11-(p-tolyl)-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



<sup>1</sup>H-NMR spectra of **4k**

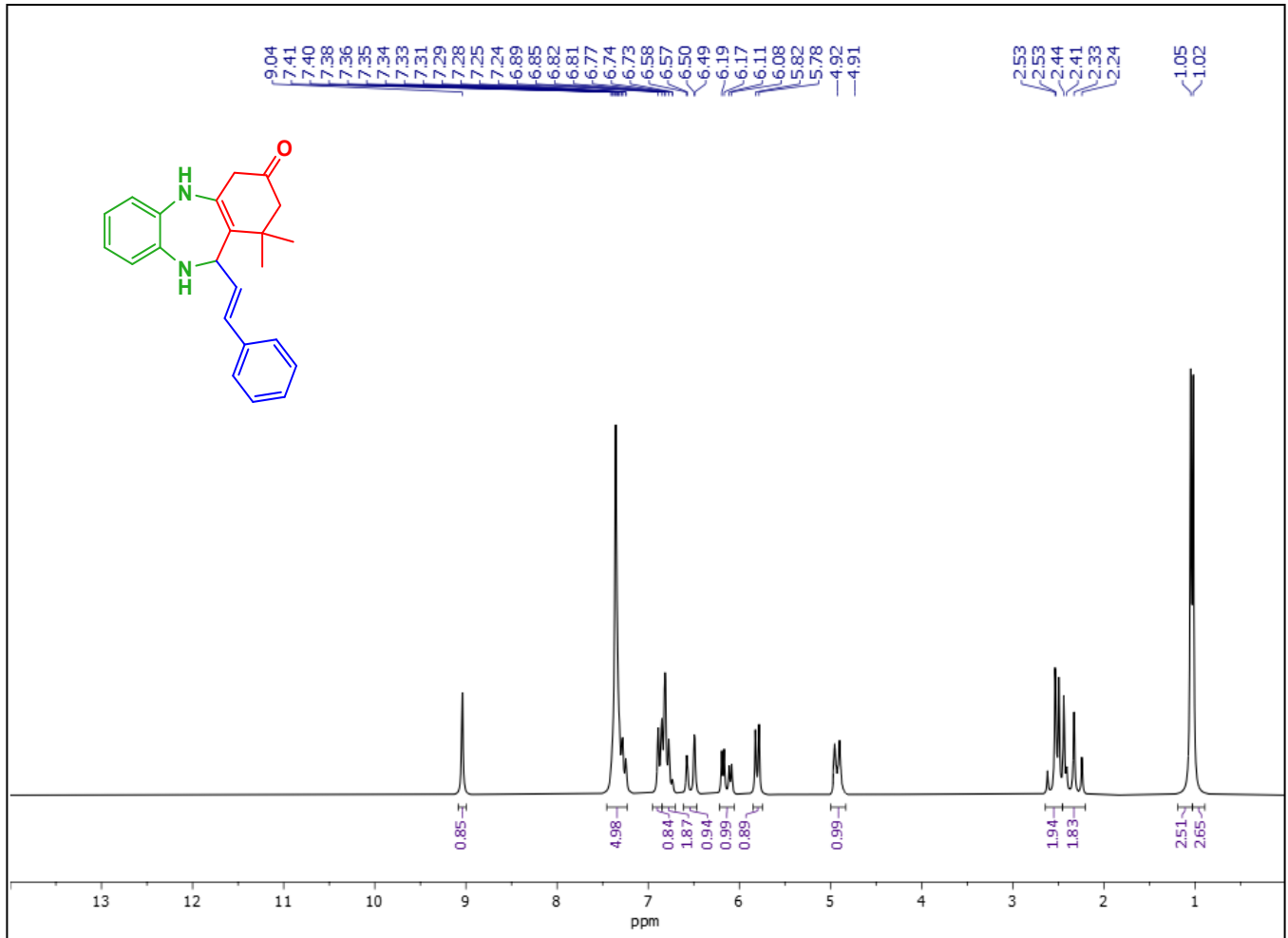


4k. 3,3-Dimethyl-11-(p-tolyl)-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:



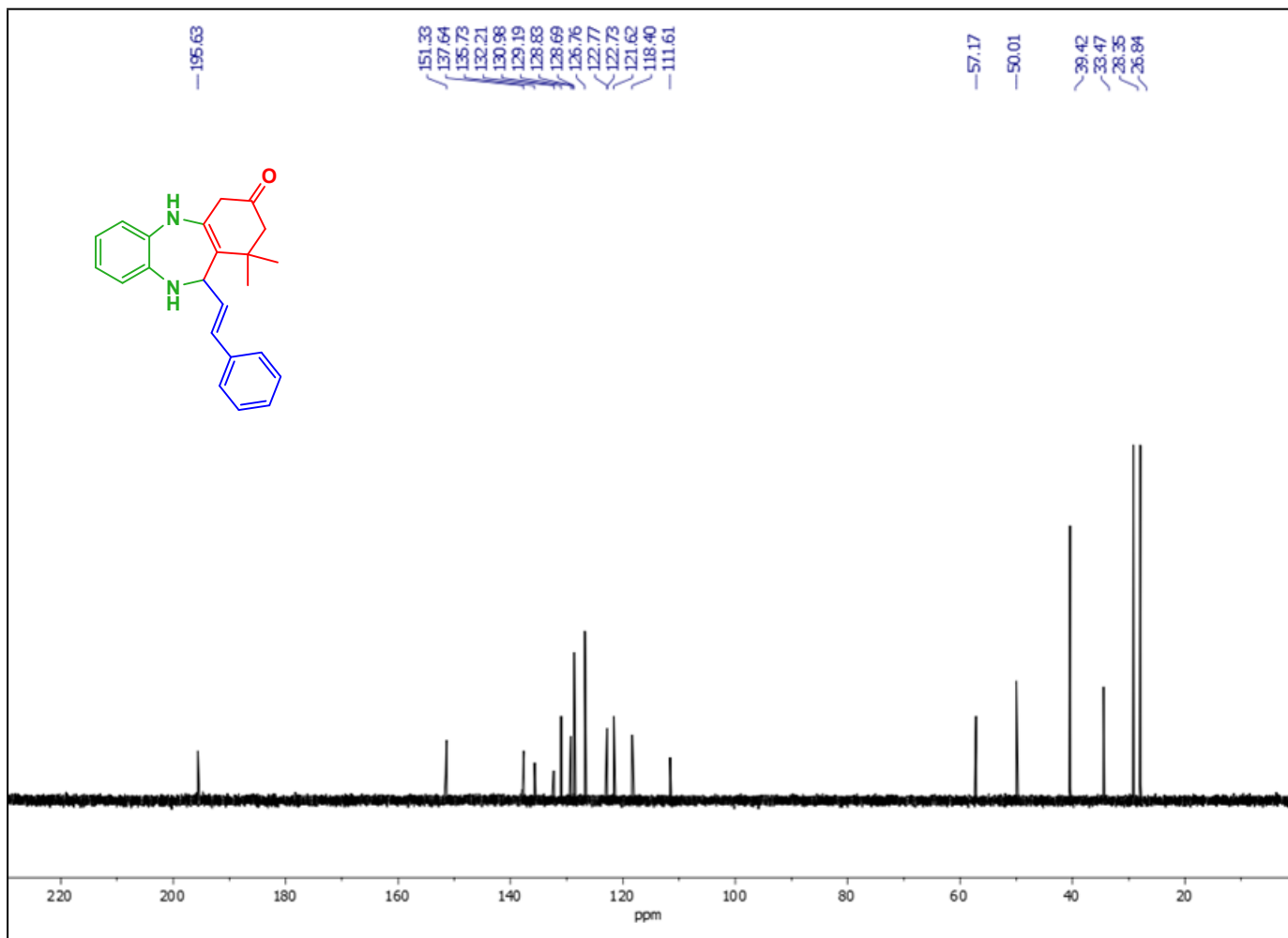
<sup>13</sup>C-NMR spectra of 4k

4l. (E)-3,3-Dimethyl-11-styryl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one



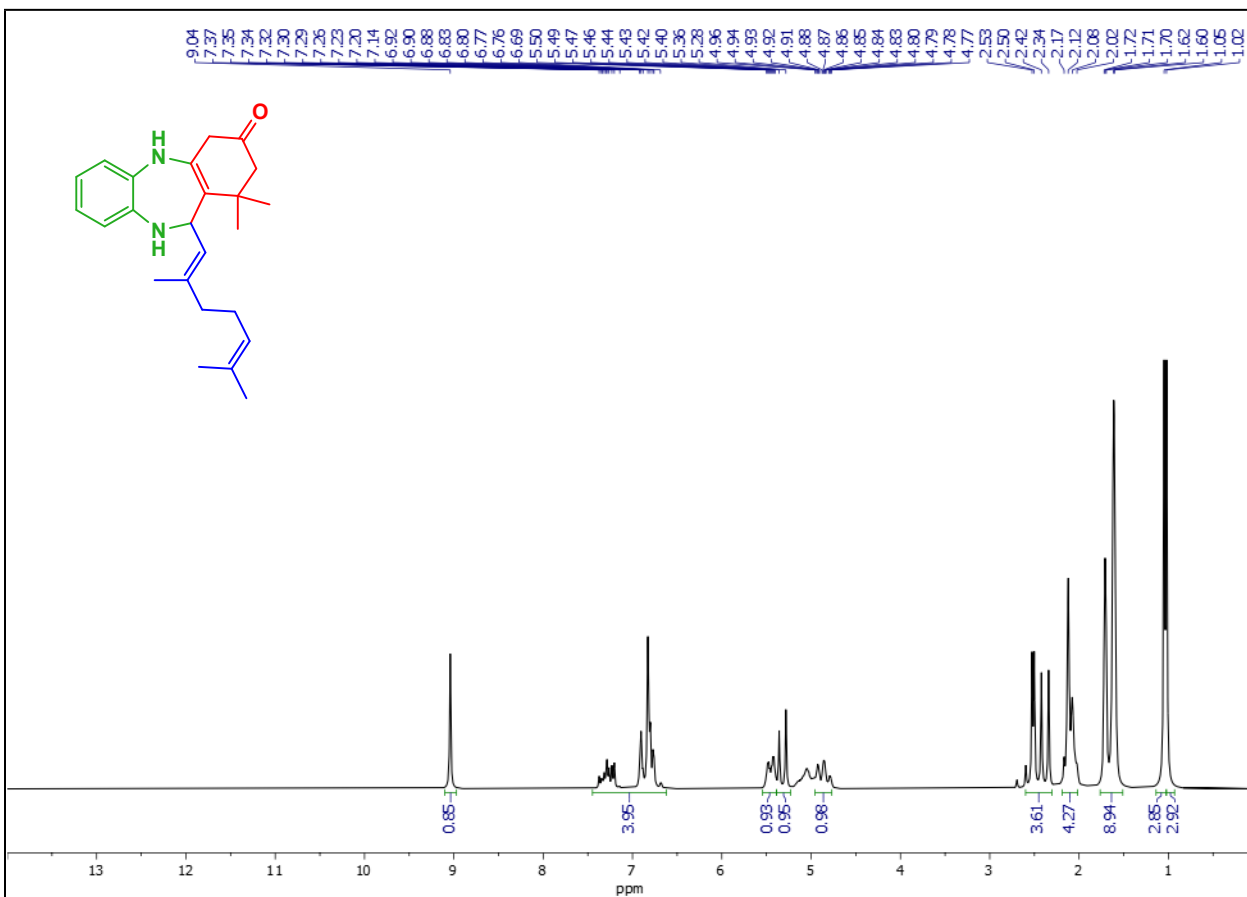
$^1\text{H-NMR}$  spectra of 4l

4l. (E)-3,3-Dimethyl-11-styryl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one



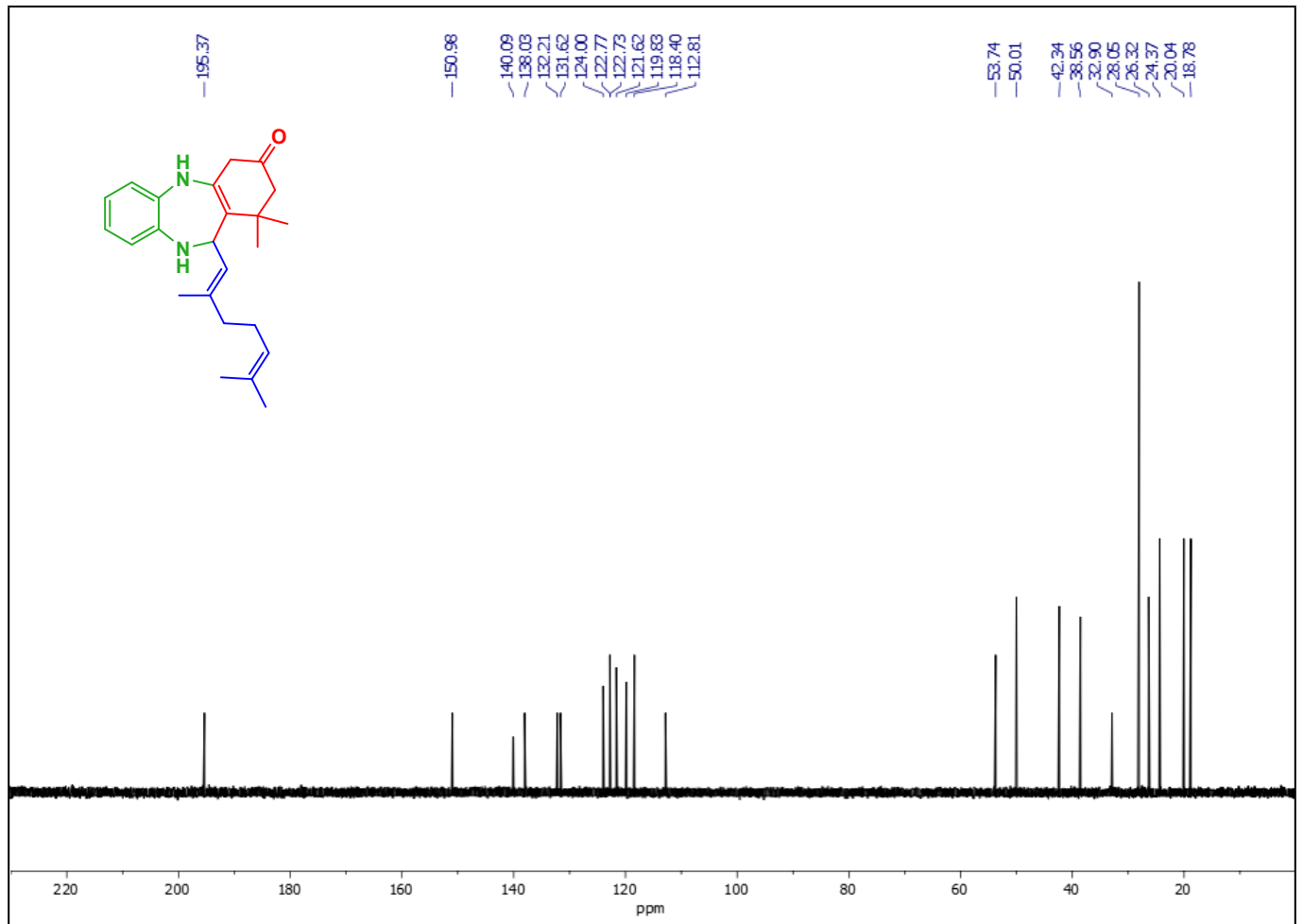
<sup>13</sup>C-NMR spectra of 4l

**4m. (E)-11-(2,6-Dimethylhepta-1,5-dien-1-yl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



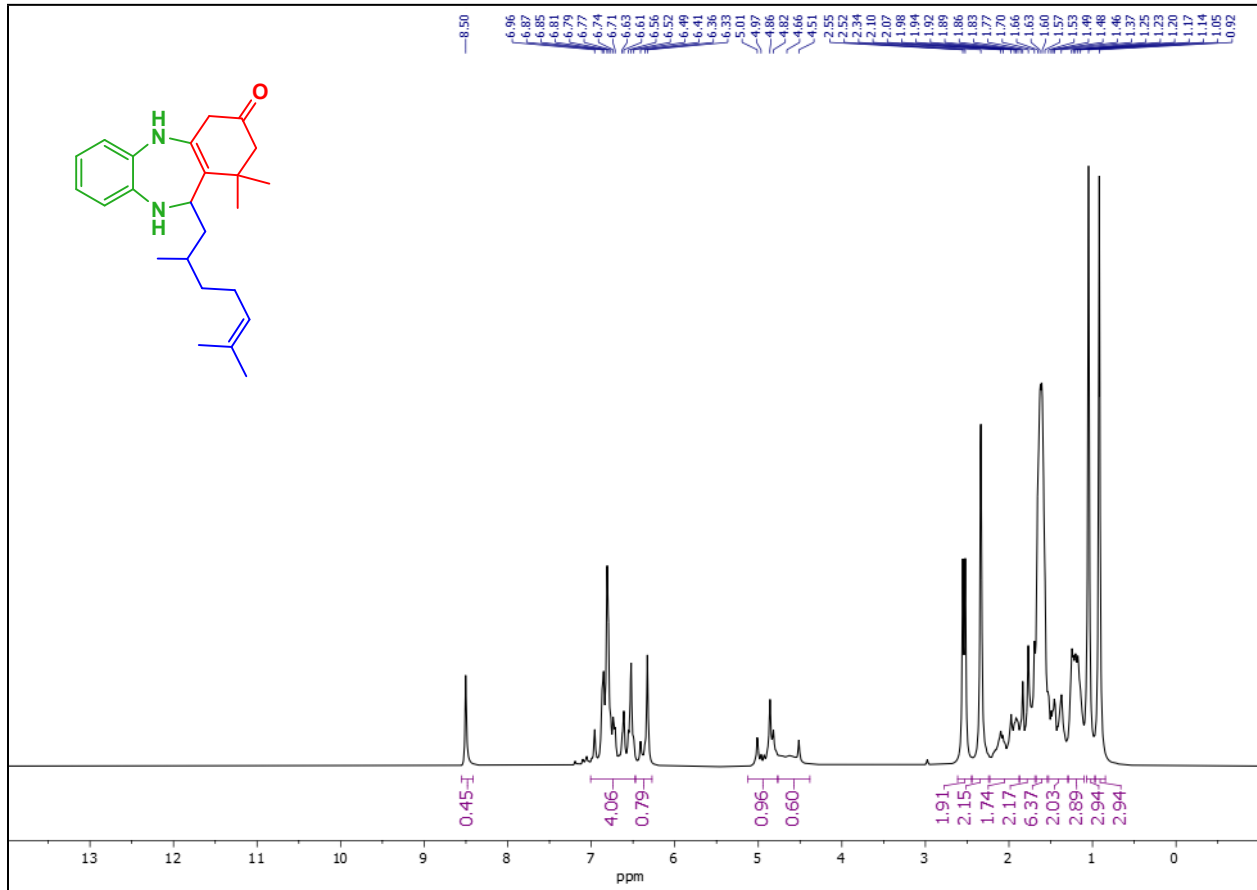
<sup>1</sup>H-NMR spectra of 4m

**4m. (E)-11-(2,6-Dimethylhepta-1,5-dien-1-yl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one:**



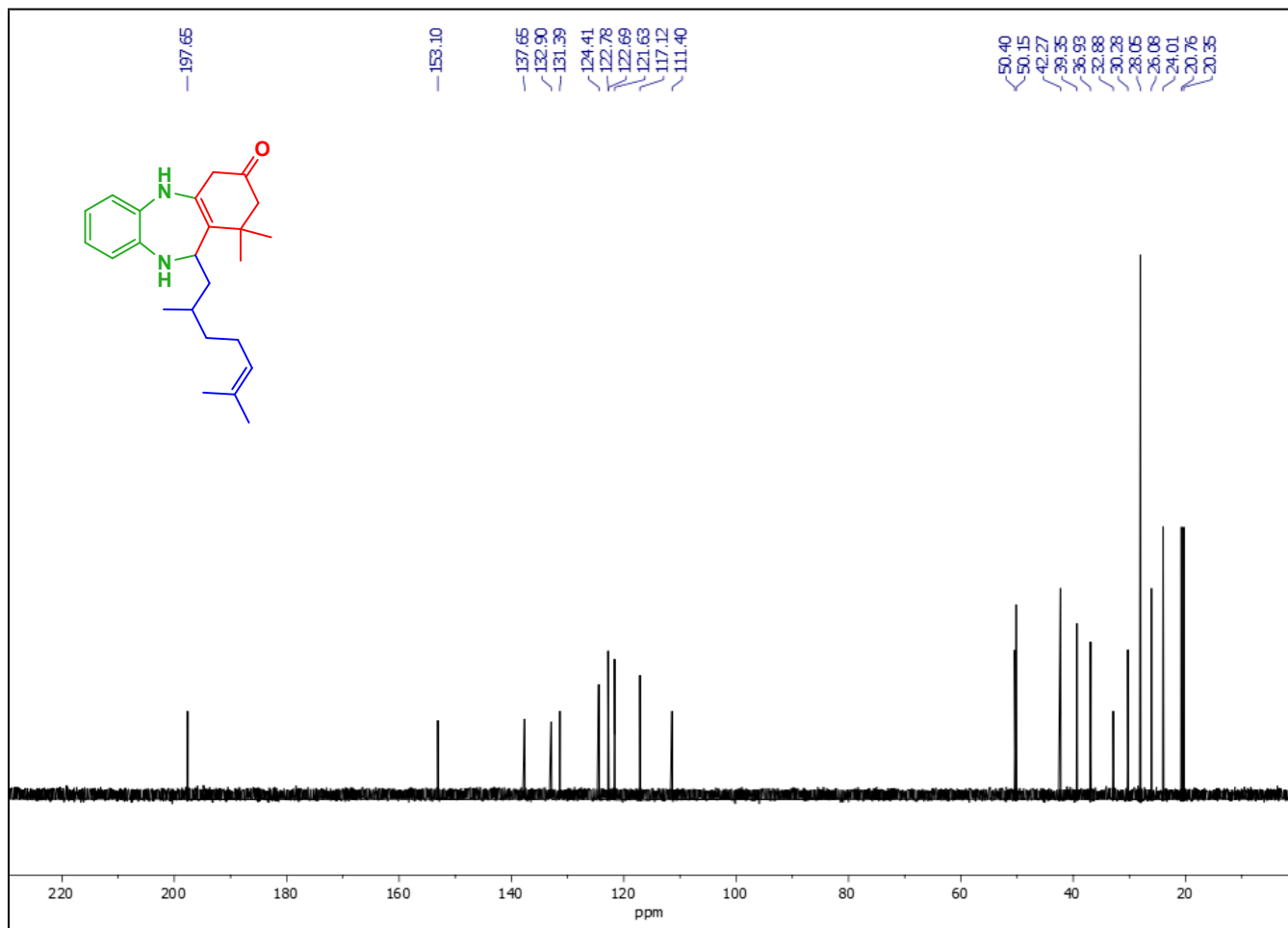
<sup>13</sup>C-NMR spectra of **4m**

**4n. 11-(2,6-Dimethylhept-5-en-1-yl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



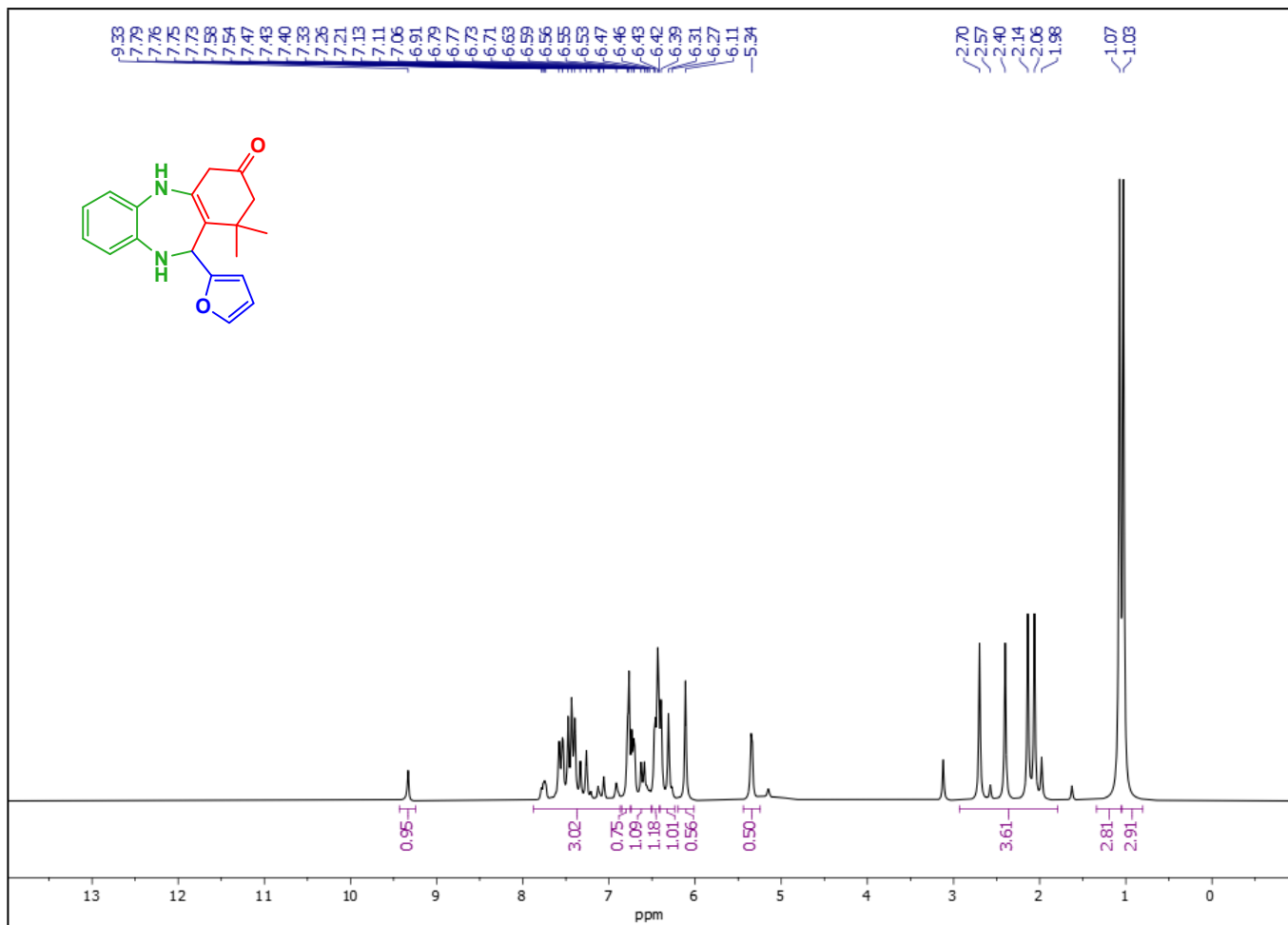
<sup>1</sup>H-NMR spectra of 4n

**4n. 11-(2,6-Dimethylhept-5-en-1-yl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[*b,e*][1,4]diazepin-1-one:**



<sup>13</sup>C-NMR spectra of **4n**

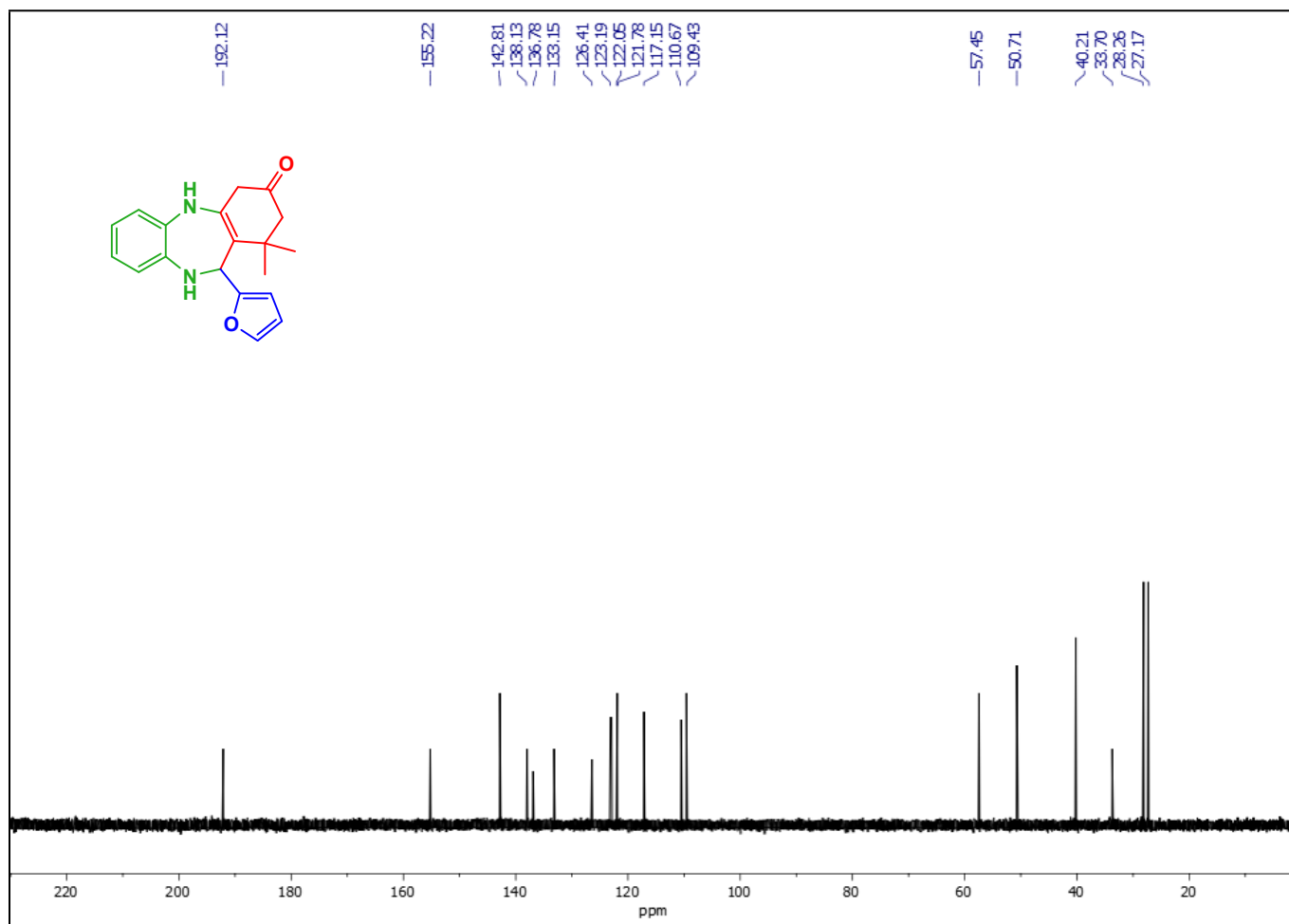
4o. 11-(Furan-2-yl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1H-dibenzo[b,e][1,4]diazepin-1-one





<sup>1</sup>H-NMR spectra of **4o**

**4o.** 11-(Furan-2-yl)-3,3-dimethyl-2,3,4,5,10,11-hexahydro-1*H*-dibenzo[*b,e*][1,4]diazepin-1-one



$^{13}\text{C}$ -NMR spectra of **4o**