

Supporting Information

Microwave-assisted synthesis of 3-sulfenylindoles by sulfonyl hydrazides using organic ionic base-Brønsted acid

Rajjakfur Rahaman, Namita Devi, Kuladip Sarma and Pranjit Barman*

Department of Chemistry, National Institute of Technology Silchar, Silchar

788010, India

*Email: barmanpranjit@yahoo.co.in

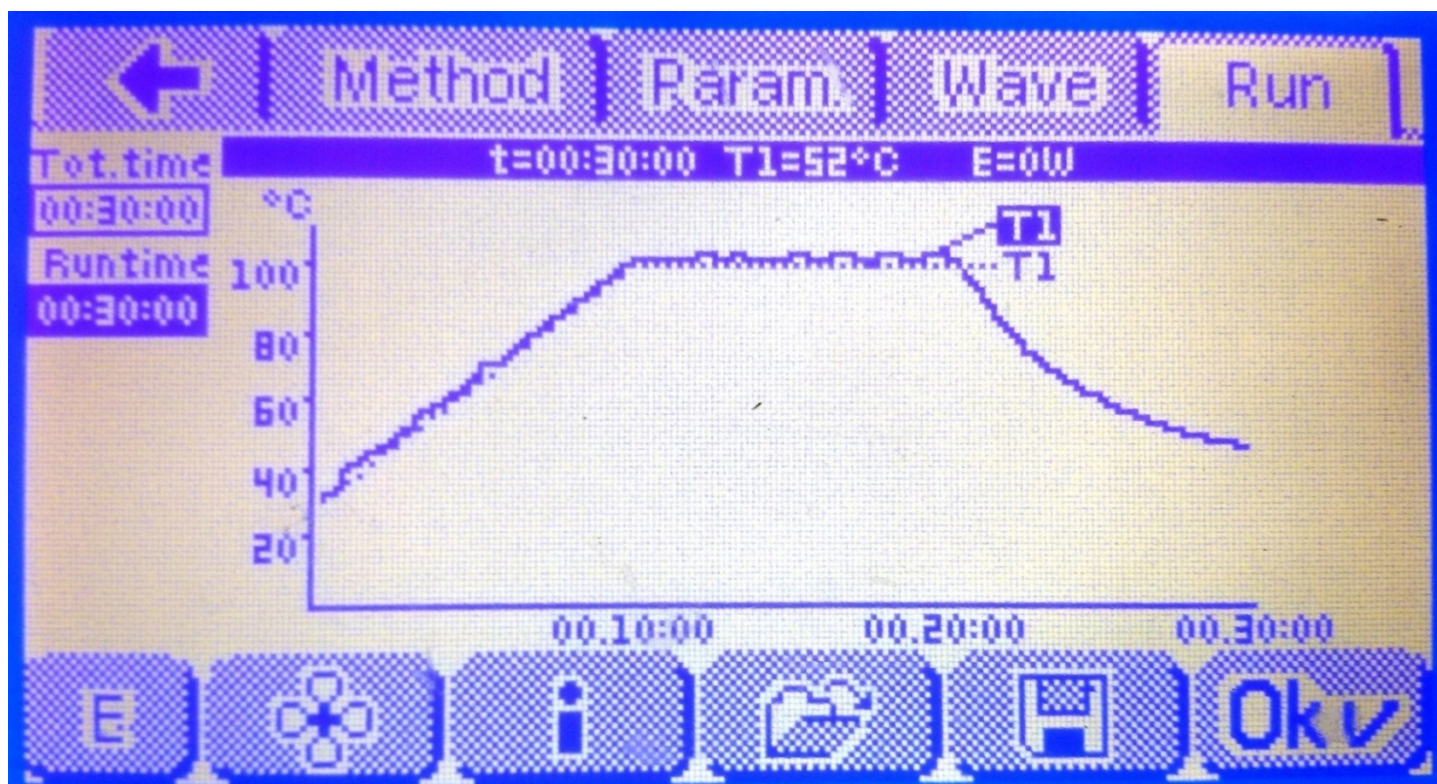
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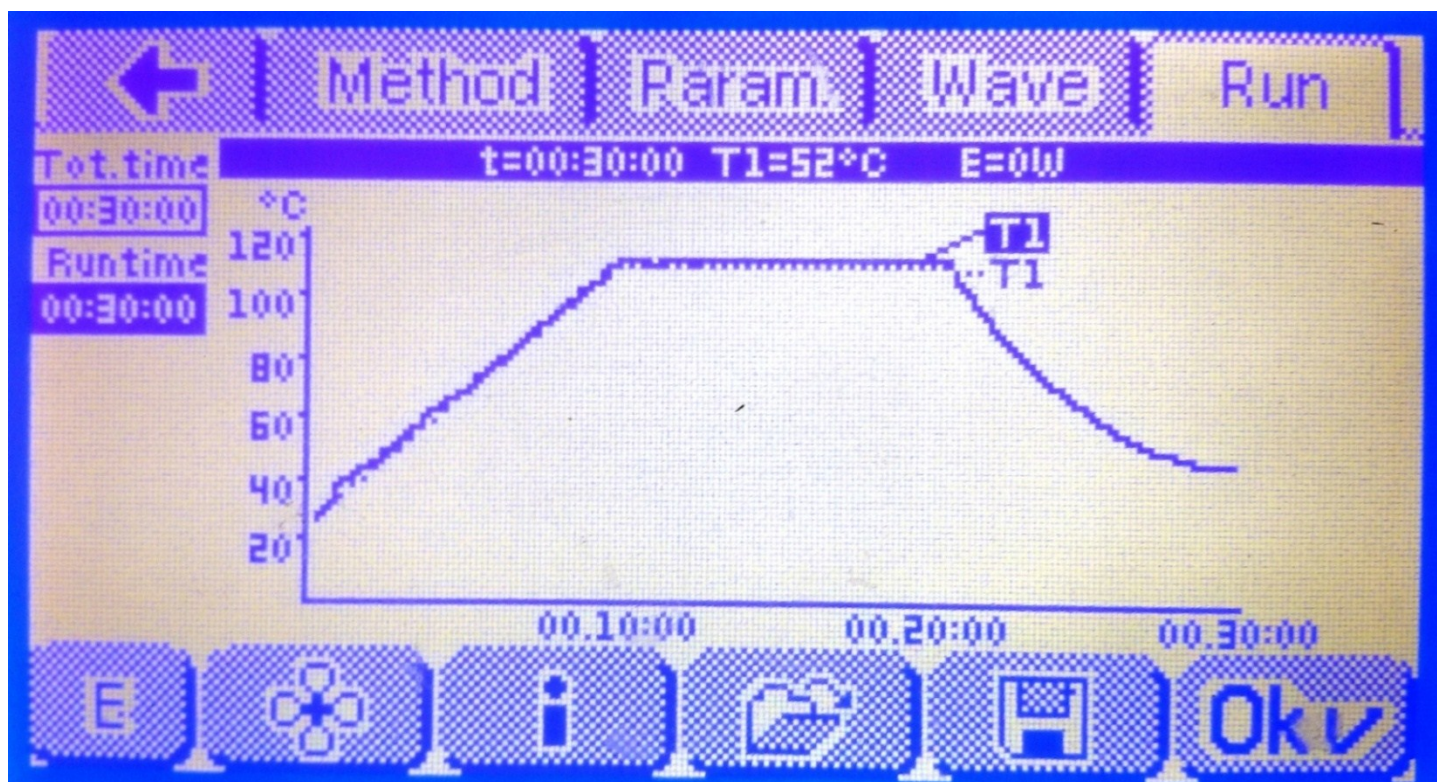
The optimization heating curves for microwave assisted synthesis:

All the synthesis processes were performed on a programmed microwave synthesis reactor (START SYNTH, Milestone). All the reaction parameters were programmed with optimized increased time, target temperature, standing time and temperature. The three different optimization temperature curves are given below (as recorded in Terminal 260):

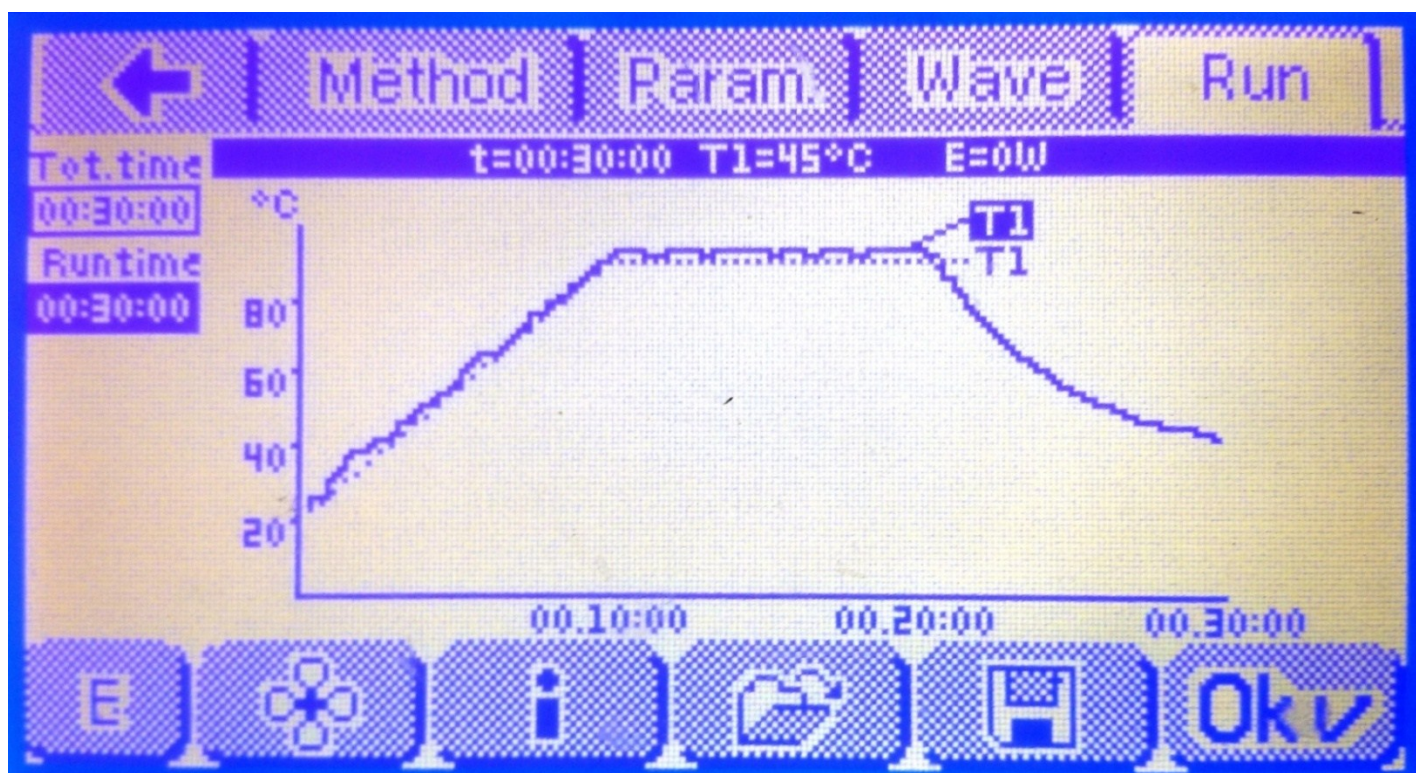
1. 80 W, 100 °C, 10 min



2. 80 W, 110 °C, 10 min

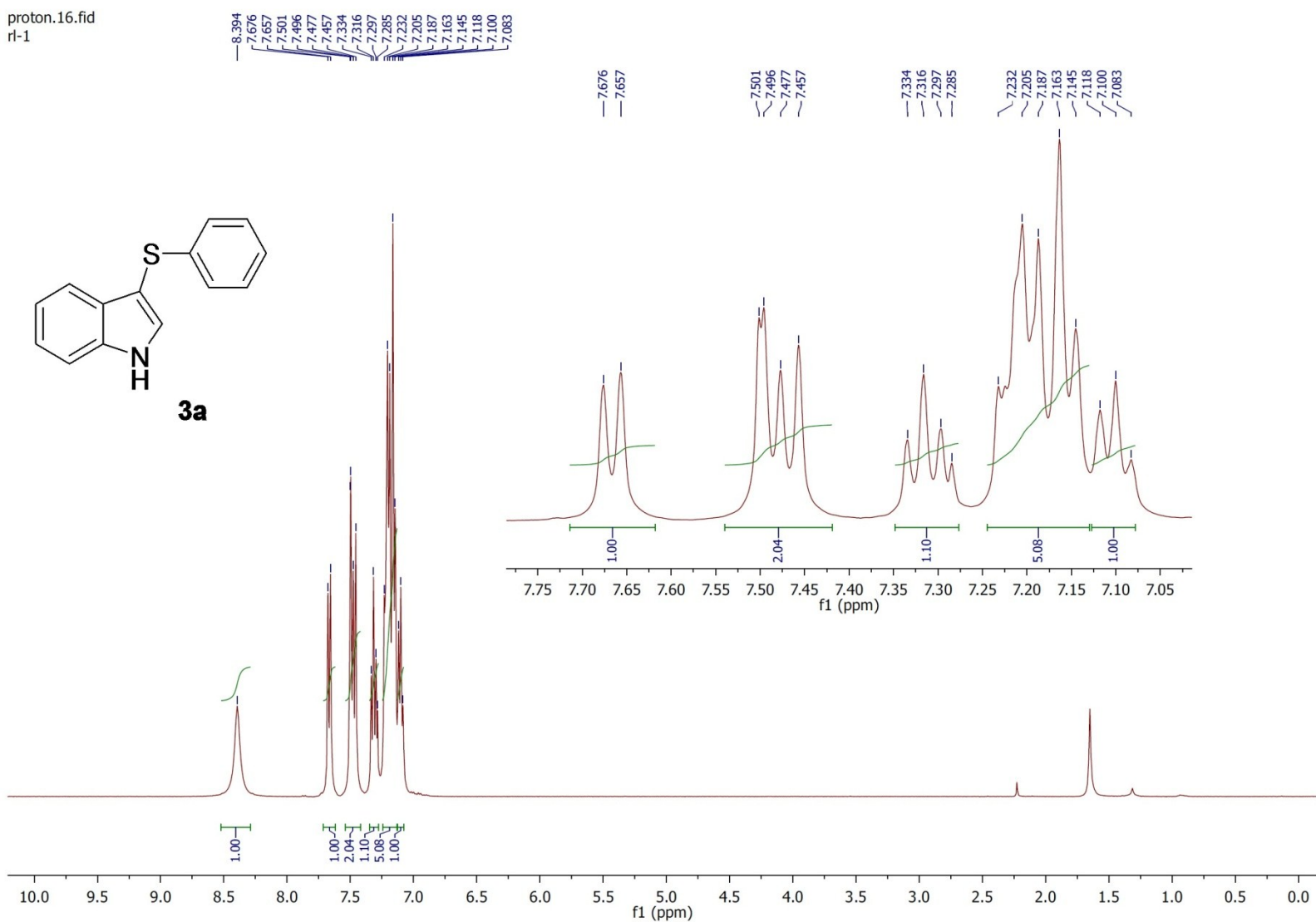


3. 80 W, 90 °C, 10 min



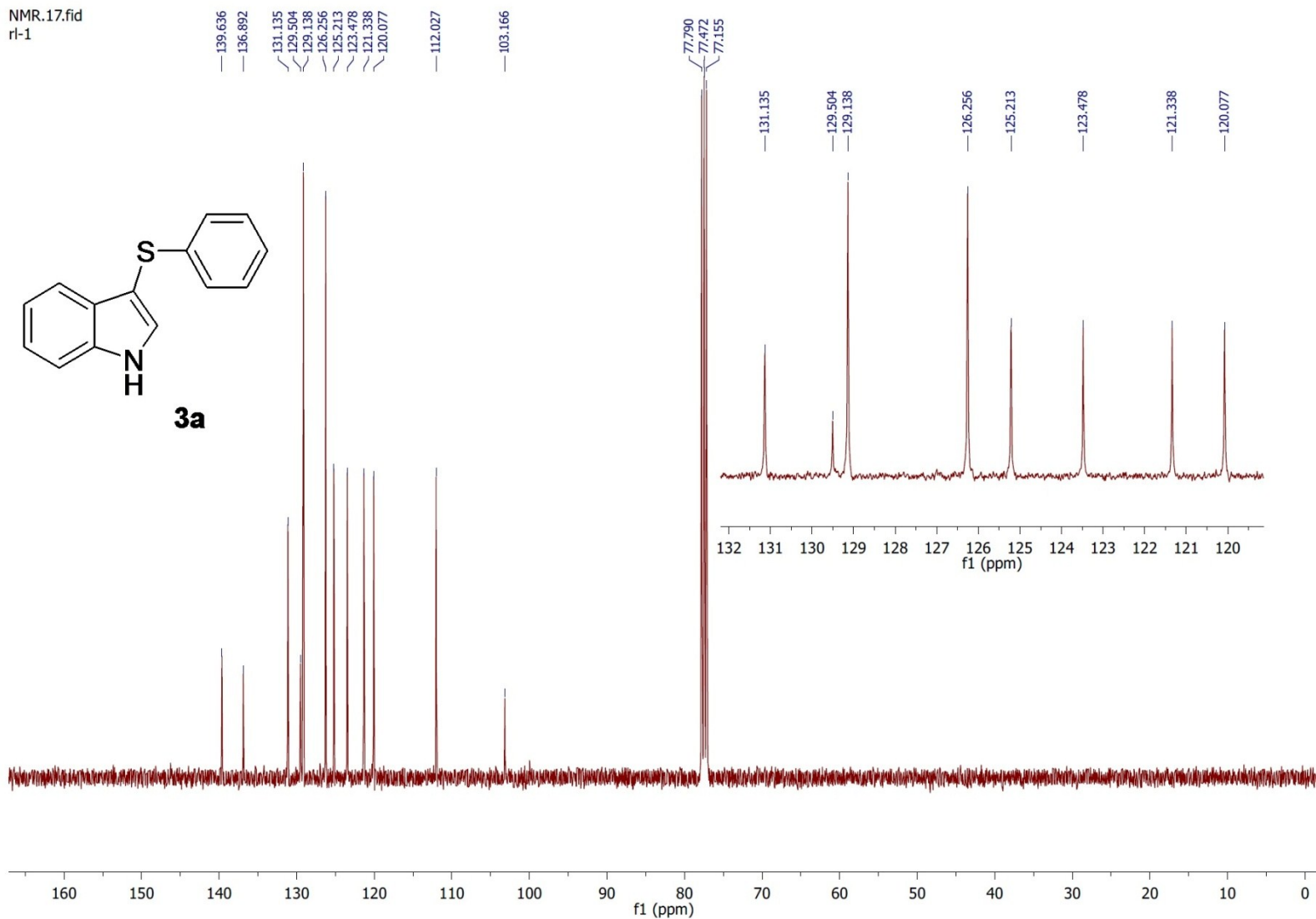
Characterization data of the synthesized compounds

^1H NMR of compound **3a** (CDCl_3 , 400 MHz)

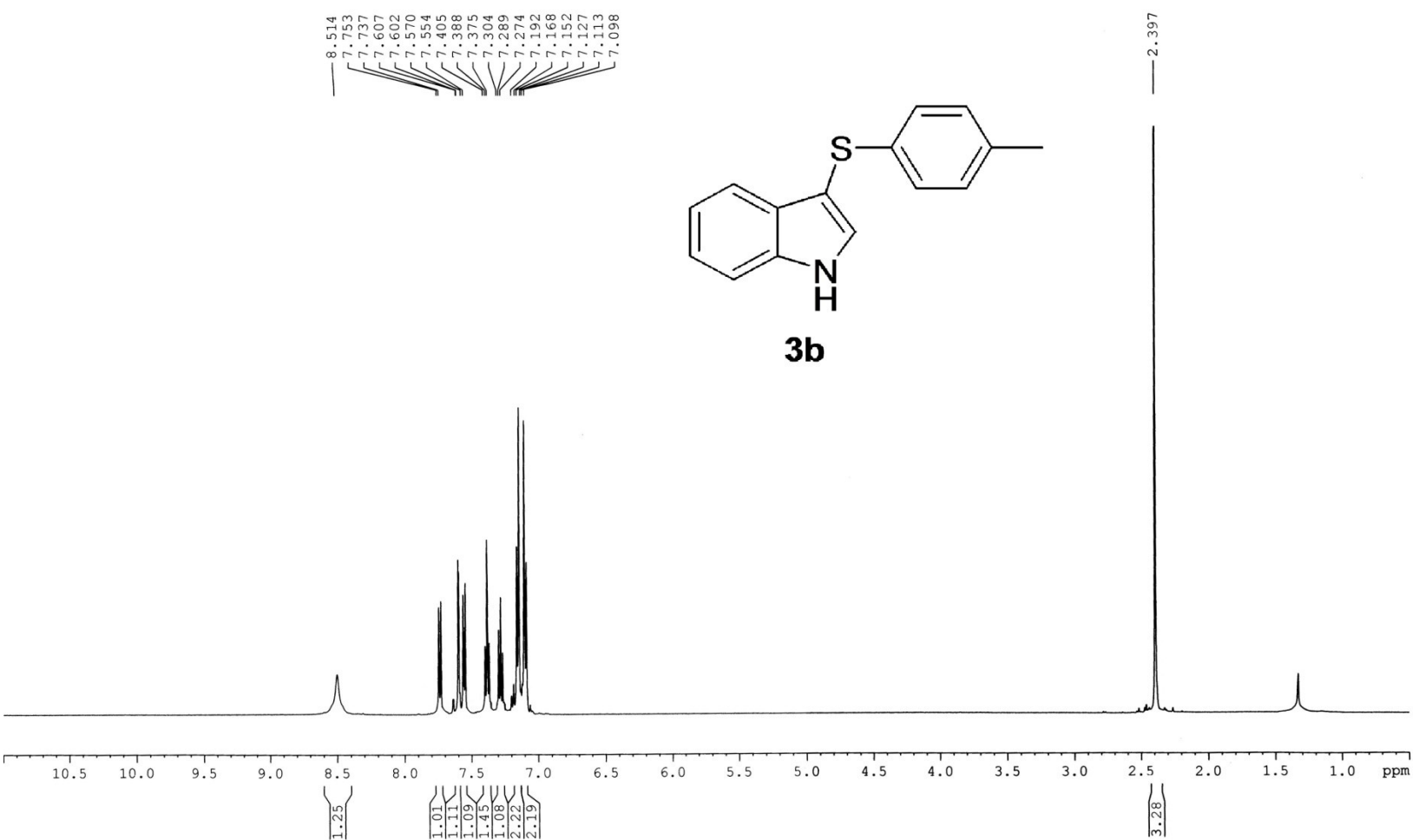


^{13}C NMR of compound **3a** (CDCl_3 , 100 MHz)

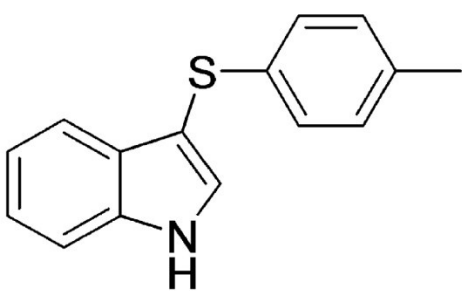
NMR.17.fid
rl-1



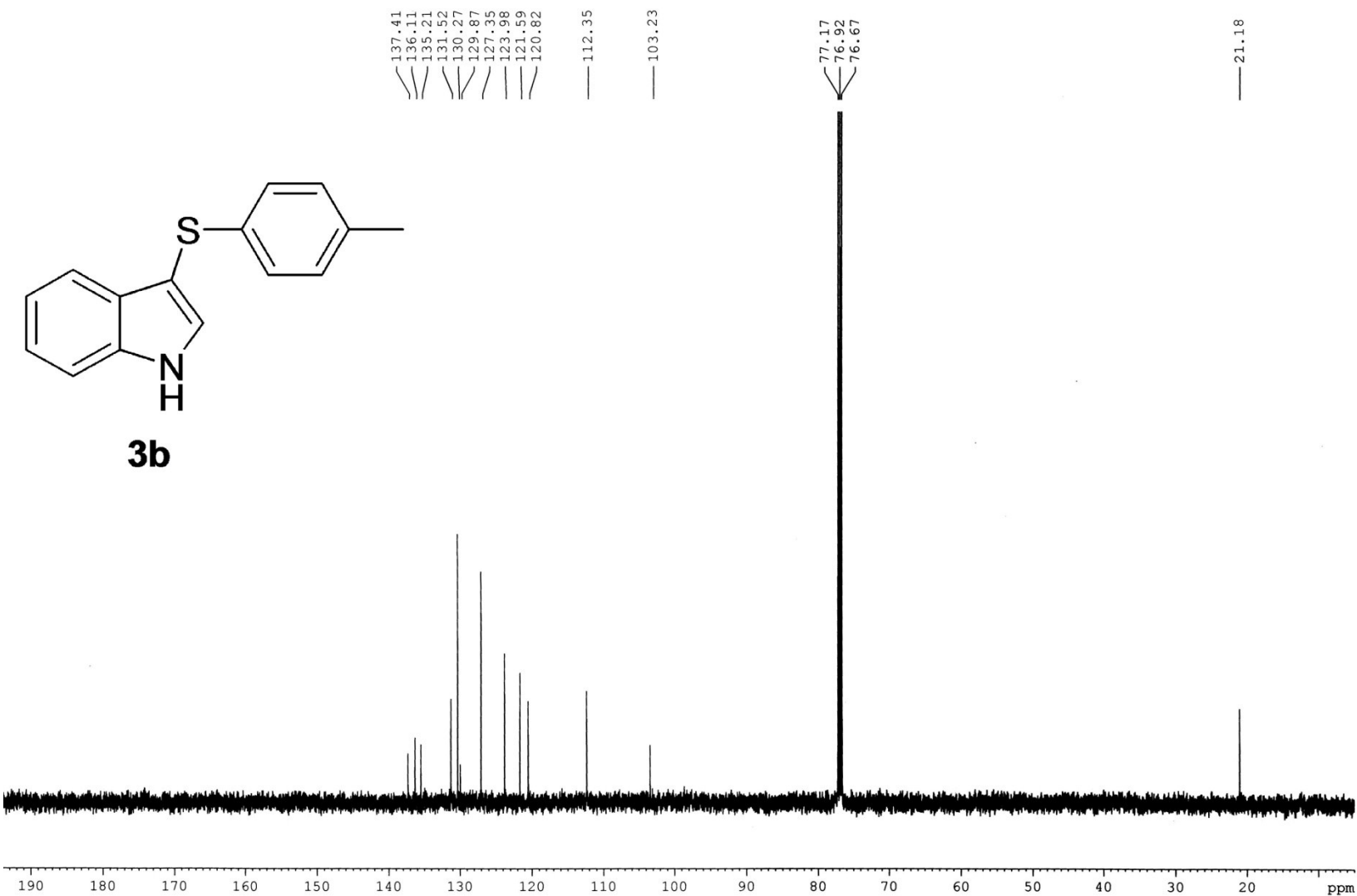
^1H NMR of compound **3b** (CDCl_3 , 400 MHz)



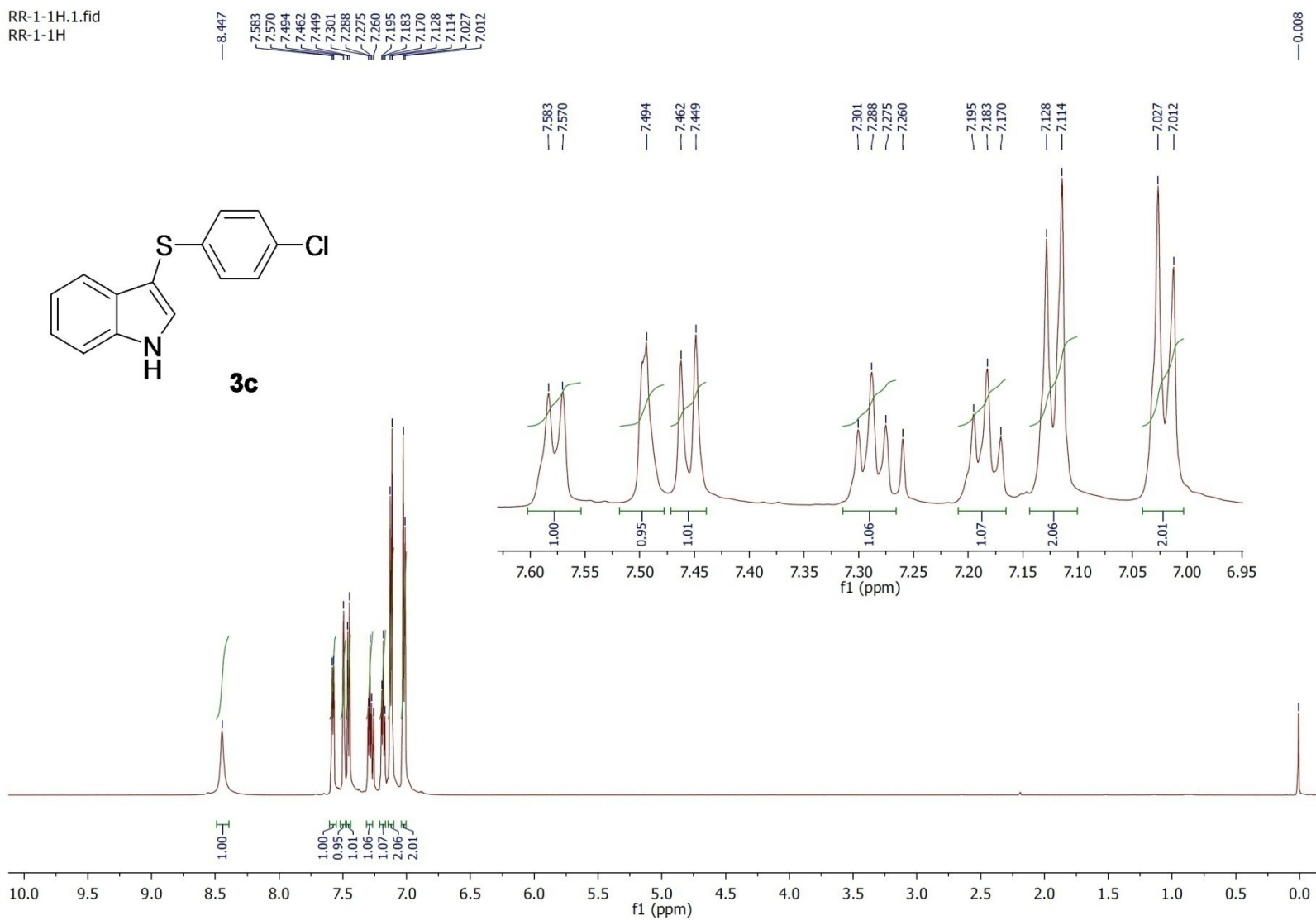
^{13}C NMR of compound **3b** (CDCl_3 , 125 MHz)



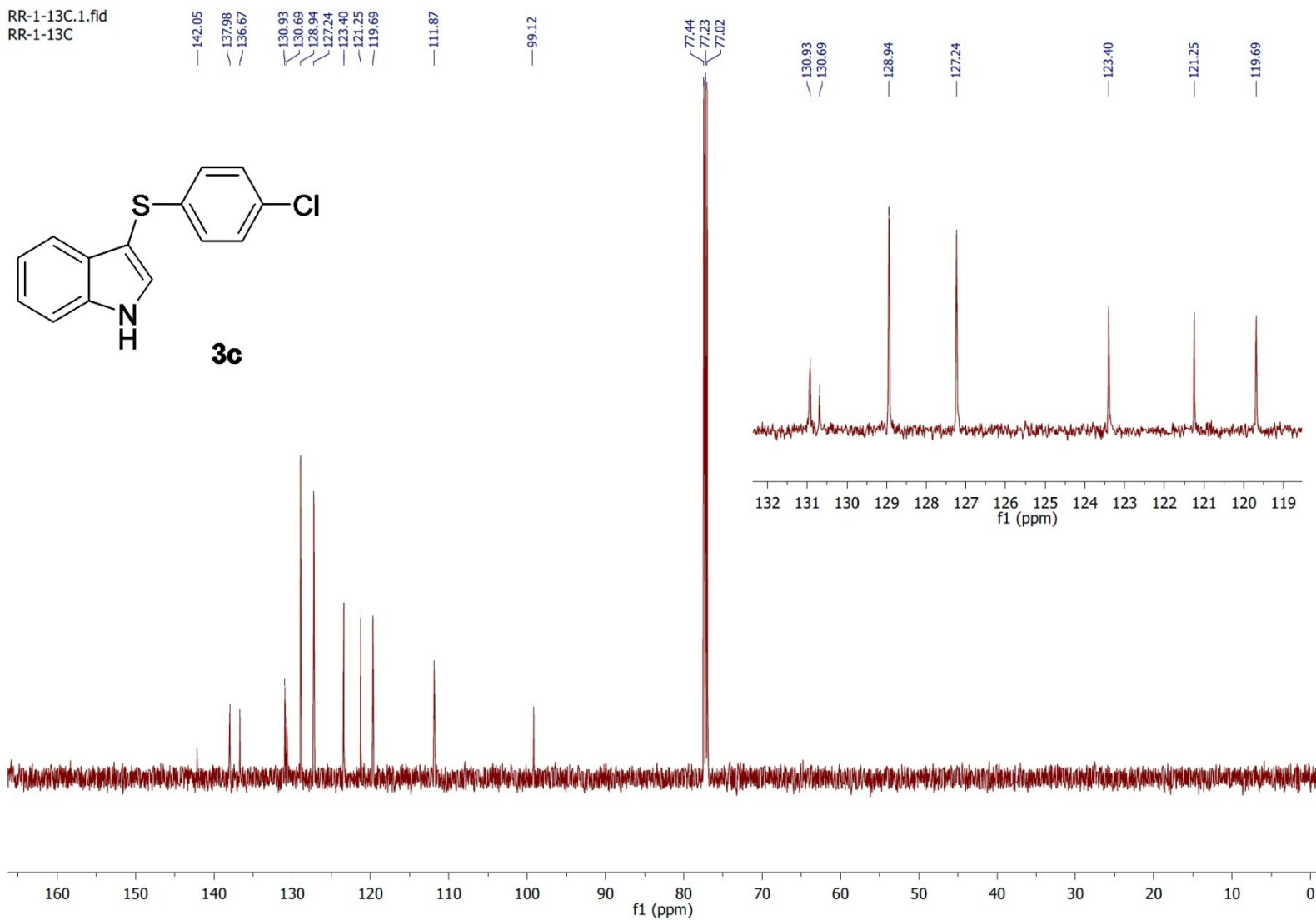
3b



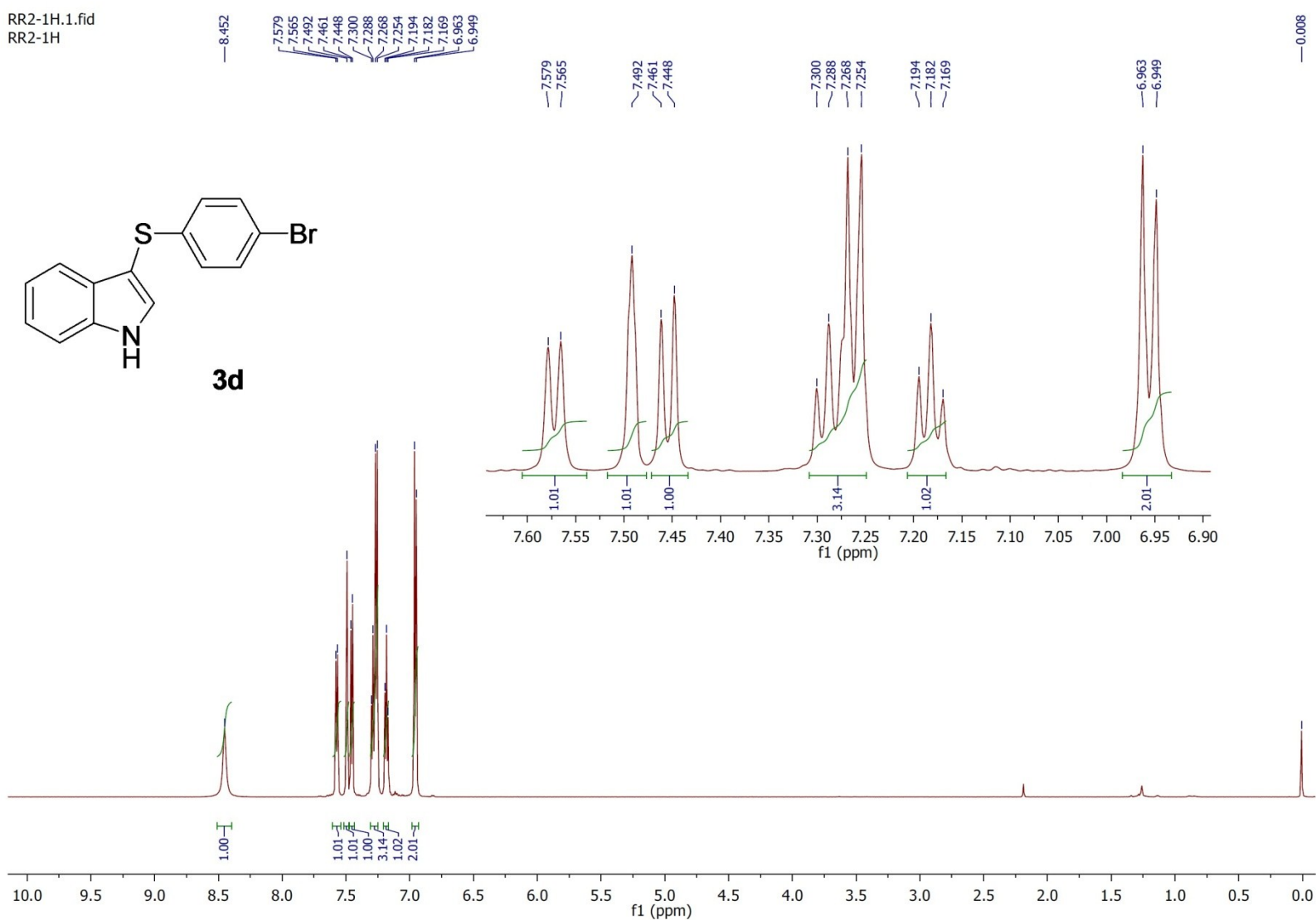
¹H NMR of compound **3c** (CDCl₃, 600 MHz)



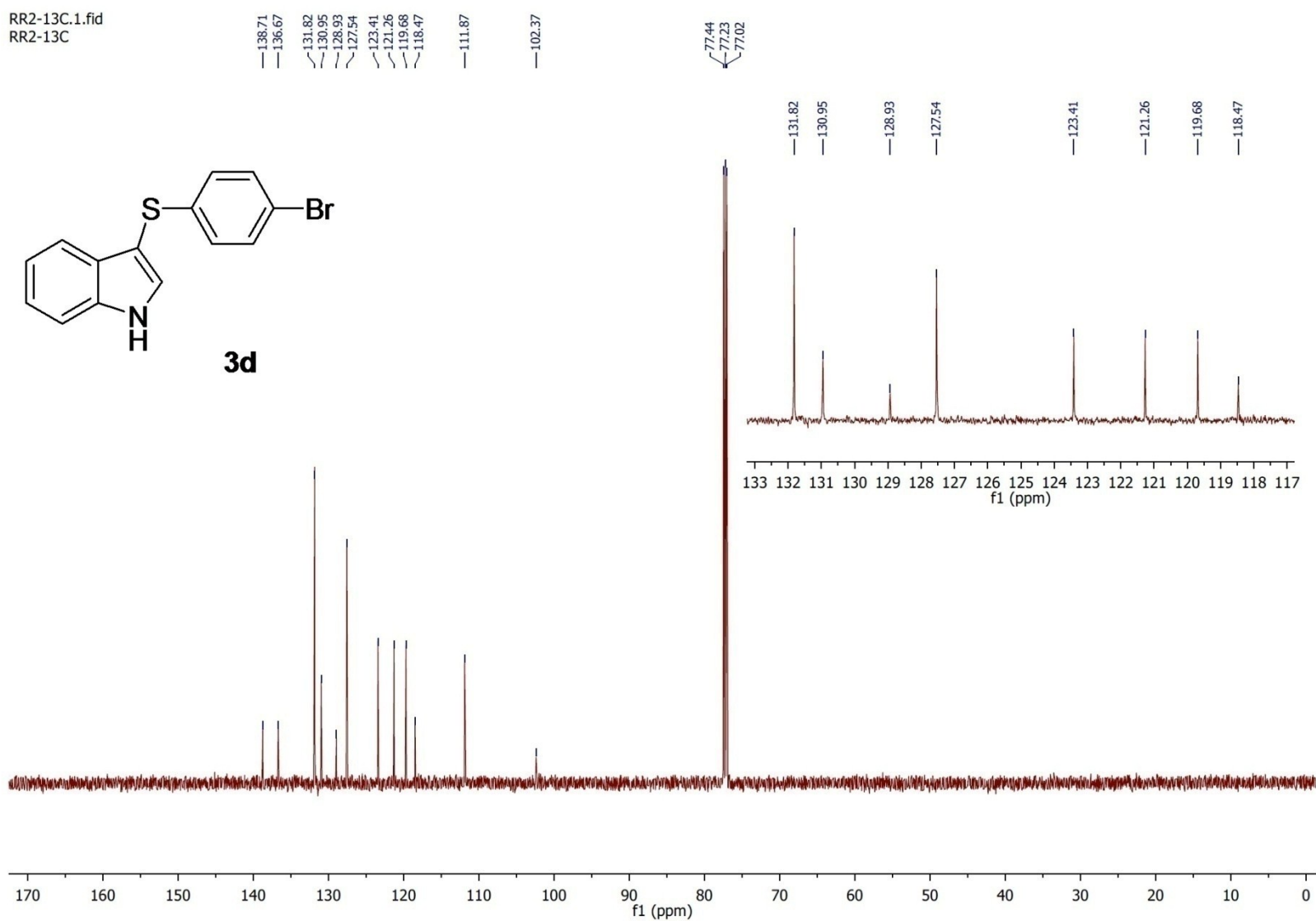
^{13}C NMR of compound **3c** (CDCl_3 , 150 MHz)



^1H NMR of compound **3d** (CDCl_3 , 600 MHz)

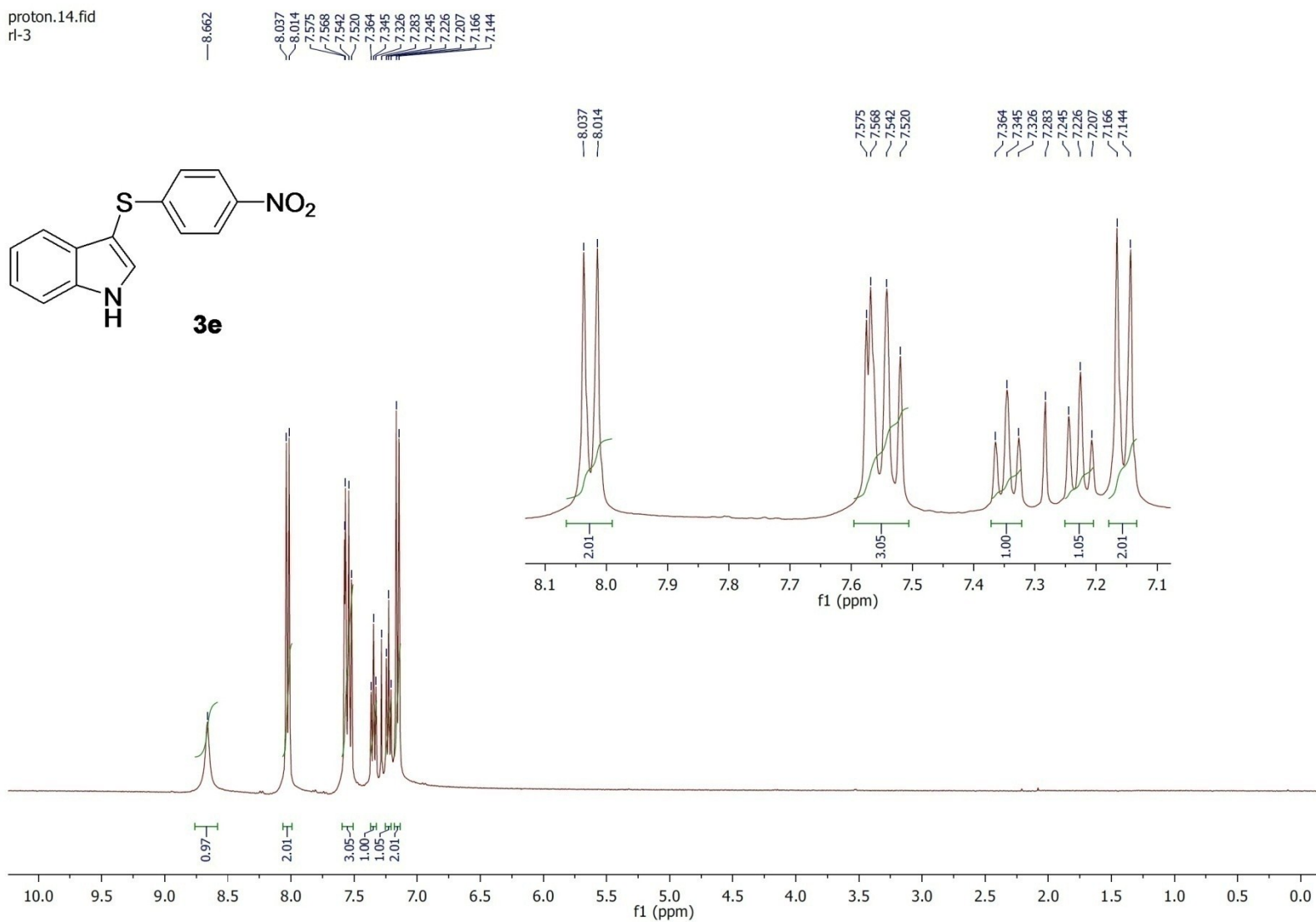


^{13}C NMR of compound **3d** (CDCl_3 , 125 MHz)

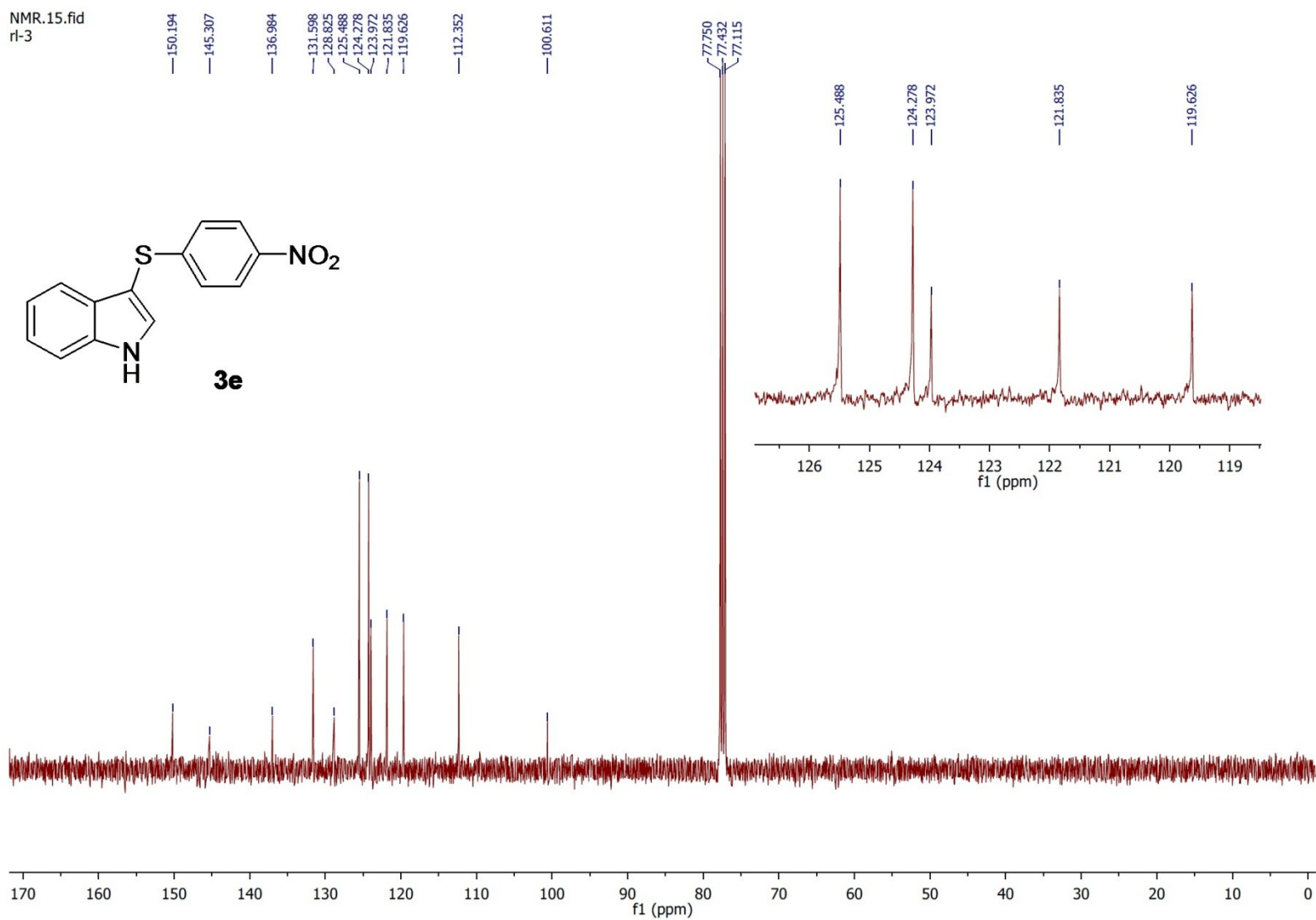


^1H NMR of compound **3e** (CDCl_3 , 400 MHz)

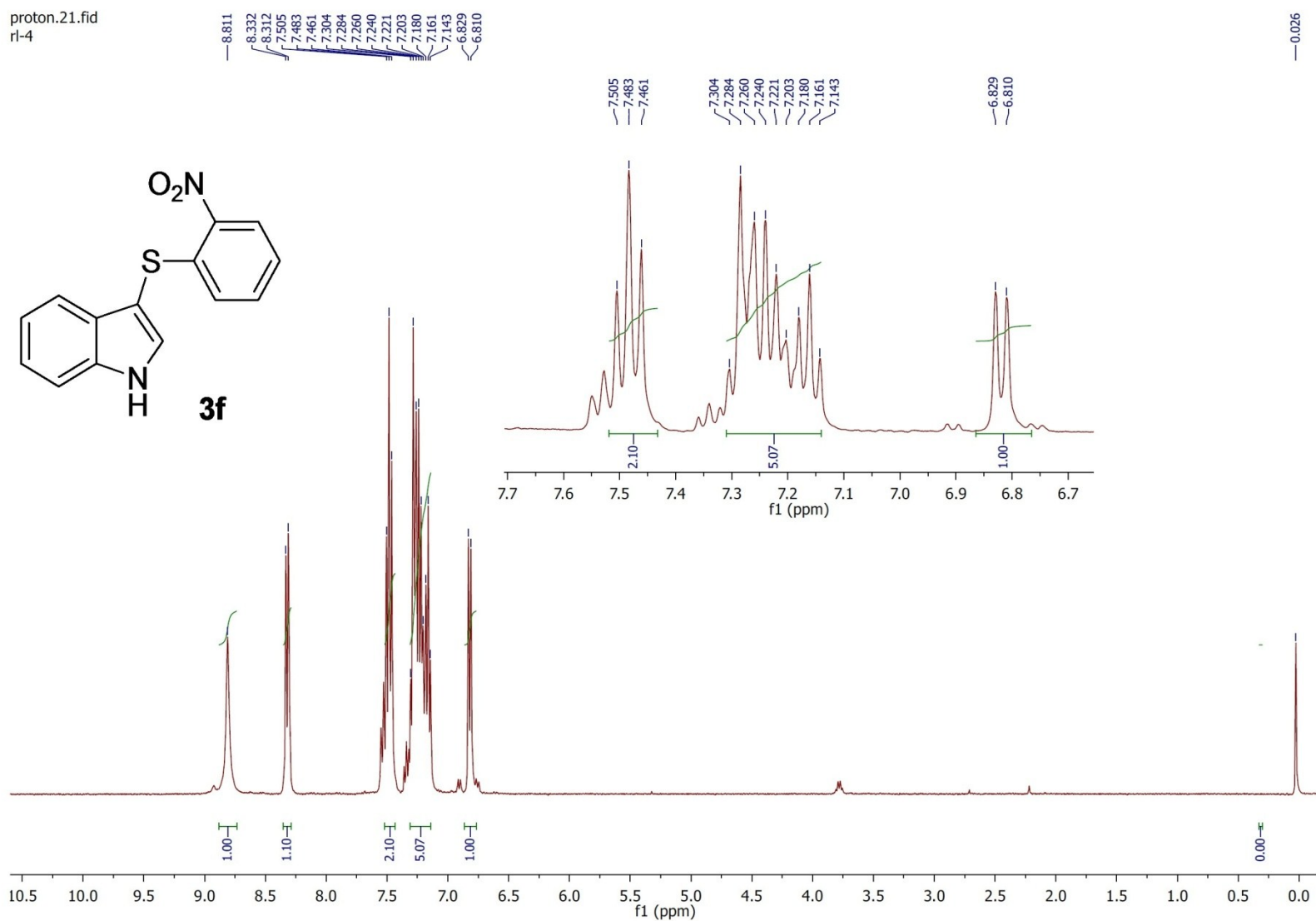
proton.14.fid
rl-3



^{13}C NMR of compound **3e** (CDCl_3 , 100 MHz)

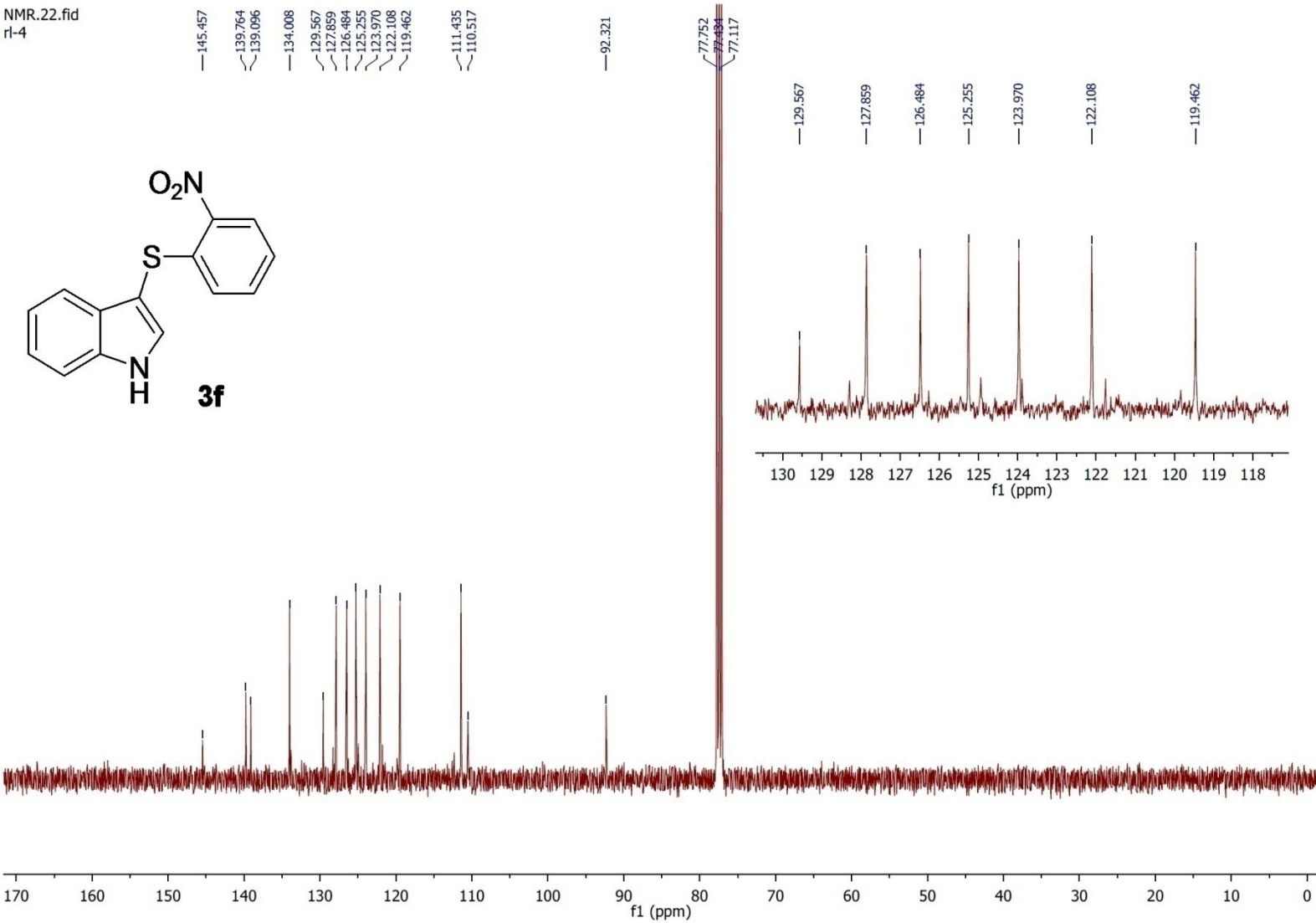


^1H NMR of compound **3f** (CDCl_3 , 400 MHz)



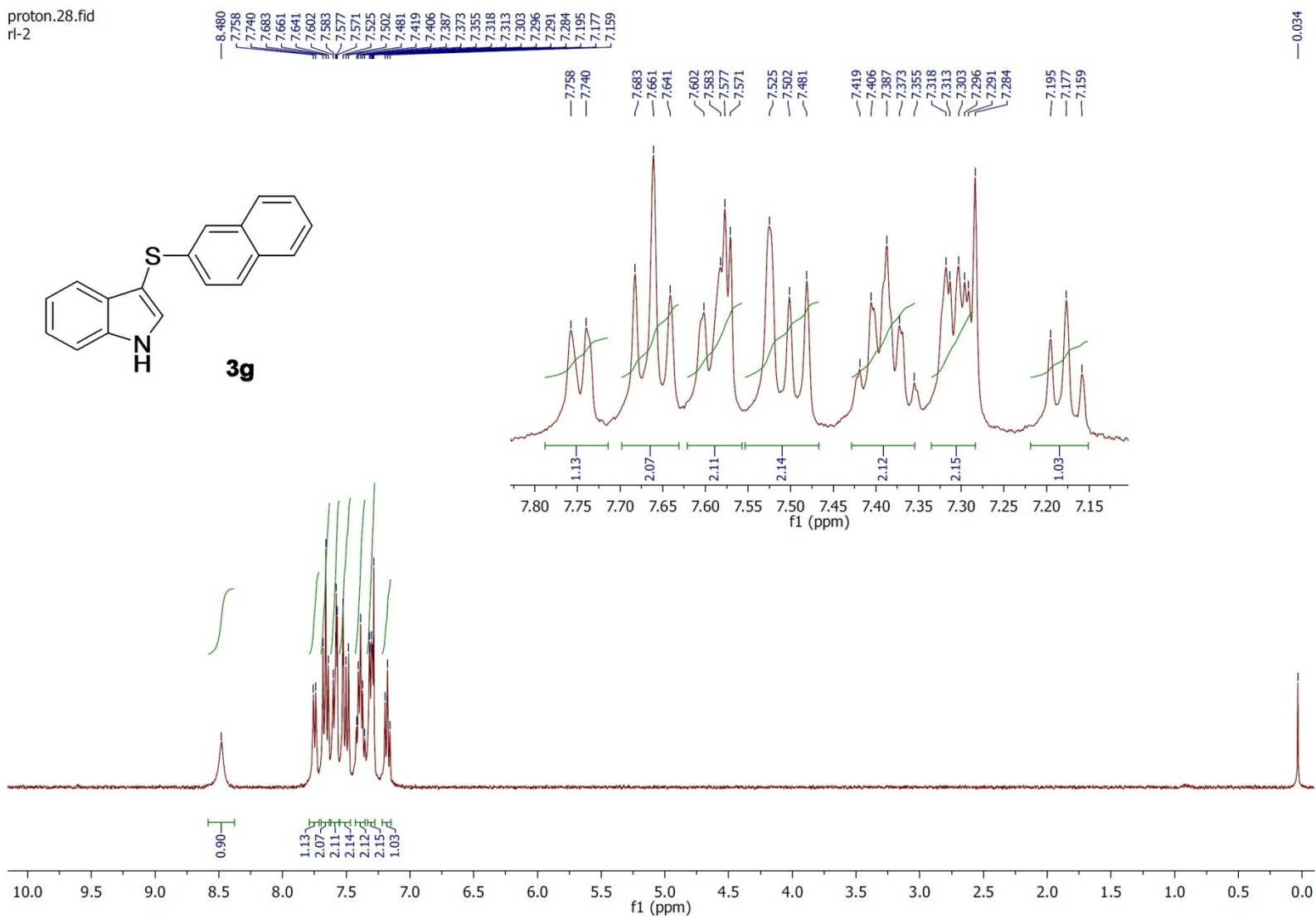
^{13}C NMR of compound **3f** (CDCl_3 , 100 MHz)

NMR.22.fid
rl-4

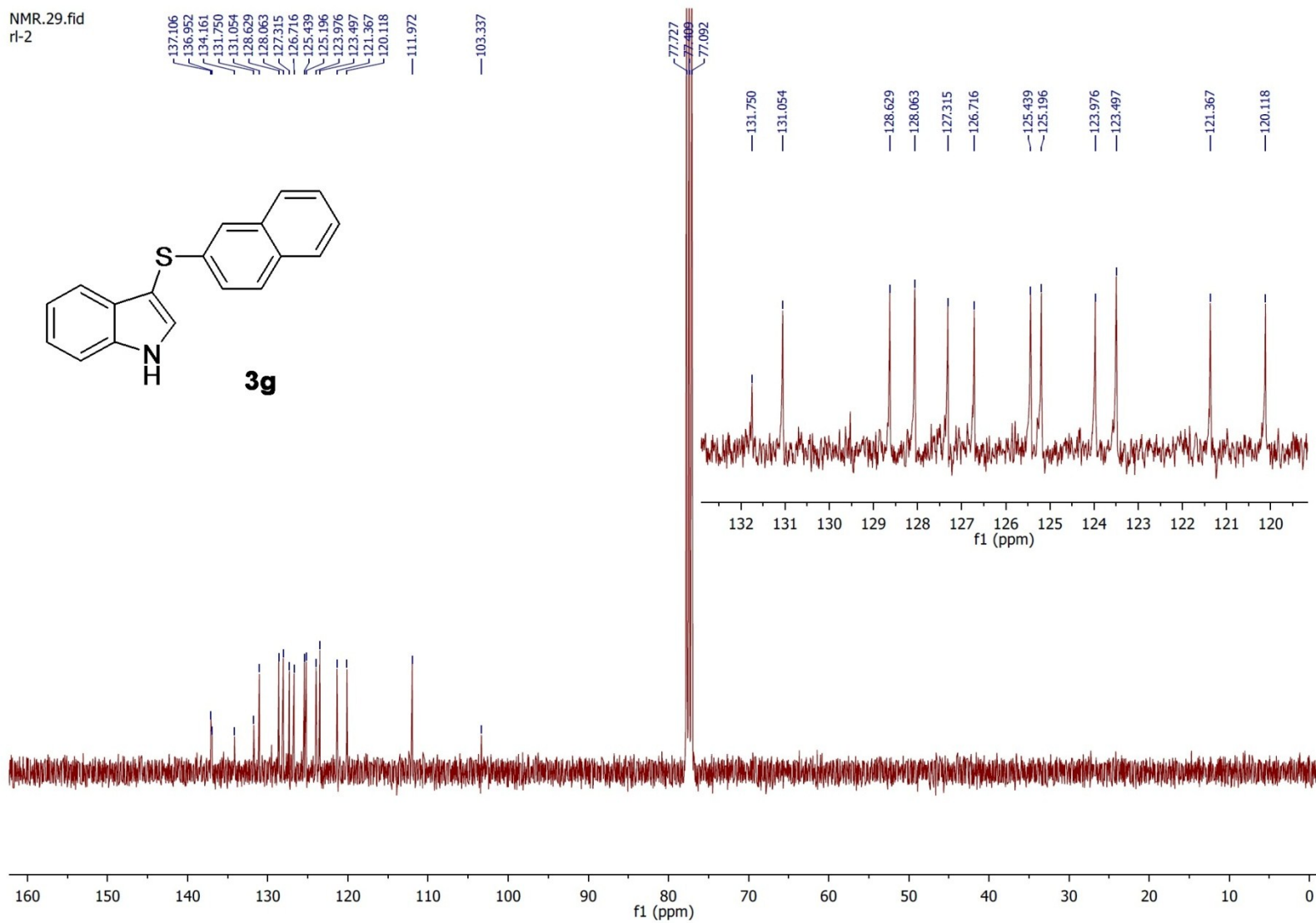


^1H NMR of compound **3g** (CDCl_3 , 400 MHz)

proton.28.fid
rl-2

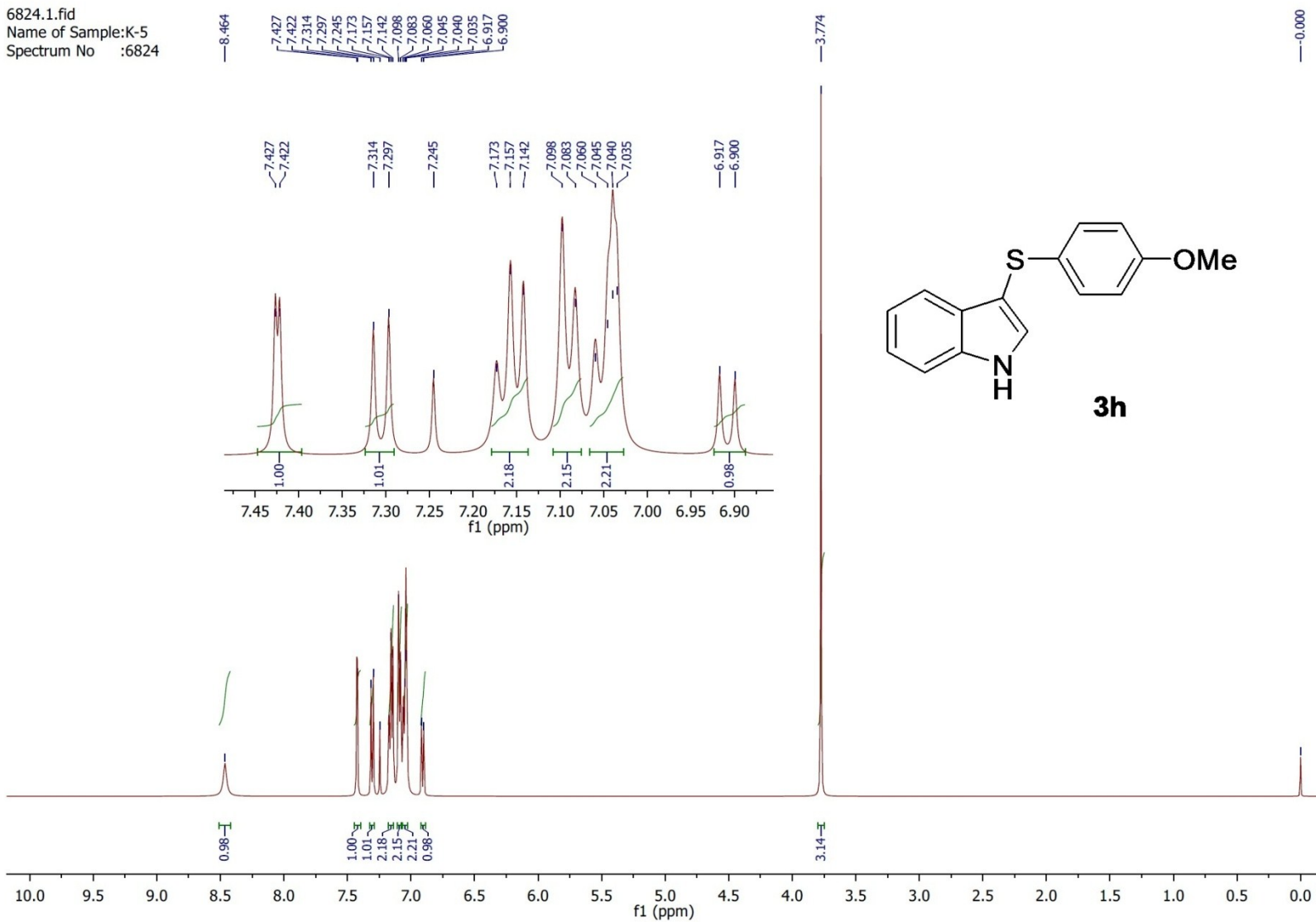


^{13}C NMR of compound **3g** (CDCl_3 , 100 MHz)

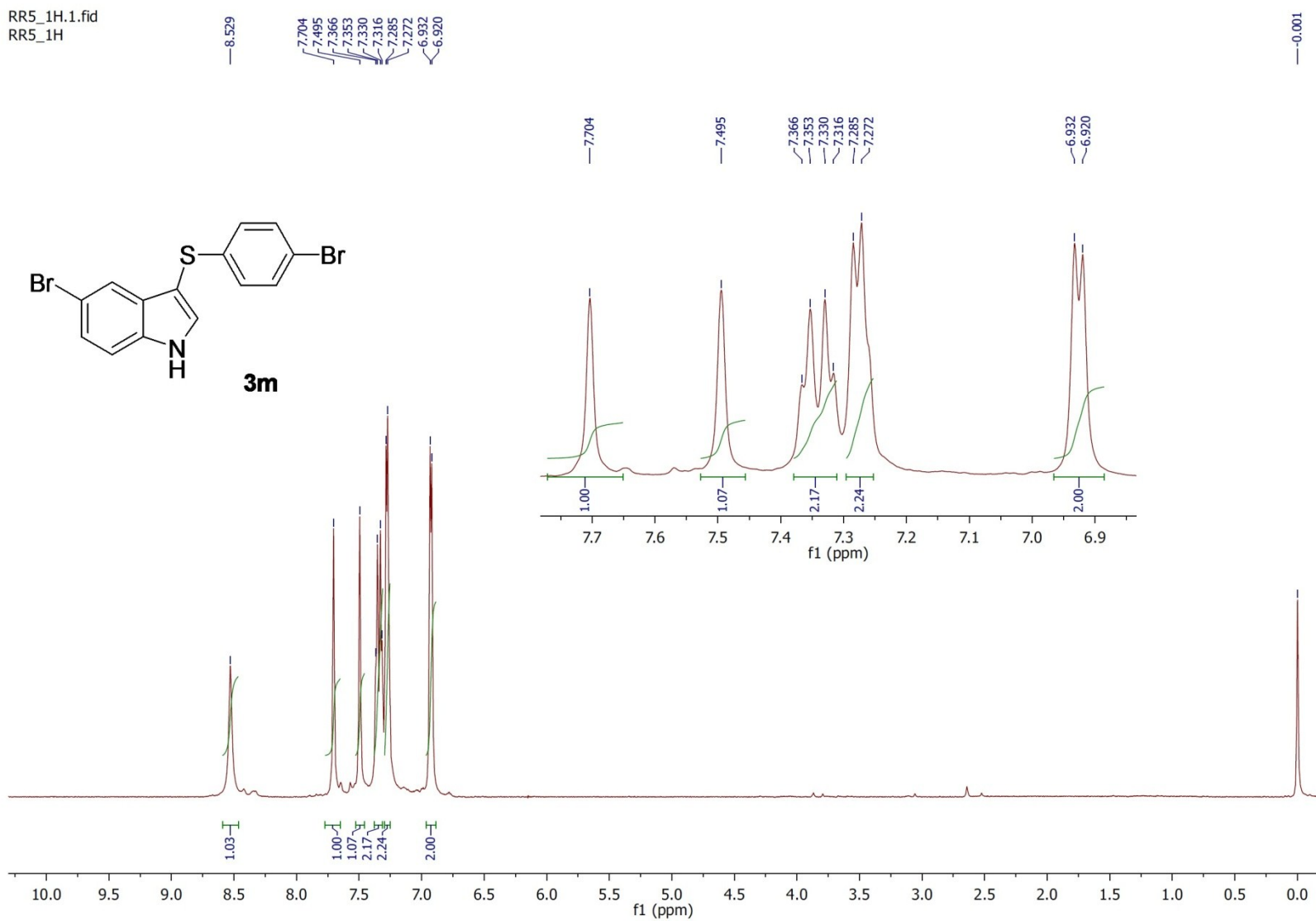


¹H NMR of compound **3h** (CDCl₃, 400 MHz)

6824.1.fid
Name of Sample:K-5
Spectrum No :6824



¹H NMR of compound **3m** (CDCl₃, 600 MHz)



¹H NMR of compound **3n** (DMSO-d₆, 400 MHz)

6591.1.fid

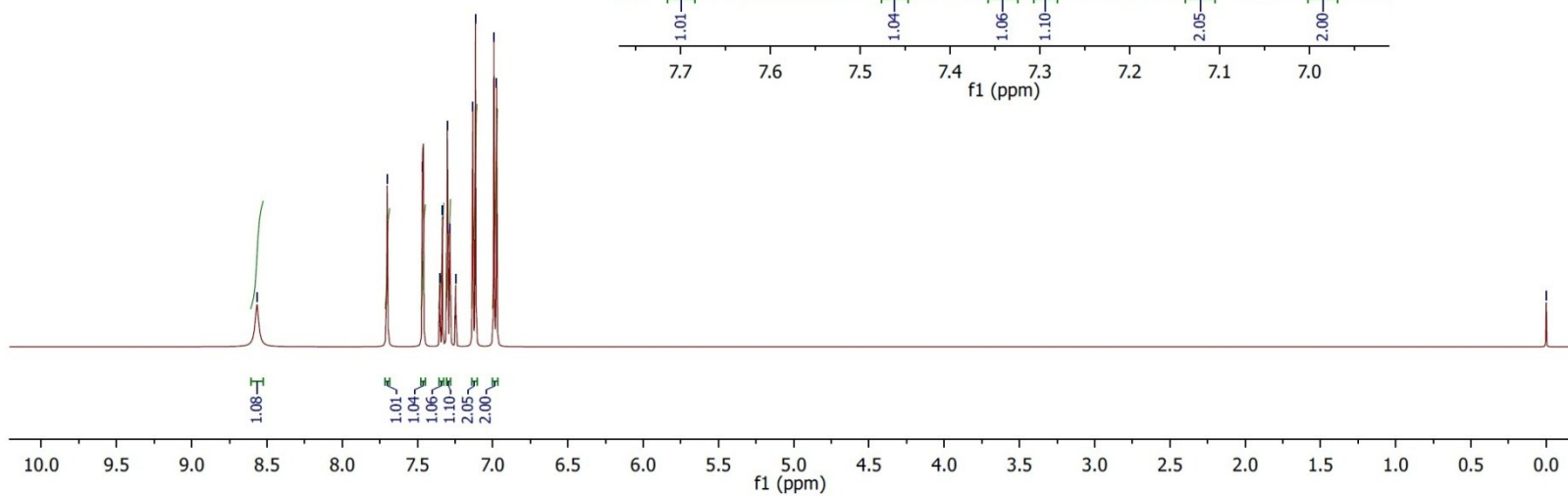
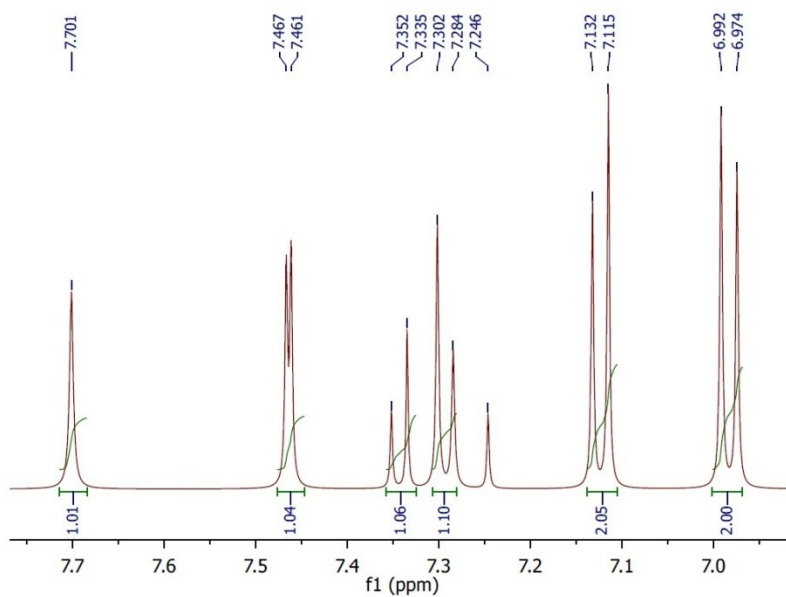
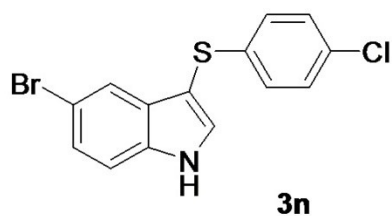
Name of Sample:K-3

Spectrum No :6591

—8.567

7.701
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7.461
7.352
7.335
7.302
7.284
7.246
7.132
7.115
6.992
6.974

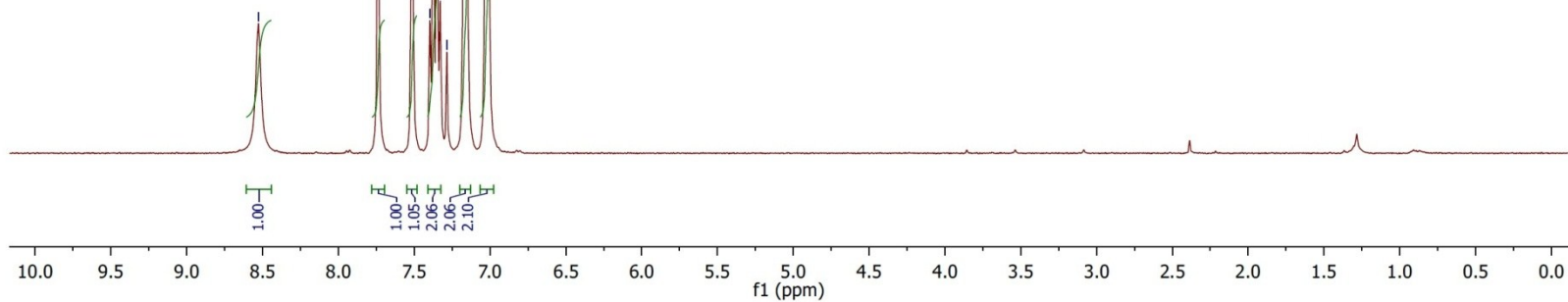
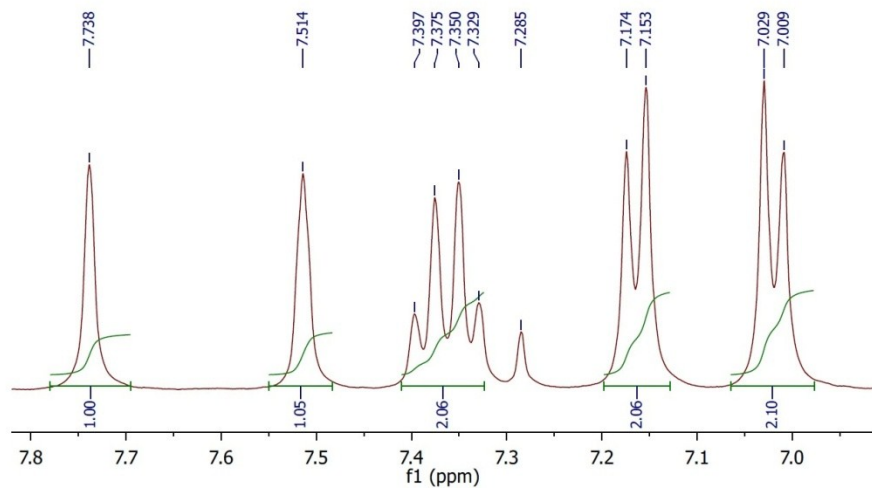
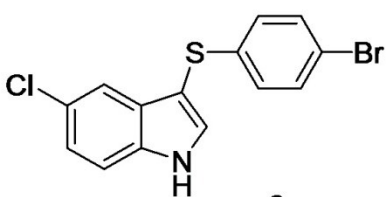
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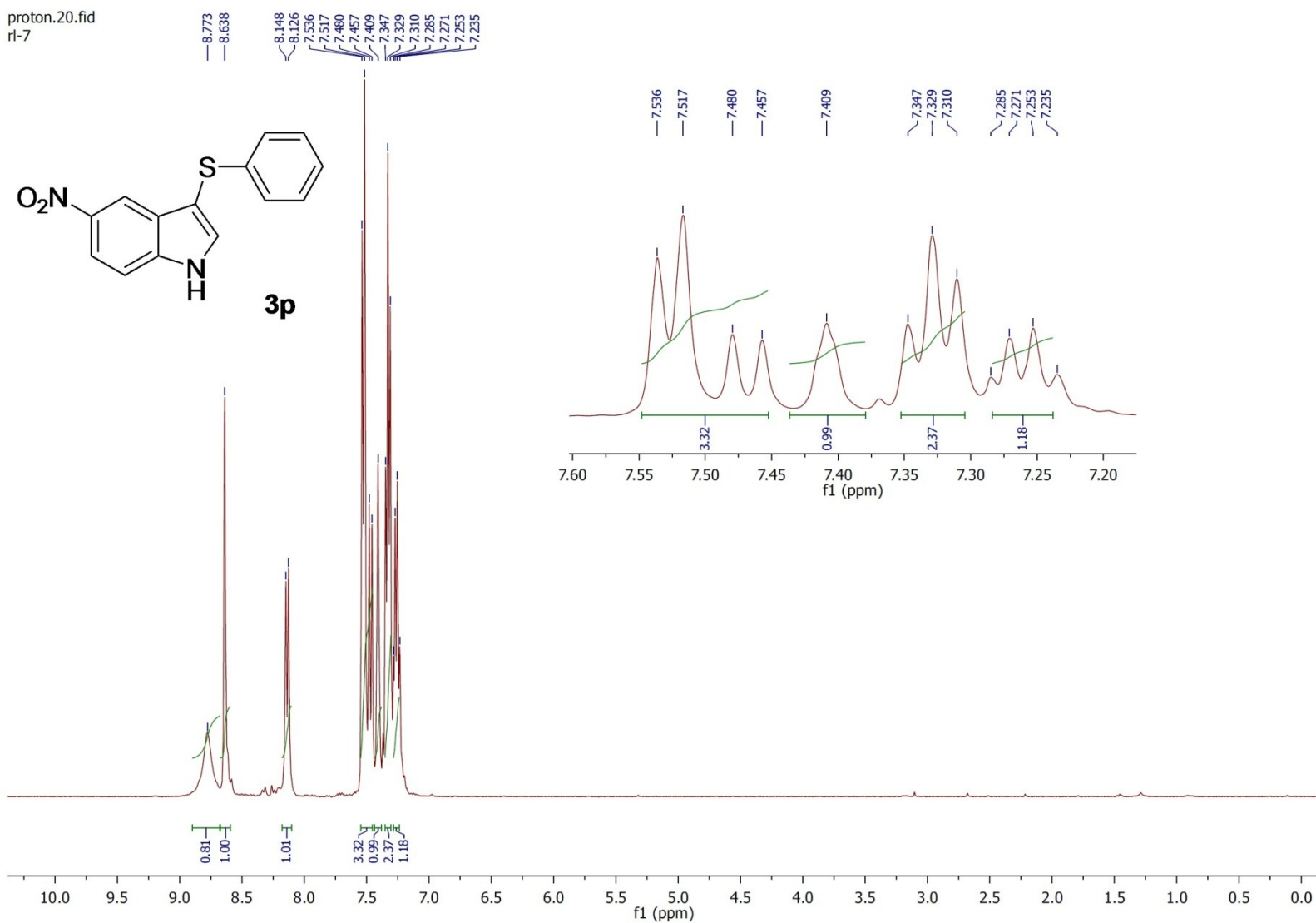
^1H NMR of compound **3o** (CDCl_3 , 400 MHz)

NMR IN.27.fid
IN-10

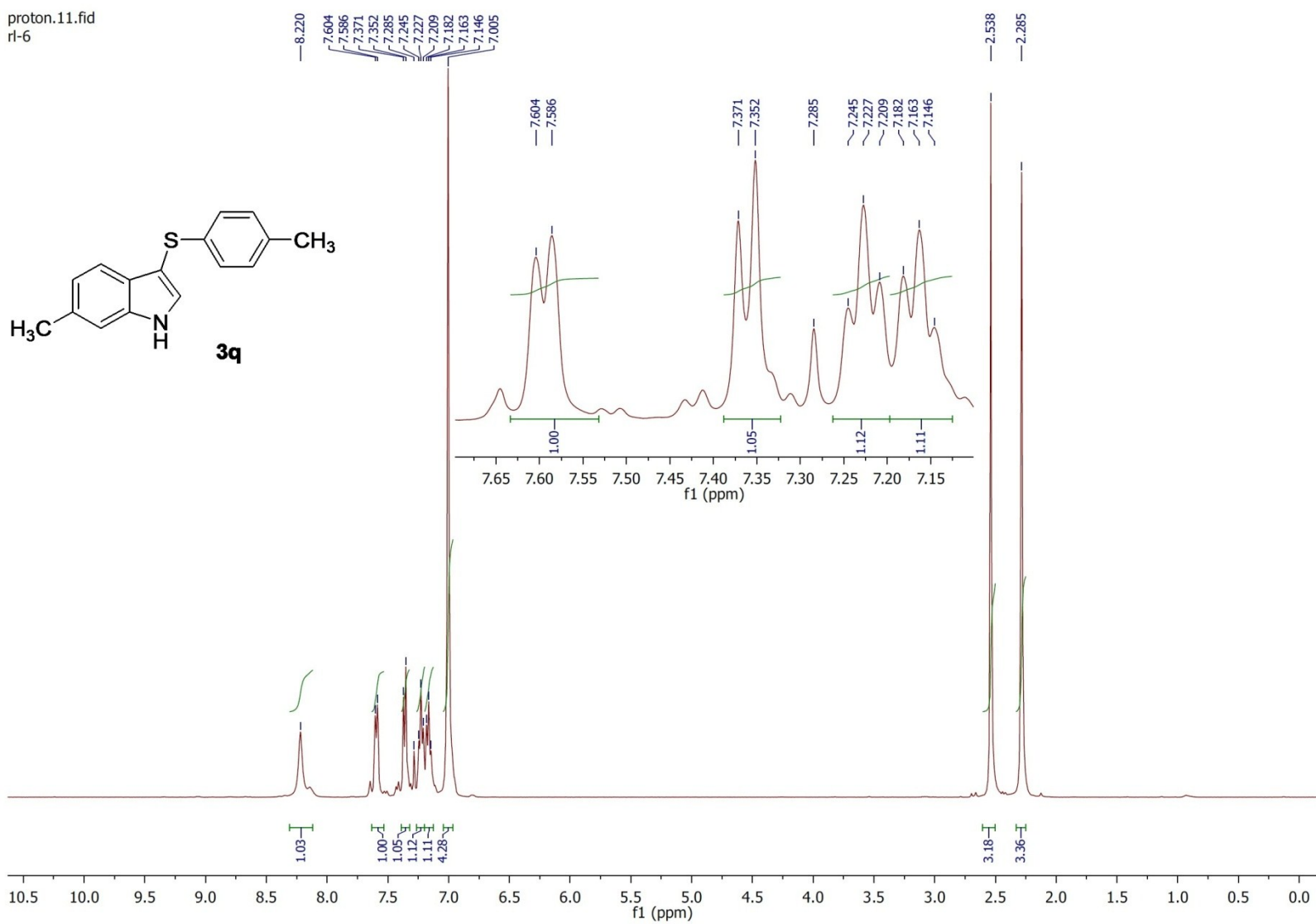
— 8.527
7.738
7.514
7.397
7.375
7.350
7.329
7.285
7.174
7.153
7.029
7.009



^1H NMR of compound **3p** (CDCl_3 , 400 MHz)

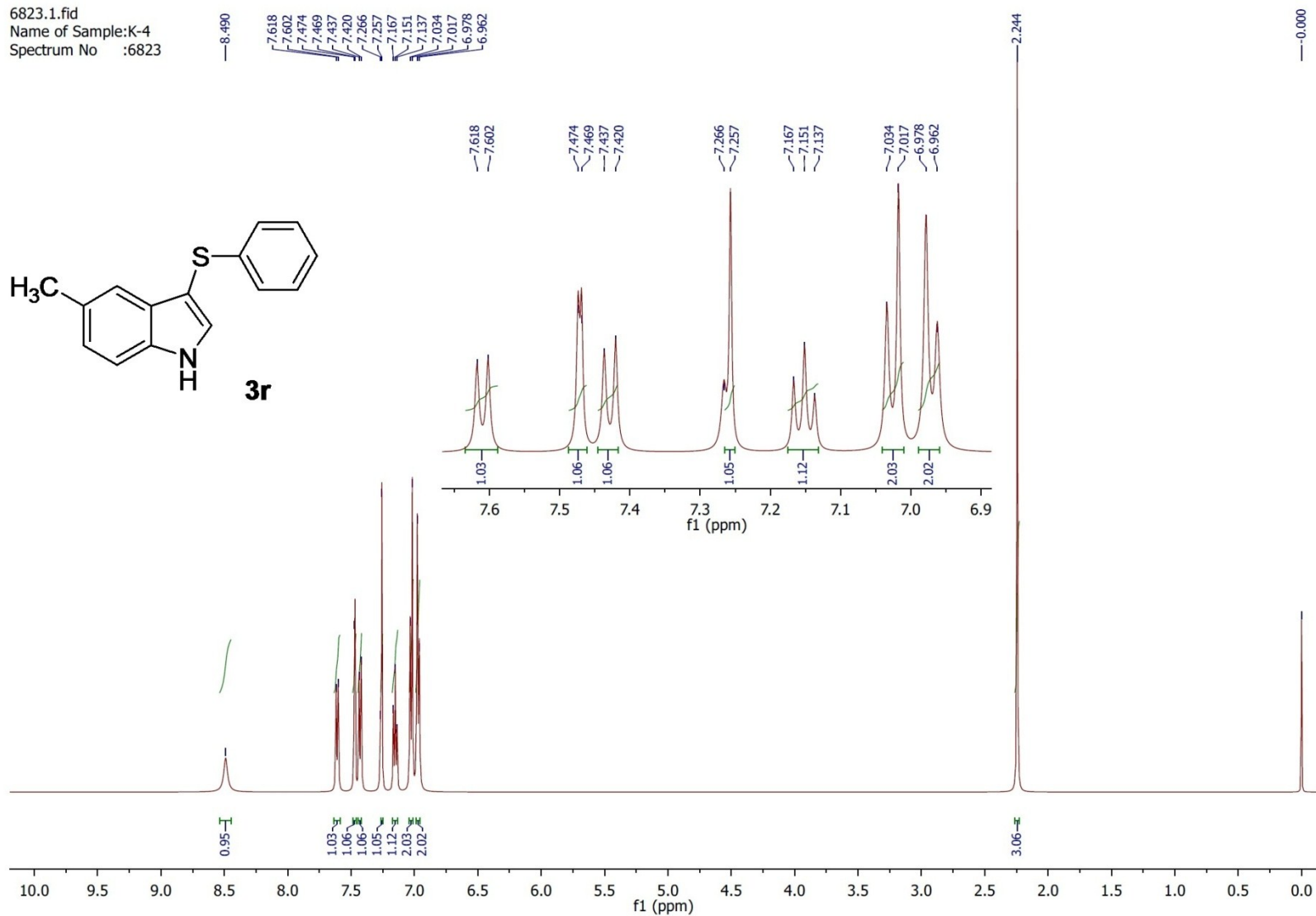


^1H NMR of compound **3q** (CDCl_3 , 400 MHz)

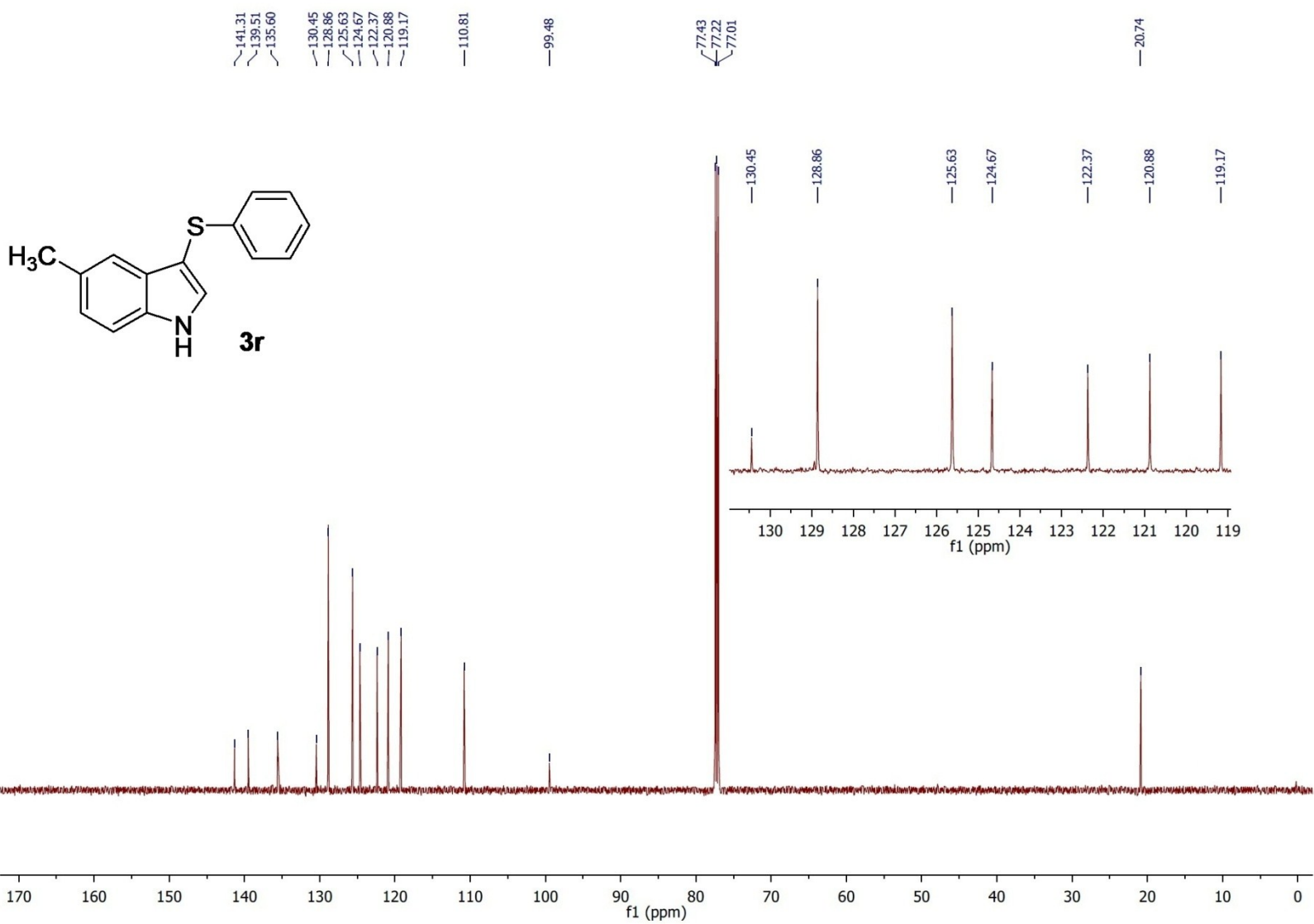


¹H NMR of compound **3r** (CDCl₃, 400 MHz)

6823.1.fid
Name of Sample:K-4
Spectrum No :6823

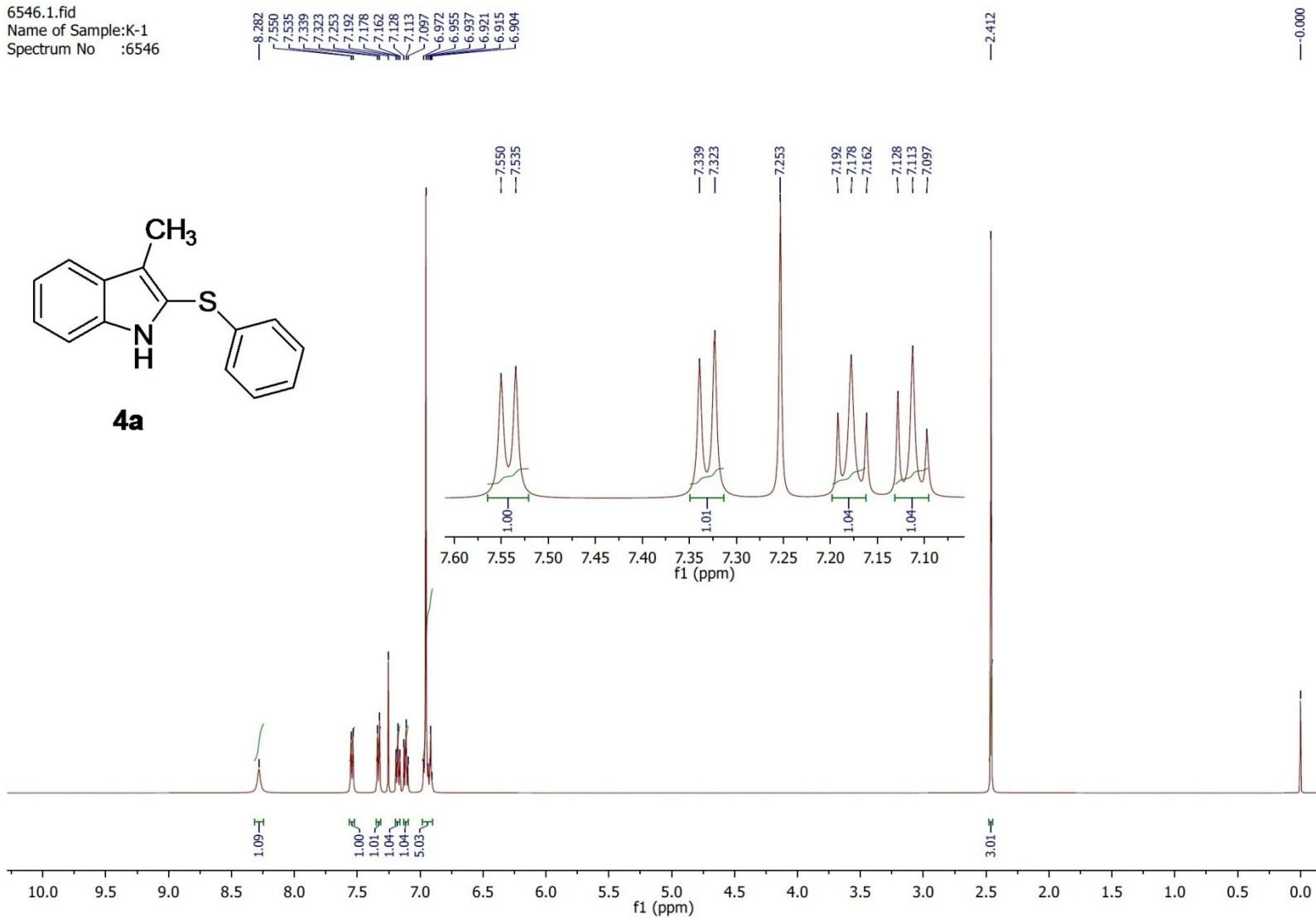
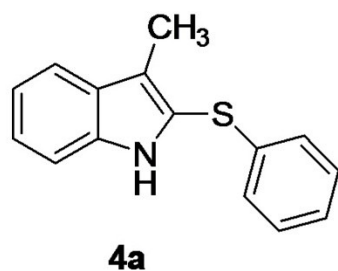


^{13}C NMR of compound **3r** (CDCl_3 , 125 MHz)

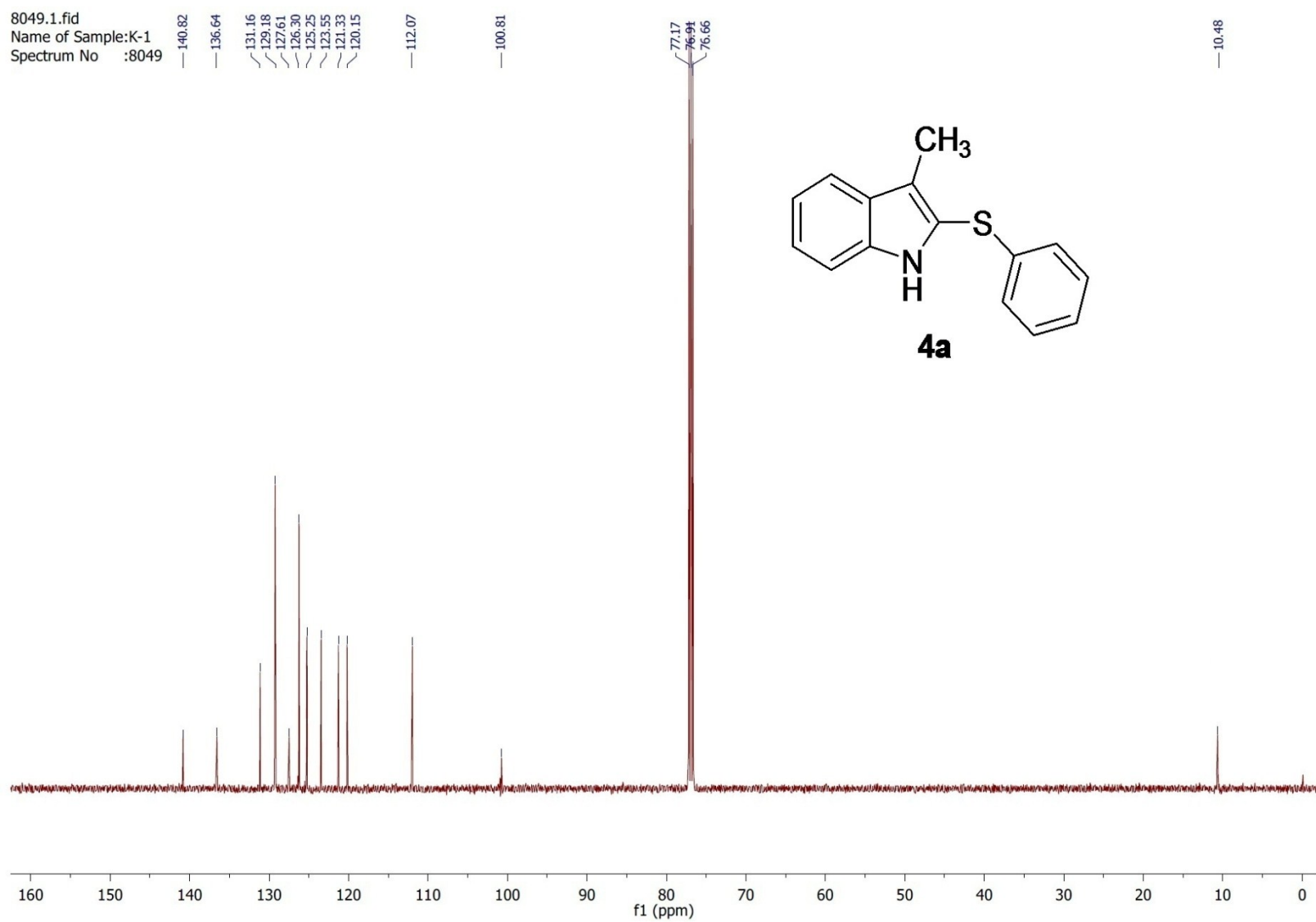


¹H NMR of compound **4a** (DMSO-d₆, 400 MHz)

6546.1.fid
Name of Sample:K-1
Spectrum No :6546



^{13}C NMR of compound **4a** (CDCl_3 , 100 MHz)



^1H NMR of compound **Ha** (CDCl_3 , 400 MHz)

