

## Supporting Information

# A Direct Conversion of Carboxylic Acids into Thioamides

*Babak Kaboudin,\*<sup>a</sup> Vahid Yarahmadi,<sup>a</sup> Jun-ya Kato<sup>b</sup> and Tsutomu Yokomatsu<sup>b</sup>*

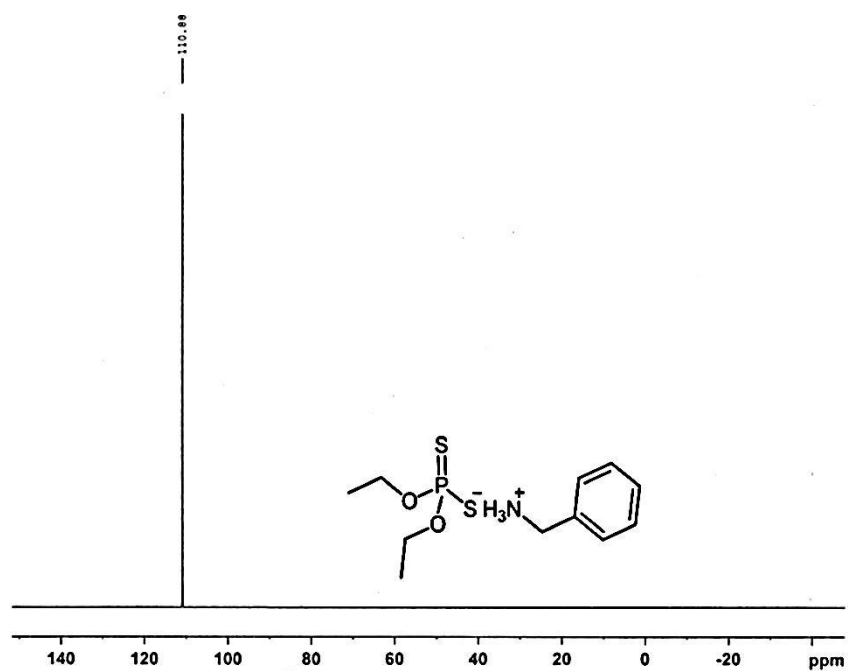
<sup>a</sup>*Department of Chemistry, Institute for Advanced Studies in Basic Sciences  
Gava Zang, Zanjan 45137-66731, Iran  
Fax: (+98) 241-4214949  
E-mail: [kaboudin@iasbs.ac.ir](mailto:kaboudin@iasbs.ac.ir)*

<sup>b</sup>*School of Pharmacy, Tokyo University of Pharmacy and Life Science  
14321-1 Horinouchi, Hachioji, Tokyo 192-0392, Japan*

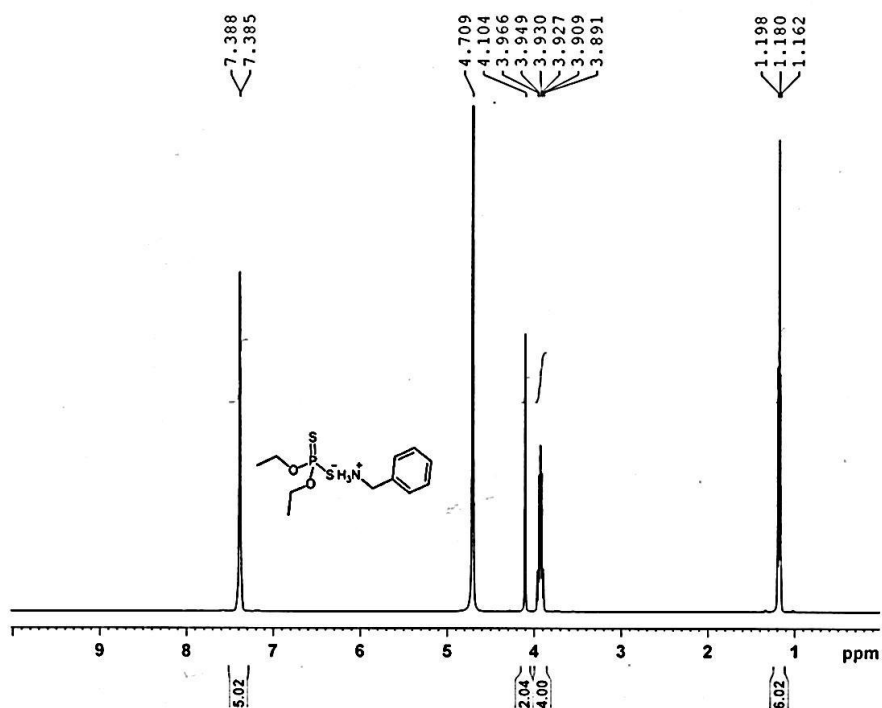
### Table of Contents

NMR spectra of compounds <b>1b-1e</b> , <b>3f-3q</b> , <b>4-7b</b> .....	2-23
--	------

$^{31}\text{P}$ -NMR of compound **1b**



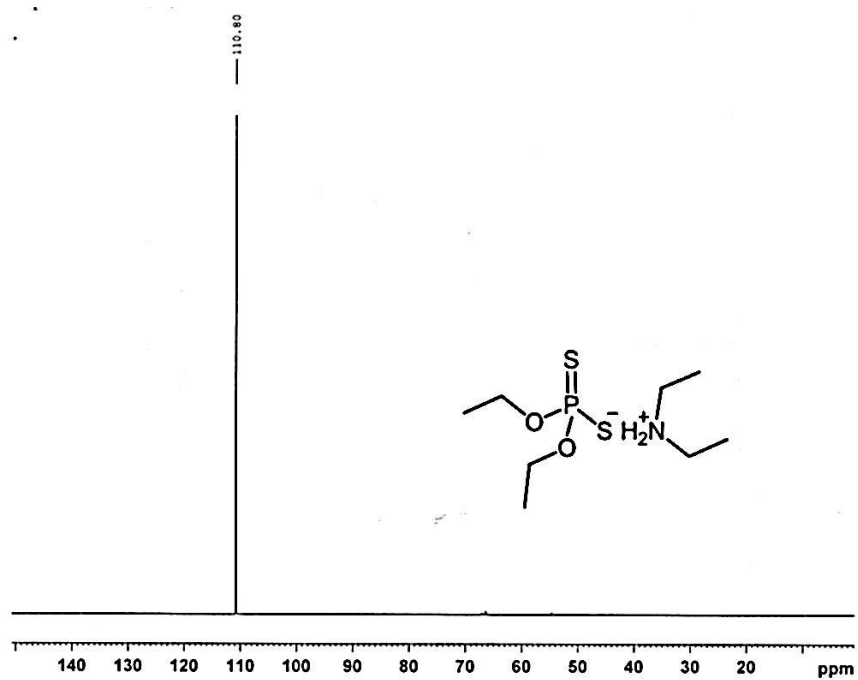
$^1\text{H}$ -NMR of compound **1b**



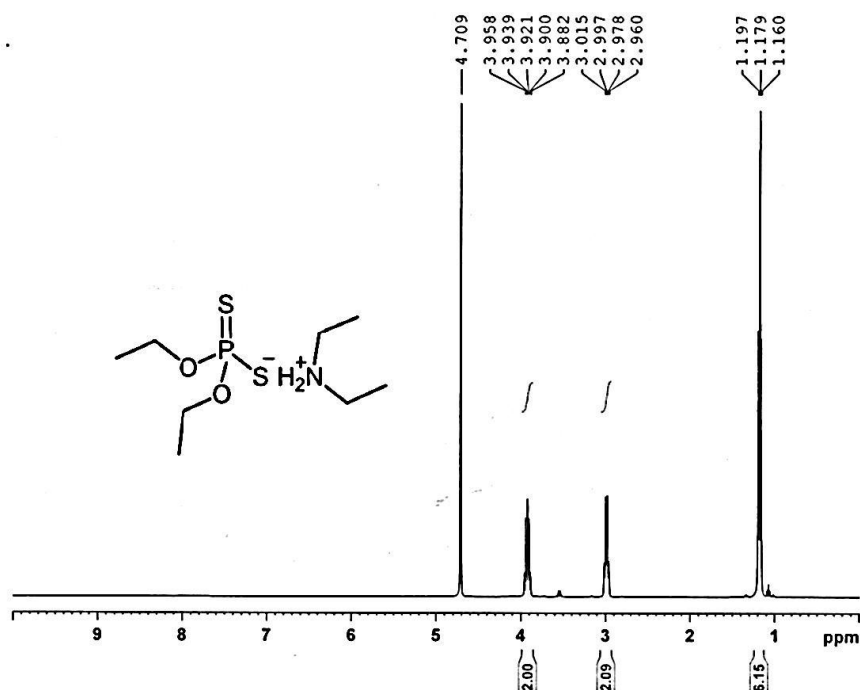
$^{13}\text{C}$ -NMR of compound **1b**



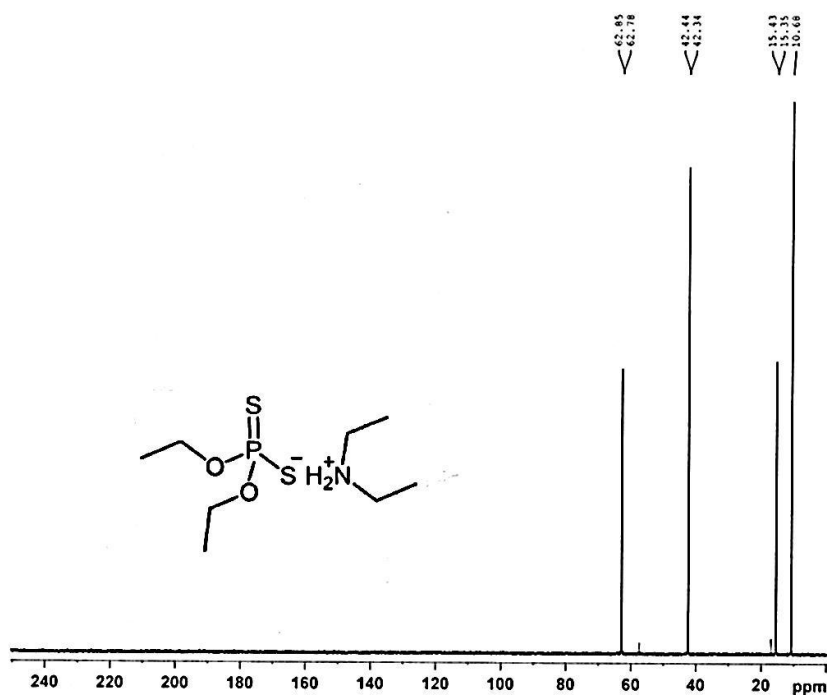
$^{31}\text{P}$ -NMR of compound **1c**



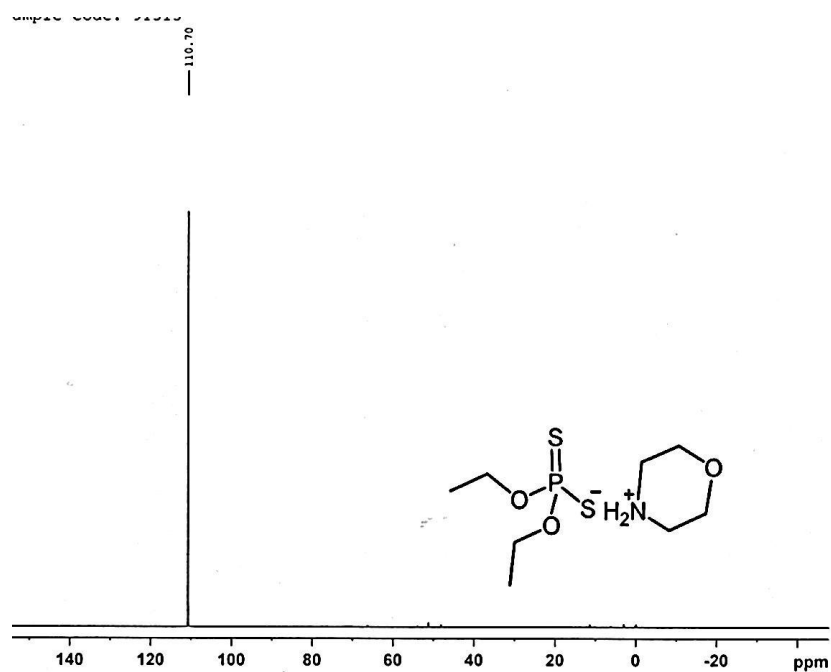
$^1\text{H}$ -NMR of compound **1c**



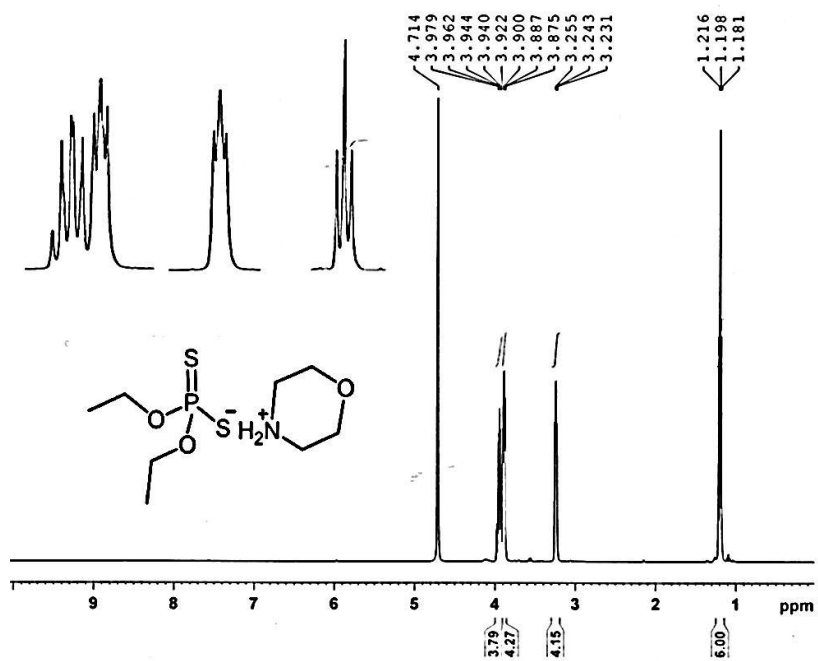
$^{13}\text{C}$ -NMR of compound **1c**



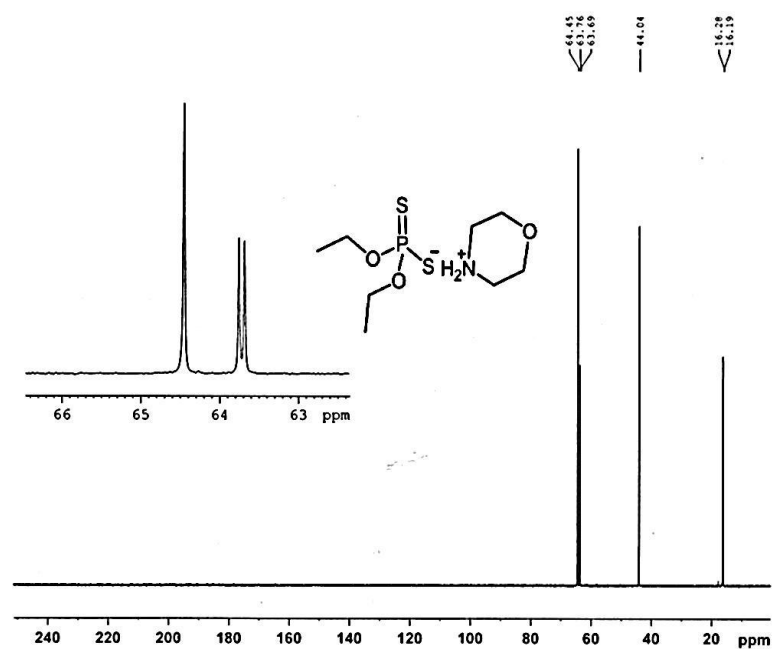
# <sup>31</sup>P-NMR of compound **1d**



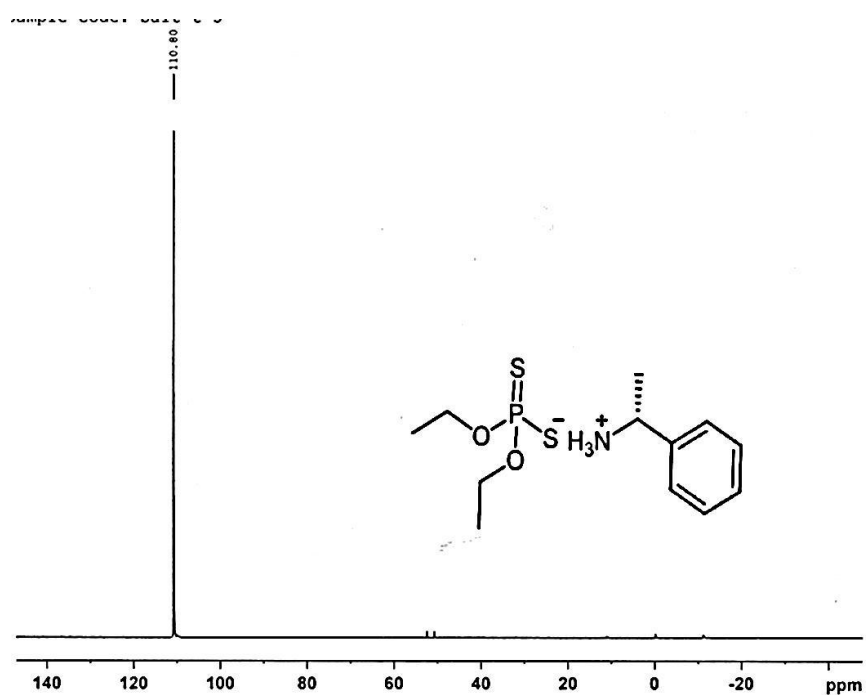
# <sup>1</sup>H-NMR of compound **1d**



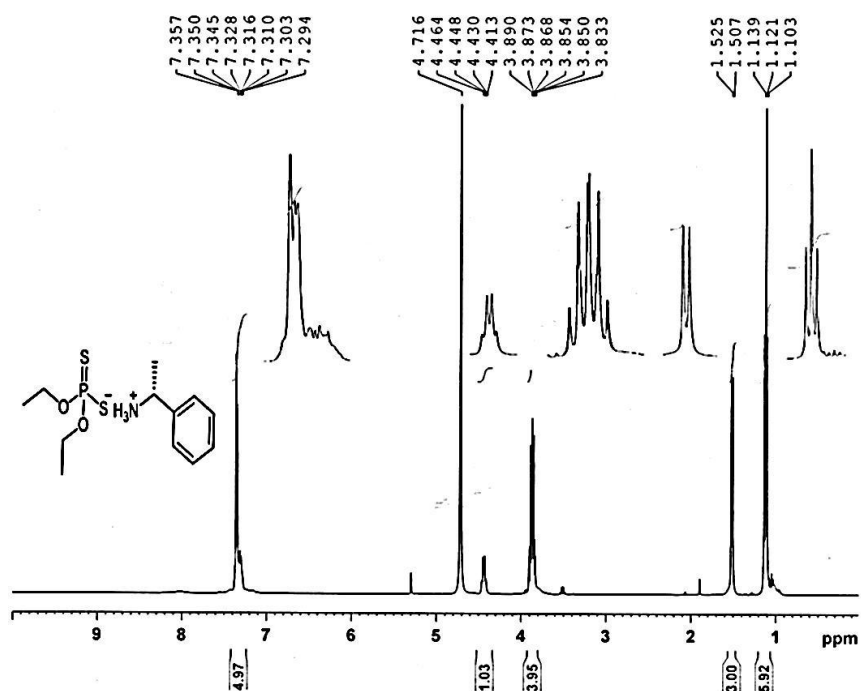
$^{13}\text{C}$ -NMR of compound **1d**



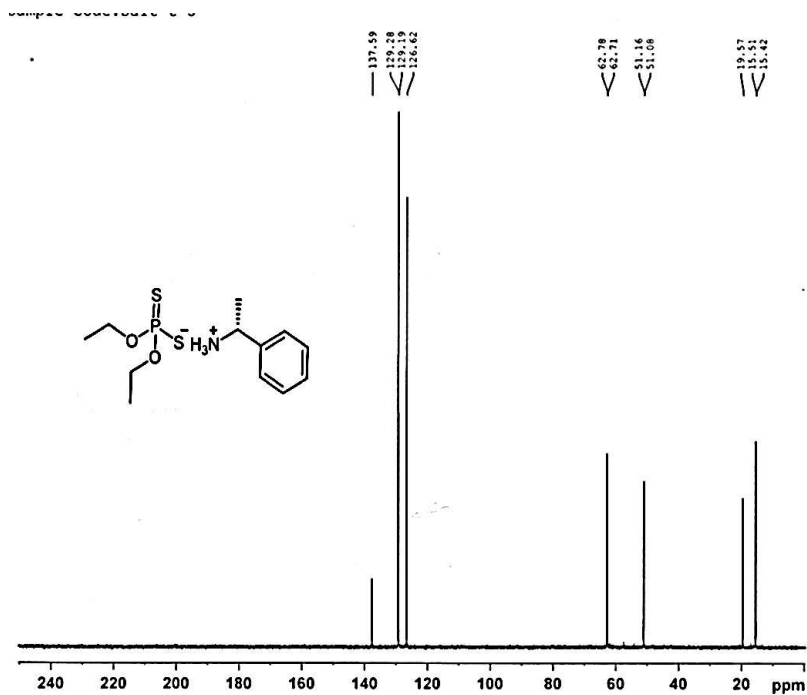
$^{31}\text{P}$ -NMR of compound **1e**



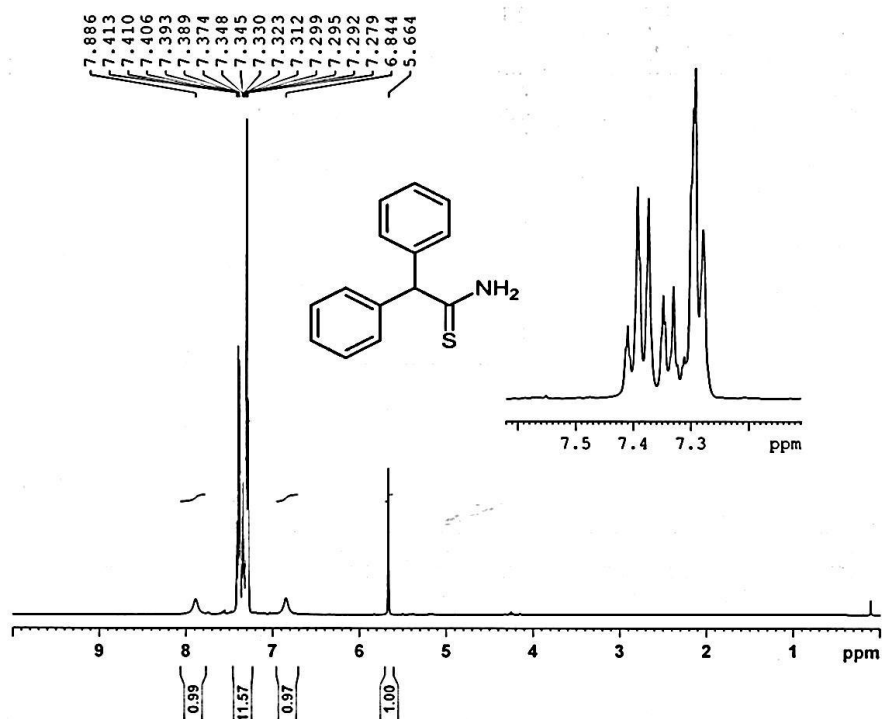
<sup>1</sup>H-NMR of compound **1e**



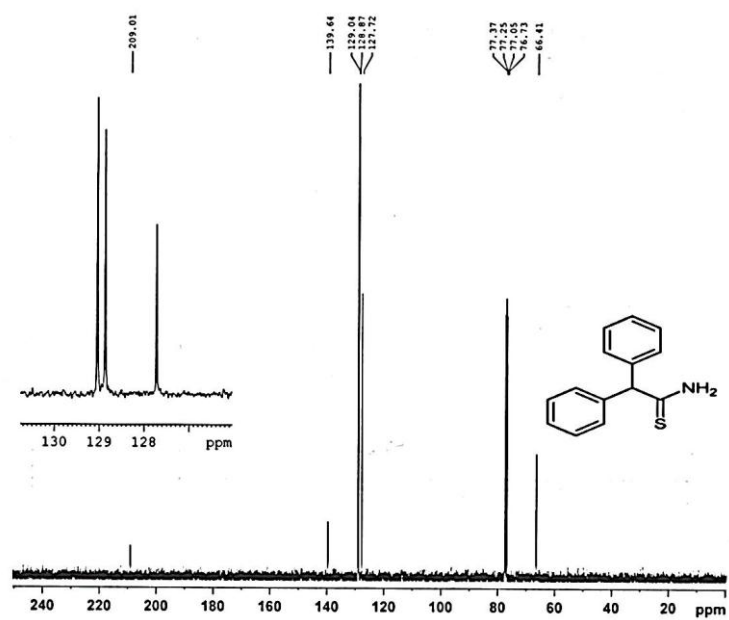
<sup>13</sup>C-NMR of compound **1e**



$^1\text{H}$ -NMR **3f**

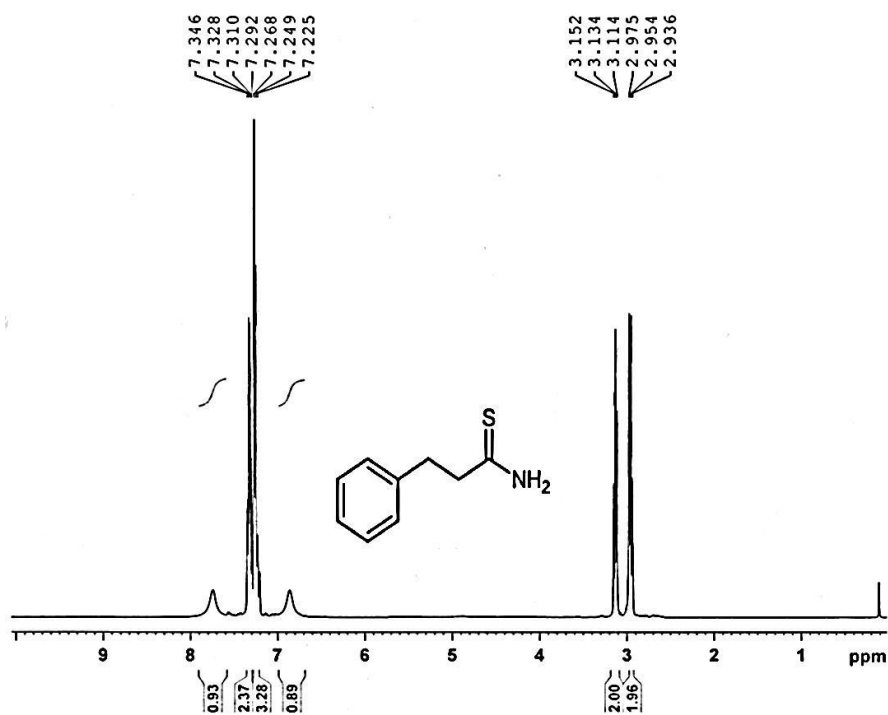


$^{13}\text{C}$ -NMR **3f**

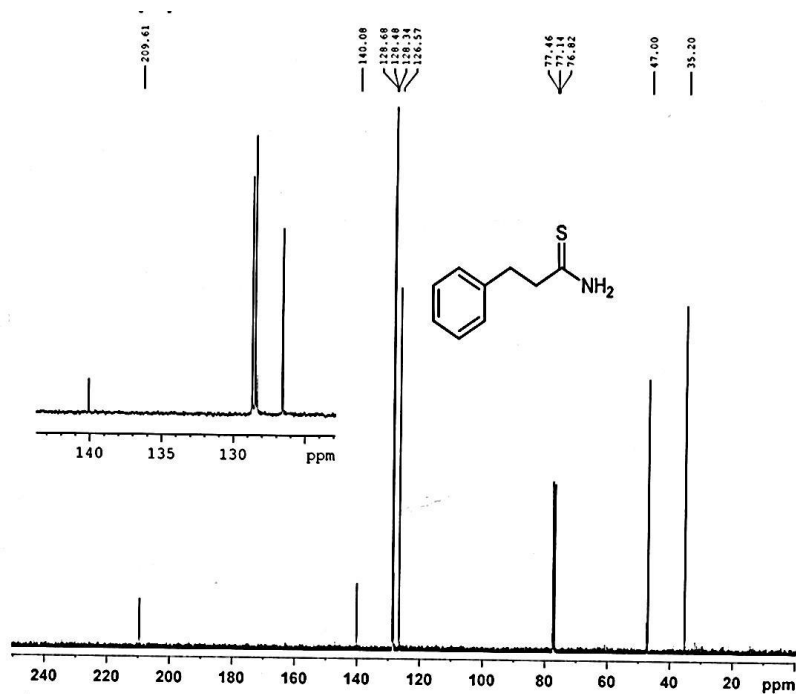


$^1\text{H}$ -NMR **3g**

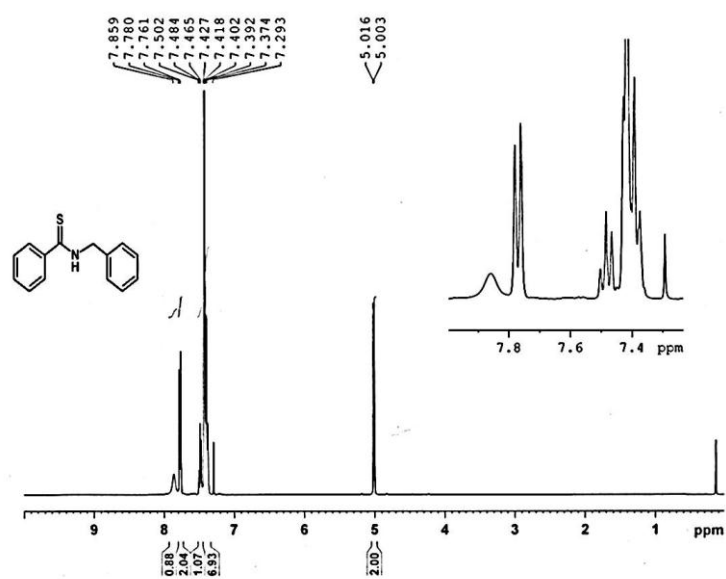




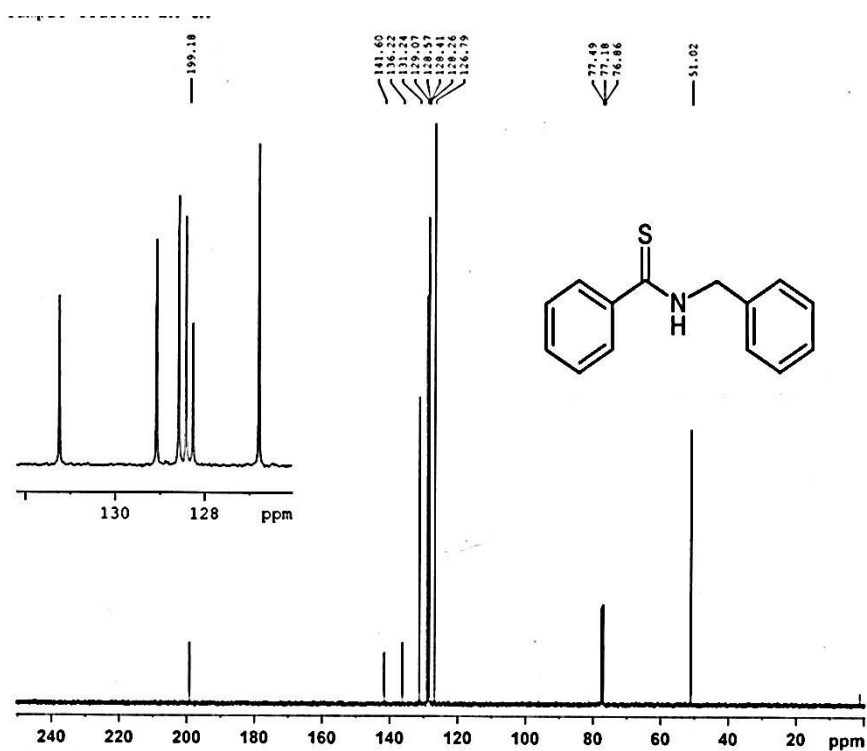
<sup>13</sup>C-NMR 3g



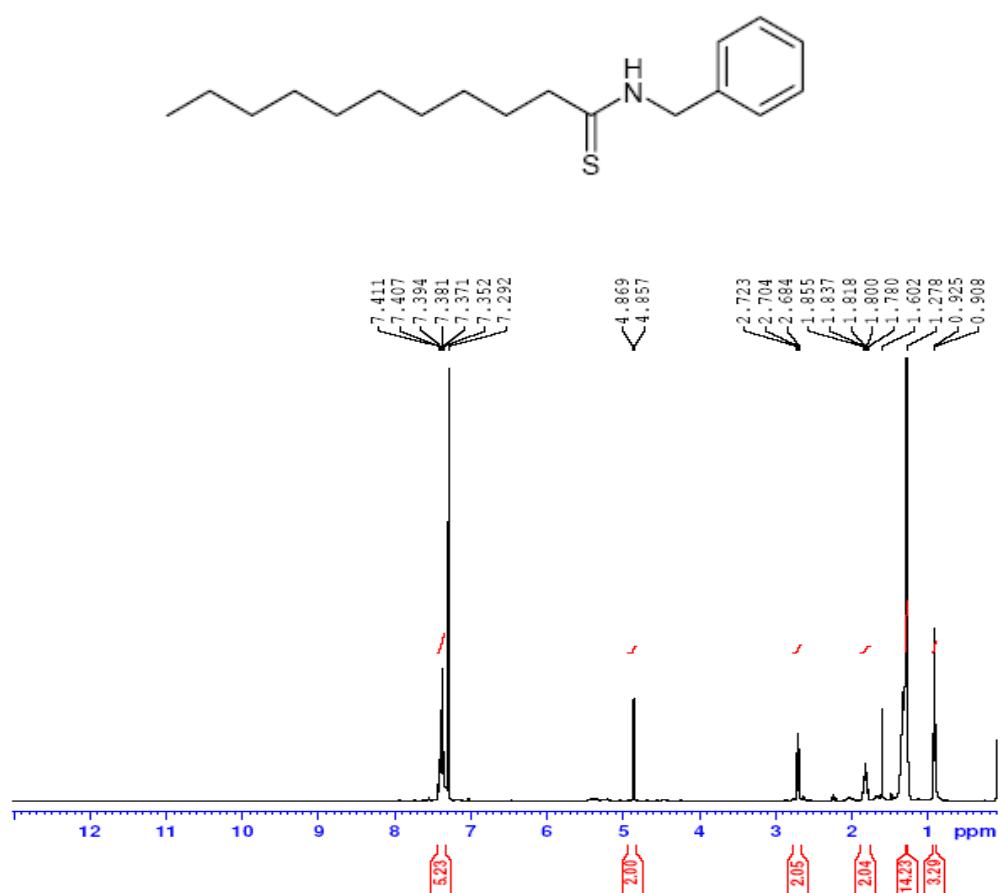
<sup>1</sup>H-NMR 3h



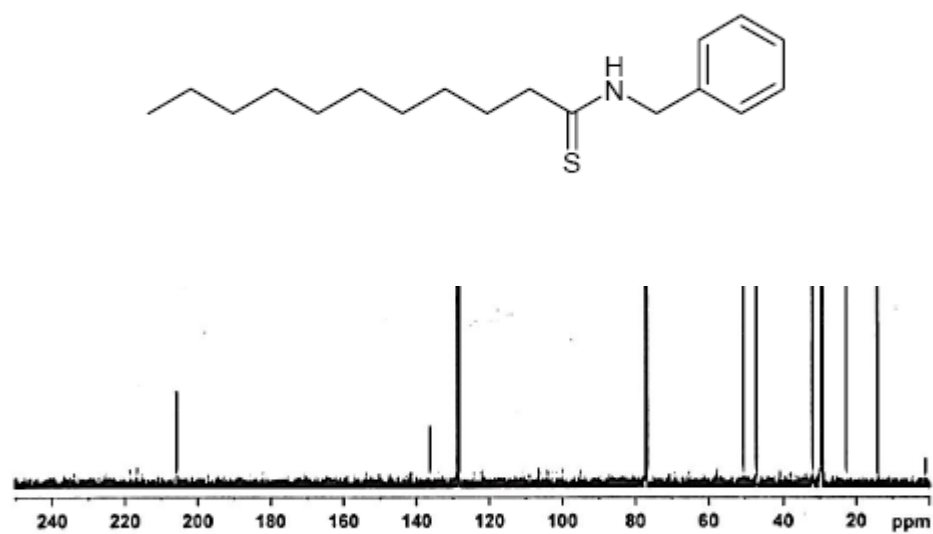
**<sup>13</sup>C-NMR 3h**



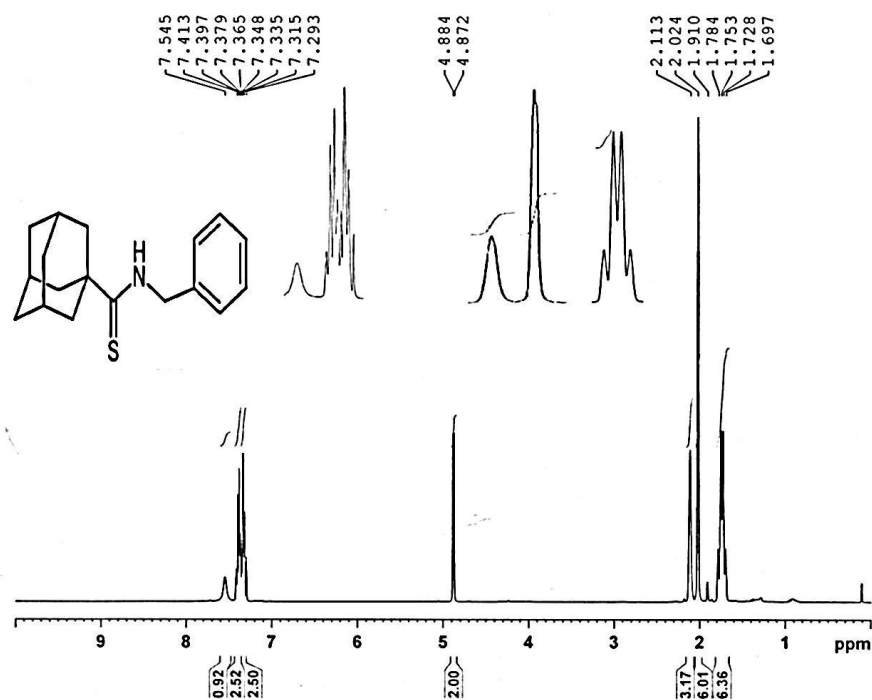
**<sup>1</sup>H-NMR 3i**



<sup>13</sup>C-NMR 3i



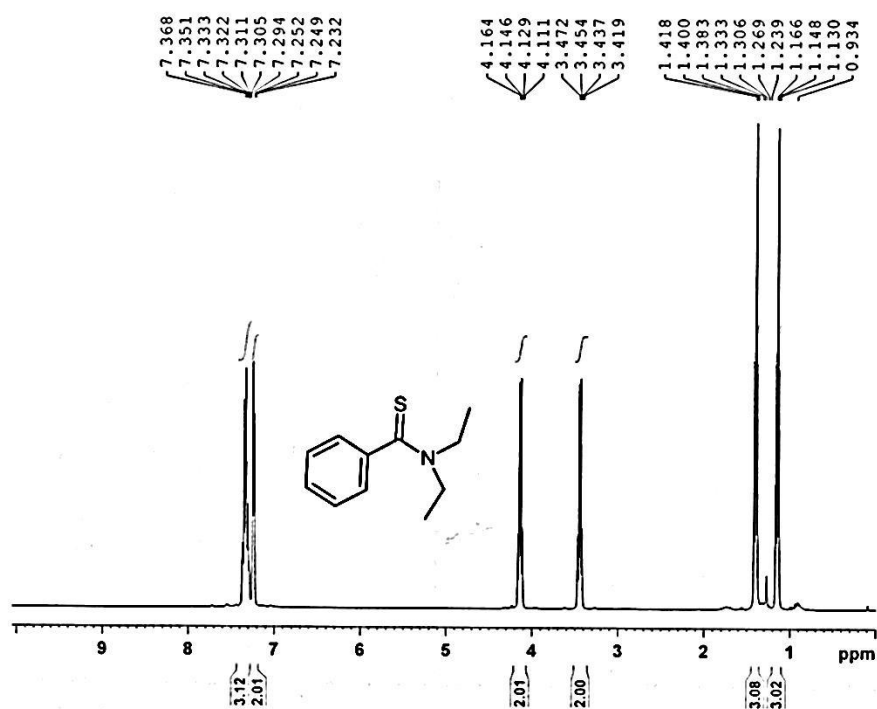
<sup>1</sup>H-NMR 3j



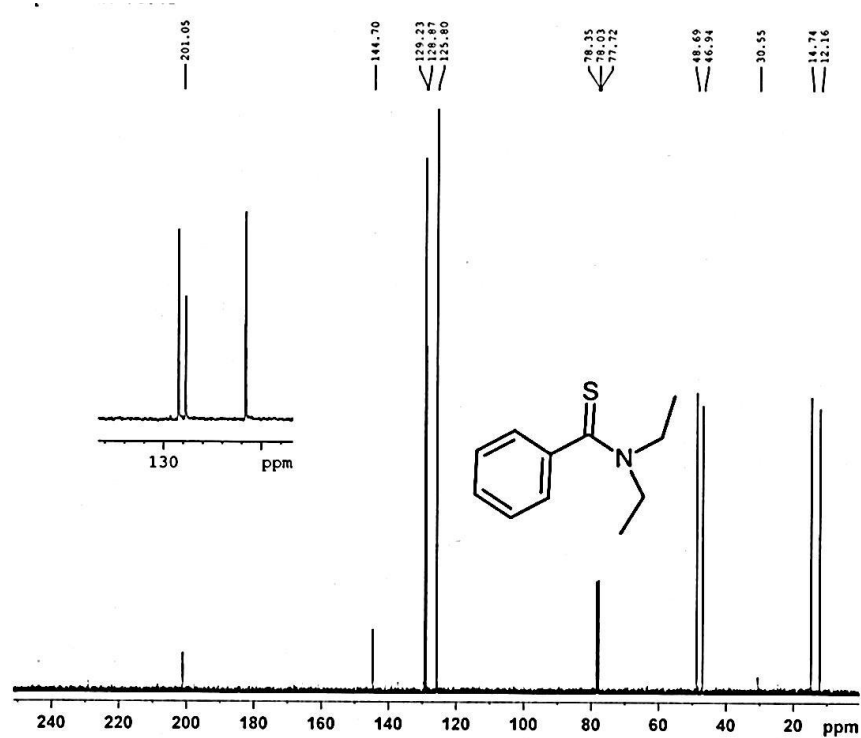
<sup>13</sup>C-NMR 3j



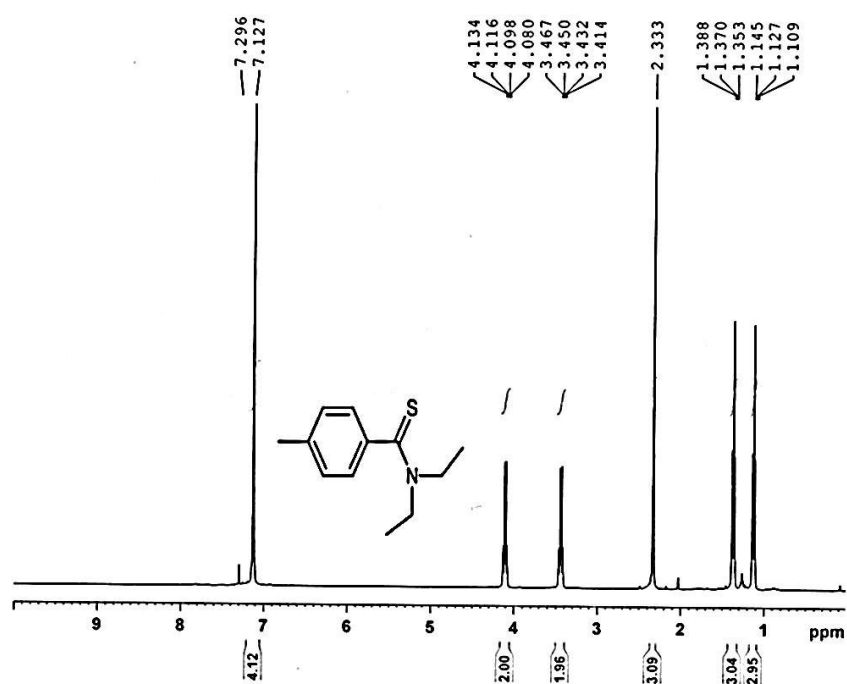
<sup>1</sup>H-NMR 3k



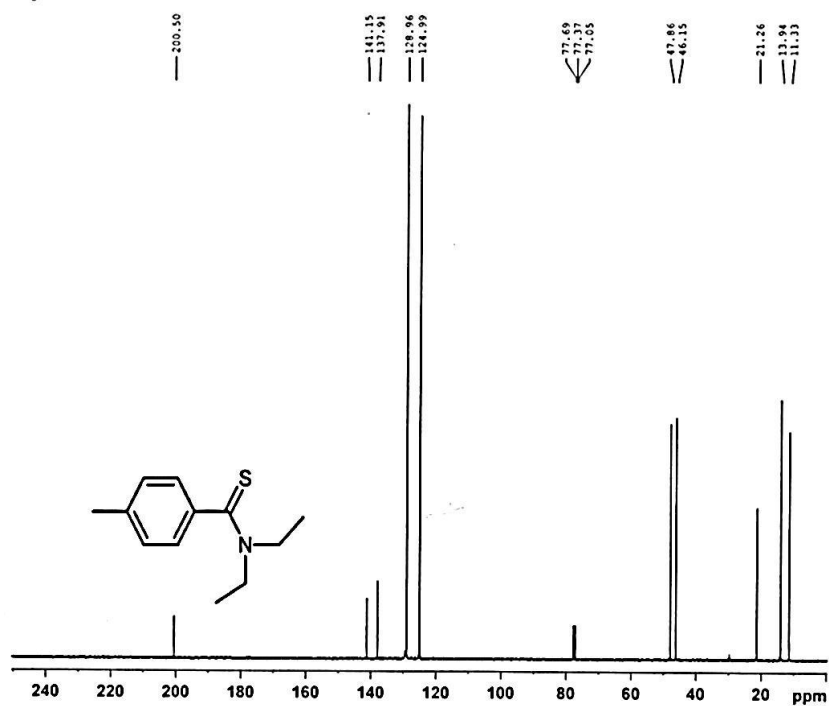
<sup>13</sup>C-NMR 3k



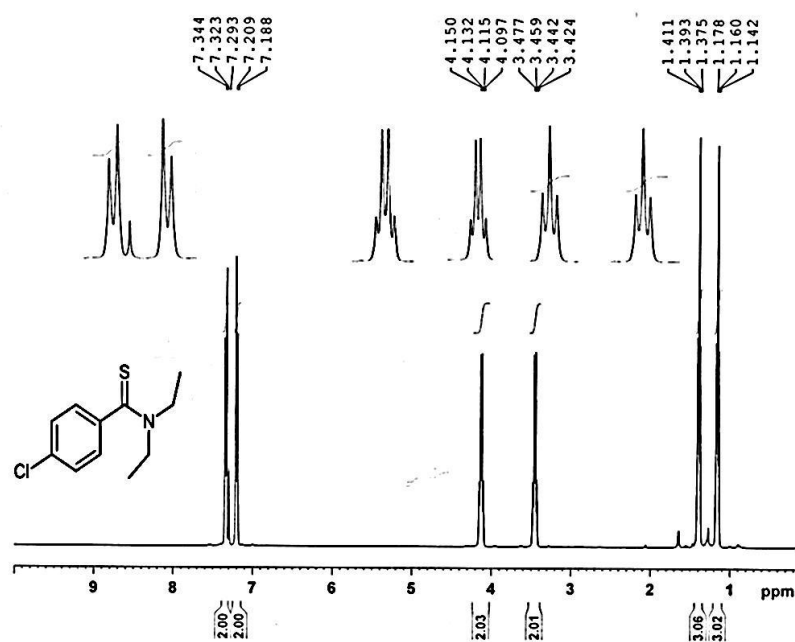
<sup>1</sup>H-NMR 3l



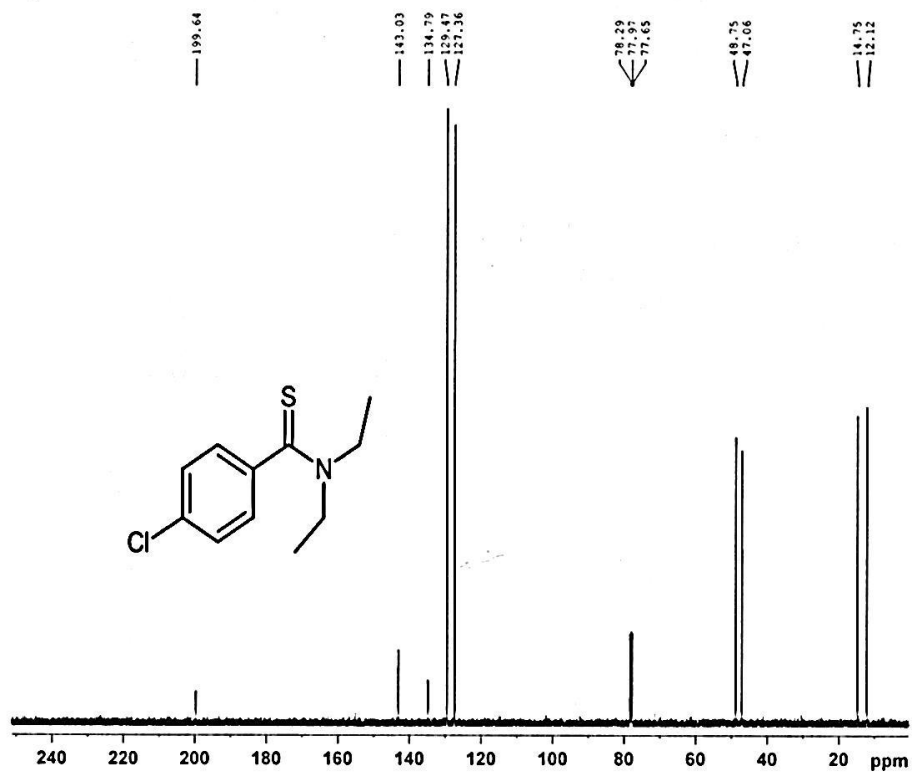
<sup>13</sup>C-NMR **3l**



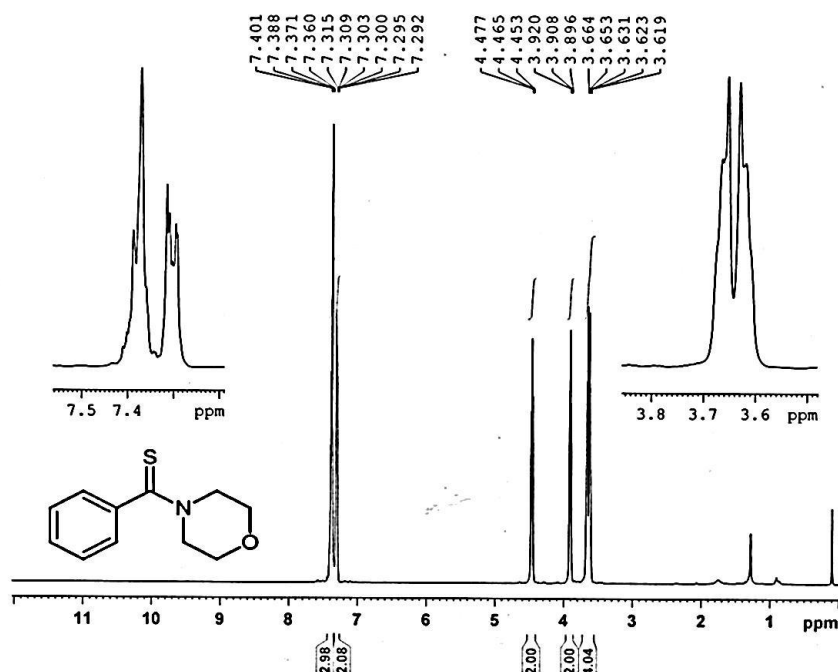
<sup>1</sup>H-NMR **3m**



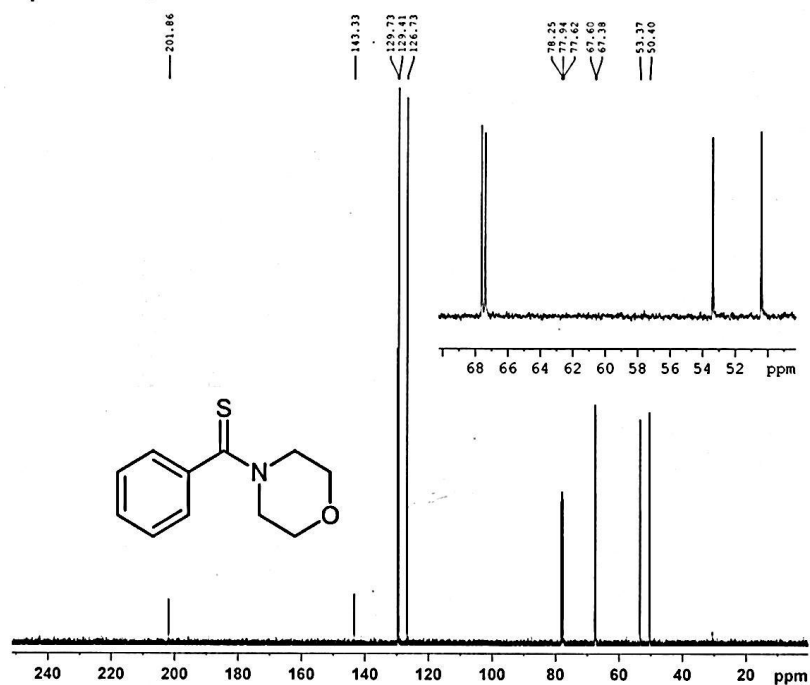
<sup>13</sup>C-NMR **3m**



<sup>1</sup>H-NMR **3n**

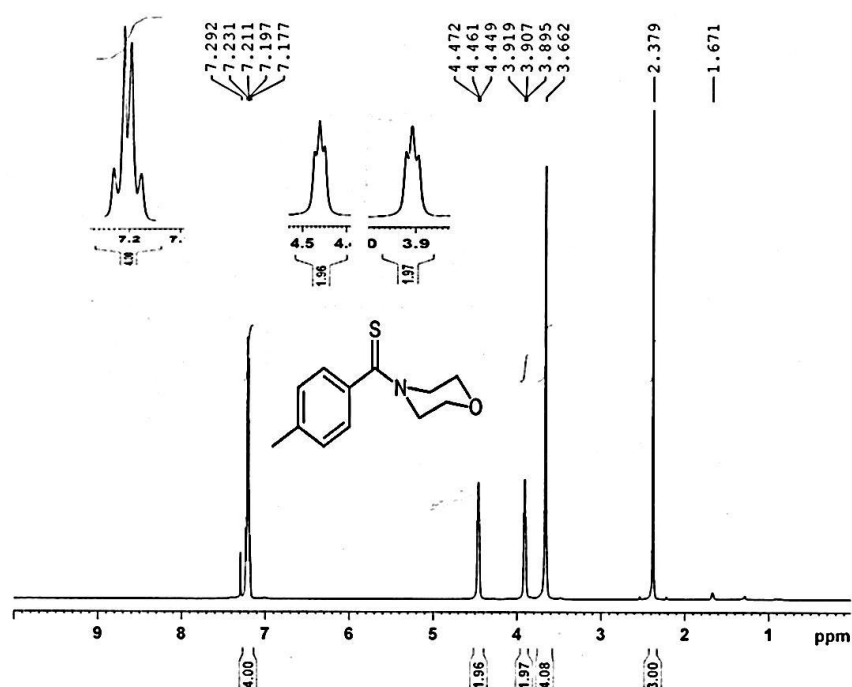


<sup>13</sup>C-NMR 3n

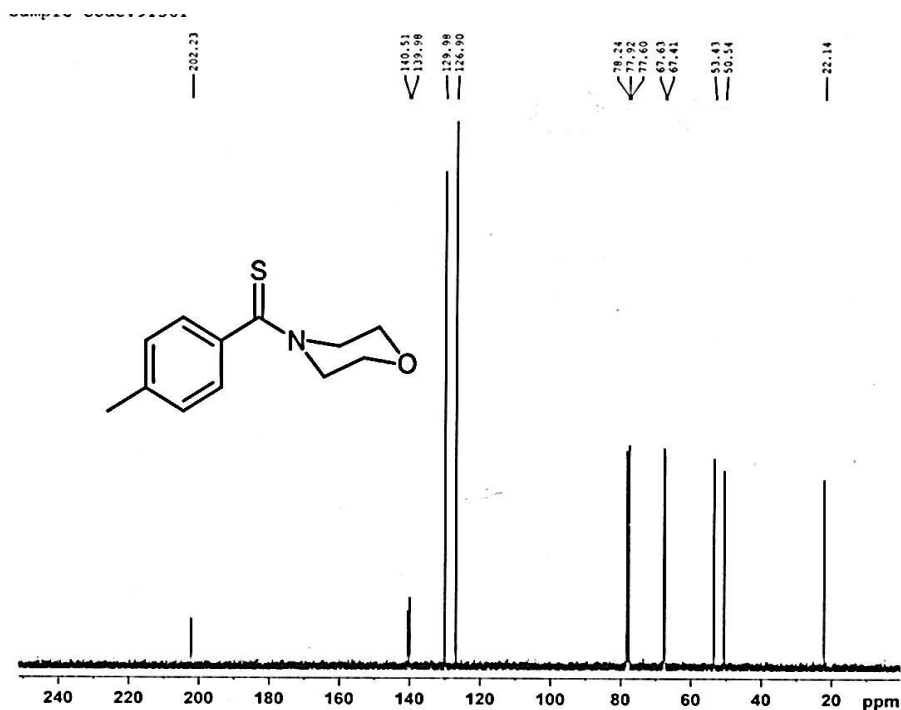


<sup>1</sup>H-NMR 3o

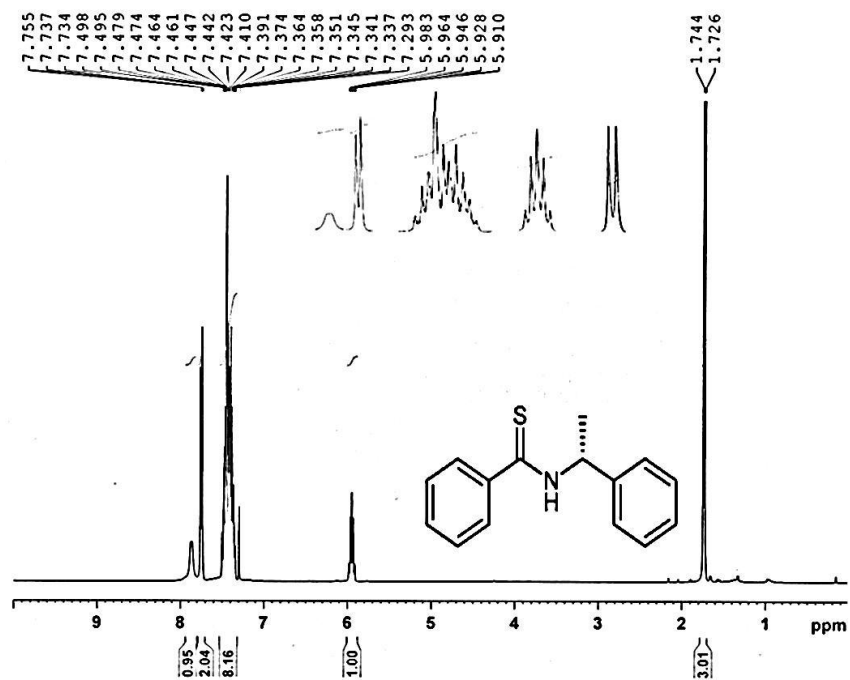




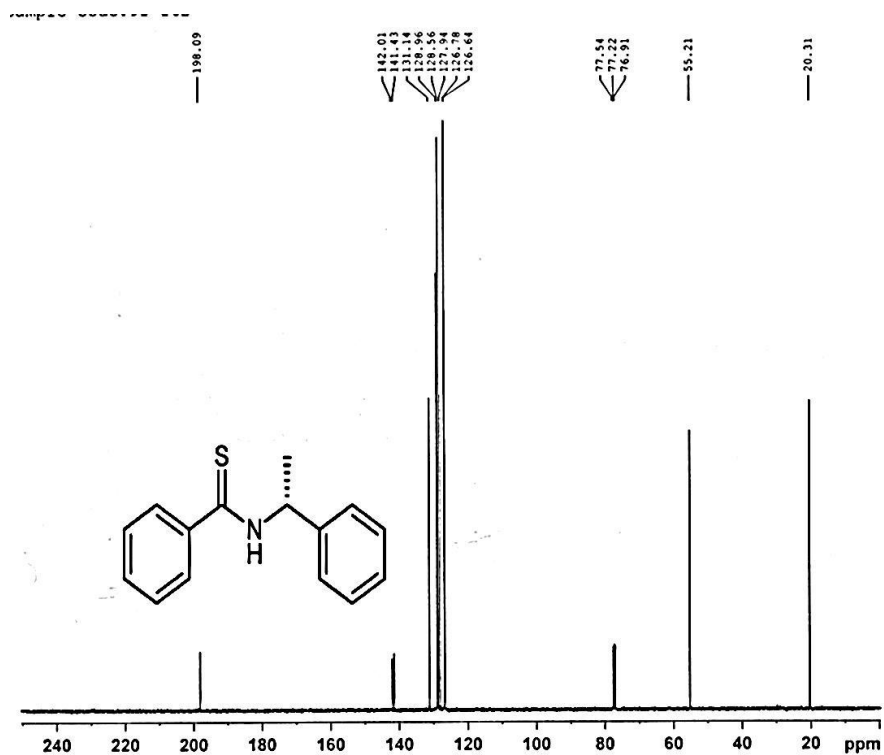
<sup>13</sup>C-NMR **30**



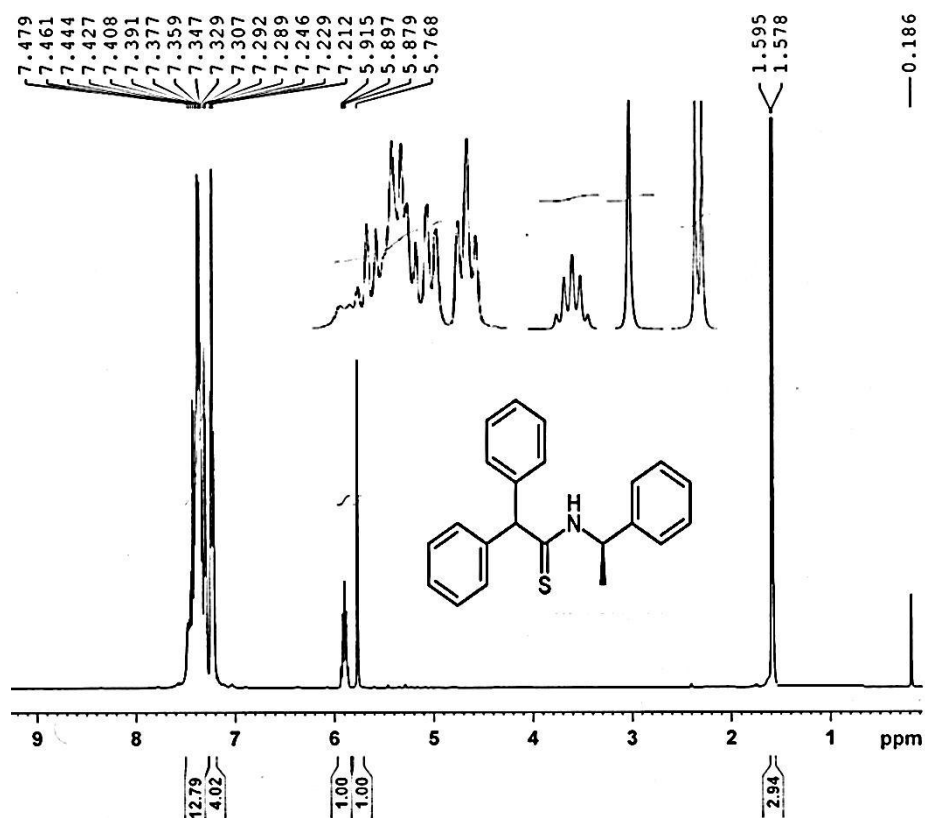
<sup>1</sup>H-NMR **3p**



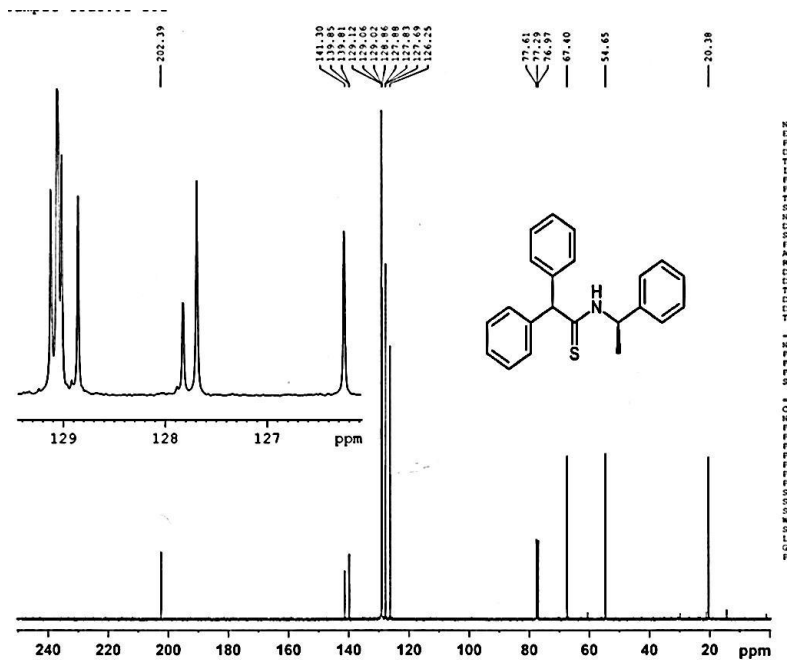
<sup>13</sup>C-NMR 3p



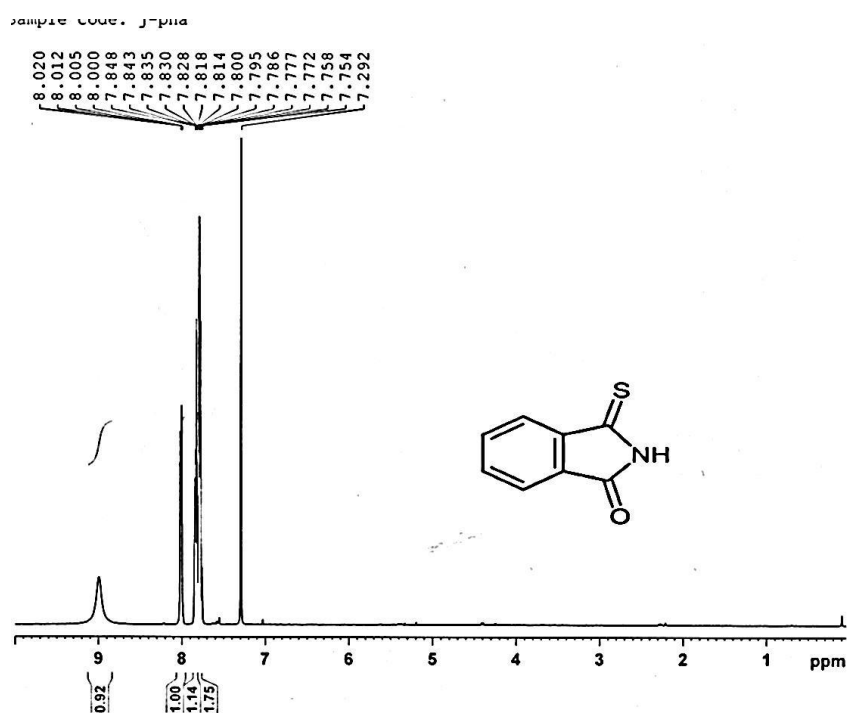
<sup>13</sup>H-NMR 3q



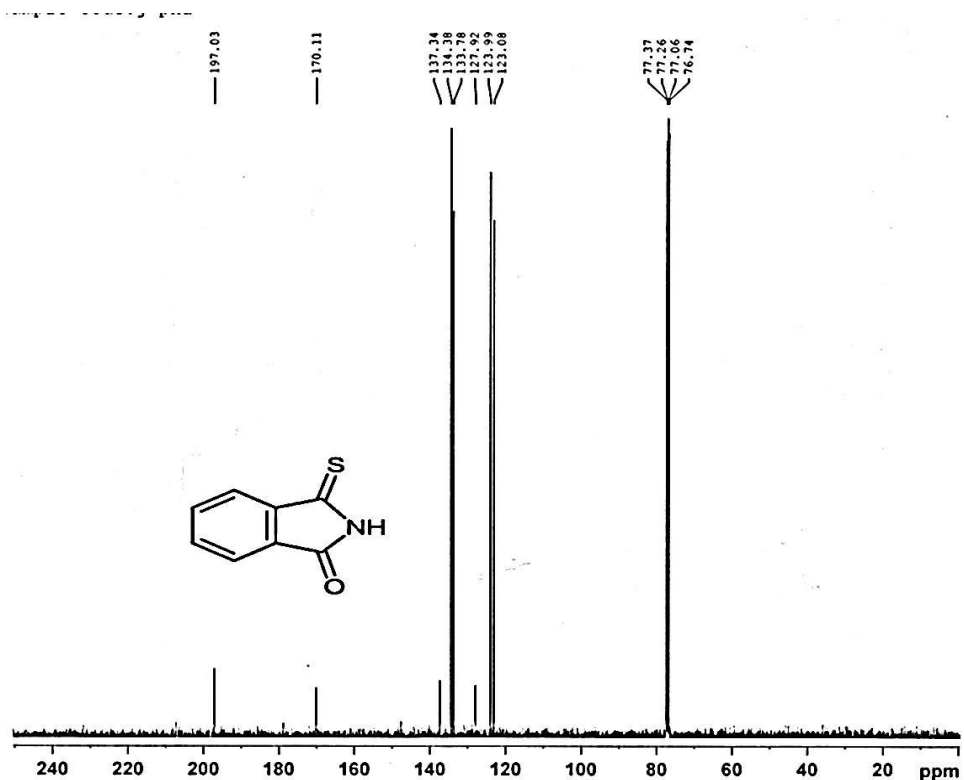
<sup>13</sup>C-NMR **3q**



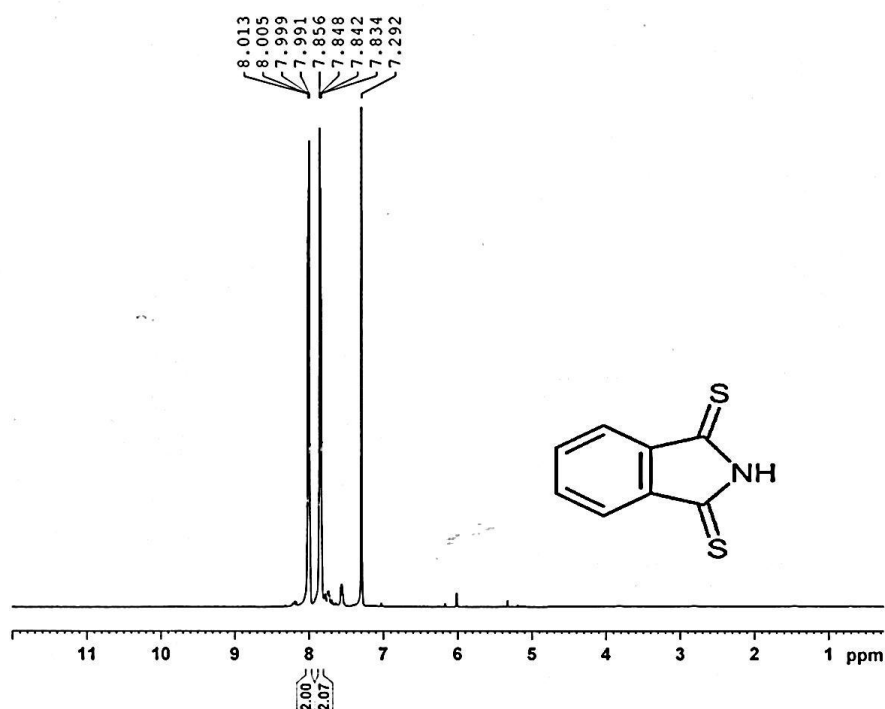
<sup>1</sup>H-NMR **4**



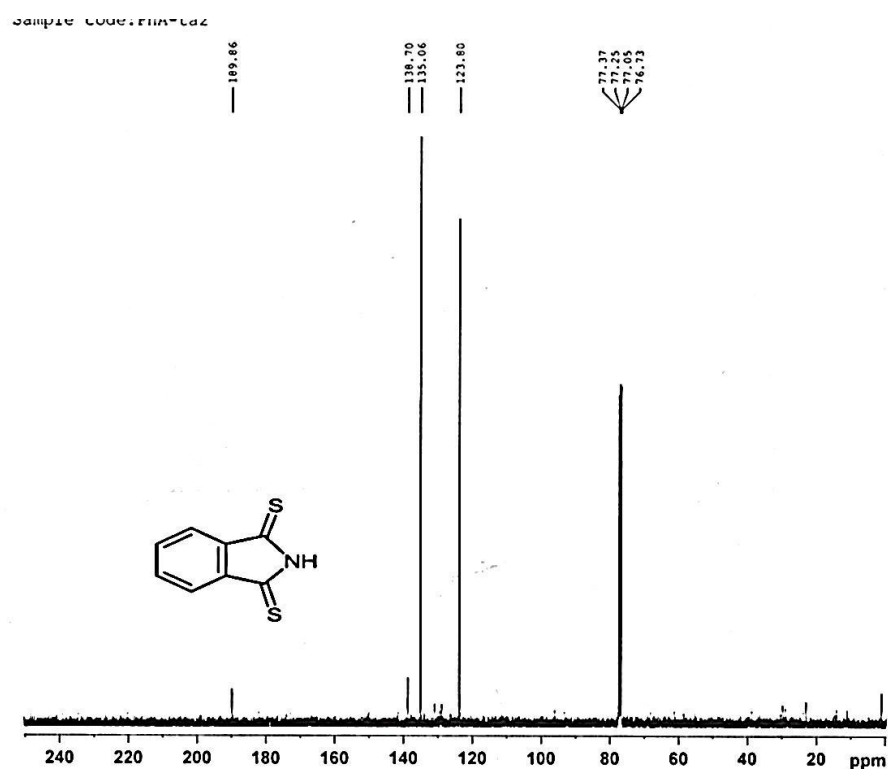
#### $^{13}\text{C}$ -NMR 4



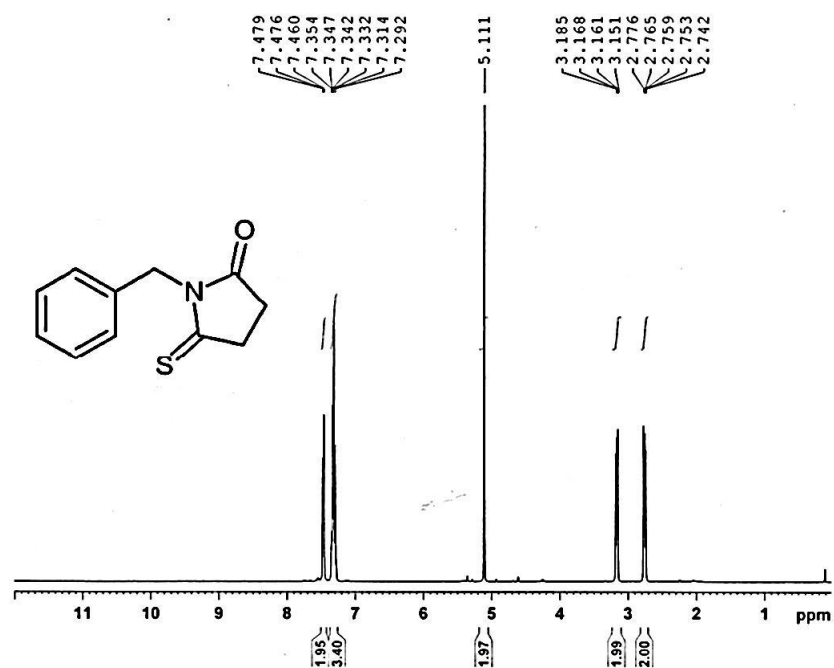
#### $^1\text{H}$ -NMR 5



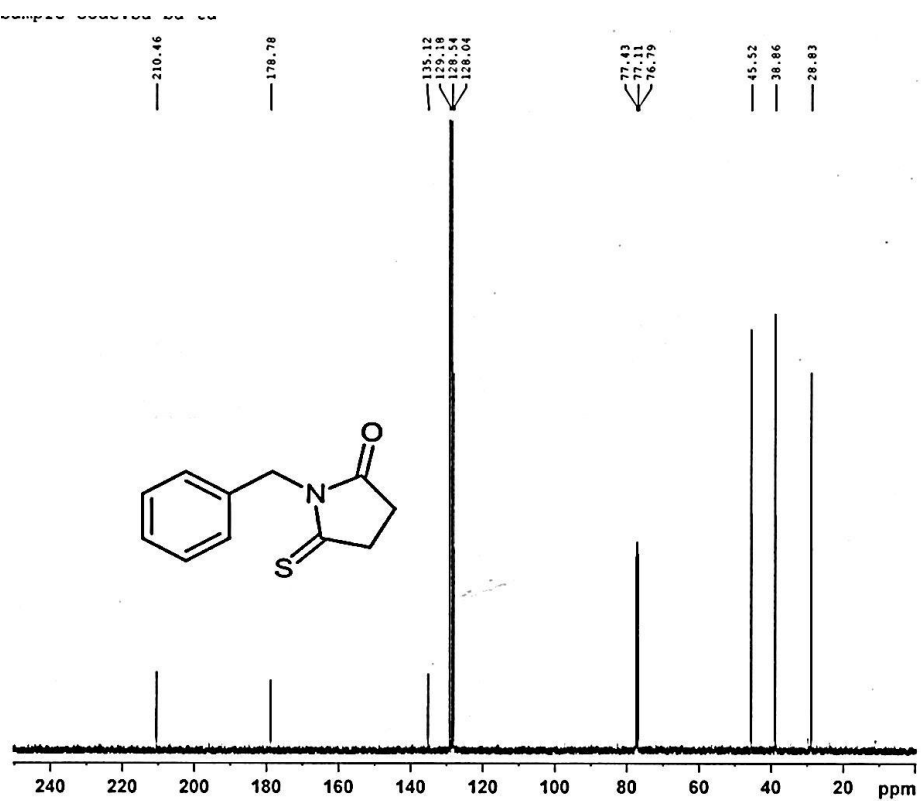
### <sup>13</sup>C-NMR 5



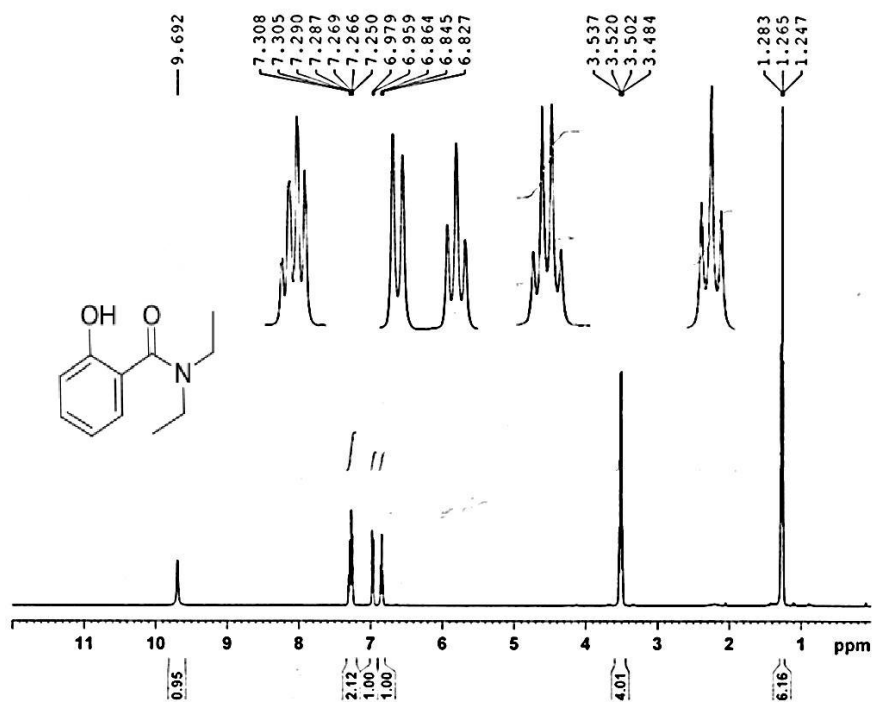
### <sup>1</sup>H-NMR 6



<sup>13</sup>C-NMR 6



# <sup>1</sup>H-NMR **7b**



# <sup>13</sup>C-NMR of compound **7b**

