

## Supplementary Material

### Synthesis of some novel coumarin-pyrazoline hybrid compounds from 6- and 8-acetyl-7-hydroxy-4-methylcoumarin

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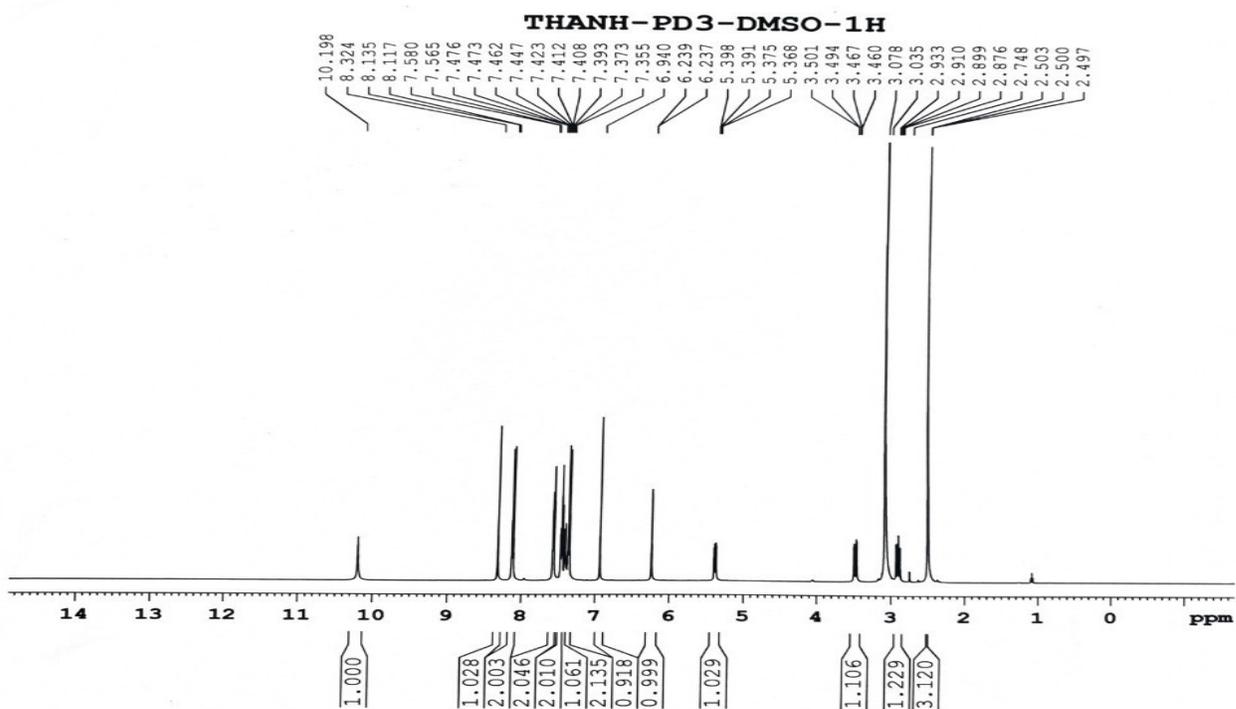
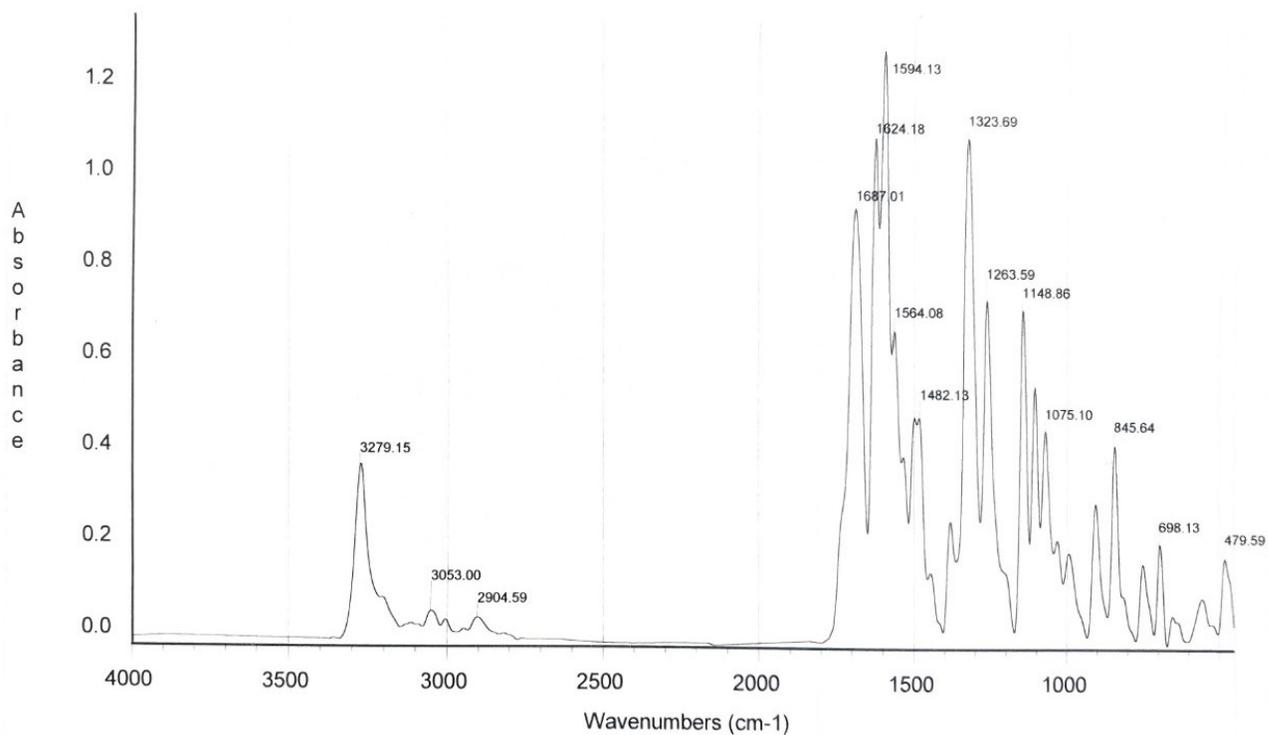
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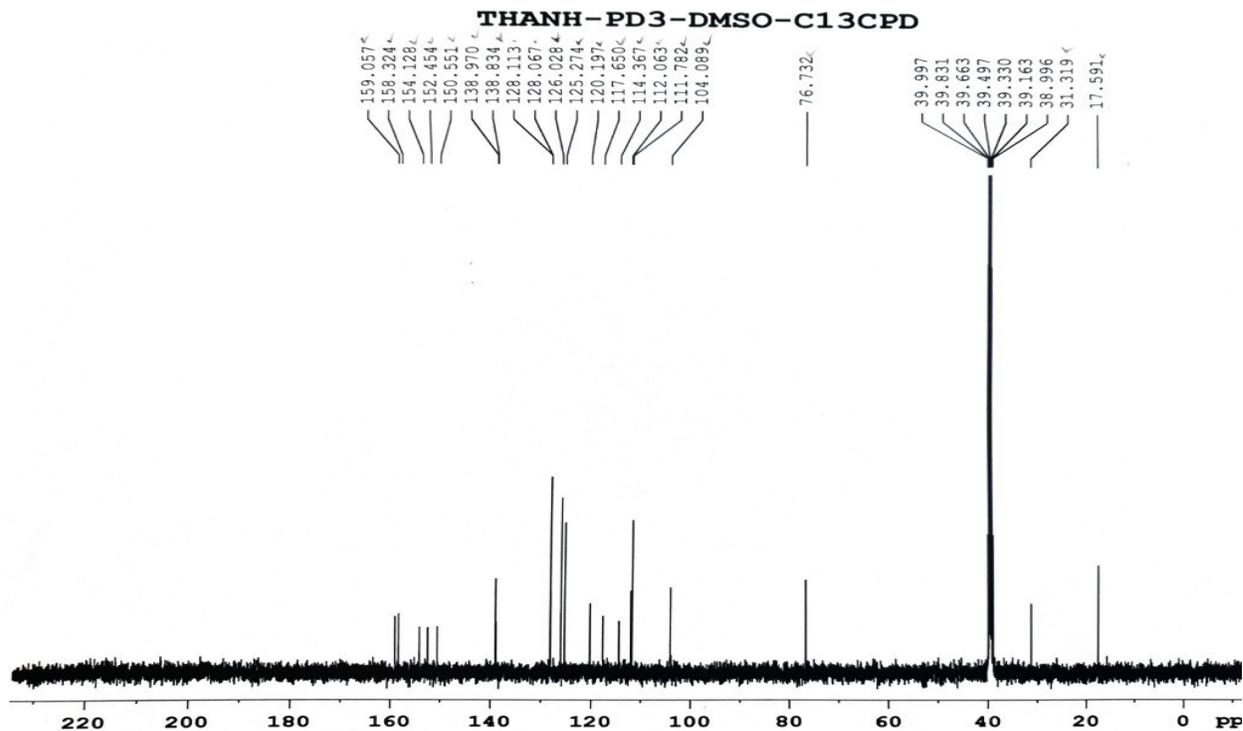
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## 1. Spectra of 6-(5-phenyl-1-(4-nitrophenyl) pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (6a)





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THANH\_PD3\_100729154003

8/2/2010 3:19:53 PM

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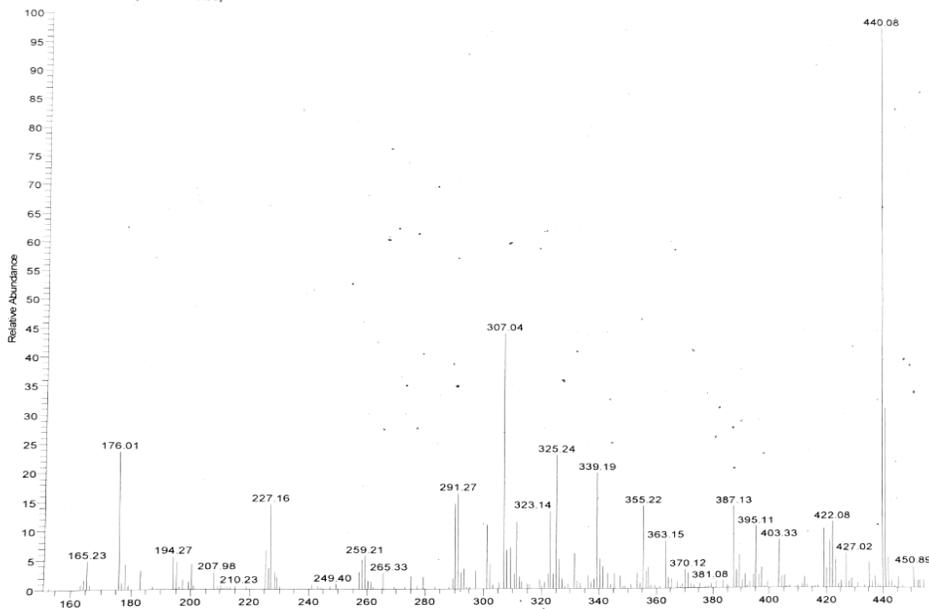
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Method: M-H

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Date: 2/08/2010

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Mass Spectrometer

LTO Orbitrap XL™

Thermo SCIENTIFIC company

Resolution: >60 000 Da

Sensitivity: 10<sup>11</sup>

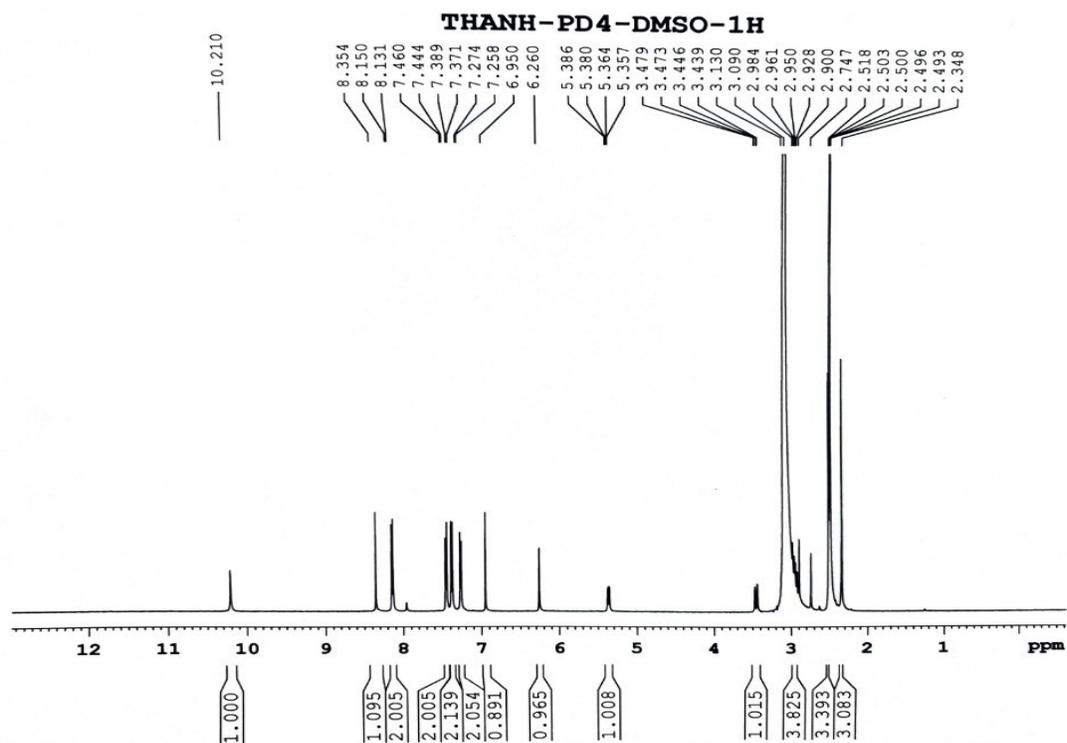
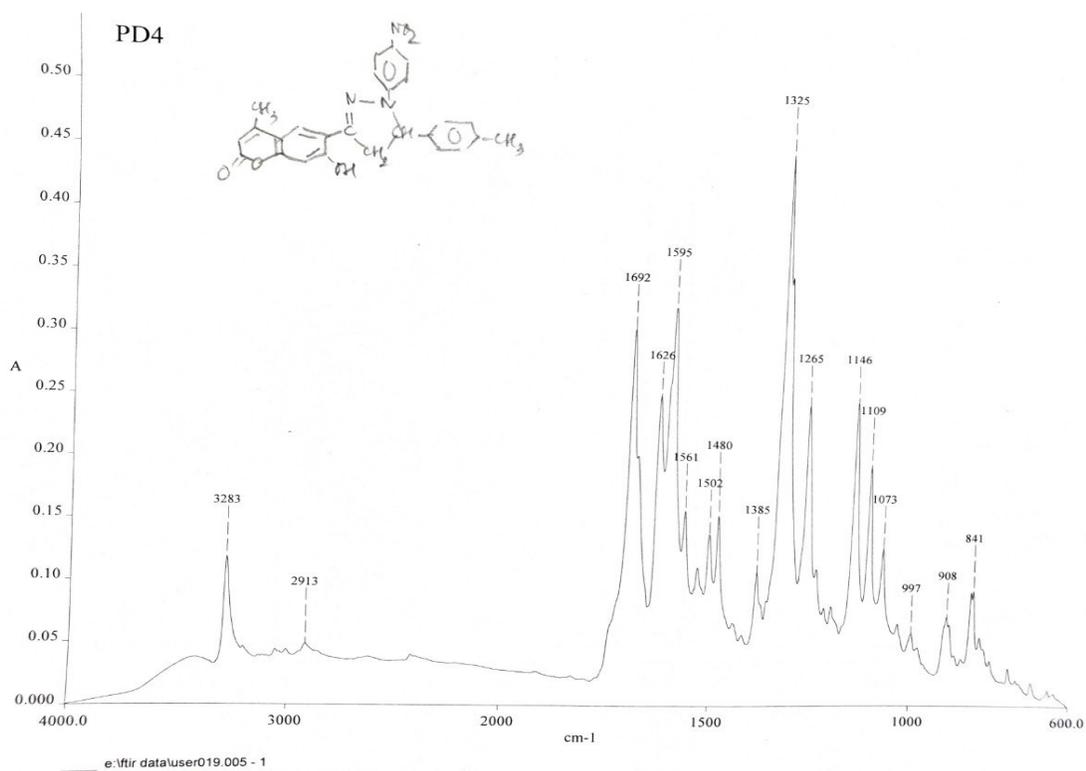
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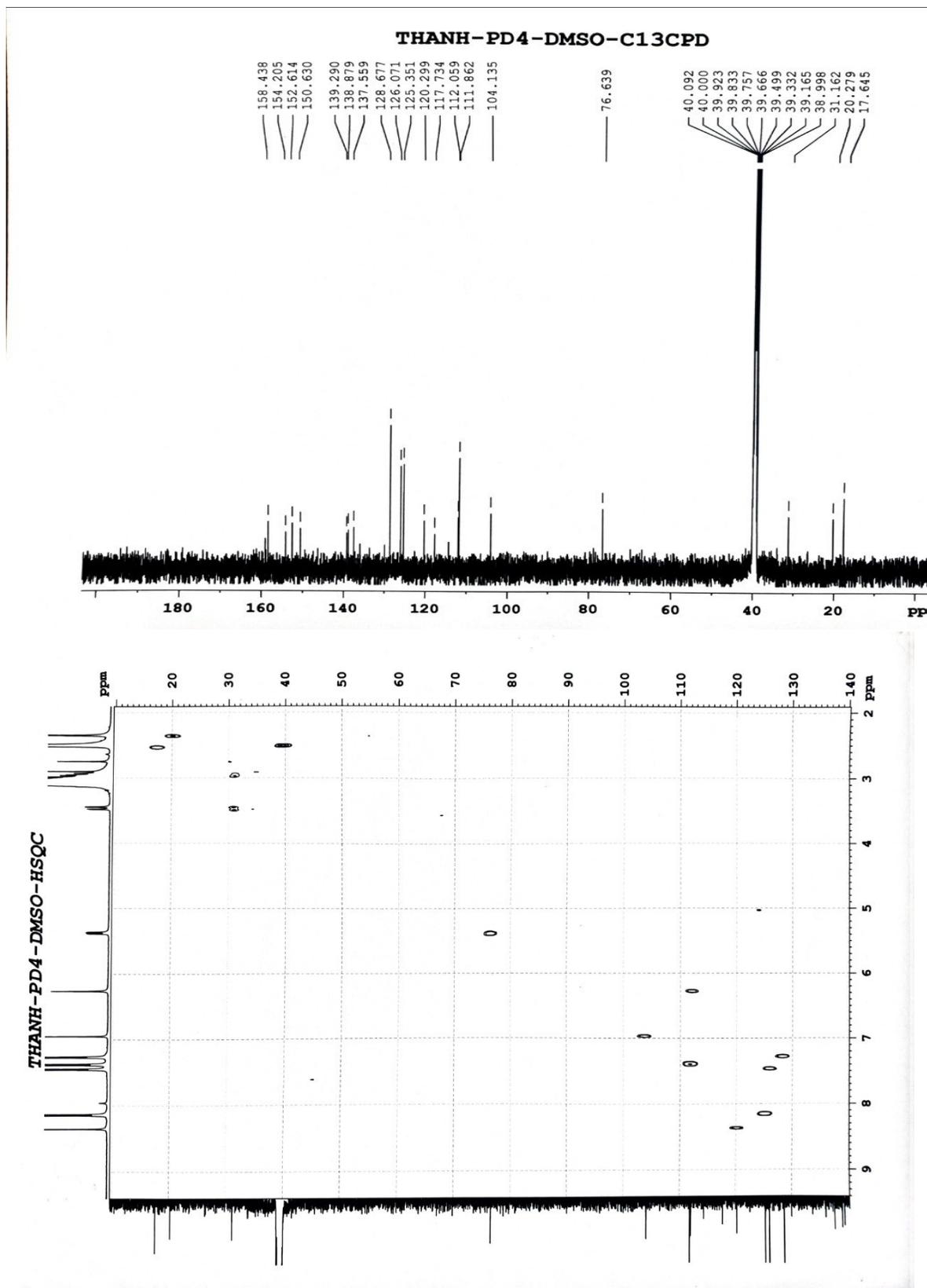
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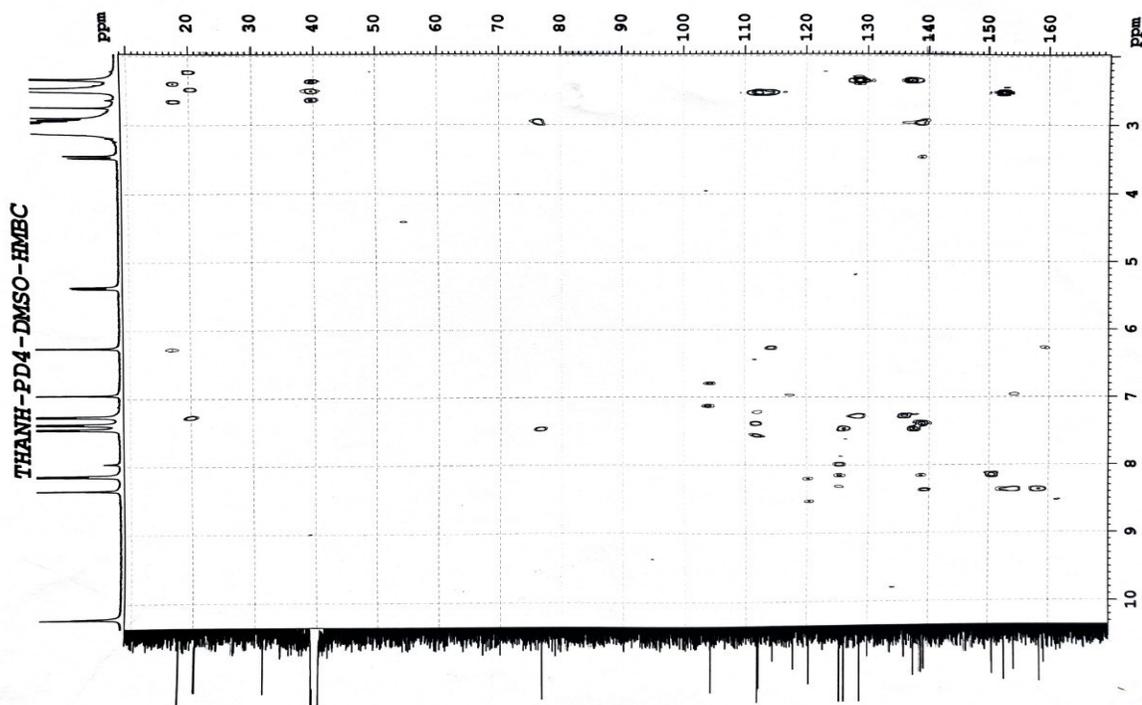
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Mobile: 0948 119 043

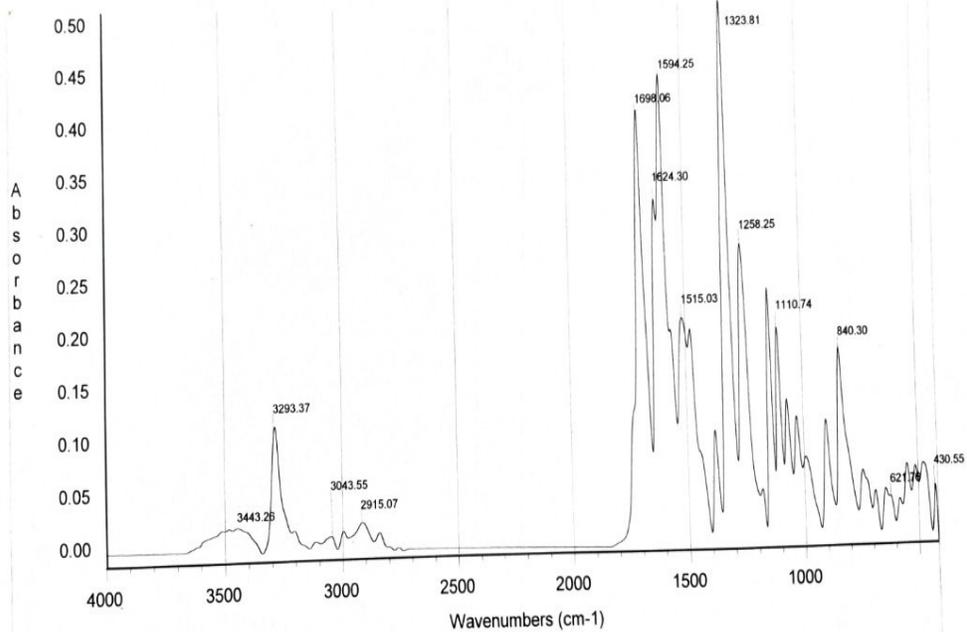
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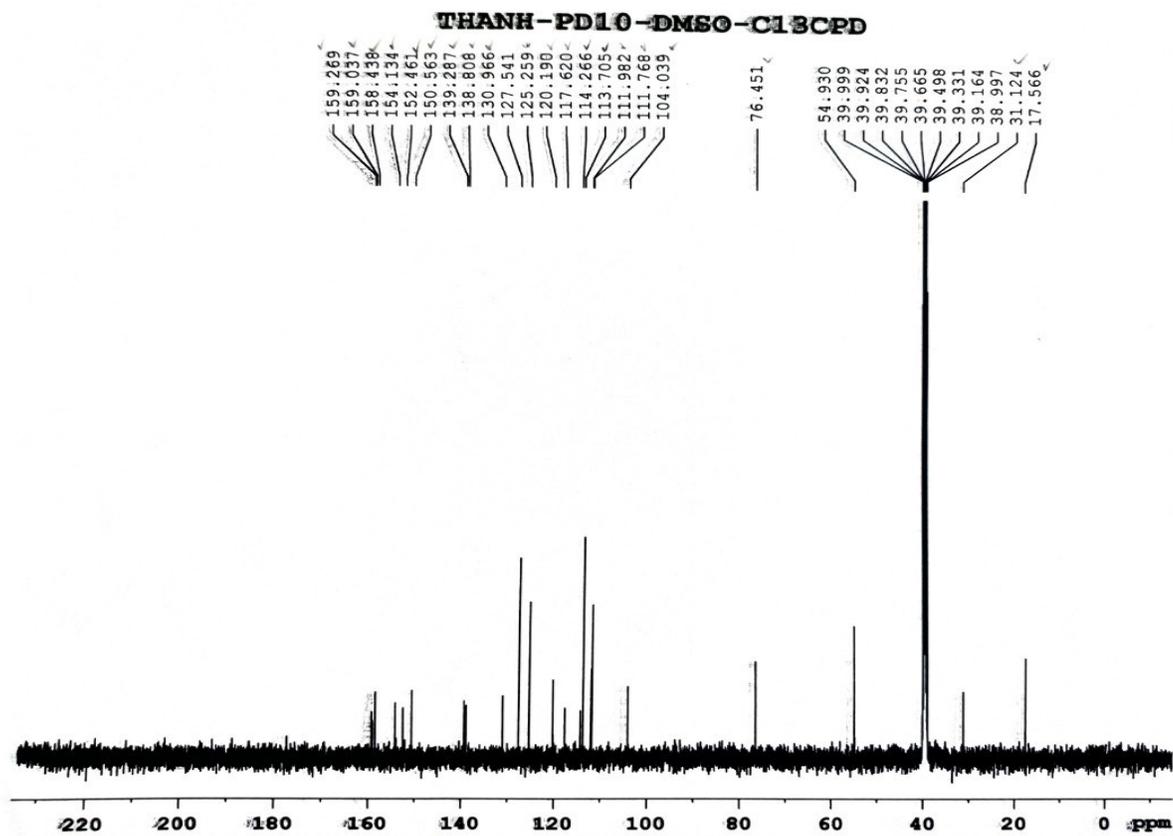
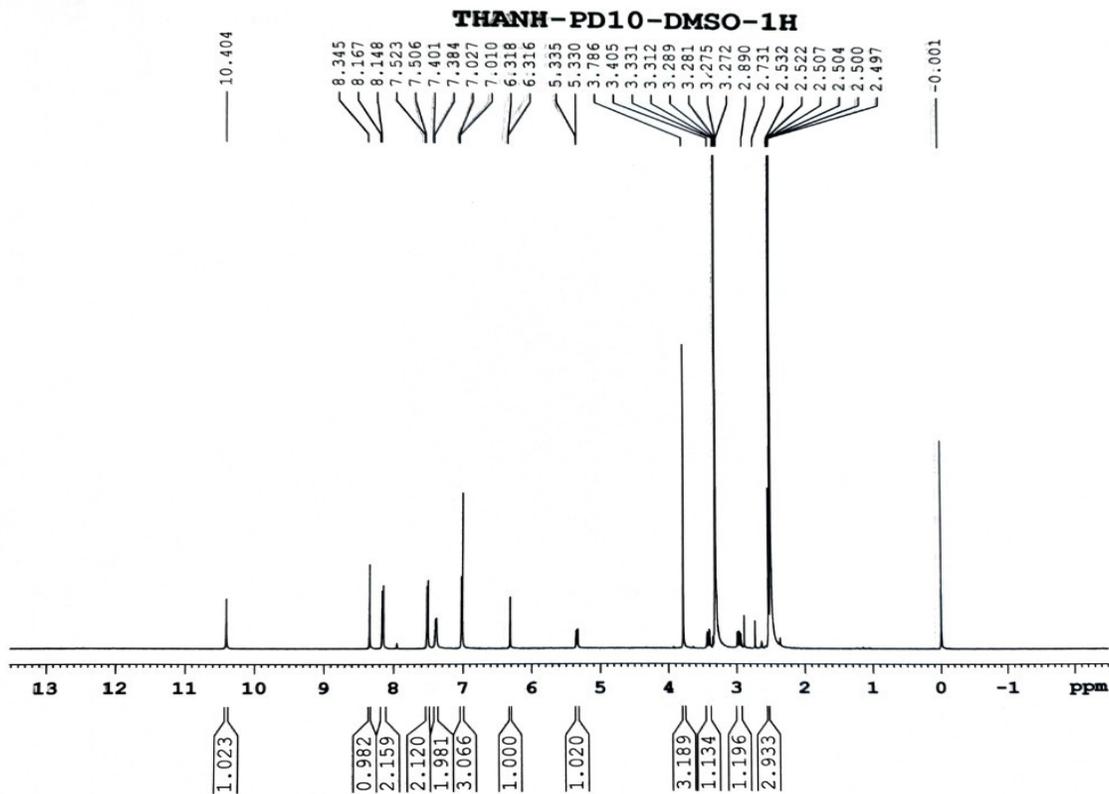
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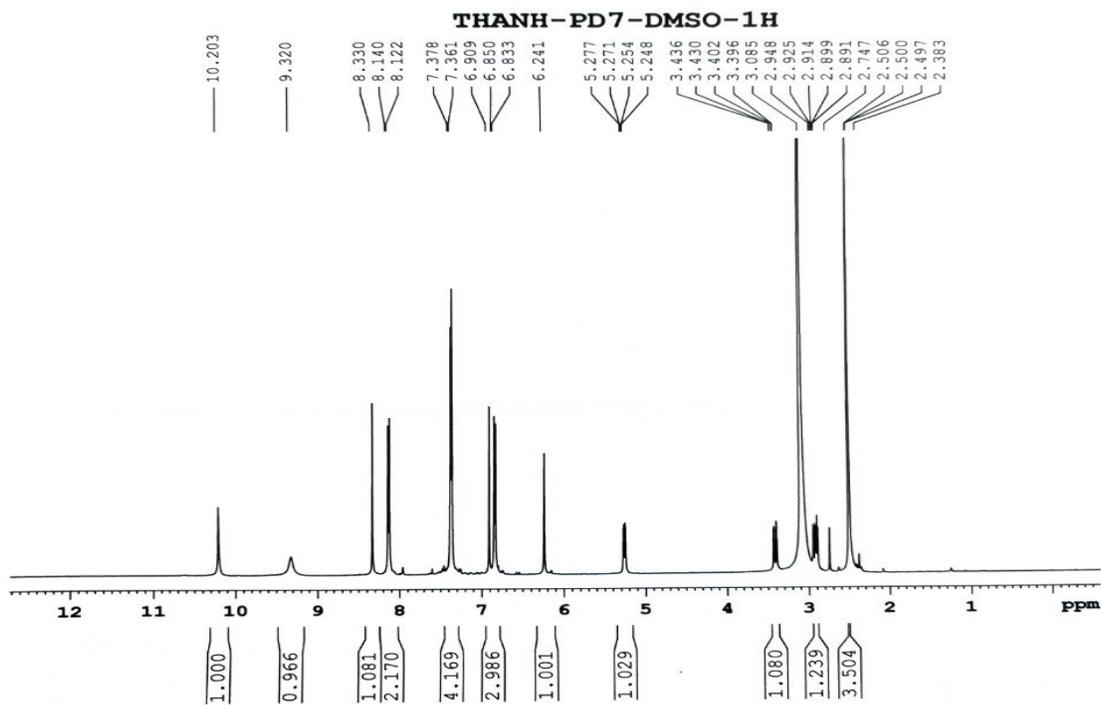
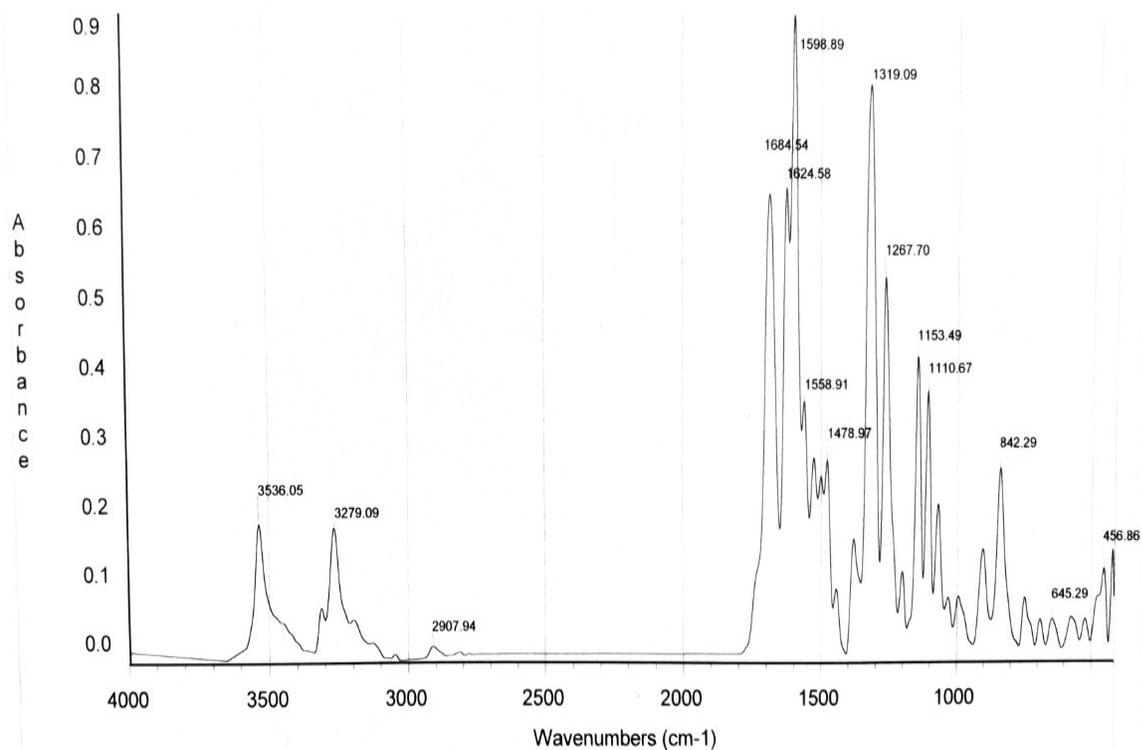


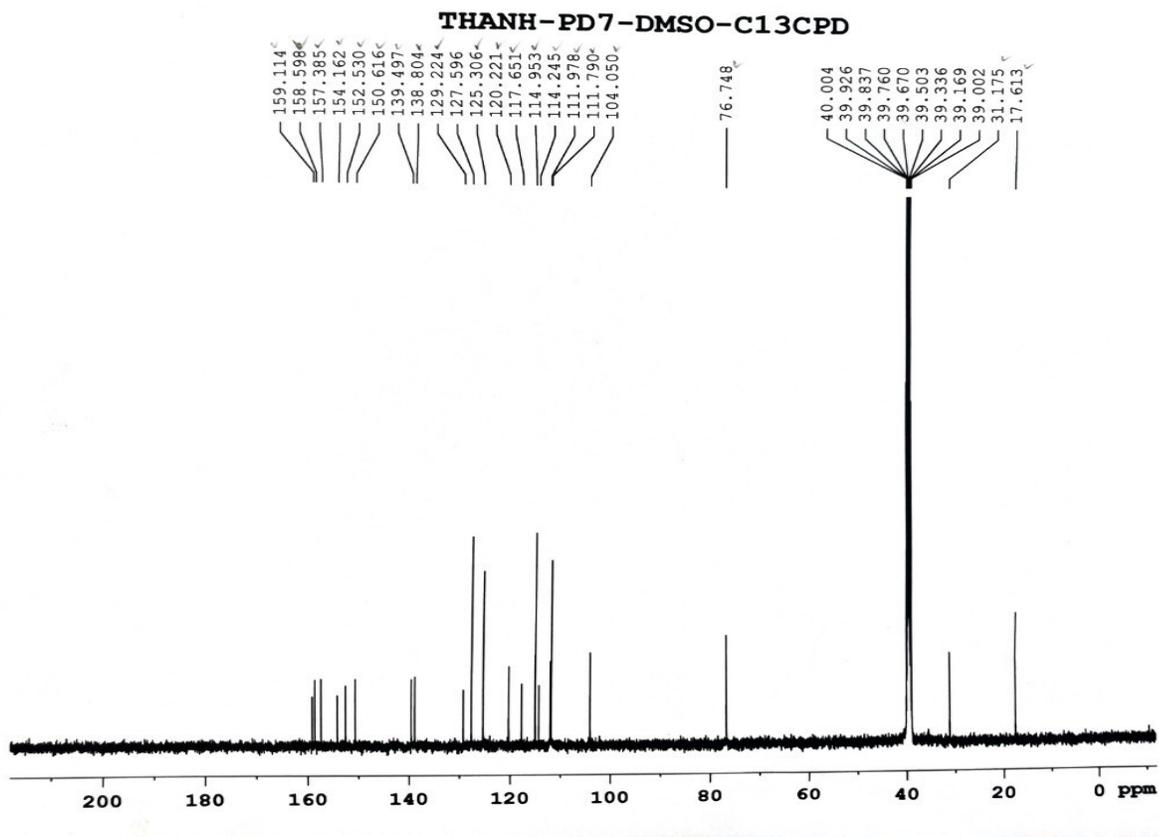
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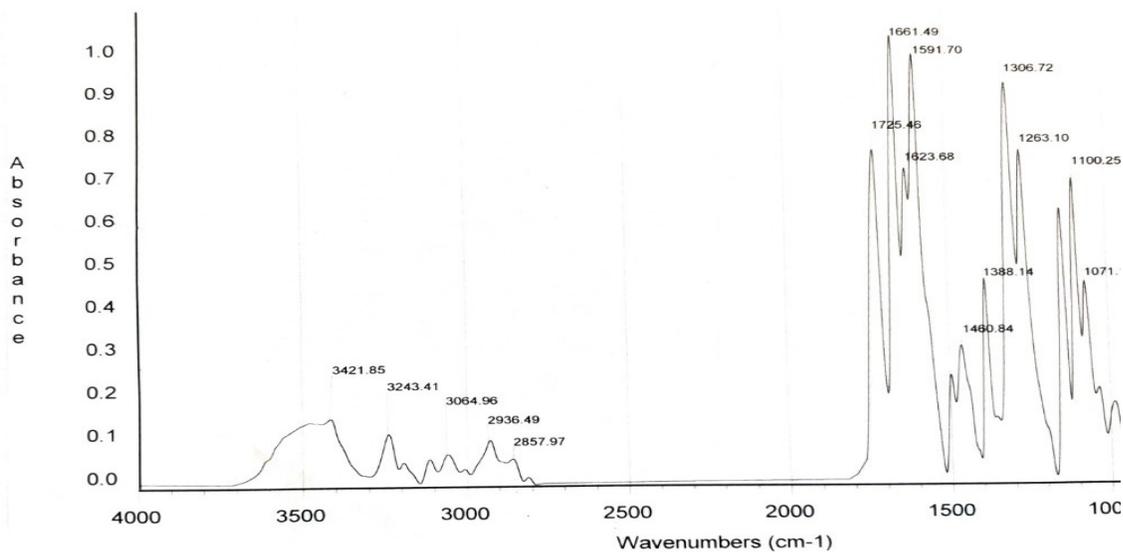


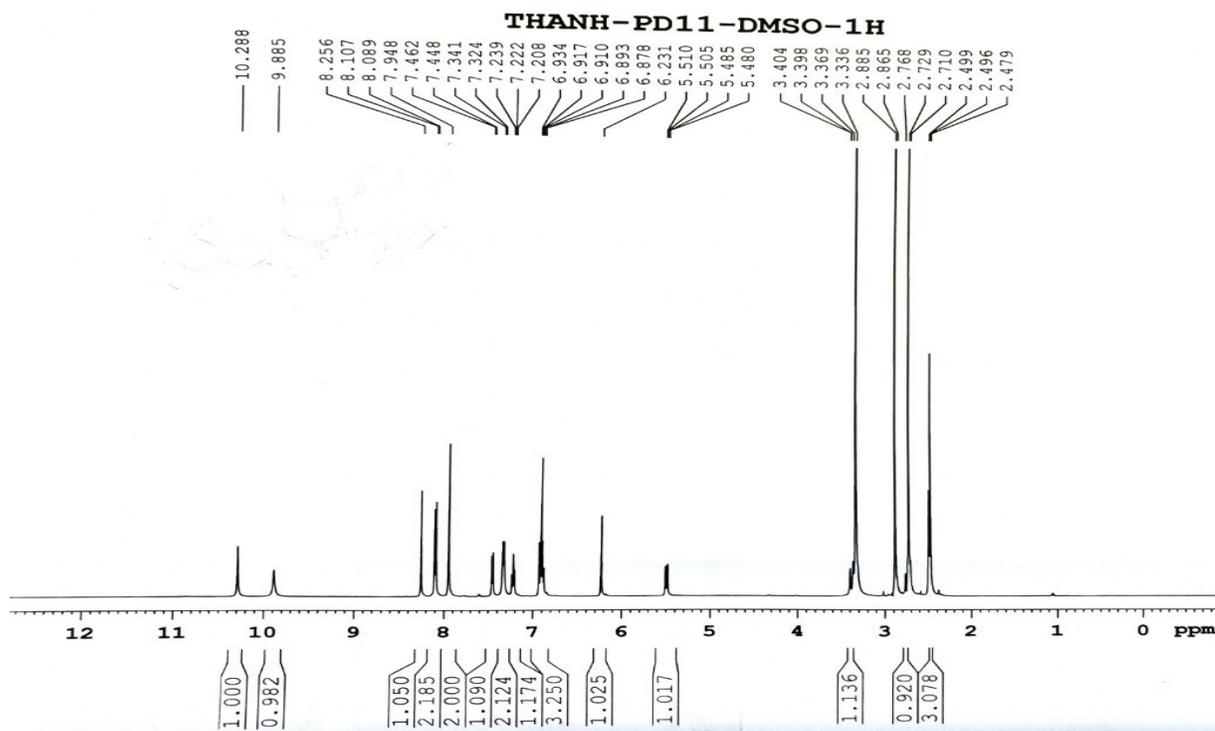
## 4. Spectra of 6-(5-(4-hydroxyphenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (6d)





5. Spectra of 6-(5-(2-hydroxyphenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (6e)





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8/2/2010 3:25:40 PM

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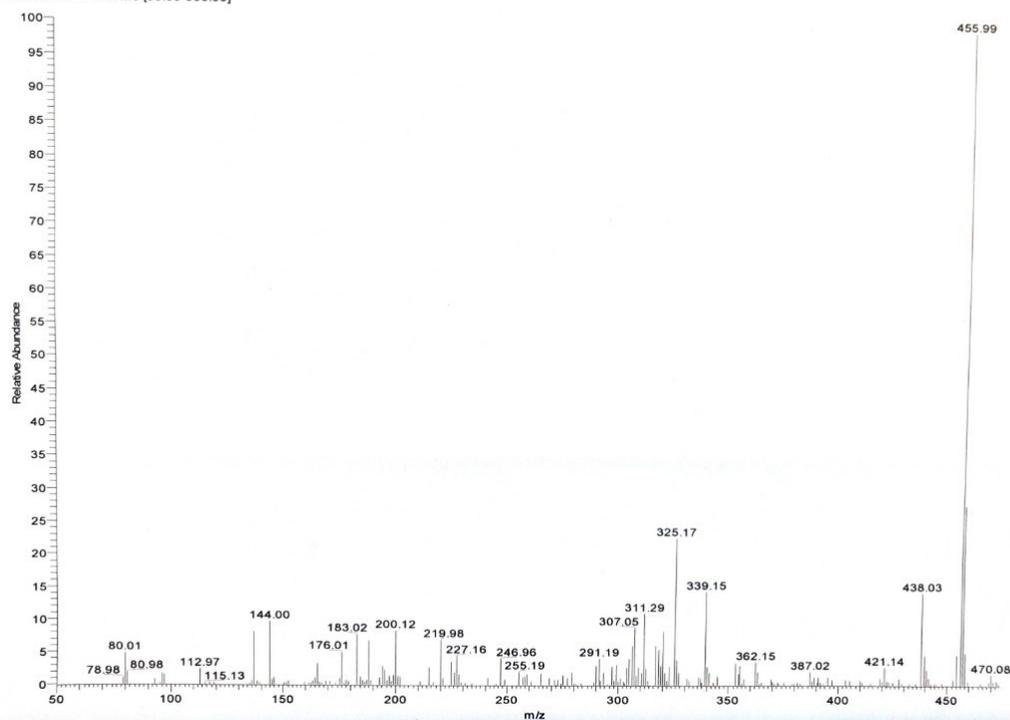
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Mass Spectro

LTO Orbitrap

Thermo SCIENTIFIC

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Sensitivity: 10<sup>-14</sup>

Tandem: n >= 15

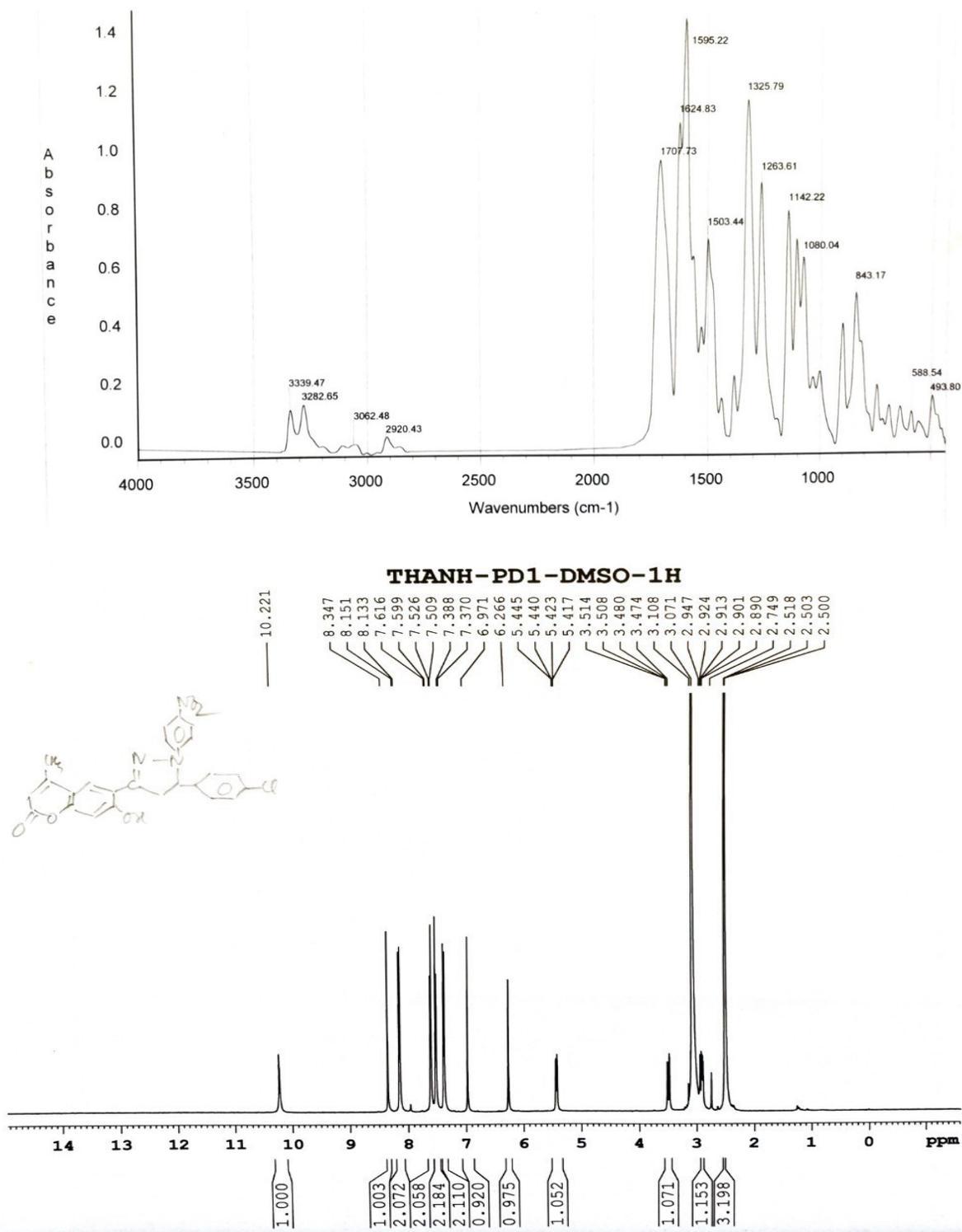
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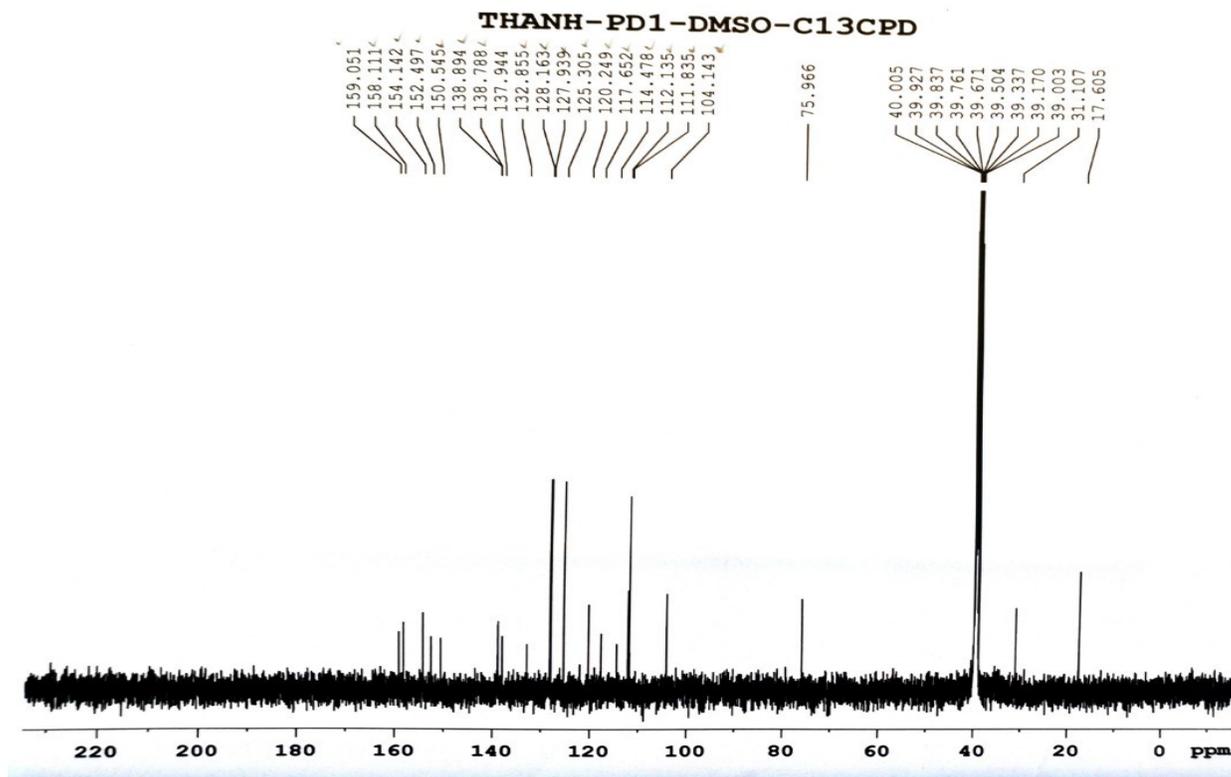
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Mobile: 0948 119 043

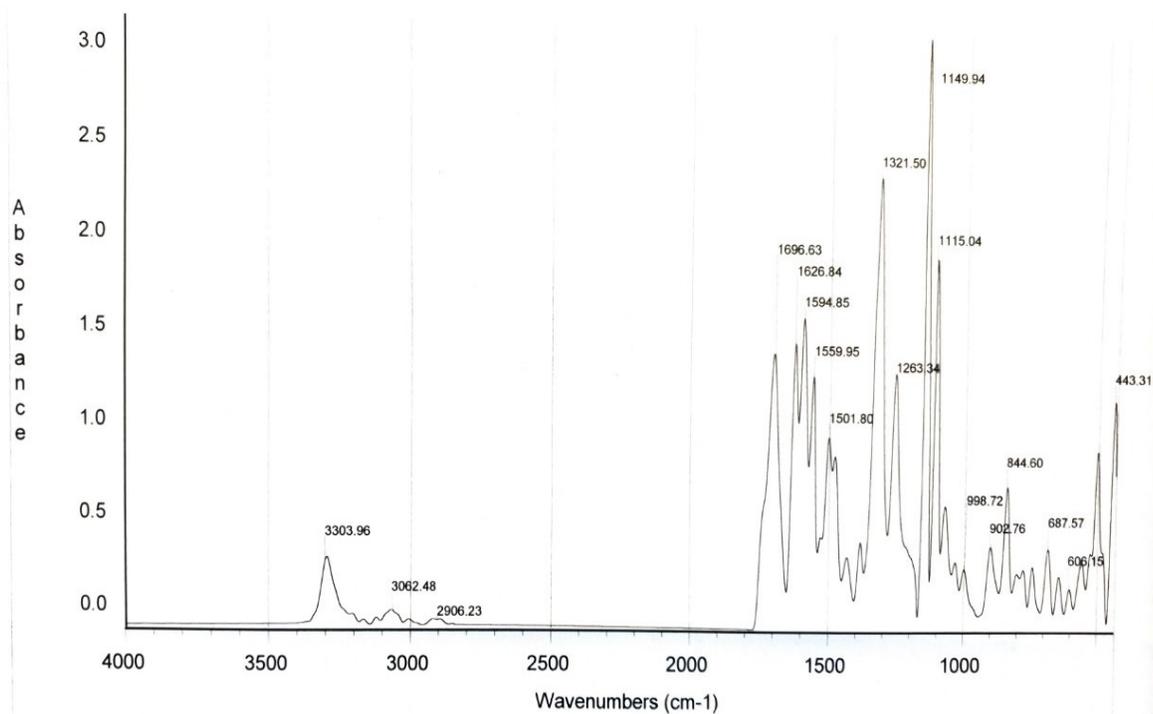
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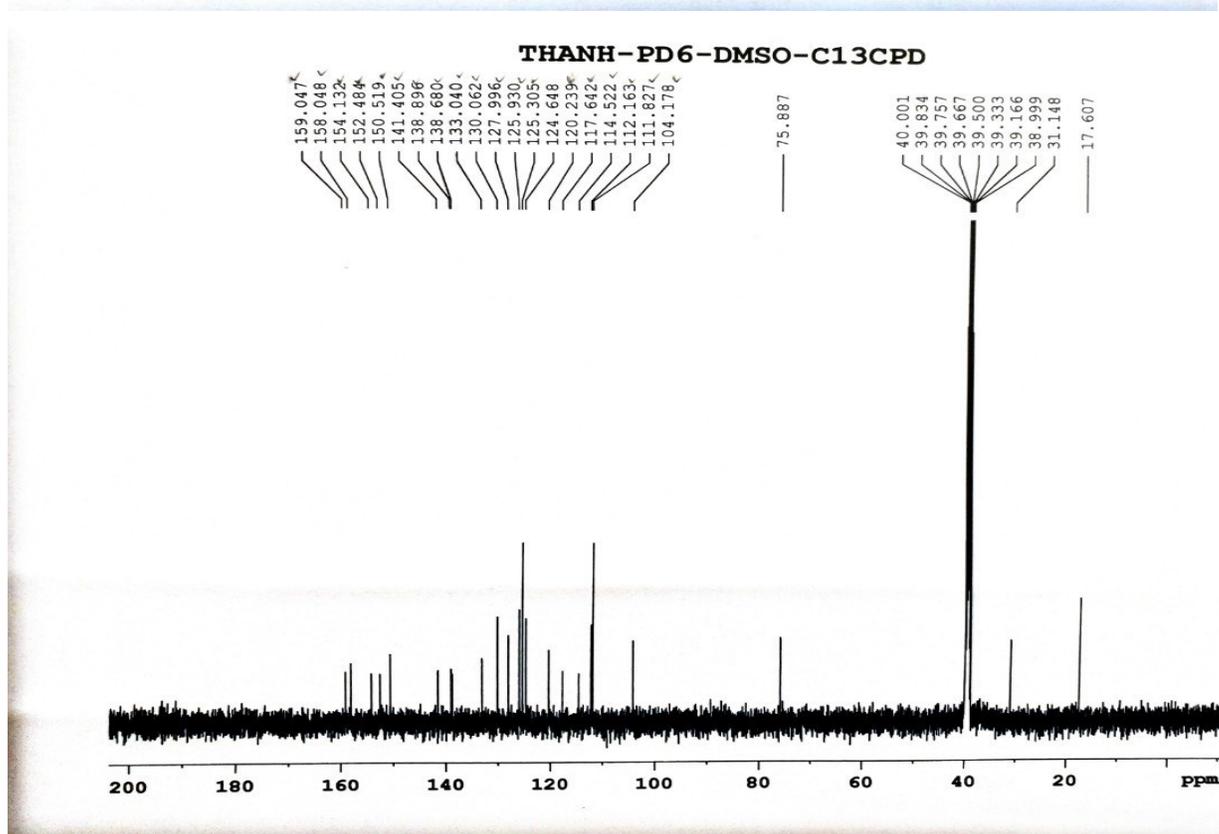
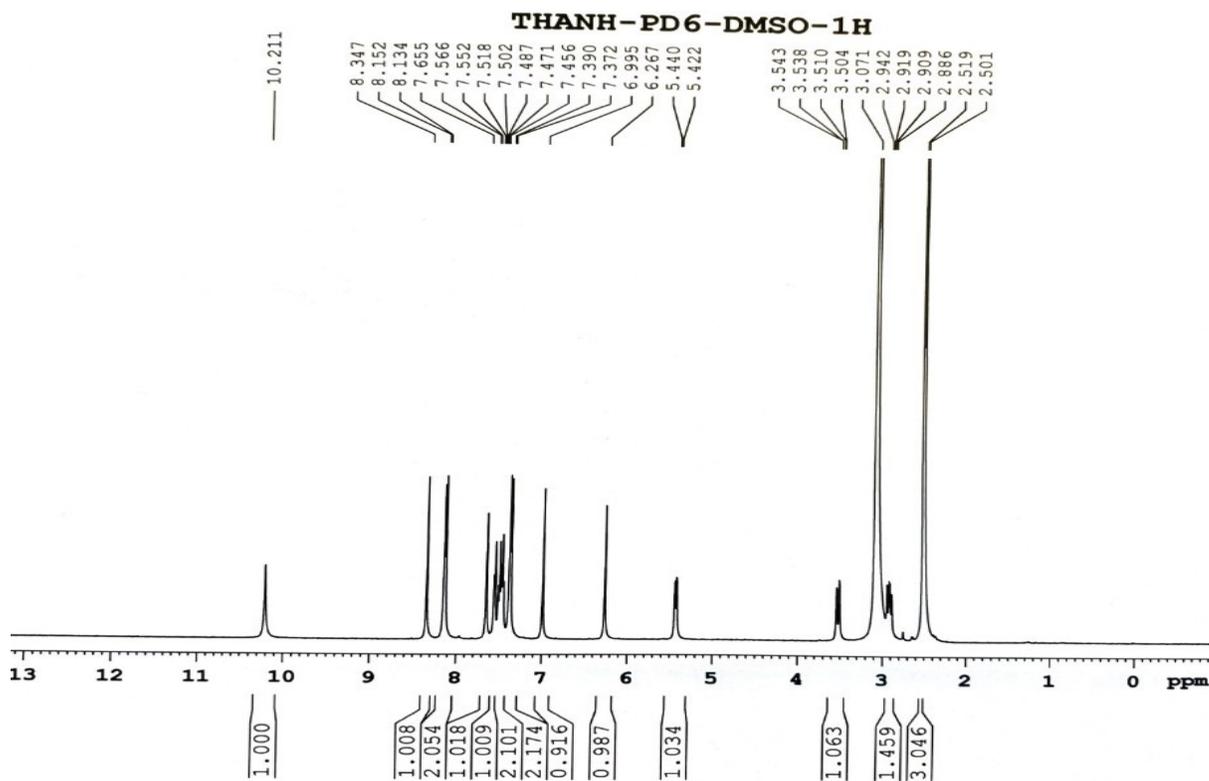
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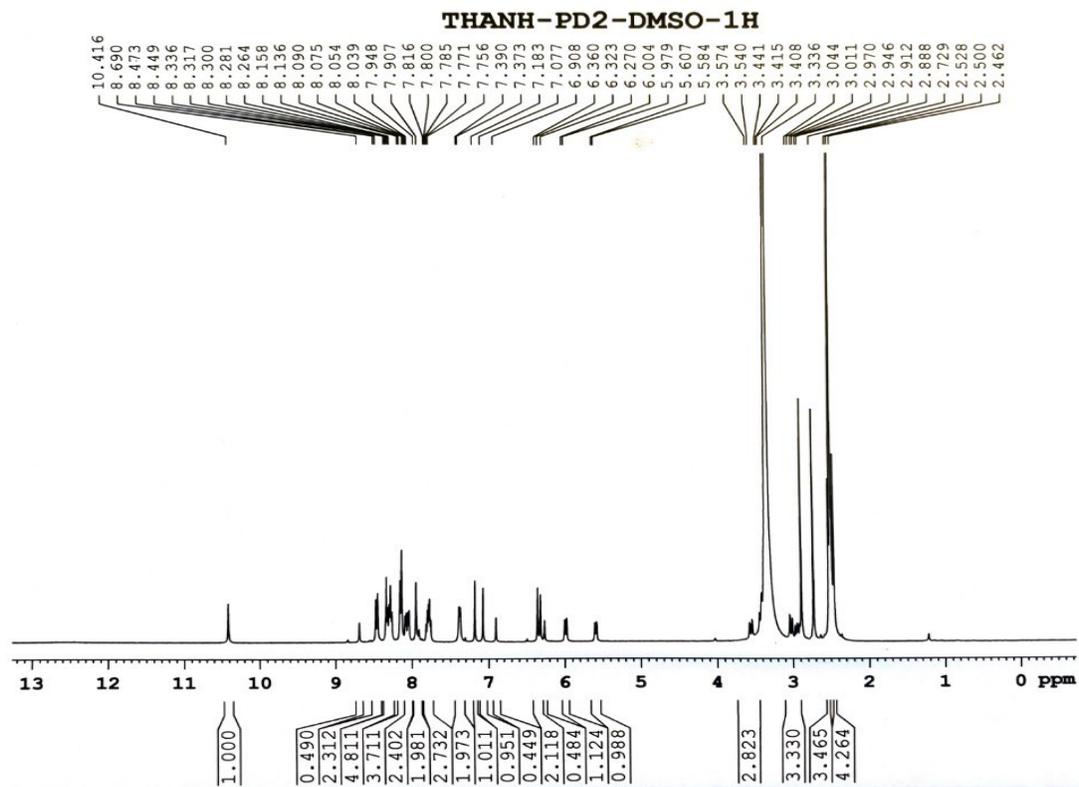
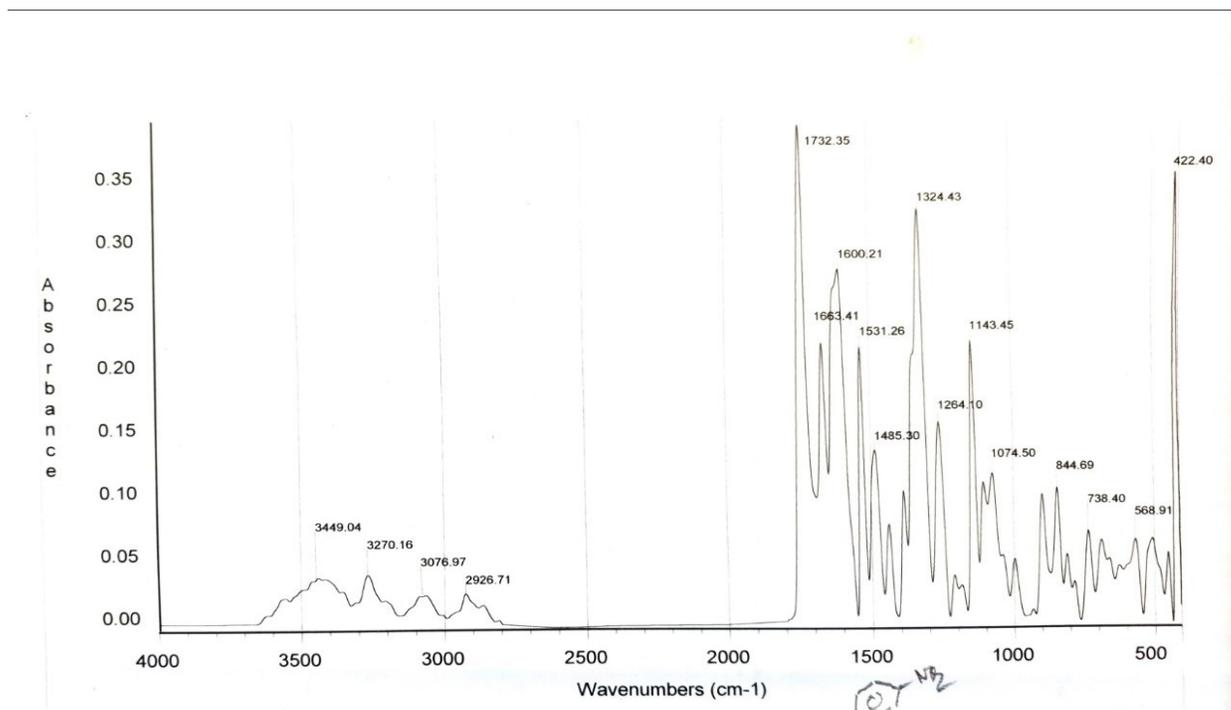


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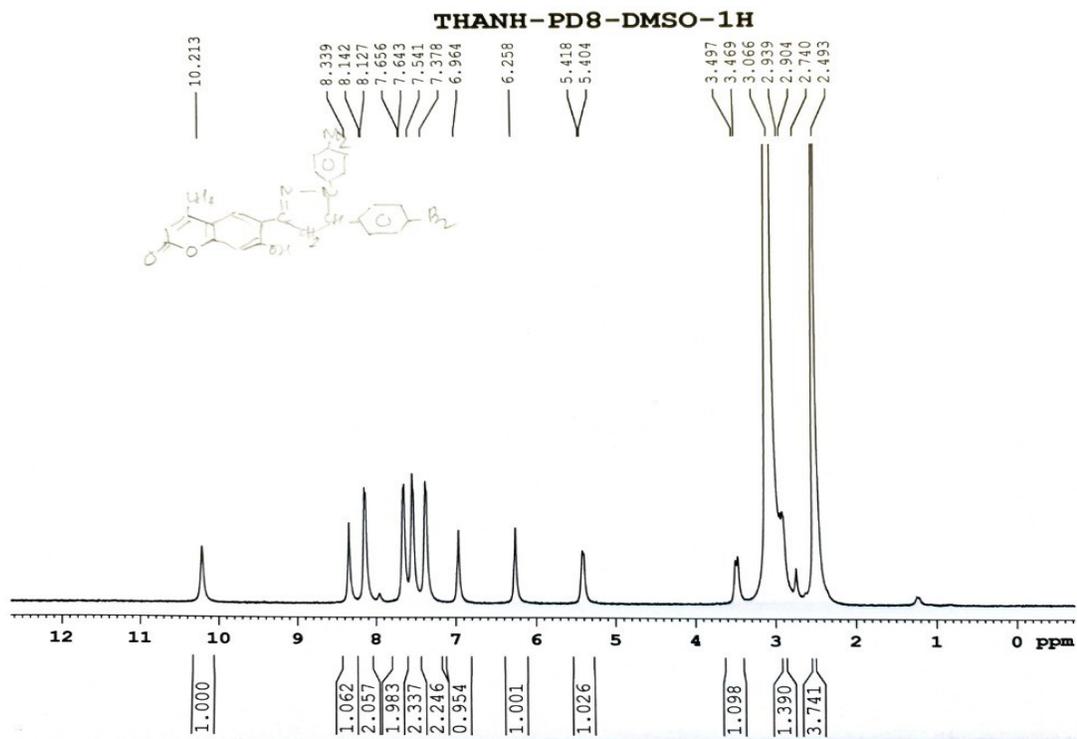
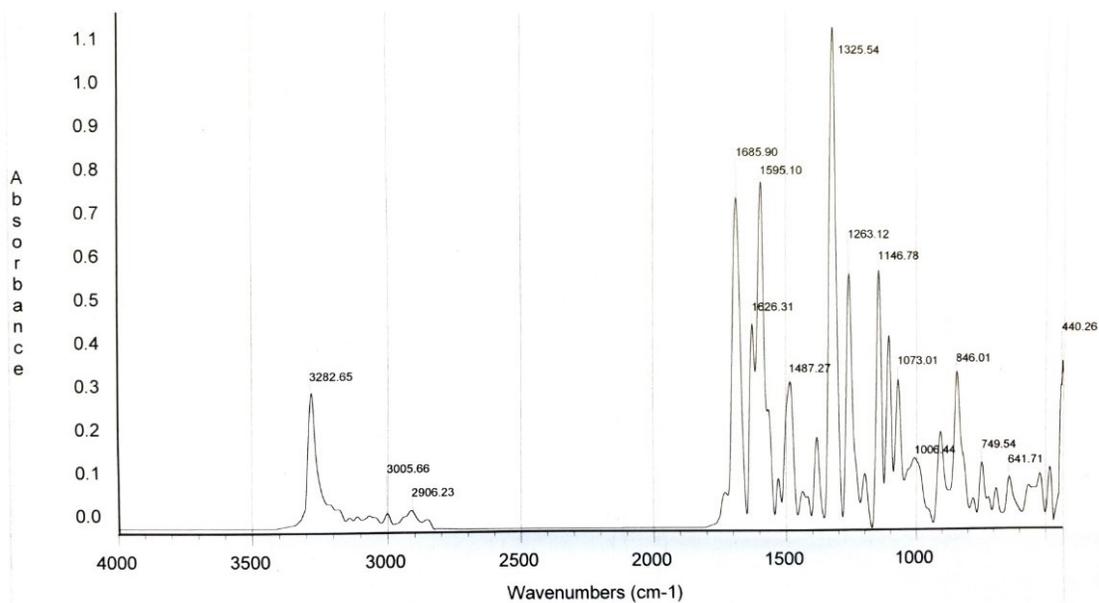


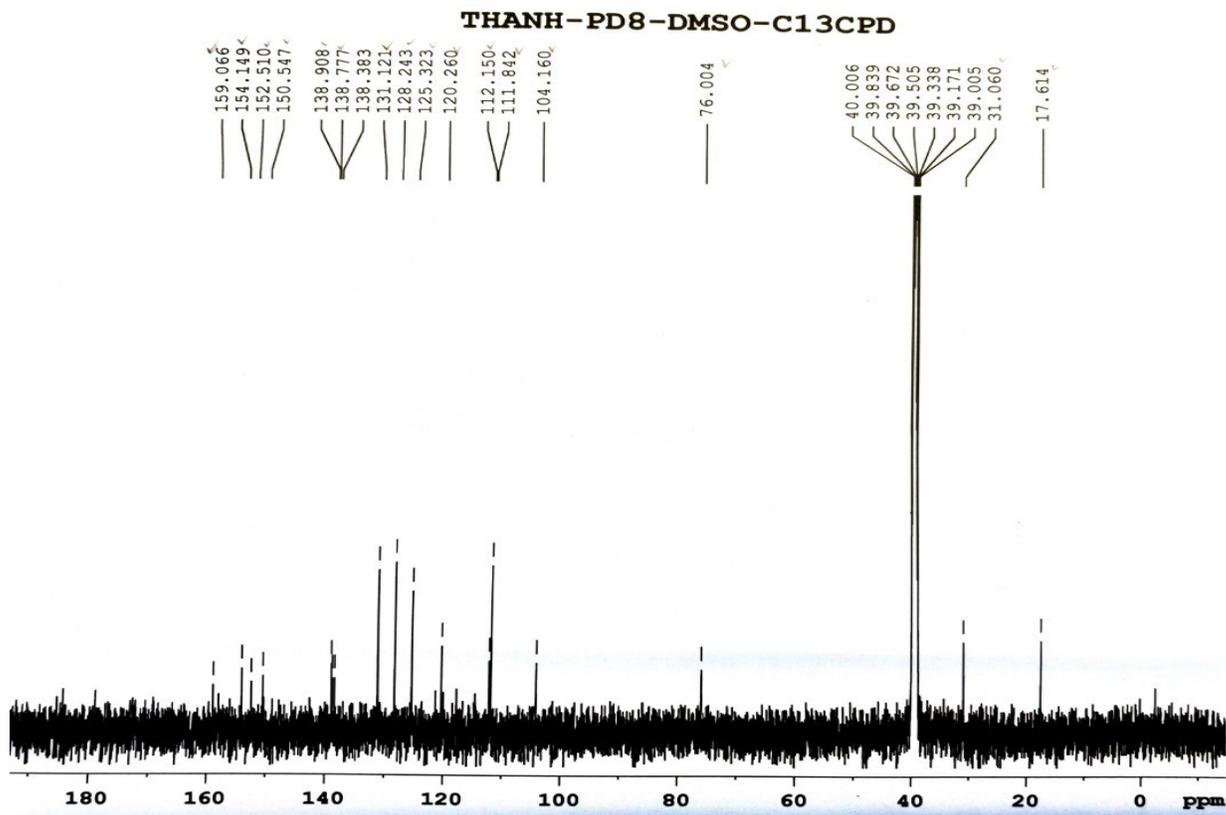


8. Spectra of 6-(5-(3-nitrophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (6h)



## 9. Spectra of 6-(5-(4-bromophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (6i)





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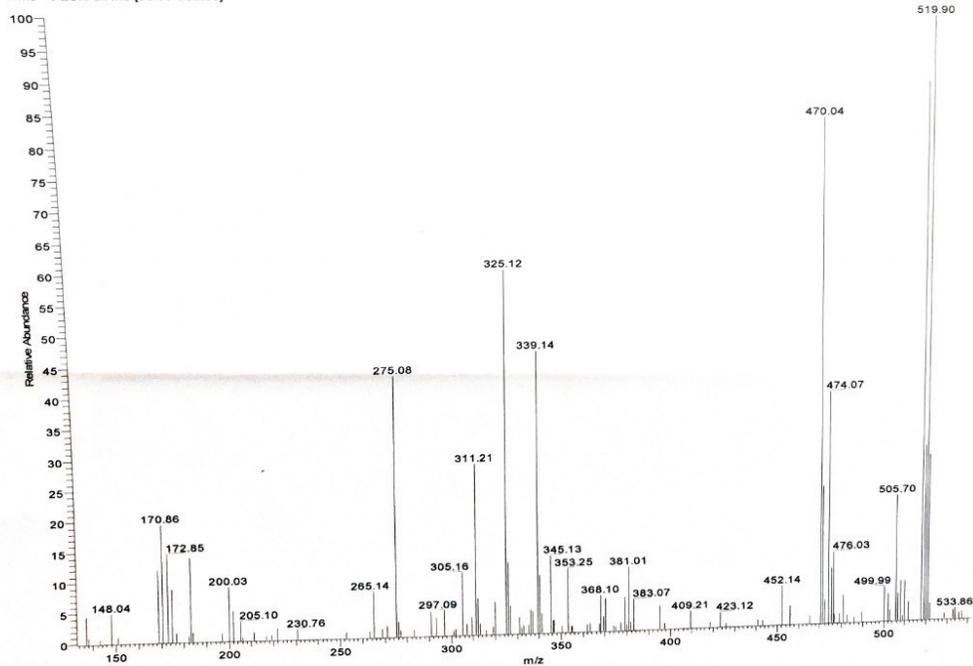
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Method: M-H

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Date: 29/07/2010

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Mass Spectrometer

LTQ Orbitrap XL™

Thermo SCIENTIFIC company

Resolution: >60 000 Dt

Sensitivity: 10<sup>14</sup>

Tandem: n >= 15

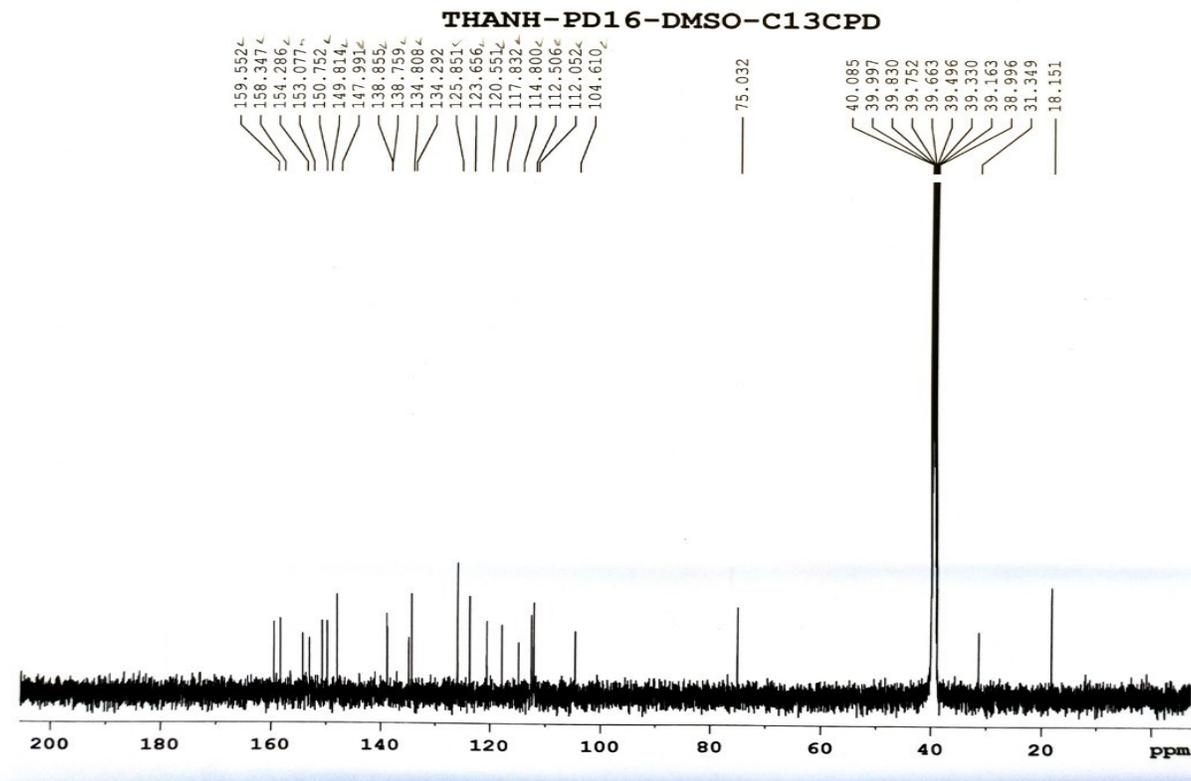
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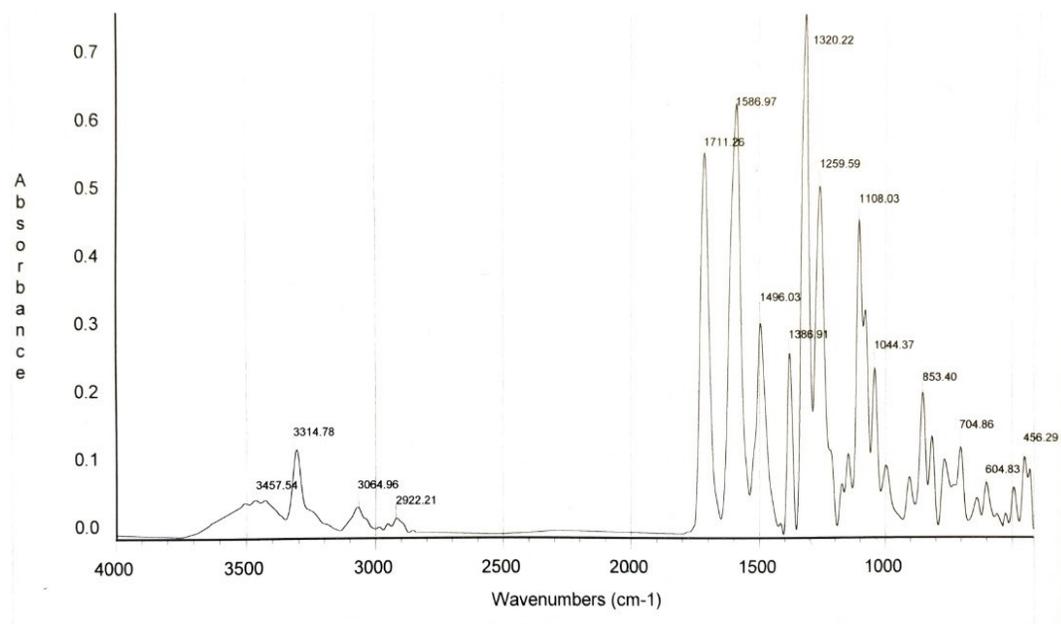
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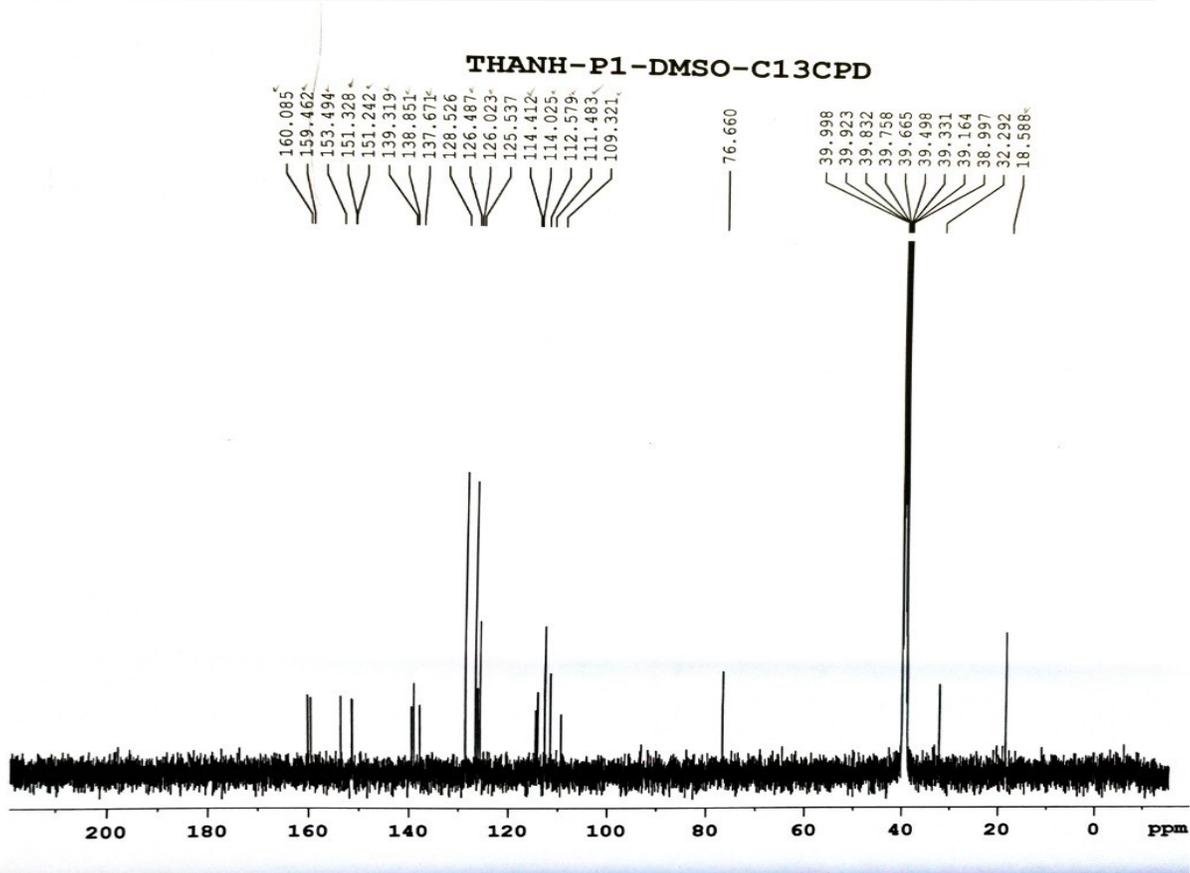
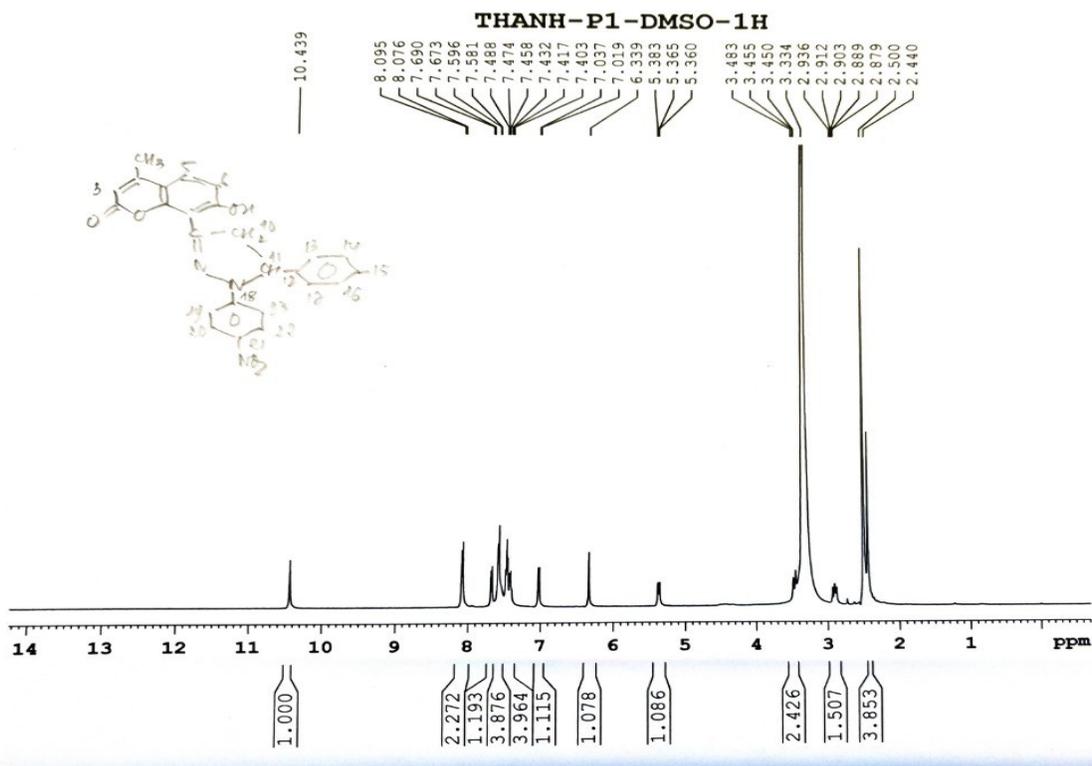
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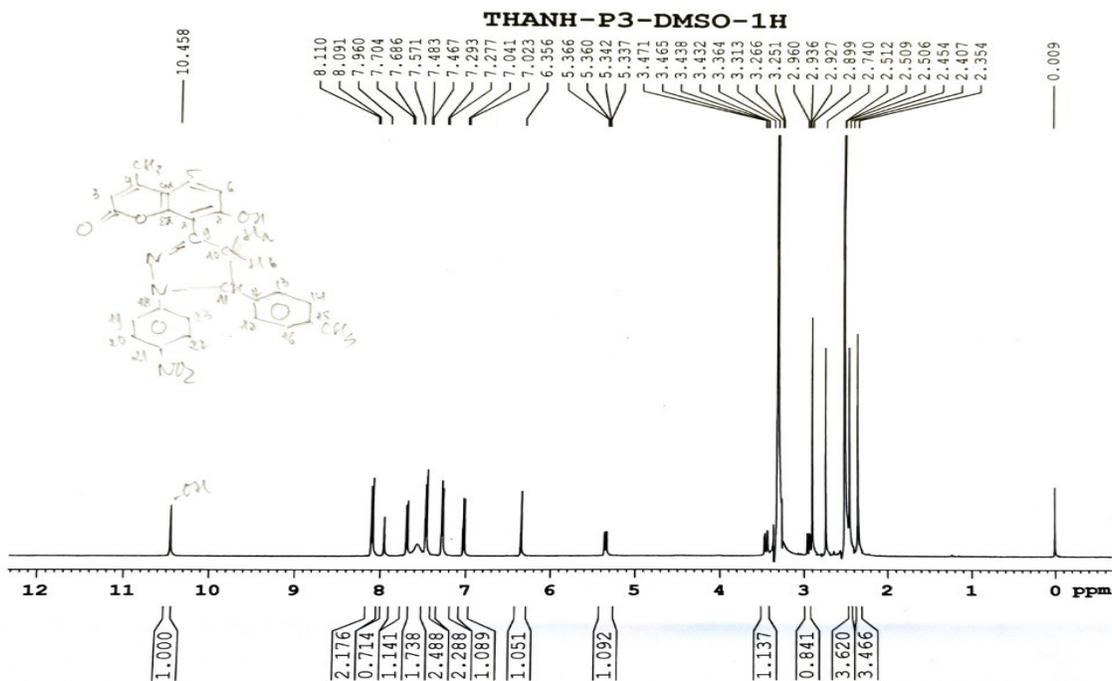
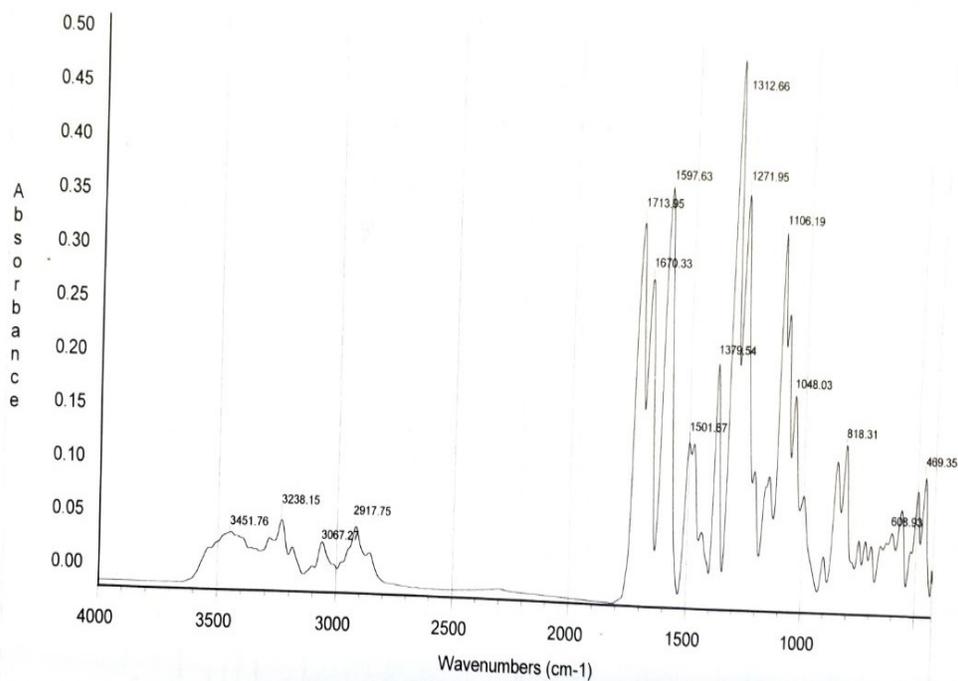


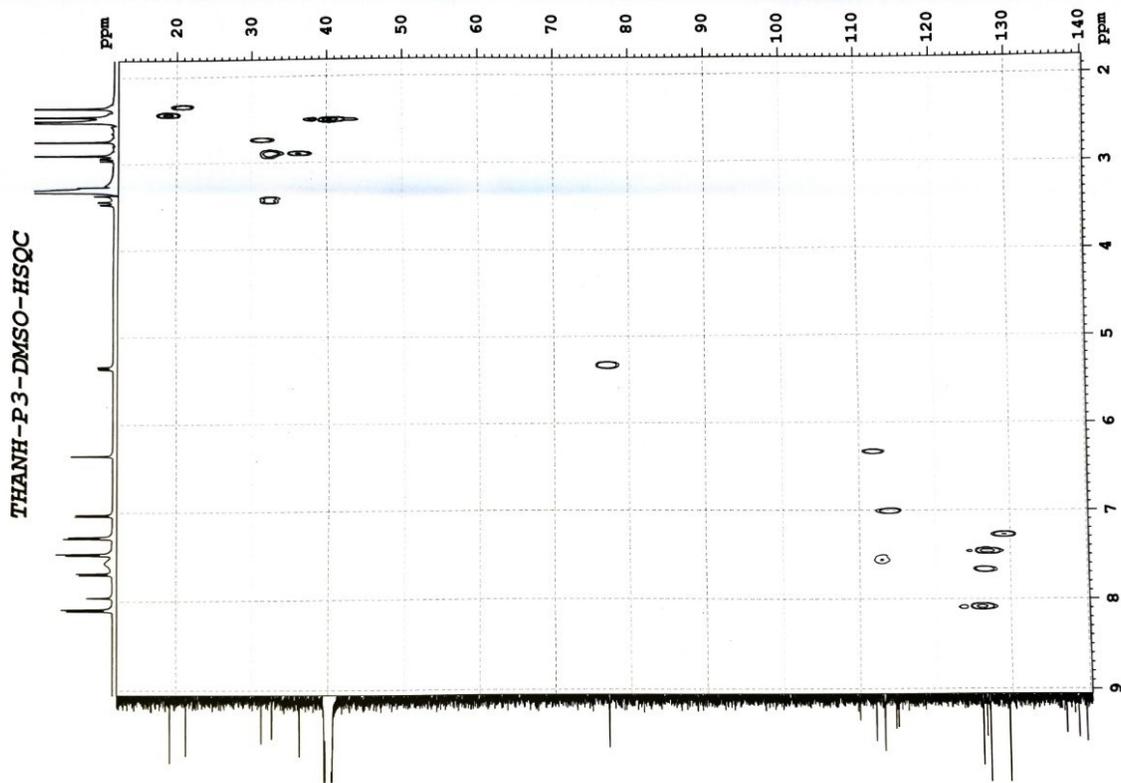
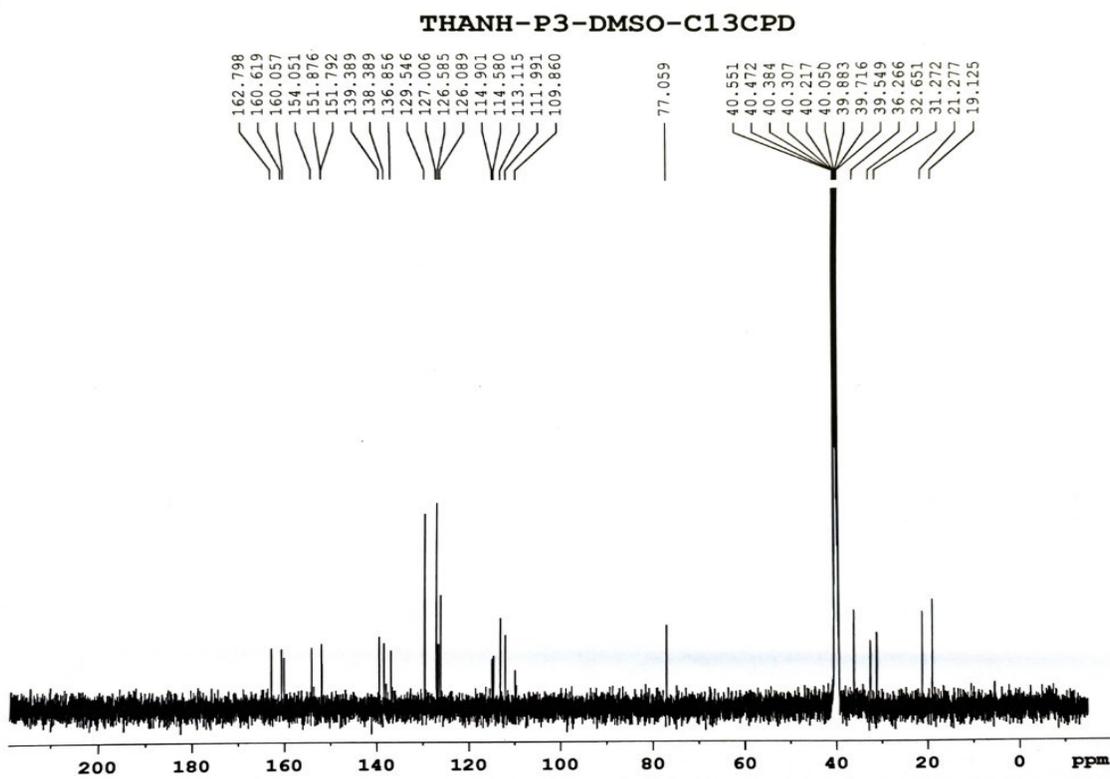


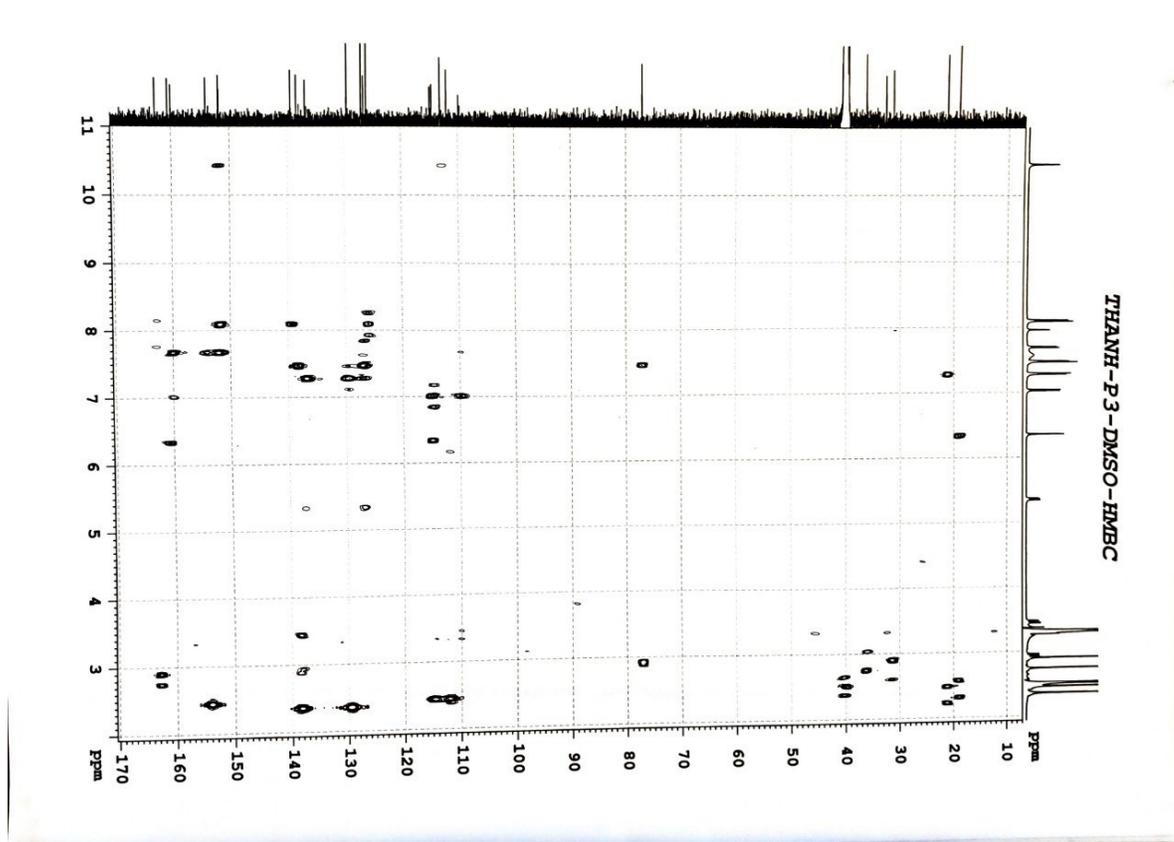
### 11. Spectra of 8-(5-phenyl-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13a)





12. Spectra of 8-(5-*p*-tolyl-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13b)





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Operator: Ms: Dao Thi Nhung

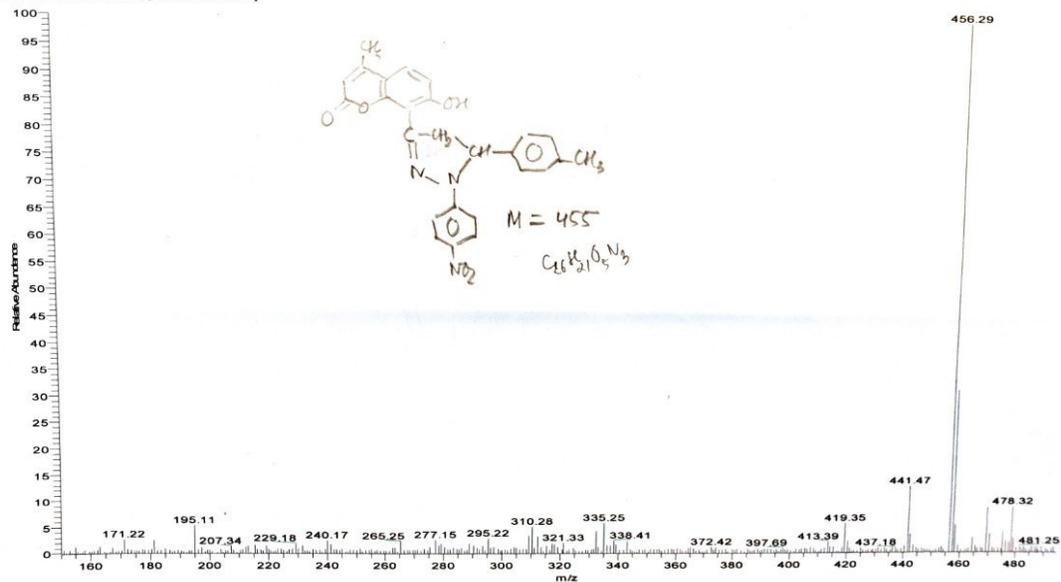
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 Solvent: ACN  
 Note : [M+H]<sup>+</sup>/M+Na

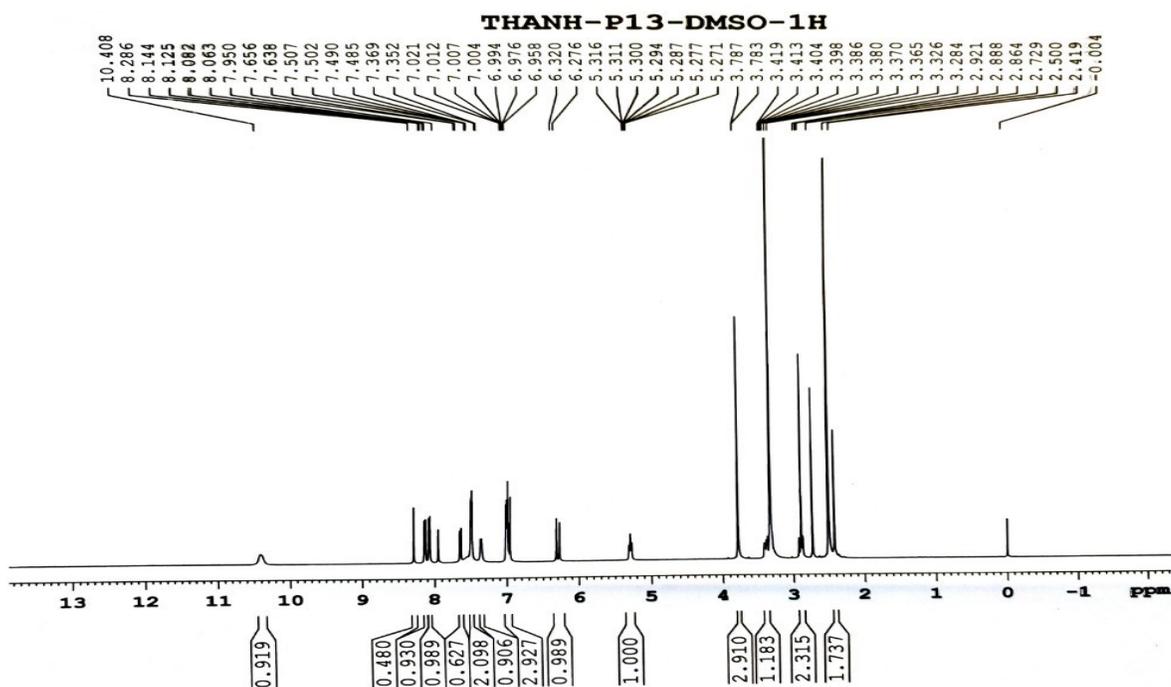
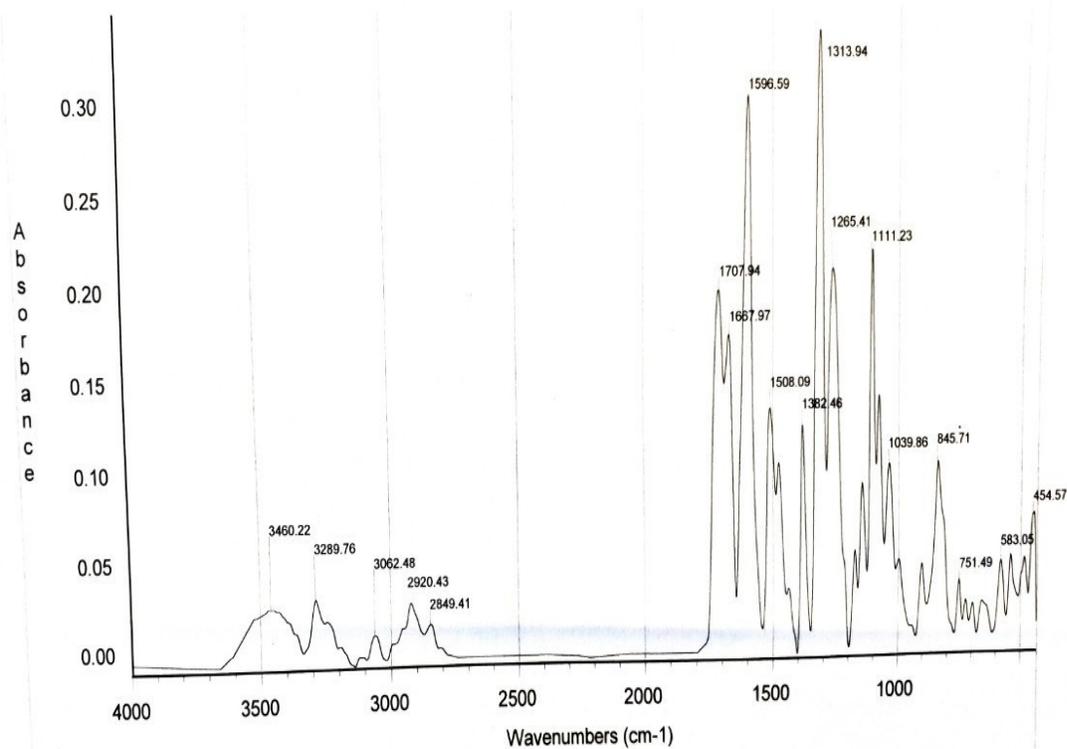
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 Tandem: n >= 15  
 Mass Accuracy: <= 2ppm

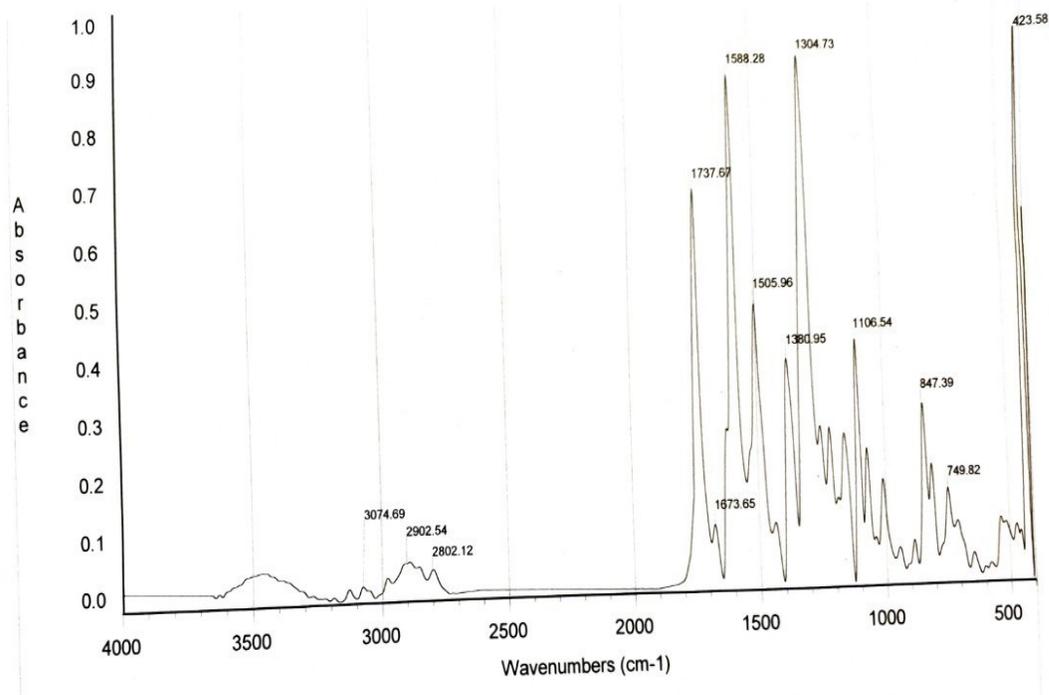
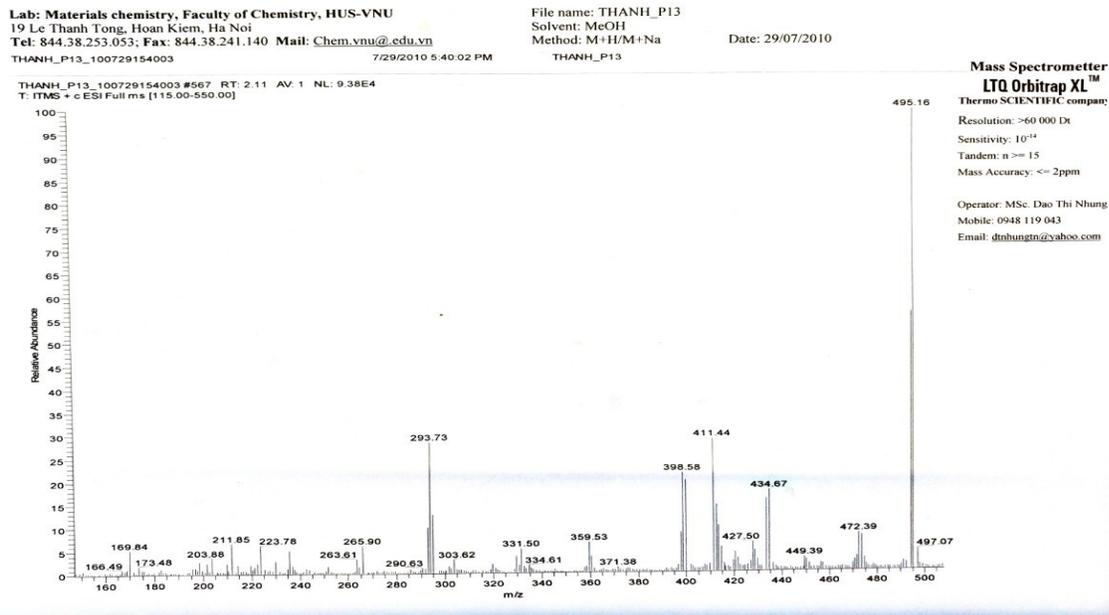
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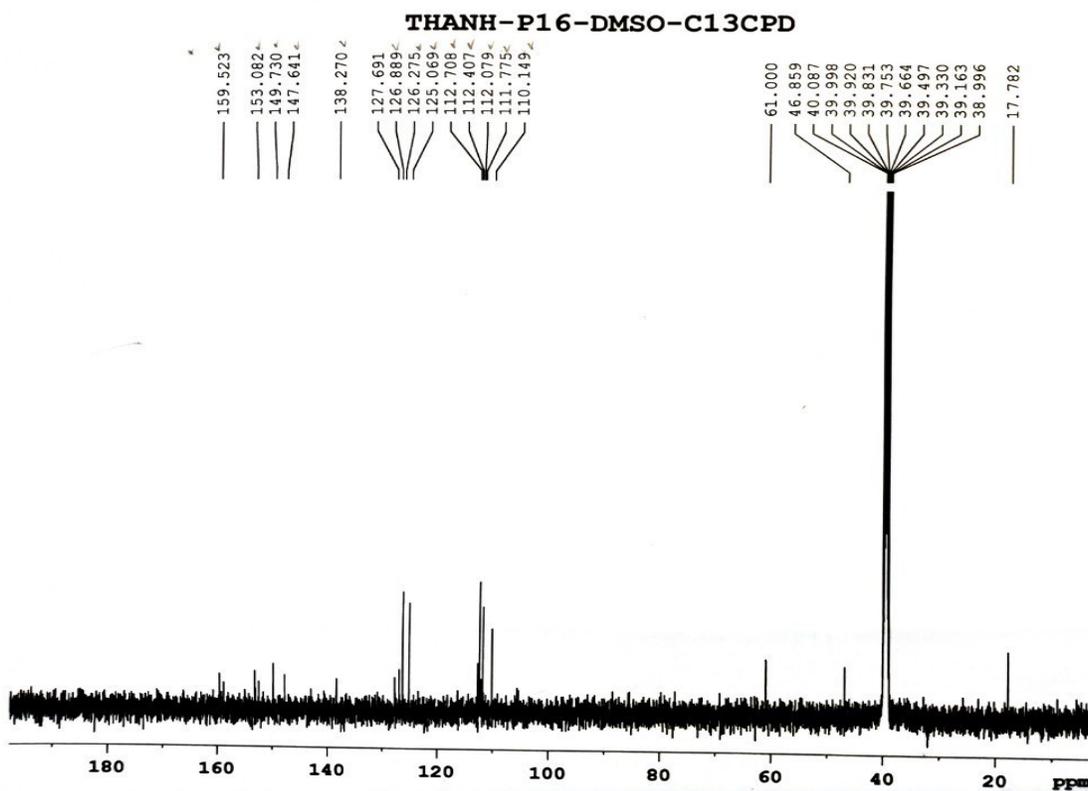
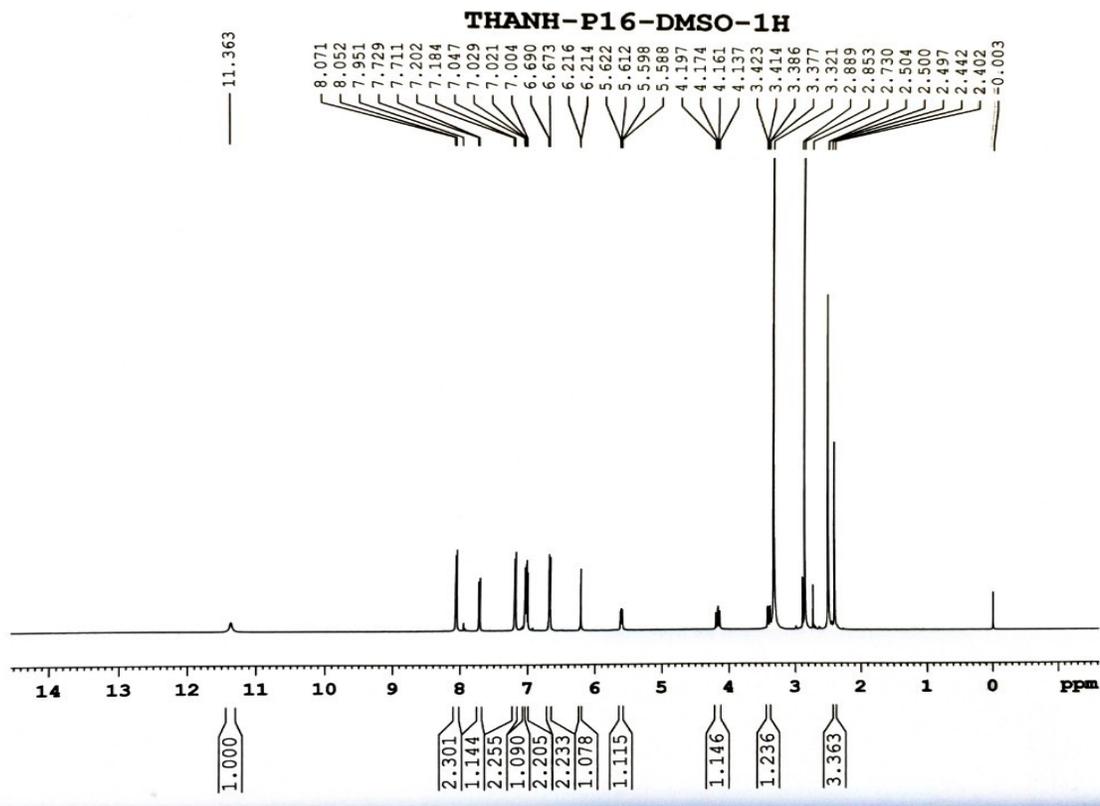
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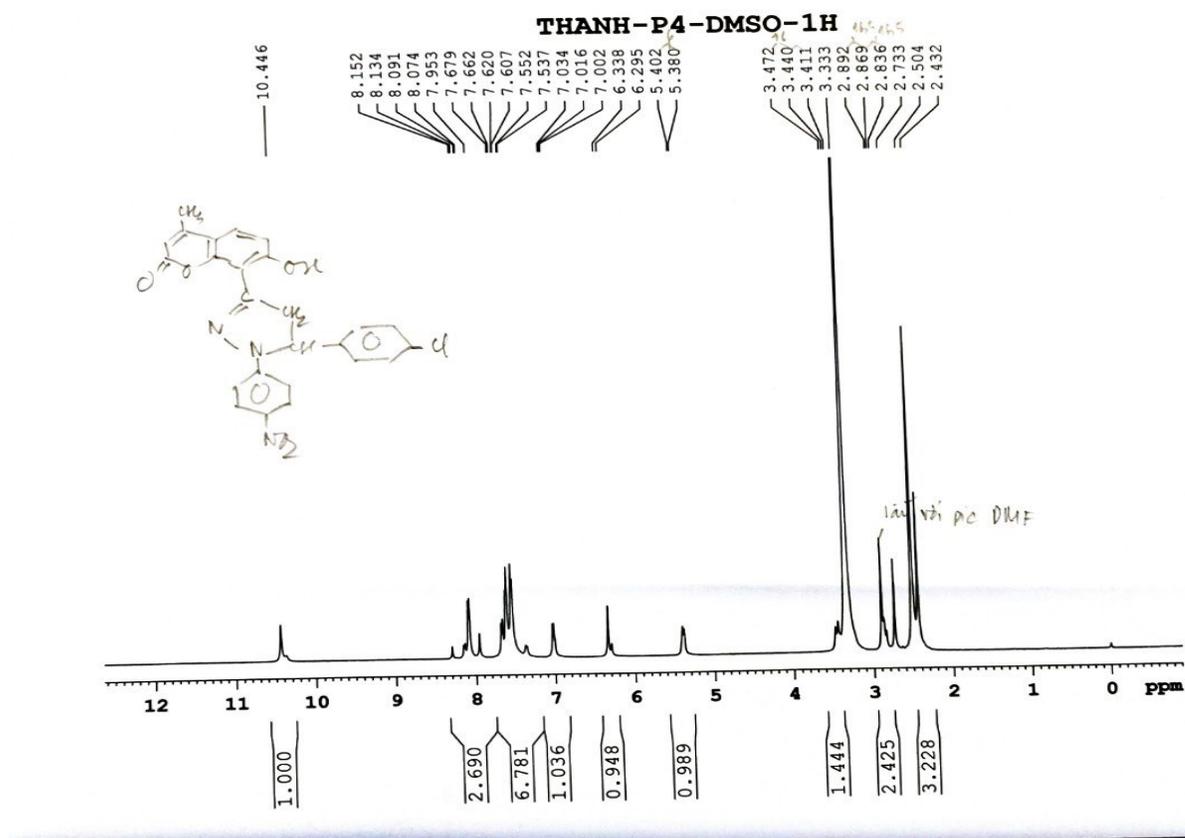
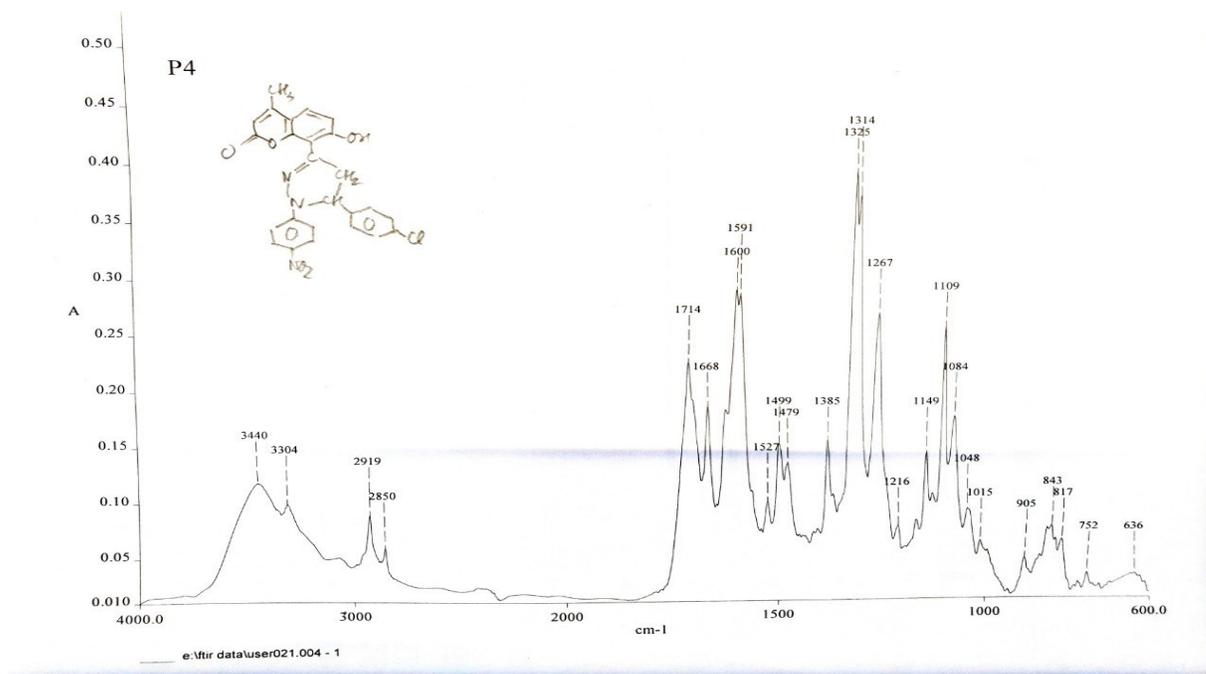


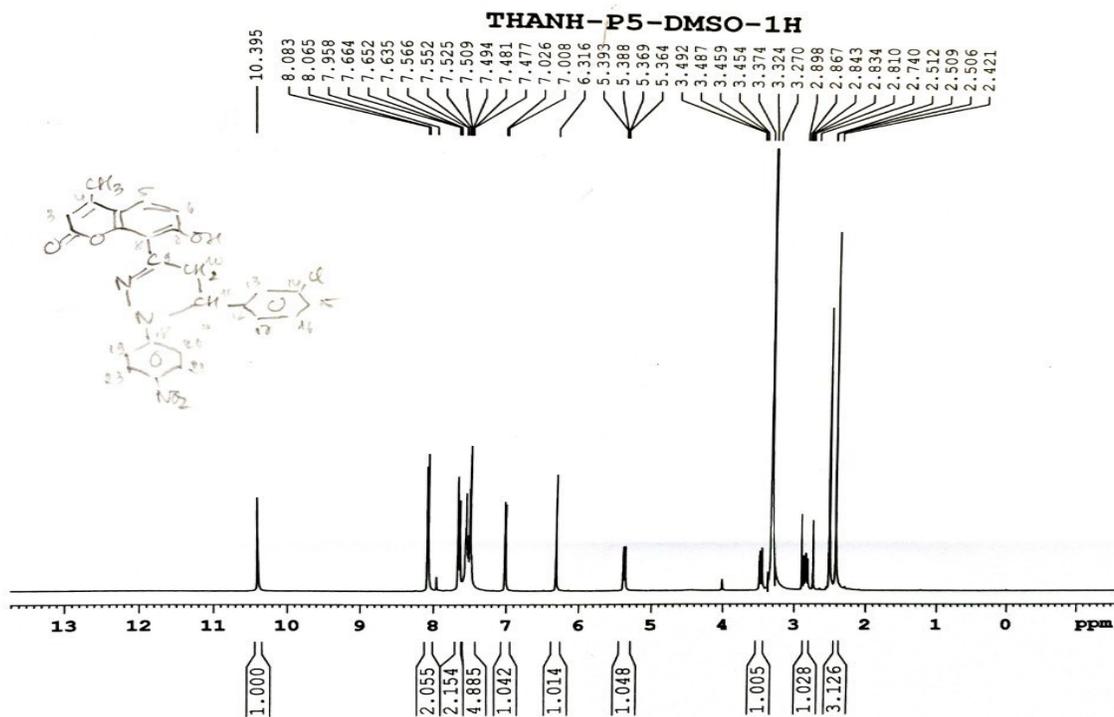
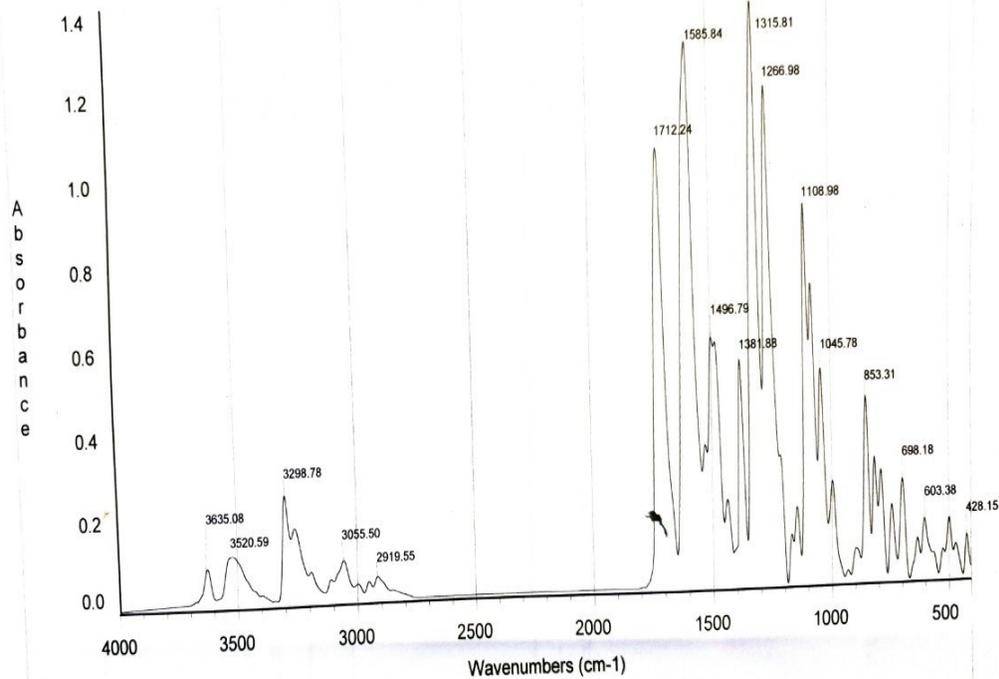
**13. Spectra of 8-(5-(*p*-methoxyphenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13c):**

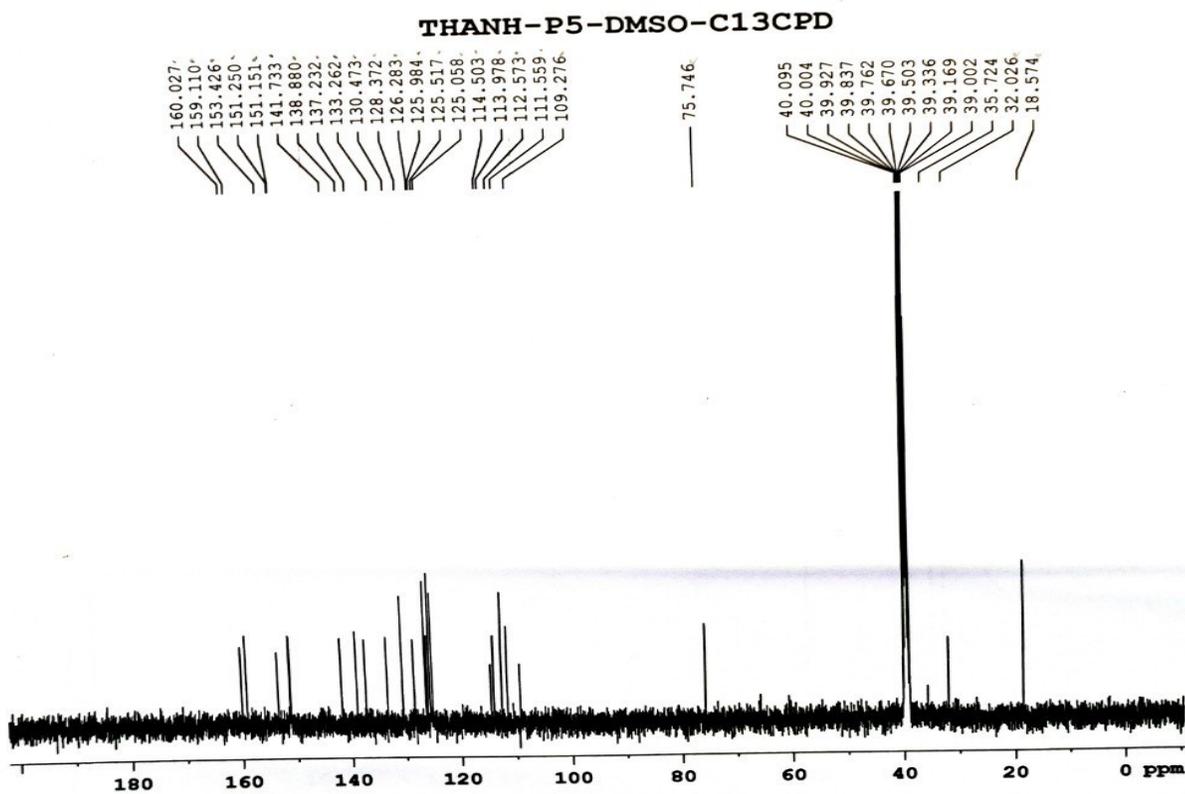
**14. Spectra of 8-(5-(*p*-dimethylaminophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13d)**



15. Spectra of 8-(5-(*p*-chlorophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13e)



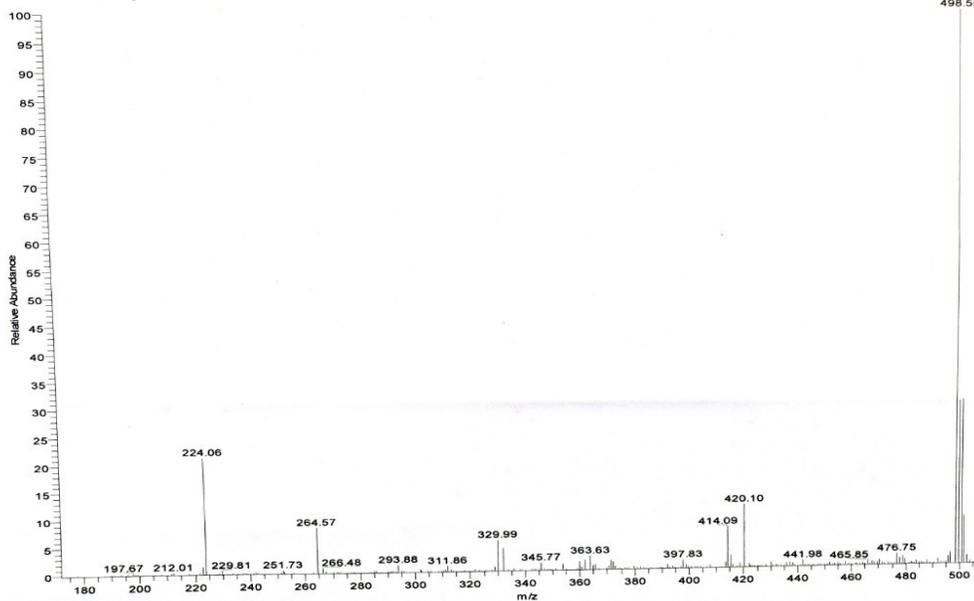
16. Spectra of 8-(5-(*m*-chlorophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13f)



Lab: Materials chemistry, Faculty of Chemistry, HUS-VNU  
 19 Le Thanh Tong, Hoan Kiem, Ha Noi  
 Tel: 844.38.253.053; Fax: 844.38.241.140 Mail: [Chem.vnu@edu.vn](mailto:Chem.vnu@edu.vn)  
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 Method: M+H/M+Na  
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 Date: 29/07/2010

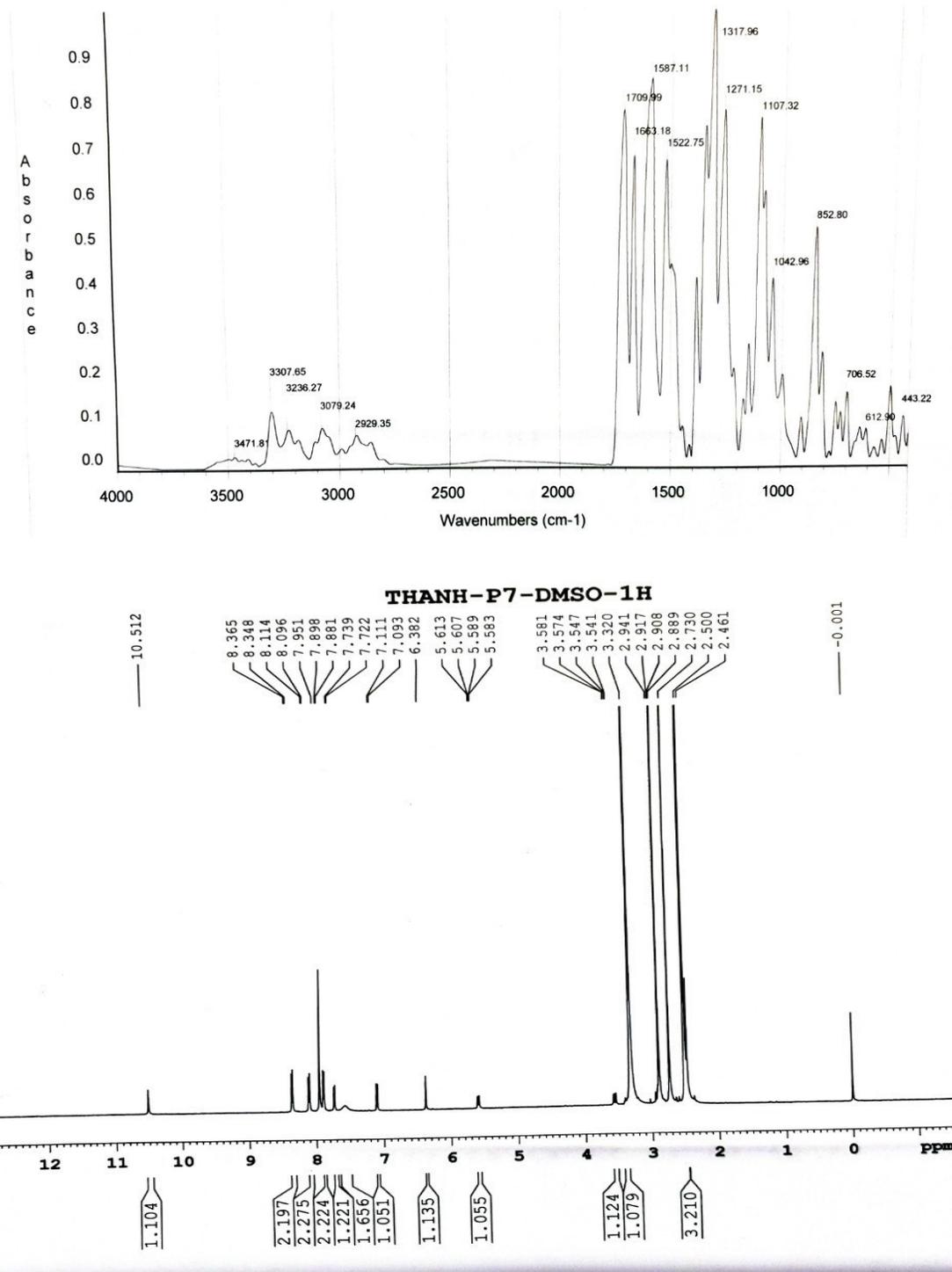
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 T: ITMS + c ESI Full ms [125.00-550.00]

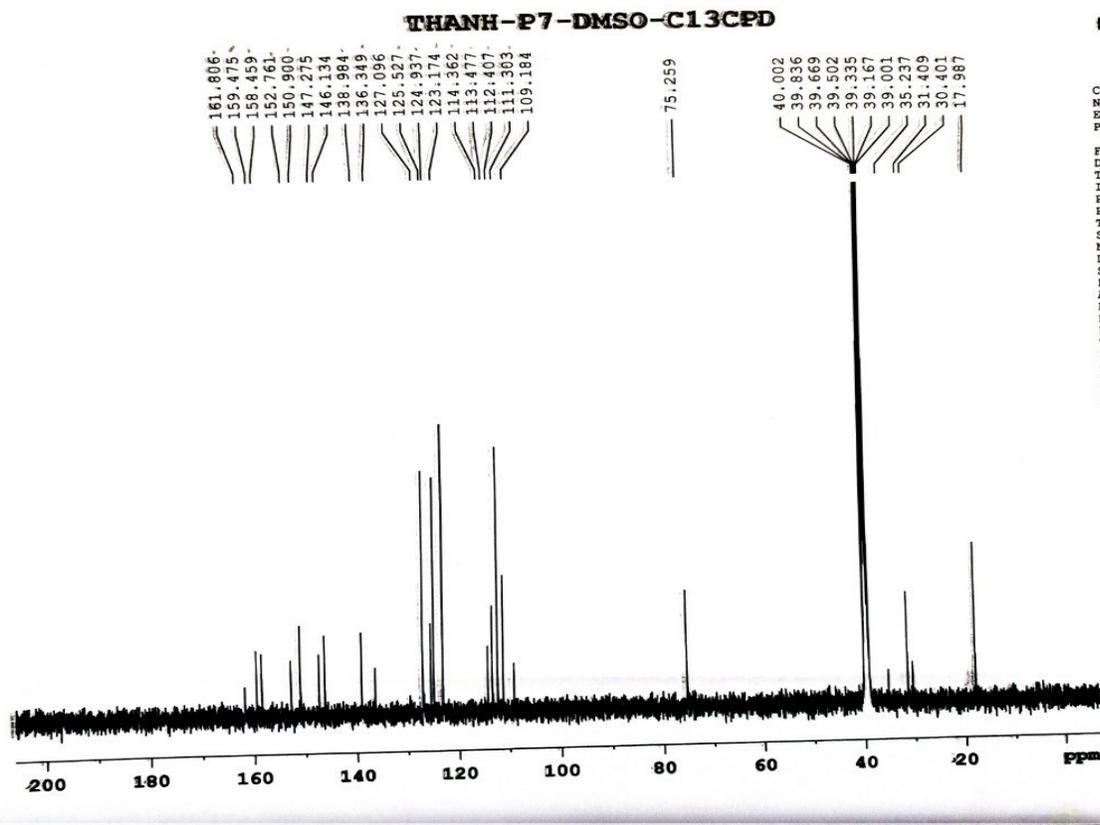


**Mass Spectrometer**  
**LTQ Orbitrap XL™**  
 Thermo SCIENTIFIC company  
 Resolution: >60 000 Da  
 Sensitivity: 10<sup>-14</sup>  
 Tandem: n >= 15  
 Mass Accuracy: <= 2ppm

Operator: MsC. Dao Thi Nhung  
 Mobile: 0948 119 043  
 Email: [dinhungtn@yahoo.com](mailto:dinhungtn@yahoo.com)

17. Spectra of 8-(5-(*p*-nitrophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13g)

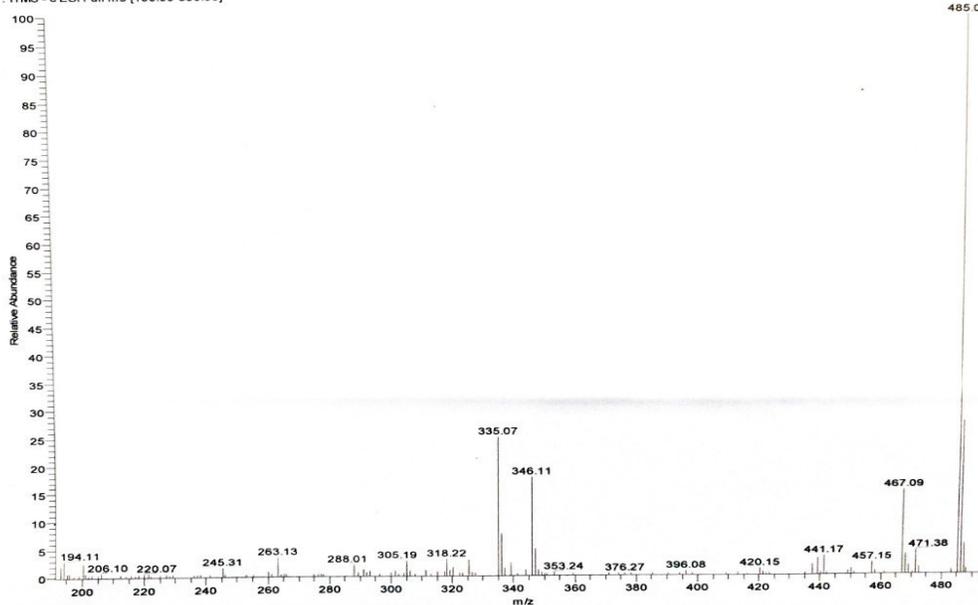




Lab: Materials chemistry, Faculty of Chemistry, HUS-VNU  
 19 Le Thanh Tong, Hoan Kiem, Ha Noi  
 Tel: 844.38.253.053; Fax: 844.38.241.140 Mail: [Chem.vnu@edu.vn](mailto:Chem.vnu@edu.vn)  
 THANH\_P7\_100729154003 7/29/2010 5:14:40 PM

File name: THANH\_P7  
 Solvent: MeOH  
 Method: M-H Date: 29/07/2010  
 THANH\_P7

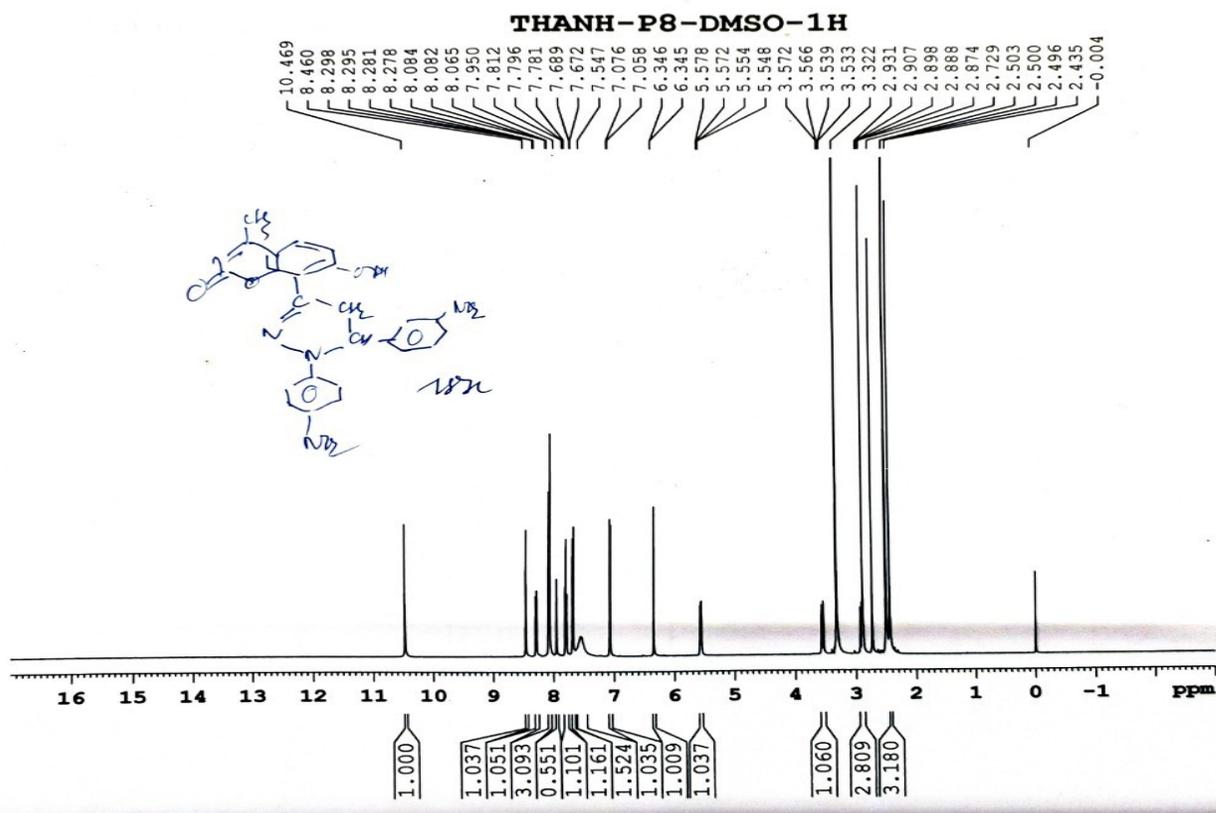
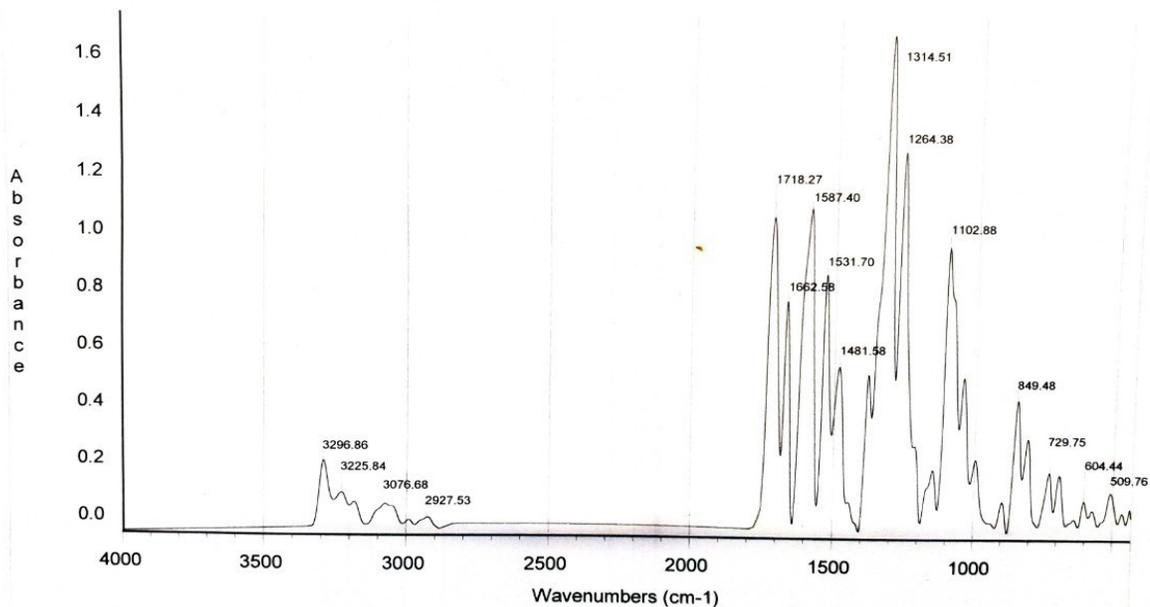
THANH\_P7\_100729154003 #1021 RT: 3.51 AV: 1 NL: 3.34E4  
 T: ITMS - c ESI Full ms [130.00-550.00]

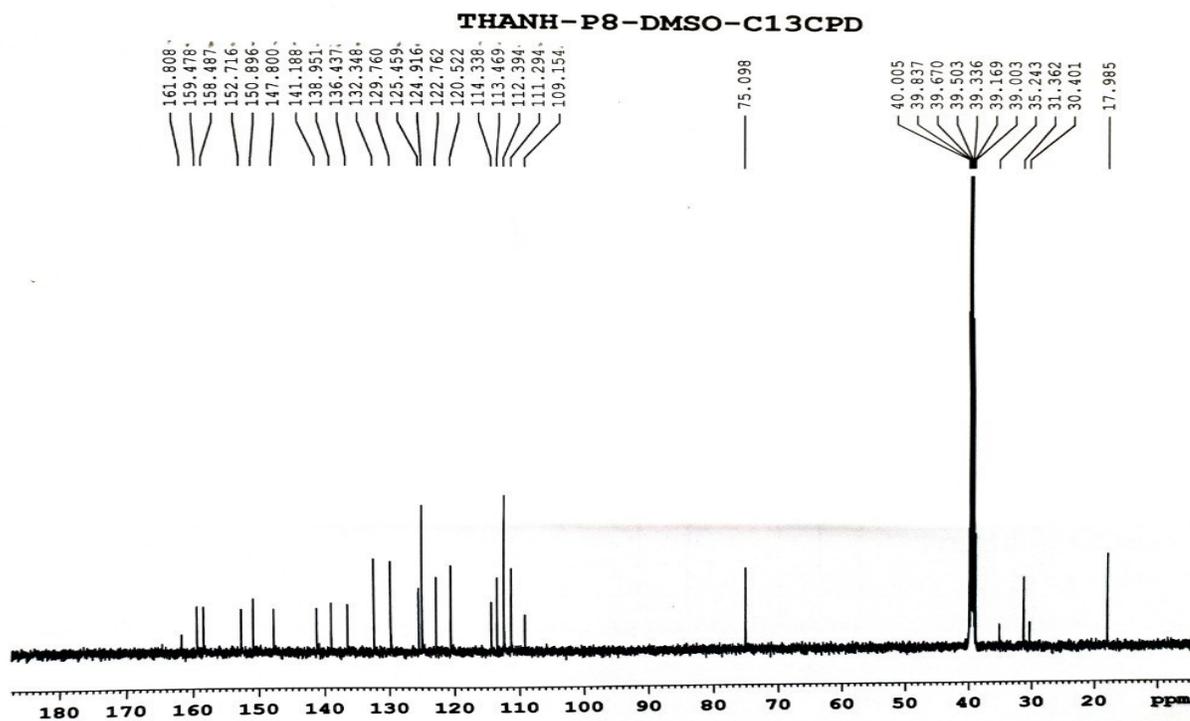


Mass Spectrometry  
**LTQ Orbitrap XL™**  
 Thermo SCIENTIFIC compas

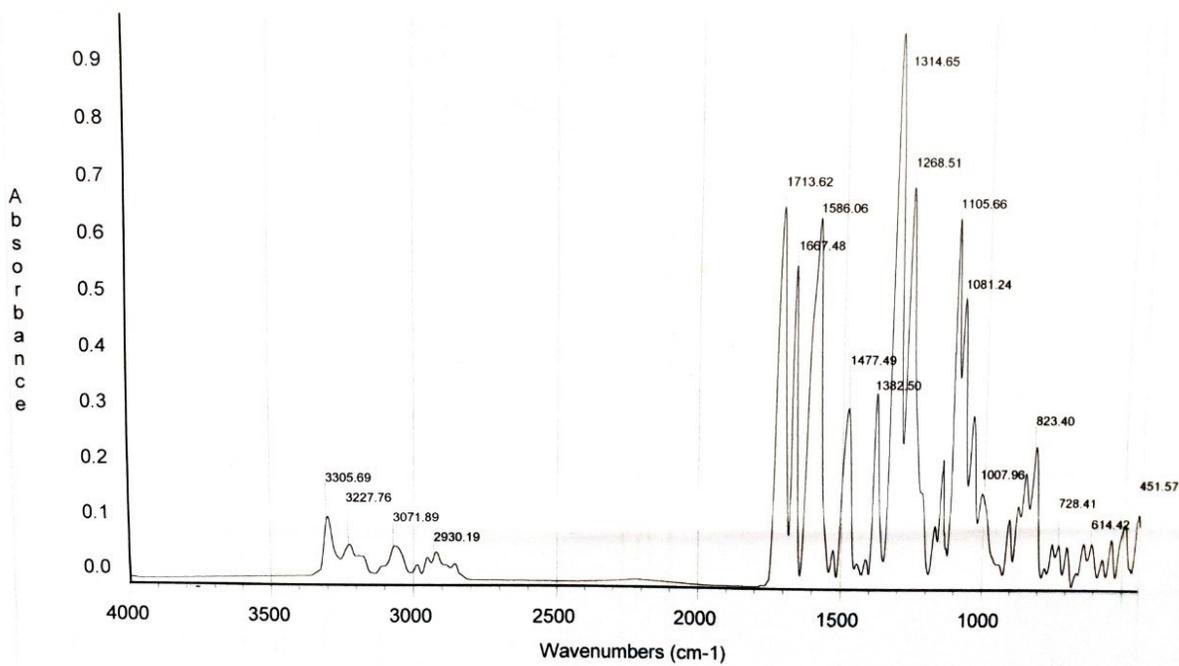
Resolution: >60 000 Da  
 Sensitivity: 10<sup>11</sup>  
 Tandem: n >= 15  
 Mass Accuracy: <= 2ppm

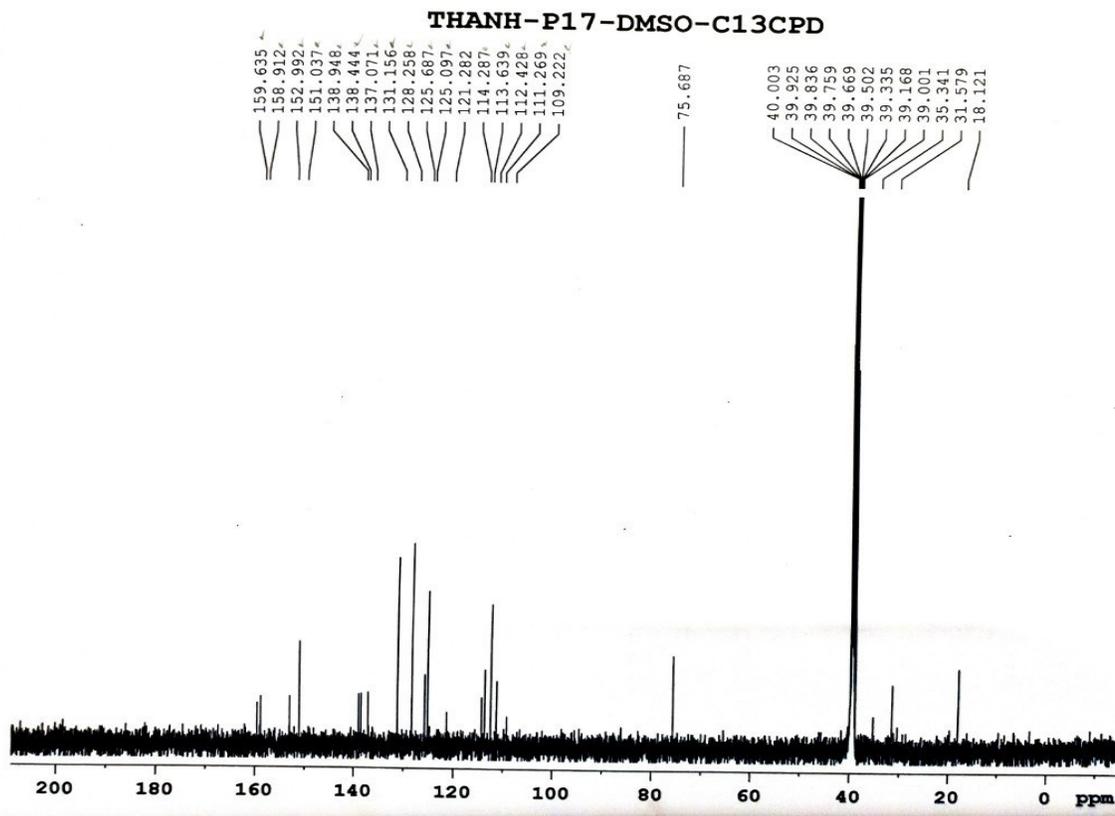
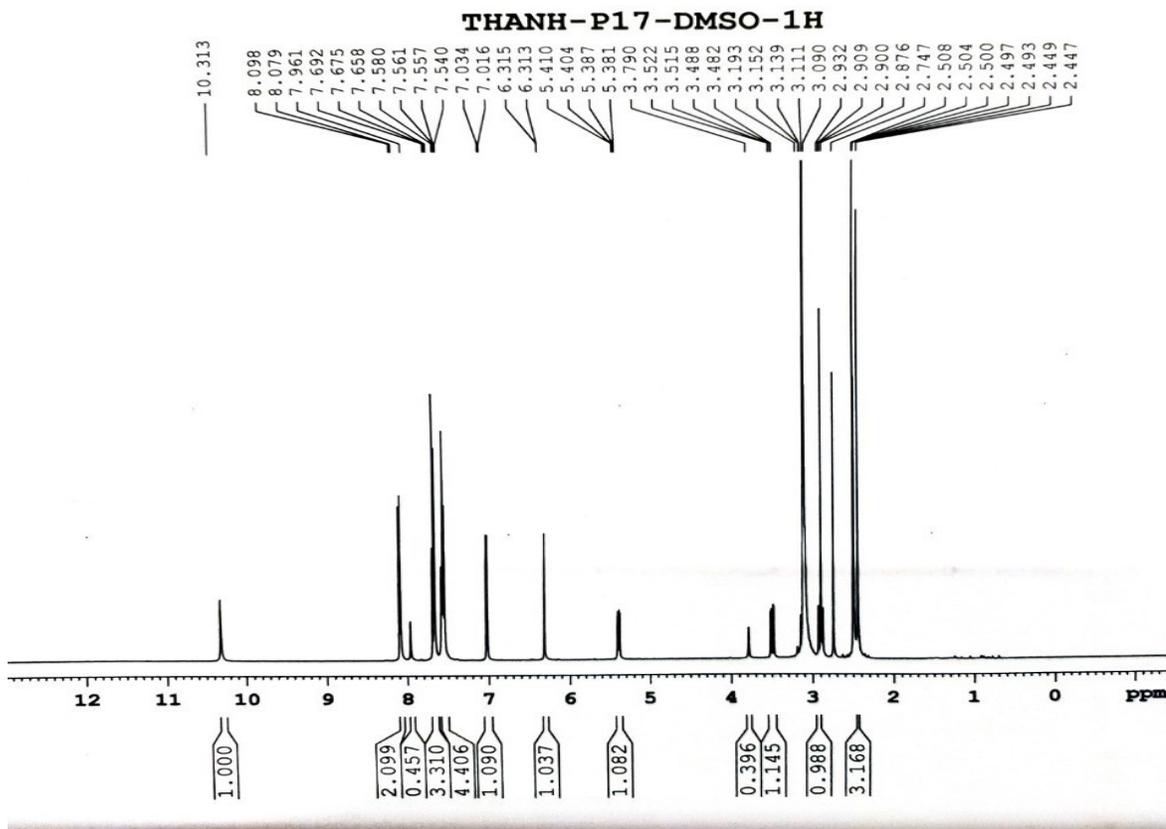
Operator: MSc. Dao Thi Nhung  
 Mobile: 0948 119 043  
 Email: [dtnhungtn@yahoo.com](mailto:dtnhungtn@yahoo.com)

18. Spectra of 8-(5-(*m*-nitrophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13h)

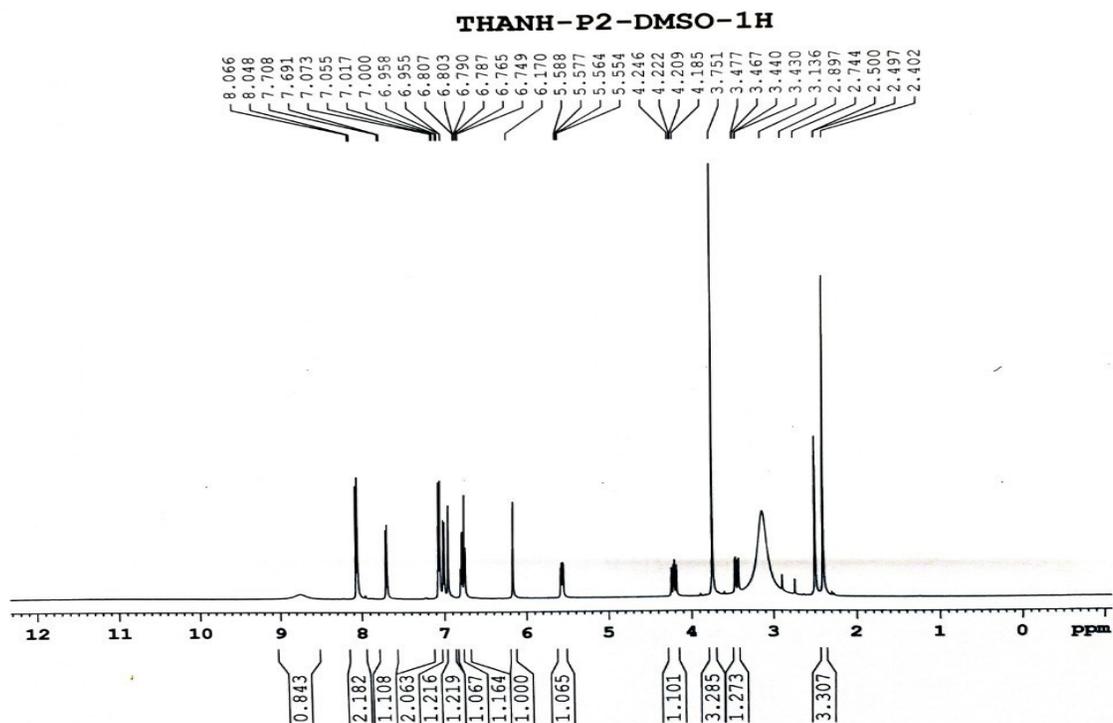
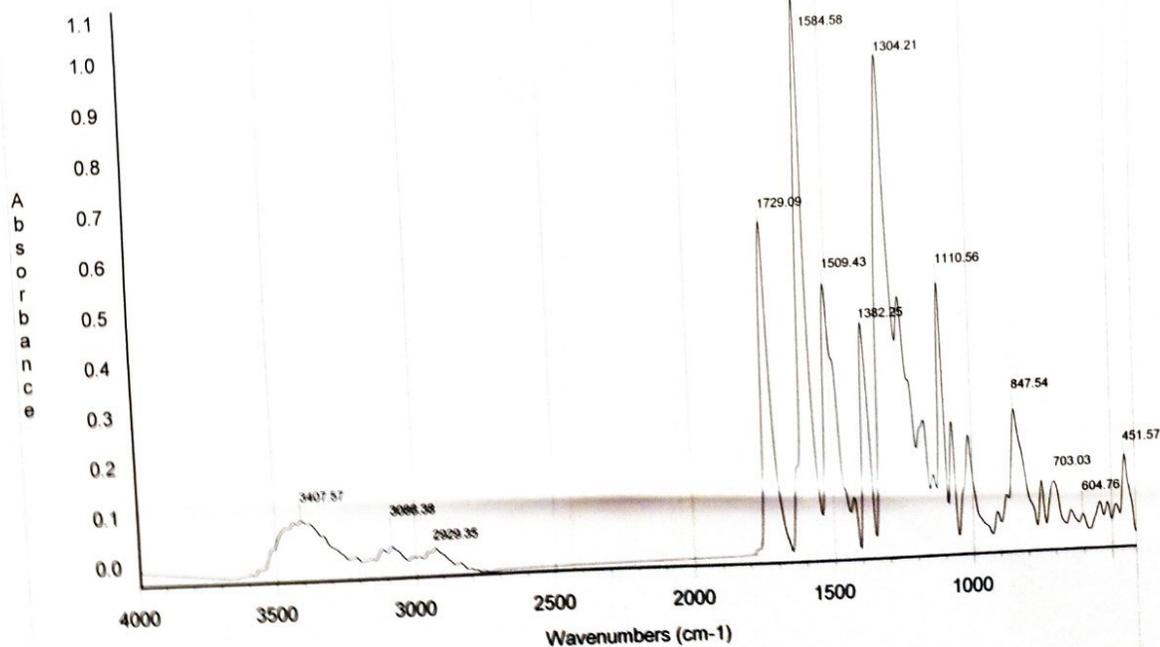


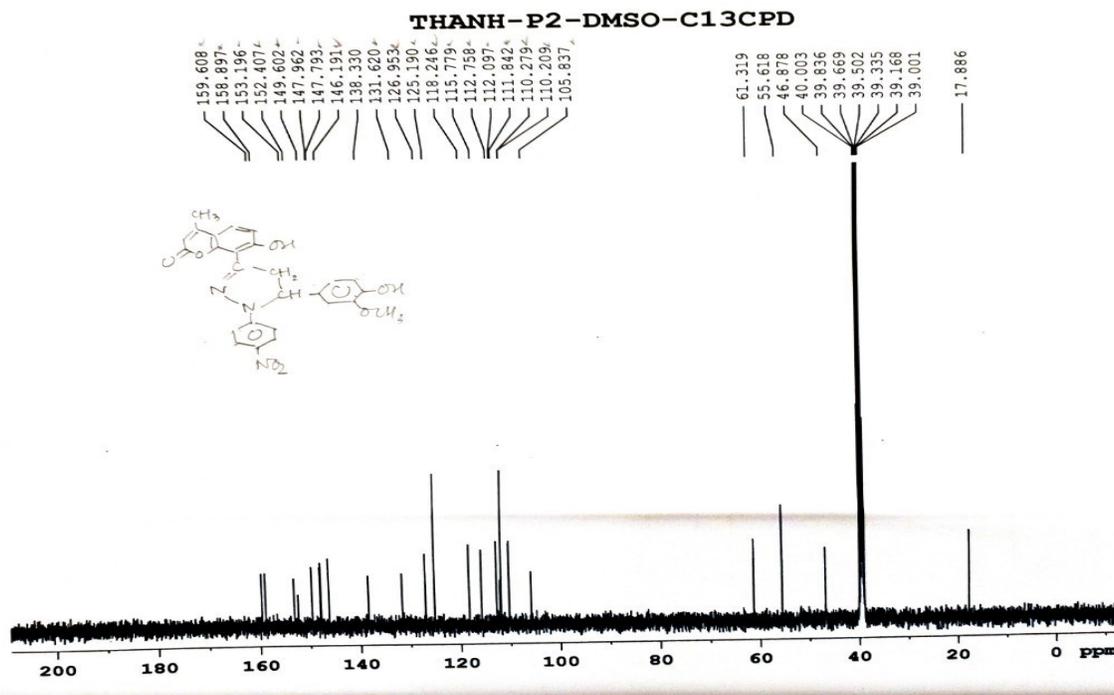
19. Spectra of 8-(5-(*p*-bromophenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13i)





## 20. Spectra of 8-(5-(4-hydroxy-3-methoxyphenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13j)





21. Spectra of 8-(5-(3,4-methylenedioxyphenyl)-1-(4-nitrophenyl)pyrazoline-3-yl)-7-hydroxy-4-methylcoumarin (13k)

