

Supplementary Material

Synthesis of some *bis*(arylidenes) containing heterocyclic chromones and α -pyronochromones

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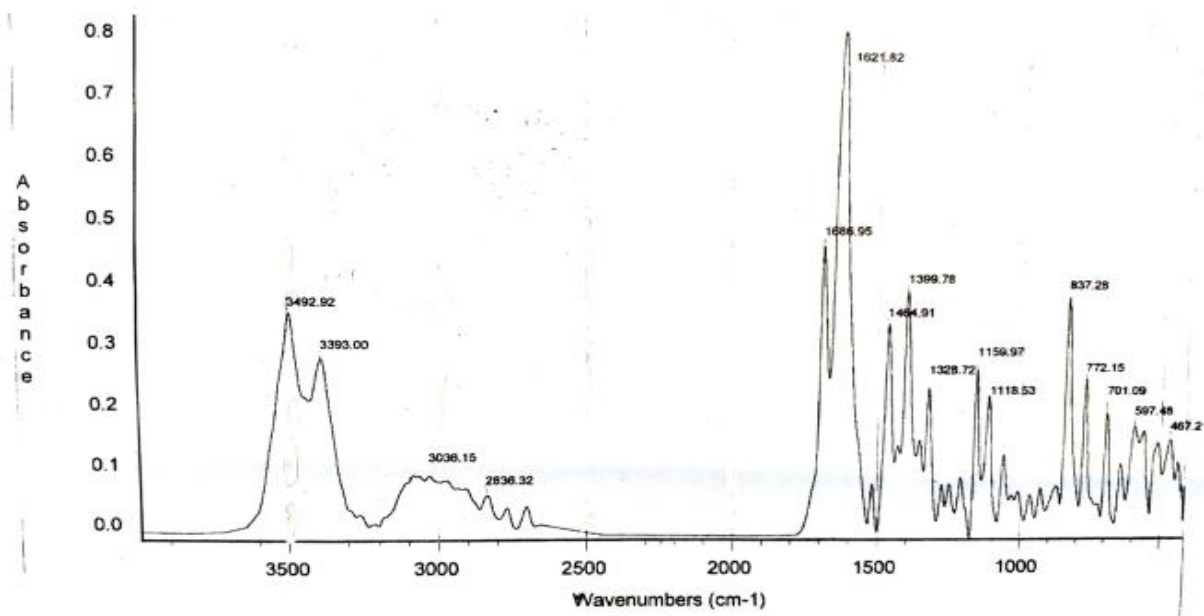
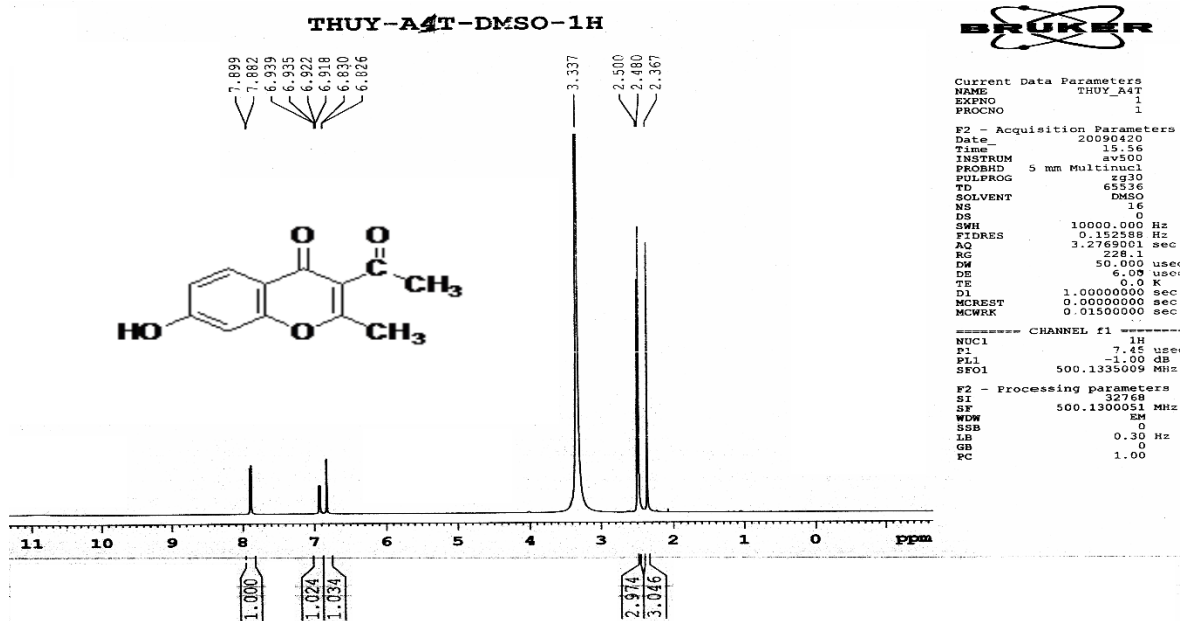
1. IR, ¹H-NMR, and the charge density of the carbon atoms in compound 2

Figure S1. IR spectrum of 2

Figure S2. ¹H-NMR spectrum of 2

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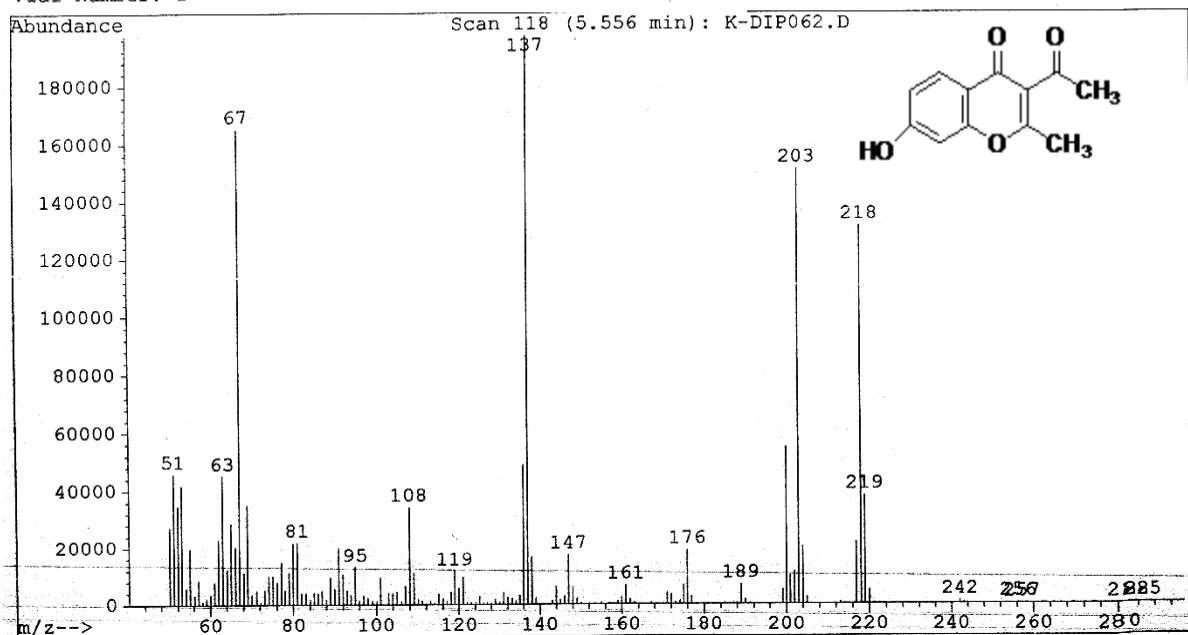


Figure S3. MS spectrum of 2

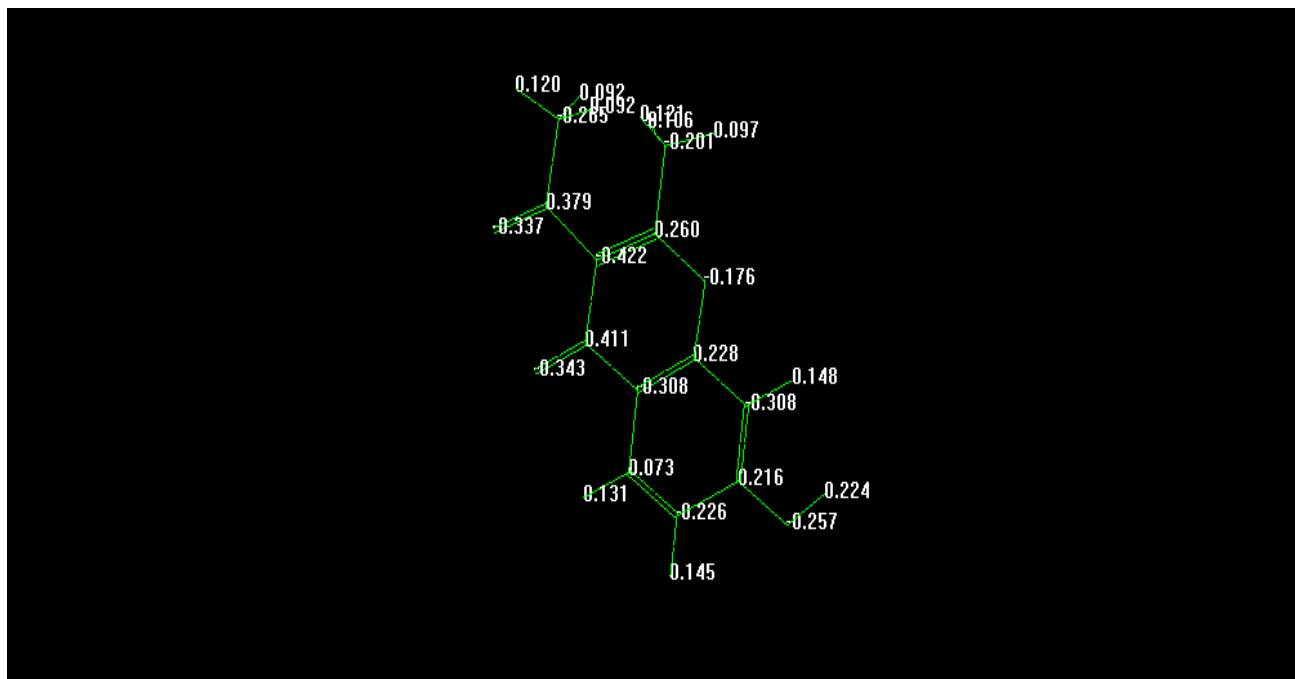


Figure S4. The charge density of the carbon atoms in 2

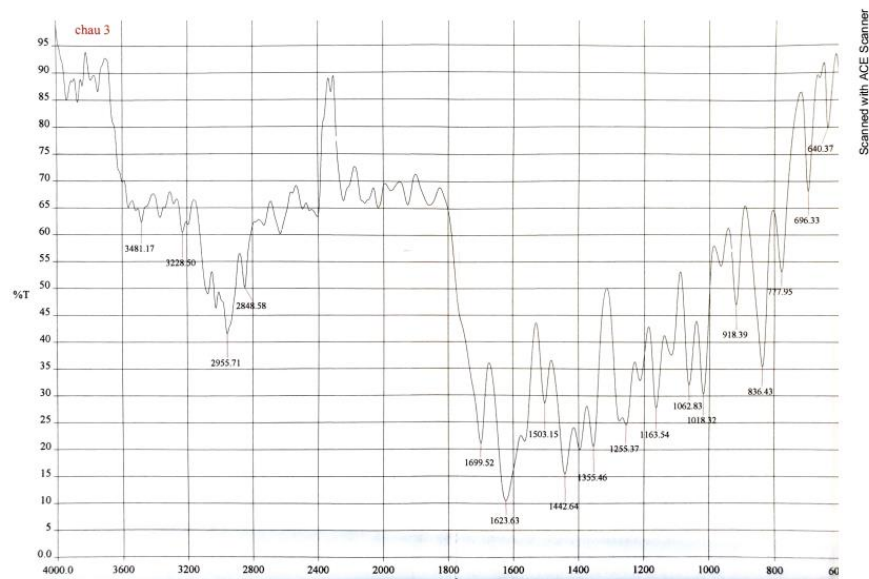
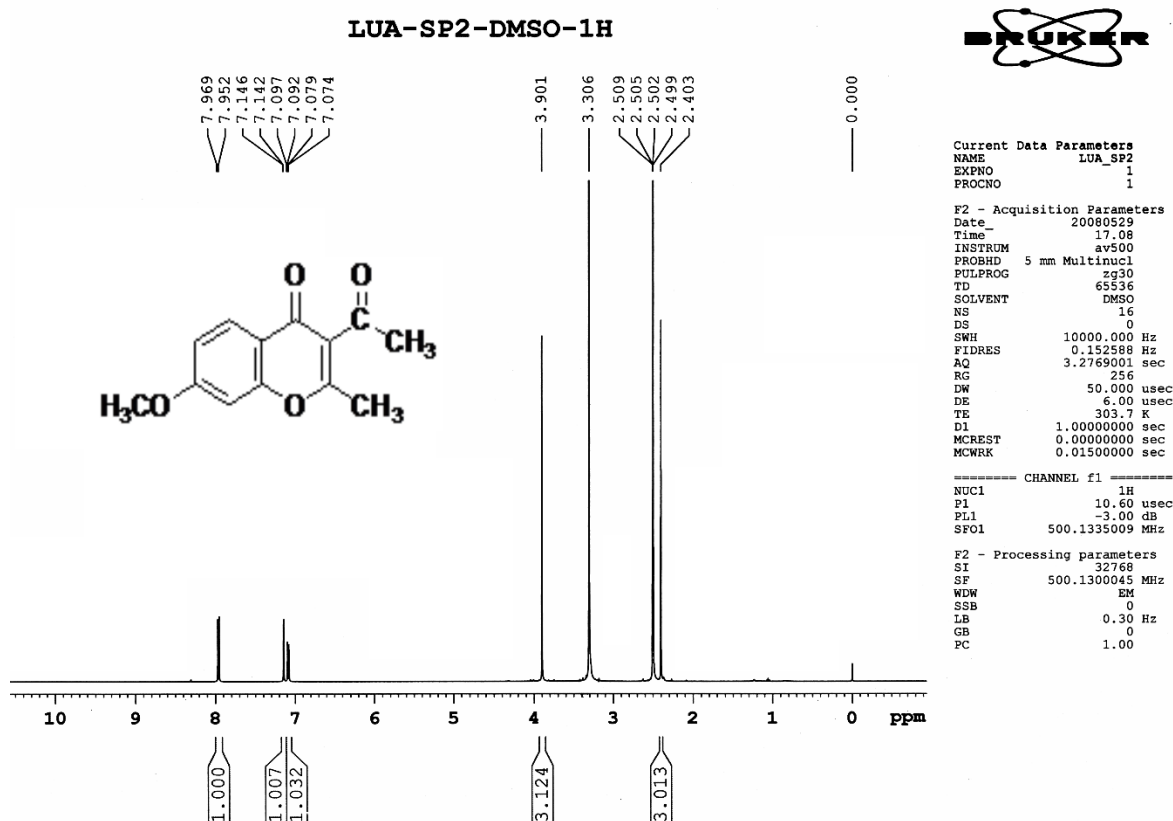
2. IR, ¹H-NMR, HR-MS, and the charge density of the carbon atoms in compound 4

Figure S5. IR spectrum of 4

Figure S6. ¹H-NMR spectrum of 4

Phong Thi nghiem HOA VAT LIEU - Khoa Hoa hoc - Truong DH KHTN - DH QG HN
 Ten mau : Lua (SP2)
 Nguoi do : Le Tuan Anh
 Ngay do : 14-Mar-08

Ten may : **AutoSpec Premier**
 Hang san xuat : **WATERS**
 Nuoc san xuat : **USA**

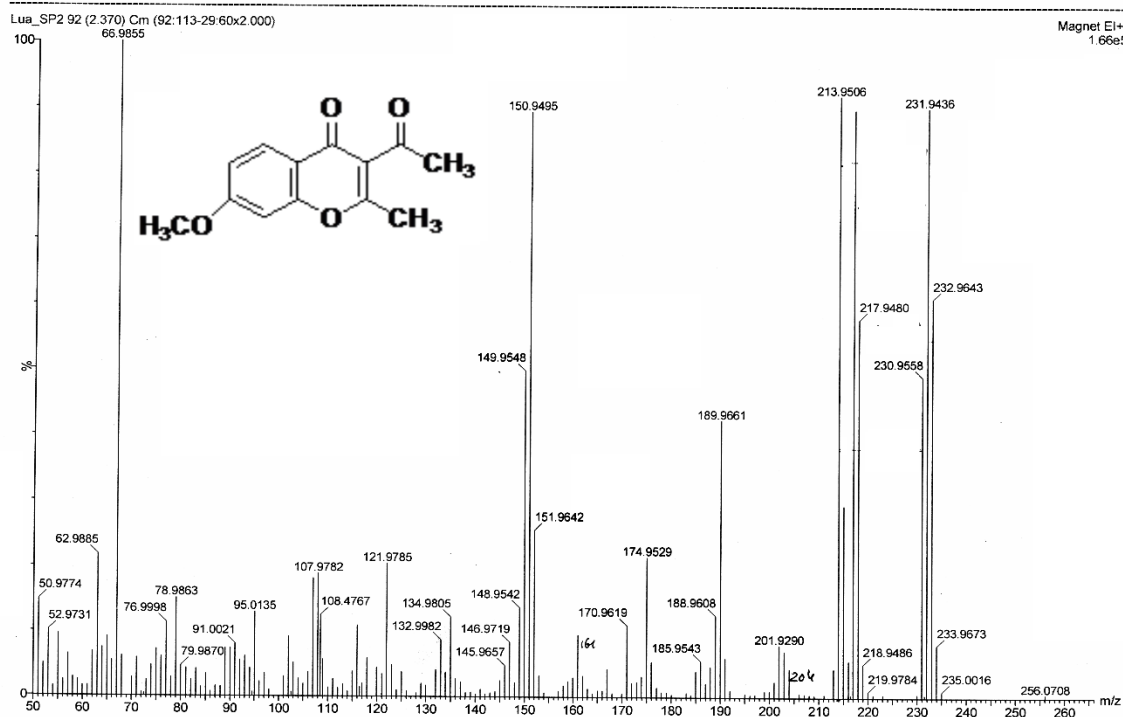


Figure S7. HR-MS spectrum of 4

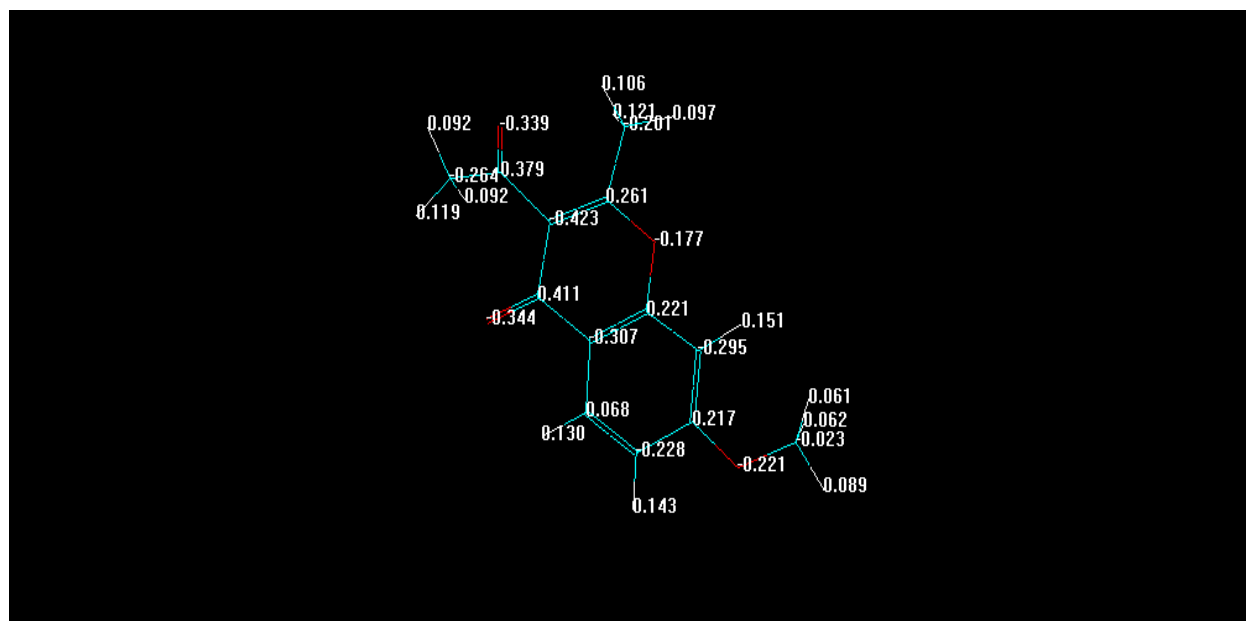


Figure S8. The charge density of the carbon atoms in 4

3. IR, $^1\text{H-NMR}$, HR-MS, and the charge density of the carbon atoms in compound 6

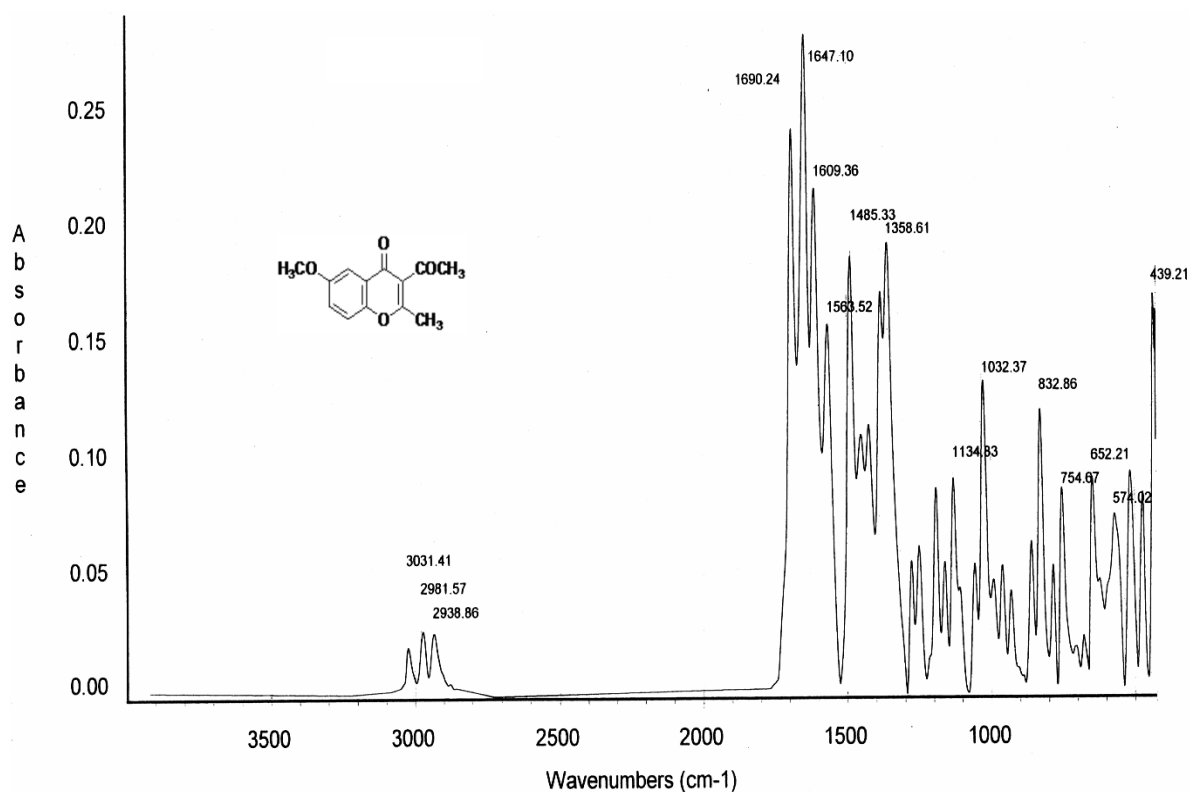
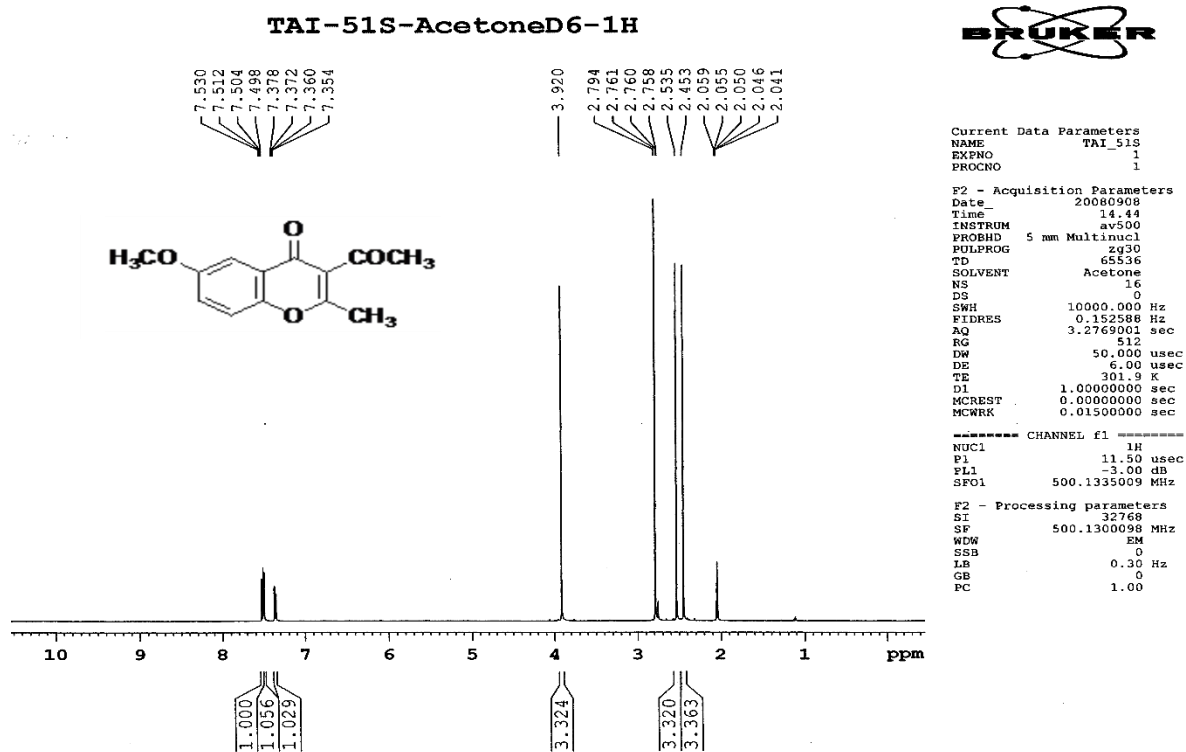


Figure S9. IR spectrum of 6

Figure S10. ¹H NMR spectrum of 6

THI NGHIỆM HÓA VẬT LIỆU - KHOA HÓA HỌC - TRƯỜNG ĐẠI HỌC KHÍ - ĐẠI HỌC HN
 Tên mẫu : Tai_Trang_TD1
 Người đo : Le Tuan Anh
 Ngày đo : 21-08-08

Tên máy : **AutoSpec Premier**
 Hãng sản xuất : **WATERS**
 Nước sản xuất : **USA**

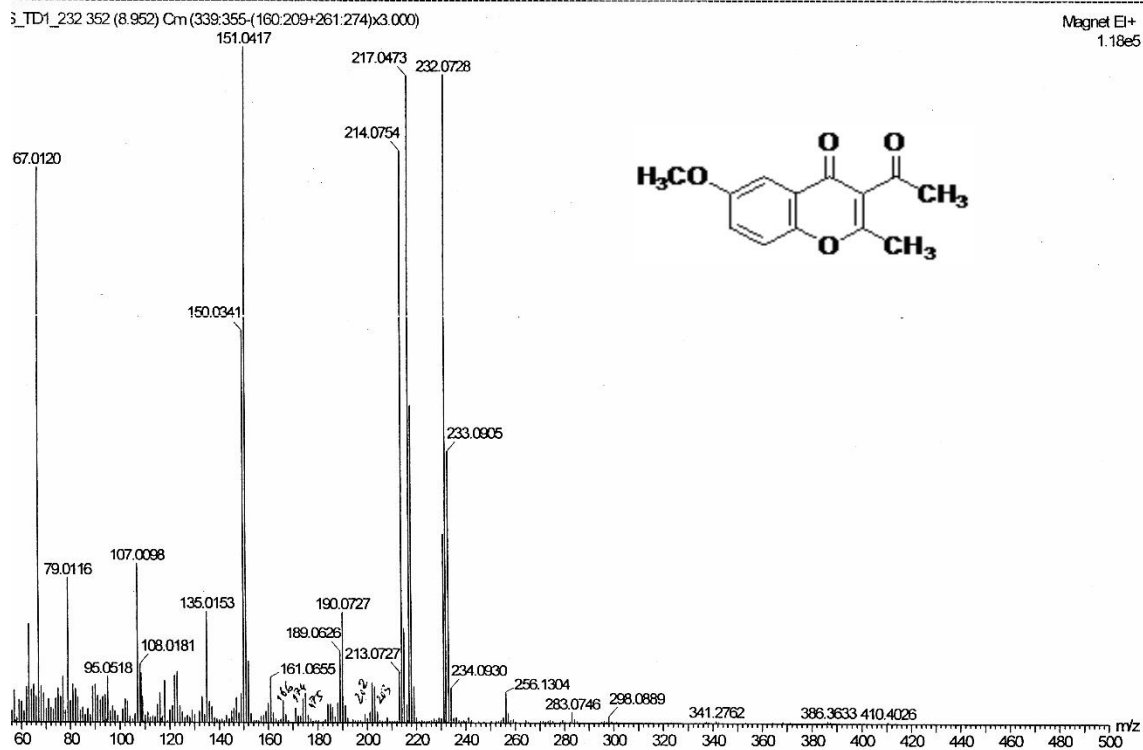


Figure S11. HR-MS spectrum of 6

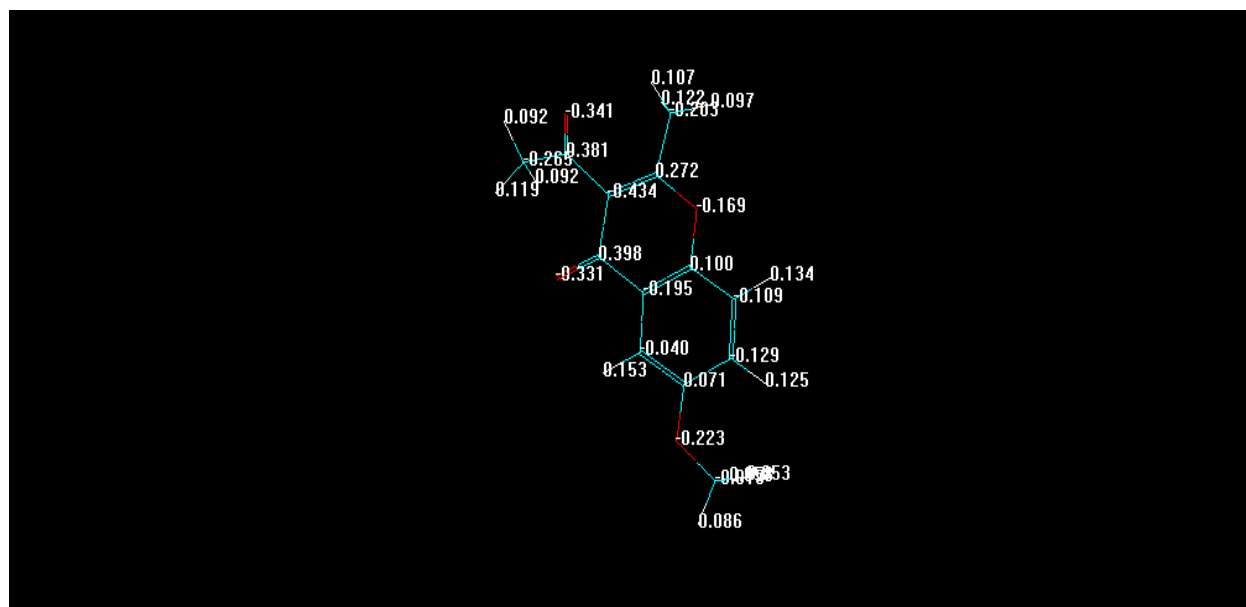


Figure S12. The charge density of the carbon atoms in 6

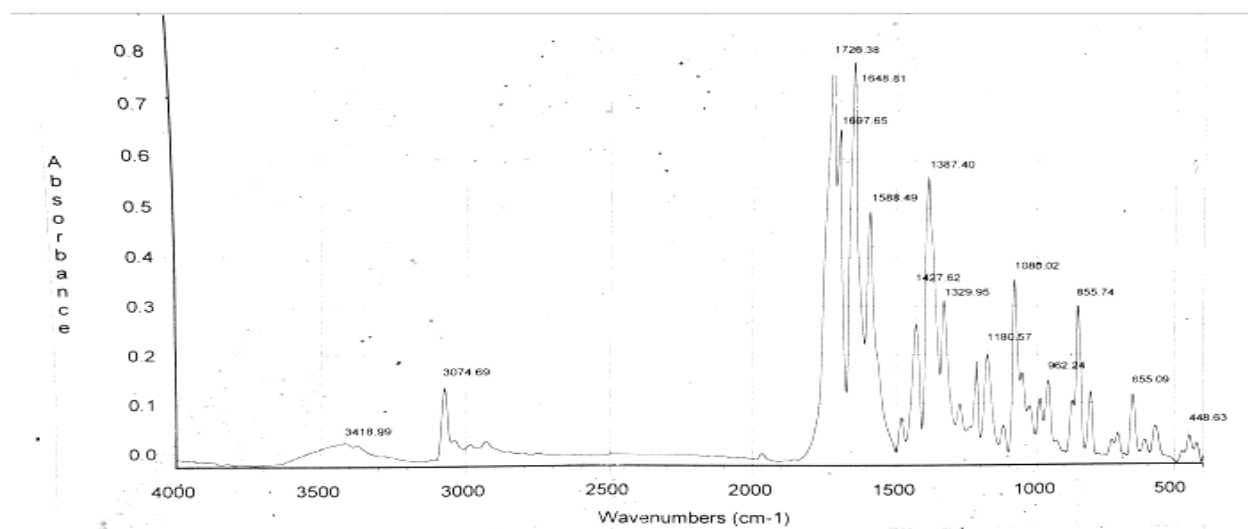
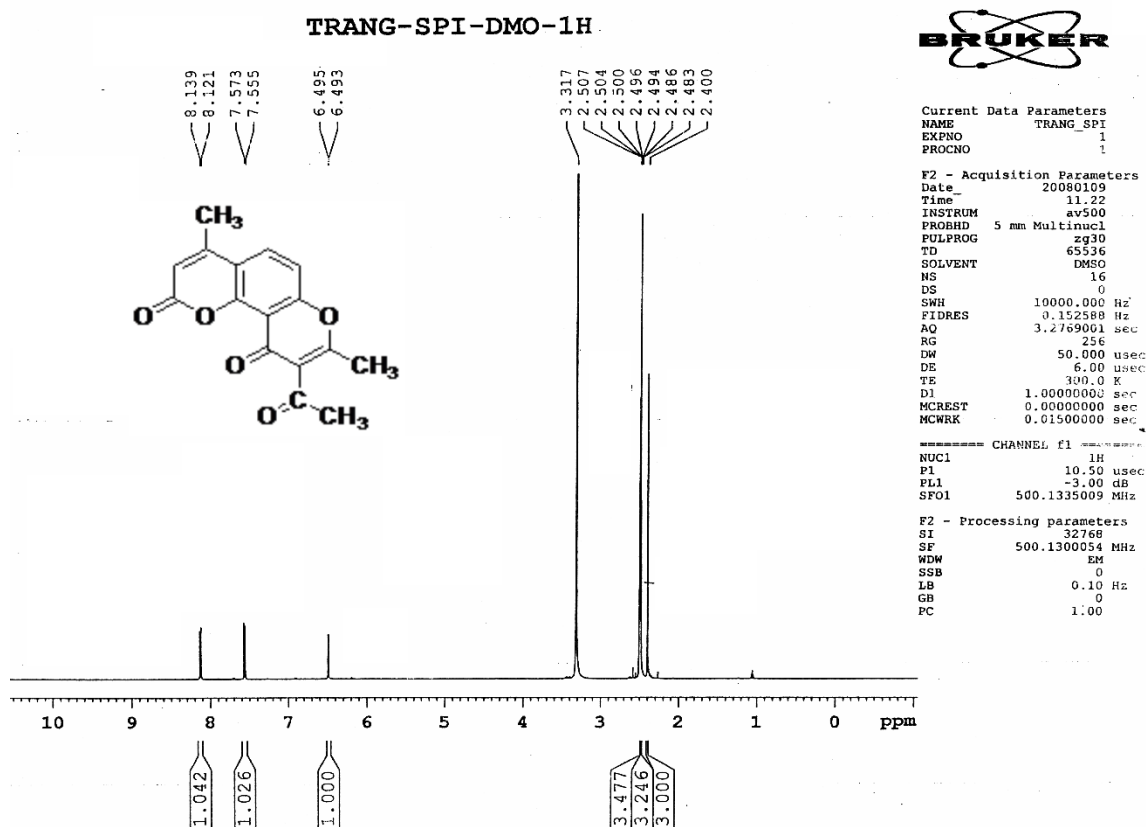
4. IR, ¹H-NMR, HR-MS, and the charge density of the carbon atoms in compound 9

Figure S13. IR spectrum of 9

Figure S14. ¹H-NMR spectrum of 9

Phong Thi nghiem HOA VAT LIEU - Khoa Hoa hoc - Truong DH KHTN - DH QG HN
Ten mau : Thu trang_K17_Cromon_SP1
Nguoi do : Le Tuan Anh
Ngay do : 21-Dec-07

Ten may : **AutoSpec Premier**
Hang san xuat : **WATERS**
Nuoc san xuat : **USA**

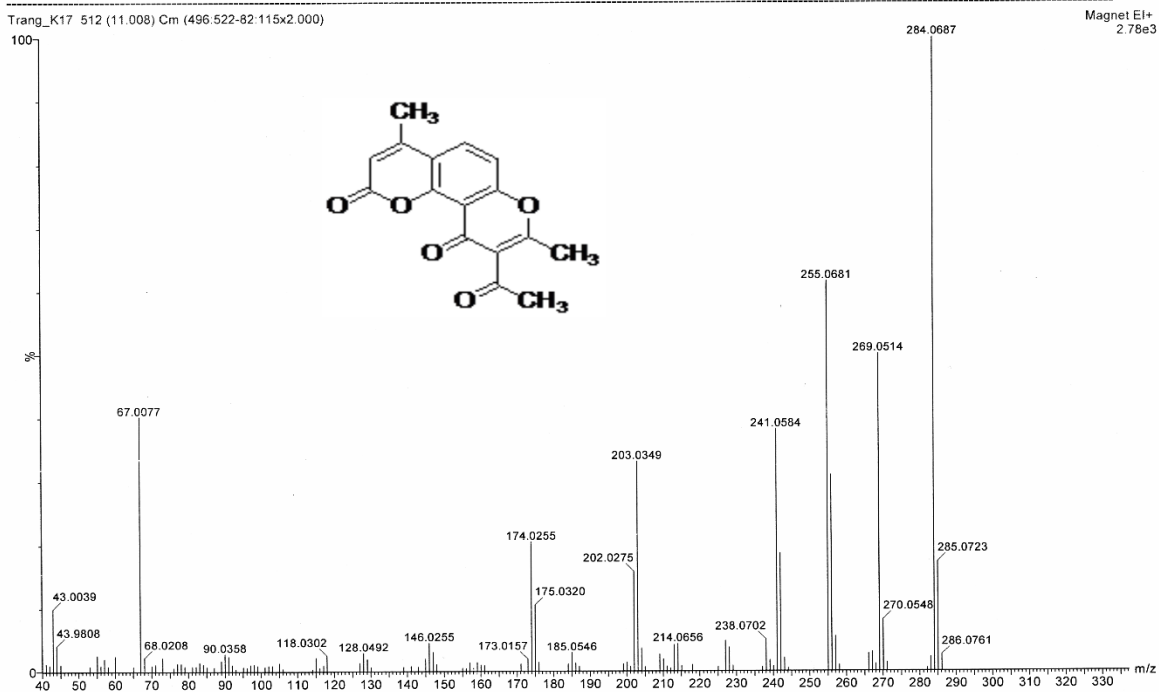


Figure S15. HR-MS spectrum of 9

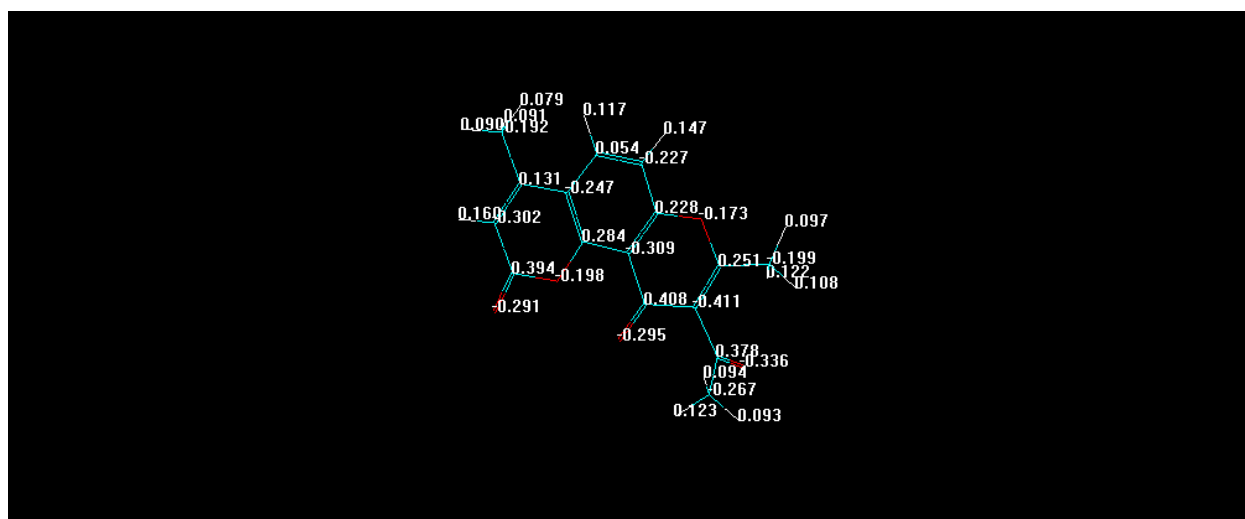


Figure S16. The charge density of the carbon atoms in 9

5. IR, $^1\text{H-NMR}$, MS, and the charge density of the carbon atoms in compound 12

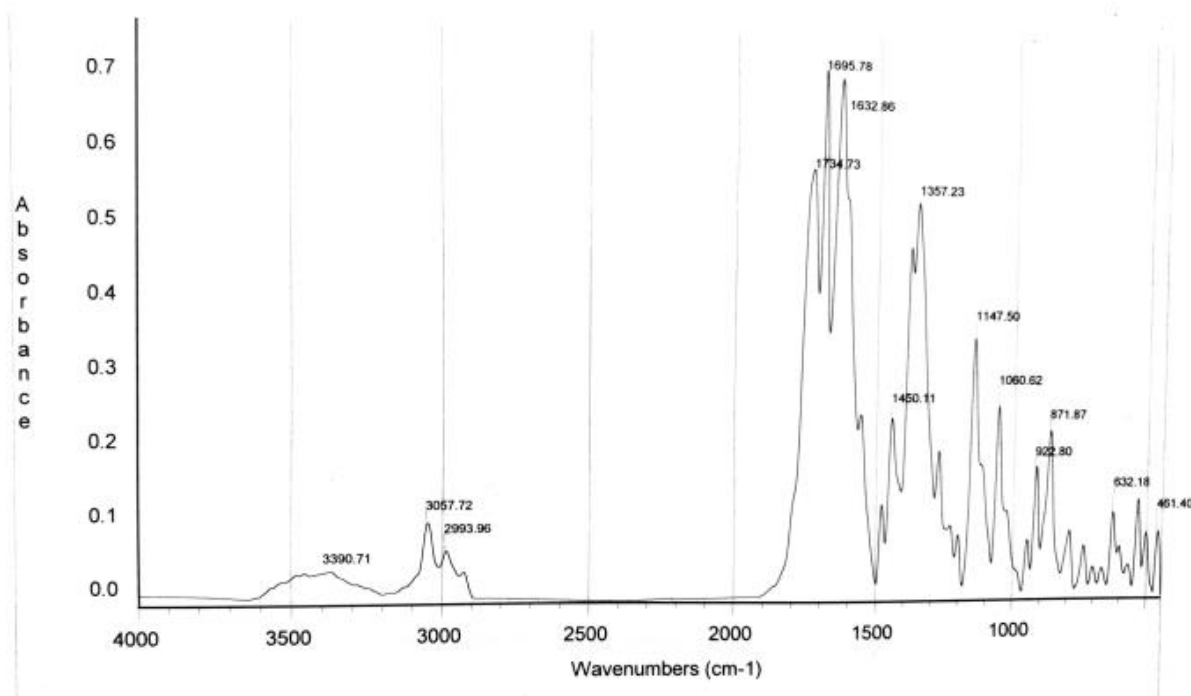
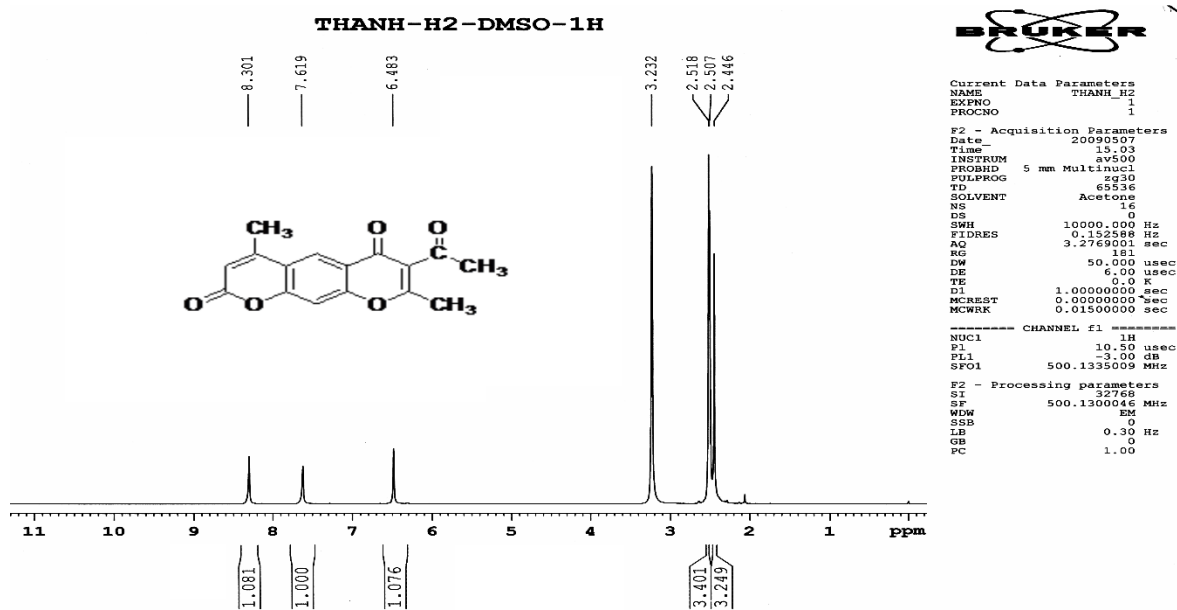


Figure S17. IR spectrum of 12

Figure S18. ¹H-NMR spectrum of 12

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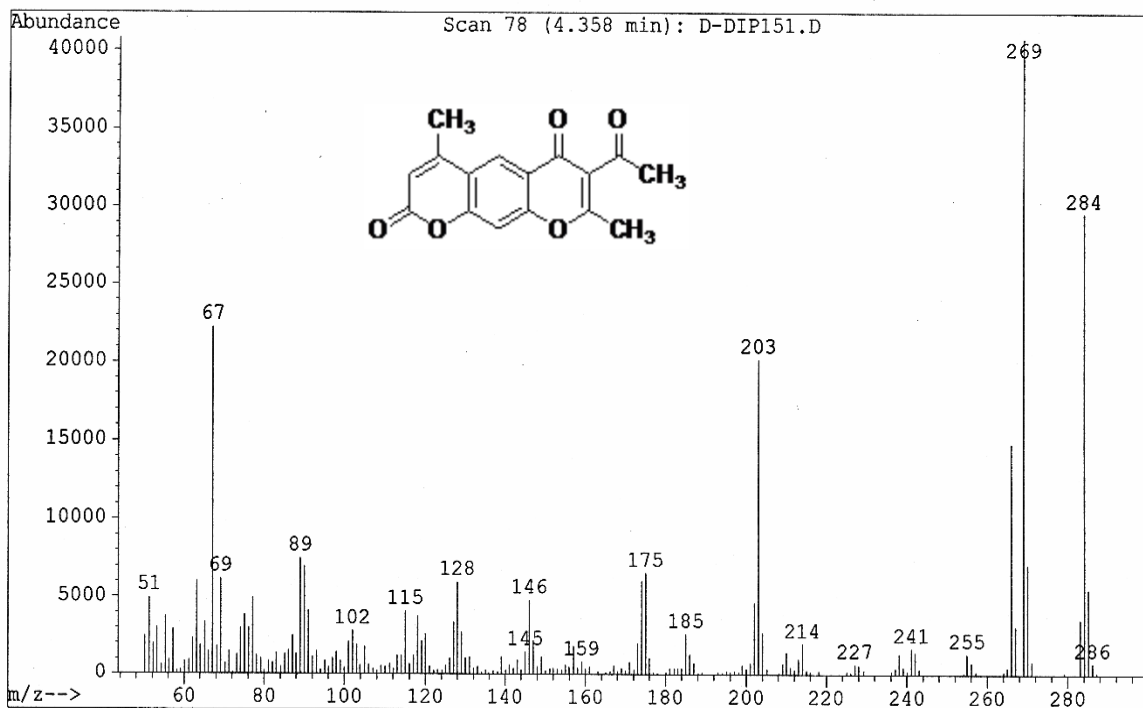


Figure S19. MS spectrum of 12

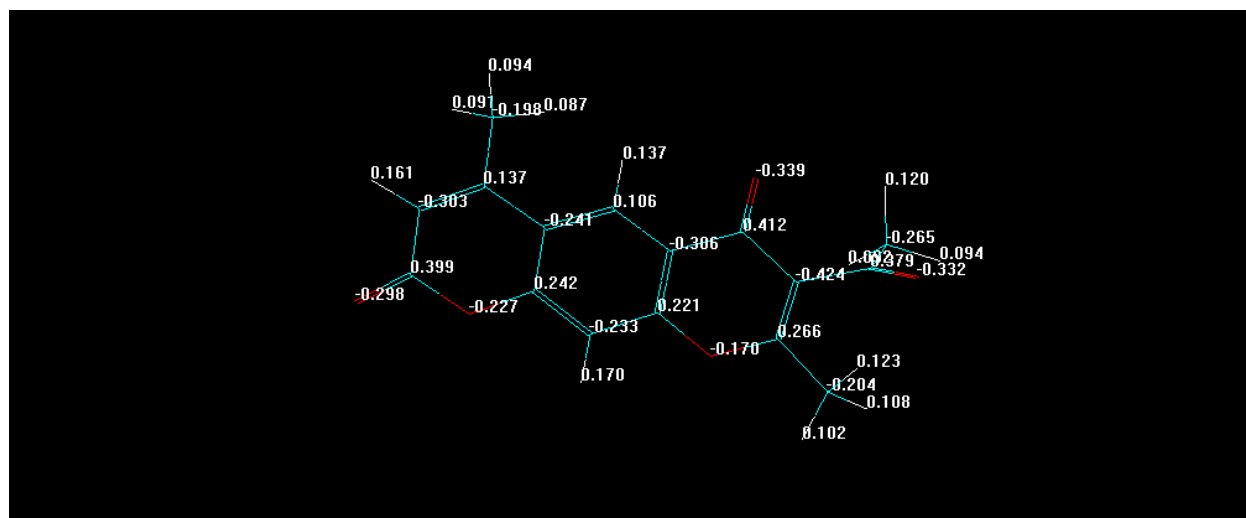


Figure S20. The charge density of the carbon atoms in 12

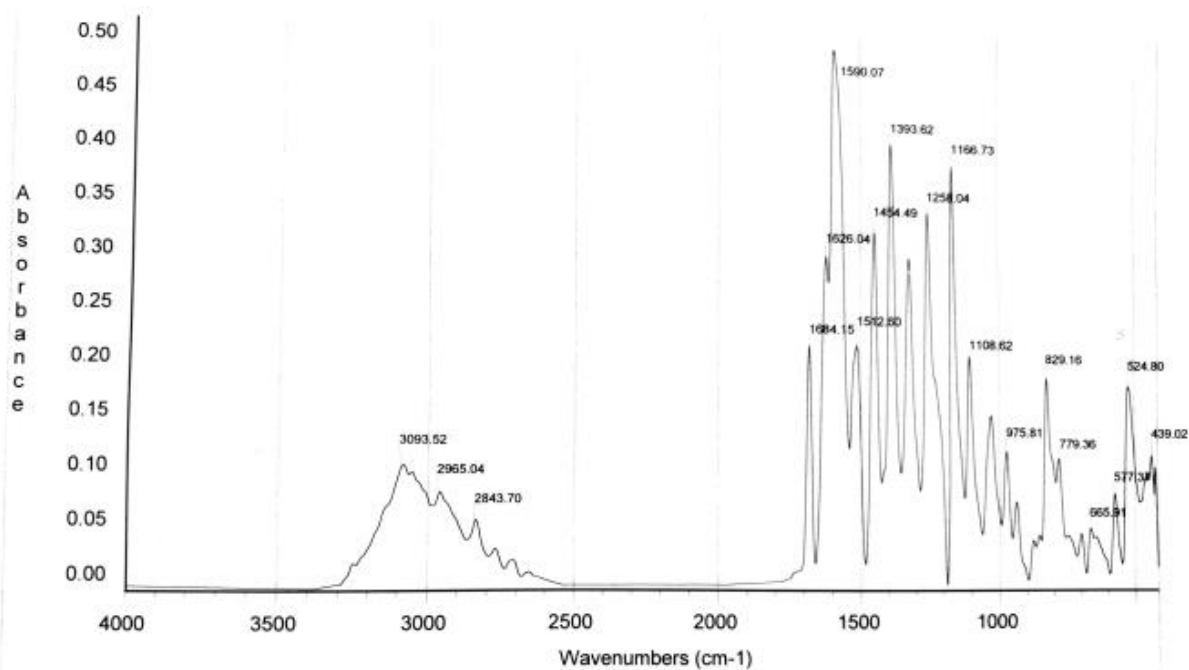
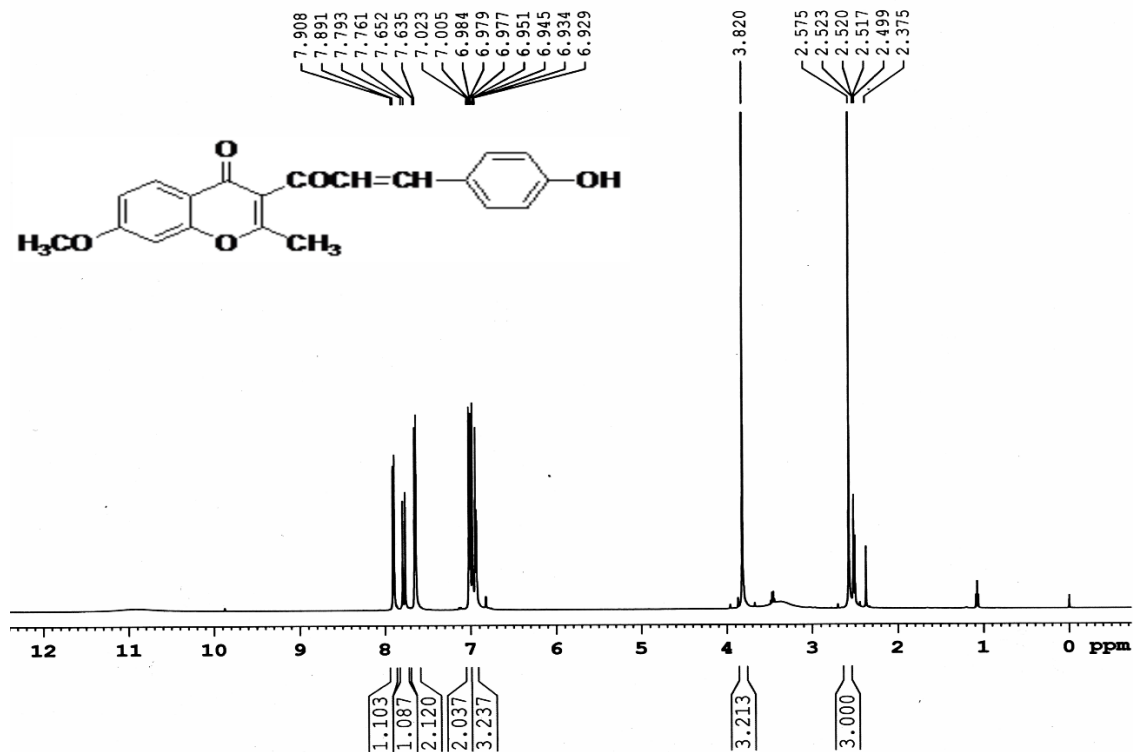
6. IR, ¹H-NMR, HR-MS spectrum of 5d'

Figure S21. IR spectrum of 5d'

Figure S22. ¹H-NMR spectrum of 5d'

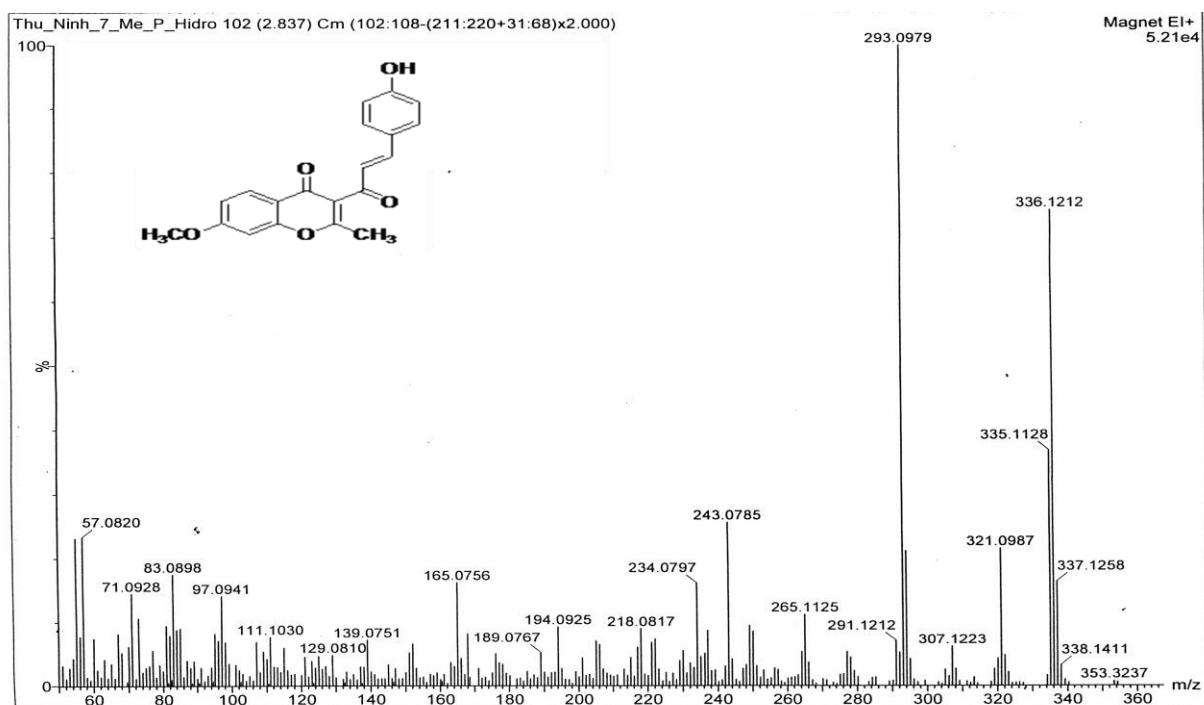


Figure S23. HR-MS spectrum of 5d'

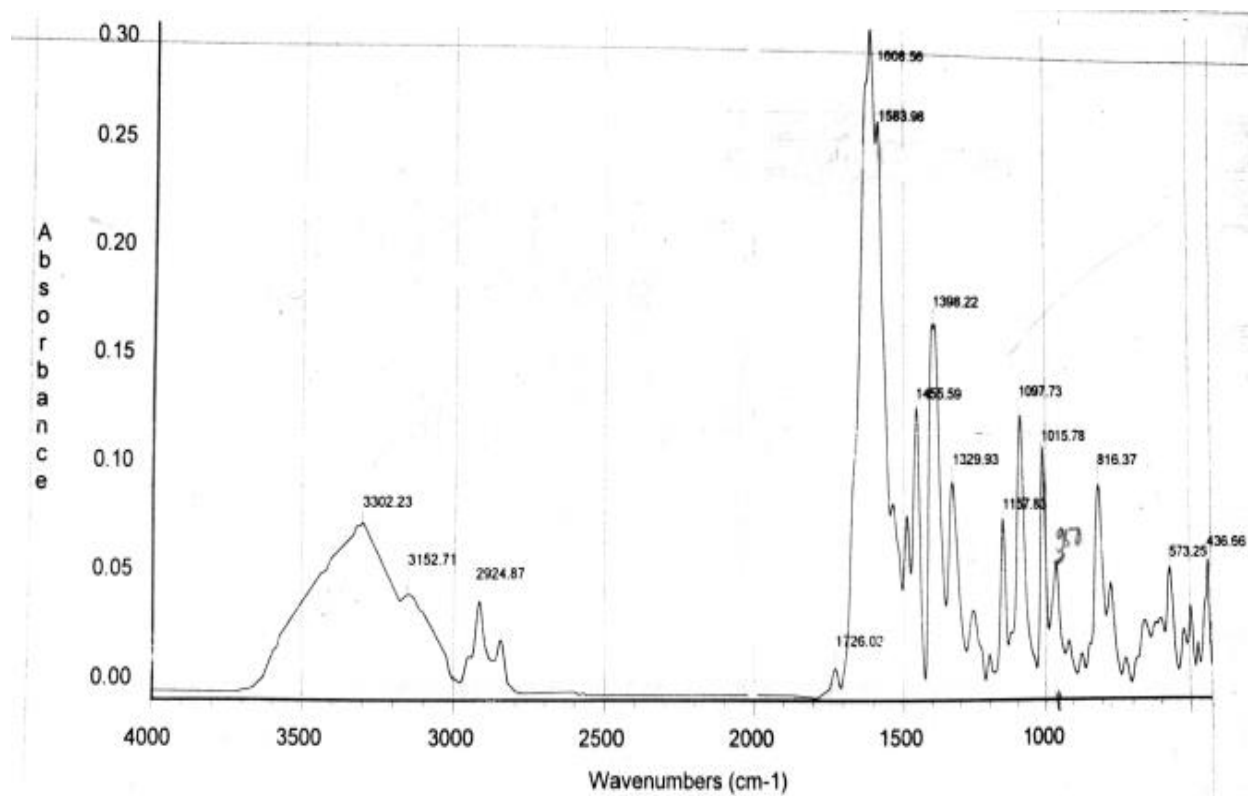
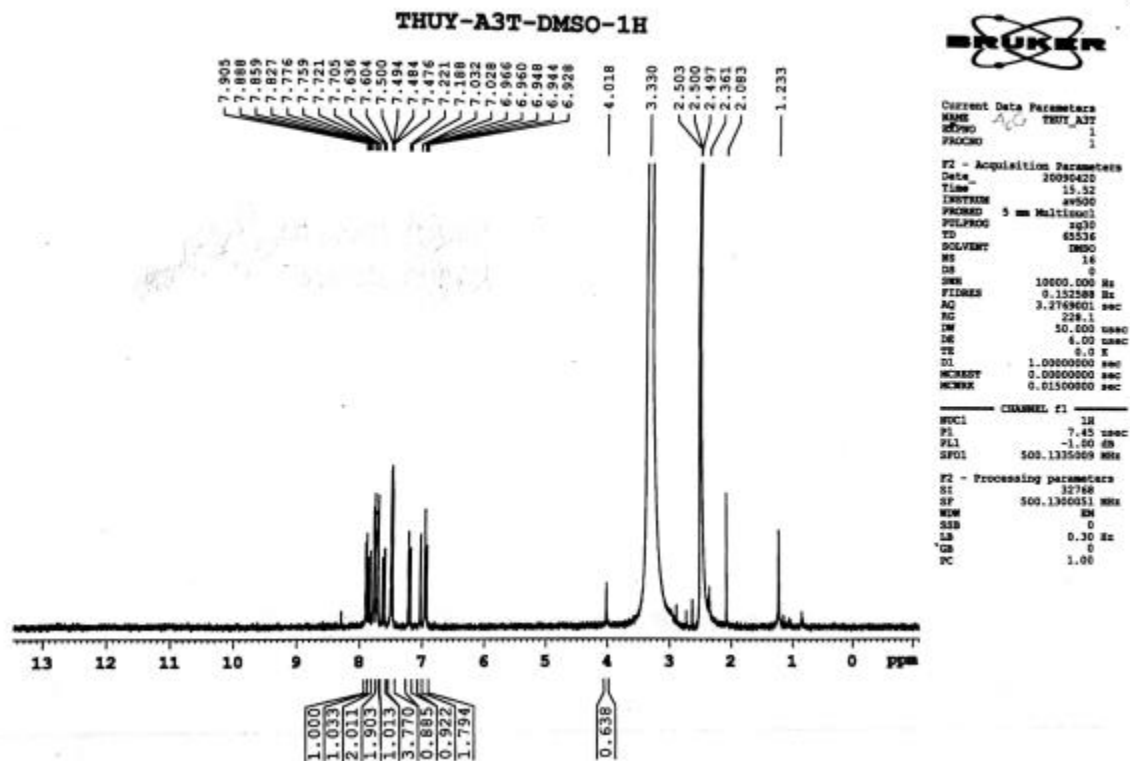
7. IR, ¹H-NMR, MS spectrum of 3a

Figure S24. IR spectrum of 3a

Figure S25. ¹H-NMR spectrum of 3a

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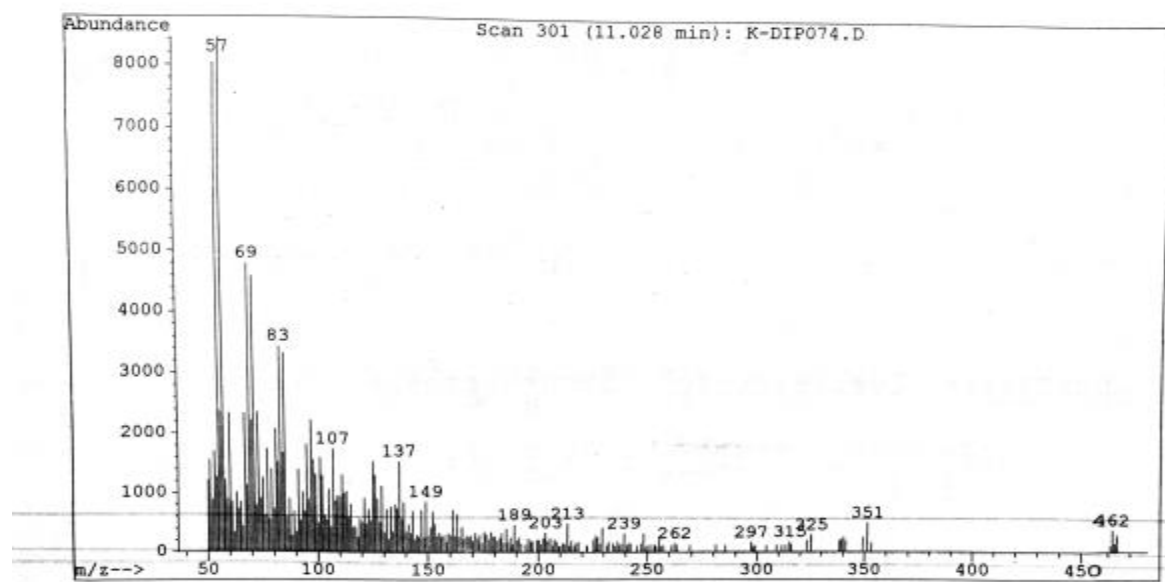


Figure S26. MS spectrum of 3a

8. IR, NMR spectrum of 3b

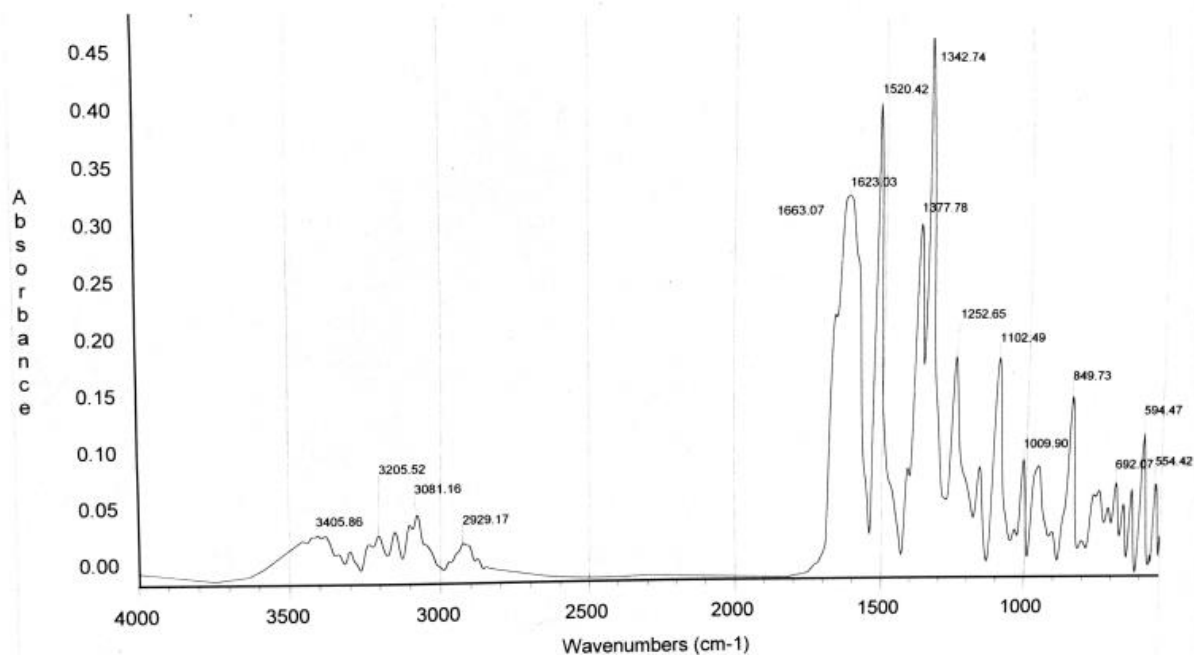
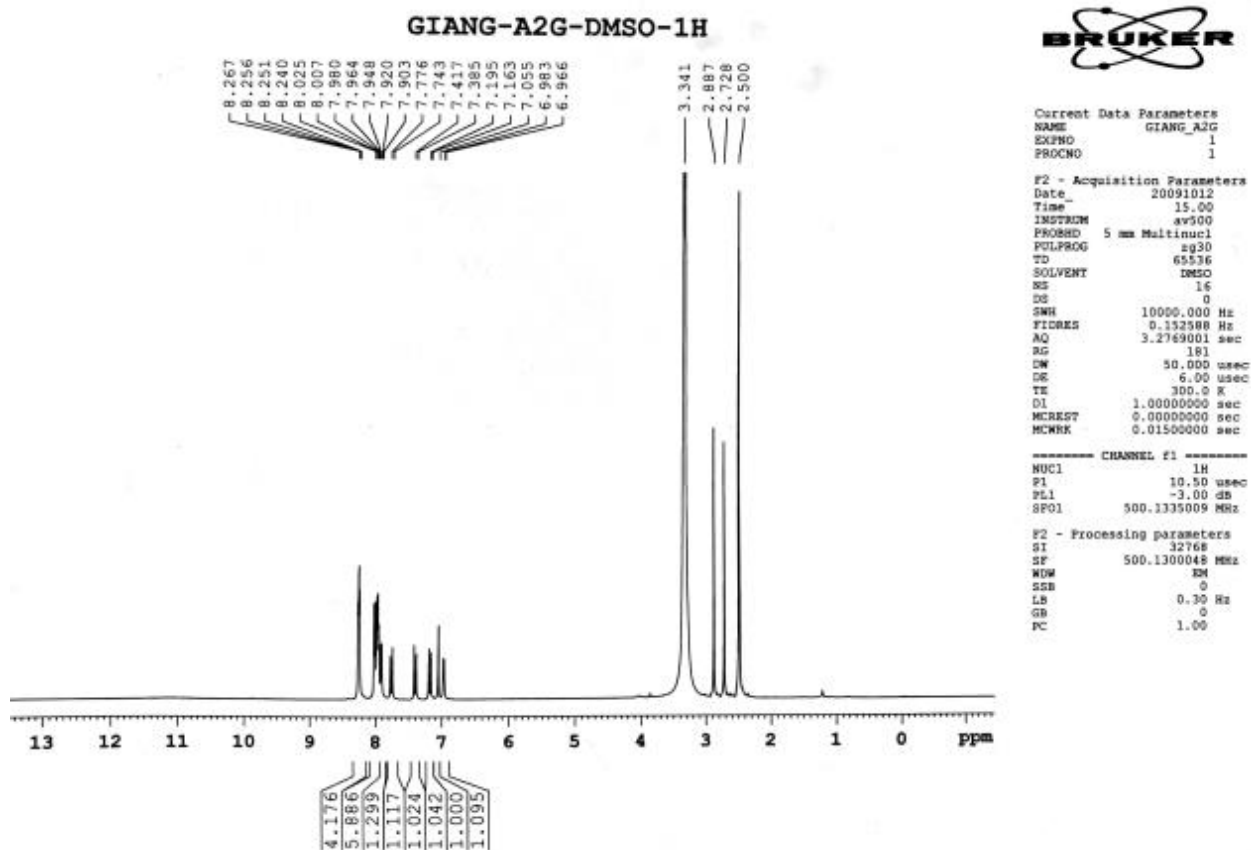


Figure S27. IR spectrum of 3b

Figure S28. ¹H-NMR spectrum of 3b

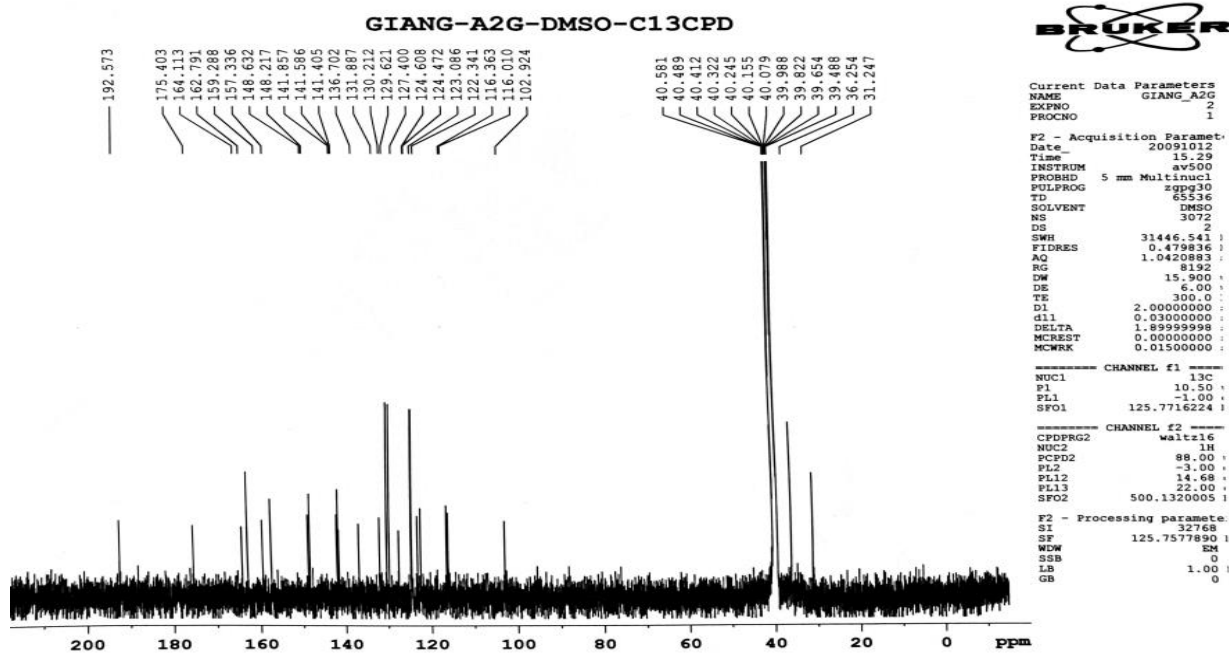
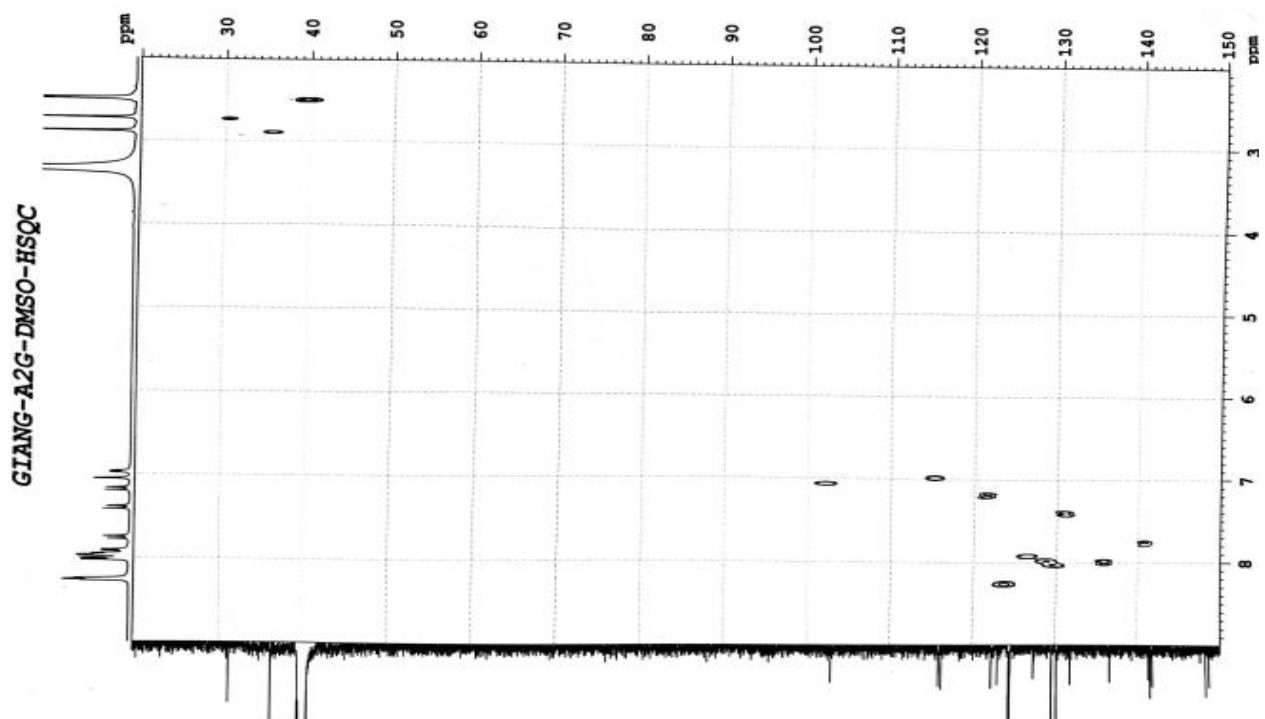
Figure S29. ^{13}C -NMR spectrum of 3b

Figure S30. HSQC spectrum of 3b

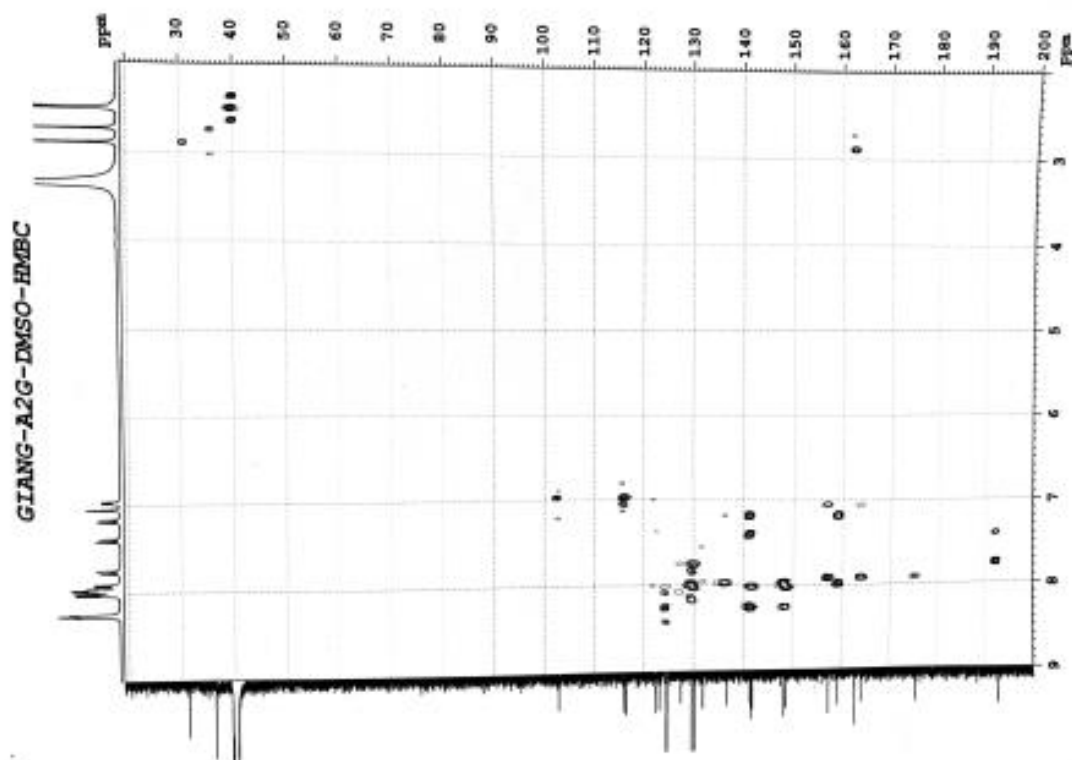


Figure S31. HMBC spectrum of 3b

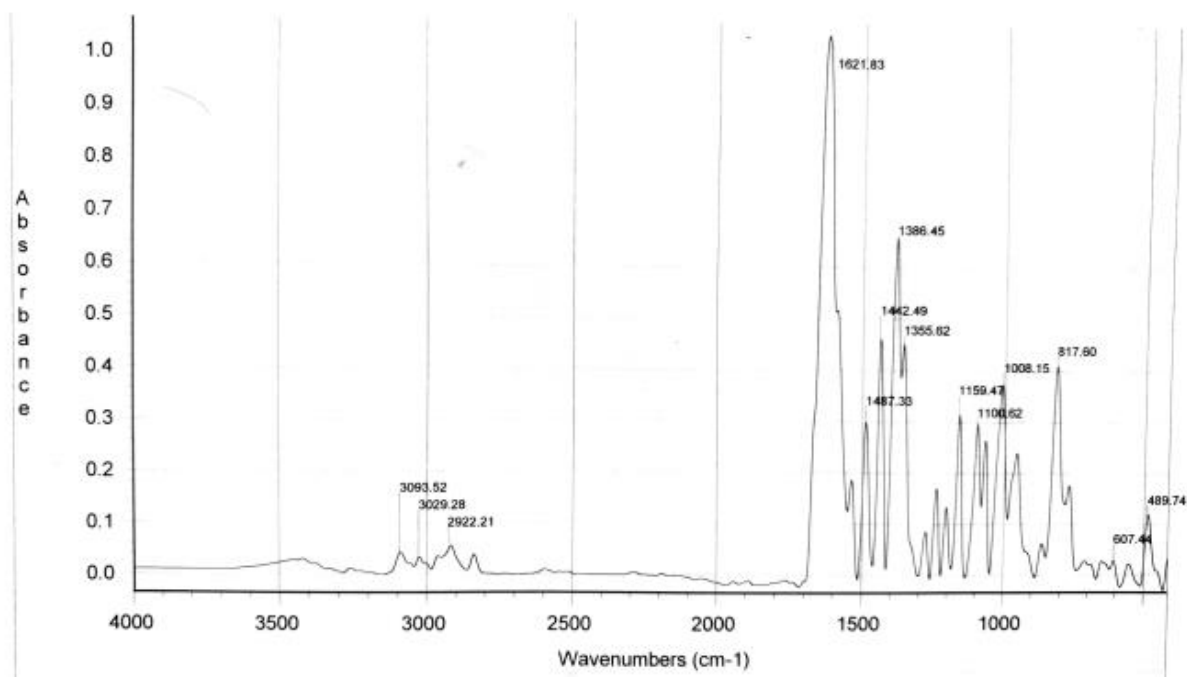
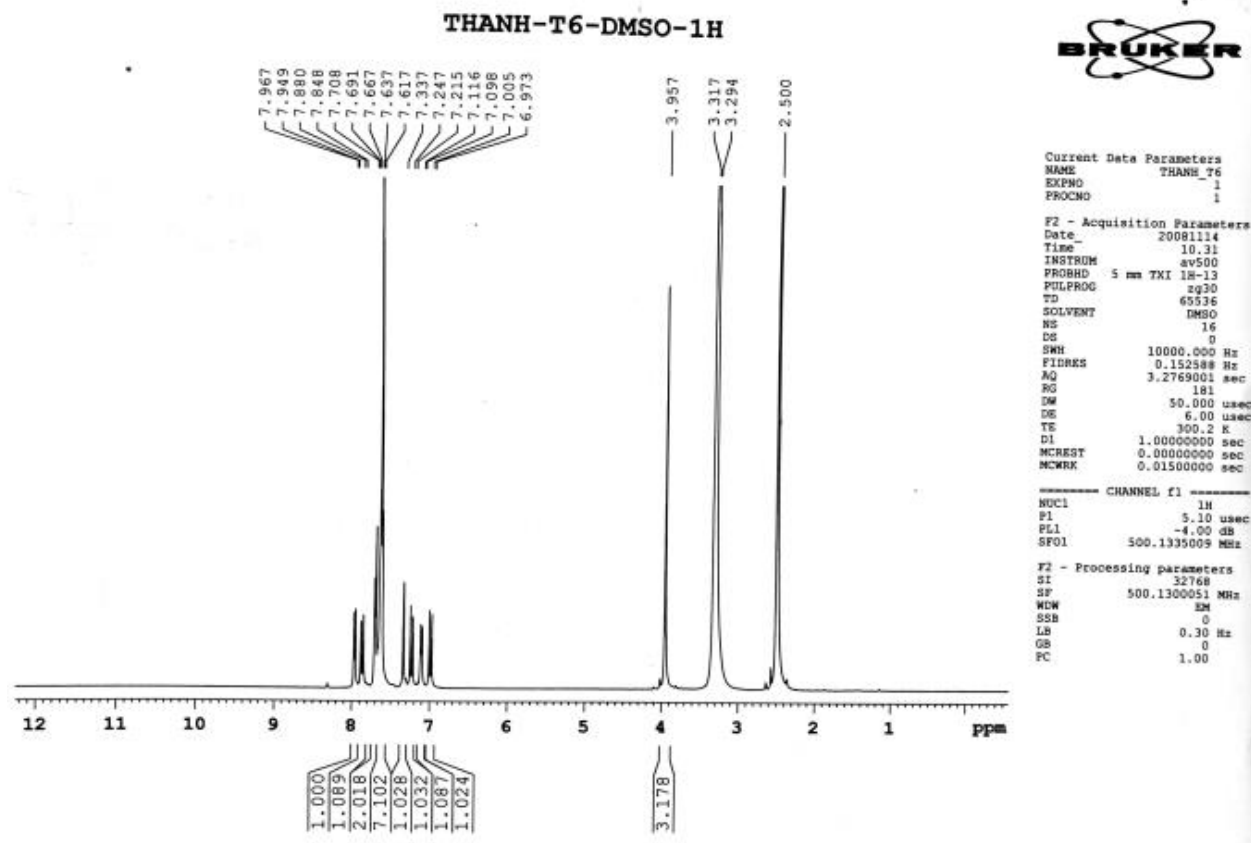
9. IR, ¹H-NMR spectrum of 5a

Figure S32. IR spectrum of 5a

Figure S33. ¹H-NMR spectrum of 5a

10. IR, NMR and HR-MS spectrum of 5b

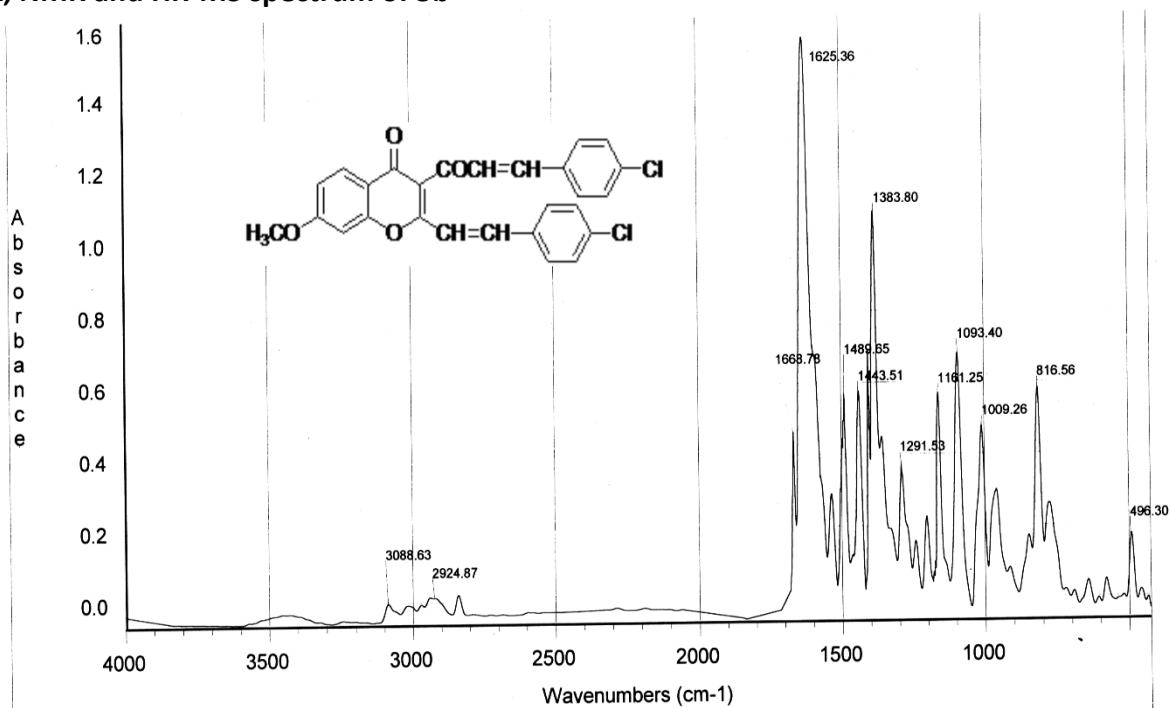
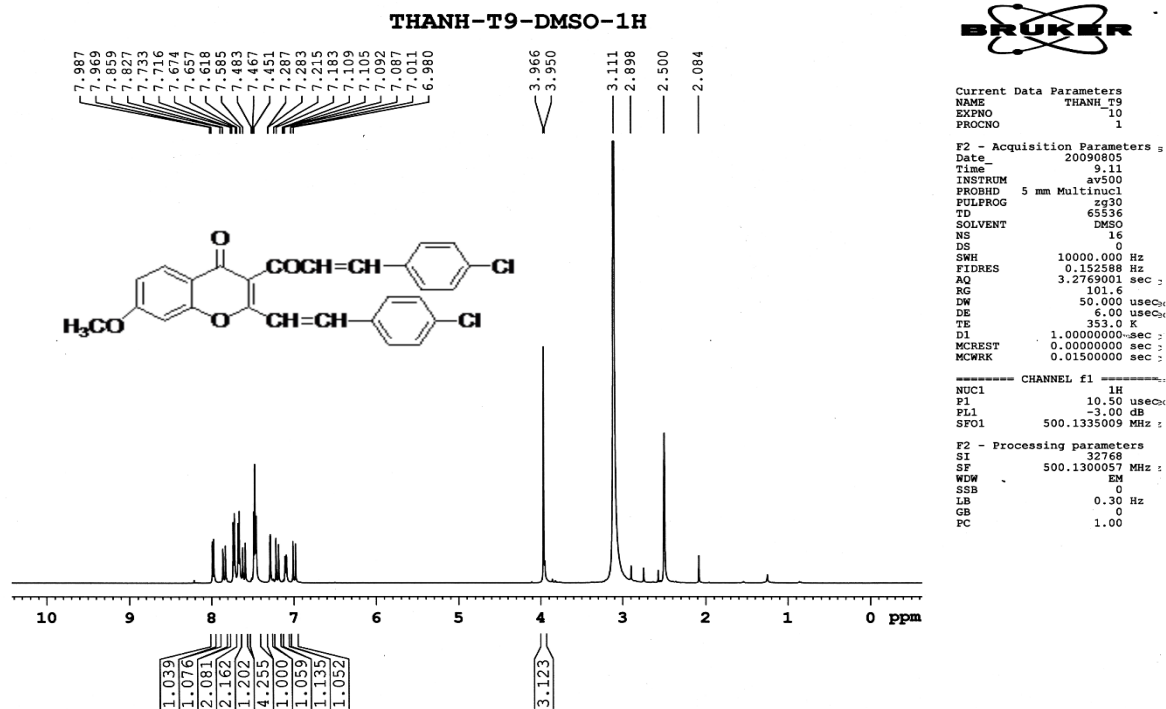
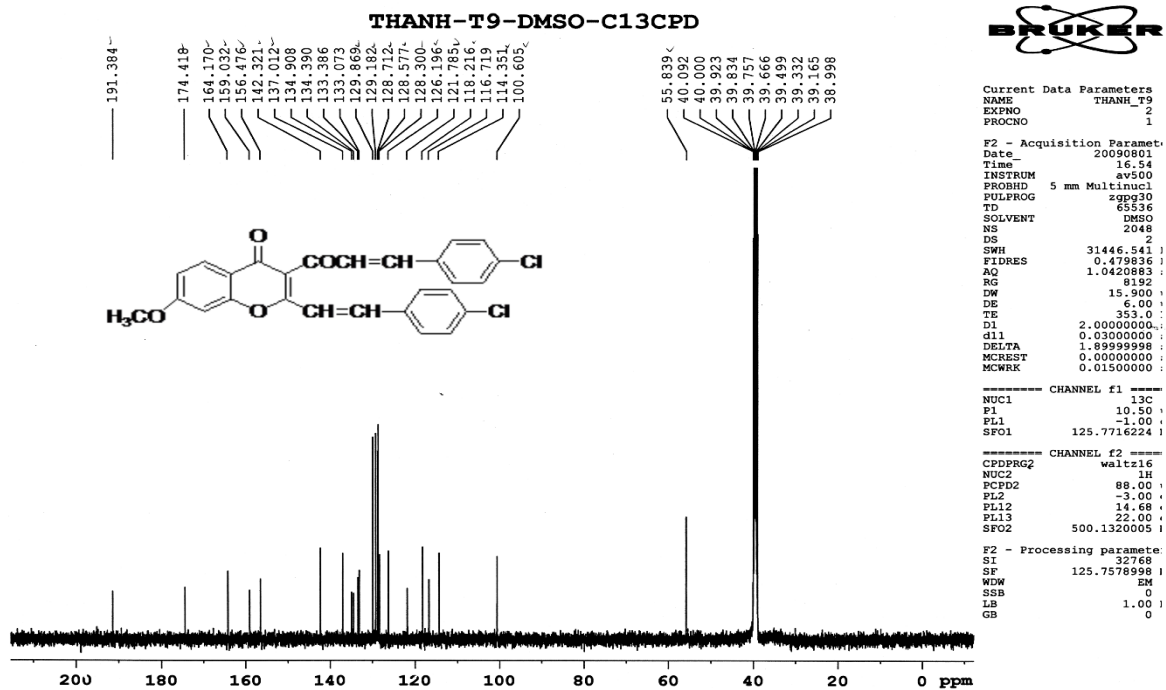


Figure S34. IR spectrum of 5b

Figure S35. ¹H-NMR spectrum of 5bFigure S36. ¹³C-NMR spectrum of 5b

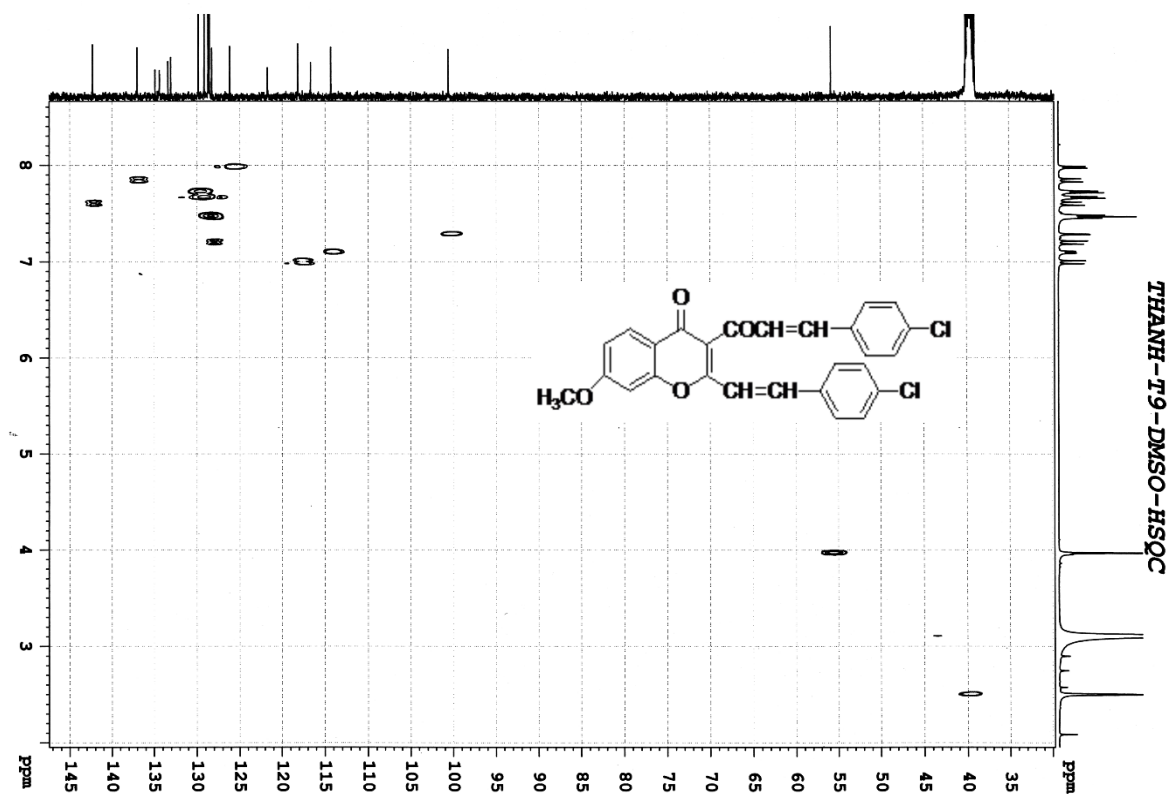


Figure S37. HSQC spectrum of 5b

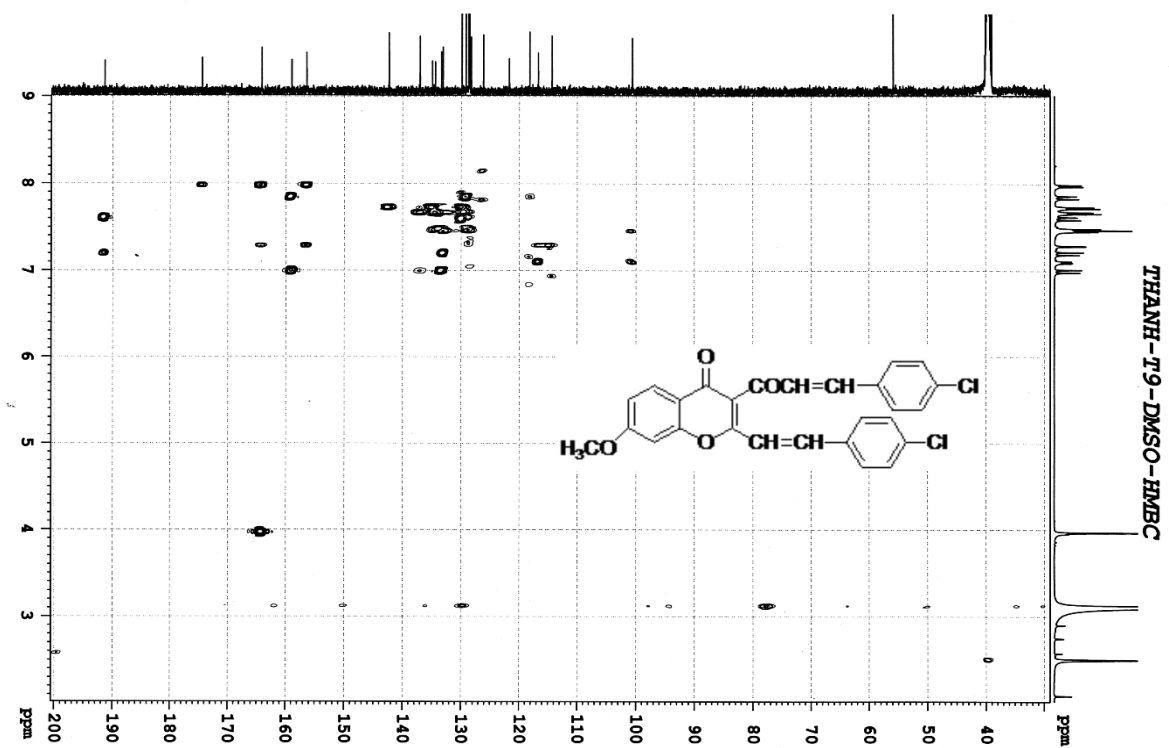


Figure S38. HMBC spectrum of 5b

Phong Thi nghiem HOA VAT LIEU - Khoa Hoa hoc - Truong DH KHTN - DH QG HN
 Ten mau : T9_354_477
 Nguoi do : TS.Le Tuan Anh
 Ngay do : 10-Dec-08

Ten may : **AutoSpec Premier**
 Hang san xuat : **WATERS**
 Nuoc san xuat : **USA**



Figure S39. HR-MS spectrum of 5b

11. IR, NMR, and HR-MS spectrum of 5c

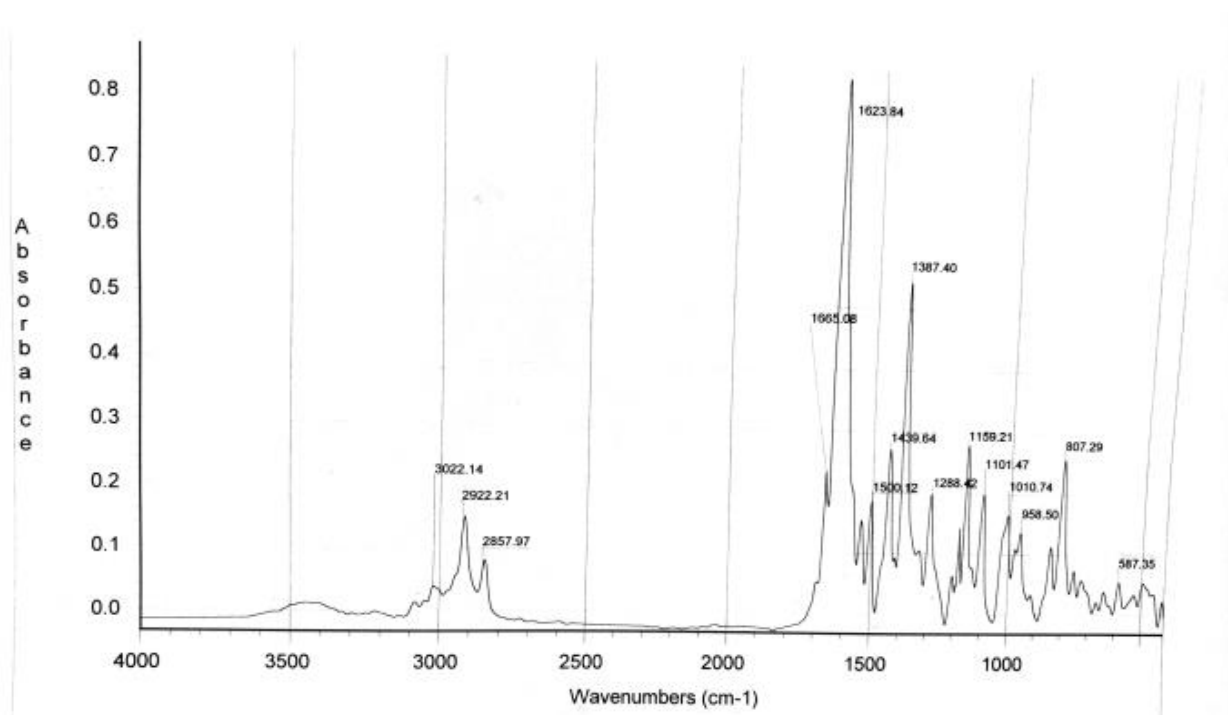
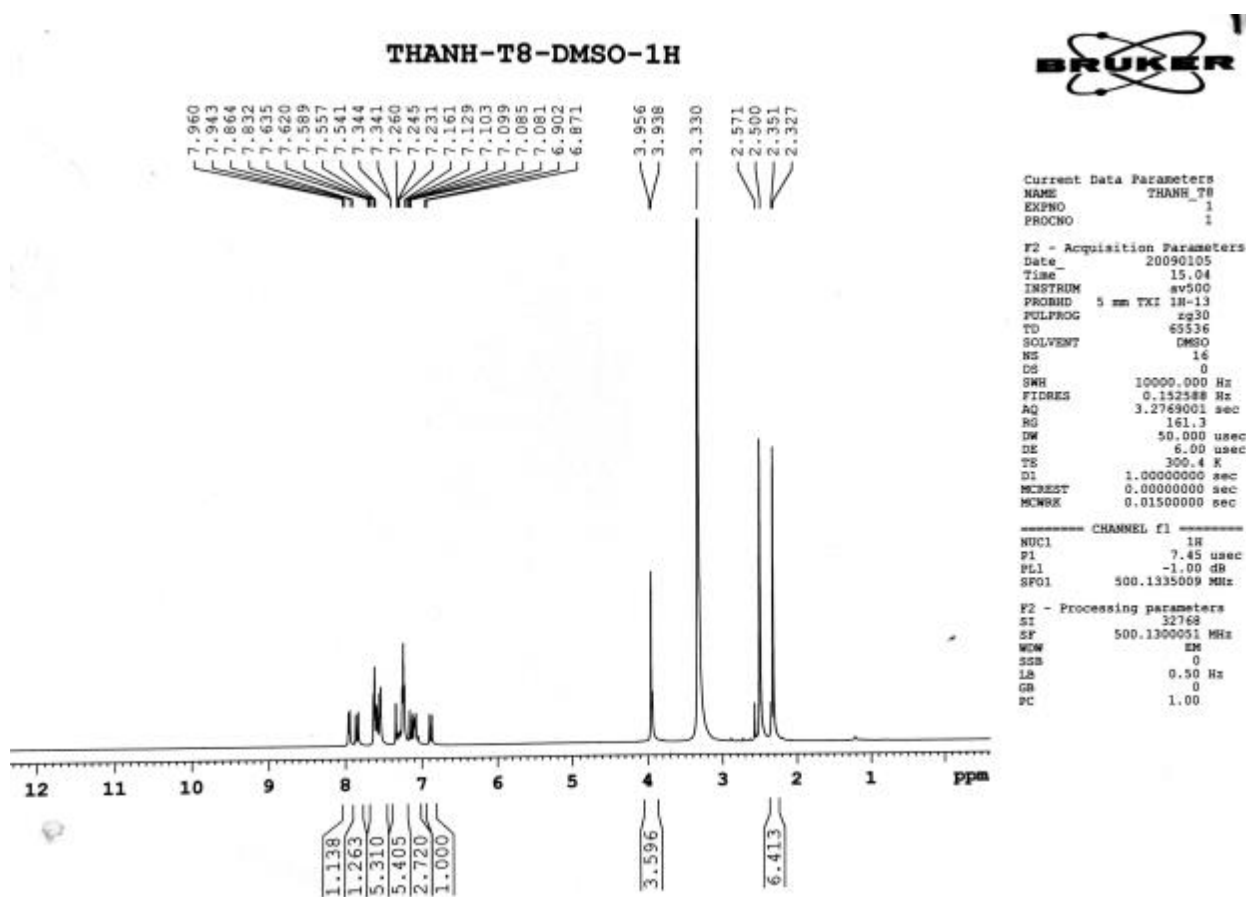
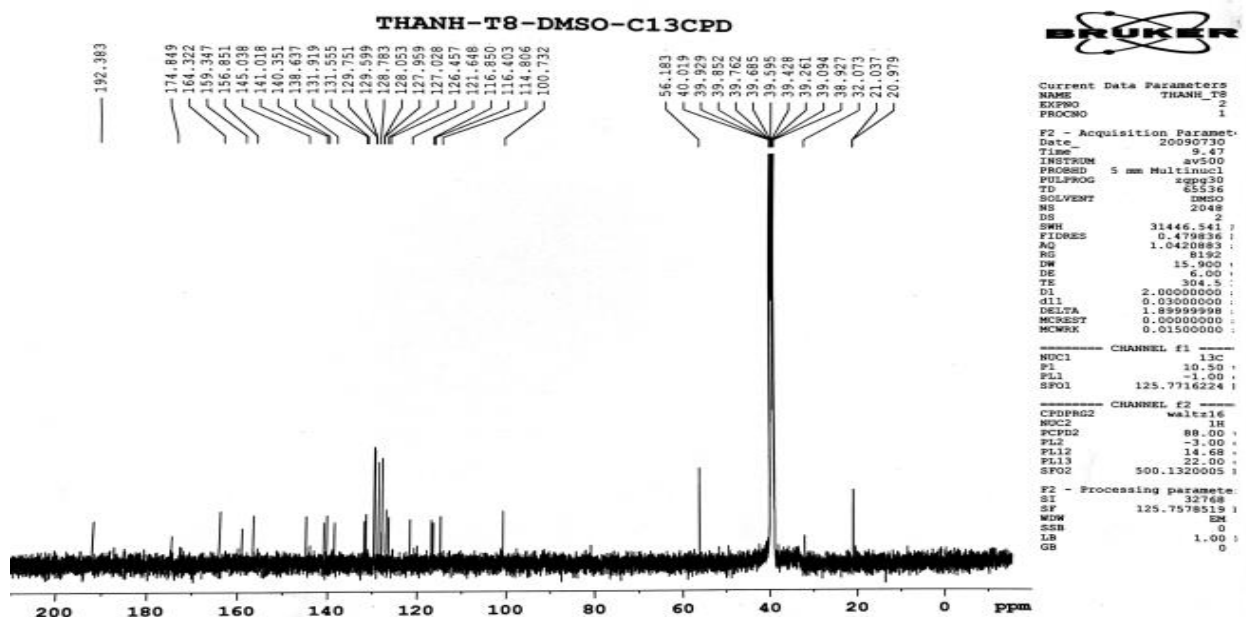


Figure S40. IR spectrum of 5c

Figure S41. ^1H -NMR spectrum of 5cFigure S42. ^{13}C -NMR spectrum of 5c

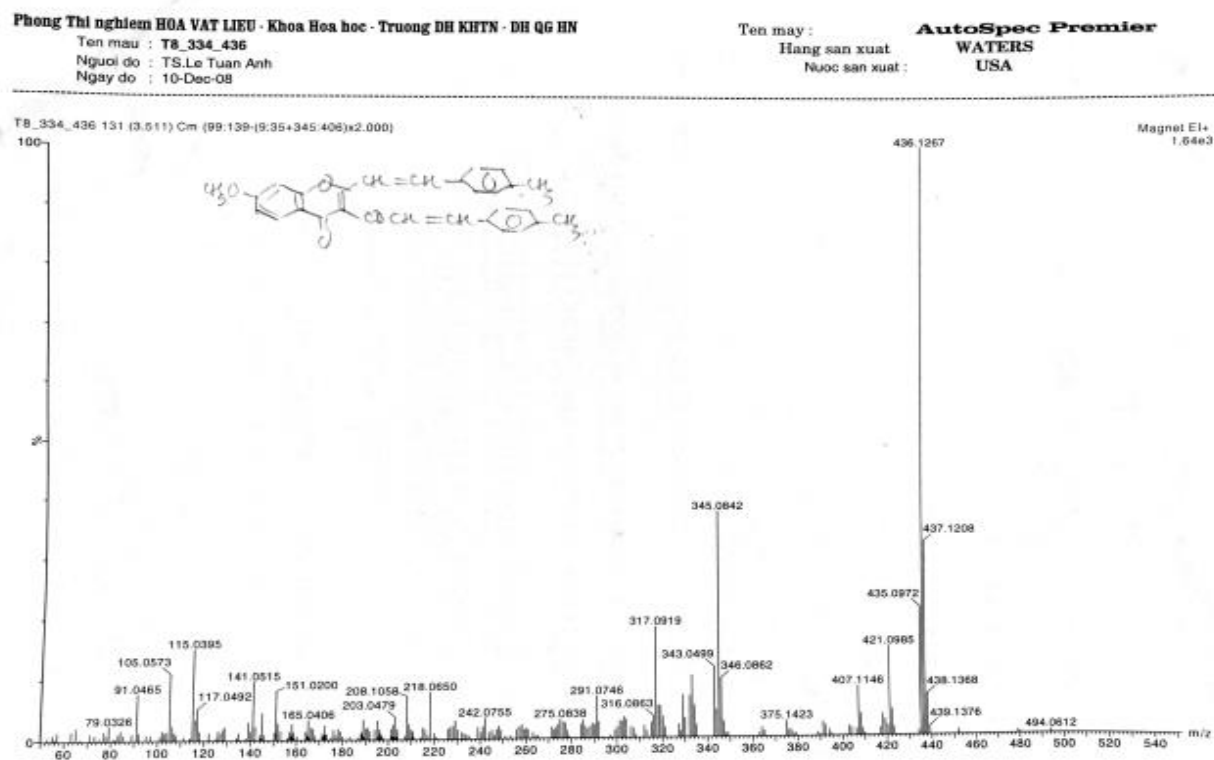


Figure S43. HR-MS spectrum of 5c

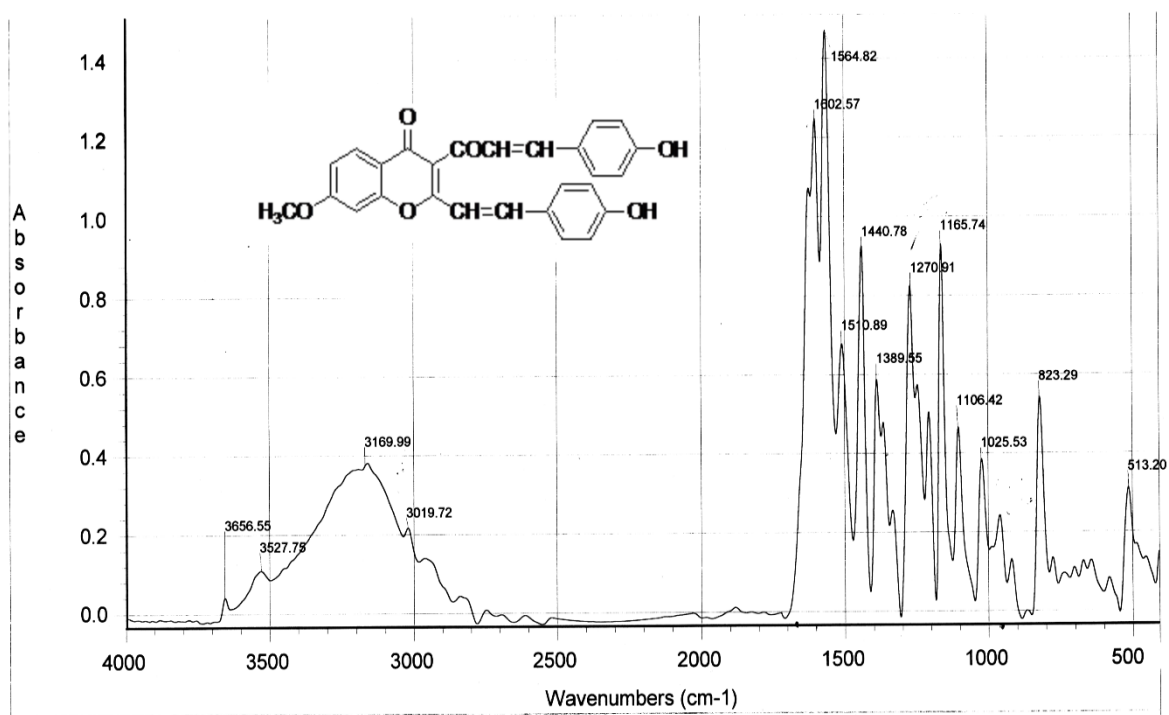
12. IR, ¹H-NMR spectrum of 5d

Figure S44. IR spectrum of 5d

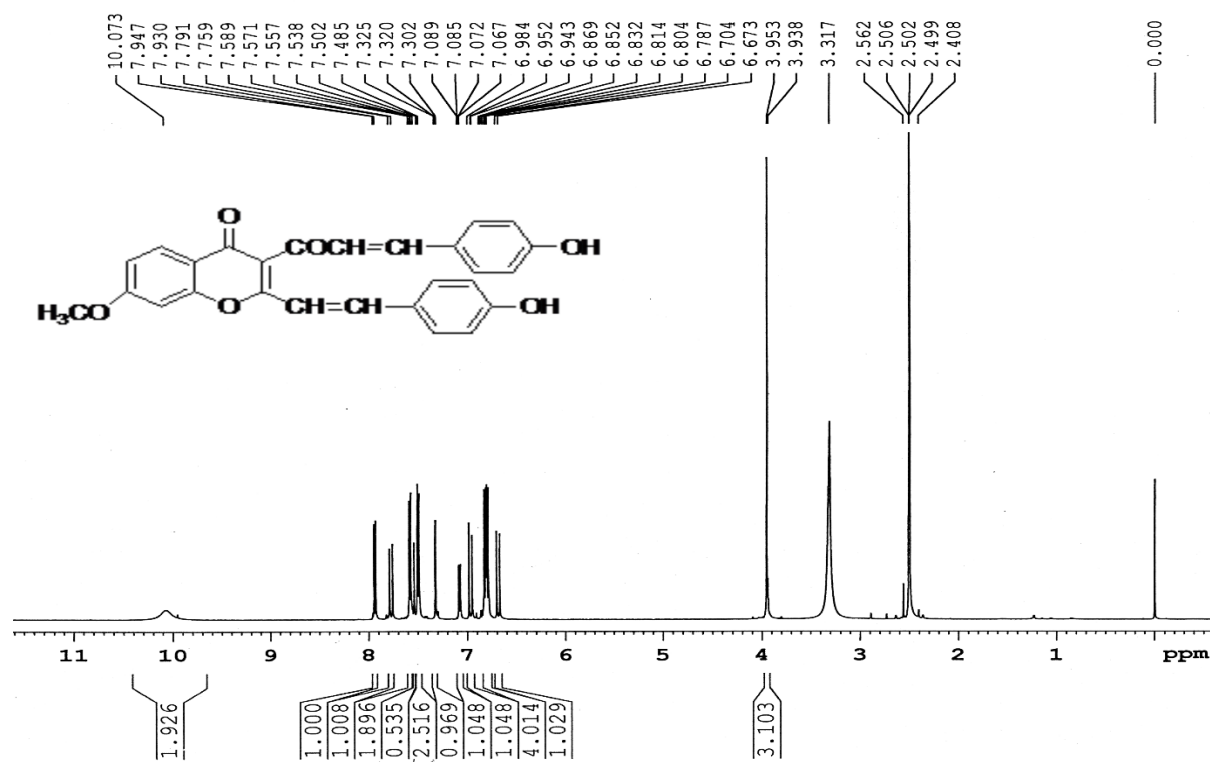
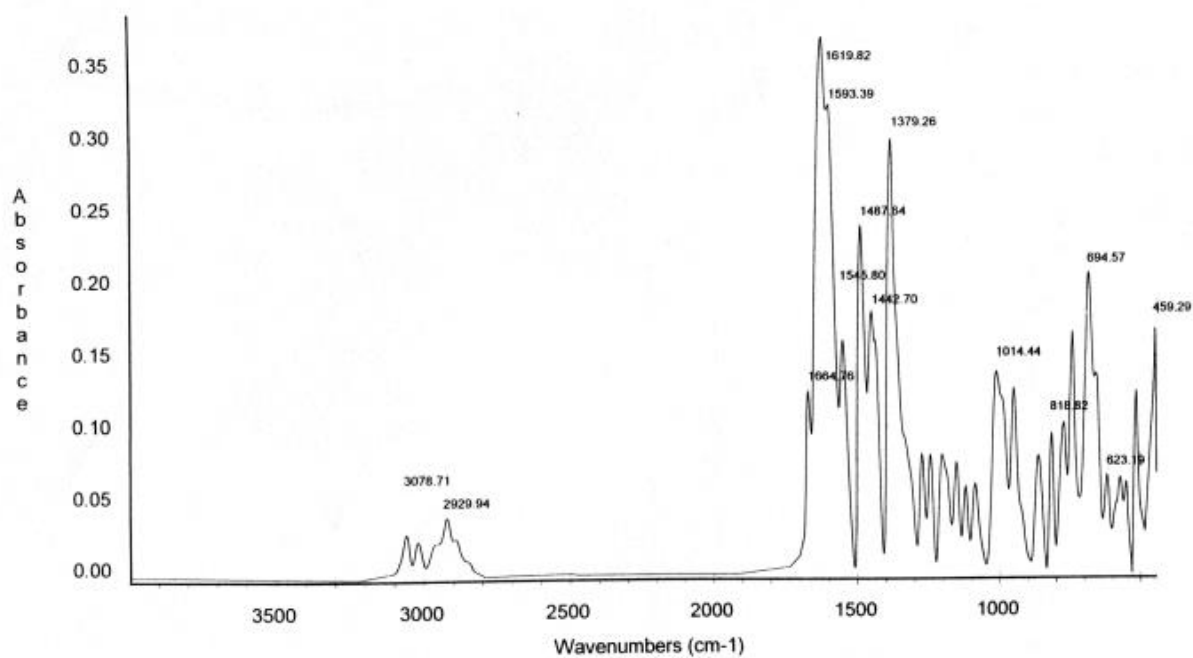
Figure S45. ¹H-NMR spectrum of 5d13. IR, ¹H-NMR spectrum of 7a

Figure S46. IR spectrum of 7a

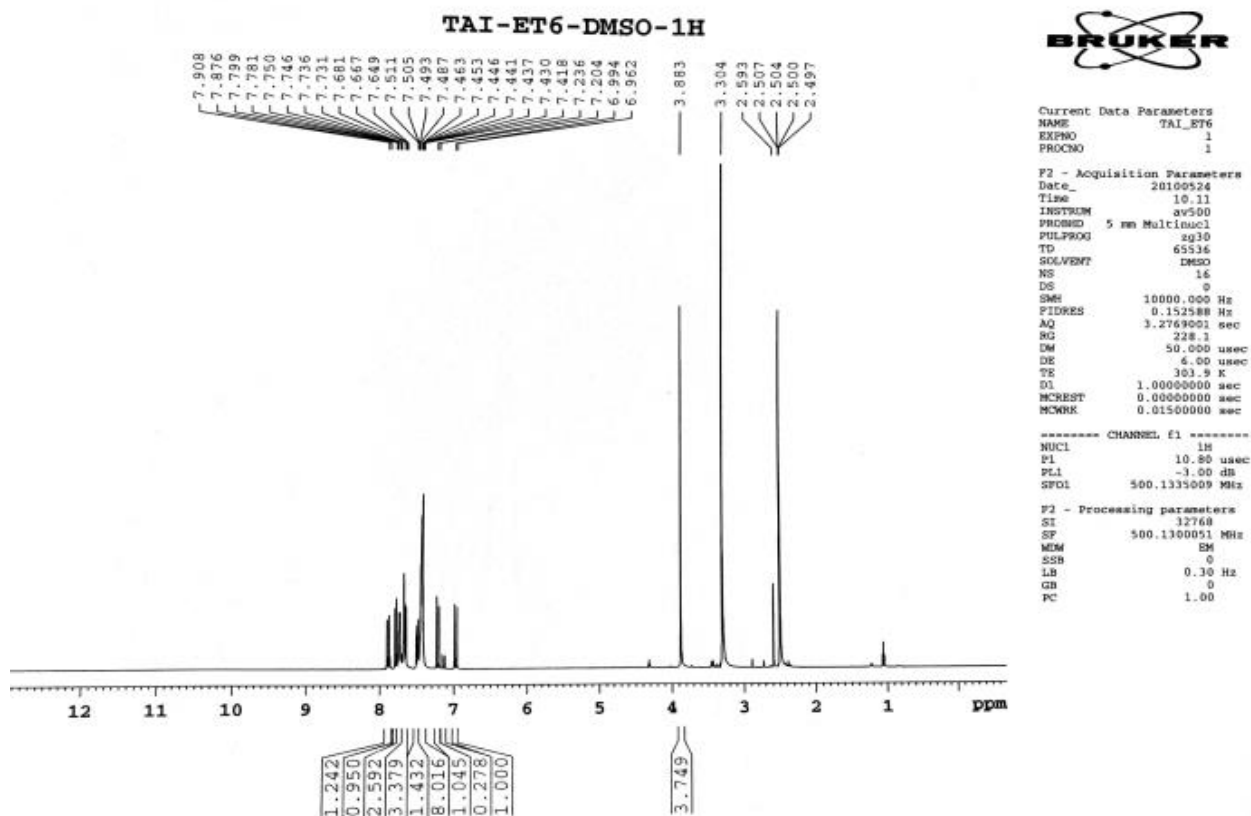
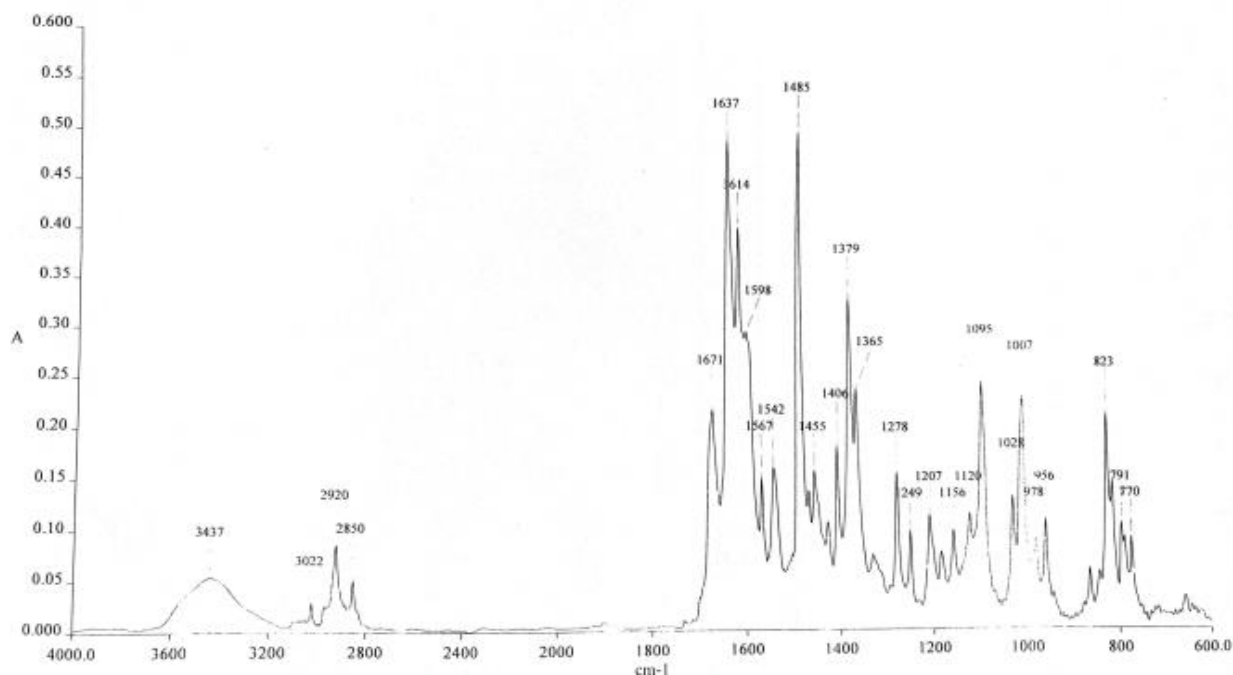
Figure S47. $^1\text{H-NMR}$ spectrum of 7a14. IR, $^1\text{H-NMR}$ spectrum of 3c2

Figure S48. IR spectrum of 7b

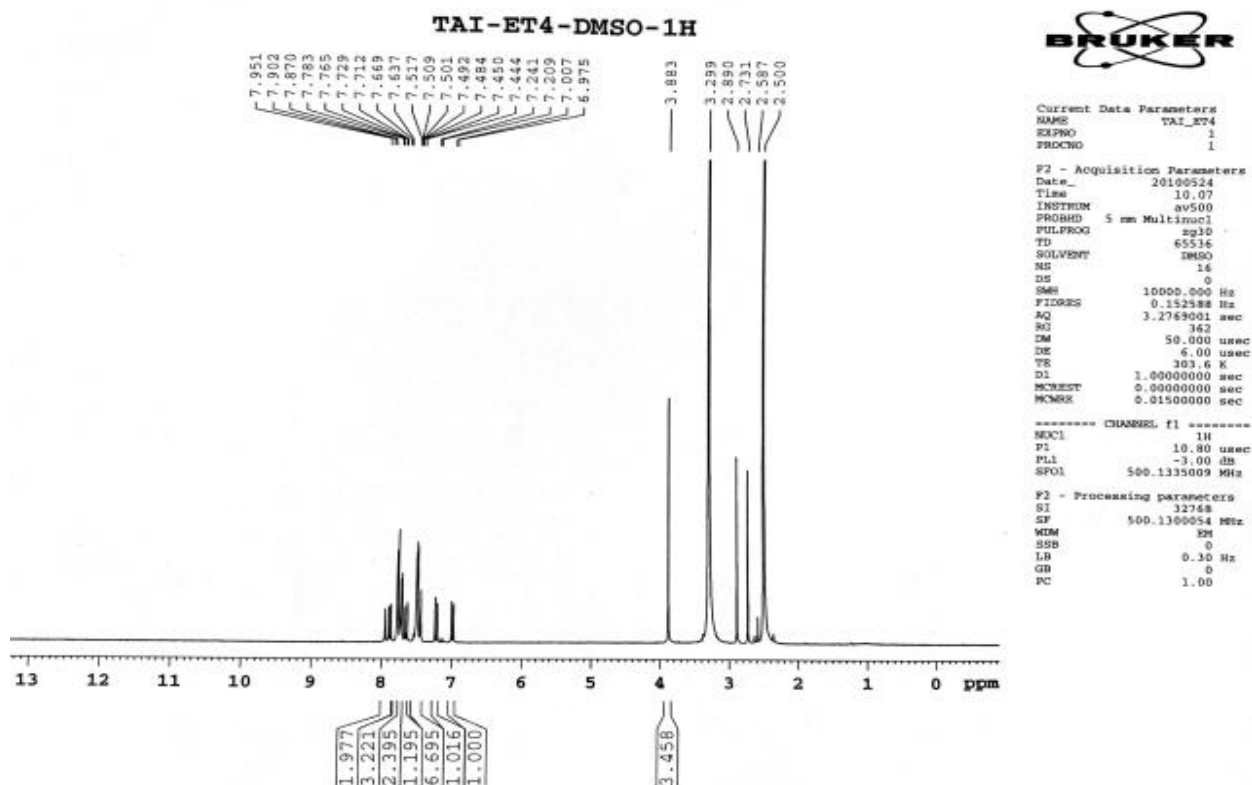
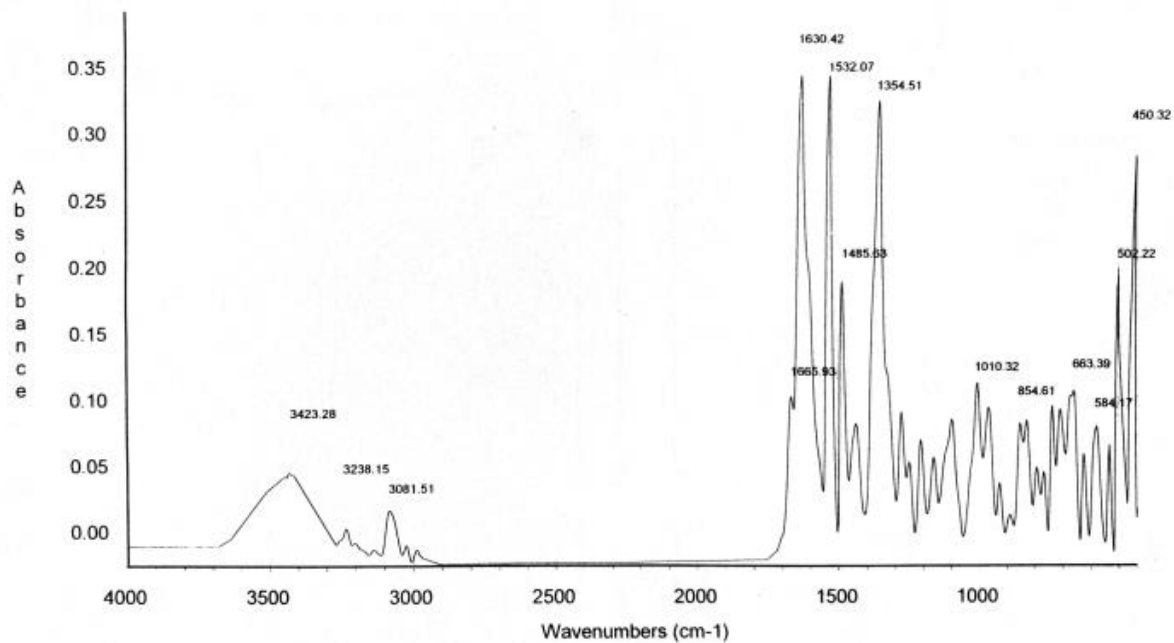
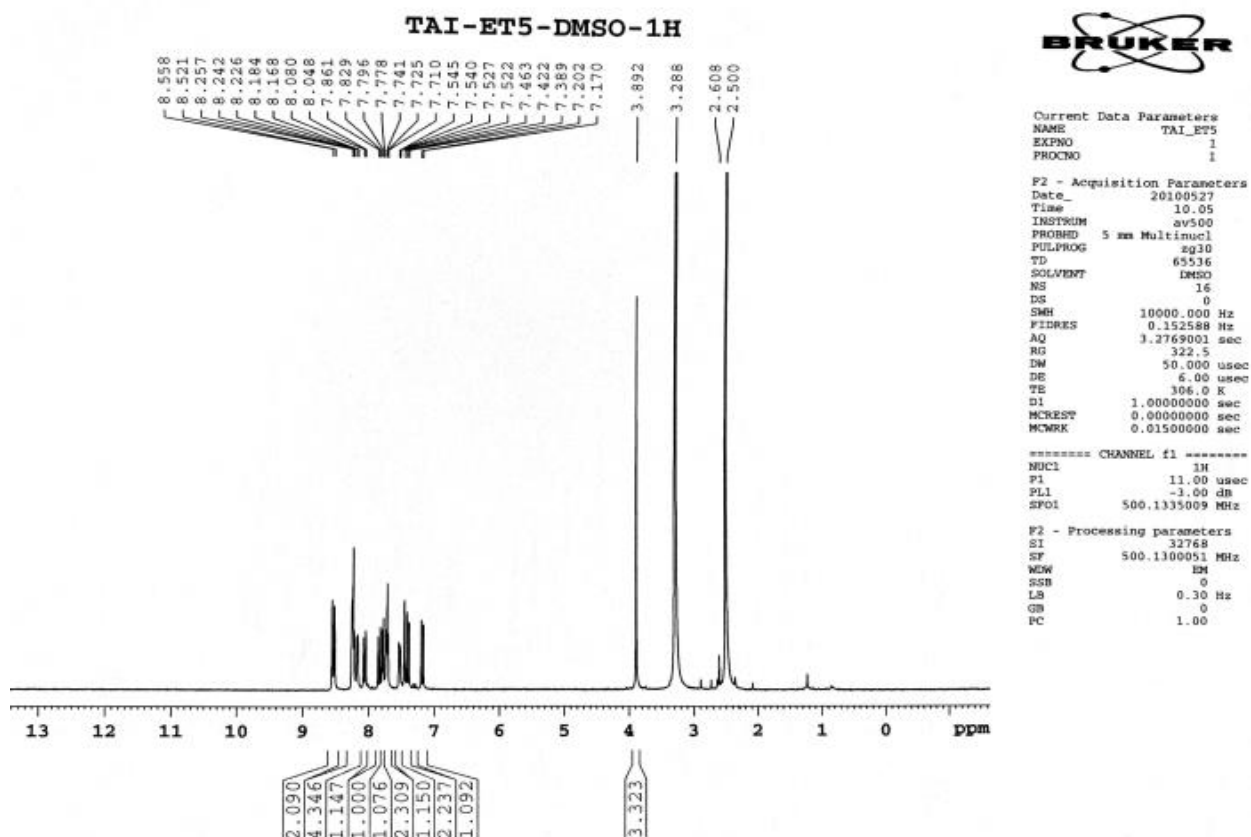
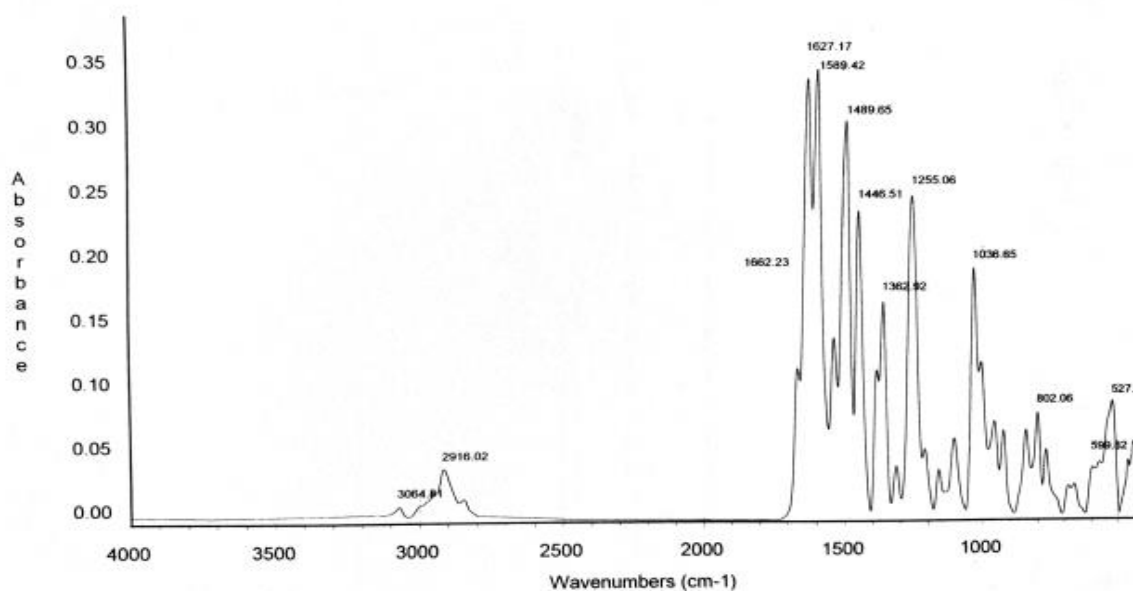
Figure S49. ^1H -NMR spectrum of 7b15. IR, ^1H -NMR spectrum of 7c

Figure S50. IR spectrum of 7c

Figure S51. $^1\text{H-NMR}$ spectrum of **7c**16. IR, $^1\text{H-NMR}$, LC-MS spectrum of **7d**Figure S52. IR spectrum of **7d**

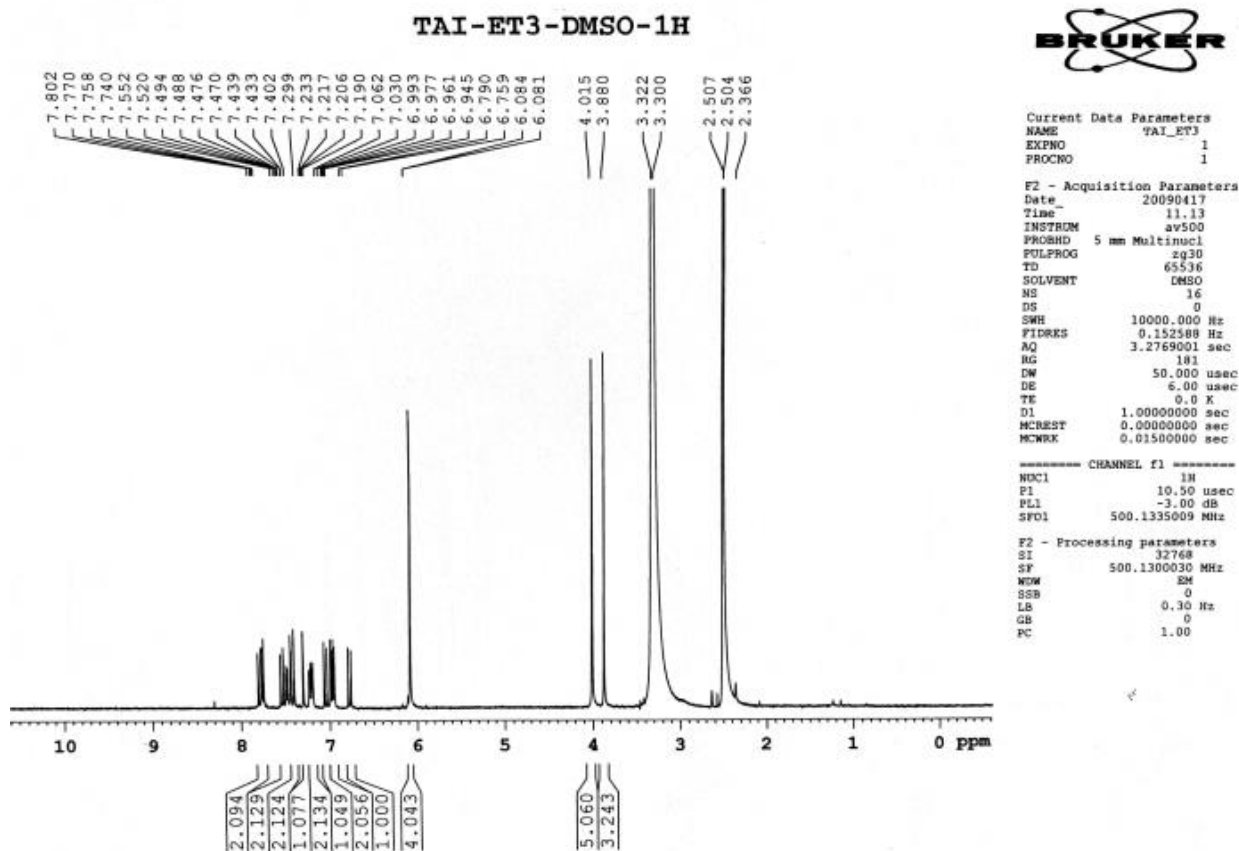
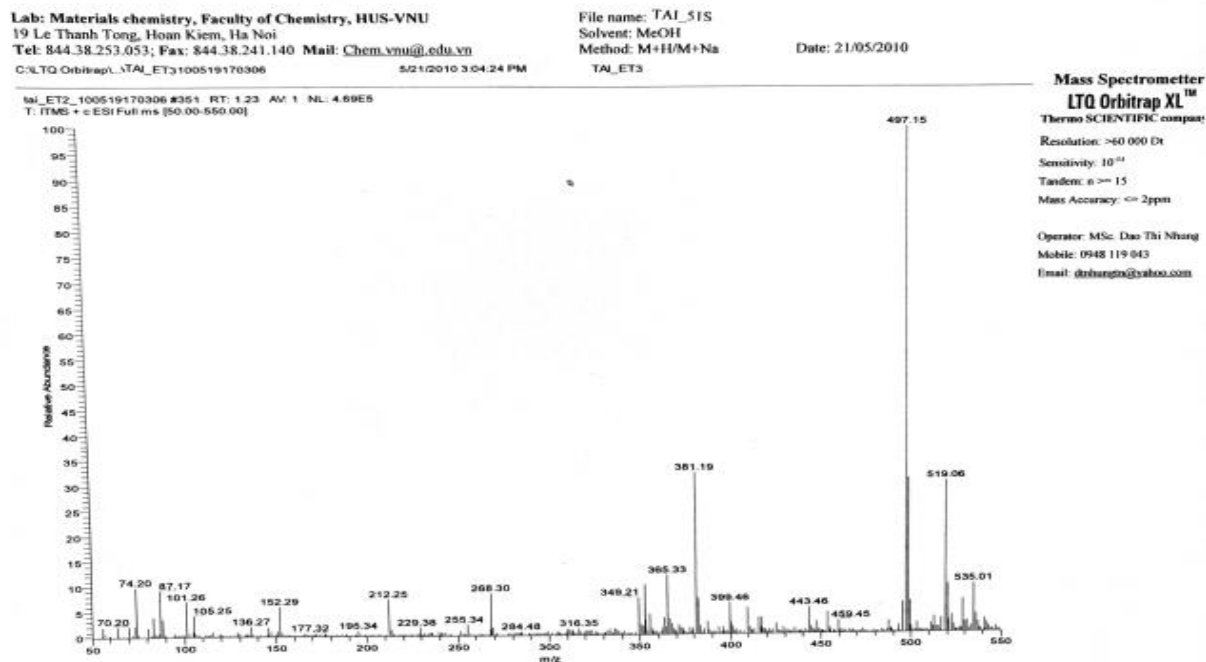
Figure S53. $^1\text{H-NMR}$ spectrum of 7d

Figure S54. LC-MS spectrum of 7d

17. IR, $^1\text{H-NMR}$, HR-MS spectrum of 10a

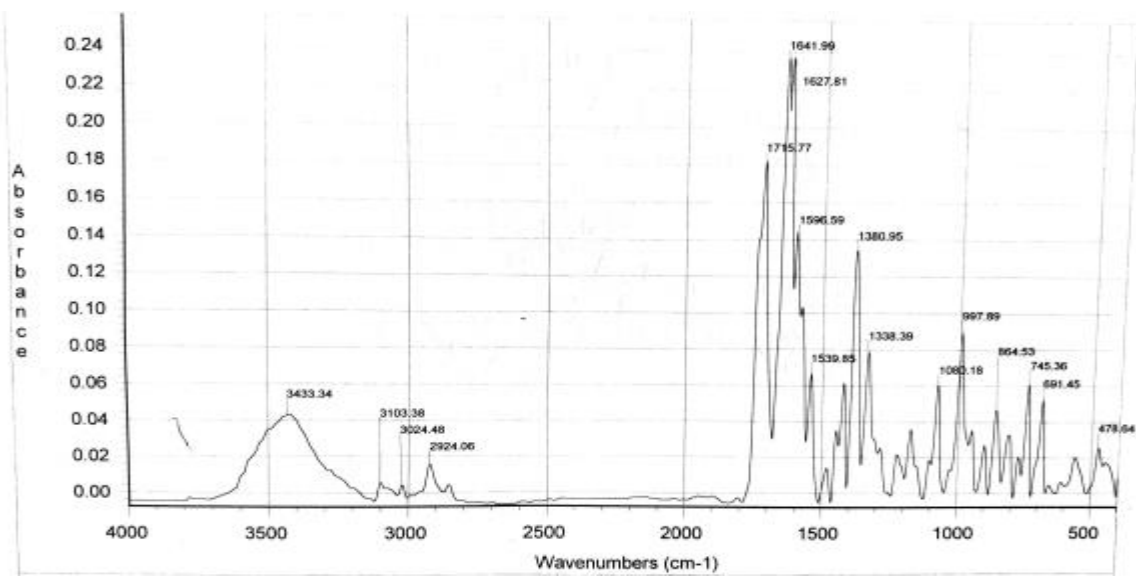
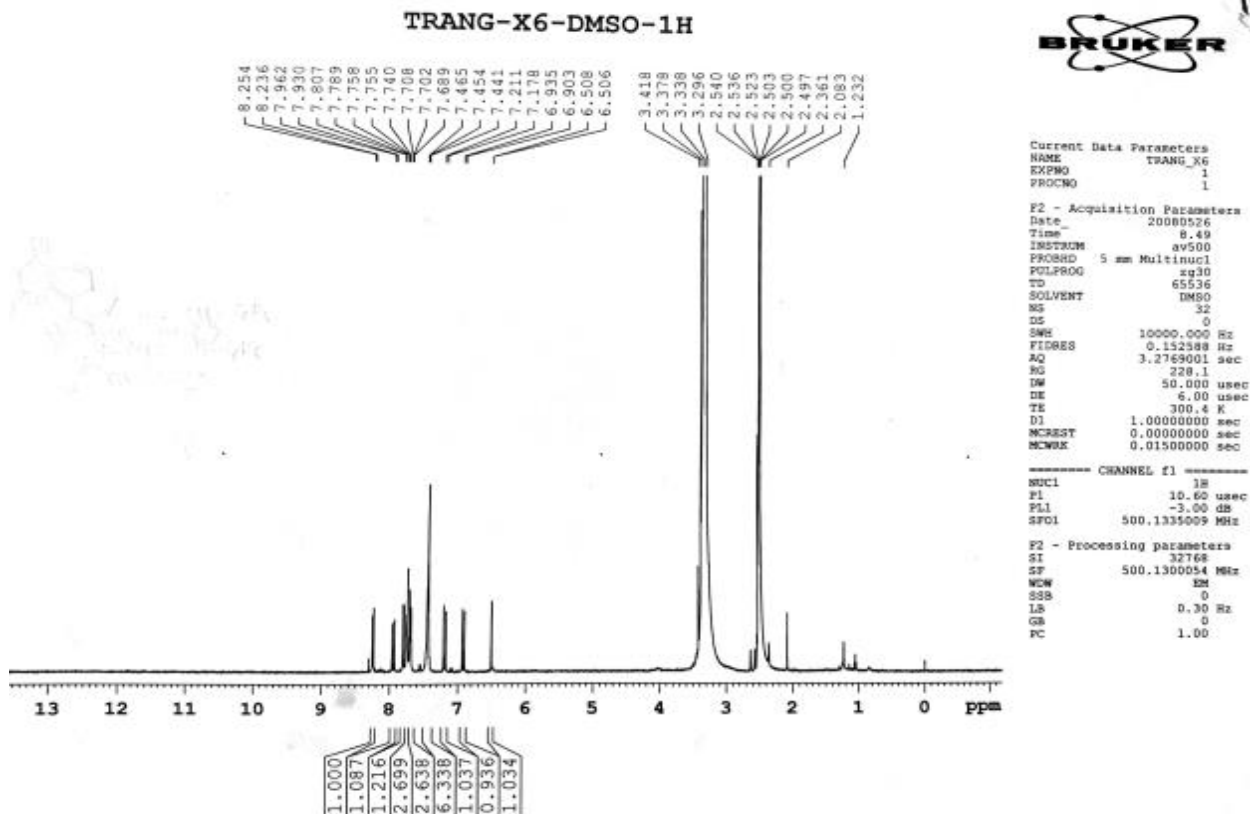


Figure S55. IR spectrum of 10a

Figure S56. ¹H-NMR spectrum of 10a

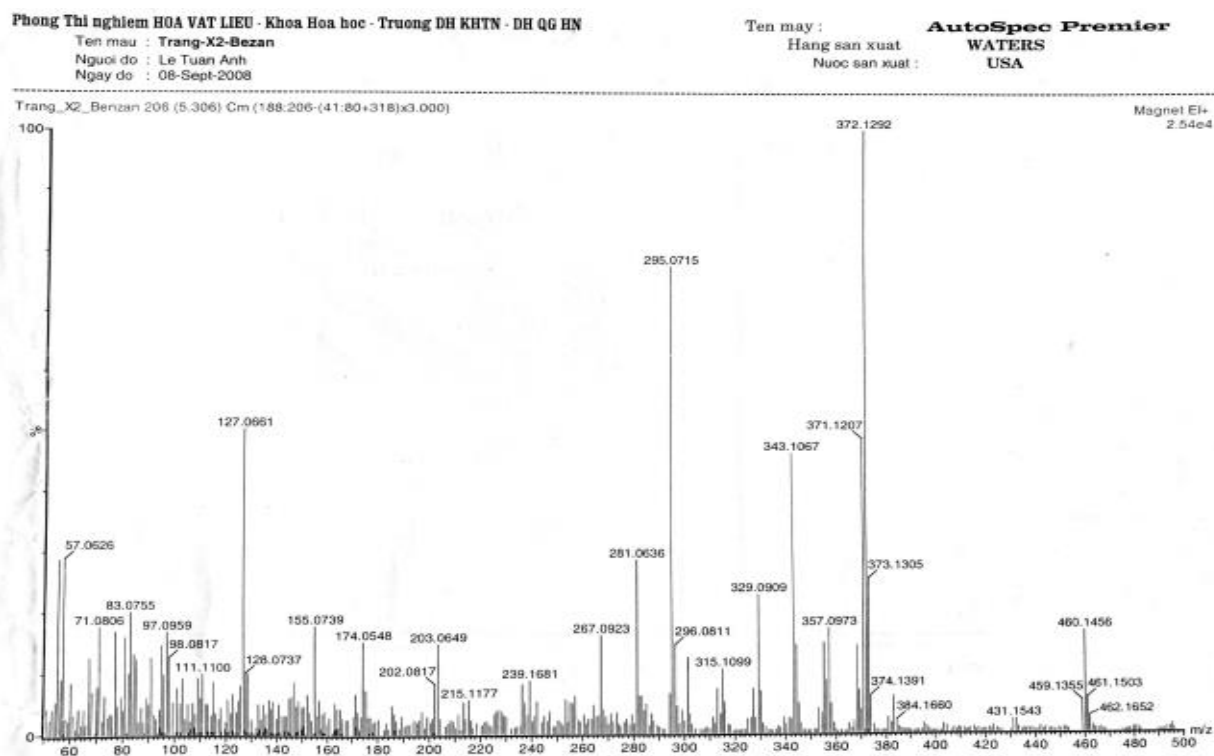


Figure S57. HR-MS spectrum of 10a

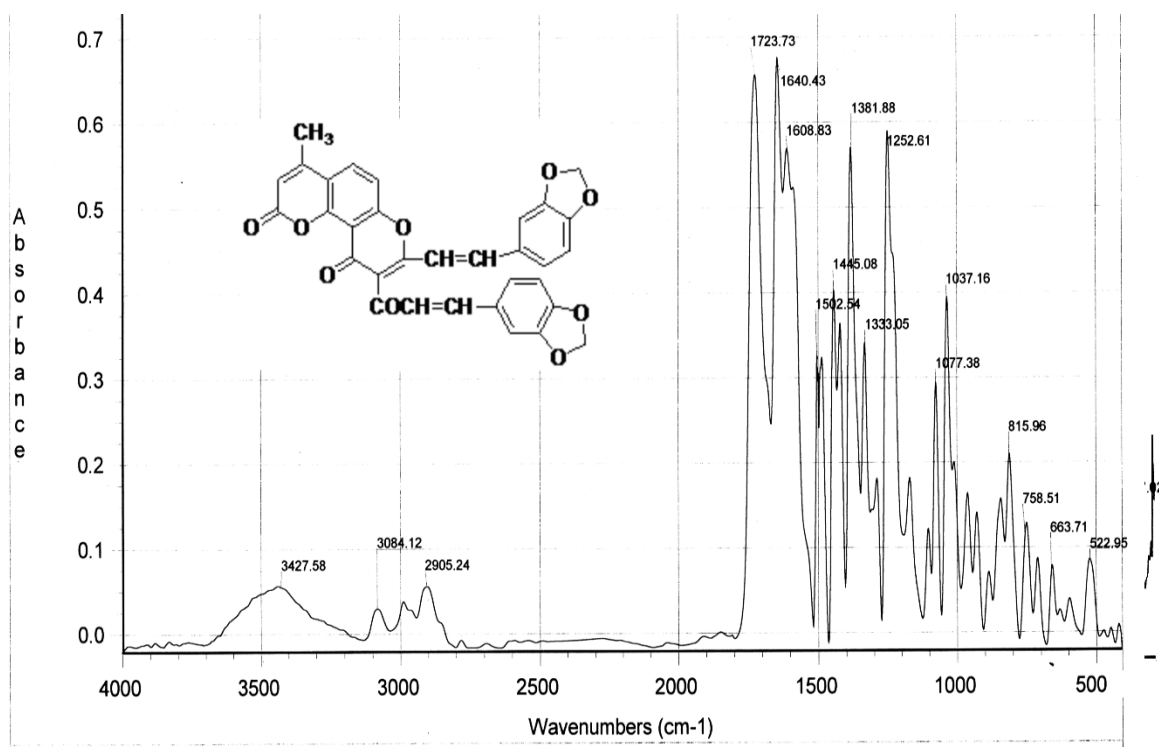
18. IR, ¹H-NMR, HR-MS spectrum of 10b

Figure S58. IR spectrum of 10b

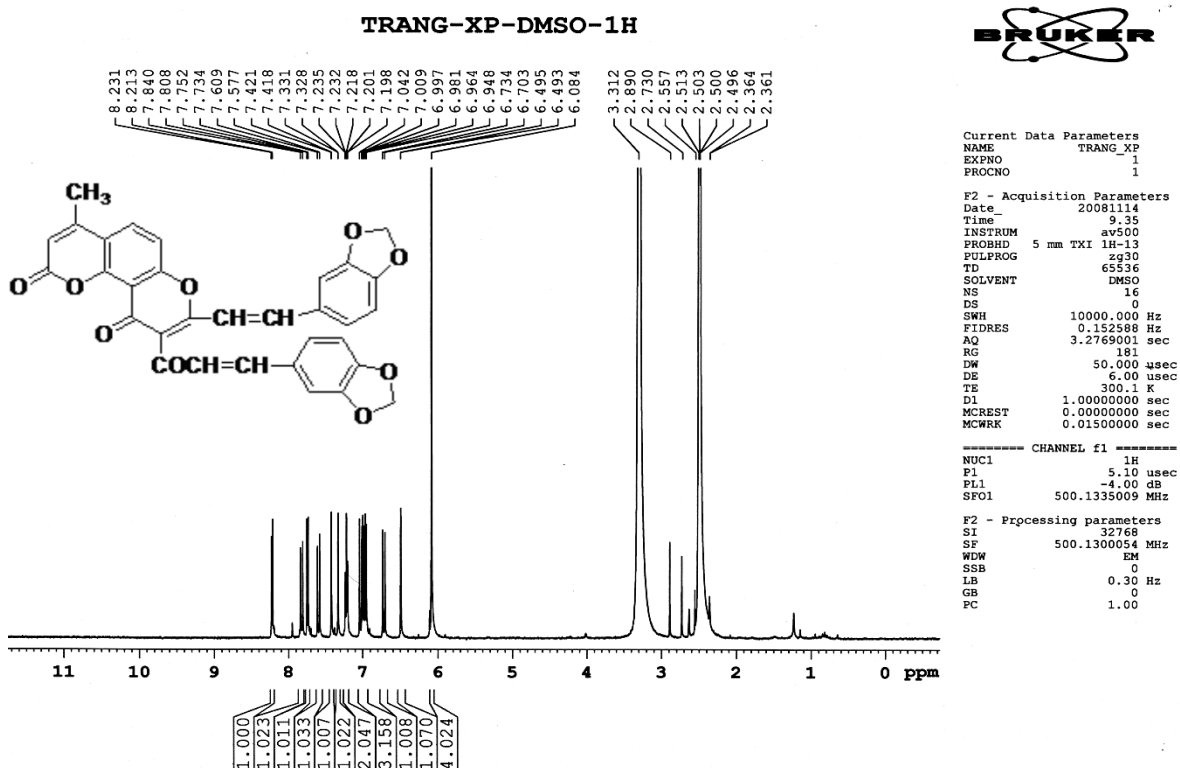
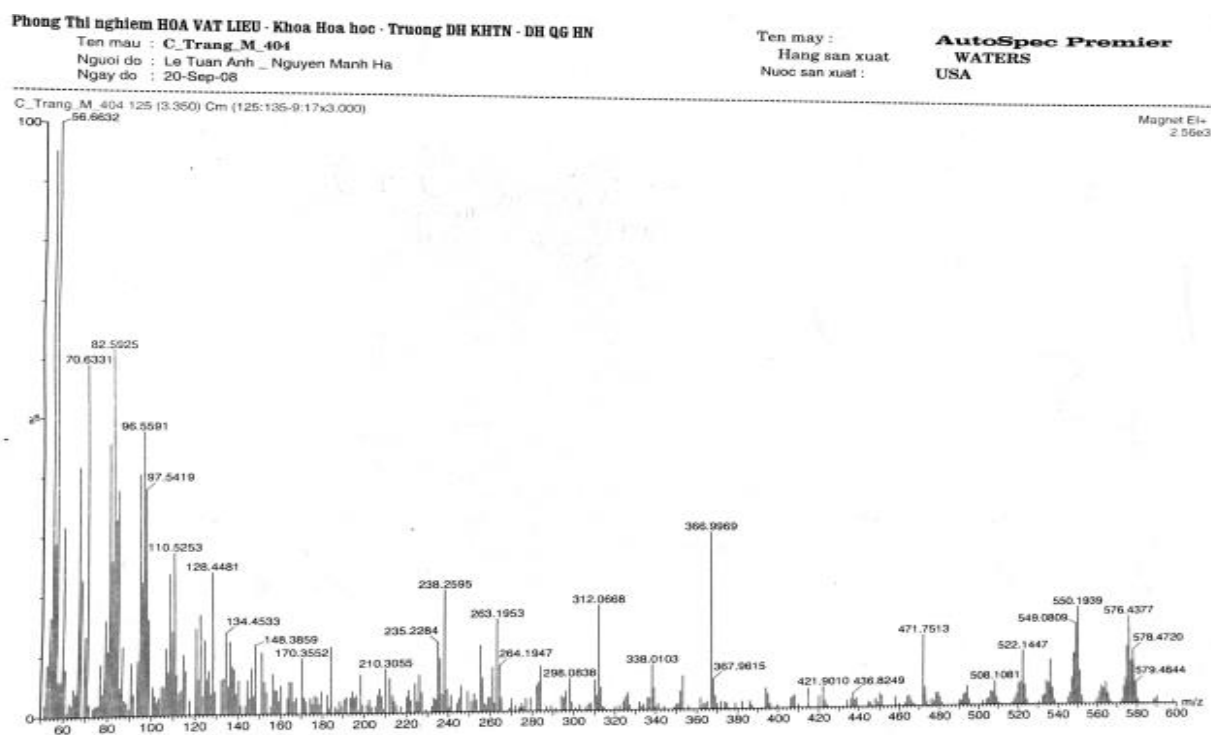
Figure S59. ¹H-NMR spectrum of 10b

Figure S60. HR-MS spectrum of 10b

19. IR, NMR, MS spectrum of 13a

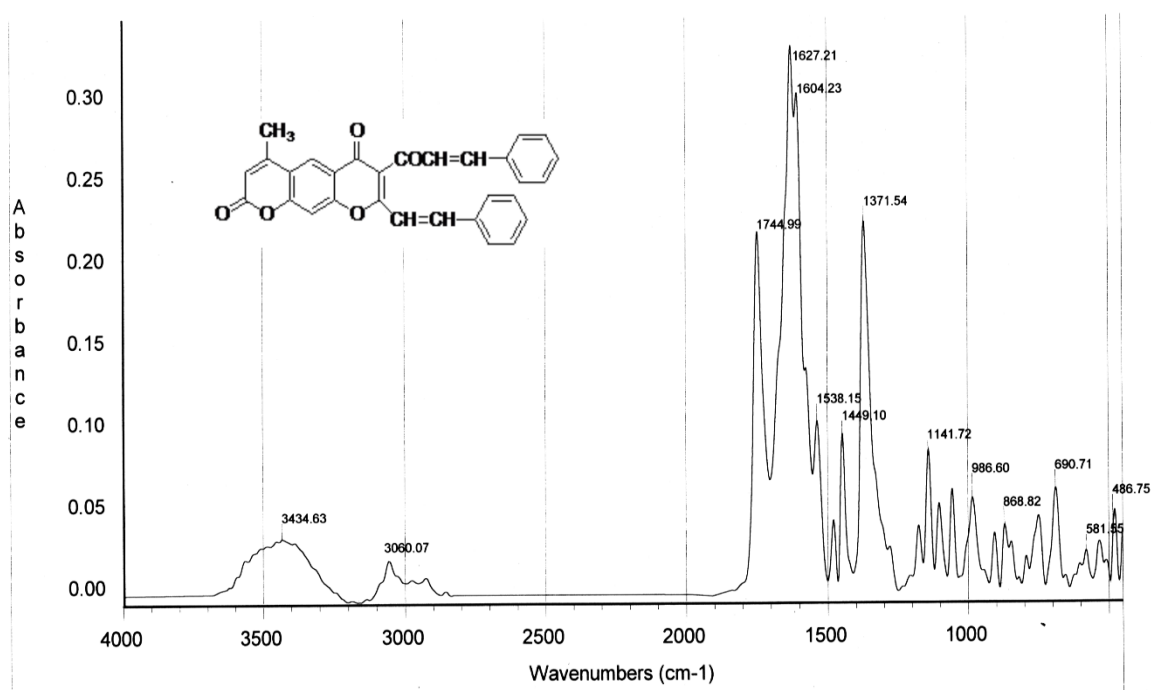
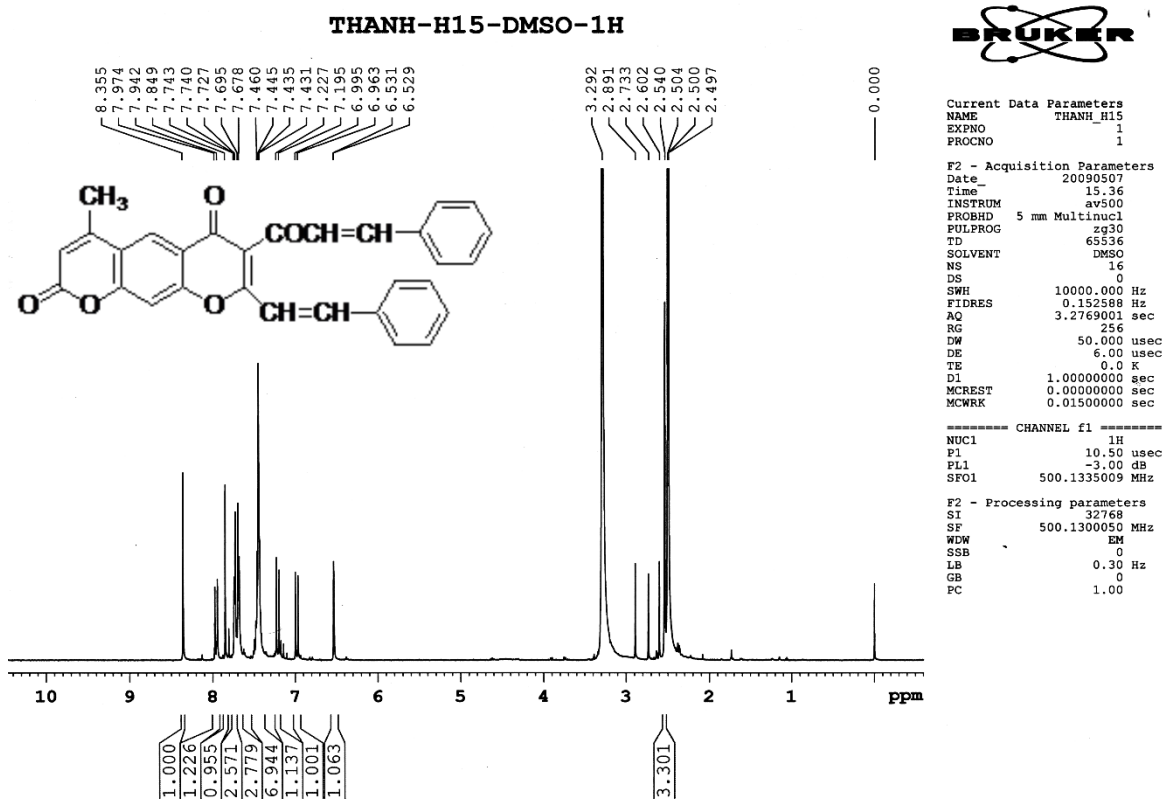


Figure S61. IR spectrum of 13a

Figure S62. ¹H-NMR spectrum of 13a

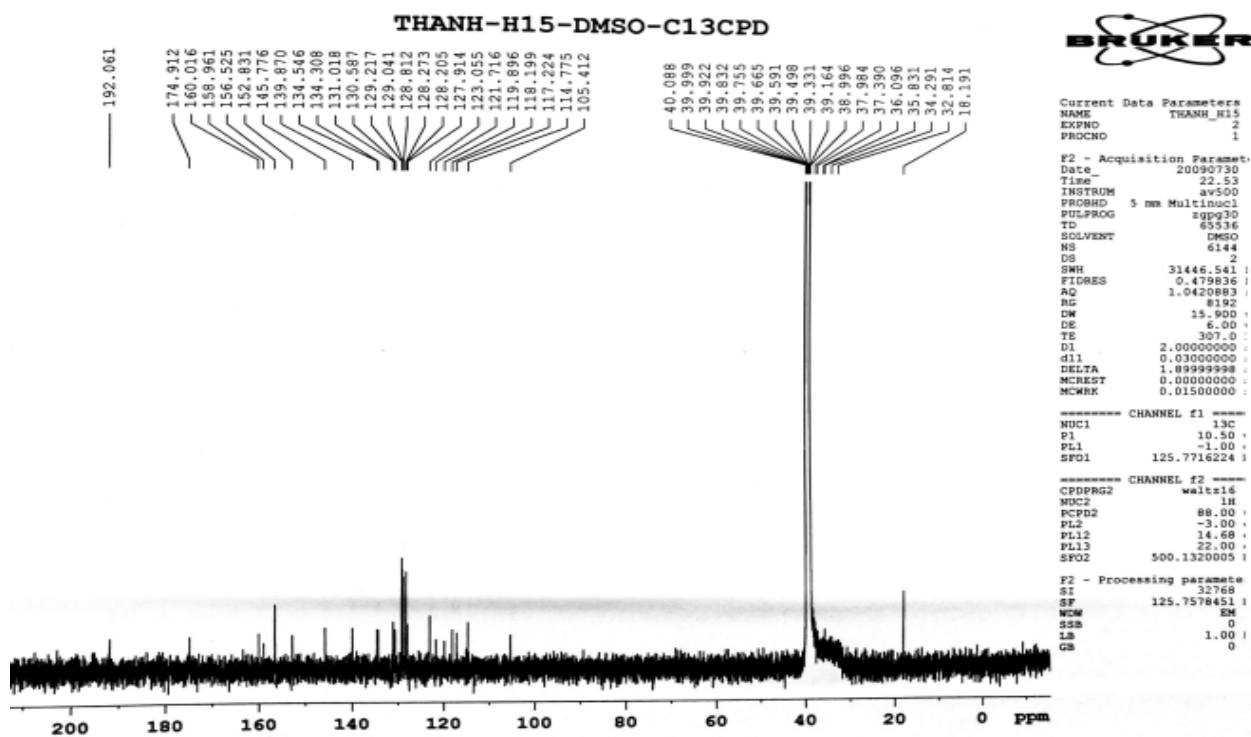
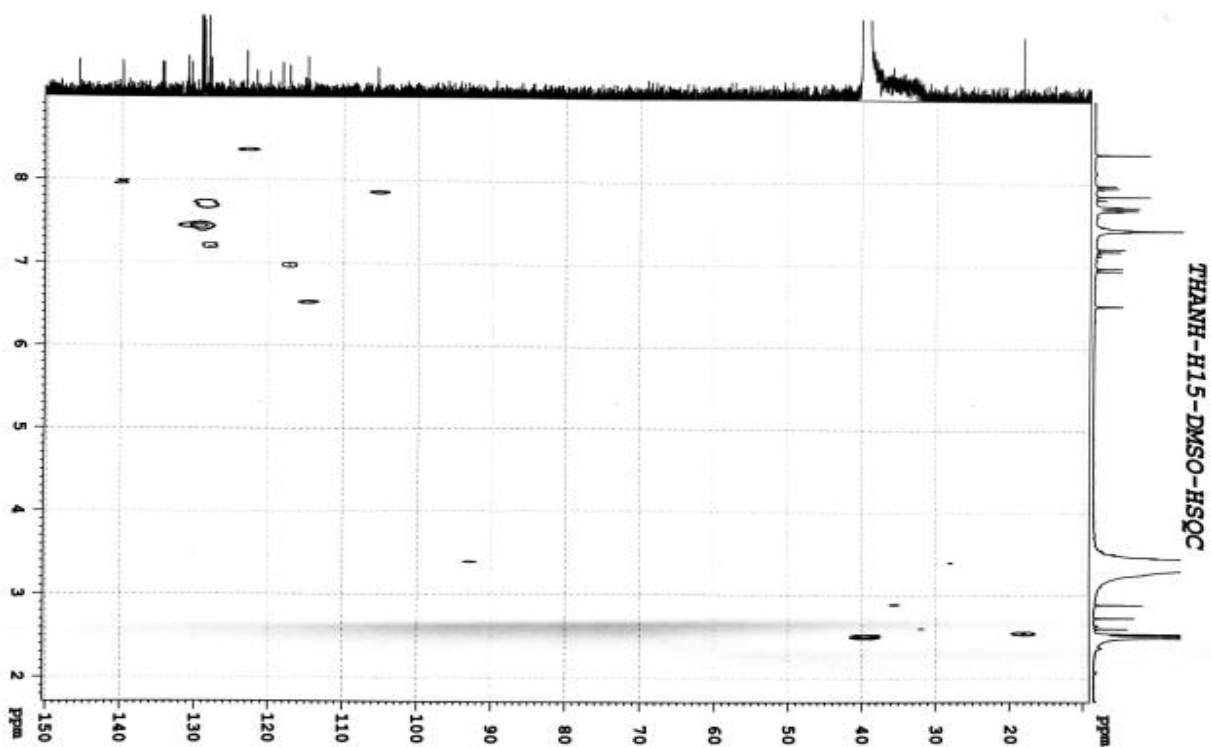
Figure S63. ^{13}C -NMR spectrum of 13a

Figure S64. HSQC spectrum of 13a

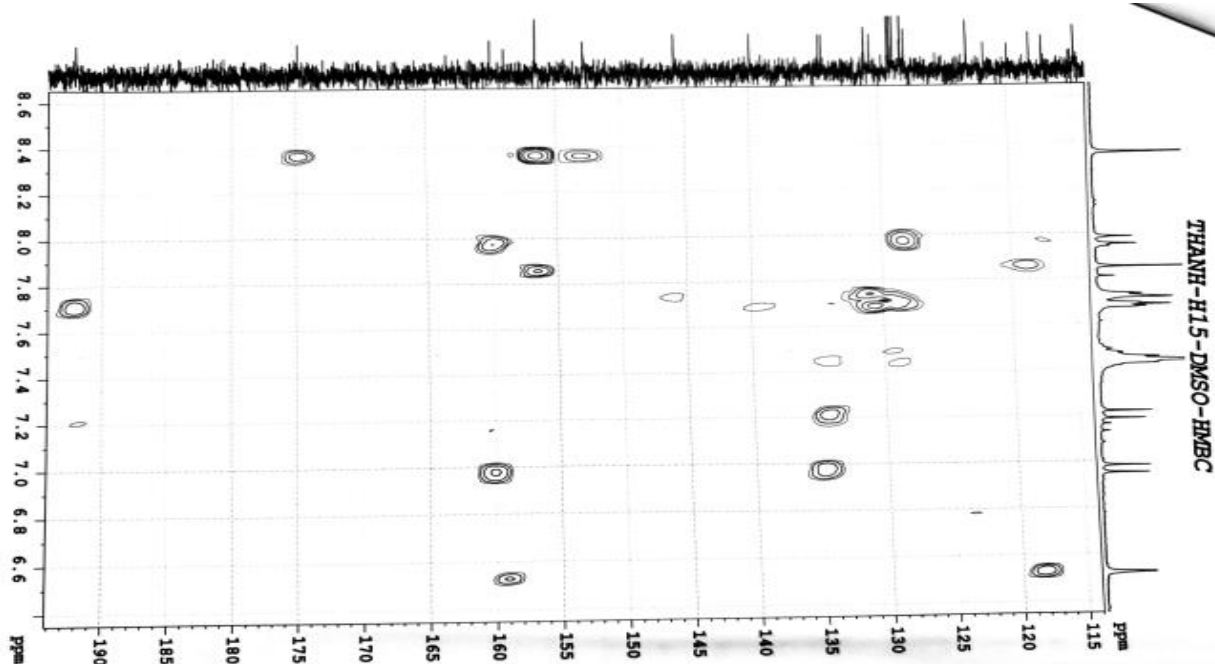


Figure S65. HMBC spectrum of 13a

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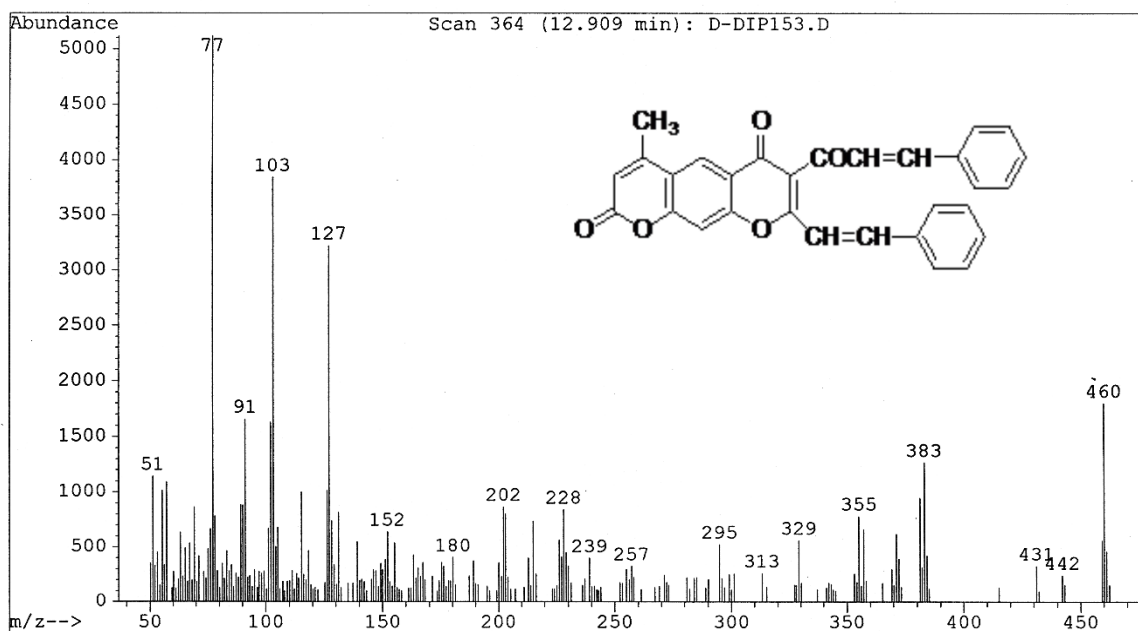


Figure S66. MS spectrum of 13a

20. IR, ¹H-NMR spectrum of 13b

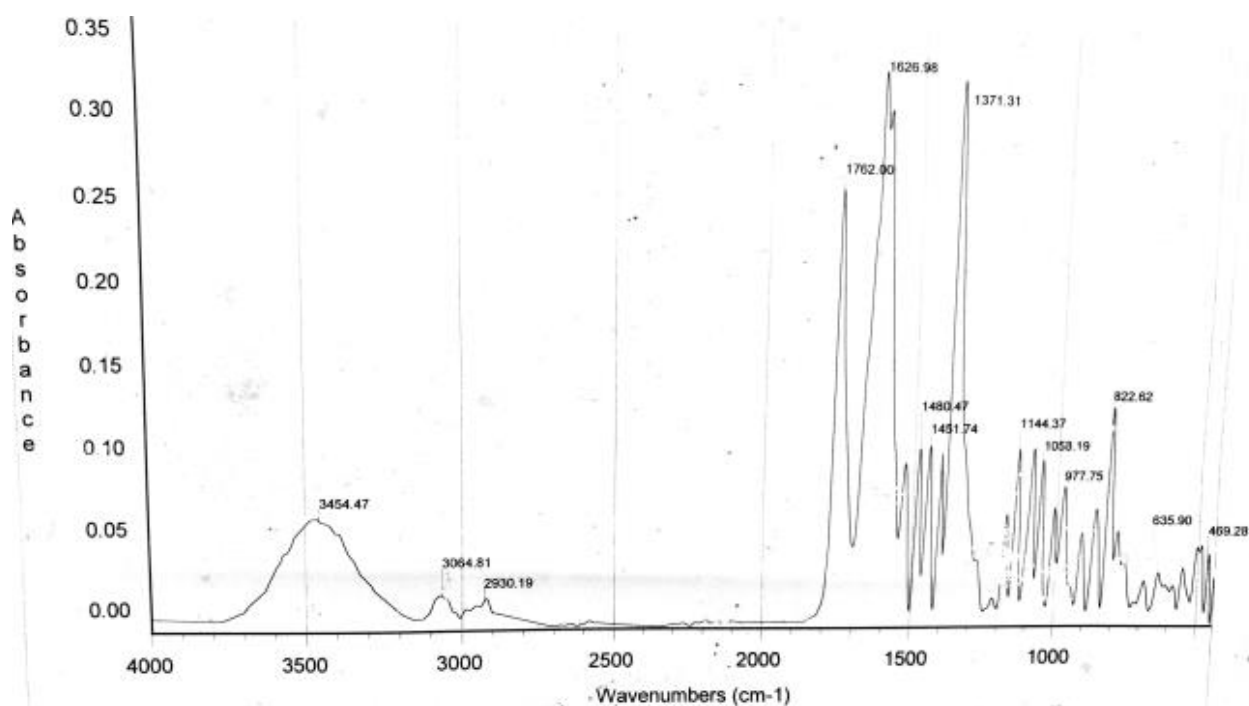
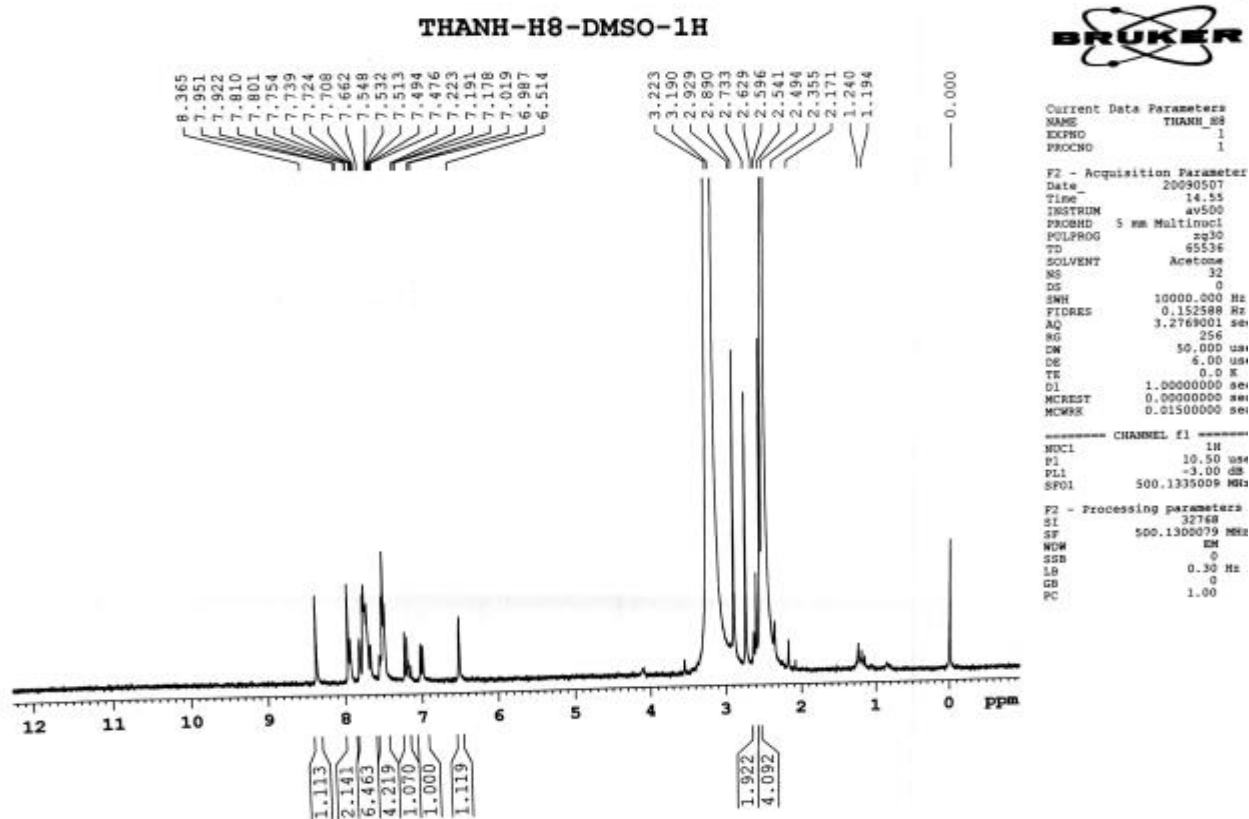


Figure S67. IR spectrum of 13b

Figure S68. $^1\text{H-NMR}$ spectrum of 13b